



Advanced Technical Skills (ATS) North America

zPCR Capacity Sizing Lab

SHARE - Sessions 8883/9098

March 2, 2011

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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 V7.1a
- Includes Advanced Mode Update
- What's new in zPCR V7.2a

■ 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



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zPCR Capacity Sizing Lab

Part 1 Introduction 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 V7.2a**
- **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

Introduction to LSPR

- **A set of representative SCP/workload environments**
 - SCPs: z/OS, z/VM, and Linux on System z
 - Workload categories: Low ←Relative Nest Intensity→ High
 - Current LSPR workload categories: Low, Average, High
 - zPCR extends published categories
 - Low-Avg
 - Avg-High
 - A methodology focused on processor capacity
 - No significant external constraints
 - Equivalent (reasonably high, e.g. $\geq 95\%$) processor utilization
- **A metric to communicate the results**
 - ITR: Internal Throughput Rate
 - Transactions or Jobs per processor busy second
- **Information stored on the web**
 - <https://www.ibm.com/servers/resourcelink/lib03060.nsf/pages/lspindex?OpenDocument>

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 LoLo-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

RNI-based Workload "Hint" Decision Table

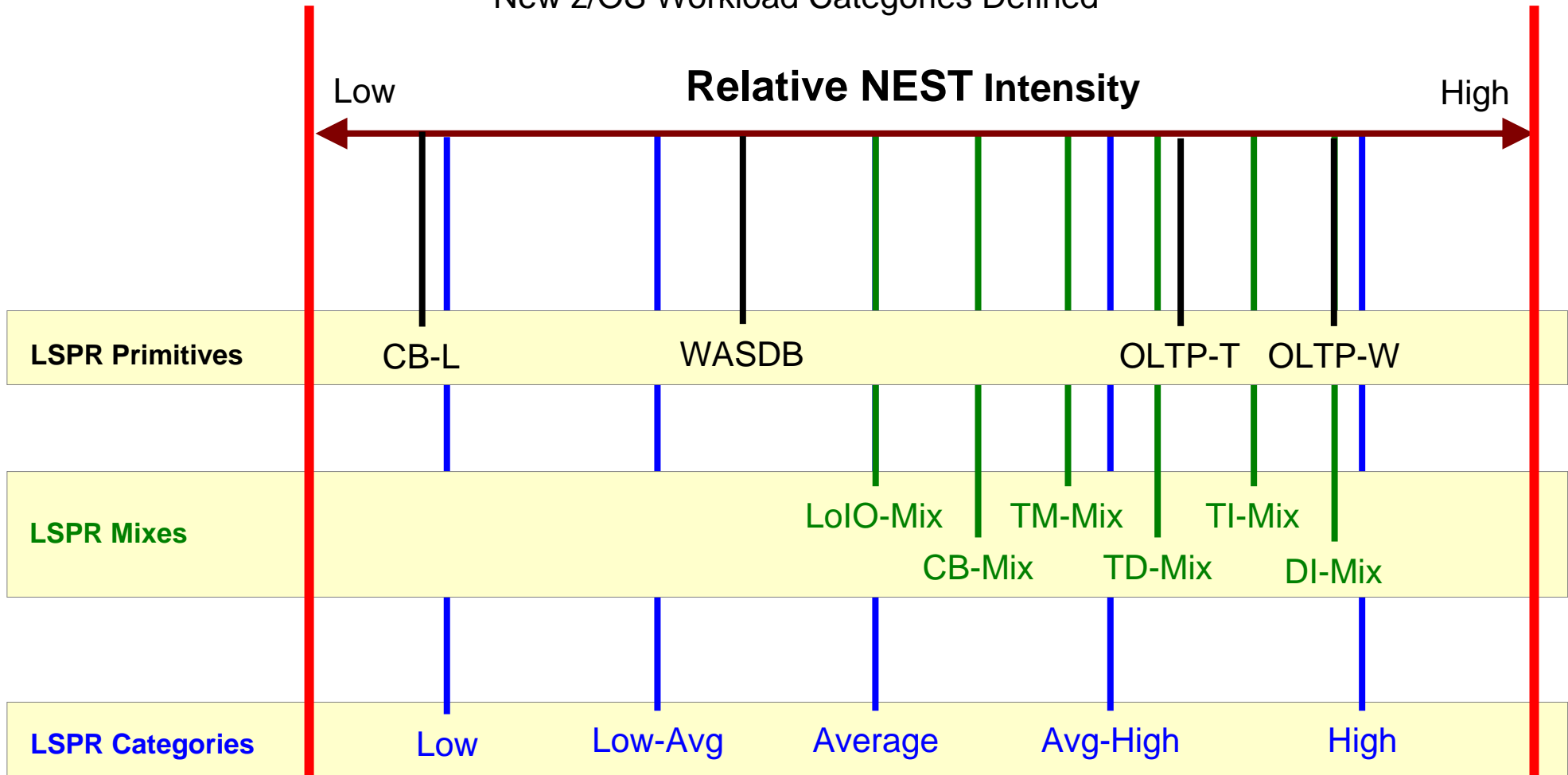
L1MP	RNI	Workload Hint
<3%	≥ 0.75	AVERAGE
	< 0.75	LOW
3% to 6%	>1.0	HIGH
	0.6 to 1.0	AVERAGE
	< 0.6	LOW
$>6\%$	≥ 0.75	HIGH
	< 0.75	AVERAGE

Notes: applies to z10 CPU MF data
table may change based on feedback

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

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

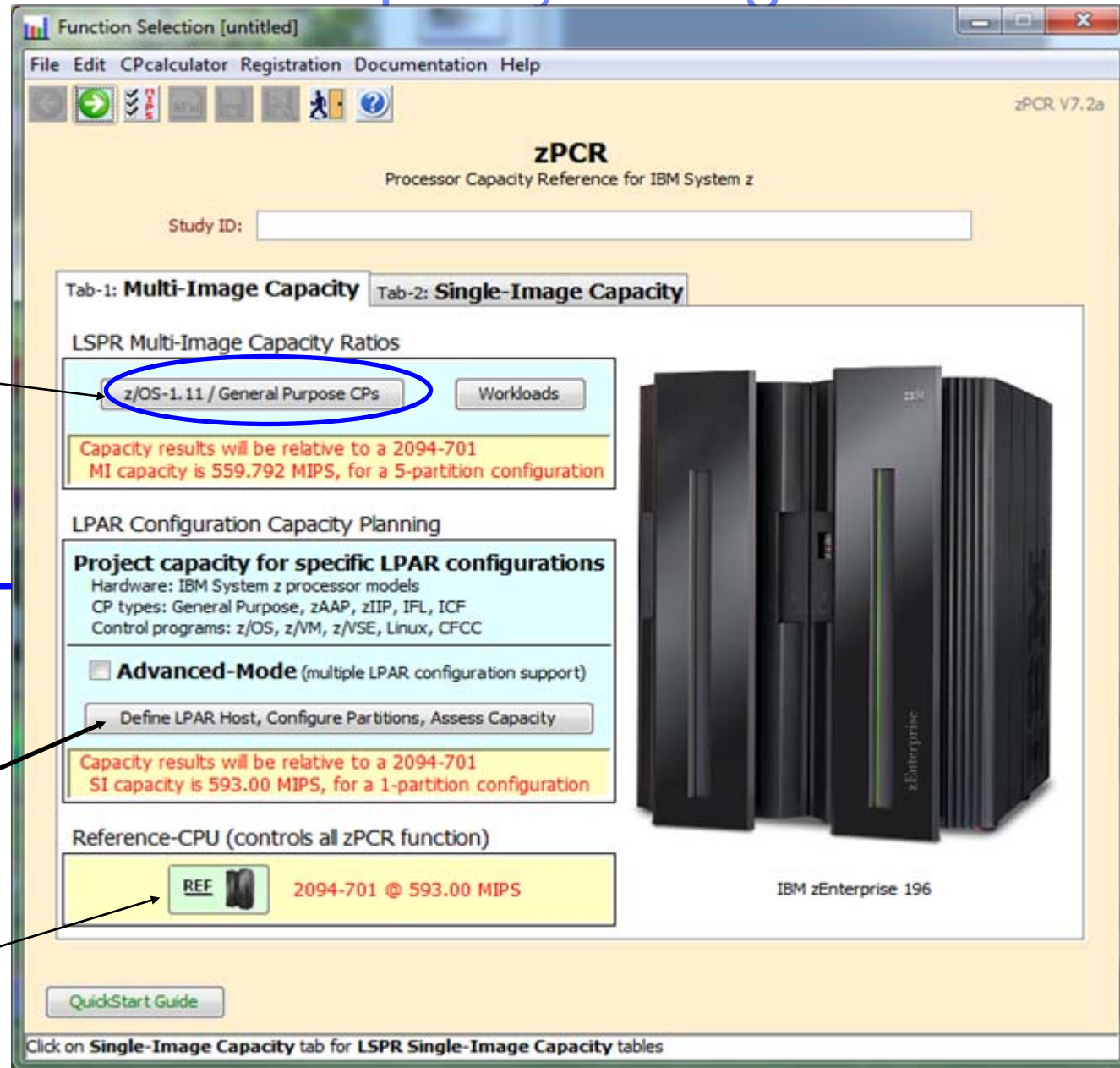
■ zPCR Sizing - LPAR Configuration Capacity Planning

- 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

What is new in zPCR C V7.2a

- **z/OS LSPR Single-Image and Multi-Image Tables enhanced**
 - The default processor table size has been reduced to include only z9 and later families
 - The user can now switch between this “subset” view and the full table
- **Enhanced EDF (Enterprise Data File) support**
 - Supports Power-Saving mode
 - Number of Logical engines parked will now be indicated
 - EDFs collected in different Time Zones will now be synced to the first EDF
- **Enhanced RMF support**
 - Power-Saving mode is now supported
- **zPCR External File format enhanced**
 - To indicate if a processor is in Power-Saving mode
- **Enhanced LPAR configurations definitions in Advanced-Mode**
 - These may now be renamed up to 20 characters in length
- **Basic Mode enhanced**
 - Users may now provide a 50 character description.
 - Shows on all input and report windows
 - Consistent with Advanced Mode
- **SMF 113 “Hint” workload**
 - New CPU MF workload window allows the user apply the “hint” workload to all partitions with a “Hint” workload assigned
- **SMF 113 terminology has been changed**
 - CPU MF CPU Measurement Facility

zPCR 7.2a “Basic Mode” Capacity Sizing Tool



MIPS Table

LSPR Multi-Image

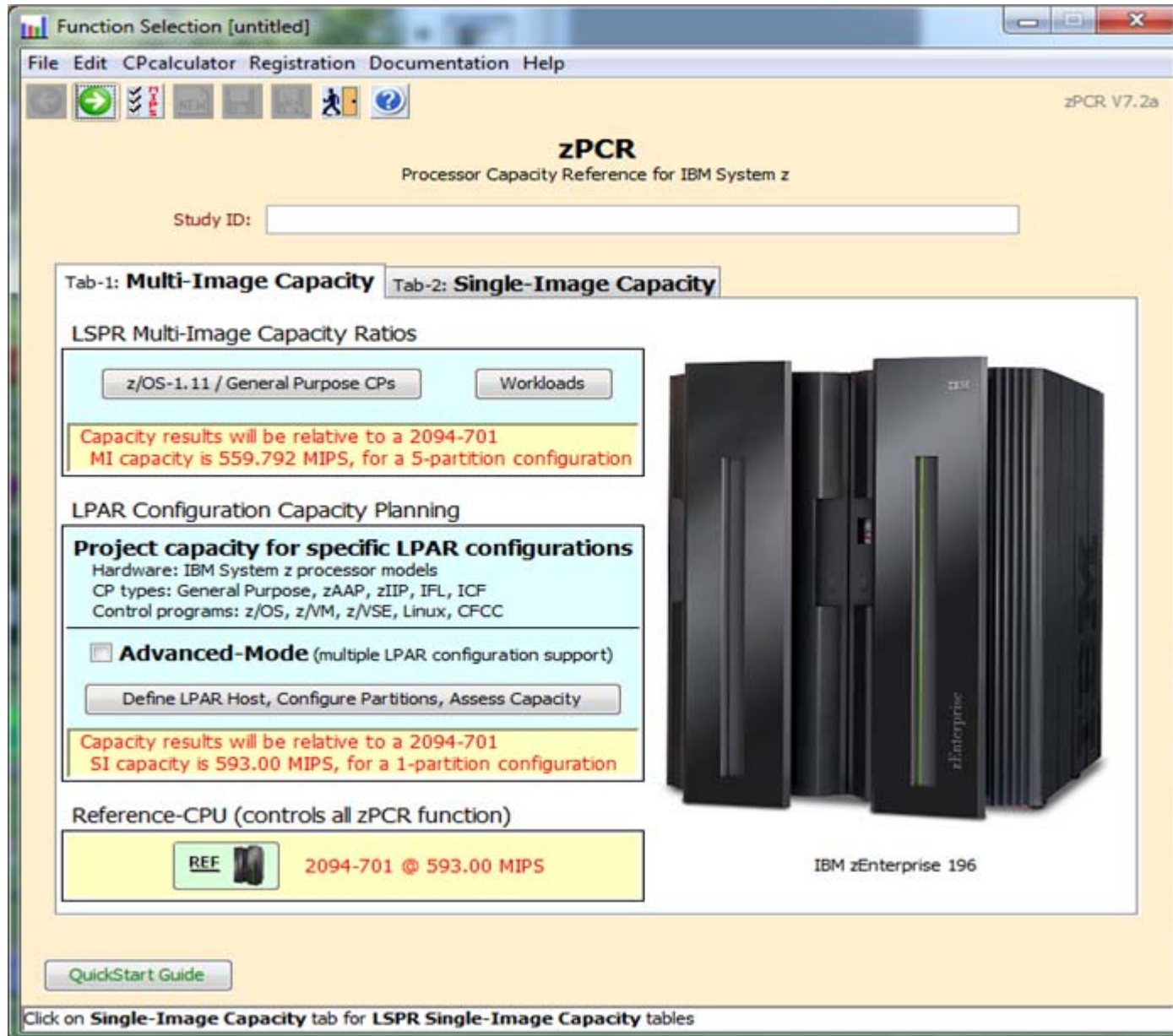
**zPCR LPAR
Configuration
Capacity Planning**

**Built on LSPR
Single-Image
MIPS Table**

zPCR V7.2a 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 and beyond in “Basic Mode” are “Basic Mode”

Introducing zPCR C V7.2a – Advanced Mode



zPCR Advanced Mode

- **Provides Capacity Comparisons between 2 LPAR configurations**
 - The “Current” Vs “Alternate” (Alt-1, Alt-2, Alt-3, Alt-4, Alt-5)
 - User can rename these to what ever they wish up to 20 characters
 - More efficient than running zPCR multiple times and manually comparing the results
 - Ability to drag & drop RMF partition reports, zPCR files and *EDF 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).

Note: EDF (Enterprise data Files) are new with zPCR 7.x and are created using CP3KEXTR

Summary of Advanced Mode function

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

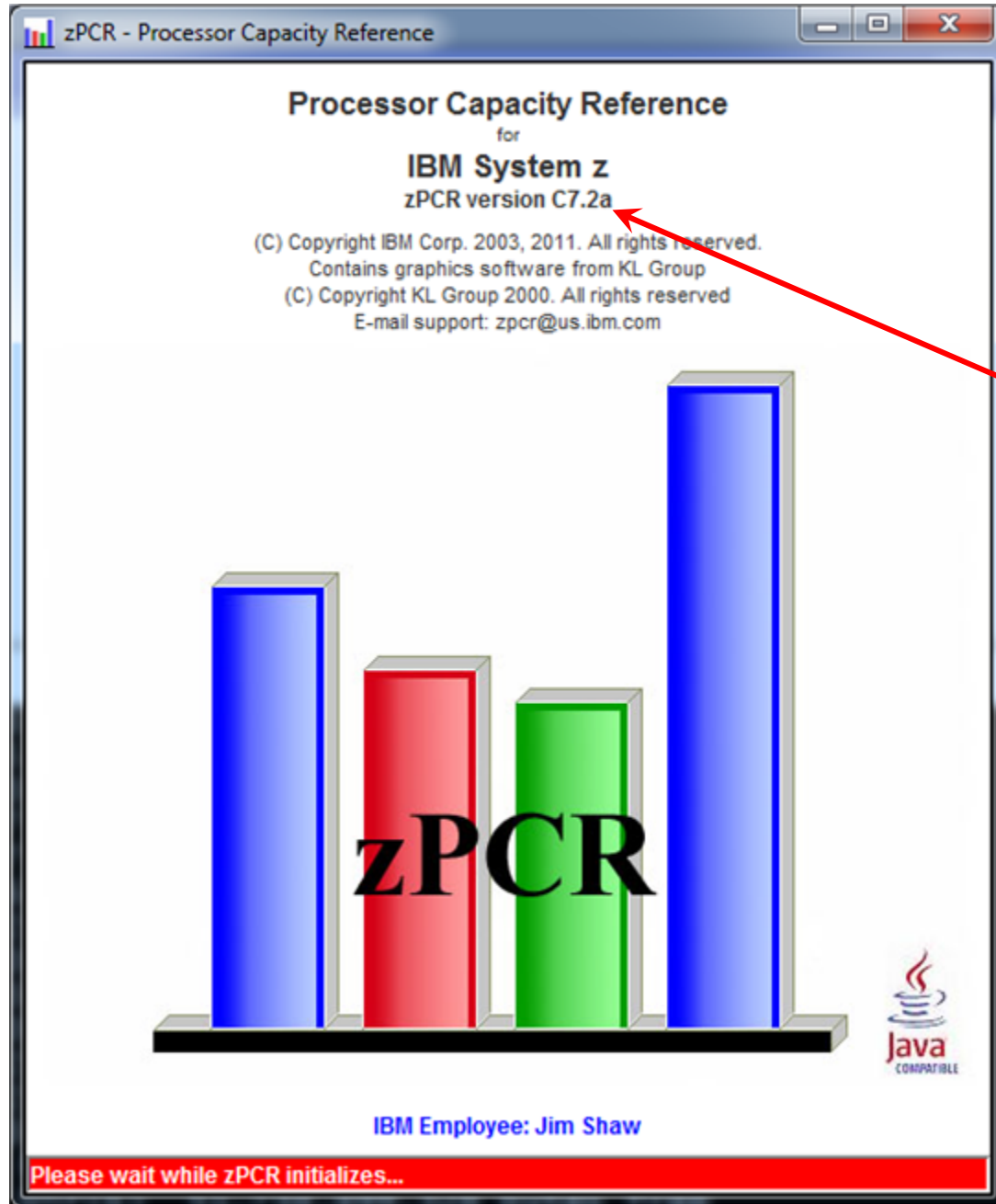
- **Several additional windows and functions are available**
 - *LPAR Host / Partition Comparison Reports*- To compare capacity results between LPAR configurations
 - *Margin of Error Consideration* - To show the effect on capacity when $\pm 5\%$ margin-of-error is applied
 - *Optimize SHR LCPs* – To 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

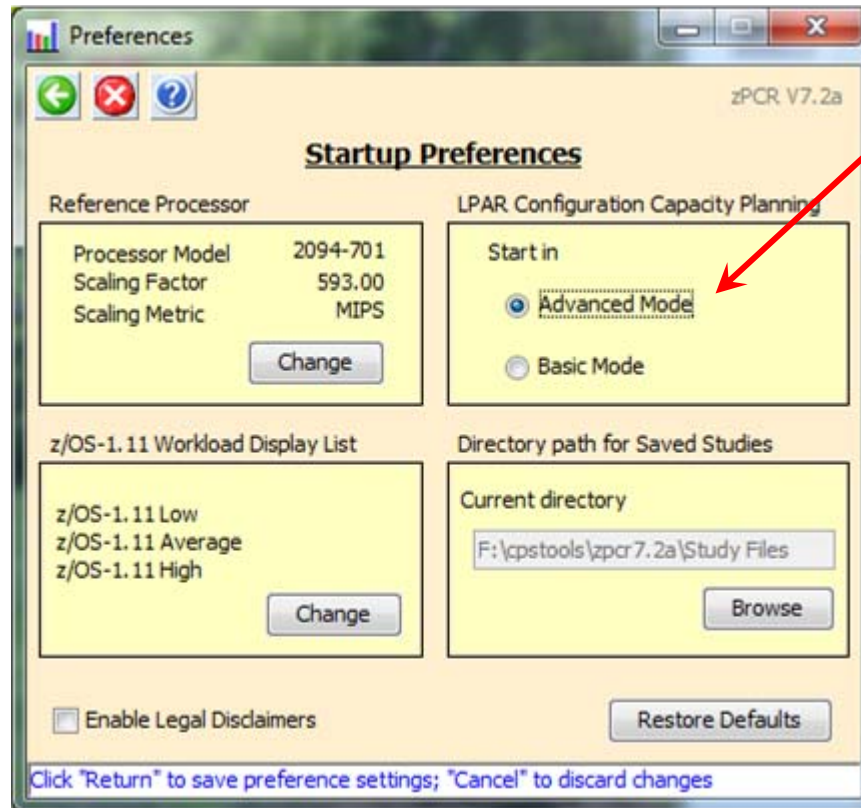
Set "Startup" preferences

Select "Advanced-Mode" check box

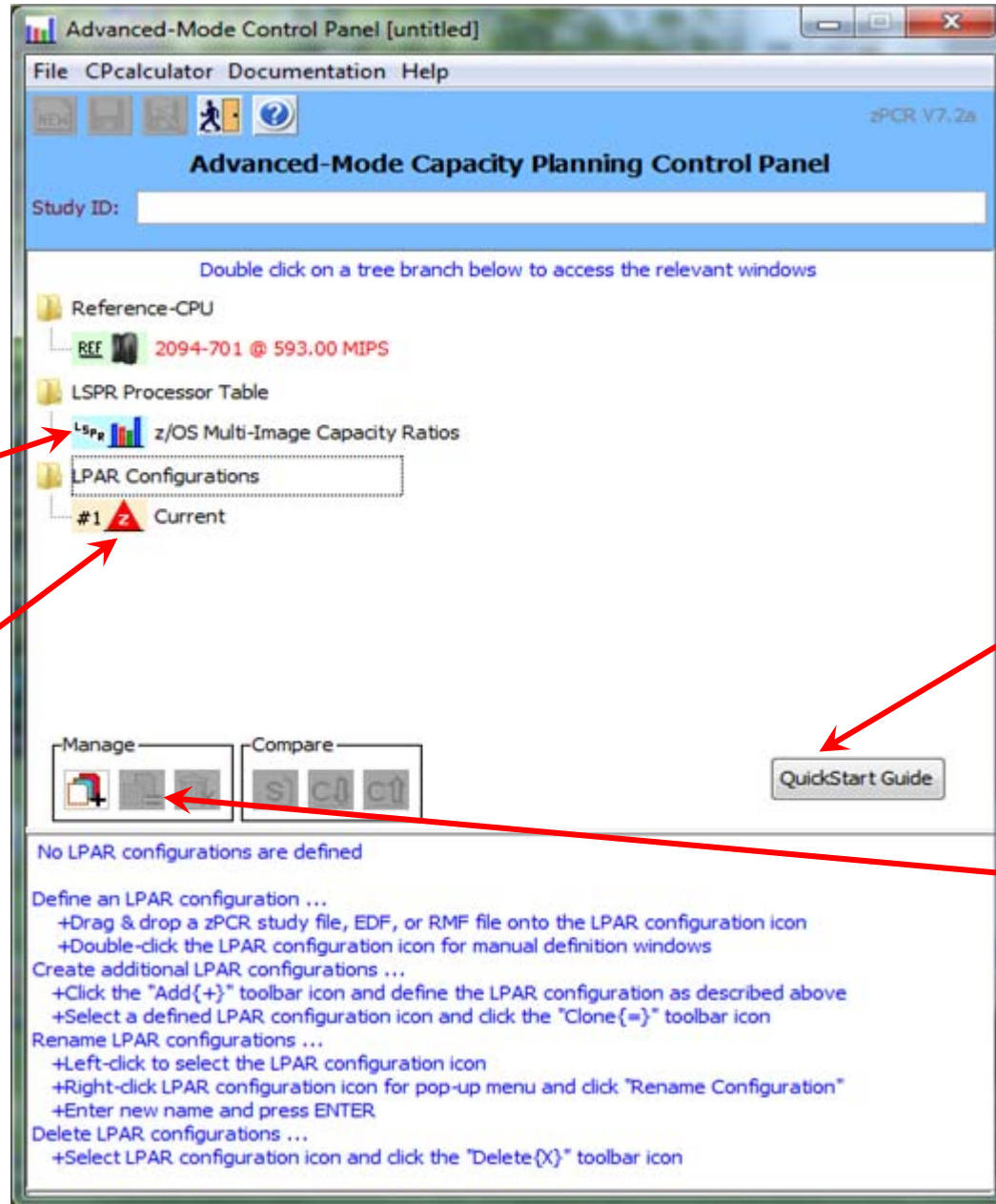
Press Enter
Advanced-Mode

zPCR Startup Preferences

Set "Advanced Mode" as the default
when starting zPCR



zPCR Advanced-Mode Capacity Planning Control Panel



View Multi-Image LSPR table

View "QuickStart" Guide

LPAR Configuration Planning Right "click" to rename up to 20 characters

Manage Multiple Configurations

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

zPCR Advanced-Mode Capacity Planning Control Panel

Configuration Renamed

Advanced-Mode Capacity Planning Control Panel

Study ID: Sample zPCR Study

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

- Reference-CPU
 - REF 2094-701 @ 593.00 MIPS
- LSPR Processor Table
 - LSPR z/OS Multi-Image Capacity Ratios
- LPAR Configurations
 - #1 2094-S18

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

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	4,822	517	502	1,084	551	7,477

Capacity basis: 2094-701 @ 593.00 MIPS for a single partition configuration

Configuration Summary

zPCR Advanced-Mode Capacity Planning Control Panel

Comparison Report

Advanced-Mode Capacity Planning Control Panel

Study ID: Sample zPCR Study

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

- Reference-CPU
 - REF 2094-701 @ 593.00 MIPS
- LSPR Processor Table
 - LSPR z/OS Multi-Image Capacity Ratios
- LPAR Configurations
 - #1 Current 2094-S18
 - #2 Proposed 2097-E26

Manage:

QuickStart Guide

#1	Current 2094-S18 ABC Production / IBM z9-EC Configuration 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	4,822	517	502	1,084	551	7,477

Capacity basis: 2094-701 @ 593.00 MIPS for a single partition configuration

Host Capacity Comparison Report

Host Capacity Comparison

zPCR V7.2a

LPAR Host Capacity Comparison Report

Capacity by Partition Type

Study ID: Sample zPCR Study

Current 2094-S18: ABC Production / IBM z9-EC Configuration

Proposed 2097-E26: ABC Production / IBM z10-EC Configuration

Capacity basis: 2094-701 @ 593.00 MIPS for a single partition configuration
z196 and z10 processor capacity for z/OS is represented with HiperDispatch turned ON

Partition Type	#1 Current 2094-S18 2094-S18/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1					#2 Proposed 2097-E26 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	4,822	4	10	19	1.900	7,152	+2,330	+48.3%
zAAP	1	1	1	1.000	517	1	1	1	1.000	778	+261	+50.5%
zIIP	1	1	1	1.000	502	1	1	1	1.000	705	+203	+40.4%
IFL	2	2	3	1.500	1,084	2	2	3	1.500	1,762	+678	+62.5%
ICF	1	1	1		551	1	1	1		828	+277	+50.3%
Total	9	15	27		7,477	9	15	25		11,225	+3,748	+50.1%

Comparison Report by Partition

Minimum Capacity Maximum Capacity

Show capacity as: Full Single CP

Consider Margin-of-Error

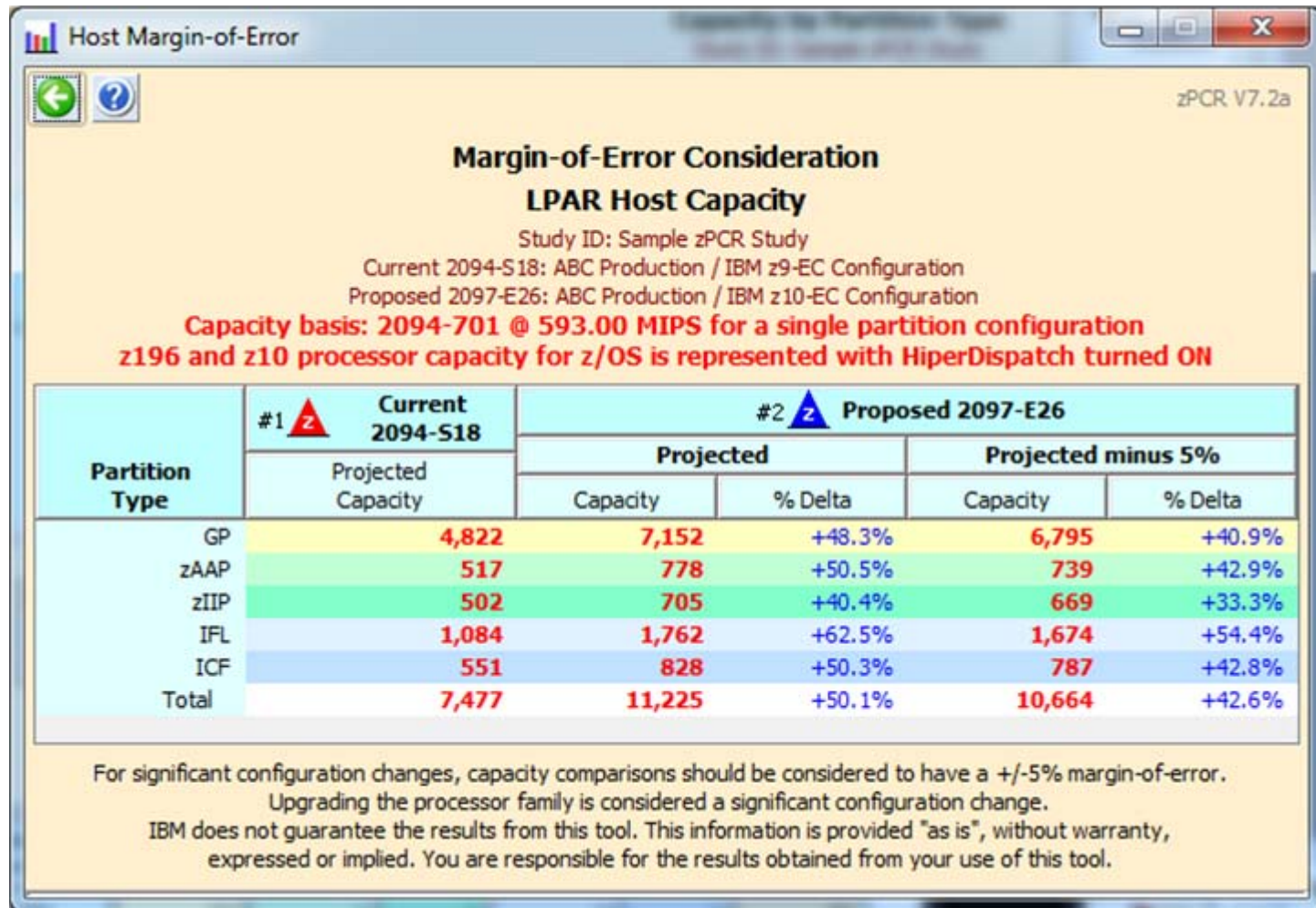
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 Upgrading the processor family is considered a significant configuration change.
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Comparison Report by Partition

Show Full or Single-CP capacity

Margin-of-Error

Margin-of-Error Report



Partition Capacity Comparison Report

Partition Capacity Comparison Report
 Based on Partition Minimum Capacity
 Study ID: Sample zPCR Study
 Current 2094-S18: ABC Production / IBM z9-EC Configuration
 Proposed 2097-E26: ABC Production / IBM z10-EC Configuration
Capacity basis: 2094-701 @ 593.00 MIPS for a single partition configuration
z196 and z10 processor capacity for z/OS is represented with HiperDispatch turned ON

Partition Identification List of All Included Partitions With Unique ID Metrics				#1 Current 2094-S18 2094-S18/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1						#2 Proposed 2097-E26 2097-E26/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1						Full Capacity (MIPS)	
				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*	Average	1	SHR	10	53.23%	2,587	1	SHR	8	700	53.23%		3,904	+1,317	+50.9%
GP	LP-02	z/OS-1.9*	Average	2	SHR	6	30.42%	1,479	2	SHR	6	400	30.42%		2,200	+721	+48.7%
GP	LP-03	z/OS-1.9*	High	3	SHR	4	15.21%	699	3	SHR	4	200	15.21%		966	+267	+38.2%
GP	LP-04	z/MM	High/LV	4	SHR	1	1.14%	57	4	SHR	1	15	1.14%	<input checked="" type="checkbox"/>	82	+25	+43.9%
zAAP	LP-02	z/OS-1.9*	Average	*2	SHR	1	100.00%	517	*2	SHR	1	400	100.00%		778	+261	+50.5%
zIIP	LP-03	z/OS-1.9*	High	*3	SHR	1	100.00%	502	*3	SHR	1	200	100.00%		705	+203	+40.4%
IFL	LP-05	Linux	Low/L	5	SHR	2	88.89%	964	5	SHR	2	200	88.89%		1,564	+600	+62.2%
IFL	LP-06	Linux	Low/L	6	SHR	1	11.11%	121	6	SHR	1	25	11.11%		198	+77	+63.6%
ICF	LP-07	CFCC	CFCC	7	DED	1	n/a	551	7	DED	1	n/a			828	+277	+50.3%

Change Controls

Commit Undo **Optimize SHR LCPs** Consider Margin-of-Error

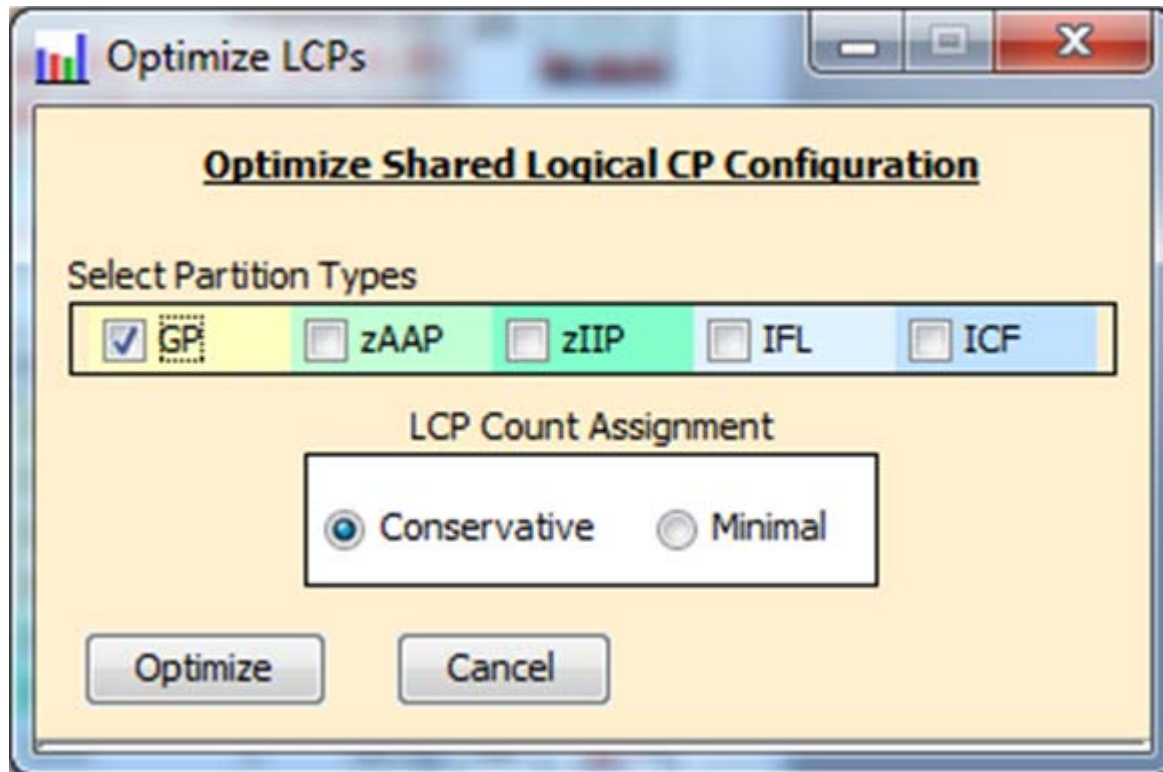
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 expressed or implied. You are responsible for the results obtained from your use of this tool.

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: Sample zPCR Study
Current 2094-S18: ABC Production / IBM z9-EC Configuration
Proposed 2097-E26: ABC Production / IBM z10-EC Configuration

Capacity basis: 2094-701 @ 593.00 MIPS for a single partition configuration
z196 and z10 processor capacity for z/OS is represented with HiperDispatch turned ON

Partition Identification List of All Included Partitions With Unique ID Metrics				#1 Current 2094-S18 2094-S18/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1						#2 Proposed 2097-E26 2097-E26/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1						Full Capacity (MIPS)		
				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*	Average	1	SHR	10	53.23%		2,587	1	SHR	7	700	53.23%	<input type="checkbox"/>	3,957	+1,370	+53.0%
GP	LP-02	z/OS-1.9*	Average	2	SHR	6	30.42%		1,479	2	SHR	5	400	30.42%	<input type="checkbox"/>	2,225	+746	+50.4%
GP	LP-03	z/OS-1.9*	High	3	SHR	4	15.21%		699	3	SHR	2	200	15.21%	<input type="checkbox"/>	945	+246	+35.2%
GP	LP-04	z/VM	High/LV	4	SHR	1	1.14%	✓	57	4	SHR	1	15	1.14%	<input checked="" type="checkbox"/>	82	+25	+43.9%
zAAP	LP-02	z/OS-1.9*	Average	*2	SHR	1	100.00%		517	*2	SHR	1	400	100.00%	<input type="checkbox"/>	789	+272	+52.6%
zIIP	LP-03	z/OS-1.9*	High	*3	SHR	1	100.00%		502	*3	SHR	1	200	100.00%	<input type="checkbox"/>	739	+237	+47.2%
IFL	LP-05	Linux	Low/L	5	SHR	2	88.89%		964	5	SHR	2	200	88.89%	<input type="checkbox"/>	1,566	+602	+62.4%
IFL	LP-06	Linux	Low/L	6	SHR	1	11.11%		121	6	SHR	1	25	11.11%	<input type="checkbox"/>	198	+77	+63.6%
ICF	LP-07	CFCC	CFCC	7	DED	1	n/a		551	7	DED	1	n/a		<input type="checkbox"/>	829	+278	+50.5%

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.
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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: Sample zPCR Study

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

- Reference-CPU
 - REF 2094-701 @ 593.00 MIPS
- LSPR Processor Table
 - z/OS Multi-Image Capacity Ratios
- LPAR Configurations
 - #1 Current 2094-S18
 - #2 Proposed 2097-E26

Manage Compare QuickStart Guide

Proposed 2097-E26 ABC Production / IBM z10-EC Configuration z10-EC LPAR Host: 2097-E26/700						
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	15	1	1	3	1	21
Capacity	7,209	789	739	1,764	829	11,329

Capacity basis: 2094-701 @ 593.00 MIPS for a single partition configuration

Select "RMF" report and drag it onto the "Proposed 2097-E26" configuration

RMF Interval Selection

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	14	99.97%
2.	SYSB	2084-312	09/23/2008	07.59.00	001.00.00	14	98.90%
3.	SYSB	2084-312	09/24/2008	07.59.00	000.59.59	14	94.37%
4.	SYSB	2084-312	09/25/2008	07.59.00	000.59.59	14	91.63%
5.	SYSB	2084-312	09/26/2008	07.59.00	001.00.00	14	93.10%
6.	SYSB	2084-312	09/29/2008	07.59.00	000.59.59	14	99.93%

Table View

Show All Pools Number of intervals: 10

Default SCP/Workload for Partitions

GP/zAAP/zIIP	z/OS	Average
IFL	Linux	Low/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

“Proposed 2097-E26” configuration

Select an interval

Default SCPs for Partitions

Default z/OS workload is Average

Get specific partitions from RMF

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

Copy Partitions from RMF

RMF Report File: F:\CPSTOOLS\zPCR7.2a\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 Proposed 2097-E26 (ABC Production / IBM z10-EC Configuration)
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				Workload Assignment Metrics			
	Active	No.	Type	Name	SCP	Workload Assigned	Mode	LCPs	Weight	Weight %	CAP	Method Used	Physical Utilization	DASD I/O Rate/Sec
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1	GP	SYSB	z/OS-1.11	Average	SHR	7.4	431	43.1%		Default	24.96%	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	GP	TESTCICS	z/OS-1.11	Average	SHR	2.0	20	2.0%		Default	1.22%	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	3	GP	PROD1	z/OS-1.11	Average	SHR	3.5	91	9.1%		Default	12.96%	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	4	GP	TEST1	z/OS-1.11	Average	SHR	1.5	7	0.7%		Default	0.64%	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	5	GP	TEST2	z/OS-1.11	Average	SHR	1.5	7	0.7%		Default	0.60%	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	6	GP	PROD2	z/OS-1.11	Average	SHR	8.3	444	44.4%		Default	51.96%	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	*1	zAAP	SYSB	z/OS-1.11	Average	SHR	3	431	41.2%		Default	18.36%	

Select All Select Active Remove All Chose Another RMF Interval Workload Selection Assistant

Copy Partitions

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

Determine the Workload

Determine the appropriate SCP/workloads

Workload assigned from the "Method" used

Transfer partitions to zPCR

Copy Partitions from RMF
 RMF Report File: F:\CPSTOOLS\zPCR7.2a\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 Proposed 2097-E26 (ABC Production / IBM z10-EC Configuration)
 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				Workload Assignment Metrics			
	Active	No.	Type	Name	SCP	Workload Assigned	Mode	LCPs	Weight	Weight %	CAP	Method Used	Physical Utilization	DASD I/O Rate/Sec
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1	GP	SYSB	z/OS-1.11	Average	SHR	7.4	431	43.1%		ASD I/O	24.96%	1,400
<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	GP	TESTCICS	z/OS-1.11	Average	SHR	2.0	20	2.0%		Default	1.22%	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	3	GP	PROD1	z/OS-1.11	Average	SHR	3.5	91	9.1%		Default	12.96%	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	4	GP	TEST1	z/OS-1.11	Average	SHR	1.5	7	0.7%		Default	0.64%	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	5	GP	TEST2	z/OS-1.11	Average	SHR	1.5	7	0.7%		Default	0.60%	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	6	GP	PROD2	z/OS-1.11	Average	SHR	8.3	444	44.4%		Default	51.96%	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	*1	zAAP	SYSB	z/OS-1.11	Average	SHR	3	431	41.2%		DASD I/O	18.26%	

Select All Select Active Remove All Chose Another RMF Interval Workload Selection Assistant

Copy Partitions

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

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 Documentation

zPCR V7.2a

Partition Detail Report

Based on LSPR Data for IBM System z Processors
Study ID: Sample zPCR Study

#2 Proposed 2097-E26
Description: ABC Production / IBM z10-EC Configuration

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 basis: 2094-701 @ 593.00 MIPS for a single partition configuration
z196 and 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*	Average	SHR	7	700	40.09%	<input type="checkbox"/>	2,923	5,104
<input checked="" type="checkbox"/>	2	GP	LP-02	z/OS-1.9*	Average	SHR	5	400	22.91%	<input type="checkbox"/>	1,643	3,587
<input checked="" type="checkbox"/>	3	GP	LP-03	z/OS-1.9*	High	SHR	2	200	11.45%	<input type="checkbox"/>	697	1,217
<input checked="" type="checkbox"/>	4	GP	LP-04	z/VM	High/LV	SHR	1	15	0.86%	<input checked="" type="checkbox"/>	61	61
<input checked="" type="checkbox"/>	5	GP	SYSB	z/OS-1.11	Average	SHR	8	431	24.68%	<input type="checkbox"/>	1,744	5,653
<input checked="" type="checkbox"/>	*2	zAAP	LP-02	z/OS-1.9*	Average	SHR	1	400	48.13%	<input type="checkbox"/>	375	779
<input checked="" type="checkbox"/>	*5	zAAP	SYSB	z/OS-1.11	Average	SHR	1	431	51.87%	<input type="checkbox"/>	388	747
<input checked="" type="checkbox"/>	*3	zIIP	LP-03	z/OS-1.9*	High	SHR	1	200	100.00%	<input type="checkbox"/>	738	738
<input checked="" type="checkbox"/>	6	IFL	LP-05	Linux	Low/L	SHR	2	200	88.89%	<input type="checkbox"/>	1,565	1,761
<input checked="" type="checkbox"/>	7	IFL	LP-06	Linux	Low/L	SHR	1	25	11.11%	<input type="checkbox"/>	198	892
<input checked="" type="checkbox"/>	8	ICF	LP-07	CFCC	CFCC	DED	1	n/a		<input type="checkbox"/>	830	830

Table View

Display: All Partitions Includes Only

Pools:

- GP
- zAAP
- zIIP
- IFL
- ICF

Capacity Summary by Pool

CP Pool	RCPs	Partitions	LCPs	Capacity
GP	10	5	23	7,068
zAAP	1	2	2	762
zIIP	1	1	1	738
IFL	2	2	3	1,763
ICF	1	1	1	830
Totals	15	11	30	11,161

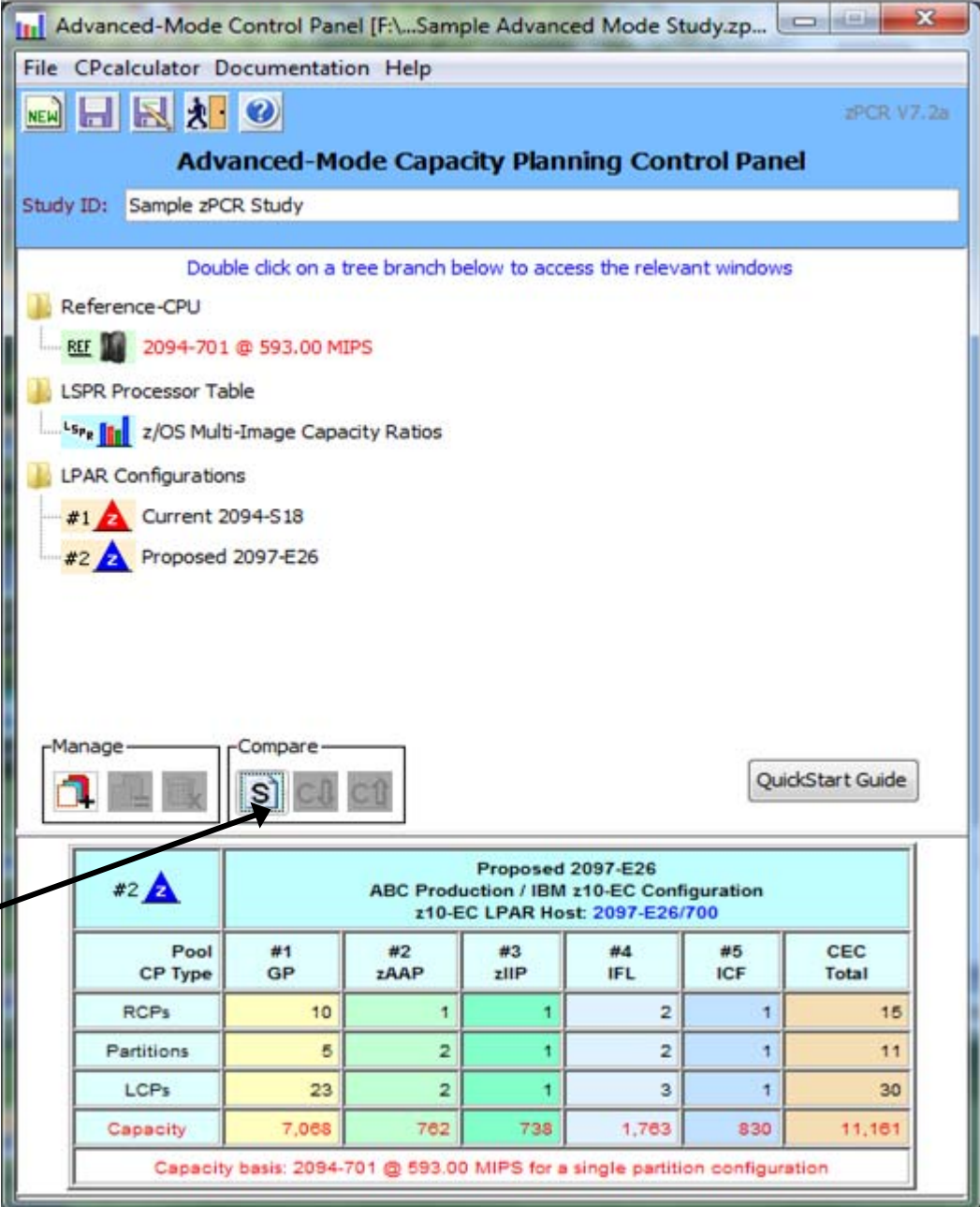
Host Summary Modify SCP/Workload

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.
IBM does not guarantee the results from this tool. This information is provided "as is", without warranty, expressed or implied. You are responsible for the results obtained from your use of this tool.

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' for a 'Sample zPCR Study'. The interface includes a menu bar (File, CPcalculator, Documentation, Help), a toolbar with icons for 'NEW', 'Save', 'Print', 'Help', and 'Info', and a 'zPCR V7.2a' version indicator. The main area displays a tree view with the following structure:

- Reference-CPU
 - REF 2094-701 @ 593.00 MIPS
- LSPR Processor Table
 - LSPR z/OS Multi-Image Capacity Ratios
- LPAR Configurations
 - #1 Current 2094-S18
 - #2 Proposed 2097-E26

Below the tree view are 'Manage' and 'Compare' toolbars. The 'Compare' toolbar contains the 'Host Capacity Summary' icon (a blue square with a white 'S' and a document symbol), which is highlighted by a callout box. A 'QuickStart Guide' button is also present. The bottom section of the window displays a table for the 'Proposed 2097-E26' configuration.

Proposed 2097-E26 ABC Production / IBM z10-EC Configuration z10-EC LPAR Host: 2097-E26/700						
Pool CP Type	#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	23	2	1	3	1	30
Capacity	7,068	762	738	1,763	830	11,161

Capacity basis: 2094-701 @ 593.00 MIPS for a single 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**.

Host Capacity Summary

zPCR V7.2a

LPAR Host Capacity Summary Report

Study ID: Sample zPCR Study

Capacity basis: 2094-701 @ 593.00 MIPS for a single partition configuration
z196 and z10 processor capacity for z/OS is represented with HiperDispatch turned ON

LPAR Configuration		Full Capacity (based on usable RCP count)					Total
Identity	Hardware	GP	zAAP	zIIP	IFL	ICF	
#1	Current 2094-S18 2094-S18/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1	4,822	517	502	1,084	551	7,477
#2	Proposed 2097-E26 2097-E26/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1	7,068	762	738	1,763	830	11,161

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.
 IBM does not guarantee the results from this tool. This information is provided "as is", without warranty, expressed or implied. You are responsible for the results obtained from your use of this tool.

Position mouse on LPAR configuration to display description

Sum of the capacity values

Show **Full** or **Single-CP** capacity

Advanced-Mode Control Panel [F:\...Sample Advanced Mode Study.zp...]

File CPcalculator Documentation Help

NEW Save Print Exit Help zPCR V7.2a

Advanced-Mode Capacity Planning Control Panel

Study ID: Sample zPCR Study

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

- Reference-CPU
 - REF 2094-701 @ 593.00 MIPS
- LSPR Processor Table
 - z/OS Multi-Image Capacity Ratios
- LPAR Configurations
 - #1 Current 2094-S18
 - #2 Proposed 2097-E26

Manage Compare QuickStart Guide

Pool CP Type	Proposed 2097-E26 ABC Production / IBM z10-EC Configuration 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	23	2	1	3	1	30
Capacity	7,068	762	738	1,763	830	11,161

Capacity basis: 2094-701 @ 593.00 MIPS for a single partition configuration

Exit zPCR

Save Study

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

New workload name

SCP/Workload Conversion zPCR V7.2a

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

zAAP and zIIP partitions inherit the SCP/Workload of their associated GP partition

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

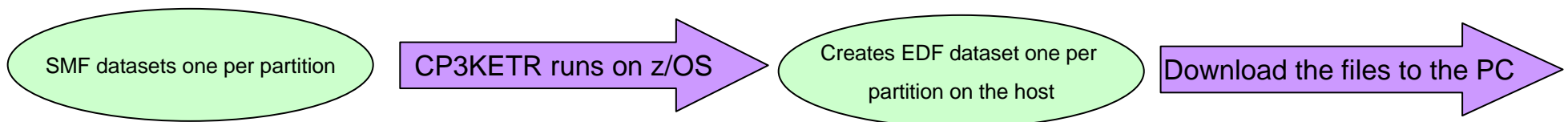
Load EDF(s)

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	
Processor	Model	
Speed	Setting	
Books	Configured	
Books	Unused	
Maximum	CPs	
Maximum	Partitions	
CP Type	Assigned	Unused
GP		
zAAP		
zIIP		
IFL		
ICF		
Total		

Logical Partition Configuration

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

Define LPAR Host Processor

Specify Host

Create Host and Partitions From

EDF RMF

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

DASD I/O data available

Sort on GP Pool Utilization

EDF Interval Selection

EDF Intervals
EDF File Name: I:\zpcr\burg.edf

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	CPU-MF	
8.	CEC7675	2817-780	2010-07-16	13:30:00	00:30:00	61	✓	✓	27.23%
9.	CEC7675	2817-780	2010-07-16	14:00:00	00:30:00	61	✓	✓	27.06%
10.	CEC7675	2817-780	2010-07-16	14:30:00	00:30:00	61	✓	✓	26.88%
11.	CEC7675	2817-780	2010-07-16	15:00:00	00:30:00	61	✓	✓	25.06%
12.	CEC7675	2817-780	2010-07-16	15:30:00	00:30:00	61	✓	✓	24.97%
7.	CEC7675	2817-780	2010-07-16	13:00:00	00:30:00	61	✓	✓	23.37%
6.	CEC7675	2817-780	2010-07-16	12:30:00	00:30:00	61	✓	✓	22.57%
5.	CEC7675	2817-780	2010-07-16	12:00:00	00:30:00	61	✓	✓	22.57%

Table View

Show All Pools Number of intervals: 12

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

CPU MF (SMF 113) data available

Important Considerations when getting LPAR configuration metrics

Parked Engines for the partition.
None for this interval

DASD I/Os per second from RMF 74s

LPAR Configuration from EDF
 z/OS SMF Data Set Name: JPBURG.WSCSYSC.SMF.SYSC.JUL16.T
 CP2KEXTR Version: CP2KEXTR07/23/10
 EDF File Name: I:\zpcr\burg.edf
 Interval #8: Date=2010-07-16 Time=13:30:00 Length=00:30:00
CEC ID: CEC7675; GP Processor Model = 2817-780
 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 Workload		Partition Configuration					Workload Assignment Metrics					
	Active	No.	Type	Name	SCP	Workload Assignment	CPU-MF Hint	Mode	CPs		Weight	Weight %	CAP	HD Active	Method Used	Physical Utilization	DASD I/O Rate/Sec	RNI
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1	GP	TOSP2	z/OS-1.11	Average	Average	SHR	4	10	25.0%			<input checked="" type="checkbox"/>	DASD I/O	4.68%	3,557.4	1.24
<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	25.0%			Default	0.00%			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	6	GP	TOSP1	z/OS-1.11	Average		SHR	2	10	25.0%			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	25.0%			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%			

Pass the mouse over the "CPU-MF Hint" workload to reveal the actual metrics used

HiperDispatch active for the partition

"RNI" for the partition

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 for 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

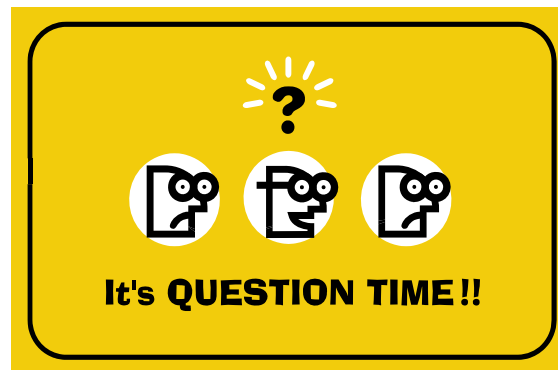


Don't use "single-number tables" for capacity comparisons!

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

Brad Snyder

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



Advanced Technical Skills (ATS) North America

zPCR Capacity Sizing Lab Part 2 Hands on Lab

SHARE - Session 9098

March 2, 2011

John Burg
Brad Snyder
Bill Schray

Materials created by John Fitch and Jim Shaw

IBM

**Advanced
Technical
Skills**

TECHNICAL SALES
NORTH AMERICA

Agenda

- Lab Exercise Introduction
- Lab Exercise

Overview of Lab Exercise

■ **XYZ Corporation Background**

- Currently has System z10 EC
 - 2097-707 (7 way GCPs)
 - Customer views it as having 5100 MIPS
 - Machine averages 92% busy during peak

■ **Plan being developed to replace with z196**

- Must have at least 20%+ additional capacity
 - at least 6150 MIPS

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 z196 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
- Review Rename function