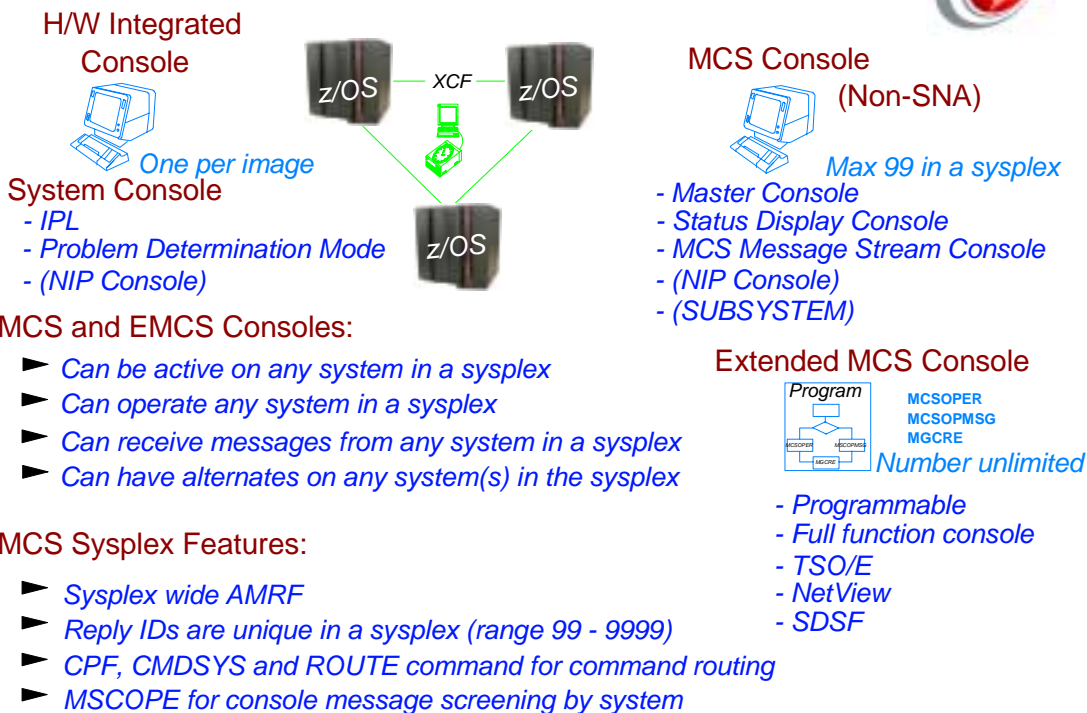


## z/OS Version 1.4 Consoles Enhancements

# Console Restructure, One-Byte ID Tracker and System Console Availability



## Multisystem Consoles in a Sysplex



## Consoles in a Sysplex

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- ☐ Single master console for sysplex
  - Any console may have master authority
- ☐ Consoles attached to any system
- ☐ Sysplex-wide control from any console
  - MCS consoles
  - Extended MCS consoles
  - System console
  - Netview consoles
  - TSO CONSOLE mode consoles

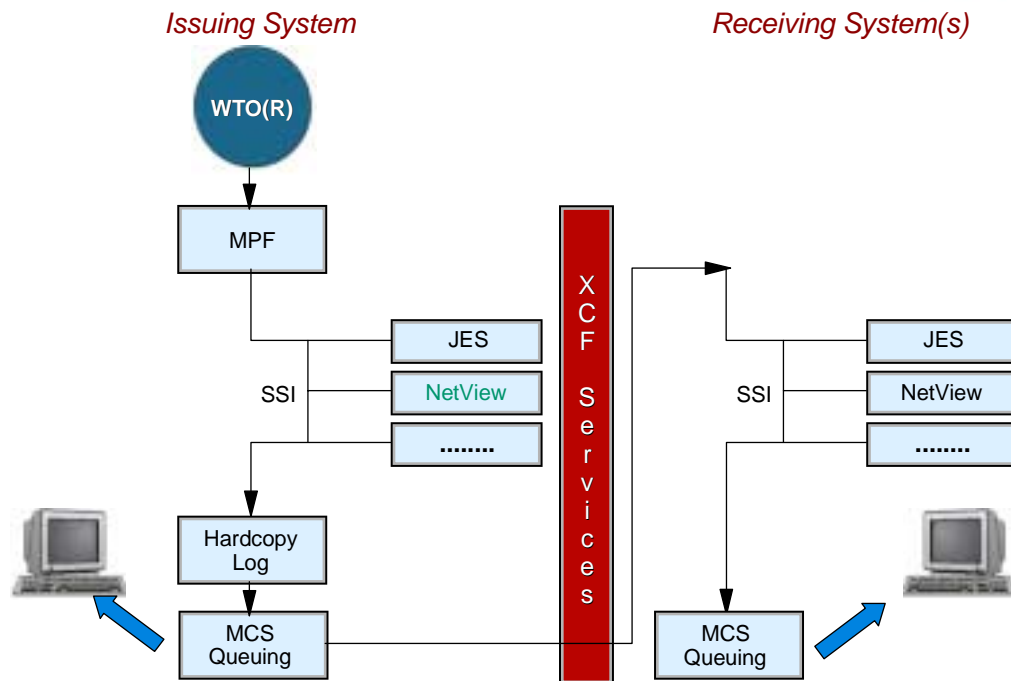
## Multisystem Consoles in a Sysplex

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- ☐ Single system image
  - Attached to any system
  - Not separate consoles for every system
- ☐ Single point of control
  - Receive messages from any system in the sysplex
  - Route commands to any system in the sysplex

## Message Flow in a Sysplex



## Reasons for Console Restructure



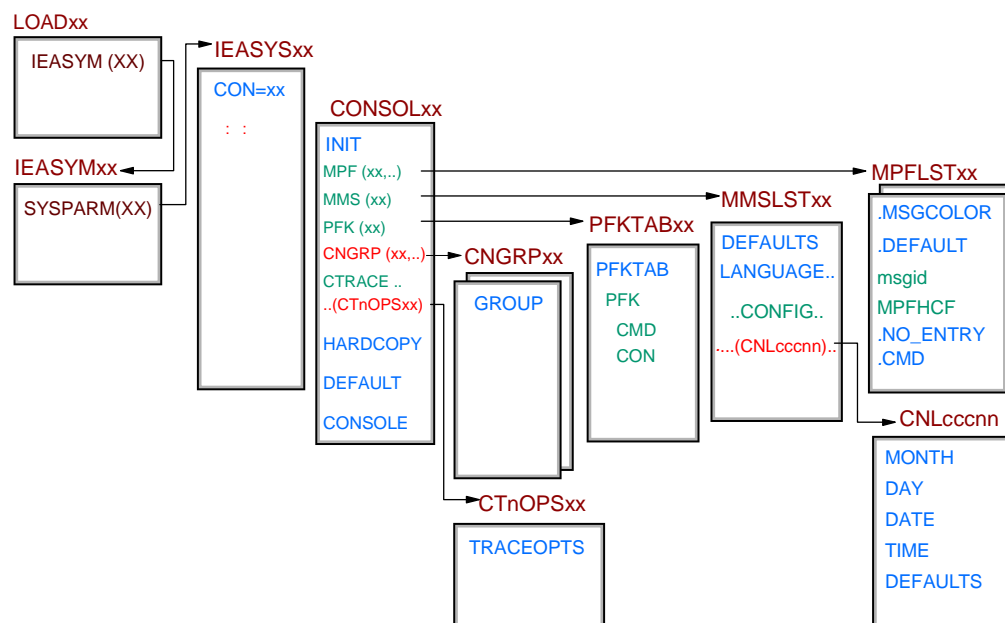
- ❑ **Problems seen with current console implementation**
  - Runaway application can kill a system
  - Large systems can overwhelm small systems
  - All queuing decisions are made from a single task
- ❑ **Prone to backups and storage overloads**
  - Traffic to a particular console
  - SYSLOG
  - Un-ended multiline WTOs
- ❑ **Inflated importance on a single message**
  - Delivery of all messages considered the overriding responsibility
- ❑ **Inflated importance of MCS consoles**

## Consoles Restructure Components



- ❑ Console restructure - Console availability enhancements
  - Runaway application can kill a system
  - Large systems can overwhelm small systems
  - All queuing decisions are made from a single task
- ❑ System console availability
- ❑ One-byte ID tracker

## Console Related Parmlib Members



## CONSOLxx in a Sysplex

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- ❑ Two or more systems in a sysplex
  - Code separate CONSOLxx each system
  - Code a single CONSOLxx for all systems
- ❑ Sysplex scope parameters
  - NAME, MSCOPE, CMDSYS, SYSTEM - (CONSOLE)
  - RLIM, AMRF, CNGRP, ROUTTIME - (INIT)
  - RMAX - (DEFAULT)

## CONSOLxx - CONSOLE Statement

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- ❑ Console device numbers
  - Same number on multiple systems - separate CONSOLxx
    - Using system symbols allows a single member
  - Unique numbers on all systems - single CONSOLxx
- ❑ NAME(conname) - console name
  - Choose name to identify console
  - Be aware of possible EMCS name, userids, .....
  - **(Console restructure)**
    - The NAME keyword is now required
    - Except for the system console where the code will continue to create a name if none is supplied
    - The console definition is rejected if no name is specified

## CONSOLxx - CONSOLE Statement



Receiving messages not explicitly routed to it

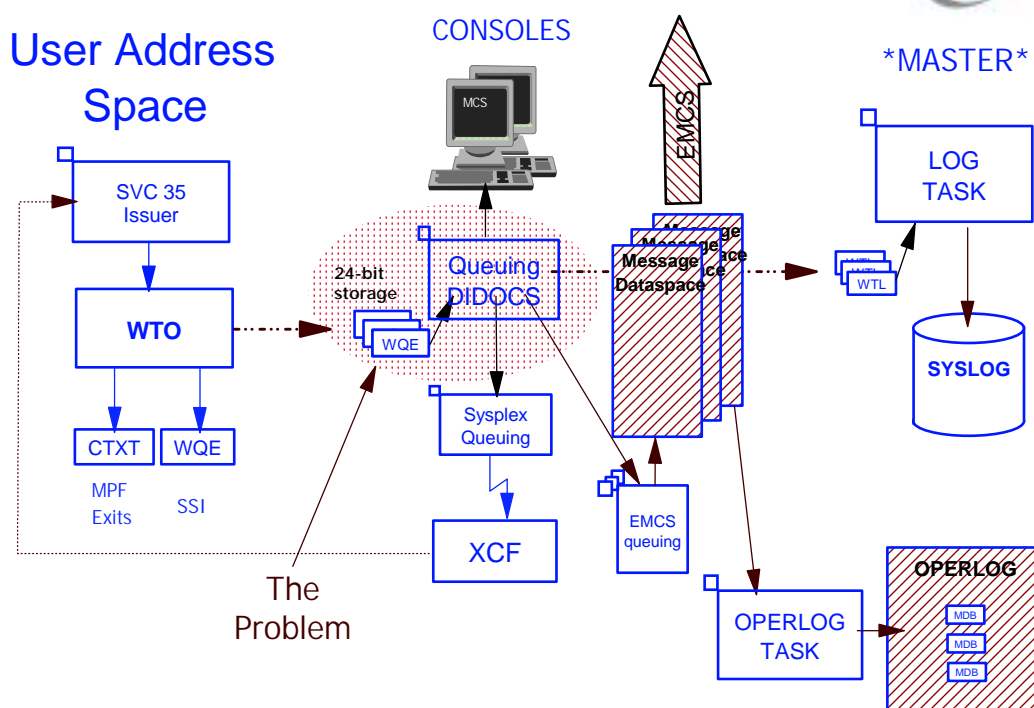
```
MSCOPE {(sysname|*[,sysname]...) }  
        {(*ALL) }
```

If a console has \*ALL or multiple sysnames

```
VARY CN(ROGERS),MSCOPE=SC50
```

The MSCOPE of the system console now defaults to \* instead of \*ALL (**Console restructure**)

## Message Processing before Restructure



## Console Restructure Design Changes

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- ❑ Eliminate outages due to a flood of WTOs or DOMs
  - Reduce reliance on one main task
  - Message cache data space
  - Queuing independence
  - Deliver message to syslog/operlog from caller's unit of work
  - Do not queue MLWTOs for delivery until message is complete

## Multi-line Message Changes

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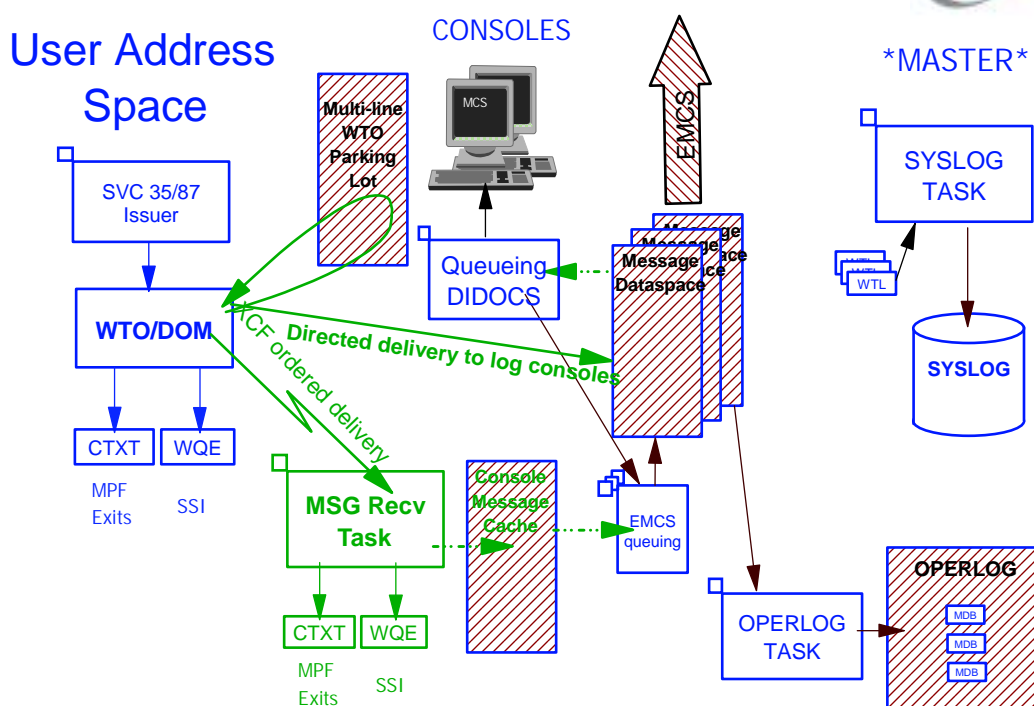
- ❑ Multi-line messages that are built dynamically using CONNECT processing will be held in a dataspace until complete
  - Not queued to a console or hardcopy until completed
  - Each line sent to message exits and SSI as issued
  - Un-ended messages will be ended at EOT or after a period of inactivity
  - MTRACE is performed for each line as it arrives

## Console Restructure Design Changes



- ❑ System/Sysplex is more important than any message
- ❑ Lose messages to maintain healthy (message will still go to hardcopy and possibly some targets)
- ❑ Provide means to avoid effects of fast producer / slow consumers
- ❑ Remove reliance on a single task for queuing decisions
- ❑ Do more processing under the SVC 35 (WTO) and SVC 87 (DOM) issuers thread
- ❑ Use updated XCF services for transport
- ❑ Eliminate effects of poorly behaved issuers of multiline WTOs

## Message Processing after Restructure





## Console Externals Deleted

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### ❑ HARDCOPY statement in CONSOLxx

- devnum deleted

```
HARDCOPY  DEVNUM  {(devnum)      }  
                {(SYSLOG)        }  
                {(OPERLOG)       }  
                {(devnum,OPERLOG)}  
                {(SYSLOG,OPERLOG)}
```

**Hardcopy can only be directed to SYSLOG and/or OPERLOG**

## Console Externals Deleted

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- ❑ The HCPYGRP keyword on the HARDCOPY statement in CONSOLxx is no longer accepted
- ❑ The R= parameter on the CONTROL Q command is no longer supported
  - Can no longer redirect backed up messages to another console

## System Console Availability



- ❑ System Console Availability is a RAS item
- ❑ **Provide an automated way to indicate when the system console should be in PD mode to handle operator instructions**
- ❑ SMCS consoles cannot be activated until VTAM or TCPIP is active
  - z/OS V1R1 introduced SMCS consoles as an alternative to MCS consoles
- ❑ System consoles do not normally run in a full function mode (PD mode)
  - A command (V CN(console),ACTIVATE) is required to enter this mode
- ❑ In the gap between NIP and VTAM/TCPIP activation there are no 'ready' consoles.

## System Console Availability Problem



- ❑ Currently, installations that wish to eliminate their MCS consoles are faced with the following problem
  - System IPLed with System Console
  - After NIP, System Console is not in PD-MODE
  - Messages may have been lost
  - Manual operator intervention required to get into PD-mode
  - After operator's console is activated system console must be manually removed from PD-mode

## System Console Availability Solution



- ❑ System console availability can be achieved through the definition of a console group in PARMLIB
  - `CONSOLE DEVNUM(SYSCONS)`
  - `AUTOACT(groupname)`
- ❑ System console will automatically be placed in PD-mode if none of the consoles in the group are active
- ❑ System console is automatically removed from PD-MODE when any of the consoles in the group are active

## System Console Changes



- ❑ Utilizing console restructure
  - The function is integral to running the operating system
- ❑ Utilizing system console availability - `AUTOACT`
  - Create a group in CNGRPxx parmlib member containing the consoles which can "replace" the system console
  - Specify `AUTOACT(groupname)` on the `CONSOLE` statement in `CONSOLxx` for the system console
  - Alternatively, the group can be activated dynamically through the use of the:
    - `SET CNGRP` and
    - `V CN(syscons),AUTOACT` commands

## Console Externals Changes

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- ❑ The ALTERNATE keyword on the CONSOLE statement no longer accepted
  - Must use ALTGRP for specifying back-up consoles
- ❑ Undelivered messages (UD) are no longer detected
  - UD keyword on the CONSOLE and HARDCOPY statements in CONSOLxx is no longer accepted
  - UD keyword no longer supported on the VARY CONSOLE and VARY HARDCPY commands

## One-byte Console ID Overview

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- ❑ Future enhancements to the consoles components will require a redefinition of the console id field
- ❑ In z/OS V1R7 the one-byte console id will no longer be valid
- ❑ To aid in finding and eliminating users of one-byte console ids a service has been created.
  - Tracks 1-byte users on: WTO, MPF, SSI, MGCR/MGCRE, CONVCON, MCSOPER
  - Allows hooks into the same infrastructure for customers/vendors to track users of 1-byte console ids in their code

## One-byte Console ID Solution

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- ❑ Service is provided to detect and record instances of one-byte id usage
  - Command interface to activate / deactivate the service and to display the list of uses
- ❑ Programmable Interface is provided for customers and vendors to track usages in other interfaces
  - Requires hooks into existing code

## Utilizing One-byte ID Tracker

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- ❑ To track usages on the console component interfaces
  - Operator command to control the activation of the service SETCON TRACKING=ON/ONWITHABEND/OFF
  - Display 'violators' via the following command
    - DISPLAY OPDATA,TRACKING
  - Known instances can be ignored through the specification of CNIDTRxx member in SYS1.PARMLIB.
- ❑ To track other instances of 1-byte console ids
  - Initialize the CNZTRPL parameter list
    - Includes data that describes what is being tracked
    - Includes the 'bad' console id being used
  - Invoke the CNZTRKR service, passing the CNZTRPL parameter list

## D OPDATA,TRACKING command



CNZ1001I 10.53.40 TRACKING DISPLAY

```
STATUS=ON,ABEND NUM=08    MAX=1000 MEM=n/a EXCL=0    REJECT=0
----TRACKING INFORMATION---- -VALUE--  JOBNAME  PROGNAME+OFF--  ASID  NUM
Parmlib Reader: ADYSET00      00 *MASTER* ADYSETP   1BD8   01   1
Parmlib Reader: COFVLF04      00 VLF        COFMINIT  2EFE   18   1
Parmlib Reader: IEFSSN00      00 *MASTER* IEEMB860  9E2A   01   1
Parmlib Reader: SMFPRM00      00 SMF        IFASMF    ECBE   19   1
WTO: CNZ1234I                 00 CNZJ      MOD1      1B0AC  14   2
WTO: CNZ1234I SYSTEM ZZ13 IS  A3 CNZJ      MOD2        9A   09   2
WTO: CNZ1234I SYSTEM ZZ13 IS  B0 CNZJ      MOD2        9A   09   5
WTO: CNZ5888E UH OH           00 CNZEND    MOD3      1288  18   1
```

## Example CNIDTRxx Parmlib Member



```
*                               Jobname  Pgmname                               *
* Tracking Information Mask      Mask      Mask      Comments (ignored)      *
*-----+-----+-----+-----+-----+-----+-----+-----+-----+
CONVCON                               |*      |AJOB    | AJOB ISSUES CONVCON |
MCSOPER: *                           |MAINAS |EMCSCON | EMCSCON GETS MIGID  |
MGCR: *                              |SS2    |THESS20 |                      |
MGCR: *                              |*      |MYASIS  |                      |
PARMLIB READER: IEFSSN??             |*MASTER*|IEEMB860|                      |
WTO: IEF452I *                       |*      |IEFNB903|                      |
WTO: IEF677I WARNING MESSAGE|*      |IEFNB903|                      |
***** Bottom of Data *****
```

## Migration - Coexistence Considerations

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### ❑ Compatibility requirements

- All systems in a sysplex must be at either
  - z/OS 1.5
  - z/OS V1R4M2 with SDSF APAR PQ73805 installed
  - z/OS V1R4 with APAR OW56244 and SDSF APAR PQ73805 installed
  - Have APAR OW56244 installed on any level between OS/390 V2R10 and z/OS V1R3