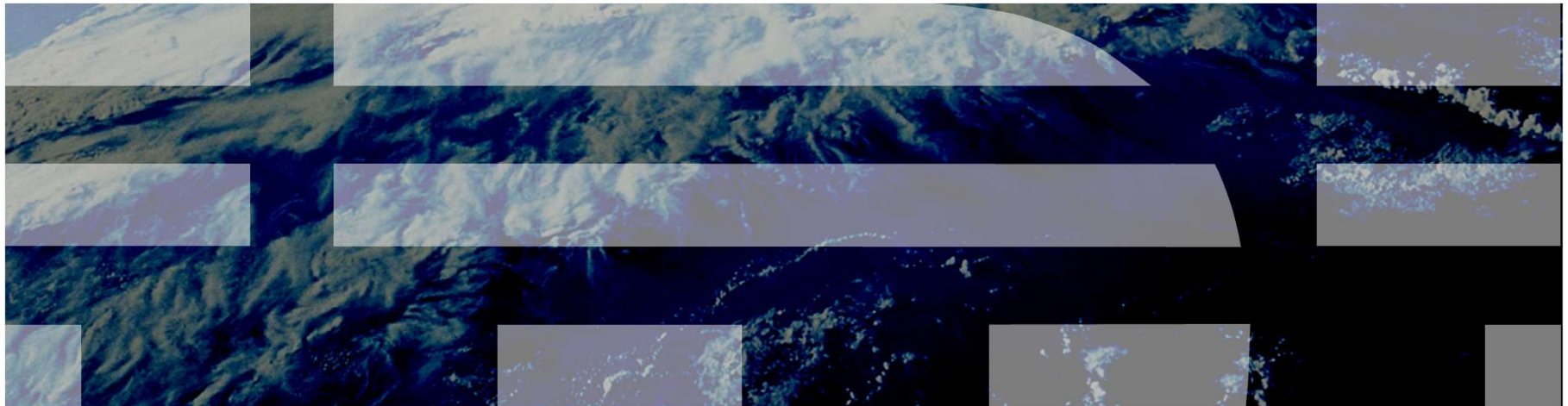


# Quick-install of the PowerHA Full System Flashcopy Manager

Version 4.3

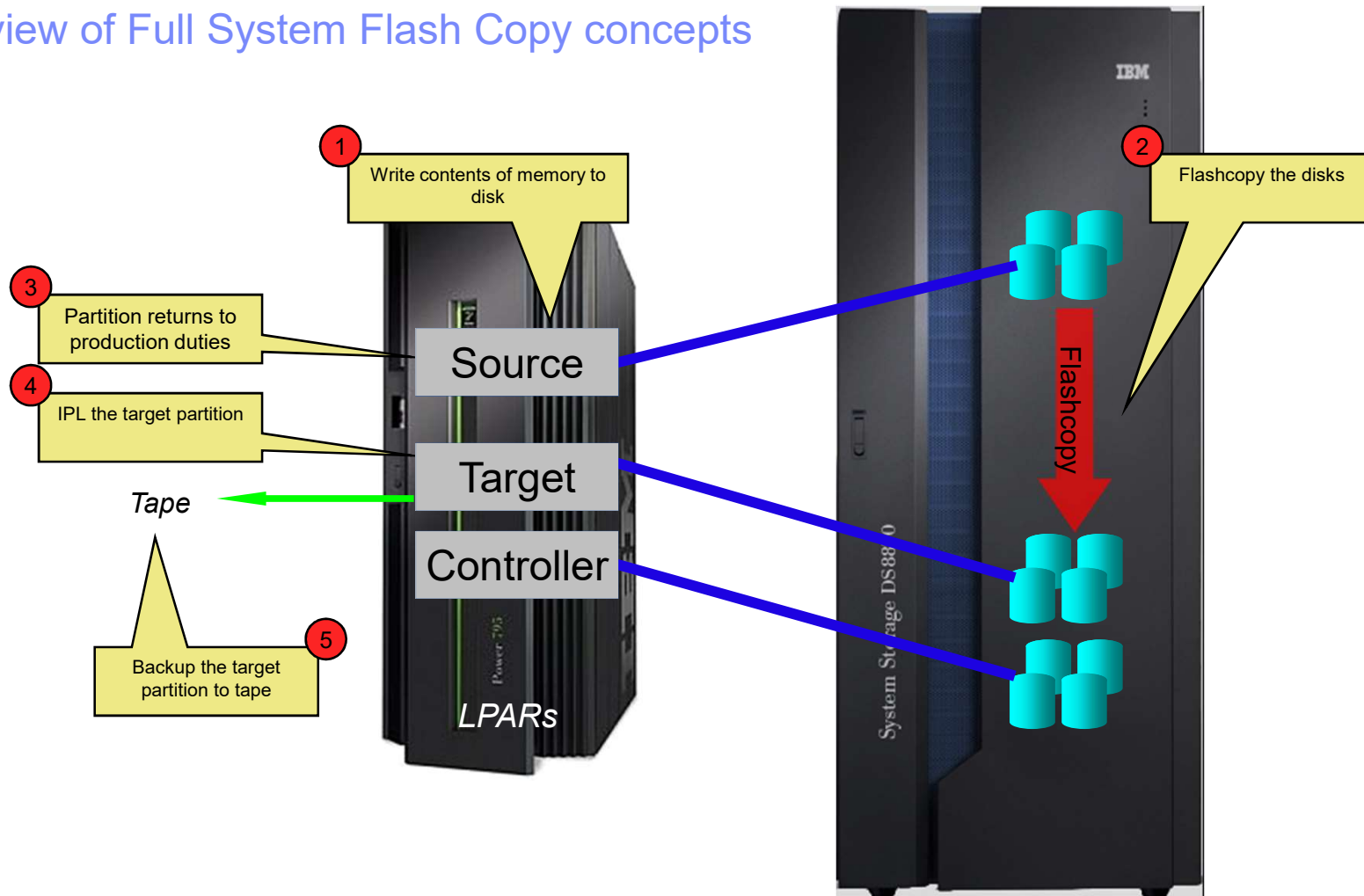
Christian Aasland  
Wednesday, September 25, 2019



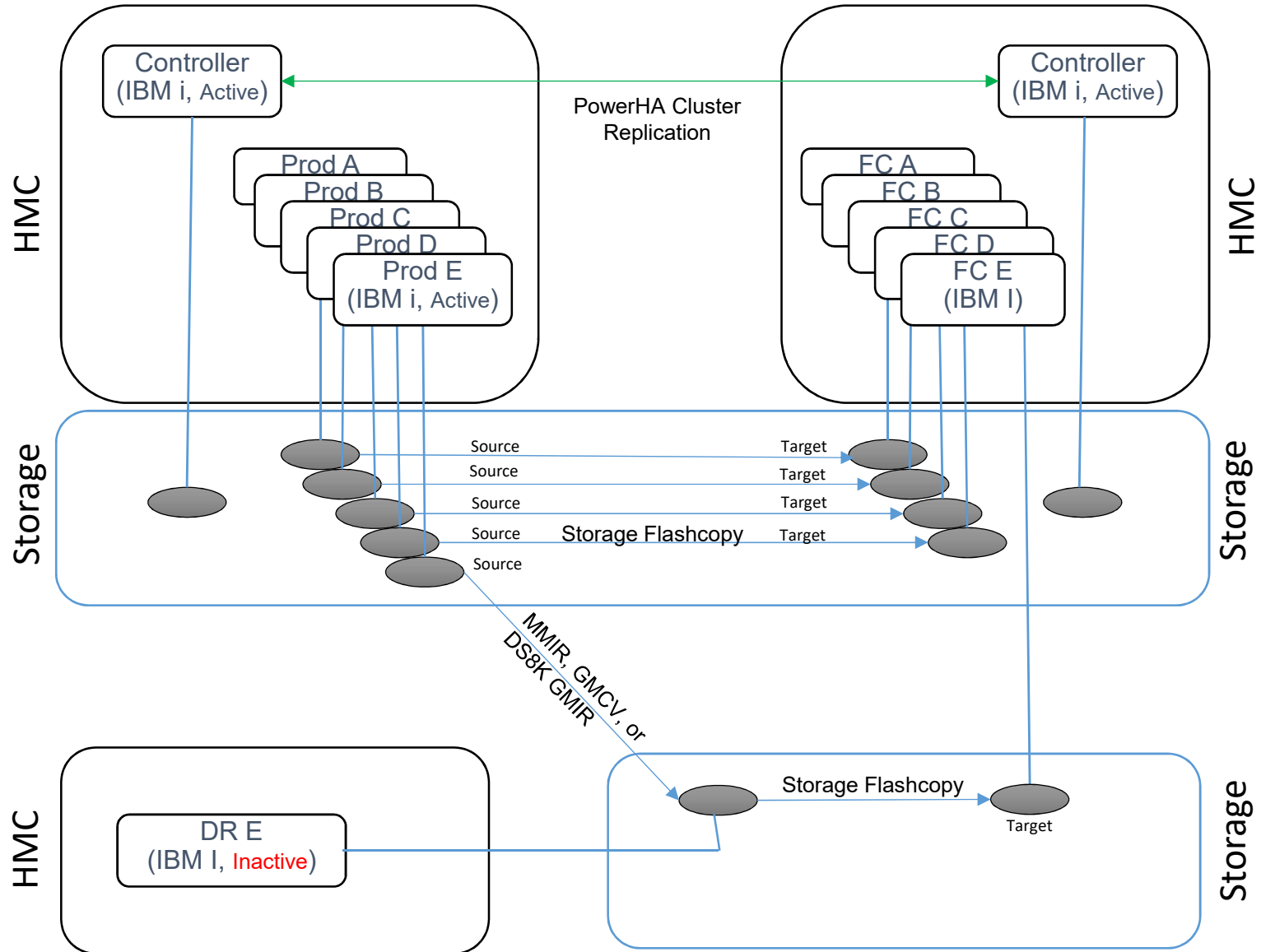
## What the heck is this document for?

- ❑ This is a quick-install guide for configuring the Full System Flashcopy Manager for the following storage products:
  - ❑ SVC family (V3700, V5000, V7000, V9000)
  - ❑ DS8K family
- ❑ Customers can have it, but it is designed to be performed by a Lab Services consultant
- ❑ It does not explain details or how to handle errors or special/complex situations
  
- ❑ Primary documentation is the FSFC Manager Wiki
- ❑ Has more detail and explanations
  - ❑ <https://ibm.biz/BdsULY>

## Overview of Full System Flash Copy concepts



## Overview of Full System Flashcopy topography





## Customer actions prior to our engagement

- ❑ Provide Lab Services with the IBM i serial numbers so we can generate license keys
- ❑ Source and Controlling LPARs configured with IBM i OS
  - ❑ Install the [LPP's](#) and [PTF's](#) on pages 5 and 6
  - ❑ PowerHA (Standard Edition) installed and licensed
    - ❑ We will help you set up the clusters
  - ❑ Place FSFC Manager savefile PHATOOLS43 in QGPL on the controlling and production LPARs
    - ❑ We will send this to you before we arrive
- ❑ Get IP addresses, administrative user IDs and passwords for:
  - ❑ HMC
  - ❑ LPAR's (including the secondary)
  - ❑ Storage devices (SVC / DS8K)

## Controlling LPAR LPPs and PTFs

7.1	7.2	7.3	7.4
5733SC1 *Base, 1	5733SC1 *Base, 1	5733SC1 *Base, 1	5733SC1 *Base, 1
5770SS1 30, 33, 41	5770SS1 30, 33, 41	5770SS1 30, 33, 41	5770SS1 30, 33, 41
5761JV1 *Base, 14	5770JV1 *Base, 14	5770JV1 *Base, 16	5770JV1 *Base, 16
5770HAS *Base	5770HAS *Base, 2	5770HAS *Base, 2	5770HAS *Base, 2
Group PTFs SF99706, SF99572	Group PTFs SF99776, SF99716	Group PTFs SF99876, SF99725	Group PTFs SF99666, SF99665
5770HAS PTF SI57181	5770HAS PTF SI57302, SI62180  5770999 PTF MF62565	5770999 PTF MF62566	

## Source LPAR PTFs

7.1	7.2	7.3	7.4
<b>MF99006</b> , MF56047, SI49487	5770999 PTF MF62565, MF64640	5770999 PTF MF62566, MF64641	-None-
If using BRMS, the following PTF's are required (superceding PTF's are ok) :			
SI64249 (BR1) SI53781 (SS1)	SI70366 (BR1) SI53860 (SS1)	SI70367 (BR1)	SI70368 (BR1)

**RED** PTF's may require an IPL.



## SVC setup prior to our engagement

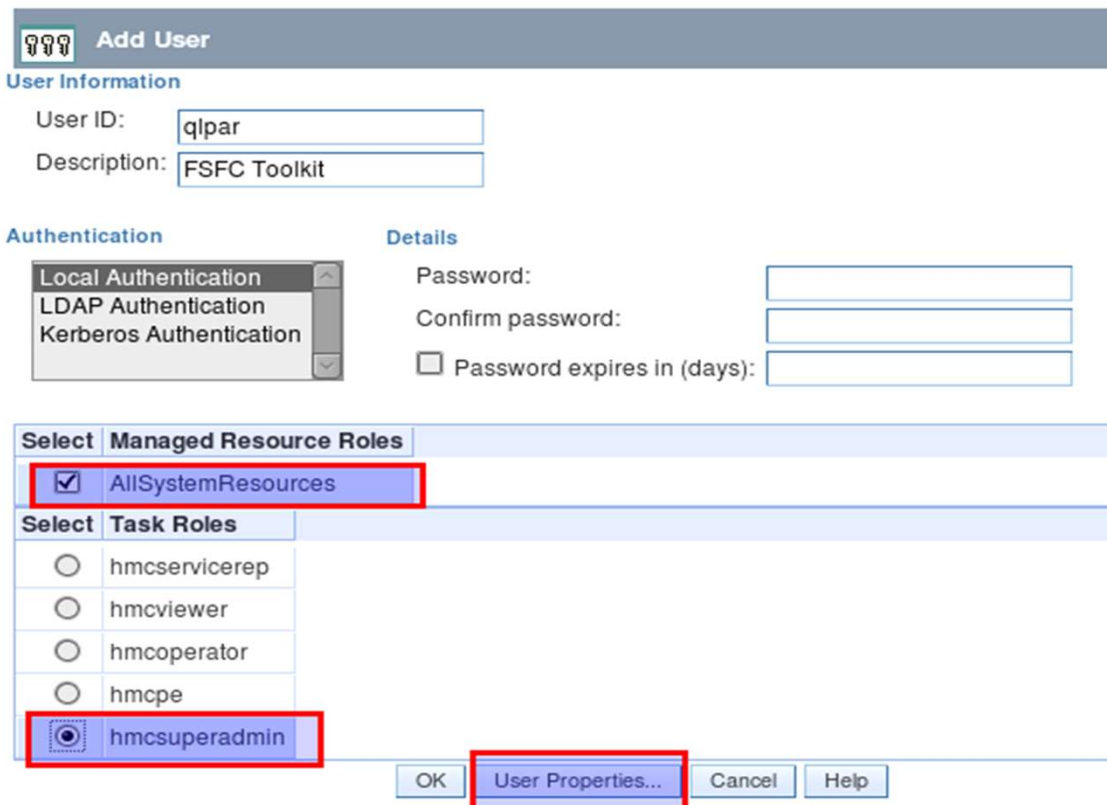
- ❑ Configure the storage unit for Primary, Secondary and Controlling LPAR.
  - ❑ Firmware level 7.5.0.3 or newer
  - ❑ Create or select user profile
    - ❑ Must be assigned to CopyOperator (or better) user group
    - ❑ If changing host connections, must be Administrator
  - ❑ LUNs
    - ❑ For source and target LPARs
  - ❑ Host connections
  - ❑ Licenses (Replication, Thin-provision, etc)
  - ❑ If using replication:
    - ❑ Partnerships
      - ❑ We can remotely help you set this up (also ensures you have communication between the SVC's before we arrive)
    - ❑ Start replication
      - ❑ Replication should be completed before we're onsite so that won't have to wait for it to catch up

## DS8K setup prior to our engagement

- ❑ Create a user profile on the DS8K
  - ❑ Can be other than QLPAR, make a member of the admin group
  - ❑ Remember the password, set to not expire
    - ❑ `chpass -expire 0`
- ❑ Configure the storage unit for Primary, Secondary and Controlling LPAR.
  - ❑ Recent firmware level
    - ❑ Install DSCLI on the IBM i from the DS8K CD
    - ❑ Bundle 87.10.91.0 or newer (required for creating GMIR D-Copy)
  - ❑ Create fixed block volumes (requires ranks, arrays, extent pools, space efficient repositories, etc)
    - ❑ For source and target LPARs
  - ❑ Volume groups, ports and host connections
  - ❑ Licenses (Replication, Space Efficient, etc)
  - ❑ PPRC Paths
    - ❑ We can remotely help you set this up (also ensures you have communication between the DS's before we arrive)
  - ❑ Start replication
    - ❑ Replication should be completed before we're onsite so that won't have to wait for it to catch up

## HMC Configuration

- Create a user on the LPAR HMCs
- Any user name will do (as long as you remember it)
- Password is required
- Hmcsuperadmin with AllSystemResources



**Add User**

**User Information**

User ID:

Description:

**Authentication**

Local Authentication  
LDAP Authentication  
Kerberos Authentication

**Details**

Password:

Confirm password:

Password expires in (days):

**Select Managed Resource Roles**

<input checked="" type="checkbox"/>	AllSystemResources
-------------------------------------	--------------------

**Select Task Roles**

<input type="radio"/>	hmcservicerep
<input type="radio"/>	hmcviewer
<input type="radio"/>	hmcoperator
<input type="radio"/>	hmcpe
<input checked="" type="radio"/>	hmcsuperadmin

OK **User Properties...** Cancel Help

# HMC Configuration

## Enable remote command execution

**HMC Management** ( [HMC Version](#) )

**Operations**

- View HMC Events
- Shut Down or Restart
- Schedule Operations
- Format Media
- Back up HMC Data
- Restore HMC Data
- Save Upgrade Data
- Change Network Settings
- Test Network Connectivity
- View Network Topology
- Tip of the Day
- View Licenses
- Change Default User Interface Settings
- Change User Interface Settings
- Change Date and Time
- Launch Guided Setup Wizard

**Administration**

- Change User Password
- Manage User Profiles and Access
- Manage Task and Resource Roles
- Manage Users and Tasks
- Manage Certificates
- Configure KDC
- Configure LDAP
- Remote Command Execution**
- Remote Virtual Terminal
- Remote Operation

**Remote Command Execution**

Enable the following option to provide remote command execution through ssh.

Enable remote command execution using the ssh facility

OK Cancel

## HMC Configuration

Allow ssh (port 22) through the firewall (on all adapters)

The screenshot shows the HMC Management console interface. On the left is a navigation menu with items: Welcome, Systems Management, System Plans, HMC Management (highlighted), Service Management, and Updates. The main content area is titled 'Operations' and lists various tasks such as 'View HMC Events', 'Shut Down or Restart', 'Schedule Operations', 'Format Media', 'Back up HMC Data', 'Restore HMC Data', 'Save Upgrade Data', 'Change Network Settings' (highlighted with a red box), 'Test Network Connectivity', and 'View Network Topology'. A red arrow points from the 'Change Network Settings' link to a dialog box titled 'Customize Network Settings'. The dialog has tabs for 'Identification', 'LAN Adapters' (highlighted with a red box), 'Name Services', and 'Routing'. The 'LAN Adapters' tab displays a list of network interfaces: Ethernet eth0 5C:F3:FC:BA:FD:F8 (192.168.128.1), Ethernet eth1 5C:F3:FC:BA:FD:FA (9.5.168.169), Ethernet eth2 34:40:B5:A5:0C:28 (0.0.0.0), and Ethernet eth3 34:40:B5:A5:0C:2A (0.0.0.0). A 'Details...' button is highlighted with a red box at the bottom of the list. At the bottom of the dialog are 'OK', 'Cancel', and 'Help' buttons.

## HMC Configuration

Secure Shell (port 22:tcp) must be allowed.

- Allow all hosts: 0.0.0.0/0.0.0.0
- Allow specified hosts: at least specify the IP of your controlling LPAR

LAN Adapter Details

Basic Settings IPv6 Settings **Firewall Settings**

LAN interface address: 5C:F3:FC:BA:FD:FA Ethernet

Available Applications

Select	Application Name	Ports
<input checked="" type="radio"/>	Secure Shell	22:tcp
<input type="radio"/>	Secure Remote Web Access	443:tcp 9960:tcp
<input type="radio"/>	Secure ASM Access	9443:tcp
<input type="radio"/>	Open Pegasus	5989:tcp

Allowed Hosts

Select	Application Name	Ports	Allowed Hosts
<input type="radio"/>	SLP	427:udp	0.0.0.0/0.0.0.0
<input type="radio"/>	SLP	427:udp	:::
<input type="radio"/>	RSCT Peer Domains	12347:udp udp:12348	0.0.0.0/0.0.0.0
<input type="radio"/>	RSCT Peer Domains	12347:udp udp:12348	:::
<input type="radio"/>	Cluster Ready Hardware Server	8899:tcp	0.0.0.0/0.0.0.0
<input type="radio"/>	Cluster Ready Hardware Server	8899:tcp	:::
<input type="radio"/>	Secure Remote Web Access	443:tcp tcp:9960	0.0.0.0/0.0.0.0
<input type="radio"/>	Secure Remote Web Access	443:tcp tcp:9960	:::
<input type="radio"/>	Secure Shell	22:tcp	0.0.0.0/0.0.0.0
<input type="radio"/>	Secure Shell	22:tcp	:::

Allow Incoming

Allow Incoming by IP Address

Allow remote Secure Shell access.

Remove

OK Cancel Help

## Restoring toolkit library, setup on both Controllers

- ❑ Place the toolkit savefile in QGPL (FTP, scp etc)
- ❑ Restore the toolkit library:
  - ❑ RSTLIB SAVLIB(QZRDHASM) DEV(\*SAVF) SAVF(QZRDHASM43)
    - ❑ The '43' refers to the release and may change
  - ❑ ADDLIBLE QZRDHASM
- ❑ Run the setup program
  - ❑ SETUPFSFC NODEROLE(\*CTL) PORT(\*DFT) ACSCODE(<your license access code>)
  - ❑ The port is used to receive communications from the production LPARs, \*DFT is 55920
  - ❑ Will create user profile QLPAR without a password, initialize files etc.

### Set up IBM Pwr HA tools - FSFC (SETUPFSFC)

Type choices, press Enter.

```

Node role . . . . . > *CTL           *CTL, *PRD
FSFC communications port . . . . . *DFT       1-65535, *SAME, *DFT
Toolkit access code . . . . . 12345
    
```

## Restoring toolkit library, setup on Production LPARs

- ❑ Place the toolkit savefile in QGPL (FTP, scp etc)
- ❑ Restore the toolkit library:
  - ❑ RSTLIB SAVLIB(QZRDHASM) DEV(\*SAVF) SAVF(QZRDHASM43)
    - ❑ The '43' refers to the release and may change
  - ❑ ADDLIB QZRDHASM
- ❑ Run the setup program
  - ❑ SETUPFSFC NODEROLE(\*SRC) ACSCODE(<your license access code>)
    - ❑ Press PF9 and specify the line description, TCPIP interface and subnet mask to create on the controller for the target to use
  - ❑ The port number is used for toolkit communications from the controllers, \*DFT is 55920
  - ❑ The line description and IP interfaces will be created
  - ❑ Will create user profile QLPAR without a password, initialize files etc.
- ❑ If the target LPAR is on a different serial number:
  - ❑ A license key for the target LPAR must be entered.
  - ❑ Use ADDPRDACS on the Production LPAR to enter the serial number and license for the target LPAR.



## Modifying the Startup Program on Production LPARs

- ❑ Modify startup program on each node to prevent QSTRUPPGM from running on the target.
  - ❑ This is optional but adds a layer to safety.
  - ❑ QZRDHASM/RUNLPARCMD SRLN(xxxxxxx) LPAR(xx) CMD(CALL PGM(QZRDHASM/QZRDENDSBS))
    - ❑ Specify the target LPAR serial and LPAR numbers
    - ❑ Review QZRDHASM/QCLSRC QZRDENDSBS for changes
    - ❑ Include MONMSG CPF0000 after RUNLPARCMD
  
- ❑ Modify startup program on each node to start the subsystem:
  - ❑ This is not necessary if FSR is also installed (FIXSTRPRSC will start the subsystem)
  - ❑ After IP and QSYSWRK start, before applications,
  - ❑ STRSBS QZRDHASM/QZRDFSR

## Creating the cluster on the controllers

- ❑ If there is only one controller, you must create a single-node cluster. Perform the following steps on the single node only.
- ❑ If multiple controllers are to be configured, issue these messages on all of them:
  - ❑ STRTCPSVR \*INETD
  - ❑ CHGTCPSPVR \*INETD AUTOSTART(\*YES)
  - ❑ CHGNETA ALWADDCLU(\*ANY)
- ❑ On the Master controller
  - ❑ CRTCLU CLUSTER(FSFC) START(\*YES), PF4, fill in Primary Controlling node name and IP address
  - ❑ ADDCLUNODE CLUSTER(FSFC) NODE(Secondary Controlling node name and IP)
  - ❑ WRKCLU - Option 7, create a device domain (call it whatever you'd like)
    - ❑ Enter one node name first, press enter
    - ❑ Option 6, add the other node name
- ❑ On Auxiliary controller:
  - ❑ WRKCLU, validate cluster is started
- ❑ With multiple controllers, modify startup program on each node to start the cluster and subsystem:
  - ❑ After IP and QSYSWRK start, before applications,
  - ❑ STRCLUNOD CLUSTER(FSFC) NODE(Master or Auxiliary controller nodes)
    - ❑ **This requires \*IOSYSCFG so QSTRUPJD should specify a profile like QLPAR**
    - ❑ **CHGJOB JOB(QSTRUPJD) USER(QLPAR)**
  - ❑ STRSBS QZRDHASM/QZRDFSR

## Download the Java Secure Channel code (on the Controllers)

- ❑ Download Java Secure Channel to /QIBM/qzrdhasm/ssh from
  - ❑ <http://sourceforge.net/projects/jsch/files/jsch.jar/0.1.52/jsch-0.1.52.jar/download>
- ❑ Don't download a different version. It won't work.
- ❑ The Java Secure Channel is an open-source implementation of ssh which allows the FSFC toolkit to issue ssh calls programmatically and to review the results.
- ❑ Because it is open-source, IBM Legal requires that you download it yourself (i.e. we can't bundle it with our toolkit)
- ❑ Download to desktop, FTP to both IBM i controllers
- ❑ Place it into directory /QIBM/qzrdhasm/ssh/

```
ftp> bin
200 Representation type is binary IMAGE.
ftp> put jsch-0.1.52.jar /QIBM/qzrdhasm/ssh/jsch-0.1.52.jar
local: jsch-0.1.52.jar remote: /QIBM/qzrdhasm/ssh/jsch-0.1.52.jar
227 Entering Passive Mode (9,5,168,177,167,46).
150-NAMEFMT set to 1.
150 Sending file to /QIBM/qzrdhasm/ssh/jsch-0.1.52.jar
226 File transfer completed successfully.
249282 bytes sent in 0.742 secs (336.12 Kbytes/sec)
ftp>
```

## Create the credentials on either controller

- FSFC uses userid/password to log into the HMCs, DS8Ks and SVCs. Use WRKCSECRDL or ADDCSECRDE to manage these credentials.
- Enter the IP address, user ID, password and a description of the host for:
  - SVCs
  - DS8Ks
  - HMCs
- This information is encrypted and placed into the device data domain and is kept consistent on both of the controllers.
- WRKCSECRDL uses PowerHA to keep the controllers in sync

```

Add CSE Credential Entry (ADDCSECRDE)

Type choices, press Enter.

Host IP address . . . . . > '1.2.3.4'
nn.nn.nn.nn
User ID . . . . . User
Password . . . . .
Confirm password . . . . .
Host description . . . . . Host name display
```

## SVC vs. DS8K configuration

### SVC Environment Configuration

### DS8K Credentials and Environment Configuration

## Create the SVC environments on the controller

- ❑ An FSFC Environment describes the storage to the toolkit. Use WRKCSE to manage the environments.
  - ❑ Option 1 creates a new environment
  - ❑ Enter \*NONE when prompted for ASP Copy Descriptions
- ❑ The environments are stored in the device data domain and is kept in sync with both controllers.
- ❑ On the SVC, flashcopy consistency groups define background copy rates, full or incremental etc. The toolkit just manages the consistency groups.

```

Change a FLASH Environment
Type choices, press Enter.

Environment name . . . . . : TEST
Storage Type . . . . . : SVC

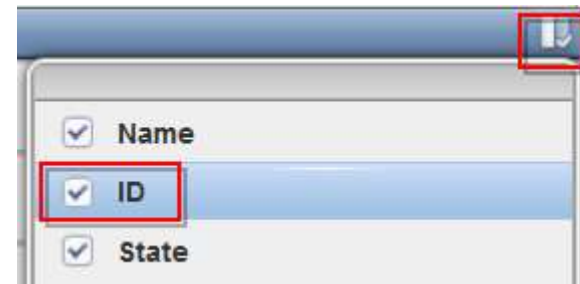
FlashCopy SVC information:
Flash SVC IP Address . . . . . 1.2.3.4           IPv4
FlashCopy consistency group Id . . 2             Id
GMCV Source SVC IP Address . . . . .           IPv4
Remote copy consistency group Id           Id

Comment:
Text . . . . . Something meaningful to humans

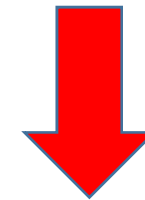
Bottom
F1=Help  F3=Exit  F6=Validate  F12=Cancel
    
```

## Finding the Flashcopy consistency group Id

- ❑ The environment requires the Flashcopy consistency group Id.
- ❑ To find it, view the flash copy consistency groups and enable the Id column



Mapping Name	ID	Status
Not in a Group	-	
AAKyle_Full_Incremental	1	Idle or Copied
AAKyle_Thin	4	Idle or Copied
ctciha9m_ctciha9p1	8	Copying
ctciha9m_ctciha9p2	14	Copying
DEMO_FSCSM_DEMOSRC	2	Empty



[Click here to continue with CSE Data](#)

## Create the DS environments on the controller

- An FSFC Environment describes the storage to the toolkit. Use WRKCSE to manage the environments.
  - Option 1 creates a new environment
- The environments are stored in the device data domain and is kept in sync with both controllers.
- Enter the requested information then PAGE DOWN

```

Change a FLASH Environment
Type choices, press Enter.

Environment name . . . . . : TEST
Storage Type . . . . . : DS8K

FlashCopy Power HA, ASP information:
Device name . . . . . *SYSTEM *SYSTEM, Name
Source Copy Description . . . . . *NONE *NONE, Name
Target Copy Description . . . . . *NONE *NONE, Name

FlashCopy DS unit information:
Device . . . . . IBM.1234-1234565 Name

More . . .
    
```



## Enter the DS information

- Enter the flashcopy details
- Enter the DS unit details
- If the IP address isn't in WRKCSECRDL yet, pressing enter will take you there to add it.

```

Change a FLASH Environment
Type choices, press Enter.

FlashCopy IASP Manager options:
  Full FlashCopy . . . . . *NO           *YES, *NO
  Resync FlashCopy . . . . . *NO           *YES, *NO
  Multi incremental resync . . . . . *YES     *YES, *NO
  Space Efficient FlashCopy . . . . . *NO           *YES, *NO
  Target PPRC . . . . . *NO             *YES, *NO
  GMIR D-Copy target flash . . . . . *NO           *YES, *NO

DS unit SMC information:
  Flash hmc1 . . . . . IPv4
  Flash hmc2 . . . . . IPv4
  Port . . . . . 1751          1750, 1751

Comment:
  Text . . . . .

Press Enter to add DS8K credentials for 1.2.3.4, press F12 to cancel.
    
```

## Enter the DS information

- ❑ Enter the volume details

### Add, Change or Delete Volumes

```
Environment . : TEST                Source device : IBM.123
Type . . . . . : FLASH             Target device : IBM.123
Volume sets . : 0
```

Type Volume options; 1=Add, 2=Change, 4=Delete, press Enter.

Opt	Source Volumes	Flash Volumes
1	0100	0200

## Enter the Copy Services Environment (CSE) Data on either Controller

- ❑ The CSE Data describes the non-storage elements of an environment.
- ❑ This data is also stored in CRG's. The toolkit will create the CRG. It will always remain inactive when viewed in WRKCLU opt 9.
- ❑ CRTCEDTA, CHGCSEDTA, DLTCSEDTA and DSPCEDTA can be used to work with this information.
  - ❑ Stored in the CRG so the data is synchronized between the controllers
- ❑ WRKCEDTA displays all the data created.

```

Work with CSE Data

Type options, press Enter.
  1=Create  2=Change  3=Copy  4=Delete  5=Display

Opt      CSE Data      CRG
          CSE Data      type      Text

          FSR9M2       FSR       FSR from 9M to 90
          HA8FSR2      FSR       DS8K FSR from HA8FSR1 to HA8FSR2
          FSFC9J9K     FSFC
          FSFC9M9N     FSFC       GMCV Flash
          FSFC9M9P1    FSFC
          FSR9J2       FSR
          FSFC9M9P2    FSFC
          FSFC9F9G     FSFC

                                          More...

Parameters or command:
===>

```

## Enter the Copy Services Environment (CSE) Data on either Controller

- Use CRTCEDTA or WRKCEDTA opt 1 to enter the flashcopy operational details
- The command will prompt for details depending on what you enter
- Start with \*FRCWRT, no BRMS integration.

```

Create Full System FlashCopy CSE Data

Supply all required values, press Enter.

CSE Data Name . . . . . : TEST
Use . . . . . : *SYSTEM
Copy type . . . . . : *FLASH

Environment . . . . . TEST           Name
Primary controlling node . . NODE1     Name
Secondary controlling node   node2     Name
Communications port . . . . 55920

Source LPAR IP address . . . 9.4.153.4 IPv4 address
Source host alias . . . . . SOURCE    Name
Target host alias . . . . . TARGET    Name

Method to flush memory . . . *FRCWRT  *QUIESCE, *FRCWRT, *IPL

More . . .
    
```

## Enter the Copy Services Environment (CSE) Data on either Controller

- ❑ Do not specify a backup command yet

```
Change Full System FlashCopy CSE Data
Supply all required values, press Enter.

Target LPAR Device Setup:

Backup device description      *NONE          *NONE, device name
Device serial number . . .    *NONE

    + for more values . .

Target LPAR backup command    *NONE

    + for more values . .

More...
```

## Enter the Copy Services Environment (CSE) Data on either Controller

- ❑ Target keylock position set to \*MANUAL

```

Change Full System FlashCopy CSE Data

Supply all required values, press Enter.

Wait for ENDFSFLASH . . . . *NO                *YES, *NO
FlashCopy Exit program . . . *NONE
  Library . . . . . *LIBL                *LIBL, library
Hold scheduled jobs . . . . *YES                *YES, *NO
Target keylock position . . *MANUAL            *PANEL, *AUTO, *MANUAL
Stop target after backups  *NO                *YES, *NO, *RMV

Text . . . . .

Bottom
    
```

## Test the configuration on either Controller

- Use CHKFSFLASH to verify communications configurations first
- Resolve issues until it is successful

```
CHKFSFLASH CSEDTA(FSFC9M9P1)
Acquired lock on LPAR CTCIHA9M.
Validating flashcopy consistency group 8
Validating flashcopy mappings
Consistency group 8 validated.
Successfully performed local verifications.
Performing Full System FlashCopy verifications on CTCIHA9M.
Released lock on LPAR CTCIHA9M.
Log file used : /QIBM/Qzrdhasm/fsfc/FSFC9M9P1/ctl.log.
CHKFSFLASH validation for FSFC9M9P1 completed successfully.
```

## Before you test the Flash Copy

- On the production LPAR, do QCTL and QSYSWRK have prestart or autostart jobs?
  - DSPSBSD SBSD(QSYS/QCTL) option 5, option 3 and 10
  - DSPSBSD SBSD(QSYS/QCTL) option 5, option 3 and 10
  - If YES then you'll need to use the exit program QZRDIAFFEX
    - Remove them at \*QUIESCE and add them back at \*POSTFLASH (include MONMSG CPF0000)
      - RMVAJE SBSD(QSYS/QCTL) JOB(jobname)
      - RMVPJE
      - ADDAJE SBSD(QSYS/QCTL) JOB(jobname) JOBD(job description)
      - ADDPJE
    - Add them to the BRMS Recovery report (we'll do this later when we edit QO1AUSRRCY)
    - Update the CSE Data to call the exit program
- Did you add RUNLPARCMD to the startup program?
- On the target LPAR, do any comm adapters (virtual and physical) have the same slot numbers (Cxx) as the comm adapters on the source LPAR?
  - If yes, move them to other slots
  - This will prevent the OS from using them with the existing line descriptions.



## Test the configuration on either Controller

- Did you read the previous slide?
- Use STRFSFLASH to perform a flashcopy
- The target will IPL into manual mode
- Sign on to the target LPAR console
- Continue to IPL the LPAR to **restricted** state.
- When you've got a command line, verify the startup program is QZRDHASM/QZRDIASRP
  - DSPSYSVAL QSTRUPPGM
- Continue the IPL
  - STRSBS QCTL
- Get the information needed for the communications interface
  - DSPHDWRSC \*CMN
  - Get the location code
- Get the information needed for the tape devices
  - DSPHDWRSC \*STG
  - Get the serial number
- On the target, execute command QZRDHASM/ENDFSFLASH to finish the process



## Update the configuration on either Controller: Tape devices

- ❑ Using CHGCSEDTA, update:
  - ❑ Device descriptions that the backups will use
  - ❑ Serial numbers of the devices
    - ❑ If using logical libraries, use the tape drive serial numbers

```
Change Full System FlashCopy CSE Data
```

```
Supply all required values, press Enter.
```

```
Target LPAR Device Setup:
```

```
Backup device description      TS3400PROD          *NONE, device name
```

```
Device serial number . . .    78-78F1101
```

```
+ for more values . .
```

## Update the configuration on either Controller: BRMS

- Using CHGCSEDTA, update:
  - BRMS Integration = \*YES
  - Change the defaults if necessary

```

Change Full System FlashCopy CSE Data

Supply all required values, press Enter.

Use BRMS integration . . . . . *YES          *YES, *NO
BRMS information:
  Lock BRMS . . . . . *SRONLY          *BOTH, *NO, *SRONLY,
                                     *TRGONLY
  Lock type . . . . . *FCNUSG          *ALL, *FCNUSG, *HOLD
  Base media class . . . . . *NONE      class, *NONE
  Base media class suffix      *NONE    suffix, *NONE
  BRMS Transfer Method . . . *ALL       *ALL, *CHGONLY, *NONE
  BRMS Transfer port . . . . *DFT       *DFT, 1024-65535
  BRMS save compression . . . *DEV       *DEV, *YES, *NO, *HIGH,
                                     *MEDIUM, *LOW
  Restricted media class(es)   *NONE     *NONE, class
    + for more values . .
    
```

## Update the configuration on either Controller: BRMS

- Using CHGCSEDTA, update:
  - BRMS Integration = \*YES
  - Change the defaults if necessary

Use BRMS integration . . . .	*YES	*YES, *NO
BRMS information:		
Lock BRMS . . . . .	*SRCONLY	*BOTH, *NO, *SRCONLY, *TRGONLY
Lock type . . . . .	*FCNUSG	*ALL, *FCNUSG, *HOLD
Base media class . . . . .	*NONE	class, *NONE
Base media class suffix	*NONE	suffix, *NONE
BRMS Transfer Method . . .	*CHGONLY	*ALL, *CHGONLY, *NONE
BRMS Transfer port . . . .	*DFT	*DFT, 1024-65535
BRMS save compression . .	*MEDIUM	*DEV, *YES, *NO, *HIGH, *MEDIUM, *LOW
Restricted media class(es)	*NONE	*NONE, class
+ for more values . .		

- Specify a BRMS command
  - If SBMJOB(\*YES) then specify a job description that ensures it will run (i.e. if QBATCH isn't started don't send it to QBATCH)
    - JOBD(QLPARJOB) sends it to job queue QSYSNOMAX which sends to QSYSWRK

Target LPAR backup command	STRBKUBRM CTLGRP(BACKUPS) SBMJOB(*YES or *CTLSBS)
----------------------------	---

## Update the configuration on either Controller: Keylock

- ❑ Using CHGCSEDTA, update:
  - ❑ Target keylock position = \*AUTO

```

Change Full System FlashCopy CSE Data

Supply all required values, press Enter.

Wait for ENDFSFLASH . . . . . *YES          *YES, *NO
FlashCopy Exit program . . . *NONE
  Library . . . . . *LIBL          *LIBL, library
Hold scheduled jobs . . . . . *YES          *YES, *NO
Target keylock position . . . *AUTO       *PANEL, *AUTO, *MANUAL
Stop target after backups    *NO          *YES, *NO, *RMV

Request type . . . . . 0             Number
Auto start cluster . . . . . *YES      *YES, *NO
Wait time . . . . . 0               Number of seconds
Message Queue . . . . . *SYSOPR       name, *SYSOPR
  Library . . . . .                library name

Text . . . . .
    
```

## BRMS Changes on the Source LPAR

- ❑ Change the system policy to allow backups in batch:
  - ❑ WRKPCYBRM \*SYS, Option 1, Page down

V7R3M0	Change System Policy	CTCIHA9L
Type choices, press Enter.		
End all subsystems options		
Controlled end delay time . . . . .	1200	1-99999 seconds,*IMMED
Abnormal end delay time . . . . .	*NOLIMIT	10-999 minutes,*NOLIMIT
End servers wait time . . . . .	0	0-9999 seconds
Controlling subsystem:		
Allow backups in batch . . . . .	*YES	*NO, *YES
Restricted state time limit . . . . .	*NOMAX	5-9999 minutes, *NOMAX
Allow alternate input media. . . . .	*YES	*NO, *YES
Volume prefix . . . . .		Prefix
Enable Full System FlashCopy . . . . .	*YES	*NO, *YES
BRMS submitted jobs:		
Job description. . . . .	*USRPRF	Name, *USRPRF
Library. . . . .		Name, *LIBL, *CURLIB
Job queue. . . . .	*JOBQ	Name, *JOBQ
Library. . . . .		Name, *LIBL, *CURLIB
BRMS flight recorder size . . . . .	050	001-999 megabytes

## BRMS Changes on the Source LPAR

- ❑ Modify the control group to call ENDFSFLASH in the last exit
  - ❑ WRKCTLGBRM, Opt 2, F10 to modify the exit
  - ❑ SBMJOB CMD(QZRDHASM/ENDFSFLASH ACTION(\*NORMAL))  
JOB(ENDFSFLASH) JOBD(QGPL/QLPARJOB)

```

Display Backup Control Group Entries                CTCIHA9M

Group . . . . . : SAVSYSALL
Default activity . . . . : *BKUPCY
Text . . . . . : *NONE

      Backup      List ASP      Weekly   Retain Save   SWA
Seq  Items      Type Device   Activity Object While  Message  Sync
      .          .          .          .          .          .          .
10  *EXIT
20  *SAVSYS
30  *EXIT
40  *IBM          *SYSBAS   *DFTACT *ERR  *NO
50  *ALLUSR      *SYSBAS   *DFTACT *ERR  *NO
60  *ALLDLO
70  *LINK        *ALLAVL   *DFTACT *NO   *NO
80  *EXIT
    
```



## BRMS Changes on the Source LPAR - Subsystems

- ❑ Subsystems should NOT be set to start
  - ❑ WRKCTLGBRM, Opt 9

```

Subsystems to Process

Use . . . . . : *BKU
Control group . . . . : SAVSYSALL

Type choices, press Enter.

Seq   Subsystem   Library   End
      Option     Delay     Restart
-----
  10   *ALL         *ALL      *CNTRLD  30      *NO
    
```

## BRMS Changes on the Source LPAR - Attributes

- ❑ Do not run STRMNTBRM or manage servers after control group
  - ❑ WRKCTLGBRM, Opt 8, page down all the way

```

Additional Backup Policy Properties

Client backup policy . . . . . : SAVSYSALL

Type information, press Enter.

Allow activity overrides . . . . . *YES          *NO, *YES
Allow retention overrides . . . . . *YES          *NO, *YES
Additional management:
  TCP/IP servers . . . . . *NO                 *NO, *END, *RESTART, *BOTH
  Lotus servers . . . . . *NO                 *NO, *END, *RESTART, *BOTH
  Integrated Windows servers . . . . . *NO      *NO, *VARYOFF, *VARYON ...
  Guest partitions . . . . . *NO             *NO, *VARYOFF, *VARYON ...
Unmount user-defined file systems . . . *NO      *NO, *YES
Run maintenance after backup . . . . . *NO      *NO, *YES
    
```

## Modify BRMS recovery report user-added steps

- ❑ Insert custom message into the recovery reports to change system settings to start IP etc.
  - ❑ STRSEU SRCFILE(QUSRBRM/QO1AUSRRCY) SRCMBR(STEP014)
  - ❑ Insert the following text:  
After restoring the configuration settings, run the following commands:  
CHGSYSVAL SYSVAL(QSTRUPPGM) VALUE('QSTRUP QSYS ')  
CHGLINETH LIND(ETHLINE) ONLINE(\*YES)  
CHGTCPIFC INTNETADR('1.2.3.4') AUTOSTART(\*YES)  
CHGIPLA STRTCP(\*YES)  
ADDAJE SBSDB(QSYS/QSYSWRK) JOB(QBRMSTRUP) JOBD(QBRM/Q1ASTRJD)
- ❑ Modify the recovery report creation to include the user info
  - ❑ Add the parameter USRRCYINF(\*ADD)
  - ❑ If STRMNTBRM is used to generate the reports
    - ❑ Modify the STRMNTBRM call with PRTRCYRPT(\*NONE)
    - ❑ Add STRRCYBRM USRRCYINF(\*ADD) to the job scheduler, to run 15 minutes (or so) after STRMNTBRM
  - ❑ Consider using the Flashcopy Exit Program
    - ❑ WRKMBRPDM QZRDHASM/QCLSRC member QZRDIAFFEX
      - ❑ Copy the source files to utility libraries
      - ❑ Compile a blank program for the controller, and one that calls STRMNTBRM and STRRCYBRM at exit \*FINISH on the source

## Test the configuration on either Controller

- ❑ Use CHKFSFLASH to verify communications configurations first
- ❑ Resolve issues until it is successful

```
CHKFSFLASH CSEDTA(FSFC9M9P1)
Acquired lock on LPAR CTCIHA9M.
Validating flashcopy consistency group 8
Validating flashcopy mappings
Consistency group 8 validated.
Successfully performed local verifications.
Performing Full System FlashCopy verifications on CTCIHA9M.
Released lock on LPAR CTCIHA9M.
Log file used : /QIBM/Qzrdhasm/fsfc/FSFC9M9P1/ctl.log.
CHKFSFLASH validation for FSFC9M9P1 completed successfully.
```

## Test the configuration on either Controller

- Use STRFSFLASH to perform a flashcopy
- Flashcopy target LPAR IPL etc will occur
- If this is a SAVSYS backup then the HMC SRC will be A900 3C70 while in Batch Restricted State
- After backups, BRMS will be transferred to the source LPAR
  - If not, check /tmp/qzrdiash.log on the target
- On the source LPAR, verify backups are complete
  - DSPLOGBRM
  - WRKMEDIBRM
  - BRMS Recovery reports
    - Look for the customer recovery steps after RSTCFG.
    - This is usually step 14 – if not, find the correct step and move the text in member QUSRBRM/QO1AUSRRCY STEP014 to the correct member.

## Schedule Log Cleanup on all the LPARs

- ❑ CLNICSMLLOG will prune toolkit logs to save on space
  - ❑ Tell it how many days of log entries to retain
  - ❑ `ADDJOBSCDE JOB(CLNICSMLLOG) FRQ(*WEEKLY)  
CMD(QZRDHASM/CLNICSMLLOG RETAIN(120)) SCDDATE(*NONE)  
SCDDAY(*ALL) SCDTIME('10:00')`

```
Clean Full System Flashcopy logs (CLNFSFCLOG)

Type choices, press Enter.

Configuration name . . . . . *ALL           F4 to prompt
Days of information to retain . 10         *NONE, days
```

## How to reset after failure

- ❑ Failures can happen, you need to know how to set things back to normal.
- ❑ To abandon the backups:
  - ❑ On the target: QZRDHASM/ENDFSFLASH \*FAILBKU
  - ❑ On the source: QZRDHASM/ENDFSFLASH \*RSTFCNUSG
- ❑ The wiki contains additional recovery steps

## Saving and Restoring WRKCSE, WRKCSEDTA and WRKCSECRDL

- ❑ WRKCSE, WRKCSEDTA and WRKCSECRDL information is stored on the controller in PowerHA device data domains (DDD)
- ❑ The DDD's are not saved/restored with the usual commands SAVCFG, SAVOBJ etc or even GO SAVE opt 21
- ❑ The Toolkit includes two commands to save and restore the DDD:
  - ❑ SAVDDD
    - ❑ Saves all the DDD information to an existing IFS directory
      - ❑ Use mkdir to create the directory first
  - ❑ RSTDDD
    - ❑ Restores all the DDD information from an existing IFS directory
- ❑ Recommendation is to run SAVDDD prior to an upgrade or backup of the controlling LPAR



## Where can I find the logs for troubleshooting?

- ❑ Logs are in the following place:
  - ❑ /QIBM/Qzrdhasm/qzrdhasm.log
  - ❑ /QIBM/Qzrdhasm/fsfc/<CSE Data name>/\*
  - ❑ /QIBM/Qzrdhasm/qzrdhasm.log.bak
  - ❑ /QIBM/Qzrdhasm/java.logs/\*
  - ❑ /QIBM/Qzrdhasm/joblogs/\*
- ❑ DMPINF ENV(\*ALL) EXTDLOGS(\*YES) will grab all these files and put them in a zip file.
  - ❑ Specify the failing job information on Job Name:

```

                                Dump ICSM Information (DMPINF)

Type choices, press Enter.

Environment name . . . . . *ALL           Name, *ALL
Type . . . . . *ALL           *ALL, *FLASH, *GMIR, *LUN...
Extended logging . . . . . *YES          *YES, *NO
Job name . . . . . *NONE         Name, *CURRENT, *NONE, *LAST
  User . . . . .                Name
  Number . . . . .                000000-999999
Days of logs to keep . . . . . 90         days, *NONE, *NOMAX
    
```

## Contacting support if you have problems

Support for the FSFC Toolkit is to customers who meet the following criteria:

- Current System i Software Maintenance Agreement
- Current FSFC Toolkit Software Maintenance Agreement

For non-urgent issues or questions contact the consultant who installed the Toolkit. To reach a Toolkit developer for non-urgent issues and questions, or to report a bug, send an email to [iessspt@us.ibm.com](mailto:iessspt@us.ibm.com)

For immediate 24x7 assistance, reach out to IBM Support:

US: <http://www.ibm.com/planetwide/us/>

Worldwide: <http://www.ibm.com/planetwide/>

To assist IBM personnel in correctly routing your problem, request support for the iSeries

Lab Services “Copy Services Toolkit – Full System Flashcopy” using component identifier 5798CST00.