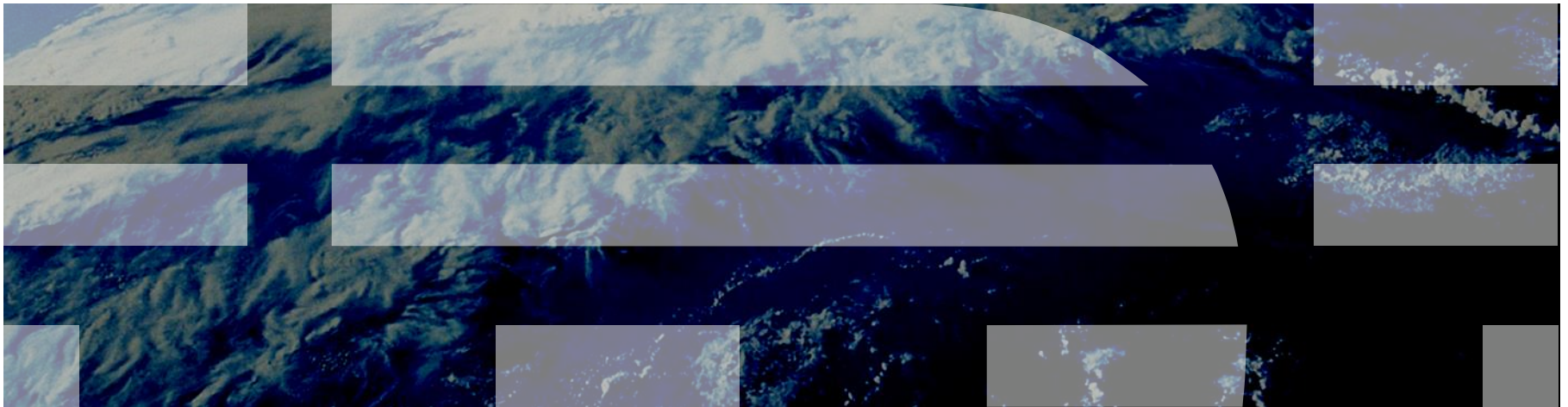


# What's new in FSFC and FSR 4.6 ?

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## Current status of FSFC/FSR 4.6

- Code is mostly finished
  - Still need to add DSI VTL automation once we have a functional test environment
- Testing is partially done
  - Regression testing is under way
  - Need to create testcases for new functions
- Documentation:
  - In Box: <https://ibm.box.com/s/efp7p538n9x77e6faw5657gd43ihmmeh>
  - Quicksetup guides are in progress
    - User/Installation guides are in progress
  - Webpages are in progress
    - Will be published when ready

# Common Enhancements

## Prompting on commands

- Commands have prompting on F4 in many places:

```

Work with CSE Data (WRKCEDTA)

Type choices, press Enter.

CSE Data . . . . . *ALL           F4 to prompt
    
```

```

Switch Copy Services Environ. (SWCSE)

Type choices, press Enter.

Environment name . . . . .           F4 to prompt
Switch type . . . . . *SCHEDULED  *SCHEDULED, *UNSCHEDULED
Type . . . . . *                 *, *GMIR, *MMIR
Auto replicate . . . . . *DFT     *DFT, *YES, *NO
    
```

## Prompting on in WRKCSE and WRKCSEDTA

```

Change Full System FlashCopy CSE Data

Select Environment

Select choice, press Enter.
1=Select Environment

Opt      Name
-----
  _      ANENV
  _      ATEST
  _      BAKERCLD2
  _      BAKERCLOUD
  _      BUSYTEST
  _      CLOUDSRC1
  _      CLOUDSRC2
  _      CLOUDSRC2B

More...

F1=Help  F12=Cancel
  
```

- Now you don't have to try to remember the environment names, spend brain capacity on more important things, like what to have for lunch

## WRKCSEDTA subselect and position to

- WRKCSEDTA parameter to filter on CSEDTA name

```

Work with CSE Data (WRKCSEDTA)

Type choices, press Enter.

CSE Data . . . . . fsfc*      Name, generic*, *ALL
  
```

- Position to:

```

Work with CSE Data

Position to . . . . . a-place      Starting characters

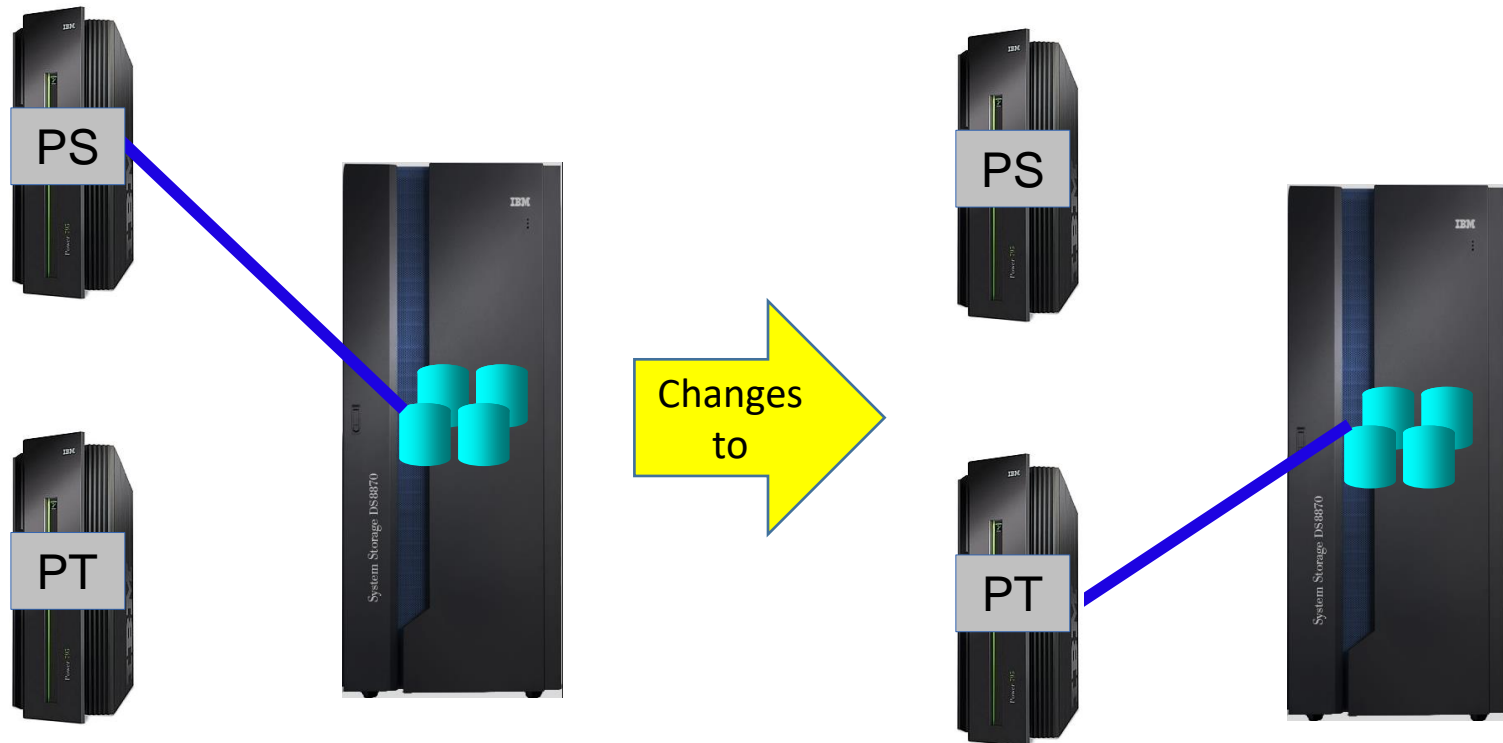
Type options, press Enter.
 1=Create   2=Change   3=Copy    4=Delete   5=Display   6=Print   7=Rename
 8=Check    9=Start    14=View FSFC logs  15=Show log tail

Opt      CSE Data      CRG      Text
-----  -
_____  FSFCDS8K      FSFC
_____  FSFC9F9G      FSFC
_____  FSFC9JN09K    FSFC
_____  FSFC9J9K      FSFC
_____  FSFC9J9KF     FSFC
_____  FSFC9J9KIN    FSFC      treset flashing when disk in use
_____  FSFC9J9K2     FSFC      Use when 9J-4J reversed

Parameters or command:
==>
F1=Help   F3=Exit   F4=Prompt F5=Refresh F7=QZRDFSR F9=Retrieve
  
```

## Full System LUN Switch – Now for SVC

A Full System LUN Switch is like an FSR switch except that we change the host connections to IPL a different LPAR from the same LUNs.



## WRKCSEDTA Easy Access to Auto-refresh Log

- WRKCSEDTA opt 15
  - ctl.log for FSFC
  - qzrdhasm.log for FSR

```

Work with CSE Data

Position to . . . . . _____ Starting characters

Type options, press Enter.
  1=Create   2=Change   3=Copy   4>Delete   5=Display   6=Print   7=Rename
  8=Check    9=Start    14=View FSFC logs  15=Show log tail

Opt      CSE Data      CRG      Text
-----
 15      FSFC9J9K      FSFC
 15      FSFC9J9KF     FSFC
 15      FSFC9J9KIN    FSFC      target flashing when disk in use
  
```

```

-
Display Log

File : /QIBM/Qzrdhasm/fsfc/FSFC9J9K/ctl.log

489325 2021-12-10 14:14:31      46139 bytes written to /QIBM/Qzrdhasm/fsfc/FSFC9J9K/2021-12-10_1414_TRG.joblog
489325 2021-12-10 14:14:31      Released LPAR-IP lock T18CFCE0E2. (getLPARLock)
489325 2021-12-10 14:14:31      PowerHA license released. (qzrdiaFFMC)
489325 2021-12-10 14:14:34      Joblog saved. (saveJobLog)
489325 2021-12-10 14:14:34      FSFC succeeded. (qzrdiaFFMC)
  
```



## CSM Enhancements 1

- New command: RTVCSMSSNS

```

Retrieve CSM Session State (RTVCSMSSNS)

Type choices, press Enter.

Session . . . . . _____
State . . . . . _____ *PRIMARY, *H1H2, *H1H3...
CSM Primary Server IP . . . . . _____
CSM Secondary Server IP . . . . . _____
CL variable for returned value _____ Character value

```

- New command: RUNCSMCMD

```

Run CSM Command (RUNCSMCMD)

Type choices, press Enter.

Session . . . . . _____
Command . . . . . _____
CSM Primary Server IP . . . . . _____
CSM Secondary Server IP . . . . . _____

```

## CSM Enhancements 2

- RUNCSMACT supports \*FLASH type

```
Run CSM Action (RUNCSMACT)

Type choices, press Enter.

Environment name . . . . .
Type . . . . . > *FLASH
Action . . . . . *CHK

Name
*GMIR, *GMIR2, *MMIR...
*CHK, *RUN, *ACS, *RCS
```

## Miscellaneous enhancements

- Check that QLPAR on the source
  - FSR and FSFC
  - Not disabled
  - Not expired
  - Has \*SECADM, \*IOSYSCFG and \*ALLOBJ
- QZRDIAEXT2 on the source will log incoming IP address in debug mode
- SAVDDD and RSTDDD have more log messages and support \*GEN which creates a directory based on the timestamp
  - Saves to /QIBM/QZRDHASM/QZ\_DDDDBKU\_<timestamp>
- WRKCSEDTA F7 = WRKACTJOB SBS(QZRDFSR)
- Support for BRMS restricted state IP's in Physical Virtual Isolation (PVI) and FSR
- Full length (63 character) controller host names are supported

## New commands: TSTCOMM

- Added late in 4.5
- Idea behind this is to diagnose network/firewall issues by communicating on the toolkit ports
- To use this command, log into the two LPARs to test the communication between and free the port to be tested (this may mean ending QZRDFSR).
- Designate one LPAR as the server, the other as the client.
- On the server, issue :

```
TSTCOMM ROLE(*SERVER) IPADDR('<client IP address>') PORT(55920)
```

- When TSTCOMM is 'Listening on socket' issue the following command on the client:

```
TSTCOMM ROLE(*CLIENT) IPADDR('<server IP address>') PORT(55920)
```

- The results will indicate either success or failure (timeout) communicating on the specified port.

# FSR Enhancements

## FSR and FSFC Integrations

- Added new commands CHKFSRFLSH and STRFSRFLSH to make it easier for customers to select which flashcopy to perform when also using FSR
- Call the command from the controlling LPAR. It will determine from replication direction and where the LPAR is active which CSEDTA to use
- Must be called from the controller – which means each controller may need it on the job scheduler and customer is responsible for holding / releasing the correct one
- Next release we may allow a remote call from the source

```
Start FSR Flash (STRFSRFLSH)

Type choices, press Enter.

Replication Environment . . . . .
Preferred source remote flash . . *NONE      Name, *NONE
Preferred source local flash . . . *NONE      Name, *NONE
Preferred target remote flash . . . *NONE      Name, *NONE
Preferred target local flash . . . *NONE      Name, *NONE
```

## SETUPFSR includes toolkit access codes

```

Setup IBM i Copy Services Mana (SETUPFSR)

Type choices, press Enter.

Node role . . . . . *CTL, *PRD
FSR communications port . . . . . *SAME 1-65535, *SAME, *DFT
Toolkit access code for *CTL . . *SAME
Preferred source serial number *CURRENT 21AE977, Character value
Toolkit access code for *PS . . *SAME
Preferred target serial number *SAME 21AE977, Character value
Toolkit access code for *PT . . *SAME

```

## CFGSTRPRSC enhancements

- A non-critical failure will not prevent it from running to completion and configuring what it can
- Will not save job scheduler entries if they're already all held

## WRKSTRPRSC \*CMN has one port per location code

- Required for SR-IOV adapters
- \*LOC = resolve port number from hardware resources

```

Add or Change Communication Resources
Enter details, press Enter.

Usage . . . . . *PS1                *PS, *PT, *FCxx, *CTLx
IP Interface . . . . . T.2.3.4          IPv4 address
Line Description . . . . . *IPADDR        Name, *IPADDR, *VIRTUALIP
Resource Location . . . . . *LINE
-----
Port . . . . . *LOC                    Name, *LINE, blank
Resource Location . . . . . *LOC, *DFT, 0-65535
-----
Port . . . . . _____                Name, *LINE, blank
Resource Location . . . . . *LOC, *DFT, 0-65535
-----
Port . . . . . _____                Name, *LINE, blank
Resource Location . . . . . *LOC, *DFT, 0-65535
-----
Port . . . . . _____                Name, *LINE, blank
Resource Location . . . . . *LOC, *DFT, 0-65535
-----
Port . . . . . _____                Name, *LINE, blank
Resource Location . . . . . *LOC, *DFT, 0-65535
-----
More . . .
    
```

- Support for LPAR type \*SGxx
  - Same as \*PS/\*PT but nice to distinguish Safeguarded Copy for recovery vs. backup)



# FSFC Enhancements

## Safeguarded Copies: Frequency and Retention

- New parameters on WRKSGCPY:

```
                                Safeguarded Backups
Environment name . . . . . :   SGTEST
CSM session name . . . . . :   CTCSG_TEST
Backup recovery option . . :   No Copy
Minimum time between copies:   1
CSM Retention period . . . . :  10080
```

## \*TAGJOBLOG works for all BRMS backups

- On the target LPAR, run the command ENDFSFLASH \*TAGJOBLOG in the job whose joblog you want copied to the source LPAR
- For example, place it in a \*EXIT in a control group:

```
Seq      Backup
      Items      Exit command
  10     *EXIT      QZRDHASM/ENDFSFLASH ACTION(*TAGJOBLOG)
  20     *SAVSYS
  30     *IBM
```

- When ENDFSFLASH \*NORMAL or \*SBMNORMAL is called, the toolkit will copy that joblog to the output queue defined on the BRMS system policy (WRKPCYBRM \*SYS opt1)
- If \*PRTF is defined then the toolkit will default to QUSRBRM/QZOUTQ
- The toolkit will create the output queue if it doesn't exist
- After BRMS is copied back to the source LPAR, the new spoolfiles will be in the BRMS output queue (or QUSRBRM/QZOUTQ).
- **NOTE:** Jobs which call QZBRMSEXIT and/or ENDFSFLASH \*NORMAL/\*SBMNORMAL will automatically grab the joblog

## Control group error behavior

- Allow toolkit to modify how it responds to control groups which end in error:
  - \***NOTIFY**: Tell the controller it failed
  - \***IGNORE**: Ignore the error and consider it be a success
- Abnormal ends will always trigger a failure.

```
Display Full System FlashCopy CSE Data
Press Enter to continue.
Use BRMS integration . . . . . : *YES
BRMS information:
BRMS Transfer method . . . . . : *ALL
BRMS Transfer port . . . . . : *DFT
Encrypt BRMS transfer . . . . . : *NO
Custom *SYSBAS timestamp . . . . . : *NONE
Control group error behavior . . . . . : *NOTIFY
Control groups prior to xfer . . . . . : 1
Lock BRMS . . . . . : *SRCONLY
Lock type . . . . . : *FCNUSG
Base media class . . . . . : *NONE
Base media class suffix . . . . . : *NONE
Restricted media class(es) . . . . . : *NONE
```

## New exit points

- \*PRERESTOR
  - Called on source LPAR before BRMS is restored
  - Allows customers check locks etc.
- \*BRMFINTGT
  - Called on the target after backups and before BRMS is locked down and saved
  - Allows customers to put things into QUSRBRM, send messages etc.
- \*FAILNFY
  - Called on the target when ENDFSFLASH \*FAILNFY is called (which might be from QZBRMSEXIT).
  - Allows customers a chance to decide whether to override the \*FAILNFY by converting to \*FAILBKU or \*NORMAL
  - They can create data area CVTNORMAL or CVTFAILBKU in QZRDHASM

## Delay ENDFSFLASH until multiple backups are done

- Some customers run multiple concurrent backups but ENDFSFLASH must only be called once at the end of all of them.  
In the past we've created custom programs using data areas etc.
- In 4.6 we've added a new parameter to the CSEDTA to make this easier:
- Parameter is "Control groups prior to xfer".
- Default is 1. Each control group which uses QZBRMSEXIT will subtract one, when it gets to zero then BRMS is xferred.
- STRFSFLASH will count them down.

```

Use BRMS integration . . . . . : *YES
BRMS information:
BRMS Transfer method . . . . . : *ALL
BRMS Transfer port . . . . . : *DFT
Encrypt BRMS transfer . . . . . : *NO
Custom *SYSBAS timestamp . . . . : *NONE
Control group error behavior . . . : *NOTIFY
Control groups prior to xfer . . . : 1
Lock BRMS . . . . . : *SRCONLY
Lock type . . . . . : *FCNUSG
Base media class . . . . . : *NONE
Base media class suffix . . . . . : *NONE
Restricted media class(es) . . . . : *NONE
  
```

```

===>
F1=Help   F3=Exit   F4=Prompt  F5=Refresh  F7=QZRDFSR  F9=Retrieve
F12=Cancel
Remaining control groups required to complete before xfer: 2
  
```

## SVC Volume Protection Delay

- If SVC Volume Protection is enabled the SVC won't allow changing host connections until there is no disk activity for some pre-defined time span
- If the toolkit needs to change host connections and VP is enabled the toolkit will:
  - Issue warning message that VP is enabled
  - Delay for the protection period plus one minute
- If an attempt to change the host connection fails then we'll back off, wait, and try again later.

## Compatibility with BRMS Cloud Object Storage

- Toolkit will delay BRMS transfer until all COS volumes have been transferred to COS
- No configuration required, toolkit will manage it automatically
- Requires a recent BRMS PTF (Sept '21 or newer)



## Don't call CHGASPACT at all

- New option on WRKCSEDTA:
  - Method to flush memory - \*NONE
- Generally not recommended for use by nearly all of our customers.
- Used by [very very few] customers where even a \*FRCWRT has too much impact on performance and they are aware that it increases the chance of damage (or at best a longer target IPL in database recovery and access path rebuilds)

```
Method to flush memory . . . . *NONE          *QUIESCE, *FRCWRT, *IPL,  
                                *NONE
```

## WRKCSECRDL Validation option

- Use option 6 to validate the credentials
- Useful when debugging changed passwords
- Choose whether to use ssh or REST API's

```

Work with CSE Credentials List

Type options, press Enter.
 1=Add   2=Change  4=Remove  6=Validate

Opt      IP Address      Role      User ID      Description
-----
 1.2.166.147  *USER      fake
 9.5.34.38    *USER      aasland     CTCHA10
 9.5.34.58    *CSM       csmadmin    CTCCSMT2
 9.5.34.120   *USER      aasland
 9.5.50.31    *USER      powerha     evtids8880
 9.5.95.139   *USER      aasland     CTCHAHMC2
 6 9.5.167.13   *USER      lkj
 9.5.167.21
 9.5.167.58
 9.5.167.87
 9.5.167.149
 9.5.167.150
 9.5.167.172
 9.5.168.19

Validation interface
Type value and press enter
Interface _____ *SSH, *REST
F1=Help  F12=Cancel
More...

F1=Help  F3=Exit  F5=
    
```

## Miscellaneous changes

- QIPLDATTIME set to \*NONE on the target
- On remote FSFC check that replication is active and consistent
- If CHGASPACT on remote FSFC fails then ensure GMCV is restarted
- Will check file level id's on the source QUSRBRM before a restore
  - Catch a PTF upgrade mid-flashcopy
- Activation Engine / Cloud-init automatically handled