



Session G24

LPAR Advanced Topics

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Miami, FL



IBM eServer™

LPAR Advanced Topics

ON DEMAND BUSINESS™

zSeries Expo Session G24
November, 2004
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LPAR Advanced Topics

- Introduction to IBM eServer™ zSeries® 890 and 990 (z890 and z990)
 - Logical Channel Subsystems
 - HCD Definition
 - LPAR Enhancements – More than 16 logical processors, zAAPs, etc.
- z990 Activation Profile Changes
- Changing Running Partitions
- Memory Addressability, Configuration and Reconfiguration
 - Concurrent Memory Upgrades
 - Dynamic Storage Reconfiguration
 - HSA Size and Estimation Tool
- References: <https://www.ibm.com/servers/resource link>
 - **zSeries 890 and 990 PR/SM Planning**, SB10-7036-03 (October, 2004)
 - **zSeries (z800, z900) PR/SM Planning**, SB10-7033-06a (August, 2004)

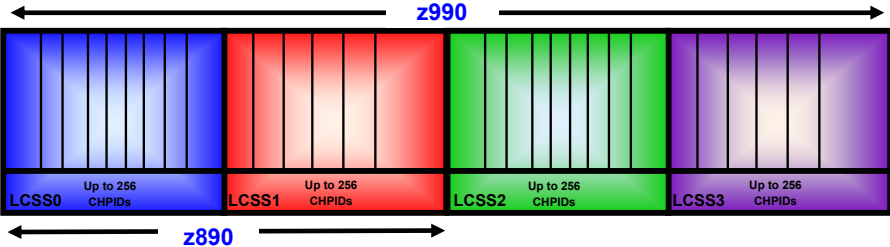
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Introduction to z890 and z990


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z990 and z890 Logical Channel SubSystems (LCSSes)



- Up to four Logical Channel SubSystems (LCSSs) z990, two LCSSes on z890
 - ▶ Up to 15 LPARs per LCSS
 - ▶ Up to 256 channels per LCSS
- Multiple LCSSes Enable
 - ▶ Up to 30 Logical Partitions per CEC (Even with three or four LCSSes on z990)
 - ▶ Up to 1024 external channels on z990, Up to 421 external channels on z890
- An LPAR can access channels ONLY in its assigned LCSS
- Some channels may be assigned to multiple LCSSes - **"Spanned Channels"**
 - ▶ ICP, IQD, FC, FCP, OSE, OSD, OSC, CBP, CBS, CFP, CFS
 - ▶ But not ESCON, FICON Conversion, Coupling Receiver (CBR, CFR)

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Multiple LCSSes and External Spanned Channels

- CHPID 04 Spanned Internal HiperSockets (IQD) or Internal Coupling Link (ICP)
- CHPID 06 Spanned external channel (FICON, OSA, or External Coupling Link) – New Supported: FC, FCP, OSE, OSD, OSC, CBP, CBS, CFP, CFS
Not supported: ESCON, FICON Conversion, Coupling Receiver (CBR, CFR)

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Dynamic LPAR Name (Reserved LPAR) z890 and z990 (z990 at GA3 – May, 2004 level)

```

Partition List
-----
C  CBDDPPAF0                               Row 1 of 8
S  Command ==>                               Scroll ==> PAGE
P  Select one or more partitions, then press Enter. To add, use F11.


Processor ID . . . . : P20846A3
Configuration mode . : LPAR
Channel Subsystem ID : 2

/ Partition Name  Number Usage + Description
- - - - -
P  CF21           A    CF/OS  Coupling facility
- - - - -
P  TC4T21         1    OS    Production A
- - - - -
P  TC4T22         2    OS    Production B
- - - - -
P  TC4T23         3    OS    Development
- - - - -
P  TC4T24         4    OS    Test
- - - - -
P  *             5    OS    Reserved partition 1
- - - - -
P  *             6    OS    Reserved partition 2
- - - - -
P  *             7    OS    Reserved partition 3
- - - - -
***** Bottom of data *****

```







- A dynamic partition must be reserved in the IOCDs used for POR.
- A reserved partition is defined with partition name placeholder '*'.
- It has a MIF ID (partition number) and a usage type assigned. It may contain a description.
- Reserved partitions can not be assigned to access or candidate lists of channel paths or devices.
- z/OS 1.6 dynamic I/O can name a reserved LPAR or change a named LPAR to '*'.

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HCD – Definition Sequence without Migration

(Reference: z/OS 1.4 HCD even for lower releases!)

- Define processor 
 - ▶ Define channel subsystems 
 - Define partitions 
 - Define channel paths 
- Define control units 
- Define devices 

- Only LPAR mode allowed
- Number of channel subsystems


- CSS id (0-3), description, MAXDEV


- Partition names may not be duplicated across CSSs
- Partition number = MIF image id in range of 1-F, unique within LCSS

- CHPIDs unique only within a LCSS
- Spanned channels - access and candidate lists are by LCSS and partition
- Physical channel id must be specified to map logical CHPID to physical hardware

- CHPID.link combinations must be specified for each LCSS





- Channel subsystem data - preferred path and candidate lists must be specified for each LCSS

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HCD – Definition Sequence with Migration

(Reference: z/OS 1.4 HCD even for lower releases!)


- Define z890 processor 
 - ▶ Define channel subsystems 
- Modify existing Definitions (if needed) 
 - Migrate into z890 definition 
- Migrate other definitions as needed

- Only LPAR mode allowed
- Number of channel subsystems

- CSS id (0-1), description, MAXDEV

- Delete or change unsupported channel types
Example: Parallel channels from existing z900

- Select target processor
- Specify target LCSS
- Resolve duplicate partition names

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z890 and z990 LPAR Enhancements

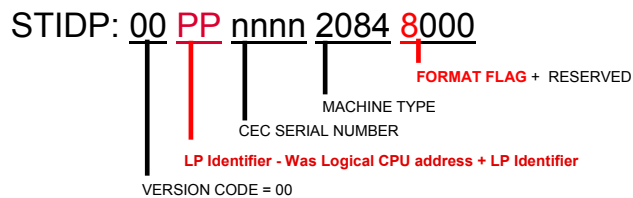
- Up to 32 physical processors can be managed
 - **z990 PR/SM** – Up to 32 logical processors per partition (z990 GA3 – May, 2004)
 - **z/OS 1.6 and z/VM 5.1** – Both allow up to 24.
 - Caution – Don't exceed 16 for older releases
- New zSeries Application Assist Processors (z890 and z990 - 3Q 2004)
 - Java processing under z/OS 1.6 only (3Q 2004)
- New Reserved LPAR Definition (z890 and z990 - 3Q 2004)
 - Dynamic Name/Rename z/OS 1.6 only (3Q 2004)
- z990/z890 Implementation = massive **internal** changes to PR/SM
 - Awareness of z990 book structure
 - Efficient resource allocation to logical partitions at activation
 - Efficient dispatching decisions
 - Logical Channel Subsystems and up to 30 partitions
 - Large storage / large concurrent memory upgrade
 - Partition virtualization of storage increment size for memory allocation and reconfiguration
 - Massive increase in available central memory addressability
- Limited but important **external** change
 - **"Partition Identifier"** now two hex digits
 - Change to Store CPU ID (STIDP) instruction

zSeries Partition ID, MIF ID, and Partition Number

	Partition Identifier	MIF ID	Partition (Zone) Number
Defined	By systems programmer in the LPAR image profile on HMC	By systems programmer: HCD "Partition Number" IOCP RESOURCE statement	z800/z900 = MIF ID else assigned at POR by PR/SM z890/z990 assigned at POR by PR/SM
Range (Hex)	z800/z900 - 0-F z890/z990 - 00-3F	1-F	z800/z900 - 1 to F z890/z990 - 1 to 1E
Size	z800/z900 - 4 bits z890/z990 - 8 bits	4 bits	4 bits z800/z900 8 bits z890/z990
Usage	Messages, Store CPUID, PGID z890/z990: CFRM Policy to identify a CF LPAR	MIF Channel Sharing z800/z900: CFRM policy to identify a CF LPAR	Internal usage, not externalized.
Aliases	LP ID, User logical Partition ID (UPID)	Image ID (IID), EMIF ID	None
Notes	Unique on the CEC. LPAR deactivate/activate to change.	z800/z900: Unique on CEC z890/z990: Unique in LCSS POR to change.	Unique on the CEC.

Note: z990 compatibility support for the OSEs is required to support changes to Partition Identifier "Size" and "Usage" running on z990 or z890 and often on other images in a Sysplex with an OS image on z990. ICKDSF R17 is required on any image sharing disk with an OS on z990 for the same reasons, especially the path group ID (PGID) change.

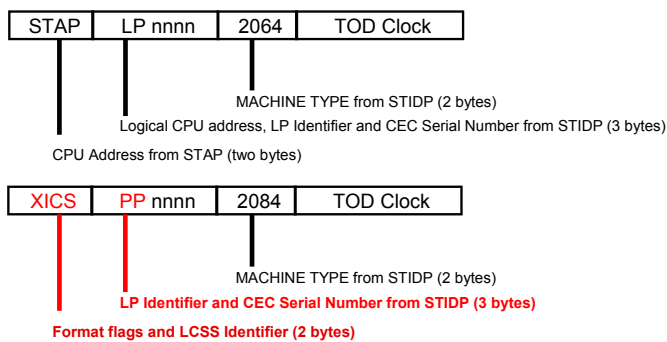
New z990 STIDP Result Format



Programs that use this must change

- PGID (OS/390®, VM/ESA®, VSE/ESA™, Linux/390, ICKDSF)
- XES and CFRM (CF identification)
- RMF™
- ISV software (should use STSI instruction, not STIDP)

Path Group Identifier (PGID) Before z990 and New Format



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z990 Activation Profile Changes

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z990 - Reset Profile - General (CEC OSYS)

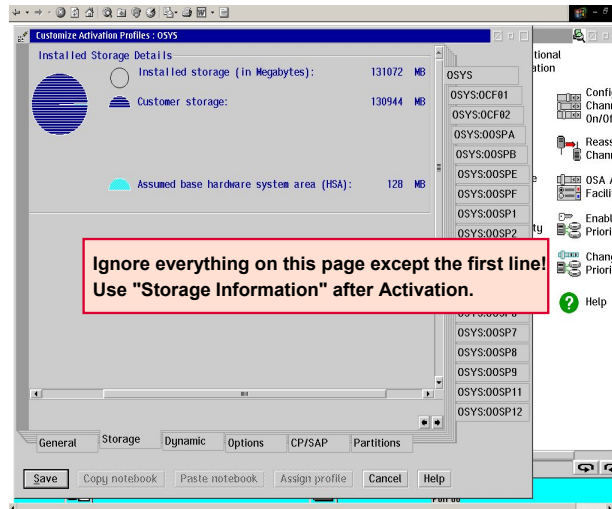
Data Set	Type	Allow Dynamic I/O	Partitions
A0 07.24.03	Partition	Yes	OCF01 OCF02
A1 07.14.03	Partition	Yes	OCF01 OCF02
A2 07.18.03	Partition	Yes	OCF01 OCF02
A3 07.23.03	Partition	Yes	OCF01 OCF02
D8 DIAGNOSE	Partition	No	008LP01 008LP02

Logical partition is the only mode supported, basic mode is not available (HCD also provides only the LPAR mode option)

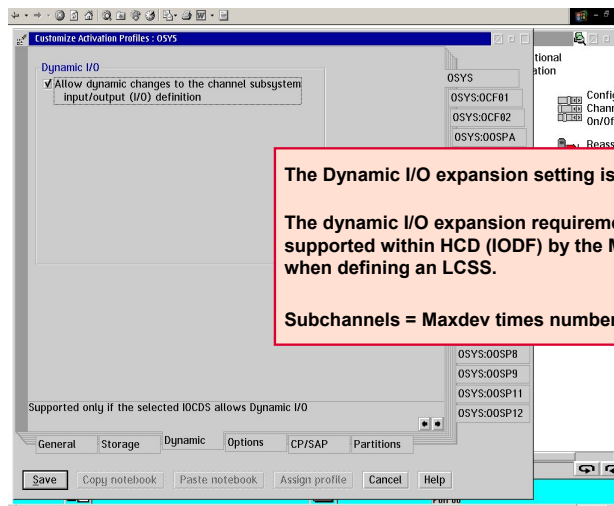
Logical Partition 'Suffix' Naming Convention
LPNameXX
 where LPname is the first 6 characters of the customer required name
 where xx = LPname suffix
 1st character = LCSSid (0 = LCSS.0, 1 = LCSS.1)
 2nd character = same as MIFid of 1 to F

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z990 - Reset Profile - Storage



z990 Reset Profile - Dynamic



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z990 Reset Profile - Options

Customize Activation Profiles : OSYS

Enable global input/output (I/O) priority queuing

Automatic input/output (I/O) interface reset

System recovery time

Limit system recovery time

Time limit: 1 to 999 seconds

Processor running time

Warning: Selecting 'Determined by the user' risks suboptimal use of processor resources.

Dynamically determined by the system

Determined by the user

Running time: 1 through 100 milliseconds

Do not end the timeslice if a partition enters a wait state

OSYS
OSYS:OCF01
OSYS:OCF02
OSYS:00SPA
OSYS:00SPB
OSYS:00SPE
OSYS:00SPF
OSYS:00SP1
OSYS:00SP2
OSYS:00SP3
OSYS:00SP4
OSYS:00SP5
OSYS:00SP6
OSYS:00SP7
OSYS:00SP8
OSYS:00SP9
OSYS:00SP11
OSYS:00SP12

General Storage Dynamic Options CP/SAP Partitions

Save Copy notebook Paste notebook Assign profile Cancel Help

No change

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z990 Reset Profile - CP/SAP

Customize Activation Profiles : OSYS

Select a CP/SAP assignment.

CPs	SAPs
15	4
14	5
13	6
12	7
11	8
10	9

OSYS
OSYS:OCF01
OSYS:OCF02
OSYS:00SPA
OSYS:00SPB
OSYS:00SPE
OSYS:00SPF
OSYS:00SP1
OSYS:00SP2
OSYS:00SP3
OSYS:00SP4
OSYS:00SP5
OSYS:00SP6
OSYS:00SP7

Integrated facility for Applications (IFAs): 1


General Storage Dynamic Options CP/SAP Partitions

Save Copy notebook Paste notebook Assign profile Cancel Help

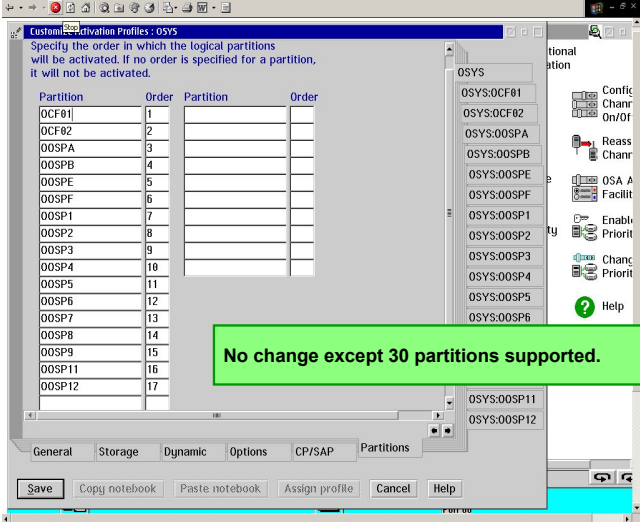
Allows the customer to use purchased CPs as SAPs. Uncommon to use. Test?
Change: Number of zAAPs (IFAs) shown.

When using this option, the z990 model capacity indicator (3nn) does not change. The purchased characterization of the PU (a CP) remains the same.


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z990 Reset Profile - Partitions

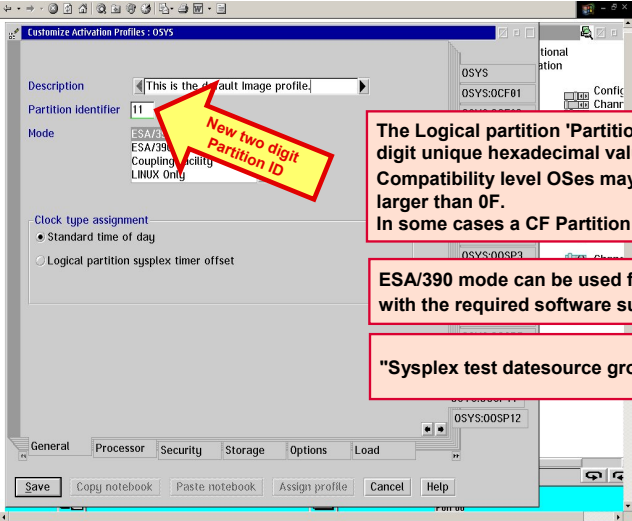


Partition	Order	Partition	Order
OCF01	1		
OCF02	2		
OOSP1	3		
OOSP2	4		
OOSP3	5		
OOSP4	6		
OOSP5	7		
OOSP6	8		
OOSP7	9		
OOSP8	10		
OOSP9	11		
OOSP10	12		
OOSP11	13		
OOSP12	14		
OOSP13	15		
OOSP14	16		
OOSP15	17		
OOSP16	18		
OOSP17	19		
OOSP18	20		
OOSP19	21		
OOSP20	22		
OOSP21	23		
OOSP22	24		
OOSP23	25		
OOSP24	26		
OOSP25	27		
OOSP26	28		
OOSP27	29		
OOSP28	30		

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z990 Image Profile - General (Partition OOSP11)




New two digit Partition ID

The Logical partition 'Partition Identifier' is a 1 or 2 digit unique hexadecimal value from 0 to 3F. Compatibility level OSeS may not support a Partition ID larger than 0F. In some cases a CF Partition ID cannot exceed 0F.

ESA/390 mode can be used for OS/390® z/OS® - z/VM® with the required software support for the z990

"Sysplex test datesource group" time removed.

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z990 LPAR – More than 16 Processors in an LPAR ESA/390 Mode – CPs and zAAPs

z990 allows up to 32 processors total. That is, the sum of Initial and Reserved processors of all types (e.g. CPs plus zAAPs) up to 32.

Up to 32 is valid even on an A08 or B16 because of concurrent book add support.

Announced OS support for more than 16: z/OS 1.6 and z/VM 5.1 – Both up to 24. (SOD for more. Watch this space!)

Cryptographic Coprocessor Selection removed. Cryptographic controls now in "PCI Crypto" page

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z990/890 - zAAP Characteristics

- z990 zAAP feature code 0520 characterizes one PU as a zAAP
- z890 zAAP feature code 6520 characterizes one PU as a zAAP
 - ▶ One zAAP feature may be ordered for each CP and Unassigned CP feature ordered
 - ▶ zAAPs do not affect the overall MSU rating of a CEC or an LPAR
- Supporting level of z/OS and JVM (planned)
 - ▶ z/OS 1.6 and later
 - ▶ JVM 1.4.1 - SDK 1.4.1 and later (SOD: to be 64-bit with the release of z/OS 1.6)
- IBM, Vendor and Customer Java can exploit zAAPs if running on a supporting level of z/OS AND JVM.
 - ▶ This includes:
 - WebSphere Application Server 5.1
 - CICS®/TS 2.3
 - DB2 V8
 - IMS™ V8
 - WebSphere WBI for z/OS
 - ▶ Execution of Java on traditional CPs only, zAAPs only, or both is controlled by a z/OS system parameter when zAAPs are present in the LPAR

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"LINUX ONLY" Mode – CPs or IFLs

z990 GA3 and z890:
Linux Mode LPAR processors now CPs or "IFLs" (was CPs or "ICFs")

IFLs, ICFs and zAAPs are still in a common pool for weight/share calculations for shared processors.

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z990 Image Profile - Security

Enable Dynamic I/O

No change

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z990 Image Profile - Storage

Central storage : Hardware supports up to 128 GB
 Central Storage (Initial + Reserved)
 Check OS level for supported amounts.

Only MVS (OS/390 or z/OS) supports Reserved.
 Reserved: for DSR or storage added by CUoD

Expanded Storage: Some OSs do not support. One example is z/OS (64-bit) running on a z990.
 z/VM and Linux 64- or 31-bit do support.

Only MVS (OS/390 or z/OS) supports Reserved.
 Reserved: for DSR or storage added by CUoD

Storage origin (Central and Expanded storage)
 It is recommended that you use the
 'Determined by the system' option

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z990 Image Profile - Options

No change

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z990 Image Profile - Load

Customize Activation Profiles : OSYS

Load during activation

Load address: 0000 Use dynamically changed

Load parameter: 300 Use dynamically changed

Time-out value: 60 to 600 seconds

No change

OSYS: OSYS:OCF01, OSYS:OCF02, OSYS:00SPA, OSYS:00SPB, OSYS:00SPE, OSYS:00SPF, OSYS:00SP1, OSYS:00SP2, OSYS:00SP3, OSYS:00SP4, OSYS:00SP5, OSYS:00SP6, OSYS:00SP7, OSYS:00SP8, OSYS:00SP9, OSYS:00SP11, OSYS:00SP12

General Processor Security Storage Options **Load**

Save Copy notebook Paste notebook Assign profile Cancel Help

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z990 Image Profile - PCI Crypto for PCICA and PCIXCC

Customize Activation Profiles : OSYS

Control domain index: 00, 01, 02, 03, 04, 05

Usage domain index: 00, 01, 02, 03, 04, 05

PCI Cryptographic Candidate List: 00, 01, 02, 03, 04, 05

PCI Cryptographic Online List: 00, 01, 02, 03, 04, 05

Attention: You must install the 'IBM CP Assist for Cryptographic Functions' (CPACF) feature if a PCI Cryptographic Candidate is selected from the list box; otherwise, some functions of Integrated Cryptographic Service Facility (ICSF) may fail.


OSYS: OSYS:00SPC, OSYS:00SPD, OSYS:00SPA, OSYS:00SPB, OSYS:00SPE, OSYS:00SPF, OSYS:00SP1, OSYS:00SP2, OSYS:00SP3, OSYS:00SP4, OSYS:00SP5, OSYS:00SP6, OSYS:00SP7, OSYS:00SP8, OSYS:00SP9

Processor Security Storage Options Load **PCI Crypto**


Save Copy notebook Paste notebook Assign profile Cancel Help


Single Page Crypto Control

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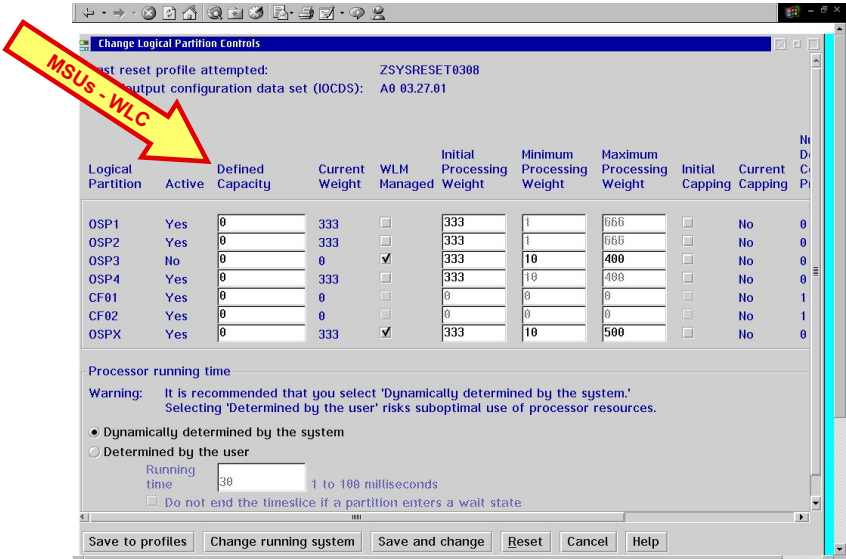
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Changing Running Partitions

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HMC/SE Change LPAR Controls (Left)



Change Logical Partition Controls

Most recent reset profile attempted: ZSYSRESET0308
 Output configuration data set (IOCDS): A0 03.27.01


Logical Partition	Active	Defined Capacity	Current Weight	WLM Managed	Initial Processing Weight	Minimum Processing Weight	Maximum Processing Weight	Initial Capping	Current Capping	N D C Pi
OSP1	Yes	0	333	<input type="checkbox"/>	333	1	666	<input type="checkbox"/>	No	0
OSP2	Yes	0	333	<input type="checkbox"/>	333	1	666	<input type="checkbox"/>	No	0
OSP3	No	0	0	<input checked="" type="checkbox"/>	333	10	400	<input type="checkbox"/>	No	0
OSP4	Yes	0	333	<input type="checkbox"/>	333	10	400	<input type="checkbox"/>	No	0
CF01	Yes	0	0	<input type="checkbox"/>	0	0	0	<input type="checkbox"/>	No	1
CF02	Yes	0	0	<input type="checkbox"/>	0	0	0	<input type="checkbox"/>	No	1
OSPX	Yes	0	333	<input checked="" type="checkbox"/>	333	10	500	<input type="checkbox"/>	No	0

Processor running time

Warning: It is recommended that you select 'Dynamically determined by the system.'
 Selecting 'Determined by the user' risks suboptimal use of processor resources.

- Dynamically determined by the system
- Determined by the user
 - Running time: 30 1 to 100 milliseconds
 - Do not end the timeslice if a partition enters a wait state

Save to profiles Change running system Save and change Reset Cancel Help

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HMC/SE LPAR Change Controls (Right)

Logical Partition	WLM Managed	Initial Processing Weight	Minimum Processing Weight	Maximum Processing Weight	Initial Capping	Current Capping	Number of Non-dedicated Central Processors	Number of Non-dedicated Integrated Coupling Facility Processors	Logical Partition
OOSPA	<input type="checkbox"/>	333	1	666	<input type="checkbox"/>	No	2	0	OOSPA
OOSPB	<input type="checkbox"/>	333	1	666	<input type="checkbox"/>	No	2	0	OOSPB
OOSPC	<input checked="" type="checkbox"/>	333	10	400	<input type="checkbox"/>	No	2	0	OOSPC
OOSPD	<input type="checkbox"/>	333	10	400	<input type="checkbox"/>	No	2	0	OOSPD
OOSPE	<input type="checkbox"/>	0	0	0	<input type="checkbox"/>	No	2	0	OOSPE
OOSPF	<input type="checkbox"/>	0	0	0	<input type="checkbox"/>	No	2	0	OOSPF
OOSP1	<input checked="" type="checkbox"/>	333	10	500	<input type="checkbox"/>	No	4	0	OOSP1


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zSeries Change Logical Partition, CSS I/O Priority Queuing


Logical Partition	Active	Minimum input/output (I/O) priority	Maximum input/output (I/O) priority
ROSP1	Yes	07%	13%
ROSP2	Yes	07%	13%
ROSP3	Yes	00%	00%
ROSP4	Yes	00%	00%
ROSP5	Yes	00%	00%
ROSP6	No	07%	13%
ROSP7	No	00%	00%
ROSP8	No	00%	00%
ROSP9	Yes	15%	15%
ROSPA	Yes	00%	00%
ROSPB	Yes	00%	00%
RCF01	Yes	00%	00%
RCF02	Yes	00%	00%
RCF03	Yes	00%	00%

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zSeries 

zSeries Memory and Addressability


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zSeries 

z900 and z800 Memory Granularity

- Memory Granularity = Increment Size
 - Storage assignments/reconfiguration and HSA must be an even multiple
 - Varies depending on installed memory size
 - LPAR Mode ONLY, 1 MB in BASIC mode for HSA)
 - Was 1 MB prior to G3 Dr 88 for LPAR, too
- Single Storage Pool - All central storage
 - ES configured as needed from CS - No POR needed
 - zSeries and G5/6 (Dr 22e and later)
- Machines without Single Storage Pool support
 - POR required to change CS/ES split

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



RSU Increment
Size!!!

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z990 Memory Granularity

- Memory Granularity = Increment Size
 - Storage assignments/reconfiguration and HSA must be an even multiple
 - **Physical increment size fixed at 64 MB**
 - **Expanded memory granularity always 64 MB**
 - **Central memory granularity is virtualized for each LP**
 - LP central memory increment is determined according to the size of the larger of the two central memory elements defined in the activation profile: Initial central memory or Reserved central memory
- Single Storage Pool - All central storage
 - ES configured as needed from CS - No POR needed
- **Review MVS™ RSU parameter.** Large z990 increment size may result in too much memory being reserved for reconfiguration after migration unless the new RSU options introduced in OS/390 2.10 are used.

Large Element Size	Granularity
64 MB to 32 GB	64 MB
>32 GB to 64 GB	128 MB
>64 GB to 128 GB	256 MB
>128 GB to 256 GB	512 MB

← Rare to exceed today

← z/OS Limit = 128 GB

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

$$\text{RSU} = \frac{\text{CS amount to be reconfigured}}{\text{storage increment size}}$$

- 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

zSeries IBM

z990 Image "Storage" Page Increment Example

40 GB initial Element =128 MB Increment.

Valid at 64 even with 128 MB increment.

Customize Image Profiles: P00LSM1

Central storage
Amount (in megabytes)

Initial:
Reserved:

Storage origin
 Determined by the system
 Determined by the user
Origin:

Expanded storage
Amount (in megabytes)

Initial:
Reserved:

Storage origin
 Determined by the system
 Determined by the user
Origin:

General Processor Security **Storage** Options Load Crypto

Save Copy notebook Paste notebook Cancel Help

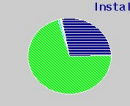
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z990 SE - System Storage Allocation after POR

Storage Information

Installed Storage Details

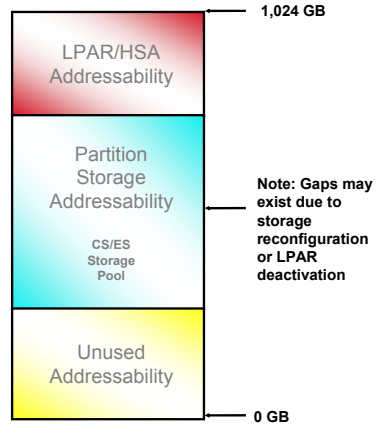


Installed storage (in Megabytes):	131072 MB
Central storage:	36864 MB
Expanded storage:	0 MB
Base hardware system area (HSA):	1344 MB
Available storage:	92864 MB

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z990 and z990 Absolute Address Assignment

- Storage Addressability for LPAR/HSA is allocated top down from highest supported address
 - z800, z900 - Highest address based on installed memory
 - z990/890 - Highest address = 1,024 GB (1 TB), HUGE!
- Partition Storage Addressability for OS, applications, and I/O is assigned below HSA at LPAR activation
 - **OS, Application, I/O operations**
 - **Origin address is assigned top/down by default but a specific origin can be requested**
 - **All Initial and Reserved CS and ES takes addressability at LPAR activation**
 - **Addressability is contiguous**
- In Book/Memory Physical Storage
 - **LPAR/HSA starts at book/memory physical address 0 (in book 0)**
 - **LPAR/HSA size can exceed 2 GB**
 - **Physical storage assigned to LPARs is above this**
 - **No requirement to be contiguous**



z990 Base Logical Partition Storage Allocation

OSYS - State Active - keystrokes remote


Input/output configuration data set (IOCDS): A0 07.24.03

Available storage: 92864 MB

Central Storage Allocation


Name	Origin	Initial	Current	Maximum	Gap	Expanded Storage Element
OCF02	1038144	4096	4096	4096	0	
OOSP1	1021760	16384	16384	16384	0	
OOSP2	1017664	4096	4096	4096	0	
OOSPA	1013568	4096	4096	4096	0	
OOSPB	1009472	4096	4096	4096	0	

Base system storage allocation Logical partition storage allocation

zSeries 

z990 Hardware System Area (HSA)

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zSeries 

z990 HSA Estimation Tool

HSA estimation tool

File Help

Configuration

dynamic enabled

50 Physical Control Units (PCUs)

64512 Number of devices CSS 0

15 Number of logical partitions CSS 0

0 Number of devices CSS 1

0 Number of logical partitions CSS 1

Result Window

Estimated HSA size	1351837 kB
HSA granularity	64 MB
Effective HSA size	1344 MB

Calculate Help Close

HSA estimation tool

File Help

Configuration

dynamic enabled

Physical Control Units (PCUs)

64512 Number of devices CSS 0

15 Number of logical partitions CSS 0

0 Number of devices CSS 1

0 Number of logical partitions CSS 1

0 Number of devices CSS 2

0 Number of logical partitions CSS 2

0 Number of devices CSS 3

0 Number of logical partitions CSS 3

Result Window

Estimated HSA size	1723169 kB
HSA granularity	64 MB
Effective HSA size	1728 MB

Calculate Help Close

1,344 MB – Big at GA!

1,728 MB – Bigger at GA3!

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End of Presentation