

## [zPCR News](#)

Processor Capacity Reference for IBM z Systems  
zPCR for IBM Customers

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**zPCR** is a product of Capacity Planning Support (CPS), part of IBM's Advanced Technical Skills (ATS). The tool can be obtained from the following website:

[www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/PRS1381](http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/PRS1381)

### **Support Contact**

Support concerning zPCR function, usability, satisfaction, etc. is available as follows:

- o Email: [zPCR@us.ibm.com](mailto:zPCR@us.ibm.com)

### **Registration**

Registration is necessary before using zPCR. You will be prompted the first time that zPCR (or other CPS tool) is initialized. A single registration serves for all of the Java-based CPS tools. The purpose of registration is:

1. Maintain an email contact should important information relative to zPCR need to be disseminated
2. Understand usage for the purpose of justifying resources to maintain these tools.

Registration requires access to an IP address. In certain instances, installation firewalls would need to be updated to allow internet access, per the table below. Alternatively, an email registration process is available.

	IP Address	Port
CPS Registration	63.90.229.134	5316

### **Java Runtime**

**zPCR** requires the IBM Java runtime environment (another CPS tool, **zSoftCap**, has the same requirement). The IBM JRE supporting this tool is independent of any other installed Java environment. There is no way to configure this tool to use any Java other than the IBM JRE.

For **IBM Customers**, the required IBM 32-bit Java runtime environment can be obtained by installing either the **zPCR** package file that includes Java or the **zSoftCap** package file that includes Java. If the IBM Java runtime environment has already been installed via one of these packages, the other tool must be installed using the package that excludes Java.

Two **zPCR** installation packages are available on your download Web site:

1. **zPCRInstallWithJava.exe** zPCR tool plus the required IBM Java runtime (~110 MB)
2. **zPCRInstall.exe** zPCR tool only (~14MB)

If you do not already have the required IBM 32-bit Java runtime installed, you should download the larger package. The Java runtime, supporting both **zPCR** and **zSoftCap**, will automatically be installed as **zPCR** is being installed.

If the required IBM Java runtime is already installed on your PC, you should download and install the "zPCR tool-only" package.

Should the release requirement for the IBM Java runtime environment ever change, the larger package including Java will be needed. In this case, it is recommended that you uninstall any previous IBM Java runtime environment prior to installing the new one.

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**Note:** When other Java runtime environments have been installed and configured with Java security enabled, a fresh install of CPS Java may fail to execute properly. This has been observed in a very small number of CPS Java installations. Should this situation occur, one possible solution is to: 1) uninstall the other Java, 2) uninstall CPS Java, 3) re-install CPS Java, and 4) re-install the other Java.

### Installation Tips, Usage Notes, and Problem Solutions

1. The currently supported environment for zPCR is Windows 7. zPCR should function under Windows 8 and Vista; however, reported problems will be addressed only if they can be recreated using Windows 7.
2. Users no longer require Window's **Administrator** authority to install or run zPCR. However, when installing the package that excludes Java, you will be prompted for an Administrator password. This prompt can be avoided by uninstalling zPCR, and then reinstalling the larger package that includes Java. zPCR can only be run on the userID to which it was installed.
3. For the IBM Java runtime environment, a minimum 1 GB of memory is recommended in order to run smoothly.
4. A monitor resolution of at least 1280x1024 is required; higher is extremely desirable. At the minimum resolution, some windows may require the entire vertical or horizontal dimension (see next item).
5. The Windows task bar may prevent some windows from being entirely visible. This situation can be corrected by going to Windows task bar properties and checking **Auto hide the taskbar**.
6. Windows desktop configured to use large fonts (i.e., **Display Text size 150%**) may cause certain zPCR windows to render poorly. We believe that the problem windows have been corrected. Please inform the owners at the zPCR support ID if any such problem persists.
7. Erratic Behavior and Abend Situations: Most of the reported execution problems have been traced to outdated graphics drivers and Java activities that invoke "Hardware acceleration". To identify this as the problem, you should turn "Hardware acceleration" off (go to **Desktop properties**, click on the **Settings** tab, click the **Advanced** button, click the **Troubleshoot** tab, and move the slider to "**None**"). If this solves the problem, you can try to find a more current graphics adapter driver version, or continue to run with the accelerator slider at a reduced setting.

### Documentation and Education

Available from your CPS tools distribution site:

- **zPCR User's Guide** (PDF)
- **zPCR Demonstration** (3 short videos)
- **zPCR Familiarization Exercise** (PDF)
- **LPAR Concepts** (video)
- **Introduction to IBM's LSPR** (PDF visuals and voice recording)

Included with the zPCR package distribution materials:

- **zPCR Online Help** (User's Guide without screen captures)
- **LSPR FAQ** (concerning assumptions for the LSPR Multi-Image and Single-Image tables)
- **LSPR Workloads** paper discusses LSPR workloads and mix considerations
- **QuickStart Guide** provides step-by-step instructions for defining LPAR configurations and making capacity comparisons thereof.

### Disclaimer

The performance data contained in this tool was derived by IBM in a controlled environment. A customer's actual performance results may vary significantly. Accordingly, IBM provides no representations or assurances that a customer will obtain the same or similar results.

**Current Version / Recent Change History**

**V8.7g (09/15/2015)**

**C8.7g (09/15/2015) Customer version**

- **z/VM EDF:** The z/VM extract program has been updated to more accurately characterize of the physical CEC. Users creating EDFs from z/VM should obtain and use **CP3KVMXT version 2.7e**.
- **Problems Corrected**
  - **RMF Input:** IFL: partitions were being assigned z/VM as the SCP by default. This name is now invalid (see **z/VM** above), causing zPCR to crash.
  - The **Workloads** window failed to render the **SCP/Workload Category** table image.
  - When reading multiple EDFs from a single CEC where both z/OS and z/VM partitions are involved, the EDFs will now be identified as being on the same physical CEC.

**V8.7f (08/18/2015)**

**C8.7f (08/18/2015) Customer version**

- **KVM** support added as SCP for a partition. KVM runs on z13, zEC12, and zBC12 models only, supporting up to 141 IFL or GP logical CPs. z13 IFL SMT is not currently supported. 5 workload classifications are similar to those of the other SCPs, and are intended to represent Linux guest activity.
- **z/VM** support enhanced with versions
  - **z/VM-5.4** is intended to represent any z/VM version prior to z/VM-6.3. 32 logical CPs is the maximum that can be supported regardless of the processor family.
  - **z/VM-6.3** is intended to represent z/VM versions that include support for using SMT on z13 IFLs. While z/VM-6.3 on a z13 can support a maximum of 64 logical CPs, the zPCR limit remains at 32. 64 CP support can be expected at a later date.
- **Measured SMT Benefit** from **EDF** and **RMF**
  - Measured **SMT Benefit** values that are **manually** entered must now be in the range of 0% to 90%. Negative values cannot be entered.
  - Measured **SMT Benefit** values from **EDF or RMF** will be reported at the time the information is read. An explanation dialog will be presented. Negative values will not be transferred to the partition definition in zPCR. Rather, the choice afforded is to either set the partition's **SMT Benefit** to 0% or to turn SMT off.
- **Problems Corrected**
  - Capacity for **z/VSE** partitions was not being computed correctly. Values were 1-6% higher than expected depending on the number of logical CPs defined. z/VSE capacity for 1, 2, and 3-way partitions will be reduced accordingly.
  - Study file could not be loaded when a z13 was included: z13 SMT values read from a study file were not being handle properly if the study file had been created in other than English.
  - Improved rendering of charts produced from the **Partition Detail Report** window when the disclaimer was included.
- **General Items**
  - **User's Guide** and **Online Help** have been updated.

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### V8.7e (07/20/2015)

#### C8.7e (07/20/2015) Customer version

- **EDF Input:** For z/OS Extract, watch for a new **CP3KEXTR** version subsequent to v05/15. The new version will provide **Measured SMT Benefit** for z13 zIIP partitions with SMT active. The equivalent z/VM Extract, providing **Measured SMT Benefit** for z13 IFL partitions with SMT active, will not be available until later.
- **Problems Corrected**
  - Any changes made to partition definitions on the **Partition Detail Report** window when the LPAR host was other than a z13 would cause a code failure, with unpredictable results. Equivalent changes made using the **Partition Definition** window were not a problem.
  - When the LPAR host was other than a z13, the **Modify SCP/Workload** window (from the **Partition Detail Report** window) could only be closed by doing a **Commit**. Any attempt to **Cancel** (exit without **Commit**) failed to close the window.
  - **SMT Benefits** window: Changes made to the **SMT Benefit Default** values for zIIP and for IFL CPs were lost when the window was closed. Also, these changes were not included for the partition in a saved study.

Note that the above problems originated with v8.7d.

**V8.7d (07/01/2015)**

**C8.7d (07/01/2015) Customer version**

• **z13 SMT Benefit**

- Visibility for **SMT Benefit** for zIIPs and IFLs on z13 LPAR hosts has been increased. Current **SMT Benefit** values and resulting capacity will always be displayed on the **Partition Detail Report** window. **SMT Benefit** values are managed via the **SMT Benefit** window, accessed via the **SMT Benefit** button. Two classes of **SMT Benefit** values are available, displayed in separate columns:

1. **Measured SMT Benefit** values normally result from EDF or RMF input when such information is included in the data. Measured values may also be input manually. Values may be in the range of 0.0% to 90.0%. Manually entering 0.0% causes an existing measured value to be removed.
2. **Estimated SMT Benefit** values are managed by the user. When no measured value has been established, estimates may be set. Estimates are set globally for zIIPs and for IFLs, or set independently by partition. Values may be in the range of 0% to 60%, and are set using a spinner in 1% increments. A default value is provided for zIIPs (25%) and for IFLs (20%).

As **SMT Benefit** changes are made, the **Partition Detail Report** window is updated dynamically. Both measured and estimated values are displayed with estimated values prefixed by “est”. A **Commit Changes** button is available to permanently set pending **SMT Benefit** changes.

• **Measured SMT Benefit from RMF and EDF**

- **SMT Benefit** for zIIP CPs can now be obtained from z/OS-2,1 RMF reports.
- **SMT Benefit** for zIIP CPs can now be obtained from a z/OS EDF (the most recent version of CP3KEXTR must be used)

Note that z/VM EDF support to obtain **SMT Benefit** for IFL CPs is not yet available (the CP3KVMXT program to report this information remains to be implemented).

• **CEC information from z/VM EDF**

- z/VM EDFs contained insufficient information to accurately identify the number of books or drawers installed. The CP3KVMXT program has been updated to correct this. Starting with zPCR v8.7d, z/VM EDFs must be created using the latest CP3KVMXT program.
- When reading EDFs, zPCR should be counting the number of CPs installed to determine the minimum number of books or drawers installed. Instead, zPCR was always configuring a single book (or drawer), which would often lead to an invalid configuration. This problem has been corrected, and will allow an older z/VM EDF to be read. However, using the new CP3KVMXT program to create EDFs will further improve zPCR ability to correctly interpret the LPAR configuration.

• **Problems Corrected**

- Definition of ICFs on a z13 model was limited to 16. Any number may be defined.
- When optimizing LCP counts based on weights, the counts could exceed the maximum LCP count allowed for the SCP defined. Both the **LCP Assignment Alternatives** window and the **Partition Capacity Comparison** window were affected.
- **Clone** would lose the association of IFL LCPs to a z/VM GP partition. A separate IFL partition was created instead (no effect on capacity results).
- Rendering of several windows has been improved to better map to various PC screen sizes and Windows Text Size settings.

• **General Items**

- **User's Guide** and **Online Help** have been updated.

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**V8.7c (05/01/2015)**

**C8.7c (05/01/2015)    Customer version**

- **LSPR Capacity Ratio Tables**

- Added the ability to search the **Multi-Image LSPR Table** (GPs only) for processor models with similar **capacity or similar MSU ratings**. **Access this feature via the LSPR Table Control window.**
- Corrected problem where z9 and z10 processors would remain displayed regardless of their **Selected Families** check box setting.

- **LPAR Configuration Capacity Planning**

- **Capacity results for zBC12 and z114 2-drawer models (2828-H13 and 2818-M10), when the 2<sup>nd</sup> drawer is actually used, will vary somewhat from those of previous zPCR versions.** Capacity results for all other BC and EC models remain unaffected.

Algorithms have been refined for the zBC12 and z114 2-drawer models. A capacity impact is now applied when **GP/zAAP/zIIP** and **IFL/ICF** CPs intersect within the same drawer. In addition, a cost is applied to **GP+zAAP** or **GP+zIIP** partitions whenever 2 drawers are used by the combination of CPs. These considerations are identical to those currently used for the multi-book and multi-drawer EC models.

- **z/VSE Workloads** have been converted to use the z/OS ITRRs and RNI naming convention. The new workload categories are **Low/VS, Low-Avg/VS, Average/VS, Avg-High/VS, and High/VS**. When reading a former study with partitions defined with z/VSE, the workload names will be translated via the **SCP/Workload Conversion** window as follows:
  - **Batch** will become **Low-Avg/VS**
  - **Mixed** will become **Average/VS**
  - **Online** will become **Avg-High/VS**

**Since the z/OS LSPR ITR data is now being used, z/VSE capacity projections for 2, 3, and 4-way partitions may vary somewhat from those of previous zPCR versions.**

- **General Items**

- The **LSPR Workload Categories** window has been updated to reflect the new z/VSE workload names.
- When loading an **Advanced-Mode** study, the **SCP/Workload Conversion** window will now identify which LPAR configuration the partition with SCP or workload change belongs to.
- Support for **RMF XML** input to zPCR has been dropped. The **RMF Partition Data Report** file (text format) continues to be supported by zPCR. EDF input is an even better alternative.
- Under the **File** menu item of the **Function Selection** window and the **Advanced-Mode Control Panel** window, the list of previous loaded zPCR study files has been increased from 5 to 10.
- An internal table restructure has removed approximately 1,100 pseudo processors formerly used to compute GP+zAAP and GP+zIIP partition capacity when GP engines are less than full-speed. Algorithms are now used; there will be no difference in capacity results from those of the previous zPCR version. This change has also removed artificial restrictions on the degree to which a GP/zAAP or GP/zIIP configuration may be nonstandard.
- The dialog that, after 6 months, suggests that your zPCR version may be out of date, has been changed to 9 months. We do not expect to ever go more than a few months without an updated version, so it would be wise to check your download web site frequently, should a new version become available.
- **User's Guide** and **Online Help** have been updated.

**V8.7b (04/01/2015)**

**C8.7b (04/01/2015) Customer version**

- **Important:** zPCR capacity results may be affected due to an algorithm improvement.

The redistribution of partition's **unusable capacity** was formerly based on each partition's LCPs relative to the total number of LCPs defined within the CP pool. To more accurately reflect the way partitioning works, redistribution is now based on the partition's weight assignment relative to the total of partition weights within the CP pool.

Redistribution of a partition's **unusable capacity** can occur in two ways:

1. When a partition's weight indicates more capacity than can be provided by its LCPs. This type of **unusable capacity** is redistributed to other partitions within the same CP pool.

This situation can be avoided by assigning partition weights that can be met by its LCP count.

2. When **Absolute Capping** is specified with a value that would cause the partition's **Maximum Capacity** to be less than its **Minimum Capacity**, the **Minimum Capacity** is reduced. This type of unusable capacity is redistributed to other non-capped partitions within the same CP pool.

This situation can be avoided by assigning reasonable **Absolute Capping** values. Assigning **Absolute Capping** values that cause capacity redistribution, while valid, is not recommended.

Whenever **unusable capacity** is detected, this algorithm change will cause the **Minimum Capacity** result for the other partitions within the CP pool to differ from previous zPCR versions. Partition **Maximum Capacity** results are unaffected. The total capacity result for each CP pool (sum of partition **Minimum Capacity** values) is essentially unaffected. However, when partition workloads within the CP pool vary, the pool total capacity result could vary somewhat.

- **Absolute Capping** (z13, zEC12, and zBC12 models only)
  - For each partition, any value between zero and the number of LCPs defined can now be entered. Previously, when the value caused **Maximum Capacity** to be less than its **Minimum Capacity**, it was considered an error and the **Absolute Capping** setting was ignored. Now, in this situation, the partition's **Minimum Capacity** will be reduced to match its **Maximum Capacity** (such settings are not recommended). The amount of **Minimum Capacity** reduction is redistributed to the remaining partitions within the same CP pool.
- **SMT Benefit** (z13 only; zIIP and IFL partitions only)
  - **zIIP Partitions:** Values can be set only when the SCP is z/OS-2.1. Default is 25%; the setting can be changed within the range of 0% to 60%.
  - **IFL Partitions:** Values can be set only when the SCP is z/VM (z/VM-6.3 must be assumed). Default is 20% (when Linux is defined to the partition, the default value is 0%). The setting can be changed within the range of 0% to 60
- **LPAR Host Definition** window now identifies the selections necessary if no GP CPs are required.
- **RMF XML** input to zPCR from Report Writer v1.13 or v2.1 will not work, because the interpreting logic was never implemented. RMF text input should be used instead.
- **User's Guide** and **Online Help** have been updated
- Various problems corrected:
  - CPU-MF data was viewed as corrupted under rare conditions.
  - Copying partitions from an **Advanced-Mode** study, partition names were seen as invalid.
  - A GP partition with both zAAP and zIIP associated LCPs, if either the zAAP or zIIP LCPs were excluded, the resulting **Minimum** and **Maximum Capacity** values for the GP partition could be corrupted. This could also happen when the excluded zAAP or zIIP LCP counts were adjusted.
  - National language problem when reading **Absolute Capping** values from a zPCR study file.
  - Windowing problem when the Windows text size was set to 125% (Medium). Previously, scroll bars appeared unnecessarily on certain zPCR windows.
  - **External Study File** support issues corrected and documentation updated (now version 2.0)

### V8.7a (01/30/2015)

#### C8.7a (01/30/2015) Customer version

- **LSPR Table** – corrected missing flag fields for certain z13 models.
- **Absolute Capping** – Previously, the value specified had to be able to provide a **Maximum Capacity** value that was greater than the **Minimum Capacity** value. If it would not, a dialog was offered and the user was required to correct the entry.

Now, any value between zero and the number of LCPs defined to the partition is accepted. If the value would result in a **Maximum Capacity** less than **Minimum Capacity**, the **Absolute Capping** value background is made red, the **Maximum Capacity** is set to the **Minimum Capacity** (normal capping), and a message line at the bottom of the window documents the situation.

- **zAAP Capacity Estimator** – corrected problem when z13 was defined as the host, algorithms did not include some hardware related cost factors. With this fix, z13 zAAP capacity results (assuming the use of “zAAP on zIIP”) will be slightly less than those from v8.7.

### V8.7 (01/14/2015)

- The **IBM z Systems (z13)** processor family has been added, with 231 General Purpose models (90 slugged and 141 full-speed) and 141 IFL models. Various drawer configurations provide up to 141 real CPs, which can be configured as General Purpose, zIIP, IFL, or ICF engines. The processor designation is 2964-7xx for full speed models, and 2964-4xx, -5xx, or 6xx for slugged models.
- **LSPR data is now based on z/OS-2.1** (formerly z/OS-1.13)
  - The **LSPR Multi-Image Table** includes all IBM z System processor families and models. The **LSPR Single-Image Table** includes all IBM z System processor families and models for up to 30 CPs (only reasonable single-image configurations are displayed).
  - For z13, zEC12, zBC12, z196, z114, and z10 processors, z/OS LSPR data is represented with HiperDispatch turned on. This means that capacity results for defined LPAR configurations on these processor families also are assumed to represent HiperDispatch turned on.
  - z13, 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 setting can be displayed.
  - **z13 Symmetrical Multi-Threading (SMT)**: z13 LSPR zIIP and IFL capacity can be displayed with an estimated **SMT Benefit**. The default **SMT Benefit** for zIIPs is 25% and for IFLs is 20%.
  - The z/OS LSPR data is also considered representative for z/VM (up to the 32 CP maximum) and Linux (any number of CPs).
  - CFCC data is not displayed in any LSPR table, but is included for the purpose of sizing partitions running it. CFCC v20 is assumed for z13 processor models.
- In **Advanced-Mode**, the number of LPAR configurations that can be defined has been increased from 7 to 10.
- On the **Advanced-Mode Control Panel** window, the display field for LPAR configuration names has been widened to fully display the longest possible name (30 characters).
- **LPAR Configuration Capacity Planning** function:
  - The **Partition Definition** window has been redesigned to allow the complete definition of zAAP and zIIP LCPs associated with a z/OS partition and IFL LCPs associated with a z/VM partition. The format is now identical to the **Partition Detail Report** window with the exception of not showing capacity values.
    - Note 1: For **z990** and **z890** processors, the rules for defining zAAP LCPs associated with a z/OS partition are not automatically enforced. The user must ensure that **Mode**, **Weight**, and **Capping** assignments match those of the associated z/OS partition.
    - Note 2: For **z9**, **z990**, **z890**, **z900**, and **z800** processors, the association of IFL LCPs with a z/VM partition is not supported. If defined, such partitions will automatically be excluded.



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- **Absolute Capping** - In addition to normal capping, **Absolute Capping** may now be specified for a partition when the LPAR Host is a z13, zEC12, or zBC12. A fractional value up to the total number of logical CPs is used to specify **Absolute Capping**. The result is reflected in the partition's **Maximum Capacity** value. **Absolute Capping** inputs must be done on the **Partition Detail Report** window. Input allowed only for supported processor models. Currently all **Absolute Capping** values must be entered manually (the ability to read this information from an EDF remains to be implemented).
- **SMT Benefit** - On z13 processors only, **Symmetrical Multi Threading (SMT)** can be activated for z/OS running on zIIPs and z/VM running on IFLs. When enabled, SMT will generally provide a capacity benefit for activity on these CP types. SMT is currently supported only by z/OS-2.1 and z/VM-6.3.

When a z13 is designated as the LPAR host, an additional column, **SMT Benefit**, can be displayed on the **Partition Detail Report** window. Input for this column is enabled for all z/OS-2.1 zIIP partitions and all IFL partitions. When these fields are populated with a percent benefit value, the partition's **Minimum Capacity** and **Maximum Capacity** results will be adjusted accordingly. **SMT Benefit** values can be applied globally for all zIIP and all IFL partitions or can be entered manually by partition. A default value is provided for zIIPs (25%) and for IFLs (20%). All windows presenting capacity results will identify z13 configurations where **SMT Benefit** values have been applied.
- On the **Partition Definition** and **Partition Detail Report** windows, the **Summary by Pool** table appearing at the bottom has been enhanced. The table is now more complete and more consistent across the windows. When an **SMT Benefit** has been defined for z13 zIIPs and IFLs, an extra column appears showing the average **SMT Benefit** for the pool.
- Algorithms concerning GP partitions with associated zAAPs or zIIPs have been updated. Capacity results for all processor families with these partition types may vary slightly from those of previous zPCR versions.
- **EDF** input now includes any partition **Absolute Capping** values that may have been set. When loading the entire LPAR configuration from EDF, these values will be transferred. When copying partitions from EDF **Absolute Capping** values will be transferred only if the new LPAR host is a zEC12/zBC12 or later.
- **RMF** input window now includes an **Absolute Capping** column. However, **Absolute Capping** information is not currently available from RMF; therefore values will not be displayed. The alternative is to use EDF to capture these values.
- **Copy Partitions from Study** has been updated to display any **Absolute Capping** and **SMT Benefit** values that may be included in the LPAR configuration. **Absolute Capping** values will be transferred only if the new LPAR host is a zEC12/zBC12 or later. **SMT Benefit** values will be transferred only if the new LPAR host is a z13.
- **zPCR User's Guide** and **Online Help**: Updated to discuss changes implemented in support of the **z13, Absolute Capping** and **SMT**.