Security zSecure Command Verifier
Version 2.1.0

User Guide

SC27-5648-00

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User Guide

IBM

SC27-5648-00

Note

Before using this information and the product it supports, read the information in “Notices” on page 199.

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This edition applies to version 2, release 1, modification 0 of the IBM Security zSecure Command Verifier (product number 5655-N19). It also applies to all subsequent releases and modifications until otherwise indicated in new editions.

Contents

About this publication

This publication provides information about installing and using IBM® Security zSecure™ Command Verifier. IBM Security zSecure Command Verifier protects RACF® mainframe security by enforcing RACF policies as RACF commands are entered. The first three chapters provide an overview of the product purpose and product function along with installation instructions. The remaining chapters describe the auditing facilities and the installation policy profiles and provide reference information for policy definitions and messages.

Note: The installation policy controls described in this publication supersede the IBM Security zSecure Command Verifier exits that were provided as samples in previous releases.

This manual does not provide instructions for using RACF. However, you can find RACF documentation resources listed in "Related documentation" on page ix.

Intended audience

This publication is intended for the following people:

- Systems support personnel responsible for the installation of IBM Security zSecure Command Verifier. SeeChapter 3, "zSecure Command Verifier installation," on page 11.
- Security administrators responsible for implementing the additional RACF command controls provided by IBM Security zSecure Command Verifier. See Chapter 5, "Policy profiles," on page 41.
- Auditors responsible for designing and creating reports about RACF commands as issued or executed by terminal users. See the following sections:
  - Chapter 1, "Introduction," on page 1
  - Chapter 2, "Product overview," on page 7
  - Chapter 4, "Functions for auditing commands and policy effects," on page 21
  - Chapter 5, "Policy profiles," on page 41

The IBM Security zSecure Command Verifier policies are implemented from RACF profiles. Readers must be familiar with RACF concepts and the RACF commands. People implementing the policies must have a thorough understanding of regular RACF (generic) profiles and RACF command keywords.

What this publication contains

This publication contains the following chapters:

Chapter 1, "Introduction," on page 1
Introduces IBM Security zSecure Command Verifier, what it is, and what it does.

Chapter 2, "Product overview," on page 7
Describes how this product is implemented and provides an overview of RACF commands.

Chapter 3, "zSecure Command Verifier installation," on page 11
Provides the installation procedure for IBM Security zSecure Command Verifier.

Chapter 4, "Functions for auditing commands and policy effects," on page 21
Describes the auditing functions of IBM Security zSecure Command Verifier.

Chapter 5, "Policy profiles," on page 41
Explains the policy profiles that IBM Security zSecure Command Verifier uses.

Access to publications and terminology

This section provides:
- A list of publications in the "IBM Security zSecure library."
- Links to "Online publications" on page viii.
- A link to the "IBM Terminology website" on page viii.

IBM Security zSecure library

The following documents are available online in the IBM Security zSecure library:
- *IBM Security zSecure Release information*

  For each product release, the release information topics provide information about new features and enhancements, incompatibility warnings, and documentation update information for the IBM Security zSecure products. You can obtain the most current version of the release information at http://publib.boulder.ibm.com/infocenter/tivihelp/v2r1/index.jsp?topic=/com.ibm.zsecure.doc_2.1/welcome.htm.
- *IBM Security zSecure CARLa-Driven Components Installation and Deployment Guide*, SC27-5638

  Provides information about installing and configuring the following IBM Security zSecure components:
  - IBM Security zSecure Admin
  - IBM Security zSecure Audit for RACF, CA-ACF2, and CA-Top Secret
  - IBM Security zSecure Alert for RACF and ACF2
  - IBM Security zSecure Visual for RACF
  - IBM Tivoli® Compliance Insight Manager Enabler for z/OS®
- *IBM Security zSecure Admin and Audit for RACF Getting Started*, GI13-2324

  Provides a hands-on guide introducing IBM Security zSecure Admin and IBM Security zSecure Audit product features and user instructions for performing standard tasks and procedures. This manual is intended to help new users develop both a working knowledge of the basic IBM Security zSecure Admin and Audit for RACF system functionality and the ability to explore the other product features that are available.
- *IBM Security zSecure Admin and Audit for RACF User Reference Manual*, LC27-5639

  Describes the product features for IBM Security zSecure Admin and IBM Security zSecure Audit. Includes user instructions to run the features from ISPF panels, RACF administration and audit user documentation with both general and advanced user reference material for the CARLa command language and the SELECT/LIST fields. This manual also provides troubleshooting resources and instructions for installing the zSecure Collect for z/OS component. This publication is only available to licensed users.
- *IBM Security zSecure Audit for ACF2 Getting Started*, GI13-2325

  Describes the IBM Security zSecure Audit for ACF2 product features and provides user instructions for performing standard tasks and procedures such as analyzing Logon IDs, Rules, and Global System Options, and running reports. The manual also includes a list of common terms for those not familiar with ACF2 terminology.

- *IBM Security zSecure Audit for ACF2 User Reference Manual*, LC27-5640

  Explains how to use IBM Security zSecure Audit for ACF2 for mainframe security and monitoring. For new users, the guide provides an overview and conceptual information about using ACF2 and accessing functionality from the ISPF panels. For advanced users, the manual provides detailed reference information including message and return code lists, troubleshooting tips, information about using zSecure Collect for z/OS, and details about user interface setup. This publication is only available to licensed users.
- *IBM Security zSecure Audit for Top Secret User Reference Manual*, LC27-5641

  Describes the IBM Security zSecure Audit for Top Secret product features and provides user instructions for performing standard tasks and procedures.
- *IBM Security zSecure Alert User Reference Manual*, SC27-5642

  Explains how to configure, use, and troubleshoot IBM Security zSecure Alert, a real-time monitor for z/OS systems protected with the Security Server (RACF) or CA-ACF2.
- *IBM Security zSecure Command Verifier User Guide*, SC27-5648

  Explains how to install and use IBM Security zSecure Command Verifier to protect RACF mainframe security by enforcing RACF policies as RACF commands are entered.
- *IBM Security zSecure CICS Toolkit User Guide*, SC27-5649

  Explains how to install and use IBM Security zSecure CICS® Toolkit to provide RACF administration capabilities from the CICS environment.
- *IBM Security zSecure Messages Guide*, SC27-5643

  Provides a message reference for all IBM Security zSecure components. This guide describes the message types associated with each product or feature, and lists all IBM Security zSecure product messages and errors along with their severity levels sorted by message type. This guide also provides an explanation and any additional support information for each message.
- *IBM Security zSecure Quick Reference*, SC27-5646

  This booklet summarizes the commands and parameters for the following IBM Security zSecure Suite components: Admin, Audit, Alert, Collect, and Command Verifier. Obsolete commands are omitted.
- *IBM Security zSecure Visual Client Manual*, SC27-5647

  Explains how to set up and use the IBM Security zSecure Visual Client to perform RACF administrative tasks from the Windows-based GUI.
- *IBM Security zSecure Documentation CD*, LCD7-5373

  Supplies the IBM Security zSecure documentation, which contains the licensed and unlicensed product documentation. The *IBM Security zSecure: Documentation CD* is only available to licensed users.
- *Program Directory: IBM Security zSecure CARLa-Driven Components*, GI13-2277

  This program directory is intended for the system programmer responsible for program installation and maintenance. It contains information concerning the material and procedures associated with the installation of IBM Security zSecure CARLa-Driven Components: Admin, Audit, Visual, Alert, and the IBM Tivoli Compliance Insight Manager Enabler for z/OS. Program directories are provided with the product tapes. You can also download the latest copy from the IBM

Security zSecure documentation website at http://publib.boulder.ibm.com/infocenter/tivihelp/v2r1/index.jsp?topic=/com.ibm.zsecure.doc_2.1/welcome.html.

- *Program Directory: IBM Security zSecure CICS Toolkit*, GI13-2282

  This program directory is intended for the system programmer responsible for program installation and maintenance. It contains information concerning the material and procedures associated with the installation of IBM Security zSecure CICS Toolkit. Program directories are provided with the product tapes. You can also download the latest copy from the IBM Security zSecure documentation website at http://publib.boulder.ibm.com/infocenter/tivihelp/v2r1/index.jsp?topic=/com.ibm.zsecure.doc_2.1/welcome.html.
- *Program Directory: IBM Security zSecure Command Verifier*, GI13-2284

  This program directory is intended for the system programmer responsible for program installation and maintenance. It contains information concerning the material and procedures associated with the installation of IBM Security zSecure Command Verifier. Program directories are provided with the product tapes. You can also download the latest copy from the IBM Security zSecure documentation website at http://publib.boulder.ibm.com/infocenter/tivihelp/v2r1/index.jsp?topic=/com.ibm.zsecure.doc_2.1/welcome.html.
- *Program Directory: IBM Security zSecure Admin RACF-Offline*, GI13-2278

  This program directory is intended for the system programmer responsible for program installation and maintenance. It contains information concerning the material and procedures associated with the installation of the IBM Security zSecure Admin RACF-Offline component of IBM Security zSecure Admin. Program directories are provided with the product tapes. You can also download the latest copy from the IBM Security zSecure documentation website at http://publib.boulder.ibm.com/infocenter/tivihelp/v2r1/index.jsp?topic=/com.ibm.zsecure.doc_2.1/welcome.html.

Online publications

IBM posts product publications when the product is released and when the publications are updated at the following locations:

IBM Security zSecure library
: The product documentation site (http://publib.boulder.ibm.com/infocenter/tivihelp/v2r1/index.jsp?topic=/com.ibm.zsecure.doc_2.1/welcome.html) displays the welcome page and navigation for the library.

IBM Security Systems Documentation Central
: IBM Security Systems Documentation Central provides an alphabetical list of all IBM Security Systems product libraries and links to the online documentation for specific versions of each product.

IBM Publications Center
: The IBM Publications Center site (http://www.ibm.com/e-business/linkweb/publications/servlet/pbi.wss) offers customized search functions to help you find all the IBM publications you need.

IBM Terminology website

The IBM Terminology website consolidates terminology for product libraries in one location. You can access the Terminology website at http://www.ibm.com/software/globalization/terminology.

Related documentation

If you are using IBM Security zSecure products in a RACF environment, you can find RACF user and reference information in several IBM manuals. The RACF commands and the implications of the various keywords can be found in the *RACF Command Language Reference* and the *RACF Security Administrator's Guide*. Information about writing other RACF exits can be found in the *RACF System Programmer's Guide*. Information about auditing RACF can be found in the *RACF Auditor's Guide*. You can access this documentation from the z/OS internet library available at http://www.ibm.com/systems/z/os/zos/bkserv/.

For information about incompatibilities, see the **Incompatibility** section under **Release Information** on the IBM Security zSecure documentation website at http://publib.boulder.ibm.com/infocenter/tivihelp/v2r1/index.jsp?topic=/com.ibm.zsecure.doc_2.1/welcome.html.

Table 1. Further information about RACF administration, auditing, programming, and commands

Manual	Order Number
z/OS V1 Security Server RACF Command Language Reference	SA22-7687
z/OS V1 Security Server RACF System Administrator's Guide	SA22-7683
z/OS V1 Security Server RACF Auditor's Guide	SA22-7684
z/OS V1 Security Server RACF System Programmer's Guide	SA22-7681
z/OS MVS™ System Commands	SA22-7627

Accessibility

Accessibility features help users with a physical disability, such as restricted mobility or limited vision, to use software products successfully. With this product, you can use assistive technologies to hear and navigate the interface. You can also use the keyboard instead of the mouse to operate all features of the graphical user interface.

Technical training

For technical training information, see the following IBM Education website at http://www.ibm.com/software/tivoli/education.

Support information

IBM Support provides assistance with code-related problems and routine, short duration installation or usage questions. You can directly access the IBM Software Support site at http://www.ibm.com/software/support/probsub.html.

Statement of Good Security Practices

IT system security involves protecting systems and information through prevention, detection and response to improper access from within and outside your enterprise. Improper access can result in information being altered, destroyed, misappropriated or misused or can result in damage to or misuse of your systems, including for use in attacks on others. No IT system or product should be considered completely secure and no single product, service or security measure can be completely effective in preventing improper use or access. IBM systems, products and services are designed to be part of a comprehensive security approach, which will necessarily involve additional operational procedures, and may require other systems, products or services to be most effective. IBM DOES NOT WARRANT THAT ANY SYSTEMS, PRODUCTS OR SERVICES ARE IMMUNE FROM, OR WILL MAKE YOUR ENTERPRISE IMMUNE FROM, THE MALICIOUS OR ILLEGAL CONDUCT OF ANY PARTY.

Chapter 1. Introduction

Resources and users in the MVS Operating System can be described in RACF using RACF profiles.

Each resource in the system, whether it is a data set, a CICS transaction, or something else, can be described in RACF through a resource profile.

Historically, RACF separates data sets from other types of resources, called General Resources. This separation is also reflected in the RACF command syntax, where two distinct sets of commands are being used: one for data sets and one for general resources.

A user profile describes a user. For efficiency purposes, users are collected into RACF *groups*. These groups can be used for the following purposes:
- To access resources
- To authorize to modify profiles

Access to the resources is controlled through the resource profiles. These resource profiles can be discrete or generic.
- One *discrete* profile describes exactly one resource.
- One *generic* profile describes zero or multiple different resources.

People mostly use generic profiles. The resource profiles contain a universal access, or UACC, and two forms of Access List, or ACL. The UACC controls the access that everybody has, provided the user is not specified in the ACL. The Standard ACL is a list of users and groups and their respective access. The Conditional ACL is a list of users and some condition, such as program, terminal, or console, which is combined with their corresponding access rights.

Authorization to modify profiles is based on ownership of the profile. The owner of a profile must be an existing RACF user or group. If you specify a user as the owner, then only that particular user is authorized to maintain the profile. If you specify a group as the owner, then all people with administrative authorization in the group `group-SPECIAL` can maintain the profile.

Like users and resources, groups are described in RACF by using profiles. These group profiles have an owner. The owner of a group profile can authorize people to modify the definition of the group. However, when `group-SPECIAL` is used as the authorization method, then `group-SPECIAL` user also has authorization over many of the subgroups of the group. You can find more information about this percolation of `group-SPECIAL` authority in the *RACF Security Administrator's Guide*. See the information about user attributes at the group level in the chapter about defining groups and users.

Authorization to define, modify, and delete RACF profiles is based on the RACF profile itself. Sometimes, other authorizations such as `system-SPECIAL` can be used as well; but these authorizations are not standard authorizations available to regular users. However, RACF does not often control the change or the new value you store into the profile in any way. For instance, if you are the owner of a group, you can connect any user in the system to your group. RACF does not verify which users you are connecting or removing. Another example is changing the owner and ACL of a profile. If you are the owner, you can specify any other user or group to be the new owner. In effect, you can give away any profile you own to anyone.

These examples are typical of the types of actions that an installation might want to prevent from occurring. Often, you want to control which of the profiles that are provided by RACF and attributes are being changed and to what they are being changed. For example, you might want to specify that an authorized user can change the Owner value to `Mary` but not to `Joe`. With IBM Security zSecure Command Verifier, you can control the new value of any field, option, or attribute of any profile.

RACF commands

Using the RACF commands, you can add, change, or delete RACF profiles and define system-wide options.

Only users that are defined by RACF can issue RACF commands. Although you can issue most RACF commands, RACF verifies that you are authorized to issue the command against the profile that is specified in the command. Most of the RACF commands can be issued from the TSO environment. In addition, there are some RACF commands that can be issued only from the MVS operator console. The TSO RACF commands are no longer restricted to the TSO environment. The commands can also be issued from the operator console, the RACF Parameter Library, and an R-Admin RACF Callable Service. When issued from the operator console, the console operator must be logged on, and the authorization is based on the user ID of the operator.

Historically, RACF commands are grouped by the type of profile. This grouping is still useful for users and groups, but less so for data sets and the General Resources. In particular, the **`PERMIT`** command often confuses people when they try to authorize access to a general resource profile. The long history of RACF can be seen in the implementation of discrete profiles and the user attributes that can be used to automatically set data set attributes like UACC. Using the RACF ISPF panel interface alleviates some of the problems that are caused by the history and compatibility with an earlier version of RACF.

Some command-related problems are caused by the basic philosophy of RACF:

> The owner of a profile can change any attribute of the profile if changing the attribute does not increase the authority or access of the owner itself.

As mentioned before, some installations do not want to allow their users this freedom. Users can change the access rules to effectively disable RACF access control for their resources. You can reduce this exposure by disallowing the RACF commands entirely. This task can be done through RACF program protection of the RACF commands), or through coding of exits. Both solutions have their problems. Disallowing the commands prevents legitimate changes that an owner of a resource might want to make. The standard RACF exits often do not provide the amount of control that is required by the installation. See “RACF command exits” on page 3. Subsequent sections describe how zSecure Command Verifier introduces an extra flexible control point.

RACF command exits

There are several types of RACF exits. The first category consists of exits that are not even RACF exits, but MVS exits: The System Authorization Facility (SAF) exits. These exits are started for all instances in which any system component needs a function that is provided by the security product. However, for most of the RACF commands, these exits are not started because there is not yet any profile to be verified. In other situations, the RACF command does the verification itself, based on information already in storage, or retrieved directly from the RACF database.

The second category of exits consists of the RACF SVC-processing exits. During RACF SVC-processing, a preprocessing and a post-processing exit are started. RACF SVC-processing comprises the following RACROUTE requests: `AUTH`, `VERIFY`, `DEFINE`, `LIST`, and `FASTAUTH`. These exits are primarily intended to change the behavior of RACF for these functions in a limited way. It is possible to misuse these exits and include more processing, but that is not an intended function of the exit. In addition, some RACF commands do not use the specific `RACROUTE` requests that use these exits.

A third category of exits is that for data set naming conventions. As the name implies, these exits are only started during RACF command processing if a data set name is present or implied. Examples are the **`DELUSER`** and **`DELGROUP`** commands that must verify whether data set profiles still exist for the user or group. However, for the **`ALTUSER`** and **`ADDUSER`** commands, no data set profile is involved, and thus none of these exits is called.

The next category of exits comprises the password-related exits. The new password exit is called only when a password or password interval is changed. The encryption exit is called when the new password must be encrypted in the RACF database. These exits are not called for those commands that do not involve passwords or other encrypted data.

RACF also provides an ACEE Compression/ Expansion exit, but that exit, similarly to the RACFRW exit, is not relevant to RACF command processing.

Starting with OS/390® Release 3, RACF also provides a Common Command exit. This exit is called for most RACF commands. Before this exit, it was difficult to implement installation controls on RACF commands. Its major disadvantage is that the command string is passed as a single argument, adding all the complexity of parsing and interpreting its contents to the exit. The exit:

- Can either disallow or change the command string.
- Cannot change the command name.
- Cannot generate more commands.

Standard RACF command exits

The *RACF System Programmers Guide* mentions some examples of usage of the RACF exits:

- Controlling password quality
- Permitting access when RACF is inactive
- Protecting the resources of the user from the user
- Restricting a SPECIAL user to resume and password reset

Other purposes for the RACF exits are sometimes used as well. In some installations, RACF exits are used for the following purposes:

- Enforcing a smaller password interval for selected users
- Setting auditing attributes for users with non-standard authorizations
- Preventing changes to the UACC of data sets
- Preventing addition of the user ID "*" to an access list

The password quality control can be done by comparison of the new password against a list of forbidden words or against the characters in the current password. An example is testing for keyboard patterns like QWERTY and LKJHGF, or months like MARCH and APRIL. Comparison against current password can involve things like `more than 3 characters in the same position`. For this second test, an example of an invalid password is QP11AL if the current password is QP10AL.

To facilitate recovery when the RACF database is not available, ensure that the authorization verification pre-processing exit (ICHRCX01) permits access in RACF `FAILSOFT` mode. The tests must involve testing for `FAILSOFT` and for a particular user ID. This exit is not sufficient to allow recovery, but it eliminates replying `Y` or `N` to each data set access.

Another example of the application of ICHRCX01 is preventing a user from unrestricted access to the resources of that user. You can prevent such unrestricted access by changing the data set qualifier to blanks, and thus reducing the access to the value specified in the UACC and Access List of the profile. Similarly, to prevent RACF from automatically putting a user on the access list of a group-data-set profile, an installation can change the data set type to a user-data set, instead of a group-data set. The latter can be done in the exit for the define function (ICHRDX01). If you have OS/390 Release 3 or higher, you can also use the `NOADDCREATOR` option on `SETROPTS`.

For a more detailed description of the three uses of the exits, read the relevant sections of the *RACF System Programmers Guide*. The following description illustrates the more advanced uses of the RACF exits. This example describes an attempt to prevent changes to the UACC of data sets.

Preventing changes to the UACC of data sets involves several RACF exits. The first is the one called during the special form of the `RACROUTE REQUEST=AUTH` issued internally in the RACF commands. In the RACF command processors, it is used to determine access to the RACF profile. On its own, this exit is not enough. It must be combined with the RACF exit called in `RACROUTE REQUEST=DEFINE`. However, even this combination is not foolproof against all possible ways that a user can influence the UACC setting of a data set profile. This example demonstrates that the RACF exits as previously provided by RACF do not allow all kinds of command-related options to be controlled.

For this reason, RACF has a new exit point in OS/390 Release 3. This Common Command exit is called before and after execution of most RACF commands. However, RACF places the following restrictions on this exit:

- The RRSF keywords `AT` and `ONLYAT` are already processed and stripped from the command.
- You cannot check which keywords are by the terminal user because defaults are already supplied.
- You cannot change the command itself.

In addition, coding such an exit is not trivial mainly because the keywords are presented in the form of a long character string. Processing of the TSO command syntax, including parenthesis and quoted strings, is considered a complicated and difficult task by many people. It is partly for this reason that zSecure Command Verifier is an effective way to implement more security controls. Another advantage of zSecure Command Verifier is that no assembler or other programming skills are required. The installation policy rules can be defined by policy profiles. The zSecure Command Verifier takes care of the parsing, verification, error messages, and generation of the audit trail.

Advantages of using zSecure Command Verifier to monitor RACF

zSecure Command Verifier intercepts RACF commands at an earlier stage than most other exits provided by RACF. Thus, the installation can verify keywords on the RACF commands before any significant RACF processing takes place. The installation can also change keywords in such a way that the RACF command processors cannot distinguish these modified keywords from those keywords that are entered by the terminal user. Alternatively, zSecure Command Verifier intercepts at a stage that the normal TSO command keyword prompting can take place. However, this latter feature is not supported. Some keyword validations can be done only during the final processing of the command, and are thus not eligible for terminal prompting.

Although it is possible for the console operator to issue RACF commands, not all operator commands are intercepted by zSecure Command Verifier. zSecure Command Verifier does not intercept the original operator commands like **DISPLAY** and **SIGNOFF**, but it does intercept the other RACF commands like **ALTUSER** and **LISTUSER**.

z/OS also provides a USS callable service to execute RACF functions. This R_Admin service can execute some predefined functions, but also for all TSO RACF commands. These RACF commands are executed in the RACF address space under the authority of the RACF user ID associated with the USS process. It is usually the expected RACF user. Because these commands also start the standard RACF Common Command exit (IRREVX01), they can also be controlled by zSecure Command Verifier.

The current version of zSecure Command Verifier does not differentiate between the various sources of RACF commands or the execution environment. The execution environment includes TSO, Operator command, and RRSF propagated command, or R_Admin command.

Prerequisite software

zSecure Command Verifier requires at least the software levels that are indicated in Table 2 for correct installation and functioning. You might be able to install parts of the product on lower releases of RACF but such usage is not supported. zSecure Command Verifier is tested and supported on the following levels:

Table 2. Required software and levels for zSecure Command Verifier

Product	Supported level
z/OS	1.11 and higher
SMP/E for z/OS	3.5 or later

Chapter 2. Product overview

zSecure Command Verifier is implemented as an exit to the RACF commands. It uses the RACF Common Command exit (IRREVX01).

The zSecure Command Verifier routines are started by the RACF command processor. These routines scan the keywords and parameters as entered by the terminal user and pass to the RACF command processor. Only those keywords that are accepted. In the following description, the user who issues the command is identified as the terminal user. This term also applies to all other methods of issuing RACF commands. For example, issuing a command from the MVS operator console or from a Batch job. The following steps are performed:

1. The command as entered by the terminal user is analyzed and verified. Obvious syntax errors are reported back to the user and the user must correct them. This process is like the standard RACF command interface.
2. If the command is syntactically correct, the keywords and parameters are translated into an internal format. This format permits the zSecure Command Verifier installation policy interpretation and enforcement routines to easily access the keywords and parameters.
3. The keywords and parameters are evaluated and matched against the installation policies as specified in the `C4R` profiles in the `XFACILIT` resource class. If the keywords and parameters violate the installation policy, the command is rejected, or the keyword is suppressed.

   The installation policy profiles can specify one command that is executed before the user-entered RACF command, or the pre-command, and one command that is executed after the user-entered RACF command, or the post-command.
4. The command or commands are executed. Normally, the authority of the terminal-user to execute the commands is not modified by zSecure Command Verifier. It is possible that the commands fail because of insufficient authority. It must be noted that the policy specified pre-commands and post-commands are executed independently of the acceptance of the terminal-user-specified command, keywords, or parameters. In addition, a complete ABEND of one of the commands can result in the termination of the entire set of commands such as pre-command, policy-accepted-command, and post-command.
5. Auditing is being done through an Audit-only `RACROUTE REQUEST=AUTH` for a specific C4R profile in the `XFACILIT` resource class. For more information about these profiles and the related auditing options, see "Profile audits in zSecure Command Verifier" on page 9.

How RACF processes commands

zSecure Command Verifier verifies all RACF commands that start the RACF Common Command exit. In processing the verified RACF commands, there is a minor incompatibility with the way RACF normally handles these commands. The incompatibility is related to the processing of repeated keywords. In some situations, RACF processes all parameter values for repeated keywords, while in other situations only the last specification is used. For example:

- If you specify `ALTUSER` *`userid`* `CICS(ADDOPCLASS(01) ADDOPCLASS(02))`, RACF adds both OPCLASSes.
- In contrast, if you specify `ALTUSER` *`userid`* `ADDCAT(cat1) ADDCAT(cat2)`, RACF adds only a single CATEGORY.

The zSecure Command Verifier uses only the last specified value of any keyword is used, and all other specifications of the same keyword are ignored.

RACF commands that do not start the Common Command exit

Because zSecure Command Verifier uses the RACF Common Command exit, some RACF commands are not subject to policy verification. These commands are shown in the following list.

RVARY
: Because of the high risk of causing extra problems when you implement more protection for the **RVARY** command, support for **RVARY** is not implemented in zSecure Command Verifier. In the RACF product code, **RVARY** has a special position that is based on similar availability concerns.

RACLINK
: In the RACF implementation of RACF Remote Sharing Facility, or RRSF the **RACLINK** command and its keywords and parameters are protected by RACF profiles in the RRSFDATA resource class.

RACDCERT
: RACF implemented the **RACDCERT** command as a command that is not handled by the RACF command envelope. As a result, it does not start the Common Command exit point. Fortunately, the use of the **RACDCERT** command is controlled by SPECIAL and profiles in the FACILITY class. The following text is taken from the *RACF Command Language Reference*:

  To issue the **RACDCERT** command, you must have one of the following authorities:

  - SPECIAL
  - Sufficient authority to resource IRR.DIGTCERT.*function* in the FACILITY class, where function is LIST, ADD, ALTER, or DELETE
  - READ access to IRR.DIGTCERT.*function* to run the function for yourself
  - UPDATE access to IRR.DIGTCERT.*function* to run the function for others

  This combination of existing controls reduces the need for more zSecure Command Verifier controls.

RACPRIV
: The **RACPRIV** command affects only the status of the write-down privilege in the address space of the user. It has no impact on profiles in the RACF database, and cannot be propagated to other systems. Use of the command is partially controlled by the IRR.WRITEDOWN.BYUSER profile. For this reason, no additional controls are implemented in zSecure Command Verifier.

RACMAP
: The **RACMAP** command creates, deletes, and lists a distributed identity filter. The command is not eligible for routing to other RRSF nodes that use command direction, and it does not start any RACF exit. The command can be controlled by using profiles in the FACILITY class of the form IRR.IDIDMAP. *function*, where *function* is MAP, DELMAP, or LISTMAP.

  For more information about the **RACMAP** command, see the *RACF Command Language Reference*.

Installation policies

In zSecure Command Verifier, a point is needed for the decisions about the commands, keywords, and parameters. Because there are many different options possible, the installation must specify which decisions must be made based on which criteria. This step is done through the definition of policy profiles in the `XFACILIT` resource class. These policy profiles are described in Chapter 5, "Policy profiles," on page 41.

Profile audits in zSecure Command Verifier

Using the definition of specific `C4R` profiles in the `XFACILIT` resource class, an auditor can specify the events that are to be logged to SMF. For every RACF command, the product can log the command as entered by the terminal user and the command as finally executed. It is also possible to specify that both must be logged. The auditor can indicate that auditing through SMF must be done only for selected users, or for all users. For each command, only the first 255 characters are available from the generated SMF records.

The error message as issued to the terminal user is available as `LOGSTR` in the SMF record from the `C4R.ERRMSG.`*command* profile.

An example of a profile that is used for audit specification is shown. It indicates that the **`ADDUSER`** command must be audited for all users before it is processed according to the installation policy profiles. When **`ADDUSER`** is issued by user `IBMUSER`, it must not be audited.

```
C4R.PREAUD.ADDUSER UACC(READ) AUDIT(SUCCESS(READ))
          ACL: IBMUSER NONE
```

Note: Any sensitive fields like passwords and encryption keys are removed from the RACF command before it is logged in SMF.

For more information, see Chapter 4, "Functions for auditing commands and policy effects," on page 21.

Product version and status verification with the C4RSTAT command

The C4RSTAT command is provided to verify the status and version of zSecure Command Verifier.

The **`C4RSTAT`** command verifies that the main code is activated as part of the RACF Common Command exit, and that the Policy Interpretation and Enforcement Routine, or C4RPIER can be located for the current session. The command also shows the resource class that is used for the Policy Profiles, and the number of Policy Profiles defined.

The following figure lists example output from the **`C4RSTAT`** command:

```
C4R982I zSecure Command Verifier is active
C4R971I EXIT version is 2.1.0
C4R973I PIER version is 2.1.0
C4R985I Resource class used for policy profiles is XFACILIT
C4R976I Resource class is active
C4R969I Generic profiles are enabled
C4R978I Number of policy profiles is 29
```

Figure 1. CR4STAT command output

Chapter 3. zSecure Command Verifier installation

The installation of zSecure Command Verifier is done through SMP/E

Before you install, verify that you have the zSecure Command Verifier version that matches the level of z/OS with RACF that is active on your system.

Installation preparation

zSecure Command Verifier is shipped in the form of two SMP/E FUNCTIONs. The first FUNCTION contains all the parsing and command building code. The second FUNCTION contains all the policy control code. Both functions are required to use the product.

The installation of zSecure Command Verifier consists of several steps. Aside from the creation of the executable modules in the system libraries, you must issue some operator commands or make updates to a parmlib member to activate the product.

Resource class selection

zSecure Command Verifier policy rules are defined through profiles in the XFACILIT resource class. It is possible to use a different resource class; however, it is best to use the default resource class.

The administrator defines the zSecure Command Verifier policy rules through profiles in the XFACILIT resource class. A different resource class can be used. However, it is best to use the default resource class.

The resource class that is needed for the zSecure Command Verifier control profiles must have the following characteristics:

- Maximum profile length 246 characters.
- The default return code can be 4 or 8. In most cases, zSecure Command Verifier ignores the default return code.
- First character must be specified as alphanumeric, and other characters must be specified as allowing any character.
- RACLIST must be allowed for performance reasons. You can decide to RACLIST the resource class through SETROPTS or not. If the resource class is not SETROPTS RACLISTed, it is GLOBAL ONLY RACLISTed at the first RACF command invocation.

Overview of installation steps

Use the following checklist to track the tasks completed during the zSecure Command Verifier installation process.

See the links to procedures in the table for instructions on completing each task.

Table 3. Installation checklist for SMP/E installation

Step	Procedure	Jobname
1	"Step 1: Define the data set naming conventions" on page 12	
2	"Step 2: Load the installation JCL" on page 12	

Table 3. Installation checklist for SMP/E installation (continued)

Step	Procedure	Jobname
3	“Step 3: Create and initialize SMP/E zones” on page 13	C4RJSMPA C4RJSMPB C4RJSMPC
4	“Step 4: Receive the SYSMODs” on page 14	C4RJREC
5	“Step 5: Allocate the TARGET and DLIB data sets” on page 14	C4RJALL
6	“Step 6: Update SMP/E DDDEFs” on page 15	C4RJDDD
7	“Step 7: Add the zSecure Command Verifier code” on page 15	C4RJAPP
8	“Step 8: Specify the resource class for policy profiles” on page 15	C4RJEXP
9	“Step 9: Update the parmlib for APF-authorized TSO commands” on page 15	C4RJIKJ
10	“Step 10: Activate and test zSecure Command Verifier” on page 16	Parmlib Operator Commands
11	“Step 11: Accept the zSecure Command Verifier product” on page 18	C4RJACC
12	“Convert Consul zLock policy profiles” on page 18	C4RJCONV

Step 1: Define the data set naming conventions

Before you install SMP/E, establish the data set naming conventions that you want to use during the installation process.

Define conventions for all required data set types, including the following data sets:

- Data set with installation JCL or `SC4RINST`
- `SMP/E` control data sets like `CSI`, `PTS`, and others
- System data sets for the installed software

Step 2: Load the installation JCL

The JCL used during the zSecure Command Verifier installation process is in the `SC4RINST` data set. If you install from tape, use the following JCL to copy the following data to a DASD data set.

```
//jobname   JOB (account info),'Copy install JCL',
//             CLASS=a,MSGCLASS=r
//*-----------------------------------------------------------------
//FILE8  EXEC PGM=IEBCOPY
//SYSUT2   DD DISP=(NEW,CATLG),UNIT=SYSALLDA,SPACE=(CYL,(1,1,10)),
//            DSN=userid.C4R1D1.INSTJCL
//SYSUT1   DD DISP=SHR,VOL=(,RETAIN,SER=C4R1D1),UNIT=3480,
//            LABEL=(6,SL),DSN=IBM.JC4R1D1.F3
//SYSPRINT DD SYSOUT=*
//SYSIN    DD DUMMY
```

After successful execution of this job, you can continue with “Step 3: Create and initialize SMP/E zones” on page 13.

Step 3: Create and initialize SMP/E zones

Before starting the zSecure Command Verifier installation process, determine the SMP/E zones for the installation.

You can choose from the following installation options:
- Install in existing z/OS zones
- Install in new (dedicated) zones in an existing CSI
- Install in new (dedicated) zones in a new CSI

Sample installation jobs are only provided for the third option.

If you decide to install the product in existing zones, you do not need to define any `SMP/E CSIs` or zones. You can immediately continue with the procedure "Step 4: Receive the SYSMODs" on page 14.

If you decide to install in dedicated zSecure Command Verifier zones by using new or existing CSIs, complete the pre-installation steps by using the example jobs that are provided in `SC4RINST` before you continue the installation process. For details on the pre-installation steps, see "Preinstallation tasks" on page 14.

The example jobs that are provided in the `SC4RINST` all use lowercase strings for the values that must be adapted to fit your installation standards. The following are the values that are currently used.

Your-Global
: The data set prefix that you want to use for the `GLOBAL SMP/E` data sets. This prefix is used for the name of the `GLOBAL CSI` and for the `SMP/E` data sets shared between all `SMP/E` zones.

Your-Product
: The data set prefix that you want to use for the zSecure Command Verifier data sets. This data set is also the prefix for the SMP/E data sets specific to zSecure Command Verifier.

SYSALLDA
: The unit name that is used for all data set allocations.

volser
: The name of the DASD volume in your system where you want to create the zSecure Command Verifier data sets. In an SMS environment, the ACS routines can assign another volume than the one specified by the *volser*.

tape
: The unit name of the tape-unit where the zSecure Command Verifier distribution tape can be mounted.

Note: The value for *Your-Global* cannot be the same as *Your-Product*. If you want to use similar prefixes, you can add a qualifier for the `GLOBAL` zone. For example, you can use the following values.
- `SMPE.CMDVFY.GLOBAL` as the value for *Your-Global*
- `SMPE.CMDVFY` as the value for *Your-Product*

Table 4. Pre-installation variable values used to define SMP/E zones

Variable	Your Value
Your-Global	
Your-Product	
sysda	

Table 4. Pre-installation variable values used to define SMP/E zones (continued)

Variable	Your Value
volser	
tape	

Preinstallation tasks

1. Create and initialize `GLOBAL CSI` and `GLOBAL ZONE`:

   If you want to use an existing `GLOBAL` zone, you can skip the definition of the `GLOBAL CSI`, the `GLOBAL ZONE`, and the related data sets. In that case, continue with the next step. If you want to create a `GLOBAL` zone, start with running sample job `C4RJSMPA` to define and initialize the data sets for the `GLOBAL` zone.

   `Submit C4RJSMPA`
2. Create zSecure Command Verifier `TARGET` and `DLIB ZONES`:

   The zSecure Command Verifier `TARGET` and `DLIB ZONES` can be created in their own `CSI`. The sample job that is provided creates a product `CSI` and defines two `SMP/E` zones in that `CSI`.

   `Submit C4RJSMPB`
3. Create the `OPTIONS` entry in the zSecure Command Verifier `ZONE`s:

   The next job is used to specify the `OPTIONS` entry that is used during the subsequent `SMP/E` installation steps that follow.

   `Submit C4RJSMPC`

Step 4: Receive the SYSMODs

If you are installing from the zSecure Command Verifier product tape, the first file on that tape is the `SMPMCS` data set. It contains the `SMP/E` Modification Control Statements that are needed for correct installation of zSecure Command Verifier. In this situation, you can use sample job **`C4RJREC`** to `RECEIVE` the product.

```
Submit C4RJREC
```

Step 5: Allocate the TARGET and DLIB data sets

zSecure Command Verifier adds four target data sets and four distribution data sets to your `SMP/E` environment. See Table 5 for the sizes and attributes of these data sets.

Table 5. Target and Dlib data sets needed for zSecure Command Verifier

DDname	Type	Recfm	Blksize (suggested)	Lrecl	Space (tracks)	Dir
`AC4RLNK`	DLIB	U	32760	N/A	21	14
`SC4RLNK`	Target	U	32760	N/A	13	2
`AC4RSMP`	DLIB	FB	27920	80	2	2
`SC4RSMP`	Target	FB	27920	80	2	2
`AC4RINST`	DLIB	FB	27920	80	3	3
`SC4RINST`	Target	FB	27920	80	3	3

For example, **`JOB C4RJALL`** contains the necessary JCL to allocate the required `TARGET` and `DLIB` data sets.

```
Submit C4RJALL
```

Step 6: Update SMP/E DDDEFs

In this step, the data sets that you allocated in the previous step are defined to SMP/E. If you decide to include appropriate DD-statements in all your SMP/E jobs, you can omit this step. If you want to use the preferred setup through dynamic allocation, this step is required. The example job **C4RJDDD** contains the JCL needed for this step.

```
Submit C4RJDDD
```

Step 7: Add the zSecure Command Verifier code

During this step, use the following SMP/E statement to add the zSecure Command Verifier code, examples, and documentation to the system:

```
APPLY  SELECT(JC4R210,HC4R210) GROUPEXTEND.
```

Because of the use of a **SELECT** for the product FMID, SMP/E does not require the use of the **FUNCTIONS** keyword. An example job is included in member **C4RJAPP**. Before you run this job, specify the data set name of your GLOBAL CSI.

```
Submit C4RJAPP
```

Step 8: Specify the resource class for policy profiles

You can specify the resource class in zSecure Command Verifier that is used for all installation policy profiles. The default value that is provided is XFACILIT.

Normally, you do not need to change the resource class. If your installation requires a different setting of the resource class, review and submit the sample job C4RJEXP. The first time that you run this job, it is likely to end with a return code **12**. It is caused by an inline SMP/E REJECT step that ensures that you can run the same job multiple times.

Review the following fields:

RSVDx
: These fields are reserved. Do not modify them unless you are instructed otherwise by zSecure Command Verifier support personnel.

CLASS
: Complete the resource class that you want to use for the zSecure Command Verifier policy profiles. The default name is XFACILIT.

Step 9: Update the parmlib for APF-authorized TSO commands

zSecure Command Verifier requires two APF-authorized TSO commands. The first command displays information about the current state of the zSecure Command Verifier module, which can be active or inactive, and about the resource class currently in use. The other command displays and manages the Command Audit Trail information in various profiles. These APF-authorized modules are installed in the SC4RLNK library. To enable use of these modules as a TSO command, you must add their names to the TSO-authorized command table in **PARMLIB**. Add lines like the following ones to the AUTHCMD section in your IKJTSOxx member. After you update the member, you can activate it using the **TSO PARMLIBUPDATE xx** command.

```
AUTHCMD NAMES(          /* AUTHORIZED COMMANDS      */      +
   ...  Leave the first part of this list of commands as is.
   ...  Insert the following line at the end of the list.
   C4RSTAT            /* zSecure Command Verifier status disp*/ +
   C4RCATMN           /* zSecure Command Verifier Audit Trail*/ +
   ...  Ensure that the last line in the AUTHCMD block ends
   ...  with a right parenthesis as shown below.
   ...                  /* SOME COMMENT            */)
   ...  Rest of member need not be modified.
```

An example parmlib member that describes the required changes is provided in member **C4RJIKJ**.

Step 10: Activate and test zSecure Command Verifier

Because zSecure Command Verifier is implemented through the dynamic exit facility, it is possible to activate zSecure Command Verifier immediately without a prior IPL of your system. A prerequisite for this type of implementation is that the two main routines of zSecure Command Verifier are in standard *linklist* libraries. You can use one of the following methods:

- Install the product directly in the system libraries. Although installing directly in active system libraries works, it is considered to be bad systems programming practice.
- Copy the modules from the SMP/E controlled SC4RLNK data set to another data set that is already part of the *linklist*.
- Use the z/OS dynamic *linklist* facility to add the SC4RLNK data set to the active *linklist*.

In all of the preceding cases, you must also issue the **F LLA,REFRESH** operator command before you attempt to activate the **C4RMAIN** exit. Do not use a directed load through the DSN keyword on the **SETPROG** command. The **C4RPIER** module cannot be activated in this way; it must be present in an active *linklist* library or STEPLIB.

To add the zSecure Command Verifier library to the active APF list, add a member like the following example to **PARMLIB**, and run the **T PROG=xx** operator command:

```
APF ADD DSNAME(Your-Product.SC4RLNK)                SMS
```

To add the zSecure Command Verifier library to the active *linklist*, add a member like the following example to **PARMLIB**, and run the **T PROG=xx** operator command:

```
LNKLST DEFINE NAME(LNKLSTC4) COPYFROM(CURRENT)
LNKLST ADD NAME(LNKLSTC4) DSN(Your-Product.SC4RLNK)
LNKLST ACTIVATE NAME(LNKLSTC4)
LNKLST UPDATE,JOB=*
```

To activate zSecure Command Verifier, add a member like the following example to **PARMLIB**, and run the **T PROG=xx** operator command.

```
EXIT ADD EXITNAME(IRREVX01) MODNAME(C4RMAIN) STATE(ACTIVE)
```

Alternatively, you can run the following **OPERATOR** command directly:

```
SETPROG EXIT,ADD,EXITNAME=IRREVX01,MODNAME=C4RMAIN,STATE=ACTIVE
```

Note that this direct operator command does not persist over an IPL.

If you must remove zSecure Command Verifier, use the following **OPERATOR** command:

```
SETPROG EXIT,DELETE,EXITNAME=IRREVX01,MODNAME=C4RMAIN
```

The **C4RSTAT** command is an APF-authorized TSO command that can be used to display if the zSecure Command Verifier module is active, and to provide information about the currently used resource class. If zSecure Command Verifier is installed and active, the output of the **C4RSTAT** command now looks like the following example:

```
C4R982I zSecure Command Verifier is active
C4R971I EXIT version is 2.1.0
C4R973I PIER version is 2.1.0
C4R985I Resource class used for policy profiles is XFACILIT
C4R976I Resource class is active
C4R969I Generic profiles are enabled
C4R978I Number of policy profiles is 0
```

To test zSecure Command Verifier after you activate it, issue some RACF commands that must work or fail exactly as you expect. For example, a **LISTUSER** command without any keywords must still show information for your own `userid`. If you also want to verify that zSecure Command Verifier policy profiles are interpreted as you want, you can use sample job **C4RJTST** in `SC4RSMP`. This sample job defines several system-wide policies and issues some commands that show the effects of these policies. These policies apply to all users, and might thus affect other users on the system or sysplex where this job is executed. Inspect the policy profiles in this sample to ensure that they are appropriate for the system where you are installing zSecure Command Verifier. Use the sample only in a test environment. The sample job consists of several parts:

- Defining several sample policy profiles. Some of these affect only messages that are being issued to the terminal user, while others affect the creation of user profiles and data set profiles.
- Issuing several RACF commands that fail or are modified. The successful commands must be echoed at the terminal, as part of the **C4R913I** message. The commands that violate one of the defined policies must receive RACF violation messages (ICH408I) because of insufficient access to the policy profile.
- Removing the sample policy profiles, thus returning the system to the state before you run the test job.
- Removing the user and data set profiles that were created as the result of the test commands.

Running the sample test job requires non-standard RACF authorizations. At a minimum, `CLAUTH` in the `XFACILIT` or the alternative resource class that is specified in "Step 8: Specify the resource class for policy profiles" on page 15 and the `USER` class, and group-special in the current connect group is required. It is also possible to use only System-SPECIAL authority for the entire job. In that case, `CLAUTH` and `Group-SPECIAL` are not needed.

Attention: This sample job defines system-wide policies. These policies apply to all users, and might thus affect other users on the system/sysplex where this job is executed. Inspect the commands as issued, and evaluate if execution of this sample installation verification procedure is appropriate for your environment.

```
Adapt and submit optional job C4RJTST from SC4RSMP
```

If the commands work as expected and you are satisfied with the results, continue with the next step, which is accepting the installation of zSecure Command Verifier code on your system.

Step 11: Accept the zSecure Command Verifier product

If you are satisfied with the implementation of zSecure Command Verifier, run an **ACCEPT** job to integrate the product with your system. An example **ACCEPT** job is provided in C4RJACC. After you run this job, there is no need for any further system programming work to use zSecure Command Verifier.

```
Submit C4RJACC
```

Convert Consul zLock policy profiles

If you installed Consul zLock, you might want to convert the existing policy profiles to zSecure Command Verifier policy profiles. The main differences between the two types of policy profiles are the HLQ of the profiles, and the resource class that is used for the profiles. The policy profiles for Consul zLock were probably defined in the $C4R resource class, and they all start with the qualifier $C4R. The policy profiles for zSecure Command Verifier are by default that is defined in the XFACILIT resource class, and these profiles all start with the qualifier C4R.

To help the conversion, sample job **C4RJCONV** is provided. This job defines new policy profiles like the existing Consul zLock policy profiles. The userid running this job must have either System-SPECIAL or access to all existing policy profiles and CLAUTH in the resource class to be used for the new policy profiles.

Note: If this conversion job is run on a system without the SETROPTS NOADDCREATOR setting, the userid performing the conversion is added to the access list with ALTER authority. Ensure that the userid for performing conversion has the wanted access to the new zSecure Command Verifier policy profiles.

In addition, if Consul zLock is active on the system, verify that the userid performing the conversion has sufficient authority to define zSecure Command Verifier policy profiles and to use the FROM and FCLASS keywords.

The job requires some adaptation before execution. You must change the following variables:

Your-HLQ
The high-level qualifier that is used for an intermediate CLIST data set. The CLIST data set is named Your-HLQ.EXEC.RACF.CLIST. If such a data set exists, it is overwritten during the conversion process. At the end of the job, the data set is deleted again. The user that runs the conversion job needs ALTER access to the data set.

oldclass
The resource class that is used for the existing Consul zLock policy profiles. If Consul zLock was installed by using the defaults, the value of *oldclass* is probably $C4R. If the quick testing option was used during the previous installation, the suggested value is VMSEGMT. Profiles in this class that match the high-level qualifier $C4R are converted. The conversion job does not change any of these profiles.

newclass
The resource class that is used for zSecure Command Verifier. If zSecure Command Verifier is installed by using the default resource class, the value of *newclass* is XFACILIT. The conversion job defines new policy profiles in this resource class by using the existing *oldclass* policy profiles as model on the FROM keyword.

```
Adapt and Submit Optional Job C4RJCONV
```

Check that the job is adapted before you submit, and verify that the resulting profiles are created successfully.

Resources for auditing profiles

After you install zSecure Command Verifier, the auditor for your installation might need to create policy profiles to activate zSecure Command Verifier auditing.

To allow your auditor to specify when and what to audit, zSecure Command Verifier implemented an extra **RACROUTE REQUEST=AUTH** for a dummy resource. This resource is the name of the command that is being issued prefixed by `C4R`. The profile must be defined in the `XFACILIT` class. If you do not define any profiles, no additional auditing of zSecure Command Verifier processed commands is available. You cannot modify normal RACF command auditing by using any zSecure Command Verifier setting. During the installation process, contact the auditor to specify which profiles must be defined and what auditing options must be activated for these profiles. For more information about the profiles and auditing options available, see Chapter 4, “Functions for auditing commands and policy effects,” on page 21.

Chapter 4. Functions for auditing commands and policy effects

zSecure Command Verifier provides various functions for auditing both the commands as issued and the effects of the implemented policies.

The following list contains the auditing functions:

Command Audit Trail function
: Records information about the RACF commands that are issued in the affected profiles themselves. By using easy RACF list commands, it is possible to obtain information about who last changed a particular part of a profile, like the OWNER, the UACC, or the Access List. For more information, see "Command audit trail."

Policy Profile Effect function
: Records information about the effect of the zSecure Command Verifier policy profiles from SMF records. The RACF command before and after the processing of the Policy Profiles is recorded by the LOGSTRING information for access to special Policy Profile Effect recording profiles. For more information, see "Policy profiles for command auditing" on page 34.

SMF access recording
: You can also use regular SMF access recording for the Policy Profiles themselves. For more information, see "Regular access recording through SMF" on page 38.

Command audit trail

zSecure Command Verifier provides a function to collect and retain additional data about issued commands in the RACF profiles affected by these commands.

For example, if user C4RTEST issues the command **`ALTUSER IBMUSER RESTRICTED`**, the setting of the RESTRICTED attribute, together with the date and time, and `userid` C4RTEST is saved in the IBMUSER profile. The information that is retained can be used as a Command Audit Trail. The same information can usually be obtained from SMF audit records. However, use of the zSecure Command Verifier function has the advantage of finding the same information quicker, and without processing potentially large amounts of SMF data. An example of this Command Audit Trail information for a USER, as maintained by zSecure Command Verifier is shown:

```
Command Audit Trail for USER IBMUSER

Segment:  CICS    Added on 05.241/03:19 by C4RTEST
                  Changed on 05.241/03:20 by C4RTEST
          TSO     Changed on 05.241/03:19 by C4RTEST
Attrib:   PASSWRD Removed on 05.238/14:24 by C4RTEST
          INTERV  Changed on 05.241/04:42 by C4RTEST
          RESTR   Added on 05.238/14:24 by C4RTEST
Connect:          BCSC Added on 05.238/14:24 by IBMUSER
GrpAttr:  ADSP    BCSC Removed on 05.238/14:24 by IBMUSER
```

Figure 2. Command Audit Trail data for a user

The data is maintained in the **USRDATA** fields in each profile. The **USRDATA** fields are normally not shown as part of the regular RACF commands. When appropriate controls are set, the **USRDATA** fields that are used for the Command Audit Trail are shown as part of the various RACF LIST commands, like **`LISTUSER`**. The data is displayed following the regular command output.

Because the Command Audit Trail data is maintained in the affected profile, no information is collected, and all existing information is deleted if the profile is deleted.

Control of the Command Audit Trail function

You can define =CMDAUD policy profiles to control the Command Audit Trail function.

When you create these policies, you can control whether zSecure Command Verifier collects and retains Command Audit Trail information for all terminal users, and whether the information is shown as part of the regular LIST output. The collected information provides accountability for changes to profiles because it shows who made a certain change, and at what date and time. If you do not define the =CMDAUD policy profiles, then zSecure Command Verifier does not collect the Command Audit Trail information.

The policy profile definition determines whether Command Audit Trail information is collected. For most =CMDAUD policy profiles, the access level is ignored. The only exception is the =CMDAUD.=MAINT policy profile. Two access levels are reserved for authorization of the **`C4RCATMN`** command that can be used to remove the collected Command Audit Trail data.

Note: If these command audit policy profiles are absent, then no information is collected.

Structure of =CMDAUD policy profile

The basic structure of the =CMDAUD policy profiles includes five separate sections in the following format:

```
C4R.class.=CMDAUD.data-type.profile-identification
```

In the current implementation, the *class*, the *data-type*, and the profile itself (*profile-identification*) are used to select which parts of the Command Audit Trail are collected. The variable parts of the =CMDAUD policy profiles are described in the following list.

class This part of the policy profile describes the resource class of the profile as used in or implied by the command.

data-type
The value of this part of the =CMDAUD policy profile can have any of the following values:

=SEGMENT
Information about adding, changing, and deleting segments.

=ATTR
Information about adding and deleting attributes.

=CONNECT
Information about adding, changing, and deleting user to group connections.

=ACL Information about use of the **PERMIT** command to manage Access List entries.

=MEMBER
Information about adding and deleting members in a grouping resource class profile.

=MAINT
Controls display and removal of the Command Audit Trail data.

profile-identification
The value of this part of the =CMDAUD policy profile is dependent on the *class* of the profile. For USER and Group profiles, it includes the *owner* of the profile. For other profiles, it is the resource profile itself.

USER *owner.userid*

GROUP
owner.group

resource
resource-profile

In the following example of an =CMDAUD policy profile, the =CMDAUD qualifier and the *data-type* qualifier cannot be represented by a generic qualifier. They both must be present in the profile exactly as shown.

```
C4R.USER.=CMDAUD.=SEGMENT.SYS1.IBMUSER
```

Access level for the =CMDAUD policy profile

Access to the =CMDAUD policy profile is not used to control collection of the Command Audit Trail data. Only the profile existence is used to determine whether audit trail data must be collected or not. The access level that is defined for the =CMDAUD.=MAINT profile determines whether the Command Audit Trail is displayed. If the profile has READ access, Command Audit Trail information is included in the output of the various RACF LIST commands. Access to this policy profile also controls the use of the **C4RCATMN** command. You can use this command to display or remove the Command Audit Trail information from selected profiles. For details, see "C4RCATMN command" on page 25. For all other =CMDAUD policy profiles, the access level is not used.

If the relevant Policy Profiles are defined, the Command Audit Trail information is collected and retained for all terminal users. For this reason, the Command Audit Trail provides accountability for changes to profiles. Using the collected information, it is possible to determine who made a certain change, and at what date and time. The information is missing only if zSecure Command Verifier is not active or if the policy profiles did not exist at the time the command was run. The nature of an audit trail implies that no terminal users must be exempt. For this reason, the access level is not used to control the collection of the Command Audit Trail.

The following access levels are currently used for the policy profiles, except for the =CMDAUD.=MAINT policy profile.

No Profile Found
No command audit data is collected or retained.

NONE
Command Audit Trail data is collected and retained.

READ Same as NONE.

UPDATE
Same as NONE.

CONTROL
Same as NONE.

The following access levels are currently used for the =CMDAUD.=MAINT policy profile.

No Profile Found
Command Audit Trail data is not displayed and cannot be maintained by using the **C4RCATMN** command.

NONE
The Audit Trail data is not shown and cannot be maintained through the **C4RCATMN** command.

READ The Audit Trail data is shown as part of the RACF LIST command.

UPDATE
The Audit Trail data is shown as part of the RACF LIST command. It can also be displayed through the **C4RCATMN** command. The **C4RCATMN** command does no scope verification. When the terminal user is authorized for the display function through **C4RCATMN**, the Command Audit Trail of all profiles in the RACF database can be inspected.

CONTROL
The terminal user is also authorized to use the **C4RCATMN** command to remove the Command Audit Trail data.

The profiles for the various types of information are independent. For example, that an installation can decide to only record changes to user attributes, and not record any changes to user segments. Or an installation can implement a policy to record changes only to those users that are owned by the group SYS1.

When you use the RACF LIST commands, the Command Audit Trail is shown only if the terminal user did not suppress the RACF BASE segment information. If the RACF information is suppressed by using the NORACF keyword, the Command Audit Trail information is also suppressed.

When you use the RACF LIST commands, zSecure Command Verifier does not display the Command Audit Trail information without the BASE segment information. To display only the Command Audit Trail information, you can use the **C4RCATMN** command. Because the **C4RCATMN** command does no scope verification, UPDATE access to the =CMDAUD.=MAINT policy profile is required.

In most situations, you set the UACC of all Command Audit Trail policy profiles to NONE. Only a few auditors or system administrators must have READ or UPDATE access to the =CMDAUD.=MAINT policy profile. CONTROL access to this policy profile is normally only granted to a few individuals. This level of access can be used to correct errors, or to remove the Command Audit Trail if such information is no longer needed.

Typically, generic =CMDAUD policy profiles are sufficient to control collection and maintenance of the Command Audit Trail.

C4RCATMN command

You can use the C4RCATMN command to display and remove Command Audit Trail information in various profiles

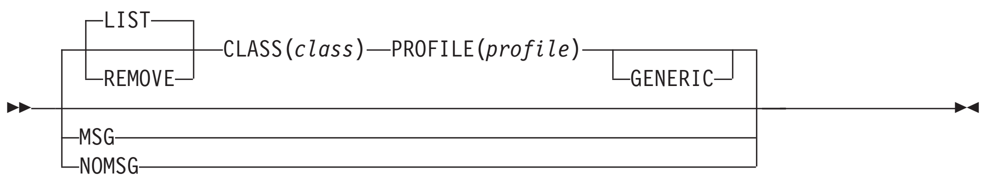
Before the Command Audit Trail information is displayed or removed, the applicable =CMDAUD.=MAINT policy profile is checked. If the terminal user has insufficient access, a RACF access violation event is created. The =CMDAUD.=MAINT policy profile has the following form:

```
C4R.class.=CMDAUD.=MAINT.profile-identification
```

For the **C4RCATMN** command, the required access level is UPDATE to display the Command Audit Trail, and CONTROL to remove the Command Audit Trail.

The **C4RCATMN** command has the following syntax:

C4RCATMN



The following list contains keywords and parameters:

LIST This action is the default action. The Command Audit Trail data for the *profile* in class *class* is shown. If this action is used, you need at least UPDATE access to the =CMDAUD.=MAINT policy profile. If you do not have sufficient access, the Command Audit Trail is not shown.

REMOVE
The Command Audit Trail data for the *profile* in class *class* is removed. If this action is used, you need at least CONTROL access to the =CMDAUD.=MAINT policy profile. If you do not have sufficient access, a RACF violation is recorded, and the Command Audit Trail is not removed.

MSG This option indicates that the Command Audit Trail information is to be shown as part of the regular RACF LIST commands. This option is saved across sessions. It is only effective if you fulfill the other requirements for displaying the Command Audit Trail information, like sufficient access to the applicable =CMDAUD.=MAINT policy profile. The initial setting of the MSG / NOMSG setting if you did not issue the **C4RCATMN (NO)MSG** command is MSG.

NOMSG
This option indicates that the Command Audit Trail information must not be shown as part of the regular RACF LIST commands. This option is saved across sessions. If this option is activated, you can display only the Command Audit Trail information through the **C4RCATMN** command. The **C4RCATMN** command requires a higher authorization than the regular RACF LIST commands to display the information. The initial setting of the MSG / NOMSG setting if you did not issue the **C4RCATMN (NO)MSG** command is MSG.

class The resource class of the profile that you want to display or remove the Command Audit Trail data from. This keyword and parameter are required when you use the LIST or REMOVE keywords.

profile The profile that you want to display or from which you want to remove the Command Audit Trail data. The profile must the same that is stored in the RACF database. No matching of the best fitting generic is done. For data sets, the profile name must include the prefix, and must not be quoted. This keyword and parameter are required when you use the LIST or REMOVE keywords.

GENERIC
This optional keyword indicates that the *profile* is a generic profile, even though it does not contain any generic characters. In general, generic profiles without generic characters occur only in the `DATASET` class.

An example of the **C4RCATMN** command is shown. The output of the **C4RCATMN LIST** command is identical to that of the corresponding RACF LIST command.

```
c4rcatmn list class(user) profile(ibmuser)

Command Audit Trail for USER IBMUSER
Segment:  CICS    Added on 05.241/03:19 by C4RTEST
                  Changed on 05.241/03:20 by C4RTEST
          TSO     Changed on 05.241/03:19 by C4RTEST
Attrib:   PASSWRD Removed on 05.238/14:24 by C4RTEST
          INTERV  Changed on 05.241/04:42 by C4RTEST
          RESTR   Added on 05.238/14:24 by C4RTEST
Connect:          BCSC Added on 05.238/14:24 by IBMUSER
GrpAttr:  ADSP    BCSC Removed on 05.238/14:24 by IBMUSER
```

Figure 3. C4RCATMN LIST command output

The following example shows the output of the **C4RCATMN** command when the Command Audit Trail information is removed.

```
c4rcatmn remove class(gcicstrn) profile(cicsa.spro)
Command Audit data for segments has been removed
Command Audit data for attributes has been removed
Command Audit data for access list unchanged
Command Audit data for members has been removed
```

Figure 4. C4RCATM command output when the Command Trail Audit data is removed

Format of the Command Audit Trail data display

In the example in Figure 4, the output from the **C4RCATMN** command is shown. This output is identical to the information appended at the end of the standard RACF **LIST** command when the terminal user has READ access to the =CMDAUD.=MAINT policy profile. The information is only shown if the terminal user has sufficient access to the applicable =CMDAUD.=MAINT policy profile.

By default, if the terminal user has sufficient authorization to the =CMDAUD.=MAINT policy profile, the Command Audit Trail information is appended to the output of the regular RACF LIST commands. There is no option on the RACF LIST commands to suppress these additional lines. There are two indirect ways to suppress the Command Audit Trail information:

- Issue the **C4RCATMN** command with the NOMSG keyword. The Command Audit Trail information is no longer shown. It is still possible to show the information by using the **C4RCATMN** command, but it requires a higher authorization than the regular RACF commands need. You can use the **C4RCATMN MSG** command to reactivate showing the Command Audit Trail. The MSG / NOMSG setting is saved across sessions. The initial setting of the MSG / NOMSG setting if you did not issue the **C4RCATMN (NO)MSG** command is MSG.

- Allocate a ddname `=filename` with the name C4RNOCAT. This ddname does not need to be allocated to a particular data set, sysout class, or device. The preferred allocation is to DUMMY. The allocation of this ddname is sufficient to suppress display of all Command Audit Trail information as part of the regular RACF LIST commands. It is still possible to show this information by using the **C4RCATMN** command, although it requires a higher authorization to the =CMDAUD.=MAINT policy profile.

The Command Audit Trail information is shown as part of the regular RACF LIST commands, or as a response to the **C4RCATMN** command. It consists of the following sections.

- **The Header**

  The Header shows the class and profile that is listed.
- **The Segments section**

  The Segments section contains the information about the last change to non-base segments. The first line starts with the word *Segment:*, followed by an abbreviated name for the segment. The remainder of the line contains information about the type of change, like add, change, delete, when the change was made, and which user ran the command. It also contains the highest non-zero return code from the pre-, RACF, and post-command. For modifications to existing segments, only the last change is shown.

  Collection is controlled by the policy profile

  ```
  C4R.class=CMDAUD.=SEGMENT.pv.profile-identification
  ```

  A separate block (add, change, delete) is shown for each segment that was modified. The following segments are currently supported.

  USER CICS, DFP, LANGUAGE, NETVIEW, OMVS, OPERPARM, TSO, WORKATTR, OVM, DCE, NDS, LNOTES, KERB, PROXY, EIM, CSDATA

  GROUP
  DFP, OMVS, OVM, TME, CSDATA

  DATASET
  DFP, TME

  General Resource
  SESSION, DLFDATA, SSIGNON, STDATA, SVFMR, TME, KERB, PROXY, EIM, CDTINFO, ICTX, CFDEF, ICSF, SIGVER, PROGRAM
- **The Attributes section**

  The Attributes section contains the attributes and the information about the last change to the attributes. The first line starts with the word *Attrib:*, followed by an abbreviated name for the attribute. The remainder of the line contains information about the type of change such as add or remove, when the change was made, and which user ran the command. It also contains the highest non-zero return code from the pre-, RACF, and post-command. If the profile already has the attribute, a possible *confirmation* command is not shown. The information that is shown reflects the date, time, and ID that changed the profile.

  Collection is controlled by the policy profile

  ```
  C4R.class=CMDAUD.=ATTR.profile-identification
  ```

A separate block (add, change, remove) is shown for each attribute that was modified. The following attributes are currently supported.

USER
ADSP, SPECIAL, OPERATIONS, REVOKE, GRPACC, UAUDIT, AUDITOR, PASSWORD, OIDCARD, INTERVAL, EXPIRED, RESTRICTED, SECLEVEL, SECLABEL, MODEL, INSTDATA, CATEGORY, RESUME, OWNER, DFLTGRP, NAME, PHRASE

GROUP
TERMUACC, UNIVERSAL, MODEL, INSTDATA, OWNER, SUPGRP

DATASET
WARNING, NOTIFY, SECLEVEL, SECLABEL, ERASE, ACL, INSTDATA, CATEGORY, OWNER, LEVEL, UACC

General Resource
WARNING, NOTIFY, SECLEVEL, SECLABEL, SINGLEDS, TVTOC, TIMEZONE, APPLDATA, ACL, INSTDATA, CATEGORY, OWNER, LEVEL, UACC

- **The Connects section**

  The Connects section contains the Groups, the Authorizations, and the UACC together with information about the last change to the connect.

  Collection is controlled by the policy profile

  `C4R.class=CMDAUD.=CONNECT.profile-identification`

  The Connects section is only present for user profiles. It is not included for group profiles. The first line starts with the word *Connect:*. Each line shows the GROUPNAME, followed by the UACC setting, or when the group is used as the current connect group, and the GROUP-Authority, and when the change was made. It also shows which user ran the command and the highest non-zero return code from the pre-, RACF and post-command. If both the UACC and the AUTH setting have their default value (that is, UACC=NONE and AUTH=USE) their values are not explicitly shown. You can then easily spot non-default settings. For more information about the UACC and AUTH settings, see the *RACF Security Administrator 's Guide* and the *RACF Command Language Reference*.

  Because of size limitations, only the last 64 changes to the connect groups are shown.

- **The Group-Attributes section**

  The Group-Attributes section immediately follows the Connect section and it contains information about the last change to any GROUP-attribute. The first line starts with the word *GrpAttr:*, followed by an abbreviated name for the attribute.

  Collection is controlled by policy profile

  `C4R.class=CMDAUD.=CONNECT.profile-identification`

  The Group-Attributes section is only present for User profiles. It is not included in Group profiles. The lines show the attribute, followed by the GROUP name, when the change was made, and which user ran the command. It also shows the highest non-zero return code from the pre-, RACF, and post-command. There can be multiple lines for the same attribute, if the attribute was added and removed. The lines for each attribute are in date/time sequence, so the last line reflects the status.

  Because of size limitations, only the last 64 changes to the connect groups are shown. The following attributes are currently supported.

  ADSP, SPECIAL, OPERATIONS, REVOKE, GRPACC, AUDITOR, RESUME

- **The Access List section**

The Access List section contains access list entries and the information about the last change to the access list entries. The lines show the access level that was granted, followed by when the change was made, and which user ran the command. It also shows the highest non-zero return code from the pre-, RACF, and post-command. There is only one line for each user or group. The last instance of granting or removing access is shown. If a user was removed from the access list, the value `Removed` is shown. The special ID **ALL** is used to reflect the use of the RESET keyword on the PERMIT command. Because of size limitations, only the last 64 changes to the access list are collected.

Collection is controlled by policy profile

C4R.*class*=CMDAUD.=ACL.*profile-identification*

- **The Member section**

  The Member section contains members that are part of a grouping class profile. The lines reflect adding or removing entries to and from the member list of grouping class profiles. Each line has one member, followed by when the change was made, and which user ran the command. It also shows the highest non-zero return code from the pre-, RACF, and post-command. There is only one line for each member, reflecting the last action. Because of size limitations, only the last 64 changes to the member list are shown. Also, only the first 128 bytes of the member name are collected and thus included in the display.

  Collection is controlled by policy profile

  C4R.*class*=CMDAUD.=MEMBER.*profile-identification*

An example for a user profile is shown here:

```
Command Audit Trail for USER IBMUSER
Segment:  CICS    Added on 05.241/03:19 by C4RTEST
                  Changed on 05.241/03:20 by C4RTEST
          TSO     Changed on 05.241/03:19 by C4RTEST
Attrib:   PASSWRD Removed on 05.238/14:24 by C4RTEST
          INTERV  Changed on 05.241/04:42 by C4RTEST
          RESTR   Added on 05.238/14:24 by C4RTEST
Connect:          C4RGRP1 Added on 05.238/14:24 by IBMUSER
GrpAttr:  ADSP    C4RGRP1 Removed on 05.238/14:24 by IBMUSER
```

Figure 5. Command Audit Trail data for a user profile

An example for a data set profile is shown. In this example, a DFP segment was added, the profile was placed in WARNING mode, and several access list entries were changed or removed. On 14 September 2005 (05.257) the entire access list was reset by IBMUSER by using the **`PERMIT RESET`** command.

Figure 6. Command Audit Trail data for a data set profile

```
Command Audit Trail for DATASET  IBMUSER.**
Segment:  DFP     Added on 05.245/05:21 by C4RTEST
Attrib:   WARNING Added on 05.245/05:20 by C4RTEST
Access:           C4RGRP1 access READ on 05.234/09:39 by C4RTEST
                  C4RGRP2 access READ on 05.234/09:39 by C4RTEST
                  C4RTEST access READ on 05.234/09:39 by C4RTEST
                  SYS1 access READ on 05.234/09:39 by C4RTEST
                  IBMUSER access READ on 05.234/09:39 by C4RTEST
                  * access UPD on 05.234/09:39 by C4RTEST
                  CRMBGUS access Removed on 05.234/09:39 by C4RTEST
                  **ALL** access Removed on 05.257/15:06 by IBMUSER
```

The following example shows the Command Audit Trail information for adding and removing members from a profile in a grouping resource class.

```
Command Audit Trail for GCICSTRN CICSA.SPRO
Member:           CICSA.CEDA Added on 05.249/14:21 by C4RTEST
                  CICSA.CEMT Removed on 05.249/14:21 by C4RTEST
```

Figure 7. Command Audit Trail data for managing members in a profile in a grouping resource class

The information about a segment or attribute is presented in date/time sequence. The last line that is shown for a particular segment or attribute is the last recorded action. If an attribute was granted and later removed, the first line must show who granted the attribute and the last line must show who removed the attribute.

For Access List entries and Member Lists, only the last 64 changes are retained. This restriction is mainly for profile size and performance reasons. Only the last action for each ID or member is recorded.

RRSF overview

When the zSecure Command Verifier Command Audit Trail function is used in an RRSF environment, the Command Audit Trail information is maintained on each system in the RRSF environment individually. It means that the policy profiles as defined on the target system control if and how the Command Audit Trail is maintained. Flow of the data across RRSF is based on the RRSFDATA profiles and operational setting for Command propagation. If the command is propagated on the target system, zSecure Command Verifier adds Command Audit Trail data if applicable. The individual entries in the Command Audit Trail are not propagated. The Command Audit Trail on each system in the RRSF environment is maintained independently of the Command Audit Trails on the other systems.

If zSecure Command Verifier is not installed or not active on a system, the Command Audit Trail is not maintained. The same applies when the required policy profiles are absent.

As a result, Command Audit Trail data can be slightly out of synch. For instance, if the SPECIAL attribute on the RRSF node SYSA is removed from user IBMUSER on 05.283/14:13 and the RRSF command propagation to the RRSF node SYSB is completed a few minutes later, the Command Audit Trail data on SYSB shows 05.283/14:15. In every situation, the Command Audit Trail shows the date and time that the change became effective on the current system.

Storage space planning

The Command Audit Trail function requires more space in the RACF database. The initial amount of space that is required depends on the rate at which changes are made to the profiles. After some RACF commands, the space requirements stabilize. This stabilization probably occurs at a significant lower requirement than the possible maximum space requirement. For instance, the maximum space that is needed for the Command Audit Trail of a user profile is used if commands are issued to give and remove every possible attribute to a user ID. In that case, you need space for recording 2 events, give, and remove, for 20 attributes. This space amounts to 20 * 58 bytes = 1160 bytes.

Typically, only one or two attributes are managed for each user ID. In this case, the estimated storage would be 60 bytes per user ID.

For data sets and general resources, the amount of storage that is needed depends mainly on the access list entries. Each access list entry requires 34 bytes. A maximum of 64 access list entries are recorded, which can take up to 2176 bytes. For most profiles, the total access list activity probably stabilizes at 20 entries, which can require 680 bytes.

The following table shows the required space for each type of information. It also shows estimates of how much storage would be needed on average for each profile. The actual space that is required in your RACF database depends strongly on the RACF command activity in your environment.

Table 6. Storage estimates per audit data type

Data-Type	Class	Min	Maximum	Maximum # Entries	Total	Estimate
`Segment`	`User`	33	80	15	1200	56
`Segment`	`Group`	33	80	4	320	56
`Segment`	`Dataset`	33	80	2	160	0
`Segment`	`General`	33	80	10	800	56
`Attr`	`User`	33	58	20	1060	64
`Attr`	`Group`	33	58	6	348	64
`Attr`	`Dataset`	33	58	10	580	64
`Attr`	`General`	33	58	13	754	64
`Connect`	`User`	43	2249	1	2057	168
`GrpAttr`	`User`	42	2185	7	15295	195
`ACL`	`Dataset`	42	2185	1	2185	319
`ACL`	`General`	42	2185	1	2185	319
`Member`	`Transaction Groups`	47	2505	1	2505	2505
`Member`	`General`	47	2505	1	2505	369

Internal format of USRDATA entries

The information in this section is only relevant for people who want to inspect the USRDATA entries as maintained by zSecure Command Verifier manually, or who must diagnose problems in these fields.

In each profile, relevant information is kept in multiple **USRDATA** fields. The USRDATA is accessed as a name-value pair. The **USRNAME** field describes the information kept in the corresponding **USRDATA** field. The following USRNAME values are used:

`$C4RS`*`seg`*	`profile segment` *`seg`*
`$C4RA`*`att`*	`profile attribute` *`att`*
`$C4RCONN`	`connect groups`
`$C4RC`*`att`*	`connect group attribute` *`att`*
`$C4RPACL`	`access list`
`$C4RRMEM`	`member list`

The corresponding data fields contain the information in EBCDIC format. The information in these data fields is specific for the profile class. For instance, for USERs, the attribute might be SPECIAL, which is abbreviated to SPC. While for GROUPS, the TERMUACC attribute might be present, which is represented by $C4RATRM.

The data fields for each segment or attribute are treated as a block of data that contained multiple statistics. The different events, which are; add, change, and remove, for that particular attribute or segment are kept in one statistics block. For the access-list-related field, the last 64 `userid` values are kept together in one block. The following list shows the format of the data.

$C4RSseg

This field retains information about one segment. It has four subfields that are separated from each other by a comma. Information about Add, Change, and Delete of the segment is separated by a semicolon. The following subfields are present:

Action
: Character indicating whether this information is about A(dd), C(hange), or D(elete) of the segment.

DATETIME
: 10 characters when the command was issued. The format is YYDDD/HHMM.

User ID
: Maximum eight-character `userid` that handled the segment.

RC
: Two-digit maximum return code of the RACF command or the pre-command and post-command.

An example entry for a TSO segment might be:

```
A,09220/0801,CRMBTST,00;C,09221/0815,IBMUSER,00
```

$C4RAatt

This field retains information about attributes that were added or removed from the profile. It has four subfields that are separated from each other by a comma. Information about different actions is separated by a semicolon. The following subfields are present:

Action
: Character indicating whether this information is about A(dd), C(hange), or D(elete) of the attribute.

DATETIME
: 10 characters when the command was issued. The format is `YYDDD/HHMM`.

User ID
: Maximum eight-character `userid` that last handled the attribute.

RC
: Two-digit maximum return code of the RACF command or the pre-command and post-command.

An example entry for the Special attribute might be:

```
A,09181/0917,IBMUSER,00;D,09181/0920,IBMUSER,00
```

$C4RCONN

This field retains information about the connection of users to groups. It is kept in the user profile. Only the last 64 changes are retained in the profile. It has five subfields that are separated from each other by a comma. Information about different connect groups is separated by a semicolon. The following subfields are present:

Group
: The group to which the user is connected.

Auth and UACC
: These characters represent the Authority in the group and the

UACC for new data sets. These characters can also represent other resource profiles when **GROUP** is the current connect group. Authority can be `Use`, `Create`, `Connect`, or `Join`. UACC can be `None`, `Execute`, `Read`, `Update`, `Control`, or `Alter`.

DATETIME
10 characters that show when the command was issued. The format is `YYDDD/HHMM`.

User ID
Maximum eight-character `userid` that last changed this connect.

RC Two-digit maximum return code of the RACF command or the pre-command and post-command.

An example entry might be:

```
SYS1,JR,09245/0545,C4RTEST,08
```

$C4RCatt
This field retains information about the group attributes of users. It is kept in the user profile. Only the last 64 changes are retained in the profile. It has five subfields that are separated from each other by a comma. Information about different connect groups is separated by a semicolon. The following subfields are present:

Group The group to which this attribute applies.

Action
Character indicating whether this information is about A(dd) or D(elete) of the attribute.

DATETIME
10 characters when the command was issued. The format is `YYDDD/HHMM`.

User ID
Maximum eight-character `userid` that last changed this connect.

RC Two-digit maximum return code of the RACF command or the pre-command and post-command.

An example entry might be:

```
SYS1,A,09245/0550,C4RTEST,00;SYS1,D,09245/0555,C4RTEST,00
```

$C4RPACL
This field retains information about the access list of data sets and general resource profiles. Only the last 64 changes are retained in the profile. It has five subfields that are separated from each other by a comma. Information about different users/groups in the access list is separated by a semicolon. The following subfields are present:

User ID
The access list entry, which can be a RACF user ID, group ID, an asterisk, or the special value &RACUID.

Access level
Character for the access level granted: N(one), E(xecute), R(ead), U(pdate), C(ontrol), A(lter), or D(elete).

DATETIME
10 characters when the command was issued. The format is `YYDDD/HHMM`.

User ID
: Maximum eight-character `userid` that last changed this access list entry.

RC
: Two-digit maximum return code of the RACF command or the pre-command and post-command.

An example entry might be:

```
IBMUSER,R,09245/0545,C4RTEST,00
```

$C4RRMEM
: This field retains information about the member list for profiles in a grouping resource class. Only the last 64 changes are retained in the profile. It has four subfields that are separated from each other by a comma. Information about different members is separated by a semicolon. The following subfields are present:

Member
: The member name. This name usually has the format of a profile in the corresponding member (non-grouping) class.

Action
: Character indicating whether this information is about A(dd) or D(elete) of the member.

DATETIME
: 10 characters when the command was issued. The format is `YYDDD/HHMM`.

User ID
: Maximum eight-character `userid` that last added or removed this member.

RC
: Two-digit maximum return code of the RACF command or the pre-command and post-command.

The following list shows other example entries.

- `'SYS1.LINKLIB'//NOPADCHK,A,09249/1419,C4RTEST,00`
- `TEST.CEMT,A,09249/1421,C4RTEST,00;TEST.CEDA,A,09249/1421,C4RTEST,00`

Policy profiles for command auditing

So that the installation auditor can specify when and what to audit,zSecure Command Verifier has more RACROUTE REQUEST=AUTH macros for dummy resources. All of these resources have a name that consists of the RACF command that is prefixed by C4R and the type of auditing. The profile can be defined in the `XFACILIT` class.

After parsing, the complete RACF command is recorded as extra data in the SMF records. By specifying the correct auditing values, the auditor might indicate that the following information must be recorded through SMF:

- Original command as entered by the terminal user
- Command as run by RACF
- Error message that is generated during processing

Auditing is being done through an Audit-only RACROUTE REQUEST=AUTH for a specific auditing profile in the `XFACILIT` class. The following separate profiles are used:

- A profile for the unmodified command as issued by the terminal user
- A profile for the command as passed to RACF for execution
- A profile that is used to record a possible error message

You can use **`AUDIT(SUCCESS)`** in combination with the UACC and Access List to control which users must be audited under which circumstances. The access to the profile is not used for policy decisions by zSecure Command Verifier in any way. The preferred setting for full auditing of all commands is **`UACC(READ)`** and **`AUDIT(ALL(READ))`**.

- **C4R.PREAUD.***COMMAND* specifies whether the command string entered by the terminal user must be audited. The complete command string is available in the LOGSTRING of the generated SMF record.
- **C4R.PSTAUD.***COMMAND* specifies whether the command string after zSecure Command Verifier processing must be audited. The complete command string is available in the LOGSTRING of the generated SMF record.
- **C4R.ERRMSG.***COMMAND* records the error or warning message that is issued by zSecure Command Verifier. It can be found in the LOGSTRING of the SMF record that is generated for this profile.

Only successful access to these profiles is recorded. So, by carefully selecting the access list, you can control which commands, issued by which user, are recorded. Only the users that do have access are traced through SMF. Users that do not have access are not traced.

The definition of these command auditing profiles and their access list (or UACC) has relevance only for the auditing of these commands. These profiles are not used to control execution of the command or of any keywords.

In summary, for the auditor to activate auditing, the following actions must be completed.

- Define a profile in the RACF XFACILIT resource class; for example, C4R.PREAUD.ADDUSER
- Set UACC and Access List (ACL) at READ or higher for those users you want to audit.
- Set AUDIT(SUCCESS(READ)) if you want to audit command usage.
- Setting AUDIT(FAIL(....)) is not effective because zSecure Command Verifier does not support failed access auditing for these profiles.

The XFACILIT profiles that are being used are formed like **C4R.PREAUD.***command*. The qualifiers might be set as follows:

The first qualifier:

C4R Fixed prefix to indicate that these profiles are related to the zSecure Command Verifier.

The second qualifier:

PREAUD
For the command as entered by the terminal user.

PSTAUD
For the command after it is modified and approved by the policy routines.

ERRMSG
The error message if the command is rejected by the policy routines.

The third qualifier:

command
Variable part to indicate the command that is being audited. It is the full unabbreviated RACF command as entered by the terminal-user.

It is possible to use generic profiles. If the installation auditors want to audit all commands, they define a profile C4R.PREAUD.* with **`UACC(READ)`** and **`AUDIT(SUCCESS(READ))`**. It generates standard RACF audit records for access to these profiles. The audit LOGSTR is the command as issued by the user or modified as specified through policies. Unfortunately, if the command is longer then 255 characters, only the first 255 are shown.

An example of a profile that is being used for audit specification is shown. It indicates that the **`ADDUSER`** command must be audited for all users before inspection and possible modification by the policy routines. When ADDUSER is issued by user IBMUSER, it must not be audited at all.

```
C4R.PREAUD.ADDUSER   UACC(READ) AUDIT(SUCCESS(READ))
                     IBMUSER(NONE)
```

Sensitive fields are not present in the audit trail. For instance, if a system administrator issues a command to reset the password of a user ID, the new password value is not present in the audit string. For other sensitive fields, like session keys and PassTicket encryption keys, the same suppression of sensitive information occurs.

Example zSecure audit reports

Using zSecure Audit, it is possible to generate reports about the RACF commands that are entered before and after the zSecure Command Verifier policy routines are evaluated and possibly modified the RACF commands. You might generate such a report from the zSecure Audit interactive interface. Select the **Trail/Detail** option and specify the resource class `XFACILIT`. The following screen is an example of the input you can use.

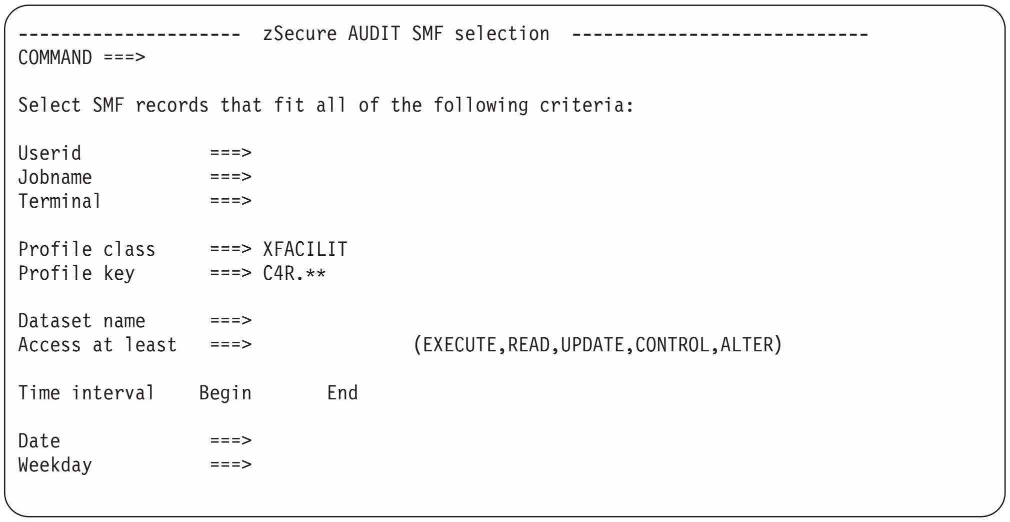

```
--------------------  zSecure AUDIT SMF selection  ---------------------------
COMMAND ===>

Select SMF records that fit all of the following criteria:

Userid          ===>
Jobname         ===>
Terminal        ===>

Profile class   ===> XFACILIT
Profile key     ===> C4R.**

Dataset name    ===>
Access at least ===>              (EXECUTE,READ,UPDATE,CONTROL,ALTER)

Time interval    Begin      End

Date            ===>
Weekday         ===>
```

Figure 8. Input for generating a zSecure Command Verifier audit report

It is also possible to create a zSecure Audit custom report for zSecure Command Verifier. The following example, which is also present in member C4RCNA00 in SC4RSMP, can be used as a custom display when you use zSecure Audit version 1.1. Most of the commands are related to the information displayed on the reports. The following line is the selection criteria for the RACF commands before zSecure Command Verifier policy processing.

```
S CLASS=(XFACILIT) PROFILE=(C4R.PREAUD.**)
```

The following line is the selection criteria for the RACF commands after zSecure Command Verifier policy processing.

```
S CLASS=(XFACILIT) PROFILE=(C4R.PSTAUD.**, C4R.ERRMSG.**)
```

The remaining zSecure Audit statements provide detailed information for the layout of the report. An example is the definition of a variable as a substring of the XFACILIT profile. This substring is the RACF command that is being issued by the terminal-user. The example shown results in a combined report of all RACF commands before and after zSecure Command Verifier policy processing. If you remove the MERGELIST/ENDMERGE statements, you obtain three separate reports.

An example of the output from the combined report is shown. The terminal-user was not authorized to specify the OPERATIONS keyword. It is removed from the RACF command during policy profile processing.

```
1S M F   R E C O R D   L I S T I N G    3May07 01:45 to 13May07 22:36
 RACF Commands processed by Command Verifier

 Date      Time              Resource

 08Dec2001 23:49 Before PIER   ALTUSER
 System ID                     SYS1 Fri 11 May 2007 23:49
 RACF userid/ACF2 logonid      BCSCGB2
 User name                     GUUS SECONDARY ID
 SAF profile key               C4R.PREAUD.*
 SAF resource name             C4R.PREAUD.ALTUSER
 RACF Command                  ALTUSER  BCSCGB3 OPER

 08Dec2001 23:49 After  PIER   ALTUSER
 System ID                     SYS1 Fri 11 May 2007 23:49
 RACF userid/ACF2 logonid      BCSCGB2
 User name                     GUUS SECONDARY ID
 SAF profile key               C4R.PSTAUD.*
 SAF resource name             C4R.PSTAUD.ALTUSER
 RACF Command                  ALTUSER  BCSCGB3
```

Figure 9. zSecure Audit report: RACF commands before and after zSecure Command Verifier policy processing

Regular access recording through SMF

Aside from auditing the entire command that is provided by the profiles that are shown, zSecure Command Verifier also audits individual keywords. zSecure Command Verifier creates successful and failed access records for the profile that was used in the decision process. For example, if the profile C4R.USER.ID.CRMB* allows the definition of the new user CRMBTST, a successful access event is recorded against this profile. If a policy profile denied setting a field to the specified value, a violation event is recorded against the policy profile.

The creation of these types of SMF records is controlled by the standard RACF audit settings for the profile. So, if you use the RACF default, only failed access is audited. However, you might decide to change it into AUDIT(ALL(READ)). That way, both successful and failed access attempts are recorded.

In general, zSecure Command Verifier creates an SMF event only if the policy profile was used in the decision process. For example, there are several policy profiles for the naming convention of a new user ID. If a new user ID is rejected by one policy profile, but accepted by another, only the one that allowed the name of the new user ID is recorded through SMF. The other policy profile that did not the new user ID, is not recorded through SMF.

An example can help understand this process. Suppose that here are two user ID naming convention policy profiles. The first one states that a new user ID must have the same three starting characters as the terminal user. The second one states that if the first 3 characters are C4R, the new user ID is allowed.

```
C4R.USER.ID.&RACUID(3)         UACC(UPDATE)
C4R.USER.ID.C4R*               UACC(UPDATE)
```

Now suppose that user IBMUSER attempts to define a new `userid`:

```
ADDUSER C4RTEST DFLTGRP(C4R) OWNER(C4R)
```

The first policy profile does not apply, since the terminal user (IBMUSER) does not match the target user (C4RTEST). The second profile does apply because the target USERID starts with C4R. In this case, zSecure Command Verifier records successful access to the second profile as follows:

```
Resource:      C4R.USER.ID.C4RTEST
Profile:       C4R.USER.ID.C4R*
Access:        UPDATE
User           IBMUSER
```

The resource name that is used for the access verification, and thus the SMF record, usually does contain the value for the field as specified by the terminal user. For instance, when the **PERMIT** command to add IBMUSER to an Access List as issued by C4RTEST is allowed,

```
PERMIT 'SYS1.PARMLIB' ID(IBMUSER) AC(UPDATE)
```

a successful access event is created, such as

```
Resource:      C4R.DATASET.ACL.IBMUSER.UPDATE.SYS1.PARMLIB
Profile:       C4R.*.ACL.*.UPDATE.**
Access:        UPDATE
User:          C4RTEST
```

Access to the Policy Profiles can be reported by using any standard SMF reporting tool, like IBM Security zSecure Audit, or IRRADU00.

Chapter 5. Policy profiles

In zSecure Command Verifier, you can define the installation policies from policy profiles in the XFACILIT resource class.

For the best performance, **RACLIST** the zSecure Command Verifier policy profiles. If the installation does not use **RACLIST** on the resource class, zSecure Command Verifier internally issues a RACROUTE REQUEST=LIST. A resource class that is RACLISTed requires a refresh before any changes to profiles become effective. You must always issue a **SETROPTS RACLIST**(*class*) **REFRESH** command after you complete changes to the zSecure Command Verifier policy profiles.

If the zSecure Command Verifier resource class is shown as GLOBAL RACLIST ONLY in the SETROPTS output, some releases of RACF do not warn the administrator about the requirement to issue a **SETROPTS RACLIST**(*class*) **REFRESH**. Although no longer necessary for zSecure Command Verifier performance, you can still issue a **SETROPTS RACLIST**(*class*) command to load all relevant zSecure Command Verifier policy profiles into a dataspace. If you did so, most RACF commands issue the warning message that profiles must be refreshed to be effective.

Attention: Do not define a top generic profile like C4R.** or **. If you define a generic profile, the following actions, which depend on the specified access, occur:

- All RACF commands for which no more specific profiles were defined fail.
- All zSecure Command Verifier controls are bypassed.

Policy profile syntax

The policy profiles that zSecure Command Verifier uses, must be defined in the XFACILIT resource class.

Alternatively, you can specify another RACF resource class for use in zSecure Command Verifier.

In general, the profiles that are used for policy specification have four qualifiers. The first qualifier is always C4R to indicate that these profiles are for zSecure Command Verifier. The second qualifier indicates the type of profile that this control applies to. Examples of the second qualifier are USER, GROUP, data set, TCICSTRN. The third qualifier is used as an indicator of the function or field that is controlled. Examples are ID, OWNER, NOTIFY, ATTR, UACC. The fourth qualifier can specify a value for the particular function or field. Examples are READ, JOIN, and *groupname*. Some types of policy profiles also support more qualifiers to specify the profile to which this policy applies. The additional qualifiers are primarily intended to allow for exceptions to the rules. Two example policy rules that fit the general pattern are shown in the following list.

- **C4R.DATASET.UACC.READ.SYS1.****

  This profile controls the authority to set the UACC for data sets that match the pattern SYS1.**. The only UACC value that is explicitly controlled by this policy profile is READ.
- **C4R.USER.DFLTGRP.SYS1.****

  This profile controls the authority to select the group SYS1 as DFLTGRP. The ** at the end of the policy profile indicates that it applies to all user IDs.

Additionally, special values for certain qualifiers are implemented in these profiles. Use /SCOPE to refer to target profiles like users, groups, or data sets that are *not in scope*. The /SCOPE policy profiles control the authorizations to handle the *not in scope* profiles. Other special qualifiers are indicated by an = sign. These qualifiers are used to describe *equal to* type of policies. Examples of these types of special qualifiers are shown in the following list.

- **C4R.USER.PASSWORD.=DFLTGRP**

  The profile controls the authority to set the password equal to the default group DFLTGRP of the user.
- **C4R.USER.=OWNER.IBM***

  This profile specifies that the owner of a user ID, if it matches the pattern IBM*, must be equal to a certain value. The value is specified in the **APPLDATA** field of the policy profile.

If a policy profile contains a special qualifier that starts with a special character, like a slash "/", equals "=", or similar, that entire qualifier must be present in the policy profile. Generic characters cannot be used to represent this qualifier. Other qualifiers in the policy profile can be covered by generics. For example, the authority to set the password equal to the default group of the user is controlled by the policy:

```
C4R.USER.PASSWORD.=DFLTGRP
```

This policy can be covered by the following policy profiles:

```
C4R.USER.*.=DFLTGRP
C4R.**.=DFLTGRP
C4R.*.PASS*.=DFLTGRP
```

The policy is not covered by any of the following profiles:

```
C4R.**
C4R.USER.PASSWORD.*
C4R.USER.*.=DFLT*
```

There are some exceptions to this rule. These exceptions are mentioned in the detailed description of the policy profiles.

The policy profiles that are used in zSecure Command Verifier fall into two different categories. The first one is the general one used throughout the product. It describes the *result* of a command, and not the command itself. The policy profile has qualifiers that describe the target profile and field, like **DATASET.ACL**, and do not contain any reference to the actual command used to change the ACL, which is the **PERMIT** command. The second type of profile is the one focused around a particular command or command keyword. These policy profiles are, for instance, used to temporarily grant system-special during the execution of the **LISTUSER** command. They contain the actual command, like **ALTUSER**, as a qualifier in the policy profile.

The field-value policy profiles are used to allow, disallow, or force the adding, changing, or setting of particular fields to the specified value for a certain profile. The command-related policy profiles do not allow control over fields or values, but provide only the functionality for the entire command.

In general, if you do not define a profile, zSecure Command Verifier behaves as if there is no specific policy and defers the authorization decision to RACF. Standard

RACF processing is followed, as if zSecure Command Verifier were not implemented. If a policy profile exists, the access level, from access list and UACC, is interpreted as follows:

No profile found
The policy rule is not implemented.

NONE
The terminal user does not meet the requirements as described by the policy rule. Most often, the command is rejected. For Mandatory Value policy profiles, see "Mandatory and default value policy profiles" on page 62. The mandatory value is not applied.

READ Same as NONE. Also, in many situations, READ access is sufficient to remove an attribute, or specify an initial value.

UPDATE
The terminal user does meet all the requirements as described by the policy rule. The command continues.

CONTROL
The policy rule does not apply to this terminal user.

Read the specific descriptions for each profile for a description how this general usage applies to a specific policy rule.

Avoid warning mode

zSecure Command Verifier does not support the use of warning mode on policy profiles. Global Access Checking, the Universal Access, and the Standard Access list are used. Certain types of Conditional Access are also supported. If you use warning mode on zSecure Command Verifier policy profiles, the results can be confusing. For example, if warning mode is enabled, you receive **ICH408I** messages that show `WARNING: INSUFFICIENT AUTHORITY - TEMPORARY ACCESS ALLOWED`. However, processing still ends, and access to the policy is not granted.

The reason for the confusing messages is that at the end of processing after zSecure Command Verifier determines the required actions, a RACF audit-only request is made to create the appropriate audit trail from SMF. The response of RACF to this audit-only request is ignored by zSecure Command Verifier.

RACFVARS profiles

In some policy profiles, and in some `APPLDATA` values, zSecure Command Verifier uses special values, like `=RACUID`, `=RACGPID`, `=user ID`, and `=GROUP`. The function of `=RACUID` is like the function of the RACF built-in variable `&RACUID`. However, because RACF treats the ampersand (&) as a special character, it cannot be used in general resource profiles like the zSecure Command Verifier policy profiles. Therefore, an equals sign (=) is used instead. In general, the following four special values have the following meaning:

=RACUID
The `userid` of the terminal user that issues the command.

=RACGPID
The list of connect groups of the terminal user issues the command. It is different from the use of `&RACGPID` by RACF. RACF uses it to represent only the current connect group, while zSecure Command Verifier uses it for all connect groups.

=USERID
The RACF USERID specified in the command.

=GROUP
The RACF GROUP specified in the command.

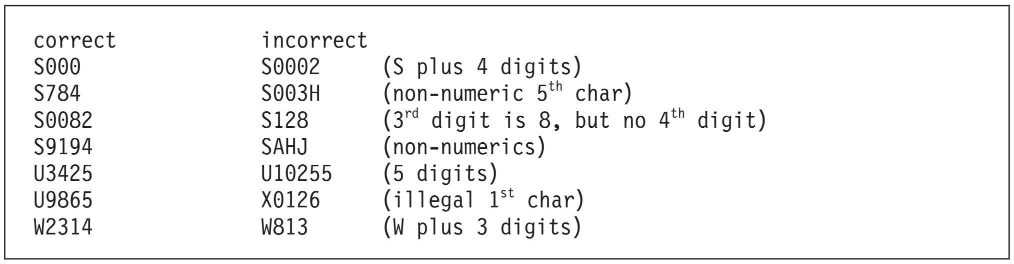
In addition to these default variables, you can also use RACFVARS in most policy profiles. You can use these variables in all places where regular generic characters are allowed, but where conventional generic characters (%, *, and.**) do not fit the required pattern. An example of conventional use of a RACF variable is shown in the following example. For user IDs, only two default groups can be used. You can define two profiles, but it is also possible to define one policy profile, and use a RACF variable to specify the exact values.

```
RDEFINE XFACILIT C4R.USER.DFLTGRP.DEPTA.*
RDEFINE XFACILIT C4R.USER.DFLTGRP.DEPTS.*

or

RDEFINE RACFVARS &DFLTGRP ADDMEM(DEPTA, DEPTS)
RDEFINE XFACILIT C4R.USER.DFLTGRP.&DFLTGRP*
```

Another example of the use of RACFVARS is the specification of more complex patterns for user ID naming conventions. Suppose that an installation uses the following naming conventions:

- The first character is an S, T, U, V, or a W.
- If the first character is an S, it is normally followed by 3 digits. However, if the third digit is an 8 or 9, an extra digit is used for a total of 4 digits.
- If the first character is a T, U, V, or W, it is always followed by 4 digits.

This naming convention clearly shows historical growth. In the past, there were a limited number of S-users. When more userid values were needed, two free digits were used to signal the use of an extra digit. The following list of correct and incorrect userid values illustrates the naming convention rules.



```
correct           incorrect
S000              S0002     (S plus 4 digits)
S784              S003H     (non-numeric 5th char)
S0082             S128      (3rd digit is 8, but no 4th digit)
S9194             SAHJ      (non-numerics)
U3425             U10255    (5 digits)
U9865             X0126     (illegal 1st char)
W2314             W813      (W plus 3 digits)
```

Figure 10. User ID naming convention example

To enforce this naming convention, zSecure Command Verifier policy profiles that use RACFVARS can be used. The first step consists of recognizing the different characters that are being used and defining RACFVARS for these different types.

```
RDEFINE RACFVARS &S ADDMEM(S)                       Special character
RDEFINE RACFVARS &F ADDMEM(T U V W)                 First characters
RDEFINE RACFVARS &N ADDMEM(0 1 2 3 4 5 6 7 8 9)    Normal digits
RDEFINE RACFVARS &X ADDMEM(8 9)                     eXtension digits
RDEFINE RACFVARS &Y ADDMEM(0 1 2 3 4 5 6 7)         non-extension digits
```

The next step is to use these variables to define the three valid patterns.

```
&S&N&N&Y                  S plus three digits (non-extension)
&S&N&N&X&N                S plus four digits (extension)
&F&N&N&N&N                T,U,V,W plus four digits
```

The patterns are designed such that for each user ID, only one pattern applies. For instance, the definitions of &X and &Y do not overlap, and thus there is no ambiguity about which of the first two patterns apply. If the first pattern was &S&N&N&N, an ambiguity would arise when the third digit is an eight.

The last step is to use three patterns in a set of zSecure Command Verifier policy profiles:

```
C4R.USER.ID.*           UACC(NONE)
C4R.USER.ID.&S&N&N&Y    UACC(NONE)  UPDATE(RACFADM)
C4R.USER.ID.&S&N&N&X&N  UACC(NONE)  UPDATE(RACFADM)
C4R.USER.ID.&F&N&N&N&N  UACC(NONE)  UPDATE(RACFADM)
```

The first profile ensures that user IDs outside the naming convention cannot be created. The next three profiles allow `RACFADM` to create user IDs according to any of the three patterns. Remember to issue a **`SETROPTS REFRESH RACLIST`** for both the `RACFVARS` and the `XFACILIT` class. The `RACFVARS` class must be RACLISTed and REFRESHed before the `XFACILIT` class.

The preceding example shows how `RACFVARS` can be used in policy profiles. It clearly shows the benefits when you define patterns for naming conventions. In these cases, only a few policy profiles suffice to implement fairly complex conventions.

Policy profile selection

Every RACF command and keyword has these basic control items:

- Field or attribute that is affected
- Terminal user who issues the command to set the field or attribute
- Profile that is affected

The following example illustrates these control items:

```
IBMUSER:    ALTUSER CRMAHJB DFLTGRP(SYS1)
```

The following list contains the control items.

- *DFLTGRP* selection
- Terminal user *IBMUSER*
- Object user *CRMAHJB*

In general, the design of the policies is based on the result of a command, and not on the command itself. So, the policies try to control the value of the attributes, independent of how such a value is set. For instance, for the **`DFLTGRP`**, it does not matter if the value is set during creation of the user ID, or afterward through a change of the user ID. The net result is what is controlled. It is also one of the main arguments why most policies do not take System-SPECIAL or similar authorizations into consideration.

If you want to implement a policy for the **`DFLTGRP`**, and you do not want any changes to the **`DFLTGRP`** of any user, you can implement a profile like:

```
C4R.USER.DFLTGRP.**   UACC(NONE)   ACL(empty)
```

If you want to make exceptions to the general rule, you must decide what type of exceptions you want to make. If you want an exception that is based on the terminal user who issued the command, you must modify the ACL and grant the terminal user, or one of its groups, with UPDATE access. If you want to make an exception that is based on the **DFLTGRP** itself, you can define a profile that contains the name of the **DFLTGRP**:

```
C4R.USER.DFLTGRP.SYS1.**
```

In previous versions (before Tivoli zSecure Command Verifier version 1.7) the first profile `C4R.USER.DFLTGRP.**` also controlled the Additional Policies for the **DFLTGRP**. This first profile also covered the `/SCOPE` and `/OWNER` policies. The effect of the `/OWNER` profile is that you can change only the **DFLTGRP** if you also change the `OWNER` in the same command. Because the example **ALTUSER** command changes only the **DFLTGRP**, it is rejected. In Tivoli zSecure Command Verifier version 1.7, the rules for specification of the Additional Policy Profiles are changed. The special qualifiers in the Additional Policy Profiles must now be covered by discrete characters. The generic profile no longer applies, and the Additional Policies are considered not implemented. The example **ALTUSER** command is now accepted. If you want to explicitly control the Additional Policies, you must define more specific profiles, where the special qualifier is not generic.

```
C4R.USER.DFLTGRP./SCOPE.**   UACC(UPDATE)
C4R.USER.DFLTGRP./OWNER.**   UACC(UPDATE)
```

For more information about the Additional Policy profiles for the **DFLTGRP**, see “Additional policy controls for the default group” on page 80.

Summary

You must define at least three profiles for **DFLTGRP** control.

```
C4R.USER.DFLTGRP.**          UACC(???)   ACL(empty)
C4R.USER.DFLTGRP./SCOPE.**   UACC(???)   ACL(empty)
C4R.USER.DFLTGRP./OWNER.**   UACC(???)   ACL(empty)
```

To make exceptions to the general rule, specify one of the following items:

- Extra qualifiers in the first profile to permit certain users to have a certain group as DFLTGRP
- Extra users or groups in the access list
- A combination of the previous two methods

Other policy profiles must be evaluated in a similar way.

General functions

Aside from the preceding result-related policy profiles, zSecure Command Verifier also uses some general profiles. An example profile in this area is the profile that determines whether terminal users with `FIELD` access level authority can run commands for all RACF profiles or only for profiles in their regular scope.

Attention: Do not define a top generic profile like `C4R.**` or `**`. If you define a generic profile, the following actions, which depend on the specified access, occur:

- All RACF commands for which no more specific profiles were defined fail.
- All zSecure Command Verifier controls are bypassed.

User exemption, violation suppression, error handling

The following general profiles are used to specify whether certain users are exempt from all zSecure Command Verifier policy rules, and what action zSecure Command Verifier must take in case of policy violations and other error situations.

The following list contains the general profiles.

- **C4R.EXEMPT**

  This profile controls whether certain users are exempt from policy enforcement. If the terminal user has sufficient access, no further verification of any policy is completed. It is not possible to detect if the command violated any policy, and if the exemption is needed for successful execution of the command. You must audit this policy profile successful access by using the following command:

  ```
  RALT XFACILIT C4R.EXEMPT AUDIT(SUCCESS(UPDATE))
  ```

  The LOGSTR for the access event to this policy profile contains the command as entered.

  In many situations, it is preferable to use the C4R.ERROR.CONTINUE policy profile. The main advantage is that all policy profiles are examined, and that possible policy violations can be recorded through the log string of the access event to the `C4R.ERRMSG.command` auditing profile.

  The following access rules apply for the `C4R.EXEMPT` policy profile:

  No profile found
  No users are exempt from policy enforcement.

  NONE
  This terminal user is not exempt from policy enforcement.

  READ Same as NONE.

  UPDATE
  The user is not subject to any policy rule verification or enforcement. No audit trail of the various command keywords and options is created.

  CONTROL
  Same as UPDATE.

- **C4R.SUPPRESS**

  This profile controls whether zSecure Command Verifier must attempt to suppress keywords and parameter values that are a violation of the specified policy. If suppression is not feasible, the command is failed anyway. This situation can be the case where suppression of the command leads to incorrect commands, or leads to commands that violate the policy. An example of such a situation can be found when a terminal user tries to explicitly set the password of another user to the DFLTGRP of that other user. Suppression of the new password value can result in the very situation that the policy is trying to avoid. In a situation like this one, zSecure Command Verifier fails the entire command, regardless of the access to the `C4R.SUPPRESS` policy profile. The following access rules apply.

  No profile found
  Keyword suppression is not to be attempted. Any policy violation results in failure of the command.

  NONE
  Keyword suppression is not to be attempted for this terminal user.

  READ Same as NONE.

  UPDATE
  When possible, keywords and parameter values that violate a policy are suppressed. As noted before, this suppression might not always be possible.

CONTROL
Same as UPDATE.

- **C4R.ERROR.CONTINUE**

  This policy profile is used to specify how errors during interpretation of policy profiles and policy violations are handled. An example policy profile error is the use of a circular definition of the owner and *dfltgrp* for new user IDs. An example of a policy violation is the specification of a not-allowed owner for a new user ID. UPDATE access to this profile does bypass the normal processing of policy violations. ICH408I messages are still generated, but the regular zSecure Command Verifier violation messages are suppressed. The main use of this policy is as policy override during an implementation period, and as emergency authority against incorrect policy definitions. The following access rules apply:

  No Profile Found
  This control is not implemented. The command is failed if any of the keywords are not acceptable.

  NONE
  The command is failed if any error or policy violation occurs.

  READ Same as NONE.

  UPDATE
  The command is always allowed to continue, regardless of errors or policy violations. Polices that add or change keywords are executed.

  CONTROL
  Same as UPDATE.

  This policy need not be effective when the terminal user specified a list of profiles. In such situations, the only option available to the program might be to terminate the entire command.

  Also, some policy rules might require the command to be split into multiple commands. Splitting a command is not supported. The commands cannot be run correctly and must therefore be failed.

Message control

The following profiles control whether certain warning and information messages are issued.

The following list contains profiles that control warning and information messages.

- **C4R.DEBUG**

  This profile is now deprecated. Instead, use the `C4R.=MSG.CMD` profile.

- **C4R.=MSG.CMD**

  This profile specifies the command that is passed to RACF before it runs the command. The terminal user needs at least READ access to the profile. Use only the READ access level.

  The RACF command as shown might differ slightly different from the command as entered. For instance, the command itself is always shown in its primary form, and not as one of the possible aliases.

  No Profile Found
  This control is not implemented. The command is not displayed before execution.

  NONE
  The command is not displayed before execution.

READ The RACF command as approved or modified by zSecure Command Verifier is displayed before execution.

UPDATE
Same as READ.

CONTROL
Same as READ.

- **C4R.=MSG.SUPPRESSED**

  This profile controls whether message **C4R899W** is issued when a keyword or parameter value is suppressed. Before version 1.12, these messages are automatically issued if the `C4R.SUPPRESS` policy profile was enabled, but now messages are issued only if this profile is also in effect.

  No Profile Found
  This control is not implemented. **C4R899W** messages are not issued.

  NONE
  C4R899W messages are not issued.

  READ Message **C4R899W** is issued when keyword suppression occurs.

  UPDATE
  Same as READ.

  CONTROL
  Same as READ.

- **C4R.=MSG.MANDATORY**

  This profile controls whether message **C4R899W** is issued when a zSecure Command Verifier policy overrides a mandatory keyword or parameter value of a user-specified keyword or parameter.

  No Profile Found
  This control is not implemented. **C4R899W** messages are not issued.

  NONE
  C4R899W messages are not issued.

  READ Message **C4R899W** is issued when a mandatory keyword or parameter value override occurs.

  UPDATE
  Same as READ.

  CONTROL
  Same as READ.

- **C4R.=MSG.DEFAULTS**

  This profile controls whether message **C4R899W** is issued when a zSecure Command Verifier policy supplies a default keyword or parameter value to complete the user-specified command.

  No Profile Found
  This control is not implemented. **C4R899W** messages are not issued.

  NONE
  C4R899W messages are not issued.

  READ Message **C4R899W** is issued when a default keyword or parameter value is supplied.

  UPDATE
  Same as READ.

CONTROL
Same as READ.

Temporary system-SPECIAL authorization

zSecure Command Verifier provides a facility to use System-SPECIAL authorization for a particular RACF command even if the terminal user does not have this attribute.

Two policy profiles control this function. The first one grants unconditional temporary SPECIAL authorization during the command. The second policy profile grants only temporary SPECIAL if all relevant keywords in the RACF command are explicitly covered by policy profiles. If a keyword or parameter is used that is not explicitly authorized, the command runs without temporary SPECIAL.

Attention: Ensure that you have the fix for IBM APAR OW48138 applied before you activate this facility. Without the fix, terminal users can retain `System-SPECIAL` if the RACF command fails, or if the terminal user presses the attention key to interrupt RACF command processing.

Unconditional temporary SPECIAL authorization

- **C4R.***command.***=SPECIAL**

  Users with UPDATE access to this profile have RACF System-SPECIAL authorization during the execution of the command and during execution of potential **`PRE-`** and **`POST-`** commands. The qualifier `=SPECIAL` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown. The following access rules apply:

  No Profile Found
  This function is not implemented. The command runs by using the regular authorization of the terminal user.

  NONE
  `System-SPECIAL` is not temporarily assigned. The command runs by using the regular authorization of the terminal user.

  READ Same as NONE.

  UPDATE
  The command runs with temporary System-SPECIAL authorization. More **`PRE-`** and **`POST-`** commands are also run by using this authorization.

  CONTROL
  Same as UPDATE.

Controlled temporary SPECIAL authorization

The difference between the Controlled Temporary Special and the Unconditional Temporary Special function is the requirement that all keywords and parameters must be covered by applicable zSecure Command Verifier policy profiles. If one such profile is absent, the Controlled Temporary Special Policy does not apply, and temporary SPECIAL is not granted.

The Controlled Temporary Special gives an installation more granular control over which functions must run with system special and those functions that do not. However, designing correct controls for effective use of Controlled Temporary Special is rather complex because the definition of individual policy profiles now has a dual effect: It determines whether a keyword or parameter is authorized to be used, and it determines whether temporary SPECIAL must be granted. The easiest method to handle this duality is to treat the definition of policy profiles as a way to specify which keywords and parameters can be present without affecting the temporary SPECIAL authorization. For example, you might define policies by using the following strategy:

- Do not define any policy to control keywords and parameters that you do not care about, for example the ADSP attribute in user profiles.
- Define appropriate policy profiles to prevent the use of certain keywords and parameters, for example the OWNER of a user profile.
- Define a Controlled Temporary Special Profile for selected commands.

Temporary special functions are now granted only for those commands that are authorized, and for which a policy profile exists. So, if somebody wants to change the ADSP attribute, the command is passed to RACF, which can accept or reject the command. The commands are not run with temporary SPECIAL because there is no applicable policy profile for the ADSP attribute. If somebody wants to change the OWNER of a user profile, zSecure Command Verifier can accept or reject the command that is based on the access to the OWNER policy profile. If the command is accepted, it can run with temporary SPECIAL, since there is a policy profile. If the command is rejected, it does not matter if it runs with or without temporary SPECIAL.

The major issue to watch when you use the Controlled Temporary Special policy is the exact list of keywords and parameters that are now authorized, not just in the original context of the permanent RACF authorizations, but also in the context of the temporary authorization.

When you grant Controlled Temporary Special, you must carefully verify whether all currently authorized changes to profiles must indeed run with SPECIAL authorization. A strategy that can help prevent unintended side effects is to never define a policy profile that explicitly allows the same function as allowed in the absence of the policy profile.

The following policy profile can be used to implement Controlled Temporary Special. The access levels that are supported are explained in detail.

- **C4R.***command.***=CTLSPEC**

  Users with UPDATE access to this profile have RACF `System-SPECIAL` during the execution of the command and during execution of potential **`PRE-`** and **`POST-`** commands. The policy applies only if all keywords and parameters are controlled by a zSecure Command Verifier policy profile. The qualifier `=CTLSPEC` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown. The following access rules apply:

  No Profile Found
  : This function is not implemented. The command runs by using the regular authorization of the terminal user.

  NONE
  : `System-SPECIAL` is not temporarily assigned. The command runs by using the regular authorization of the terminal user.

  READ Same as NONE.

  UPDATE
  : The command runs with temporary `System-SPECIAL` authorization. More **`PRE-`** and **`POST-`** commands are also run by using this authorization.

  CONTROL
  : Same as UPDATE.

The Controlled Temporary Special policy does not require that all zSecure Command Verifier policy profiles are defined. Only those policy profiles that control a particular keyword or parameter. For instance, when you grant READ access to user USRXYZ for data set MYHLQ.TEST.DSN, you do not need a policy profile that allows the use of user IDs instead of GROUPs on access lists, which is the `ACL./GROUP` policy profile. The only controlling profile that is needed in this example is the one for the following resource:

```
C4R.DATASET.ACL.USRXYZ.READ.MYHLQ.TEST.DSN
```

This resource can be controlled by the following policy profile:

```
C4R.*.ACL.USRXYZ.READ.**
```

The following list shows all policy profiles that are used to determine whether Controlled Temporary Special must be applied. In the list, `generics` are used to denote one or more qualifiers that can have multiple values.

```
C4R.USER.ID.*              C4R.USER.DELETE.*          C4R.USER.DFLTGRP.*
C4R.USER.OWNER.*           C4R.USER.ATTR.*            C4R.USER.PASSWORD.*
C4R.USER.PWINT.*           C4R.USER.PWEXP.*           C4R.USER.NAME.*
C4R.USER.INSTDATA.*        C4R.USER.CLAUTH.*          C4R.USER.SECLABEL.*
C4R.USER.SECLEVEL.*        C4R.USER.CATEGORY.*        C4R.USER.MODEL.*
C4R.USER.WHEN.*            C4R.USER.segment.*         C4R.USER.segment./SCOPE
C4R.GROUP.ID.*             C4R.GROUP.DELETE.*         C4R.GROUP.SUPGRP.*
C4R.GROUP.OWNER.*          C4R.GROUP.ATTR.*           C4R.GROUP.INSTDATA.*
C4R.GROUP.MODEL.*          C4R.GROUP.segment.*        C4R.GROUP.segment./SCOPE
C4R.CONNECT.*              C4R.REMOVE.*               C4R.CONNECT.OWNER.*
C4R.CONNECT.AUTH.*         C4R.CONNECT.UACC.*         C4R.CONNECT.ATTR.*
C4R.class.ID.*             C4R.class.OWNER.*          C4R.class.UACC.*
C4R.class.ACL.*            C4R.class.CONDACL.*        C4R.class.VOLUME.*
C4R.class.UNIT.*           C4R.class.RACFIND.*        C4R.class.TYPE.*
C4R.class.ATTR.*           C4R.class.INSTDATA.*       C4R.class.NOTIFY.*
C4R.class.APPLDATA.*       C4R.class.SECLABEL.*       C4R.class.CATEGORY.*
C4R.class.SECLEVEL.*       C4R.class.LEVEL.*          C4R.class.RETPD.*
C4R.class.segment.*        C4R.class.segment./SCOPE
```

Figure 11. Sample Policy profiles used to determine whether Controlled Temporary Special policy applies

Profiles that manage non-base segments

RACF allows management of information in non-base segments, such as, the OMVS and TSO segments to all System-SPECIAL users and to all users with sufficient access to profiles in the `FIELD` class. The latter method is often referred to by the term *Field Level Access Checking*. In some situations, it might be desirable to restrict management of these types of segments even further. To allow control over the non-base segment, zSecure Command Verifier implements three types of profiles.

- **C4R.***class.segment.***=RACUID**

  This policy profile is used to control the authority to manage your own segment information. This profile is like the user of &RACUID on the access list of the field profiles.
- **C4R.***class.segment*

  This policy profile controls the authority to manage segment information for user profiles other than your own.
- **C4R.***class.segment.***/SCOPE**

  This policy profile can be used to control the scope of authority for management of segment information.

Either the first or the second profile is used to determine the authority of the terminal user to manage the non-base segment. For users without System-SPECIAL, the third profile can be used as well to reduce the scope of control. If the terminal user must be able to display their own TSO information, the following two profiles must be in place:

```
XFACILIT     C4R.USER.TSO.=RACUID           userid(READ)
FIELD        USER.TSO.**                    &racuid(READ);
```

For allowing the same terminal user to display the TSO information of other users the following two profiles must be in place:

```
XFACILIT     C4R.USER.TSO                   userid(READ)
FIELD        USER.TSO.**                    userid(READ)
```

In these scenarios, both the zSecure Command Verifier and the field profile must be in place. The implementations can also be mixed, as in the following example.

```
XFACILIT     C4R.USER.TSO.=RACUID           uacc(NONE) userid(READ)
XFACILIT     C4R.USER.TSO                   uacc(NONE)
FIELD        USER.TSO.**                    uacc(READ)
```

In this situation, the terminal user can manage the TSO segment of the user according to the first zSecure Command Verifier profile. This profile is also authorized by the field profile. This field profile also allows displaying the TSO segment of all other users. However, the second zSecure Command Verifier policy profile that is shown prevents that.

Attention: See “USS segment management functions” on page 193 for important information about how to restrict certain field value assignments in non-base segments. Without appropriate profiles, providing UPDATE access from field level access can create undesirable effects.

The following section describes the profiles and access levels in detail.

- **C4R.***class.segment***.=RACUID**

  This profile is used if the terminal user tries to display or change the *segment* in their own user profile. Because the =RACUID qualifier refers to the terminal user itself, the policy profile is only applicable for the USER *class*. If the profile does not exist, or does not allow access, authorization verification continues with the general profile for all users that are described in the next entry (**C4R.***class.segment*). You cannot use generic characters to cover the =RACUID qualifier in the policy profile; it must be present in the exact form shown.

  Use care when you define a generic value for the segment name because the resulting policy profile might also match the authority to change your own password or password phrase. For more information about the policy profiles for passwords and password phrases, see “Policy profiles for user password management” on page 96.

  The following access rules apply:

  No Profile Found

  This control is not implemented. zSecure Command Verifier does not control access to *segment*. RACF controls access to the *segment* according to the definitions in the field class.

  NONE

  The terminal user cannot access the *segment* information of their own user ID. However, this restriction can be overruled by the general segment access policy profile. This restriction is independent of the definition of profiles in the field class.

READ The terminal user can display the *segment* information of the user. This ability is also subject to the appropriate access to the profiles defined in the field class.

UPDATE
The terminal user can update the *segment* information of the user. This ability is also subject to the appropriate access to the profiles defined in the field class.

CONTROL
Same as UPDATE.

- **C4R.***class.segment*

  This profile is used if the terminal user tries to display or change the *segment* information for any user profile. This profile is also used if the terminal user tried to access the *segment* of the user ID, but is not authorized by the profile that is mentioned before. The following access rules apply:

  No Profile Found
  This control is not implemented. zSecure Command Verifier does not control access to *segment*. RACF controls access to the *segment* according to the definitions in the field class.

  NONE
  The terminal user cannot access the *segment* information of the target user ID. This restriction is independent of the definition of profiles in the field class.

  READ The terminal user can display the *segment* information. This ability is also subject to the appropriate access to the profiles defined in the field class. If the target user ID is outside the `Group-SPECIAL` scope of the terminal user, or the terminal user does not have any `Group-SPECIAL` attribute, the `/SCOPE` policy profile that is described in the following section applies.

  UPDATE
  The terminal user can update the *segment* information. This ability is also subject to the appropriate access to the profiles defined in the field class. If the target user ID is outside the `Group-SPECIAL` scope of the terminal user, or the terminal user does not have any `Group-SPECIAL` attribute, the `/SCOPE` policy profile that is described in the following section applies.

  CONTROL
  Same as UPDATE.

Currently, the following values are supported for the qualifier *segment* in the preceding profiles:

USER CICS, DFP, LANGUAGE, NETVIEV, OMVS, OPERPARM, TSO, WORKATTR, OVM, DCE, NDS, LNOTES, KERB, PROXY, EIM, CSDATA

GROUP
DFP, OMVS, OVM, TME, CSDATA

DATASET
DFP, TME

General Resource
SESSION, DLFDATA, SSIGNON, STDATA, SVFMR, TME, KERB, PROXY, EIM, CDTINFO, ICTX, CFDEF, ICSF, SIGVER, PROGRAM

Scoping rules to manage segments

In RACF, access to profiles in the field class controls access to the fields in the non-base segments of all profiles. You cannot allow a decentralized administrator to manage, for example, the TSO segments of only those users that fall within the `Group-SPECIAL` scope of the administrator. zSecure Command Verifier provides a facility that allows enforcing the same scoping rules as used for the normal RACF (is BASE) segment, for the non-base segments. Using the `/SCOPE` profile, it is possible to restrict these users to just the profiles that are within their BASE-segment scope.

zSecure Command Verifier does not replace the RACF access control to the non-base segment information. If the decentralized administrator does not have access from field level access checking, the administrator still cannot view or modify non-base segments. Full implementation of *Scoping of Segment Management* requires that all decentralized administrators who must maintain the non-base segments of their profiles have access to the corresponding field profiles.

zSecure Command Verifier does not consider direct ownership of the target profile in this scoping rule. Only `Group-SPECIAL` is used for determining the scope of control.

Terminal users with `System-SPECIAL` authorization are exempt from this control because all profiles in the system are considered to be in their scope.

Attention: See "USS segment management functions" on page 193 for important information about how to restrict certain field value assignments in non-base segments. Without appropriate profiles, activation of Segment Management Scoping and providing `UPDATE` access from field level access to decentralized administrators can create undesirable effects.

- **C4R.***class.segment.***/SCOPE**

  The qualifier `/SCOPE` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown. The following access rules apply:

  No Profile Found
  This control is not implemented. Standard RACF rules apply. The non-base segments of all profiles can be accessed according to the definitions in the field class.

  NONE
  The terminal user cannot access any non-base segment outside the standard RACF scope. For profiles within the scope, the access level to the respective field class profiles controls if the fields can be displayed or modified.

  READ The terminal user can display the authorized non-base segments of all profiles in the system. For profiles outside the scope, only list commands are allowed. For profiles within the scope, all commands are allowed. The access level to the respective field class profiles controls if the fields can be displayed or modified.

  UPDATE
  The terminal user can modify the authorized non-base segments of all profiles in the system. The profiles in the field class still control if a field is accessible for display or modify to a particular terminal user.

CONTROL
Same as UPDATE.

RACF command replacement

zSecure Command Verifier provides a way to replace commands with other commands by a combined add/replace approach. The first step is to specify a pre-command or a post-command. The second step is to specify whether the original commands must be run, maybe stripped of some keywords, or not. It can be controlled by three profiles. In the pre-command and post-command, several fields from the original RACF command can be referenced by variables. For instance, the target class and profile can be specified by `&CLASS` and `&PROFILE`.

Note: Currently this function is only available for the following commands and keywords:

Table 7. Commands and keywords supported by the Command/Keyword Replace Function.

Command	Keyword	Keyword-qualification
ALTUSER	RESUME	RESUME
ALTUSER	REVOKE	REVOKE
ALTUSER	RESUME(date) NORESUME	RESUMEDT
ALTUSER	REVOKE(date) NOREVOKE	REVOKEDT
ADDUSER **ALTUSER**	SPECIAL	SPECIAL
ADDUSER **ALTUSER**	OPERATIONS	OPERATIONS
ADDUSER **ALTUSER**	AUDITOR	AUDITOR
PERMIT	CLASS(*class*)	CLASS.*class*
ADDUSER **ALTUSER**	*segment* **NO***segment*	*segment.action action*={Add | Alt | Del}

The following three types of profiles specify the PRE-Command and POST-Command and to indicate whether and how the original RACF command must be run. For setting attributes through the **ADDUSER** or **ALTUSER** command, the *keyword-qualification* consists of only one qualifier, which can be SPECIAL, AUDITOR, or another qualifier. When you manage user segments, the *keyword-qualification* consists of two qualifiers. The first is the full name of the segment, and the second is the action, which can be ADD, ALT, or DEL. For the **PERMIT** command, the *keyword-qualification* also consists of two qualifiers CLASS.*class*.

The special qualifier `=PRECMD`, `=PSTCMD`, or `=REPLACE` must be explicitly coded in the policy profile. It cannot be matched by generic characters. Other qualifiers in these policy profiles like the command or the resource class can be described by generic characters.

The following list contains some sample policy profiles.

```
C4R.*.=PRECMD.SPECIAL
C4R.ALTUSER.=PRECMD.REVOKE
C4R.ALTUSER.=PSTCMD.TSO.ADD
C4R.A*.=PRECMD.*.A*
C4R.PERMIT.=PSTCMD.CLASS.DATASET
```

See the following list for the detailed description of the profiles and the supported access levels.

- **C4R.***command***.=PRECMD.***keyword-qualification*

  This profile specifies the command that must be run before the original RACF command. The pre-command is specified by the `APPLDATA` of the profile. The most common use of this profile is to replace the **`ALTUSER RESUME`** command by a **`CKGRACF RESUME`** command.

  If more than one keyword matches an **=PRECMD** profile, any of the profiles can be used to specify the pre-command. The profile that is used by zSecure Command Verifier is unpredictable.

  The qualifier `=PRECMD` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  If the pre-command fails during execution, the original, or modified RACF command is suppressed. This way, dependent actions in the modified RACF command are only run if the prerequisite action from the pre-command is completed.

  The following access rules apply:

  No Profile Found
  : This control is not implemented. No pre-command is issued.

  NONE
  : The pre-command that is specified in this profile is not run for this terminal user.

  READ
  : The pre-command that is defined by the `APPLDATA` is run before the original RACF command.

  UPDATE
  : Same as READ.

  CONTROL
  : Same as UPDATE.

- **C4R.***command***.=REPLACE.***keyword-qualification*

  This profile specifies whether the original keyword must be kept or suppressed or if the entire RACF command must be suppressed. If the pre-command fails, the original RACF command is not run. This case is independent of the definition of the `=REPLACE` profile.

  If the *keyword* is present in the command, the action is controlled by the access rules that are specified in the following list. If more than one keyword matches an **=REPLACE** profile, all of these profiles can be used to suppress keywords or the entire command.

  The qualifier `=REPLACE` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  The following access rules apply:

  No Profile Found
  : This control is not implemented. The keyword is not removed.

  NONE
  : The keyword suppress is not done for this terminal user.

READ The keyword is suppressed. This suppression can result in a command without any effective keywords.

UPDATE
The entire command is suppressed. This suppression can result in error flags that are being presented to the terminal user, indicating that the command failed.

CONTROL
Same as UPDATE.

- **C4R.***command***.=PSTCMD.***keyword-qualification*

  This profile specifies the command that must be run after the original RACF command. The post-command is specified by the `APPLDATA` of the profile. In the command, the target class and profile can be specified by `&CLASS` and `&PROFILE`.

  If more than one keyword matches an **=PSTCMD** profile, any of the profiles can be used to specify the post-command. The profile that is used by zSecure Command Verifier is unpredictable.

  The qualifier `=PSTCMD` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  The following access rules apply:

  No Profile Found
  This control is not implemented. No post-command is issued.

  NONE
  The post-command that is specified in this profile is not run for this terminal user.

  READ The post-command that is defined by the `APPLDATA` is run after the original RACF command. If the original RACF command issues a warning message, the post-command is suppressed. This access level can be useful for some RACF commands like **`ALTUSER`** and **`ALTGROUP`** that issue only a warning message, even if the command fails completely.

  UPDATE
  The post-command that is defined by the `APPLDATA` is run after the original RACF command. If the original RACF command failed with an error message or an abend, the post-command is suppressed.

  CONTROL
  Same as UPDATE.

The `APPLDATA` of `=PRECMD` and `=PSTCMD` profiles can be used to specify the command to be run before and after the original RACF command. Because of the way that RACF handles the **APPLDATA** field, the value that is entered is folded to uppercase. In the specified command string, variables can be used to refer to parts of the original RACF command. Variables are prefixed by an ampersand (&) sign. The following variables are supported:

&CLASS
Represents the CLASS of the PROFILE. For the **`ALTUSER`** command, this value is USER. For the **`PERMIT`** command, the value is data set or the general resource class specified.

```
PERMIT STGADMIN.** CLASS(FACILITY) ID(IBMUSER,C4RTEST) ACCESS(READ)
&CLASS ---> FACILITY

ALTUSER IBMUSER REVOKE
&CLASS ---> USER
```

&PROFILE

Represents the PROFILE. For the **ALTUSER** command, it is the affected user ID. For the **PERMIT** command, it is the fully qualified data set name or the general resource profile name.

```
PERMIT STGADMIN.** CLASS(FACILITY) ID(IBMUSER,C4RTEST) ACCESS(READ)
&PROFILE ---> STGADMIN.**

ALTUSER IBMUSER REVOKE
&PROFILE ---> IBMUSER
```

&PROFILE(1)

Represents one PROFILE. For the **ALTUSER** command, it is one of the affected user IDs. For the **PERMIT** command, it is one of the fully qualified data set names or general resource profile names. Which profile is used is unpredictable.

```
PERMIT STGADMIN.** CLASS(FACILITY) ID(IBMUSER,C4RTEST) ACCESS(READ)
&PROFILE(1) ---> STGADMIN.**

ALTUSER (IBMUSER) REVOKE
&PROFILE(1) ---> IBMUSER

ALTUSER (IBMUSER, C4RTEST) REVOKE
&PROFILE(1) ---> C4RTEST (maybe)
```

&SEGMENT

Represents the list of USER SEGMENTs that are being managed in this command.

```
ALTUSER IBMUSER TSO OMVS(UID(0))
&SEGMENT ---> TSO OMVS
```

&SEGMENT(1)

Represents one of the USER SEGMENTs that are being managed in this command. Which SEGMENT is used is unpredictable.

```
ALTUSER IBMUSER TSO OMVS(UID(0))
&SEGMENT(1) ---> OMVS (maybe)
```

&RACUID

Represents the user ID of the terminal user that is issuing the command.

```
PERMIT STGADMIN.** CLASS(FACILITY) ID(IBMUSER,C4RTEST) ACCESS(READ)
&RACUID ---> CRMAHJB (maybe)

ALTUSER IBMUSER REVOKE
&RACUID ---> CRMAHJB (maybe)
```

&RACGPID

Represents the current connect GROUP of the terminal user that is issuing the command.

```
PERMIT STGADMIN.** CLASS(FACILITY) ID(IBMUSER,C4RTEST) ACCESS(READ)
&RACGPID ---> CRMA (maybe)

ALTUSER IBMUSER REVOKE
&RACGPID ---> CRMA (maybe)
```

&DATE

Represents the current date in Julian format (YY.DDD). The Julian date is the same format as used by RACF in the LISTUSER output.

```
ALTUSER IBMUSER REVOKE
&DATE ---> 04.060 (maybe)
```

&TIME

Represents the current time in 24 hour format (HH:MM:SS). This time format is the same as used by RACF in the LISTUSER output.

```
ALTUSER IBMUSER REVOKE
&TIME ---> 08:17:31 (maybe)
```

&SYSID
Represents the SMF System Identifier of the current system. This variable is the four character string that is specified by SMFPARMxx in parmlib. It is the same value that can be used in the conditional access list of PROGRAM profiles.

```
ALTUSER IBMUSER REVOKE
&SYSID ---> IDFX (maybe)
```

&ACLID
Represents the list of IDs of both user and GROUPs specified in the ID keyword of the **PERMIT** command. The list can consist of a single value, or a blank separated list. Leading and trailing blanks are not included.

```
PERMIT STGADMIN.** CLASS(FACILITY) ID(IBMUSER,C4RTEST) ACCESS(READ)
&ACLID ---> IBMUSER C4RTEST
```

&ACLID(1)
Represents one of the IDs of both user and GROUPs specified in the ID keyword of the **PERMIT** command. Which one of the IDs is used is not predictable.

```
PERMIT STGADMIN.** CLASS(FACILITY) ID(IBMUSER,C4RTEST) ACCESS(READ)
&ACLID(1); ---> C4RTEST (maybe)
```

&ACLACC
Represents the access level that is granted by the ACCESS keyword of the **PERMIT** command. In addition to the regular access levels, the value DELETE represents that an ACL-entry is to be removed.

It is also possible to substitute by using a substring of the ACCESS level. This substitution can be specified by a single digit between parenthesis immediately following the string &ACLACC. Only a single digit from 1 to 8 is allowed, and the total substring specification must consist of exactly 3 characters. Any other format is treated as a regular character string.

```
PERMIT STGADMIN.** CLASS(FACILITY) ID(IBMUSER C4RTEST) ACCESS(UPDATE)
&ACLACC    ---> UPDATE
&ACLACC(3); ---> UPD
```

Example 1

In this example, the following two profiles replace the **ALTUSER RESUME** command with the zSecure Admin Resume function:

```
XFACILIT:   C4R.ALTUSER.=PRECMD.RESUME
  UACC:     UPDATE
  APPLDATA: 'CKGRACF &class &profile RESUME'

XFACILIT:   C4R.ALTUSER.=REPLACE.RESUME
  UACC:     READ
```

By using the two profiles, the following substitution takes place:

```
Input:   ALTUSER userid PASSWORD(password) RESUME
Precmd:  CKGRACF USER userid RESUME
Maincmd: ALTUSER userid PASSWORD(password)
```

Note: When you use the substitution, verify that necessary files for CKGRACF (SYSTERM) are available.

Example 2

Another example of command replacement can be done for the REVOKE keyword. This keyword can be replaced by a **CKGRACF DISABLE**. This **DISABLE** can be undone only by **CKGRACF ENABLE** commands. If the **RESUME** function is translated into a **CKGRACF RESUME**, most resume attempts fail because of the **DISABLE** schedule. The REVOKE can be converted by definition of profiles:

```
XFACILIT:   C4R.ALTUSER.=PRECMD.REVOKE
  UACC:     UPDATE
  APPLDATA: 'CKGRACF &class &profile SCHEDULE GRPADMIN DISABLE TODAY'

XFACILIT:   C4R.ALTUSER.=REPLACE.REVOKE
  UACC:     UPDATE
```

By using the two profiles, the following substitution takes place:

```
Input:   ALTUSER userid REVOKE
Precmd:  CKGRACF USER userid SCHEDULE GRPADMIN DISABLE TODAY
Maincmd: none
```

See the *IBM Security zSecure Admin and Audit for RACF: User Reference Manual* for detailed documentation of the **CKGRACF** command and the required authorization to manage Revoke/Resume schedules.

Example 3

In the scenario where a **REVOKE** is converted, as described in “Example 2” on page 60, it is possible to automatically **ENABLE** the user on an **ALTUSER RESUME**. In this case, the suggested approach is to use a pre-command to attempt to **ENABLE** the user. If a **CKGRACF ENABLE** command is issued, **CKGRACF** determines whether other schedules prevent the user from being resumed. If not, **CKGRACF** automatically resumes the user at the **ENABLE** date (=today). The **RESUME** can be converted by definition of profiles:

```
XFACILIT:   C4R.ALTUSER.=PRECMD.RESUME
  UACC:     UPDATE
  APPLDATA: 'CKGRACF &class &profile SCHEDULE GRPADMIN ENABLE TODAY'

XFACILIT:   C4R.ALTUSER.=REPLACE.RESUME
  UACC:     READ
```

By using the two profiles, the following substitution takes place:

```
Input:   ALTUSER userid PASSWORD(password) RESUME
Precmd:  CKGRACF USER userid SCHEDULE GRPADMIN ENABLE TODAY
Maincmd: ALTUSER userid PASSWORD(password)
```

See the *IBM Security zSecure Admin and Audit for RACF: User Reference Manual* for detailed documentation of the **CKGRACF** command and the required authorization to manage Revoke/Resume schedules.

Example 4

In this final example, some **PERMIT** commands are replaced by a **CONNECT** to the appropriate group. The name of the group is derived from the access level. The current implementation allows only ACCESS to be truncated. No provision is made to create **REMOVE** commands if the specified ACCESS is DELETE.

```
XFACILIT:   C4R.PERMIT.=PRECMD.CLASS.SDSF
  UACC:     UPDATE
  APPLDATA: 'CONNECT &ACLID GROUP(SDSF#ACLACC(1))'

XFACILIT:   C4R.PERMIT.=REPLACE.CLASS.SDSF
  UACC:     UPDATE
```

By using the profiles, the following substitution takes place:

```
Input:   PERMIT profile CLASS(SDSF) ID(IBMUSER) ACCESS(READ)
Precmd:  CONNECT IBMUSER GROUP(SDSF#R)
Maincmd: none
```

Group-Special authorization restriction

In this version, zSecure Command Verifier recognizes only the system-wide and group-related `SPECIAL` attributes for command authorizations. zSecure Command Verifier ignores all other command authorization methods, such as group operations, group connect authorizations `JOIN`, `CONNECT`, `CREATE`, and direct ownership, where the terminal user is the owner of the affected RACF profiles. For the **RDEFINE** and **ADDUSER** command, zSecure Command Verifier accepts the **CLAUTH** command, if the command otherwise conforms to the specified policy.

Mandatory and default value policy profiles

In zSecure Command Verifier, you can use profiles that enforce a specific value for a keyword. The value overrides anything that is specified by the terminal-user. These profiles are called *Mandatory Value* policy profiles. They can be used only when the RACF command requires the keyword or uses a default value. This restriction means that for most keywords, the Mandatory Value policy profiles can be used only for create or add command types such as **ADDUSER**. They all have a third qualifier that starts with `=`, for example, `=DFLTGRP`. These profiles are examples of Mandatory Value policy profiles.

- **C4R.DATASET.=UACC.SYS1.LINKLIB**

  This profile specifies a mandatory value for the UACC of the `SYS1.LINKLIB` data set. The value for the UACC is specified in the **APPLDATA** field of the policy profile.
- **C4R.USER.=OWNER.IBM***

  This profile specifies that the OWNER of a user ID, if it matches the pattern IBM*, must be equal to a certain value. The value is specified in the **APPLDATA** field of the policy profile.

When Mandatory Value policy profiles are present, they override any value that the terminal user specified. So, in the second example (**C4R.USER.=OWNER.IBM***), if the terminal user entered the command:

```
ADDUSER IBMTEST OWNER(CMDVFY)
```

and the **APPLDATA** of the Mandatory Value policy profile contains the value `SYS1`, the actual command that is passed to RACF i:

```
ADDUSER IBMTEST OWNER(SYS1)
```

The terminal user must have sufficient RACF authorization to create the User profile. If access is insufficient, RACF issues the usual error message.

Profiles can be used to provide a default value in case the terminal user did not specify a value. These profiles are called the `Default` policy profiles. Again, these profiles can be used only or those situations when RACF needs a value, or defaults to a specific value. If the RACF action is to leave an existing value unmodified, the profile is not used. They are used for create or add types of commands. The third qualifier for these profiles starts with `/`, for example `/OWNER`. If Mandatory Value policy profiles are present, they pre-empt the Default policy profiles. For example, see the following Default policy profile:

```
C4R.USER./OWNER.IBM*
```

If this profile is present, its `APPLDATA` value is never used. The Mandatory Value policy profile provides a value, and the Default value is never needed.

The use of Mandatory and Default Value policy profiles can sometimes interfere with the possibility to define or modify multiple profiles in a single command. Most RACF commands allow manipulation of multiple profiles in a single command.

```
ADDUSER (AHJBTST, IBMTEST) OWNER(CMDVFY)
```

By using the same Mandatory Value policy profile, the actual command that is required for the second user ID looks like the following sample:

```
ADDUSER IBMTEST OWNER(SYS1)
```

However, the new value for the OWNER, might be unacceptable for the `AHJBTST` user ID. In a single RACF command, it is not possible to specify two different OWNERs. Because the conflict cannot be resolved, the entire command is rejected. To avoid these kinds of situations:

- Your installation must specify non-conflicting policies for all profiles that are likely to be handled by a single RACF command. For example, if the Mandatory Value policy profile applied to all user IDs, `C4R.USER./OWNER.**`, there is no conflict.
- The terminal user must split RACF commands such that they act upon a single profile, or that only profiles with matching policy profiles are grouped into a single RACF command.

The details of the preceding profiles are described in the following sections, together with the verification process for the terminal user specified values of keywords.

SETROPTS-related profiles

To control the keywords and parameters on the SETROPTS command, a pseudo resource class is used: RACF. The regular profile-related policy profiles consist of four qualifiers, as described in “Policy profile syntax” on page 41.

Because the SETROPTS command has many options, the keywords to manage these options are into broad categories. The resulting policy profiles have therefore the form:

C4R.RACF.*category.field.value*

The following categories are currently used for the RACF options:

LIST This category is only used to describe the **SETROPTS LIST** command. Only one profile is implemented in this category.

OPTION
This category is used for general RACF options, like `ERASE`, `ADDCREATOR` and `GRPLIST`.

AUDIT
This category is used for all audit-related RACF settings, like `SAUDIT` and `CMDVIOL`. The `LOGOPTIONS` setting is not part of this category. Log options are set per class, and are therefore part of the *class* category.

JES This category is used for JES-related settings.

USER This category is used for `USER` and `Password` options, like the InActive interval and The Password History.

MLS This category is used for all options that are related to the Implementation of Multi-Level Security.

class All *class* related settings are categorized per class. This way, one policy profile can be used to control all class-related settings for a particular resource class.

For many options and audit settings, the *value* qualifier in the policy profiles is unused. The seven tables on the following pages summarize per category all RACF options that can currently be controlled by zSecure Command Verifier policy profiles.

One important observation about these policy profiles is the absence of a separate policy profile to describe the REFRESH keyword. The REFRESH keyword is treated as a modifier on the CLASS-related keywords. See the discussion of all CLASS-related profiles.

Because of the complexity of the **SETROPTS** command, the general zSecure Command Verifier policy profiles for error and authority failure suppression are not implemented. If zSecure Command Verifier detects insufficient authorization, it rejects the entire command, regardless of the terminal authority of the user to the C4R.SUPPRESS and C4R.ERROR.CONTINUE profiles.

An example implementation of the SETROPTS-related profiles is shown here:

```
C4R.RACF.AUDIT.**           UACC(NONE) SYSAUDIT(UPDATE)
C4R.RACF.USER.**            UACC(NONE)
C4R.RACF.OPTION.**          UACC(NONE)
C4R.RACF.JES.**             UACC(NONE)
C4R.RACF.XFACILIT.**        UACC(NONE) CMVFYADM(UPDATE)
C4R.RACF.%CICS*.**          UACC(NONE) CICSADM(UPDATE)
C4R.RACF.PROGRAM.*          UACC(NONE) SPROGK(UPDATE)
C4R.RACF.*.RACLIST          UACC(READ)
C4R.RACF.**                 UACC(NONE)
```

Sometimes, it is necessary to give product administrators the System-SPECIAL or System-AUDITOR attribute to be able to fully manage all aspects of the required resource classes. Also, in many organizations, the central user administrator is given System-SPECIAL to manage all profiles for all users and groups. To limit the authority of such people, you can implement profiles like the ones that are shown in the preceding example. Basically, you exclude managing the RACF system-wide settings from their scope of control. The profiles in the preceding example have as a direct effect:

- C4R.RACF.AUDIT.**

  Only people in the SYSAUDIT group can change audit settings. If other people outside that group have the System-Auditor attribute (for instance, because you want them to be able to see various auditing settings), they still cannot modify any of the RACF global audit settings.
- C4R.RACF.USER.**

  Nobody can modify the System Password rules and options.
- C4R.RACF.XFACILIT.**

  Only the zSecure Command Verifier administrators can change the settings of the XFACILIT resource class. This class includes classact and refresh in-storage profiles.
- C4R.RACF.PROGRAM.*

  Only certain people in the Systems Programming department can change the SETROPTS settings for PROGRAM control, including the **REFRESH** of the in-storage profiles.
- C4R.RACF.*.RACLIST

All System-SPECIAL people, and all others that have sufficient RACF authorization, can **REFRESH** RACLISTed resource classes. RACF permits people with CLAUTH or Group-SPECIAL to **REFRESH** those resource classes.

- C4R.RACF.**

  All remaining SETROPTS keywords and parameters are restricted from all users. If you must modify one of these options, somebody in the CMVFYADM group must define a matching profile, provide access, and issue a REFRESH of the XFACILIT resource class. When you implement SETROPTS controls, you must ensure that at least one person has authority to manage the XFACILIT class.

Table 8 shows the policy profile that is used to control the **SETROPTS LIST** command. The information is provided in a separate table so that it can be retrieved more easily.

Table 8. Profiles used for verification of SETROPTS LIST authority. The entries in this table reflect the SETROPTS keywords that are used to set a particular option.

Keyword	Value	Profile
LIST	**N/A**	**C4R.RACF.LIST**

Table 9 describes all the policy profiles that are used for general RACF Options. These options are set only one time for a certain system, and never changed afterward.

Table 9. Profiles used for verification of RACF options. The entries in this table reflect the SETROPTS keywords that are used to set a particular option.

Keyword	Value	Profile
(NO)ADDCREATOR	**N/A**	**C4R.RACF.OPTION.ADDCREATOR**
(NO)ADSP	**N/A**	**C4R.RACF.OPTION.ADSP**
CATDSNS	*mode*	**C4R.RACF.OPTION.CATDSNS.***mode mode* ={ FAILURES, WARNING }
NOCATDSNS	**N/A**	**C4R.RACF.OPTION.CATDSNS.FAILURES C4R.RACF.OPTION.CATDSNS.WARNING**
(NO)EGN	**N/A**	**C4R.RACF.OPTION.EGN**
ERASE	*type*	**C4R.RACF.OPTION.ERASE.***type type* = { PROFILE, SECLEVEL, ALL }
(NO)GENERICOWNER	**N/A**	**C4R.RACF.OPTION.GENERICOWNER**
(NO)GRPLIST	**N/A**	**C4R.RACF.OPTION.GRPLIST**
KERBLVL	*level*	**C4R.RACF.OPTION.KERBLVL**
PROTECTALL	*mode*	**C4R.RACF.OPTION.PROTECTALL.***mode mode* = { FAILURES, WARNING }
NOPROTECTALL	**N/A**	**C4R.RACF.OPTION.PROTECTALL.FAILURES C4R.RACF.OPTION.PROTECTALL.WARNING**
(NO)REALDSN	**N/A**	**C4R.RACF.OPTION.REALDSN**
RETPD	*period*	**C4R.RACF.OPTION.RETPD**
SESSIONINTERVAL NOSESSIONINTERVAL	*interval* **N/A**	**C4R.RACF.OPTION.SESSIONINTERVAL**
(NO)TAPEDSN	**N/A**	**C4R.RACF.OPTION.TAPEDSN**
TERMINAL	*access*	**C4R.RACF.OPTION.TERMINAL.***access*
RVARYPW	**SWITCH(***password***)**	**C4R.RACF.OPTION.RVARYPW.SWITCH**

Table 9. Profiles used for verification of RACF options (continued). The entries in this table reflect the SETROPTS keywords that are used to set a particular option.

Keyword	Value	Profile
RVARYPW	**STATUS(***password***)**	**C4R.RACF.OPTION.RVARYPW.STATUS**

The following table describes all the policy profiles that are used for the non-class-specific auditing options. These options are already restricted to people with the System-AUDITOR attribute. However, you must define these profiles if you assigned this attribute to people so that they can see the auditing settings.

Table 10. Profiles used for verification of RACF auditing settings. The entries in this table reflect the SETROPTS keywords that are used to set a particular option.

Keyword	Value	Profile
(NO)APPLAUDIT	**N/A**	**C4R.RACF.AUDIT.APPLAUDIT**
(NO)CMDVIOL	**N/A**	**C4R.RACF.AUDIT.CMDVIOL**
(NO)INITSTATS	**N/A**	**C4R.RACF.AUDIT.INITSTATS**
(NO)OPERAUDIT	**N/A**	**C4R.RACF.AUDIT.OPERAUDIT**
(NO)SAUDIT	**N/A**	**C4R.RACF.AUDIT.SAUDIT**
(NO)SECLABELAUDIT	**N/A**	**C4R.RACF.AUDIT.SECLABELAUDIT**
SECLEVELAUDIT	*seclevel*	**C4R.RACF.AUDIT.SECLEVELAUDIT.***seclevel*
NOSECLEVELAUDIT	**N/A**	**C4R.RACF.AUDIT.SECLEVELAUDIT**

The next table describes all the policy profiles that are used for the JES-related setting. Usually, these options are only set one time, and need never be changed.

Table 11. Profiles used for verification of JES-related settings. The entries in this table reflect the SETROPTS keywords that are used to set a particular option.

Keyword	Value	Profile
(NO)BATCHALLRACF	**N/A**	**C4R.RACF.JES.BATCHALLRACF**
(NO)EARLYVERIFY	**N/A**	**C4R.RACF.JES.EARLYVERIFY**
(NO)XBMALLRACF	**N/A**	**C4R.RACF.JES.XBMALLRACF**
NJEUSERID	*userid*	**C4R.RACF.JES.NJEUSERID.***userid*
UNDEFINEDUSER	*userid*	**C4R.RACF.JES.UNDEFINEDUSER.***userid*

The following table describes all the policy profiles that are used for the USER and PASSWORD-related setting.

Table 12. Profiles used for verification of USER-related settings. The entries in this table reflect the SETROPTS keywords that are used to set a particular option.

Keyword	Value	Profile
(NO)INACTIVE	*days*	**C4R.RACF.USER.INACTIVE**
PASSWORD	**HISTORY(***count***)**	**C4R.RACF.USER.PASSWORD.HISTORY**
PASSWORD	**INTERVAL(***period***)**	**C4R.RACF.USER.PASSWORD.INTERVAL**
PASSWORD	**MINCHANGE(***period***)**	**C4R.RACF.USER.PASSWORD.MINCHANGE**
PASSWORD	**(NO)MIXEDCASE**	**C4R.RACF.USER.PASSWORD.MIXEDCASE**
PASSWORD	**REVOKE(***count***)**	**C4R.RACF.USER.PASSWORD.REVOKE**

Table 12. Profiles used for verification of USER-related settings (continued). The entries in this table reflect the SETROPTS keywords that are used to set a particular option.

Keyword	Value	Profile
PASSWORD	**WARNING(***period***)**	**C4R.RACF.USER.PASSWORD.WARNING**
PASSWORD	**RULEn(***rule-spec***)NORULEnNORULES**	**C4R.RACF.USER.PASSWORD.RULES**

The next table describes all the policy profiles that are used for control of the Multi-Level Security-related settings. Unless you are implementing Multi-Level Security, these options must not be modified.

Table 13. Profiles used for verification of MLS-related settings. The entries in this table reflect the SETROPTS keywords that are used to set a particular option.

Keyword	Value	Profile
(NO)COMPATMODE	**N/A**	**C4R.RACF.MLS.COMPATMODE**
MLACTIVE	*mode*	**C4R.RACF.MLS.MLACTIVE.***modemode* **= {FAILURES, WARNING }**
NOMLACTIVE	**N/A**	**C4R.RACF.MLS.MLACTIVE.FAILURES** **C4R.RACF.MLS.MLACTIVE.WARNING**
MLS	*mode*	**C4R.RACF.MLS.MLS.***modemode* **= { FAILURES, WARNING }**
NOMLS	**N/A**	**C4R.RACF.MLS..FAILURES** **C4R.RACF.MLS.WARNING**
(NO)MLSTABLE	**N/A**	**C4R.RACF.MLS.MLSTABLE**
MLFSOBJ	*mode*	**C4R.RACF.MLS.MLFSOBJ**
MLIPCOBJ	*mode*	**C4R.RACF.MLS.MLIPCOBJ**
(NO)MLNAMES	**N/A**	**C4R.RACF.MLS.MLNAMES**
(NO)MLQUIET	**N/A**	**C4R.RACF.MLS.MLQUIET**
(NO)SECLABEL CONTROL	**N/A**	**C4R.RACF.MLS.SECLABELCONTROL**
(NO)SECLBYSYSTEM	**N/A**	**C4R.RACF.MLS.SECLBYSYSTEM**

The following table describes all the policy profiles that are used for the class-specific options. Usually these options are set frequently by many different people. The policy profiles in this category also describe the authorization to `REFRESH` in-storage profiles.

Table 14. Profiles used for verification of class-specific settings. The entries in this table reflect the SETROPTS keywords that are used to set a particular option.

Keyword	Value	Profile
(NO)AUDIT	*class*	**C4R.RACF.***class***.AUDIT**
(NO)CLASSACT	*class*	**C4R.RACF.***class***.CLASSACT**
(NO)GENCMD	*class*	**C4R.RACF.***class***.GENCMD**
(NO)GENERIC	*class*	**C4R.RACF.***class***.GENERIC**
(NO)GENLIST	*class*	**C4R.RACF.***class***.GENLIST**

Table 14. Profiles used for verification of class-specific settings (continued). The entries in this table reflect the SETROPTS keywords that are used to set a particular option.

Keyword	Value	Profile
(NO)GLOBAL	*class*	**C4R.RACF.***class***.GLOBAL**
(NO)RACLIST	*class*	**C4R.RACF.***class***.RACLIST**
(NO)STATISTICS	*class*	**C4R.RACF.***class***.STATISTICS**
(NO)WHEN	*class*	**C4R.RACF.***class***.WHEN**
LOGOPTIONS	*condition(class)*	**C4R.RACF.***class***.LOGOPTIONS.***conditioncondition* = { **ALWAYS, NEVER, SUCCESSES, FAILURES, DEFAULT** }

The following list describes the profiles in detail, and shows the required access.

- **C4R.RACF.LIST**

  Specifies the authority to issue the **SETROPTS LIST** command. The following access rules apply.

  No profile found
  Only the regular RACF authority must be used to determine the authority of the terminal user to **LIST** the current RACF settings.

  NONE
  The terminal user is not authorized to **LIST** the current RACF settings.

  READ If the terminal user has sufficient RACF authorization, the current RACF settings can be listed.

  UPDATE
  Same as READ.

  CONTROL
  Same as READ.

- **C4R.RACF.***category.keywords.values*

  The access requirements for most policy profiles are as follows. See the following descriptions for more notes about the use of the policy profiles.

  No profile found
  This control is not implemented. Only the regular RACF authority must be used.

  NONE
  The terminal user is not authorized to modify the RACF setting in hand.

  READ Same as NONE.

  UPDATE
  If the terminal user has sufficient RACF authorization, the RACF setting can be modified.

  CONTROL
  Same as UPDATE.

- **C4R.RACF.OPTION.CATDSNS.***mode*

  Specifies the authority to modify the settings for the `CATDSNS` option. If the `CATDSDN` option is used without a *mode* parameter, RACF defaults to `FAILURES` mode. If the `NOCATDSNS` option is used, zSecure Command Verifier does not check for the current *mode* but requires access to both *modes*. For most environments, use generics (".**") for the last qualifier (*mode*).

- **C4R.RACF.OPTION.ERASE.***mode*

  Specifies the authority to modify the options for the `ERASE` on scratch setting. If `ERASE` is used without a subparameter, RACF uses the `ERASE` settings for individual data set profiles. In zSecure Command Verifier this case is described by the *mode* PROFILE. This mode is also used for the `NOERASE` setting. The other `ERASE` settings are described by *modes* `SECLEVEL` and `ALL`. The `SECLEVEL` policy profile does not include the actual *seclevel* specified in the command. It also describes the use of the NOSECLEVEL option. For most situations, use generics (".**") for the last qualifier.
- **C4R.RACF.OPTION.KERBLVL**

  The actual *level* specified in the command is not represented in the zSecure Command Verifier policy profile.
- **C4R.RACF.OPTION.PROTECTALL.***mode*

  Specifies the authority to modify the settings for the `PROTECTALL` option. If the `PROTECTALL` option is used without a *mode* parameter, RACF defaults to `FAILURES` mode. If the `NOPROTECTALL` option is used, zSecure Command Verifier does not check for the current *mode* but requires access to both *modes*. For most environments, use generics `(".**")` for the last qualifier (*mode***).**
- **C4R.RACF.OPTION.RETPD**

  The actual default retention period that is specified in the command is not represented in the zSecure Command Verifier policy profile.
- **C4R.RACF.OPTION.SESSIONINTERVAL**

  Specifies the authority to modify the settings for the `SESSIONINTERVAL` option. This profile is used both for the `NOSESSIONINTERVAL` and the `SESSIONINTERVAL` setting.

  The actual session *interval* specified in the command, is not represented in the zSecure Command Verifier policy profile.
- **C4R.RACF.OPTION.RVARYPW.***action*

  This policy profile describes the authority to set the `RVARY` passwords. RACF supports a separate password for both the `SWITCH` and `STATUS` *action*s. The actual `RVARY` passwords that are specified in the command are not represented in the zSecure Command Verifier policy profile.
- **C4R.RACF.AUDIT.SECLEVELAUDIT.***level*

  Specifies the authority to modify the settings for the `SECLEVELAUDIT` option. When you set the preceding `SECLEVEL` which auditing must be done, the *level* is included as the last qualifier of the zSecure Command Verifier policy profile. When you disable `SECLEVELAUDIT`, this *level* qualifier is not used. For most environments, use generics `(".**")` for this last qualifier (*level*).
- **C4R.RACF.USER.INACTIVE**

  The actual INACTIVE *days* specified in the command are not represented in the zSecure Command Verifier policy profile.
- **C4R.RACF.USER.PASSWORD.HISTORY**

  The actual HISTORY *count* specified in the command is not represented in the zSecure Command Verifier policy profile.
- **C4R.RACF.USER.PASSWORD.INTERVAL**

  The actual INTERVAL *period* specified in the command is not represented in the zSecure Command Verifier policy profile.
- **C4R.RACF.USER.PASSWORD.MINCHNAGE**

  The actual MINCHANGE *period* specified in the command is not represented in the zSecure Command Verifier policy profile.

- **C4R.RACF.USER.PASSWORD.MIXEDCASE**

  This policy profile controls the setting for the `mixedcase` option for user passwords.
- **C4R.RACF.USER.PASSWORD.REVOKE**

  The actual REVOKE *count* specified in the command is not represented in the zSecure Command Verifier policy profile.
- **C4R.RACF.USER.PASSWORD.WARNING**

  The actual WARNING *period* specified in the command is not represented in the zSecure Command Verifier policy profile.
- **C4R.RACF.USER.PASSWORD.RULES**

  This single policy profile is used to describe all changes to any RACF password rule. The policy profile is also used when you disable any or all password rules. The current version of zSecure Command Verifier does not provide support for the actual password rule content.
- **C4R.RACF.MLS.MLACTIVE.***mode*

  Specifies the authority to modify the settings for the `MLACTIVE` option. If the `MLACTIVE` option is used without a *mode* parameter, RACF defaults to `WARNING` mode. If the `NOMLACTIVE` option is used, zSecure Command Verifier does not check for the current *mode* but requires access to both *modes*. For most environments, use generics `(".**")` for the last qualifier (*mode*).
- **C4R.RACF.MLS.MLS.***mode*

  Specifies the authority to modify the settings for the `MLS` option. If the `MLS` option is used without a *mode*parameter, RACF defaults to WARNING mode. If the NOMLS option is used, zSecure Command Verifier does not check for the current *mode* but requires access to both *modes*. For most environments, use generics `(".**")` for the last qualifier (*mode*).
- **C4R.RACF.MLS.MLFSOBJ**

  Specifies the authority to modify the mode for `MLFSOBJ` processing. Both modes (ACTIVE and INACTIVE) are described by the same zSecure Command Verifier policy profile.
- **C4R.RACF.MLS.MLIPCOBJ**

  Specifies the authority to modify the mode for `MLIPCOBJ` processing. Both modes (ACTIVE and INACTIVE) are described by the same zSecure Command Verifier policy profile.
- **C4R.RACF.***class.function*

  These profiles are used to describe the authority to activate and deactivate class-related options, and to `REFRESH` in-storage profile. The *function* can be any of the functions that are shown in the preceding table. WHEN applies only to the PROGRAM class.

  The access requirements for these policy profiles differ from the access requirements for most other policy profiles. The READ access level is significant and provides the authority to REFRESH in-storage profiles. It is only used for the listed *function*s.

  For most installations, use generics `(.**)` for the last qualifier. For the `LOGOPTIONS`, this option reflects the *condition* when audit records must be created. The extra qualifier allows easier delegation to the designated people.

  No profile found

  This control is not implemented. Only the regular RACF authority must be used.

NONE
The terminal user is not authorized to activate, deactivate, or refresh *function* for the *class*.

READ The terminal user is authorized to REFRESH in-storage profiles for the *class*. This case applies to the `GENERIC`, `GENLIST`, `GLOBAL`, `RACLIST`, and `WHEN` *function*s. For all other *function*s, this access level has the same effect as access `NONE`. This access level does not permit use of any of the listed *function*s without the REFRESH keyword.

UPDATE
The terminal user is authorized for the *function* for the *class*. This setting applies only if the user has sufficient RACF authorization to perform the *function*.

CONTROL
Same as UPDATE.

Profiles for managing user IDs

All the possible keywords and the corresponding profiles are split in several categories. The first group of profiles describes naming conventions for a new `userid` and the place in the RACF group hierarchy for new or existing `userid`s. Subsequent sections describe the Connections of users to groups and the attributes and authorizations of users.

If you want to implement naming conventions for your user IDs, you must use the profiles for enforcing naming conventions. For specifying the position of a new user ID in the RACF hierarchy, use the profiles for placing user IDs in the RACF hierarchy. More policy profiles are available for specifying user attributes, authorizations, and other user-related policies. For more information, see the following topics:

- "Conventions for naming user IDs"
- "Deletion of existing users" on page 73
- "Placement of new IDs in the RACF group hierarchy" on page 74
- "Policy profiles selection for the default group" on page 75
- "Policy profiles for the owner" on page 82
- "Implementation of a new user policy" on page 88
- "Implementation of an existing user policy" on page 89
- "Policy profiles for user attributes and authorizations" on page 90
- "Policy profiles for user password management" on page 96
- "Other user-related policy profiles" on page 102

Conventions for naming user IDs

Many installations have user ID naming conventions to indicate which department an ID belongs to. zSecure Command Verifier implements several of these naming conventions. These rules are only applied to the `ADDUSER` command for creating new User profiles. The following table summarizes the profiles that control the `userid` itself. The next tables describe mandatory values and Default values for some keywords. The last table describes the profiles for verifying the values that are specified by the terminal user.

Table 15. Profiles used for verification of the RACF user ID. The entries in this table reflect the keywords that describe the name of new and deleted `USERIDs`.

Command	Keyword	Profile
ADDUSER	*userid*	**C4R.USER.ID.=RACUID(n)**
ADDUSER	*userid*	**C4R.USER.ID.=RACGPID(n)**
ADDUSER	*userid*	**C4R.USER.ID.***userid*
DELUSER	*userid*	**C4R.USER.DELETE.***userid*

The profiles in this table describe new `userids` that can be defined. For the `userid` itself, zSecure Command Verifier provides controls to enforce the naming conventions. The authority to change existing user IDs is not controlled by naming conventions. This authorization is already sufficiently restricted by the normal RACF scoping rules. The authority to delete users is also controlled by the normal RACF ownership rules; however, an extra control is needed. Therefore, another name-based rule is used to implement this control. To define new `userids`, the terminal user still needs `CLAUTH(USER)` plus at least one group-related authorization like `JOIN`, the group-SPECIAL attribute, or direct ownership.

The user ID-based controls enforce naming conventions for new IDs. This first set of profiles controls the `userid` for the user. These profiles are intended to specify which `userids` can be defined. In general, only one of these profiles is used to specify your naming convention. More generic profiles must be used to block the definition of new `userids` that do not follow your naming convention. Exceptions can be implemented by the definition of more specific discrete or generic profiles. The following example shows the implementation of these profiles.

```
C4R.USER.ID.=RACUID(4)        UACC(UPDATE)
C4R.USER.ID.TEST*             UACC(NONE) IBMUSER(UPDATE)
C4R.USER.ID.*                 UACC(NONE)
```

These profiles ensure that no new `userids` can be defined unless the first 4 characters of the new `userid` are the same as the first 4 characters of the terminal user who defines the ID. An exception is `userids` that start with TEST. These user IDs can be defined by the terminal user `IBMUSER`, and also, according to the first profile, by all terminal users that have a `userid` starting with `TEST`. The third profile is required to stop definition of new `userids` outside the specified naming convention. Without the third profile, almost any `userid` is accepted, either explicitly by the first or second profile or implicitly by the absence of a matching profile.

- **C4R.USER.ID.=RACUID(n)**

  Specifies a special generic policy for the new `userid`. The =RACUID stands for the `userid` of the terminal user. If the substring (`=RACUID,1,`*n*) matches, this profile is used in preference to other profiles, independent of the value of *n*. If you have multiple profiles that are defined, only the one with the smallest numeric specification is used for matching the `userids`.

  This profile is discrete. Only the single digit between parenthesis is variable. It must be specified as a value in the range 1-8. It is not possible to use a true generic profile.

  The following access rules apply.

  No profile found

  The `userid` of the terminal user is not used as naming convention for new `userids`. Verification continues with the `=RACGPID`*(n)* profile.

NONE
The new `userid` is not allowed. The command is failed.

READ Same as NONE.

UPDATE
The new `userid` is accepted.

CONTROL
Same as UPDATE.

- **C4R.USER.ID.=RACGPID(n)**

  Specifies a special generic policy for the new `userid`. The `=RACGPID` stands for the list of groups the terminal user is connected to. All the groups of the user are used, independent of the `list of group access checking` setting. This profile is used only if `=RACUID(`*n*`)` profile is not present or does not match. If the substring (`=RACGPID,1,`*n*) matches, this profile is used in preference to other profiles described in the following paragraph, independent of the value of *n*. If you defined multiple profiles of this type, only the one with the smallest numeric specification is used for matching the `userid`s.

  This profile is discrete. Only the single digit between parenthesis is variable and must be specified from 1 to 8. It is not possible to use a true generic profile.

  No profile found
  The groups of the terminal user are not used as naming convention for new `userid`s. Verification continues with profile C4R.USER.ID.userid.

  NONE
  The new `userid` is not allowed. The command is failed.

  READ Same as `NONE`.

  UPDATE
  The new `userid` is accepted.

  CONTROL
  Same as `UPDATE`.

- **C4R.USER.ID.***userid*

  Specifies which new *userid*s can be created by the terminal user. This profile is only used for the ADDUSER command if both =RACUID(*n*) and =RACGPID(*n*) are absent or do not match. This rule can be covered by a generic profile.

  No profile found
  No naming convention is enforced for new user IDs.

  NONE
  The specified `userid` is not allowed. The command is failed.

  READ Same as `NONE`.

  UPDATE
  Permission to create the specified `userid`.

  CONTROL
  Same as `UPDATE`.

Deletion of existing users

The authority to delete user profiles is normally controlled by some form of ownership–direct, within the scope of a group-SPECIAL attribute, and by system-special authorization. Some organizations want to keep strict control over the authority to delete existing users. Most often, it is because they implemented more procedures like saving or renaming data sets or interaction with non-RACF information. The following profile puts more constraints on the authorization to delete users. This profile is not verified whether RACF already rejected deletion of the user ID because of syntax errors or insufficient authority.

- **C4R.USER.DELETE.***userid*

  This profile can be used to control which `userid` in scope can be deleted, protect certain IDs from being deleted, and restrict `userid` deletion through generic profile definition. Only the terminal users who have access through this profile are allowed to delete these user IDs. This control reduces the normal delete authorization (special, within group-special scope, direct ownership).

  No profile found
  The control is not implemented. No additional restrictions on deleting the specified `userid`.

  NONE
  The `userid` cannot be deleted. The command is failed.

  READD The `userid` can be deleted only if the terminal user has the system special attribute.

  UPDATE
  The `userid` can be deleted.

  CONTROL.
  Same as UPDATE.

Placement of new IDs in the RACF group hierarchy

When a `userid` is created according to the preceding profiles, more rules can apply to the placement of the new ID in the RACF Group hierarchy. zSecure Command Verifier provides the following types of profiles to control this aspect:

- The mandatory value profiles enforce a specific owner and default group for the new `userid`.
- The default profiles provide default values if the terminal user does not specify a value.
- The last set of profiles verifies that the values that the terminal user specifies are acceptable.

The following information describes how these profiles are used together and which keywords can be suppressed or added.

For Mandatory Value profiles, the third qualifier consists of an equals sign (=), followed by the keyword. So for the `DFLTGRP`, the profile has the qualifier `=DFLTGRP`. Table 16, describes the Mandatory Value profiles.

Table 16. Mandatory Value policy profiles for RACF user ID place-related command/keywords. The entries in this table reflect the keywords that describe the Mandatory Value place of new `USERID`s.

Command	Keyword	Profile
ADDUSER	*userid*	**C4R.USER.=DFLTGRP.***userid*
ADDUSER	*userid*	**C4R.USER.=OWNER.***userid*

Table 17 on page 75 describes the Default profiles that are used if the terminal user did not specify any keywords that control the place in the RACF Group hierarchy. For Default profiles, the third qualifier consists of a forward slash, followed by the keyword. So for the `DFLTGRP`, the policy profile has `/DFLTGRP`.

Table 17. Profiles used for Default values of RACF user ID place-related command/keywords. The entries in this table reflect the default values for keywords that describe the Default Place of new `USERID`s.

Command	Keyword	Profile
ADDUSER	*userid*	**C4R.USER./DFLTGRP.***userid*
ADDUSER	*userid*	**C4R.USER./OWNER.***userid*

Finally, Table 18 describes the profiles that are used to verify acceptability of the terminal user-specified values. The table summarizes which profile is to be used for which keyword or function.

Table 18. Profiles used for verification of the RACF user ID. The entries in this table reflect the keywords that are specified by the terminal user to describe the name and place of new or changed user IDs.

Command	Keyword	Profile
ADDUSER ALTUSER	**DFLTGRP**	**C4R.USER.DFLTGRP.=RACUID(n)**
ADDUSER ALTUSER	**DFLTGRP**	**C4R.USER.DFLTGRP.=RACGPID(n)**
ADDUSER ALTUSER	**DFLTGRP**	**C4R.USER.DFLTGRP.=USERID(n)**
ADDUSER ALTUSER	**DFLTGRP**	**C4R.USER.DFLTGRP.***group.userid*
ADDUSER ALTUSER	**DFLTGRP**	**C4R.USER.DFLTGRP./SCOPE.***group.userid*
ADDUSER ALTUSER	**DFLTGRP**	**C4R.USER.DFLTGRP./OWNER.***group.userid*
ADDUSER ALTUSER	**OWNER**	**C4R.USER.OWNER.=RACUID(n)**
ADDUSER ALTUSER	**OWNER**	**C4R.USER.OWNER.=RACGPID(n)**
ADDUSER ALTUSER	**OWNER**	**C4R.USER.OWNER.=USERID(n)**
ADDUSER ALTUSER	**OWNER**	**C4R.USER.OWNER.***owner.userid*
ADDUSER ALTUSER	**OWNER**	**C4R.USER.OWNER./SCOPE.***owner.userid*
ADDUSER ALTUSER	**OWNER**	**C4R.USER.OWNER./GROUP.***owner.userid*
ADDUSER ALTUSER	**OWNER**	**C4R.USER.OWNER./DFLTGRP.***owner.userid*

Policy profiles selection for the default group

Aside from the name of a new `userid`, two other important aspects when you define new users or changing existing users, are the place in the RACF hierarchy (`=OWNER`) and the default group `DFLTGRP`. The default group as such is not exceptional in any way. It is only important when you define a user because it controls the authorization to create the user. In RACF, the terminal user must either have `JOIN` authority in that group, the group must be within the scope of a group-SPECIAL attribute, or the terminal user must own the group. zSecure Command Verifier implements some additional controls on the default group. To define new User profiles, the terminal user also needs system special or CLAUTH in the User class. The next paragraphs describe how the zSecure Command Verifier profiles from the preceding tables are used.

The first set of profiles controls the default group `DFLTGRP` of the new `userid` for the **`ADDUSER`** command. zSecure Command Verifier does not use the Mandatory or Default Value profiles for the `OWNER` and `DFLTGRP` on the **`ALTUSER`** command. Because the **`ALTUSER`** command does not force these existing values to change, it is not necessary enforce a specific value.

When you define a new user profile, zSecure Command Verifier also verifies the authorization to `CONNECT` the new user to the specified `DFLTGRP`. The specification of a GROUP as DFLTGRP during the creation of a new user results in an automatic CONNECT of the userid to the GROUP. The required authorization is verified independently. See "CONNECT management" on page 128 for details.

Mandatory and default value policy profiles for the DFLTGRP

The following profiles describe the mandatory and default value policy profiles for the DFLTGRP of a new userid. These profiles are only used for the **ADDUSER** command.

1. **C4R.USER.=DFLTGRP.***userid*

   This profile is used to specify a mandatory value for the DFLTGRP of every newly defined userid. It is only used for the ADDUSER command. The DFLTGRP that is used, is obtained from the APPLDATA field in the profile. This value is used to override any terminal user specified value, or added to the command if the terminal user did not specify a value. The DFLTGRP value that is obtained by this Mandatory Value profile is not subject to more DFLTGRP-related policy profiles.

   The value *userid* represents the affected user. This value allows the specification of exceptions to the general rule. Only the most specific profile is used by zSecure Command Verifier. Generic profiles can be used to specify the DFLTGRP for users.

   The qualifier =DFLTGRP in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

   No profile found
   The control is not implemented. No mandatory value is enforced.

   NONE
   The control is not active for the terminal user. No mandatory value is enforced.

   READ The **APPLDATA** field is extracted and used for the command. If this process does not yield a valid group, the current connect group of the terminal user is used instead.

   UPDATE
   Same as READ.

   CONTROL
   The control is not active for the terminal user. No mandatory value is enforced. If the terminal user specified a value for the group, it is used. If no value was specified, RACF uses the current group of the terminal user.

   Note: The access levels for this profile are not hierarchical. In general, zSecure Command Verifier policies do not apply to users that have CONTROL access or higher. However, access NONE indicates that the facility as described by the policy is unavailable to the terminal user. For the Mandatory Value profiles, the odd situation then occurs that access NONE has the same net result as access CONTROL.

   The values that are accepted for the **APPLDATA** field are shown in the following list. The terminal user still needs sufficient authority in the assigned DFLTGRP to define new users. This authorization is not verified in zSecure Command Verifier. Insufficient authority can result in failure of the command by RACF.

   BLANK
   Indicates that RACF default processing must be used. That is, RACF uses the current group of the terminal user.

userid This entry is not valid. Because this entry is not caused by incorrect entry by the terminal user, the command is allowed to continue by using the current group of the terminal user.

group This group is inserted. If the terminal user does not have sufficient access to this group, the command is failed by RACF.

=OWNER
Reflects the OWNER as specified (or defaulted) by the OWNER keyword on the command. This value might also be an OWNER value as inserted by zSecure Command Verifier. If the OWNER resolves to the special value =DFLTGRP (indicating the default group), the command is failed.

=MYOWNER
Reflects the OWNER of the terminal user. This value must be a group. All other situations are considered an error. Because this case is not caused by incorrect entry by the terminal user, the command is allowed to continue by using the current group of the terminal user.

=USERID(n)
Reflects the first *n* characters of the new USERID itself. This value must be a GROUP. All other situations are considered an error, and the current GROUP of the terminal user is used instead.

=RACGPID
Reflects the GROUP that was used to allow definition of the userid through =RACGPID(*n*) in C4R.USER.ID.=RACGPID(n). This value is only used if =RACGPID(*n*) was used to permit definition. In all other situations, the APPLDATA value =RACGPID is considered an error, and the current group of the terminal user is used instead.

After zSecure Command Verifier processes this profile and determining the mandatory value for the DFLTGRP, it verifies the authorizations for the specified connection, as described in "CONNECT management" on page 128 for all user-to-group connections.

2. **C4R.USER./DFLTGRP.***userid*

   This profile is used to specify a default value for the DFLTGRP in case the terminal user did not specify a DFLTGRP on the ADDUSER command. If the preceding Mandatory Value policy profile is used to provide a value, the /DFLTGRP profile is not used.

   The DFLTGRP that is used as default, is obtained from the **APPLDATA** field in the profile. The DFLTGRP value that is obtained by this Mandatory Value profile is not subject to more DFLTGRP-related policy profiles.

   The qualifier /DFLTGRP in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

   No profile found
   The control is not implemented. No default value is supplied.

   NONE
   No default value is supplied. Using the default value that is normally provided by RACF is also not acceptable and the command is failed. Using this access level allows an installation to force the terminal user to explicitly specify a value for the DFLTGRP.

   READ The **APPLDATA** field is extracted and used for the command.

   UPDATE
   Same as READ.

CONTROL
: The control is not active for the terminal user. No default value is supplied. The current group of the terminal user is used by RACF.

The values that are accepted for the **APPLDATA** field are shown in the following list. The terminal user still needs sufficient authority in the assigned DFLTGRP to define new users. Insufficient authority can result in failure of the command.

BLANK
: Indicates that RACF default processing must be used. The current group of the terminal user is used.

userid
: This entry is not valid. Because this case is not caused by incorrect entry by the terminal user, the command is allowed to continue by using the current group of the terminal user.

group
: The group is inserted.

=OWNER
: Reflects the `OWNER` as specified (or defaulted) by the `OWNER` keyword on the command. This value can be an `OWNER` value as inserted by zSecure Command Verifier. If the `OWNER` resolves to the special value `=DFLTGRP` (indicating the default group), the command is failed.

=MYOWNER
: Reflects the owner of the terminal user and this value must be a group. All other situations are considered an error. Because this error is not caused by incorrect entry by the terminal user, the command is permitted to continue by using the current group of the terminal user.

=USERID(n)
: Reflects the first *n* characters of the new `USERID` itself. This value must be a group. All other situations are considered an error, and the current group of the terminal user is used instead.

=RACGPID
: Reflects the `GROUP` that was used to permit definition of the `userid` through `=RACGPID(`*n*`)` in C4R.USER.ID.=RACGPID(n). This value is only used if `=RACGPID(`*n*`)` was used to permit definition. In all other situations, the APPLDATA value `=RACGPID` is considered an error, and the current group of the terminal user is used instead.

After zSecure Command Verifier processes this profile and determining the Default value for the `DFLTGRP`, it verifies the authorizations for the specified connection, as described in “CONNECT management” on page 128 for all user-to-group connections.

Verification of the default group

The following set of profiles is used to control the selection of the default group for new users and the selection of the default group for existing users.

These profiles are used to verify the specification of the `DFLTGRP` by the terminal user. Restrictions on the selection of a default group through the **`ALTUSER`** command, are probably not relevant to most RACF processing. The user can still select any of its groups as the current group during logon processing. Only the specification of the default value is controlled by the **`ALTUSER`** RACF command.

When you add a user to the system through the **`ALTUSER`** command, a second check is performed for the `DFLTGRP`. The selection of a `DFLTGRP` has an immediate result that the new user is also connected to the specified group. Therefore, the authorization to connect the user to the specified group is also verified. The same applies for the group-authorizations. For more information about the user-to-group connections and authorization, see "CONNECT management" on page 128.

- **C4R.USER.DFLTGRP.=RACUID(*n*)**

  Specifies a special generic policy for the `DFLTGRP` in `ADDUSER` and `ALTUSER` commands. The `=RACUID` stands for the `USERID` of the terminal user. If the substring `=RACUID,1,`*n* matches, this profile is used in preference to other profiles, independent of the value of *n*. If you have multiple of these profiles that are defined, only the one with the smallest numeric specification is used for matching the user ID values.

  This profile is a discrete profile. Only the single digit between parenthesis is variable, and must be specified from 1 to 8. It is not possible to use a true generic profile.

  No profile found
  The user ID of the terminal user is not used as naming convention or restriction for the `DFLTGRP`.

  NONE
  The specified `DFLTGRP` is not allowed. This decision can be overruled by authorization to profile *group.userid* described as follows.

  READ Same as NONE.

  UPDATE
  The specified DFLTGRP is accepted.

  CONTROL
  Same as UPDATE

- **C4R.USER.DFLTGRP.=RACGPID(*n*)**

  Specifies a special generic policy for the **`DFLTGRP`** in **`ADDUSER`** and **`ALTUSER`** commands. The `=RACGPID` stands for the list of groups the terminal user is connected to. All the user groups are used, independent of the setting of "list of group access checking". This profile is used only if the preceding `=RACUIDn` profile is not present or does not match. If the substring (`=RACGPID,1,`*n*) matches, this profile is used in preference to other profiles described later in the list, independent of the value of *n*. If you have multiple of these profiles that are defined, only the one with the smallest numeric specification is used for matching the `USERID` values.

  This profile is a discrete profile. Only the single digit between parenthesis is variable, and must be specified from 1 to 8. It is not possible to use a true generic profile.

  No profile found
  The current group of the terminal user is not used as naming convention or restriction for the `DFLTGRP`.

  NONE
  The specified `DFLTGRP` is not allowed. This decision can be overruled by authorization to profile *group.userid* described.

  READ Same as NONE.

  UPDATE
  The specified `DFLTGRP` is accepted.

  CONTROL
  Same as UPDATE

- **C4R.USER.DFLTGRP.=USERID(*n*)**

Specifies a special generic policy for the `DFLTGRP` in **ADDUSER** and **ALTUSER** commands. The `=USERID` stands for the user ID that is being defined or changed. If the substring (`=USERID,1,`*n*) matches, this profile is used in preference to other generic profiles, independent of the value of *n*. This profile is used only if `=RACUID(`*n*`)` and `=RACGPID(`*n*`)` are not present or do not match.

`C4R.USER.DFLTGRP.=USERID(`*n*`)` is a discrete profile. Only the single digit between parenthesis is variable. It must be specified as a value in the range 1-8. It is not possible to use a true generic profile.

No profile found
The first *n* characters of `userid` are not used as a restriction on the `DFLTGRP` for the user.

NONE
The specified `DFLTGRP` is not allowed. This decision can be overruled by authorization to profile *group.userid*.

READ Same as NONE.

UPDATE
The specified `DFLTGRP` is accepted.

CONTROL
Same as UPDATE

If any of the preceding three profiles allow the selected `DFLTGRP`, the next profile is skipped. Processing continues with the `/SCOPE` and `/OWNER` policies that are described in "Additional policy controls for the default group." If the preceding profiles did not authorize the use of a certain `DFLTGRP`, the next profile is used as alternative authorization method.

- **C4R.USER.DFLTGRP.***group.userid*

This profile is used independently of the three rules that are defined earlier. It can be used to specify exceptions to the generic name-based policies. It controls whether *group* can be used as `DFLTGRP` for the new *userid*. For existing IDs, the profile specifies which of the groups for the user can be selected as the `DFLTGRP` on the `ALTUSER` command.

In most situations, you specify *userid* through a generic. Explicit profiles can be used to define exceptions for certain `userid`s.

This profile is not used if any of the previous three profiles already allowed the use of the specified `DFLTGRP`.

No profile found
The control is not implemented. No name-based policy is enforced.

NONE
If this parameter is specified, the command is failed.

READ Same as NONE.

UPDATE
The groupname can be used.

CONTROL
Same as UPDATE.

Additional policy controls for the default group

The next profiles are used to define general restrictions on the DFLTGRP.

The first one restricts `DFLTGRP` to be within the scope of a group-SPECIAL attribute. It effectively disables `JOIN` authorization and direct ownership of a GROUP as a means to permit creation of new User profiles. As normal users usually do not have group-SPECIAL, all changes to the DFLTGRP are considered outside their scope. This profile also effectively disallows normal users to change their DFLTGRP. Each user can still specify any of its groups as the current group during the logon process.

The second profile compares the DFLTGRP against the OWNER of the USERID. It can be used to enforce a match, but it also allows exceptions to this general rule.

- **C4R.USER.DFLTGRP./SCOPE.***group.userid*

  This profile is used to specify that the default group of new users must be within the scope of group-SPECIAL. It also controls which of the existing groups can be selected as the default group. The main purpose of this profile is to prevent decentralized administrators from changing the DFLTGRP to a group that they do not control.

  The variables *userid* and *group* represent the affected User profile and the specified (=new) DFLTGRP for the user. This step enables specification of exceptions to the general rule. The most specific profile is used by zSecure Command Verifier.

  The qualifier /SCOPE in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  If the profile is within scope of a group-SPECIAL authorization, the use of this authorization is recorded through the profile

  - **C4R.USESCOPE.***group*

  Successful UPDATE access to this profile is recorded by SMF. If the terminal user has System-SPECIAL, the *group* **=SYSTEM** is used for tracking this authorization.

  No profile found
  The control is not implemented.

  NONE
  Only groups within the scope of the terminal user can be specified as DFLTGRP on both the **ADDUSER** and **ALTUSER** commands. If any other GROUP is specified, the command is failed.

  READ Same as NONE.

  UPDATE
  Groups outside the scope of the terminal user can be used on both the **ADDUSER** and **ALTUSER** command. If the terminal user does not have sufficient authority in the specified group, the command is failed by RACF.

  CONTROL
  This policy is not in effect for the terminal user.

- **C4R.USER.DFLTGRP./OWNER.***group.userid*

  Specifies that the DFLTGRP of new users must be the same as the /OWNER of the userid. Users need access to this profile to specify anything but the owner as the value for the DFLTGRP.

  For existing users, it restricts the selection of the DFLTGRP through the **ALTUSER** command to the group that is the OWNER of the user profile. If the OWNER is changed concurrently in the same **ALTUSER** command, the new DFLTGRP is verified against the new OWNER.

  For new userids, the use of **C4R.USER.=DFLTGRP.***userid*, described previously, is preferred. This Mandatory Value policy profile overlays any value that is specified by the terminal user. The current /OWNER profile requires the terminal user to specify the correct value. If the Mandatory Value policy profile is used, the current profile is skipped. The main purpose of the /OWNER profile is to permit certain users to be exempt from the DFLTGRP=OWNER requirement.

The variables *userid* and *owner* represent the affected User profile and its new DFLTGRP. These variables permit specification of exceptions to the general rule. The most specific profile is used by zSecure Command Verifier.

The qualifier /OWNER in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

No profile found
The control is not implemented.

NONE
The DFLTGRP for the user must be the same as the OWNER of the user ID.

READ Same as NONE

UPDATE
The terminal user is authorized to specify a value for the DFLTGRP that is different from the current or new OWNER of the user ID.

CONTROL
This policy is not in effect for the terminal user.

Policy profiles for the owner

The other piece of information that describes a newly defined user ID is the OWNER. The following profiles are used to control the specification of the owner. These profiles apply both to the **ADDUSER** and **ALTUSER** commands. In general, the processing for these profiles assumes that the policy of your installation is to use GROUPs as OWNER. The last profile that is described in "Mandatory and default value profiles for the OWNER" /GROUP provides a control that can be used to indicate whether your installation wants to enforce such a policy or not. Again, the description is split into several sets of profiles. The first specifies a mandatory or default value for the owner. The second set of profiles describes controls on a specified value for the owner. The final set of three profiles describes general policies that can be used for the OWNER of user IDs.

Mandatory and default value profiles for the OWNER

The administrator must specify the mandatory and default value policy profiles for the OWNER of the new user ID.

The following Mandatory and Default Value policy profiles for the OWNER of the new user ID are only used for the **ADDUSER** command.

- **C4R.USER.=OWNER.***userid*

  This profile is used to specify a mandatory (overriding) value for the OWNER of the newly defined user ID. It is only used during **ADDUSER** processing. The OWNER value that is obtained from this Mandatory Value profile is not subject to more OWNER-related policy profiles.

  The qualifier =OWNER in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  No profile found
  The control is not implemented. No mandatory value is enforced.

  NONE
  No action. No mandatory value is enforced.

  READ The **APPLDATA** field is extracted and used for the command. If the process yields an ID that is not valid, or a non-existing entry, the current group of the terminal user is used instead.

UPDATE
Same as READ

CONTROL
The control is not active for the terminal user. No mandatory value is supplied. The value for the `OWNER` as specified by the terminal user is used in the command.

Note: The access levels for this profile are not hierarchical. In general, zSecure Command Verifier policies do not apply to users that have `CONTROL` access or higher. However, access `NONE` indicates that the facility as described by the policy is unavailable to the terminal user. For the Mandatory Value profiles, the odd situation can then occur that access `NONE` has the same net result as access `CONTROL`.

The values that are accepted for the **APPLDATA** field are given as follows. The `OWNER` can be a user ID or GROUP.

BLANK
The specified value of the new `OWNER` is suppressed, and replaced by the user ID of the terminal user. This value is the default value that RACF uses if no `OWNER` was specified. Depending on the access level to the `/GROUP` profile, zSecure Command Verifier allows use of the terminal user as the new `OWNER`.

userid Depending on the access level to the `/GROUP` profile, the *userid* is inserted as the owner of the new user ID.

group The specified `GROUP` is used as `OWNER` of the new user ID.

=DFLTGRP
Represents the default group DFLTGRP as specified or defaulted on the command. If this value resolves to the special value `=OWNER`, which represents the `OWNER` that is being determined, the command fails.

=MYOWNER
Reflects the `OWNER` of the terminal user. If this value is a `GROUP`, the value is used as the `OWNER` of the new user ID. If this value is a user ID, further processing is dependent on the access level that the terminal user must the `/GROUP` profile.

=USERID(n)
Reflects the first *n* characters of the new user ID itself. This value must be a user ID or GROUP. All other situations are considered an error, and the current `GROUP` of the terminal user is used instead.

=RACGPID
Reflects the `GROUP` that was used to allow definition of the user ID in C4R.USER.ID.=RACGPID(n). This value is only used if =RACGPID(*n*) is used to allow definition. In all other situations, the value =RACGPID is considered an error, and the current GROUP of the terminal user is used instead.

- **C4R.USER./OWNER.***userid*

  This profile is used to specify a default value for the `OWNER` of the newly defined user ID profile. It is only used during **`ADDUSER`** processing. The `OWNER` that is to be used as the default value is obtained from the **APPLDATA** field in the profile. The `OWNER` value that is obtained through this Default Value profile is not subject to more OWNER-related policy profiles. If the preceding =OWNER profile is used to provide a value, the /OWNER profile is not used.

The qualifier /OWNER in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

No profile found
: The control is not implemented. No default value is supplied. This case results in RACF providing a default for the OWNER =the terminal user itself.

NONE
: No action. No default value is supplied. zSecure Command Verifier does not allow RACF to provide a value for the OWNER. The command is failed. Using this access level allows an installation to force the terminal user to explicitly specify a value for the OWNER.

READ
: The **APPLDATA** field is extracted and used for the command. If the process yields an ID that is not valid, or a non-existing entry, the current group of the terminal user is used instead.

UPDATE
: Same as READ

CONTROL
: The control is not active for the terminal user. No default value is supplied. Because the terminal user did not specify a value for the OWNER, RACF makes the terminal user the OWNER of the new profile.

The values that are accepted for the **APPLDATA** field are given in the following list. The specified OWNER can be a user ID or GROUP.

BLANK
: Depending on the access level to the /GROUP profile, the terminal user can become the OWNER of the new profile.

userid
: Depending on the access level to the /GROUP profile, the specified user ID is inserted as the OWNER of the new user ID.

group
: The specified GROUP is used as OWNER of the new user ID.

=DFLTGRP
: Reflects the default group DFLTGRP as specified or defaulted on the command. If this value resolves to the special value =OWNER, indicating the OWNER of the new profile, the command is failed. See the description at =DFLTGRP for details.

=MYOWNER
: Reflects the owner of the terminal user. If this value is a GROUP, the value is used as the OWNER of the new user ID. If this value is a user ID, further processing is dependent on the access level that the terminal user must the /GROUP profile.

=USERID(n)
: Reflects the first *n* characters of the new user ID itself. This value must be a user ID or GROUP. All other situations are considered an error, and the current GROUP of the terminal user is used instead.

=RACGPID
: Reflects the GROUP that was used to permit definition of the USERID in C4R.USER.ID.=RACGPID(n). This value is only used if =RACGPID(*n*) was

used to permit definition. In all other situations, the value =RACGPID is considered an error, and the current GROUP of the terminal user is used instead.

Verification of the specified owner

The following set of three profiles is used when a new OWNER are specified in the **ADDUSER** or **ALTUSER** command. RACF itself does not impose any constraints on the value of the new owner. The new owner must be an existing user ID or existing GROUP only. Aside from this restriction, all values are allowed. This set of profiles can be used to restrict the choice of new OWNERs. If the use of the specified OWNER is not accepted by any of these general policy rules, the explicit profile in the subsequent section is used.

- **C4R.USER.OWNER.=RACUID(*n*)**

  This profile specifies a special generic policy for the OWNER in ADDUSER and ALTUSER commands. The =RACUID stands for the userid of the terminal user. If the substring ((=RACUID,*1*,*n*) matches, this profile is used in preference to other profiles, independent of the value of *n*. If you have more than one of these profiles that are defined, only the one with the smallest numeric specification is used for matching the userids.

  This profile is discrete. Only the single digit between parentheses is variable; it must be specified as a value in the range 1-8. It is not possible to use a true generic profile.

  If the OWNER specified by the terminal user is accepted, processing continues with the additional verifications described like /SCOPE and /GROUP.

  No profile found
  The terminal user ID of the user is not used as naming convention or restriction for the OWNER.

  NONE
  The specified OWNER is not allowed. The command is failed. This decision can be overruled by authorization to profile *owner.userid*.

  READ Same as NONE.

  UPDATE
  The specified OWNER is accepted.

  CONTROL
  Same as UPDATE.

- **C4R.USER.OWNER.=RACGPID(*n*)**

  This profile specifies a special generic policy for the OWNER in **ADDUSER** and **ALTUSER** commands. The =RACGPID stands for the list of groups the terminal user is connected to. All the groups of the user are used, independent of the setting of "list of group access checking". If the substring =RACGPID,1,nmatches, this profile is used in preference to other profiles, independent of the value of *n*. It is only used if =RACUID(*n*) is not present or does not match. If you defined multiple of these profiles, only the one with the lowest value for *n* is used.

  This profile is a discrete profile. Only the single digit between parenthesis is variable and must be specified from 1 to 8. It is not possible to use a true generic profile.

  If the OWNER specified by the terminal user is accepted, processing continues with the additional verifications described like /SCOPE and /GROUP.

  No profile found
  The terminal GROUPs of the user are not used as naming convention or restriction for the OWNER.

NONE
The specified OWNER is not allowed. The command is failed. This decision can be overruled by authorization to profile *owner.userid*.

READD Same as NONE.

UPDATE
The specified OWNER is accepted.

CONTROL
Same as UPDATE

- **C4R.USER.OWNER.=USERID(*n*)**

  This profile specifies a special generic policy for the OWNER in ADDUSER and ALTUSER commands. The special value =user ID represents the affected user profile itself. This profile can be used to enforce a naming convention that states that the first *n* characters of a user ID must match the first *n* characters of its owner.

  The `=USERID` stands for the `userid` in the command. If the substring (`=USERID,1,`*n*) matches the specified `OWNER`, this profile is used in preference to other generic profiles, independent of the value of *n*. It is only used if `=RACUID(`*n*`)` and `=RACGPID(`*n*`)` are not present or do not match. If you defined multiple profiles like these profiles, only the one with the lowest value for *n* is used.

  This profile is a discrete profile. Only the single digit between parenthesis is variable and must be specified from 1 to 8. It is not possible to use a true generic profile.

  If the OWNER specified by the terminal user is accepted, processing continues with the additional verifications described like `/SCOPE` and `/GROUP`.

  No profile found
  The target user ID itself is not used as naming convention or restriction for the OWNER.

  NONE
  The specified OWNER is not allowed. The command is failed. This decision can be overruled by authorization to profile *owner.userid* described as following.

  READ Same as NONE.

  UPDATE
  The specified OWNER is accepted.

  CONTROL
  Same as UPDATE.

  If any of the above three profiles allow the specified OWNER, the next profile rule is skipped. Processing continues with the `/SCOPE`, `/GROUP`, and `/DFLTGRP` policies that are described as following. If the preceding profiles did not authorize the use of a certain OWNER, the next profile is used as alternative authorization method.

- **C4R.USER.OWNER.***owner.userid*

  The primary purpose of this control is to specify a policy if none of the general policies that are described applies. The variable *owner* represents the new OWNER of the *userid*. This case allows specification of exceptions to the general rule. The most specific profile is used by zSecure Command Verifier.

  The OWNER as verified by this policy profile is still subjected to the additional policies `/SCOPE`, `/GROUP`, and `/DFLTGRP`.

No profile found
This control is not implemented.

NONE
The command is failed.

READ Same as NONE.

UPDATE
The specified OWNER is accepted.

CONTROL
Same as UPDATE.

Additional policy controls for the owner

Aside from the profiles that are intended to enforce a naming convention, it is also possible to implement a policy that is based on the existing RACF group hierarchy. The profiles allow specification of general rules for the new OWNER. By using more specific (or fully qualified) profiles, you can specify that some users or groups are exempt from such a restriction.

The three profile rules are used as an extra set of policies. If the specified OWNER is accepted by any of the rules above, it is verified against the three policies. If it fails any of these policies below, the command is rejected.

- **C4R.USER.OWNER./SCOPE.***owner.userid*

  This profile is used to control if the new OWNER as specified by the terminal user must be within the scope of a group-SPECIAL attribute. This case applies both for the **ADDUSER** command and the **ALTUSER** command. This profile can prevent the terminal user from "giving away" user ID profiles that are within the scope of a group-SPECIAL attribute.

  The variables *userid* and *owner* represent the affected User profile and its new OWNER. This step allows specification of exceptions to the general rule. The most specific profile is used by zSecure Command Verifier.

  The qualifier /SCOPE in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  If the profile is within scope of a group-SPECIAL authorization, the use of this authorization is recorded by the profile

  – **C4R.USESCOPE.***group*

  Successful UPDATE access to this profile is recorded by SMF. If the terminal user has System-SPECIAL authorization, the *group* **=SYSTEM** is used for tracking this authorization.

  No profile found
  The terminal user group-SPECIAL scope is not used to control the new OWNER of user profiles.

  NONE
  If the specified new OWNER is outside the scope of a group-SPECIAL attribute of the terminal user, the command is failed.

  READ Same as NONE.

  UPDATE
  The specified OWNER is accepted, irrespective of the scope of the terminal user.

  CONTROL
  Same as UPDATE.

- **C4R.USER.OWNER./GROUP.***owner.userid*

The profile is used to control if the specified OWNER must be a RACF GROUP or not. This profile is verified independently of the other preceding profiles. If either the `=OWNER` or the `/OWNER` profiles are used, this policy rule is bypassed.

The variables *userid* and *owner* represent the affected `USERID` and its new `OWNER`. This step permits specification of exceptions to the general rule. The most specific profile is used by zSecure Command Verifier.

The qualifier `/GROUP` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

No profile found
This control is not implemented. The specified OWNER can be a GROUP or a user ID.

NONE
If the specified owner is an existing RACF group, the command is accepted. In all other situations, the command is failed.

READ Same as NONE.

UPDATE
The specified OWNER is accepted even if it does not represent an existing group. If the specified OWNER is not a valid entry, the command is failed by RACF.

CONTROL
Same as UPDATE.

- **C4R.USER.OWNER./DFLTGRP.***owner.userid*

This profile is used to control if the OWNER as specified by the terminal user must be the same as the DFLTGRP of the user ID. This case applies both for the **`ADDUSER`** command and the **`ALTUSER`** command.

The values *userid* and *owner* represent the affected `USERID` and its new `OWNER`. This step permits specification of exceptions to the general rule. The most specific profile is used by zSecure Command Verifier.

The qualifier `/DFLTGRP` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

No profile found
This control is not implemented. The specified OWNER can be different from the current `DFLTGRP`.

NONE
The specified new OWNER must be the same as the current or new `DFLTGRP`.

READ Same as NONE.

UPDATE
The specified OWNER is accepted, irrespective of the value of the `DFLTGRP`.

CONTROL
Same as UPDATE.

Implementation of a new user policy

In the previous sections, the profiles that are used in the decision process for the user ID and the place in the RACF group hierarchy are described. These profiles allow great flexibility in specification of the user IDs that a terminal user is allowed to create. Use the following scenario to describe the steps that are required to implement a new user policy:

- Central administrators can define all users.
- De-centralized administrators can define users only for their own department.
- Departments can be recognized by the RACF group structure (ownership).
- All user profiles must be owned by a RACF group, according to the departmental structure.
- A user ID naming convention is used where the first 3 characters of the `userid` are the same as the first 3 characters of the department name.

For the preceding organization the following profiles can be implemented:

c4r.user.id.* uacc(none) sysadmin(update)
: This profile ensures that only system administrators are allowed to define new user profiles outside the regular naming conventions.

c4r.user.id.=racuid(3) uacc(update)
: This profile allows all decentralized administrators to define new users that have as first 3 characters the same characters as the decentralized administrator. Only those decentralized administrators who have `CLAUTH(USER)` and the group-SPECIAL attribute are allowed to define new users.

  Note: The implementation of this policy through the `=RACGPID(3)` profile is not as effective. All the groups of the terminal user are used as naming convention. It is not guaranteed that the terminal user is not connected to a functional group of another department, which has a different prefix.

c4r.user.delete. uacc(none) sysadmin(update)**
: This profile ensures that only the central system administrators are allowed to delete existing users.

c4r.user.=dfltgrp. uacc(update) sysadmin(control) appldata('=myowner')**
: This profile specifies that independent of what any decentralized administrator specifies, the newly defined `userid` is always connected to the GROUP that owns the decentralized administrator. Central system administrators must specify a `DFLTGRP` because this control does not apply to them. However, see the next profile.

c4r.user./dfltgrp. uacc(none) sysadmin(update) appldata('USERS')**
: If the central system administrator does not specify a DFLTGRP for new users, the user is assigned to the group called USERS.

c4r.user.=owner. uacc(update) sysadmin(control) appldata('=myowner')**
: This profile ensures that the OWNER of the new user ID profile is the same as the OWNER of the decentralized administrator. Again, this control does not apply to the central system administrators. The next profile is especially defined for their usage.

c4r.user./owner. uacc(none) sysadmin(update) appldata('=dfltgrp')**
: The use of `=DFLTGRP` as the `APPLDATA` value ensures that if no value is specified for the OWNER, the OWNER is completed by zSecure Command Verifier to be the same as the `DFLTGRP` for the new user ID.

Implementation of an existing user policy

Continuing with the scenario used in the New User policy example in the previous section, you can also set up a policy to handle existing users. For this example, extend the New User policy that is defined previously with some additional rules:

- Central administrators can modify all users.

- Central administrators can specify any user or group as owner.
- De-centralized administrators can change the owner within their own department only.
- De-centralized administrators can return existing users to the `not-in-a-department` pool.
- The `not-in-a-department` pool is implemented through the RACF group HOLDING.

This example does not describe the profiles that are needed to connect users to a group or to remove them, or how to change the user authorizations and attributes. The next section shows the profiles that are required to control the **CONNECT** and **REMOVE** commands. It is assumed in this case that the user IDs are somehow connected to the RACF `GROUP HOLDING`.

For the preceding organization the following profiles can be implemented.

c4r.user.dfltgrp./scope. uacc(none) sysadmin(control)**
: This profile ensures that only system administrators are allowed to change the default group to all values. The decentralized administrators can specify only groups that are within their scope of control. Because this `/SCOPE` profile is defined, normal users can no longer permanently change their own default groups. They can still select their current connect `GROUP` during logon.

c4r.user.owner./scope. uacc(none) sysadmin(control)**
: This profile ensures that only system administrators have unrestricted authorization to change the OWNER of existing users. Decentralized administrators can change the `OWNER` only within their scope. They cannot give away any of their user IDs. Normal users cannot change the OWNER of any user IDs that they own because they do not have group-SPECIAL: everything is outside their scope.

c4r.user.dfltgrp.HOLDING.* uacc(update)
: This profile identifies the RACF `GROUP HOLDING` as an exceptional group. All users in the system can select the RACF `GROUP HOLDING` as their default group if they are already connected to the `GROUP`.

c4r.user.owner.HOLDING.* uacc(control)
: This profile identifies the RACF `GROUP HOLDING` as an exceptional group. It allows all decentralized administrators to transfer existing users from their current `OWNER` to the `HOLDING` group.

Policy profiles for user attributes and authorizations

This section describes the controls that can be implemented for user attributes and authorizations.

Similar attributes and authorizations also exist for GROUP connections. Some of the keywords that are available on the **ADDUSER** and **ALTUSER** command apply to the GROUP connections for the `DFLTGRP` or the specified GROUP. For the description of the `CONNECT` attributes and authorizations, see "CONNECT management" on page 128. The user/system level keywords are summarized in the following table.

Table 19. Profiles used for RACF attributes. The entries in this table reflect the keywords that are specified on the **ADDUSER** and **ALTUSER** commands

Command	Keyword	Profile
ADDUSER	**N/A**	**C4R.USER.=ATTR.***owner.userid*

Table 19. Profiles used for RACF attributes (continued). The entries in this table reflect the keywords that are specified on the **ADDUSER** and **ALTUSER** commands

Command	Keyword	Profile
ADDUSER ALTUSER	**SPECIAL**	**C4R.USER.ATTR.SPECIAL.***owner.userid*
ADDUSER ALTUSER	**OPERATIONS**	**C4R.USER.ATTR.OPERATIONS.***owner.userid*
ADDUSER ALTUSER	**AUDITOR**	**C4R.USER.ATTR.AUDITOR.***owner.userid*
ADDUSER ALTUSER	**RESTRICTED**	**C4R.USER.ATTR.RESTRICTED.***owner.userid*
ALTUSER	**UAUDIT**	**C4R.USER.ATTR.UAUDIT.***owner.userid*
ADDUSER ALTUSER	**ADSP**	**C4R.USER.ATTR.ADSP.***owner.userid*
ADDUSER ALTUSER	**GRPACC**	**C4R.USER.ATTR.GRPACC.***owner.userid*
ADDUSER ALTUSER	**NOPASSWORD**	**C4R.USER.ATTR.PROTECTED.***owner.userid*
ADDUSER ALTUSER	**OIDCARD**	**C4R.USER.ATTR.OIDCARD.***owner.userid*
ALTUSER	**REVOKE**	**C4R.USER.ATTR.REVOKE.***owner.userid*
ALTUSER	**RESUME**	**C4R.USER.ATTR.RESUME.***owner.userid*
ALTUSER	**REVOKE**(*date*) **NOREVOKE**	**C4R.USER.ATTR.REVOKEDT.***owner.userid*
ALTUSER	**RESUME**(*date*) **NORESUME**	**C4R.USER.ATTR.RESUMEDT.***owner.userid*

Mandatory value profiles for user attributes

Using the mandatory value policy profile for user attributes, an installation can specify that new users must always have certain attributes, irrespective of the keywords that are used on the **ADDUSER** command. The most obvious use for this function is setting the NOADSP and NOGRPACC values. The standard policy profiles can be used to prevent a terminal user from specifying the value ADSP or GRPACC. If they accidentally specify such a value, the command can be rejected. Use of the Mandatory Value policy profile allows effectively ignoring any non-acceptable value. The Mandatory Attribute policy profile and the applicable access level is described in the following list.

The qualifier =ATTR in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

- **C4R.USER.=ATTR.***owner.userid*

  No profile found
  This control is not implemented. No action is performed.

  NONE
  The mandatory attributes do not apply for the terminal user.

  READ The APPLDATA of the Mandatory Value policy profile is used as the list of attributes for the new user.

  UPDATE
  Same as READ.

  CONTROL
  The control is not active for the terminal user. No mandatory value is supplied. The attributes as specified by the terminal user are used in the command.

Note: The access levels for this profile are not hierarchical. In general, zSecure Command Verifier policies do not apply to users that have CONTROL access or higher. Alternatively, access `NONE` indicates that the facility as described by the policy is not available to the terminal user. For the Mandatory Value profiles, these profiles lead to the odd situation that access `NONE` has the same net result as access `CONTROL`.

The **APPLDATA** field of the Mandatory Value policy profile specifies a list of user attributes. The following user attributes are recognized.

- `SPECIAL` and `NOSPECIAL`
- `OPERATIONS` and `NOOPERATIONS`
- `AUDITOR` and `NOAUDITOR`
- `PASSWORD` and `NOPASSWORD`
- `RESTRICTED` and `NORESTRICTED`
- `OIDCARD` and `NOOIDCARD`
- `ADSP` and `NOADSP`
- `GRPACC` and `NOGRPACC`

It is not possible to use abbreviations for the attributes. If multiple attributes must be assigned, the individual attributes must be separated by a single comma without any intervening blanks, for example:

```
NOADSP,NOGRPACC
```

User attributes and access level descriptions

The following paragraphs describe the access levels that are used to control which keywords and which values can be used.

In general, the access level that is required is `UPDATE` to give the attribute or `READ` to take away the attribute. For the **ADDUSER** commands, zSecure Command Verifier does not check the default value that is used by RACF. However, the non-default value is checked by using a method similar to the one used to check the **ALTUSER** command.

- **C4R.USER.ATTR.SPECIAL.***owner.userid*
- **C4R.USER.ATTR.OPERATIONS.***owner.userid*
- **C4R.USER.ATTR.AUDITOR.***owner.userid*
- **C4R.USER.ATTR.ADSP.***owner.userid*
- **C4R.USER.ATTR.GRPACC.***owner.userid*

No profile found
This control is not implemented. No action is performed.

NONE
The terminal user is not authorized to specify either keyword on the **ALTUSER** command. The no-attribute keyword is allowed (defaulted) on the ADDUSER command.

READ
The terminal user is authorized to explicitly specify the no-attribute keyword on the **ALTUSER** command. This setting allows removal of these attributes.

UPDATE
The terminal user is authorized to specify both keywords on the **ALTUSER** command. This setting allows regular maintenance of these attributes.

CONTROL
The control is not implemented for the terminal user. The terminal user is authorized to specify both keywords on the **ADDUSER** and **ALTUSER** command. This setting allows regular maintenance of these attributes.

In all the preceding situations, the terminal user needs sufficient RACF authorization to specify the keyword. For instance, for most keywords, the terminal user must have the SPECIAL attribute.

- **C4R.USER.ATTR.RESTRICTED.***owner.userid*

  No profile found
  This control is not implemented. No action is performed.

  NONE
  The terminal user is not authorized to specify the **(NO-)RESTRICTED** operand. The default value **NORESTRICTED** is allowed on the **ADDUSER** command.

  READ The terminal user is authorized to specify the RESTRICTED keyword on the **ADDUSER** and **ALTUSER** command. This setting reduces the standard access of the target user to only those resources that are explicitly authorized for use.

  UPDATE
  The terminal user is authorized to specify the NORESTRICTED keyword on the **ALTUSER** command. This setting allows the regular maintenance of the RESTRICTED attribute.

  CONTROL
  The control is not implemented for the terminal user. The terminal user is authorized to specify both keywords on the **ADDUSER** and **ALTUSER** command.

- **C4R.USER.ATTR.UAUDIT.***owner.userid*

  The UAUDIT attribute can be seen and assigned only by a terminal user with the System-AUDITOR attribute. It results in all RACF verifications that are audited by SMF.

  No profile found
  This control is not implemented. No action is performed.

  NONE
  The terminal user is not authorized to specify the **(NO-)UAUDIT** operand.

  Note: The **(NO-)UAUDIT** keyword is not available on the **ADDUSER** command.

  READ The terminal user is authorized to specify the NOUAUDIT keyword on the **ALTUSER** command.

  UPDATE
  The terminal user is authorized to specify the UAUDIT keyword on the **ALTUSER** command. This setting allows the regular maintenance of the UAUDIT attribute.

  CONTROL
  The control is not implemented for the terminal user. The terminal user is authorized to specify both keywords on the **ALTUSER** command.

- **C4R.USER.ATTR.PROTECTED.***owner.userid*

  The PROTECTED attribute is controlled by the NOPASSWORD keyword on the **ALTUSER** command. The PASSWORD keyword controls two different functions: the setting of a password and the PROTECTED attribute. Control of the use of these functions is split into two profiles. The current profile is only used for the transition between the PROTECTED and NON-PROTECTED status. If the current command would not result in setting or removing the PROTECTED attribute, this profile is not used. Instead, the following `C4R.USER.PASSWORD` profiles are used to control management of the password for an existing user.

No profile found
: This control is not implemented. No action is performed.

NONE
: The terminal user is not authorized to specify the NO-PASSWORD keyword. If the target user currently has the `PROTECTED` attribute (`NOPASSWORD`), use of the PASSWORD keyword is prohibited as well.

READ The terminal user is authorized to specify the `NOPASSWORD` operand to create protected `userids`. If the target user currently has the `PROTECTED` attribute (`NOPASSWORD`), use of the `PROTECTED` keyword is prohibited.

UPDATE
: The terminal user is authorized to specify the `NOPASSWORD` keyword to create `PROTECTED userids`. Using the `PASSWORD` keyword to reset a `PROTECTED userid` to a normal `NON-PROTECED userid` is also authorized.

CONTROL
: The control is not implemented for the terminal user. The terminal user is authorized to specify both the PASSWORD and the NOPASSWORD keyword.

- **C4R.USER.ATTR.OIDCARD.***owner.userid*

  This profile is used to control the use of the NOOIDCARD and the OIDCARD keyword. The default keyword NOOIDCARD is not checked for the **`ADDUSER`** command.

No profile found
: This control is not implemented. No action is performed.

NONE
: The terminal user is not authorized to specify the **`(NO-)OIDCARD`** operand on the **`ALTUSER`** command. The NOOIDCARD keyword is allowed (defaulted) on the **`ADDUSER`** command.

READ The terminal user is authorized to specify the NOOIDCARD keyword on the **`ALTUSER`** command to reset the `OIDCARD` of an existing user.

UPDATE
: The terminal user is authorized to specify the OIDCARD keyword to set the `oidcard` of a new or existing user. This command succeeds only if the terminal user has physical access to a terminal attached magnetic card reader.

CONTROL
: The control is not implemented for the terminal user.

- **C4R.USER.ATTR.REVOKE.***owner.userid*

  This policy profile applies only to the `REVOKE` attribute without a future `revoke` date. Management of revoke dates is controlled by the `REVOKEDT` policy profile.

No profile found
: This control is not implemented. No action is performed.

NONE
: The terminal user is not authorized to revoke the user. This setting applies to the REVOKE keyword without any specification of a future revoke date.

READ The terminal user is authorized to REVOKE a `userid`. This setting applies to the REVOKE keyword without specification of a future revoke date.

UPDATE
Same as READ.

CONTROL
The control is not implemented for the terminal user. The terminal user is authorized to revoke a `userid`.

- **C4R.USER.ATTR.RESUME.***owner.userid*

  This policy profile applies only to the `RESUME` attribute without a future resume date. Management of resume dates is controlled by the `RESUMEDT` policy profile.

  No profile found
  This control is not implemented. No action is performed.

  NONE
  The terminal user is not authorized to resume the user. This setting applies `RESUME` keyword without specification of a future resume date.

  READ Same as NONE.

  UPDATE
  The terminal user is authorized to `RESUME` a `userid`. This setting applies only to an immediate `RESUME` without a future resume date.

  CONTROL
  The control is not implemented for the terminal user. The terminal user is authorized to resume the `userid`.

- **C4R.USER.ATTR.REVOKEDT.***owner.userid*

  This policy profile applies to the REVOKE attribute with a future `revoke` date. It also applies to the use of the NOREVOKE keyword to remove existing revoke dates.

  No profile found
  This control is not implemented. No action is performed.

  NONE
  The terminal user is not authorized to manage `revoke` dates for the user. This setting applies to both REVOKE(*date*) and the `NOREVOKE` option.

  READ
  Same as NONE

  UPD The terminal user is allowed to manage `revoke` dates through REVOKE(*date*) or `NOREVOKE`.

  CONTROL
  The control is not implemented for the terminal user. The terminal user is authorized to manage the revoke dates for the `userid`.

- **C4R.USER.ATTR.RESUMEDT.***owner.userid*

  This policy profile applies to the RESUME attribute with a future resume date. It also applies to the use of the NORESUME keyword to remove existing resume dates.

  No profile found
  This control is not implemented. No action is performed.

NONE
The terminal user is not authorized to manage `resume` dates for the user. This setting applies to both RESUME(*date*) and the `NORESUME` option.

READ
Same as NONE

UPD The terminal user is allowed to manage `resume` dates through RESUME*date*) or `NORESUME`.

CONTROL
The control is not implemented for the terminal user. The terminal user is authorized to manage the resume dates for the `userid`.

Policy profiles for user password management

Although the `PROTECTED` attribute is also controlled by the NOPASSWORD and NOOIDCARD keywords, it is described in the previous section "User attributes and access level descriptions" on page 92 together with other attributes.

One policy profile is used to control the authority to set/change passwords and password phrases. Two policy profiles are provided to enforce a minimal password quality for the passwords that are set by an administrator. The remaining password policy controls the setting of the password interval and the use of the noexpire keyword.

Attention: This control does not enforce any standards on the passwords as set by users when they change their password during logon.

The following table lists the profiles available to manage RACF user passwords. Detailed descriptions for each profile in the table are provided below the table.

Table 20. Profiles used for RACF passwords. The entries in this table reflect the keywords that are specified on the **ADDUSER**, **ALTUSER**, and **PASSWORD** commands

Command	Keyword	Profile
ADDUSER ALTUSER	**PASSWORD**	**C4R.USER.PASSWORD.***owner.userid*
ADDUSER ALTUSER	**PASSWORD**	**C4R.USER./PASSWORD.***owner.userid*
PASSWORD	**PASSWORD**	**C4R.USER.PASSWORD.=RACUID**
ADDUSER ALTUSER	**PHRASE**	**C4R.USER.PHRASE.***owner.userid*
PASSWORD	**PHRASE**	**C4R.USER.PHRASE.=RACUID**
ADDUSER ALTUSER	**PASSWORD**	**C4R.USER.PASSWORD.=DFLTGRP**
PASSWORD	**USER(***userid***)**	**C4R.USER.PASSWORD.=DFLTGRP**
ADDUSER ALTUSER	**PASSWORD**	**C4R.USER.PASSWORD.=USERID**
PASSWORD	**(NO)INTERVAL**	**C4R.USER.=PWINT.***owner.userid*
PASSWORD	**(NO)INTERVAL**	**C4R.USER.PWINT.***owner.userid*
ALTUSER	**(NO)EXPIRED**	**C4R.USER.PWEXP.***owner.userid*

The following entries describe the policy profiles and access levels that are used to control the password-related functions of zSecure Command Verifier.

- **C4R.USER.PASSWORD.***owner.userid*

  This policy profile controls the setting of the password through the **ADDUSER** or **ALTUSER** command. Setting of the password through the **PASSWORD** command is controlled by the =RACUID profile. Setting the password of another user through the **PASSWORD** command is controlled by the password quality profile for =DFLTGRP.

If the usage of the PASSWORD keyword in the command does not result in setting or removing the PROTECTED attribute, the current profile is used. If the password setting removes the protected attribute of a userid, the C4R.USER.ATTR.PROTECTED profile is used instead. For more information, see the preceding section on attributes. The profile described here controls the authorization to manage passwords for normal (NON-PROTECTED) userid.

No profile found
This control is not implemented. No action is performed.

NONE
The terminal user is not authorized to specify the **PASSWORD** operand. For the **ADDUSER** command, this setting can result in the creation of users with a RACF default password (=DFLTGRP). This case can be prevented by the password quality controls described as following.

READ Same as NONE.

UPDATE
The terminal user is authorized to specify the **PASSWORD** operand on the **ALTUSER** command to reset the password for an existing user. However, if the target user currently has the PROTECTED attribute, the **PASSWORD** operand is not authorized. This access level allows for normal password maintenance, but prevents PROTECTED userids from becoming NON-PROTECTED.

CONTROL
The control is not implemented for the terminal user. The terminal user is authorized to specify the PASSWORD keyword, unless the target userid currently has the PROTECTED attribute.

- **C4R.USER./PASSWORD.***owner.userid*

This policy profile is used when the **ADDUSER** or **ALTUSER** command is used with the PASSWORD keyword, but without a value for the password. In this case RACF would normally assign the DFLTGRP of the target user as the new password. Use of the APPLDATA of the policy profiles allows the specification of alternative values for the password. If the **ADDUSER** or **ALTUSER** command specifies a value for the PASSWORD, this policy profile is not used.

The qualifier /PASSWORD in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

No profile found
This control is not implemented. No action is performed.

NONE
No default value is supplied.

READ The generated value for the password is inserted in the command. The password is not disclosed to the terminal user.

UPDATE
The generated value for the password is inserted in the command. A message is issued to the terminal user that shows the new password.

CONTROL
The control is not implemented for the terminal user. No default value for the password is supplied. RACF uses the DFLTGRP of the target user as the new value of the password.

The following values for APPLDATA are supported.

BLANK
: This value is used to indicate that RACF default processing must be used. RACF uses the DFLTGRP of the target user, which can trigger other password policy rules (especially **C4R.USER.PASSWORD.=DFLTGRP**), as described as following.

RANDOM
: zSecure Command Verifier generates a RANDOM value for the password.

Other
: Although this value must be considered an error, processing continues as if no value for the APPLDATA was specified. RACF uses the DFLTGRP of the target user for the new password that can trigger other password policy rules especially **C4R.USER.PASSWORD.=DFLTGRP**.

- **C4R.USER.PASSWORD.=RACUID**

  This profile describes the authority of a user to change its own password by using the **PASSWORD** command. You cannot use generic characters to cover the =RACUID qualifier in the policy profile; it must be present in the exact form shown.

  Use care when you define a generic value for the PASSWORD qualifier because the resulting policy profile might also match the authority to change your own non-base segments. For more information about the policy profiles for non-base segments, see "Profiles that manage non-base segments" on page 52.

  The following access rules apply:

  No profile found
  : This control is not implemented. No action is performed.

  NONE
  : The terminal user is not authorized to specify the **PASSWORD** operand. This setting means that the user can change only its password during logon.

  READ
  : Same as NONE.

  UPDATE
  : The terminal user is authorized to specify the **PASSWORD** operand on the **PASSWORD** command to change its password.

  CONTROL
  : The control is not implemented for the terminal user.

- **C4R.USER.PHRASE.***owner.userid*

  This policy profile controls the setting of the password phrase through the **ADDUSER** or **ALTUSER** command. Setting of the password phrase through the **PASSWORD** or **PHRASE** command is controlled by the =RACUID profile as follows.

  Since the use of a password phrase requires the presence of a password, adding or setting a password phrase for a PROTECTED user is not possible.

  No profile found
  : This control is not implemented. No action is performed.

  NONE
  : The terminal user is not authorized to specify the **PHRASE** operand.

  READ
  : Same as NONE.

  UPDATE
  : The terminal user is authorized to specify the **PHRASE** operand on the

ALTUSER command to reset the password phrase of an existing user. If the target user currently has the no password, RACF prevents use of the **PHRASE** keyword.

CONTROL
The control is not implemented for the terminal user. The terminal user is authorized to specify the **PHRASE** keyword.

- **C4R.USER.PHRASE.=RACUID**

  This profile describes the authority of a user to change its own password phrase by using the **PASSWORD** or **PHRASE** command. RACF does not allow adding a password phrase through the **PASSWORD** or **PHRASE** command. You can change only the value of existing password phrases. You cannot use generic characters to cover the `=RACUID` qualifier in the policy profile; it must be present in the exact form shown.

  Use care when you define a generic value for the `PASSWORD` qualifier because the resulting policy profile might also match the authority to change your own non-base segments. For more information about the policy profiles for non-base segments, see "Profiles that manage non-base segments" on page 52.

  The following access rules apply:

  No profile found
  This control is not implemented. No action is performed.

  NONE
  The terminal user is not authorized to specify the **PHRASE** operand. This setting means that the user can change only its password phrase during logon, if and when this setting is supported by the application.

  READ Same as NONE.

  UPDATE
  The terminal user is authorized to specify the **PHRASE** operand on the **PASSWORD** or **PHRASE** command to change its password phrase.

  CONTROL
  The control is not implemented for the terminal user.

- **C4R.USER.PASSWORD.=DFLTGRP**

  This profile is used to control the authorization to leave the password value blank at the **ADDUSER** and **ALTUSER** command. Leaving the password value blank, results in RACF by using the `DFLTGRP` of the user for the new password. Explicitly setting the `PASSWORD` to the `DFLTGRP` is also controlled by this policy.

  The **PASSWORD** command, when issued for another user without the INTERVAL keyword, resets the password to the default group of that user. This policy profile does also apply to that form of the PASSWORD command.

  The qualifier `=DFLTGRP` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  Activation of the preceding `/PASSWORD` policy preempts this policy. Implementation of that policy can result in setting a value for the password. In that case, the password value no longer matches the `DFLTGRP`, and the current policy profile does not apply.

  No profile found
  This control is not implemented. No action is performed.

  NONE
  The terminal user is not authorized to use the **ADDUSER** command without explicitly specifying a value for the password. If you use the

PASSWORD keyword on the **ALTUSER** command without specifying a value, the command is failed as well.

READ The terminal user is authorized to leave the password value blank or explicitly specify the DFLTGRP on the **ADDUSER** command. On the **ALTUSER** command, use of the PASSWORD keyword without an explicit value is not allowed.

UPDATE
The terminal user is authorized to leave the password value blank or explicitly specify the DFLTGRP on both the **ADDUSER** and the **ALTUSER** command.

CONTROL
The control is not implemented for the terminal user. A password equal to the DFLTGRP is acceptable.

- **C4R.USER.PASSWORD.=USERID**

  This profile is used to control the authorization to specify the userid as part of the new password on the ADDUSER, ALTUSER PASSWORD command.

  The qualifier =USERID in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  No profile found
  This control is not implemented. No action is performed.

  NONE
  The terminal user is not authorized to use the userid as part of the value for the new password. The command is failed.

  READ Same as NONE.

  UPDATE
  The terminal user is authorized to use the user ID as part of the new value for the password.

  CONTROL
  The control is not implemented for the terminal user. A password equal to the user ID is acceptable.

- **C4R.USER.=PWINT.***owner.userid*

  This profile can be used to enforce a particular value for the password interval. The password interval that is defined by this profile is used to override any value that is specified by the terminal user. If the **PASSWORD** command is used without the INTERVAL keyword, the password interval is not changed.

  The qualifier =PWINT in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  No profile found
  This control is not implemented. No action is performed.

  NONE
  No action. No mandatory value is enforced.

  READ The **APPLDATA** field is retrieved and used for the new password interval for the user.

  UPDATE
  Same as READ

  CONTROL
  The control is not implemented for the terminal user. No mandatory value is enforced.

The values possible for the **APPLDATA** field are given as following.

BLANK
: This value is used to indicate that the RACF `SETROPTS` value must be used as a default.

interval
: The *interval* must be specified by 3 digits that include leading zeros. Ensure that this value is less or equal to the RACF `SETROPTS` value. Otherwise, the resulting command might fail.

NEVER
: The password interval is set to `never`. This setting results in a password that never expires. RACF requires extra authorization to specify this value. If the terminal user lacks this authorization, the command is failed.

other
: This value is an error. The RACF `SETROPTS` value is used as maximum.

- **C4R.USER.PWINT.***owner.userid*

  This profile can be used to control the maximum value of the password interval. In the best fitting profile, the maximum value for the password interval must be specified by the `APPLDATA`. The *interval* must be specified by 3 digits that include leading zeros. The terminal user specified value is compared against the value that is defined in the `APPLDATA`. If the value in the command is higher than the value in the profile, the command is rejected. If the terminal user has `CONTROL` access the defined maximum value is ignored.

  No profile found
  : This control is not implemented. No action is performed.

  NONE
  : Changing the password interval is not allowed. Any value that is specified by the terminal user is rejected.

  READ
  : Same as NONE.

  UPDATE
  : The value from the **APPLDATA** is used as a maximum value for the password interval. If the terminal user specified value is less or equal to the defined value, the command is accepted. The password interval cannot be set higher than the system-wide default.

  CONTROL
  : The control is not implemented for the terminal user. Any terminal user specified value is accepted.

  The values possible for the **APPLDATA** field are given as follows.

  BLANK
  : This value is used to indicate that the RACF `SETROPTS` value must be used as a maximum.

  interval
  : The *interval* must be specified by 3 digits that include leading zeros.

  NEVER
  : The password interval can be set to NEVER. This setting results in a password that never expires. RACF requires extra authorization for this value. It is also possible to specify a password interval less or equal to the `SETROPTS` value.

  other
  : This value is an error. The RACF `SETROPTS` value is used as maximum.

- **C4R.USER.PWEXP.***owner.userid*

  This profile can be used to control usage of the no-expired option when you reset the password of another user. RACF already restricts the no-expired option to system-special users and people with UPDATE access to the `IRR.PASSWORD.RESET` profile. This profile allows restriction that is not only based on the command issuer, but also on the target `userid`.

  No profile found
  This control is not implemented. No action is performed.

  NONE
  The terminal user is not authorized to specify `NOEXPIRED` on the **`ALTUSER`** command. The EXPIRE keyword is allowed (defaulted) on the command.

  READ Same as NONE

  UPDATE
  The terminal user is authorized to specify the `NOEXPIRED` keyword on the **`ALTUSER`** command. This setting allows regular maintenance of non-expired passwords.

  CONTROL
  The control is not implemented for the terminal user. This setting allows regular maintenance of non-expired passwords.

Other user-related policy profiles

In this final section on user-related controls, the remaining settings are described. The main controls in are the controls for setting the name, installation data, and class authorizations `CLAUTH`.

Table 21. Profiles used for user settings. The entries in this table reflect the keywords that are specified on the **`ADDUSER`** and **`ALTUSER`** commands

Command	Keyword	Profile
ADDUSER ALTUSER	**NAME**	**C4R.USER.NAME.***owner.userid*
ADDUSER ALTUSER	**(NO)DATA**	**C4R.USER.INSTDATA.***owner.userid*
ADDUSER ALTUSER	**(NO)CLAUTH**	**C4R.USER.CLAUTH.***class.owner.userid*
ADDUSER ALTUSER	**(NO)SECLABEL**	**C4R.USER.SECLABEL.***seclabel.owner.userid*
ADDUSER ALTUSER	**ADD/DEL CATEGORY**	**C4R.USER.CATEGORY.***category.owner.userid*
ADDUSER ALTUSER	**(NO)SECLEVEL**	**C4R.USER.SECLEVEL.***seclevel.owner.userid*
ADDUSER ALTUSER	**(NO)MODEL**	**C4R.USER.MODEL.***owner.userid*
ADDUSER ALTUSER	**(NO)WHEN**	**C4R.USER.WHEN.***owner.userid*

The following paragraphs describe the remaining policy profiles that are supported by zSecure Command Verifier.

At the moment, there is only limited support for `SECLABEL` and `SECLEVEL`. It is possible to control assignment of these two settings, but it is not possible to control removal of the settings.

- **C4R.USER.NAME.***owner.userid*

  This profile can be used to control changing the NAME sometimes known as the `PGMRNAME` of a user ID. The main application of this policy is to prevent users from changing their own **NAME** field. The access levels that can be used for this profile are given as follows.

No profile found
: This control is not implemented. All users can change their own NAME. RACF administrators and users can change the NAME of all user IDs under their control.

NONE
: Specifying the NAME is not allowed. The command is failed. This setting applies both to the **ADDUSER** and the **ALTUSER** command.

READ
: Specifying a NAME on the **ADDUSER** command is allowed. Changing the NAME through the **ALTUSER** command is not allowed.

UPDATE
: Changing the NAME of the user ID is accepted.

CONTROL
: The control is not implemented for this terminal user. No restrictions are imposed.

- **C4R.USER.INSTDATA.***owner.userid*

  This profile is used to control the authorization to change installation data of a user. Normally this authorization is already restricted to the owner of the profile, and people with **group-** SPECIAL authorization. This profile implements further restrictions.

  The INSTDATA policy profile can also include a reference to the format required for the installation data. The name of the format can be specified by the APPLDATA of the best fitting policy profile. The name of the format is used to determine the appropriate set of format specification policy profiles. Format specification policy profiles or short format profiles use names similar to the following name:

  ```
  C4R.class.INSTDATA.=FMT.format-name.POS(start:end)
  ```

  Multiple format profiles can be used to specify different parts of the installation data of the RESOURCE profile. For a complete description of the format profiles, see "Installation data field format restriction" on page 187.

  The access levels that can be used for the INSTDATA profile are given as follows.

No profile found
: This control is not implemented. All RACF authorized users can change the installation data of users within their control.

NONE
: Specifying installation data is not allowed. The command is failed. This setting applies both to the **ADDUSER** and the **ALTUSER** command.

READ
: Specifying installation data on the **ADDUSER** command is allowed. Changing the value afterward through the **ALTUSER** command is not allowed.

UPDATE
: Changing the installation data is allowed.

CONTROL
: The control is not implemented for this terminal user. No restrictions are imposed.

The optional value that is specified by **APPLDATA** is described as follows:

Format-Name
: The name of the format that must be used for the installation data of the *userid* The *Format-Name* is used to locate the appropriate set of format profiles.

- **C4R.USER.CLAUTH.***class.owner.userid*

  This profile can be used to control which users in your system can be given the authority to define new user IDs and profiles in the specified general resource classes. Normally, users with CLAUTH for a class, can pass their authorization on to other users. The current profile can be used to prevent this case. The access levels that can be used for this profile are given as follows.

  No profile found
  This control is not implemented. Users with CLAUTH can pass on their authorization to other users in the organization. Also, users with System-SPECIAL can assign CLAUTH for all classes to all users.

  NONE
  Delegating CLAUTH for CLASS *class* to user *userid* is not allowed. The command is failed. This setting applies both to the **ADDUSER** and the **ALTUSER** command.

  READ Terminal users can remove the CLAUTH for *class* from users within their scope.

  UPDATE
  Terminal users with CLAUTH for CLASS *class* can pass their authorization to user *userid*. This method is the standard RACF authorization.

  CONTROL
  The control is not implemented for this terminal user. No restrictions are imposed.

- **C4R.USER.SECLABEL.***seclabel.owner.userid*

  This profile can be used to control assignment of Security Labels. Normally, RACF administrators can assign their own SECLABEL to other users in their scope. This label is only the default Security Label. Users can choose their SECLABEL during LOGON process, provided they have access to the defined SECLABEL.

  At the moment zSecure Command Verifier has no policy profile that controls the complete removal of a SECLABEL. Administrators can remove the assigned security label from any user within their scope.

  No profile found
  This control is not implemented. Administrators with access to a *seclabel* can assign this value as the default SECLABEL for users within their scope.

  NONE
  Assignment of the SECLABEL *seclabel* to user *userid* is not allowed. The command is failed. This setting applies both to the **ADDUSER** and the **ALTUSER** command.

  READ System special users can assign the *seclabel* to this userid.

  UPDATE
  Administrators with access to a *seclabel* can assign this value as the default SECLABEL for users within their scope.

  CONTROL
  The control is not implemented for this terminal user. No restrictions are imposed.

- **C4R.USER.CATEGORY.***category.owner.userid*

This profile can be used to control assignment of security categories. Normally, RACF administrators can assign their own CATEGORY to other users in their scope. Security categories can be used as extra method of preventing access to resources. Users must have at least all the security categories that are assigned to the resource. The current profile allows control over the assignment and removal of a CATEGORY to a user.

No profile found
: This control is not implemented. Administrators who are assigned *category* can assign and remove this CATEGORY to users within their scope.

NONE
: Assignment and removal of the CATEGORY *category* to user *userid* is not allowed. The command is failed. This setting applies both to the **ADDUSER** and the **ALTUSER** command.

READ
: System-SPECIAL users can assign and remove the *category* to this `userid`.

UPDATE
: Administrators who are assigned *category* can assign this value to other users within their scope. They also have the authority to remove *category*.

CONTROL
: The control is not implemented for this terminal user. No restrictions are imposed.

- **C4R.USER.SECLEVEL.***seclevel.owner.userid*

  This profile can be used to control assignment of security levels. Normally, RACF administrators can assign SECLEVELs up to their own SECLEVEL to other users in their scope. Security levels can be used as extra method of preventing access to resources. Users must have at least the same security level as the level assigned to the resource. The zSecure Command Verifier policy profile allows control over the assignment of a SECLEVEL to a user. Only the exact name of the *seclevel* is used in the verification process. The corresponding numeric value is not evaluated. Also, assignment of another *seclevel* with a lower value is only controlled by the zSecure Command Verifier policy profile corresponding to that particular *seclevel*.

  At the moment zSecure Command Verifier has no policy profile that controls the removal of a SECLEVEL. Administrators can remove the assigned security level from any user within their scope.

No profile found
: This control is not implemented. Administrators who are assigned *seclevel* can assign this SECLEVEL to users within their scope.

NONE
: Assignment of the SECLEVEL *seclevel* to user *userid* is not allowed. The command is failed. This setting applies both to the **ADDUSER** and the **ALTUSER** command.

READ
: System-SPECIAL users can assign the *seclevel* to this `userid`.

UPDATE
: Administrators who are assigned *seclevel* can assign this value to other users within their scope.

CONTROL
: The control is not implemented for this terminal user. No restrictions are imposed.

- **C4R.USER.MODEL.***owner.userid*

  The model data set name is used by RACF when a new data set profile that starts with this `userid` is defined. When the new data set profile is defined, the model data set name that is specified is prefixed by the `userid`. RACF allows each user to specify the name of the model profile. User data set modeling is only used if it is activated through `SETROPTS`. zSecure Command Verifier allows control over the authority to select which data set profile must be used as model. The **C4R.***class.***TYPE.***type.profile* profile that is described in "Other policy profiles and access level descriptions" on page 181 allows control over the definition of `MODEL` data sets themselves.

  No profile found
  This control is not implemented. All users can select their own model data set. The model data set is only used of `MODEL(USER)` is activated in `SETROPTS`.

  NONE
  Selection of the user MODEL data set name is not allowed.

  READ The MODEL can be specified on the **`ADDUSER`** command. It is not possible to change it later by the **`ALTUSER`** command.

  UPDATE
  Setting, changing, and removing the MODEL specification is allowed.

  CONTROL
  The control is not implemented for this terminal user. No restrictions are imposed.

- **C4R.USER.WHEN.***owner.userid*

  This single policy profile controls both the setting of the WHEN(DAYS) and the WHEN(TIME) specification for user IDs. These two options control which days of the week and which hours of the day a user ID can log on. This option applies only to interactive work, and only to the exact time and day of the LOGON itself.

  No profile found
  This control is not implemented. WHEN(DAYS) and WHEN(TIME) can be specified.

  NONE
  Specification of LOGON restrictions is not allowed.

  READ Same as NONE.

  UPDATE
  Specification and removal of LOGON restrictions is allowed.

  CONTROL
  The control is not implemented for this terminal user. No restrictions are imposed.

Profiles that manage groups

Similar to user ID definitions, for group-related commands, several profiles are used. The next sections describe these profiles. For clarity reasons, all the possible keywords and the corresponding profiles are split in several categories. The first section concentrates on those profiles that describe naming conventions for groups and the place in the RACF group hierarchy for new or existing groups. Subsequent sections describe the connections of users to groups and the attributes of groups.

If you want to implement naming conventions for your groups, the profiles in section “Profiles to enforce naming conventions for groups” must be used. For the place in the RACF hierarchy, the profiles in section “Placement of new groups in the RACF hierarchy” on page 110 can be applied. Section “Policy profiles for group attributes and authorizations” on page 125 describes the group attributes and other group-related settings.

Profiles to enforce naming conventions for groups

For the name and place of a new or existing group, the installation can use naming conventions that are based on the group itself. The first table summarizes the profiles that control the name of the new group. The profiles apply only to the **ADDGROUP** command to create new groups. Sections “Mandatory and default value policy profiles for SUPGRP” on page 112 and “Mandatory and default value policy profiles for OWNER” on page 118 describe mandatory and default values for the superior group and owner. The last table describes the profiles that are used for the verification of the values that are specified by the terminal user.

Table 22. Profiles used for verification of RACF GROUP. The entries in this table reflect the keywords that describe the name of new and deleted groups.

Command	Keyword	Profile
ADDGROUP	*groupname*	**C4R.GROUP.ID.=RACUID(n)**
ADDGROUP	*groupname*	**C4R.GROUP.ID.=RACGPID(n)**
ADDGROUP	*groupname*	**C4R.GROUP.ID.***group*
DELGROUP	*groupname*	**C4R.GROUP.DELETE.***group*

The profiles in the preceding table are used to describe new GROUPs that can be defined. For the GROUP itself, zSecure Command Verifier provides controls that are based on the name of the new group. The authority to change groups is not controlled by name-based rules. This authorization is already sufficiently restricted by the normal RACF scoping rules. The authority to delete groups is also controlled by the normal RACF ownership rules, but an extra control is needed. This authority is implemented by another name-based rule. For defining new groups, the terminal user still needs at least one group-related authorization (join, group-SPECIAL, or direct ownership).

The *groupname*-based controls preceding impose naming conventions on the new group. This first set of profiles is used to control the name of the newly defined group. These profiles are intended to specify which groups can be defined. In general, only one of these profiles is used to specify your naming convention. Other, less specific generic profiles must be used to block the definition of new groups that do not follow your naming convention. Exceptions can then be implemented by the definition of more specific discrete or generic profiles. An example implementation of these profiles is given as follows.

```
C4R.GROUP.ID.=RACGPID(4)       UACC(UPDATE)
C4R.GROUP.ID.TEST*             UACC(NONE) IBMUSER(UPDATE)
C4R.GROUP.ID.*                 UACC(NONE)
```

These profiles ensure that no new groups can be defined, unless the first 4 characters of the new group are the same as any of the groups of the terminal user that defines the new group. An exception is made for GROUPs that start with TEST. These profiles can be defined by the user IBMUSER, and also (according to the first profile) by all users that are connected to a group that also starts with TEST. The third profile is required to stop definition of new groups outside the allowed naming convention. Without the third profile, almost any `groupname` is accepted, either explicitly by the first or second profile, or implicitly by the absence of a matching profile.

- **C4R.GROUP.ID.=RACUID(n)**

  Specifies a special generic policy for the new group. The =RACUID stands for the `userid` of the terminal user. If the substring (`=RACUID,1,n`) matches, this profile is used in preference to other profiles, independent of the value of *n*. If you have multiple of these profiles that are defined, only the one with the smallest numeric specification is used.

  This profile is a discrete policy profile. Only the single digit between parenthesis is variable and must be specified from 1 to 8. It is not possible to use a true generic profile.

  No profile found
  The terminal user ID is not used as naming convention for new groups.

  NONE
  The new groupname is not allowed. The command fails.

  READ Same as NONE.

  UPDATE
  The new groupname is accepted.

  CONTROL
  Same as UPDATE.

- **C4R.GROUP.ID.=RACGPID(n)**

  Specifies a special generic policy for the new groupname. The =RACGPID stands for the list of groups the terminal user is connected to. All the groups of the user are used, independent of the setting of “"list of group access checking"”. This profile is used only if the preceding `=RACUID(`*n*`)` profile is not present or does not match. If the substring(`=RACGPID, 1, n`) matches, this profile is used in preference to other profiles, independent of the value of *n*. If you have multiple of these profiles that are defined, only the one with the smallest numeric specification is used for matching the `userids`.

  This profile is a discrete policy profile. Only the single digit between parenthesis is variable and must be specified from 1 to 8. It is not possible to use a true generic profile.

  No profile found
  The current group of the terminal user is not used as naming convention for new groups.

  NONE
  The new groupname is not allowed. The command fails.

  READ Same as NONE.

  UPDATE
  The new group is accepted.

  CONTROL
  Same as UPDATE.

- **C4R.GROUP.ID.***group*

  Specifies which new groups can be created by the terminal user.

  No profile found
  No naming convention is enforced for new groups.

NONE
The specified groupname is not allowed. The command fails.

READ Same as NONE.

UPDATE
The specified group is allowed to be created.

CONTROL
Same as UPDATE.

Deletion of existing groups

The authority to delete Group profiles is normally controlled by some form of ownership direct, or within the scope of a group-SPECIAL attribute and by system-SPECIAL authorization. Some organizations want to keep strict control over the authority to delete existing groups. Most often, this case is because they implement more procedures like saving or renaming data sets, or interaction with non-RACF information. The following policy profiles put more constraints on the authorization to delete groups.

- **C4R.GROUP.DELETE.***group*

  This profile is used to control which *group*s within scope can be deleted. It can be used to protect certain groups from being deleted. It can also be used to restrict group deletion in general, by the definition of a generic profile. Only the terminal users who have access from this profile are allowed to delete these groups. This control reduces the normal delete authorization (SPECIAL, within Group-SPECIAL scope, direct ownership).

  This profile is not verified whether RACF already rejected deletion of the *group* because of syntax errors or insufficient authority.

  The following rules apply for access to the policy profile:

  No profile found
  The control is not implemented. No additional restriction on the delete of the specified group.

  NONE
  The group cannot be deleted. The command is failed.

  READ The group can be deleted only if the terminal user has the System-SPECIAL attribute.

  UPDATE
  The group can be deleted.

  CONTROL
  Same as UPDATE.

- **C4R.GROUP.DELETE.=UNIVERSAL**

  This profile is used to control the deletion of universal groups. Universal groups do not contain a list of regular users that are connected to the group. Such groups might seem to be unused or empty, while many users are still connected to the group. More steps to change these user profiles are required when you delete universal groups. To prevent accidental creation of referential problems, a policy can be implemented that restricts the deletion of universal groups. Only terminal users with sufficient access to the policy profile are allowed to delete universal groups. The required access for system-special users is READ, while regular users require at least UPDATE access.

This policy profile is not verified whether RACF already rejected deletion of the group because of insufficient authority, or because the group is not empty. RACF decides that a group is not empty if the group shows any connected user or has one or more subgroups.

The following rules apply for access to the policy profile:

No profile found
The control is not implemented. No additional restriction is applied on the deletion of universal groups.

NONE
Universal groups cannot be deleted. The **DELGROUP** command to delete universal groups is rejected.

READ
Universal groups can be deleted only if the terminal user has the system-special attribute. The **DELGROUP** command to delete universal groups is rejected for all other users.

UPDATE
Universal groups can be deleted.

CONTROL
Same as UPDATE.

Placement of new groups in the RACF hierarchy

When a group is created according to the preceding profile, more rules might apply to the place of the new group in the RACF Group hierarchy. zSecure Command Verifier provides three types of profiles to control this aspect. The Mandatory Value policy profiles enforce a specific `OWNER` and `SUPGRP` for the new group. The Default Value profiles provide a value in case the terminal user does not provide such a value, and the last set of profiles verify that the values that the terminal user specified is acceptable. Subsequent sections describe how these profiles are used together and which values can be automatically supplied. The zSecure Command Verifier policy profiles use the abbreviation `SUPGRP` for the superior group. This case is in contrast to the RACF commands that use the abbreviation `SUPGROUP`. The first table describes the Mandatory Value policy profiles.

For Mandatory Value policy profiles, the third qualifier consists of an equals sign, followed by the keyword. So for the `SUPGRP`, the profile has the qualifier `=SUPGRP`. The first table describes the Mandatory Value policy profiles.

Table 23. Mandatory Value policy profiles for RACF GROUP place-related command/keywords. The entries in this table reflect the Mandatory Values for keywords that describe the hierarchy of new groups.

Command	Keyword	Profile
ADDGROUP	*group*	**C4R.GROUP.=SUPGRP.***group*
ADDGROUP	*group*	**C4R.GROUP.=OWNER.***group*

The second table describes the Default Value profiles that are used if the terminal user did not specify any keywords that control the place in the RACF Group hierarchy. For Default profiles, the third qualifier consists of a forward slash, followed by the keyword. So for the `SUPGRP`, the profile has `/SUPGRP`.

Table 24. Profiles used for Default values of RACF GROUP place-related command/keywords. The entries in this table reflect the default values for keywords that describe the hierarchy of new groups.

Command	Keyword	Profile
ADDGROUP	*group*	**C4R.GROUP./SUPGRP.***group*
ADDGROUP	*group*	**C4R.GROUP./OWNER.***group*

Finally, the third table describes the profiles that are used to verify acceptability of the terminal user specified values. The following table summarizes which profile is used for which keyword or function.

Table 25. Profiles used for verification of RACF GROUP. The entries in this table reflect the keywords that are specified by the terminal user to describe the name and place of new or changed groups.

Command	Keyword	Profile
ADDGROUP ALTGROUP	**SUPGRP**	**C4R.GROUP.SUPGRP.=RACUID(n)**
ADDGROUP ALTGROUP	**SUPGRP**	**C4R.GROUP.SUPGRP.=RACGPID(n)**
ADDGROUP ALTGROUP	**SUPGRP**	**C4R.GROUP.SUPGRP.=GROUP(n)**
ADDGROUP ALTGROUP	**SUPGRP**	**C4R.GROUP.SUPGRP.***supgrp.group*
ADDGROUP ALTGROUP	**SUPGRP**	**C4R.GROUP.SUPGRP./SCOPE.***supgrp.group*
ADDGROUP ALTGROUP	**SUPGRP**	**C4R.GROUP.SUPGRP./OWNER.***supgrp.group*
ADDGROUP ALTGROUP	**OWNER**	**C4R.GROUP.OWNER.=RACUID(n)**
ADDGROUP ALTGROUP	**OWNER**	**C4R.GROUP.OWNER.=RACGPID(n)**
ADDGROUP ALTGROUP	**OWNER**	**C4R.GROUP.OWNER.=GROUP(n)**
ADDGROUP ALTGROUP	**OWNER**	**C4R.GROUP.OWNER.***owner.group*
ADDGROUP ALTGROUP	**OWNER**	**C4R.GROUP.OWNER./SCOPE.***owner.group*
ADDGROUP ALTGROUP	**OWNER**	**C4R.GROUP.OWNER./GROUP.***owner.group*
ADDGROUP ALTGROUP	**OWNER**	**C4R.GROUP.OWNER./SUPGRP.***owner.group*

Policy profiles for the Superior Group (SUPGRP)

Aside from the name of a new group, two other important aspects are the place in the RACF hierarchy = `OWNER` and the superior group. In standard RACF, the terminal user must have `JOIN` authority in that group, the group must be within the scope of a group-SPECIAL attribute or the terminal user must own the group. In addition, if the owner is a RACF GROUP, the group must be the same as the `SUPGRP`. zSecure Command Verifier implements some additional controls on the superior group. The following sections describe how to use the profiles that are listed in the preceding tables.

Mandatory and default value policy profiles for SUPGRP

The first set of profiles controls the superior group SUPGRP of the group for the **ADDGROUP** command. As this first set specifies mandatory or default values, it is not used for the **ALTGROUP** command.

- **C4R.GROUP.=SUPGRP.***group*

  This profile is used to specify a mandatory value for the SUPGRP of every newly defined group. It is only used for the **ADDGROUP** command. The superior group that is used, is obtained from the **APPLDATA** field in the profile. It is used to override any terminal user specified value, or added to the command if the terminal user did not specify a value. The SUPGRP value that is obtained by this Mandatory Value profile is not subject to more SUPGRP-related policy profiles.

  The value *group* represents the affected group. This setting allows the specification of exceptions to the general rule. Only the most specific profile is used by zSecure Command Verifier.

  The qualifier =SUPGRP in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  No profile found
  The control is not implemented. No mandatory value is enforced.

  NONE
  The control is not active for the terminal user. No mandatory value is enforced.

  READ The **APPLDATA** field is extracted and used for the command. If this process does not yield a valid group, the current connect group of the terminal user is substituted.

  UPDATE
  Same as READ.

  CONTROL
  The control is not active for the terminal user. No mandatory value is enforced. If the terminal user specified a value for the GROUP, it is used. If no value was specified, the current group of the terminal user is used by RACF.

  Note: The access levels for this profile are not hierarchical. In general, zSecure Command Verifier policies do not apply to users that have CONTROL access or higher. Alternatively, access NONE indicates that the facility as described by the policy is not available to the terminal user. For the Mandatory Value policy profiles, this step leads to the odd situation that access NONE has the same net result as access CONTROL.

  The values that are accepted for the **APPLDATA** field are given as follows. The terminal user still needs sufficient authority in this group to define new groups. This authorization is not verified in zSecure Command Verifier. Insufficient authority can result in failure of the command by RACF.

  BLANK
  This value is used to indicate that RACF default processing must be used. RACF uses the current group of the terminal user.

  userid This entry is an invalid entry. Because it is not caused by incorrect entry by the terminal user, the command is allowed to continue by using the current group of the terminal user.

  group This *group* is inserted. If the terminal user has insufficient access to this group, the command is failed by RACF.

=OWNER
Reflects the OWNER as specified (or defaulted) by the OWNER keyword on the command. This value can also be an OWNER value as inserted by zSecure Command Verifier. If the OWNER resolves to the special value `=SUPGRP` indicating the superior group, the command is failed.

=MYOWNER
Reflects the OWNERof the terminal user. This value must be a `GROUP`. All other situations are considered an error. Because these situations are not caused by incorrect entry by the terminal user, the command is allowed to continue by using the current GROUP of the terminal user.

=GROUP(n)
Reflects the first *n* characters of the new `GROUP` itself. This value must be a `GROUP`. All other situations are considered an error, and the current `GROUP` of the terminal user is used instead.

=RACGPID
Reflects the `GROUP` that was used to allow definition of the `GROUP` from `=RACGPID(`*n*`)` in C4R.GROUP.ID.=RACGPID(n). This value is only used if `=RACGPID(`*n*`)` was used to allow definition. In all other situations, the **APPLDATA** value `=RACGPID` is considered an error, and the current `GROUP` of the terminal user is used instead.

- **C4R.GROUP./SUPGRP.***group*

  This profile is used to specify a default value for the `SUPGRP` in case the terminal user did not specify a `SUPGRP` on the **`ADDGROUP`** command. The `SUPGRP` that is used as default is obtained from the **APPLDATA** field in the profile. The `SUPGRP` value that is obtained by this Mandatory Value profile is not subject to more SUPGRP-related policy profiles. If the preceding `SUPGRP` profile is used to provide a value, the `/SUPGRP` profile is not used.

  The qualifier `/SUPGRP` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  No profile found
  The control is not implemented. No default value is supplied.

  NONE
  No action. No default value is supplied. RACF does not provide a value for the `SUPGRP`. The command is failed. An installation can use this access level to force the terminal user to explicitly specify a value for the `SUPGRP`.

  READ The **APPLDATA** field is extracted and used for the command.

  UPDATE
  Same as READ.

  CONTROL
  The control is not active for the terminal user. No default value is supplied. The current group of the terminal user is used by RACF.

  The values that are accepted for the **APPLDATA** field are given as follows. The terminal user needs sufficient authority in this `GROUP` to define new `GROUP`s. Insufficient authority can result in failure of the command.

  BLANK
  This value is used to indicate that RACF default processing must be used. The current `GROUP` of the terminal user is used.

  userid This entry is an invalid entry. Because this entry is not caused by incorrect entry by the terminal user, the command is allowed to continue by using the current GROUP of the terminal user.

group The *group* is inserted.

=OWNER
Reflects the OWNER as specified (or defaulted) by the OWNER keyword on the command. This value can also be an OWNER value as inserted by zSecure Command Verifier. If the OWNER resolves to the special value =SUPGRP (indicating the superior group), the command is failed.

=MYOWNER
Reflects the OWNER of the terminal user. This value must be a GROUP. All other situations are considered an error. Because this entry is not caused by incorrect entry by the terminal user, the command is allowed to continue by using the current GROUP of the terminal user.

=GROUP(n)
Reflects the first *n* characters of the new GROUP itself. This value must be a GROUP. All other situations are considered an error, and the current GROUP of the terminal user is used instead.

=RACGPID
Reflects the GROUP that was used to allow definition of the GROUP from =RACGPID(*n*) in C4R.GROUP.ID.=RACGPID(n). This value is only used if =RACGPID(*n*) was used to allow definition. In all other situations, the APPLDATA value =RACGPID is considered an error, and the current GROUP of the terminal user is used instead.

Verification of the specified Superior Group

The following set of three profiles is used to control the selection of the superior group for new GROUPs, and a change of the superior group for existing groups. These profiles are used to verify the specification of the superior group by the terminal user.

- **C4R.GROUP.SUPGRP.=RACUID(*n*)**

  Specifies a special generic policy for the SUPGRP in **ADDGROUP** and **ALTGROUP** commands. The =RACUID stands for the terminal user ID. If the substring (=RACUID, 1, n) matches, this profile is used in preference to other profiles, independent of the value of *n*. If you have multiple of these profiles that are defined, only the one with the smallest numeric specification is used for matching the SUPGRP against the user ID.

  This profile is a discrete profile. Only the single digit between parenthesis is variable and must be specified from 1 to 8. It is not possible to use a true generic profile.

  No profile found
  The terminal user ID is not used as naming convention or restriction for the SUPGRP.

  NONE
  The specified SUPGRP is not allowed. This decision can be overruled by authorization to profile *supgrp.group* described as follows.

  READ Same as NONE.

  UPDATE
  The specified SUPGRP is accepted.

  CONTROL
  Same as UPDATE.

- **C4R.GROUP.SUPGRP.=RACGPID(*n*)**

  Specifies a special generic policy for the `SUPGRP` in **`ADDGROUP`** and **`ALTGROUP`** commands. The `=RACGPID` stands for the list of groups the terminal user is connected to. All the user groups are used, independent of the setting of "list of group access checking". This profile is used only if the preceding `=RACUID`(*n*) profile is not present or does not match. If the substring (`=RACGPID, 1, n`) matches, this profile is used in preference to other profiles, independent of the value of *n*. If you have multiple of these profiles that are defined, only the one with the smallest numeric specification is used for matching the `userid`s.

  This profile is a discrete profile. Only the single digit between parenthesis is variable and must be specified from 1 to 8. It is not possible to use a true generic profile.

  No profile found
  The current group of the terminal user is not used as naming convention or restriction for the `SUPGRP`.

  NONE
  The specified `SUPGRP` is not allowed. This decision can be overruled by authorization to profile *supgrp.group* described as follows.

  READ Same as NONE.

  UPDATE
  The specified `SUPGRP` is accepted.

  CONTROL
  Same as UPDATE.

- **C4R.GROUP.SUPGRP.=GROUP(*n*)**

  Specifies a special generic policy for the `SUPGRP` in **`ADDGROUP`** and **`ALTGROUP`** commands. The `=GROUP` stands for the group that is being defined or changed. If you have multiple of these profiles that are defined, only the one with the smallest numeric specification is used for matching the `SUPGRP` against the target GROUP.

  This profile is a discrete profile. Only the single digit between parenthesis is variable and must be specified from 1 to 8. It is not possible to use a true generic profile. This profile is used only if `=RACUID`(*n*) and `=RACGPID`(*n*) are not present or do not match.

  No profile found
  The first *n* characters of the GROUP are not used as restriction on the `SUPGRP` of the `userid`.

  NONE
  The specified `SUPGRP` is not allowed. This decision can be overruled by authorization to profile *supgrp.group* described as follows.

  READ Same as NONE.

  UPDATE
  The specified `SUPGRP` is accepted.

  CONTROL
  Same as UPDATE.

  If any of the above three profiles allow the selected `SUPGRP`, the next profile is skipped. Processing continues with the `/SCOPE` and `/OWNER` policies. If the preceding profiles did not authorize the use of a certain `SUPGRP`, the next profile is used as alternative authorization method.

- **C4R.GROUP.SUPGRP.***supgrp.group*

This profile is used independently of the three rules previously defined. It can be used to specify exceptions to the generic name-based policies. It controls if *group* can be used as SUPGRP for new groups. For existing groups, it specifies which GROUP can become the new SUPGRP.

In most situations, you specify *group* from a generic. Explicit profiles can be used to define exceptions for certain groups.

This profile is not used if any of the previous profiles already allowed the command to continue.

No profile found
The control is not implemented. No name-based policy is enforced.

NONE
The command is failed.

READ Same as NONE.

UPDATE
The groupname can be used.

CONTROL
Same as UPDATE.

Additional policy profiles for the Superior Group

The next profiles are used to define general restrictions on the SUPGRP. The first one restricts the superior group to be within the scope of a group-SPECIAL attribute. It effectively disables join authorization and direct ownership of a GROUP as a means to allow creation of new GROUPs. As normal users usually do not have group-special, all changes to the SUPGRP are considered outside their scope.

The second profile compares the SUPGRP against the OWNER of the group. It can be used to enforce a match, but it also allows exceptions to this generic rule. RACF itself already enforces that if the OWNER is a GROUP, that it must be the same as the SUPGRP.

- **C4R.GROUP.SUPGRP./SCOPE.***supgrp.group*

  This profile is used to specify that the superior group of new and existing groups must be within the scope of Group-SPECIAL. The main purpose of this profile is to prevent decentralized administrators from changing the SUPGRP to a group that they do not control.

  The variables *supgrp* and *group* represent the affected group and the specified (=new) SUPGRP of the group. This setting enables specification of exceptions to the general rule. The most specific profile is used by zSecure Command Verifier.

  The qualifier /SCOPE in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  If the profile is within scope of a group-SPECIAL attribute, the use of this authorization is recorded by the profile

  – **C4R.USESCOPE.***group*

  Successful UPDATE access to this profile is recorded by SMF.

  No profile found
  The control is not implemented.

  NONE
  Only GROUPs within the terminal user scope can be specified as SUPGRP on both the **ADDGROUP** and **ALTGROUP** commands. If any other GROUP is specified, the command is failed.

  READ Same as NONE.

UPDATE
GROUPs outside the terminal user scope can be used on both the **ADDGROUP** and **ALTGROUP** command. If the terminal user does not have sufficient authority in the specified GROUP, the command is failed by RACF.

CONTROL
This policy is not in effect for the terminal user.

- **C4R.GROUP.SUPGRP./OWNER.***supgrp.group*

  This profile is used to specify that the superior group of new and existing groups must be the same as the OWNER of the group. Terminal users need access to this profile to specify anything but the OWNER as the value for the SUPGRP.

  If the OWNER is changed concurrently in the same **ALTGROUP** command, the new SUPGRP is verified against the new OWNER.

  For new groups, the use of the Mandatory Value policy profile **C4R.GROUP.=SUPGRP.***supgrp.group* described previously is preferred. This Mandatory Value policy profile overlays any value that is specified by the terminal user. The current SUPGRP./OWNER profile requires the terminal user to specify the correct value. If the Mandatory Value profile is used, the current profile is skipped. The main purpose of the current profile is to allow certain GROUPs to be exempt from the SUPGRP=OWNER requirement.

  The variables *supgrp* and *group* represent the affected userid and the specified (=new) SUPGRP of the group. This setting permits the specification of exceptions to the general rule. The most specific profile is used by zSecure Command Verifier.

  The qualifier /OWNER in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  No profile found
  The control is not implemented.

  NONE
  The SUPGRP for the GROUP must be the same as the OWNER of the GROUP.

  READ Same as NONE.

  UPDATE
  The terminal user is authorized to specify a value for the SUPGRP that is different from the current (or new) OWNER of the group.

  CONTROL
  This policy is not in effect for the terminal user.

Policy profiles for the Group Owner

The other piece of information that describes a newly defined GROUP is the OWNER. The following profiles are used to control the specification of the OWNER. These profiles apply both to the **ADDGROUP** and to the **ALTGROUP** command. In general, the processing for these profiles assumes that your installations policy is to use GROUPs as owner. The profile /GROUP, provides a control that can be used to indicate whether your installation wants to enforce such a policy.

The following description is split into several sets of profiles. The first is used to specify a mandatory or default value for the OWNER. The second set of profiles is used to describe controls on a specified value for the OWNER. The final set of three profiles describes general policies that can be user for the OWNER of GROUPs.

Mandatory and default value policy profiles for OWNER

The following two profiles specify the Mandatory and Default Value policy profiles for the `OWNER` of the new `GROUP`. These profiles are only used for the **`ADDGROUP`** command.

- **C4R.GROUP.=OWNER.***group*

  This profile is used to specify a mandatory (overriding) value for the `OWNER` of the newly defined Group profile. It is only used during **`ADDGROUP`** processing. The `OWNER` value that is obtained by this Mandatory Value profile is not subject to more `OWNER`-related policy profiles.

  The qualifier `=OWNER` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  No profile found
  The control is not implemented. No mandatory value is enforced.

  NONE
  No action. No mandatory value is enforced.

  READ The **APPLDATA** field is extracted and used for the command. If the process yields an ID that is not valid, or a non-existing entry, the current group of the terminal user is used instead.

  UPDATE
  Same as READ.

  CONTROL
  The control is not active for the terminal user. No mandatory value is supplied. The value for the `OWNER` as specified by the terminal user is used in the command.

  Note: The access levels for this profile are not hierarchical. In general, zSecure Command Verifier policies do not apply to users that have `CONTROL` access or higher. Alternatively, access `NONE` indicates that the facility as described by the policy is not available to the terminal user. For the Mandatory Value profiles, these profiles lead to the odd situation that access `NONE` has the same net result as access `CONTROL`.

  The values that are accepted for the **APPLDATA** field are given as follows. The owner can be a user or group.

  BLANK
  zSecure Command Verifier inserts the RACF default (the terminal user) as the explicit value for the `OWNER`.

  userid The user ID found is inserted as the `OWNER`.

  group The specified GROUP is used as `OWNER` of the new group.

  =SUPGRP
  Reflects the superior group (`SUPGRP`) as specified (or defaulted) on the command. If this value resolves to the special value `=OWNER`, indicating the `OWNER` of the new profile, the command fails.

  =MYOWNER
  The `OWNER` of the terminal user is inserted as the value for the owner.

  =GROUP(n)
  Reflects the first *n* characters of the new `GROUP` itself. This value must be a valid user ID or `GROUP`. All other situations are considered an error, and the current `GROUP` of the terminal user is used instead.

=RACGPID
: Reflects the GROUP that was used to allow definition of the GROUP from =RACGPID(*n*) in C4R.GROUP.ID.=RACGPID(n). This value is only used if =RACGPID(*n*) was used to allow definition. In all other situations, the **APPLDATA** value =RACGPID is considered an error, and the current GROUP of the terminal user is used instead.

- **C4R.GROUP./OWNER.***group*

  This profile is used to specify a default value for the OWNER of the newly defined Group profile. It is only used during **ADDGROUP** processing. The OWNER that is to be used as the default value is obtained from the **APPLDATA** field in the profile. The OWNER value that is obtained through this Default Value profile is not subject to more OWNER-related policy profiles. If the preceding =OWNER profile is used to provide a value, the /OWNER profile is not used.

  The qualifier /OWNER in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  No profile found
  : The control is not implemented. No default value is supplied. This setting results in RACF providing a default for the OWNER (=the terminal user itself).

  NONE
  : No default value is supplied. RACF does not provide a value for the OWNER. The command is failed. Using this access level allows an installation to force the terminal user to explicitly specify a value for the OWNER.

  READ The **APPLDATA** field is extracted and used for the command. If the process yields an ID that is not valid, or a non-existing entry, the current group of the terminal user is used instead.

  UPDATE
  : Same as READ.

  CONTROL
  : The control is not active for the terminal user. No default value is supplied. Because the terminal user did not specify a value for the OWNER, RACF makes the terminal user the OWNER of the new profile.

  The values that are accepted for the **APPLDATA** field are given as follows. The specified OWNER can be a user ID or GROUP.

  BLANK
  : zSecure Command Verifier inserts the RACF default terminal user as the explicit value for the OWNER.

  userid The user ID found is inserted as the OWNER.

  group The specified GROUP is used as OWNER of the new GROUP.

  =SUPGRP
  : Reflects the superior group DFLTGRP as specified or defaulted on the command. If this value resolves to the special value =OWNER indicating the OWNER of the new profile, the command is failed. See the preceding description at =SUPGRP for details.

  =MYOWNER
  : The OWNER of the terminal user is inserted as the value for the owner.

  =GROUP(n)
  : Reflects the first *n* characters of the new GROUP itself. This value must be

a GROUP. All other situations are considered an error, and the current GROUP of the terminal user is used instead.

=RACGPID
Reflects the GROUP that was used to allow definition of the GROUP from =RACGPID(*n*) in C4R.GROUP.ID.=RACGPID(n). This value is only used if =RACGPID(*n*) was used to allow definition. In all other situations, the **APPLDATA** value =RACGPID is considered an error, and the current group of the terminal user is used instead.

Verification of the specified Group Owner

The following set of four profiles is used when a new owner is specified in the **ADDGROUP** or **ALTGROUP** command. RACF restricts only the owner if it is a GROUP. In that case, it must be identical to the SUPGRP. If the new owner is a user ID, RACF does not impose any restrictions. This set of profiles can be used to restrict the choice of new OWNERs. If the use of the specified OWNER is not accepted by any of the three general policy rules, the explicit profile is used.

- **C4R.GROUP.OWNER.=RACUID(*n*)**

  Specifies a special generic policy for the OWNER in **ADDGROUP** and **ALTGROUP** commands. The =RACUID stands for the terminal user ID. If the substring =RACUID,1,n) matches, this profile is used in preference to other profiles, independent of the value of *n*. If you have multiple of these profiles that are defined, only the one with the smallest numeric specification is used for matching the user ID against the OWNER.

  This profile is a discrete profile. Only the single digit between parenthesis is variable and must be specified from 1 to 8. It is not possible to use a true generic profile.

  No profile found
  The userid of the terminal user is not used as naming convention or restriction for the OWNER.

  NONE
  The specified OWNER is not allowed. This decision can be overruled by authorization to profile *owner.group* described as follows.

  READ Same as NONE.

  UPDATE
  The specified OWNER is accepted.

  CONTROL
  Same as UPDATE.

- **C4R.GROUP.OWNER.=RACGPID(*n*)**

  Specifies a special generic policy for the OWNER in **ADDUSER** and **ALTUSER** commands. The =RACGPID stands for the list of groups the terminal user is connected to. All the user groups are used, independent of the setting of "list of group access checking". This profile is used only if the preceding =RACUID(*n*) profile is not present or does not match. If the substring (=RACGPID,1,n) matches, this profile is used in preference to other profiles described, independent of the value of *n*. If you have multiple of these profiles that are defined, only the one with the smallest numeric specification is used for matching the OWNER.

  This profile is a discrete profile. Only the single digit between parenthesis is variable and must be specified from 1 to 8. It is not possible to use a true generic profile.

No profile found
: The current group of the terminal user is not used as naming convention or restriction for the OWNER.

NONE
: The specified OWNER is not allowed. This decision can be overruled by authorization to profile *owner.group* described as follows.

READ Same as NONE.

UPDATE
: The specified OWNER is accepted.

CONTROL
: Same as UPDATE.

- **C4R.GROUP.OWNER.=GROUP(*n*)**

  This profile specifies a special generic policy for the OWNER in **ADDGROUP** and **ALTGROUP** commands. The =GROUP stands for the group itself. If you defined multiple of these profiles, only the one with the lowest value for *n* is used. This profile is only used if =RACUID(*n*) and =RACGPID(*n*) are not present or do not match.

  This profile is a discrete policy profile. Only the single digit between parenthesis is variable and must be specified from 1 to 8. It is not possible to use a true generic profile.

  If the specified owner is accepted, more verifications against the general policies like /SCOPE and /GROUP are performed.

  The special value =GROUP represent the affected user profile itself. This profile can be used to enforce a naming convention that states that the first *n* characters of a GROUP must match the first *n* characters of its OWNER.

  No profile found
  : The target GROUP itself is not used as naming convention or restriction for the OWNER.

  NONE
  : The specified OWNER is not allowed. This decision can be overruled by authorization to profile *owner.group*.

  READ Same as NONE.

  UPDATE
  : The specified OWNER is accepted.

  CONTROL
  : Same as UPDATE.

  If any of the above three profiles allow the specified OWNER, the next profile rule is skipped. Processing continues with the /SCOPE, /GROUP, and /SUPGRP policies that are described as follows. If the above three profiles did not authorize the use of a certain OWNER, the next profile is used as alternative authorization method.

- **C4R.GROUP.OWNER.***owner.group*

  The primary purpose of this control is to specify a policy if none of the general group-based policies described previously applies. The variable *owner* represents the new OWNER of the *group*. This setting allows specification of exceptions to the general rule. The most specific profile is used by zSecure Command Verifier.

  The OWNER as verified by this policy profile is still subjected to more policies /SCOPE, /GROUP, /SUPGRP.

No profile found
: This control is not implemented.

NONE
: The command is failed.

READ Same as NONE.

UPDATE
: The specified OWNER is accepted.

CONTROL
: Same as UPDATE.

Additional policy profiles for the Group Owner

Aside from the profiles that are intended to enforce a naming convention, it is also possible to implement a policy that is based on the existing RACF group hierarchy. The following profiles allow specification of general rules for the new `OWNER`. By using more specific or fully qualified profiles, it is possible to specify that some user IDs or GROUPs are exempt from such a restriction.

The following three profile rules are used as an extra set of `OWNER` policies. If the specified `OWNER` is accepted by any of the four rules above, it is verified again to comply with the three policies. If it fails any of these additional policies, the command is rejected.

- **C4R.GROUP.OWNER./SCOPE.***owner.group*

  This profile is used to control if the new `OWNER` as specified by the terminal user must be within the scope of a group-SPECIAL attribute. This case applies both for the **`ADDGROUP`** command and the **`ALTGROUP`** command. This profile can prevent the terminal user from giving away group profiles that are within the scope of a group-SPECIAL attribute.

  The variables *group* and *owner* represent the affected `GROUP` and the new `OWNER` of the `GROUP`. This setting allows specification of exceptions to the general rule. The most specific profile is used by zSecure Command Verifier.

  The qualifier `/SCOPE` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  If the profile is within scope of a group-SPECIAL attribute, the use of this authorization is recorded by the profile

  – **C4R.USESCOPE.***group*

  Successful UPDATE access to this profile is recorded by SMF.

  No profile found
  : The Group-SPECIAL scope of the terminal user is not used to control the new `OWNER` of Group profiles.

  NONE
  : If the specified new `OWNER` is outside the scope of a group-SPECIAL attribute of the terminal user, the command is failed.

  READ Same as NONE.

  UPDATE
  : The specified `OWNER` is accepted, irrespective of the scope of the terminal user.

  CONTROL
  : Same as UPDATE.

- **C4R.GROUP.OWNER./GROUP.***owner.group*

The profile is used to control if the specified owner must be a RACF group or not. This profile is verified independently of the other profiles. If either the =OWNER or the /OWNER profile is used, that this policy rule is bypassed.

The variables *group* and *owner* represent the affected GROUP and the new OWNER of the GROUP. This setting allows specification of exceptions to the general rule. The most specific profile is used by zSecure Command Verifier.

The qualifier /GROUP in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

No profile found
This control is not implemented. The specified owner can be a group and a user.

NONE
If the specified owner is an existing RACF group, the command is accepted. In all other situations, the command is failed.

READ Same as NONE.

UPDATE
The specified owner is accepted even if it does not represent an existing group. If the specified owner is not a valid entry, the command is failed by RACF.

CONTROL
Same as UPDATE.

- **C4R.GROUP.OWNER./SUPGRP.***owner.group*

This profile is used to control if the OWNER as specified by the terminal user must be the same as the SUPGRP of the GROUP. This profile applies both for the **ADDGROUP** command and the **ALTGROUP** command.

The values *group* and *owner* represent the affected GROUP and the new OWNER of the GROUP. This setting allows specification of exceptions to the general rule. The most specific profile is used by zSecure Command Verifier.

The qualifier /SUPGRP in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

No profile found
This control is not implemented. The specified OWNER can be different from the current SUPGRP.

NONE
The specified new OWNER must be the same as the current or new SUPGRP.

READ Same as NONE.

UPDATE
The specified OWNER is accepted, irrespective of the value of the SUPGRP.

CONTROL
Same as UPDATE.

Implementation of a new group policy

In the previous sections, the profiles that are used in the decision process for the GROUP and the place in the RACF group hierarchy are described. These profiles allow great flexibility in the specification of the GROUPs that might or might not be defined. As an example you might want to consider the following organization:

- Central administrators can define all groups.
- Decentralized administrators must define groups only for their own department.
- Departments can be recognized by the RACF group structure (ownership).

- All group profiles must be owned by a RACF group, according to the departmental structure.
- A group naming convention is used where the first 3 characters of the group are the same as the first 3 characters of the department name.

For these organizations, the following profiles can be implemented.

C4R.group.id.* uacc(none) sysadmin(update)
: This profile ensures that only system administrators are allowed to define new group profiles outside the regular naming conventions.

C4R.group.id.=racuid(3) uacc(update)
: This profile allows all decentralized administrators to define new groups that have as first 3 characters the same characters as the decentralized administrator. Implementation of this policy from the `=RACGPID(3)` profile is not as effective. All the groups of the terminal user would be used as the naming convention. It is not guaranteed that the terminal user is not connected to a functional group of another department, which would have a different prefix.

C4R.group.delete. uacc(none) sysadmin(update)**
: This profile ensures that only the central system administrators are allowed to delete existing groups.

C4R.group.=supgrp. uacc(update) sysadmin(control) appldata('=myowner')**
: This profile specifies that independent of what any decentralized administrator specifies, the newly defined group are always placed below the same group that owns the decentralized administrator itself. Central system administrators must specify a `SUPGRP` because this control does not apply to them. However, see the next profile.

C4R.group./supgrp. uacc(none) sysadmin(update) appldata('DEPTS')**
: If the central system administrator does not specify a `SUPGRP` for new groups, the group is assigned to the group called `DEPTS`.

C4R.group.=owner. uacc(update) sysadmin(control) appldata('=myowner')**
: This profile ensures that the `OWNER` of the new `/GROUP` profile is the same as the `OWNER` of the decentralized administrator. Again, this control does not apply to the central system administrators. The next profile is especially defined for their usage.

C4R.group./owner. uacc(none) sysadmin(update) appldata('=supgrp')**
: The use of `=SUPGRP` as the `APPLDATA` value ensures that if no value is specified for the `OWNER`, the `OWNER` is completed by zSecure Command Verifier to be the same as the `SUPGRP` for the new `GROUP`.

Implementation of an existing group policy

You can set up a policy profile that determines how existing groups must be handled. The following list contains more rules for the Existing Group policy.

- Central administrators can modify all groups.
- Central administrators can specify any user or group as owner.
- Decentralized administrators must change only the owner within their own department.

For these organizations, the following profiles can be implemented.

C4R.group.supgrp./scope. uacc(none) sysadmin(control)**
: This profile ensures that only system administrators are allowed to change

the superior group to all values. The decentralized administrators can specify only groups that are within their scope of control.

C4R.group.owner./scope. uacc(none) sysadmin(control)**
This profile ensures that only system administrators have unrestricted authorization to change the `OWNER` of existing groups. Decentralized administrators can change the `OWNER` only within their scope. They cannot give away any of their groups. Normal users cannot change the `OWNER` of any groups that they own because they do not have Group-SPECIAL: everything is outside their scope.

Policy profiles for group attributes and authorizations

For all user to group connect attributes and authorization, see section "CONNECT management" on page 128. The commands, keywords, and profiles are summarized in the following table. Detailed descriptions for each profile are provided in the sections that follow the table.

Table 26. Profiles used for RACF attributes. The entries in this table reflect the keywords that are specified on the **ADDGROUP** and **ALTGROUP** commands.

Command	Keyword	Profile
ADDGROUP		**C4R.GROUP.=ATTR.***owner.group*
ADDGROUP	*UNIVERSAL*	**C4R.GROUP.ATTR.UNIVERSAL.***owner.group*
ADDGROUP **ALTGROUP**	*(NO)TERMUACC*	**C4R.GROUP.ATTR.TERMUACC.***owner.group*
ADDGROUP **ALTGROUP**	*(NO)DATA*	**C4R.GROUP.INSTDATA.***owner.group*
ADDGROUP **ALTGROUP**	*(NO)MODEL*	**C4R.GROUP.MODEL.***owner.group*

Mandatory attributes for new groups

By using the Mandatory policy profile for group attributes, an installation can specify that new groups must always have certain attributes, irrespective of the keywords that are used on the **ADDGROUP** command. The most obvious use for this function is setting the `NOTERMUACC` value. The Mandatory Attribute policy profile and the applicable access level is described as follows.

- **C4R.GROUP.=ATTR.***owner.group*

  No profile found
  This control is not implemented. No action is performed.

  NONE
  The mandatory attributes do not apply for the terminal user.

  READ The `APPLDATA` of the Mandatory Value policy profile is used as the list of attributes for the new group.

  UPDATE
  Same as READ.

  CONTROL
  The control is not active for the terminal user. No mandatory value is supplied. The attributes as specified by the terminal user are used in the command.

Note: The access levels for this profile are not hierarchical. In general, zSecure Command Verifier policies do not apply to users that have CONTROL access or higher. Alternatively, access NONE indicates that the facility as described by the policy is not available to the terminal user. For the Mandatory Value profiles, this case leads to the odd situation that access NONE has the same net result as access CONTROL.

The **APPLDATA** field of the mandatory policy profile specifies a list of group attributes. The following list contains group attributes that are recognized.

- `TERMUACC` and `NOTERMUACC`
- `UNIVERSAL`

It is not possible to use abbreviations for the attributes. If multiple attributes must be assigned, the individual attributes must be separated by a single comma without any intervening blanks, for example

```
TERMUACC,UNIVERSAL
```

Group attributes and access level descriptions

The following paragraphs describe the access levels that are used to control which keywords and which values can be used.

In general, the access level that is required is `READ` to specify the value that RACF by default applies to new GROUPs, while `UPDATE` is required to set or modify the attribute. The **`ADDGROUP`** commands zSecure Command Verifier does not check the default value that is used by RACF. However, the non-default value is checked similar to the checking done for the **`ALTGROUP`** command.

- **C4R.GROUP.ATTR.UNIVERSAL.***owner.group*

  This profile controls the definition of RACF Universal `GROUP`s. Universal `GROUP`s are user `GROUP`s that do not have complete membership information that is stored in their Group profiles. The benefit of using Universal `GROUP`s, is that RACF does not impose a limit on the number of regular user IDs connected to the `GROUP`.

  No profile found
  This control is not implemented. No action is performed.

  NONE
  The terminal user is not authorized to create Universal `GROUP`s.

  READ Same as NONE.

  UPDATE
  The terminal user is authorized to create Universal `GROUP`s.

  CONTROL
  The control is not implemented for the terminal user.

  In all the preceding situations, the terminal user needs sufficient RACF authorization to create the `GROUP` in the first place. The `GROUP` must comply with the implemented zSecure Command Verifier policies.

- **C4R.GROUP.ATTR.TERMUACC.***owner.group*

  This profile controls the setting of the `(NO)TERMUACC` attribute of new and existing groups. `TERMUACC` specifies that during terminal authorization checking, RACF allows any user in the group access to a terminal based on the universal access authority (UACC) for that terminal. `TERMUACC` is the default value.

  No profile found
  This control is not implemented. No action is performed.

NONE
: The terminal user is not authorized to specify either keyword on the **ALTGROUP** command. The TERMUACC setting is allowed (defaulted) on the **ADDGROUP** command.

READ
: The terminal user is authorized to explicitly specify the TERMUACC attribute on the **ALTGROUP** command. This setting allows reset of the attribute to its default state.

UPDATE
: The terminal user is authorized to specify both keywords on the **ALTGROUP** command. This setting allows regular maintenance of these attributes.

CONTROL
: The control is not implemented for the terminal user. The terminal user is authorized to specify both keywords on the **ADDGROUP** and **ALTGROUP** command. This setting allows regular maintenance of the TERMUACC setting.

- **C4R.GROUP.INSTDATA.***owner.group*

  This profile is used to control the authorization to change the installation data of a GROUP. Normally this case is already restricted to the owner of the profile, and people with group-**SPECIAL** authorization. This profile implements further restrictions.

  The INSTDATA policy profile can also include a reference to the format required for the installation data. The name of the format can be specified by the APPLDATA of the best fitting policy profile. The name of the format is used to determine the appropriate (set of) format specification policy profiles. Format specification policy profiles (or short format profiles) use names similar to the following name:

  ```
  C4R.class.INSTDATA.=FMT.format-name.POS(start:end)
  ```

  Multiple format profiles can be used to specify different parts of the installation data of the Group profile. For a complete description of the format profiles, see "Installation data field format restriction" on page 187.

  The access levels that can be used for this profile are given in the following list.

  No profile found
  : This control is not implemented. All RACF authorized users can change the installation data of groups within their control.

  NONE
  : Specifying installation data is not allowed. The command is failed. This setting applies both to the **ADDGROUP** and the **ALTGROUP** command.

  READ
  : Specifying installation data on the **ADDGROUP** command is allowed. Changing the value afterward through the **ALTUSER** command is not allowed.

  UPDATE
  : Changing the installation data is allowed.

  CONTROL
  : The control is not implemented for this terminal user. No restrictions are imposed.

  The optional value that is specified by APPLDATA.

format The name of the format that must be used for the installation data of the *group* The *format* name is used to locate the appropriate set of format profiles.

- **C4R.GROUP.MODEL.***owner.group*

  The model data set name is used by RACF when a new data set profile that starts with this group is defined. The model data set specified is prefixed by the group. Group data set modeling is only used if it is activated by `SETROPTS`. zSecure Command Verifier allows control over the authority to select which data set profile must be used as model. The **C4R.***class***.TYPE.***type.profile* profile that is described in "Other policy profiles and access level descriptions" on page 181 allows control over the definition of MODEL data sets themselves.

  No profile found
  This control is not implemented.

  NONE
  Selection of the group `MODEL` data set name is not allowed.

  READ The `MODEL` can be specified on the **`ADDGROUP`** command. It is not possible to change it later on the **`ALTGROUP`** command.

  UPDATE
  Setting, changing, and removing the `MODEL` specification is allowed.

  CONTROL
  The control is not implemented for this terminal user. No restrictions are imposed.

CONNECT management

For the connections of users to groups (group membership) a distinction must be made between defining new connections with attributes and changing existing connect attributes. In zSecure Command Verifier two sets of controls are implemented for the two situations. Naming conventions and similar policies are enforced for new connections. For both new and existing connections, policies can be enforced about the connect authorizations and attributes.

Another issue that needs attention is whether the installation must control the user to group connections from a user viewpoint, or from a group viewpoint. In zSecure Command Verifier, the policy profiles have qualifiers for both the group and the user. However, to simplify policy implementation, implement only one of these qualifiers through generic characters. Determining the controlling profile can be more complex if you use both types of generics together.

Section "New CONNECTs" on page 130 describes the details of the zSecure Command Verifier policy profiles for new CONNECTs. Subsequent sections describe the requirements for existing CONNECTs, and the CONNECT authorization and attributes.

Authority to connect yourself

This function is required by many organizations who want to enforce a strict separation of responsibilities between the security administrator and the data or application administrator. System security polices often specify that security administrators must not have access to application resources. In standard RACF, users with System or Group-SPECIAL can change any profiles under their control. So, even if security administrators currently do not have access to application resources, it is easy for them to obtain access. In this case, the access can be gained by connecting them to a GROUP that has access. Some organizations analyze SMF data to report on those administrators that connect or remove themselves from certain groups. In zSecure Command Verifier, several policies are available to prevent security administrators from modifying the list of GROUPs that they are connected to.

Table 27. Profiles used to control self-authorization. The entries in this table reflect the keywords that describe the ACL entries or CONNECTs.

Command	Keyword	Profile
PERMIT	*userid*	**C4R.***class.***ACL.=RACUID.***access.profile*
PERMIT	*group*	**C4R.***class.***ACL.=RACGPID.***access.profile*
CONNECT	*userid*	**C4R.CONNECT.ID.***group.***=RACUID**
REMOVE	*userid*	**C4R.REMOVE.ID.***group.***=RACUID**

The preceding profiles are only applicable if the *userid* is the terminal user or if the *group* is any of the connect groups of the user. If this situation applies, zSecure Command Verifier uses the preceding profiles in preference to the CONNECT profiles described in section "New CONNECTs" on page 130. A detailed description of the last two profiles and the supported access levels is given as follows. For more information about the profiles for PERMIT, see section "Policy profile selection for self-authorization" on page 150.

- **C4R.CONNECT.ID.***group.***=RACUID**

  This profile is used to specify the authority of terminal users to CONNECT themselves to *group*. If a generic pattern is used for the *group*, the profile describes the authority to connect themselves to any *group*. This profile is primarily intended to prevent administrators from increasing their own authority through CONNECTs to functional groups with high access to application or system resources. This profile can be used most efficiently in combination with the policy profile for =RACGPID for modifying the access list, as described in section "Policy profile selection for self-authorization" on page 150.

  No profile found
  The control is not implemented. All terminal users can CONNECT themselves to any GROUP within their control.

  NONE
  The terminal user is not allowed to CONNECT him/herself to *group*, even if this GROUP is within scope.

  READ Same as NONE

  UPDATE
  The terminal user is allowed to CONNECT him/herself to *group* if the GROUP is within scope.

  CONTROL
  Same as UPDATE

- **C4R.REMOVE.ID.***group.***=RACUID**

  This profile is used to specify the authority of terminal users to REMOVE themselves from *group*. If a generic pattern is used for the *group*, the profile describes the authority to remove themselves from any *group*. This profile is primarily intended for those situations where a specific GROUP is used to reduce the access that people with the (Group-)OPERATIONS attribute might have. This profile can be used most efficiently in combination with the policy profile for

=RACGPIDfor modifying the access list, as described in section "Policy profile selection for self-authorization" on page 150.

No profile found
The control is not implemented. All terminal users can REMOVE themselves from any GROUP within scope.

NONE
The terminal user is not allowed to REMOVE him/herself from *group*, even if this GROUP is within scope.

READ Same as NONE

UPDATE
The terminal users are allowed to REMOVE themselves from *group*, only if the GROUP is within scope.

CONTROL
Same as UPDATE

New CONNECTs

The following table summarizes the profiles used to control which user to group connects can be created.

The entries in this table reflect the user and group of newly defined connections.

Table 28. Profiles used for RACF connection-related command/keywords

Command	Keyword	Profile
CONNECT	**GROUP(***group***)**	**C4R.CONNECT.ID.=USERID(***n***)**
CONNECT	*userid* **GROUP(***group***)**	**C4R.CONNECT.ID.***group.userid*
CONNECT	*userid* **GROUP(***group***)**	**C4R.CONNECT.ID./USRSCOPE.***group.userid*
CONNECT	*userid* **GROUP(***group***)**	**C4R.CONNECT.ID./GRPSCOPE.***group.userid*
CONNECT	*userid* **GROUP(***group***)**	**C4R.CONNECT.ID.=DSN.***group.userid*
REMOVE	*userid* **GROUP(***group***)**	**C4R.REMOVE.ID.***group.userid*

Authority to create CONNECTs

The first part of the CONNECT policies concerns itself with the rules for creating new CONNECTs. RACF looks only at the authorization of the terminal user in the GROUP. The user ID that is to be connected is irrelevant. In zSecure Command Verifier, more controls are implemented that allow an installation to control authorizations that are based on the user ID as well.

- **C4R.CONNECT.ID.=USERID(***n***)**

  This profile can be used to implement a general naming convention-based policy on USER to GROUP CONNECTs. The qualifier =USERID(*n*) stands for the first *n* characters of the user ID (or GROUP). The first *n* characters of the GROUP are matched against the first *n* characters of the user ID. If they match, this profile is used to determine whether the new CONNECT can be created. If you have multiple of these profiles that are defined, only the one with the smallest numerical value for *n* is used.

  This profile must be a discrete profile. The number *n* must be specified as a single digit 1 - 8.

  Note: The profile =USERID(*n*) would be functionally equivalent to =GROUP(*n*). In zSecure Command Verifier, only the =USERID(*n*) profile is implemented.

No profile found
This control is not implemented. The first characters of the `GROUP` are not matched against the characters of the user ID.

NONE
The terminal user is not authorized to `CONNECT USER`s to `GROUP`s that start with the same characters.

READ Same as NONE.

UPDATE
The terminal user is authorized to `CONNECT USER`s to like-named (first *n* characters) `GROUP`s.

CONTROL
The control is not implemented for the terminal user. No general naming convention is used for `USER` to `GROUP CONNECT`s.

- **C4R.CONNECT.ID.***group.userid*

  This profile can be used to implement other naming convention-based polices. It can also be used as a way of specifying exceptions to the general `=USERID(`*n*`)` policy.

  No profile found
  This control is not implemented. The *userid* can be connected to the *group*.

  NONE
  The terminal user is not authorized to `CONNECT` *userid* to *group*.

  READ Same as NONE.

  UPDATE
  The terminal user is authorized to `CONNECT` the *userid* to *group*.

  CONTROL
  Same as UPDATE.

Additional policy controls for new CONNECTs

After a new connection is approved by the preceding policy rules, the new connection can be subjected to more controls. Policies that are based on RACF Group-`SPECIAL` scope and based on naming conventions can be implemented as well. The policies that can be implemented are described as follows.

- **C4R.CONNECT.ID./USRSCOPE.***group.userid*

  This profile is used to control if USERs outside the Group-`SPECIAL` scope of the terminal user can be connected to the *group*.

  The qualifier `/USRSCOPE` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  No profile found
  This control is not implemented. The **`Group-`**`SPECIAL` scope of the terminal user is not considered for the *userid* that is to be `CONNECT`ed to the *group*.

  NONE
  The terminal user is not authorized to `CONNECT` users outside its scope to the *group*.

  READ Same as NONE.

UPDATE
The terminal user is authorized to CONNECT users outside its scope to the *group*.

CONTROL
Same as UPDATE.

- **C4R.CONNECT.ID./GRPSCOPE.***group.userid*

  This profile is used to control if GROUPs outside the Group-SPECIAL scope of the terminal user can be connected to this *userid*. This profile partially overlaps with the normal RACF authorization requirements. The main difference is that the zSecure Command Verifier policy does not take CONNECT authorization and direct ownership of the GROUP into account. Only Group-SPECIAL is considered to determine the authorization.

  The qualifier /GRPSCOPE in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  No profile found
  This control is not implemented. The **Group-**SPECIAL scope of the terminal user is not considered for the *group* where the USER is CONNECTed to.

  NONE
  The terminal user is not authorized to CONNECT users to GROUPs outside its scope.

  READ Same as NONE.

  UPDATE
  The terminal user is authorized to CONNECT users to GROUPs outside its scope.

  CONTROL
  Same as UPDATE.

- **C4R.CONNECT.ID.=DSN.***group.userid*

  This profile is used to control if USERs can be connected to GROUPs that are used as the High-Level Qualifier (HLQ) of data sets.

  The qualifier =DSN in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  No profile found
  This control is not implemented. The fact that the GROUP occurs as HLQ of data sets is not considered.

  NONE
  The terminal user is not authorized to CONNECT users to GROUPs that are used as HLQ of data sets.

  READ Same as NONE.

  UPDATE
  The terminal user is authorized to CONNECT users to GROUPs that are used as HLQ of data sets.

  CONTROL
  Same as UPDATE.

Removal of existing CONNECTs

zSecure Command Verifier also provides a policy to control which users can be removed from a group.

Standard RACF authorization is based on CONNECT authorization and on direct or indirect (from Group-SPECIAL) ownership of the GROUP. In some organizations, removal of a user ID from a group can remove required access authorizations from critical jobs. To prevent inadvertent removal of a user, te following policy can be implemented.

- **C4R.REMOVE.ID.***group.userid*

  This profile can be used to prevent USERs from being removed from certain GROUPs. Normally, any user with CONNECT authorization or other control over the GROUP can remove all users from the GROUP. Use this policy profile to specify exceptions to the standard authorization to manage CONNECTs.

  No profile found
  This control is not implemented. The *userid* can be removed from the *group*.

  NONE
  The terminal user is not authorized to REMOVE *userid* from *group*.

  READ Same as NONE.

  UPDATE
  The terminal user is authorized to REMOVE the *userid* from *group*.

  CONTROL
  Same as UPDATE.

Policy profiles for CONNECT attributes and authorizations

The next two tables summarize the policy profiles that are used for new and existing CONNECTs. The main purpose of these policies is to control which authorizations and attributes are used for user-to-group CONNECTs. The most important attribute is probably the group-SPECIAL attribute. The first table provides all the Mandatory and Default Value profiles, which are used only for new user-to-group CONNECTs. The second table provides all the other profiles, which are used when you create CONNECTs and when you modify existing CONNECTs.

Table 29. Profiles used for RACF connection-related command/keywords. The entries in this table reflect the keywords that are specified on the **ADDUSER**, **ALTUSER**, and **CONNECT** commands.

Command	Keyword	Profile
CONNECT	**OWNER**	**C4R.CONNECT.=OWNER.***group.userid*
CONNECT	**OWNER**	**C4R.CONNECT./OWNER.***group.userid*
CONNECT ADDUSER	**AUTH(***auth***)**	**C4R.CONNECT.=AUTH.***group.userid*
CONNECT ADDUSER	**AUTH(***auth***)**	**C4R.CONNECT./AUTH.***group.userid*
CONNECT ADDUSER	**UACC(***uacc***)**	**C4R.CONNECT.=UACC.***group.userid*
CONNECT ADDUSER	**UACC(***uacc***)**	**C4R.CONNECT./UACC.***group.userid*

Table 30. Profiles used for RACF attributes and authorizations. The entries in this table reflect the keywords that are specified on the **CONNECT** command.

Command	Keyword	Profile
CONNECT	**OWNER(***owner***)**	**C4R.CONNECT.OWNER.***owner.group.userid*
CONNECT ADDUSER ALTUSER	**AUTH(***auth***)**	**C4R.CONNECT.AUTH.***auth.group.userid*
CONNECT ADDUSER ALTUSER	**UACC(***uacc***)**	**C4R.CONNECT.UACC.***uacc.group.userid*

Table 30. Profiles used for RACF attributes and authorizations (continued). The entries in this table reflect the keywords that are specified on the **CONNECT** command.

Command	Keyword	Profile
CONNECT	**SPECIAL**	**C4R.CONNECT.ATTR.SPECIAL.***group.userid*
CONNECT	**OPERATIONS**	**C4R.CONNECT.ATTR.OPERATIONS.***group.userid*
CONNECT	**AUDITOR**	**C4R.CONNECT.ATTR.AUDITOR.***group.userid*
CONNECT	**ADSP**	**C4R.CONNECT.ATTR.ADSP.***group.userid*
CONNECT	**GRPACC**	**C4R.CONNECT.ATTR.GRPACC.***group.userid*
CONNECT	**REVOKE**	**C4R.CONNECT.ATTR.REVOKE.***group.userid*
CONNECT	**RESUME**	**C4R.CONNECT.ATTR.RESUME.***group.userid*
CONNECT	**REVOKE(***date***)**	**C4R.CONNECT.ATTR.REVOKEDT.***group.userid*
CONNECT	**RESUME(***date***)**	**C4R.CONNECT.ATTR.RESUMEDT.***group.userid*

Mandatory and default value policy profiles for CONNECTs

The following five profiles describe the Mandatory and Default Value policy profiles for the OWNER, AUTH, and UACC of a new CONNECT. These profiles are only used for the **CONNECT** command when you create a user to group CONNECT. Use of the **CONNECT** command to change an existing connection is not subjected to these policy profiles.

- **C4R.CONNECT.=OWNER.***group.userid*

  The **APPLDATA** field from the profile is used to specify a value for the connect OWNER of new user to group connections. This profile is only used for the **CONNECT** command, and only for new CONNECTs. If the new CONNECT is created as part of the creation of a new user ID, this profile is not used and RACF uses the owner of the user ID as the OWNER of the CONNECT. The access levels that are used are given as follows.

  The qualifier =OWNER in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  No profile found
  This control is not implemented. No action is performed.

  NONE
  No action. No overriding value for the CONNECT OWNER is provided. The user specified value, or the RACF default value is used.

  READ The APPLDATA value is inserted as the OWNER of the new CONNECT.

  UPDATE
  Same as READ

  CONTROL
  The control is not implemented for the terminal user. The user specified value, or the RACF default value is retained.

  Note: The access levels for this profile are not hierarchical. In general, zSecure Command Verifier policies do not apply to users that have CONTROL access or higher. Alternatively, access NONE indicates that the facility as described by the policy is not available to the terminal user. For the Default Value profiles, this case leads to the odd situation that access NONE has the same net result as access CONTROL.

  The following values re the special values that are recognized for the **APPLDATA** field.

BLANK
This value explicitly indicates that the RACF default behavior is to be accepted. The terminal user is inserted as the owner of the user to group connection.

=GROUP
The group part of the `CONNECT` is to become the owner of the `CONNECT` profile.

=user ID
The user part of the `CONNECT` is to become the owner of the `CONNECT` profile.

value The specified value is inserted. If the specified value is not an existing RACF `userid` or `GROUP`, the current group of the terminal user is used instead.

- **C4R.CONNECT./OWNER.***group.userid*

The **APPLDATA** field from the profile is used to specify a value for the connect `OWNER` of new user to group connections. This profile is only used for the **`CONNECT`** command, and only for new `CONNECT`s. If the new `CONNECT` is created as part of the definition of a new user ID, RACF uses the specified owner of the user ID as the OWNER of the `CONNECT`.

The qualifier `/OWNER` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

No profile found
This control is not implemented. No action is performed.

NONE
No action. No default value for the `CONNECT OWNER` is provided. For new connections, this case results in the use of the RACF default, which is to use the terminal user as the `OWNER` of the new connection.

READ If the terminal user did not specify a value for the `OWNER`, the value of the **APPLDATA** is inserted as the OWNER of the new CONNECT.

UPDATE
If the terminal user did not specify a value for the `OWNER`, the value from the **APPLDATA** field is used instead.

CONTROL
The control is not implemented for the terminal user. If the terminal user does not specify a value, RACF use the terminal user as `OWNER`. No explicit owner is inserted by zSecure Command Verifier.

Note: The access levels for this profile are not hierarchical. In general, zSecure Command Verifier policies do not apply to users that have `CONTROL` access or higher. Alternatively, access `NONE` indicates that the facility as described by the policy is not available to the terminal user. For the Default Value profiles, this case leads to the odd situation that access `NONE` has the same net result as access `CONTROL`.

The following values are special values that are recognized for the **APPLDATA** field.

BLANK
This value explicitly indicates that the RACF default behavior is to be accepted. The terminal user is inserted as the owner of the user to group connection.

=GROUP
: The group part of the CONNECT is to become the owner of the CONNECT profile.

=user ID
: The user part of the CONNECT is to become the owner of the CONNECT profile.

value
: The specified value is inserted. If the specified value is not an existing RACF userid or group, the current group of the terminal user is used instead.

- **C4R.CONNECT.=AUTH.***group.userid*

  This profile is used to specify a mandatory value for the AUTH of new CONNECTs. It is only used for the **ADDUSER** and **CONNECT** command, and only for new CONNECTs. The AUTH value that is used, is obtained from the **APPLDATA** field in the profile. It is used to override any terminal user specified value, or added to the command if the terminal user did not specify a value. The AUTH value that is obtained from this Mandatory Value profile is not subject to more AUTH-related policy profiles.

  The value *userid* represents the affected user. This value allows the specification of exceptions to the general rule. Only the most specific profile is used by zSecure Command Verifier. Generic profiles can be used to specify the AUTH of users within the group.

  The qualifier =AUTH in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  No profile found
  : The control is not implemented. No mandatory value is enforced.

  NONE
  : No action. No mandatory value is enforced.

  READ
  : The **APPLDATA** field is extracted and used for the command. If this process does not yield a valid AUTH level, USE is used instead.

  UPDATE
  : Same as READ.

  CONTROL
  : The control is not active for the terminal user. No mandatory value is supplied. If the terminal user specified a CONNECT AUTH, it is used. If no value was specified, RACF uses the value USE.

  Note: The access levels for this profile are not hierarchical. In general, zSecure Command Verifier policies do not apply to users that have CONTROL access or higher. Alternatively, access NONE indicates that the facility as described by the policy is not available to the terminal user. For the Mandatory Value policy profiles, this case leads to the odd situation that access NONE has the same net result as access CONTROL.

  The values that are accepted for the **APPLDATA** field. The terminal user still needs sufficient authority in the GROUP to assign the specified AUTH level. This authorization is not verified in zSecure Command Verifier. Insufficient authority can result in failure of the command by RACF

  auth
  : Any of the possible connect authorization levels USE, CREATE, CONNECT, JOIN. The value is inserted as the CONNECT authorization for this USER CONNECT.

other This value is considered an error. The RACF default `CONNECT` authorization (`USE`) is used instead.

- **C4R.CONNECT./AUTH.***group.userid*

  This profile is used to specify a default value for the connect `AUTH` in case the terminal user did not specify a connect authorization level on the **ADDUSER** or **CONNECT** command. If the Mandatory Value policy profile is used to provide a value, the `/AUTH` profiles are not used. Also, when you define a new user profile, RACF inserts the value `USE` for the authority in the `DFLTGRP`. As a result, zSecure Command Verifier does not detect the absence of any value in the command as specified by the terminal user. Instead, zSecure Command Verifier processes the command as if the terminal user entered the value `USE`.

  The `AUTH` value that is used as default, is obtained from the **APPLDATA** field in the profile. The `CONNECT` value that is obtained from this Mandatory Value profile is not subject to more `CONNECT`-related policy profiles.

  The qualifier`AUTH` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  No profile found
  The control is not implemented. No default value is supplied.

  NONE
  No default value is supplied. However, RACF also cannot provide a value for the `CONNECT` authorization. The command is failed. Using this access level allows an installation to force the terminal user to explicitly specify a value for the `CONNECT AUTH`.

  READ The **APPLDATA** field is extracted and used for the command.

  UPDATE
  Same as READ.

  CONTROL
  The control is not active for the terminal user. No default value is supplied. RACF uses its default authorization (USE).

  The values that are accepted for the **APPLDATA** field. The terminal user still needs sufficient authority to assign the `CONNECT`authorization. Insufficient authority can result in failure of the command.

  auth Any of the possible connect authorization levels `USE`, `CREATE`, `CONNECT`, `JOIN`. The value is inserted as the `CONNECT` authorization for this USER.

  other This is considered an error. The RACF default `CONNECT` authorization (USE) is used instead.

- **C4R.CONNECT.=UACC.***group.userid*

  This profile is used to specify a mandatory value for the UACC of new `CONNECT`s. The Connect-UACC specifies, for data sets and some other resource classes, the default UACC for new resource profiles. The default value is used by RACF if the terminal user did not specify a value for the UACC of the new resource profile. Because the Connect-UACC setting can lead to confusing behavior of RACF, the preferred setting is NONE.

  zSecure Command Verifier uses the =UACC policy profile to control the Connect-UACC setting. The policy profile is only used for the **ADDUSER** and **CONNECT** command, and only for new `CONNECT`s. The UACC value that is enforced, is obtained from the **APPLDATA** field in the policy profile. It is used to override any terminal user specified value, or added to the command if the terminal user did not specify a value. The UACC value that is obtained from this Mandatory Value profile is not subject to more UACC-related policy profiles.

The values *userid* and *group* represent the affected user and group. This setting allows the specification of exceptions to the general rule. Only the most specific profile is used by zSecure Command Verifier. Generic profiles can be used to specify the UACC of users within the group.

The qualifier =UACC in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

No profile found
The control is not implemented. No mandatory value is enforced.

NONE
No action. No mandatory value is enforced.

READ The **APPLDATA** field is extracted and used for the command. If this process does not yield a valid UACC level, NONE is used instead.

UPDATE
Same as READ.

CONTROL
The control is not active for the terminal user. No mandatory value is supplied. If the terminal user specified a `CONNECT UACC`, it is used. If no value was specified, RACF uses the value NONE.

Note: The access levels for this profile are not hierarchical. In general, zSecure Command Verifier policies do not apply to users that have CONTROL access or higher. Alternatively, access NONE indicates that the facility as described by the policy is not available to the terminal user. For the Mandatory Value policy profiles, this case leads to the odd situation that access NONE has the same net result as access CONTROL.

The values that are accepted for the **APPLDATA** field are given as follows.

uacc Any of the possible UACC levels `NONE`, `READ`, `UPDATE`, `CONTROL`, `ALTER`. The value is inserted as the UACC for this `CONNECT`.

other This value is considered an error. The RACF default UACC (NONE) is used instead.

- **C4R.CONNECT./UACC.***group.userid*

  This profile is used to specify a default value for the UACC in case the terminal user did not specify a UACC value on the **`ADDUSER`** or **`CONNECT`** command. If the preceding Mandatory Value policy profile is used to provide a value, the `/UACC` profile is not used. Also, when you define a new user profile, RACF inserts the value NONE as the UACC for the `DFLTGRP`. As a result, zSecure Command Verifier does not detect the absence of any value in the command as specified by the terminal user. Instead, zSecure Command Verifier processes the command as if the terminal user entered the value NONE.

  The UACC value that is used by default is obtained from the **APPLDATA** field in the profile. The UACC value that is obtained from this Mandatory Value profile is not subject to more UACC-related policy profiles.

  The qualifier `/UACC` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  No profile found
  The control is not implemented. No default value is supplied.

NONE
No default value is supplied. However, RACF also cannot provide a value for the UACC level. The command is failed. Using this access level allows an installation to force the terminal user to explicitly specify a value for the UACC.

READ The **APPLDATA** field is extracted and used for the command.

UPDATE
Same as READ.

CONTROL
The control is not active for the terminal user. No default value is supplied. RACF uses its default authorization (NONE).

The values that are accepted for the **APPLDATA** field are given as follows.

uacc Any of the possible connect authorization levels `NONE`, `READ`, `UPDATE`, `CONTROL`, `ALTER`. The value is inserted as the UACC value for this `CONNECT`.

other This value is considered an error. The RACF default UACC level (NONE) is used instead.

Verification of the CONNECT values specified by the terminal user

The following profiles are used to verify the `CONNECT` authorization and UACC values as specified by the terminal user.

- **C4R.CONNECT.OWNER.***owner.group.userid*

  This profile is used to verify the OWNER value that is specified by the terminal user. The policy can be implemented only for the **`CONNECT`** command. To define a general policy, use profiles with generic patterns for both the *owner* and the *userid* qualifiers. Use more specific (or discrete) profiles to define exceptions for certain user IDs. The value *owner* can be any RACF defined user ID or GROUP.

  This profile is not used if a Mandatory or Default Value policy profile was used to assign a **`CONNECT`** owner.

  No profile found
  The control is not implemented. Any **`CONNECT`** owner that is allowed by RACF can be assigned to this connection.

  NONE
  The command is failed.

  READ Same as NONE.

  UPDATE
  The specified OWNER is accepted for this GROUP and user ID.

  CONTROL
  Same as UPDATE.

- **C4R.CONNECT.AUTH.***auth.group.userid*

  This profile is used to verify the AUTH value that is specified by the terminal user. The policy can be implemented for the **`ADDUSER`**, **`ALTUSER`**, and **`CONNECT`** commands. For most situations, you can use generic profiles for both the *owner* and the *userid*. Explicit profiles can be used to define exceptions for certain user IDs. The value *auth* can be any RACF accepted **`CONNECT`** Authorization that is, `USE`, `CREATE`, `CONNECT`, and `JOIN`.

This profile is not used if a Mandatory or Default Value policy profile was used to assign a `CONNECT` authority. Also, when you define a new user profile or creating a `CONNECT`, the value USE is accepted without verification of these policy profiles.

No profile found
The control is not implemented. Any `CONNECT` authority that is allowed by RACF can be assigned to this connection.

NONE
The command is failed.

READ Same as NONE.

UPDATE
The specified *auth* is accepted for this GROUP and user ID.

CONTROL
Same as UPDATE.

- **C4R.CONNECT.UACC.***uacc.group.userid*

  This profile is used to verify the UACC value that is specified by the terminal user. The policy can be implemented for the **`ADDUSER`**, **`ALTUSER`**, and **`CONNECT`** commands. For most situations, you can use generic profiles for both the *owner* and the *userid*. Explicit profiles can be used to define exceptions for certain user IDs.

  This profile is not used if a Mandatory or Default Value policy profile was used to assign a UACC. Also, when you define a new user profile or creating a CONNECT, the value NONE is accepted without verification of these policy profiles.

No profile found
The control is not implemented. Any UACC value can be assigned to this connection.

NONE
The command is failed.

READ Same as NONE.

UPDATE
The specified *uacc* is accepted for this GROUP and user ID.

CONTROL
Same as UPDATE.

CONNECT attributes and access level descriptions

The following paragraphs describe the access levels that are used to control which attributes can be assigned to user to group CONNECTS.

In general, the access level that is required is `UPDATE` to give the attribute or `READ` to take away the attribute.

- **C4R.CONNECT.ATTR.SPECIAL.***group.userid*
- **C4R.CONNECT.ATTR.OPERATIONS.***group.userid*
- **C4R.CONNECT.ATTR.AUDITOR.***group.userid*
- **C4R.CONNECT.ATTR.ADSP.***group.userid*
- **C4R.CONNECT.ATTR.GRPACC.***group.userid*

No profile found
This control is not implemented. No action is performed.

NONE
: The terminal user is not authorized to specify either keyword on the `CONNECT` command.

READ
: The terminal user is authorized to explicitly specify the no-attribute keyword on the `CONNECT` command. This setting allows removal of these attributes.

UPDATE
: The terminal user is authorized to specify both keywords on the `CONNECT` command. This setting allows regular maintenance of these attributes.

CONTROL
: Same as UPDATE.

In all the preceding situations, the terminal user needs sufficient RACF authorization to specify the keyword. For instance, for most keywords, the terminal user must have the group-SPECIAL attribute in the group.

- **C4R.CONNECT.ATTR.REVOKE.***group.userid*

  This policy profile applies only to the `REVOKE` attribute without a future `REVOKE` date. Management of revoke dates is controlled by the `REVOKEDT` policy profile that is described as follows.

  No profile found
  : This control is not implemented. No action is performed.

  NONE
  : The terminal user is not authorized to revoke the user `CONNECT`. This setting applies to the REVOKE keyword without any specification of a future `REVOKE` date.

  READ
  : The terminal user is authorized to REVOKE a user `CONNECT`. This setting applies to the REVOKE keyword without specification of a future `REVOKE` date.

  UPDATE
  : Same as READ.

  CONTROL
  : The control is not implemented for the terminal user. The terminal user is authorized to revoke a `userid`.

- **C4R.CONNECT.ATTR.RESUME.***group.userid*

  This policy profile applies only to the `RESUME` attribute without a future`REVOKE` date. Management of resume dates is controlled by the `RESUMEDT` policy profile that is described as follows.

  No profile found
  : This control is not implemented. No action is performed.

  NONE
  : The terminal user is not authorized to resume the user `CONNECT`. This setting applies to the RESUME keyword without specification of a future RESUME date.

  READ
  : Same as NONE.

  UPDATE
  : The terminal user is authorized to RESUME a user `CONNECT`. This setting applies only to an immediate RESUME without a future RESUME date.

CONTROL
: The control is not implemented for the terminal user. The terminal user is authorized to resume the user `CONNECT`.

- **C4R.CONNECT.ATTR.REVOKEDT.***group.userid*

  No profile found
  : This control is not implemented. No action is performed.

  NONE
  : The terminal user is not authorized to manage to revoke dates for CONNECTS between the *user* and the *group*. This setting applies to both `REVOKE(`*date*`)` and the `NOREVOKE` option.

  READ
  : Same as NONE

  UPDATE
  : The terminal user is allowed to manage to revoke dates by `REVOKE(`*date*`)` or `NOREVOKE`.

  CONTROL
  : The control is not implemented for the terminal user. The terminal user is authorized to manage the revoke dates for the `CONNECT` from the *userid* to *group*.

- **C4R.CONNECT.ATTR.RESUMEDT.***group.userid*

  No profile found
  : This control is not implemented. No action is performed.

  NONE
  : The terminal user is not authorized to manage to resume dates for `CONNECTS` between the *user* and the *group*. This setting applies to both `RESUME(`*date*`)` and the `NORESUME` option.

  READ
  : Same as NONE

  UPDATE
  : The terminal user is allowed to manage to resume dates by `RESUME(`*date*`)` or `NORESUME`.

  CONTROL
  : The control is not implemented for the terminal user. The terminal user is authorized to manage the resume dates for the `CONNECT` from the *userid* to *group*.

Data sets and general resource-related profiles

zSecure Command Verifier provides several policies for data set and General Resources data sets. General resource profiles are handled by RACF through two distinct sets of commands. In zSecure Command Verifier, the term resource profiles are used to refer to both types. Also, for all the zSecure Command Verifier policy profiles no real distinction is made between the different types of resource profiles. However, some policies do not make any sense for a particular resource class. For instance, the timezone setting does not apply to data sets. The description of the policies ignores such specifics and concentrates on the general rule.

The following sections contain the various zSecure Command Verifier policy profiles that can be used for resource profiles. Policies regarding the authorization to create new resource profiles are described in "User authorization to create resource profiles" on page 157. These policies also describe the authorization to add or delete members to Grouping Resource Class Profiles. An ADDMEM for a GCICSTRN is treated identical to an RDEFINE for the corresponding TCICSTRN. One special policy is implemented for data sets only. It describes the authorization to maintain data set profiles that have as HLQ the terminal user. See a full description in section "Policy profiles for managing your own data set profiles" on page 149.

In sections where Policy profiles for DATASET profiles are used, the target profile is often represented by HLQ and rest-of-profile:

- The HLQ represents the High-Level Qualifier of the actual DATASET profile that is used in the RACF commands. It is the first qualifier that is specified in a quoted data set name in the RACF command. The HLQ used in the policy profiles does not reflect possible changes from the naming convention table. This HLQ must be an existing userid or group.
- The value for rest-of-profile reflects all the qualifiers after the HLQ. For most TSO users, this part is the part of the DATASET profile name that can be used as the non-quoted data set name.

Splitting the profile into two parts highlights the fact that most installations use generics to represent the rest-of-profile part. In some policy profiles, the HLQ might be reflected by the special qualifier =RACUID. The term HLQ can also be present in the **APPLDATA** specifications of certain policy profiles. In those situations, it also represents the first qualifier of the actual DATASET profile as defined in the RACF database.

The next important issue for resource profiles is the access. Access through UACC and the Access Lists is described in the section "Controlling access by using the UACC and access list" on page 168.

Other items, like the owner of resource profiles, further identification of the resource profile (Volume, Unit, Profile type, RACF indicator) attributes, and auditing are shown in the following sections.

Generic and special characters in policy profiles

Most of the policy profiles contain as part of their name the resource class and the resource profile to which the policy applies. It is possible to use generic patterns for the resource profile part. However, sometimes it is necessary to define a policy that applies to a generic resource profile such as the profile ** in the FACILITY class. Defining a specific policy profile for this resource profile is rather difficult. To be able to protect generic profiles efficiently, zSecure Command Verifier modifies the resource profile part in the policy profiles. All generic characters are replaced by plus (+) signs. This way, an installation can define a specific policy profile to implement a policy for a specific generic resource profile. Using this translation, the authorization to define above FACILITY profile is described by:

```
C4R.FACILITY.ID.++
```

This profile describes the authorization to create the profile ** (and also profiles %% and %*) in the FACILITY class. The policy profile can also be specified as:

```
C4R.FACILITY.ID.**
```

However, this second profile would control the authorization to create any profile in the facility class. A generic profile that ends in %% C4R.FACILITY.ID.%% controls all two character profiles in the FACILITY class.

The translation process also affects some special characters. The single quotation mark is also translated into a plus sign, and the forward slash is translated into a period. The translation of special characters is done to allow effective handling of members in the GLOBAL resource class.

Profiles with lowercase names

zSecure Command Verifier policies apply to all target classes and profiles for which a matching policy profile is defined. Often, the section of the policy profile that contains the resource class and the resource profile is represented by generic patterns. Exceptions can be implemented by specifying part of the resource profile by discrete characters. However, you cannot define an exception exclusively for a specific mixed case profile in a class that allows such mixed case profiles. Instead, the resulting uppercase policy profile applies to uppercase, lowercase, and mixed case resource profiles.

The zSecure Command Verifier policy profiles are defined in a class that does not support lowercase characters. If you try to define a policy profile for a lowercase resource profile, the RACF command processors immediately translate the policy profile to uppercase. zSecure Command Verifier follows this behavior, translating the resource profile to uppercase before it locates the matching policy profile. The following example describes this implementation:

```
Resource profile     EJBROLE         Test.Role-       EJBROLE         TEST.ROLE
                     EJBROLE         test.role

Policy profile       C4R.EJBROLE.ID.TEST.ROLE

Command              rdefine xfacilit c4r.ejbrole.id.test.role
```

In this example, the three different EJBROLE profiles are all controlled by the same zSecure Command Verifier policy profile. The case of the command that is used to create the policy profile is irrelevant for the resulting policy profile.

General policy profiles to add functionality

zSecure Command Verifier currently provides two general policies you can use to add functionality. The first policy automatically inserts the GENERIC keyword in an ambiguous **LISTDSD** command if no matching discrete profile exists. That way, the terminal user does not need to know whether a discrete profile or a generic profile exists when you use the **LISTDSD** command. You can use the second policy when you create new data set or general resource profiles. This policy automatically inserts the FROM keyword to model the new profile on the currently best-fitting profile. It ensures that the OWNER, auditing options, the UACC, and the ACL are copied from an existing profile. The following table lists the commands, keywords, and profile names available to add functionality.

Table 31. Profiles used for added functionality

Command	Keyword	Profile
LISTDSD	*hlq.rest-of-profile*	**C4R.LISTDSD.TYPE.AUTO.***hlq.rest-of-profile*
ADDSD RDEFINE	*hlq.rest-of-profile*	**C4R.***class***.=FROM.***hlq.rest-of-profile*
ADDSD RDEFINE	*hlq.rest-of-profile*	**C4R.***class***./FROM.***hlq.rest-of-profile*
ADDSD RDEFINE	*hlq.rest-of-profile*	**C4R.***class***.FROM.***hlq.rest-of-profile*

Automatic search for the best-fitting generic profile

For historical reasons, data set profiles are treated separately from other resources in RACF. For example, if you request a display of a data set profile, RACF assumes that the profile is a discrete profile (unless it has generic characters). If the discrete profile does not exist, RACF outputs the following message:

```
ICH35003I NO RACF DESCRIPTION FOUND FOR dataset_name
```

Quite often, the next command that is issued is the same **LISTDSD** command, but now including the GEN keyword. It can be used to display the best fitting generic profile.

Similarly, for general resource profiles, the **RLIST** command displays a discrete profile if it exists. But, in contrast to the **LISTDSD** command, **RLIST** automatically displays the best fitting generic profile if a discrete profile cannot be found. As a RACF usability feature, zSecure Command Verifier also provides this automatic search for the best fitting generic profile for data set profiles.

- **C4R.LISTDSD.TYPE.AUTO.***hlq.rest-of-profile*

  If this profile exists, zSecure Command Verifier tests for the existence of a requested profile. If the requested profile does not exist, zSecure Command Verifier inserts the GEN keyword in the **LISTDSD** command, resulting in a search for the best fitting profile. The access level controls the function is active for the terminal user. Some considerations are listed for certain combinations of commands and non-existing profiles. In most installations, the *profile* is represented by a generic pattern like `.**` The following access levels are supported.

  No Profile Found
  This function is not implemented.

  NONE
  The function is not activated for the terminal user.

  READ If a discrete profile cannot be located, the best fitting generic profile is shown instead.

  UPDATE
  Same as READ

  CONTROL
  Same as READ

Notes:

1. If the specified profile contains generic characters, this particular zSecure Command Verifier processing is bypassed. It is assumed that the user wants the specified profile to be displayed, instead of the next best generic profile. If the profile does not exist, RACF provides the appropriate error message.
2. If the terminal user requested a discrete profile for a specific volume, and no discrete profile exists, the best fitting generic is shown.
3. If the terminal user requested a discrete profile for a specific volume, and a discrete profile is defined for a different volume, RACF provides an error message, informing the terminal user that a discrete profile for the volume cannot be located.
4. In situations where the automatic search for the best fitting generic is undesirable, you can disable the automatic search function on a per command basis by including the NOGENERIC keyword on the **LISTDSD** command.
5. The presence of a discrete profile does not imply that it is used to protect a particular data set. Protection is also dependent on the correct volser, and the setting of the RACF indicated bit in the VTOC (or ICF catalog).

Profile modeling based on the best-fitting generic

Frequently, a RACF administrator is asked to define a new profile to control access to a specific resource. In most situations, access to the resource is already controlled by some profile. For example, in a PROTECTALL environment all data set profiles must be controlled by a profile. When RACF defines a new data set profile or general resource profile, it creates a profile with a UACC(NONE), and an empty access list by default. Exceptions to this general rule can occur when the NOADDCREATOR option is not set, when the terminal user has a UACC setting other than NONE, or when the terminal user has the GRPACC attribute. For data sets, an installation can have well-defined MODEL profiles with corresponding User and Group profiles such that the MODEL profile is used. However, use of MODEL profiles requires maintenance of the model profile to adequately describe the current access. It also does not apply to general resource profiles.

To allow greater flexibility in the creation of new profiles, RACF provides the FROM keyword on **ADDSD**, **RDEFINE**, and **PERMIT** commands. However, effective use of this function still requires some effort by the RACF administrator. In many situations, a sequence of several commands is still required to create the profile. When the administrator defines a new user profile or a more specific profile, the administrator does not want to lock out current users because locking-out users can seriously impact the production environment. In the example below, the first command is used to find the profile that currently controls access to the data set. In the example, the data set was controlled by the profile PAYROLL.EMPLOYEE.**. In the second command that profile is used as a model for the new profile. Finally, in the third command the user ID or GROUP that needed access to the Q4 files is granted access.

```
LISTDSD DA('PAYROLL.EMPLOYEE.Q4.Y2003') GEN
ADDSD 'PAYROLL.EMPLOYEE.Q4.**' FROM('PAYROLL.EMPLOYEE.**')
PERMIT 'PAYROLL.EMPLOYEE.Q4.**' ID(PAYTMP) AC(UPDATE)
```

zSecure Command Verifier provides a function to automatically insert the FROM keyword that is based on the current resource profile. For example, when this function is enabled for the entire DATASET class, the administrator can issue the following two commands without having to check the current access list or UACC for the resource.

```
ADDSD 'PAYROLL.EMPLOYEE.Q4.**'
PERMIT 'PAYROLL.EMPLOYEE.Q4.**' ID(PAYTMP) AC(UPDATE)
```

You can activate the automatic model function per resource class or per resource profile. Most installation sites use only the *class* or the HLQ of the profile, and probably use generics for the remaining resource profile section of the policy profile.

- **C4R.***class***.=FROM.***hlq.rest-of-profile*

  If this policy profile exists, and the terminal user has appropriate access, zSecure Command Verifier retrieves the APPLDATA of the profile to locate the resource profile to be used in the **RDEFINE** or **ADDSD** command. The *hlq.rest-of-profile* describes the new profile to be defined. Because this profile is a Mandatory Value policy profile, it overwrites any value that the terminal user specified for the FROM keyword. The value found from the **APPLDATA** field is used instead.

  The qualifier =FROM in the policy profile cannot be covered by generic characters. It must be present in the exact form shown. The following access levels are supported for the policy profile.

  No Profile Found
  This function is not implemented.

NONE
: The function is not activated for the terminal user. No Mandatory `FROM` model profile is inserted in the RACF command as entered by the terminal user.

READ The `APPLDATA` of the policy profile is retrieved and used to determine the profile to be used as the model.

UPDATE
: Same as READ

CONTROL
: The control is not active for the terminal user. No `FROM` model profile is inserted in the RACF command as entered by the terminal user.

If the terminal user has READ or UPDATE access to the Mandatory Value policy profile, zSecure Command Verifier retrieves and uses the `APPLDATA` of the policy profile. The `APPLDATA`values currently supported are shown in a subsequent section.

- **C4R.***class***./FROM.***hlq.rest-of-profile*

  If this policy profile exists, and the terminal user has appropriate access, zSecure Command Verifier retrieves the `APPLDATA` of the profile to locate the resource profile to be used in the **`RDEFINE`** or **`ADDSD`** command. The *hlq.rest-of-profile* describes the new profile that is to be defined.

  The qualifier `/FROM` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown. The following access levels are supported.

  No Profile Found
  : This function is not implemented.

  NONE
  : The function is not activated for the terminal user. No Default FROM model profile is inserted in the command.

  READ The `APPLDATA` of the policy profile is retrieved, and used to determine the profile to be used as model.

  UPDATE
  : Same as READ

  CONTROL
  : The control is not active for the terminal user. No FROM model profile is inserted in the RACF command as entered by the terminal user.

  If the terminal user has READ or UPDATE access to the Default Value policy profile, zSecure Command Verifier retrieves and uses the `APPLDATA` of the policy profile. The `APPLDATA` values currently supported are shown in a subsequent section.

- **C4R.***class***.FROM.***hlq.rest-of-profile*

  This policy profile controls if the terminal user is authorized to use the FROM keyword when it adds new data sets or general resource profiles. This profile is not used if one of the preceding Mandatory or Default Value policy profiles is used. The *hlq.rest-of-profile* describes the new profile that is to be defined. This policy profile does not contain the name of the model profile that is used in the command. The following access levels are supported.

  No Profile Found
  : This function is not implemented.

NONE
The FROM keyword is not allowed.

READ Same as NONE

UPDATE
The specified FROM keyword is allowed.

CONTROL
The control is not active for the terminal user.

If the terminal user has READ or UPDATE access to the Mandatory or Default Value policy profile, zSecure Command Verifier retrieves the `APPLDATA` of the policy profile. The **APPLDATA** field of the **C4R.***class***.FROM.***hlq.rest-of-profile* is not used.

The **APPLDATA** field can have the following value types:

BLANK
This type is used to indicate that no explicit FROM profile must be inserted. For the Mandatory Value policy profile, it means that a possibly specified FROM value in the command as entered by the terminal user is removed. Subsequent RACF default processing can result in using a USER or GROUP-specific MODEL profile (if defined and modeling is enabled).

=BESTFIT
This value specifies that zSecure Command Verifier is to locate the current best fitting profile and use the profile that is found as the value for the FROM profile. The profile is in the same resource class as the new resource profile. If no profile can be found, processing is as if `APPLDATA` had the value `BLANK`.

profile Any other value is considered to be the resource profile that must be used as model. If this resource profile does not exist, the entire command eventually fails resulting in the RACF message `ICH09036I`.

RACF profile management

zSecure Command Verifier currently provides the policies that are listed in Table 32 for RACF profile management. These polices can be used for controlling the following authorities:

- Authority to manage your own data sets
- Authority to authorize yourself (by `USERID`, or `GROUP`)
- Authority to create more specific profile (undercut)
- Authority to manage system resources (identified by LEVEL)
- Authority to grant UPDATE access to resources (identified by LEVEL)

Detailed profile descriptions are provided in the sections that follow the table.

Table 32. General Profiles used for profile management

Command	Keyword	Profile
ADDSD DELDSD ALTDSD PERMIT	*profile*	**C4R.DATASET.ID.=RACUID.***rest-of-profile*
PERMIT	*userid*	**C4R.***class.***ACL.=RACUID.***access.profile*
PERMIT	*group*	**C4R.***class.***ACL.=RACGPID.***access.profile*
CONNECT	*userid*	**C4R.CONNECT.ID.***group.***=RACUID**
REMOVE	*userid*	**C4R.REMOVE.ID.***group.***=RACUID**
ADDSD RDEFINE	*profile*	**C4R.***class***.=UNDERCUT.***current-profile*

Table 32. General Profiles used for profile management (continued)

Command	Keyword	Profile
ADDSD DELDSD ALTDSD PERMIT	*profile*	**C4R.DATASET.=NOCHANGE.***dsname*
RDEF RDEL RALT PERMIT	*profile*	**C4R.***class.***=NOCHANGE.***profile*
ADDSD DELDSD ALTDSD PERMIT	*profile*	**C4R.DATASET.=NOUPDATE.***dsname*
RDEF RDEL RALT PERMIT	*profile*	**C4R.***class.***=NOUPDATE.***profile*

Policy profiles for managing your own data set profiles

The function to control authority to manage your own data set profiles is also known as the *No-Store* function. The name is derived from a control available in ACF2 systems. In standard RACF, every user can add, delete, and modify data set profiles for which the HLQ is the same as the user ID. RACF does not provide an easy method to change this behavior. The main method is to create a naming convention table, such that the HLQ is no longer the same as the user ID. It has the obvious disadvantages that are associated with any usage of the naming convention table. An alternative would be to write several installation exits. zSecure Command Verifier externalizes this functionality for the RACF commands. The following table describes the command, keyword, and profile to manage your own data set profiles. The section that follows the table provides a detailed description of the profile.

Table 33. Profiles used for verification of RACF Resources. The entries in this table reflect the keywords that describe the name of new resources.

Command	Keyword	Profile
ADDSD DELDSD ALTDSD PERMIT	*profile*	**C4R.DATASET.ID.=RACUID.***rest-of-profile*

A possible unexpected result from the use of the No-Store function is that decentralized system administrators can be authorized to create and maintain all data set profiles for all users in their department, except their own.

- **C4R.DATASET.ID.=RACUID.***rest-of-profile*

  If the HLQ of the data set profile matches the user ID of the terminal user, this profile is used in preference to the policy profile described in "Policy profiles for creating RACF resource profiles" on page 159. The value for *rest-of-profile* reflects all the qualifiers after the HLQ. For most TSO users, the part of the data set name can be used as the non-quoted data set name. For most situations, use generic characters, like ".**", to represent the *rest-of-profile*.

  The qualifier `=RACUID` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  The following list contains the available access levels.

  No Profile Found
  This control is not implemented. The data set profile can be created.

  NONE
  The user is not authorized to define the new data set profile.

  READ Same as NONE

UPDATE
: The terminal user can create the data set profile.

CONTROL
: Same as UPDATE

Policy profile selection for self-authorization

This function is required by many organizations who want to enforce a strict separation of responsibilities between the security administrator and the data (or application) administrator. System security policies often specify that security administrators must not have access to application resources. In standard RACF, users with System or Group-SPECIAL can change any profiles under their control. Even if a security administrator currently does not have access to application resources, it is easy for an administrator to obtain access. Some organizations analyze SMF data to report on those administrators that give themselves access to application data or resources. In zSecure Command Verifier, several policies are available to prevent security administrators from modifying the ACL of resource profiles such that they can gain access to resources.

The following table describes the command, keyword, and profile to control self-authorization. Detailed descriptions of the profiles are provided in the sections that follow the table.

Table 34. Profiles used to control self-authorization. The entries in this table reflect the keywords that describe the ACL entries or CONNECTs.

Command	Keyword	Profile
PERMIT	*userid*	**C4R.***class.***ACL.=RACUID.***access.profile*
PERMIT	*group*	**C4R.***class.***ACL.=RACGPID.***access.profile*
CONNECT	*userid*	**C4R.CONNECT.ID.***group.***=RACUID**
REMOVE	*userid*	**C4R.REMOVE.ID.***group.***=RACUID**

These profiles are only applicable if the *userid* is the terminal user or if the *group* is any of the connect groups of the user. If this situation applies, zSecure Command Verifier uses the preceding profiles in preference to the ACL modification profiles described in section "Controlling access by using the UACC and access list" on page 168. A detailed description of the first two profiles and the supported access levels is given as follows. For more information about the profiles for CONNECT and REMOVE, see section "Authority to connect yourself" on page 128.

- **C4R.***class.***ACL.=RACUID.***access.profile*

  This profile is used to specify the authority of the terminal user to issue a PERMIT command that changes the access level of him/herself. It also applies to the **`DELETE`** option of the **`PERMIT`** command. If you implement this profile, make sure to set the `SETROPTS NOADDCREATOR` option. Otherwise, a RACF administrator can automatically be added to the access list of resource profiles, without any possibility for the administrator to remove this questionable access level.

  The qualifier =RACUID in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  No profile found
  : The control is not implemented. Any terminal users can add, change, and remove themselves from any access list within their scope.

  NONE
  : The terminal users are not allowed to add, change, or remove themselves from access lists within their scope.

READ Same as NONE

UPDATE
The terminal users are allowed to add, change, or remove herself from access lists within their scope.

CONTROL
Same as UPDATE

- **C4R.***class.***ACL.=RACGPID.***access.profile*

  This profile is used to specify the authority of the terminal user to issue a `PERMIT` command that changes the access level of any of the GROUPs the terminal user is connected to. It also applies to the `DELETE` option of the `PERMIT` command. Ensure that if you implement this option, the `GRPACC` attribute is not specified for the terminal user or for any of the GROUP CONNECTs. Otherwise, the current GROUP of the RACF administrator can automatically be added to the access list of data set profiles, without any possibility for the administrator to remove this questionable access level.

  The qualifier `=RACGPID` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  No profile found
  The control is not implemented. Any terminal users can add, change, and remove any of their connect GROUPs to any access list within their scope.

  NONE
  The terminal users are not allowed to add, change, or remove any of their connect GROUPs to any access lists within their scope.

  READ Same as NONE

  UPDATE
  The terminal users are allowed to add, change, or remove any of their connect GROUPs to access lists within their scope.

  CONTROL
  Same as UPDATE

User authorization to create more specific profiles

As described in section “User authorization to create resource profiles” on page 157, RACF uses multiple methods to control the creation (definition) of profiles. For data set profiles, only the HLQ is used to determine the authorization. Existing generic profiles are not used in this authorization process. This case generally results in the possibility for group administrators, or users with CREATE authority in a GROUP, to define more specific generic profiles, or even discrete profiles that undermine existing access controls. The more specific profile is used by RACF, and the previously best fitting profile (including its UACC and ACL) is no longer used for some resources.

For general resources, RACF uses CLAUTH in combination with `GENERICOWNER` to control which users can define new profiles.

zSecure Command Verifier provides a generic facility that can be used to prevent creation of more specific profiles. Since the process of creating more specific profiles is sometimes referred to as *undercutting* the existing profile, the profiles are referred to as *undercut-profiles* in the remainder of this document.

Note: zSecure Command Verifier currently does not provide a similar function that prevents the use of ADDMEM to undercut existing members in existing grouping profiles.

The following table shows the controls that are provided by zSecure Command Verifier to prevent creation of more specific profiles. Depending on the status (RACLISTed or not) of the resource class, the use of `RDEFINE` might be restricted.

Table 35. Profiles used for verification of RACF Resources. The entries in this table reflect the keywords that describe the name of new resources.

Command	Keyword	Profile
ADDSD RDEFINE	*profile*	**C4R.***class***.=UNDERCUT.***current-profile*

The authority to create a profile is controlled by a policy profile that contains the current best fitting profile. When the current best fitting profile contains generic characters, plus signs (+) are used to represent these generic characters in the zSecure Command Verifier policy profiles. Translation of generic characters in policy profiles is described in "Generic and special characters in policy profiles" on page 143. For instance, when the following data set profiles exist,

```
ABC.**
ABC.TEST*.**
```

the definition of data set profile:

```
ABC.TEST1.PROF*
```

is controlled by the definition:

```
C4R.DATASET.=UNDERCUT.ABC.TEST+.++
```

which can be covered by the following zSecure Command Verifier policy profile:

```
C4R.DATASET.=UNDERCUT.**
```

The following section describes the policy profiles for undercutting RACF resource profiles and the corresponding access levels. These profiles are used in addition to the standard RACF profile create authority to other zSecure Command Verifier policy profiles and to policies defined as described in "User authorization to create resource profiles" on page 157.

- **C4R.***class***.=UNDERCUT.***current-profile*

  This profile describes the authorization to create resource profiles that would undercut the *current-profile*. The *current profile* is the profile that is used by RACF to protect the resources that would be covered by the new profile. Phrased differently, the *current-profile* is the existing profile that is being undercut, and not the new profile that is undercutting.

  The qualifier `=UNDERCUT` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  The following access levels are available.

  No Profile Found
  This control is not implemented.

  NONE
  The user is not authorized to define the new profile.

  READ Same as NONE

UPDATE
The terminal user can create the profile, provided the terminal user has otherwise sufficient RACF authorization.

CONTROL
Same as UPDATE

User authorization to manage locked resource profiles

This function is also known as the *No-Change* function. The name indicates that this control can be used to prevent changes to certain profiles. The most common use of this feature is to prevent users from updating profiles that protect system resources such as APF-authorized data sets. Since it is difficult to recognize all possible resources automatically for every RACF command, zSecure Command Verifier implements an indirect approach to the problem. A special =NOCHANGE policy profile is used to define a characteristic of the target profile. If the target profile has this characteristic, then more access to the policy profile is required to modify the target profile as illustrated in the following scenario.

Assuming that you want to implement this additional control for the data set SYS1.LINKLIB, define the following policy profile:

```
C4R.DATASET.=NOCHANGE.SYS1.** APPLDATA('LEVEL=99')
```

This policy profile indicates that all SYS1 data sets that have a LEVEL specification of 99 need this additional control. To activate this control for SYS1.LINKLIB, specify the value 99 for the LEVEL of the data set profile. Assuming that the data set is covered by the profile SYS1.LINK*, use the following command:

```
ALTDSD 'SYS1.LINK*' LEVEL(99)
```

By using SYS1.** in the =NOCHANGE profile, one policy profile is sufficient to indicate that all SYS1 data sets with a particular level are controlled. At the same time, you can implicitly specify that all non-SYS1 data sets are not controlled. If you wanted all data sets to be controlled by this No-Change function, you can also use the following policy profile instead:

```
C4R.DATASET.=NOCHANGE.** APPLDATA('LEVEL=99')
```

For most commands, the characteristic that is used to determine whether a resource profile is controlled is obtained from the profile that is specified in the RACF command. However, you cannot obtain that characteristic from the **ADDSD** and **RDEFINE** commands. For these two commands, the characteristic is obtained from the currently best fitting profile.

In effect, it enforces undercut control as described in section “User authorization to create more specific profiles” on page 151. Adding a better fitting profile that would undermine the No-Change policy is not allowed. Similarly, removing a profile that currently enforces the No-Change policy is also not allowed. Although it can b e viewed as a mixing of control policies, it does allow the use of one profile to effectively indicate that a particular block of resources is off-limits. In the example above, the use of the next-best profile prevents the creation of a profile like SYS1.LINKLIB with a LEVEL(00) as shown in the following example:

```
ADDSD 'SYS1.LINKLIB' GENERIC LEVEL(00)
```

Specifying the LEVEL(00) effectively takes the resource profile out of the =NOCHANGE policy. This step must not be allowed. Use of the best fitting profile for the =NOCHANGE policy enforces this rule. Similarly, the command

```
DELDSD 'SYS1.LINK*' GENERIC
```

is not allowed because it would also remove the current No-Change policy from all data sets covered by that profile. Most likely the next-best fitting profile (`SYS1.**`) does not have the `LEVEL(99)` specification, and thus the `=NOCHANGE` policy would be disabled for these data sets. This is not allowed.

The access to the policy profile determines whether the profile modification is allowed or not.

The following table is split into two rows, one for data sets `dsname` and the other for general resources (profiles). The remainder of this topic does not discuss data sets separately, but treats them as a special case where *class* has the value DATASET.

Table 36. Profiles used for verification of RACF Resources. The entries in this table reflect the keywords that describe the name of new resources.

Command	Keyword	Profile
ADDSD DELDSD ALTDSD PERMIT	*profile*	**C4R.DATASET.=NOCHANGE.***dsname*
RDEF RDEL RALT PERMIT	*profile*	**C4R.***class***.=NOCHANGE.***profile*

The following access levels and values for the **APPLDATA** are currently available.

- **C4R.***class***.=NOCHANGE.***profile*

  The **APPLDATA** of the policy profile is used to indicate which characteristic of the target profile to use to identify the profiles that cannot be modified without more authorization. The value of *profile* reflects the data set name or the general resource profile. For most situations, the *profile* is represented by using generic characters, like `".**".`

  The qualifier `=NOCHANGE` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  Only one type of characteristic is implemented. The possible value for **APPLDATA** is given as follows:

  LEVEL= *nn*
  : The LEVEL of the profile is used to indicate whether more controls on modification of the profile are required. If the target has *nn* specified for the LEVEL, at least UPDATE access to the policy profile is required to allow modification of the target profile.

  The following access levels are available.

  No Profile Found
  : This control is not implemented. Modification of the target profile is not prevented.

  NONE
  : If the target profile fits the requirement that is specified by the **APPLDATA**, the terminal user is not authorized to modify the target profile.

  READ Same as NONE

  UPDATE
  : The terminal user can modify the target profile, provided it is within the regular RACF authorization of the terminal user.

CONTROL
Same as UPDATE

Policy profile selection to control UPDATE access

This function is also known as the *No-Update* function. The name indicates that this control can be used to prevent granting UPDATE access to certain profiles. The resources that are covered by this policy can be identified by a combination of the LEVEL of the resource profile and the name of the resource. The main difference to the regular ACCESS control mechanisms, is that the resources can be selected by the LEVEL of the profile. Using this selection method, a single policy profile can be used to apply this rule to as a separate set of resources.

The process is probably best illustrated by using an example. Assuming that you want to implement this additional control for the following data sets:

```
ACCPAY.JCLLIB
ACCPAY.PARMLIB
```

You can define the following policy profiles:

```
C4R.DATASET.=NOUPDATE.ACCPAY.**        APPLDATA('LEVEL=98')
```

This policy profile indicates that all ACCPAY data sets that have a LEVEL specification of '98' need this additional control. To effectuate this control for the two ACCPAY data sets, you must specify the value '98' for the LEVEL of the data set profiles. Assuming the data sets are covered by fully qualified generics. You can use the following two commands. All other data sets with ACCPAY can be defined by discrete or generic profiles. Also, the two data set profiles cannot be easily covered by one generic profile.

```
ALTDSD 'ACCPAY.JCLLIB'  GEN LEVEL(98)
ALTDSD 'ACCPAY.PARMLIB' GEN LEVEL(98)
```

By using ACCPAY.** in the =NOUPDATE profile, you can use one policy profile to apply to multiple resources. If more resources also must be protected against UPDATE access, you add a matching generic (or discrete) profile that specifies the correct LEVEL value. There is no must modify the existing policy profiles. The policy profiles must be extended only if other High-Level Qualifiers (HLQ) are involved. To reduce complexity and avoid possible confusion, ensure that all =NOUPDATE policy profiles specify the same value for the applicable LEVEL by the **APPLDATA**.

For most commands, the LEVEL is obtained from the profile that is specified in the RACF command. However, it is not possible for the **ADDSD** and **RDEFINE** commands. For these two commands, the LEVEL is obtained from the currently best fitting profile. In effect, it enforces undercut control as described in “Policy profile selection to control UPDATE access.” Although this task can be viewed as a mixing of control policies, it does allow the use of one profile to effectively indicate that a particular block of resources is off-limits. In the example before, it prevents the creation of a discrete profile for such as ACCPAY.JCLLIB with a LEVEL(00) by

```
ADDSD 'ACCPAY.JCLLIB' LEVEL(00)
```

Specifying the LEVEL(00) effectively take the resource profile out of the =NOUPDATE policy. This case is explicitly prevented by zSecure Command Verifier

To achieve complete, consistent control of all selected data sets against UPDATE access, you also must control management of the LEVEL value of all involved data sets. See the description of the **C4R.**_class._**LEVEL.**_level.profile_ on page “Other policy profiles and access level descriptions” on page 181 for details on the applicable policy profiles.

The access to the policy profile determines whether granting UPDATE access is allowed.

Table 37. Profiles used for NOUPDATE control. The entries in this table reflect the keywords that describe the affected profiles.

Command	Keyword	Profile
ADDSD DELDSD ALTDSD PERMIT	*profile*	**C4R.DATASET.=NOUPDATE.**_dsname_
RDEF RDEL RALT PERMIT	*profile*	**C4R.**_class._**=NOUPDATE.**_profile_

This table is split into two rows for data sets and general resources. Data sets are not provided separately, but treats them as a special case where *class* has the value `DATASET`. The following access levels and values for the **APPLDATA** are currently available.

- **C4R.**_class._**=NOUPDATE.**_profile_

  The **APPLDATA** of the policy profile is used to specify the LEVEL of the target profile that must be used as identification of the resource profiles that must be protected against UPDATE access. The value of *profile* reflects the data set name or the general resource profile. For most situations, use generic characters, like `".**"`, to represent the profile.

  The qualifier `=NOUPDATE` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  At the moment, only one type of characteristic is implemented. The possible value for **APPLDATA** is given as follows:

  LEVEL= *nn*
  The LEVEL of the target resource profile is used to indicate whether more controls on modification of the target resource profile are required. If the target has *nn* specified for the LEVEL, at least UPDATE access to the policy profile is required to allow granting UPDATE access to the target profile.

  The following access levels are available.

  No Profile Found
  This control is not implemented. Granting UPDATE access to the target profile is not prevented.

  NONE
  If the target profile matches the LEVEL as specified by the **APPLDATA** , the terminal user is not authorized to grant UPDATE access to the target profile.

  READ Same as NONE

  UPDATE
  The terminal user can grant UPDATE access to the target profile, provided it is within the regular RACF authorization of the terminal user.

  CONTROL
  Same as UPDATE

User authorization to create resource profiles

RACF recognizes several methods for authorizing users to create new resource profiles. For data sets, RACF uses the HLQ as the main criterion. Creation of a data set profile is allowed if any of the following conditions are true:

- The HLQ is the same as the user ID.
- The HLQ is a GROUP in which the terminal user has CREATE authority.
- The HLQ is a user ID or GROUP that is within the scope of Group-SPECIAL.
- The HLQ is a GROUP that is within the scope of Group-OPERATIONS.

For general resources, RACF uses `CLAUTH` in the resource class as the main criterion. For regular general resource classes, the authority to create new resource profiles can be further restricted by the `SETROPTS` setting for `GENERICOWNER`. In its simplest form, it can be described as a method to prevent undercutting existing generic profiles that are not yours. However, it does not work for grouping resource classes and adding new generic members.

Note: In some releases of RACF, users cannot define discrete general resource profiles even if the `GENERICOWNER` is not active because of an existing top generic profile. If the `GENERICOWNER` is not active, you can bypass this restriction by performing the following steps:

1. Add a temporary, more specific generic profile.
2. Add the discrete profile.
3. Delete the temporary intermediate generic profile.

zSecure Command Verifier provides a generic facility to prevent creation of more specific profiles, both for general resources and data sets. This facility is described in section "User authorization to create more specific profiles" on page 151.

Enforcement of resource naming conventions

The need for naming conventions for user IDs and groups also applies to data sets and general resources. However, for data sets, the need is greatly reduced because RACF already implements severe restrictions on the names of data set profiles. RACF requires that the HLQ of any data set profile corresponds to an existing `userid` or `GROUP` that falls in the scope of the terminal user.

If you want to control creation of data set profiles with a HLQ of ABCX, only users ABCX1, ABCX2, and XYZA1 must be able to create such data set profiles. Using zSecure Command Verifier, you can implement this restriction by using the following policy profile definition:

```
C4R.DATASET.ID.ABCX.**  UACC(NONE)  UPDATE(ABCX1,ABCX2,XYZA1)
```

However, RACF already enforces that the `HLQ` is an existing RACF `userid` or `GROUP`. So, of all possible HLQs, most are already controlled because they do not fulfill this basic requirement. RACF requires that the terminal user has some form of authorization to create data set profiles. If the HLQ is a GROUP (as in this example), the user must be connected to the group with at least `CREATE` authority, or must have Group-SPECIAL authority over the group. It means that for all GROUPs and user IDs defined in your installation that can potentially occur as a data set HLQ, only a few are authorized for a specific terminal user. For example, although your RACF database has a `GROUP SYS1`, only a few users are authorized to create data set profile with `SYS1` as HLQ. So, the preceding profile is only useful if the three users have either Group-SPECIAL authorization, or are connected with

CREATE authority. Without either, the users are not authorized to create data set profiles, independent of the existence of the zSecure Command Verifier policy profile.

In current RACF implementations, the use of CREATE authorization is discouraged. It is because of its double function as both a method to control creation of data set profiles, which control security and the creation or allocation of new data set on disk and tape. In most modern RACF implementations, the authority to create application data set profiles is managed by Group-SPECIAL, while creation of data sets on disk and tape is controlled by ALTER access on the appropriate data set profile, which is set up by the security administrator.

If your installation must further control which data set profiles within a HLQ can be created by a person with RACF Group-SPECIAL authorization, you can use zSecure Command Verifier policy profiles. In the previous example, you probably do not use the policy profile on its own but define it with several profiles as follows:

```
C4R.DATASET.ID.ABCX.**            UACC(NONE)     UPDATE(XYZA1)
     Only user XYZA1 can create within ABCX.
C4R.DATASET.ID.ABCX.TEST*.**      UACC(NONE)     UPDATE(ABCX1,ABCX2,XYZA1)
     All three users can create "test" dataset profiles.
```

Note: In this example, all three users still need basic RACF authorization to create the data set profile. zSecure Command Verifier policy profiles enforce the naming conventions, but generally do not increase authorization of the terminal user.

Although this step is discouraged, the previous set of example profiles can also be used to restrict the authority inherent in a CREATE level connect authorization. Even though the users ABCX1 and ABCX2 might be connected to the GROUP ABCX with CREATE authorization, they are not authorized to create data set profiles. An exception is implemented for the test data set profiles.

Policy profiles for enforcing resource naming conventions

In zSecure Command Verifier, the problem of authorizing the creation of profiles is solved by policy profiles as summarized in the following table. In most situations, you do not need these profiles. These profiles can help you restrict profile creation even further than already enforced by RACF.

Table 38. Profiles used for verification of RACF Resources. The entries in this table reflect the keywords that describe the name of new resources.

Command	Keyword	Profile
ADDSD DELDSD	*profile*	**C4R.DATASET.ID.***hlq.rest-of-profile*
RDEFINE RDELETE	*profile*	**C4R.***class***.ID.***profile*
RDEFINE RALTER	*ADDMEM*	**C4R.***class***.ID.***member*
RDEFINE RALTER	*DELMEM*	**C4R.***class***.ID.***member*

In these profiles, the variable *class* represents the class as specified on the **RDEFINE** command. When used for the ADDMEM and DELMEM keywords, the *class* represents the corresponding member class. The following examples can clarify the *class* used in the policy profiles.

Table 39. Profiles used for verification of RACF Resources. This table shows examples of the profile and class that is used for certain commands.

Command	profile	Class
RDEFINE DASDVOL xyzzyx	*xyzzyx*	**DASDVOL**
RDEFINE GDASDVOL pool1	*pool1*	**GDASDVOL**
RALTER GDASDVOL pool1 ADDMEM(xyzzyx)	*xyzzyx*	**DASDVOL**
RDEFINE GDASDVOL pool1 ADDMEM(xyzzyx)	*xyzzyx pool1*	**DASDVOL GDASDVOL**

In the policy profiles, the variable *profile* reflects the profile that is being defined, and the variable *member* reflects the member that is being manipulated. In the examples above, they are respective **pool1** and **xyzzyx**. For data set profiles, the *profile* is sometimes split into two parts:

- The High-Level Qualifier (HLQ). This qualifier is the first qualifier of the data set profile. In RACF, the first qualifier must be an existing `userid` or `GROUP`.
- The remaining qualifiers (referred to as "rest-of-profile").

This split of the data set profile name is done to stress the special usage of the HLQ and highlight the similarity in form between the No-Store profiles that are described in section “Policy profiles for managing your own data set profiles” on page 149 and the standard policy profiles that are described in the following section.

Policy profiles for creating RACF resource profiles

The following sections describe the policy profiles for creating RACF resource profiles and the corresponding access levels. For the authority to create data set profiles for which the HLQ is the user ID of the terminal user, see “Policy profiles for managing your own data set profiles” on page 149.

- **C4R.DATASET.ID.***hlq.rest-of-profile*

  This profile describes the authorization to create the data set profile that is specified by *hlq.rest-of-profile*. The policy profile can be a generic or discrete profile. When you define policy profiles, the profile part can contain plus signs to replace standard generic characters.

  zSecure Command Verifier does not pre-verify the normal RACF authorization to create the data set profile. If zSecure Command Verifier approves the creation of a certain data set profile, RACF still performs its own authorization verification. So, for data set profiles, the terminal user must also have authorization as described in section “User authorization to create resource profiles” on page 157. The following access levels are available.

  No Profile Found
  This control is not implemented.

  NONE
  The user is not authorized to define the new data set profile.

  READ Same as NONE

  UPDATE
  The terminal user can create the data set profile, provided the terminal user has otherwise sufficient RACF authorization.

  CONTROL
  Same as UPDATE

- **C4R.***class***.ID.***profile*
- **C4R.***class***.ID.***member*

  These two policy profiles both refer to the same basic policy profile. Different names are used for the variables *profile* and *member* to describe the two different places where the values are obtained. The first profile describes the authorization to create the *profile* in *class*. This profile is used for the **RDEFINE** command. The second form of the same policy profile is used for the ADDMEM and DELMEM keywords on the **RDEFINE** and **RALTER** commands. See the discussion in the previous section for a general description and examples. The following access levels are available.

  No Profile Found
  Not Implemented. zSecure Command Verifier does not verify authorization to create *profile* in class *class*.

  NONE
  The user is not authorized to define the new *profile*.

  READ Same as NONE

  UPDATE
  The terminal user can create the *profile*. The terminal user still needs sufficient RACF authorization, like **clauth(***class***)**.

  CONTROL
  Same as UPDATE

Resource policy profiles for special applications

The profiles in the previous section and their translation can be used for some special applications. Examples of two special applications for the profiles are provided. The first application is for profiles in the Global Access Checking Table. The second is for profiles in the PROGRAM class.

Global access checking table: The first application relates to the definition of entries in the GAC table. zSecure Command Verifier also performs more checking on the use of the ADDMEM keyword. It is possible to allow or disallow inclusion of certain entries in the GAC table. Situations are known where an authorized system administrator, accidentally created an entry **/ALTER in the GAC table, resulting in ALTER access to all data sets in the system. This situation can be prevented by two policy profiles: One preventing definition of any GAC table entry, and one more specific profile that allows definition of GAC table entries that allow READ access. The following policy profiles can be used.

- **C4R.GMBR.ID.**.* UACC(NONE)**

  This profile explicitly uses an EGN feature that allows use of the ".**" in the middle of a profile to indicate that an unspecified number of qualifiers can be present. It also uses an explicit "*" as final qualifier to highlight the difference with the next profile. The UACC of the profile is NONE. It prevents anybody from defining an entry in the GAC table.
- **C4R.GMBR.ID.**.R* UACC(UPDATE)**

  This profile is more specific than the previous profile. The profiles are identical up to the R, which is not a generic character. The UACC of the profile in UPDATE. It allows anybody to add entries that have a last qualifier that starts with R.

If an authorized RACF administrator tries to add a GAC table entry like SYS1.LINKLIB/READ, the command is

```
RALT GLOBAL DATASET ADDMEM('SYS1.LINKLIB'/READ)
```

Because the GLOBAL resource class is matched in RACF with the pseudo member class GMBR that is needed for RACF internal reasons, zSecure Command Verifier verifies the following policy resource name:

```
C4R.GMBR.ID.+SYS1.LINKLIB+.READ
```

The translate mechanism that is described in "Generic and special characters in policy profiles" on page 143, translates all generic characters and some special characters into plus-signs. It also translates the slash (/) character into a period. This policy resource is covered by profile 2, and is thus allowed. If the administrator makes a mistake and by accident issue the command

```
RALT GLOBAL DATASET ADDMEM('SYS1.LINKLIB'/UPDATE)
```

the resulting policy resource name is

```
C4R.GMBR.ID.+SYS1.LINKLIB+.UPDATE
```

Since this policy resource is covered by profile 1, creation of the GAC table entry is denied.

The data set name in the ADDMEM keyword is always normalized. As part of the normalization process, quotation marks are placed around the data set name and a prefix is applied when needed. The translated value of the normalized data set name is used in the policy profiles. The previous example for SYS1.LINKLIB shows a translated normalized data set name as used in policy profiles.

The access level that in the ADDMEM keyword is not normalized. RACF accepts access levels even if they are abbreviated to a single letter (R=READ, U=UPDATE). The absence of normalization of the access level is the reason that the example profile is specified with the generic value R* as the last qualifier. The generic pattern matches all possible abbreviations of READ.

PROGRAM class: The second application is one where the mandatory value profile is used for the UACC in combination with generic profile translation. The purpose of this particular application is to prevent accidental definition of UACC=NONE on generic profiles in the PROGRAM class. There are situations where an administrator accidentally left out a UACC generic program profiles are defined for such as linklist data sets. It can result in rendering the entire system unusable. If all programs in SYS1.LINKLIB are protected against usage, all TSO commands, including all RACF commands do fail with an access violation. Using mandatory profiles, it is possible to prevent such a situation from occurring. The following profiles do prevent default assignment of UACC=NONE for new generic profiles in the PROGRAM class:

```
C4R.PROGRAM.=UACC.+            UACC(READ)     APPLDATA('READ')
C4R.PROGRAM.=UACC.%+           UACC(READ)     APPLDATA('READ')
C4R.PROGRAM.=UACC.%%+          UACC(READ)     APPLDATA('READ')
 ...
C4R.PROGRAM.=UACC.%%%%%%%+     UACC(READ)     APPLDATA('READ')
```

The previous profiles control the UACC of all possible generic profiles in the PROGRAM class. If you want to extend these profiles to all including discrete profiles, it would be possible to replace these profiles with the following single profile.

```
C4R.PROGRAM.=UACC.*            UACC(READ)     APPLDATA('READ')
```

Either way, these profiles ensure that new PROGRAM profiles have a UACC=READ. It does not prevent an authorized administrator to later reset the UACC to any other value. However, that requires a conscious decision and command by such an administrator. It is different from the default assignment that is used during the definition of the profile.

Policy profiles for the resource profile owner selection

These profiles apply to all four commands that allow specification of the `OWNER`, that is, **`ADDSD`**, **`RDEFINE`**, **`ALTDSD`**, and **`RALTER`**. In general, the processing for these profiles assumes that your installations policy is to use the HLQ as `OWNER`. The last profile that is described in the following section `/HLQ` provides a control that can be used to indicate whether your installation wants to enforce such a policy or not. Again, the following description is split into several sets of profiles. The first is used to specify a mandatory or default value for the `OWNER`.

For Mandatory Value policy profiles, the third qualifier consists of an equals sign, followed by the keyword. So for the `OWNER`, the profile has the qualifier `=OWNER`. For Default profiles, the third qualifier consists of a forward slash, followed by the keyword. So, for the `OWNER`, the profile has `/OWNER` as third qualifier.

Table 40. Mandatory Value policy profiles for Owner of Resource Profiles. The entries in this table reflect the commands and keywords that describe the Mandatory or Default value for the `OWNER` of new resource profiles.

Command	Keyword	Profile
ADDSD	*profile*	**C4R.DATASET.=OWNER.***profile*
ADDSD	*profile*	**C4R.DATASET./OWNER.***profile*
RDEFINE	*profile class*	**C4R.***class.***=OWNER.***profile*
RDEFINE	*profile class*	**C4R.***class.***/OWNER.***profile*

The second set of profiles is used to describe controls on the value for the OWNER as specified by the terminal user. It also describes the general policies that can be used for the OWNER of resource profiles.

Table 41. Profiles used for Owner of Resource Profiles. The entries in this table reflect the commands and keywords that are specified by the terminal user that describe the owner of new or changed resource profiles.

Command	Keyword	Profile
ADDSD ALTDSD	*profile owner*	**C4R.DATASET.OWNER.=RACUID(***n***)**
ADDSD ALTDSD	*profile owner*	**C4R.DATASET.OWNER.=RACGPID(***n***)**
ADDSD ALTDSD	*profile owner*	**C4R.DATASET.OWNER.=HLQ(***n***)**
ADDSD ALTDSD	*profile owner*	**C4R.DATASET.OWNER.***owner.profile*
ADDSD ALTDSD	*profile owner*	**C4R.DATASET.OWNER./SCOPE.***owner.profile*
ADDSD ALTDSD	*profile owner*	**C4R.DATASET.OWNER./GROUP.***owner.profile*
ADDSD ALTDSD	*profile owner*	**C4R.DATASET.OWNER./HLQ.***owner.profile*
RDEFINE RALTER	*profile class owner*	**C4R.***class.***OWNER.=RACUID(***n***)**
RDEFINE RALTER	*profile class owner*	**C4R.***class.***OWNER.=RACGPID(***n***)**

Table 41. Profiles used for Owner of Resource Profiles (continued). The entries in this table reflect the commands and keywords that are specified by the terminal user that describe the owner of new or changed resource profiles.

Command	Keyword	Profile
RDEFINE **RALTER**	*profile class* *owner*	**C4R.***class.***OWNER.=HLQ(***n***)**
RDEFINE **RALTER**	*profile class* *owner*	**C4R.***class.***OWNER.***owner.profile*
RDEFINE **RALTER**	*profile class* *owner*	**C4R.***class.***OWNER./SCOPE.***owner.profile*
RDEFINE **RALTER**	*profile class* *owner*	**C4R.***class.***OWNER./GROUP.***owner.profile*
RDEFINE **RALTER**	*profile class* *owner*	**C4R.***class.***OWNER./HLQ.***owner.profile*

Mandatory and default value policy profiles for the owner

These profiles are only used for the **ADDSD** and **RDEFINE** commands.

- **C4R.***class.***=OWNER.***profile*

  This profile specifies a mandatory overriding value for the OWNER of the newly defined resource profile. It is only used during **ADDSD** and **RDEFINE** processing. The OWNER value that is obtained by this Mandatory Value profile is not subject to more OWNER-related policy profiles.

  The qualifier =OWNER in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  No profile found
  The control is not implemented. No mandatory value is enforced.

  NONE
  No action. No mandatory value is enforced.

  READ The **APPLDATA** field is extracted and used for the command.

  UPDATE
  Same as READ

  CONTROL
  The control is not active for the terminal user. No mandatory value is supplied. The value for the OWNER as specified by the terminal user is used in the command.

  Note: The access levels for this profile are not hierarchical. In general, zSecure Command Verifier policies do not apply to users that have CONTROL access or higher. Access NONE indicates that the facility as described by the policy is not available to the terminal user. For the Mandatory Value profiles, it leads to the odd situation that access NONE has the same net result as access OWNER.

  The values that are accepted for the **APPLDATA** field are given as follows. The OWNER can be a user ID or GROUP.

  BLANK
  Any specified value of the new OWNER is suppressed, and replaced by the current GROUP of the terminal user.

  =HLQ Reflects the High-Level Qualifier HLQ of the resource profile. This setting typically makes sense only for data set profiles. If the HLQ is not an existing user ID or GROUP, the current GROUP of the terminal user is used instead.

=MYOWNER
Reflects the OWNER of the terminal user. If this OWNER is an existing user ID or GROUP, the value is used as the OWNER of the new resource profile. Otherwise, the current GROUP of the terminal user is used instead.

other The specified user ID or GROUP is used as OWNER of the new resource profile. If this owner is not an existing user ID or GROUP, the current GROUP of the terminal user is used instead.

- **C4R.***class***./OWNER.***profile*

  This policy profile specifies a default value for the OWNER of the newly defined resource profile. It is only used during **ADDSD** and **RDEFINE** processing. The OWNER that is to be used as default value is obtained from the **APPLDATA** field in the profile. The OWNER value that is obtained by this Default Value profile is not subject to more OWNER-related policy profiles. If the =OWNER profile is used to provide a value, the /OWNER profile is not used.

  The qualifier /OWNER in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

No profile found
The control is not implemented. No default value is supplied. This setting results in RACF providing a default for the OWNER (=the terminal user itself).

NONE
No default value is supplied. RACF does not provide a value for the OWNER. The command is failed. Using this access level allows an installation to force the terminal user to explicitly specify a value for the OWNER.

READ The **APPLDATA** field is extracted and used for the command.

UPDATE
Same as READ

CONTROL
The control is not active for the terminal user. No default value is supplied. Because the terminal user did not specify a value for the OWNER, RACF makes the terminal user the OWNER of the new profile.

The values that are accepted for the **APPLDATA** field are given as follows. The specified OWNER can be a user ID or GROUP.

BLANK
The current GROUP of the terminal user is inserted as the value for the OWNER.

=HLQ Reflects the High-Level Qualifier (HLQ) of the resource profile. This setting typically makes sense only for data set profiles. If the HLQ is not an existing user ID or GROUP, the current group of the terminal user is used instead.

=MYOWNER
Reflects the OWNER of the terminal user. If this OWNER is an existing userid or GROUP, the value is used as the OWNER of the new resource profile. Otherwise, the current group of the terminal user is used instead.

other The specified USERID or GROUP is used as OWNER of the new resource profile. If this owner is not an existing USERID or GROUP, the current group of the terminal user is used instead.

Resource policy profile owner verification

For data sets, RACF itself does sometimes impose as constraint that the owner must be connected to the `HLQ-GROUP` with at least `CREATE` authority. For general resources, or `HLQ=user ID` data sets, RACF does not impose any constraints on the `OWNER`. The policy profiles that are shown can be used to restrict the choice of new `OWNER`s. If the use of the specified `OWNER` is not accepted by any of the general policy rules `=RACUID`, `=RACGPID`, `=HLQ`, the explicit policy profile is used.

- **C4R.***class.***OWNER.=RACUID(***n***)**

  This profile specifies a special generic policy for the `OWNER`. The `=RACUID` stands for user ID of the terminal user. If the substring (`=RACUID,1,n`) matches, this profile is used in preference to other profiles, independent of the value of *n*. If you have multiple of these profiles that are defined, only the one with the smallest numeric specification is used for matching the `userids`.

  This profile is a discrete profile. Only the single digit between parenthesis is variable, and must be specified from 1 to 8. It is not possible to use a true generic profile.

  If the specified `OWNER` is accepted, more verifications against the general policies like `/SCOPE` and `/GROUP` are performed.

  No profile found
  User ID of the terminal user is not used as naming convention or restriction for the `OWNER`.

  NONE
  The specified `OWNER` is not allowed. The command fails. This decision can be overruled by authorization to profile *owner.profile* described as follows.

  READ Same as NONE.

  UPDATE
  The specified `OWNER` is accepted.

  CONTROL
  Same as UPDATE.

- **C4R.***class.***OWNER.=RACGPID(***n***)**

  This profile specifies a special generic policy for the OWNER. The `=RACGPID` stands for the list of groups the terminal user is connected to. The groups of all the user are used, independent of the setting of “list of group access checking”. If the substring(`=RACGPID,1,n`) matches, this profile is used in preference to other profiles, independent of the value of *n*. It is only used if `=RACUID(`*n*`)` is not present or does not match. If you defined multiple of these profiles, only the one with the lowest value for *n* is used.

  This profile is a discrete policy profile. Only the single digit between parenthesis is variable and must be specified from 1 to 8. It is not possible to use a true generic profile.

  If the specified `OWNER` is accepted, more verifications against the general policies like `/SCOPE` and `/GROUP` are performed.

  No profile found
  The GROUPs of the terminal user are not used as naming convention or restriction for the `OWNER`.

  NONE
  The specified `OWNER` is not allowed. The command fails. This decision can be overruled by authorization to profile *owner.profile* described as follows.

READ Same as NONE.

UPDATE
The specified `OWNER` is accepted.

CONTROL
Same as UPDATE

- **C4R.***class*.**OWNER.=HLQ(***n***)**

  This profile specifies a special generic policy for the `OWNER`. The special value `=HLQ` represents the High-Level Qualifier of the resource profile itself. This policy profile typically makes sense only for data set profiles. It can be used to enforce a naming convention, which states that the first *n* characters of a data set profile must match the first *n* characters of its owner.

  The `=HLQ` stands for the HLQ of the resource profile in the command. If the substring(`=HLQ,1,n`) matches the specified `OWNER`, this profile is used in preference to other generic profiles, independent of the value of *n*. It is only used if `=RACUID`(*n*) and `=RACGPID`(*n*) are not present or do not match. If you defined multiple of these profiles, only the one with the lowest value for *n* is used.

  This profile is a discrete policy profile. Only the single digit between parenthesis is variable and must be specified from 1 to 8. It is not possible to use a true generic profile.

  If the specified OWNER is accepted, more verifications against the general policies like `/SCOPE` and `/GROUP` are performed. zSecure Command Verifier does not test if the specified OWNER is a valid user ID or GROUP.

  No profile found
  The target resource profile is not used as naming convention or restriction for its OWNER.

  NONE
  The specified OWNER is not allowed. The command fails. This decision can be overruled by authorization to profile *owner.profile* described as follows.

  READ Same as NONE.

  UPDATE
  The specified OWNER is accepted.

  CONTROL
  Same as UPDATE.

  If any of the above three profiles allow the specified OWNER, the next profile rule is skipped. Processing continues with the `/SCOPE`, `/GROUP`, and `/HLQ` policies. If the previous profiles did not authorize the use of a certain `OWNER`, the next profile is used as alternative authorization method.

- **C4R.***class*.**OWNER.***owner.profile*

  The primary purpose of this control is to specify a policy if none of the general policies apply. The variable *owner* represents the new OWNER of the resource *profile*. It allows specification of exceptions to the general rule. The most specific profile is used by zSecure Command Verifier.

  The OWNER as verified by this policy profile is still subjected to the additional policy profiles (`/SCOPE`, `/GROUP`, `/HLQ`) as described here:

  No profile found
  This control is not implemented.

NONE
The command is failed.

READ Same as NONE.

UPDATE
The specified OWNER is accepted.

CONTROL
Same as UPDATE.

More policy profiles for the resource profile owner

Aside from the profiles that are intended to enforce a naming convention, it is also possible to implement a policy that is based on the existing RACF group hierarchy.

The following profile rules are used as an extra set of policies. If the specified `OWNER` is accepted by any of the rules above, it is verified against the following three policies. If it fails any of these policies, the command is rejected.

C4R.*class***.OWNER./SCOPE.***owner.profile*

This profile is used to control if the new `OWNER` as specified by the terminal user must be within the scope of a `group-SPECIAL` attribute. This profile can prevent the terminal user from giving away resource profiles that are within the scope of a `group-SPECIAL` attribute.

The variables *profile* and *owner* represent the affected resource profile and the new `OWNER` of the resource profile. It allows specification of exceptions to the general rule. The most specific profile is used by zSecure Command Verifier.

The qualifier `/SCOPE` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

If the profile is within scope of a `Group-SPECIAL` authorization, the use of this authorization is recorded by the **C4R.USESCOPE.***group* profile.

Successful UPDATE access to this profile is recorded by SMF. If the terminal user has `System-SPECIAL`, the *group* **=SYSTEM** is used for tracking this authorization.

No profile found
The `group-SPECIAL` scope of the terminal user is not used to control the new `OWNER` of user profiles.

NONE
If the specified new `OWNER` is outside the scope of a `group-SPECIAL` attribute of the terminal user, the command fails.

READ Same as NONE.

UPDATE
The specified `OWNER` is accepted, irrespective of the scope of the terminal user.

CONTROL
Same as UPDATE.

C4R.*class***.OWNER./GROUP.***owner.profile*

The profile is used to control if the specified OWNER must be a RACF GROUP or not. This profile is verified independently of the other profiles. If either the `=OWNER` or the `/OWNER` profile is used, that this policy rule is bypassed.

The variables *profile* and *owner* represent the affected resource profile and the new OWNER of the resource profile. It allows specification of exceptions to the general rule. The most specific profile is used by zSecure Command Verifier.

The qualifier /GROUP in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

No profile found
This control is not implemented. The specified OWNER can be a GROUP and a user ID.

NONE
If the specified owner is an existing RACF group, the command is accepted. In all other situations, the command fails.

READ Same as NONE.

UPDATE
The specified OWNER is accepted even if it does not represent an existing group. If the specified OWNER is not a valid entry, the command is failed by RACF.

CONTROL
Same as UPDATE.

C4R.*class***.OWNER./HLQ.***owner.profile*
This profile is used to control if the OWNER as specified by the terminal user must be the same as the HLQ of the resource profile. It typically makes sense only for data set profiles.

The *profile* and *owner* values represent the affected resource profile and the new OWNER of the profile. It allows specification of exceptions to the general rule. The most specific profile is used by zSecure Command Verifier.

The qualifier /HLQ in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

No profile found
This control is not implemented. The specified OWNER can be different from the HLQ.

NONE
The specified new OWNER must be the same as the current (or new) HLQ.

READ Same as NONE.

UPDATE
The specified OWNER is accepted, irrespective of the value of the HLQ.

CONTROL
Same as UPDATE.

Controlling access by using the UACC and access list

Aside from the authority to create profiles, the most important part of a resource profile is its access specification. In zSecure Command Verifier, all forms of access management are supported by policy profiles.

RACF also has a fast path option from the Global Access Checking (GAC) table. In zSecure Command Verifier, this table is not directly controlled as an access mechanism. However, since the GAC table is defined by RACF profiles in the `GLOBAL` resource class, it can also be controlled by zSecure Command Verifier policy profiles.

Note: The authorization to issue the **`PERMIT`** or **`ALTDSD`** command is also subject to the No-Store control described in "Policy profiles for managing your own data set profiles" on page 149.

The following tables summarize the various policy profiles that are used for the different access mechanisms. The first one provides an overview of the UACC control and the standard Access List. The table also summarizes the additional policies for access management. The additional polices are enforced after the command is approved according to the other ACL policies.

These additional policy profiles can be used to prevent data set groups from being placed on the access list of resources and to prevent granting access to individual users or groups outside a possible group-special scope. A group is considered to be a data set group if a data set profile is defined with the group as the HLQ.

Table 42. Profiles used for verification of RACF access. The entries in this table reflect the commands and keywords that are used to manage access.

Command	Keyword	Profile
ADDSD **RDEFINE**	*profile*	**C4R.***class*.**=UACC.***profile*
ADDSD **RDEFINE**	*profile*	**C4R.***class*.**/UACC.***profile*
ADDSD **RDEFINE** **ALTDSD** **RALTER**	*profile*	**C4R.***class*.**UACC.***uacc.profile*
PERMIT	*userid*	**C4R.***class*.**ACL.=RACUID.***access.profile*
PERMIT	*group*	**C4R.***class*.**ACL.=RACGPID.***access.profile*
PERMIT	*profile* **ID(***id***)**	**C4R.***class*.**ACL.=PUBLIC.***profile*
PERMIT	*profile* **ID(***userid***) AC(***access***)**	**C4R.***class*.**ACL.***userid.access.profile*
PERMIT	*profile* **ID(*) AC(***access***)**	**C4R.***class*.**ACL.=STAR.***access.profile*
PERMIT	*profile* **FROM(model)**	**C4R.***class*.**ACL.=FROM.***profile*
PERMIT	*profile* **RESET(Standard)**	**C4R.***class*.**ACL.=RESET.***profile*
PERMIT	*profile* **ID(***group***)**	**C4R.***class*.**ACL.=DSN.***group.profile*
PERMIT	*profile* **ID(***userid***)**	**C4R.***class*.**ACL./GROUP.***userid.profile*
PERMIT	*profile* **ID(***userid***)**	**C4R.***class*.**ACL./SCOPE.***userid.profile*

Note: In this table, the policy profiles for granting access to yourself are repeated for completeness only. These policy profiles are described in "Policy profile selection for self-authorization" on page 150.

The following table summarizes the policy profiles that are used for the conditional access list. This summary describes the authority to use certain when-condition classes and the authority to reset the conditional access list.

Table 43. Profiles used for verification of RACF access. The entries in this table reflect the commands and keywords that are used to manage access.

Command	Keyword	Profile
PERMIT	*profile* **WHEN(***whenclass***)**	**C4R.***class***.CONDACL.***whenclass.profile*
PERMIT	*profile* **RESET(when)**	**C4R.***class***.CONDACL.=RESET.***profile*

In this table, some of the general policy rules use the same qualifiers for special keywords as those qualifiers used for ACL entries. For example, the `/SCOPE` qualifier is the same as the qualifier for the regular *userid*. If you want to explicitly allow one group administrator to put a group `GROUPX` on any access list, you must define several profiles to explicitly handle these general policies.

For example, consider the rule:

```
ADMINX is only allowed to put GROUPX on any ACL.
Any other ACLid is "protected" and can only be permitted by SUPERADM.
```

For this policy rule, you would need the following profiles:

```
C4R.*.ACL.*.**           uacc(none) update(superadm)
C4R.*.ACL.groupx.**      uacc(none) update(superadm,adminx)
```

These two policy profiles ensure that all ACL entries are allowed to `SUPERADM`, and that `GROUPX` is allowed for `ADMINX`. You might also want to explicitly spell out the following more policy profiles:

```
C4R.*.ACL./SCOPE.**      uacc(update)
C4R.*.ACL./GROUP.**      uacc(update)
C4R.*.ACL.=STAR.**       uacc(update)
C4R.*.ACL.=DSN.**        uacc(update)
C4R.*.ACL.=RESET.**      uacc(update)
```

You cannot use generics for qualifiers like `/SCOPE` or `/GROUP`. These five profiles ensure that the general policies are not implemented. You can also grant access `CONTROL`. If you want to explicitly deny the authority to put `userid` "*" on the access list, use the following profile:

```
C4R.*.ACL.=STAR.** uacc(none) update(superadm)
```

The example policy rule did not specify how `ADMINX` is allowed to put `GROUPX` on any ACL. Normally RACF allows only management of access list entries that are based on the resource profile itself, and not based on the ACL entry. To manage all ACLs, the terminal user requires `System-SPECIAL`, or `Group-SPECIAL` authorization in several GROUPS.

Controlling access to the resource profile UACC

The first profile can be used to specify a mandatory value for the UACC. One of the primary purposes of this profile is to prevent an administrator from accidentally defining profiles in the program class with a `UACC=NONE`. Defining such a profile can shut down the entire system, without an easy way of recovery. Mandatory UACC profiles can be used to prevent such a situation from occurring. The Mandatory Value profile is only used for the **`ADDSD`** and **`RDEFINE`** command.

The second policy profile provides a default UACC in case no UACC is specified and no mandatory profile is enforced.

The last policy profile is intended to verify the terminal user specified value. It is used both during the creation of new resource profiles and during the modification of the UACC value of existing resource profiles.

- **C4R.***class.***=UACC.***profile*

  This profile specifies a mandatory value for the UACC. The **APPLDATA** field of this profile is extracted, and inserted as the value. The **APPLDATA** field must contain one of the standard RACF access level values `NONE`, `EXECUTE`, `READ`, `UPDATE`, `CONTROL`, or `ALTER`. Any other value is interpreted as `NONE`. The access of the terminal user to the policy profile determines whether the value found can be used.

  The qualifier `=UACC` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

  No profile found
  The control is not implemented. No mandatory value is enforced.

  NONE
  The mandatory value is not used. The value that is specified by the terminal user is accepted, or RACF provides a default.

  READ The **APPLDATA** of the policy profile is extracted and inserted as the UACC value of the new profile.

  UPDATE
  Same as READ

  CONTROL
  The control is not active for the terminal user. No mandatory value is supplied. The value for the UACC as specified by the terminal user is used in the command.

  Note: The access levels for this profile are not hierarchical. In general, zSecure Command Verifier policies do not apply to users that have `CONTROL` access or higher. Access `NONE` indicates that the facility as described by the policy is not available to the terminal user. For the Mandatory Value profiles, it leads to the odd situation that access `NONE` has the same net result as access `CONTROL`.

  The UACC value that is obtained by this Mandatory Value profile is not subject to more UACC-related policy profiles.

- **C4R.***class.***/UACC.***profile*

  This profile specifies a default value for the UACC. This policy profile is only used if no value for the UACC was specified on the RACF command. The **APPLDATA** field of this policy profile is extracted, and inserted as the value.

  The qualifier `/UACC` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown. The **APPLDATA** field must contain one of the standard RACF access level values `NONE`, `EXECUTE`, `READ`, `UPDATE`, `CONTROL`, or `ALTER`. Any other value is interpreted as `NONE`. The access of the terminal user determines whether the **APPLDATA** value found must be inserted in the command or not.

  No Profile Found
  The policy is not implemented.

  NONE
  The Default value is not used. The possible default value that is provided by RACF is used.

  READ The **APPLDATA** of the policy profile is extracted and inserted as the UACC value of the new profile.

UPDATE
Same as NONE.

CONTROL
The default UACC policy rule is not applicable to this terminal user.

Note: The access levels for this profile are not hierarchical. In general, zSecure Command Verifier policies do not apply to users that have `CONTROL` access or higher. Access NONE indicates that the facility as described by the policy is not available to the terminal user. For the Default Value profiles, it leads to the odd situation that access NONE has the same net result as access `CONTROL`.

The UACC value that is obtained by this Mandatory Value profile is not subject to more UACC-related policy profiles.

- **C4R.***class*.**UACC.***uacc.profile*

  This profile is used to verify the UACC value as specified by the terminal user. The variable *uacc* represents the UACC level as specified. Accepted values are all the RACF allowed values for the UACC, that is, `NONE`, `EXECUTE`, `READ`, `UPDATE`, `CONTROL`, or `ALTER`. This profile is not used for the **`ADDSD`** and **`RDEFINE`** command if the terminal user explicitly specified the RACF default value NONE. The value NONE is always accepted when you define new resources, independent of the specification of the corresponding UACC policy rule. For the **`ALTDSD`** and **`RALTER`** commands, all values for the UACC are verified by using the UACC policy rules.

  No Profile Found
  The control is not implemented. The terminal user specified value is accepted.

  NONE
  Specified UACC not allowed. The command is failed.

  READ Same as NONE.

  UPDATE
  The UACC value that is specified by the terminal user is accepted.

  CONTROL
  Same as UPDATE.

Policy profiles for the resource profile ACL

Two main types of profiles are being used. The first type specifies the combination of the ID (in RACF terms, the user ID, but in reality a user ID or GROUP) and the access level. The second type of profile controls usage of the WHEN (when-class) keyword. The current section describes the access level and the ID used in both the Standard ACL and the Conditional ACL. The following section describes the *class* used in the conditional access list.

In the profiles for the access list, a special qualifier is supported for usage of `ID(*)` on the ACL. In the policy profiles, it is represented by the special qualifier `=STAR`. If the default translation for profiles is used, it results in usage of a plus-sign in the policy profiles to represent the use of an asterisk in the Access List.

They are included in the preceding table for reference only. These policy profiles are described in "Policy profile selection for self-authorization" on page 150.

All policy profiles are only evaluated for non-public resources and for those public resources for which the policy profiles allow the terminal user to modify the access list. Resource profiles are considered public if their UACC is greater than NONE, or if ID(*) is granted access greater than NONE. For a discussion of public resource access control, see "Policy profiles for the ACL" on page 174. If applicable profiles described in the current section are evaluated.

- **C4R.***class.***ACL.***user.access.profile*

  This profile describes the authority to grant user ID or GROUP *user* access to the *profile* in the resource class *class*, at the *access* level. The following list contains examples of policy profiles.

  ```
  C4R.DATASET.ACL.IBMUSER.UPDATE.SYS1.**
  C4R.FACILITY.ACL.IBMUSER.UPDATE.ICHBLP
  C4R.DATASET.ACL.*.*.**
  ```

  In general, the resource profile is expected to be covered by a generic pattern that consists of the HLQ followed by a double asterisk. As a backstop profile for all resource profiles, a profile similar to the third previous example is expected to be used, in which the required qualifiers are coded explicitly by the use of single asterisk generic characters.

  No Profile Found
  The policy is not implemented for this situation.

  NONE
  The specified access is not allowed. The command is failed.

  READ Same as NONE.

  UPDATE
  The specified access is allowed for this *user* and resource profile.

  CONTROL
  Same as UPDATE.

- **C4R.***class.***ACL.=STAR.***access.profile*

  This profile represents the use of ID(*) on the access list. In general, ID(*) has the same net result as use of the UACC. Some organizations want to make an explicit distinction between all users of the system and all RACF defined users of the system. In well-protected systems, there is no difference between the two categories. For this reason, zSecure Command Verifier implements a special qualifier to quickly recognize and control the access level for ID(*).

  In contrast to the general rule, the special value =STAR can be covered by a generic pattern. For example, the profile **C4R.***class.***ACL.*.***profile* can be used to prevent all changes to the ACL.

  Many installations are expected to define a profile similar to

  ```
  C4R.DATASET.ACL.=STAR.*.**   UACC(NONE)
  ```

  to prevent the use of ID(*) on any data set access list. The access levels that are supported for this policy profile are the same as those levels for the regular access list policy profiles.

  No Profile Found
  The policy is not implemented for this situation.

  NONE
  The specified access is not allowed. The command is failed.

  READ Same as NONE.

  UPDATE
  The specified access is allowed for ID(*) and this resource profile.

CONTROL
Same as UPDATE.

- **C4R.***class***.ACL.=FROM.***profile*

  This profile controls the authorization to copy an existing ACL from one profile to another. The RACF **`PERMIT FROM`** function is a quick way for issuing **`PERMIT`** commands for several ACL entries. The ACL entries of the model profile are only added to the existing ACL for the target profile. Existing ACL entries in the target profile are not changed.

  The main reason an installation might choose to implement this policy is that the copied ACL can contain entries that do not fit the policy rules. The `ACL.=FROM` profile is used to control authorization to use this copy function for access lists. The model profile name is not included in the policy profile.

  In contrast to the general rule, the special value `=FROM` can be covered by a generic pattern. For example, the profile **C4R.***class***.ACL.*.***profile* can be used to prevent all changes to the ACL.

  No Profile Found
  The policy is not implemented for this situation.

  NONE
  The terminal user is not authorized to copy an existing ACL into this *profile*

  READ Same as NONE.

  UPDATE
  Copying an existing ACL is allowed.

  CONTROL
  Same as UPDATE.

- **C4R.***class***.ACL.=RESET.***profile*

  This profile controls the authorization to reset the entire access list, and thus removing all entries from the access list. The RACF **`PERMIT RESET`** function is a quick way for issuing **`PERMIT DELETE`** commands for all entries in the access list. The `ACL.=RESET` profile is used to control authorization to reset the standard access list. A similar profile is described in the following section for the authorization to reset the **`conditional`** access list.

  In contrast to the general rule, the special value `=RESET` can be covered by a generic pattern. For example, the profile **C4R.***class***.ACL.*.***profile* can be used to prevent all changes to the ACL.

  No Profile Found
  The policy is not implemented for this situation.

  NONE
  The terminal user is not authorized to reset the ACL for *profile* in *class*.

  READ Same as NONE.

  UPDATE
  Reset of the standard ACL is allowed.

  CONTROL
  Same as UPDATE.

Policy profiles for the ACL

You can use these policies for the following purposes:

- Use the first policy to prevent any updates to the access list of so called public resources. Updates to the access list are most likely to be redundant, or needed only for exceptional situations.
- Use the second policy to prevent the granting of access to data set groups. A group is considered to be a data set group if a data set profile is defined with the group as HLQ.
- Use the third, forth, and fifth policies to prevent user IDs from being put on the access list. Only groups are allowed.
- Use the last policy to prevent the granting of access to entries that are not within the scope of the Group-SPECIAL authorization of the decentralized administrator.

C4R.*class.***ACL.=PUBLIC.***profile*

This policy profile can be used to prevent modifications to the access list of public resources. Resource profiles are considered public, if their UACC is greater than NONE, or if `ID(*)` is granted access greater than NONE. If the policy applies, and the terminal user does not have sufficient access, the command is rejected, and none of the other access lists related policy profiles are evaluated. The policy applies only to changes to the access list made by the PERMIT command. Changes to the UACC itself (which can be the reason that the resource is considered a public resource) are not controlled by this policy profile. All changes to the ACL, including the access of `ID(*)`, are subject to this policy. The access that is granted to `ID(*)` is also controlled by the `=STAR` policy.

The qualifier `=PUBLIC` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

No Profile Found

The policy is not implemented.

NONE

The terminal user is not authorized to manage the access list of the resource profile.

READ

The terminal user is authorized to delete entries from the access list of the resource profile. So, the command

```
PERMIT profile ID(any-id) DELETE
```

is allowed, provided none of the other policies or RACF authorizations prevent the command from executing.

UPDATE

The terminal user is authorized to manage the access list of this public resource profile.

CONTROL

Same as UPDATE.

C4R.*class.***ACL.=DSN.***group.profile*

This policy profile can be used to prevent granting access to data set groups. A group is considered to be a data set group if a data set profile is defined with the group as HLQ. The variable *group* is the entry that is being placed on the access list. In access lists, the term user ID is used to indicate any type of entry user ID or GROUP. In this profile, the term *group* is explicitly used to indicate that policy profile is only applicable to GROUPs. Since it is normal for user IDs to have data set profiles that are defined, the policy profile does not apply if the access list entry is a user ID. Most installations can use a double asterisk (`**`) to cover the *group* and *profile*. Exceptions to the general rule can be made by specifying more qualifiers. zSecure Command Verifier uses only the most specific profile.

The qualifier `=DSN` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

No Profile Found
The policy is not implemented for this situation.

NONE
The terminal user is not authorized to place data set groups on the access list.

READD Same as NONE.

UPDATE
The terminal user is authorized to put GROUPs in the access list even if a data set profile is defined with a HLQ equal to this GROUP.

CONTROL
Same as UPDATE.

C4R.*class***.ACL./GROUP.***userid.profile*
This policy profile can be used to prevent user IDs from being put on access lists. It applies to the standard access list and the conditional access list. If the terminal user does not have sufficient access to this policy profile, only RACF GROUPs can be placed on access lists. The variable *userid* is the user that is being placed on the access list. In access lists, the term *userid* is used to indicate any type of entry user ID or GROUP. In this profile, the term user ID is used in the limited sense of the ID of a user. In most installations, the user ID and profile are to be covered by a double asterisk. Exceptions to the general rule can be made by specifying more qualifiers. zSecure Command Verifier uses only the most specific profile.

This policy profile can also be used to override the two more `/GROUP` policy profiles (**C4R**.*class*.**ACL./GROUP.=HLQTYPE.USER** and **C4R**.*class*.**ACL./GROUP.=HLQTYPE.GROUP**).

The qualifier `/GROUP` in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

No Profile Found
The policy is not implemented for this situation.

NONE
The terminal user is not authorized to place users on the access list.

READ Same as NONE.

UPDATE
The terminal user is authorized to put individual user IDs and GROUPs on the ACL.

CONTROL
Same as UPDATE.

C4R.*class***.ACL./GROUP.=HLQTYPE.USER**
This policy profile can be used to prevent placing user IDs on the access list of user data sets. A data set is considered a user data set if the high-level qualifier (the first qualifier) is defined in RACF as a user ID. The policy profile applies to the standard access list and to the conditional

access list. If the entry to be placed on the access list is a user ID, and the data set is a user data set, the terminal user must have sufficient access to the current policy profile. If the terminal user does not have sufficient access, the **C4R.***class.***ACL./GROUP.***userid.profile* policy can be used to override the current policy. If the **C4R.***class.***ACL./GROUP.***userid.profile* policy also does not allow placing a user ID on the access list, the command is rejected. In that case, only existing RACF GROUPs can be permitted access.

Although this policy can be defined by using a generic profile, the qualifiers `/GROUP.=HLQTYPE` must be present in the policy profile in the exact form shown.

No Profile Found
The policy is not implemented for this situation.

NONE
The terminal user is not authorized to put users on the access list. The **C4R.***class.***ACL./GROUP.***userid.profile* policy might still allow users to be placed on the access list of user data sets.

READ Same as NONE.

UPDATE
The terminal user is authorized to put individual user IDs and GROUPs on the access list of user data sets.

CONTROL
Same as UPDATE.

C4R.*class.***ACL./GROUP.=HLQTYPE.GROUP**
This policy profile can be used to prevent placing user IDs on the access list of group data sets. A data set is considered a group data set if the high-level qualifier (the first qualifier) is defined in RACF as a GROUP. The policy profile applies to the standard access list and to the conditional access list. If the entry to be placed on the access list is a user ID, and the data set is a group data set, the terminal user must have sufficient access to the current policy profile. If the terminal user does not have sufficient access, the **C4R.***class.***ACL./GROUP.***userid.profile* policy can be used to override the current policy. If the **C4R.***class.***ACL./GROUP.***userid.profile* policy also does not allow placing a user ID on the access list, the command is rejected. In that case, only existing `RACF GROUP`s can be permitted access.

Although this policy can be defined by using a generic profile, the qualifiers `/GROUP.=HLQTYPE` must be present in the policy profile in the exact form shown.

No Profile Found
The policy is not implemented for this situation.

NONE
The terminal user is not authorized to place users on the access list. The **C4R.***class.***ACL./GROUP.***userid.profile* policy might still allow users to be placed on the access list of group data sets.

READ Same as NONE.

UPDATE
The terminal user is authorized to put individual user IDs and GROUPs on the access list of group data sets.

CONTROL
Same as UPDATE.

C4R.*class.***ACL./SCOPE.***userid.profile*
This general policy profile can be used to prevent the terminal user from placing people outside their Group-SPECIAL scope on access lists. It applies to the standard access list and the conditional access list. If the terminal user does not have sufficient access to this policy profile, only users and groups within the RACF Group-SPECIAL scope of the terminal user can be placed on access lists. The variable *userid* is the entry that is being placed on the access list (either a user ID or GROUP). In this profile description, the RACF term *userid* is used in this special meaning. Exceptions to the general rule can be made by specifying more qualifiers for the *profile*. In most installations, it is expected that the *profile* is covered by a double asterisk (**). zSecure Command Verifier uses only the most specific profile.

The `/SCOPE` qualifier in the policy profile cannot be covered by generic characters. It must be present in the exact form shown.

This policy profile uses only the RACF group-SPECIAL attribute for determining whether an entry can be added. Implementing this profile can result in normal users not being able to modify the access list of their own data set profiles because all entries are considered outside their scope. A similar effect can be obtained more directly by using the No-Store function that is described in "Policy profiles for managing your own data set profiles" on page 149.

No Profile Found
The policy is not implemented for this situation.

NONE
The terminal user can add or modify only Access List entries that are within the scope of Group-SPECIAL. If the terminal user does not have Group-SPECIAL scope, all access list entries are considered outside the scope.

READ Same as NONE.

UPDATE
The terminal user is authorized to add or modify Access List entries that are outside the Group-SPECIAL scope.

CONTROL
Same as UPDATE.

Policy profiles for the conditional access list

Traditionally, that class is the `PROGRAM` class, and it is still the most often used resource class for the conditional access list entries. Other classes are also possible. The policy profiles that are already described in the previous section for the standard access list also apply to the conditional access list.

- **C4R.***class.***CONDACL.***whenclass.profile*

  This profile controls the use of the WHEN keyword to manage entries on the conditional access list. It is used in combination with the policy profiles for the standard access list. The `CONDACL` profile controls the use of the *whenclass*. The *whenclass* in the profile is normally the first parameter of the WHEN keyword in the **`PERMIT`** command. An exception is made for the form of the **`PERMIT`** commands that uses the CRITERIA term. In that situation, the criteria-name is used instead. For example, when the following command is issued:

```
PERMIT DSND.USER01.HOMEWORK_GRADES.SELECT CLASS(MDSNTB) ID(STUDENT)
      WHEN(CRITERIA(SQLROLE('TEACHING ASSISTANT'))) ACCESS(READ)
```

The *whenclass* used in the policy profile is SQLROLE. This setting results in access verification to the following two resources

```
C4R.MDSNTB.ACL.STUDENT.READ.DSND.USER01.HOMEWORK_GRADES.SELECT
C4R.MDSNTB.CONDACL.SQLROLE.DSND.USER01.HOMEWORK_GRADES.SELECT
```

The following access levels are supported in the policy profile.

No Profile Found
The policy is not implemented for this situation.

NONE
The terminal user is not authorized to specify conditional access list entries.

READ Same as NONE.

UPDATE
Creating conditional access list entries is allowed. The **ACL.***user.access* profiles determine which entries on the conditional access list are allowed.

CONTROL
Same as UPDATE.

- **C4R.***class.***CONDACL.=RESET.***profile*

  This profile controls the authorization to reset the entire conditional access list, and thus remove all entries from the conditional access list. The RACF **PERMIT RESET(WHEN)** function is a quick way for issuing **PERMIT DELETE** commands for all entries in the conditional access list. The CONDACL.=RESET profile is used to control authorization to reset the conditional access list.

  In contrast to the general rule, the special value=RESET can be covered by a generic pattern. For example, the profile **C4R.***class.***CONDACL.*.***profile* can be used to prevent all changes to the conditional access list.

  No Profile Found
  The policy is not implemented for this situation.

  NONE
  The terminal user is not authorized to reset the Conditional ACL for *profile* in *class*.

  READ Same as NONE.

  UPDATE
  Reset of the Conditional ACL is allowed.

  CONTROL
  Same as UPDATE.

Further identification of the resource

Discrete data set profiles also contain information about the volume and type of device where the RACF indicator is kept. The following two profiles control the use of these keywords.

- **C4R.***class.***VOLUME.***dsname*

  This profile controls the use of the VOLUME keyword on the **ADDSD** command, and the **ADDVOL**, **DELVOL**, ALTVOL keywords on the **ALTDSD** command.

  No profile found
  This control is not implemented.

NONE
Specifying or Modifying Volume names on the **ADDSD** and **ALTDSD** commands is not allowed and causes the command to fail.

READ Same as NONE.

UPDATE
Explicit selection and Management of the VOLUME for discrete data set profiles is allowed.

CONTROL
Same as UPDATE

- **C4R.***class***.UNIT.***dsname*

This profile controls the use of the UNIT keyword on the **ADDSD** command.

No profile found
This control is not implemented.

NONE
Specifying or Modifying the Unit-type on the **ADDSD** and **ALTDSD** commands is not allowed and causes the command to fail.

READ Same as NONE.

UPDATE
Explicit selection and Management of the Unit type for discrete data set profiles is allowed.

CONTROL
Same as UPDATE

Other resource-related policy profiles

In this final section on resource profile-related controls, the remaining settings are described. The main controls are related to the RACF indicator, the type of profile, and the installation data.

Table 44. Profiles used for Resource profile settings. The entries in this table reflect the keywords that are specified on the RACF commands.

Command	Keyword	Profile
ADDSD	*noset setonly*	**C4R.DATASET.RACFIND.***set-value.profile*
ADDSD **RDEFINE**	*generic model tape other*	**C4R.***class***.TYPE.***type-value.profile*
ADDSD **ALTDSD** **RDEFINE** **RALTER**	**NO(WARNING)**	**C4R.***class***.ATTR.WARNING.***profile*
ADDSD **ALTDSD** **RDEFINE** **RALTER**	**(NO)DATA**	**C4R.***class***.INSTDATA.***profile*
ADDSD **ALTDSD** **RDEFINE** **RALTER**	**(NO)NOTIFY**	**C4R.***class***.NOTIFY.***notify-id.profile*
RDEFINE **RALTER**	**APPLDATA**	**C4R.***class***.APPLDATA.***profile*

Table 44. Profiles used for Resource profile settings (continued). The entries in this table reflect the keywords that are specified on the RACF commands.

Command	Keyword	Profile
ADDSD ALTDSD RDEFINE RALTER	**(NO)SECLABEL**	**C4R.***class***.SECLABEL.***seclabel.profile*
ADDSD ALTDSD RDEFINE RALTER	**ADD/DEL CATEGORY**	**C4R.***class***.CATEGORY.***category.profile*
ADDSD ALTDSD RDEFINE RALTER	**(NO)SECLEVEL**	**C4R.***class***.SECLEVEL.***seclevel.profile*
ADDSD ALTDSD RDEFINE RALTER	*level*	**C4R.***class***.LEVEL.***level.profile*
ADDSD ALTDSD	**RETPD**	**C4R.DATASET.RETPD.***profile*

The following table describes the remaining resource profile attributes that can be controlled by zSecure Command Verifier.

Table 45. Profiles used for Resource profile settings. The entries in this table reflect the keywords that are specified on the RACF commands.

Command	Keyword	Profile
RDEFINE RALTER	**SINGLEDSN**	**C4R.***class***.ATTR.SINGLEDSN.***profile*
RDEFINE RALTER	**TVTOC**	**C4R.***class***.ATTR.TVTOC.***profile*
RDEFINE RALTER	**TIMEZONE**	**C4R.***class***.ATTR.TIMEZONE.***profile*
RDEFINE RALTER	**WHEN**	**C4R.***class***.ATTR.WHEN.***profile*
ADDSD ALTDSD	**NO(ERASE)**	**C4R.DATASET.ATTR.ERASE.***profile*

Other policy profiles and access level descriptions

The following paragraphs describe the remaining policy profiles that are supported by zSecure Command Verifier.

There is only limited support for **SECLABEL** and **SECLEVEL**. You can control assignment of these two settings, but you cannot control removal of the settings.

- **C4R.DATASET.RACFIND.***value.profile*

  This policy profile can be used to control the setting of the RACF indicator bit for data sets. The variable *value* can be specified as either NOSET or SETONLY. RACF also supports the explicit value SET, but that setting can default and ignored in many inappropriate situations like when you define a generic profile. The NOSET keyword specifies that for discrete profiles, the RACF indicator is not to be modified. The SETONLY keyword indicates that the `TAPE` data set is covered by a discrete profile, and that only the `TVTOC` must be updated. The following access rules apply:

No profile found
This control is not implemented.

NONE
Specifying the NOSET or SETONLY keyword is not allowed and causes the command to fail.

READ Same as NONE.

UPDATE
Explicitly manipulating the RACF indicator flag is allowed.

CONTROL
Same as UPDATE

- **C4R.***class***.TYPE.***type.profile*

  This policy profile controls the type of profile that is to be created. It is only applicable to the **ADDSD** and **RDEFINE** commands. The following are the possible values for *type*.

  - **GENERIC**
  - **MODEL**
  - **TAPE**
  - **DISCRETE**

  The first three values can be specified as keyword on most RACF commands. If these keywords are used, zSecure Command Verifier uses them as profile type for the policy profile. If none of these keywords are present, zSecure Command Verifier examines the resource profile to determine whether a discrete or generic profile is to be created and set the value for the profile type accordingly.

  Discrete data set profiles are discouraged because of the operational characteristics and cumbersome security administration. For some special situations, however, discrete profiles are still preferred. Some installations choose to automatically convert all discrete profiles to generic profiles. If operational procedures in the organization are not changed, it can have devastating effects on RACF performance.

  Discrete profiles for general resources have none of the undesirable side effects that are associated with discrete data set profiles. In general, the choice between discrete and generic profiles must be based on the need for one or more profiles to protect multiple resources.

  zSecure Command Verifier provides a policy that allows an administrator to make conscious decisions about using discrete or generic profiles. Using policy profiles, it is possible to globally disallow the creation of discrete data set profiles, while still allowing room for exceptions. This step is done by inclusion of the resource profile as part of the policy profile.

  For many situations, you can use a double asterisk (**) to cover the profile part of the policy profile, as shown in these example policy profiles:

```
C4R.DATASET.TYPE.DISCRETE.**      UACC(NONE)
C4R.DATASET.TYPE.DISCRETE.SYS1.** UACC(UPDATE)
C4R.FACILITY.TYPE.*.**            UACC(UPDATE)
```

  The third type of profile in these examples is only needed if other policies for that resource class are implemented. The profile can be needed to create a more specific profile that allows creation of both discrete and generic profiles.

The available access levels to the policy profile are shown as follows.

No profile found
: This control is not implemented. All users can create discrete, generic, and other types of profiles.

NONE
: Creating a particular type of profile is not allowed and causes the command to fail. The type of profile can be specified by the terminal user, or can be determined automatically by zSecure Command Verifier.

READ Same as NONE.

UPDATE
: Creating the type of profile is allowed.

CONTROL
: The control is not implemented for this terminal user. No restrictions are imposed.

- **C4R.***class.***ATTR.WARNING.***profile*

  This profile can be used to control the setting of the `WARNING` or `NOWARNING` attribute of resource profiles. The `WARNING` attribute results in effectively disabling the resource access rules as defined by the profile. All users of the system can do anything to the resources protected by the resource profile. The only difference with `UACC(ALTER)` is the generation of more warning messages that the access is not granted if it was a regular profile.

  No profile found
  : This control is not implemented.

  NONE
  : The terminal user is not authorized to specify `WARNING` or `NOWARNING` on the **`ADDSD`**, **`ALTDSD`**, **`RDEFINE`**, and **`RALTER`** command. The NOWARNING keyword is allowed defaulted on the **`ADDSD`** and **`RDEFINE`** command.

  READ The terminal user is authorized to explicitly specify the `NOWARNING` attribute keyword on the **`ALTDSD`** and **`RALTER`** command. It allows removal of these attributes.

  UPDATE
  : The terminal user is authorized to specify both keywords on all four relevant commands. It allows regular maintenance of these attributes.

  CONTROL
  : Same as UPDATE.

- **C4R.***class.***NOTIFY.***notify-id.profile*

  This profile can be used to control setting of the Notify-ID. Normally, RACF administrators can specify which TSO user receives access violation messages. This policy profile provides control over the authorization to specify and select the Notify-ID.

  No profile found
  : This control is not implemented. Administrators can specify and select any TSO user for notify messages.

  NONE
  : Setting the Notify-ID is not allowed and causes the command to fail.

  READ Same as NONE.

  UPDATE
  : Setting and selecting the Notify-ID is allowed

CONTROL
: The control is not implemented for this terminal user. No restrictions are imposed.

- **C4R.***class***.INSTDATA.***profile*

  This profile is used to control the authorization to change the installation data of a resource profile. Normally the owner of the profile and people with (group-)SPECIAL authorization are restricted. This profile implements further restrictions.

  The INSTDATA policy profile can also include a reference to the format required for the installation data. The name of the format can be specified by the APPLDATA of the best fitting policy profile. The name of the format is used to determine the appropriate (set of) format specification policy profiles. Format specification policy profiles (or short format profiles) are named like:

  ```
  C4R.class.INSTDATA.=FMT.format-name.POS(start:end)
  ```

  Multiple format profiles can be used to specify different parts of the installation data of the resource profile. For a complete description of the format profiles, see "Installation data field format restriction" on page 187.

  The access levels that can be used for this profile are given as follows.

  No profile found
  This control is not implemented. All RACF authorized users can change the installation data of resource profiles within their control.

  NONE
  Specifying installation data is not allowed and causes the command to fail. It applies to all commands that can be used to set or modify INSTDATA.

  READ Specifying installation data on the **ADDSD** and **RDEFINE** commands is allowed. Changing the value afterward by the **ALTDSD** or **RALTER** commands is not allowed.

  UPDATE
  Changing the installation data is allowed.

  CONTROL
  The control is not implemented for this terminal user. No restrictions are imposed.

  The optional value that is specified by **APPLDATA** is described as follows:

  format The name of the format that must be used for the installation data for the *profile*. The *format* name is used to locate the appropriate set of format profiles.

- **C4R.***class***.APPLDATA.***profile*

  This profile is used to control the authorization to change the application data of a resource profile. Normally the owner of the profile and people with (Group-)SPECIAL authorization are restricted. This profile implements further restrictions. The access levels that can be used for this profile are given as follows:

  No profile found
  This control is not implemented. All RACF authorized users can change the **APPLDATA** of resource profiles within their control.

  NONE
  Specifying installation data is not allowed and causes the command to fail. It applies both to **RDEFINE** and **RALTER**.

READ Specifying **APPLDATA** on the **RDEFINE** command is allowed. Changing the value afterward by the **RALTER** command is not allowed.

UPDATE
Changing the **APPLDATA** is allowed.

CONTROL
The control is not implemented for this terminal user. No restrictions are imposed.

- **C4R.***class.***SECLABEL.***seclabel.profile*

  This profile can be used to control assignment of Security Labels. Normally, RACF administrators can assign their own **SECLABEL** to resource profiles in their scope.

  No profile found
  This control is not implemented. Administrators with access to *seclabel* can assign it as the **SECLABEL** for resource profiles within their scope.

  NONE
  Assignment of the **SECLABEL** *seclabel* to *profile* is not allowed and causes the command to fail. It applies to all commands that can be used to set or modify the **SECLABEL**.

  READ System special users can assign *seclabel* to this resource profile.

  UPDATE
  Administrators with access to *seclabel* can assign this level to resource profiles within their scope.

  CONTROL
  The control is not implemented for this terminal user. No restrictions are imposed.

- **C4R.***class.***CATEGORY.***category.profile*

  This profile can be used to control assignment of security categories. Normally, RACF administrators can assign their own CATEGORY to resource profiles in their scope. Security categories can be used as extra method of preventing access to resources. Users must have at least all the security categories that are assigned to the resource. The current profile allows control over the assignment and removal of a CATEGORY to a resource profile.

  No profile found
  This control is not implemented. Administrators who are assigned *category* can assign and remove this CATEGORY to resource profiles within their scope.

  NONE
  Assignment and removal of the CATEGORY *category* to *profile* is not allowed and causes the command to fail. It applies to all commands that can be used to set or modify the categories.

  READ System-SPECIAL users can assign and remove the *category* to this *profile*.

  UPDATE
  Administrators who are assigned *category* can assign this level to resource profiles within their scope. They also have the authority to remove *category*.

  CONTROL
  The control is not implemented for this terminal user. No restrictions are imposed.

- **C4R.***class.***SECLEVEL.***seclevel.profile*

This profile can be used to control assignment of security levels. Normally, RACF administrators can assign **SECLEVEL**s up to their own **SECLEVEL** to resource profiles in their scope. Security levels can be used as extra method of preventing access to resources. Users must have at least the same security level as the assigned to the resource. The current profile allows control over the assignment of a **SECLEVEL**to a resource profile. Only the exact name of *seclevel* is used in the verification process. The corresponding value is not used. Also, assignment of another *seclevel* with a lower value is only controlled by the XFACILIT profile corresponding to that particular *seclevel*.

No profile found
This control is not implemented. Administrators who are assigned *seclevel* can assign this **SECLEVEL** to resource profiles within their scope.

NONE
Assignment of the **SECLEVEL** *seclevel* to *profile* is not allowed and causes the command to fail. It applies to all commands that can be used to set or modify the **SECLEVEL**.

READ System-SPECIAL users can assign *seclevel* to this *profile*.

UPDATE
Administrators who are assigned *seclevel* can assign this level to resource profiles within their scope.

CONTROL
The control is not implemented for this terminal user. No restrictions are imposed.

- **C4R.***class*.**LEVEL.***level.profile*

This profile can be used to control assignment of Levels. The resource profile level must not be confused with the **SECLEVEL**. The LEVEL value is not used by RACF for any purpose.

No profile found
This control is not implemented.

NONE
Assignment of the LEVEL *level* to *profile* is not allowed and causes the command to fail.

READ Same as NONE.

UPDATE
Assignment of this LEVEL to the resource profile is allowed.

CONTROL
The control is not implemented for this terminal user. No restrictions are imposed.

- **C4R.***class*.**ATTR.WHEN.***profile*

This single policy profile controls both the setting of the WHEN(DAYS) and the WHEN(TIME) specification for the TERMINALs. These two options control which days of the week, and which hours of the day, the TERMINAL can be used.

No profile found
This control is not implemented. WHEN(DAYS) and WHEN(TIME) can be specified.

NONE
Specification of LOGON restrictions is not allowed.

READ Same as NONE.

UPDATE
Specification and removal of `LOGON` restrictions is allowed.

CONTROL
The control is not implemented for this terminal user. No restrictions are imposed.

- **C4R.***class.***RETPD.***profile*

  This policy profile controls the setting of the `RETPD` of tape data sets.

  No profile found
  This control is not implemented. The `RETPD` can be set and modified.

  NONE
  The retention period cannot be set or changed. It does not prevent setting of the RACF retention period that is based on the presence and value of JCL parameters.

  READ Same as NONE.

  UPDATE
  Specification and removal of tape data set `RETPD` is allowed.

  CONTROL
  The control is not implemented for this terminal user. No restrictions are imposed.

- **C4R.***class.***ATTR.TIMEZONE.***profile*
- **C4R.***class.***ATTR.SINGLEDSN.***profile*
- **C4R.***class.***ATTR.TVTOC.***profile*
- **C4R.***class.***ATTR.ERASE.***profile*

  The above four attribute related policy rules have the same access rules. The possible UACC and ACL values are described as follows:

  No profile found
  This control is not implemented.

  NONE
  The terminal user is not authorized to specify either keyword on the **`ADDSD`** and **`RDEFINE`** commands. The no-attribute keyword is allowed on these commands.

  READ Same as NONE

  UPDATE
  The terminal user is authorized to set and remove the attributes through the **`ALTDSD`**, **`RALTER`**, **`ADDSD`**, and **`RDEFINE`** commands. It allows regular maintenance of these attributes.

  CONTROL
  The control is not implemented for the terminal user. It allows regular maintenance of these attributes.

Installation data field format restriction

All RACF profiles provide a field that is reserved for installation usage. Many organizations use that installation data field for various purposes. RACF does not suggest any particular usage for this installation data field. Within the industry, there is also no real standard for usage of the installation data field. The only industry-wide consensus seems to exist for group profiles, where the installation data describes in text how the group is used like HLQ of particular application or access for certain jobs to certain applications.

RACF considers the installation data field as just a variable length text string. The only restriction for the RACF commands is the length of the field (maximum of 255 characters) and automatic uppercase translation for lowercase alphabetic characters. However, organizations might want to use certain positions in the installation data field for specific purposes. zSecure Command Verifier supports the enforcement of restrictions on the format of the installation data field. It is implemented by the definition of a named set of format rule policy profiles. These profiles are named like:

```
C4R.class.INSTDATA.=FMT.format-name.POS(start:end)
```

The *format-name* is specified by the APPLDATA of the policy profile that controls the authorization to manage the installation data (the INSTDATA policy profile) of the target profile in class *class*. For instance, the INSTDATA profile for *IBMUSER*, owned by *SYS1.* might be:

```
C4R.USER.INSTDATA.SYS1.IBMUSER
      Appldata('SYS1FMT')
```

In this example, the *format-name* is **SYS1FMT**. The format profiles for IBMUSER can then be:

```
C4R.USER.INSTDATA.=FMT.SYS1FMT.POS(start:end)
```

Multiple format profiles can be defined to specify the formats for different parts of the installation data field. The parts are indicated by the *start* and *end* positions. The format specifications for user IDs, GROUPs, and resource profiles must all be specified independently. In the absence of any profile for a certain resource class, it is also possible to use generic policy profiles for the INSTDATA format. The only generic profile that is supported is of the form:

```
C4R.*.INSTDATA.=FMT.format-name.POS(start:end)
```

The resource *class* can be replaced by an asterisk. It is not possible to specify partial generics for the resource class. If any format profile is defined for a particular resource class, all generic format profiles are ignored.

The zSecure Command Verifier policy profiles for the format are designed in a hierarchical way:

- The following sample is the structure of the top policy profile.

  ```
  C4R.class.INSTDATA.profile
  ```

  The top policy profile specifies the access that the user must have with the INSTDATA, and also specifies in the APPLDATA the format name (*format-name*) that is used to locate the FORMAT policies.
- The next level of policy profiles forms the set of FORMAT policies. You can specify up to 10 FORMAT profiles. These profiles are structured as:

  ```
  C4R.class.INSTDATA.=FMT.format-name.POS(start:end)
  ```

  These profiles specify the format rules and the access of the user to these format rules. The format rules are included as part of the APPLDATA of the FORMAT policy profiles.
- The format rules are specified as a list of comma-separated values without any additional blanks.

  ```
  'NB,ALPHA'
  'NB,LIST(EXPIRED,DELETE,STARTED)'
  ```

The possible format rules are described in "Format rules" on page 191. The following format rules are currently implemented format rules.

```
NB, NC, ALPHA, NUM, ALPHANUM, PICT, LIST, LISTX, =USERID, =GROUP
```

- Some of the format rules require more specification between parentheses. These formats are `PICT`(*picture-string*), `LIST`(*list-of-strings*), and `LISTX`(*list-of-strings*). These rules are documented in the following sections.

The profiles that are involved are summarized in the following two tables. The following sections describe the required access to these profiles and possible values for the *Format-Rules*.

Table 46. Profiles used for INSTDATA verification. The profiles in this table describe the authority to manage the `INSTDATA`, and are used to identify the `INSTDATA` format profile.

Class	Profile	Appldata
USER	**C4R.USER.INSTDATA.***owner.userid*	*Format-Name*
GROUP	**C4R.GROUP.INSTDATA.***owner.group*	*Format-Name*
DATASET	**C4R.DATASET.INSTDATA.***hlq.rest-of-profile*	*Format-Name*
class	**C4R.***class***.INSTDATA.***profile*	*Format-Name*

The next table describes the policy profiles that are used for the format rules. These profiles are called format profiles. The `APPLDATA` of these profiles is used to specify the format rules.

Table 47. Profiles used for INSTDATA verification. The profiles in this table describe the `INSTDATA` format profile. The `APPLDATA` is used to describe the format rules.

Class	Profile	Appldata
class	**C4R.***class***.INSTDATA.=FMT.***format-name***.POS(***start***:***end***)**	*Format-Rule*
class	**C4R.*.INSTDATA.=FMT.***format-name.***POS(***start***:***end***)**	*Format-Rule*

INSTDATA policy profiles

The starting point is the profile that is used to control a change of the `INSTDATA`. This same profile is used to locate the applicable `INSTDATA`format descriptions.

- **C4R.***class.***INSTDATA.***profile*

  This profile is used to control the authorization to change the installation data of a resource profile. Normally it is already restricted to the owner of the profile, and people with `(group-)SPECIAL` authorization. This profile implements further restrictions. The access levels that can be used for the `INSTDATA` profile are given as follows.

  No profile found
  : This control is not implemented. All RACF authorized users can change the installation data of users within their control.

  NONE
  : Specifying installation data is not allowed and causes the command to fail. The **APPLDATA** field is not used, since the `INSTDATA` modification is not allowed.

  READ
  : Specifying installation data on the add and define commands, like **`ADDUSER`** and **`RDEFINE`**, is allowed. Changing the value afterward through

the alter commands, like `ALTUSER` and `RALTER`, is not allowed. The Format-Name that is specified by the **APPLDATA** is used to locate the applicable rules for the `INSTDATA`.

UPDATE
: Changing the installation data is allowed. The Format-Name that is specified by the **APPLDATA** is used to locate the applicable rules for the `INSTDATA`.

CONTROL
: The `INSTDATA` control is not implemented for this terminal user. However, the Format-Name that is specified by the **APPLDATA** is used to locate the applicable rules for the `INSTDATA`.

The optional value that is specified by **APPLDATA** is described as follows:

Format-Name
: The name of the format that must be used for the installation data for the *profile*. The *Format-Name* is used to locate the appropriate set of format profiles that describe the Format-Rules.

Format profiles

If the **APPLDATA** field of the preceding profile contains a nonblank value, zSecure Command Verifier tries to locate the format profiles. The sections of the `INSTDATA` are defined by the *start* and *end* variables in the format profiles.

The *start* to *end* range of the **INSTDATA** field as specified in one format profile can overlap with the field of other format profiles. In that case, the overlapping part must comply to both sets of format rules. Format profiles can contain multiple format rules. These rules must be specified as a list and separated by commas. The following is an example of such a combined format rule.

```
NB,NC,ALPHA,LISTX(EXPIRED)
```

This sample indicates that this portion of the installation data field must be specified (NB) and cannot be changed (NC). If the user is authorized to bypass the `NoChange` requirement, the field must be all alphabetic characters, and cannot be specified as the value **EXPIRED**.

- **C4R.***class***.INSTDATA.=FMT.***format-name.***POS(***start***:***end***)**

  This profile is used to describe the format of a part of the `INSTDATA`. The part is specified by *start* and *end* The *start* and *end* values must both be specified as three-digit numbers. The *end* value must be greater or equal than the *start* value, and must also be 255 or less. The *start* value must be 001 or greater. The access levels that are used for the format profile are given as follows.

  This profile is a discrete policy profile. It is possible to replace the *class* by a single generic asterisk. However, this generic profile is only used in complete absence of any matching format profile.

  NONE
  : The set of format rules applies to this terminal user. The new `INSTDATA` must comply with all format rules.

  READ
  : The set of format rules applies to this terminal user. When present, the NB format rule does not apply. All other format rules must be followed.

  UPDATE
  : The set of format rules applies to this terminal user. When present, the NB and NC format rules do not apply. All other format rules must be followed.

CONTROL
The set of format rules does not apply to this terminal user.

The **APPLDATA** describes the format rules that are applicable to the specific section of the INSTDATA.

Set of format rules
The format rules that describe allowable contents for this part of the INSTDATA. For a detailed description of the possible format rules, see the next section.

Format rules

Table 48 summarizes the available format rules that are recognized by zSecure Command Verifier. If a specified format rule is not listed in this table, the entire set of format rules that are specified in the format profile is ignored. Processing continues with the next format profile. Multiple format rules can be combined in the **APPLDATA** of one format profile. There is no test for logical consistency of the different format rules. For example, no specific error message is issued if the format rule specifies ALPHA, NUM, which would reject all possible characters.

Table 48. Format rules used for INSTDATA verification. The entries in this table contain the format rule and a description of the rule.

Format Rule	Description
NB	NonBlank. The specified part of the installation data field cannot consist of all blanks.
NC	NoChange. The current value of the specified part of the installation data cannot be modified.
ALPHA	Alphabetic. The specified part of the installation data field can contain only alphabetic characters or blanks.
NUM	Numerics. The specified part of the installation data field can contain only numeric characters or blanks.
ALPHANUM	Alphanumerics. The specified part of the installation data field can contain only alphabetic or numeric characters or blanks.
PICT(*picture-string***)**	Picture format. The specified part of the installation data field must match the *picture-string* format. See "Picture string format."
LIST(*list-of-strings***)**	List of allowed values for the specified part of the installation data field. See "List of strings format" on page 192.
LISTX(*list-of-strings***)**	List of values that are not allowed for the specified part of the installation data field. See "List of strings format" on page 192.
=USERID	Any valid RACF user ID.
=GROUP	Any valid RACF GROUP.

The PICT(*picture-string*), LIST(*list-of-strings*), and LISTX(*list-of-strings*) format rules require more specification between parentheses. These specifications are explained in the following sections.

Picture string format

For the PICT format rule, the *picture-string* specification is a single string of characters that describe possible values for each position in the INSTDATA. If the *picture-string* is shorter than the specified part of the installation data field, the remaining characters are not tested. If the *picture-string* is longer than the specified part of the installation data field, the extraneous characters are ignored.

The picture characters that can be specified are shown in Table 49.

Note: Currently, you cannot use a right parenthesis as a literal character in the *picture-string*. If your installation data uses a right parenthesis, you can revert to using a period as a pattern character for that position.

Table 49. PICTURE string characters used for format rules. The entries in this table describe the supported `PICTURE` string characters.

Picture	Description
#	Numeric character (0-9)
@	Alphabetic character (A-Z)
*****	Alphanumeric character (A-Z, 0-9)
$	Special character (@#$)
.	Anything. No verification that is done.
Other	Literal value. The installation data character must be identical to the picture-string character.

List of strings format

For `LIST` and `LISTX`, *list-of-strings* is a list of comma-separated strings. Each character, other than the comma and the parentheses, is significant. Each string is delimited by either a comma or the parenthesis at the beginning or end of the list. Each string can be at most 32 characters. If the string is shorter than the range specified by `POS`(*start:end*), the remaining characters in the `INSTDATA` must be blank. If the string is longer than the range specified by `POS`(*start:end*), the remainder is ignored. You do not need to explicitly specify an empty string as a possible LIST value because that is already controlled by the NB format rule.

The following example contains list-of-strings.

```
EXPIRED,DELETE,STARTED
```

Note in this example that the strings are of different length and contain no embedded blanks.

You can include blanks in the strings, even at the beginning or end of a string. For example, the following string list contains blanks in the beginning, middle, and end of a string. The double quotation marks are not part of the syntax; they are included in the example only to indicate the inclusion of a trailing blank character:

```
 "EXPIRED USERID, TO BE DELETED, STARTED TASK "
```

This example assumes that POS(*start:end*) specifies a total of at least 14 characters in the format profile. Otherwise, it would not make sense to specify each string as exactly 14 characters.

One possible use of the LIST format rule is to implement special rules for a single position. Currently, zSecure Command Verifier does not provide a format rule to specify vowels or consonants. You can specify alphabetics, numerics, alphanumerics, and national characters, but you cannot specify that you need vowels. However, you can implement such a requirement by specifying a single POS and by including the format rule that lists all allowed characters. For example:

```
C4R.OPERCMDS.INSTDATA.=FMT.OPER.POS(001:001)
APPLDATA('NB,LIST(A,E,I,O,U,Y)')
```

Using this same example, if you want to implement this format rule for two character positions, you must specify two different format policies:

```
C4R.OPERCMDS.INSTDATA.=FMT.OPER.POS(001:001)
APPLDATA('NB,LIST(A,E,I,O,U,Y)')

C4R.OPERCMDS.INSTDATA.=FMT.OPER.POS(002:002)
APPLDATA('NB,LIST(A,E,I,O,U,Y)')
```

You can also specify POS(001:002), but then you must list all 36 combinations of two vowels.

Because each format name can have at most 10 format policies, you can use this approach only for a limited number of character positions in the `INSTDATA` for the profile.

USS segment management functions

Using RACF FIELD profiles, it is possible to control which administrators are authorized to maintain segment information. The way RACF implements this step, can most accurately be described as a way to facilitate "product administrators". Many organizations expressed a desire to allow Group-Administrators to maintain their own users, across all products. RACF does not support such an implementation. “Profiles that manage non-base segments” on page 52 describes how zSecure Command Verifier implements a facility to restrict "product administrators" to profiles within their RACF Group-SPECIAL scope, effectively creating the "across-all-products" Group Administrators.

However, there are certain fields, especially in the USS environment, that must remain restricted to central administrators. The most important one is the USS UID that is assigned to users by the OMVS segment. UID(0) is equivalent to SuperUser authority in the USS environment. You do not want your decentralized Administrators to be able to assign UID(0) to any of their users.

Similarly, a GID of a GROUP is used in the access verification process for USS files. It therefore requires similar controls.

Table 50. Profiles used for verification of USS ID values. The entries in this table reflect the Class, Segment, and Field and the corresponding policy profiles.

Class	Segment	Field	Profile
USER	*OMVS*	*UID*	**C4R.USER.OMVS.UID.***uid.owner.userid*
USER	*OVM*	*UID*	**C4R.USER.OVM.UID.***uid.owner.userid*
GROUP	*OMVS*	*GID*	**C4R.GROUP.OMVS.GID.***gid.owner.group*
GROUP	*OVM*	*GID*	**C4R.GROUP.OVM.GID.***gid.owner.group*

The profiles in above table are used to describe the values for the `UID` and `GID` in the `OMVS` and `OVM` segments of USERIDs and GROUPs. The *uid* and *gid* must be specified as a 10-digit number. Generics can be used as well. The following example shows the profile that protects the assignment of `UID(0)` to any user.

```
C4R.USER.OMVS.UID.0000000000.**
```

If you wanted to allow UID(0) to be assigned to people in systems support, you might use a profile similar to

```
C4R.USER.OMVS.UID.0000000000.SYSSUP.*
```

Specifying the 10-digit zeros by an asterisk, indicating that all UIDs are open to people in system support, does not work. RACF treats the numeric characters as more specific, and use that profile instead of the asterisk profile. If you specified a second profile with a generic for the UID number, it would indicate that all other `UID`s are open to people in systems support. The terminal user that does the actual assignment needs access to the policy profile. Also, RACF authorization, like `System-SPECIAL` or `FIELD` profiles, is required.

- **C4R.USER.OMVS.UID.***uid.owner.userid*
- **C4R.USER.OVM.UID.***uid.owner.userid*
- **C4R.GROUP.OMVS.GID.***gid.owner.group*
- **C4R.GROUP.OVM.GID.***gid.owner.group*

  These profiles specify the authorization to set a specific *uid* for *userid* owned by *owner* The *UID* and *GID* must be specified as a 10 digit, zero padded, right-aligned number. It is also possible to use generics to allow/disallow management of certain ranges of *UID*s and *GID*s.

  No profile found
  : Control not implemented. Only RACF authorization is used to control assignment of USS ID values.

  NONE
  : The terminal user is not authorized to assign this `UID/GID` to the `USERID` or `GROUP`. This setting causes the command to fail.

  READ
  : Same as NONE.

  UPDATE
  : The value for the `UID/GID` is accepted. RACF authorization requirements can still cause failure of the command.

  CONTROL
  : Same as UPDATE.

STDATA segment management functions

Considering the sensitive nature of certain fields in the `STDATA` segment, several installations want to maintain control over the `STDATA` profiles, beyond the controls already provided by RACF. As mentioned before, RACF command authorization allows verification only on the field name itself, and not on its value. Using `Field Level Access Checking`, it is possible to restrict setting the `PRIVILEGED` flag to certain users, if the terminal user does not have the System-SPECIAL attributes. Profiles in the **FIELD** class are not checked for System-SPECIAL users.

Additionally, some installations want to restrict the assignment of certain values for the USER and GROUP in the `STDATA` segment.

More controls are provided by zSecure Command Verifier for the `STDATA` segment. These controls are in addition to the RACF requirements like System-SPECIAL or UPDATE access to the applicable profiles in the `FIELD` class. For instance, the zSecure Command Verifier policy profiles can be used to prevent the accidental assignment of the `PRIVILEGED` attribute by RACF administrators with System-SPECIAL.

Table 51. Profiles used for verification of STDATA values. The entries in this table reflect the Class, Segment, and Field and the corresponding policy profiles.

Class	Field	Profile
STARTED	**PRIVILEGED**	**C4R.STARTED.STDATA.ATTR.PRIVILEGED.***started-profile*
STARTED	**TRUSTED**	**C4R.STARTED.STDATA.ATTR.TRUSTED.***started-profile*
STARTED	**TRACE**	**C4R.STARTED.STDATA.ATTR.TRACE.***started-profile*
STARTED		**C4R.STARTED.STDATA.=USER.***started-profile*
STARTED		**C4R.STARTED.STDATA./USER.***started-profile*
STARTED	*userid*	**C4R.STARTED.STDATA.USER.***userid.started-profile*
STARTED	**NOUSER**	**C4R.STARTED.STDATA.USER.=NONE.***started-profile*
STARTED		**C4R.STARTED.STDATA.=GROUP.***started-profile*
STARTED		**C4R.STARTED.STDATA./GROUP.***started-profile*
STARTED	*group*	**C4R.STARTED.STDATA.GROUP.***group.started-profile*
STARTED	**NOGROUP**	**C4R.STARTED.STDATA.GROUP.=NONE.***started-profile*

The profiles in preceding table describe mandatory and default values for both the USER and the GROUP. They also describe the policies that verify whether the values for the keywords as entered by the terminal user are acceptable.

- **C4R.STARTED.STDATA.ATTR.PRIVILEGED.***started-profile*
- **C4R.STARTED.STDATA.ATTR.TRUSTED.***started-profile*
- **C4R.STARTED.STDATA.ATTR.TRACE.***started-profile*

  These profiles specify the authorization to set one of the attributes in the STDATA segment. The Privileged attribute results in passing most authorization checking. No installation exits are called, and no SMF records are written. It must be strictly controlled. The Trusted attribute is similar to the Privileged attribute, but SMF records can be written. The Trace attribute specifies that a record must be written to the console when the STARTED profile is used to assign an ID to a started task.

  No profile found
  Control not implemented. Only RACF authorization is used to control assignment of STDATA attributes.

  NONE
  The terminal user is not authorized to assign the attribute to this STARTED profile. The command is failed.

  READ Same as NONE.

  UPDATE
  The attribute setting is accepted. RACF authorization requirements can still cause failure of the command.

  CONTROL
  Same as UPDATE.

- **C4R.STARTED.STDATA.=USER.***started-profile*
- **C4R.STARTED.STDATA.=GROUP.***started-profile*

  These two Mandatory Value policy profiles can be used to assign a mandatory value for these **STDATA** fields. The mandatory value must be specified in the **APPLDATA** field of the policy profile. zSecure Command Verifier does not recognize any special values for the **APPLDATA**. This setting allows use of the value "=MEMBER" for the USER. This value is not substituted by zSecure Command Verifier but is used by RACF when the STARTED profile is used.

These Mandatory Value policy profiles are only used when you add an STDATA segment either through the **RDEFINE** or the **RALTER** command. When you change existing STDATA segments, the Mandatory Value policy profiles are not used. The USER or GROUP obtained from this Mandatory Value profile is not subject to more user-or group-related policy profiles. The USER or GROUP value that is obtained from this Mandatory Value profile is not subject to more user- or group-related policy profiles.

The qualifiers =USER and =GROUP in the policy profile cannot be covered by generic characters. They must be present in the exact form shown.

No profile found
: The policy is not implemented. As a result, no mandatory value is enforced.

NONE
: No action. No mandatory value is enforced.

READ
: The **APPLDATA** field is extracted and used for the command.

UPDATE
: Same as READ

CONTROL
: The policy profile is not active for the terminal user. No mandatory value is supplied. The value for the USER or GROUP as specified by the terminal user is used in the command.

Note: The access levels for this profile are not hierarchical. In general, zSecure Command Verifier policies do not apply to users that have CONTROL access or higher. Alternatively, access NONE indicates that the facility as described by the policy is not available to the terminal user. For the Mandatory Value policy profiles, the profiles lead to the odd situation that access NONE has the same net result as access CONTROL.

Currently, the following values for the **APPLDATA** are recognized:

BLANK
: This setting is used to indicate that no explicit ID must be inserted.

id
: Any other value is considered to be the *userid* or *group* that must be inserted in the STDATA segment. No verification is done to ensure that this value is a valid user ID or GROUP.

- **C4R.STARTED.STDATA./USER.***started-profile*
- **C4R.STARTED.STDATA./GROUP.***started-profile*

These two Default value profiles can be used to assign a Default value for these **STDATA** fields. The Default value must be specified in the **APPLDATA** field of the policy profile. zSecure Command Verifier does not recognize any special values for the **APPLDATA**. This setting allows use of the value "=MEMBER" for the USER. This value is not substituted by zSecure Command Verifier, but is used by RACF when the STARTED profile is used.

These Default value profiles are only used when you add an STDATA segment without a value for the USER or the GROUP, either through the **RDEFINE** or the **RALTER** command. When you change existing STDATA segments, the Default value policy profiles are not used. The USER or GROUP value that is obtained from this Default Value profile is not subject to more user- or group-related policy profiles.

The qualifiers /USER and /GROUP in the policy profile cannot be covered by generic characters. They must be present in the exact form shown.

No profile found
: The policy is not implemented. No default value is provided.

NONE
: No action. No default value is provided.

READ
: The **APPLDATA** field is extracted and used for the command.

UPDATE
: Same as READ

CONTROL
: The policy profile is not active for the terminal user. No default value is provided.

Note: The access levels for this profile are not hierarchical. In general, zSecure Command Verifier policies do not apply to users that have CONTROL access or higher. Alternatively, access NONE indicates that the facility as described by the policy is not available to the terminal user. For the Default Value profiles, these profiles lead to the odd situation that access NONE has the same net result as access CONTROL.

Currently, the following values for the **APPLDATA** are recognized:

BLANK
: This setting is used to indicate that no explicit ID must be inserted.

id
: Any other value is considered to be the *userid* or *group* that must be inserted in the STDATA segment. No verification is done to ensure that this value is a valid user ID or GROUP.

- **C4R.STARTED.STDATA.USER.***userid.started-profile*
- **C4R.STARTED.STDATA.USER.=NONE.***started-profile*

This policy profile specifies valid values for the *userid* for the *started-profile*. The special value =NONE is used when the terminal user specified the NOUSER keyword for the STDATA segment. This special value can be covered by a generic pattern. This setting allows treating the removal of the user assignment from the same policy profile as setting the user to a value. The following access levels are used.

No profile found
: The policy is not implemented. The user specified value is accepted.

NONE
: The specified USER is not allowed. The command is failed.

READ
: Same as NONE

UPDATE
: The specified value for the USER is accepted

CONTROL
: Same as UPDATE

- **C4R.STARTED.STDATA.GROUP.***group.started-profile*
- **C4R.STARTED.STDATA.GROUP.=NONE.***started-profile*

This policy profile specifies valid values for the *group* for the *started-profile*. The special value =NONE is used when the terminal user specified the NOGROUP keyword for the STDATA segment. This special value can be covered by a generic pattern. This setting allows treating the removal of the group assignment from the same policy profile as setting the group to a value. The following access levels are used.

No profile found
: The policy is not implemented. The user specified value is accepted.

NONE
: The specified GROUP is not allowed. The command is failed.

READ Same as NONE

UPDATE
: The specified value for the GROUP is accepted

CONTROL
: Same as UPDATE

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