zPCR Capacity Sizing Lab

SHARE - Sessions 13097 / 12674

February 7, 2013

John Burg

Materials created by John Fitch and Jim Shaw

IBM

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zPCR Capacity Sizing Labs

- **Part 1 - Intro and Overview**
  - zPCR Introduction
  - Includes Advanced Mode Update
  - What's new up through zPCR V8.1 in Back Up
- **Part 2 – Hands-on Lab**
  - 1 Exercise to demonstrate the use of Advanced Mode functions in zPCR
    - 6 Tasks
    - 2 Additional Analysis to Try
  - Use as a refresher

zPCR Capacity Sizing Lab – Part 1 Introduction and Overview

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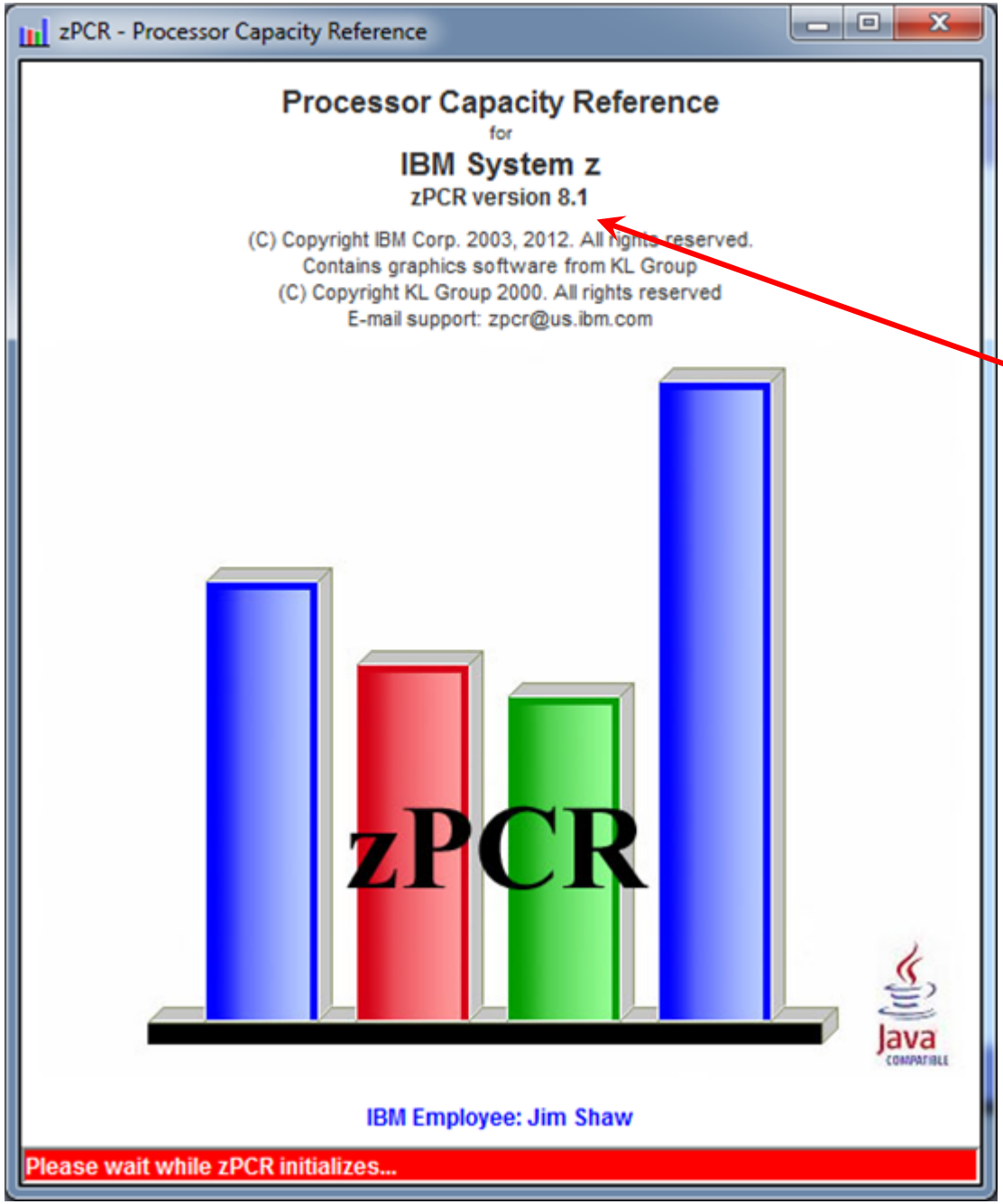
Agenda

- Introducing zPCR
- LSPR Background
- MIPS Tables vs. zPCR LPAR Configuration Capacity Planning
- zPCR Basic / Advanced Mode
- zPCR Preferences
- zPCR Execution Flow
- EDF Files
- zPCR Output
- Where to get more Information
- Summary

Introducing zPCR

- **Provides capacity relationships for System z processors, considering**
  - LPAR configurations
  - 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 ±5%
- **A PC based tool written in Java for Windows XP/Win 7**
  - "As Is", no charge tool available from the web
- **New Processor Announcements available in zPCR for:**
  - IBM Account Teams - at Announcement
  - Customers - generally within 30 days after Announcement

zPCR Logo Window

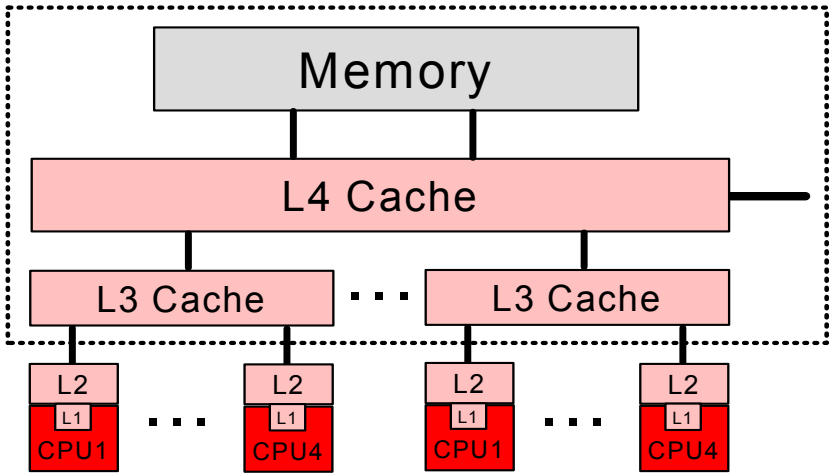


Version Identification

New Day Dawning in System z Capacity Planning

Processor Design
- **CPU**
- **Memory Hierarchy (Nest)**

Hipervisor (PR/SM)
- **Amount of virtualization**



Nest

Operating System
- **Virtualization at address space level**

Workload Characteristics
- **Instructions**
- **Dispatch Profile**
- **I/O Rate**

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
  - A methodology focused on processor capacity
  - No significant external constraints
  - Equivalent (reasonably high, e.g. >= 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**
  - **https://www.ibm.com/servers/resourcelink/lib03060.nsf/pages/lsprindex?OpenDocument**

LSPR Benchmarks

- 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
  - **LSPR tables are labeled based on the z/OS operating system level used at time of the benchmark**
- Cannot directly compare relative processor capacity across different versions of LSPR benchmarks

LSPR Workload Categories

- Various combinations of 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**

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, e.g. “MIPS Tables”
  - Used to develop the MSU rating

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

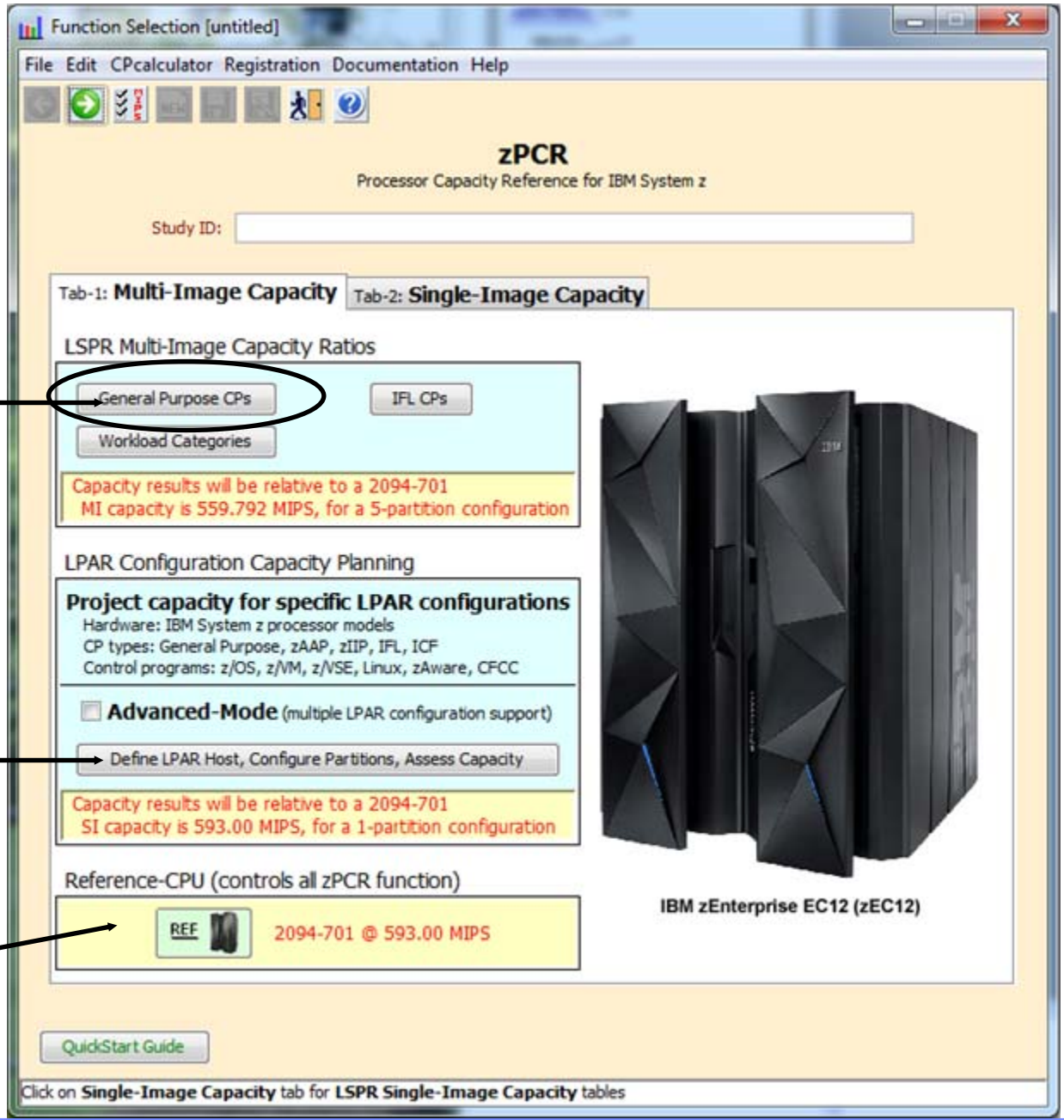
zPCR Home Page

MIPS Table

LSPR Multi-Image

zPCR LPAR Configuration Capacity Planning

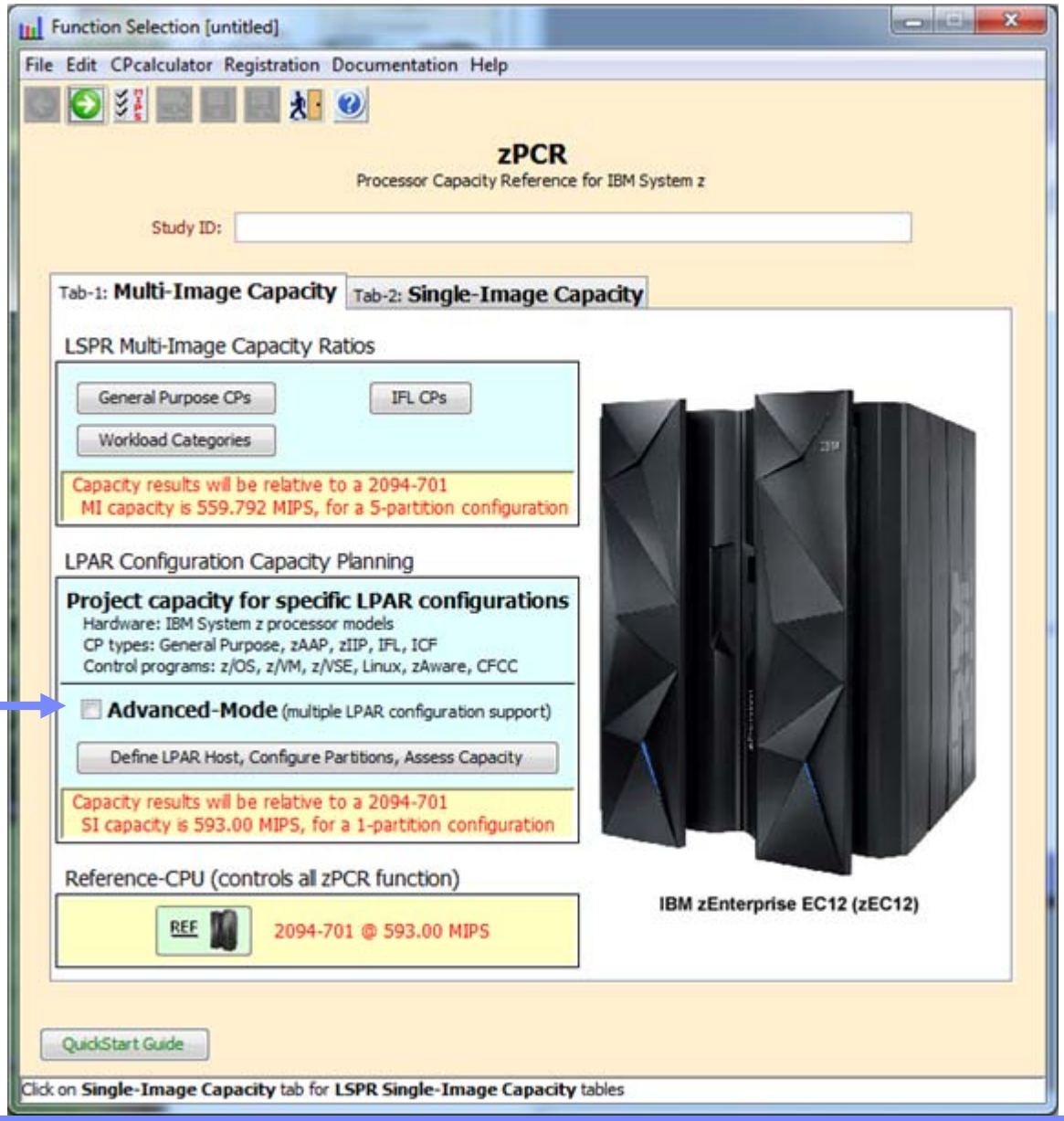
Setting the Reference Processor



zPCR Basic Mode and Advanced Mode

- **zPCR can be run in 2 Modes:**
  - Basic Mode
    - Operates on 1 processor configuration at a time
  - Advanced Mode
    - Operates up to 7 processor configurations at a time
    - Shows Capacity Comparisons between 2 LPAR configurations
    - More efficient than running zPCR multiple times
      - Manually comparing the results
    - Recommended Mode

Introducing zPCR– Advanced Mode



zPCR Advanced Mode

- **Provides Capacity Comparisons between 2 processor configurations**
  - The "Configuration #1" Vs ("Configuration #2, Configuration #3…Configuration #7)
  - 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"
- **Recommended when comparing capacity changes including:**
  - 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 for z/OS and CP3KVMEXT for z/VM**

Advanced Mode Function

- **Multiple processor configurations**
  - Up to seven can be defined
- **Several additional functions are available**
  - *LPAR Host / Partition Comparison Reports*
    - Compares capacity results between LPAR configurations
  - *Margin of Error Consideration*
    - Shows the effect on capacity when ±5% margin-of-error is applied
  - *Optimize SHR LCPs*
    - Optimizes LCPs
  - *LPAR Host Capacity Summary*
    - Summarizes MIPS by pool type for Current and all Alternates
- **All capacity values based on a single Reference-CPU setting**
  - 1-way processors only

Reference CPU and Typical

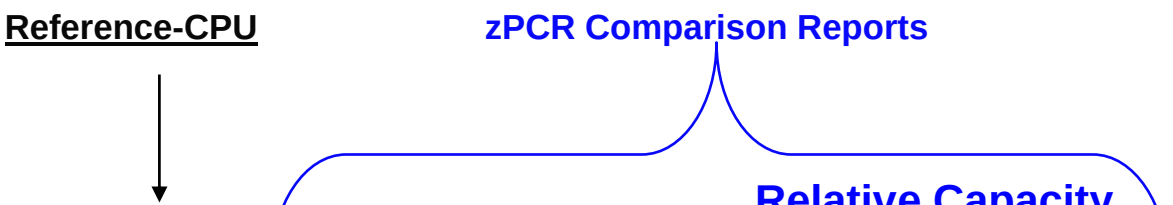
Reference Processor

- Used to scale the capacity all of the LSPR processors relative to this processor
  - Must be set to any IBM System z 1-way model (GCP model)

"Typical"

- 2094-701
  - 593 MIPS
- IBM recommended and widely accepted in the Industry

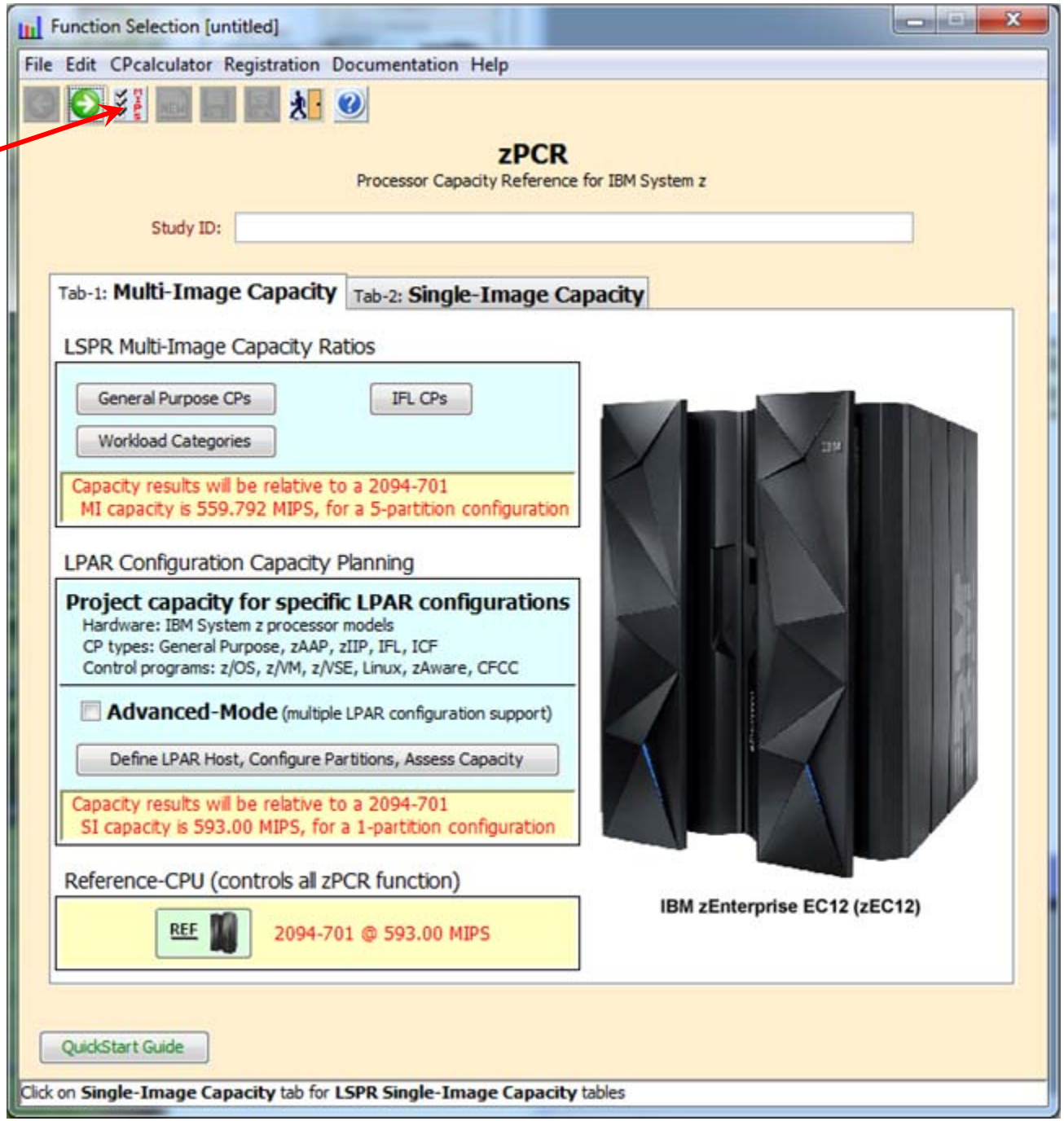
It is critical all capacity being compared be obtained using a consistent ***Reference-CPU*** metric



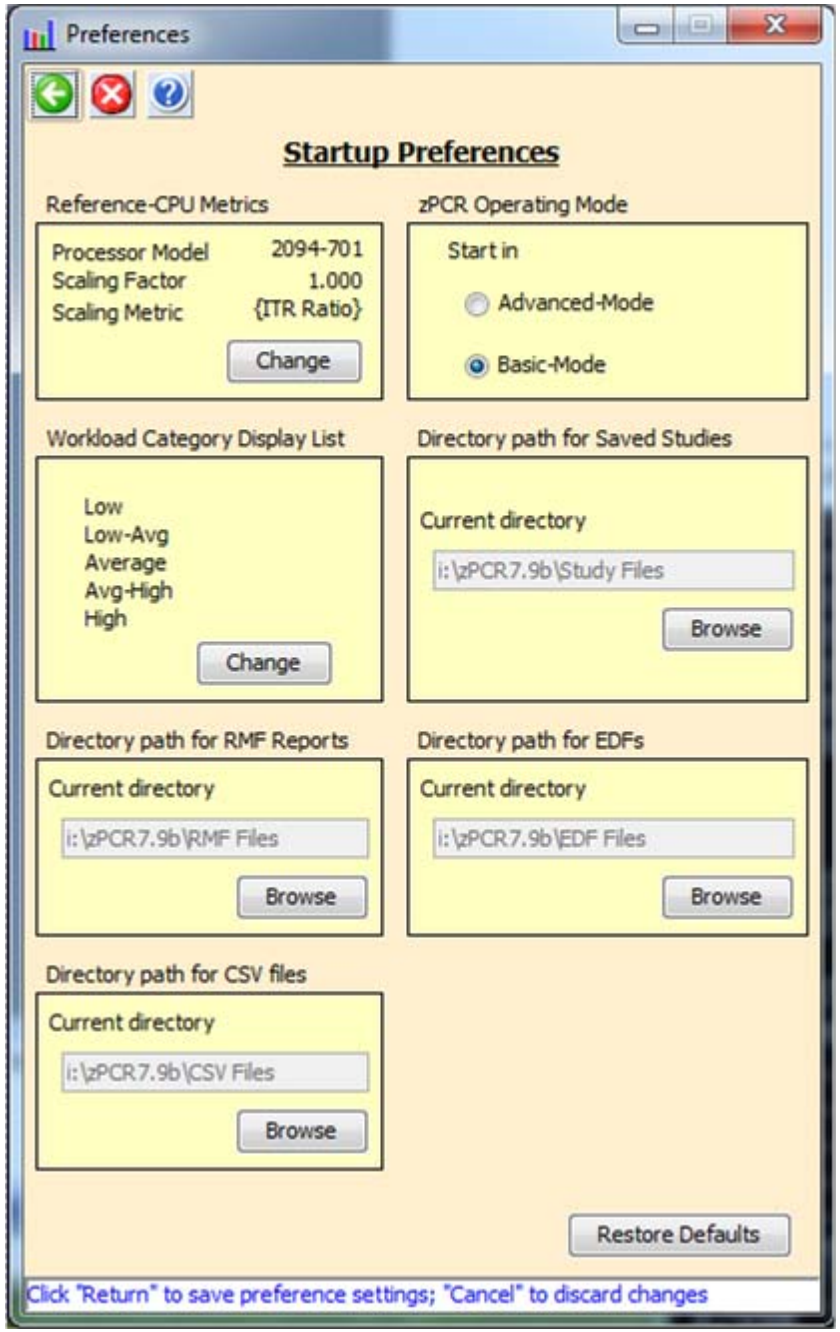
	2094-701	z196 708	zEC12 708	Relative Capacity Difference
Relative Capacity	1.00	13.61	16.97	1.25
MIPS	593	8,072	10,063	(1,991 MIPS) 1.25

zPCR Function Selection Window

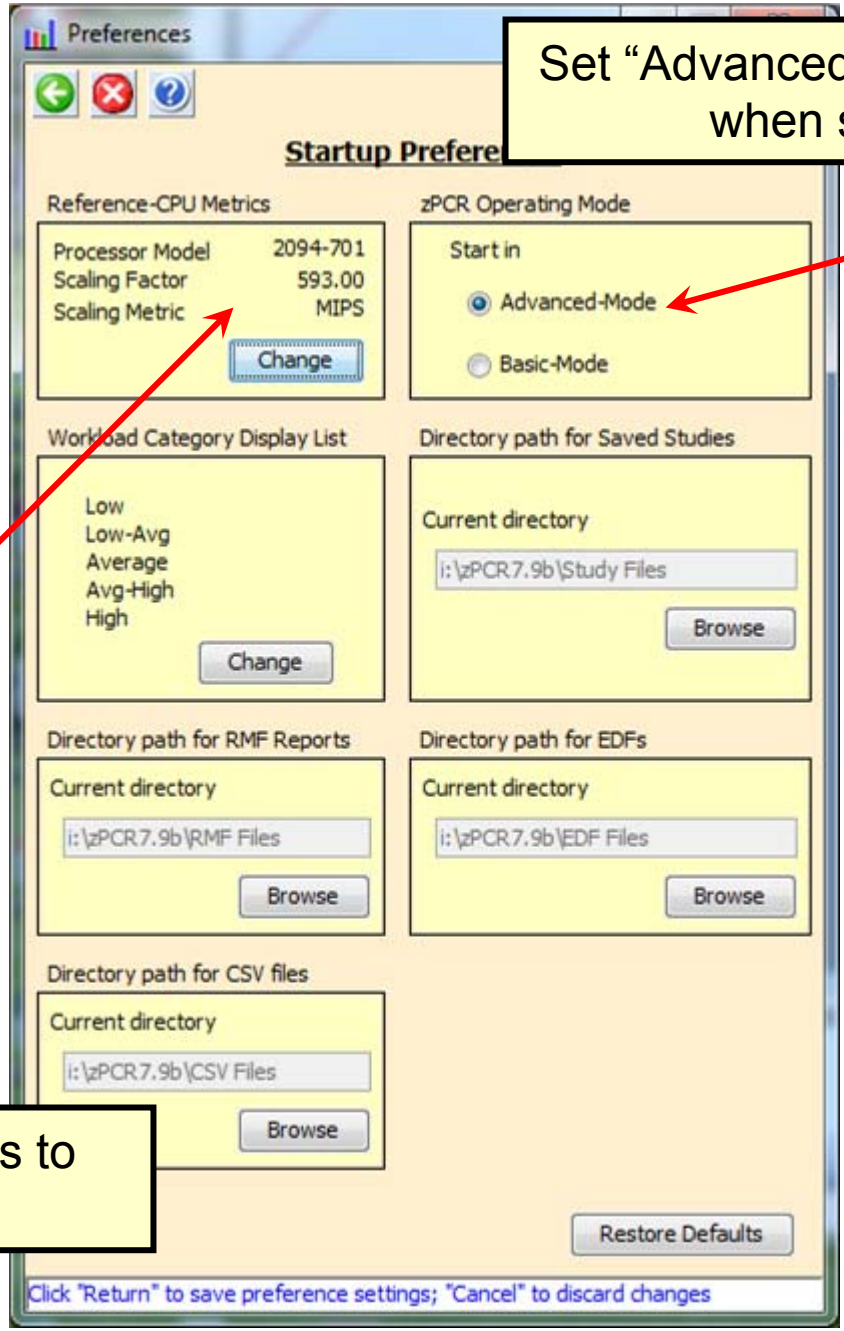
Set “Startup” preferences



Default zPCR Startup Preferences



Recommended zPCR Startup Preferences



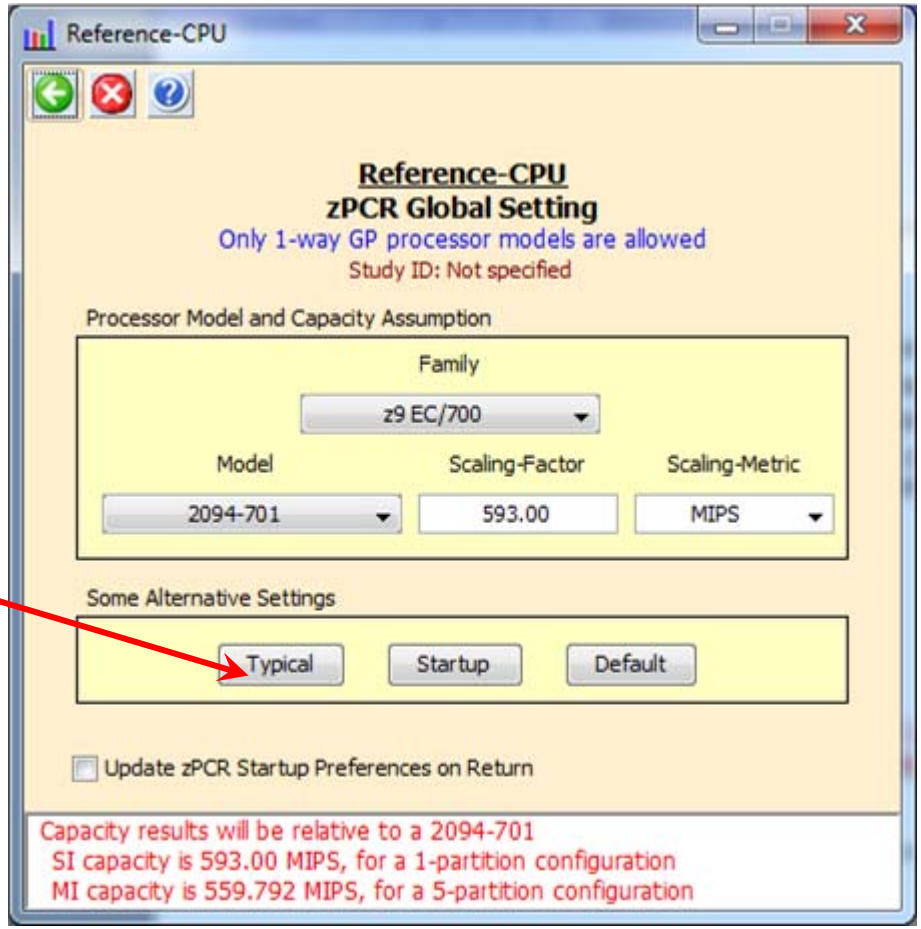
Set "Advanced Mode" as the default when starting zPCR

Set "Reference-CPU" Metrics to "Typical" as the default

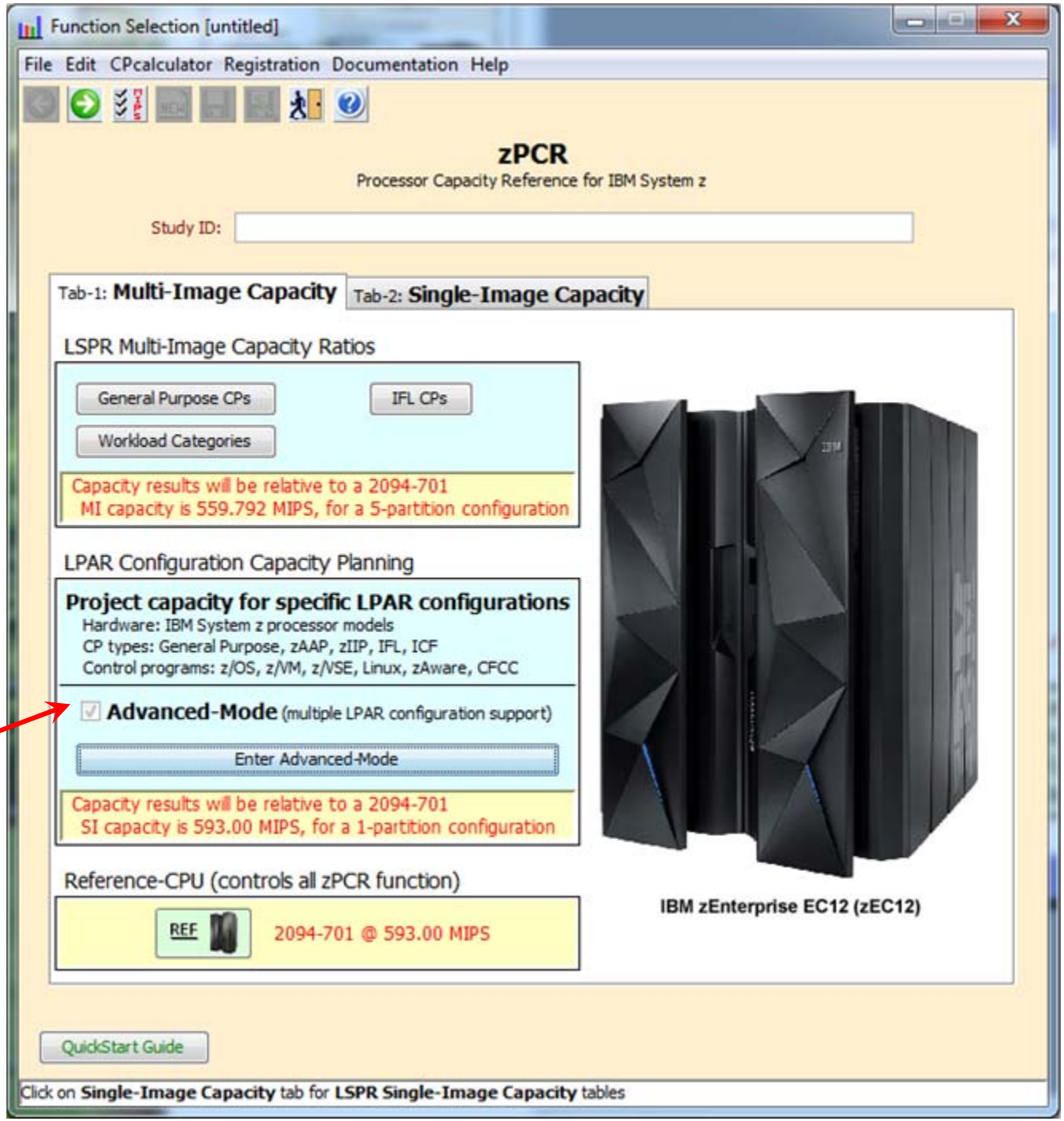
Reference CPU continued…

- **Reference Processor Window**
  - The ***Reference-CPU*** window is accessed primarily from the ***Function Selection*** window by clicking the **Reference-CPU** button

Select “Typical”

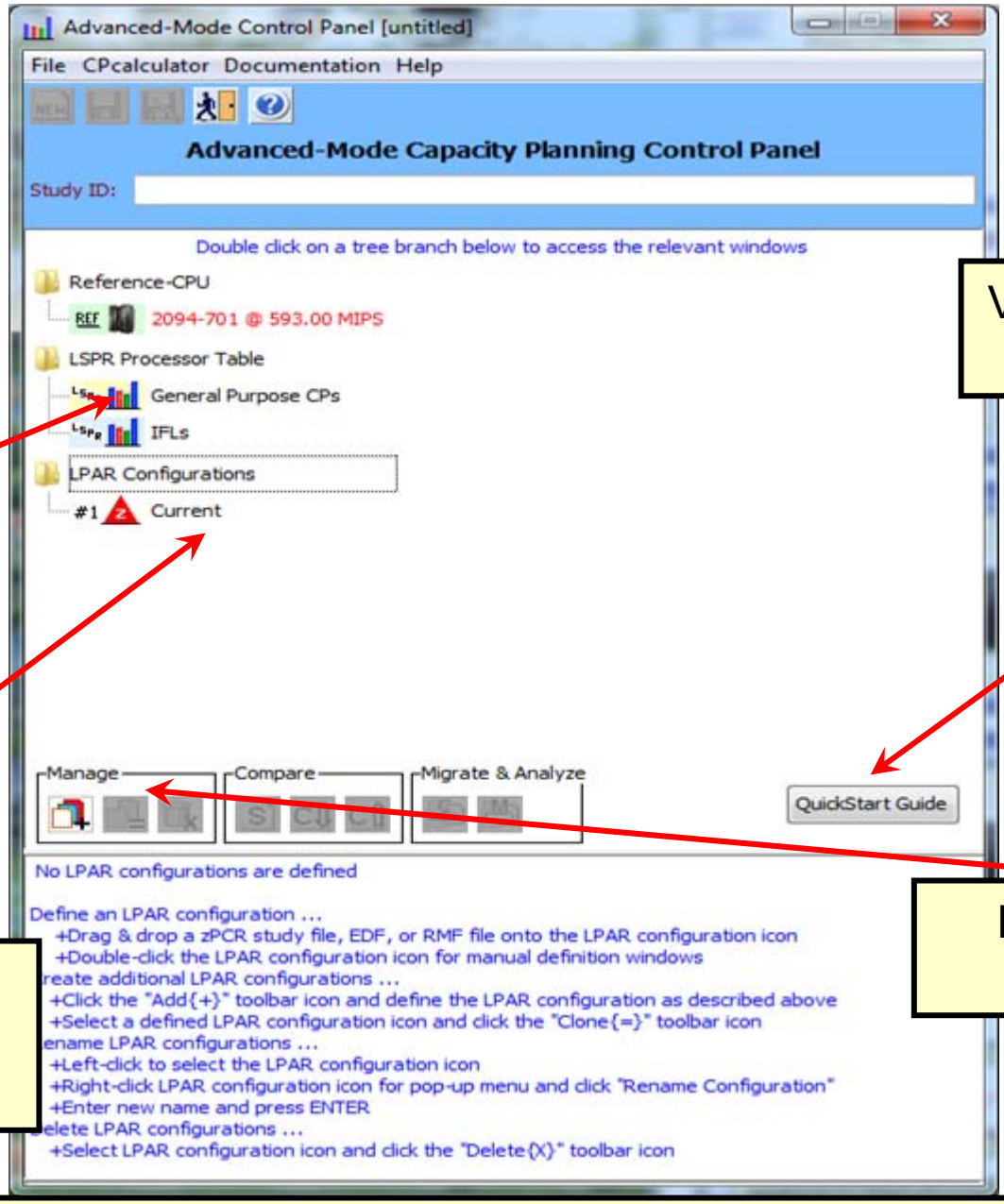


zPCR Function Selection Window



Select “Advanced-Mode” check box and press “Enter Advanced-Mode”

zPCR Advanced-Mode Capacity Planning Control Panel



View Muli-Image LSPR table

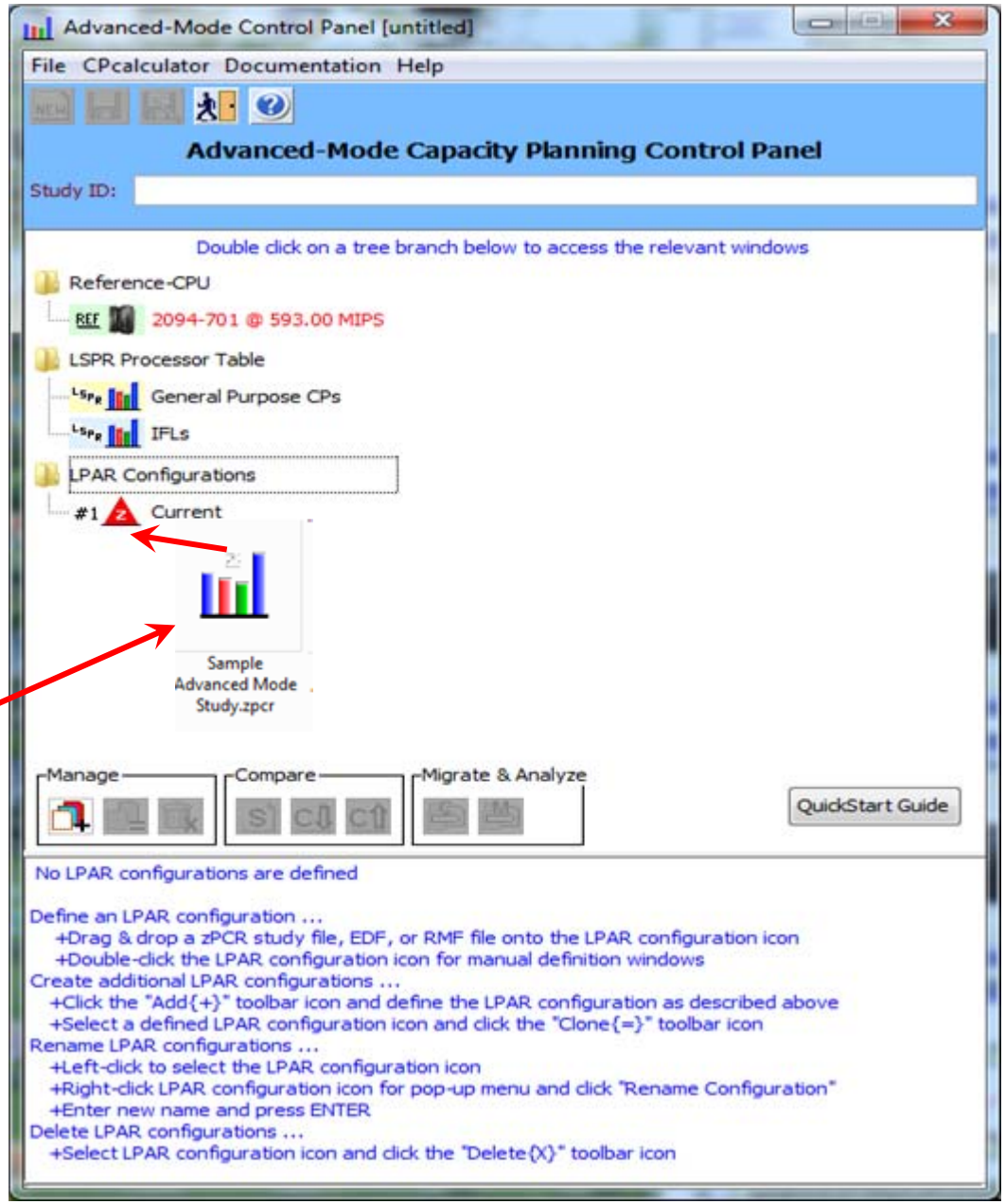
View "QuickStart" Guide

LPAR Configurations Right "click" to rename up to 20 characters

Manage Multiple Configurations

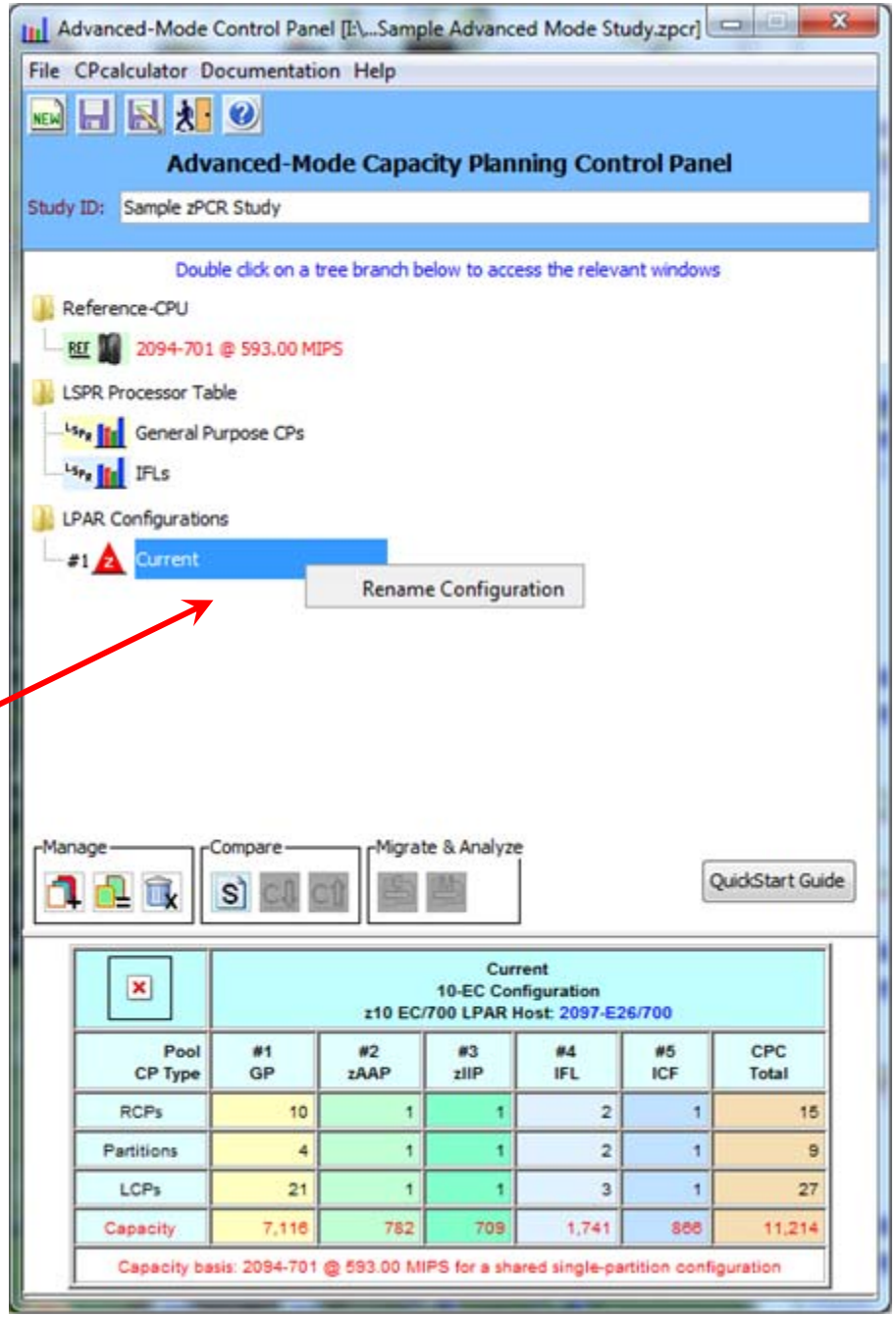
You may drag and drop zPCR study files, RMF reports or EDFs onto the LPAR Configurations planning area or use the file drop down to load zPCR study files.

zPCR Advanced-Mode Capacity Loading a file via Drag and Drop



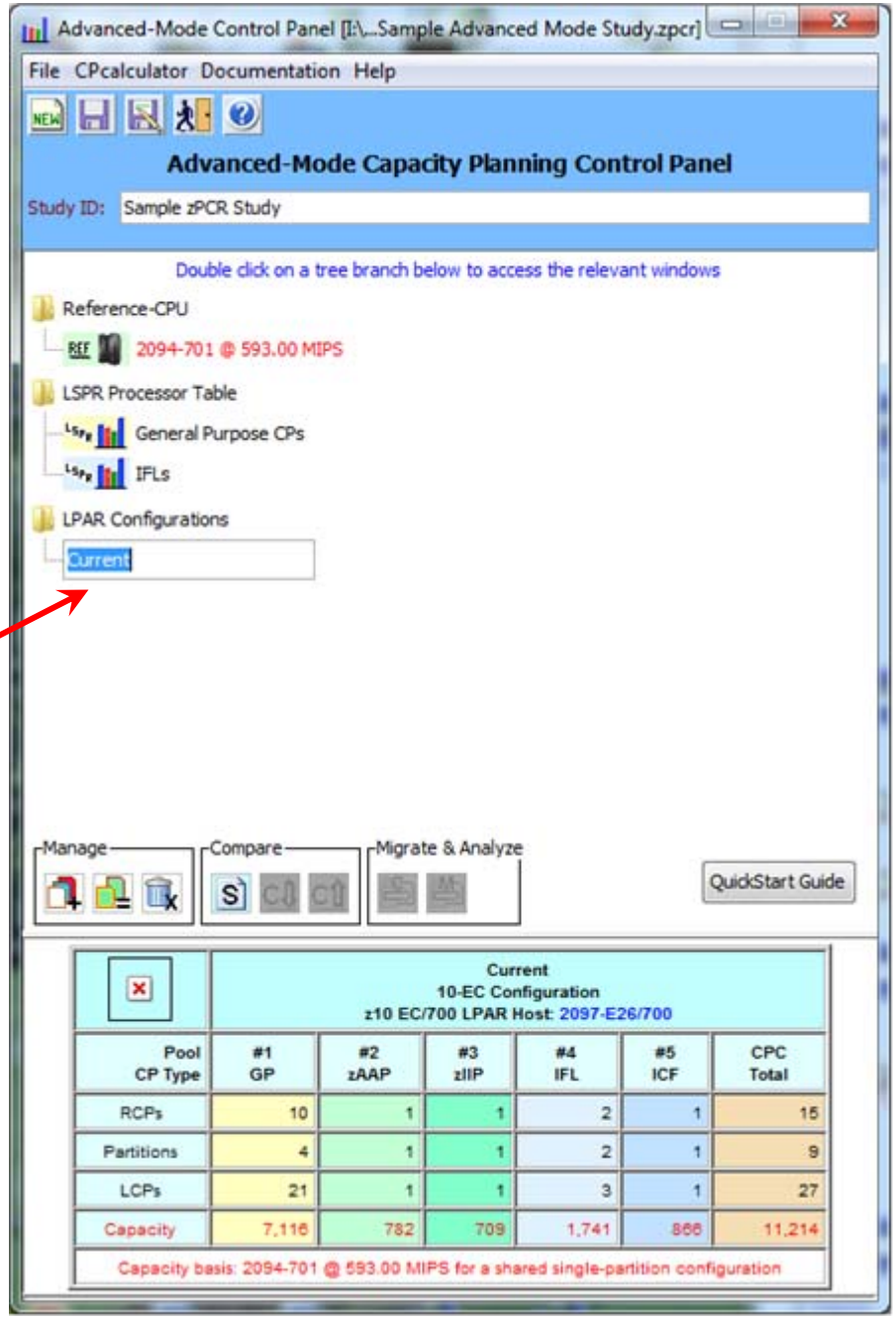
Browse Windows Explorer to find the file then “drag” it to the zPCR Advanced Mode” window and “drop” it on Current

zPCR Advanced-Mode Capacity Renaming the configuration step 1



Select “Current”, Right Click, Click on “Rename Configuration”

zPCR Advanced-Mode Capacity Renaming the configuration step 2

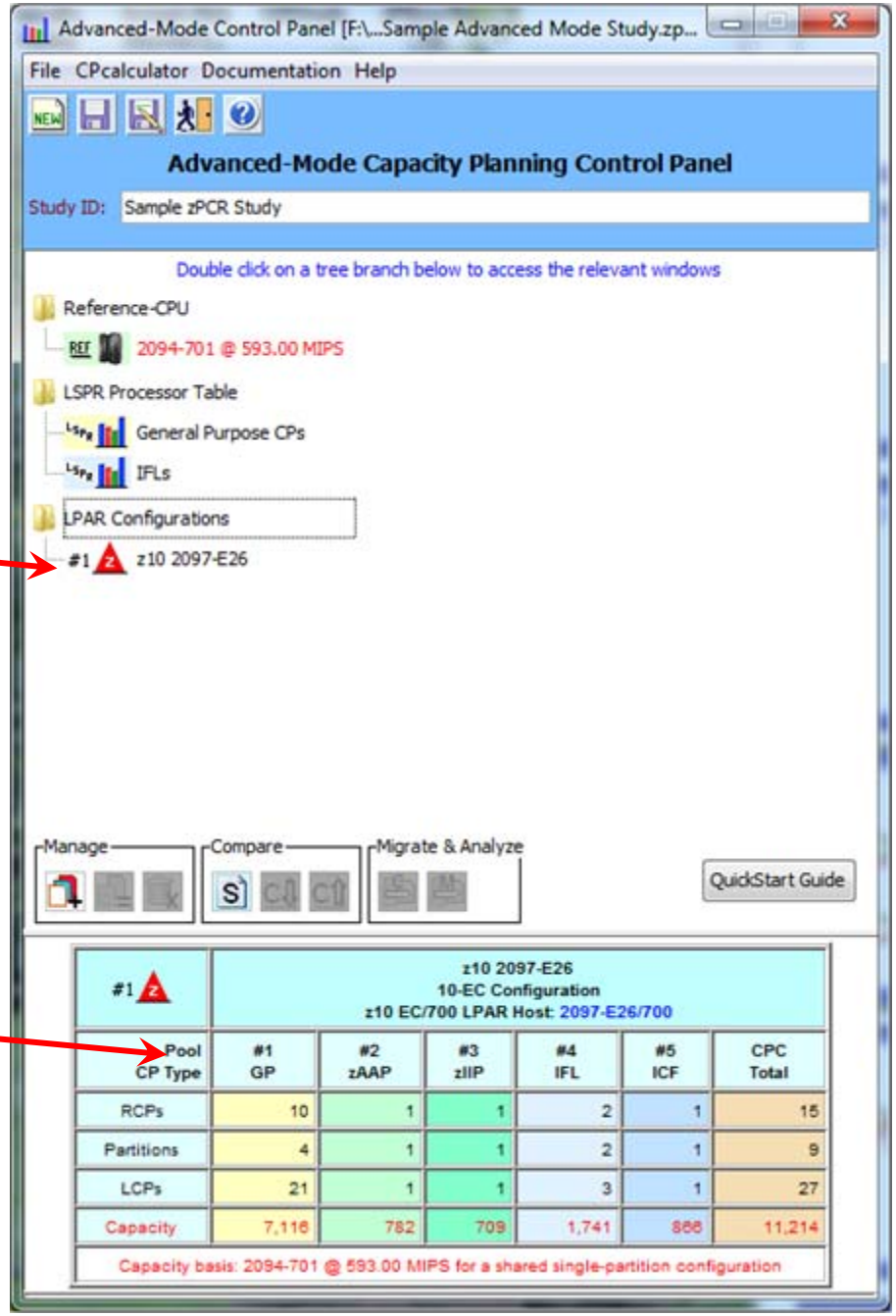


Type over “Current” with “z10-2097 E26” and Press Enter

zPCR Advanced-Mode Capacity Planning Control Panel

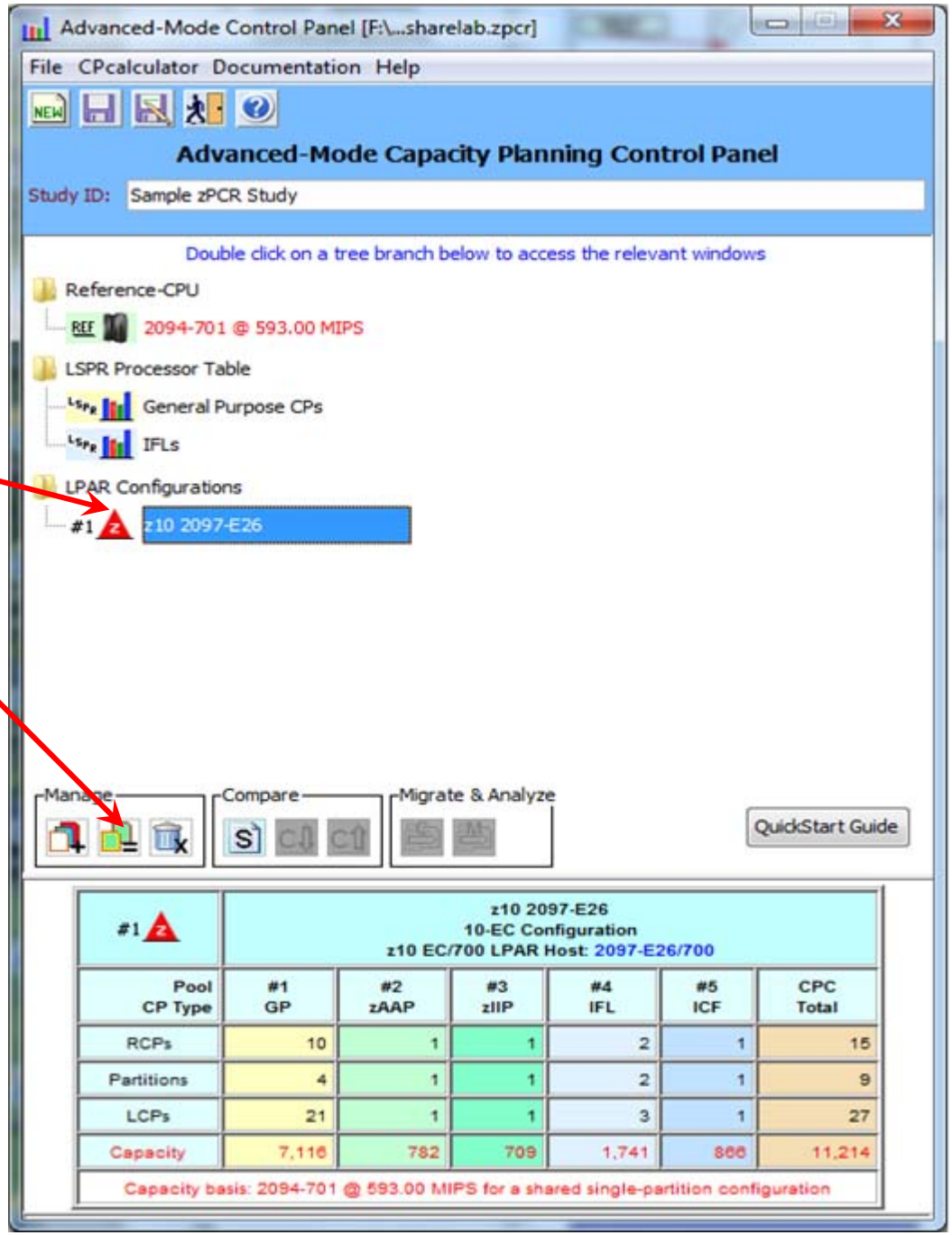
Configuration Renamed

Configuration Summary



zPCR Advanced-Mode Capacity Planning Control Panel

1 Select
2 then Click on Clone

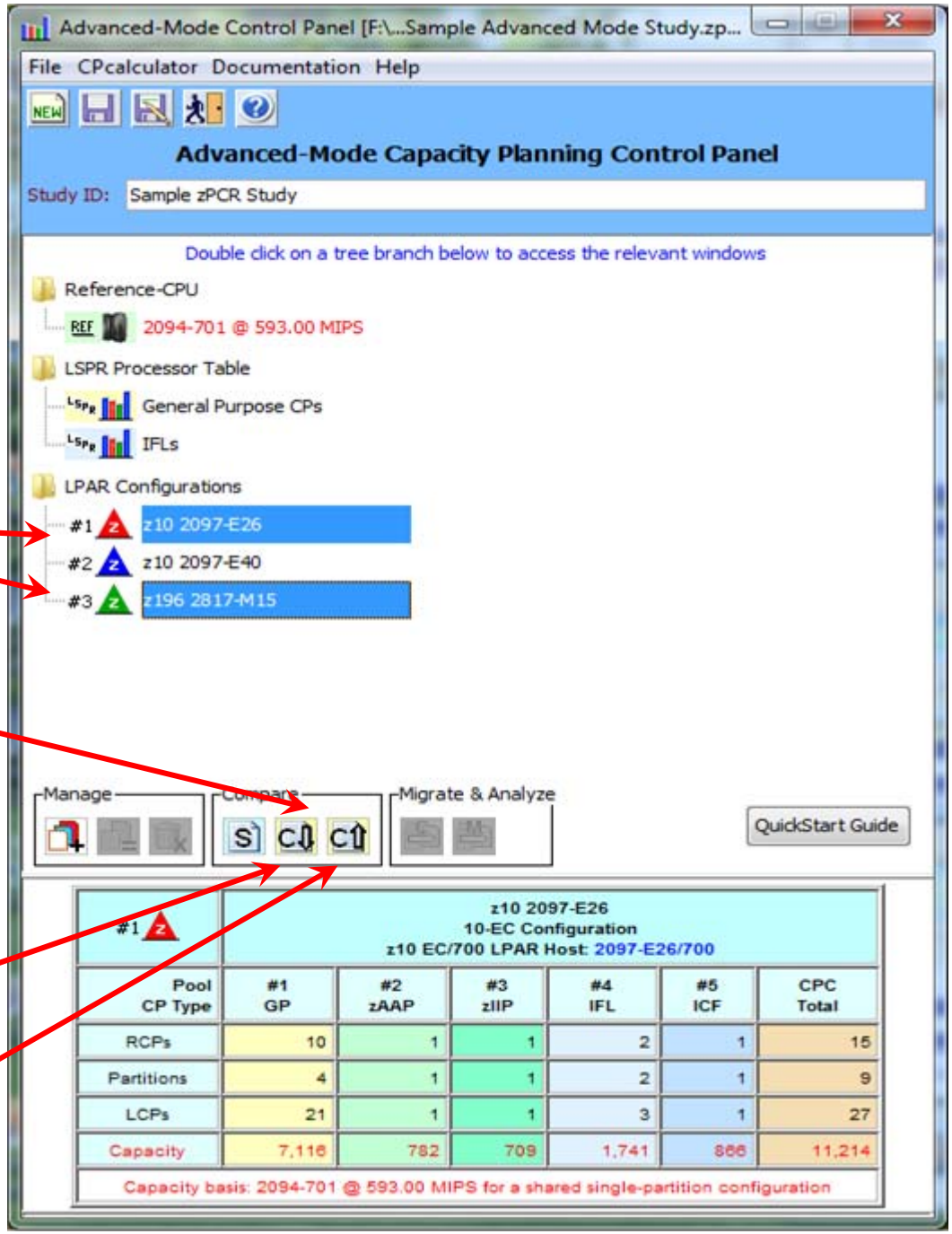


zPCR Advanced-Mode Capacity Planning Control Panel

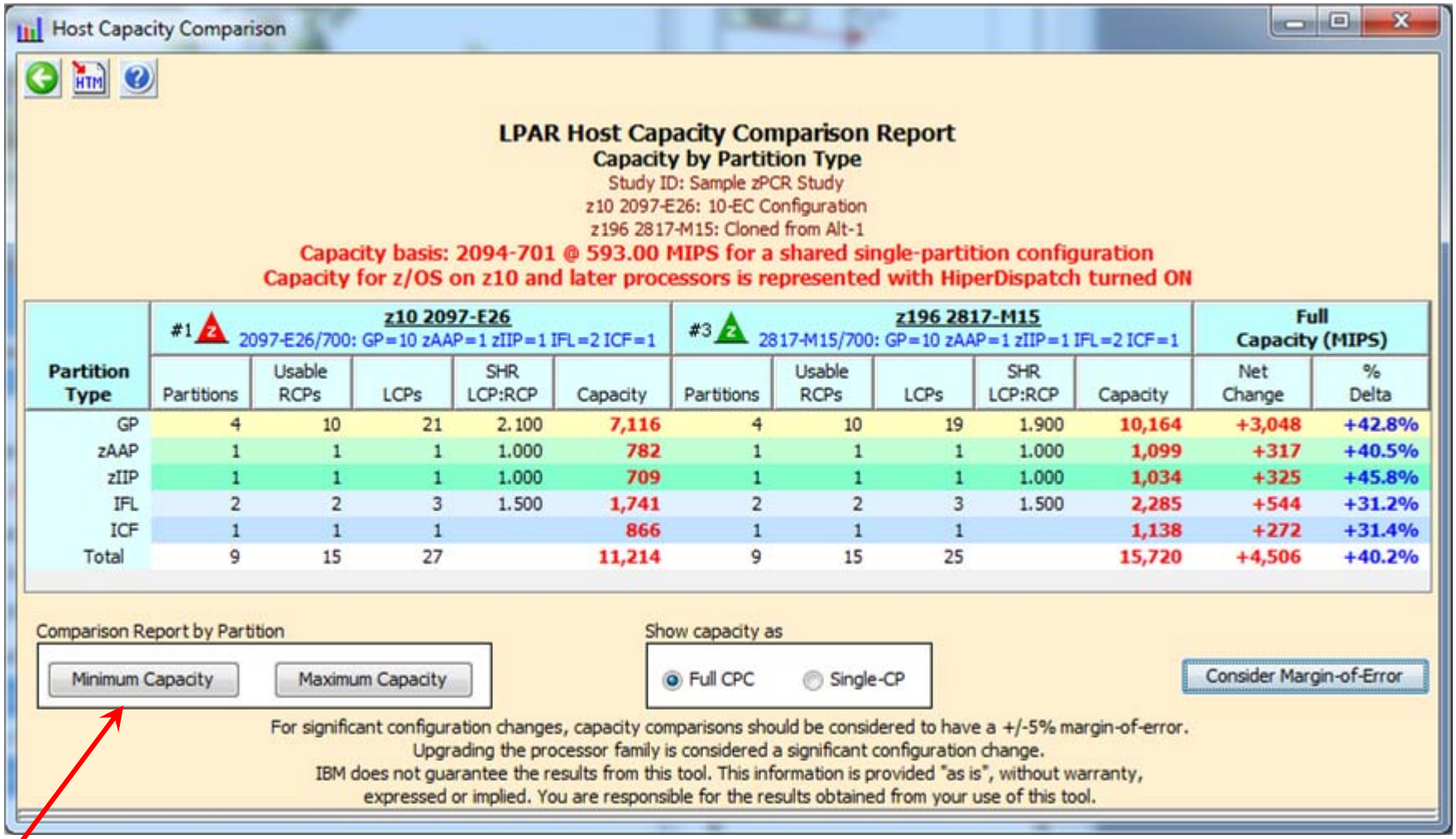
1) Select 2 Configurations then
2) Click on Comparison Report

Note “Down Arrow” compares Bottom Configuration (#3) Relative to Top Configuration (#1)

“Up Arrow” compares Top Configuration (#1) Relative to Bottom Configuration (#3)



Host Capacity Comparison Report



Host Capacity Comparison

LPAR Host Capacity Comparison Report
Capacity by Partition Type
Study ID: Sample zPCR Study
z10 2097-E26: 10-EC Configuration
z196 2817-M15: Cloned from Alt-1
Capacity basis: 2094-701 @ 593.00 MIPS for a shared single-partition configuration
Capacity for z/OS on z10 and later processors is represented with HiperDispatch turned ON

Partition Type	#1 z10 2097-E26 2097-E26/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1					#3 z196 2817-M15 2817-M15/700: 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	7,116	4	10	19	1.900	10,164	+3,048	+42.8%
zAAP	1	1	1	1.000	782	1	1	1	1.000	1,099	+317	+40.5%
zIIP	1	1	1	1.000	709	1	1	1	1.000	1,034	+325	+45.8%
IFL	2	2	3	1.500	1,741	2	2	3	1.500	2,285	+544	+31.2%
ICF	1	1	1		866	1	1	1		1,138	+272	+31.4%
Total	9	15	27		11,214	9	15	25		15,720	+4,506	+40.2%

Comparison Report by Partition
Minimum Capacity | Maximum Capacity

Show capacity as
Full CPC | Single-CP

Consider Margin-of-Error

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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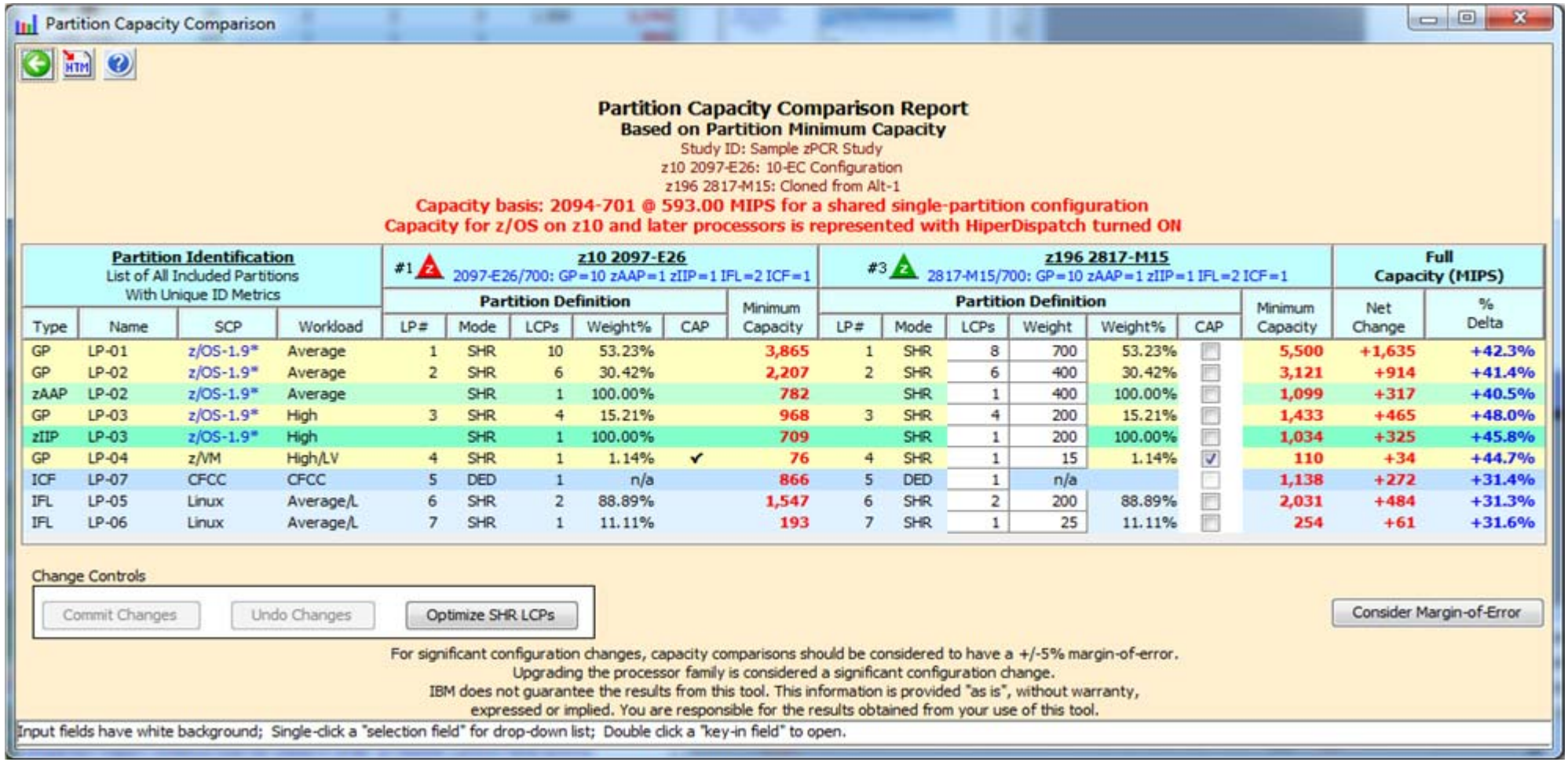
Click "Minimum Capacity" to get Partition Capacity Comparison Report

Minimum Capacity is Partition Capacity when weights are being enforced

Partition Minimum Capacity Comparison Report



Partition Capacity Comparison

Partition Capacity Comparison Report
Based on Partition Minimum Capacity
Study ID: Sample zPCR Study
z10 2097-E26: 10-EC Configuration
z196 2817-M15: Cloned from Alt-1
Capacity basis: 2094-701 @ 593.00 MIPS for a shared single-partition configuration
Capacity for z/OS on z10 and later processors is represented with HiperDispatch turned ON

Partition Identification (List of All Included Partitions With Unique ID Metrics)				#1 z10 2097-E26 2097-E26/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1						#3 z196 2817-M15 2817-M15/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1						Full Capacity (MIPS)	
				Partition Definition						Partition Definition							
Type	Name	SCP	Workload	LP#	Mode	LCPs	Weight%	CAP	Minimum Capacity	LP#	Mode	LCPs	Weight	Weight%	CAP	Minimum Capacity	Net Change	% Delta
GP	LP-01	z/OS-1.9*	Average	1	SHR	10	53.23%		3,865	1	SHR	8	700	53.23%	☐	5,500	+1,635	+42.3%
GP	LP-02	z/OS-1.9*	Average	2	SHR	6	30.42%		2,207	2	SHR	6	400	30.42%	☐	3,121	+914	+41.4%
zAAP	LP-02	z/OS-1.9*	Average		SHR	1	100.00%		782		SHR	1	400	100.00%	☐	1,099	+317	+40.5%
GP	LP-03	z/OS-1.9*	High	3	SHR	4	15.21%		968	3	SHR	4	200	15.21%	☐	1,433	+465	+48.0%
zIIP	LP-03	z/OS-1.9*	High		SHR	1	100.00%		709		SHR	1	200	100.00%	☐	1,034	+325	+45.8%
GP	LP-04	z/VM	High/LV	4	SHR	1	1.14%	✔	76	4	SHR	1	15	1.14%	☑	110	+34	+44.7%
ICF	LP-07	CFCC	CFCC	5	DED	1	n/a		866	5	DED	1	n/a		☐	1,138	+272	+31.4%
IFL	LP-05	Linux	Average/L	6	SHR	2	88.89%		1,547	6	SHR	2	200	88.89%	☐	2,031	+484	+31.3%
IFL	LP-06	Linux	Average/L	7	SHR	1	11.11%		193	7	SHR	1	25	11.11%	☐	254	+61	+31.6%

Change Controls

Commit Changes | Undo Changes | Optimize SHR LCPs | Consider Margin-of-Error

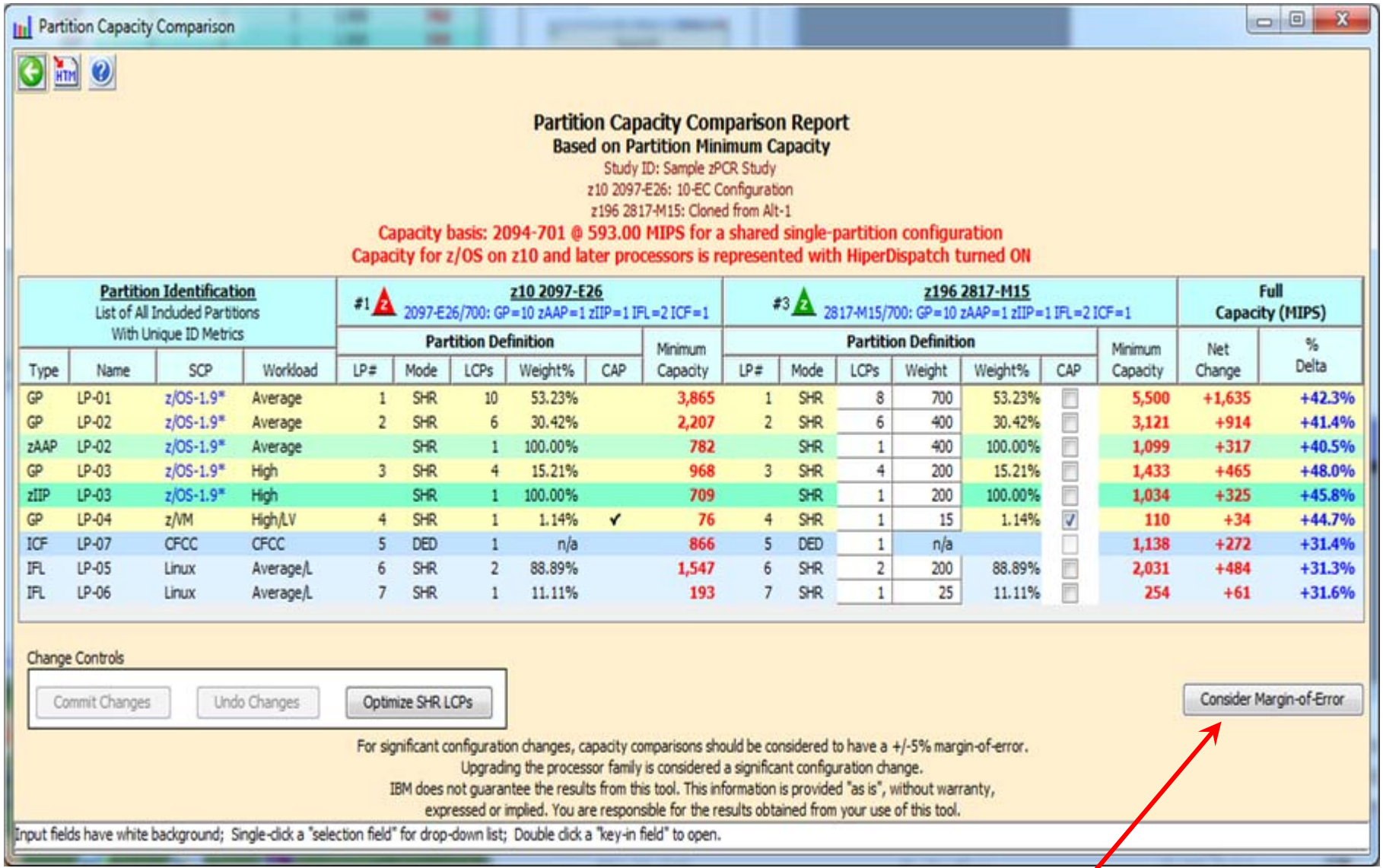
For significant configuration changes, capacity comparisons should be considered to have a +/-5% margin-of-error.
Upgrading the processor family is considered a significant configuration change.
IBM does not guarantee the results from this tool. This information is provided "as is", without warranty, 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.

zPCR Margin of Error

- **A new processor capacity expectation should normally be considered as having a margin of error of up to +5% or - 5%**
  - The full ±5% margin of error should be considered when:
    - The LPAR host processor family is changed
    - Very significant changes are made to the LPAR host CP configuration
    - Significant changes are made to the partition configuration
  - The margin of error is due to factors that include variability in workload/instruction mix and processor utilization
  - When changes are minor, the margin-of-error should be less

Partition Capacity Comparison Report



Partition Capacity Comparison

Partition Capacity Comparison Report
Based on Partition Minimum Capacity
Study ID: Sample zPCR Study
z10 2097-E26: 10-EC Configuration
z196 2817-M15: Cloned from Alt-1
Capacity basis: 2094-701 @ 593.00 MIPS for a shared single-partition configuration
Capacity for z/OS on z10 and later processors is represented with HiperDispatch turned ON

Partition Identification (List of All Included Partitions With Unique ID Metrics)				#1 z10 2097-E26 2097-E26/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1						#3 z196 2817-M15 2817-M15/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1						Full Capacity (MIPS)	
				Partition Definition						Partition Definition							
Type	Name	SCP	Workload	LP#	Mode	LCPs	Weight%	CAP	Minimum Capacity	LP#	Mode	LCPs	Weight	Weight%	CAP	Minimum Capacity	Net Change	% Delta
GP	LP-01	z/OS-1.9*	Average	1	SHR	10	53.23%		3,865	1	SHR	8	700	53.23%		5,500	+1,635	+42.3%
GP	LP-02	z/OS-1.9*	Average	2	SHR	6	30.42%		2,207	2	SHR	6	400	30.42%		3,121	+914	+41.4%
zAAP	LP-02	z/OS-1.9*	Average		SHR	1	100.00%		782		SHR	1	400	100.00%		1,099	+317	+40.5%
GP	LP-03	z/OS-1.9*	High	3	SHR	4	15.21%		968	3	SHR	4	200	15.21%		1,433	+465	+48.0%
zIIP	LP-03	z/OS-1.9*	High		SHR	1	100.00%		709		SHR	1	200	100.00%		1,034	+325	+45.8%
GP	LP-04	z/VM	High/LV	4	SHR	1	1.14%	✓	76	4	SHR	1	15	1.14%	✓	110	+34	+44.7%
ICF	LP-07	CFCC	CFCC	5	DED	1	n/a		866	5	DED	1	n/a			1,138	+272	+31.4%
IFL	LP-05	Linux	Average/L	6	SHR	2	88.89%		1,547	6	SHR	2	200	88.89%		2,031	+484	+31.3%
IFL	LP-06	Linux	Average/L	7	SHR	1	11.11%		193	7	SHR	1	25	11.11%		254	+61	+31.6%

Change Controls
Commit Changes | Undo Changes | Optimize SHR LCPs

Consider Margin-of-Error

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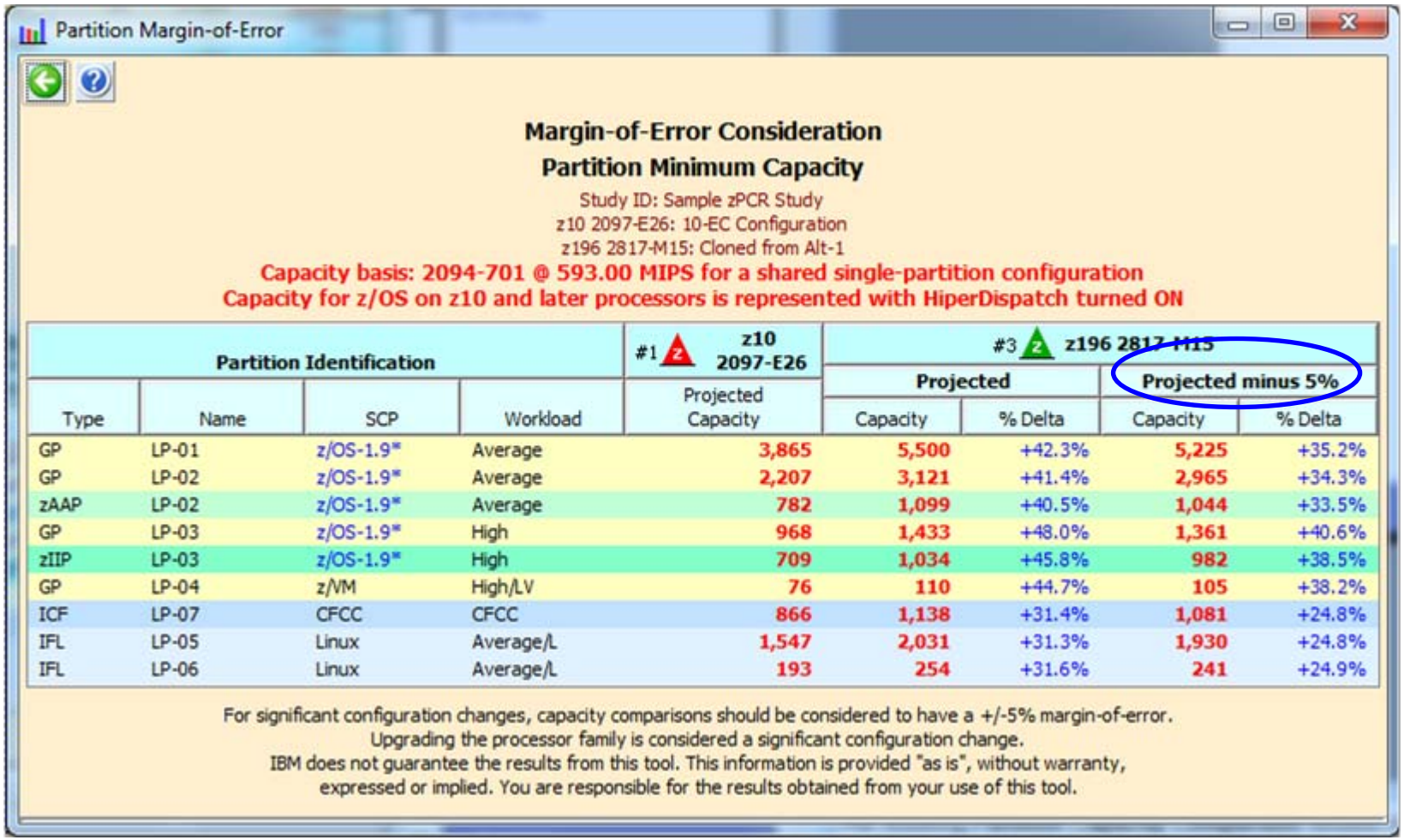
Input fields have white background; Single-click a "selection field" for drop-down list; Double click a "key-in field" to open.

Margin-of-Error

Margin of Error Report



Partition Margin-of-Error

Margin-of-Error Consideration

Partition Minimum Capacity

Study ID: Sample zPCR Study
z10 2097-E26: 10-EC Configuration
z196 2817-M15: Cloned from Alt-1

Capacity basis: 2094-701 @ 593.00 MIPS for a shared single-partition configuration
Capacity for z/OS on z10 and later processors is represented with HiperDispatch turned ON

Partition Identification				#1 z10 2097-E26	#3 z196 2817-M15			
					Projected		Projected minus 5%	
Type	Name	SCP	Workload	Projected Capacity	Capacity	% Delta	Capacity	% Delta
GP	LP-01	z/OS-1.9*	Average	3,865	5,500	+42.3%	5,225	+35.2%
GP	LP-02	z/OS-1.9*	Average	2,207	3,121	+41.4%	2,965	+34.3%
zAAP	LP-02	z/OS-1.9*	Average	782	1,099	+40.5%	1,044	+33.5%
GP	LP-03	z/OS-1.9*	High	968	1,433	+48.0%	1,361	+40.6%
zIIP	LP-03	z/OS-1.9*	High	709	1,034	+45.8%	982	+38.5%
GP	LP-04	z/VM	High/LV	76	110	+44.7%	105	+38.2%
ICF	LP-07	CFCC	CFCC	866	1,138	+31.4%	1,081	+24.8%
IFL	LP-05	Linux	Average/L	1,547	2,031	+31.3%	1,930	+24.8%
IFL	LP-06	Linux	Average/L	193	254	+31.6%	241	+24.9%

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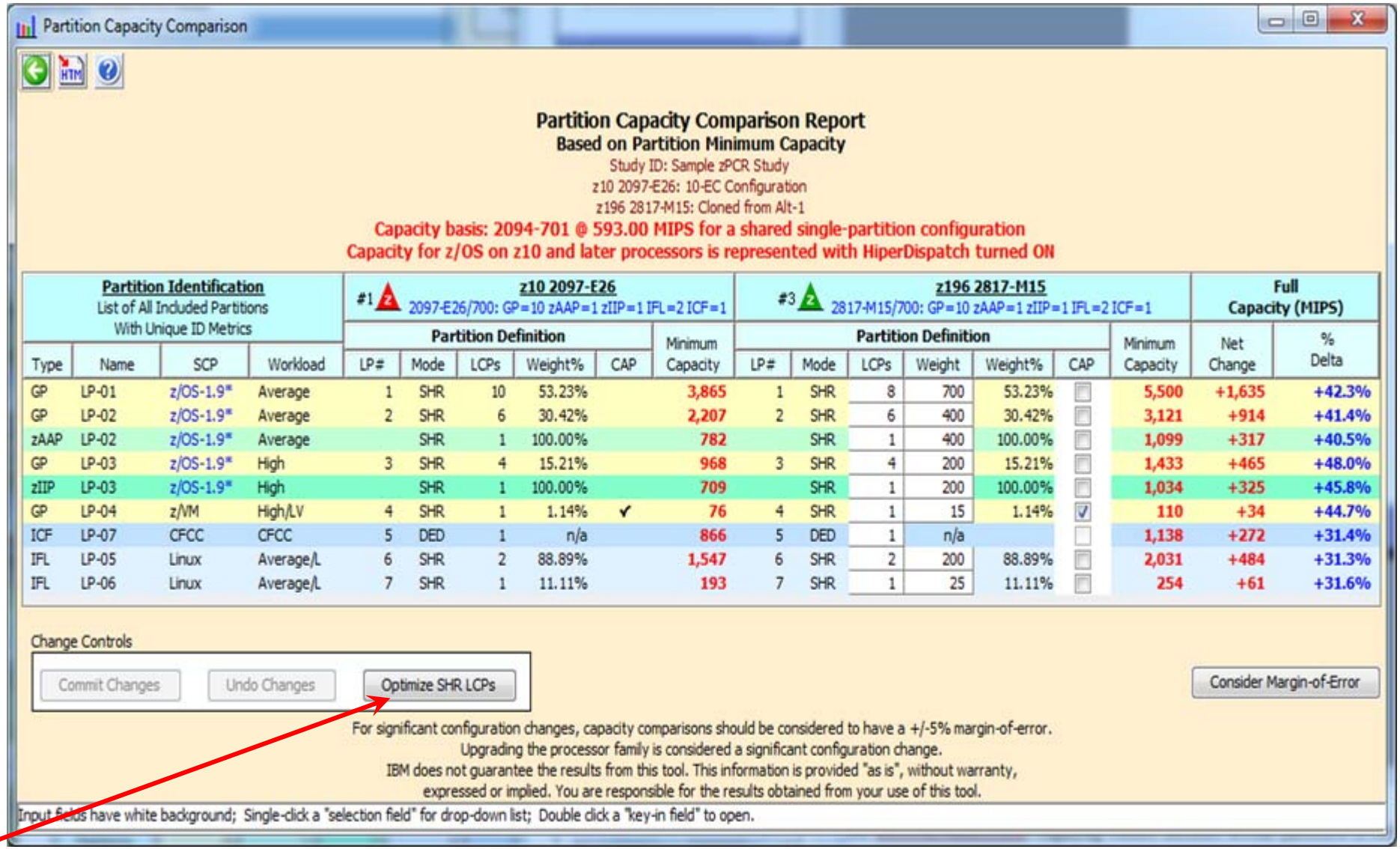
Optimize Shared Logical Processors

- **When migrating to a new processor evaluate the weights & logical processors needed**
  - If Hard Capping partitions, evaluate amount of capacity required to be guaranteed
- **Operating System impact on Logical Processors needs to be reviewed**
- **Level of optimization for LCP Count Assignment can be chosen as follows**
  - **Moderate**:
    - When the weight percent indicates number of logical CPs greater than or equal to 2.6
      - The exact number of logical CPs plus 1 (rounded up to the nearest whole number) will be assigned
    - When the weight percent indicates number of logical CPs should be less than 2.6
      - the exact number of logical CPs (rounded up to the nearest whole number) will be assigned
  - **Minimum**:
    - The weight percent is used to determine the exact number of logical CPs (rounded up to the nearest whole number) will be assigned

Partition Capacity Comparison Report



Partition Capacity Comparison

Partition Capacity Comparison Report
Based on Partition Minimum Capacity
Study ID: Sample zPCR Study
z10 2097-E26: 10-EC Configuration
z196 2817-M15: Cloned from Alt-1
Capacity basis: 2094-701 @ 593.00 MIPS for a shared single-partition configuration
Capacity for z/OS on z10 and later processors is represented with HiperDispatch turned ON

Partition Identification (List of All Included Partitions With Unique ID Metrics)				#1 z10 2097-E26 2097-E26/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1						#3 z196 2817-M15 2817-M15/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1						Full Capacity (MIPS)	
				Partition Definition						Partition Definition							
Type	Name	SCP	Workload	LP#	Mode	LCPs	Weight%	CAP	Minimum Capacity	LP#	Mode	LCPs	Weight	Weight%	CAP	Minimum Capacity	Net Change	% Delta
GP	LP-01	z/OS-1.9*	Average	1	SHR	10	53.23%		3,865	1	SHR	8	700	53.23%		5,500	+1,635	+42.3%
GP	LP-02	z/OS-1.9*	Average	2	SHR	6	30.42%		2,207	2	SHR	6	400	30.42%		3,121	+914	+41.4%
zAAP	LP-02	z/OS-1.9*	Average		SHR	1	100.00%		782		SHR	1	400	100.00%		1,099	+317	+40.5%
GP	LP-03	z/OS-1.9*	High	3	SHR	4	15.21%		968	3	SHR	4	200	15.21%		1,433	+465	+48.0%
zIIP	LP-03	z/OS-1.9*	High		SHR	1	100.00%		709		SHR	1	200	100.00%		1,034	+325	+45.8%
GP	LP-04	z/VM	High/LV	4	SHR	1	1.14%	✓	76	4	SHR	1	15	1.14%	☑	110	+34	+44.7%
ICF	LP-07	CFCC	CFCC	5	DED	1	n/a		866	5	DED	1	n/a			1,138	+272	+31.4%
IFL	LP-05	Linux	Average/L	6	SHR	2	88.89%		1,547	6	SHR	2	200	88.89%		2,031	+484	+31.3%
IFL	LP-06	Linux	Average/L	7	SHR	1	11.11%		193	7	SHR	1	25	11.11%		254	+61	+31.6%

Change Controls

Commit Changes | Undo Changes | Optimize SHR LCPs

Consider Margin-of-Error

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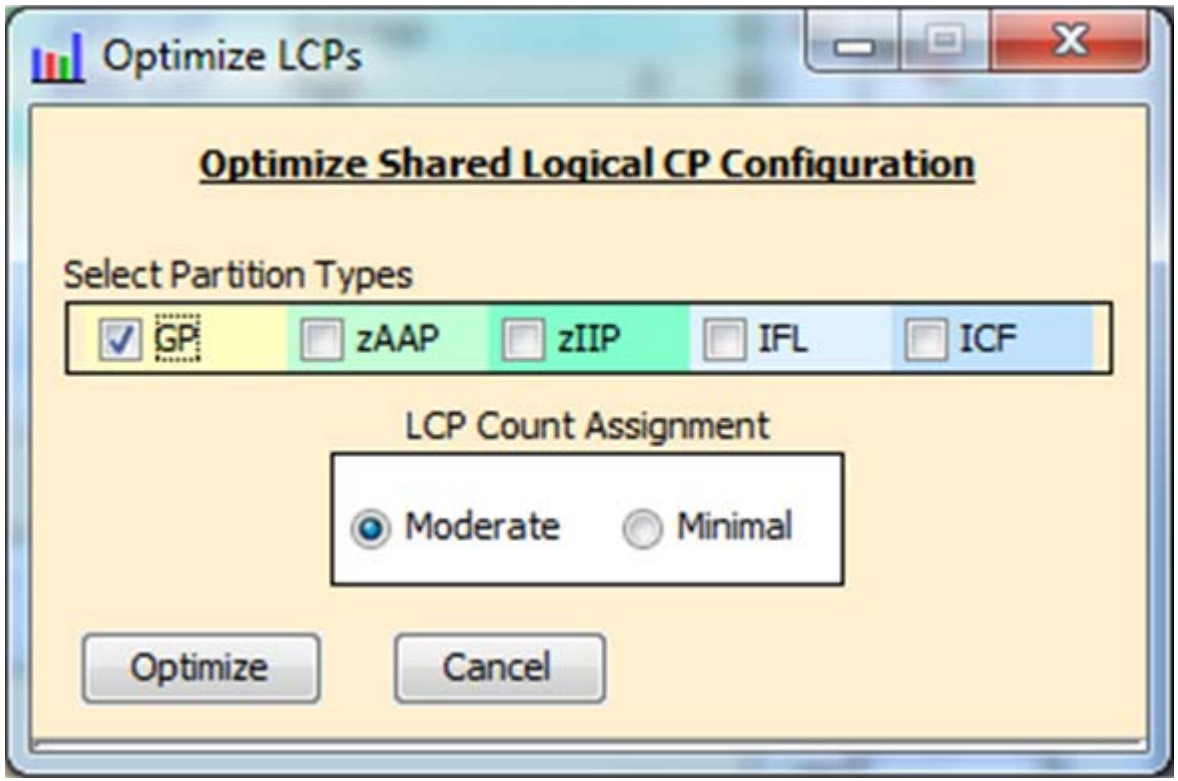
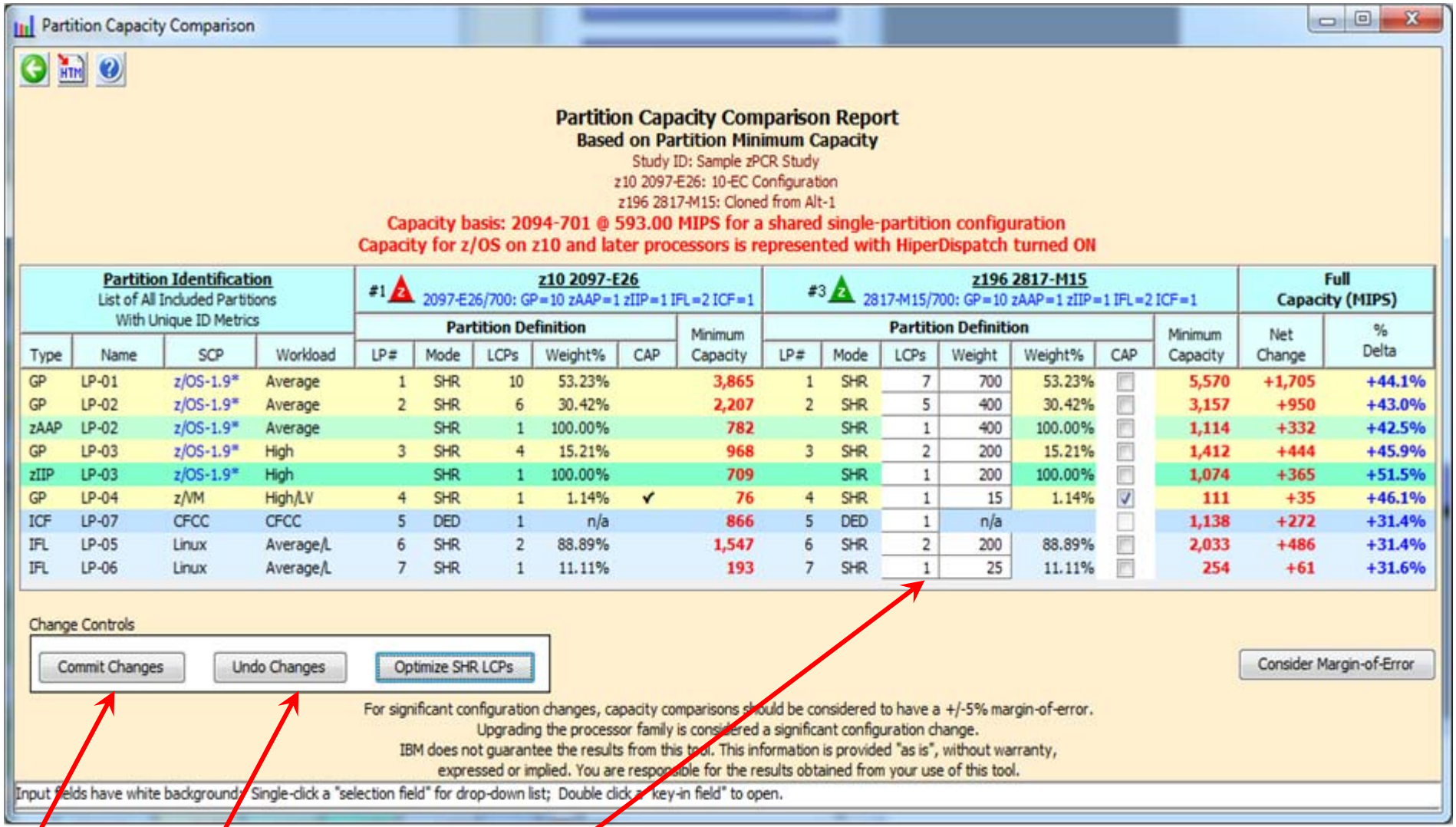
Input fields have white background; Single-click a "selection field" for drop-down list; Double click a "key-in field" to open.

"Optimize" SHR LCPs

Optimize Share LCP Configuration



Commit the Changes



Partition Capacity Comparison

Partition Capacity Comparison Report
Based on Partition Minimum Capacity
Study ID: Sample zPCR Study
z10 2097-E26: 10-EC Configuration
z196 2817-M15: Cloned from Alt-1
Capacity basis: 2094-701 @ 593.00 MIPS for a shared single-partition configuration
Capacity for z/OS on z10 and later processors is represented with HiperDispatch turned ON

Partition Identification (List of All Included Partitions With Unique ID Metrics)				#1 z10 2097-E26 2097-E26/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1						#3 z196 2817-M15 2817-M15/700: GP=10 zAAP=1 zIIP=1 IFL=2 ICF=1						Full Capacity (MIPS)		
				Partition Definition						Partition Definition								
Type	Name	SCP	Workload	LP#	Mode	LCPs	Weight%	CAP	Minimum Capacity	LP#	Mode	LCPs	Weight	Weight%	CAP	Minimum Capacity	Net Change	% Delta
GP	LP-01	z/OS-1.9*	Average	1	SHR	10	53.23%		3,865	1	SHR	7	700	53.23%		5,570	+1,705	+44.1%
GP	LP-02	z/OS-1.9*	Average	2	SHR	6	30.42%		2,207	2	SHR	5	400	30.42%		3,157	+950	+43.0%
zAAP	LP-02	z/OS-1.9*	Average		SHR	1	100.00%		782		SHR	1	400	100.00%		1,114	+332	+42.5%
GP	LP-03	z/OS-1.9*	High	3	SHR	4	15.21%		968	3	SHR	2	200	15.21%		1,412	+444	+45.9%
zIIP	LP-03	z/OS-1.9*	High		SHR	1	100.00%		709		SHR	1	200	100.00%		1,074	+365	+51.5%
GP	LP-04	z/VM	High/LV	4	SHR	1	1.14%	✔	76	4	SHR	1	15	1.14%	✔	111	+35	+46.1%
ICF	LP-07	CFCC	CFCC	5	DED	1	n/a		866	5	DED	1	n/a			1,138	+272	+31.4%
IFL	LP-05	Linux	Average/L	6	SHR	2	88.89%		1,547	6	SHR	2	200	88.89%		2,033	+486	+31.4%
IFL	LP-06	Linux	Average/L	7	SHR	1	11.11%		193	7	SHR	1	25	11.11%		254	+61	+31.6%

Change Controls

Commit Changes | Undo Changes | Optimize SHR LCPs | Consider Margin-of-Error

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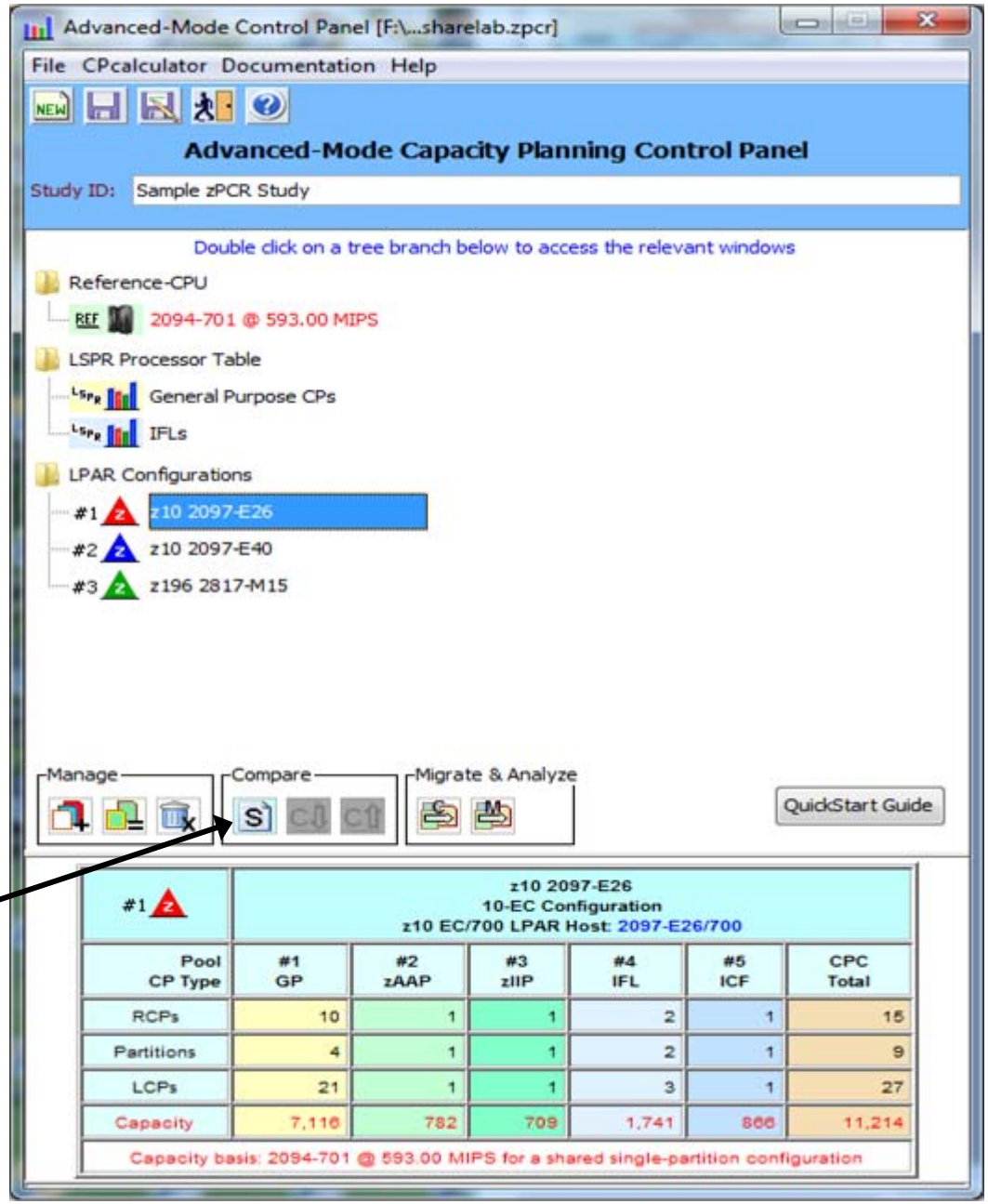
Input fields have white background. Single-click a "selection field" for drop-down list; Double click a "key-in field" to open.

Commit, Undo Changes, or change by hand (any white area)

Show Host Capacity Summary

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

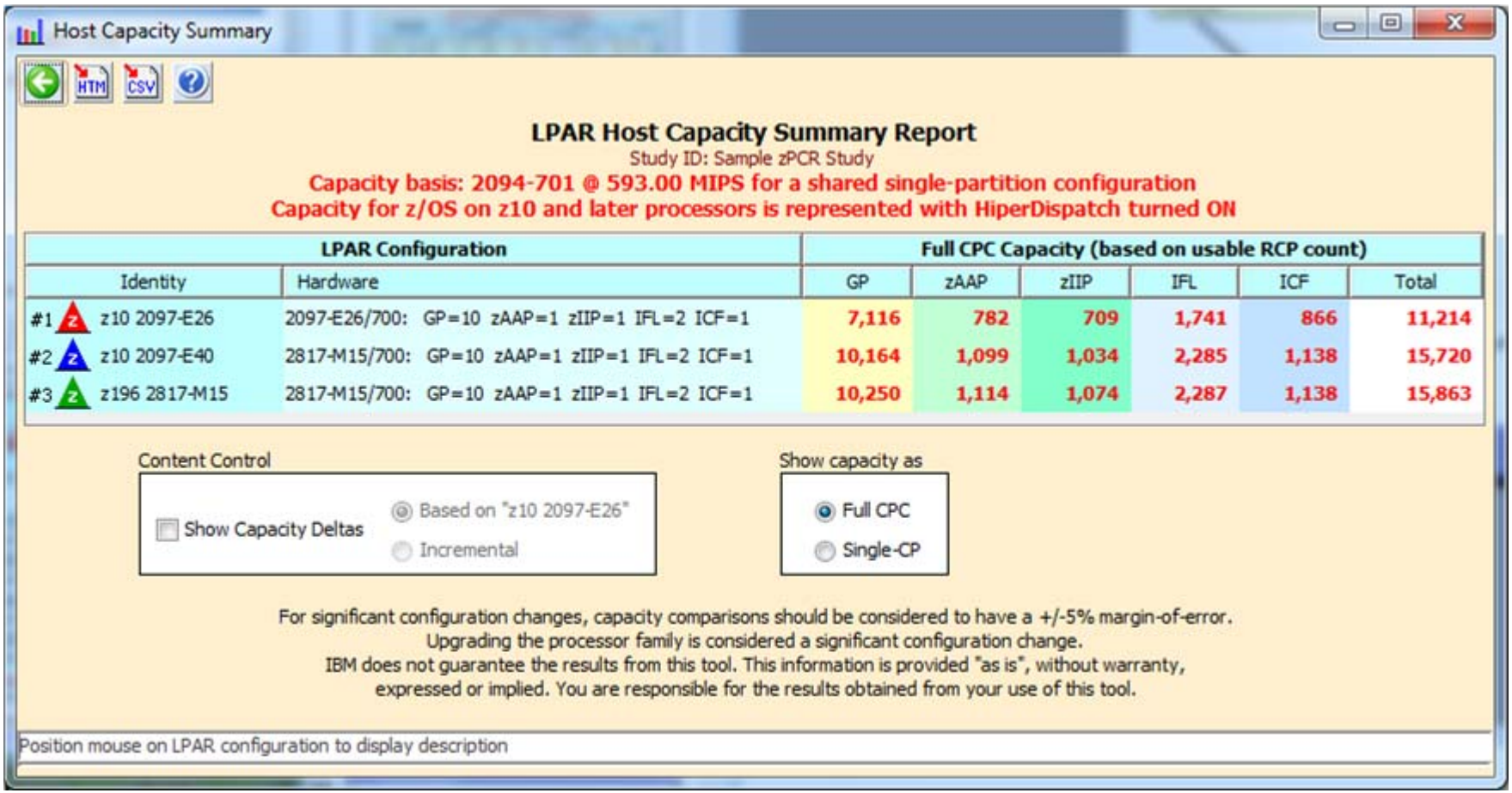


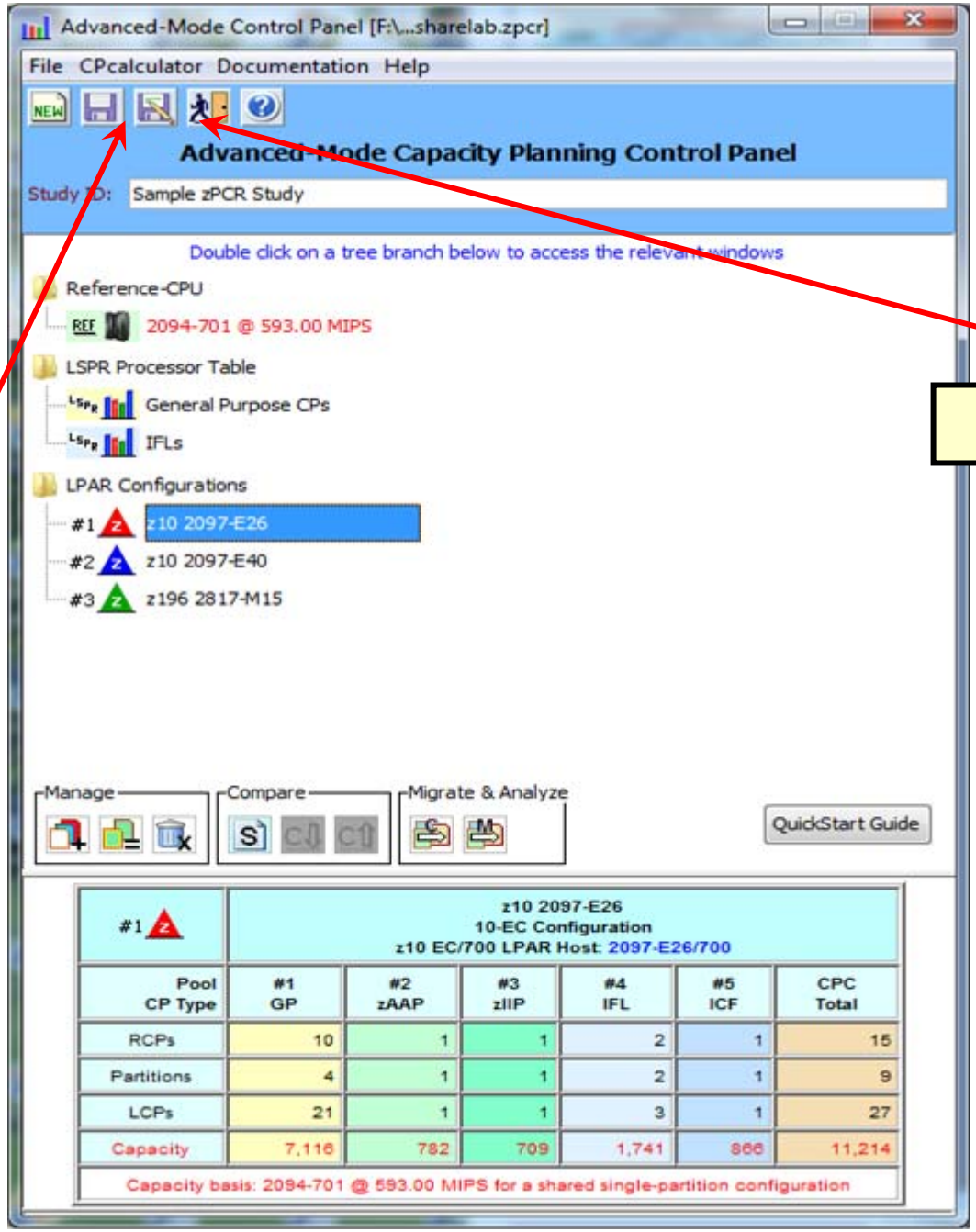
Click Host Capacity Summary

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

- Click on the **Return** to take you back at the **Advanced-Mode Control Panel**





Exit zPCR

Save Study

3 Ways to Input Data into zPCR

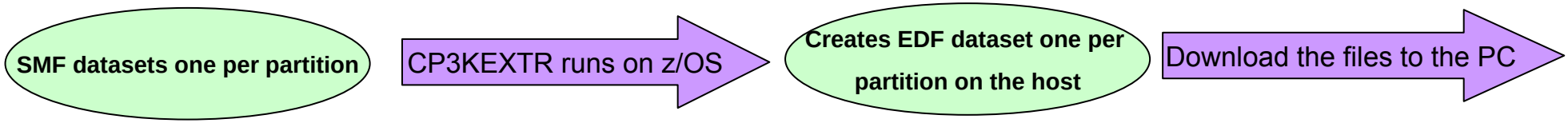
- **1 – Manually**
  - For “what if” when no processor/system exists
- **2 – RMF**
  - When processor/system exists
- **3 - EDF File**
  - When processor/system exists
  - Recommended because of CPU MF input

EDF Input for zPCR

z/OS

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

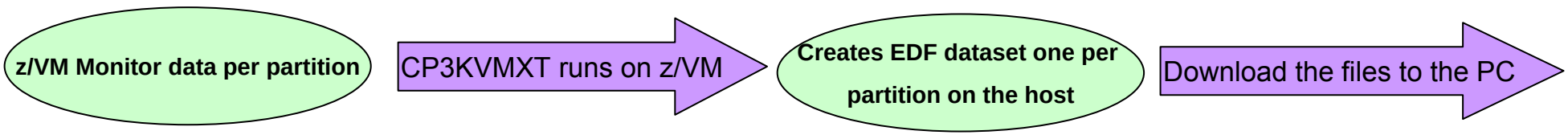
Post process SMF data with CP3KEXTR to produce EDF



z/VM

Enable Monitor to record CPU MF data (primary partitions)

Post process Monitor data with CP3KVMXT to produce EDF



z/OS EDF Input

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

Get zPCR CP3KEXTR here: http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/PRS4229

Windows PC with zPCR installed

Download EDF (1 per partition) to PC

In zPCR, Get Host and Partitions from EDF

Load EDF(s)

Select (or drag) Processor Partitions simultaneously ← **Gets CPU MF and Parked Engines for all partitions at the same time**

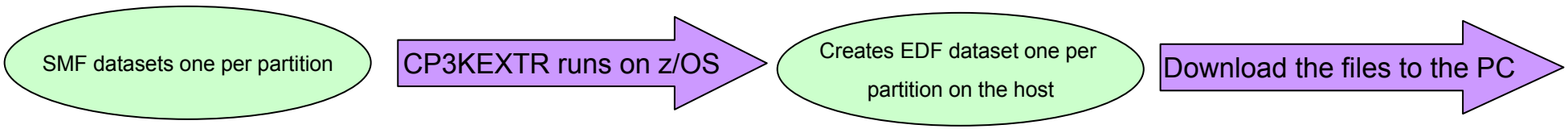
Select a representative interval

Show LPAR Host and its partition configuration

Create LPAR Configuration

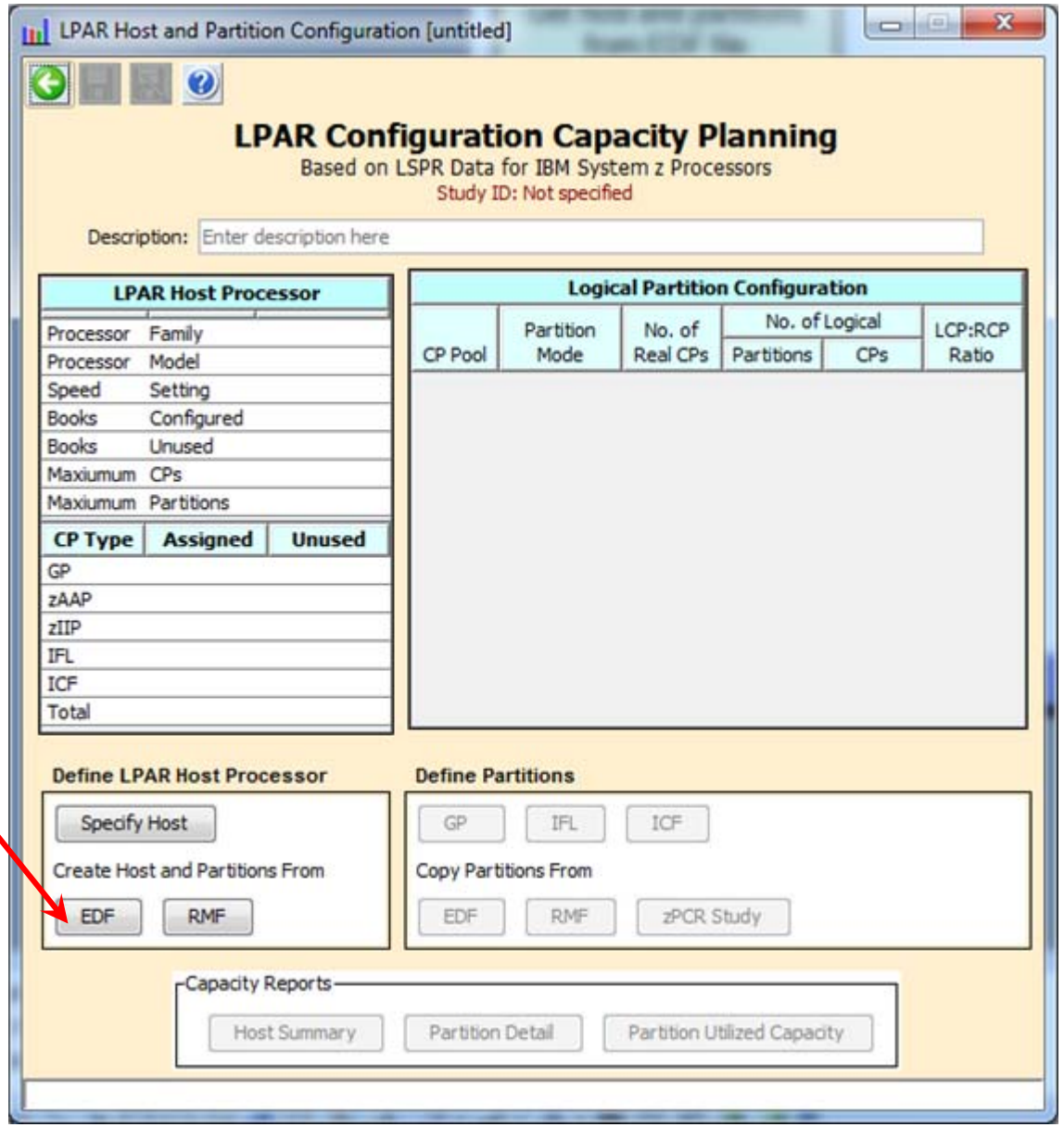
Partitions with SMF 113s will assign “CPU MF” workload

Partitions with SMF 74s will show “DASD I/O” workload



Load the EDF files into zPCR

Get host and partitions from EDF file



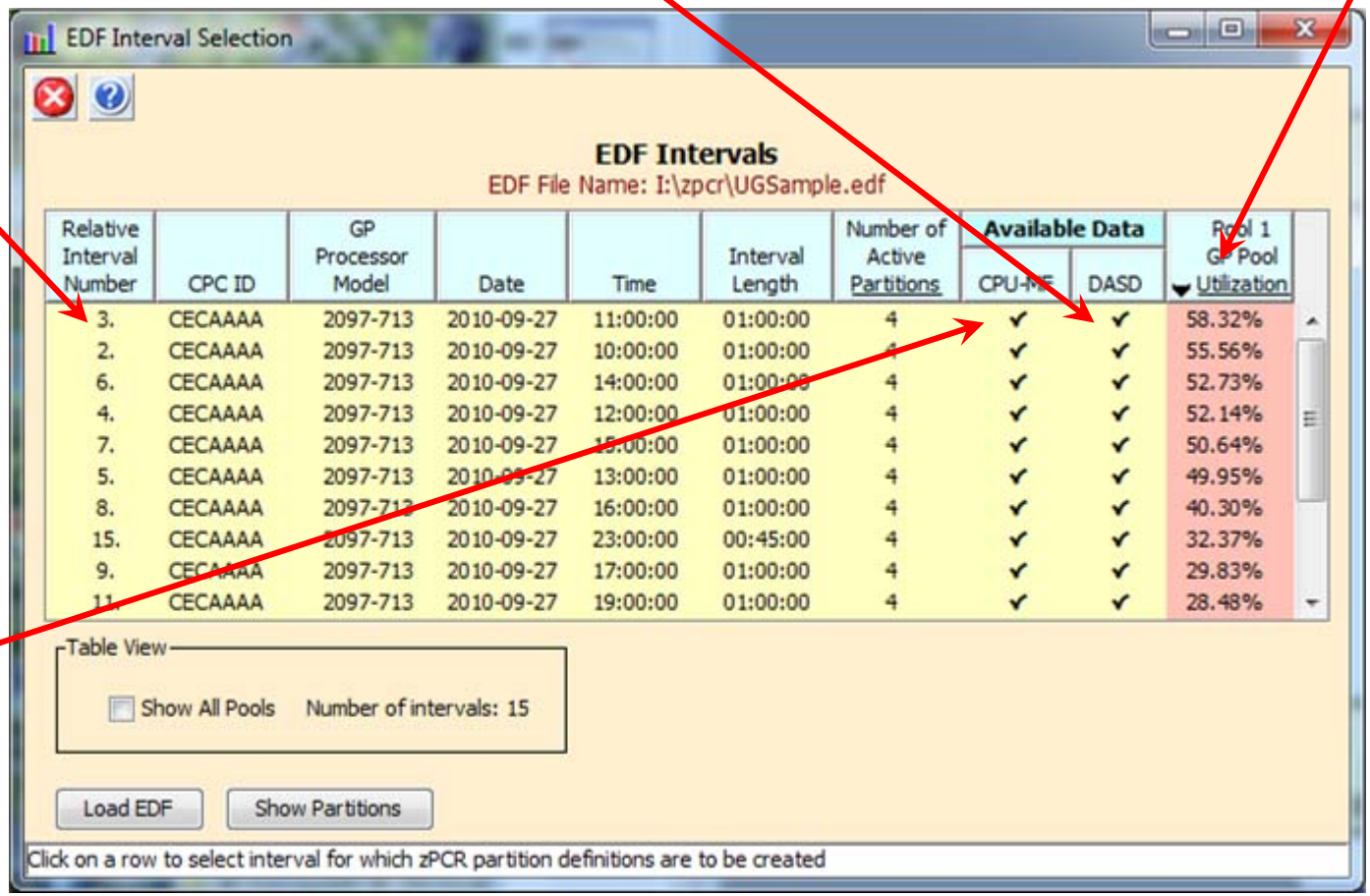
Load the EDF files into zPCR – Select an Interval

Select an interval

DASD I/O data available

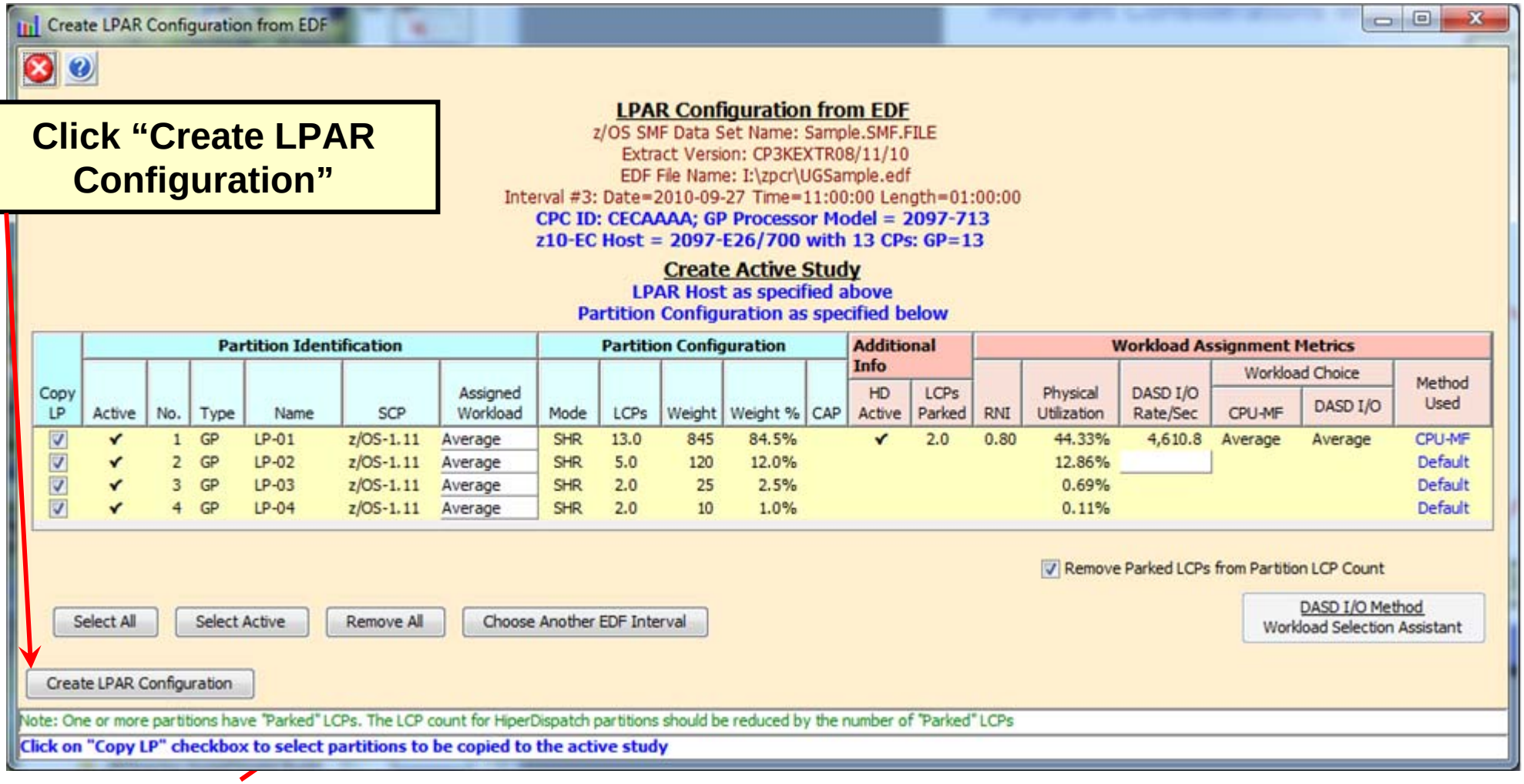
Sort on GP Pool Utilization

CPU MF (SMF 113) data available



LPAR Configuration from EDF for Chosen Interval

Click "Create LPAR Configuration"



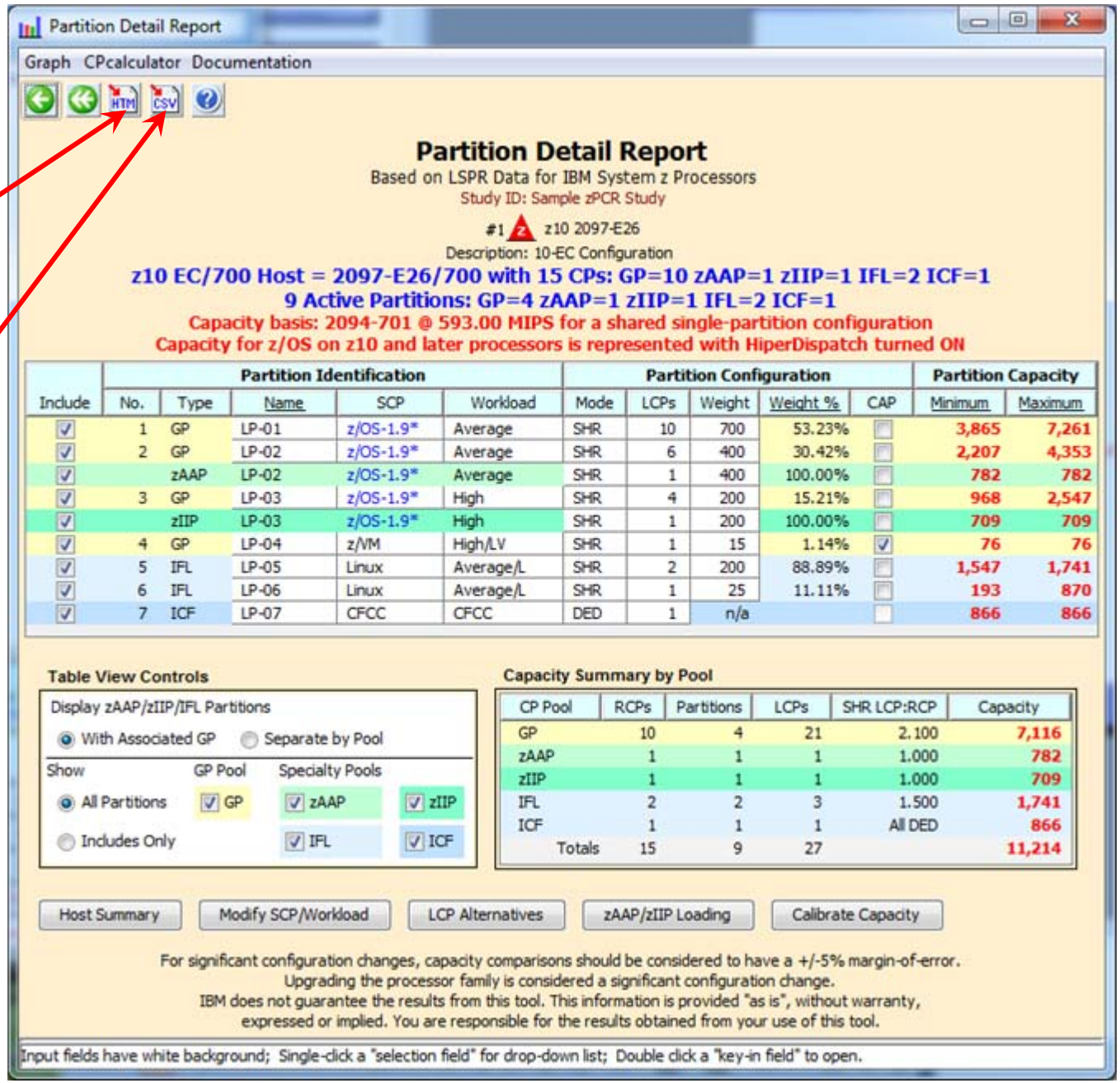
Output Options

- **Types**
  - CSV
  - HTML
- **Processed by**
  - Spreadsheets (HTML and CSV)
  - Word Processors (HTML)
  - Browsers (HTML)

Output Results

Output to HTML file

Output to CSV file



Single Spot on the Web to Get More Information

- zPCR Getting Started Page
  http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/PRS1381
  - Contains:
    - Downloadable Code
    - zPCR Users Guide
    - External File Layout documentation
    - Links to both CP3KEXTR and CP3KVMXT
    - Link to enabling CPU MF information
  - Technical Support Information
    - Training materials in .avi format (voice over foils)
    - zPCR Demonstration
      - 5 sections (wmv files)
        - > Fundamentals
        - > LPAR planning (basic and Advanced mode)
    - Education Exercises
      - 1 Advanced Mode Exercise for z10 to z196
    - Special Notices and FAQs
- **Q&A and defect support are available through email: zpcr@us.ibm.com**

Techdocs provides the latest ATS technical collateral

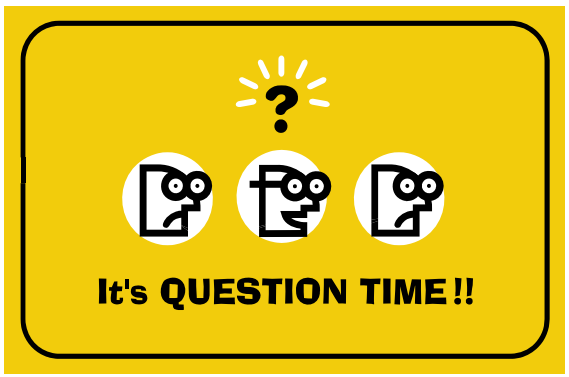
www.ibm.com/support/techdocs

System z Social Media

- **System z official Twitter handle:**
  - @ibm_system_z
- **Top Facebook pages related to System z:**
  - Systemz Mainframe
  - IBM System z on Campus
  - IBM Mainframe Professionals
  - Millennial Mainframer
- **Top LinkedIn Groups related to System z:**
  - Mainframe Experts Network
  - Mainframe
  - IBM Mainframe
  - System z Advocates
  - Cloud Mainframe Computing
- **YouTube**
  - IBM System z
- **Leading Blogs related to System z:**
  - Evangelizing Mainframe (Destination z blog)
  - Mainframe Performance Topics
  - Common Sense
  - Enterprise Class Innovation: System z perspectives
  - Mainframe
  - MainframeZone
  - Smarter Computing Blog
  - Millennial Mainframer

Summary

- **zPCR models <u>your unique</u> 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**



Back Up

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.

Acknowledgements

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

John Fitch

Gary King

Jim Shaw

Brad Snyder

Kathy Walsh

What is new in zPCR V8.1…

- The **IBM zEnterprise EC12** (**zEC12**) processor family has been added, with 161 General Purpose models and 101 IFL models. Various book configurations provide up to 101 real CPs, which can be configured as General Purpose, zAAP, zIIP, IFL, or ICF engines. The processor designation is 2827-XXX.
- • **LSPR data for z/OS is now based on z/OS-1.13** (formerly z/OS-1.11)
  - **For zEC12, z196, z114, and z10 processors, z/OS LSPR data represents HiperDispatch turned on. This means that capacity results for defined LPAR configurations on these processor families also are assumed to represent HiperDispatch turned on.**
  - **zEC12 and z196 processors can be sized at** *Full Capacity* **(default) or in** *Power Saving Mode***. In the LSPR tables, capacity values and MSU ratings for either can be displayed.**
  - **CFCC data is not displayed in any LSPR table, but is included for the purpose of sizing partitions running it. CFCC v18 capacity data now represents z196 as well as zEC12.**
- ***LSPR Capacity Ratio tables***
  - **The** *LSPR Multi-Image Table* **includes all IBM System z processor families and models, for up to 101 General Purpose CPs or 101 IFLs.**
  - **The** *LSPR Single-Image Table* **includes all IBM System z processor families and models for up to 99 CPs (the maximum supported by z/OS). The tables for Linux and z/VM have been removed, since there were significant restrictions on the number of CPs that could be shown.**

What is new in zPCR V8.1 continued…

- ***LPAR Configuration Capacity Planning*** function.
  - **Adjustment to some algorithms and tables has occurred, for the purpose of more accurately projecting partitioned capacity. This change along with the LSPR change of moving to z/OS-1.13 will likely have some effect on capacity results from those of previous zPCR versions..**
  - **The zPCR restriction of 32 logical CPs for Linux partitions has been removed. Any legitimate Linux LCP configuration (GP or IFL) up to 101-way can now be defined.**
  - **On the** *LPAR Host Summary* **window, the estimates for** *LPAR Management Time* **have been revised downward to better represent that of contemporary processors.**
  - *zAware* **can now be configured to an IFL or GP partition as an additional SCP type.**
- **Capacity results from zPCR v8.1 should not be compared to those of previous zPCR versions**
  - Capacity comparisons should always be made using the same zPCR version
    - Such comparisons will remain substantially unchanged regardless of the version being used.

What is new in zPCR C V7.9b…

- ***LPAR Configuration Capacity Planning*** function:
  - zPCR algorithms for multi-book configurations have been updated.
    - Partition capacity results for multi-book systems will be higher than those from previous zPCR versions.
    - The largest improvements will be seen on 4-book processors, 2 and 3 book processors improvements will be less
- ***Advanced-Mode*** – The number of LPAR configurations defined has been increased from 6 to 7
- ***LSPR Capacity Ratio tables*** now default to showing all 5 LSPR workload categories
- ***EDF*** input for z/VM partitions:
  - CPU-MF counter data from z/VM is now recognized by zPCR
  - Will be used to make the workload assignment for the partition.
- ***RNI calculation*** – Minor change for z196 and z114 processors
- **Capacity results from zPCR v7.9b should not be compared to those of previous zPCR versions**
  - Capacity comparisons should always be made using the same zPCR version
    - Such comparisons will remain substantially unchanged regardless of the version being used.

zPCR Capacity Sizing Lab – Part 2 Hands-on Lab

SHARE - Session 12674

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IBM

Agenda

- Lab Exercise Introduction
- Lab Exercise

Overview of Lab Exercise

- **XYZ Corporation Background**
  - Currently has System z196
    - 2817-707 (7 way GCPs)
    - Customer views it as having 7,127 MIPS from last zPCR
    - Machine averages 100% busy during peak

- **Plan being developed to replace with zEC12**
  - Must have at least 20%+ additional capacity
    - at least 8,553 MIPS
  - Prefer a 2827-7xx but would consider a sub-capacity 2827-6xx

Lab Exercise – Tasks to Complete

- Task 1 – Load EDF containing the latest RMF/SMF data
  - Including SMF 113s
- Task 2 – Rename the configuration
- Task 3 - Save the current study in Advanced-Mode
  - e.g. task2.zpcr
- Task 4 - Find an appropriate zEC12 700 replacement processor
- Task 5 - Model the intended zEC12 LPAR host using Advanced Mode
- Task 6 - Review the Capacity results and save the Study
  - Use a different file name than Task 3, e.g. task6.zpcr

- Additional Analysis To Try
  - A. Model a zEC12 600 as an alternative
  - B. Add 1 IFL partition running Linux for System z under z/VM to zEC12 700

The purpose of this lab is to enable familiarization and skill in executing zPCR Advanced Mode, and it may not necessarily reflect capacity sizing best practices