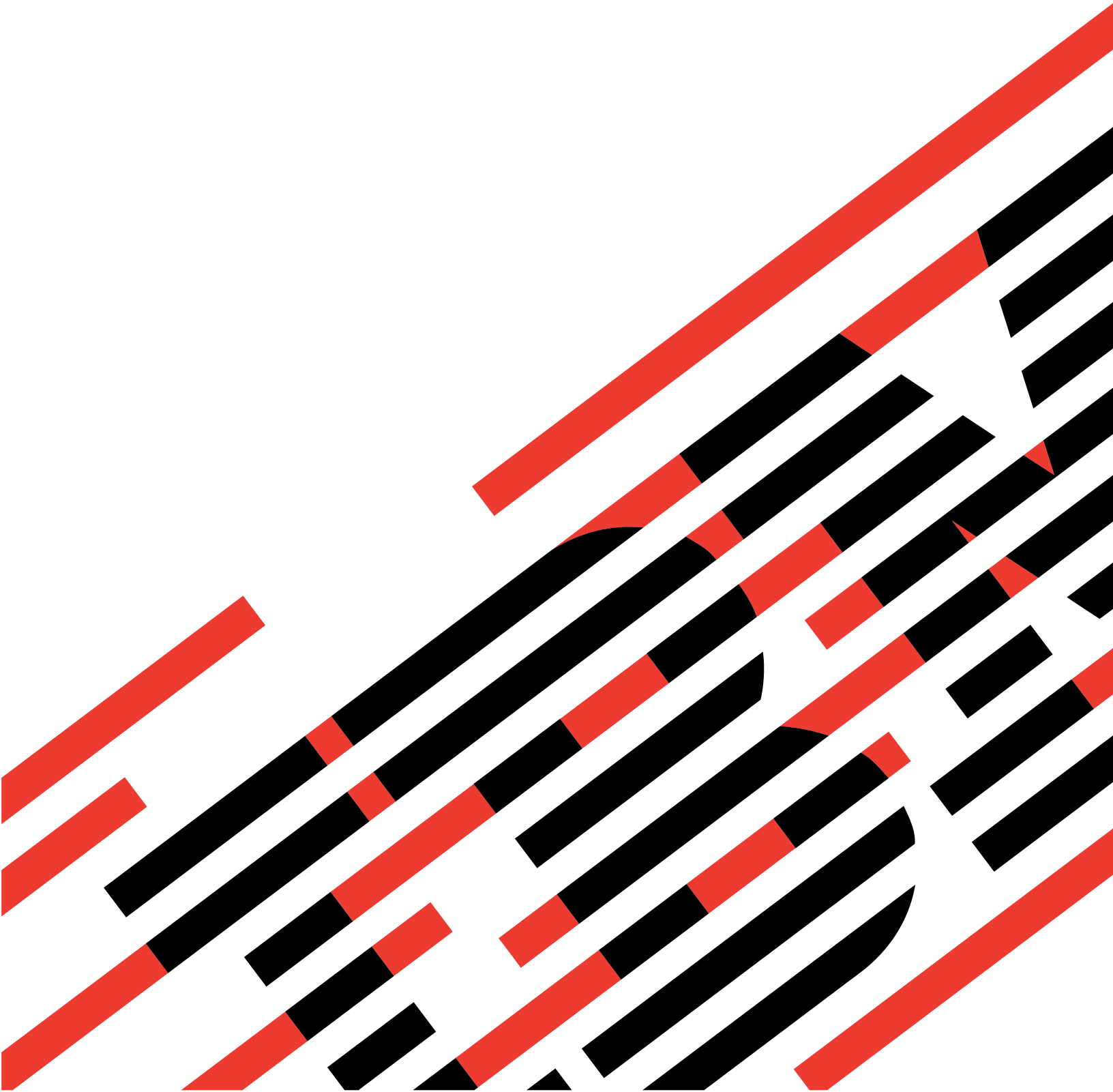
IBM

System z9 109 and @server® zSeries 890 and 990
CHPID Mapping Tool User's Guide

GC28-6825-02



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Note

Before using this information and the product it supports, be sure to read the information under "Safety and Environmental Notices" on page v and Appendix B, "Notices," on page 53.

Third Edition (August 2005)

This edition, GC28-6825-02, applies to IBM® System z9™ 109 and zSeries® 890 and 990 processors. This edition replaces GC28-6825-01. A technical change to the text or illustration is indicated by a vertical line to the left of the change.

There may be a newer version of this document in PDF format available on **Resource Link™**. Go to *http://www.ibm.com/servers/resourcelink* and click on **Library** on the navigation bar. A newer version is indicated by a lower-case, alphabetic letter following the form number suffix (for example: 00a, 00b, 01a, 01b).

Contents

Safety and Environmental Notices

Safety Notices

Safety notices may be printed throughout this guide. **DANGER** notices warn you of conditions or procedures that can result in death or severe personal injury. **CAUTION** notices warn you of conditions or procedures that can cause personal injury that is neither lethal nor extremely hazardous. **Attention** notices warn you of conditions or procedures that can cause damage to machines, equipment, or programs.

There are no **DANGER** notices in this guide.

World Trade Safety Information

Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, a safety information booklet is included in the publications package shipped with the product. The booklet contains the safety information in your national language with references to the US English source. Before using a US English publication to install, operate, or service this IBM product, you must first become familiar with the related safety information in the booklet. You should also refer to the booklet any time you do not clearly understand any safety information in the US English publications.

Laser Safety Information

All System z9 and zSeries models can use I/O cards such as PCI adapters, ESCON, FICON, Open Systems Adapter (OSA), InterSystem Coupling-3 (ISC-3), or other I/O features which are fiber optic based and utilize lasers or LEDs.

Laser Compliance

All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with IEC 60825 as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

CAUTION:
Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than Class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. (C027)

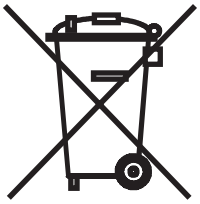
CAUTION:
This product contains a Class 1M laser. Do not view directly with optical instruments. (C028)

Environmental Notices

Product Recycling and Disposal

This unit must be recycled or discarded according to applicable local and national regulations. IBM encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. IBM offers a variety of product return programs and services in several countries to assist

equipment owners in recycling their IT products. Information on IBM product recycling offerings can be found on IBM's Internet site at *http://www.ibm.com/ibm/environment/products/prp.shtml*.



Notice: This mark applies only to countries within the European Union (EU) and Norway.

Appliances are labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.

In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the WEEE Directive, as shown above, must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE. For proper collection and treatment, contact your local IBM representative.

注意: このマークは EU 諸国およびノルウェーにおいてのみ適用されます。

この機器には、EU 諸国に対する廃電気電子機器指令 2002/96/EC(WEEE) のラベルが貼られています。この指令は、EU 諸国に適用する使用済み機器の回収とリサイクルの骨子を定めています。このラベルは、使用済みになった時に指令に従って適正な処理をする必要があることを知らせるために種々の製品に貼られています。

Remarque : Cette marque s'applique uniquement aux pays de l'Union Européenne et à la Norvège.

L'étiquette du système respecte la Directive européenne 2002/96/EC en matière de Déchets des Equipements Electriques et Electroniques (DEEE), qui détermine les dispositions de retour et de recyclage applicables aux systèmes utilisés à travers l'Union européenne. Conformément à la directive, ladite étiquette précise que le produit sur lequel elle est apposée ne doit pas être jeté mais être récupéré en fin de vie.

Refrigeration

These systems contain a modular refrigeration unit with R-134A refrigerant and a polyol ester oil. This refrigerant must not be released or vented to the atmosphere. Skin contact with refrigerant may cause frostbite. Wear appropriate eye and skin protection. Modular refrigeration units are sealed and must not be opened or maintained.

Battery Return Program

This product may contain sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery(s). Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries outside the United States, go to *http://www.ibm.com/ibm/environment/products/batteryrecycle.shtml* or contact your local waste disposal facility.

In the United States, IBM has established a return process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and other battery packs from IBM Equipment. For information on proper disposal of these batteries, contact IBM at 1-800-426-4333. Please have the IBM part number listed on the battery available prior to your call.

In Taiwan, the following applies:

Please recycle batteries 廢電池請回收

IBM Cryptographic Coprocessor Card Return Program

This machine may contain an optional feature, the cryptographic coprocessor card, which includes a polyurethane material that contains mercury. Please follow Local Ordinances or regulations for disposal of this card. IBM has established a return program for certain IBM Cryptographic Coprocessor Cards. More information can be found at *http://www.ibm.com/ibm/environment/products/prp.shtml*.

برنامج ارجاع كرت IBM Cryptographic Coprocessor

هــذه الماكيــنة قد تحتــوي على خاصــية اختيارية، وهى كــارت
Cryptographic Coprocessor
والتي تحتــوي على مـــادة بولــييوريثيـــن التي تحتــوي على الزئبــق
رجـــــاء اتبــاع القوانيــن أو التعليمــات المحــلية للتخــلص من هــذا الكـــارت .
قامــت شركة IBM باعداد برنامج لارجاع بعض كــروت IBM Cryptographic
Coprocessor

لمزيد من المعلومات، رجاء زيارة الموقع
http://www.ibm.com/ibm/environment/products/prp.shtml

Cable Warning

WARNING: Handling the cord on this product or cords associated with accessories sold with this product, will expose you to lead, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm. ***Wash hands after handling.***

Preface

This guide is intended to help users of the CHPID Mapping Tool to obtain and learn to use the tool for availability mapping.

This guide is available in portable document format (PDF) to view or print from Resource Link (at http://www.ibm.com/servers/resourcelink). This guide is also available from within the CHPID Mapping Tool itself under the **Help** menu. For more information, see "Help" on page 24.

How to Use this Guide

This guide includes the following:

- Chapter 1, "Overview" describes the uses of the CHPID Mapping Tool and explains its requirements.
- Chapter 2, "Obtaining the CHPID Mapping Tool and CFReport Order File," on page 5 lists the steps for downloading the CHPID Mapping Tool (or an update) and the CFReport Order file from Resource Link. You need a valid Configuration Control Number (CCN) to download the latter.
- Chapter 3, "Starting the Tool and Importing CFReport Order and IOCP Files," on page 9 explains how to start the CHPID Mapping Tool and describes its menu items. This chapter lists the steps for importing your CFReport Order file and IOCP file.
- Chapter 4, "Manual Mapping," on page 25 explains the columns in the CHPID Mapping Tool and how to use the manual mapping method.
- Chapter 5, "Availability Mapping: Strategies and Guidelines for Deciding the Priorities," on page 31 explains how to determine priorities for availability mapping.
- Chapter 6, "Availability Mapping: Performing the Steps," on page 35 lists the steps to perform availability mapping.
- Chapter 7, "Reports," on page 43 lists the steps to create reports.
- Chapter 8, "Troubleshooting/Support," on page 47 provides troubleshooting information and the answers to frequently asked questions.

Figures included in this document illustrate concepts and are not necessarily accurate in content, appearance, or specific behavior.

Hypertext links are available to you throughout the online document. Hypertext links look like the following: Chapter 1, "Overview." Click the link to go to the section of the document called "Overview."

How to Send Your Comments

Your feedback is important in helping to provide the most accurate and high-quality information. Send your comments by using Resource Link at *http://www.ibm.com/servers/resourcelink*. Select **Feedback** on the Navigation bar on the left. Be sure to include the name of the book, the form number of the book, the version of the book, if applicable, and the specific location of the text you are commenting on (for example, a page number or table number).

Summary of Changes

The following is a list of changes:

- You can download your CFReport Order file (instead of your hardware configuration file) on Resource Link. See “Obtaining the CFReport Order File” on page 6.

  In the CHPID Mapping Tool, actions under **File** include **Import H/W Config from file** and **Import CFReport Order file**. This user’s guide describes how to import your CFReport File rather than the hardware configuration file. The **Import H/W Config from file** action may be removed in the future.
- For an upgrade or MES to a System z9 109 (z9-109), configuration files (config files) can be referenced in several situations:
  - If you imported your CFReport Order file, when you import your IOCP file, you may see the **CHPIDs assigned by CMT for config files** window (see Step 3 on page 12).
  - When IOCP loads, you may see “Config File” in the **Source** column (see “Explanation of the Columns in the CHPID Mapping Tool” on page 25).
  - When you are assigning priorities for availability mapping and the Reset CHPID Assignment window is displayed, the **Reset CHPIDs assigned by CMT for config files** choice may be included (see Step 4 on page 38).

  An appendix has been added to provide comprehensive information about configuration files. See Appendix A, “An Explanation of Configuration Files,” on page 49.
- For the z9-109, in the Manual panel, the second column heading is **Book/Fanout Slot/Jack**. For the z990 and z890, it is **Book/Jack/MBA**. (Each fanout represents an MBA.) For more information, see “Explanation of the Columns in the CHPID Mapping Tool” on page 25.

  For the z9-109 the first column heading in the CHPID Report is also changed. See Figure 50 on page 45.
- Previously, if a control unit was not assigned a priority, its priority was determined solely by the default priority of its control unit number. Now the default priority for a control unit not assigned a priority is determined by the number of paths it has, then its control number. For more information, see Note 1b on page 36.

Chapter 1. Overview

This chapter describes the CHPID Mapping Tool and its requirements.

Overview of the CHPID Mapping Tool

The CHPID Mapping Tool maps your hardware's I/O ports to the CHPID definitions in your IOCP source statements. This helps to avoid connecting critical paths to single-points-of-failure. The CHPID mapping tool can save you time by minimizing or eliminating changes when you get new hardware or upgrade existing hardware.

You can use the CHPID Mapping Tool for all new build IBM System z9 109 (z9-109) hardware, for upgrades from a z990 processor to a z9-109 processor, or for z990 or z890. It can also be used for making changes to an already installed machine after hardware upgrades increase the number of STI links or channels.

No default CHPIDs are assigned to ports of z9-109, z990, or z890 processors. CHPIDs are assigned in the IOCP source file and mapped to the physical channel paths (PCHIDs). Using the CHPID mapping tool helps with these assignments. When the resulting IOCDS is loaded during activation of the CPC hardware, the CHPID to PCHID assignments become part of the configuration.

Using the CHPID Mapping Tool:

- The existing IOCP definitions for CHPID assignments to control units can be maintained. This minimizes any changes that might need to be made to in-house documentation, cable labels, as well as changes to the HCD definitions.
- You can implement a numbering scheme for associating different device types to ranges of CHPID addresses. For example, you might want to have all DASD devices within a certain CHPID range.
- All of the existing control units and wiring can be maintained.

For purposes of this document, consider a CHPID assignment as a logical value that will be associated with a physical entity that is called a PCHID. A PCHID can be a specific port on an ESCON® card, OSA-Express card, FICON® card, ICB, ISC link, and so forth. A CHPID will merely be an arbitrary number defined within the IOCP. The mapping tool relates that logical assignment to a PCHID location in the machine.

Requirements

Before using the tool, there are certain requirements that must be satisfied.

- ***Resource Link ID***

  Before using the tool, the user must have a valid user ID and password for Resource Link. The URL for Resource Link is:

  www.ibm.com/servers/resourcelink

  An option on the Resource Link Sign-in window allows you to obtain a user ID and password.

  After you obtain a Resource Link ID, you can download the CHPID Mapping Tool (or upgrades to the tool).
- **Configuration Control Number (CCN) for the new processor**

  When the machine to be mapped is configured and sent to the manufacturing database from the IBM configurator (e-config), a CCN is associated with the

configuration. You can download your CFReport Order file from the Resource Link Web site by identifying your order with the CCN. The CCN appears on the output listing of the configurator. Ask your IBM representative to verify that you have the latest CCN associated with the machine order.

Alternately your IBM representative can provide you with the CFReport that is generated by e-config and can be used by the CHPID Mapping Tool.

- ***IOCP Source Input***

  A validated IOCP source input must be provided. There are two ways to get a validated IOCP source input.

  – Use the function in HCD to generate IOCP source from a "validated work" IODF. "Validated work" IODF is the stage of IODF where all logical definitions (channel subsystems, logical partitions, CHPIDs, control units and devices) are in place except PCHID definitions. At this stage HCD allows you to generate IOCP statements that can be transferred to a PC as an ASCII text file for use in the CHPID Mapping Tool. After PCHIDs have been mapped to the CHPIDs using the tool, the same IOCP source must be migrated back into HCD.

    Attention: You cannot put the output of the CHPID Mapping Tool directly into IOCP. You must migrate it back into HCD.

    If you generate IOCP statements from HCD, no manual editing of the file should be done. Editing this file may prevent it from being re-imported back into the "validated work" IODF.

  – Create an IOCP source manually and validate it using the ICP IOCP with an execution parameter of WRTCDS=NO and the correct SYSTEM= *value* for the target machine. For example, use `SYSTEM=2094` for a z9-109.

  Some factors must be considered regarding this IOCP source file:

  – This file must represent the configuration of the machine that is on order. For example, if the current machine has parallel channels and the new machine does not, then the IOCP needs to be changed to remove the parallel channel definitions.

  – Do not include in the IOCP source file CHPIDs that might be added later as part of concurrent feature adds. The mapping tool tries to find a home on the machine for every CHPID defined in the IOCP. If there are definitions for CHPIDs that will be added at a later time, the tool will not be able to determine that from the source file.

  – The IOCP input must be generated by a level of HCD that supports the z9-109, z990, or z890. All of the channels to be used on the z9-109, z990, or z890 must be defined, and the associated control unit statements must be included and CHPID types accurately defined (for example, OSA-Express have different CHPID types).

  – The IOCP source input should be validated by HCD or IOCP for the correct target machine. A manually generated source file might have errors associated with it that would be invalidated by IOCP. The mapping tool does not do any extensive validation of the source file. The file is presumed to be correct by IOCP standards.

  – The tool does not consider logical partitions (that is, which CHPIDs are assigned to which LPs), switch configurations, or control unit availability characteristics. For these reasons the tool results may not be acceptable for all users. While helpful for many, it cannot replace an expert system programmer.

After mapping CHPIDs and exporting the updated IOCP file from the CHPID Mapping Tool, you must import the file back into the same “validated work IODF” from which it was generated.

- ***Standalone Application and System Requirements***

  The CHPID Mapping Tool requires:

  – Microsoft® Windows® operating system
  – 30 MB hard disk space
  – A display resolution of at least 1024x768
  – 128MB of system memory.

Chapter 2. Obtaining the CHPID Mapping Tool and CFReport Order File

This chapter explains how to download the CHPID Mapping Tool and the CFReport Order File. You need to have the correct Configuration Control Number (CCN) to download this file. For other requirements, see “Requirements” on page 1.

Download the CHPID Mapping Tool (or an Upgraded Version)

Perform the following steps to download the CHPID Mapping Tool (or an upgraded version).

1. Log onto Resource Link.
2. Click **Tools** on the left navigation bar.
3. In the list of tools in the next (Tools) window, click **CHPID Mapping Tool**. This displays the following window (Figure 1):

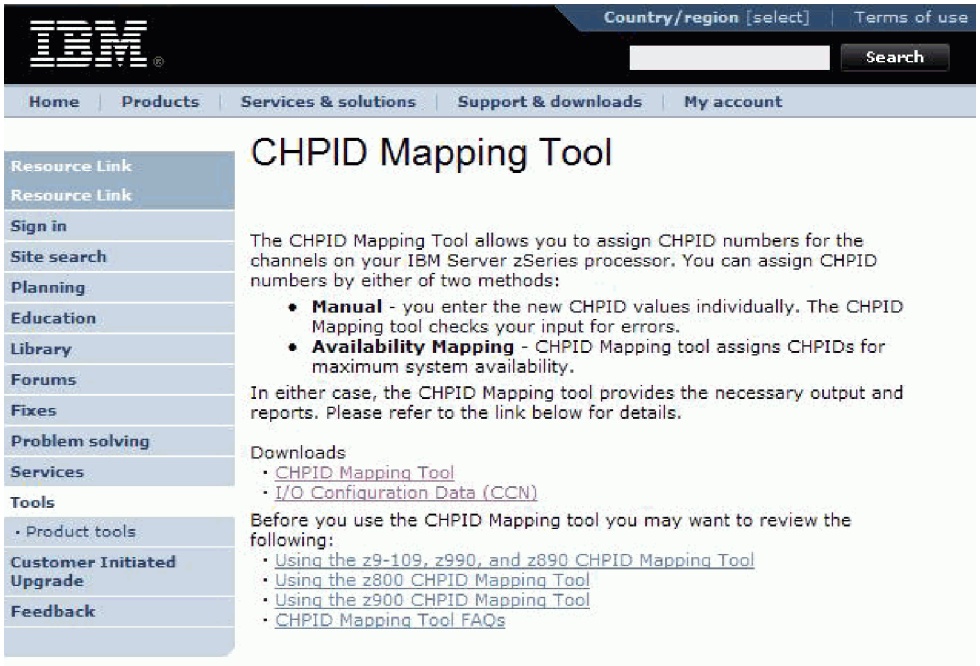


Figure 1. Starting Point: The CHPID Mapping Tool Window

From this window, you can download the CHPID Mapping Tool or the CFReport Order file (with a valid CCN) or access an education module or frequently asked questions (FAQ).

4. Click **CHPID Mapping Tool** to display the next window (in Figure 2 on page 6):

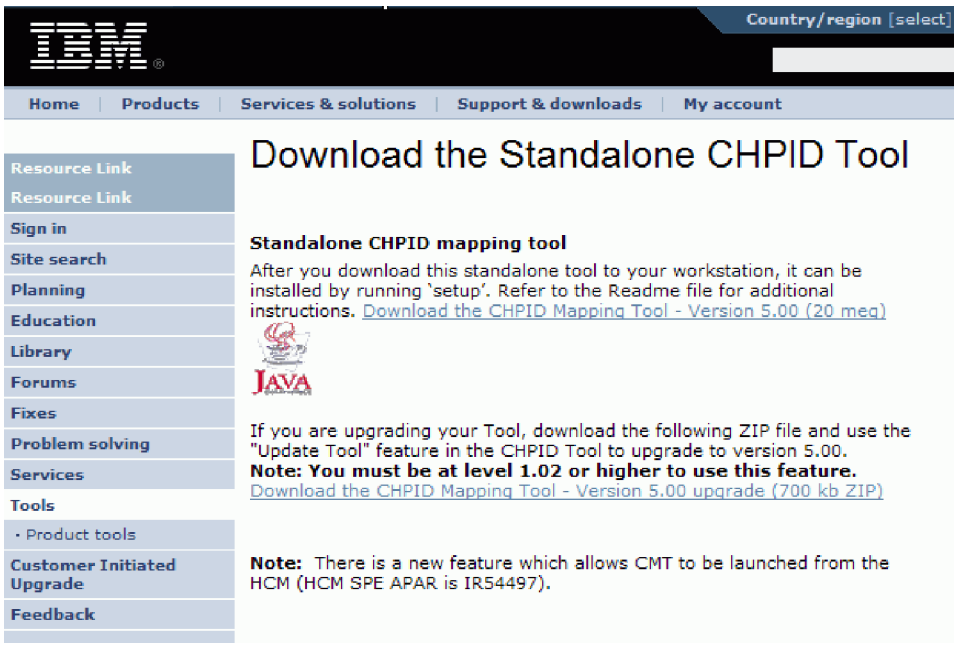


Figure 2. Download the Standalone CHPID Tool Window

From this window you can:

- Obtain the installer for the tool
- Obtain an upgrade to your existing level of the tool.

5. Click the appropriate link to download the tool for the first time or upgrade your version. A license window is displayed.

   Note: When you download the code for the tool, a record of your user ID is created. You are notified of any time-critical updates you need to obtain. However, when you need to map a new machine, it is a good idea to log onto Resource Link to see if a newer version of the tool is available.

6. Review the terms of the license, and click **I agree** to continue (or **I disagree** to end the process).
7. This begins the process of downloading the CHPID Mapping Tool.

Obtaining the CFReport Order File

The CHPID Mapping Tool uses the CFReport Order File. Your IBM representative can provide you with a softcopy of this file, which e-config generates. Alternately, you can download a copy of your CFReport Order File on Resource Link.

Before you begin: To obtain the CFReport Order File, you need to know your CCN. This is an 8-digit number that is the unique identifier for the ordered machine. It is critical that you verify with the IBM representative that you have the correct number.

Perform the following steps to obtain the CFReport Order file:

1. Log on to Resource Link if you are not already logged on to it.
2. Click **Tools** on the left-hand navigation.
3. In the list of tools in the Tools window, click **CHPID Mapping Tool**. This displays the CHPID Mapping Tool window (Figure 3 on page 7):

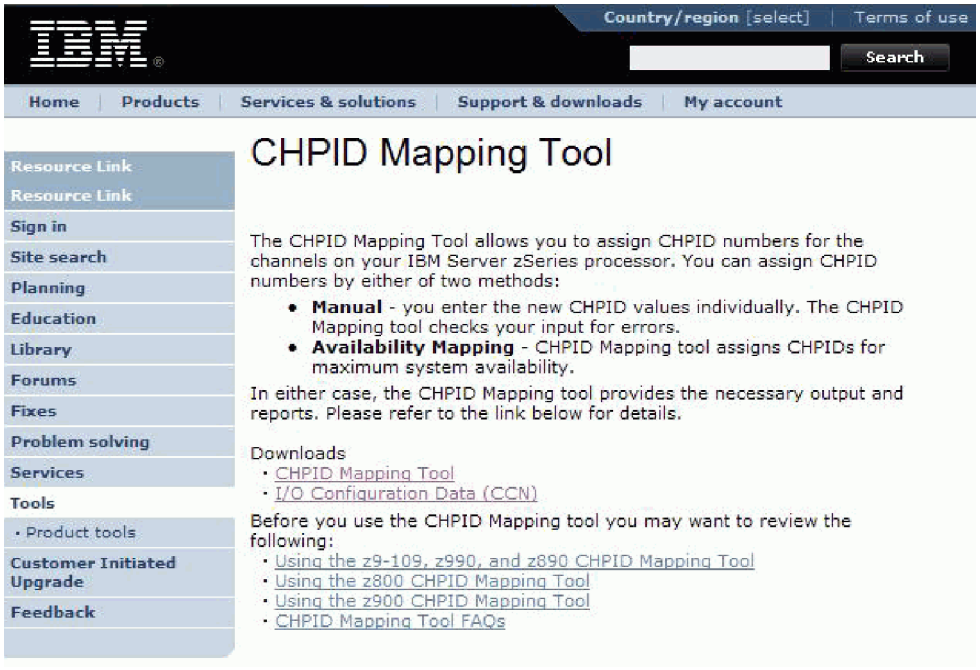


Figure 3. The CHPID Mapping Tool Window

4. Click **I/O Configuration Data (CCN)**. This displays the **CFReport Download** window (see Figure 4).

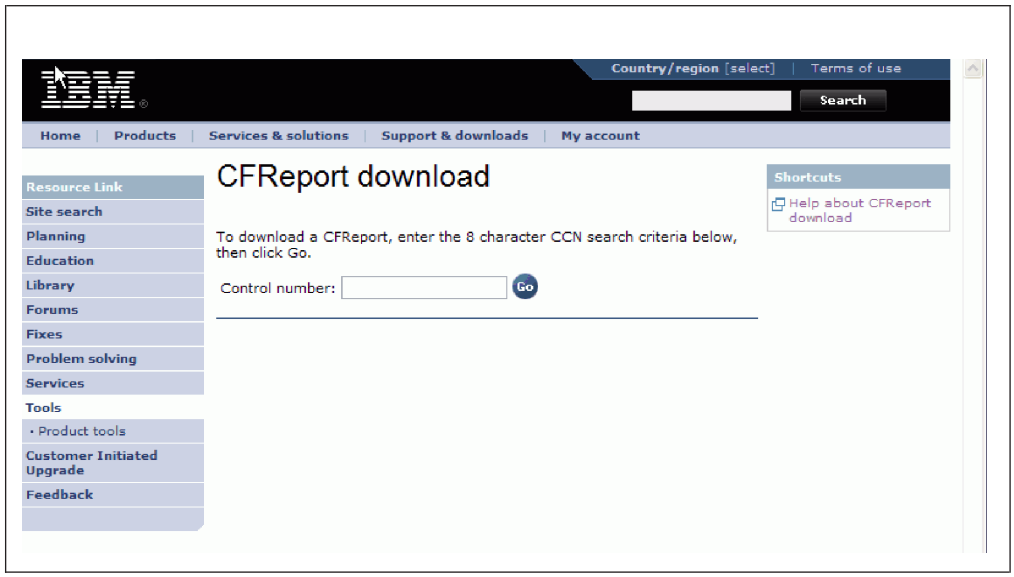


Figure 4. CFReport Download Window

5. Enter the CCN in the **Control number** field, and click **Go**.
6. If there are no problems, downloading begins.

   A File Download window is displayed, followed by a Save As window. These allow you to specify the location to save the file and so forth. The extension for this file should always be ".cfr." You can use any name you want for the high-order name but are recommended not to change it. When the file is downloaded from Resource Link, the name is <*CCN*>.cfr.

7. If there are problems with the CCN, an error message is displayed on the CFReport Download window under the **Control number** field:

   `Control number: control_number not found`

   One reason the CCN could be incorrect is that the processing of the order from the IBM configurator may not have completed. As part of the configuration process, the IBM representative running the configurator must send the order to the manufacturing database. You can click the **Help about CFReport download** link to display a window listing additional information. Figure 5 shows this.

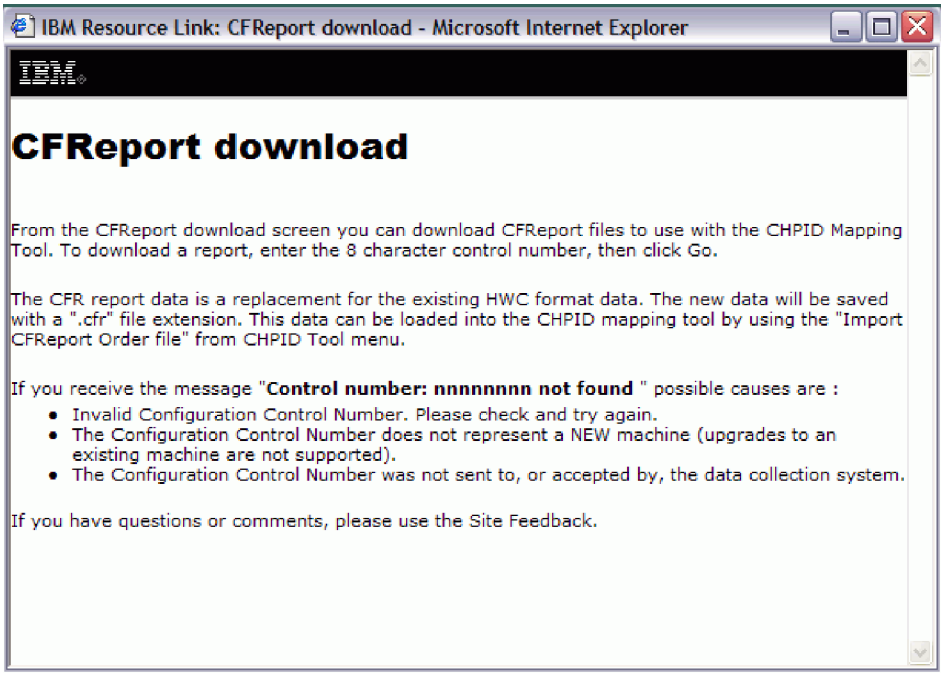


Figure 5. CFReport Download Help WIndow

   If you cannot readily figure out the problem, contact your IBM representative as soon as possible, or click **Feedback** in the left-hand navigation of Resource Link.

Chapter 3. Starting the Tool and Importing CFReport Order and IOCP Files

This chapter provides:

- Directions for starting the CHPID Mapping Tool
- Directions for importing your CFReport Order File
- Directions for loading your IOCP file and information about resolving CHPID definition problems
- A reference section for the menu items available in the tool.

Starting the Tool and Importing Your CFReport Order File

Before you begin: You must have already downloaded the CHPID Mapping Tool from Resource Link and obtained the CFReport Order file.

After you have downloaded and installed the CHPID Mapping Tool, the icon shown in Figure 6 should be present on the desktop.

Figure 6. CHPID Mapping Tool Icon

If you are updating the CHPID Mapping Tool, see “Updating the Tool” on page 17. Otherwise, perform the following steps:

1. Double-click this icon to open the CHPID Mapping Tool.

   If this is the first time you have used the CHPID Mapping Tool, starting it displays a window like that shown in Figure 7 on page 10:

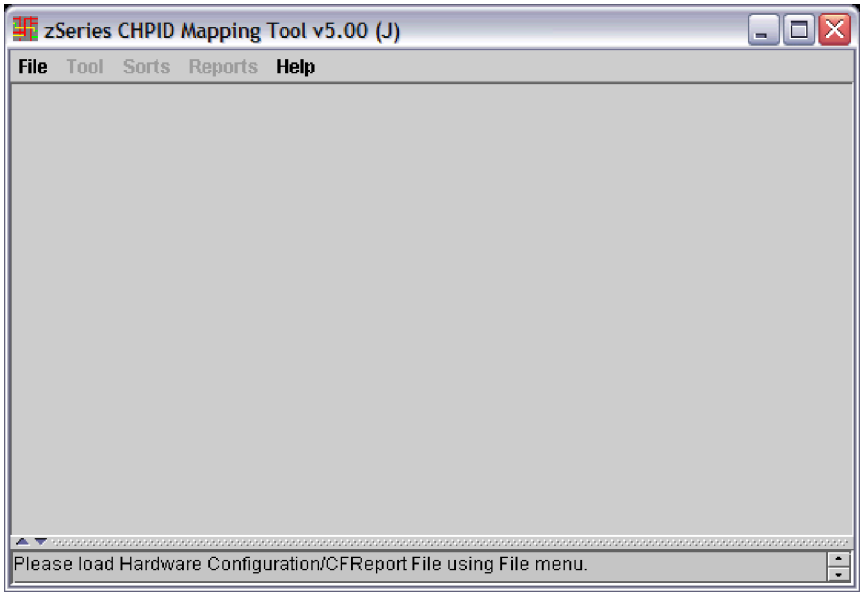


Figure 7. Example of the First Time You Open the CHPID Mapping Tool

2. Perform the following steps to import your CFReport Order file.
   a. Click **File**. This displays selections as shown in Figure 8.

      Note: Actions under **File** include **Import H/W Config from file** and **Import CFReport Order file**. The **Import H/W Config from file** selection may be removed in the future.

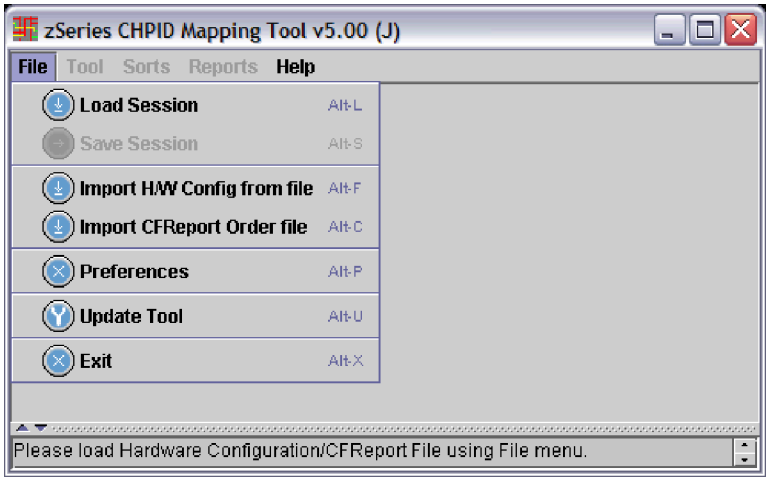


Figure 8. Selections under File

   b. Click **Import CFReport Order file**
   c. The Open CFReport window is displayed. Double-click the CFReport Order file (it has an extension of .cfr), or select it and click **Open**.

   As a result of importing your CFReport Order file, the CHPID Mapping Tool displays information. Figure 9 on page 11 shows an example for the z9-109.

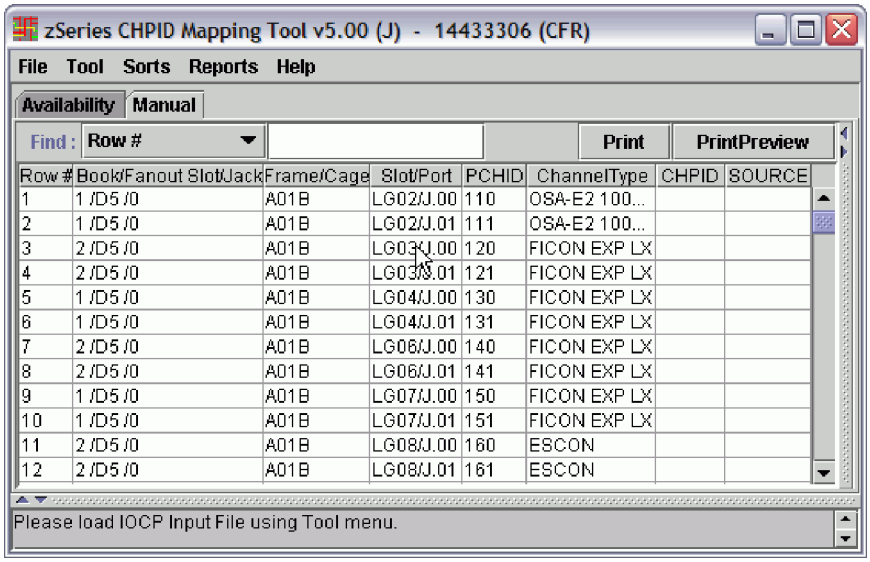


Figure 9. After Importing CFReport Order File on z9-109

For the z9-109, the second column heading is **Book/Fanout Slot/Jack**, as shown in Figure 9. (Each z9-109 fanout slot represents one MBA.) For the zz990 or z890, it is **Book/Jack/MBA (**Figure 10 shows an example).

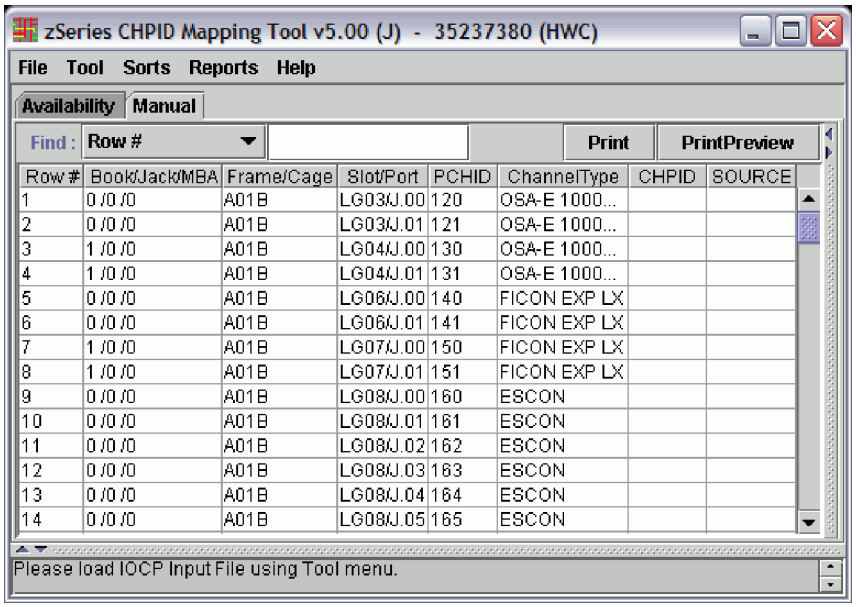


Figure 10. After Importing Configuration Data on z890 or z990

Importing Your IOCP File

You must load your IOCP file to manually map your CHPIDs or to use the Availability mapping option. For an upgrade from a z990 to a z9-109 or a MES for a z9-109, you must import the IOCP file (for the z9-109 or z990 being upgraded) that contains the previous CHPID to PCHID assignments. The CHPID Mapping Tool needs this to correctly assign logical CHPIDs to new PCHID values.

Before you begin: For an upgrade from a z990 to a z9-109 or a MES for a z9-109, you must have a backup record of the following customization data stored in your configuration files:

- For OSA-Express2 channels, record all user-assigned MAC addresses (using the **Display or alter MAC address** function in **Card specific advanced facilities**) or user-specified OAT tables.

  Note: If you are an OSA/SF user, a better method is to use OSA/SF to back up and restore the configuration information for your OSD CHPIDs.
- For CHPIDs defined as OSC (OSA-ICC), use the **Export source file** function in **Manual configuration options**.
- For FCP ACT, ensure the access rights source is current and available to the privileged (the one with access to the 'FC' or 'FD' unit address) Linux® image.

Perform the following steps to load your IOCP file:

1. Click **Tool**. This displays the selection **Import IOCP File**. Figure 11 shows this.

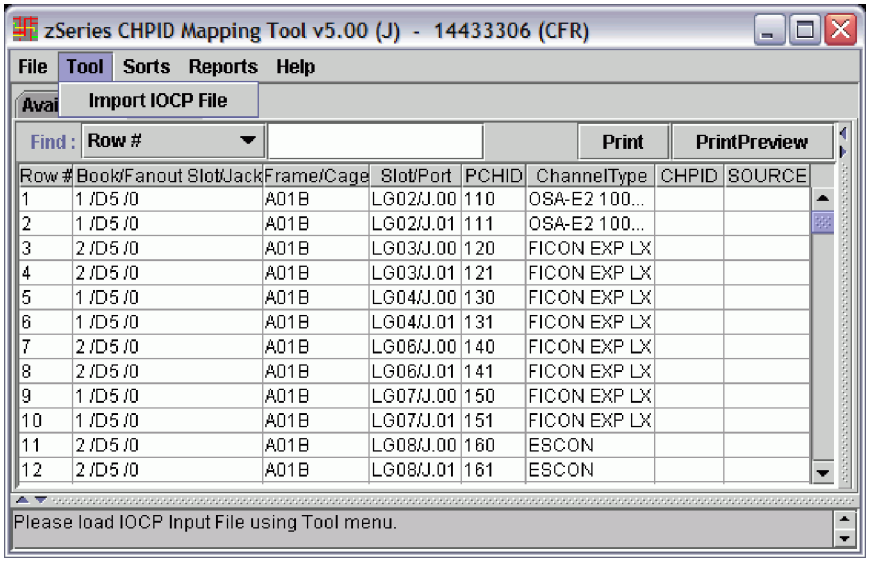


Figure 11. Tool Menu Includes Import IOCP File

2. Click **Import IOCP File**. This displays an open window from which you can select the correct file. The IOCP file has an extension of .txt.
3. For an upgrade or MES to a z9-109, the panel shown in Figure 12 on page 13 may be displayed:

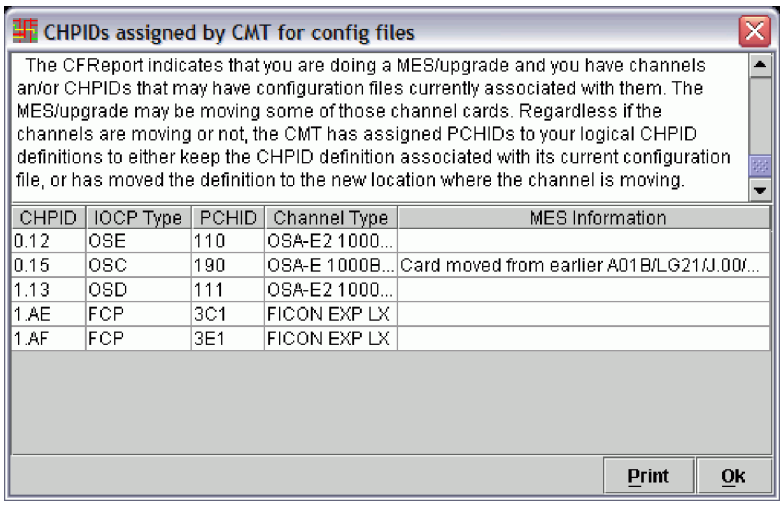


Figure 12. CHPIDs Assigned by CMT for Config Files Window

(See Appendix A, “An Explanation of Configuration Files,” on page 49 for more information.)

On this panel, you can optionally click **Print**. When you are done viewing the panel, click **OK** to continue.

4. Possible outcomes are:
   - The IOCP file loaded correctly, but CHPID definition resolution is required. (See “CHPID Definition Resolution Is Needed.”)
   - The IOCP file loaded correctly with no further CHPID definition resolution required. (See “IOCP Loads” on page 15.)
   - The IOCP file can fail to load correctly. (See “If the IOCP File Fails to Load Correctly” on page 16.)

CHPID Definition Resolution Is Needed

The IOCP file may load correctly but you may need to resolve CHPID definitions. Perform the following steps to resolve CHPID definitions:

1. A panel such as that shown in Figure 13 on page 14 may be displayed.

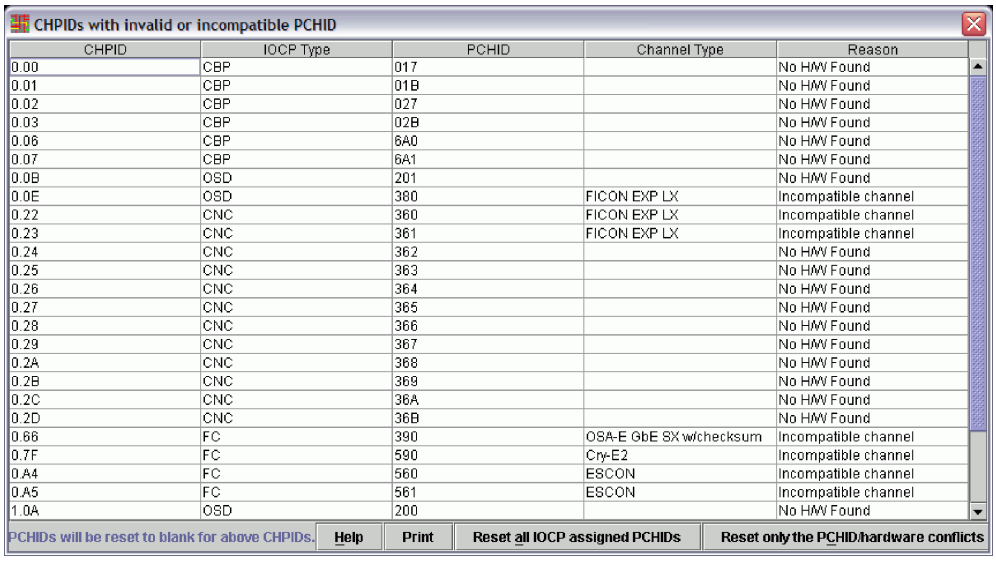


Figure 13. CHPIDS with Invalid or Incompatible PCHID Window

2. Do one of the following:
   - Click **Reset all IOCP assigned PCHIDs**.
   - Click **Reset only the PCHID/hardware conflicts**.
3. Some CHPID types can be used for multiple card types. For example, a CHPID defined as OSD can be used on different card types -- Gigabit Ethernet or Fast Ethernet. You may be presented with a panel that asks you to define how to use the CHPID. Figure 14 shows an example:

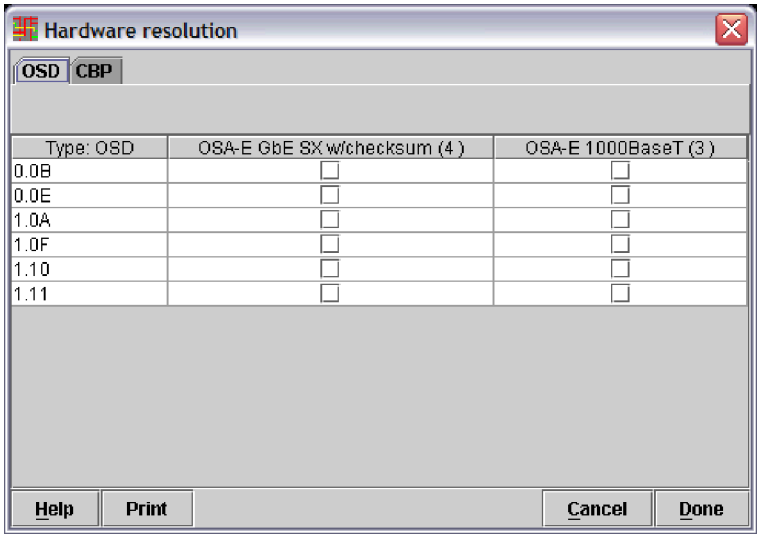


Figure 14. Hardware Resolution Window

The tab at the top indicates the channel type. The light-colored tab (OSD) is active, as shown in Figure 14; the shaded tab (CBP) is not active. You can toggle back and forth between the panels by clicking the tabs.

a. You need to resolve the hardware listed under each tab. You can select a check box in each row. Alternately, you can select one or more rows (to

select non-adjacent rows, press Ctrl while clicking rows; to select adjacent rows, press Shift while clicking the top and bottom rows in the block) and click the column heading.

The numbers in parentheses in the column headings indicate the number available for each feature. For example, Figure 14 on page 14 shows six channels (six rows) of type OSD that need resolution. The first of these is 0.0B. For 0.0B, you would need to check the box under **OSA-E Gbe SX w/checksum** or the box under **OSA-E 1000BaseT**. There are four of the former and three of the latter available, as the numbers in parentheses indicate. When you select check boxes, the parenthetical numbers are decremented.

b. After you make the appropriate resolutions, click **Done**.

4. A message such as that shown in Figure 15 is displayed. Click **OK**.

Figure 15. Information Message

5. See “IOCP Loads.”

IOCP Loads

When the IOCP file loads, the CHPID Mapping Tool looks similar to Figure 16.

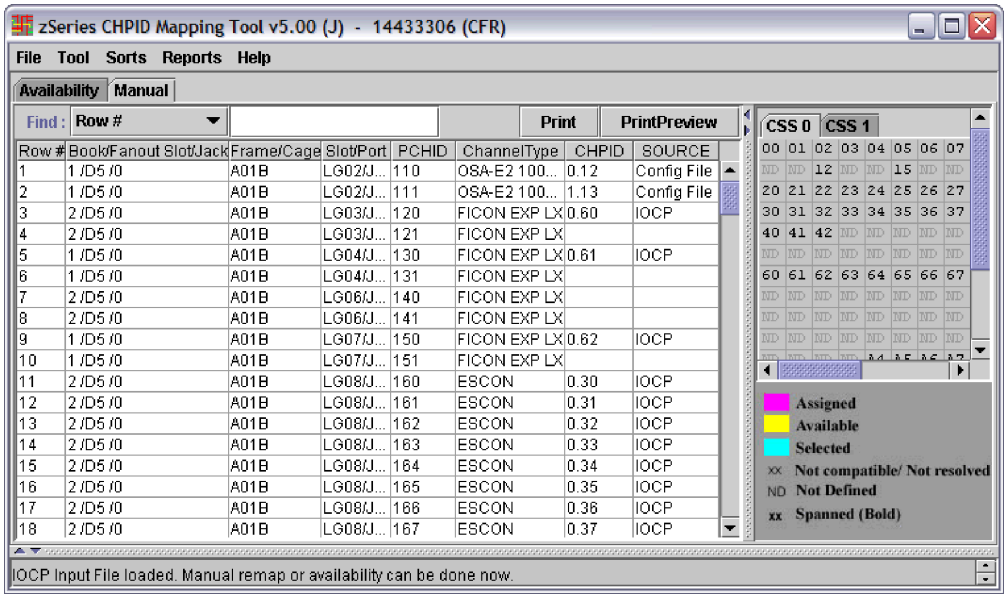


Figure 16. IOCP File Loaded with No Further CHPID Definition Resolution Needed

Notes:

1. For CHPIDs affected by an upgrade or MES to a z9-109, the CHPID Mapping Tool displays “Config File” in the **SOURCE** column to identify PCHIDs assigned

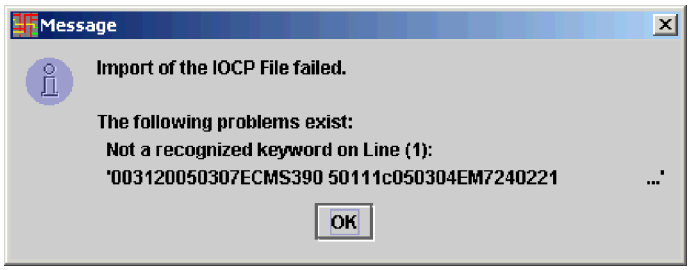
because they have configuration files. (See Appendix A, “An Explanation of Configuration Files,” on page 49 for more information about configuration files.)

2. You may have to widen the window by dragging the right edge to display the rightmost information.

If the IOCP File Fails to Load Correctly

As part of loading the IOCP, a verification program runs to ensure there are no errors with the IOCP being used. If there are problems with the IOCP input, you get an error message and cannot proceed until the problem is fixed.

Figure 17 shows some sample error messages.



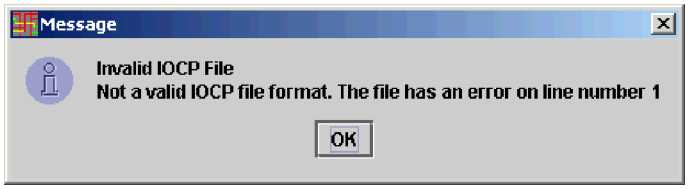


Figure 17. Error Messages Displayed When Importing the IOCP File Fails

Some possible causes of errors are:

- The IOCP input could contain channel definitions for channel types that are not part of the new machine configuration.
- The source input could contain errors. For example, someone could edit a file to remove some of the channel definitions but fail to delete the control unit definitions referencing those channels. The source input must be accurate and verified by IOCP or generated by HCD.
- The source input could have been corrupted during editing or during a file transfer. Some characters could be dropped or the "*" used for continuation indicators could be in the wrong column. The source file must be accurate and adhere to the syntax rules of IOCP.
- There could be potentially more channels defined or implied than can be supported on the machine. For example, if a machine is fully configured with the maximum number of CHPIDs, any definitions in the IOCP for internal coupling channels cause the input to fail.
- Some CHPID types could have changed from previous generation machines, and the IOCP may not have been updated to reflect that change. For example, all of the OSA-2 cards on G5/G6 machines will be replaced in an upgrade with OSA-Express cards. On the G5/G6, the OSA-2 CHPID type was defined as OSA, but on the 2084 the OSA-Express can be defined only as either an OSE or OSD CHPID type.

Note: It is required that the IOCP input provided to the tool be the direct output of HCD or be verified by IOCP. The IOCP definitions must be output directly from a version of HCD/HCM that supports the 2084 or be verified by the appropriate level of ICP IOCP before loading into the tool.

Updating the Tool

If you are updating the tool rather than installing it for the first time, perform the following steps to install the updated version:

1. Click **File**. This displays selections as shown in Figure 18.

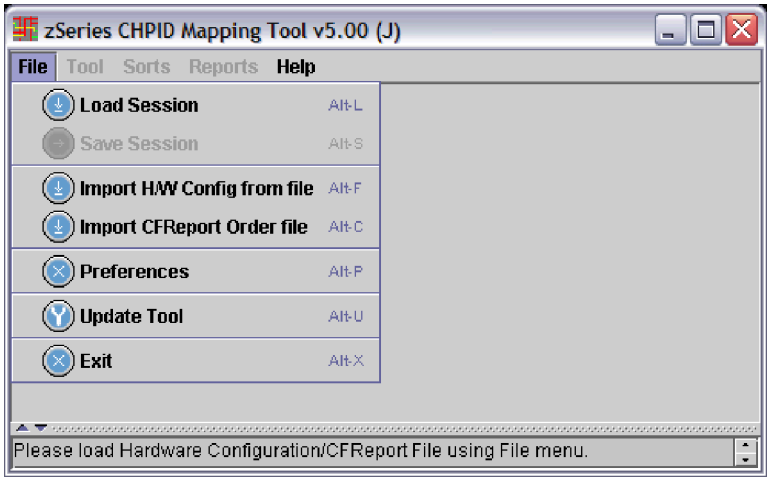


Figure 18. Selections under File

2. Click **Update Tool**. This displays a message like the following:

```
This window will close now and another 'Tool Update Utility' will start
in a few seconds.
If Utility does not appear, please start 'Update Utility' manually from
IBM CHPID Mapping Tool Folder.
```

3. Click **OK**. This displays a window like that shown in Figure 19:

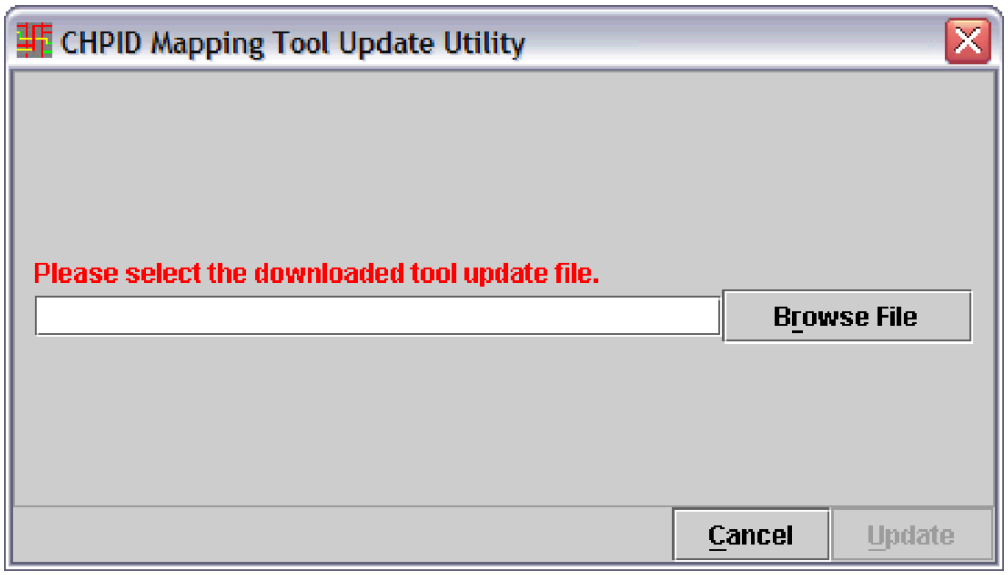


Figure 19. CHPID Mapping Tool Update Utility

4. Click **Browse File**, and browse to the location of the file you downloaded. Select it and click **Open**.
5. You are returned to the CHPID Mapping Tool Update Utility. Click **Update**. You should see a message like the following:

```
CHPID Mapping Tool has been updated. Version can be verified using
'Help->About Tool' menu.
```

6. Click **OK** to clear the message. This reopens the CHPID Mapping Tool window.

Menus

You have already used several of the menus to import your CFReport Order file and load your IOCP file. This section provides reference information for the menu items and their selections.

The CHPID Mapping Tool contains the following menus:

- **File**
- **Tool**
- **Sorts**
- **Reports**
- **Help.**

File

You have already seen the **File** menu (when importing the CFReport Order file). Figure 20 on page 19 displays the selections under **File**.

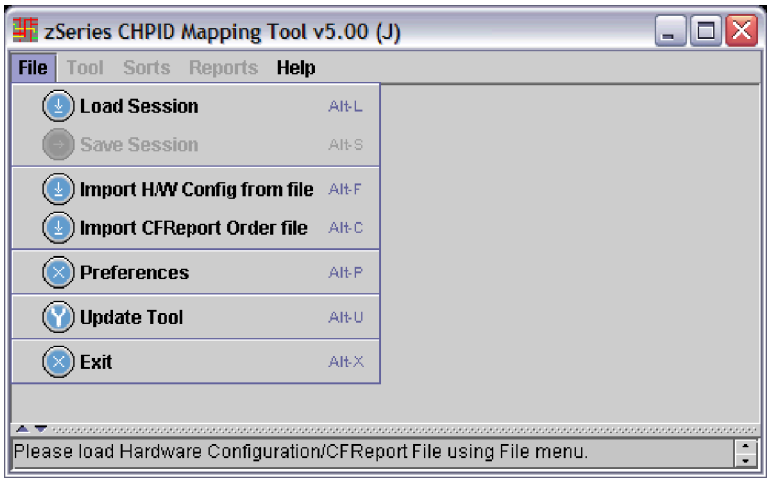


Figure 20. File Menu

These selections include the following (some of which are not active upon initial entry into the tool):

Load Session
Loads an earlier saved session. Obviously, the first time through the tool, there are no saved sessions. A saved session has the file extension of .chp.

Save Session
Saves your work after you have entered data and run the tool. This is for backup purposes or because you are not finished and must complete your work at a later time. The file extension must be .chp.

Recommendation: It is recommended that the high order name be the CCN.

Import H/W Config from file
Loads the hardware configuration file for your machine.

Note: The **Import H/W Config from file** action may be removed in the future.

Import CFReport Order file
Loads the CFReport Order file for your machine that you can obtain from your IBM representative or download from Resource Link.

Preferences
Controls how often the tool automatically saves your work.

Update Tool
Closes the mapping tool and runs an update utility. Use this option if you have downloaded program fixes from Resource Link. If the *CHPID Mapping Tool User's Guide* is open, close it (because the utility does not close it, and it will not be replaced if the updates include a new version).

Exit Closes the tool and exits the program. If you have made any changes or updates, you should be prompted to save your session. However, it is best to do an explicit Save before exiting any program.

Tool

You have already seen the **Tool** menu (Figure 11 on page 12 shows it with the single available action **Import IOCP file**). After you have imported your IOCP file, additional actions are available. Figure 21 shows the selections under **Tool** as they appear on the **Availability** panel. (This includes **Process CU Priority**, which is not included on the **Manual** panel.)

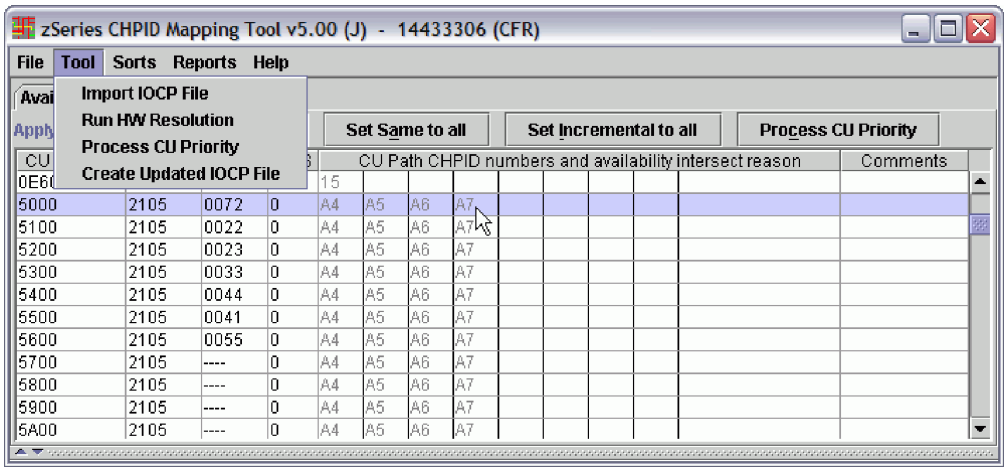


Figure 21. Tool Menu

Selections under **Tool** include the following (some of which are not active upon initial entry into the CHPID Mapping Tool):

Import IOCP File
Loads your IOCP source file.

Run HW Resolution
Defines channel types. After you import your IOCP file, the tool may need to know how you plan to use certain channel types. Type FC channels, for example, can be FICON Express long wave or FICON Express short wave.

Process CU Priority
Is available only under the **Availability** tab. See Availability Mapping Steps and Step 3 on page 38.

Create Updated IOCP File
Provides an updated IOCP file. Use this option when you have completed mapping.

Sorts

Figure 22 shows the selections under the **Sorts** menu item on the **Manual** panel:

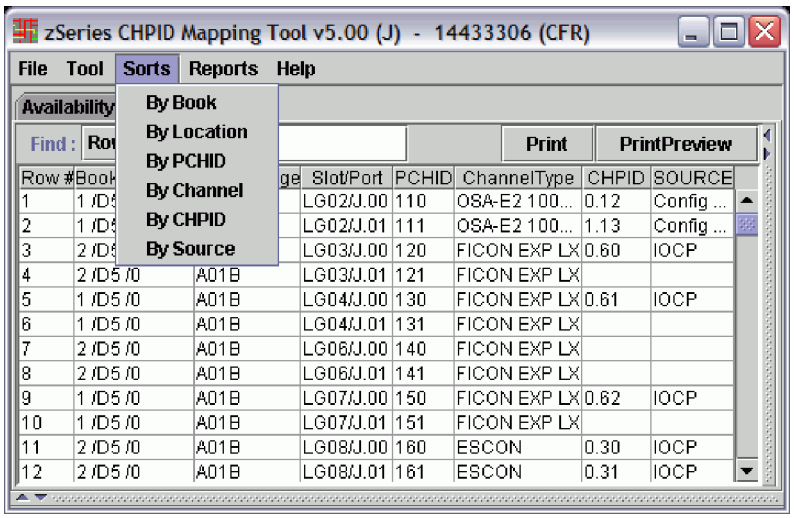


Figure 22. Sorts Menu on Manual Panel

The sort actions on the **Manual** panel include the following:

By Book
: Is the default and sorts all rows by the information in the second column, which is **Book/Fanout Slot/Jack** for the z9-109 or **Book/Jack/MBA** for the z990 and z890.

By Location
: Sorts all rows by the information in the third column, the **Frame/Cage** location.

By PCHID
: Sorts all rows by the information in the fifth column, **PCHID** number.

By Channel
: Sorts all rows by the information in the sixth column, **Channel Type.**

By CHPID
: Sorts all rows by the information in the seventh column, **CHPID**.

By Source
: Sorts all rows by the information in the last column, **SOURCE**, which indicates how the CHPID assignment was made. The value can be “Config File”, “IOCP”, “Manual”, or “Avail”.

Chapter 4, “Manual Mapping,” on page 25 and Chapter 6, “Availability Mapping: Performing the Steps,” on page 35 recommend different types of sorts in different situations.

Figure 23 on page 22 shows the sort actions on the **Availability** panel.

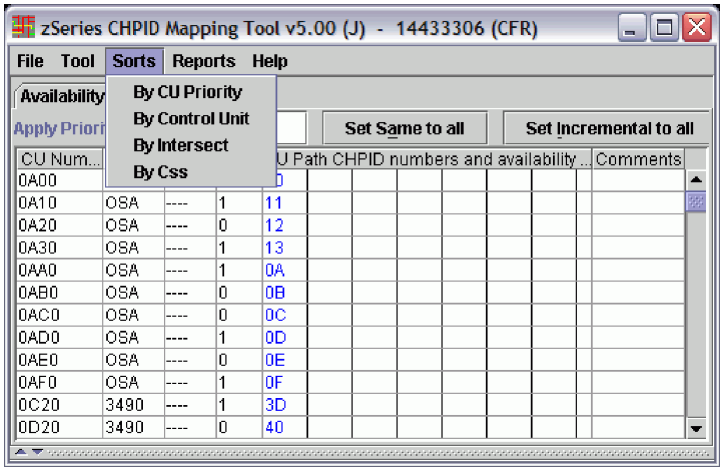


Figure 23. Sorts Menu on Availability Panel

The sort actions on the **Availability** panel include the following:

By CU Priority
: Displays all the control units sorted by the priorities you have given them. This is helpful for reviewing the priorities before processing CU priority assignments.

By Control Unit
: Displays all the control units sorted by their control unit numbers. This is the default sorting method for the **Availability** panel. After sorting by another method, you can use this to return the panel to its original order.

By Intersect
: Displays all the control units sorted by intersect type. After processing CU priority, you can use this sort to view all the intersects of a particular type.

By Css
: Displays all control units sorted by CSS. This could be helpful if you wanted to view information for a particular CSS.

Reports

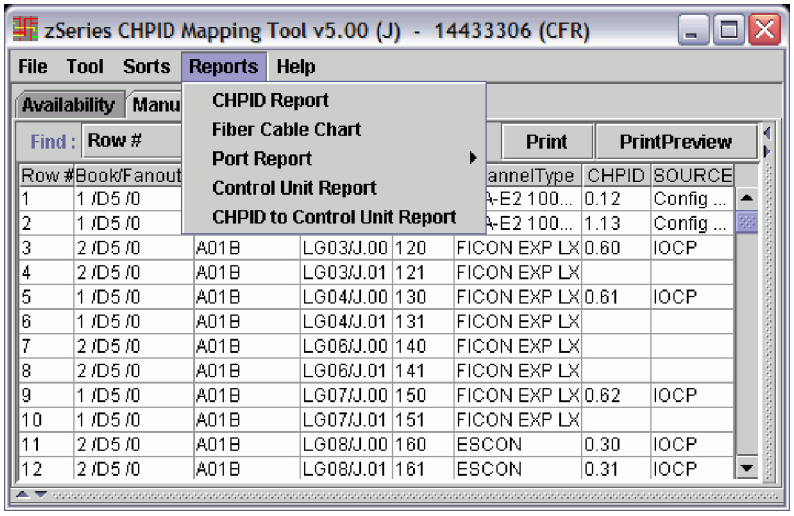


Figure 24. Reports Menu

Selections allow you to generate:

- CHPID Report
- FQC Report (available if the CFReport Order file (or hardware configuration file) contains Fibre Quick Connect)
- Fiber Cable Chart
- Port Report
- Control Unit Report
- CHPID to Control Unit Report.

See Chapter 7, “Reports,” on page 43 for more information.

Help

Figure 25 shows the selections under the **Help** menu item:

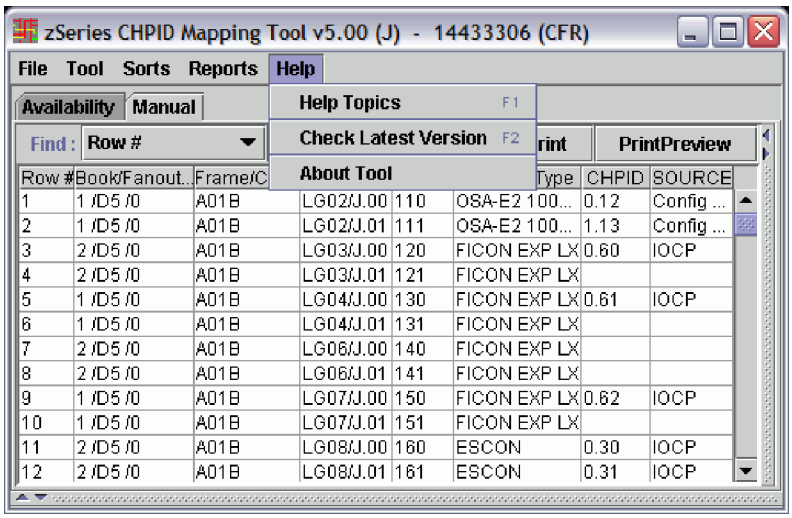


Figure 25. Help Menu

Selections include:

Help Topics
: Provides access to additional information, including this *CHPID Mapping Tool User's Guide* and the CHPID Mapping Tool Readme file.

Check Latest Version
: Provides a link to Resource Link identifying the latest version number of the CHPID Mapping Tool.

About Tool
: Opens a window that includes the version number of the CHPID Mapping Tool.

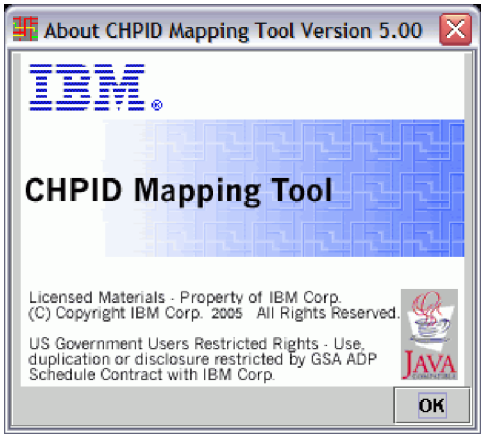


Figure 26. About CHPID Mapping Tool Window

Chapter 4. Manual Mapping

In the previous chapters, you learned to perform the following tasks:

- Download the CHPID Mapping Tool and the CFReport Order file on Resource Link.
- Load the CHPID Mapping Tool with the CFReport Order File and your IOCP file and resolve any CHPID definition problems.

You are now ready to map CHPIDs with one of the following methods:

- Manual method
- Availability method.

This chapter explains the columns that appear in the **Manual** panel of the CHPID Mapping Tool and how to perform mapping with the manual method.

Explanation of the Columns in the CHPID Mapping Tool

After you have imported your CFReport Order file and loaded your IOCP file, a panel similar to that shown in Figure 27 should be displayed. (Figure 27 shows the z9-109 version of the panel, and for all additional figures unless otherwise noted, the z9-109 version will be shown.)

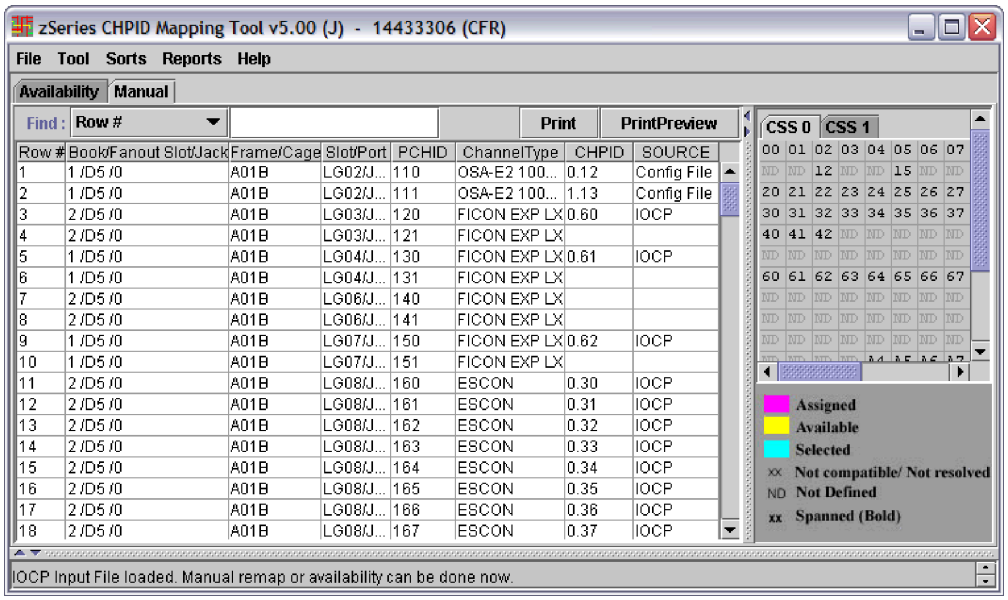


Figure 27. CHPID Mapping Tool

Notice that there are two tabs under the menu items. After you import your CFReport Order file, the **Manual** tab is selected, and the **Availability** tab is not selected. You can toggle back and forth between these two panels by clicking the tabs.

The columns of information are:

Row# Simply lists a line number.

Book/Fanout Slot/Jack
Provides the location where the STI link for that channel plugs into the processors. This is displayed for the z9-109 only.

Note: For the z9-109, the second column heading is **Book/Fanout Slot/Jack**. (Each fanout slot represents one MBA.) For z890 and z990, the second column heading is **Book/Jack/MBA**.

Book/Jack/MBA
Provides the location where the STI link for that channel plugs into the processors. This is displayed only for the z990 and z890.

Frame/Cage
Provides the frame and cage location where the particular port is located.

Z Indicates it is located in the Z-Frame.

A Indicate it is located in the A-frame.

For each of these, "01" indicates that the card cage containing the card on which this port is located is in the lower part of the frame. "Z15B" indicates the top cage in the Z-frame, and "A19B" indicates the top cage in the A-frame. A19B is the processor cage and contains no I/O adapters; only ICB4 connections are displayed for that cage.

Slot/Port
Indicates the card location within the cage and the port location on the card. For example, LG14/J.00 indicates card slot 14 and that the port is the first port on the card (the top port).

PCHID
Specifies the PCHID assigned to the port.

Channel Type
Indicates the type of card containing the port.

CHPID
Is initially blank unless this PCHID has been assigned a CHPID in IOCP. After you assign a CHPID to a PCHID, the value of the CHPID assignment is displayed in this field.

SOURCE
Indicates how the CHPID assignment was made. Values can be:

- "Manual" -- You made the assignment using manual mapping.
- "Avail" -- You made the assignment using availability mapping.
- "IOCP" -- Assignment was from the IOCP source.
- "Config File"-- The CHPID Mapping Tool forced an assignment because of config file requirements.

Note: For CHPIDs affected by an upgrade or a MES to a z9-109, the CHPID Mapping Tool identifies PCHIDs with new values by displaying "Config File" in the **SOURCE** column. You are recommended **not** to change these assignments. (See Appendix A, "An Explanation of Configuration Files," on page 49 for more information about configuration files.)

How to Use the Manual Mapping Method

The IBM configurator has carefully tuned card placement in the machine. With manual mapping, there is no availability checking related to the I/O configuration and the assignment of CHPIDs to I/O adapter card ports and the availability characteristics depend on your level of knowledge.

Use the CHPID Mapping Tool to perform manual mapping if the following conditions apply:

- You have a specific requirement regarding how CHPIDs should be laid out on the machine.
- The allocation of devices to channels has been thoroughly evaluated, and you have in-depth knowledge of the availability characteristics of the machine structure.

Before you begin: You must have already imported your CFReport Order file, loaded the IOCP file, and resolved any CHPID definition problems.

Perform the following steps for manual mapping:

1. If you have not already done so, start the CHPID Mapping Tool by double-clicking its icon (shown in Figure 28) on the desktop.

Figure 28. CHPID Mapping Tool Icon

The CHPID Mapping Tool should look similar to the example shown in Figure 29. (You must have already imported your CFReport Order file, and loaded your IOCP file, and resolved any CHPID definition problems.)

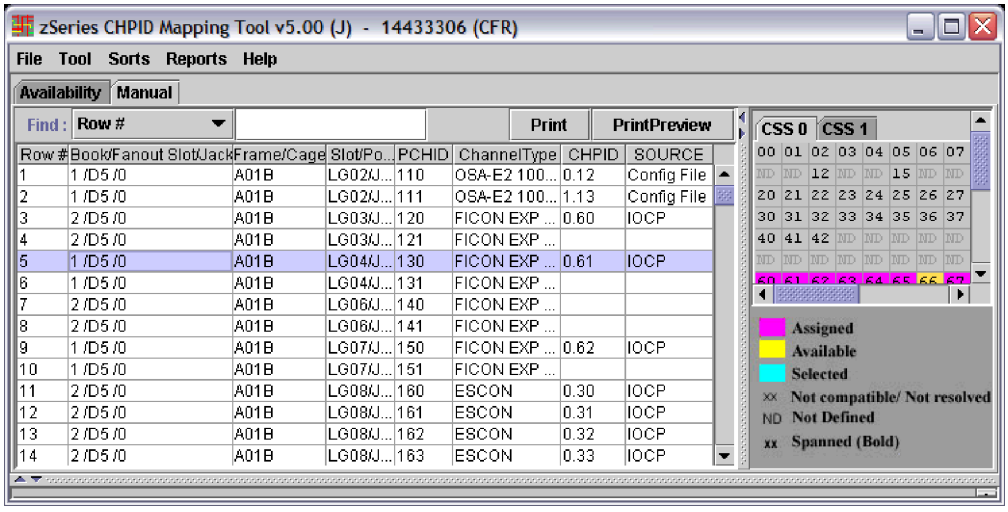


Figure 29. CHPID Mapping Tool

Notes:

a. For CHPIDs affected by an upgrade to a z9-109 or for a MES to a z9-109, the CHPID Mapping Tool displays “Config File” in the **SOURCE** column to identify PCHIDs assigned because they have configuration files. You are recommended **not** to change these assignments.

b. Cryptographic co-processors are not displayed in the windows because they are not assigned CHPIDs. However, they are listed in reports.

2. Make sure the **Manual** tab is selected. (When **Manual** is selected, the right side of the panel displays the CHPIDs that are defined in the IOCP file.)
3. Optionally, you can sort the data by clicking **Sorts** (see Figure 30) and selecting select the option that works best for you.

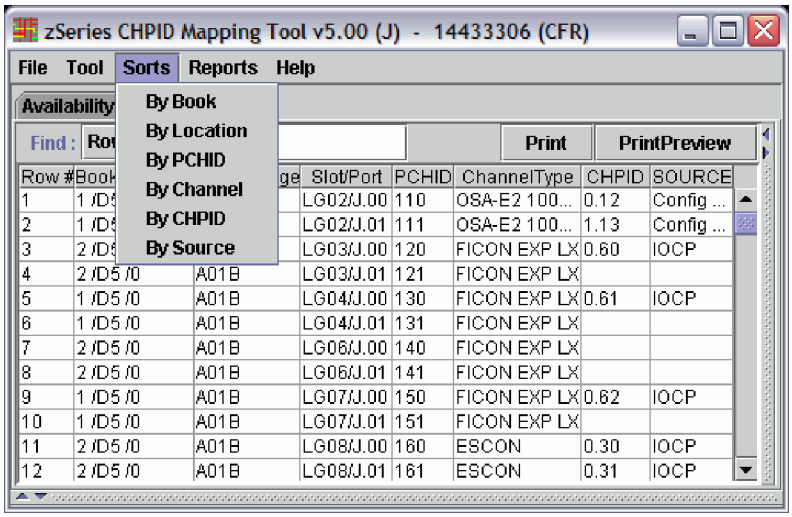


Figure 30. Sorting the Data

4. Select a channel in the left side of the window. Selecting a channel highlights the available CHPIDs in yellow on the right side of the panel; see Figure 31 on page 29. This shows a FICON Express channel selected; CHPIDs 02, 03, 04 and 05 in CSS 0 are available for this channel type.

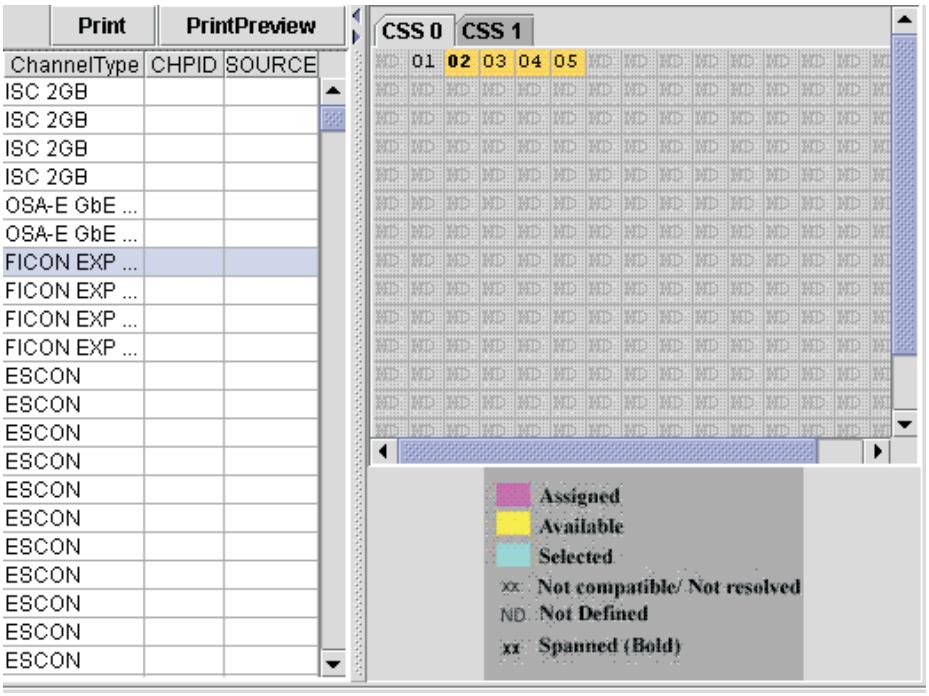


Figure 31. Selecting a Channel

5. To assign a CHPID, you can:
   a. Click once on a CHPID to select it. It will be highlighted in cyan to indicate that it is selected. The following shows an example:

      04 05

   b. Double-click on the CHPID to assign it to the selected PCHID. This highlights the CHPID in magenta. The following shows an example:

      04 05

      Alternately, you can type the number of an available CHPID into the **CHPID** field. Doing so also highlights the CHPID in magenta. Figure 32 shows an example.

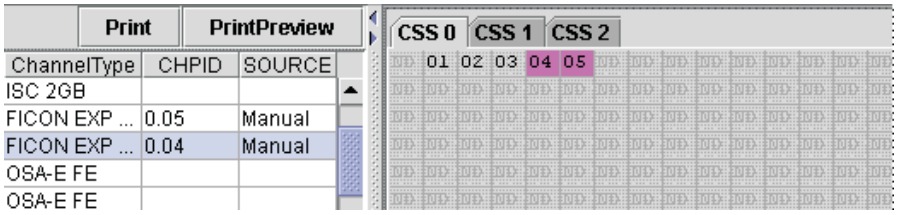


Figure 32. Alternate Way of Assigning a CHPID to a PCHID

Regardless of which method you use, the **SOURCE** field is updated as you make each manual assignment.

Note: A CHPID that is spanned across CSSs is displayed in bold type. Figure 33 on page 30 shows an example in which CHPIDs 20 to 27 are spanned.

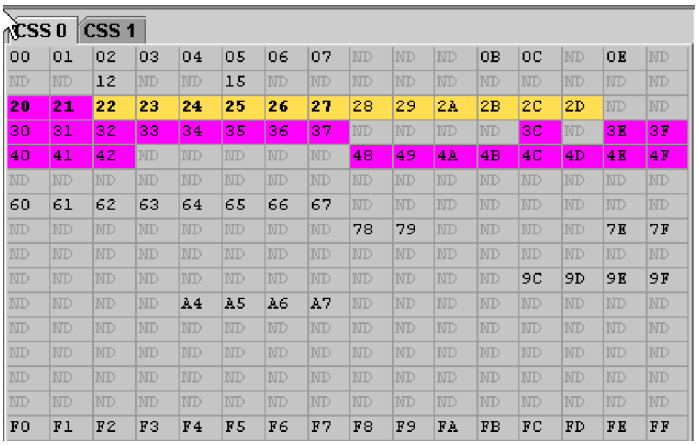


Figure 33. CHPIDs Spanned across CSSs

6. When you are finished manually mapping, click **File** and then **Save Session** to save your work.

   Note: For saved sessions, the file extension must be .chp, and the recommendation is to use the CCN for the file name.

7. When mapping is complete, you can create a new IOCP with statements that include the assignments you have made with the tool. Click **Tool** and then **Create Updated IOCP File**.

Using the **Reports** menu tab is described in a separate chapter (see Chapter 7, “Reports,” on page 43) because reports are common to both the manual and the availability mapping options.

Chapter 5. Availability Mapping: Strategies and Guidelines for Deciding the Priorities

Setting priorities specifies the order in which the control units and associated CHPID assignments should be processed for availability. The key requirement of mapping for high availability is accurately assigning priority numbers to the control units. Priority numbers represent ***the order*** in which the tool will map the control units.

For example, a control unit with a priority number of 0001 is mapped before one with a priority number of 1000. A lower priority number indicates a relatively higher level of importance. The priority numbers correspond to the order of processing.

This chapter provides strategies and guidelines to help you assign priority numbers effectively for good availability mapping. Chapter 6, "Availability Mapping: Performing the Steps," on page 35 focuses the mechanics of entering the priorities.

Use Incremental Numbering

The first time you specify the priorities of control units, use incremental numbering for priorities rather than numbering sequentially by ones. For example, use increments of five (0005, 0010, 0015, and so on) or ten (0010, 0020, 0030, and so on). Because it is unlikely that a single pass through the tool will provide the desired mapping, incremental numbering enables you to change the priorities of some control units without having to redo others.

For example, suppose you start with priority 0001 and assign priorities by ones from 0001 to 0100. Then you run the tool and discover you need to change the control unit with priority 0025 to priority 0009. You would have to go back and redo all of the control units from 0009 to 0100. With incremental numbering, you could reassign only the control unit with the problem to one of the unassigned priorities within the intervals, and you would not have to redo the priorities of other control units.

Examine Critical Devices and Paths and the HCD Definitions

To prioritize at the control unit level, first look at the paths to critical devices, and then identify how these devices are defined to HCD. This should include the relationship to control units and ultimately to channel paths. For example, Figure 34 on page 32 shows IOCP source input for a string of devices where each individual path is defined with a single control unit statement:

```
CNTLUNIT CUNUMBR=1000,PATH=(CSS(0),A3),UNITADD=((00,256)),LINK=(52), *
   UNIT=3990
CNTLUNIT CUNUMBR=1001,PATH=(CSS(0),B4),UNITADD=((00,256)),LINK=(53), *
   UNIT=3990
CNTLUNIT CUNUMBR=1002,PATH=(CSS(0),B7),UNITADD=((00,256)),LINK=(F1), *
   UNIT=3990
CNTLUNIT CUNUMBR=1003,PATH=(CSS(0),C0),UNITADD=((00,256)),LINK=(F3), *
   UNIT=3990
CNTLUNIT CUNUMBR=1004,PATH=(CSS(0),C4),UNITADD=((00,256)),LINK=(52), *
   UNIT=3990
CNTLUNIT CUNUMBR=1005,PATH=(CSS(0),C7),UNITADD=((00,256)),LINK=(53), *
   UNIT=3990
CNTLUNIT CUNUMBR=1006,PATH=(CSS(0),CC),UNITADD=((00,256)),LINK=(F1), *
   UNIT=3990
CNTLUNIT CUNUMBR=1007,PATH=(CSS(0),DE),UNITADD=((00,256)),LINK=(F3), *
   UNIT=3990

IODEVICE ADDRESS=(1000,256),
        CUNUMBR=(1000,1001,1002,1003,1004,1005,1006,1007),          *
        STADET=Y,UNIT=3390
```

Figure 34. IOCP Code i -- Each Individual Path Is Defined with a Single Control Unit Statement

In this example, there are eight paths to the string of DASD in the address range 1000. Optimally, the eight paths would be spread across availability boundaries to ensure high availability should one or more paths to the devices fail. Therefore, control units 1000, 1001, 1002, 1003, 1004, 1005, 1006, and 1007 should be defined as having the same priority (that is, they should be in the same priority group) to enable the mapping tool to understand the relationships between the control units. Defining the control units with the same priority will ensure that all eight paths are mapped for availability.

Examine Relationships Across Different Control Units

Although some control units and their attached devices are physically independent, there may be a critical relationship in terms of availability. An example is the use of 3174 control units for master and alternate console support. Consider the following:

```
CNTLUNIT CUNUMBR=1D40,PATH=(CSS(0),44),
      UNITADD=((00,016)),UNIT=3174
CNTLUNIT CUNUMBR=2D40,PATH=(CSS(0),45),
      UNITADD=((00,016)),UNIT=3174
```

At first glance, these might appear to be unrelated control units. However, you might be aware that 1D40 is the control unit for the master consoles for a given LPAR and that 2D40 is the control unit for the alternate consoles of the same LPAR. Because availability would be key for both of these control units, they should be in the same priority group.

You should continue this analysis across different control unit types, such as 3745s, tape units, CTCs, and so forth. Usually the customer is well aware of these relationships and can plan accordingly.

CHPIDs Not Connected to Control Units

In the **Availability** mapping panel, the CHPID Mapping Tool displays at the end of the list all CHPIDs defined in the IOCP input that are **not** connected to control units. All coupling CHPIDs in this list are preceded with an “S” in the **CU Number** column. All non-coupling CHPIDs are preceded with a “P”. Figure 35 shows an example:

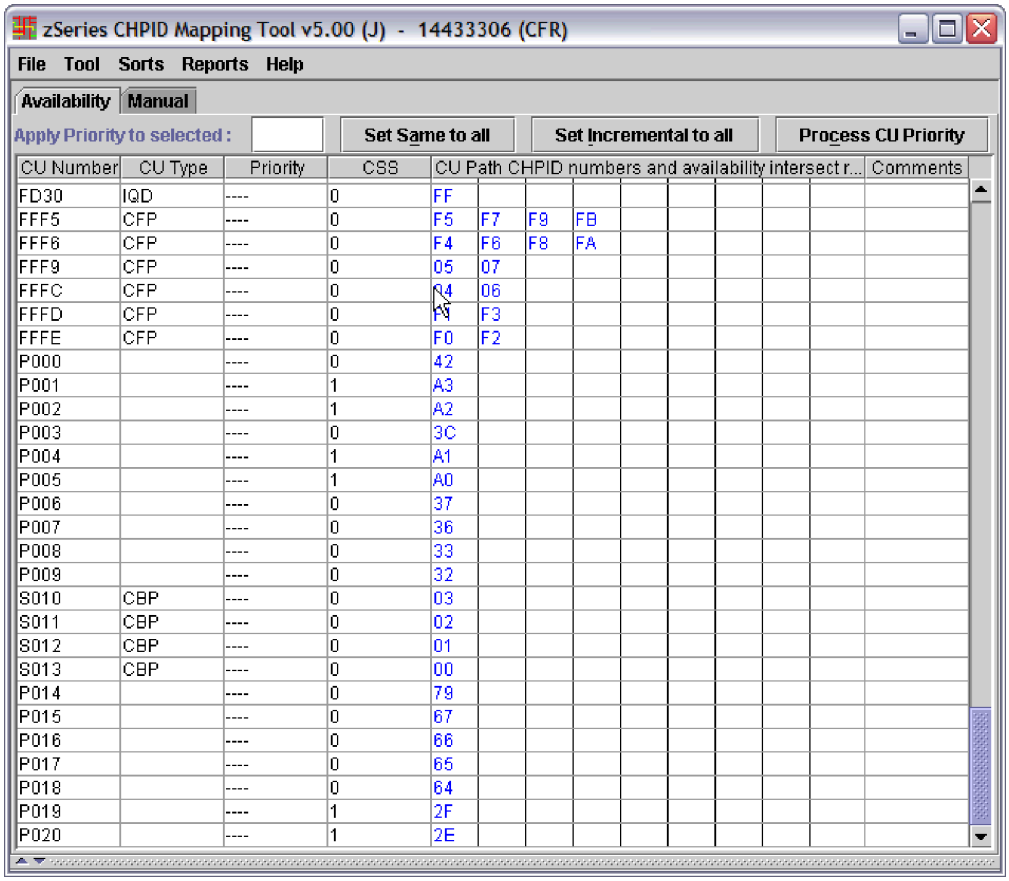


Figure 35. CHPIDs Not Connected to Control Units - Preceded with "S" or "P"

You should review this list because:

- You may have forgotten to add a CHPID to a control unit and may need to update the IOCP source before continuing in the CHPID Mapping Tool.
- The unconnected CHPIDs may be extra channels you are ordering in anticipation of new control units
- The unconnected CHPIDs may be coupling links that are being used in coupling facility (CF) images (these do not require control units).

If they are extra CHPIDs for anticipated new control units, you may want to group these CHPIDs with a common priority. This will allow the availability mapping function to pick PCHIDs that will afford your new control unit good availability.

If they are coupling links used by a CF image, you should group these links.

Each set of CHPIDs going to a different CPC should be grouped with a common priority. For example, suppose the CF image has four links (CHPIDs 40, 41, 42, 43), and that 40 and 41 go to one CPC, and 42 and 43 go to a different CPC. In

this case you should give CHPIDs 40 and 41 one priority and CHPIDs 42 and 43 a different priority. The concept is the same regardless of the number of connecting CPCs or the number of links to each CPC.

Note: Different sysplexes are likely to have different levels of importance. You should consider this when assigning the priorities.

Set Priorities for Daisy-Chained Control Units

In many cases, especially when ESCON directors are used, multiple control units are daisy-chained off the same channels either logically or physically. In this case, you do not need to prioritize all of the control units. (This is because you are simply trying to map the channels for the control units, and, if you map the first one, the others are automatically mapped for availability. So, if you pick one of the control units (or groups of control units) for the range of channels, the others will be taken care of without your assigning them a priority.)

If some of the daisy-chained control units have a different number of CHPIDS going to them, it is advantageous from an availability perspective to separate the control units into different groups, even though the same CHPIDs are being used. Assign the control units with fewer common channels as a higher priority (lower priority number) than those with larger number of common channels.

For example, suppose control units CU1 and CU2 are daisy chained, and CU1 has CHPIDs 1 and 2, while CU2 has CHPIDs 1,2,3, and 4. Have CU1 in a priority group that is processed before the priority group containing CU2 (even though all of the CHPIDs going to CU1 also go to CU2).

Note: When a priority is entered for a control unit in the **Availability** panel and the same CHPIDs are used by other control units, those entries are unavailable to indicate possible daisy chaining.

Remember There Are Limits

There is a limit on how many control units can be placed in the same priority group. The limit is measured by the number of associated channels. The exact number of the limit depends on the types of channels. It is a fixed value independent of the configuration. The CHPID Mapping Tool will inform you if the number has been exceeded in the same priority group.

The reason for this limit is that there is a physical limit of how many CHPIDs in a single group can be spread across cards for availability. For example, for an IOCP that has 256 ESCON channels, it might seem to be the easiest approach to place all the control units in a single group. However, this is not feasible because the machine would have to have 256 separate ESCON cards.

Chapter 6. Availability Mapping: Performing the Steps

Setting the priorities is key to ensuring high availability. While Chapter 5, “Availability Mapping: Strategies and Guidelines for Deciding the Priorities,” on page 31 discusses determining the priority values, this chapter focuses on the mechanical steps for setting the priorities.

Availability Algorithm

The **Availability** option of the mapping tool configures paths to multiple path control units according to the following priorities (highest to lowest):

- Books
- MBAs
- STIs
- I/O cards.

The tool does not consider logical partitions (that is, which CHPIDs are assigned to what LPs), switch configurations, or control unit availability characteristics. For these reasons the tool’s results may not be acceptable for all users. While helpful for many, it cannot replace an expert system programmer.

Availability Mapping Steps

Before you begin:

- You should have completed the steps to start the CHPID Mapping Tool (see Chapter 3, “Starting the Tool and Importing CFReport Order and IOCP Files,” on page 9) by importing your CFReport order file and loading your IOCP file.
- You should have decided which control units should be mapped as a group and the relative priorities of the various control units.

1. Click the **Availability** tab. This displays a panel similar to Figure 36:

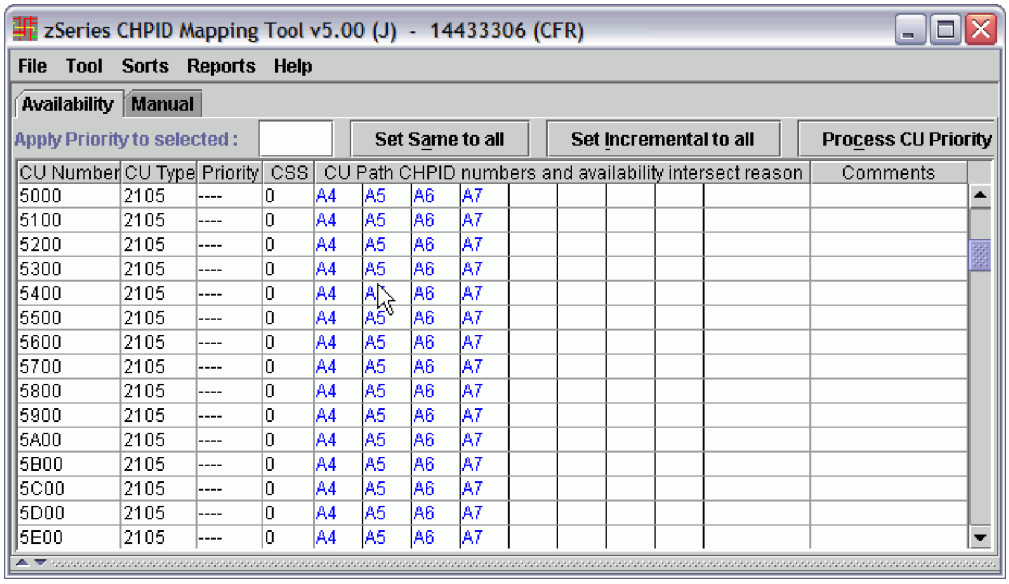


Figure 36. Availability Mapping

This panel allows you to specify to the tool the order in which the control units and associated CHPID assignments should be processed for availability. The priority value in the third column defines this order. When you are assigning priorities, you should identify the most important control units and begin with low values (for example 5) for these, proceeding to higher values (lower values are processed first).

Notes:

a. If a control unit does not reference a CHPID in the IOCP file, a pseudo program control unit is created and displayed in the **Availability** panel. This is done so you can assign priorities to such individual CHPIDs or group them to assign to them a single priority.

b. Previously, if a control unit was not assigned a priority, its priority was determined solely by the default priority of its control unit number. For the z9-109, z990, or z890, the default priority for a control unit not assigned a priority is determined by the number of paths it has.

- The greater the number of paths, the higher the priority. (However, this priority is less than for control units that have been assigned a priority.)
- If two control units have the same number of paths, control unit numbers determine the relative order. For example, if D000 and D800 both have the same number of paths but D000 has a lower **Priority** value, it has a higher priority.

c. A CHPID that is spanned across CSSs is displayed in bold type. Figure 33 on page 30 shows an example in which CHPIDs 20 to 27 are spanned.

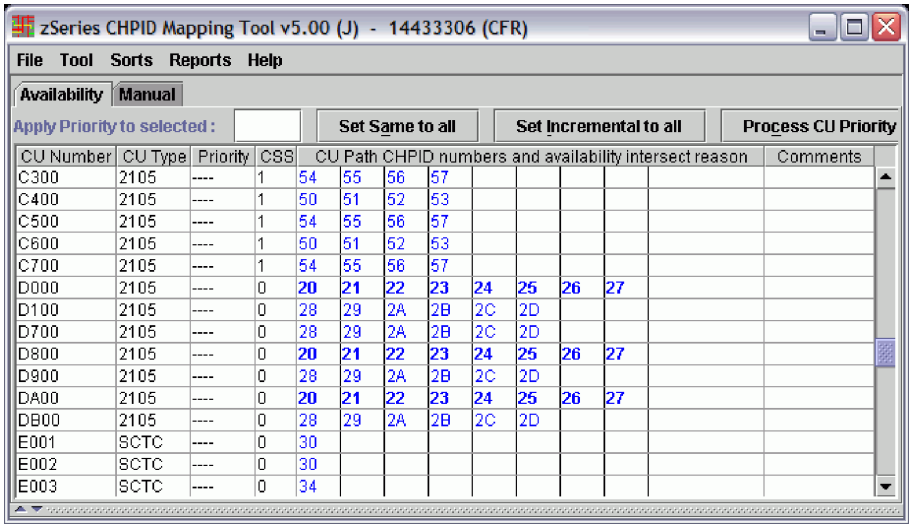


Figure 37. CHPID Spanned across CSSs

2. Assign the priorities:
   - To specify the priority of a single control unit, type in the numeric value you want in the **Priority** column. (Remember, the lower the number, the higher the priority.)
   - To assign the same priority to multiple control units:
     a. Click the first line in the list you want to assign to the group.
     b. To select other individual lines press Ctrl while clicking, or to select a block of lines press Shift while clicking. Figure 38 on page 37 shows the selection of multiple lines.

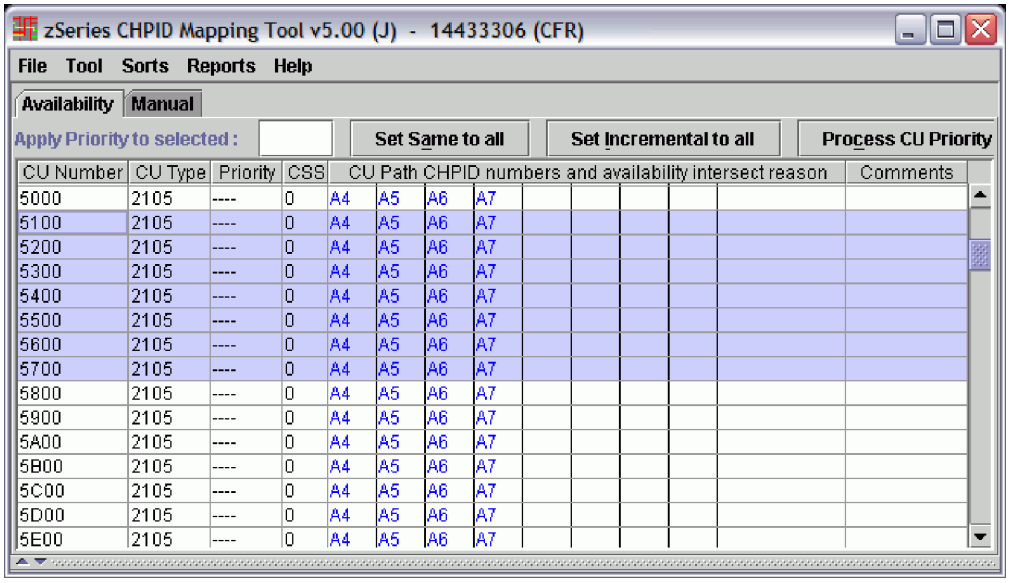


Figure 38. Making Selections on the Availability Panel

c. After you have selected all the lines to which you want to assign the same priority, type the priority group number in the **Apply Priority to selected:** field.

   (If multiple control units are in the same priority group, assigning CHPIDs to ports for all of the associated channels ensures that all the CHPIDs in the group are assigned for availability. For example, if there are two control units in the same priority group, each with four totally different paths defined on each control unit, the tool maps all eight of the paths so they are all mapped for high availability. Otherwise paths from one control unit could be mapped to the same card as the other paths on the second control unit. This might not be what you want. Chapter 5, “Availability Mapping: Strategies and Guidelines for Deciding the Priorities,” on page 31 discusses the reasons for assigning the same priority to multiple control units.)

d. Then click **Set Same to all**.

Note that after you assign a control unit into a priority group, its associated CHPIDs become unavailable (“grayed out”). Figure 39 on page 38 shows the Availability panel before this occurs; Figure 40 on page 38 shows the Availability panel afterward.

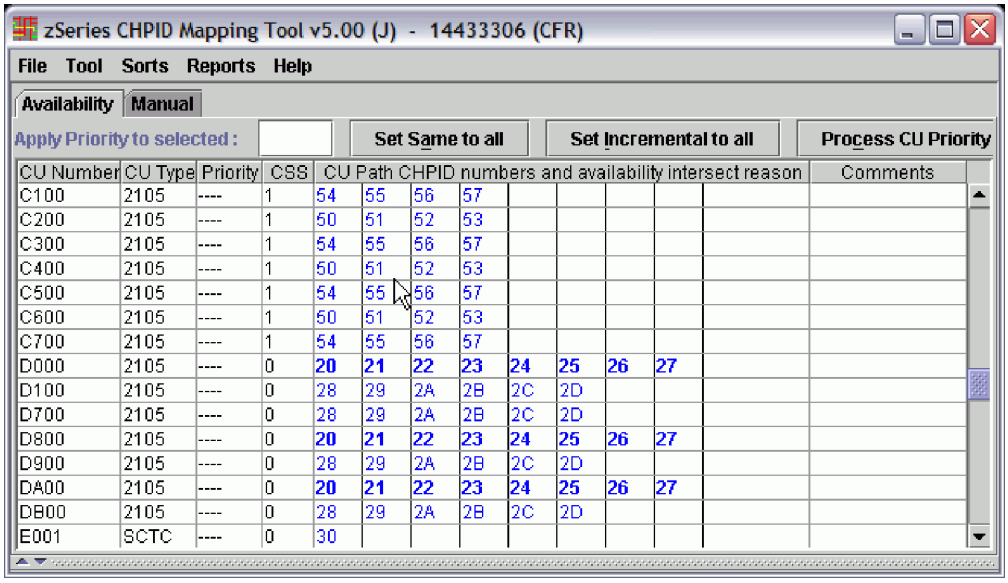


Figure 39. Same Paths in Other CUs Before Priority Assignment

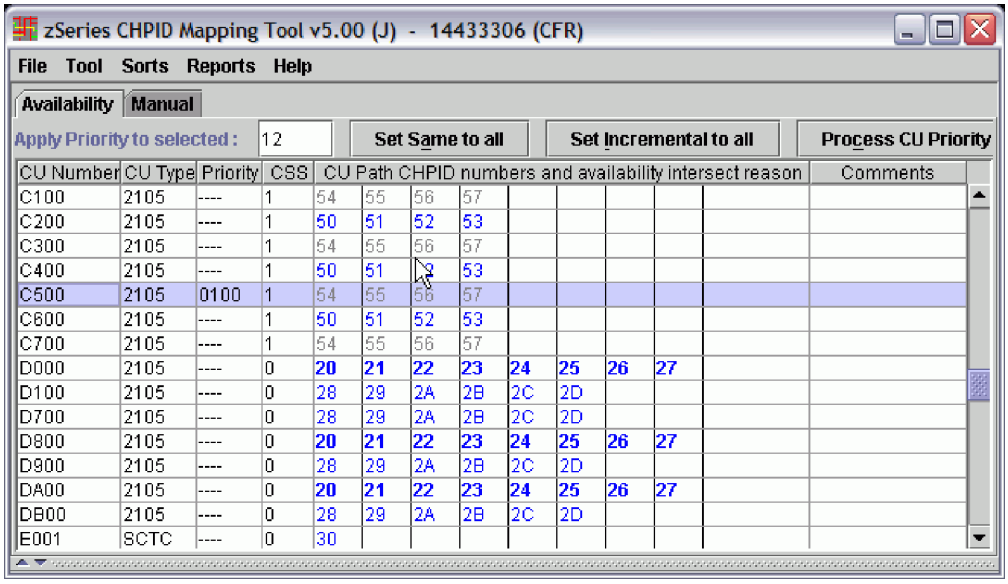


Figure 40. Same Paths in Other CUs After Priority Assignment

Tip: Before running availability, you can review the order of control units being processed by clicking **Sorts** and then **By CU Priority**.

3. After you are satisfied with the priorities, click **Process CU Priority** (or the **Tool** menu item, then **Process CU Priority**).
4. The Reset CHPID Assignments window is displayed.

   Figure 41 on page 39 shows an example of the window, including the **Reset CHPIDs assigned by CMT for config files** selection.

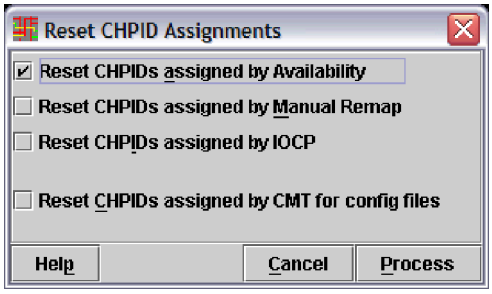


Figure 41. z9-109 Reset CHPID Assignments Window

Reset CHPIDs assigned by CMT for config files is displayed for an upgrade from a z990 to a z9-109 or a MES for a z9-109 if there were some CHPID assignments for config files when you imported your IOCP file.

Otherwise, this selection is not included. Figure 42 shows an example:

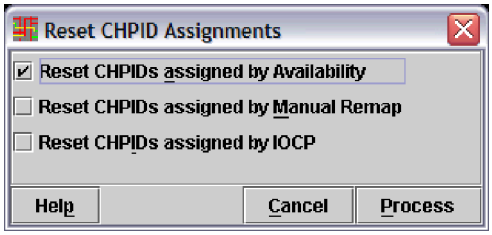


Figure 42. z990 and z890 Reset CHPID Assignments Window

Select none, any, or all of the options, and then click **Process**.

- If you select none of the options (by clearing the default selection of **Reset CHPIDs assigned by Availability**), availability mapping is performed on only those CHPIDs that do not have PCHIDs assigned. If all CHPIDs are assigned, and you select none of the options, the tool analyzes the assignments for intersects.
- If select only **Reset CHPIDs assigned by Availability**, this resets all CHPIDs processed by previous availability mapping in this session. By default, this option is selected.
- If you select **Reset CHPIDs assigned by Manual Remap**, this resets CHPIDS that were assigned a PCHID by manual mapping. By default this option is not selected.
- If you select **Reset CHPIDs assigned by IOCP**, this resets CHPIDS assigned in the IOCP input file. By default this option is not selected.

  Selecting this option may require recabling after availability mapping is performed. The following message is displayed (in red on the Reset CHPID Assignments window):

  ```
  Resetting IOCP assignments may require recabling
  ```

- If you select **Reset CHPIDs assigned by CMT for config files**, this resets assignments made by the CHPID Mapping Tool (for an upgrade or MES to a z9-109).

  Recommendation: Even if the **Reset CHPIDs assigned by CMT for config files** option is available, you are recommended not to select this option. After you run availability mapping, if you review the intersects and conclude that the configuration file assignments are causing unacceptable intersects, you

are recommended to use manual mapping to reset only those configuration file assignments that are causing the unacceptable intersects.

If you select **Reset CHPIDs assigned by CMT for config files**, the following message is displayed (in red on the Reset CHPID Assignment window):

```
Important: Please select Help for more information
```

For more information about config files, see Appendix A, "An Explanation of Configuration Files," on page 49.

5. After processing is complete, you receive a message informing you whether or not there were intersects:
   - If the tool was able to satisfy all of the availability requirements, a message (like that shown in Figure 43) is displayed.

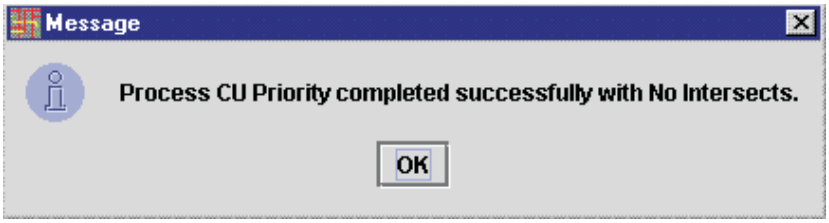


Figure 43. Success Message

Click **OK**. You are done with this task.

   - If a message (such as that in Figure 44) is displayed, an "intersect" case has occurred. This can happen if the tool was not able to spread all of the paths across availability boundaries for a given control unit.

Figure 44. Intersect Message

Click **OK**.

6. If you received a message that there were intersects:
   a. Scroll down the list, to see where there are potential problems. (Alternately, you can display all the intersects to the top of the panel by clicking **Sorts** and then **By Intersect**.) Figure 45 on page 41 is an example showing intersects detected.

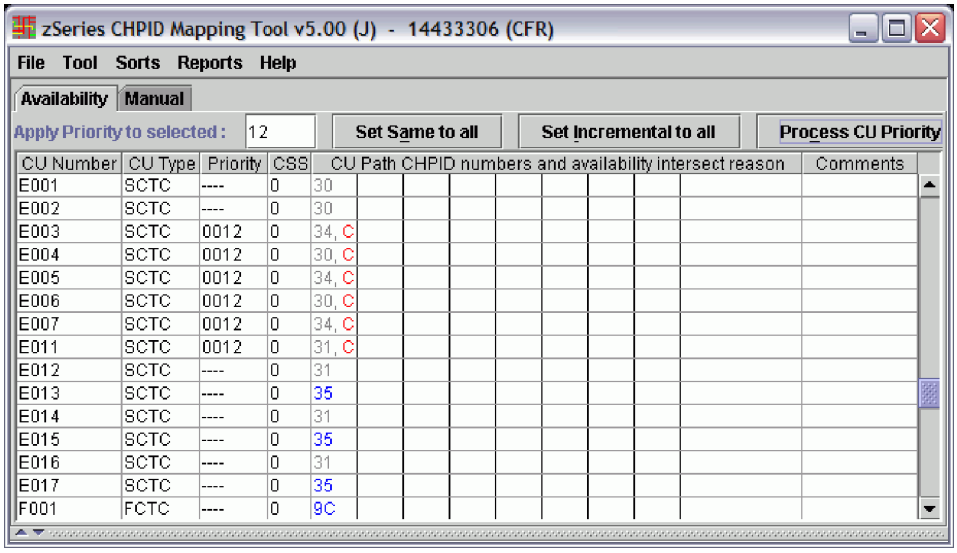


Figure 45. Example of Panel Showing Intersects Detected

b. Move the mouse pointer over one of the CHPIDs that has a character next to it. This displays a pop-up message explaining the intersect. Figure 46 shows an example:

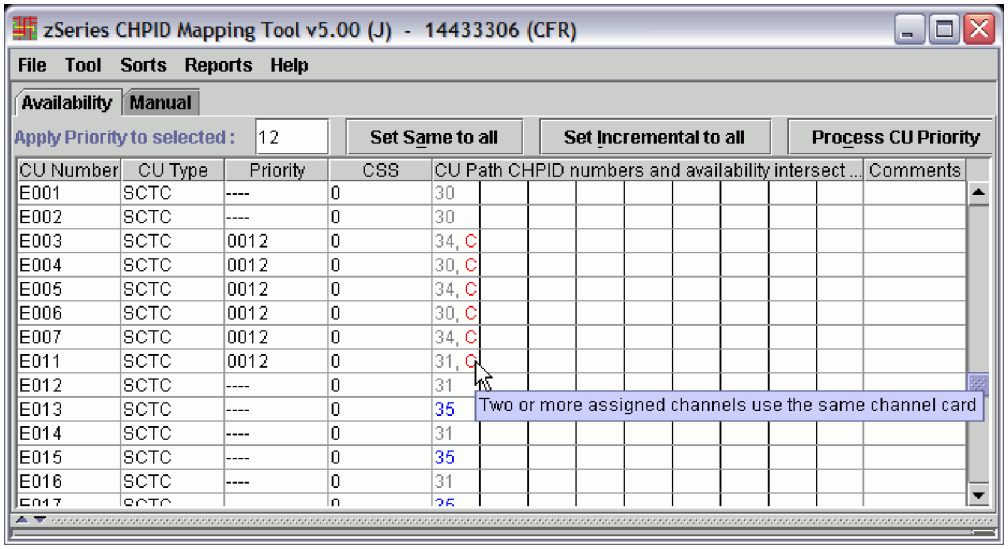


Figure 46. Pop-up Message Concerning an Intersect

c. Examine the column entitled **CU Path CHPID numbers and availability intersect reason**, where potential intersects are noted.

   Remember: This simply means there is a possible availability "problem" that you might need to consider and attempt to correct. You determine this by checking the code in red (beside the CHPID number in this section). In Figure 46, for example, a "C" indicates that two or more assigned channels use the same channel card. The following is a list of intersects:

   D Assigned channels are on the same daughter card.

   C Two or more assigned channels use the same channel card.

   S Greater than half the assigned channels use the same STI.

M All the assigned channels are supported by the same MBA group.

B Greater than half the assigned channels are connected to the same book.

d. If you have encountered unacceptable intersects, you can try to fix them by using manual mapping to change the CHPID to PCHID assignments. (See "Performing Manual Mapping after Availability Mapping.") Or you can change the priority on those control units with unacceptable intersects and rerun availability mapping, resetting "CHPIDs assigned by Availability." As a last resort, you may need to order more I/O features to gain the desired availability.

Performing Manual Mapping after Availability Mapping

You can perform manual mapping after availability mapping to try to fix intersect problems or if, for some other reason, you are not satisfied with the mapping the tool has provided.

Recommendation: You are recommended to perform manual mapping after availability mapping if configuration file assignments are causing unacceptable intersects. In this case, you are recommended to reset **only** the configuration file assignments causing unacceptable intersects.

Note: If manual mapping after availability mapping does not correct the problem or causes unacceptable problems with other control units, you may need to add additional cards to the configuration to provide more ports to perform the mapping.

Before you begin: It is recommended that you save the session before you make any manual changes. It is your responsibility to have backed up the customization data and to restore it to the PCHID to which the logical CHPID has been assigned.

Perform the following steps to perform manual mapping (after availability mapping):

1. Click the **Manual** tab.

   You may see ports that the tool did not assign CHPIDs. (This is caused by having ports in the hardware configuration that did not have a corresponding definition in the IOCP input and, thus, were not mapped as part of the availability mapping function. In other words, there are more ports on the machine than there were CHPID definitions in the IOCP.)
2. Manually make your changes. For steps in performing manual mapping, see "How to Use the Manual Mapping Method" on page 27.
3. Rerun availability mapping, without selecting any reset option to review any new intersects.
4. When mapping is complete, you can create a new IOCP with statements that include the assignments the tool made. Click **Tool** and then **Create Updated IOCP File**.

Chapter 7. Reports

The CHPID Mapping Tool includes report options that allow you to:

- Create reports
- Save reports in HTML format
- View reports in your Web browser
- Print reports.

This chapter discusses report options.

Reports Options

Figure 47 shows selections under the **Reports** menu item in the CHPID Mapping Tool.

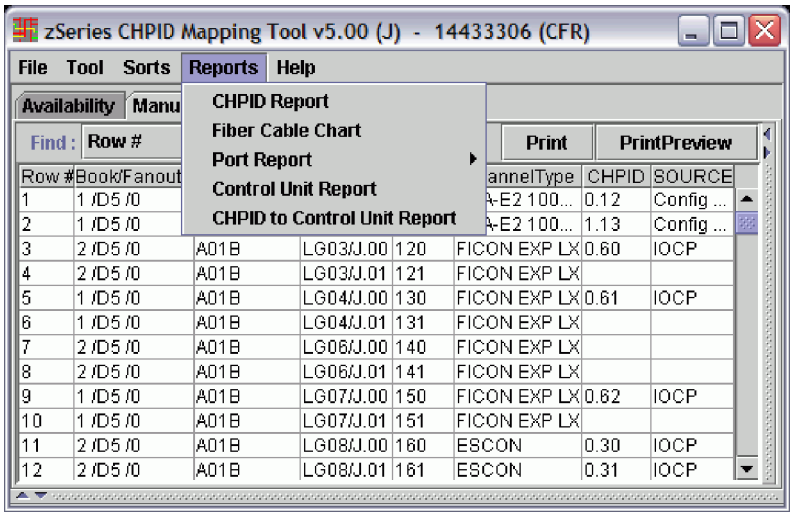


Figure 47. Report Options

Selections include:

- **CHPID Report**
- **FQC Report** -- (Available only if the hardware order contains Fibre Quick Connect)
- **Fiber Cable Chart**
- **Port Report** -- This includes three suboptions:
  - **Sorted by Location**
  - **Sorted by CHPID**
  - **Database Order**

  Note: The person who will install the I/O cables during system installation needs one of the reports. The Port Report, sorted by location, is recommended. The installer can use this to help with labeling the cables. The labels must include the PCHID or cage/slot/port information before system delivery.
- **Control Unit Report** -- This is a good record of how you prioritized the control units and any availability intersects you may have encountered.
- **CHPID to Control Unit Report**.

Generating a Report

Perform the following steps to generate and view a report:

1. Click **Reports** and then the option you want to use. Your selection depends on how you want to view the data.
2. A window is displayed, recommending that you save before continuing. Figure 48 shows this message:

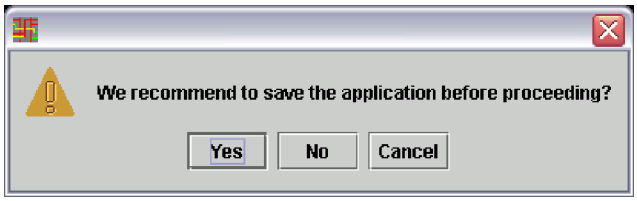


Figure 48. Save Message

Click **Yes** to save or **No** to continue without saving (or **Cancel** to close the window).

3. Figure 49 shows the Report File Name window, which allows you to specify a file name for the report.

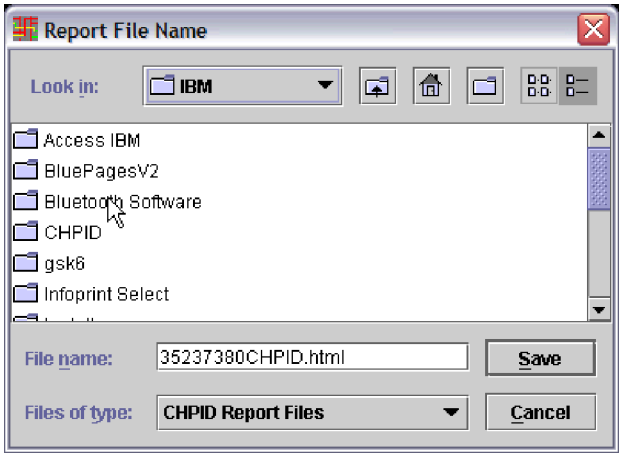


Figure 49. Report File Name Window

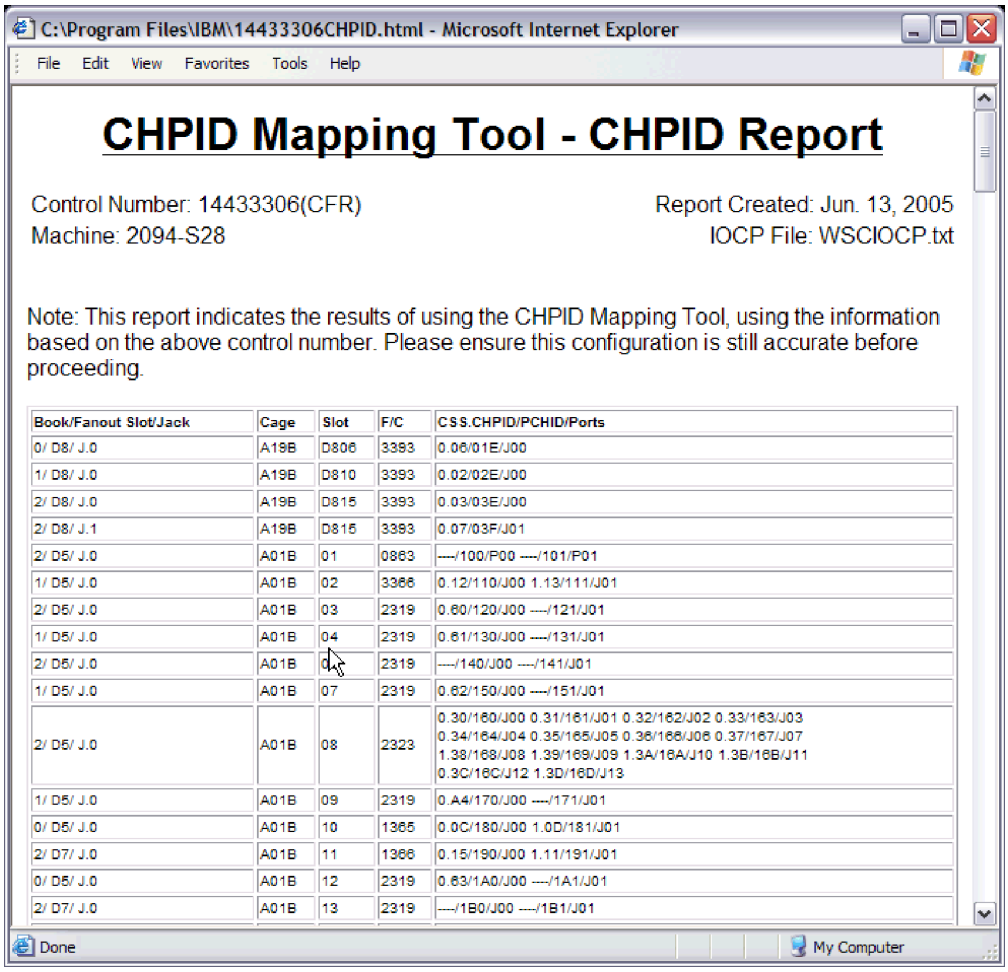
You can:

- Click **Save** to save the file with the specified name.
- Change the file name and then click **Save**.
- Click **CHPID Report Files** to specify listing files of all types or only the type of report currently being created.
- Click **Cancel** to cancel the action of generating a report.

Note: You are recommended to save all reports. You can save the reports in HTML format or use a Word Processing application that will accept HTML as input but allow you to save the report in a different format. You can add additional comments, and so forth.

4. After you click **Save** a report in HTML format, the CHPID Mapping Tool tries to open your browser to present the report, which is in HTML format.

For a z9-109 machine, the report looks similar to that shown in Figure 50.



Book/Fanout Slot/Jack	Cage	Slot	F/C	CSS.CHPID/PCHID/Ports
0/ D8/ J.0	A19B	D806	3393	0.06/01E/J00
1/ D8/ J.0	A19B	D810	3393	0.02/02E/J00
2/ D8/ J.0	A19B	D815	3393	0.03/03E/J00
2/ D8/ J.1	A19B	D815	3393	0.07/03F/J01
2/ D5/ J.0	A01B	01	0863	----/100/P00 ----/101/P01
1/ D5/ J.0	A01B	02	3366	0.12/110/J00 1.13/111/J01
2/ D5/ J.0	A01B	03	2319	0.60/120/J00 ----/121/J01
1/ D5/ J.0	A01B	04	2319	0.61/130/J00 ----/131/J01
2/ D5/ J.0	A01B	05	2319	----/140/J00 ----/141/J01
1/ D5/ J.0	A01B	07	2319	0.62/150/J00 ----/151/J01
2/ D5/ J.0	A01B	08	2323	0.30/160/J00 0.31/161/J01 0.32/162/J02 0.33/163/J03 0.34/164/J04 0.35/165/J05 0.36/166/J06 0.37/167/J07 1.38/168/J08 1.39/169/J09 1.3A/16A/J10 1.3B/16B/J11 0.3C/16C/J12 1.3D/16D/J13
1/ D5/ J.0	A01B	09	2319	0.A4/170/J00 ----/171/J01
0/ D5/ J.0	A01B	10	1365	0.0C/180/J00 1.0D/181/J01
2/ D7/ J.0	A01B	11	1366	0.15/190/J00 1.11/191/J01
0/ D5/ J.0	A01B	12	2319	0.63/1A0/J00 ----/1A1/J01
2/ D7/ J.0	A01B	13	2319	----/1B0/J00 ----/1B1/J01

Figure 50. z9-109 CHPID Report

For a z990 or z890, the report has slightly different column headings. The z9-109 information is **Book/Fanout Slot/Jack**; the z990 and z890 information is **Book/Jack/MBA**. The z890 and z990 CHPID Report looks similar to that shown in Figure 51 on page 46:

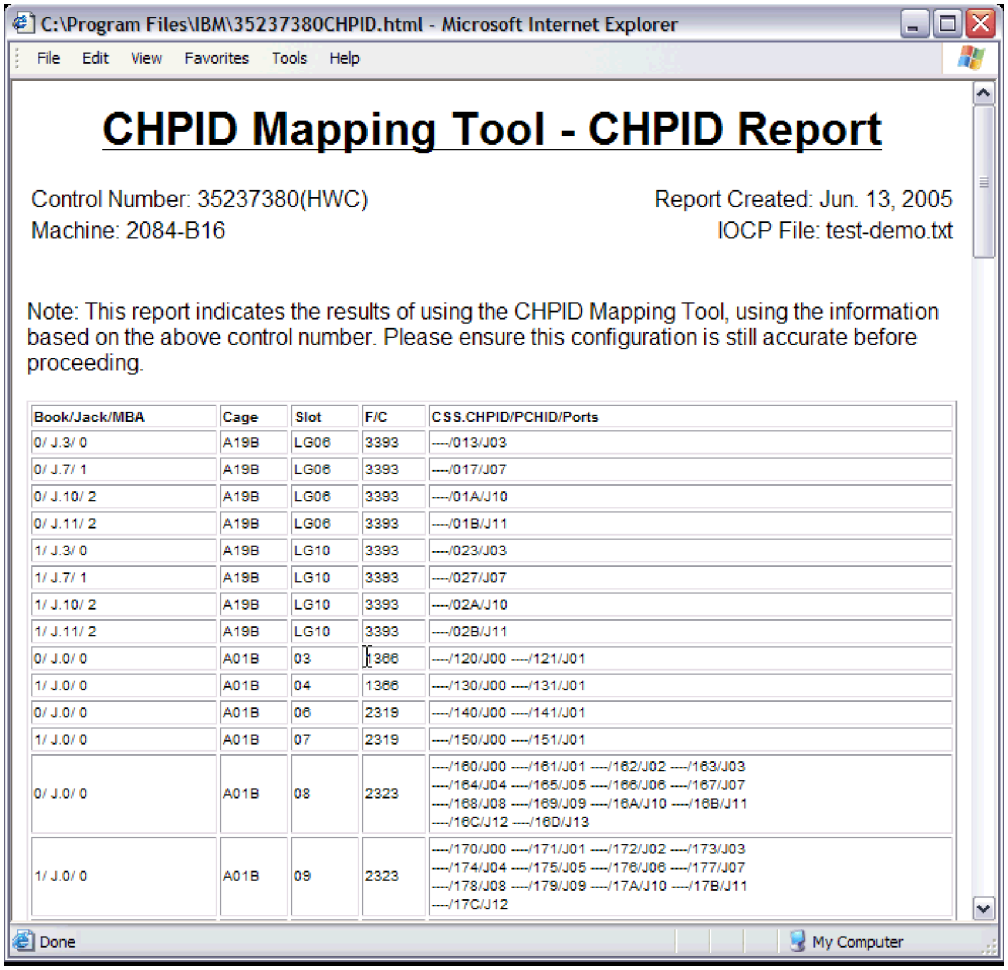


Figure 51. z890 or z990 CHPID Report

5. Optionally, you can print the report from your browser. You are recommended to print all reports.

   Note: When you print using Internet Explorer, certain reports, such as CHPID reports and FQC reports, may have page breaks at logical sections.

Chapter 8. Troubleshooting/Support

This chapter provides directions for reporting a problem or submitting a suggestion on the CHPID Mapping Tool through Resource Link and ViewBlue. It also provides a brief list of frequently asked questions (FAQ).

Submitting a Problem or Suggestion

You can report a problem or submit a suggestion through Resource Link. Alternately, your IBM representative or IBM business partner can report a problem for you using ViewBlue.

Submitting a Problem or Suggestion with Resource Link

IBM monitors feedback from Resource Link during normal U.S. business hours.

Perform the following steps to submit a problem or suggestion to the tool developers:

1. On the main Resource Link site, click **Feedback** in the left-side navigation. This opens the Feedback form, as shown in Figure 52.

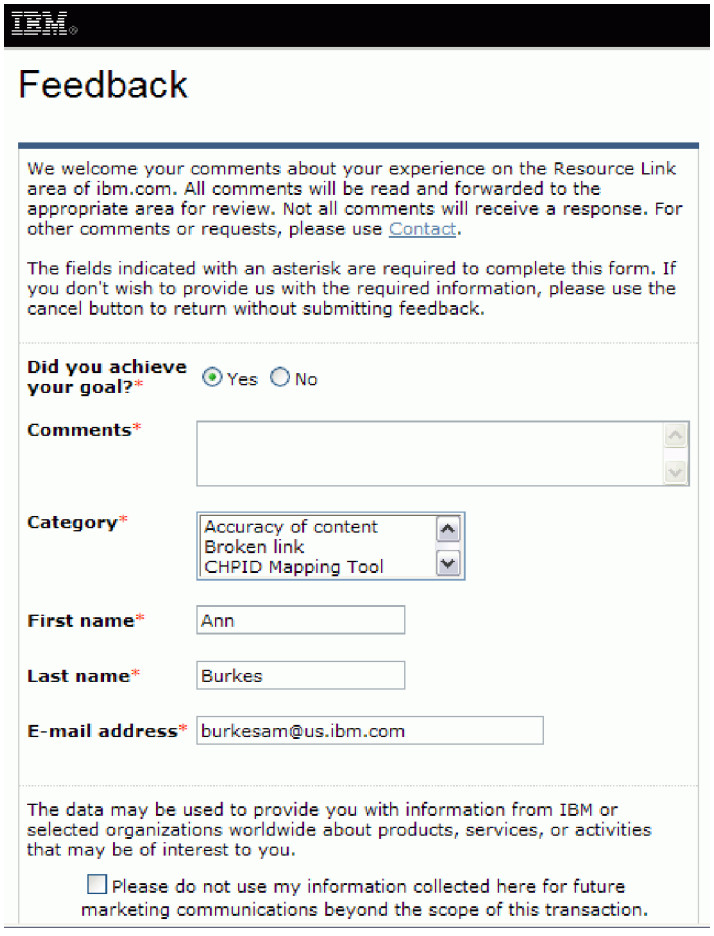


Figure 52. Feedback Form

2. Select CHPID Mapping Tool in the Category list.

3. Enter your comments, **making sure to include the version of the tool you are using** (this is displayed in tool title bar).
4. Complete the fields for first and last names and e-mail address, optionally select the check box regarding information use, and click **Submit**.
5. Save the work in a session file if possible. A session file can be used by the development team to analyze the problem.
6. If “Internal Tool Error” is encountered, the log file named chpid.log, found in the tool installation directory (usually “c:\program files\ibm\chpid”) can be sent to the development team for quick resolution, along with the session file, hardware data and IOCP file.

Submitting a Problem with ViewBlue

For issues outside U.S. business hours, please contact your IBM representative/Business Partner to report the problem using ViewBlue.

The following instruction are for IBM representatives/Business Partners:

1. Open http://w3.viewblue.ibm.com/.
2. Open up a “feedback” to report the problem.
3. Click **Report a problem**.
4. Identify the subject of the feedback as **Configurators**.
5. Select eConfig.

Note: Users who do not have access to ViewBlue can open up a feedback from the eConfig application.

Frequently Asked Questions (FAQ)

Q: Why do I get an “Invalid Feature Code” error while importing a CFReport?

A: The tool maintains a list of feature codes. It is possible for the CFReport to include recently introduced feature codes that the installed version of the tool does not yet support. If the installed version is not the latest, you should download the latest upgrade of tool from the Resource Link Web site. If the error still occurs, you should contact support.

Q: How do I find the version of the installed tool?

A: After the tool is started, the version is displayed in the title bar. Alternately, to display the version number: Click **Help** and **About Tool**.

Q: When I load a session file, why do I get the message the following message?

```
Tool has detected a more recent save session.
```

A: The tool has an auto-save feature that periodically saves changes to a separate session file to avoid productivity loss due to desktop or application failures. If you exited the tool or a desktop or application failure occurred before you saved the latest changes to a session file, this message displays to inform you that the tool detects an auto-saved file for the same CCN with later changes. You can load the auto-saved file to recover lost changes.

Q: How do I know if a CHPID is spanned in the **Manual** pane?

A: Spanned CHPIDs are displayed in bold text in the CHPID table.

Appendix A. An Explanation of Configuration Files

The following information applies if you are performing:

- An upgrade from a z990 to a z9-109
- A MES from a z9-109 to another z9-109.

On the z890 and z990, customization information is stored in files on the SE. The files are called configuration files (or 'config files'), and they are named based on the PCHID value (physical location) of the channel. The following table lists channel or CHPID types that have config files on a z9-109, z990, or z890 and the kind of information stored in these files:

Table 1. Channel or CHPID Type Information in Configuration Files

Channel or CHPID Type	Information Stored in Configuration Files
OSA-Express2	Any user specified MAC addresses and OAT tables
1000BaseT channel defined as CHPID type OSC	Console session information
FCP CHPID using LUN access control	Access Control Table (ACT)

For an upgrade from a z990 to a z9-109 or a MES for a z9-109, if channels or CHPIDs have associated configuration files, the CHPID Mapping Tool can assign PCHIDs to your logical CHPID definitions or move a CHPID definition to a new location. This can occur regardless of whether channels are moving. The CHPID Mapping Tool can override PCHID assignments for the following:

FICON channels supporting FCP:

- 2319
- 2320
- 3319
- 3320.

OSA Express2 and channels supporting OSC:

- 1366
- 3364
- 3365
- 3366
- 3368.

The following explains how the system preserves the config files on an upgrade from a z990 to a z9-109. However, it is ultimately your responsibility to have a record or backup of the customization data stored in config files. You should always make a backup record:

- For OSA-Express2 channels, record all user-assigned MAC addresses using the **Display or alter MAC address** function in **Card specific advanced facilities** or user-specified OSA Address Tables (OAT).

  Note: If you are an OSA/SF user, a better method is to use OSA/SF to back up and restore the configuration information for your OSA-Express2 channels.

- For CHPIDs defined as OSC (OSA-ICC), use the **Export source file** function in **Manual configuration options**.
- For FCP ACT, ensure the access rights source is current and available to the privileged (the one with access to the 'FC' or 'FD' unit address) Linux image.

For an upgrade of a z990 to a z9-109, most of the existing channels cards to move from the old machine to the new machine are rebalanced to take advantage of the availability characteristics of the z9-109. This rebalancing also takes into consideration any new channels that may be added as part of the upgrade. The configurator creates machine configuration data and reports that contain information on which PCHIDs have been relocated.

The information contained in the configurator data is used to create a CD that the service representative uses as part of the installation (or MES) activities of the new z9-109. This CD supports the relocation for channel types that have specific files containing customization data.

It is important that the file names containing the customization data be renamed to the new PCHID value. As part of the installation (or MES) process, the service representative is presented with a panel (Migrate Channel Configuration Files) that shows the movement of PCHIDs based on the information contained in the manufacturing-provided CD. This function provides the capability to automatically rename the files so that they reflect the new PCHID values (so that the customization data is not lost and follows the physical movement for those cards). If you used the CHPID Mapping Tool to perform the CHPID to PCHID assignments (a process that is recommended), then the service representative need only accept the values on the panel and the files are copied correctly. On the panels displayed, the service representative can change the "TO" PCHID during this process.

This can accommodate those customers who choose not to do not follow the recommendations (those who do not use the CHPID Mapping Tool or who override the CHPID Mapping Tool default assignments). If the customer and service representative team preplan and develop their own from-to-PCHID list, manual entry can be used to override the CD.

It is strongly recommended that you use the CHPID Mapping Tool to configure the CHPID to PHCID assignments because the tool ensures that logical CHPIDs are assigned to the new PCHID values. The tool has been changed to handle the previously described issues. When the appropriate files have been loaded into the tool (that is, CFReport Order file and IOCP file with PCHID assignments for the z990 or for the current z9-109 if this is an MES to a z9-109), the tool assigns new PCHID values to those affected CHPIDs based solely on the physical movement of the channel cards. If you use the manual mode, these PCHIDs have an identifier ('Config File'). You are not recommended to change that these assignments.

The availability mapping option is recommended. If you choose the availability mapping option, the CHPID Mapping Tool protects any CHPID/PCHIDs that have been assigned because of config files. The tool does not make any changes unless you select the option to change the assignments as part of the availability process. A **Reset CHPIDs assigned by CMT for config files** option is available to reset the CHPID Mapping Tool assignments for config files. (See Figure 41 on page 39 for an example of the panel.) The other reset options do not reset the config file assignments. You are recommended not to reset the config file assignments. After you run the availability option and review the intersects, if you believe the config file assignments are causing unacceptable intersects, you are recommended to use manual mapping to reset only those config file assignments that are causing the

unacceptable intersects. Remember it is your responsibility to have backed up the customization data (and to restore it to the PCHID to which the logical CHPID has been assigned).

After you have completed working with the CHPID Mapping Tool, one of the available reports will identify all the CHPIDs that have new PCHID values. A subset of these may have had config files associated with the old PCHIDs. The service representative can use this report to verify or change the “to” column of the **Migrate Channel Configuration Files** panel.

The use of the mapping tool is highly recommended for this migration because it ensures the logical CHPIDs are assigned to the new PCHID values. The IOCP file (for the z990 being upgraded to the z9-109) that is input to the CHPID Mapping Tool must contain the current CHPID to PCHID assignments for the CHPID Mapping Tool to perform the function as previously described.

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