



BMC Mainframe: Parallel Sysplex Implementation, Customisation & Exploitation

COURSE ABSTRACT

COURSE CODE

» MGRS-PSIC-2021

APPLICABLE VERSIONS

» Not Applicable

DELIVERY METHOD

» Instructor-led Training (ILT)

COURSE DURATION

» 5 Days

PREREQUISITES

- » Parallel Sysplex Concepts and Facilities
- » Already have a thorough understanding of the principles of the parallel sysplex environment.

RECOMMENDED TRAININGS

» NA

Course Overview

The course is developed and delivered by © RSM Technology.

This in-depth, five-day course examines the issues involved in implementing the parallel sysplex environment. It covers hardware configuration issues, setting up the cloned z/OS environment, setting up the sysplex software environment, setting up sysplex data sharing, the system logger and the exploitation of z/OS components.

Extensive, real-world hands-on practical sessions occur throughout the course.

Target Audience

System programmers and support staff involved in setting up, customizing, and running a parallel sysplex environment.

Learner Objectives

- » Identify the different stages of parallel sysplex implementation, and understand the benefits and implications of implementing each of these stages
- » Understand the hardware configuration for a parallel sysplex, including the Coupling Facility, CTC and sysplex timer environments
- » Set up a cloned, multi-system, shared SYSRES environment with appropriate SYS1.PARMLIB parameters (and a suitable backup SYSRES!)
- » Set up and maintain the controls for the parallel sysplex environment, including the Couple Data Sets, signaling environment, timer, GRS and parmlib member controls set up and maintain the CFRM environment
- » Set up and maintain an SFM environment
- » Interpret the various RMF reports associated with the sysplex environment
- » Set up and configure the following exploiters using the CF Sizer tool:
 - JES2 Checkpoint
 - GRS Star
 - RACF data sharing
 - TCP/IP ports and DVIPA
 - VTAM generics
 - Enhanced Catalog Sharing
 - LOGREC
 - OPERLOG



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COURSE ACTIVITIES

- » Classroom Presentations
- » Demonstration


BMC MAINFRAME INFRASTRUCTURE AND PLATFORMS LEARNING PATH

- » <https://www.bmc.com/education/courses/find-courses.html#filter/%7B%22type%22%3A%22edu-specific-types-159150236%22%7D>

CERTIFICATION PATHS

- » This course is not part of a BMC Certification Path

DISCOUNT OPTIONS

- » Have multiple students? Contact us to discuss hosting a private class for your organization
- » **Contact us for additional information** 

Course Modules

Implementation Stages

- » Parallel sysplex history
- » Why the fuss about continuous availability?
- » Just a little bit further?
- » Continuous availability of what?
- » Workload balancing is essential
- » So is sysplex data sharing?
- » Configuration is critical
- » Planning for a full availability sysplex
- » Planning and configuring the base sysplex
- » Stage 1 - systems management
- » Single system image courtesy of XCF
- » Do not bring all your old baggage with you!
- » Cloned images
- » Naming conventions
- » IBM's example naming convention
- » Collections and Groups
- » For example: CICS APPLIDs and jobnames
- » Using the SYSNAME in the convention
- » Controlling the sysplex
- » Operational issues
- » The JESplex
- » Advanced operations and automation
- » Stage 2 - resource sharing
- » Mixed environments
- » GRS ring
- » GRS star
- » RACFplex
- » SMSplex and HSMplex
- » WLMplex and RMFplex
- » TWSplex
- » VTAMplex
- » Batchplex and Pipeplex
- » JESplex
- » 'Tapeplex'
- » The full availability sysplex
- » Stage 2 - data sharing
- » CACHE
- » LIST
- » LOCK
- » Data sharing - a prerequisite for full availability
- » Data sharing - capacity and growth
- » Data sharing - the application environment
- » Setting up data sharing
- » IBM application data sharing exploiters
- » Disaster recovery & data sharing applications
- » Coupling Facility redundancy and capacity
- » Data Sharing and workload balancing
- » Workloads and workload balancing
- » Enclave
- » WLM application environments
- » Workload classification
- » Nested definitions
- » Non-IBM work units
- » Workload balancing in reality
- » Transaction affinities
- » Analysis tools
- » Licensing issues
- » So, I have continuous availability?
- » Continuous availability?
- » The network and continuous availability
- » DASD and data availability
- » Database availability
- » Continuous availability - DB applications
- » CICS (VSAM)
- » IMS/DB
- » Db2
- » Continuous availability - DST
- » Continuous availability - capacity
- » 'N+1' capacity

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COURSE ABSTRACT

- » GDPS
- » GDPS configuration
- » It is a business decision!

Hardware Configuration

- » Configuration considerations
- » Our example system
- » Example system, logical view
- » Timer configurations
- » Server Time Protocol
- » Clock synchronization techniques
- » CLOCKxx
- » Switch concepts and terminology
- » Chained switches
- » CTCs
- » CTCs: connections vs paths
- » CTCs: connections and XCF paths
- » XCF paths and Operations
- » Example naming convention
- » Setting it up - Switch and CHPIDs
- » S Setting it up - primary and alternate paths
- » Setting it up - XCF signaling example
- » Advantages of the naming convention
- » Example system, a more logical view
- » Coupling Facility configuration options
- » Coupling Facility configuration considerations
- » Coupling Facility configuration comparison
- » Coupling Facility performance
- » CFCC: CFLEVEL and feature support
- » Coupling Facility connection options
- » Defining the Coupling Facility environment
- » Coupling Facility Channels (CFCs)
- » CFC connections
- » CFCs: Paths vs Subchannels
- » Create a CF LPAR
- » Coupling Facility links
- » Types of Coupling Facility links
- » Create CF Links
- » Connect LPARs together
- » Defining CIB Links
- » Defining CS5 and CL5 links

- » XCF signaling via the Coupling Facility
- » The consoles environment
- » Console configurations
- » Console names
- » CONSOLnn
- » Command Prefix Facility
- » OSC/ICC
- » DASD
- » Migrating your current configuration files

Software Configuration

- » A single image environment
- » Cloned images
- » Cloning support
- » What can and cannot be shared?
- » Configuration controls
- » IPL and the LOAD parm
- » LOADxx placement
- » LOADxx
- » Parmlib concatenation
- » IEASYMnn
- » Defaults
- » System symbols, types and rules
- » Static symbols
- » Dynamic symbols
- » Coding rules for these symbols
- » IEASYSnn concatenation
- » Specifying the system name (&SYSNAME)
- » IEASYSnn
- » SMFPRMnn
- » Setting up dynamic dump datasets
- » A cloned environment - example
- » What if the systems are not clones?
- » A not-quite-cloned environment - example
- » Using multiple symbols instead of multiple IEASYS
- » Using multiple parmlibs
- » Symbols, started jobs and MSTJCLnn
- » Started jobs?
- » MSTJCLnn
- » The Symbolic Parmlib Parser
- » SYSRES integrity
- » What do we mean by SYSRES

- » Multiple SYSRES volumes
- » Dual master catalogs
- » Continuous availability
- » PROGnn and dynamic exits
- » Dynamic exits
- » PROGnn
- » SMF and dynamic exits
- » Multiple PROGnn members
- » The CSVSNEX macro
- » Controlling the linklist via PROGnn
- » Rules regarding the linklist
- » Dynamic linklist reconfiguration
- » SETPROG - dynamic linklist and LPA
- » Manipulating the LPA via PROGnn
- » Dynamic SSI services
- » IEFSSNnn
- » JES and the sysplex

Setting up the Sysplex

- » Sysplex definitions
- » Sysplex configuration parameters
- » PLEXCFG=
- » COUPLE00
- » CLOCKnn
- » Sysplex Timer setup with 'critical system'
- » IPLing temporarily in ETRLOCAL
- » Multiple timezones in a sysplex
- » Local time, DST and DST changes
- » Multiple time zones implications
- » Sysplex Couple Data Sets
- » Performance issues
- » Migration issues
- » Formatting the sysplex Couple Data Sets
- » XCF groups
- » Couple Data Sets, allocation, and contents
- » What is in the Couple Data Sets?
- » Switching Couple Data Sets between IPLs
- » Other Couple Data Sets
- » Couple Data Set placement
- » Defining the XCF signaling paths
- » Signaling path configurations
- » Not all messages are equal!

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- » Transport classes
- » Defining the transport classes
- » Message buffers
- » Defining the message buffers
- » Path reconfiguration
- » RMF: XCF usage by system
- » RMF: XCF usage by member
- » RMF: XCF path statistics
- » GRS
- » A GRS Star complex
- » GRS: Ring or Star considerations
- » Setting up a GRS ring
- » Miscellaneous parmlib changes
- » IBM's Parallel Sysplex Configuration Assistant

Coupling Facility Management

- » HCD: defining the CF and CFCs
- » CFCs: Paths vs Subchannels
- » Subchannels
- » SYNCH vs ASYNCH CF requests
- » SMSG - SYNCH or ASYNCH?
- » 'Changed' CF requests
- » CFRM introduction
- » CFRM Policy in a CFRM Couple Data Set
- » Formatting the CFRM Couple Data Sets
- » Creating a CFRM Policy
- » Restricting access to IXCMIAPU
- » Coupling Facilities
- » IXCMIAPU - defining the Coupling Facilities
- » Structure considerations
- » Structure considerations - structure rebuild
- » Different rebuild processes
- » User-managed structure rebuild
- » 'User-Managed'
- » User-managed structure rebuild threshold
- » User-Managed Duplex rebuild
- » Limitations, rules, etc.
- » System-Managed rebuild process
- » Structure duplexing
- » IXCMIAPU - defining the structures
- » Allocating structures - CFRM vs IXLCONN
- » IBM product structures

- » IBM's CF Structure Sizer Tool
- » Activating the Coupling Facility environment
- » Maintaining CFRM Policy status
- » RMF: CF usage - structure summary
- » CF activity - CF Usage Summary - Structure
- » RMF: CF usage - storage & processor summaries
- » RMF: CF Structure Activity - list structures
- » RMF: CF Structure Activity - lock structures
- » RMF: CF Structure Activity - cache structures
- » RMF: CF - Subchannel Activity

The System Logger

- » Introduction
- » Who is using it?
- » Coupling Facility logstreams
- » Logstreams and list structures
- » DASD-only logstreams
- » System Logger environment
- » Duplexing Coupling Facility logstreams
- » Duplexing DASD-only logstreams
- » Offloading logstream data to disk
- » Log Data Sets
- » Managing logstream data
- » LOGR Policy in a LOGR Couple Data Set
- » LOGR Couple Data Sets - IXCL1DSU
- » LOGR policy concepts
- » LOGR policy parameters for a Coupling Facility logstream
- » LOGR policy parameters for a DASD-only logstream
- » Activating and updating the LOGR policy
- » System Logger services
- » Accessing logstream data
- » Using the LOGR subsystem
- » Operations log
- » D C,HC
- » SDSF main panel
- » SDSF OPERLOG or SDSF SYSLOG
- » CFRM Policy definitions
- » LOGR Policy definitions

- » D XCF,STR,STRNAME=OPERLOG
- » Introduction to LOGREC
- » DLOGREC
- » LOGREC CFRM Policy definitions
- » LOGR Policy definitions
- » D XCF,STR,STRNAME=LOGREC
- » System- managed duplexing
- » System-managed duplexing LOGR Policy
- » Commands to display the System Logger

Exploitation

- » JES2 in a parallel sysplex
- » JES2 MAS statements
- » JES2 XCF
- » JES2 checkpoint reconfiguration
- » JES2 CKPTDEF statement
- » JES2 structure size
- » CFRM Policy definitions
- » JES2 structure - error messages
- » JES2 checkpoint reconfiguration dialog
- » D XCF,STR,STRNAME=JES2CKPT
- » GRS introduction
- » GRS terminology
- » GRS RNLs - no wild cards
- » GRS RNLs - wild cards
- » GRS Ring
- » GRS Star
- » GRS Star processing
- » Sysplex Couple Data Set changes
- » GRS structure size
- » GRS structure CFRM Policy
- » Parmlib changes
- » D GRS
- » D XCF,STR,STRNAME=ISGLOCK
- » RACF in a basic sysplex
- » RACF in a parallel sysplex
- » RACF sysplex communication & data-sharing
- » RACF communication
- » RACF data sharing
- » RACF data sharing problems
- » The four sysplex modes
- » The RACF database name table

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- » Coupling Facility structures
 - » Defining Coupling Facility structures
 - » D XCF,STR,STRNAME=IRRXCFO0_P001
 - » Enhanced Catalog Sharing
 - » Catalog sharing process
 - » Implementing ECS
 - » Catalog definitions using IDCAMS
 - » ECS structure - CFRM Policy
 - » D XCF,STR,STRNAME=SYSIGGCAS_ECS
 - » The MODIFY CATALOG commands
 - » F CATALOG,ECSHR(STATUS)
 - » VTAM generic resources
- VIPAs and Sysplex**
- » VIPAs: Static VIPA, Dynamic VIPA
 - » Virtual IP addressing - a reminder
 - » Defining VIPA devices
 - » Specifying the source IP address
 - » Syntax for INTERFACE -- VIRTUAL interfaces statement
- » Examples of the INTERFACE statement for VIPA
 - » IP solutions in a sysplex
 - » Communication paths in a sysplex
 - » DynamicXCF transport choices
 - » IUTSAMEH
 - » XCF Groups and their usage
 - » Display XCF groups
 - » DYNAMICXCF
 - » DYNAMICXCF & HiperSockets
 - » Dynamic VIPA - introduction
 - » Dynamic VIPA takeover
 - » Stack-managed DVIPA
 - » Non- disruptive dynamic VIPA takeback
 - » Application-specific DVIPA
 - » IOCTL or Command-Activated DVIPA
 - » Dynamic VIPA statements
 - » MODDVIPA (EZBXFDVP) utility
 - » Dynamic VIPA usage
 - » When does the DVIPA move?
- » Load balancing and availability
 - » Sysplex Distributor
 - » How the Sysplex Distributor works
 - » Backup capability
 - » Recovery
 - » The role of dynamic routing with Sysplex Distributor
 - » Sysplex Distributor and policy
 - » Sysplex Distributor and MNLB
 - » Connection Optimizing DNS
 - » Information flow overview
 - » DNS weights
 - » DNS/WLM registration
 - » Starting the DNS serve
 - » Distributed VIPA - introduction
 - » Distributed VIPA statements
 - » Single system IP perspective of the sysplex
 - » TCPSTACKSOURCEVIPA/SYSPLEXPORTS
 - » CFRM policy example