ITSO Workshop 2003

z/OS Version 1 Release 4 and 5
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Trademarks

eNetwork	DFSMS/MVS	IMS	RACF
geoManager	DFSMSdfp	IMS/ESA	RMF
AD/Cycle	DFSMSdss	IP PrintWay	RS/6000
ADSTAR	DFSMShsm	IPDS	S/390
AFP	DFSMSrmm	Language Environment	S/390 Parallel Enterprise Server
APL2	DFSORT	Multiprise	SecureWay
APPN	Enterprise System 3090	MQSeries	StorWatch
BookManger	Enterprise System 4381	MVS/ESA	Sysplex Timer
BookMaster	Enterprise System 9000	Network Station	System/390
C/370	ES/3090	NetSpool	SystemView
CallPath	ES/4381	OfficeVision/MVS	SOM
CICS	ES/9000	Open Class	SOMobjects
CICS/ESA	ESA/390	OpenEdition	SP
CICS/MVS	ESCON	OS/2	VisualAge
CICSPlex	First Failure Support Technology	OS/390	VisualGen
COBOL/370	FLowMark	Parallel Sysplex	VisualLift
DataPropagator	FFST	Print Services Facility	VTAM
DisplayWrite	GDDM	PrintWay	WebSphere
DB2	ImagePlus	ProductPac	3090
DB2 Universal Database	Intelligent Miner	PR/SM	3890/XP
DFSMS/MVS	IBM	QMFr	z/OS
			z/OS.e

Domino (Lotus Development Corporation)   Tivoli (Tivoli Systems Inc.)   UNIX (X/Open Company Limited)
DFS (Transarc Corporation)   Tivoli Management Framework   Windows (Microsoft Corporation)
Java (Sun Microsystems, Inc.)   (Tivoli Systems Inc.)   Windows NT (Microsoft Corporation)
Lotus (Lotus Development Corporation)   Tivoli Manger (Tivoli Systems Inc.)

Agenda for today ....

- ❏ z/OS Overview and Migration
  - ➤ z/OS Support for z990
- ❏ z/OS Workload License Charges (WLC)
- ❏ 64-bit Architecture with z/OS
- ❏ Consoles Restructure
- ❏ zFS File System Update
- ❏ z/OS UNIX Update
- ❏ Infoprint Server Update
- ❏ z/OS Future Enhancements

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z/OS V1R3 and V1R4 Redbook

z/OS Version 1
Release 3 and 4
Implementation
-- SG24-6581 --

Currently available on Redbooks site
WWW.REDBOOKS.IBM.COM

z/OS V1R3 DFSMS Technical Guide, SG24-6569

z/OS Version 1 Release 4

❑ New releases of key IBM middleware
  ➤ DB2 requires z/OS 1.3 or higher in 64-bit mode
  ➤ Lotus Domino 6 requires z/OS V1R2 or higher
  ➤ Java at the SDK 1.4.1 level requires z/OS 1.2 or higher
❑ Special z/OS pricing options:
  ➤ Workload License Charges for z900 and z990
  ➤ zSeries Entry License Charge (zELC) pricing and z/OS.e for z800
❑ z/OS 1.4 is an important staging release
  ➤ Base for exploiting z990
  ➤ The last release of z/OS that OS/390 V2R10 customers can migrate to in a single step

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z/OS / zOS.e - Supported Environments

G5/G6
MP3000

z900

z800

z990

z/OS 1.1

OS/390 V2R10
z/OS 1.2
z/OS 1.3
z/OS 1.4
z/OS 1.5

z/OS.e 1.3
z/OS.e 1.4
z/OS.e 1.5

z/OS 1.6

z/OS.e 1.6
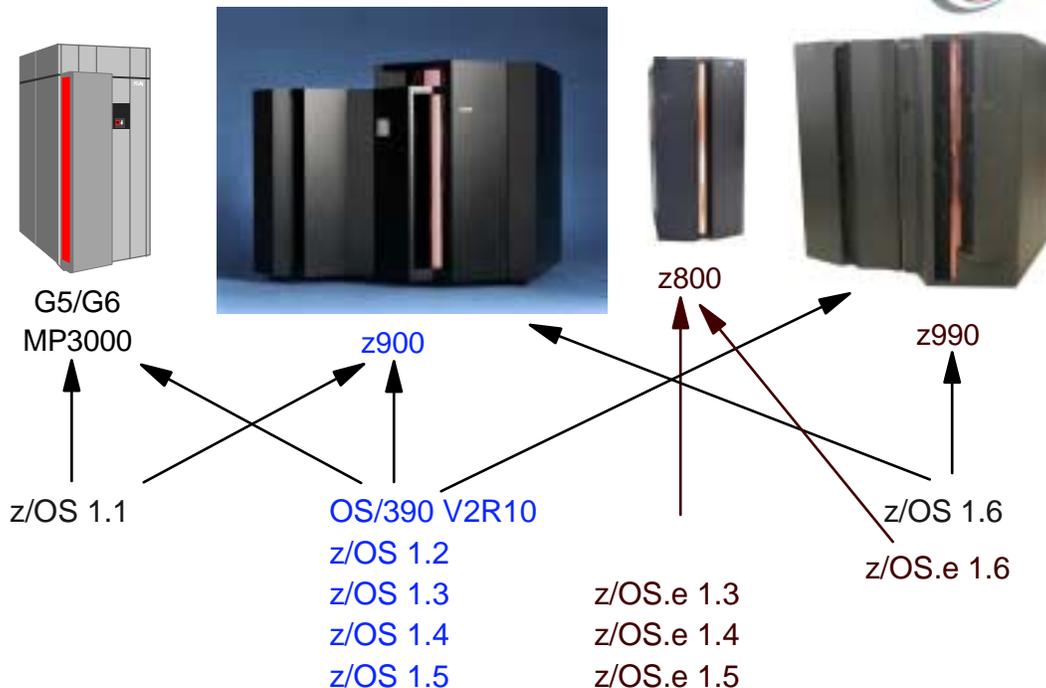
Planned Transition to Annual Releases

Annual releases begin

9/05

z/OS R6

9/04 ← **Architectural Level Set**

Transition begins

z/OS R5

1Q04

z/OS R4

New functions

z/OS R3

9/02

z/OS R2

3/02
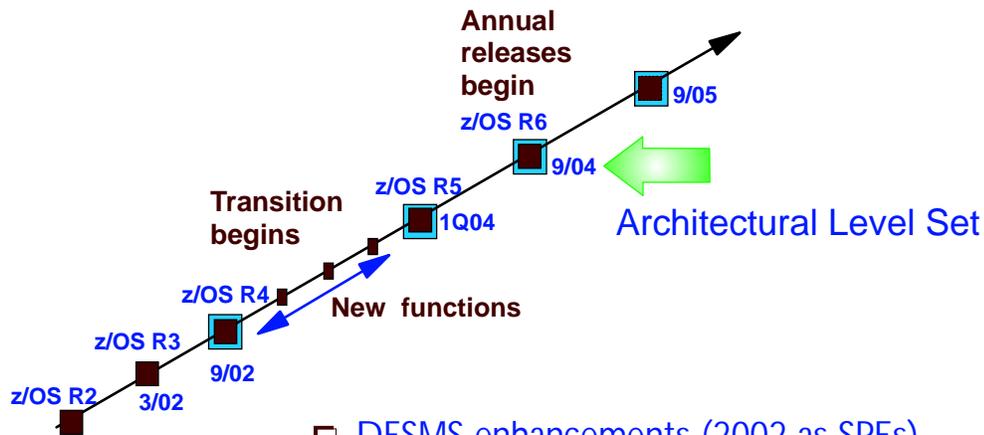
- [ ] DFSMS enhancements (2002 as SPEs)
- [ ] Enterprise Identity Manager (12/02)
- [ ] z990 Compatibility support (June 2003)
- [ ] z990 Exploitation support (Oct. 2003)
- [ ] z/OS Console Availability Feature (1Q03)

# Architectural Level Set with z/OS 1.6

- ❏ z/OS 1.6 is planned to require z/Architecture
  - ➢ z/OS 1.6 is planned to be available 9/04
- ❏ Only zSeries Servers (or comparable) are planned to be supported:
  - ➢ z990 or comparable server
  - ➢ z900 or comparable server
  - ➢ z800 or comparable server
- ❏ Following servers do not support z/Architecture and are not planned to be able to run on z/OS 1.6:
  - ➢ G5/G6 servers
    - – S/390 Parallel Enterprise Servers - Generation 5 and Generation 6 models or comparable server
  - ➢ MP/3000
    - – All models of the Multiprise 3000 Enterprise Server or comparable server

Current Coexistence/Migration Policy

❑ Coexistence: releases that can coexist in a multi-system environment

❑ Migration: releases that can be migrated to in a single step

    * OS/390 2.10 and z/OS 1.1 are treated as the same release

OS/390 z/OS	2.10 * 1.1 1.2 1.3 1.4			
z/OS	1.2 1.3 1.4 1.5			
z/OS	1.3 1.4 1.5 1.6			
z/OS	1.4 1.5 1.6 1.7			
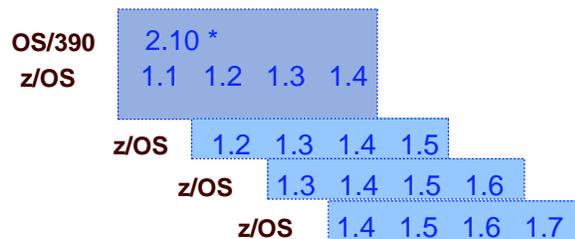
z/OS Coexistence

❑ "4 Consecutive Releases" Coexist
- ➤ N to N+3 releases are supported for coexistence, migration, and fallback
  - – When on z/OS, must migrate from four consecutive releases of the current release
  - – When on z/OS, must back out within four consecutive releases of the current release
- ➤ z/OS V1.1 counts the same as OS/390 R10
- ➤ z/OS V1.2, z/OS V1.3, z/OS V1.4, and z/OS V1.5 are supported for coexistence, migration, and fallback

❑ Only JES2/JES3 that can coexist with the shipped JES can be "staged" on z/OS - enforced in z/OS 1.5
- ➤ OS/390 R10 JES2/JES3 thru z/OS V1.5 JES2/JES3 are supported for coexistence, migration, and fallback

Planned Annual Release Policies

- ❏ IBM intends to continue providing service support for each release of z/OS or z/OS.e for three years following its (GA) date
  - ➤ IBM may choose to extend service for a given release
- ❏ Coexistence/Migration/Fallback Policy aligns with the Service policy
  - ➤ Change effective with first annual release (9/2004)
  - ➤ Generally three releases will be coexistence, migration, fallback supported
  - ➤ Releases with extended service will be coexistence, migration, fallback supported
    - − Exception: Any release having three or less months of service support remaining at the GA of a new release will be excluded
- ❏ For z/OS 1.5 and lower releases existing Coexistence/Migration/Fallback Policy remains in place
  - ➤ Example: z/OS 1.4 is supported with z/OS 1.4, z/OS 1.3, z/OS 1.2, (z/OS 1.1 & OS/390 2.10)

RELEASE	9/2004	9/2005	9/2006	9/2007	9/2008	9/2009
1st annual	Service Policy		Coexistence			
2nd annual			Migration			
3rd annual			Fallback			
4th annual						

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z/OS Planning Information

- ❏ z/OS V1R4 and z/OS.e V1R4 GA - September 27, 2002
  - ➤ z/OS: Via ServerPac, SystemPac, CBPDO
  - ➤ z/OS.e: Via ServerPac, SystemPac
- ❏ z/OS V1R5 - Planned GA March 2004
- ❏ z/OS V1R6 - Planned GA September 2004
- ❏ Planned key dates
  - ➤ OS/390 2.10 end of service planned for September 2004
  - ➤ z/OS 1.1 end of service is March 31, 2004
  - ➤ z/OS 1.2 end of service planned for September 2004

z/OS Service Policy

Release serviceable for three years following GA
Service on last release of a version might be extended
At least 12 months notice before withdrawing service
Service policy supercedes the Coexistence Policy

Release	GA date	End of Service date
OS/390 2.9	March 2000	March 31, 2003
OS/390 2.10	September 2000	September 2004 (announced)
z/OS 1.1	March 2001	March 2004 (announced)
z/OS 1.2	October 2001	October 2004 (announced)
z/OS 1.3	March 2002	March 2005 (announced)
z/OS 1.4	September 2002	March 2007 (announced)
z/OS 1.5	March 2004 (projected)	March 2007 (projected)

Was planned to be Sept. 2005 (note beside z/OS 1.4 row)

Current table available at: ibm.com/servers/eserver/zseries/zos/support/zos_eos_dates.html

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Why the extension of z/OS 1.4 service?

❑ To be coincident with z/OS 1.5 planned end of service
  ➢ z/OS 1.5 is last release to support G5/G6/MP3000 or equivalent servers

❑ Customers with G5/G6/MP3000 servers will be supported with either z/OS 1.4 or 1.5 until March 2007*

❑ Customers on z/OS 1.4 can choose to migrate to z/OS 1.5, 1.6, or 1.7**, based on the business value provided by these releases

* z/OS 1.5 end of service is planned for March 2007
** z/OS 1.7 availability is planned for September 2005

Annual Release Coexistence-Migration-Fallback Policy

Release	General Availability (GA) of Release Identified in Column 1	Service Support of Release Identified in Column 1 is Available Through	Releases Coexistence and Migration/Fallback supported with Release Identified in Column 1
R10	Sept 2000	Sept 2004	R10, R9, R8, R7, R6 (1)
z/OS R1	Mar 2001	Mar 2004	{z/OS R1/R10}, R9, R8, R7, R6 (1,2)
z/OS R2	Oct 2001	Oct 2004	z/OS R2, {z/OS R1/R10}, R9, R8 (2)
z/OS R3	Mar 2002	Mar 2005	z/OS R3, z/OS R2, {z/OS R1/R10}, R9 (2)
z/OS R4	Sept 2002	Mar 2007	z/OS R4, z/OS R3, z/OS R2, {z/OS R1/R10} (2)
z/OS R5	Mar 2004 (3)	Mar 2007 (4)	z/OS R5, z/OS R4, z/OS R3, z/OS R2
z/OS R6	Sept 2004 (3)	Sept 2007 (4)	z/OS R6, z/OS R5, z/OS R4, z/OS R3 (5)
z/OS R7	Sept 2005 (3)	Sept 2008 (4)	z/OS R7, z/OS R6, z/OS R5, z/OS R4
z/OS R8	Sept 2006 (3)	Sept 2009 (4)	z/OS R8, z/OS R7, z/OS R6, z/OS R5 (6)
z/OS R9	Sept 2007 (3)	Sept 2010 (4)	z/OS R9, z/OS R8, z/OS R7

Legend:
Where no product name is indicated in the table, OS/390 should be assumed z/OS R7 - z/OS R9 used for illustrative purposes, release numbering not a guarantee of actual release number

(1) OS/390 R6 -> OS/390 R10 provided as an exception
(2) OS/390 R10 & z/OS R1 treated as one coexistence level
(3) Represents projected GA date
(4) Represents projected end of service support date (GA+3 years)
(5) z/OS R2 excluded since service for z/OS R2 ends within 1 mo. of z/OS R6 GA
(6) z/OS R4 is not planned to be coexistence, migration, fallback supported with z/OS R8

Migrating to Latest z/OS Level

Migration Assistance

Migration Assistance Key Dates

❑ Facilitate migration from OS/390 2.10
  ➢ August 2002
    – z/OS Migration Version 1 Release 4
  ➢ February 2003
    – Updates based on customer experiences and feedback
    – New "Summary of Changed Interfaces" appendix
  ➢ May 2003
    – Updates for z990, DFSMStvs, and service updates
  ➢ Web site:
      ibm.com/eserver/zseries/
      zos/installation/zos_migration.html

Migration Assistance (V2R10 to 1.4)

❑ A guide for the migration activities
  ➢ Audience: System Programmers
  ➢ Facilitate migration from OS/390 2.10
  ➢ OS/390 2.10 to z/OS 1.4 Migration Workbook
❑ Consolidates information from
  ➢ 34 z/OS books
  ➢ Five Redbooks
  ➢ Five Washington Systems Center flashes
  ➢ IBM and user SHARE presentations
❑ Updated February 2003:
  ➢ Input based on customer experiences and feedback
 ➢ New "Summary of Changed Interfaces" appendix

Migration to z/OS V1R4 Overview

❏ Fallback to 31-bit mode on z800/z900 servers

➤ z/OS Bimodal Migration Accommodation offering

– August 2002

➤ Bimodal Accomodation offering for Disaster Recovery

– January 2003

Typical Migration Paths

zSeries: z800, z900, z990
31-bit: ESA/390
64-bit: z/Architecture

z/OS
31-bit

**6 month fallback
capability ***

**G5/G6
MP3000**

z800/z900

z800/z900

z/Architecture
Features:

Intelligent
Resource
Director

**G5/G6
MP3000**

z/OS
1.4
31-bit

z/OS
1.4
64-bit

z/OS 1.4
or
z/OS 1.5

Workload
License
Charges

**OS/390
2.10
31-bit**

z800/z900

z800/z900

64-bit

HiperSockets

64-bit

OS/390
2.10
31-bit

OS/390
2.10
64-bit

IPv6
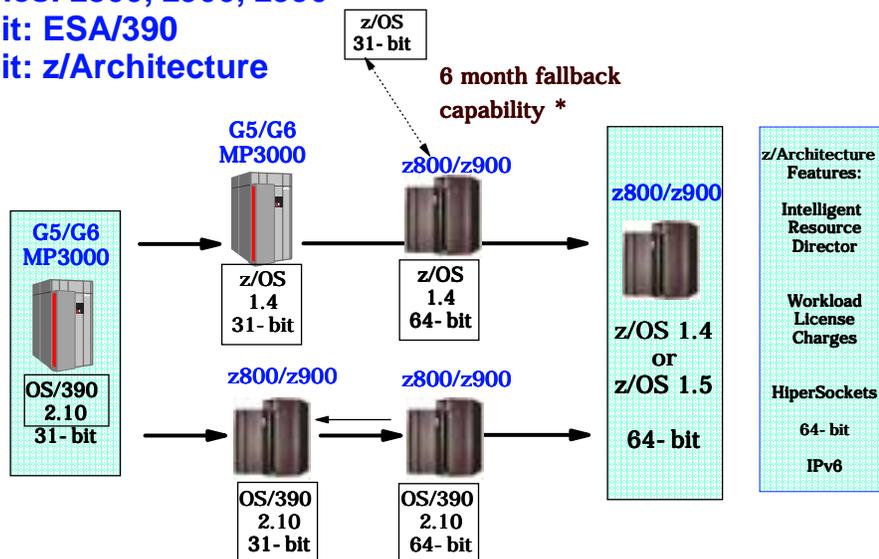
* z/OS Bimodal Migration Accommodation offering

z/OS Bimodal Migration Offering

❏ Provides a fallback option to 31-bit when first migrating to z/OS 1.4 or z/OS 1.5 in 64-bit mode
  ➤ Available as a Web deliverable on Sept. 27th, 2002
    – ibm.com/servers/eserver/zseries/zos/downloads/
❏ Six-month offering beginning with licensing of z/OS to z/Architecture server (z800/z900)
  ➤ Only PSLC pricing available on z900 in 31-bit mode
    – WLC pricing requires z/Architecture (64-bit) mode
  ➤ zELC pricing available on z800 in 31-bit mode
    – Not available for z/OS.e
❏ Mandotory requisite PTFs
  ➤ UW90737 for 1.2 - UW90738 for 1.3 - UW90739 for 1.4

z/OS Bimodal Migration Install

❏ Packaged using SMP/E GIMZIP function (z/OS 1.2)
  ➤ Download includes README.TXT and sample job
  ➤ Execute GIMUNZIP - contents to data sets for SMP/E
  ➤ SMP/E (APPLY and ACCEPT)
❏ Activating Bimodal Migration
  ➤ Recommendation is to start with ARCHLVL 1
❏ End of testing
  ➤ Remove ARCHLVL from LOADxx

Functions not Available in 31-bit mode

❏ z/OS functions not available in 31-bit mode on a z/Architecture server:

➢ Intelligent Resource Director, HiperSockets, 64-bit storage (64-bit Real and Virtual Storage), and IPv6

➢ WLC pricing

Compatibility and Exploitation Support for z990

z990 Migration

z/OS Support Levels for the z990

6/03　　　　10/03

(1) **z990 Compatibility**
z/OS 1.4, 1.3, 1.2
OS/390 2.10

(2) **z990 Exploitation**
z/OS 1.4

Clear Key Crypto (SSL)　**Full Crypto** (Secure Key and Clear Key)
z/OS 1.4, 1.3　**Oct. 2003**
z/OS 1.4　**Nov. 2003**
z/OS 1.3, 1.2　**Dec. 2003**
OS/390 2.10
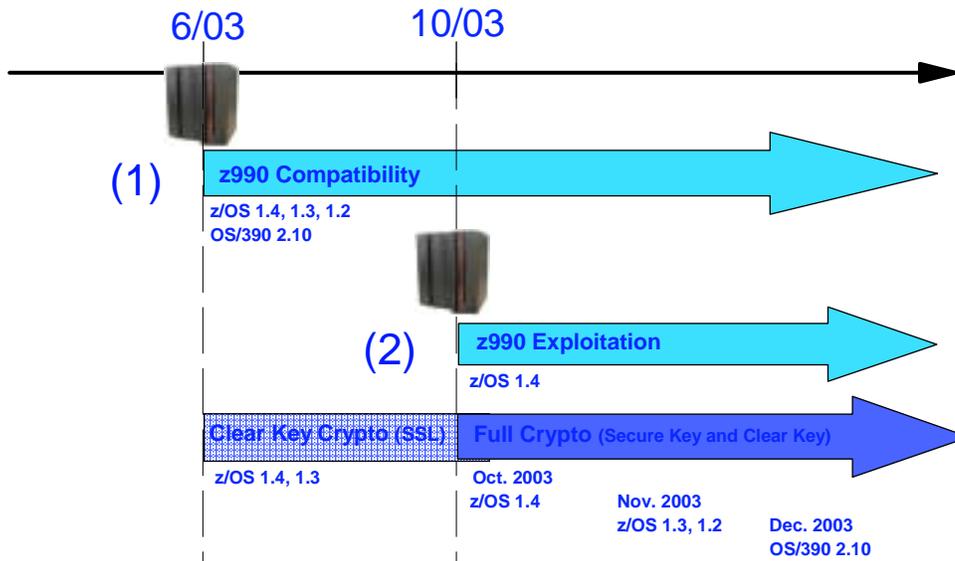
(Note: z/OS.e does NOT run on z990)

Support for z990 is done in 2 Stages

❑ Compatibility (available 2nd quarter 2003)
  ➢ Allow z/OS to run on z990 processor but not exploit new functions such as multiple channel subsystems, >15 LPARs
  ➢ Allows z/OS to coexist in same sysplex as z/OS on a z990 processor
  ➢ Available as a Web deliverable plus PTFs for OS/390 R10, z/OS V1R2, and z/OS V1R3
  ➢ Available as a separately orderable feature for z/OS V1R4

❑ Exploitation (available 4th quarter 2003)
  ➢ Exploitation of new z990 functions such as multiple channel subsystems, >15 LPARs, Extended Channel Measurement Blocks
  ➢ Shipped as a separately orderable feature on z/OS V1R4

z/OS Planned Availability for Support

❏ June 13, 2003 (CBPDO)-June 27, 03 (ServerPac/ SystemPac):
  ➤ z/OS V1 DFSMS Transactional VSAM Services (DFSMStvs)
  ➤ z/OS V1R4 z990 Compatibility Support
  ➤ z/OS.e V1R4 z990 Coexistence Support
  ➤ z990 Compatibility for Selected Releases (Web)
  ➤ z990 Crypto Assist Support for z/OS and z/OS.e V1.3 (Web)
❏ October 28, 2003: (CBPDO, ServerPac & SystemPac)
  ➤ z/OS V1R4 z990 Exploitation Support
  ➤ z/OS.e V1R4 Coexistence Update
  ➤ z990 Crypto PCIXCC Support for z/OS V1R4 (Web Deliverable)
❏ November 28, 2003:
  ➤ z990 Crypto PCIXCC Support for z/OS V1R3, V1R2 (Web)
❏ December 31, 2003
  ➤ z990 Crypto PCIXCC Support for OS/390 V2R10 (Web)
❏ 1Q04: Planned GA for additional no-charge feature
  ➤ z/OS V1 R4 Consoles Enhancements

OS/390 and z/OS Release Summary

Release	Can coexist in same sysplex as systems on z990 processor ?	Can run on z990 processor ?	Exploits the new z990 processor functions ?
OS/390 R10	Yes	Yes	No
z/OS 1.1	No	No	No
z/OS 1.2	Yes	Yes	No
z/OS 1.3	Yes	Yes	No
z/OS 1.4	Yes	Yes	No
z/OS 1.4 with z990 exploitation feature	Yes	Yes	Yes

z/OS Planned Ordering - When and What

May 13, 2003	**z/OS V1R4 z990 Compatibility Support** **z/OS V1 DFSMS Transactional VSAM Services**	**Standalone path**
June 10, 2003	z/OS V1R4 z990 Compatibility Support z/OS V1 DFSMS Transactional VSAM Services	CBPDO
June 13, 2003	**z/OS V1R3 z990 Compatibility Support** **z/OS V1R2 z990 Compatibility Support** **OS/390 V2R10 z990 Compatibility Support** **z990 Crypto Assist Support for z/OS V1R3**	**Web download**
June 24, 2003	z/OS V1R4 z990 Compatibility Support z/OS V1 DFSMS Transactional VSAM Services	ServerPac and SystemPac
October 28, 2003	**z/OS 1.4 z990 Exploitation Support**	**Standalone path, ServerPac, CBPDO,SystemPac**
October 31, 2003	z990 Crypto PCIXCC Support for z/OS V1R4	Web download
November 28, 2003	**z990 Crypto PCIXCC Support for z/OS V1R2 & V1R3**	**Web download**
December 31, 2003	z990 Crypto PCIXCC Support for OS/390 V2R10	Web download

z990 Website for Compatibility Support

http://www-1.ibm.com/servers/eserver/zseries/zos/downloads/

(Scroll down to following z990 download)

`z990 compatibility for selected releases` ← Click here

> This feature allows selected releases of z/OS and OS/390 to run on a z990 server. It is also required on all systems (z990 and non-z990) in a Parallel Sysplex when a z/OS or coupling facility image in the Parallel Sysplex is running on a z990 and the LPAR ID of the operating system or coupling facility image is greater than 15 (X'F'). This download applies to: OS/390 V2R10.0, z/OS V1R2.0, z/OS V1R3.0, and z/OS.e V1R3.0.
>
> Support for zOS V1R4.0 is available as an orderable feature through ShopzSeries.
>
> A program directory is available:
>
> z990 Compatibility for Selected Releases Program Directory (OS/390 V2R10.0, z/OS V1R2.0, z/OS V1R3.0, and z/OS.e V1R3.0)
> [Search | Browse | Adobe Acrobat PDF] ← Program directory

z990 Website for Compatibility Support

Address: http://www14.software.ibm.com/webapp/download/preconfig.jsp?id=2003-06-13+09%3A57%3A55.748077R&cat=os&fam=&s=c&S_TACT=&S_CMP=

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Software > Trials and betas > Operating Systems > OS/390

z990 Compatibility for Selected Releases

1 Configure   2 Register   3 Download

To properly configure your software download, please review the information below. Select the appropriate country, language and media type; if applicable. When you are done, press the "Continue" button at the bottom.

OS/390

Support

Trials and betas

News

Library

Services

Training and certification

Warranty info

Configuration

z990 Compatibility for Selected Releases	Enables OS/390 V2.10, z/OS V1.2, and z/OS 1.3 to run on a z990. Enables these releases and z/OS.e V1R3 to coexist in a sysplex with a z990 where an LPAR ID is greater than 15.
Platform(s):	OS/390, z/OS
Version:	1.1.0
Language:	English International
Media Type:	download
Availability:	Worldwide

Continue   Clear

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z990 Website for Compatibility Support

Address: https://www6.software.ibm.com/dl/z990/z990-i

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→ Select a country

Warranty info

z990 Compatibility for Selected Releases

OS/390, z/OS: download: English International

1 Configure   **2 Register**   3 Download

You have userid **paulroge** from this site. Please select an action:

- I'd like to continue with registration

- I'd like to verify my personal profile (name, e-mail, etc.) while I register
  Enter password here

  [   ]   Sign in

- I'd like to verify my personal profile but have forgotten my password

- I'd like to create a new userid and password

  Registration and Download Support

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z900 Versus z990 comparison

|	z900	z990
Number of Channels (CEC)	256	512
Number of logical partitions (CEC)	15	30
Number of subchannels (CEC)	512K	1890K (63K per partition * 30 partitions)
Number of devices (CEC)	63K	126K (2 CSSs * 63K devices)
Number of channels (partition)	256	256
Number of devices/subchannels (partition)	63K	63K

Physical Channel IDs (PCHIDs)

❏ Physical Channel ID (PCHID)
➢ Provides a way to map the logical CHPID (00-FF) to a physical channel (000-nnn)
➢ PCHID value must be specified for each CHPID before a production IODF or an IOCDS can be created (except IQD and ICP channels)
➢ PCHIDs can be specified manually or you can use the CHPID Mapping tool to assign
➢ Use the IBM supplied PCHID report for PCHID numbers
➢ Internal channels such as IQD and ICP do not need a PCHID
❏ Channels (CHPIDs) on a z990 processor
➢ Still one byte in size and ranges from 00-FF
➢ CHPID numbers only unique within a logical channel subsystem
➢ CHPIDs are a logically mapped to a physical channel (PCHID)

z990 Channels

z990 GA1   z990 GA2

| CSS 0 | CSS 1 | CSS 0 | CSS 1 |

LP A **LP B** **LP C**   **LP D** **LP E** **LP F**   **LP A** **LP B** **LP C**   **LP D** **LP E** **LP F**

CHPID 01
PCHID=100

CHPID 02
PCHID=110

CHPID 01
PCHID=120

CHPID 03
IQD/ICP
PCHID=n/a

Dedicated channel
★ **Accessible from one and only one partition and CSS**

Reconfigurable
★ **May be configured online to only one partition at a time within a CSS**

Shared
★ **May be configured online and used by multiple partitions within a CSS**

Spanned (New)
★ **Shared between partitions in multiple CSS's**
★ **Only IQD/ICP can be spanned**
★ **PCHID=n/a because internal channel**

Spanned Channels

❑ Same CHPID/PCHID value isused in more than one CSS

➤ Both CSS 0 and CSS 1 can have CHPID 01 defined
  – If CHPID 01 is not spanned, the CHPID number refers to a different channel (different PCHID)
  – If CHPID 03 is spanned, the CHPID number refers to the same channel (IQD or ICP internal channels)

➤ Spanning reduces the number of channels that can be defined for all CSS's on CEC
  – Worst case - 256 if all channels spanned between all CSS's
  – No spanning - 2 CSS's * 256 channels = 512 channels

Compatibility Support

❏ Support for z/OS to run on z990

❏ Support for z/OS to coexist in a sysplex with a z990

❏ z/OS compatibility support for only

➤ z/OS running in CSS 0

➤ z/OS running with an LPAR IDs <= 0F

➤ No more than 15 LPARs supported (z/OS)

	Not usable for z/OS at compatibility level
CSS 0 **Up to 256 CHPIDs**	**CSS 1** **Up to 256 CHPIDs**

Compatibility Support for z990

❏ * OS/390 or z/OS compatibility can run in an LPAR with ID > '0F' in any LCSS as a z/VM guest but must modify its LPAR ID via SET CPUID

❏ ** OS/390 or z/OS compatibility can run in LCSS1 under z/VM with either compatibility or exploitation

*	**
Compatibility level of z/OS or OS/390 can only run in LPARs with ID <= 0F	**Compatibility level of z/OS or OS/390 can only run as z/VM guest**
Up to 256 **LCSS0 CHPIDs**	**Up to 256** **LCSS1 CHPIDs**

Compatibility Support for z990

- ❏ Available on z/OS 1.2, 1.3, 1.4, OS/390 2.10 (6/13/03)
  - ➤ Web deliverable on OS/390 2.10, z/OS 1.2 and z/OS 1.3
  - ➤ Separately orderable no-charge feature on z/OS 1.4
  - ➤ z/OS 1.1 not supported
- ❏ Required for HCD/IOCP definition of z990
- ❏ Required to run on z990
  - ➤ Restricted to LPAR IDs <= '0F' (unless z/VM guest)
- ❏ Supports dynamic I/O change in LCSS0 only, LCSS1 may exist
- ❏ May be required for sysplex coexistence with z990 including z/OS.e

Compatibility Support for z990

- ❏ Other considerations:
  - ➤ Install ICKDSF 17 on non-z990 systems sharing disk with z990
    - – Provides serialization for concurrent maintenance actions against same device
  - ➤ Bimodal Accommodation supported
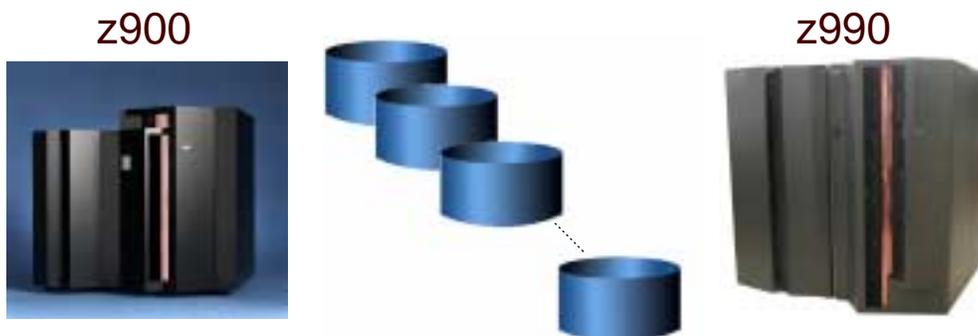
z900   z990

Compatibility Coexistence

Compatibility required

Compatibility required on all z990 images

G5, G6, z800, or z900

OS/390 R10 Comp	z/OS 1.2 Comp	z/OS 1.3 Comp	z/OS 1.4 Comp	CF	z/VM

z990

OS/390 R10 Comp	z/OS 1.2 Comp	z/OS 1.3 Comp	z/OS 1.4 Comp	CF LPAR id >0F	z/VM Comp

CSS 0

CF

CF
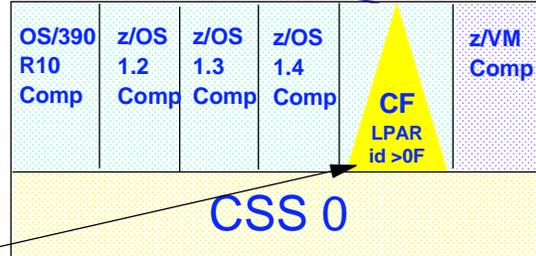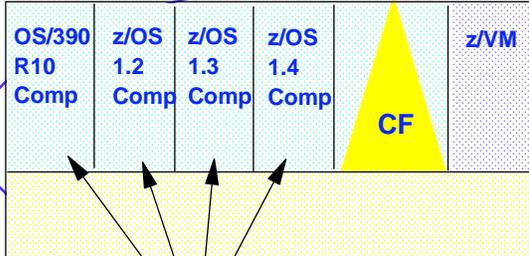
- ★ **If z990 CF LPAR id is >0F, then compatibility code is required on all systems on non-z990 processors in same sysplex**
- ★ **CF partition can be in any CSS**

- ★ **z/OS partitions on z990 must be in CSS 0 and LPAR id <=0F**

Parallel Sysplex Coexistence with z990

Compatibility *NOT* required

Compatibility or Exploitation - all z990 images

G5, G6, z800, or z900

OS/390 2.10	z/OS 1.2	z/OS 1.3	z/OS 1.4	CF

z990

OS/390 2.10 Compat	z/OS 1.2 Compat	z/OS 1.3 Compat	z/OS 1.4 Compat	CF LPAR id <=0F	z/OS 1.4 Expl LPAR id <=0F

LCSS0 | LCSS1

CF
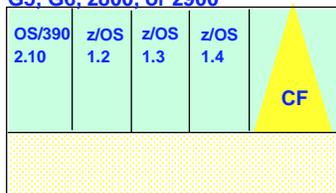
Recommendation: Roll out Compatibility or Exploitation level software to all images in the sysplex and upgrade non-z990 CFs to support z990 as soon as possible

Compatibility Restrictions

❑ z/OS must be IPLed in a partition defined to CSS0

➤ z/OS terminates with a 07C-01 wait state

– IEA004W CHANNEL SUBSYSTEM IDENTIFIER IS NOT ZERO

➤ Only z/OS 1.4 with exploitation feature supports running in non-zero CSSs

➤ Other CSS's may be defined for coupling facility, other operating systems

❑ z/OS must be IPLed with an LPAR id - 00-0F range

➤ z/OS terminates with a 07C-02 wait state

– IEA006W LOGICAL PARTITION IDENTIFIER IS NOT IN THE RANGE OF 0-F

➤ Only z/OS 1.4 with exploitation feature supports larger ID values

Exploitation Support for z/OS V1R4 and z990

z/OS 1.4 - z990 Exploitation Support

❏ Only available on z/OS 1.4 and higher
  ➤ Separately orderable no-charge feature (planned 10/31/03)
  ➤ Integrated into z/OS 1.5 and above
❏ Provides support for exploitation of new z990 functions:
  ➤ Running z/OS in an LP in LCSS1
    – Using an LPAR with ID > '0F'
  ➤ Supports I/O activates for LCSS1 in LCSS0 or LCSS1
  ➤ z990 supports up to 30 activated logical partitions (z990 GA2)
❏ Includes z990 Compatibility Feature
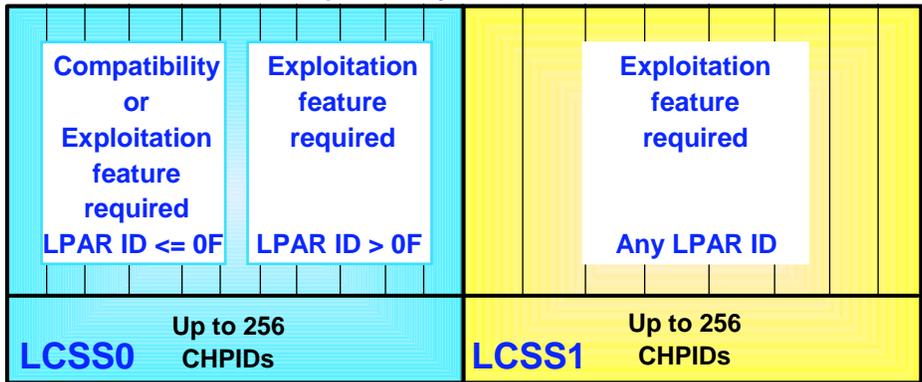
Compatibility or Exploitation feature required	Exploitation feature required	Exploitation feature required
LPAR ID <= 0F	LPAR ID > 0F	Any LPAR ID
LCSS0 Up to 256 CHPIDs		**LCSS1** Up to 256 CHPIDs

Exploitation Coexistence

Compatibility NOT required

Compatibility or exploitation required all z990 images

G5, G6, z800, or z900

OS/390 R10	z/OS 1.2	z/OS 1.3	z/OS 1.4	ICF

z990

OS/390 R10 Comp	z/OS 1.2 Comp	z/OS 1.3 Comp	z/OS 1.4 Comp	ICF LPAR id <= 0F	z/OS 1.4 Expl LPAR id <= 0F

CSS0   CSS1

CF
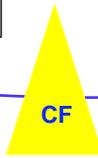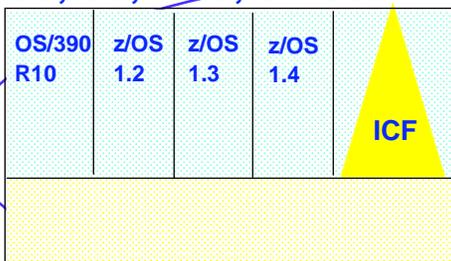
❏ **Sysplex supports systems on z990 and non-z990 processors, with and without the compatibility support**

❏ **If z990 CF and z/OS 1.4 exploitation LPAR id <= 0F compatibility code is not required on non-z990 processor**
❏ **CF and z/OS 1.4 exploitation partitions may be in any CSS**

Exploitation Coexistence

Compatibility required

Compatibility or exploitation
required all z990 images

G5, G6, z800, or z900

OS/390 R10 Comp	z/OS 1.2 Comp	z/OS 1.3 Comp	z/OS 1.4 Comp	ICF

z990

OS/390 R10 Comp	z/OS 1.2 Comp	z/OS 1.3 Comp	z/OS 1.4 Comp	ICF LPAR id > 0F	z/OS 1.4 Expl LPAR id > 0F

CSS0   CSS1

CF
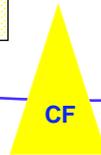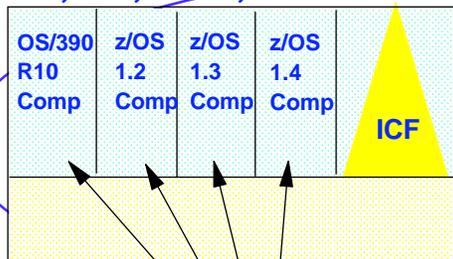
- ❏ **If z990 CF or z/OS 1.4 exploitation LPAR id is >0F, then compatibility code is required on all systems on non-z990 processors in the same SYSPLEX**
- ❏ **CF and z/OS 1.4 exploitation partitions may be in any CSS**

Exploitation Restrictions

- ❏ Compatibility or exploitation code must be installed on all systems in the sysplex if:
  - ➢ z/OS in exploitation mode is IPLed with a logical partition identifier > 0F
  - ➢ If any CFs in the SYSPLEX have a logical partition identifier > 0F (z990 processor only)
  - ➢ 2 digit LPAR identifiers are used in the CFRM policy
- ❏ If z990 processor consists of exploitation and compatibility level systems and a new H/W configuration must be activated, the H/W activate must be done on one of the exploitation systems if:
  - ➢ There is more than one CSS defined
  - ➢ A non-zero CSS is being changed or resources affected by the change are defined to non-zero CSSs

Exploitation Restrictions

❏ Compatibility or exploitation code must be installed on all systems in the sysplex if:
  ➤ z/OS in exploitation mode is IPLed with a logical partition identifier > 0F
  ➤ If any CFs in the SYSPLEX have a logical partition identifier > 0F (z990 processor only)
  ➤ 2 digit LPAR identifiers are used in the CFRM policy
❏ If z990 processor consists of exploitation and compatibility level systems and a new H/W configuration must be activated, the H/W activate must be done on one of the exploitation systems if:
  ➤ There is more than one CSS defined
  ➤ A non-zero CSS is being changed or resources affected by the change are defined to non-zero CSSs

Exploitation Migration Considerations

❏ HCD
  ➤ Must define z990 in IODF - only LPAR mode supported
  ➤ Must define an IODF/IOCDS with at least CSS0 defined
  ➤ z/OS partitions running exploitation code may be any CSS
  ➤ Maximum number of devices must be specified in CSS definition - replaces HSA expansion percentages in CPC activation profile
❏ CFRM
  ➤ If CF resides on a non-z990 processor, the partition number currently specified in the CFRM policy is the same as the partition number defined in HCD
  ➤ If the CF resides on a z990 processor, the partition number specified in the CFRM policy is the logical partition identifier specified in the PR/SM image profile

Exploitation Migration Considerations

❏ Automation
  ➢ Some messages were changed to display 2 digit LPAR ids (IOS431I, IXCxxxx, IXLxxxx)
  ➢ Dynamic ACTIVATE related message changes (IOS50xI)
❏ SMF changes
  ➢ SMF 70, 74, 79, 89, 99 record changes
❏ Standalone Dump
  ➢ Need to generate new standalone dump program
❏ CommServer
  ➢ If IQD is used for communication between remote partners, and remote partners run in different CSSs on same z990 processor, then must define IQD CHPID used as spanned

z990 CFCC Coexistence Support

CF on one of the following processors	Connected to z990 with 15 LPARs or less	Connected to z990 with more than 15 LPARs
Pre-G5	Not supported	Not supported
G5, G6	No special CFCC requirements	Requires CFCC level 11 with compatibility patch
z800, z900	No special CFCC requirements - (must be level 12)	Requires CFCC level 12 with compatibility patch

Compatibility / Exploitation Support

Component	Compatibility - OS/390 R10, z/OS 1.2, z/OS 1.3	Compatibility - z/OS 1.4 (feature 0)	Exploitation (feature 1)
BCP	PTF: IOS - OW57714 WLM - OW52986, OW53845 XES/XCF - OW54705 RSM - OW56730	Same	Feature: FMIDs JBB7717, JBB77K7
DFSMS	N/A	N/A	PTF: OW56255, OW56812, OW56947, OA01873
HCD	Web Deliverable: HCS7708, JCS77J8, JCS77H8, JCS77HJ	Same except shipped as part of a feature	Feature: FMIDs HCS7708, JCS77J8, JCS77H8, JCS77HJ
HCM	Web Deliverable: HCM1510	Same except feature	Feature: FMID HCM1510
RMF	PTF: OW54347	Same	PTF: OW56656
EREP	PTF: IR46582	Same	Same
ICKDSF	Web Deliverable: ICKDSF - R17, GA 11/02	Same except feature	Feature: FMIDs EDU1H01, FDU1H09, FDU1H08, FDU1H07
Comm Server	PTF: OA02212 (z/OS 1.2 and up), PQ71579 (OS/390 R10 and up)	Same	Same
OSA/SF	Web Deliverable: OSA/SF V3R1, GA 5/03	Same except feature	Feature: FMID H0G1400

LPAR Numbers

Customize Image Profiles: PART3

Profile Name   PART3   Assigned for activation

Description   This is a LINUX Only Logical Partition

Partition identifier   3

Mode   ESA/390
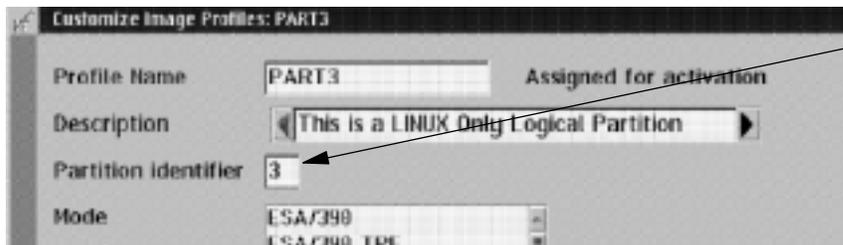
Logical Partition Identifier
- Non-z990 - 0-F
- z990 - 0-3F

Note: You can have an LPAR id >0F even if you have less than 15 partitions defined

```
                    Add Partition
CBDPPA10

  Specify the following values.

   Partition name . . . PARTD___
   Partition number . . 1
   Partition usage  . . OS      +

   Description  . . . . _____
```
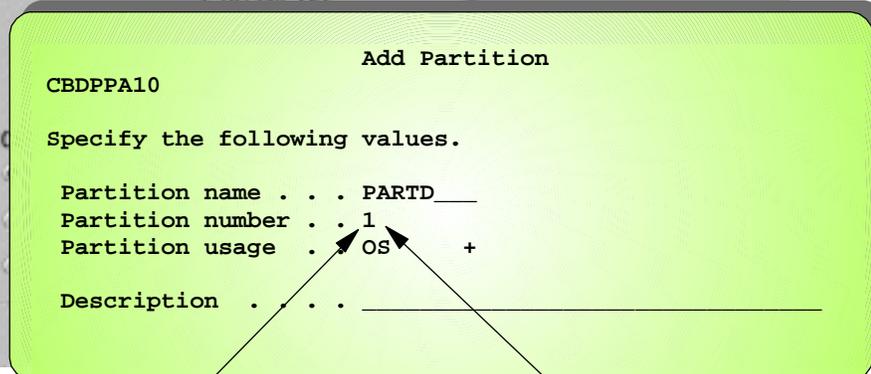
MIF image id - 1-F (non-z990 and z990)

Partition number
- Non-z990- same as MIF image id
- z990 - 1-1E - not specifiable

LPAR Numbers

	LPAR Identifier	Partition Number	MIF image id
Defined	By customer in the LPAR image profile on HMC	Non-z990 - by customer via HCD/IOCP z990 - assigned at POR based on IOCDS	By customer via HCD/IOCP
Range	Non-z990 - 0-F z990 - 0-3F	Non-z990 - 1-F z990 - 1-1E	1-F
Densely packed	No	Non-z990 - No z990 - Yes	No
Size	Non-z990 - 4 bits z990 - 8 bits	8 bits	4 bits
Usage	Messages, CFRM policy (z990)	Internal usage	Dynamic I/O, LPAR, ESCON frames, CFRM policy (non-z990)
Aliases	LP ID, User logical partition id (UPID)	None	IID, EMIF id
Notes		For non-z990, partition no. and MIF id are the same value	For z990, image ids across CSSs are not unique

Messages now Display 2-Digits LP IDs

Note: The logical CPU address no longer appears in the first digit of the serial number as a result of the change to the STIDP instruction.

This information is displayed when using the exploitation feature.

```
D M=CPU
IEE174I 14.25.09 DISPLAY M 112
PROCESSOR STATUS
ID CPU          SERIAL
0  +            126A3A2084
1  +            126A3A2084
2  -

CPC ND = 002084.305.IBM.02.000000026A3A
CPC SI = 2084.305.IBM.02.0000000000026A3A
CPC ID = 00
CPC NAME = A12        ◄─────── SCZP901 (name we specified on HMC)
LP NAME = A12      LP ID = 12
CSS ID  = 1
MIF ID  = 2

+ ONLINE   - OFFLINE   . DOES NOT EXIST   W WLM-MANAGED
N NOT AVAILABLE

CPC ND  CENTRAL PROCESSING COMPLEX NODE DESCRIPTOR
CPC SI  SYSTEM INFORMATION FROM STSI INSTRUCTION
CPC ID  CENTRAL PROCESSING COMPLEX IDENTIFIER
CPC NAME CENTRAL PROCESSING COMPLEX NAME
LP NAME  LOGICAL PARTITION NAME
LP ID    LOGICAL PARTITION IDENTIFIER
CSS ID   CHANNEL SUBSYSTEM IDENTIFIER
MIF ID   MULTIPLE IMAGE FACILITY IMAGE IDENTIFIER
```

Changes in RMF I/O Queuing Reports

- Average Control Unit Busy (CUB), Command Response (CMR) and Channel Subsystem (CSS) Delay Time added to:
  - Postprocessor/Monitor I I/O Queuing Activity Report
  - Monitor II I/O Queuing Activity Report (IOQUEUE)
  - Monitor III I/O Queuing Activity Report (IOQ)
- Switch Busy Count summation not reported, but added to
  - SMF Record 78 Subtype 3
  - SMF Record 79 Subtype 14
- The Initial Command Response Time for a start or resume function of the subchannel is the time needed until the device indicates it has accepted the command
  - Allows to distinguish between real H/W errors vs. workload spikes (contention in the fabric and at destination port)

Monitor I I/O Queuing Activity Report

```
                              I/O  QUEUING  ACTIVITY
                                                                              PAGE   1
         z/OS V1R5            SYSTEM ID SYSF           DATE 02/27/2003        INTERVAL 04.59.955
                              RPT VERSION V1R5 RMF     TIME 12.05.00          CYCLE 1.000 SECONDS

  TOTAL SAMPLES =    300   IODF = 01   CR-DATE: 01/21/2003   CR-TIME: 12.29.40   ACT: ACTIVATE

         - INITIATIVE QUEUE -   ------- IOP UTILIZATION -------   -- % I/O REQUESTS RETRIED --   -------- RETRIES / SSCH --------
   IOP    ACTIVITY   AVG Q   % IOP   I/O S...                CP   DP    CU    DV         CP    DP    CU    DV
          RATE       LNGTH   BUSY                                 BUSY  BUSY  BUSY    ALL  BUSY           BUSY  BUSY

   00     503.132    0.05    3.64                                 0.6   0.0   0.0    2.02                       .00
   01     123.609    0.00    1.92                                 0.8   0.0   0.0    6.4                        .00

   SYS    626.740    0.04    2.78    62...                  73.6  0.7   0.0   0.0    2.89                  0    0.00
```

New: ► AVG CUB DLY ► AVG CMR DLY

New: AVG CSS DLY

```
                                                       AVG  AVG                    DELAY   AVG
   LCU   CONTROL UNITS   DCM GROUP   CHAN   CHPID   % DP   % CU  CUB  CMR  CONTENTION   Q    CSS
                         MIN MAX DEF PATHS  TAKEN   BUSY   BUSY  DLY  DLY     RATE     LNGTH DLY

   0031  400A                        11     0.573   0.00   0.00  0.0  1.2
         400B                        20     0.583   28.16  0.41  1.0  0.1
                         2   2   2           2.447  10.90  0.24  0.0  0.0
                                     *       3.604  12.79  0.24  0.0  0.2     0.000    0.00  0.0

   0032  440A                        11     0.013   0.00   0.00  0.0  0.1
         440B                        20     0.027   33.33  0.00  0.0  1.2
                         0   0   2           0.000  0.00   0.00  1.0  0.1
                                     *       0.040  25.00  0.00  0.0  0.0     0.000    0.00  0.0
```

I/O Queuing Exception Reporting

❏ New conditions:

➤ IOCBT (Average control unit busy delay time)

➤ IOCMR (Average command response delay time)

➤ IOCSS (Average channel subsystem delay time)

```
//BMGUPP   JOB <.........>
//RMFPP    EXEC PGM=ERBRMFPP
//MFPINPUT DD   DISP=SHR,DSN=< SMF INPUT DATA >
//MFPMSGDS DD   SYSOUT=*
//SYSOUT   DD   SYSOUT=*
//SYSIN    DD   *
 OVW(IOCBT(IOCBT(66)))
 OVW(IOCMR(IOCMR(66)))
 OVW(IOC66(IOCSS(66)))
 OVW(IOC67(IOCSS(67)))
 NOSUMMARY
 SYSOUT(H)
```

Monitor I Channel Activity Report Changes

New: CSSID

New: Changed Characteristics Indication

Spreadsheet Reporter and RMF PM

❏ The Spreadsheet Reporter handles the changed RMF
  Postprocessor reports
  ➤ Available as version 4.8.2 shipped with OW56656
  ➤ Available via RMF Homepage
  ➤ See new RMF Spreadsheet Reporter Java (TM)
    Technology Edition
❏ RMF PM covers the new metrics
  ➤ New Distributed Data Server (DDS) shipped with
    OW56656
  ➤ Device - %delay due to device command response time
  ➤ LCU - average CU busy time (in mSec) by channel path
    and LCU average command response time (in mSec) by
    channel path and LCU average channel subsystem
    delay time (in mSec) by LCU %delay due to device
    command response time by volume

RMF PM

❏ Metrics no longer supported
  ➤ Device
    – %delay director port busy
    – %delay CU busy
  ➤ LCU
    – %delay CU busy by volume
    – %delay director port busy by volume
    – In case these metrics are used, error message
      "comp-id=6 error-code=320 not found" is issued

Availability Dates and Delivery Vehicle

Compatibility and Exploitation Delivery

May 13, 2003	z/OS V1R4 z990 Compatibility Support z/OS V1 DFSMS Transactional VSAM Services	Standalone path
June 10, 2003	z/OS V1R4 z990 Compatibility Support z/OS V1 DFSMS Transactional VSAM Services	CBPDO
June 13, 2003	z/OS V1R3 z990 Compatibility Support z/OS V1R2 z990 Compatibility Support OS/390 V2R10 z990 Compatibility Support z990 Cryptographic CP Assist Support for z/OS V1R3	Web download
June 24, 2003	z/OS V1R4 z990 Compatibility Support z/OS V1 DFSMS Transactional VSAM Services	ServerPac, SystemPac and ProductPac
September 19, 2003	z990 Cryptographic Support for z/OS V1R4 & V1R2	Web download
October 28, 2003	z/OS 1.4 z990 Exploitation Support	Standalone path, ServerPac, CBPDO, SystemPac, and ProductPac
4Q 2003	z990 Cryptographic Support for z/OS V1R3	Web download
4Q 2003	z990 Cryptographic Support for OS/390 V2R10	Web download

Crypto General Availability Acceleration

	Original Announcement 5/2003	New Announcement 7/2003
PCIXCC Feature	10/31/2003	9/19/2003
TKE 4.0 Workstation	10/31/2003	9/30/2003
z990 Cryptographic Support (z/OS V1R4) - z990	10/31/2003	9/19/2003
z990 Cryptographic Support (z/OS V1R2) - z990	11/28/2003	9/19/2003
z990 Cryptographic Support (z/OS V1R3) - z990	11/28/2003	4Q2003
z990 Cryptographic Support (OS/390 V2R10) - z990	12/31/2003	4Q2003

Summary Charts

Support	Compatibility	Exploitation
Releases	OS/390 R10, z/OS 1.2, z/OS 1.3, z/OS 1.4	z/OS 1.4
Coexistence	Can coexist with OS/390 R10 and up (but no z/OS 1.1 if z990 in SYSPLEX)	Can coexist with OS/390 R10 and up (but no z/OS 1.1 if z990 in SYSPLEX)
LPAR ids > 0F: z/OS - CF	z/OS - No, CF - Yes	z/OS - Yes, CF - Yes
Run in which CSS: z/OS - CF ?	z/OS - CSS 0, CF - any CSS	z/OS - any CSS, CF - any CSS
SMF records 1. SMF 70 2. SMF 74 3. SMF 79 4. SMF 89 5. SMF 99	1. Changed (>15 LPARs) 2. Changed (I/O architecture) 3. Changed (I/O architecture) 4. Changed (>15 LPARs) 5. Changed (DCM)	1. Changed (>15 LPARs) 2. Changed (I/O architecture) 3. Changed (I/O architecture) 4. Changed (>15 LPARs) 5. Changed (DCM)
Parmlib changes 1. IEASYSxx MAXCAD= 2. IEASYSxx CMB=	1. No 2. No	1. Update for new system CAD 2. Ignored
Commands 1. D M=CPU 2. VARY SWITCH 3. SETIOS DCM=ON/OFF 4. D IOS,CONFIG(HSA) 5. D M=CHP	1. Logical CPU address no longer appears in CPU id 2. No changes 3. No changes 4. Unshared subchannel and logical CUs will display zeroes 5. Add PCHID to the display	1. Logical CPU address no longer appears in CPU id. CSS id, MIF id etc. now formatted 2. Must issue VARY SWITCH on exploitation system if multiple CSSs in LPAR cluster 3. No changes 4. Subchannel and logical CUs displayed by CSS id 5. Added PCHID to display

Summary Charts

Support	Compatibility	Exploitation
HCD/ACTIVATE 1. CSS for z/OS partitions 2. S/W activates allowed if multiple CSSs defined 3. H/W activates allowed if multiple CSSs defined 4. IOS50xI message changes	1. CSS 0 2. Yes 3. Yes as long as changed are made only to CSS 0 and affected resources not defined to other CSSs 4. No	1. Any 2. Yes 3. Yes, no restrictions 4. Yes, CSS id added
Messages 1. IXCxxxx and IXLxxxx 2. IOS50xI 3. IOS431I 4. IOS050I, IOS051I	1. Yes, format LPAR id as 2 digits 2. No 3. Yes, LPAR id will be formatted even if system is not in same SYSPLEX (if reserve held by exploitation system only) 4. Yes, PCHID added	1. Yes, format LPAR id as 2 digits 2. Yes, CSS id added 3. LPAR id will be formatted even if system is not in same SYSPLEX (if reserve held by exploitation system only) 4. Yes, PCHID added
CFRM policy changes 1. Use MIF image id for CF defined on z990 2. Use 2 digit LPAR ids in policy 3. CF can have a 2 digit LPAR id	1. Yes 2. Yes, if compatibility code installed around SYSPLEX 3. Yes, if compatibility code installed around SYSPLEX	1. Yes 2. Yes, if compatibility code installed around SYSPLEX 3. Yes, if compatibility code installed around SYSPLEX
Miscellaneous 1. CommServer 2. SADMP 3. EREP	1. IQDCHPID must be defined as a spanned CHPID if communication with systems in other CSSs desired 2. Existing SADMP program can be used 3. PCHID display in subchannel logout record	1. IQDCHPID must be defined as a spanned CHPID if communication with systems in other CSSs desired 2. New SADMP program must be generated 3. PCHID display in subchannel logout record

Reference Books for New Support

- ❏ z/OS MVS Migration - GA22-7580
- ❏ z/OS System Commands - SA22-7627
- ❏ z/OS Initialization and Tuning Reference - SA22-7592
- ❏ MVS Setting Up a Sysplex - SA22-7625
- ❏ HCD Planning - GA22-7525
- ❏ HCD User's Guide - SC33-7988
- ❏ HCM User's Guide - SC33-7989
- ❏ IOCP User's Guide - SB10-7029
- ❏ PR/SM Planning Guide - SB10-7033
- ❏ CHPID Mapping Tool - Available via Resource Link Web Page
- ❏ zArchitecture Principles of Operation - SA22-7832

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z/OS Version 1 Release 4

Installation Improvements z/OS Version 1 Release 4 ServerPac

Installation Improvements (ServerPac)

- ❏ RESTFS job
  - ➤ Previously, required submitting user ID to have UID(0)
  - ➤ V1R4 - Submitting user ID can have access to
    - – BPX.SUPERUSER profile
    - – Effective UID is 0
  - ➤ BPXISETS and FOMISCHO job eliminated
- ❏ Select JES at install
  - ➤ Previously, JES2 and JES3 installed by installation job stream - Then, delete the JES you do not want
  - ➤ V1R4 - Choose JES element in dialog
    - – J2MERG, J2DELETE, J3MERG, J3DELETE, and UPDCSI jobs deleted

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Installation Improvements (ServerPac) ..

- ❏ Master catalog flag
  - ➤ ServerPac provides a new command which allows the required in master catalog flag to be overridden
    - – This allows you to catalog all data sets in user catalogs if you choose
- ❏ Restructured ALLOCDS job
  - ➤ Allocation in the ALLOCDS job used IEFBR14 and DD statements and always resulted in RC(0) whether it worked or not causing read of allocation messages to detect failures. ALLOCDS job could sometimes cause system performance problems. To restart, search all the allocation messages, fix the problems, edit many lines of JCL, and resubmit. The alternative was to re-initialize all the DASD volumes and start over.
  - ➤ V1R4 - Use IDCAMS ALLOCATE where possible and allocation failures cause non-zero RC and job stops - Scan SYSPRINT and restart at failed step

Installation Improvements z/OS Version 1 Release 5 ServerPac

ServerPac Enhancements

❏ Set best block sizes automatically
  ➢ Block sizes are not shown in the dialog
  ➢ ALLOCDS job uses DCB BLKSIZE=0 for most data sets and 32760 for RECFM=U
❏ Large Volume Support
  ➢ With DFSMS Large Volume Support you can define any 3390 volume size from 1024 cylinders to 32760 cylinders on 2105 DASD
❏ Support choice of HFS or zFS at installation time
  ➢ Support Choice of HFS or zHFS at Installation Time
❏ Miscellaneous enhancements
  ➢ Pre-RECEIVEd service -No more service tape!
  ➢ Subsystem file system improvements
  ➢ Various panel changes to improve usability

Statements of Direction

☛ **Any reliance on this Statement of Direction is at the relying part's sole risk and will not create any liability or obligation for IBM**
☛ **All statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice.**

Statements of Direction for z990

❑ IBM intends to provide the following support in z/OS:

➢ Greater than 16 engines in a single image of z/OS

- This support, planned for z/OS 1.6, will be designed to increase the scale of a single z/OS image by taking advantage of the increased number of engines available on a z990 server

➢ 60 LPAR support

- z/OS support for up to 60 logical partitions (LPARs). This support is planned for z/OS 1.6

➢ Four Logical Channel SubSystems:

- IBM intends to support four Logical Channel SubSystems on z/OS 1.4 and above. Each image of z/OS will still support a maximum of 256 channels.