



Advanced Technical Skills (ATS) North America

zPCR Capacity Sizing Lab

SHARE Sessions 7774 and 7785

August 4, 2010

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Materials created by John Fitch and Jim Shaw

IBM



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zPCR Capacity Sizing Labs

■ Part 1 - Intro and Overview

- zPCR Introduction with C V6.3c
- Includes Advanced Mode Update
- What's new in zPCR V7.1

■ Part 2 – Hands-on Lab

- 1 Exercise to demonstrate the use of Advanced Mode functions in zPCR
 - 6 Tasks
 - 2 optional specialty engine considerations
- Use as a refresher



Advanced Technical Skills (ATS) North America

zPCR Capacity Sizing Lab – Part 1 Intro and Overview

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Agenda

- **Introducing zPCR**
- **LSPR Background**
- **MIPS Tables Vs. zPCR LPAR Configuration Capacity Planning**
- **zPCR Basic Mode**
- **zPCR Advanced Mode**
- **Update on zPCR C V7.1**
- **Where to get more Information**
- **Summary**

Introducing zPCR

- **Provides capacity relationships for System z processors, considering**
 - LPAR configuration
 - SCP/workload environment
 - Use of specialty CPs (zAAP, zIIP, IFL, and ICF)

- **Based on IBM Large Systems Performance Reference (LSPR)**

- **The IBM tool to properly size mainframe upgrades**
 - Expected accuracy of $\pm 5\%$

- **A PC based tool written in Java for Windows XP/Vista/7**
 - Available to customers since 10/2005
 - “As Is”, free tool available from the web

- **New Processor Announcements available in zPCR for:**
 - IBM Account Teams - at Announcement
 - Customers - generally within 30 days after Announcement
 - Planned for the week of August 16th for C V7.1 (zEnterprise 196)

Introduction to LSPR

- **A set of representative SCP/workload environments**
 - SCPs: z/OS, z/VM, and Linux on System z
 - Workloads: Batch \leftrightarrow Online
 - Current LSPR workloads: ODE-B, CB-L, WASDB, OLTP-T and OLTP-W
- **A methodology focused on processor capacity**
 - No significant external constraints
 - Equivalent (reasonably high, e.g. $\geq 90\%$) processor utilization
- **A metric to communicate the results**
 - ITR: Internal Throughput Rate
 - Transactions or Jobs per processor busy second
- **Information stored on the web**
 - <http://www.ibm.com/servers/eserver/zseries/lspr/>

LSPR Data

- LSPR data is built from a set of benchmarks running representative workloads
- Over time, LSPR benchmarks are changed to reflect changes in processor architecture, operating system capabilities, and new patterns for production workloads
- Cannot directly compare relative processor capacity across different versions of LSPR benchmarks

LSPR Tables

- Multi-image (MI) Processor Capacity Ratio table
 - Median complex LPAR configuration for each model based on customer profiles
 - Most representative for vast majority of customers
 - Same workload assumed in every partition
 - z/OS only
 - Used for “high level” sizing
 - Used to develop the MSU rating

- Single-image (SI) Processor Capacity Ratio table
 - One z/OS partition equal in size to N-way of model (limit to max CPs supported by SCP version)
 - Representative for truly single image z/OS cases
 - Used as the base for zPCR LPAR Configuration Capacity Planning

MIPS Tables Vs zPCR

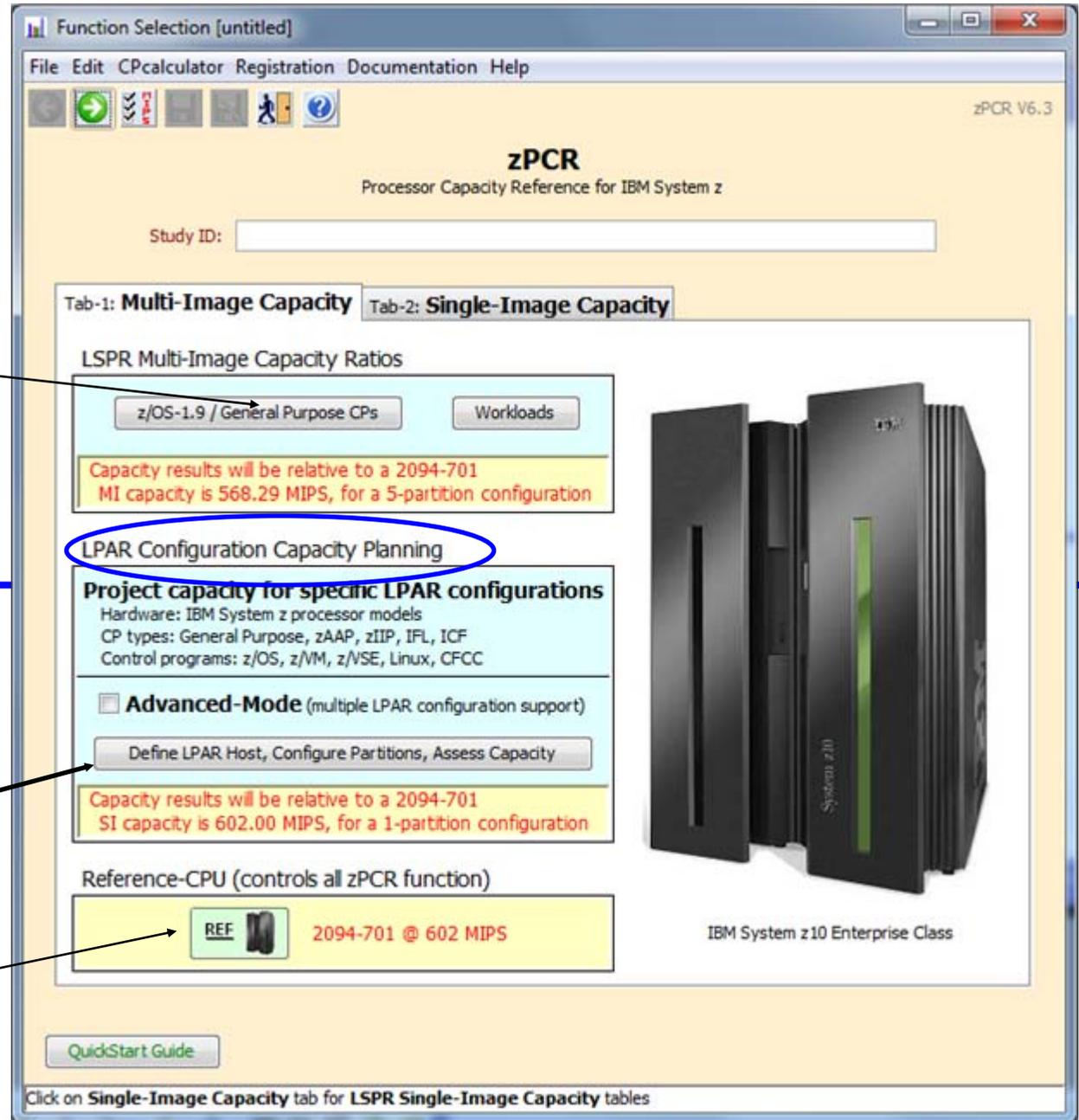
■ MIPS Tables

- Adequate for Business Planning
 - High level sizing for hardware and software budget planning
 - Based on “averages”
- Must be referenced to a specific set of LSPR benchmarks or invalid

■ zPCR Sizing - LPAR Configuration Capacity Planning

- Detailed Capacity Sizing based on:
 - Specific LPAR configuration (number, weights, and logical processors)
 - Specific SCP/workload mix
 - Specific use of specialty engines (zAAP, zIIP, IFL, and ICF)
- Built around concept of a Reference CPU

zPCR 6.3c “Basic Mode” Capacity Sizing Tool



MIPS Table

LSPR Multi-Image

zPCR LPAR Configuration Capacity Planning

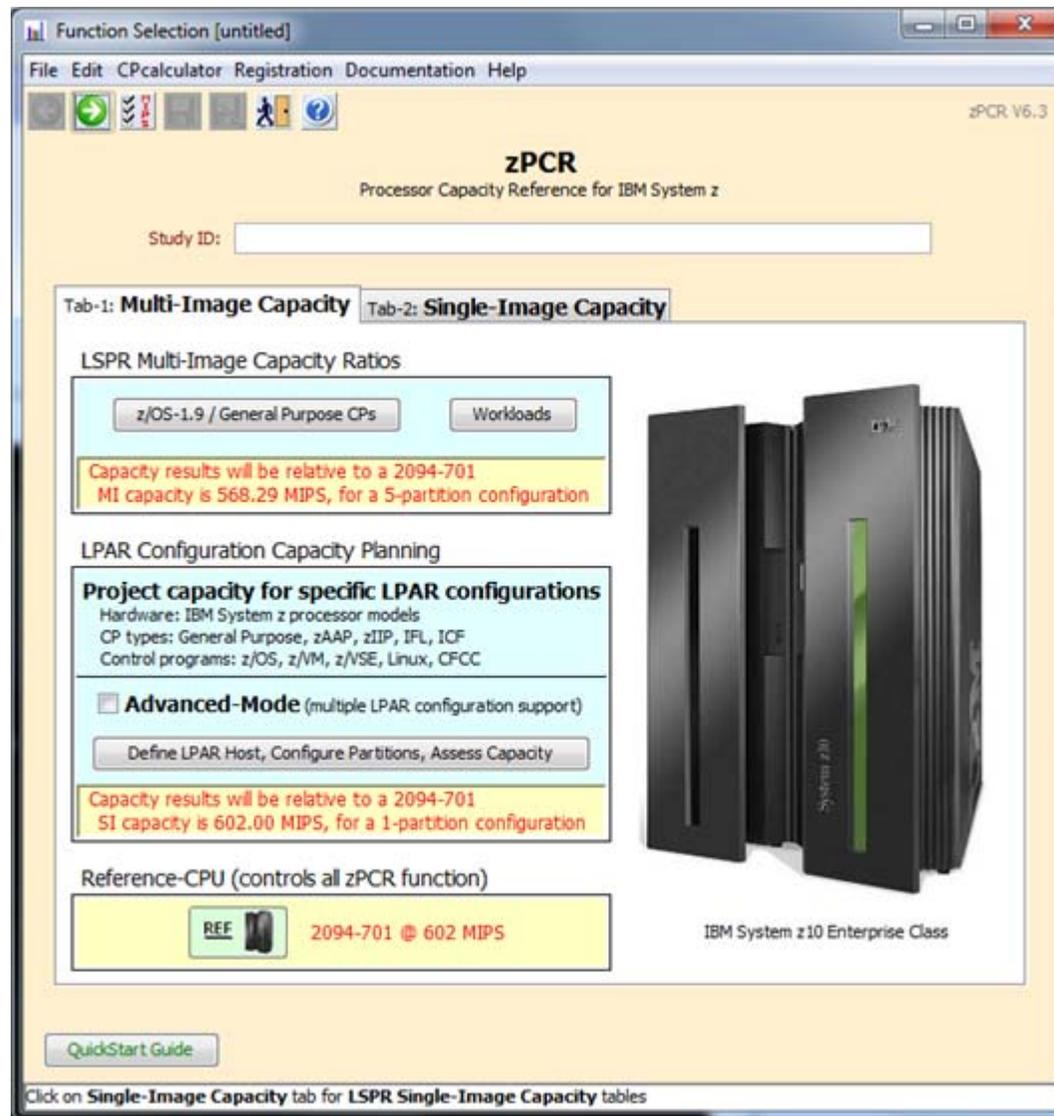
Built on LSPR Single-Image MIPS Table

zPCR V6.3c Basic Mode ...

- Operates on 1 LPAR configuration at a time.
- Operates the same as previous releases of zPCR
 - **v5.4 and before**
- All files created with zPCR 5.4 and before are “Basic Mode”.
- All files created with zPCR 6.x in “Basic Mode” are “Basic Mode”

Introducing zPCR C V6.3c – Advanced Mode

Available for Customers since May 19, 2010



zPCR Advanced Mode

- **Provides Capacity Comparisons between 2 LPAR configurations**
 - The “Current” Vs “Alternate” (Alt-1, Alt-2, Alt-3, Alt-4)
 - More efficient than running zPCR multiple times and manually comparing the results
 - Ability to drag & drop RMF partition reports and zPCR files onto “Current” & “Alternate”
- **Is recommended when comparing capacity changes that include:**
 - Changing the LPAR host processor family
 - Changing the LPAR host processor’s CP configuration
 - Changing the way that one or more partitions are defined, (e.g. weights, LCPs, SEs)
 - Adding one or more new partitions
 - Deleting one or more current partitions.
- **For Capacity Comparisons to be useful, configurations being compared should both contain some or all of the same partitions**
 - (i.e., in terms of partition type, name, SCP, and workload).

Summary of Advanced Mode function

- **Multiple LPAR configurations (currently limited to five) can be defined**

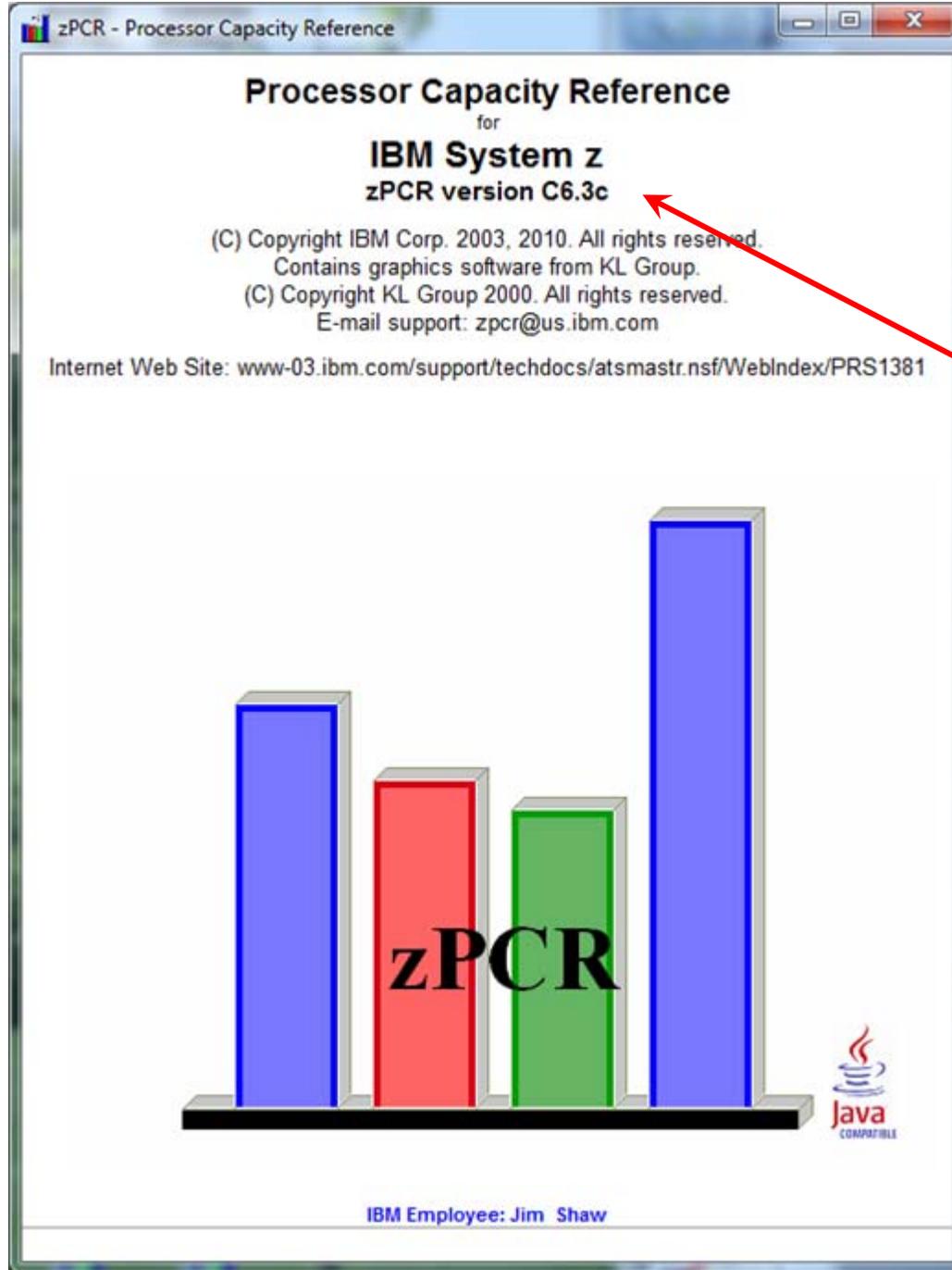
- **Several additional windows and functions are available**
 - *LPAR Host / Partition Comparison Reports*- To compare capacity results between LPAR configurations
 - *Margin of Error Consideration* - To show the effect on capacity when $\pm 5\%$ margin-of-error is applied
 - *Optimize SHR LCPs* – To optimize LCPs
 - *LPAR Host Capacity Summary* – To show summary of MIPS by pool type for Current and all Alternates

- **All capacity values are based on a single Reference-CPU setting**
 - The MI and SI tables will be viewed using Reference-CPU settings that are consistent between them
 - The MI Reference-CPU setting is based on the Reference-CPU setting as specified in the LSPR FAQ
 - 1-way processors only

- **The Reference-CPU can be calibrated for the first LPAR configuration only to produce a desired capacity result**

- **The Workloads window, used to customize the MI table view, must be accessed from either of the LSPR Processor Capacity Ratios tables,**
 - since the Function Selection window is no longer accessible

zPCR
Logo
Window



Version
Identification

zPCR Function Selection Window

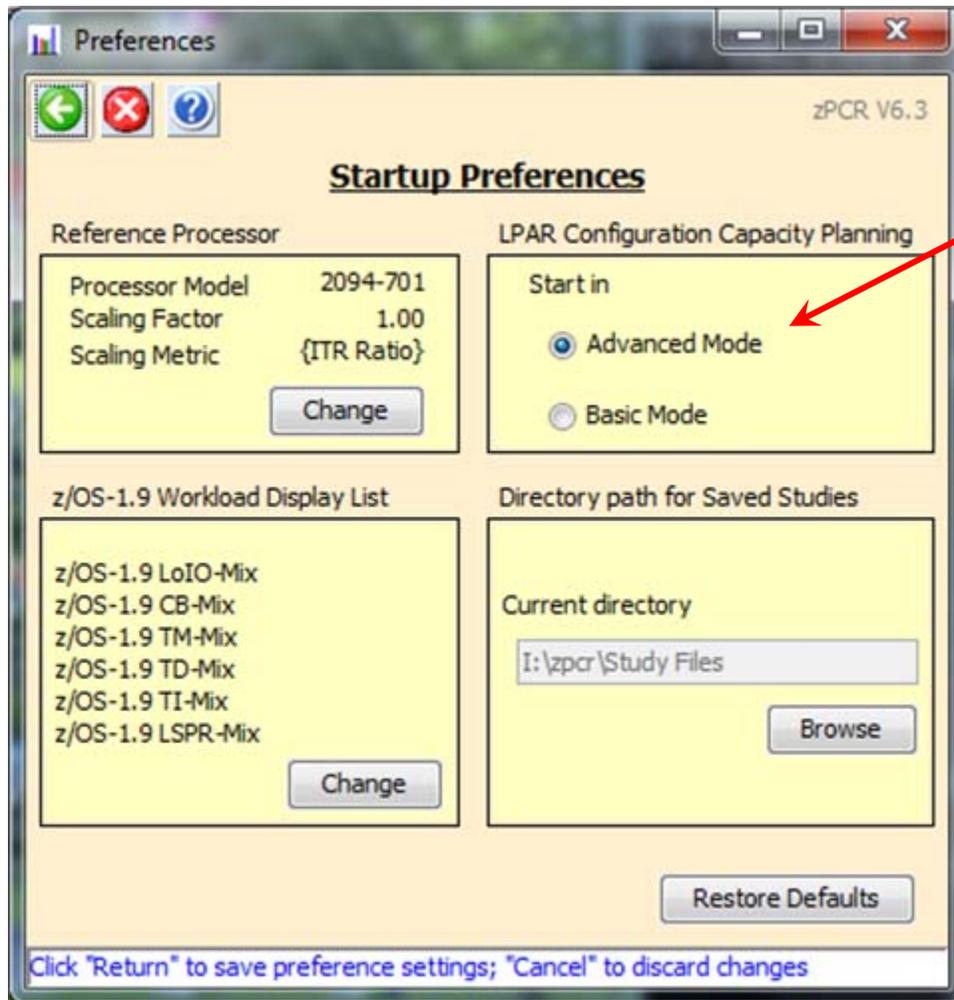
Set "Startup" preferences

Select "Advanced-Mode" check box

Press Enter
Advanced-Mode

zPCR Startup Preferences

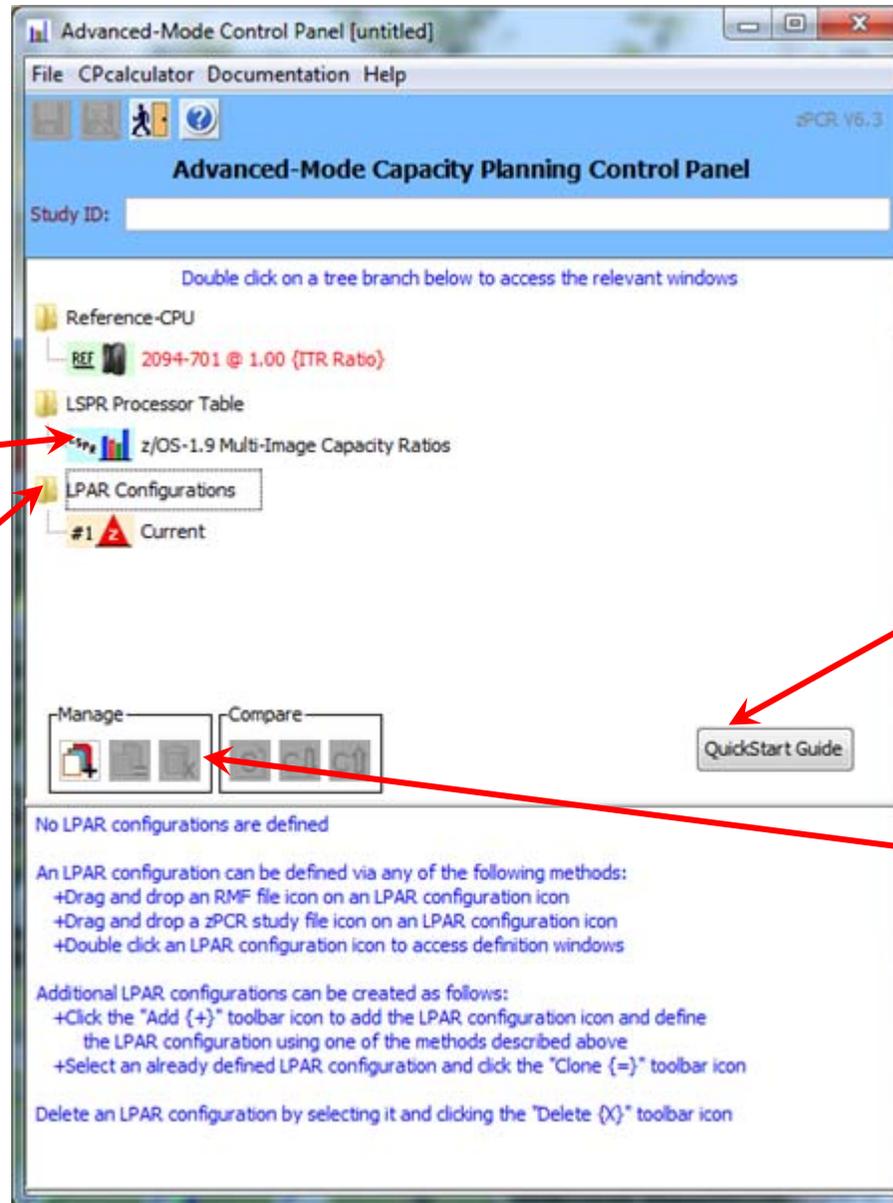
Set "Advanced Mode" as the default when starting zPCR



zPCR Advanced-Mode Capacity Planning Control Panel

View Multi-Image LSPR table

LPAR Configuration Planning



View "QuickStart" Guide

Manage Multiple Configurations

You may drag and drop zPCR study files or RMF reports onto the LPAR Configurations planning area or use the file drop down to load zPCR study files.

zPCR Advanced-Mode Capacity Planning Control Panel

Pool CP Type	#1 GP	#2 zAAP	#3 zIIP	#4 IFL	#5 ICF	CEC Total
RCPs	10	1	1	2	1	15
Partitions	4	1	1	2	1	9
LCPs	21	1	1	3	1	27
Capacity	4,911	521	524	1,093	560	7,610

Capacity is based on a 2094-701 assumed at 602.00 MIPS for a 1-partition configuration

Configuration Summary



zPCR Advanced-Mode Capacity Planning Control Panel

Comparison Report

Advanced-Mode Capacity Planning Control Panel

Study ID: XYZ Enterprises

Double click on a tree branch below to access the relevant windows

- Reference-CPU
 - REF 2094-701 @ 602 MIPS
- LSPR Processor Table
 - LSPR z/OS-1.9 Multi-Image Capacity Ratios
- LPAR Configurations
 - #1 Current
 - #2 Alt-1

Manage Compare

QuickStart Guide

#1	Current: ABC Production on IBM z9-EC z9-EC LPAR Host: 2094-S18/700					
Pool CP Type	#1 GP	#2 zAAP	#3 zIIP	#4 IFL	#5 ICF	CEC Total
RCPs	10	1	1	2	1	15
Partitions	4	1	1	2	1	9
LCPs	21	1	1	3	1	27
Capacity	4,911	521	524	1,093	560	7,610

Capacity is based on a 2094-701 assumed at 602.00 MIPS for a 1-partition configuration

Host Capacity Comparison Report

Host Capacity Comparison

zPCR V6.3

LPAR Host Capacity Comparison Report

Capacity by Partition Type

Study ID: XYZ Enterprises
 Current: ABC Production on IBM z9-EC
 Alt-1: ABC Production - z10-EC Projections

Capacity is based on a 2094-701 assumed at 602.00 MIPS for a 1-partition configuration
System z10 processor capacity for z/OS is represented with HiperDispatch turned ON

Partition Type	#1 Current 2094-S18/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1					#2 Alt-1 2097-E26/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1					Full Capacity (MIPS)	
	Partitions	Usable RCPs	LCPs	SHR LCP:RCP	Capacity	Partitions	Usable RCPs	LCPs	SHR LCP:RCP	Capacity	Net Change	% Delta
GP	4	10	21	2.100	4,911	4	10	19	1.900	7,358	+2,447	+49.8%
zAAP	1	1	1	1.000	521	1	1	1	1.000	787	+266	+51.1%
zIIP	1	1	1	1.000	524	1	1	1	1.000	778	+254	+48.5%
IFL	2	2	3	1.500	1,093	2	2	3	1.500	1,785	+692	+63.3%
ICF	1	1	1		560	1	1	1		842	+282	+50.4%
Total	9	15	27		7,610	9	15	25		11,550	+3,940	+51.8%

Comparison Report by Partition

Minimum Capacity Maximum Capacity

Show capacity as

Full Single CP

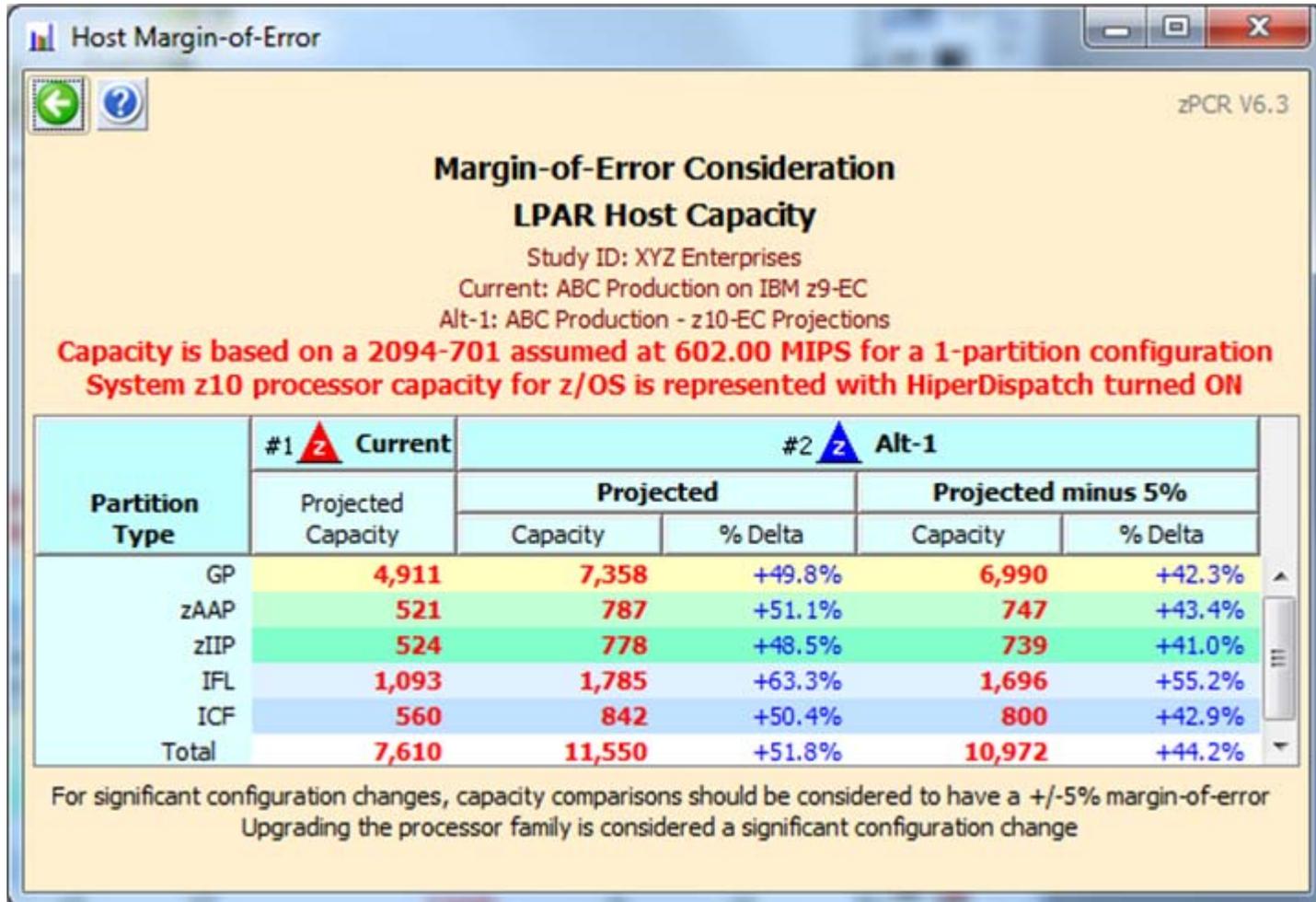
For significant configuration changes, capacity comparisons should be considered to have a +/-5% margin-of-error
 Upgrading the processor family is considered a significant configuration change

Comparison Report by Partition

Show Full or Single-CP capacity

Margin-of-Error

Margin-of-Error Report



Partition Capacity Comparison Report

zPCR V6.3

Partition Capacity Comparison Report

Based on Partition Minimum Capacity

Study ID: XYZ Enterprises
Current: ABC Production on IBM z9-EC
Alt-1: ABC Production - z10-EC Projections

Capacity is based on a 2094-701 assumed at 602.00 MIPS for a 1-partition configuration
System z10 processor capacity for z/OS is represented with HiperDispatch turned ON

Partition Identification				#1 ▲ Current						#2 ▲ Alt-1						Full Capacity (MIPS)		
List of All Included Partitions With Unique ID Metrics				2094-S18/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1						2097-E26/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1								
				Partition Definition					Minimum Capacity	Partition Definition					Minimum Capacity	Net Change	% Delta	
Type	Name	SCP	Workload	LP#	Mode	LCPs	Weight%	Cap		LP#	Mode	LCPs	Weight	Weight%	Cap			
GP	LP-01	z/OS-1.9*	LoIO-Mix	1	SHR	10	53.23%	2,638		1	SHR	8	700	53.23%	<input type="checkbox"/>	3,995	+1,357	+51.4%
GP	LP-02	z/OS-1.9*	CB-Mix	2	SHR	6	30.42%	1,490		2	SHR	6	400	30.42%	<input type="checkbox"/>	2,218	+728	+48.9%
GP	LP-03	z/OS-1.9*	TI-Mix	3	SHR	4	15.21%	726		3	SHR	4	200	15.21%	<input type="checkbox"/>	1,058	+332	+45.7%
GP	LP-04	z/VM	WASDB/LVm	4	SHR	1	1.14%	58	✓	4	SHR	1	15	1.14%	<input checked="" type="checkbox"/>	87	+29	+50.0%
zAAP	LP-02	z/OS-1.9*	CB-Mix	*2	SHR	1	100.00%	521		*2	SHR	1	400	100.00%	<input type="checkbox"/>	787	+266	+51.1%
zIIP	LP-03	z/OS-1.9*	TI-Mix	*3	SHR	1	100.00%	524		*3	SHR	1	200	100.00%	<input type="checkbox"/>	778	+254	+48.5%
IFL	LP-05	Linux	WASDB/L	5	SHR	2	88.89%	970		5	SHR	2	200	88.89%	<input type="checkbox"/>	1,584	+614	+63.3%
IFL	LP-06	Linux	WASDB/L	6	SHR	1	11.11%	122		6	SHR	1	25	11.11%	<input type="checkbox"/>	201	+79	+64.8%
ICF	LP-07	CFCC	CFCC	7	DED	1	n/a	560		7	DED	1	n/a		<input type="checkbox"/>	842	+282	+50.4%

Change Controls

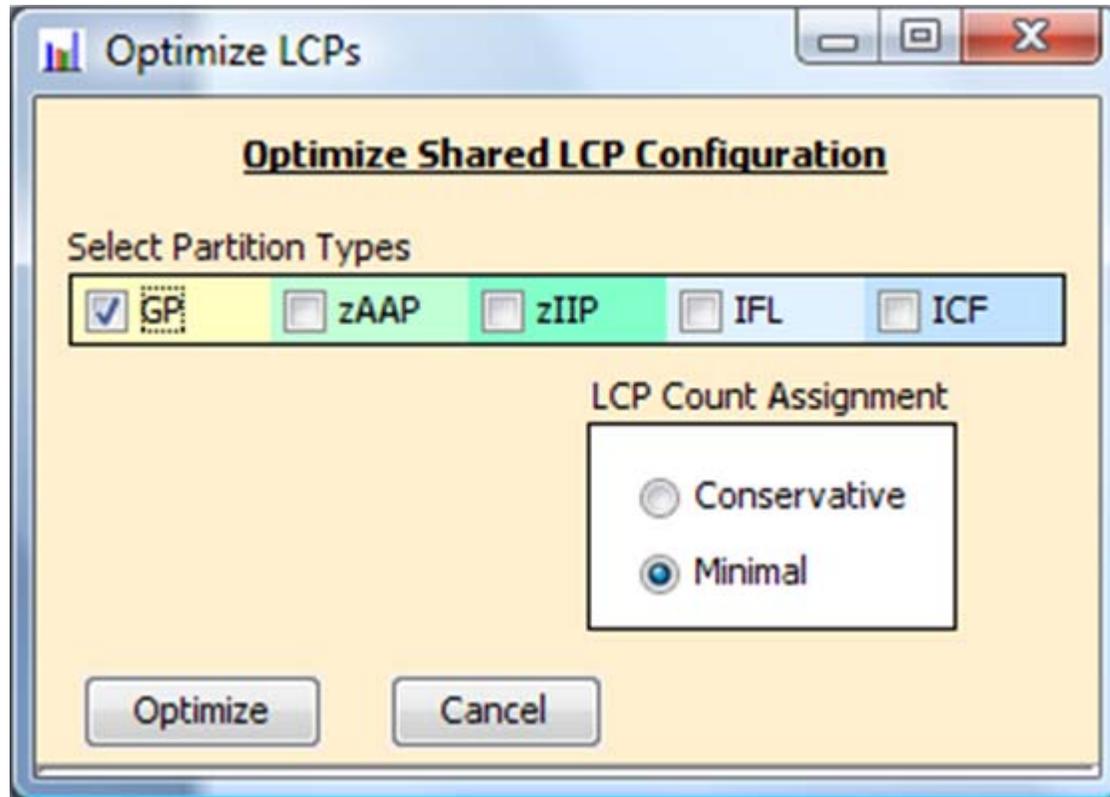
For significant configuration changes, capacity comparisons should be considered to have a +/-5% margin-of-error
Upgrading the processor family is considered a significant configuration change

Input fields have white background; Single-click a "selection field" for drop-down list; Double click a "key-in field" to open.

"Optimize" SHR LCPs

Margin-of-Error

Optimize Share LCP Configuration





Commit the Changes

Partition Capacity Comparison Report
 Based on Partition Minimum Capacity
 Study ID: XYZ Enterprises
 Current: ABC Production on IBM z9-EC
 Alt-1: ABC Production - z10-EC Projections
**Capacity is based on a 2094-701 assumed at 602.00 MIPS for a 1-partition configuration
 System z10 processor capacity for z/OS is represented with HiperDispatch turned ON**

Partition Identification				#1 Current							#2 Alt-1							Full Capacity (MIPS)	
List of All Included Partitions With Unique ID Metrics				2094-S18/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1							2097-E26/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1							Net Change	% Delta
				Partition Definition				Minimum Capacity	Partition Definition				Minimum Capacity						
Type	Name	SCP	Workload	LP#	Mode	LCPs	Weight%	Cap	LP#	Mode	LCPs	Weight	Weight%	Cap	Minimum Capacity	Net Change	% Delta		
GP	LP-01	z/OS-1.9*	LoIO-Mix	1	SHR	10	53.23%	2,638	1	SHR	6	700	53.23%	<input type="checkbox"/>	4,094	+1,456	+55.2%		
GP	LP-02	z/OS-1.9*	CB-Mix	2	SHR	6	30.42%	1,490	2	SHR	4	400	30.42%	<input type="checkbox"/>	2,263	+773	+51.9%		
GP	LP-03	z/OS-1.9*	TI-Mix	3	SHR	4	15.21%	726	3	SHR	2	200	15.21%	<input type="checkbox"/>	1,040	+314	+43.3%		
GP	LP-04	z/VM	WASDB/LVm	4	SHR	1	1.14%	58	4	SHR	1	15	1.14%	<input checked="" type="checkbox"/>	88	+30	+51.7%		
zAAP	LP-02	z/OS-1.9*	CB-Mix	*2	SHR	1	100.00%	521	*2	SHR	1	400	100.00%	<input type="checkbox"/>	813	+292	+56.0%		
zIIP	LP-03	z/OS-1.9*	TI-Mix	*3	SHR	1	100.00%	524	*3	SHR	1	200	100.00%	<input type="checkbox"/>	819	+295	+56.3%		
IFL	LP-05	Linux	WASDB/L	5	SHR	2	88.89%	970	5	SHR	2	200	88.89%	<input type="checkbox"/>	1,585	+615	+63.4%		
IFL	LP-06	Linux	WASDB/L	6	SHR	1	11.11%	122	6	SHR	1	25	11.11%	<input type="checkbox"/>	201	+79	+64.8%		
ICF	LP-07	CFCC	CFCC	7	DED	1	n/a	560	7	DED	1	n/a		<input type="checkbox"/>	842	+282	+50.4%		

Change Controls

For significant configuration changes, capacity comparisons should be considered to have a +/-5% margin-of-error
 Upgrading the processor family is considered a significant configuration change

Input fields have white background; Single-click a "selection field" for drop-down list; Double click a "key-in field" to open.

Commit or Undo Changes

Add additional partitions from RMF

Advanced-Mode Capacity Planning Control Panel

Study ID: XYZ Enterprises

Double click on a tree branch below to access the relevant windows

- Reference-CPU
 - REF 2094-701 @ 602 MIPS
- LSPR Processor Table
 - z/OS-1.9 Multi-Image Capacity Ratios
- LPAR Configurations
 - #1 Current
 - #2 Alt-1

Manage: [Icons] Compare: [Icons] QuickStart Guide

Pool CP Type	Alt-1: ABC Production - z10-EC Projections z10-EC LPAR Host: 2097-E26/700					
	#1 GP	#2 zAAP	#3 zIIP	#4 IFL	#5 ICF	CEC Total
RCPs	10	1	1	2	1	15
Partitions	4	1	1	2	1	9
LCPs	19	1	1	3	1	25
Capacity	7,358	787	778	1,785	842	11,550

Capacity is based on a 2094-701 assumed at 602.00 MIPS for a 1-partition configuration

Select "RMF" report and drag it onto the "Alt-1" configuration

RMF Interval Selection

RMF Partition Data Report Intervals
#2 **Alt-1** (ABC Production - z10-EC Projections)

Relative Interval Number	System ID	GP Processor Model	Date	Time	Interval Length	Number of Active Partitions	Pool 1 GP Pool Utilization
1.	SYSB	2084-312	09/22/2008	07.59.00	001.00.00	12	99.97%
2.	SYSB	2084-312	09/23/2008	07.59.00	001.00.00	12	98.90%
3.	SYSB	2084-312	09/24/2008	07.59.00	000.59.59	12	94.37%
4.	SYSB	2084-312	09/25/2008	07.59.00	000.59.59	12	91.63%
5.	SYSB	2084-312	09/26/2008	07.59.00	001.00.00	12	93.10%
6.	SYSB	2084-312	09/29/2008	07.59.00	000.59.59	12	99.93%
7.	SYSB	2084-312	09/30/2008	07.59.00	001.00.00	12	97.53%

Table View
 Show All Pools Number of Intervals: 10

Default SCP/Workload for Partitions

GP/zAAP/zIIP	z/OS	LoIO-Mix
IFL	Linux	WASDB/L
ICF	CFCC	CFCC

Load RMF Report Show Partitions

Click on a row to select interval for which zPCR partition definitions are to be created

“Alt-1” configuration

Select an interval

Default SCPs for Partitions

Default z/OS workload is LoIO-Mix

Get specific partitions from RMF

Select the partitions to be added. Note zAAP/zIIP partitions will always follow the GP partition.

Get Partitions from RMF
 RMF Report File: F:\CPSTOOLS\zPCR6.3c\RMF Files\RMFsample z990.txt
 Interval #5: Date=09/26/2008 Time=07.59.00 Length=001.00.00
 System ID: SYSB; GP Processor Model = 2084-312
 z990 Host = 2084-C24 with 17 CPs: GP=12 zAAP=3 ICF=2

Copy Partitions to Active Study
 #2 Alt-1 (ABC Production - z10-EC Projections)
 z10-EC Host = 2097-E26/700 configured with 15 CPs: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1
 Partition Configuration as specified below

Copy LP	Partition Identification						Partition Configuration					Partition Workload Assignment			
	Active	No.	Type	Name	SCP	Workload	Mode	LCPs	Weight	Weight...	CAP	Method Used	Physical Utilization	DASD I/O Rate per	
														Second	A-MSU
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1	GP	SYSB	z/OS-1.9*	LoIO-Mix	SHR	7.4	431	43.1%		Default	24.96%		
<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	GP	TESTCICS	z/OS-1.9*	LoIO-Mix	SHR	2.0	20	2.0%		Default	1.22%		
<input type="checkbox"/>	<input checked="" type="checkbox"/>	3	GP	PROD1	z/OS-1.9*	LoIO-Mix	SHR	3.5	91	9.1%		Default	12.96%		
<input type="checkbox"/>	<input checked="" type="checkbox"/>	4	GP	TEST1	z/OS-1.9*	LoIO-Mix	SHR	1.5	7	0.7%		Default	0.64%		
<input type="checkbox"/>	<input checked="" type="checkbox"/>	5	GP	TEST2	z/OS-1.9*	LoIO-Mix	SHR	1.5	7	0.7%		Default	0.60%		
<input type="checkbox"/>	<input checked="" type="checkbox"/>	6	GP	PROD2	z/OS-1.9*	LoIO-Mix	SHR	8.3	444	44.4%		Default	51.96%		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	*1	zAAP	SYSB	z/OS-1.9*	LoIO-Mix	SHR	3	431	41.2%		Default	18.36%		

Buttons: Select All, Select Active, Remove All, Chose Another RMF Interval, Copy Partitions, Workload Selection Assistant

Note: Partitions identified by RMF as type ICF may actually be type IFL; make necessary changes prior to transferring to the active study
 Note: IRD is determined to be active for at least one z/OS partition. The LCPs for those partitions will be rounded up to the nearest whole number.
 Note: GP Partition workloads shown in "Red" are default settings; These can be modified to appropriate "I/O per Second" from RMF.

Click on "Create LP" checkbox to select partitions to be copied to the active study

Determine the Workload

Determine the appropriate SCP/workloads

DASD I/Os per MSU automatically calculated via the "Workload Selection" assistant

Transfer partitions to zPCR

Get Partitions from RMF

RMF Report File: F:\CPSTOOLS\zPCR6.3c\RMF Files\RMFsample z990.txt
 Interval #5: Date=09/26/2008 Time=07.59.00 Length=001.00.00
 System ID: SYSB; GP Processor Model = 2084-312
 z990 Host = 2084-C24 with 17 CPs: GP=12 zAAP=3 ICF=2

Copy Partitions to Active Study

#2 Alt-1 (ABC Production - z10-EC Projections)

z10-EC Host = 2097-E26/700 configured with 15 CPs: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1
 Partition Configuration as specified below

Copy LP	Partition Identification						Partition Configuration					Partition Workload Assignment			
	Active	No.	Type	Name	SCP	Workload	Mode	LCPs	Weight	Weight %	CAP	Method Used	Physical Utilization	DASD I/O Rate per Second	LA-MSU
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1	GP	SYSB	z/OS-1.9*	LoIO-Mix	SHR	7.4	431	43.1%		DASD I/O	24.96%	1,400	8.1
<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	GP	TESTCICS	z/OS-1.9*	LoIO-Mix	SHR	2.0	20	2.0%		Default	1.22%		
<input type="checkbox"/>	<input checked="" type="checkbox"/>	3	GP	PROD1	z/OS-1.9*	LoIO-Mix	SHR	3.5	91	9.1%		Default	12.96%		
<input type="checkbox"/>	<input checked="" type="checkbox"/>	4	GP	TEST1	z/OS-1.9*	LoIO-Mix	SHR	1.5	7	0.7%		Default	0.64%		
<input type="checkbox"/>	<input checked="" type="checkbox"/>	5	GP	TEST2	z/OS-1.9*	LoIO-Mix	SHR	1.5	7	0.7%		Default	0.60%		
<input type="checkbox"/>	<input checked="" type="checkbox"/>	6	GP	PROD2	z/OS-1.9*	LoIO-Mix	SHR	8.3	444	44.4%		Default	51.96%		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	*1	zAAP	SYSB	z/OS-1.9*	LoIO-Mix	SHR	3	131	41.2%		DASD I/O	18.76%		

Select All Select Active Remove All Chose Another RMF Interval

Copy Partitions

Workload Selection Assistant

Note: Partitions identified by RMF as type ICF may actually be type IFL; make necessary changes prior to transfer
 Note: IRD is determined
 Note: GP Partition workload
 Click on "Create LP"

Method used is either "Default" or DASD I/O

Enter DASD I/Os per Second from RMF Workload Activity Report

Detail report
with
additional
partitions
added

Added partitions
from RMF

Partition Detail Report

Graph CPcalculator

zPCR V6.3

Partition Detail Report

Based on LSPR Data for IBM System z Processors
Study ID: XYZ Enterprises

#2 Alt-1 (ABC Production - z10-EC Projections)

z10-EC Host = 2097-E26/700 with 15 CPs; GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1
11 Active Partitions: GP=5 zAAP=2 zIIP=1 IFL=2 ICF=1

Capacity is based on a 2094-701 assumed at 602.00 MIPS for a 1-partition configuration
System z10 processor capacity for z/OS is represented with HiperDispatch turned ON

Include	Partition Identification					Partition Configuration					Partition Capacity	
	No.	Type	Name	SCP	Workload	Mode	LCPs	Weight	Weight %	Capping	Minimum	Maximum
<input checked="" type="checkbox"/>	1	GP	LP-01	z/OS-1.9*	LoIO-Mix	SHR	8	700	45.02%	<input type="checkbox"/>	3,324	5,907
<input checked="" type="checkbox"/>	2	GP	LP-02	z/OS-1.9*	CB-Mix	SHR	6	400	25.72%	<input type="checkbox"/>	1,845	4,304
<input checked="" type="checkbox"/>	3	GP	LP-03	z/OS-1.9*	TI-Mix	SHR	4	200	12.86%	<input type="checkbox"/>	880	2,736
<input checked="" type="checkbox"/>	4	GP	LP-04	z/VM	WASDB/LVm	SHR	1	15	0.96%	<input checked="" type="checkbox"/>	73	73
<input checked="" type="checkbox"/>	5	GP	SYSA	z/OS-1.9*	LoIO-Mix	SHR	6	240	15.43%	<input type="checkbox"/>	1,124	4,369
<input checked="" type="checkbox"/>	*2	zAAP	LP-02	z/OS-1.9*	CB-Mix	SHR	1	400	62.50%	<input type="checkbox"/>	485	776
<input checked="" type="checkbox"/>	*2	zAAP	SYSA	z/OS-1.9*	LoIO-Mix	SHR	1	240	37.50%	<input type="checkbox"/>	295	786
<input checked="" type="checkbox"/>	*3	zIIP	LP-03	z/OS-1.9*	TI-Mix	SHR	1	200	100.00%	<input type="checkbox"/>	777	777
<input checked="" type="checkbox"/>	6	IFL	LP-05	Linux	WASDB/L	SHR	2	200	88.89%	<input type="checkbox"/>	1,583	1,781
<input checked="" type="checkbox"/>	7	IFL	LP-06	Linux	WASDB/L	SHR	1	25	11.11%	<input type="checkbox"/>	201	905
<input checked="" type="checkbox"/>	8	ICF	LP-07	CFCC	CFCC	DED	1	n/a		<input type="checkbox"/>	842	842

Table View

Display: All Partitions Includes Only

Pools:

- GP IFL
- zAAP ICF
- zIIP

Capacity Summary by Pool

CP Pool	RCPs	Partitions	LCPs	Capacity
GP	10	5	25	7,245
zAAP	1	2	2	780
zIIP	1	1	1	777
IFL	2	2	3	1,784
ICF	1	1	1	842
Totals	15	11	32	11,430

Host Summary Modify SCP/Workload

For significant configuration changes, capacity comparisons should be considered to have a +/-5% margin-of-error
 Upgrading the processor family is considered a significant configuration change

Input fields have white background; Single-click a "selection field" for drop-down list; Double click a "key-in field" to open.

Show Host Capacity Summary

- Click on the **Host Capacity Summary** icon  to view the report.

The screenshot shows the 'Advanced-Mode Capacity Planning Control Panel' window. The tree view on the left includes 'Reference-CPU', 'LSPR Processor Table', and 'LPAR Configurations'. Under 'LPAR Configurations', there are two entries: '#1 Current' and '#2 Alt-1'. The '#1 Current' entry is highlighted. Below the tree view, there are 'Manage' and 'Compare' buttons. The 'Compare' button has a sub-button with an 'S' icon, which is pointed to by an arrow from the text box below. The main area of the window displays a table for the selected configuration.

Pool	#1 GP	#2 zAAP	#3 zIIP	#4 IFL	#5 ICF	CEC Total
RCPs	18	11	0	2	0	31
Partitions	4	3	0	1	0	8
LCPs	36	21	0	2	0	59
Capacity	6,800	4,269		1,009		12,079

Current: Loaded from Basic Mode Study I:...Exercise 1 add IFL.zpcr
z9-EC LPAR Host: 2094-S38/700

Capacity is based on a 2094-701 assumed at 602.00 MIPS for a 1-partition configuration

Click Host Capacity Summary

Host Capacity Summary

- For each defined LPAR configuration, its icon and name are provided, along with the processor model information and number of real CPs configured to each pool.
- To display the description field of any LPAR configuration, place the mouse pointer anywhere on that row.
- Capacity projections may be cycled between **Full** capacity and **Single-CP** capacity using the radio buttons. This is useful for revealing relative engine speed when comparing LPAR configurations where the host family is changed.
- Click on the **Return** to take you back at the **Advanced-Mode Control Panel**.

Sum of the capacity values

LPAR Configuration			Full Capacity (based on usable RCP count)					
Identity	Hardware		GP	zAAP	zIIP	IFL	ICF	Total
#1 Current	2094-S38/700: GP=18 zAAP=11 IFL=2		6,800	4,269		1,009		12,079
#2 Alt-1	2097-E40/700: GP=13 zAAP=11 IFL=2		8,451	7,204		1,616		17,271

Show capacity as

Full Single CP

Show Full or Single-CP capacity

Advanced-Mode Capacity Planning Control Panel
Study ID: XYZ Enterprises

Double click on a tree branch below to access the relevant windows

- Reference-CPU
 - REF 2094-701 @ 602 MIPS
- LSPR Processor Table
 - z/OS-1.9 Multi-Image Capacity Ratios
- LPAR Configurations
 - #1 Current
 - #2 Alt-1

Manage: [Add] [Delete] [Refresh] [Compare]

QuickStart Guide

Pool CP Type	Alt-1: ABC Production - z10-EC Projections z10-EC LPAR Host: 2097-E26/700					
	#1 GP	#2 zAAP	#3 zIIP	#4 IFL	#5 ICF	CEC Total
RCPs	10	1	1	2	1	15
Partitions	5	2	1	2	1	11
LCPs	25	2	1	3	1	32
Capacity	7,245	780	777	1,784	842	11,430

Capacity is based on a 2094-701 assumed at 602.00 MIPS for a 1-partition configuration

Save Study

Exit zPCR

What is new in zPCR C V7.1

- **Support for zEnterprise 196 processors**
- **Reference-CPU defaults have changed**
 - Typical scaling factor is now 593 MIPS.
 - Supports the changes in LSPR workloads
- **z/OS LSPR Single-Image and Multi-Image Tables now based on z/OS 1.11**
- **LSPR z/VM data is now measured up to 32-way**
 - Previously z/VM was measured up to 16-way
- **Support for SMF 113s**
 - Collects CPU MF counter data
- **New input via EDF (Enterprise Data File)**
 - Provides SMF 113 metrics
 - Provides more details including HiperDispatch
 - SMF 74 DASD I/Os
 - One file per partition
- **CP3KEXTR**
 - Load and Go will read RMF/SMF data and generate an EDF File
 - Support for processing SMF 113
- **zPCR External File format enhanced**
 - Support for processing SMF 113
- **Up to six LPAR configurations may defined in Advanced-Mode**
- **Previous study files will have their workloads automatically converted to the new LSPR workloads**

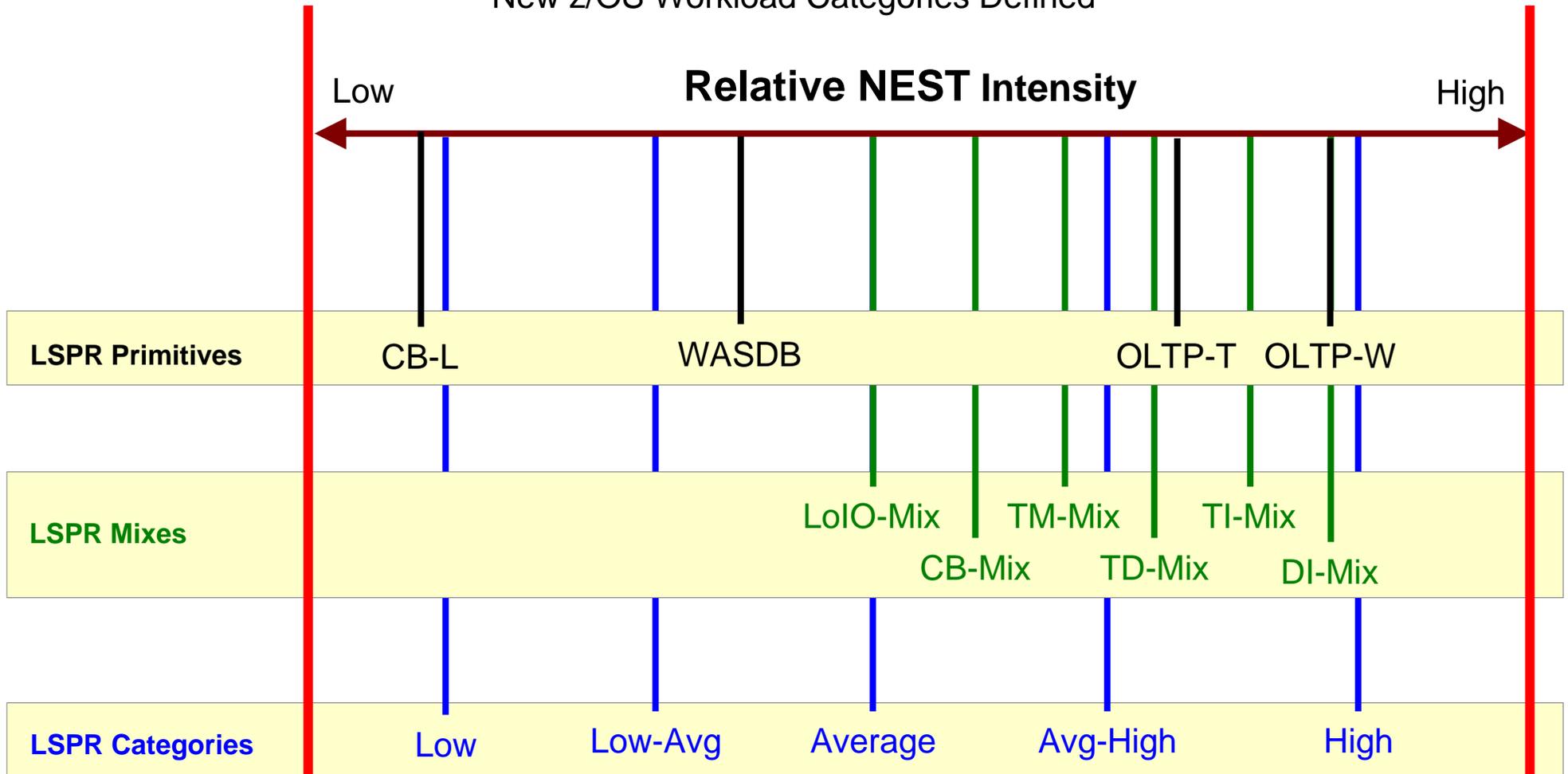
New LSPR Workload Categories

- Various combinations of prior workload primitives are measured on which the new workload categories are based
 - Applications include CICS, DB2, IMS, OSAM, VSAM, WebSphere, COBOL, utilities
- **Low** (relative nest intensity)
 - Workload curve representing light use of the memory hierarchy
 - Similar to past high scaling workload primitives
- **Average** (relative nest intensity)
 - Workload curve expected to represent the majority of customer workloads
 - Similar to the past LoIo-mix curve
- **High** (relative nest intensity)
 - Workload curve representing heavy use of the memory hierarchy
 - Similar to the past DI-mix curve
- zPCR extends published categories
 - **Low-Avg**
 - 50% Low and 50% Average
 - **Avg-High**
 - 50% Average and 50% High

zPCR Workload Characterization for z/OS

“Scope of Work” Definition Change

New z/OS Workload Categories Defined



Use zPCR’s Workload Selection Assistant to choose appropriate workload category

Automated with EDF input into zPCR

Note: Workload selection is automated in zCP3000

Automated SCP/Workload conversion for previous zPCR study file...

SCP/Workload Conversion zPCR V7.0

zPCR Study - SCP/Workload Conversion
 Your zPCR study was created with version 6.3
 New SCP and Workload Names have been implemented for z/OS, z/VM and Linux
 SCP and Workload definitions have been converted for the partitions listed

Partition Identification			Former zPCR Study		New zPCR Study	
No.	Type	Name	SCP	Workload	SCP	Workload
1.	GP	LP-01	z/OS-1.9*	LoIO-Mix	z/OS-1.9*	Average
2.	GP	LP-02	z/OS-1.9*	CB-Mix	z/OS-1.9*	Average
3.	GP	LP-03	z/OS-1.9*	TI-Mix	z/OS-1.9*	Avg-High
4.	GP	LP-04	z/VM	WASDB/LVm	z/VM	High/LV
5.	IFL	LP-05	Linux	WASDB/L	Linux	Low/L
6.	IFL	LP-06	Linux	WASDB/L	Linux	Low/L

Partitions inherit the SCP/Workload of their associated GP partition

New workload name

Previous workload name

EDF Input for zPCR

z/OS on System z

Turn on CPU MF to start SMF 113 recording (primary partitions)

Post process SMF data with CP3KEXTR to produce EDF

Windows PC with zPCR installed

Download EDF (1 per partition) to PC

In zPCR, Get Host and Partitions from EDF

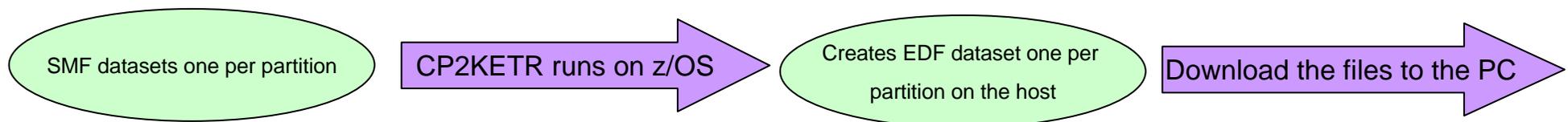
Load EDF(s)

Select a representative interval

Show LPAR Host and its partition configuration

Create LPAR Configuration

- Partition workloads assigned based on DASD I/O or default
- Partitions with SMF 113 data will show “113 Hint” workload



Load the EDF files into zPCR

Get host and partitions from EDF file

LPAR Host Processor

Processor Family Must specify
 Processor Model
 Number of Books
 Unassigned books
 Maximum Configurable CPs
 Unassigned CPs
 Maximum partitions

CP Assignments Unused

GP
 zAAP
 zIIP
 IFL
 ICF
 Total

Specify Host

Get Host and Partitions From

EDF RMF

Logical Partition Configuration

CP Pool	Partition Mode	No. of Real CPs	No. of Logical		LCP:RCP Ratio
			Partitions	CPs	

Define Partitions

GP IFL ICF

Copy Partitions From

EDF RMF zPCR Study

Capacity Reports

Host Summary Partition Detail Partition Utilized Capacity

Load the EDF files into zPCR

Select an interval

EDF Intervals

Relative Interval Number	CEC ID	GP Processor Model	Date	Time	Interval Length	Number of Active Partitions	Available Data		Pool 1 GP Pool Utilization
							DASD I/O	SMF 113	
17.	CEC9F30	2097-742	2008-03-05	15:00:00	01:00:00	10	✓		37.17%
18.	CEC9F30	2097-742	2008-03-05	16:00:00	01:00:00	10	✓		34.39%
19.	CEC9F30	2097-742	2008-03-05	17:00:00	01:00:00	10	✓		29.85%
20.	CEC9F30	2097-742	2008-03-05	18:00:00	01:00:00	10	✓		25.68%
21.	CEC9F30	2097-742	2008-03-05	19:00:00	01:00:00	10	✓		19.23%
22.	CEC9F30	2097-742	2008-03-05	20:00:00	01:00:00	10	✓		18.30%
23.	CEC9F30	2097-742	2008-03-05	21:00:00	01:00:00	10	✓		26.72%
24.	CEC9F30	2097-742	2008-03-05	22:00:00	00:26:00	10	✓		27.94%
25.	CEC9F30	2097-742	2008-03-05	23:16:00	00:14:00	10	✓		20.53%

Table View

Show All Pools Number of intervals: 25

Default SCP/Workload for Partitions

GP/zAAP/zIIP	z/OS	Average
IFL	Linux	Low/L
ICF	CFCC	CFCC

Load EDF Show Partitions

Click on a row to select interval for which zPCR partition definitions are to be created

Important Considerations when getting LPAR configuration metrics

Create LPAR Configuration from EDF

zPCR V7.1

LPAR Configuration from EDF
 z/OS SMF Data Set Name: JPBURG.WSCSYSC.SMF.SYSC.JUL16.T
 CP2KEXTR Version: CP2KEXTR07/15/10
 EDF File Name: I:\zpcr\wscsmf113.edf
 Interval #6: Date=2010-07-16 Time=12:30:00 Length=00:30:00
 CEC ID: CEC7675; GP Processor Model = 2817-722
 z196 Host = 2817-M80/700 with 80 CPs: GP=80

Create Active Study
 LPAR Host as specified above
 Partition Configuration as specified below

Copy LP	Partition Identification							Partition Configuration					Partition Workload Assignment				
	Active	No.	Type	Name	SCP	Workload		Mode	LCPs	Weight	Weight %	CAP	HD Active	Method Used	Physical Utilization	DASD I/O Rate/Sec	RNI
						Assigned	113 Hint										
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1	GP	TOSP2	z/OS-1.11	Average	Low	SHR	4	10	34.5%		<input checked="" type="checkbox"/>	DASD I/O	0.01%	0.0	0.36
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2	GP	TOSPA	z/OS-1.11	Average		DED	1	n/a				Default	1.25%		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3	GP	TOSPB	z/OS-1.11	Average		DED	1	n/a				Default	1.25%		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4	GP	TOSPC	z/OS-1.11	Average		DED	1	n/a				Default	1.25%		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	5	GP	TOSPF	z/OS-1.11	Average		SHR	2	10	34.5%			Default	0.01%		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	6	GP	TOSP1	z/OS-1.11	Average		SHR	2	10	34.5%			Default	0.02%		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	7	GP	TOSP3	z/OS-1.11	Average		DED	2	n/a				Default	2.50%		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	8	GP	TOSP8	z/OS-1.11	Average		DED	2	n/a				Default	2.50%		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	9	GP	TOSP9	z/OS-1.11	Average		DED	2	n/a				Default	2.50%		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	10	GP	TOSP1B	z/OS-1.11	Average		SHR	2	10	34.5%			Default	0.01%		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	11	GP	TOSP1C	z/OS-1.11	Average		DED	3	n/a				Default	3.75%		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	12	GP	TOSP1E	z/OS-1.11	Average		DED	2	n/a				Default	2.50%		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	13	GP	TOSP1F	z/OS-1.11	Average		DED	2	n/a				Default	2.50%		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	14	GP	TOSP18	z/OS-1.11	Average		DED	1	n/a				Default	1.25%		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	15	GP	TOSP19	z/OS-1.11	Average		DED	1	n/a				Default	1.25%		

Select All Select Active Remove All Choose Another EDF Interval Workload Selection Assistant

Create LPAR Configuration

Click on "Copy LP" checkbox to select partitions to be copied to the active study

Single Spot on the Web to Get More Information

- zPCR Getting Started Page
<http://www.ibm.com/support/techdocs/atmastr.nsf/WebIndex/PRS1381>
 - Contains:
 - Downloadable Code
 - zPCR Users Guide
 - External File Layout documentation
 - Technical Support Information
 - Training materials in .avi format (voice over foils)
 - Education Exercises
 - 1 new Advanced Mode Exercise planned for 3Q 2010 – z10 to z196
 - Registration Information
 - Special Notices and FAQs
- Q&A and defect support are available through email: zpcr@us.ibm.com

IBM System z Capacity Planning in a nutshell

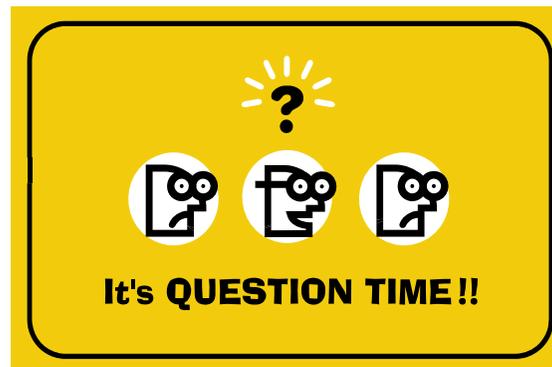


Don't use "single-number tables" for capacity comparisons!

Use zPCR to model before and after configurations

Summary

- **zPCR models your unique Processor configuration**
 - Based on LPARS, weights, # of logical processors, workload mix and Specialty Engines
- **Built upon LSPR benchmarks**
- **Using zPCR is Easy**
- **Use zPCR to correctly size your processor**



Acknowledgements

- **Many people contributed to this presentation including:**

John Fitch

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Jim Shaw

Kathy Walsh

Thank You
for attending!

In Advanced-Mode, some zPCR functions are not available

- **You cannot return to the Function Selection window**
- **Basic-mode study files cannot be created**
 - Studies will be saved in Advanced-Mode format
- **The MI Reference-CPU cannot be set independently of the Reference-CPU**
 - While viewing the Multi-image table you may set a “temporary” Reference-CPU.
- **Older LSPR Processor Capacity Ratios tables cannot be viewed,**
 - Including z/OS-1.8, z/OS-1.6, z/OS-1.4
 - To access these tables, start a second zPCR invocation in “Basic Mode”
 - Be sure the Reference-CPU settings are as desired

What has changed since zPCR C6.1c

- **Up to five LPAR configurations may defined in Advanced-Mode**
- **Reference-CPU controls have been restructured**
 - A single (global) Reference-CPU window replaces the independent SI Reference-CPU and MI Reference-CPU windows.
 - LPAR Configuration Capacity Planning results are now appropriately related to those in the LSPR Multi-Image Processor Capacity Ratios table
- **z/OS 1.8 LSPR Multi-Image Processor Capacity Ratios table has been removed;**
 - Only the table for the latest LSPR data will be provided (currently z/OS-1.9).
- **Can specify any z/OS release (\geq z/OS 1.4) in the detailed capacity plan**
 - Not every z/OS release is measured in LSPR
 - zPCR will select the most representative one from the published LSPR data
- **All output has been converted to HTML**
- **Added CSV format for Partition Detail Report/Utilized Capacity Report windows**
- **zPCR v6.3c only supports System z processors**
- **User Defined Mixes are no longer supported**



Advanced Technical Skills (ATS) North America

zPCR Capacity Sizing Lab – Part 2 Hands-on Lab

SHARE Session 7785

August 4, 2010

John Burg
Brad Snyder

Materials created by John Fitch and Jim Shaw

IBM



Agenda

- Lab Exercise Introduction
- Lab Exercise

Overview of Lab Exercise

- **XYZ Corporation Background**
 - Currently has System z9
 - 2094-707 (7 way GCPs)
 - Customer views it as having 3500 MIPS
 - Machine averages 92% busy during peak

 - **Plan being developed to replace with z10 EC**
 - Must have at least 20% additional capacity
 - at least 4200 MIPS
- Replace with sub capacity engines (6xx)

Lab Exercise – Tasks to Complete

- Task 1 - Create a model of the current LPAR Configuration
- Task 2 - Calibrate the model to XYZ Company's capacity designation
- Task 3 - Save the current study in Advanced-Mode
- Task 4 - Find an appropriate z10 replacement processor
- Task 5 - Model the intended LPAR host using Advanced Mode
- Task 6 - Review the Capacity results and save the Study
- Additional
 - Model 1 IFL in the proposed configuration
 - Model 1 zAAP in the proposed configuration