IBM Education Assistance for z/OS V2R1

Item: Integrated 3270 Console
Element/Component: BCP Consoles

Material is current as of June 2013

Agenda

- Trademarks
- Presentation Objectives
- Overview
- Usage & Invocation
- Migration & Coexistence Considerations
- Installation
- Presentation Summary
- Appendix

Trademarks

- See url http://www.ibm.com/legal/copytrade.shtml for a list of trademarks.

Presentation Objectives

- HMCS – New type of z/OS operator console interface
  - Now have: MCS, SMCS, HMCS, EMCS, Printer, Subsystem and the System Console
  - Available in both distributed and shared mode

- STANDBY – New console state
  - For MCS and HMCS consoles
  - Available in both distributed and shared mode

Overview (1 of 6)

Problem Statement / Need Addressed:

- **Need access to a z/OS operator console when existing consoles are not available**
- **Interface must be familiar to operators**
  - **Not have the problems of the System Console interface**
- **Console activation cannot require actions from other operators**

Overview (2 of 6)

Solution:

The Hardware Management Console (HMC) supports an "**Integrated 3270 Console**" interface

- In z/OS V2R1, z/OS will support that interface to IPL and control a z/OS image
  - **HMCS** is what z/OS calls this type of console

STANDBY state supported

- Press "enter" key to activate console
  - VARY command not needed to activate

Overview (3 of 6)

Benefit / Value:

HMCS console available during IPL, and before and after SMCS availability
- OSA-ICC attached MCS consoles not needed to bridge gap between NIP and SMCS availability
- No additional H/W needed

HMCS interface is **identical** to the operator interface on NIP, MCS and SMCS consoles.
- Eliminates operator learning curve
- Eliminates potential errors caused by unfamiliar and seldom used interfaces

HMCS console can be used in emergency situations
- VARY command not used to activate the console
- Operator at HMC drags the Integrated 3270 icon to the LPAR icon and presses the “enter” key

Overview (4 of 6)

Benefit / Value:

STANDBY

- Supported on HMCS and MCS consoles
- Standby is between “Inactive” and “Active” (a later slide will show how to move between the states)
  - Control blocks representing the console are created
  - Necessary ENQs are held
  - Console is “logged on” if LOGON(AUTO) is requested
  - No messages are displayed while in Standby
  - Device does not have to be physically attached to be in Standby

    The device definition does have to exist (i.e., UCB) for MCS consoles
  - Activation just requires a key press (an attention generating key)
  - Minimum system resources needed to activate console from standby

Overview (5 of 6)

Benefit / Value:

HMCS improvements over the System Console

System Console Problem	HMCS Solution
Operator interface is radically different from MCS/SMCS consoles. Operator errors occur during critical situations because of unfamiliarity.	HMCS console interface is identical to the current (NIP/MCS/SMCS) interface so there is no learning curve.
Replying to priority WTORs requires a check box to be marked before the reply will be accepted.	Priority WTORs are displayed in the same manner as on MCS consoles and replying to these WTORs does not require any special “check boxes”.
Using the system console in PD mode can cause high CPU utilization and storage shortages in the Console address space.	Message display on HMCS consoles is identical to MCS/SMCS consoles and the identical queuing structures are used. The long queue lengths associated with the System Console do not exist with HMCS consoles.

Overview (6 of 6)

Benefit / Value:

HMCS improvements over the System Console

System Console Problem	HMCS Solution
Displayed messages just contain a time stamp and message text. Other useful information, e.g., system and jobname where the message was issued, can not be displayed.	HMCS consoles support the displaying of additional text when the message is displayed. This is identical to the MCS/SMCS capabilities.
Messages that are retained on the screen can be deleted but it is a manual process. Each message must be deleted individually and it takes several mouse clicks to delete one message.	HMCS consoles have the same message retention and commands to remove the messages as do MCS/SMCS consoles. Groups of messages can be removed at one time.
No LOGON support for security product control over operator commands.	Security product controls commands as on MCS/SMCS consoles.

Usage & Invocation (1 of 19)

HMCS attributes/behavior:

- Only one per z/OS image
- Screen size is 43 rows by 80 columns
- Supports seven colors and extended highlighting (reverse video, blinking, underscore) controlled by MPFLSTxx Parmlib specifications
- As with SMCS consoles, SD and MS modes are **NOT** supported
- As with MCS consoles, messages will be displayed on the HMCS console if the operator has not yet logged on and LOGON is REQUIRED or AUTO
  - Commands ***will be rejected*** until a LOGON has been accepted
  - LOGON(OPTIONAL) can be specified for the HMCS console

Usage & Invocation (2 of 19)

HMCS attributes/behavior:

- To activate an HMCS console:
  - Attach the Integrated 3270 icon to the z/OS LPAR icon
  - Press an attention-generating key (e.g., Enter, PFx, PAx)
  - VARY CN(*consolename*),ONLINE can **NOT** be used to activate an HMCS console!

Usage & Invocation (3 of 19)

HMCS attributes/behavior:

- To deactivate an HMCS console:
  - VARY CN(consolename),STANDBY

    The console will be placed in “standby” state

  - VARY CN(consolename),OFFLINE

    The console will become “inactive” and will **NOT** be placed in “standby” state (control blocks and ENQs released)

  - Detach the Integrated 3270 console window from the z/OS image

    The console will be placed in “standby” state

  - Issue RESET CN(consolename)

    The console will become “inactive” and will **NOT** be placed in “standby” state (control blocks and ENQs released)

Usage & Invocation (4 of 19)

HMCS attributes/behavior:

- The following commands are **NOT** supported for HMCS consoles:
  - VARY CN(consolename),OFFLINE,FORCE
  - VARY CN(consolename),ONLINE[,SYSTEM] [,FORCE]

- The IEARELCN utility is able to delete the HMCS console definition
  - A VARY CN(consolename),OFFLINE or a RESET CN(consolename) command must first be issued to release the console name ENQ.

- As with MCS, if the HMCS console has LOGON(REQUIRED) but has not been logged on and is in the SYNCHDEST list, synchronous WTOR processing will **NOT** display the message on the HMCS console.

Usage & Invocation (5 of 19)

HMCS attributes/behavior:

- If the “Integrated 3270 console” icon on the HMC is attached to a z/OS LPAR image and the z/OS is IPLed (LOAD profile activated)
  - z/OS will use the HMCS console for NIP messages
  - No CONSOLxx definitions are needed for the NIP usage

    Once NIP is over, the HMCS console can no longer be used if there are no CONSOLxx definitions for it

- System selection of the console to use during NIP:
  - HMCS (Integrated 3270 console)
  - Devices defined in the IODF via NIPCON specifications
  - System Console

Usage & Invocation (6 of 19)

HMCS attributes/behavior:

- If an HMCS CONSOLxx definition exists and
  - the console was **not used at NIP**

    the console is placed in “standby”

  - the console was **used at NIP**

    the console becomes active as a z/OS operator console

    Identical to NIP → MCS processing

Usage & Invocation (7 of 19)

Attributes of STANDBY state:

- Only available for HMCS and MCS display consoles in full capability (FC) mode
  - SMCS, EMCS, subsystem consoles, the System Console, printer consoles or consoles in status display (SD) or message stream (MS) mode are **NOT** supported.

- Consoles in Standby state are
  - part of the 99 active consoles per system limit (when in distributed mode)
  - part of the 99 defined consoles per sysplex limit (when in shared mode).

- System resources are pre-allocated for consoles in Standby

Usage & Invocation (8 of 19)

Attributes of STANDBY state:

- VARY CN(xx) command used to put console into Standby
  - Can be used if device is currently “offline” or “active”

- I/O errors cause console to go into Standby instead of “offline”
  - Turn off your console (I/O error will occur on next write)
  - Operator is logged off and console placed in Standby
  - Go home for the night
  - Come back, turn on the console and hit enter
  - Log on and you are back up and running

Usage & Invocation (9 of 19)

SUPSBY attributes:

- Indicates if console supports Standby
- Always “Y” for HMCS consoles
  - Can not change
- Specify in CONSOLxx on the CONSOLE statement
  - Default is SUPSBY(N)
- Change dynamically via VARY CN(consolename),SUPSBY=Y|N
  - If console already in Standby, SUPSBY=N is rejected

Usage & Invocation (10 of 19) – CONSOLxx Parmlib Member

To define the HMCS console:

```
CONSOLE DEVNUM {(devnum)      }
               {(SUBSYSTEM)   }
               {(SYSCONS)     }
               {(SMCS)        }
               {(HMCS)        }
```

- The UNIT parameter of the CONSOLE statement is mutually exclusive with DEVNUM(HMCS)

- HMCS consoles do not support the USE(MS) or USE(SD) parameters
  - Only USE(FC) is accepted

- DEVNUM(HMCS) is mutually exclusive with the SYSTEM keyword

Usage & Invocation (11 of 19) – CONSOLxx Parmlib Member

Example of HMCS console definition:

```
CONSOLE DEVNUM(HMCS)
        ROUTCODE(1-10,12-128)
        AREA(25)
        PFKTAB(01)
        LOGON(AUTO)
        AUTH(MASTER)
        NAME(HMCS&SYSCLONE.)
        RBUF(10)
        RTME(1/4)
        RNUM(25)
        MFORM(S)
        MONITOR(JOBNAMES-T)
        MSCOPE(*)
```

Usage & Invocation (12 of 19) – CONSOLxx Parmlib Member

To indicate a console supports STANDBY:

- Specify the SUPSBY attribute on the CONSOLE statement

```
CONSOLE DEVNUM(3D0)
        USE(FC)
        AUTH(MASTER)
        UNIT(3270-X)
        NAME(MCS&SYSCLONE.3D0)
        SUPSBY(Y)
        LOGON(REQUIRED)
```

- SUPSBY is NOT supported on Printer, Subsystem, SMCS or EMCS consoles
- SUPSBY(N) is the default for MCS
- SUPSBY(Y) is the only value for HMCS

Usage & Invocation (13 of 19) – VARY Command

The VARY command can be used to:

- Put a console into STANDBY
- Change a console's standby attribute
  - Use SUPSBY

```
V CN{(*|conspec1[,conspec1]... )}
       [,AMSCOPE=([*][,name[,name]...])]
       [,AUTH={ALL|INFO|MASTER|([SYS][,IO][,CONS])}]
       [,AROUT=(rtcode[,rtcode]...)]
       [,DMSCOPE=([*][,name[,name]...])]
       [,DROUT=(rtcode[,rtcode]...)]
       [,INTIDS={Y|N}]
       [,LOGON={OPTIONAL|REQUIRED|AUTO|DEFAULT}]
       [,LU={luname|*NONE*}]
       [,MSCOPE={(*ALL)|{([*][,name[,name]...])}]
       [{,OFFLINE[,FORCE]                      }
        {,ONLINE[,SYSTEM=sysname][,FORCE]      }
        {,STANDBY                              }]
       [,SUPSBY={Y|N}]
       [,ROUT={ALL|NONE|(rtcode[,rtcode]...)}]
       [,UNKNIDS={Y|N}]
```

Usage & Invocation (14 of 19) – VARY Command

Security product resource names		
Command	Resource Name	Authority
VARY CN(...),STANDBY	MVS.VARYSTANDBY.CN	UPDATE
VARY CN(...),SUPSBY=	MVS.VARY.CN	UPDATE

Usage & Invocation (15 of 19) – DISPLAY C Command

DISPLAY C shows an active HMCS console as:

```
CNZ4100I 15.10.14 CONSOLE DISPLAY
CONSOLES MATCHING COMMAND: D C
MSG:CURR=1     LIM=3000 RPLY:CURR=1     LIM=9999  SYS=SY1        PFK=ZX
HARDCOPY  LOG=(SYSLOG,OPERLOG)  CMDLEVEL=CMDS
       ROUT=(ALL)
HMCSY1     TYPE=HMCS       STATUS=ACT-SY1
           DEFINED=(SY1)
           MATCHED=(SY1)
   ATTRIBUTES ON SY1
      AUTH=(MASTER)     CMDSYS=*              NBUF=1          SUPSBY=Y
      DEV=NONE          LOGON=AUTO            USERID=IBMUSER
      MFORM=(S)         AREA=(Z,A)            PFKTAB=01
      USE=FC   DEL=RD   RTME=1/4   RNUM=25    SEG=19     CON=N
      LEVEL=(ALL)
      MONITOR=(JOBNAMES)                      INTIDS=N   UNKNIDS=N
      ROUT=(1-10,12-128)
      MSCOPE=(*)
```

Usage & Invocation (16 of 19) – DISPLAY C Command

DISPLAY C shows a console in STANDBY in the inactive list:

```
CNZ4100I 15.17.19 CONSOLE DISPLAY
CONSOLES MATCHING COMMAND: D C,N
MSG:CURR=0     LIM=3000 RPLY:CURR=1     LIM=9999   SYS=SY1        PFK=ZX
NAME      TYPE     STATUS           DEFINED              MATCHED
HMCSY1    HMCS     STDBY-SY1        SY1                  SY1
MCSCONS   MCS      INACT            *ALL                 *ALL
MCSY13D0  MCS      STDBY-SY1        *ALL                 *ALL
MCSY13D1  MCS      INACT            *ALL                 *ALL
```

Usage & Invocation (17 of 19) –Console State Changes

From	To	Console	Command/Action
Inactive/Offline/Online	Active/Console	HMCS	Press Enter
		MCS	`V CN(x),ONLINE[,SYSTEM][,FORCE]`
	Standby	HMCS	`V CN(x),STANDBY`
		MCS	
Active/Console	Inactive/Offline/Online	HMCS	`V CN(x),OFFLINE` `RESET CN(x)`

		MCS	`V CN(x),OFFLINE[,FORCE]`
			`V ddd,OFFLINE[,FORCE]`
			`RESET CN(x)`
			`V ddd,ONLINE`
			Disconnect session `(SUPSBY=N)`

	Standby	HMCS	`V CN(x),STANDBY` Disconnect session `(SUPSBY=Y)`
		MCS	
Standby	Active/Console	HMCS	Press Enter
		MCS	`Press Enter` `V CN(x),ONLINE[,SYSTEM][,FORCE]`
	Inactive/Offline/Online	HMCS	`V CN(x),OFFLINE` `RESET CN(x)`

		MCS	`V CN(x),OFFLINE[,FORCE]`
			`V ddd,OFFLINE[,FORCE]`
			`RESET CN(x)`
			`V ddd,ONLINE`

Usage & Invocation (18 of 19) – CnzConV Macro

The CnzConV macro has been updated to support HMCS:

- The macro has an output parameter called “ConsoleSubType”
- HMCS is a valid subtype for a “ConsoleType” of MCS

Usage & Invocation (19 of 19) – Messages

Many messages have been changed for HMCS and STANDBY:

- New messages:

```
CNZ4303I CONSOLE conname STATUS CHANGED FROM status1 TO status2
CNZ4304I CONSOLE conname STATUS IS UNCHANGED: status
```

- Some have HMCS or STANDBY added to the message text

```
CNZ0005I CNZ2400I CNZ3005A CNZ3008A CNZ3009E CNZ3010I CNZ4100I
CNZ4102I CNZ4104I CNZ4207I CNZ4300I CNZ9008A CNZ9012I IEA195I
IEA196I  IEE185I  IEE328I  IEE612I  IEE921I
```

- Others just have documentation updates

```
CNZHF0002I CNZHF0003I CNZHF0005I CNZHS0003I CNZHS0005I
CNZ3011I   CNZ3012A   CNZ3015A   CNZ4301I   CNZ4302I
CNZ9001I   IEA404A    IEE150I    IEE339I
```

Migration & Coexistence Considerations (1 of 2)

- Coexistence APAR OA37696 must be installed on pre z/OS V2R1 systems
  - z/OS V2R1 systems will not be able to join a sysplex if OA37696 is not installed on every lower-level system
  - A lower-level system without OA37696 installed will not be able to join a sysplex containing a z/OS V2R1 system
  - APAR available for z/OS V1R10 and up
- The DISPLAY CONSOLES output on lower-level systems will
  - Identify HMCS consoles on z/OS V2R1 systems as “HMCS”
  - Identify consoles in standby as being “active”

Migration & Coexistence Considerations (2 of 2)

Using HMCS consoles and then falling back to a lower-level z/OS requires special processing

Assume the following scenario:

- A sysplex of two systems. One V2R1 and the other V1R13 **(with the compatibility PTF installed)**
- An HMCS console is defined (***it does not have to ever have been active***) on the V2R1 system
- The V2R1 system is removed from the sysplex
- Before a lower-level system ***that does not have the compatibility PTF installed*** can be brought into the sysplex, the HMCS console definition must first be removed using the IEARELCN utility
  - See publication: MVS Planning – Operations, chapter 2, section "Removing console definitions from a configuration"
- If the HMCS console definition is not removed, the IPLing lower-level system will see the following messages and enter a wait state:

```
CNZ0001I CNZX1PU5: SERVICE CNZXCLT FAILED WITH RC:       8 RS:     803
IEA303W ABEND 077 REASON 07090B03 DURING INITIALIZATION UNDER RIM IEAVNPA1
```

Installation

- If the HMCS or STANDBY functions are to be used, update your CONSOLxx Parmlib member
- Consider updating your CNGRPxx Parmlib member to add your HMCS console's name to your SYNCHDEST group definition
  - Allows synchronous WTORs to be displayed on the HMCS console

Presentation Summary

- Integrated 3270 Console (a.k.a. HMCS)
  - "window" on the HMC
    - No additional H/W needed
  - Usable during and after NIP
  - Same look-and-feel as MCS/SMCS consoles
  - One per z/OS image

- STANDBY
  - Supported by HMCS and MCS consoles
  - "Enter" key used to activate console
  - System resources pre-allocated for console

Appendix

- *z/OS V2R1 MVS Initialization and Tuning Reference* (SA23-1380)
  - CNGRPxx, CONSOLxx, SYNCHDEST
- *z/OS V2R1 MVS System Commands* (SA38-0666)
  - DISPLAY CONSOLES, VARY CN
- *z/OS V2R1 MVS Planning: Operations* (SA23-1390)
  - HMCS, IEARELCN, SYNCHDEST