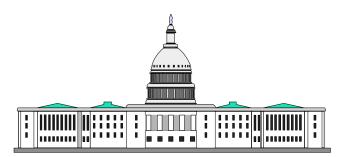




## **LPAR Advanced Topics**

IBM z/OS and OS/390 Expo October 7 - 11, 2002 Session T09



Harv Emery emeryh@us.ibm.com Washington Systems Center





## **Trademarks**

#### The following are trademarks of the International Business Machines Corporation in the United States and/or other countries.

APPN*	IBM logo*	Virtual Image Facility
DB2*	IMS	VM/ESA*
e-business logo*	Magstar*	VSE/ESA
Enterprise Storage Systems	MVS	VTAM*
ESCON*	Netfinity*	WebSphere
FICON	OS/390*	z/Architecture
GDPS	Parallel Sysplex*	z/OS
Geographically Dispersed Parallel	PR/SM	z/OS.e
Sysplex	S/390*	z/VM
HiperSockets	S/390 Parallel Enterprise Server	zSeries
IBM*		

\* Registered trademarks of IBM Corporation

#### The following are trademarks or registered trademarks of other companies.

Lotus, Notes, and Domino are trademarks or registered trademarks of Lotus Development Corporation

LINUX is a registered trademark of Linus Torvalds

Penguin (Tux) complements of Larry Ewing

Tivoli is a trademark of Tivoli Systems Inc.

Java and all Java-related trademarks and logos are trademarks or registered trademarks of Sun Microsystems, Inc., in the United States and other countries

UNIX is a registered trademark of The Open Group in the United States and other countries.

Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation.

SET and Secure Electronic Transaction are trademarks owned by SET Secure Electronic Transaction LLC.

\* All other products may be trademarks or registered trademarks of their respective companies.

#### Notes:

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.

This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM business contact for information on the product or services available in your area.

IBM considers a product "Year 2000 ready" if the product, when used in accordance with its associated documentation, is capable of correctly processing, providing and/or receiving date data within and between the 20th and 21st centuries, provided that all products (for example, hardware, software and firmware) used with the product properly exchange accurate date data with it. Any statements concerning the Year 2000 readiness of any IBM products contained in this presentation are Year 2000 Readiness Disclosures, subject to the Year 2000 Information and Readiness Disclosure Act of 1998.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Information about non-IBM products is obtained from the manufacturers of those products or their published announcements. IBM has not tested those products and cannot confirm the performance, compatibility, or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.



© IBM Corporation, 2002



# **LPAR Advanced Topics**

Introduction to z800 and Running z/OS.e

zSeries PR/SM Workload Pricing Support

#### zSeries PR/SM IRD Support

- CPU Management for z/OS
- CPU Management for z/VM and Linux
- CSS I/O Priority Queuing
- Dynamic Channel Path Management

HiperSockets (z/OS V1.2 & up) Fibre Channel Protocol (FCP)

**zSeries Coupling Facility Support** 

#### **Capacity Upgrade on Demand (G5/6 and zSeries)**

- Concurrent Memory Upgrade (z900 Dr 3C)
- Nondisruptive CBU CP Downgrade (z900 Dr 3C and z800)

#### **Memory Configuration and Reconfiguration**

- Support for CUoD CIU, CBU and MES Upgrade
- MVS Storage Reconfiguration

### Ref: <u>zSeries PR/SM Planning</u>, SB10-7033-03a (July 2002)





# **IBM zSeries 800**

#### **Complete z/Architecture (64 bit)**

- OS/390 V2.8 & up, z/OS all, z/OS.e
- VM/ESA V2.4 & up, z/VM all
- VSE/ESA V2.4 & up, TPF 4.1
- Linux Kernel 2.2 & 2.4 (31 and 64 bit)

#### **Flexible Model Structure**

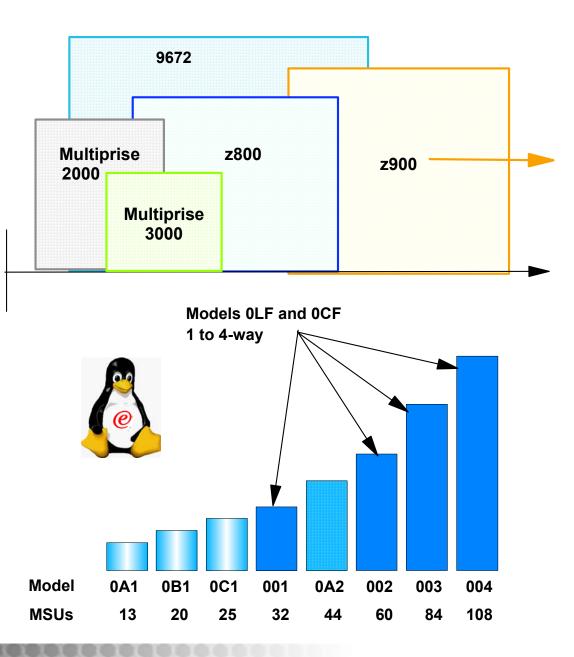
- 1 to 4-way
- z800-001 ITRR close to G6-X17
- 3 sub-uni, 1 sub-dyadic
- CUoD and CBU
- Linux Model 0LF, CF Model 0CF
- z800-004 upgrades to z900-104

#### 8, 16, 24 or 32 GB memory

No concurrent upgrade

#### zSeries I/O Subsystem supports

- All zSeries I/O cards (16 max)
  - Up to 240 Escon
  - No Parallel, OSA-2 FDDI, or ICB-2
- SOD: Linux FCP support







# z800 LPAR Mode Exclusive: z/OS.e

### z/OS.e Machine Support

- z/Architecture required 64-bit only
- z800 YES
- z900 No! Will detect and fail.

## z/OS.e Operating Mode

- LPAR Mode YES
- Basic Mode No! Will detect and fail.

### z/OS.e LPAR Requirements

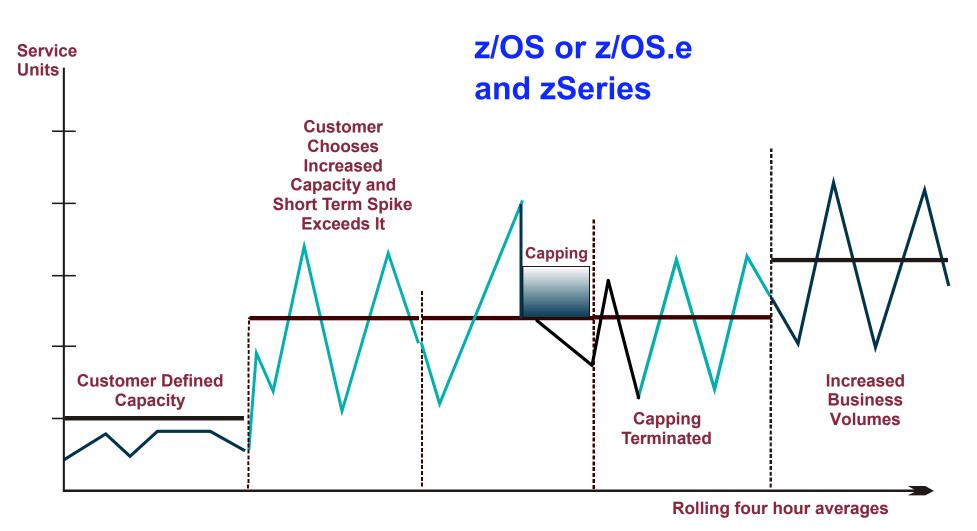
- Name in IOCDS must start with "ZOSE"
- "ZOSE" named LPAR on z800:
  - -z/OS.e and z/OS.e under z/VM will run
  - -z/OS and OS/390 will NOT run, even under z/VM
- "ZOSE" named LPAR on S/390 or z900:
  - Name has NO effect, z/OS or OS/390 will run
- Shared CP OK, Requires WLM "Defined Capacity"
- Dedicated CP OK







## Variable Workload License Charge PR/SM Management to Defined Capacity



### Pay for what you define!





# **Image Profile Options Tab**

	<ul> <li>Customize Activation Profiles : RSYS</li> <li>Image options         <ul> <li>Minimum input/output (I/O) priority</li> <li>Maximum input/output (I/O) priority</li> <li>Defined capacity</li> <li>CP management cluster name</li> </ul> </li> </ul>	75 TESTPLEX RSYS:R03 RSYS:R04	SP2 SP3 SP4 SSP5 SSP6 SSP7 SSP8 SSP9 SSP8 SSP8 SSP9 SSP8 SSP8 SSP8
Y	General Processor Security	Storage Options Load	
18	Save Copy notebook Paste no	otebook Assign profile Cancel Help	



# **HMC/SE Change Controls (Left)**

Last reset	•	ttempted: uration data se	et (IOCDS):	ZSYSRES A0 03.27.0					
Logical Partition	Active	Defined Capacity	Current Weight	WLM Managed	lnitial Processing Weight	Minimum Processing Weight	Maximum Processing Weight	Initial Capping	Current Capping
0SP1	Yes	0	333		333		666		No
0SP2	Yes	0	333		333	, in the second	666		No
0SP3	No	0	0	$\checkmark$	333	10	400		No
0SP4	Yes	0	333		333	10	400		No
CF01	Yes	0	0		0	0	0		No
CF02	Yes	0	0		0	0	0		No
0SPX	Yes	0	333	V	333	10	500		No
	Yes running t It is rec		at you selec	t 'Dynamic	ally determin	ned by the sy	ıstem.'		
0	ally dete	rmined by the	Ŭ		optimat aso		1000010000		
t	tunning ime	30		nilliseconds					
L	.] Do not	end the times	ice if a part	ition enter	s a wait stat	e			
l									





# HMC/SE Change Controls (Right)

	WLM Managed	Initial Processing Weight	Minimum Processing Weight	Maximum Processing Weight	Initial	Current Capping	Number of Dedicated Central Processors	Number of Non- dedicated Central Processors	Logic
	inanagea	noight	noight	noight	oupping	oupping	1100033013	1100033013	- Circi
		333	, min	666		No	0	4	0SP1
		333	-	666		No	0	4	0SP2
	V	333	10	400		No	0	4	0SP3
		333	10	400		No	0	4	0SP4
		0	0	0		No	1	0	CF01
		0	0	0		No	1	0	CF02
	V	333	10	500		No	0	6	0SPX
elect	'Dynamica risks sub	ally determir optimal use d	10 ned by the sy of processor	stem.'		No	0	6	0SP
00 00	Bennado								
	lliseconds ion enter	s a wait stat	A						



# Intelligent Resource Director

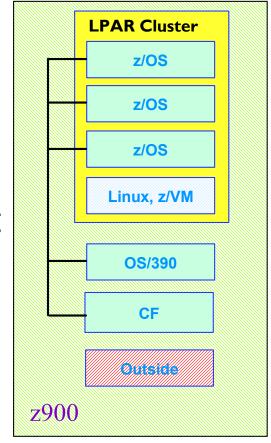
# Leverage platform strengths through integration

- Workload Manager
- Parallel Sysplex
- PR/SM
- Channel Subsystem

# View a cluster of LPs on a zSeries as single pool of computing resource

- Move physical resource to priority workloads in an LPAR cluster
- Extend goal oriented resource management across logical partitions transparently to application subsystems
- Initial resources managed: CPU and I/O
- Requires Parallel Sysplex, WLM Goal Mode, WLM Structure and Level 9 Coupling Facility
- z/OS V1.2 adds z/VM and Linux for zSeries support for LPAR weight management









# **Intelligent Resource Director**

## LPAR CPU Management

## Description

- LPAR Weight Management z/OS, z/VM and Linux for zSeries
  - Dynamically manages a partition's CPU access based on workload demands and goals (z/VM and Linux on shared CPs only)
- Vary Logical CPU Management z/OS Only
  - Optimizes number of logical CPs based on partition's current weight and CPU consumption

## **Benefits**

- Provides flexibility in managing CPU resources across logical partitions in accordance with workload goals.
  - Dynamic change of LPAR weights
  - Manage tradeoffs between meeting service goals for work and making efficient use of a system's resource
  - Prevent or mitigate possible problems
  - Provides the fastest Uniprocessor speed for single tasking workloads
  - Reduces LPAR overhead





## zSeries Image Profile Control Partition Mode Selection

	vation Profiles :						lh.
							Kov
Description	< L	NUX for zSe	ries				KSY
Partition ide	entifier 1		·				KSY KSY
Mode	ESA	200					KSYS:
HOUE	ESA	/390 TPF					KSYS
		ol <mark>ing facility</mark> X Only	•				KSYS
							KSYS
-Clock type	assignment-						KSY
	d time of day	I					KSY
	partition sysp	lex timer of	ffset				KSY
OBartioin	ate in the sys	nlav tast d	atocouroo ar				
	ate in the sys	pien lest ut	atesource gr	Jup			
						• •	
General	Processor	Security	Storage	Options	Load		
ucherut							
ucherut							

eserver



## zSeries Image Profile Control CP Management Cluster

s:	Customize Activ	vation Profiles : F	RSYS					
	lmage optio Minimum ir	ns 1put/output (I	/0) priority	5				RSYS RSYS:R0SP1
	Maximum i	nput/output (	1/0) priority	10				RSYS:R0SP2
	Defined ca	pacity		75				RSYS:R0SP3
	CP manag	ement cluster	name	TESTPLE	 X			RSYS:R0SP4
	or manag			7 1.2011 22				RSYS:R0SP5
			< /					RSYS:R0SP6
		Cluster	me					RSYS:R0SP7
			× ·					RSYS:R0SP8
		Sel Sel						RSYS:R0SP9
								RSYS:R0SPA
		$\checkmark$						RSYS:R0SPB
								RSYS:RCF01
								RSYS:RCF02
								RSYS:RCF03
								RSYS:RCF04
	Comonal	Duesees	Casurity	Changer	Options	Load	••	
	General	Processor	Security	Storage	options	LUau		
	Save Co	py notebook	Paste n	otebook	Assign profile	e Cancel	Help	





## zSeries Image Profile Control LP Assignment - ESA/390 Mode

Customize Activation Profiles : KSYS		
		h
Logical processor assignment     Opedicated central processors		KSYS
		KSYS:CF01
Not dedicated central processors		KSYS:CF02
	ĸ	SYS:0SP1
	I III	KSYS:0SP2
Not dedicated central processor details		
Initial processing weight 333 1 to 999 🗌 Initial capping	-	KSYS:0SP3
Enable WorkLoad Manager	_	KSYS:0SP4
Minimum processing weight 1		KSYS:0SPX
Maximum processing weight 666		
Number of processors - Initial 6 Reserved 4		
Cryptographic coprocessors Cryptographic coprocessor 0 Cryptographic coprocessor 1		
*	H	
•		
General Processor Security Storage Options Load		
Save Copy notebook Paste notebook Assign profile Cancel Help	)	





## zSeries Image Profile Control LP Assignment - Linux Mode

#### Customize Image Profiles: GSYS

ö± –			ñ
		*	l
	Logical processor assignment		
	<ul> <li>Dedicated central processors</li> <li>Dedicated integrated coupling facility processors</li> </ul>		
	<ul> <li>Deurcateu integrateu coupring racitity processors</li> <li>Not dedicated central processors</li> </ul>		
	Not dedicated integrated coupling facility processors		
	O not dedicated integrated coupting facility processors		
	Not dedicated central processor details		
	Initial processing weight 10 1 to 999 🗌 Initial capping		
	Enable WorkLoad Manager		
	Minimum processing weight	∎	
	Maximum processing weight		
	Number of processors - Initial 2 Reserved 0		
	Number of processors - Initial 2 Reserved 0		
	Support A		
		-	
		•	
E	General         Processor         Security         Storage         Options         Load         Crypto         PCI Crypto		Ì
_			
	Save         Copy notebook         Paste notebook         Cancel         Help		

© IBM Corporation, 2002

eserver



## zSeries Change Logical Partition Controls CPU Management

		ttempted: uration data s		ZSYSRES A0 03.27.0					
πραττοάτμ	ut conny	uration uata :		A0 03.27.0					
									1
		LM Contr	ols		Initial	Minimum	Maximum		
Logical		Defined	Current	WLM	Processing	Processing	Processing	Initial	Curr
Partition	Active	Capacity	Weight	Managed	Weight	Weight	Weight	Capping	Сар
0SP1	Yes	0	333		333	-	666		No
OSP1	Yes	0	333		333	·	666		No
0SP3	No	0	0	√	333	10	400		No
DSP4	Yes	0	333		333	10	400		No
CF01	Yes	0	0		0	0	0		No
CF02	Yes	0	0		0	Û	0		No
DSPX	Yes	0	333	V	333	10	500		No
Processor Warning:	It is rec Selectin	ime commended th ng 'Determine crmined by the	d by the use						
) Determi	-	0	9						
F	tunning	30	-	. 1861					
	ime Tino not	end the times		villiseconds					
		end the one:	ucen a pan	ioon enter	a wan aran	18			



## zSeries Change Logical Partition Controls CPU Management

	A0 03.27.0								
ent Iht	WLM Managed	Initial Processing Weight	Minimum Processing Weight	VLM Info Maximum Processing Weight	Initial	Current Capping	Number of Dedicated Central Processors	Number of Non- dedicated Central Processors	Logical Partition
		333	,im	666		No	0	4	0SP1
		333		666		No	0	4	0SP2
	$\checkmark$	333	10	400		No	0	4	0SP3
		333	10	400		No	0	4	0SP4
		0	0	Û		No	1	0	CF01
		0	0	0		No	1	0	CF02
	$\checkmark$	333	10	500		No	0	6	0SPX
	⊻ ✓	0 333 ally determin	θ	0 500 stem.'		No	1 0	0	С
illiseconds		s a wait stat	8						
art									



eserver



# **Intelligent Resource Director**

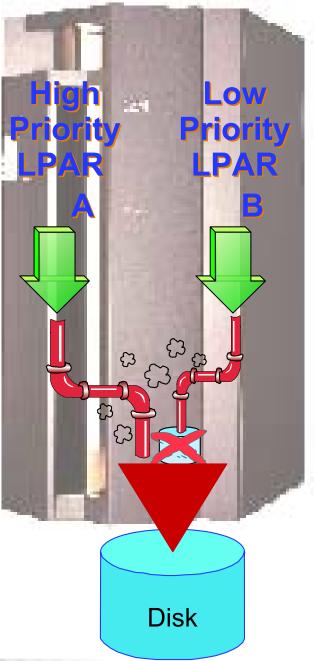
## Channel Subsystem Priority Queuing

## **Description**

- I/O Priority Queuing prioritizes I/O within an LPAR across workloads
  - Available since OS/390 V1.3
- Channel Subsystem Priority Queuing prioritizes I/O within an LPAR cluster
  - -LPAR priorities based on workload goals
  - Exclusive to zSeries
- z/VM and Linux for zSeries static only

### **Benefits**

- Allows better channel resource management with EMIF
  - Low priority work will not preempt high priority work from other LPARs







## zSeries Reset Profile Control CSS I/O Priority Queuing

<ul> <li>✓ Enable global input/output (I/O) priority queuing</li> <li>✓ Enable global input/output (I/O) priority queuing</li> <li>✓ Automatic input/output (I/O) interface reset</li> <li>System recovery time         <ul> <li>Limit system recovery time</li> <li>Limit system recovery time</li> <li>Time limit 1 to 999 seconds</li> </ul> </li> <li>Processor running time</li> </ul>	Customize Activation Profiles : KSYS					
General Storage Dynamic Options CP/SAP Partitions	<ul> <li>✓ Automatic input/output (I/ System recovery time         <ul> <li>Limit system recovery tim</li> <li>Limit system recovery tim</li> <li>Time limit 1 to</li> </ul> </li> <li>Processor running time         <ul> <li>Warning: Selecting 'Determ suboptimal use of processo</li> <li>Dynamically determined I</li> <li>Determined by the user</li> <li>Running time 30 1</li> </ul> </li> </ul>	t (I/O) priority queu O) interface reset ne 999 seconds hined by the user' ri r resources. by the system through 100 millise if a partition enters	isks			
	General Storage Dy	namic Options	CP/SAP	Partitions	1	



eserver



## zSeries System-wide Control CSS I/O Priority Queuing

- KHMC: Hardware Management Console Workplace (Version 1.7.3)		
Views		Operational stomization
Groups Exceptions Active Console Task Books Tasks Actions List	lardware lessages Operating	Configure Channel Path Channel Path On/Off Con/Off
	System Jessages	Channel Path
Defined CPCs Work Area	Customize/Delete	OSA Advanced     Facilities
Image: Construction of the second	tomize Activitu	ତ Enable I/O 미국 Priority Queuing
Enable	omatic ivation	Change LPAR I/O
Disable Disable Disable <u>OK R</u> eset Cancel Help	eduled rations	🕜 Help
<u>OK</u> <u>R</u> eset Cancel Help	tomize port Element Date/Time	
	Change LPAR	
	•	
Ise CPC Operational Customization tasks to customize CPC operational characteristics.		<u> </u>





## zSeries Image Profile Control CSS I/O Priority Queuing

22	Customize Activation Profiles : RSYS	
	Image options	RSYS
	Minimum input/output (1/0) priority 5	RSYS:R0SP1
	Maximum input/output (I/O) priority 10	RSYS:R0SP
	Defined capacity 75	RSYS:R0SP
S	CP management cluster name TESTPLEX	RSYS:R05F
		RSYS:R0S
ange		RSYS:R0S
		RSYS:R0S
- 48		RSYS:R0S
- 18		RSYS:R0S
		RSYS:R0S
		RSYS:R0S
		RSYS:RCF
	General Processor Security Storage Options Load	• •
	General Processor Security Storage Options Load	
	Save Copy notebook Paste notebook Assign profile Cancel	Help





## zSeries Change Logical Partition CSS I/O Priority Queuing

DwD Change Logical Pa	artition Input/Output (I/O) Priority (	Queuing		
Input/output co	nfiguration data set (IOCDS)	: A1		
	tput (I/0) priority queuing: i input/output (I/0) priority (	Enable queuing value: 15	d	
Logical Partition	Active	Minimum input/output (I/O) priority	Maximum input/output (I/0) priority	
R0SP1	Yes	07 🔀	13 🔀	
R0SP2	Yes	07 🍾	13 🔀 🧹	Priority Range
R0SP3	Yes	00 🖍	00 🖍	
R0SP4	Yes	00 🖍	00 🖍	
R0SP5	Yes	00 🖍	00 🖍	
R0SP6	No	07 🖍	13 🔨	
R0SP7	No	00 🖍	00 🔀	
R0SP8	No	00 🖍	00 🖍	
R0SP9	Yes	15 🖍	15 🔨 🧹	<b>Static Priority</b>
ROSPA	Yes	00 🖍	00 🖍	
R0SPB	Yes	00 🖍	00 🖍	
RCF01	Yes	00 🖍	00 🖍	
RCF02	Yes	00 🖍	00 🖍	
RCF03	Yes	00 🖍	00 🖍	
		00 -	00 -	
Save to profiles	Change running system	Save and change	<u>R</u> eset Cancel	Help





# **Intelligent Resource Director**

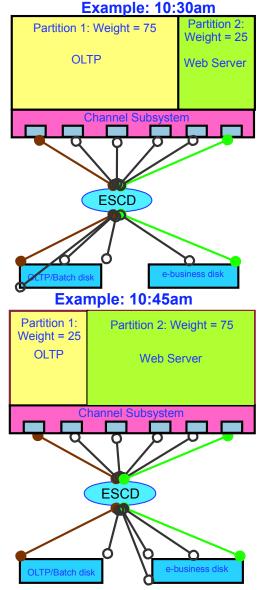
## **Dynamic Channel Path Management**

## **Description**

- Allows the system to dynamically manage channel paths in response to changing workload demands
- Moves channel capacity (bandwidth) to the disk subsystem(s) experiencing need based on workload requirements
- Optimized with Channel Subsystem Priority Queuing
- Exclusive to zSeries and z/OS

### **Benefits**

- More efficient use of hardware resource
- Reduces channel requirements
- Simplifies I/O configuration planning and definition
- Dynamically balances I/O connectivity based on workload demand







# I/O Definition for DCM

### **Rules for managed channels:**

- zSeries CEC only
- DCM supports ESCON (CNC) and FICON Conversion (FCV)
- ESCON Director attachment is required
- Specify the I/O cluster name to "own and operate"
- Do NOT specify a candidate list, candidates are IOCLUSTER members
- Do NOT specify as a PATH for any Control unit

### **Rules for CUs to accept managed paths:**

- Specify some shared, "static" paths, these will be the only paths at IPL
- Specify placeholder asterisks for managed paths

## **Examples (IOCP output from HCD)**

- Managed ESCON channel 40 attached to ESCON director 1B: CHAN40 CHPID PATH=40, TYPE=CNC, SWITCH=1B, OS=01, IOCLUSTER=TESTPLEX
- Control unit 1234 with two static, two managed paths:
  - CU1234 CNTLUNIT CUNUMBR=1234, UNIT=2105, ..... PATH=(20,30,\*\*,\*\*), LINK=(C0,C0,\*\*,\*\*)



# **HiperSockets -** The Network in the Box

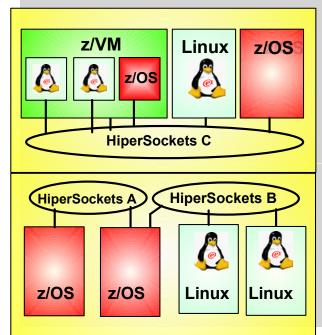
### IP networking among virtual servers in a zSeries

- Up to four HiperSockets IQD channels "internal LANs" accessible by all partitions
- LAN frame size configurable 16K, 24K, 40K, 64K
- Up to 1,024 TCP/IP stacks across all four HiperSockets
- iQDIO data transfer (similar to cross-address-space memory move) using memory bus does not use CP cache = minimal performance impact
- Each partition configures its own usage as it would another type of IP network.

### Prerequisites

- z/OS 1.2 & up or z/OS.e (z800 only)
- z/VM 4.2
- Linux kernel 2.4 (64- and 31-bit)
- z900 (Driver 3C or 3G) or z800

z900 or z800

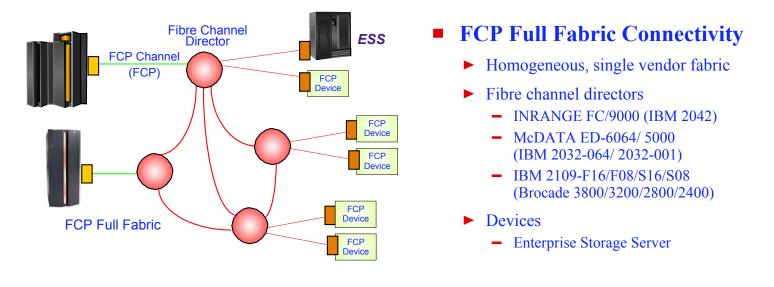


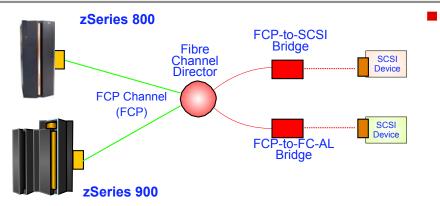




## zSeries FCP for Linux Limited Availability

Initially, FCP support with limited availability





#### FCP to SCSI Bridge

- ► FCP-to-SCSI Bridges (via switch)
  - IBM 2108-G07 SAN Data Gateway
- ► FCP-to-FC-AL bridge (via switch)
  - McDATA ES-1000 Loop Switch (IBM ES-2031-L00)

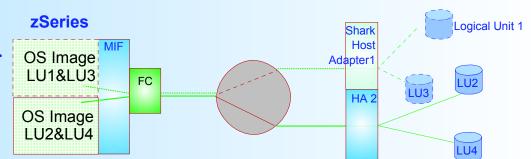
Initially, no direct attachment to device or bridge





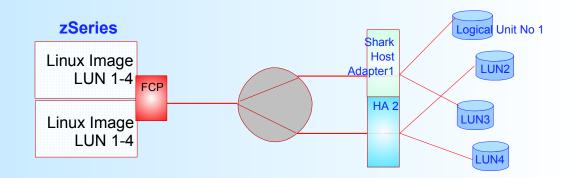
# **FCP and MIF Channel Sharing**

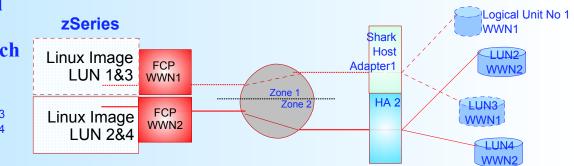
 MIF can ensure data integrity and security when FICON or ESCON channels are shared if device candidate lists (DCLs) are used.



- MIF cannot ensure data integrity and security when FCP channels are shared -FCP/SCSI does not allow.
- All Linux images can define and access all LUNs
- One image at a time, first-come, first-served.
- Data integrity for Linux and FCP requires the use of separate FCP channels, switch zoning, and LUN masking

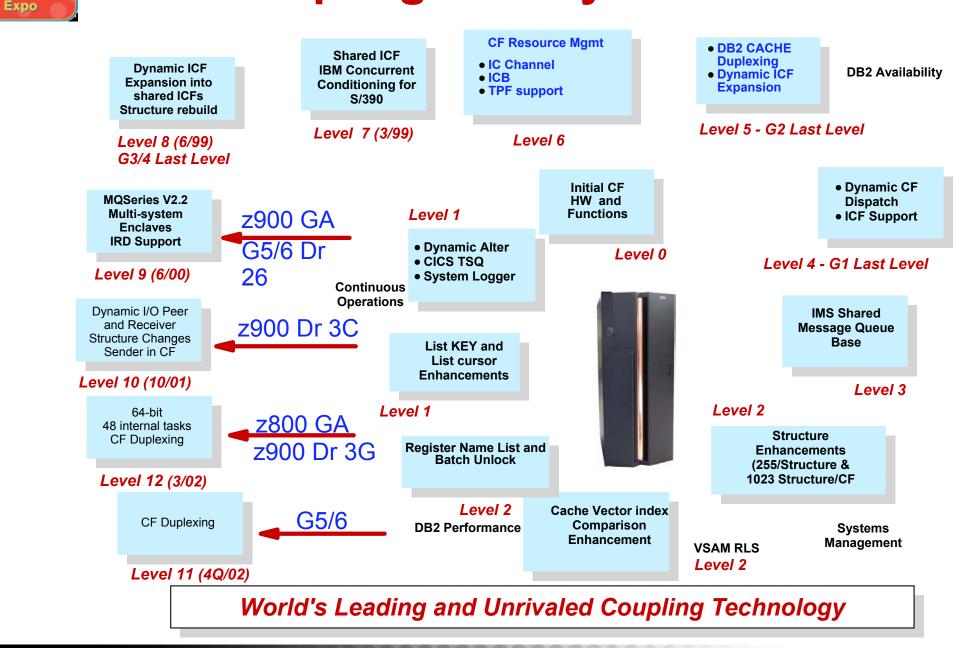
WWN1 = World Wide Port Name 1 = LUN1 and LUN3 WWN2 = World Wide Port Name 2 = LUN2 and LUN4







# **IBM Coupling Facility Control Code**

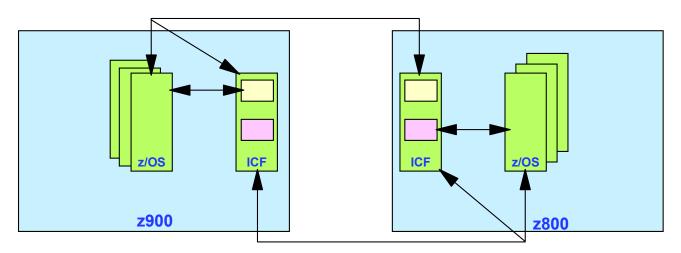




z/0S



## System Managed CF Structure Duplexing



Robust, standard recovery capability

- Ease of use for middleware and ISVs
- Eliminates rebuild delay
- Reduces need for standalone CF

#### Considerations

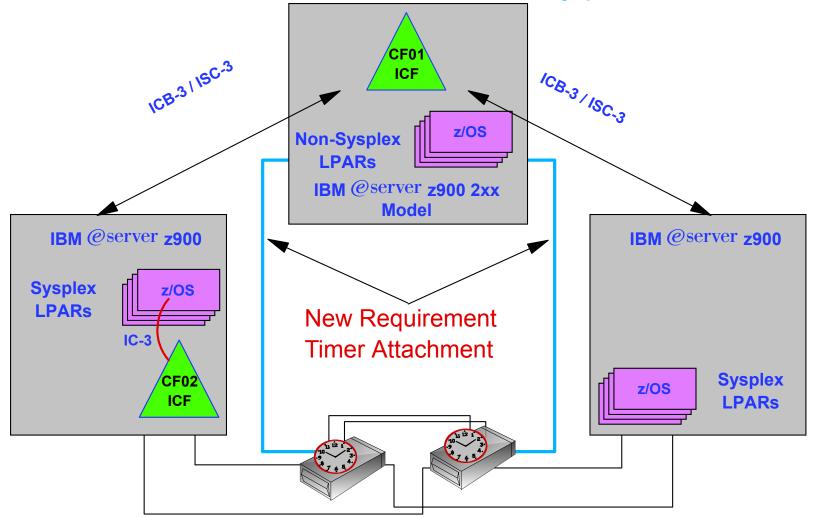
- Not all structures supported
- Overhead to duplex
- Storage required to duplex
- See Announcement 102-181 (06/02)

- Requirements:
  - Sysplex Images -
    - -z/OS v1.2 & up
  - -APAR OW41617
  - Coupling Facilities -
    - -ICF or standalone
    - -zSeries with CFCC Level 12
    - -S/390 G5/6 with CFCC Level 11
    - -CF CF link connectivity





z900 New 2xx Model with ICF and non-Parallel Sysplex LPARS



#### Required z/OS and OS/390 New Function APAR - OW53831



IBM z/OS and OS/390 Expo, 2002



## LPAR Support for CUoD and CBU zSeries and G5/6

#### **Nondisruptive CIU/CBU/MES Upgrade**

- Add physical CPs to shared CP Pool
- Add physical ICFs to shared ICF Pool (Not supported for CBU))
- Added physical engines become available and visible (STSI and event)

#### LP Profile: Initial and Reserved Processors (G5/6 Dr 26 6/2000)

- Support for ESA/390, LINUX (CP or IFL), and CF (ICF and/or CP)
- Initial On at Activation
- Reserved Can be configured on if resource is available
- Initial + Reserved can equal maximum engines possible for the MCM

#### Nondisruptive CBU CP Downgrade (z900 Dr 3C and z800)

#### LP Activation and Processor Config Rules

- Can't activate LP with more initial shared logicals than shared pool contains.
- Can't activate LP with initial dedicated logicals if physicals taken from shared pool would "starve" an active LP with shared logicals.
- z900 nondisruptive CBU CP downgrade takes CPs ONLY from the shared CP pool, will not take the last CP.





# **Initial and Reserved CP Support**

-Logical processor assignment		
O Dedicated central processors		KSYS
•		KSYS:CF01
Not dedicated central processors		KSYS:CF02
		KSYS:0SP1
		KSYS:0SP2
Not dedicated central processor details		KSYS:0SP3
Initial processing weight 333 1 to 999 Initial capping		
Enable WorkLoad Manager		KSYS:0SP4
Minimum processing weight 1	≣	KSYS:0SPX
Maximum processing weight 666		
Number of processors – Initial 6 🔀 Reserved 4 🔀	Reserved	
ryptographic coprocessors Cryptographic coprocessor 0		Ps
Cryptographic coprocessor 1		
Cryptographic coprocessor 1	• •	
	•	



© IBM Corporation, 2002



# **zSeries Storage Granularity**

### zSeries and G5/6 (Dr 22e and later)

- Single Storage Pool All central storage
- ES configured as needed from CS No POR needed

### **Earlier Machines**

• POR required to change CS/ES split

### Granularity

- Note: LPAR Mode ONLY, 1 MB in BASIC mode for HSA
- Was 1 MB prior to G3 Dr 88 for LPAR, too

Total Storage G5/6 or zSeries	Granularity CS & ES
5 - 8 GB	16 MB
10 - 16 GB	32 MB
18 - 32 GB	64 MB
40 - 64 GB	128 MB







C

S

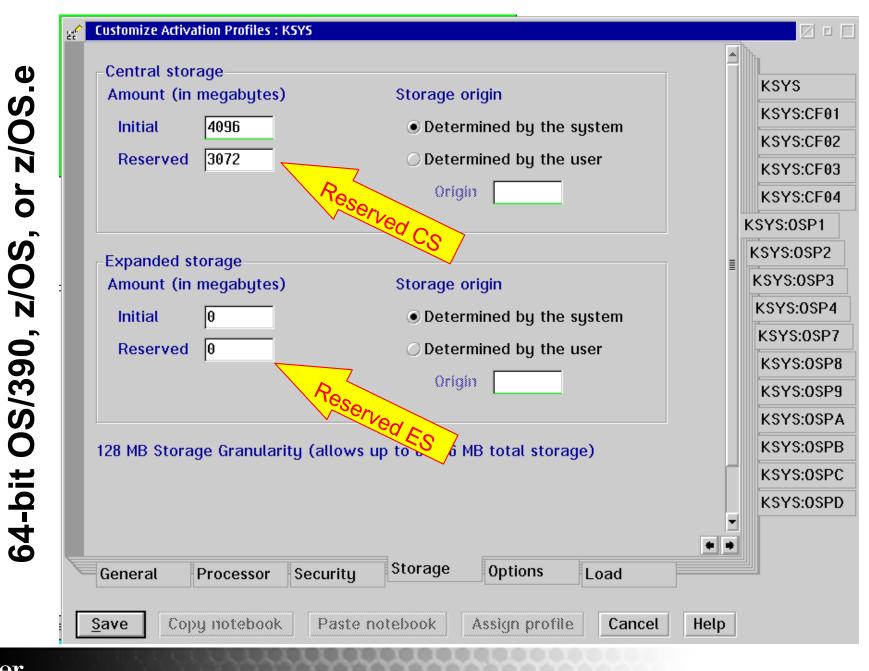
N

**D** 

64-bit OS/390

# **Initial and Reserved Storage**

Supported by z/Architecture CFCC zSeries Expanded Storag Not used



eserver



# **z900 Concurrent Memory Upgrade**

#### **Memory Card Size and Number**

### Concurrent Memory Upgrade

- LIC CC memory activation
- From current size to any size supported by cards installed (card change is disruptive)
- Add to partition using DSR/2 (MVS only) - Central or Expanded

### Prerequisites

- z900 Server, LPAR mode
- Must have spare memory capacity on installed cards, otherwise disruptive
- Must predefine additional memory to partition as "Reserved Storage"

### Note: No CBU for memory

Storage	Models 100-109	Models 110-116 210-216	Models 1C1-1C9 2C1-2C9		
5 6 7 8	4 GB x 2	Not Offered	Not Offered		
10 12 14 16	8 GB x 2	4 GB x 4	4 GB x 4		
18 20 24 28 32	16 GB x 2	8 GB x 4	8 GB x 4		
40 48 56 64	Not Offered	16 GB x 4	16 GB x 4		





# **MVS RSU Parameter**

In IEASYSxx. Specifies the number of central storage increments to be made available for central storage reconfiguration

MVS attempts to keep this area free of long term fixed pages

## RSU = CS amount to be reconfigured storage increment size

**Or: Storage to be kept free = RSU \* increment** 

• If memory is upgraded, check the RSU parameter!

## OS/390 V2.10 and z/OS - Better RSU Options

All OFFLINE storage (Reserved Storage)

• An amount (%, MB or GB) - System calculates increments

