Sub-capacity (Virtualization) License Counting Rules

Processor Deconfiguration and TurboCore on IBM Power Systems servers to Limit Processor Cores Available

NOTE: Please use these rules in conjunction with the Passport Advantage Agreement
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Summary of Virtualization Capacity Licensing Requirements

- Customers must:
  - Agree to the terms of the Sub-capacity Attachment, and follow Virtualization Capacity License Counting rules for their Eligible Virtualization Environment(s)
  - Use Eligible Sub-capacity Products
  - Use Eligible Virtualization Technologies
  - Use Eligible Processor Technologies
  - Use the IBM License Metric Tool (ILMT) and maintain report documentation
    - Tivoli Asset Discovery for Distributed (TADd) or IBM BigFix Inventory, may be used in lieu of IBM License Metric Tool
    - Certain ILMT / TADd / BigFix use exceptions may apply

**PLEASE NOTE:**
- The above is only a summary. For details about sub-capacity licensing requirements, see the Sub-capacity Attachment and other information referred to above, at [Passport Advantage Virtualization Capacity website](http://www-01.ibm.com/software/lotus/passportadvantage/subcaplicensing.html)
- Customers are responsible for the installation of the IBM License Metric Tool and for the server it runs on.
Deconfiguration and TurboCord for Power Systems Servers - Definitions

- **Processor Deconfiguration** – Feature allowing to take some of the processor cores offline.

- **TurboCore** - In standard or MaxCore mode, the Power system uses all processor cores and has access to the entire L3 cache. In TurboCore mode, only a fraction of the cores are available but at a higher frequency and these cores have access to the entire L3 cache. Thus, in Turbo-core mode there are fewer cores running at a higher frequency with a higher core-to-L3-cache ratio. TurboCore is limited to selected Power7 servers.
License counting for a Power Systems Server using Processor Deconfiguration or TurboCore to limit processor core capacity available

For above example, the PVU Virtualization Capacity licensing requirement is based on the maximum number of physical cores available to a product in each server.

<table>
<thead>
<tr>
<th>Cores to License</th>
<th>Server 1</th>
<th>Virtualization Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAS</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Full Capacity

8
Processor Deconfiguration or TurboCore for Power Systems Servers - Licensing Rules

The PVU Virtualization Capacity licensing requirement is based on the maximum number of physical cores available to a product in each server.
The licensing rules in the preceding pages reflect how ILMT will operate to calculate PVUs.

If ILMT does not yet support a Eligible Virtualization Environment, or you qualify for an exception to use ILMT, you will need to follow the Manual Calculation of Virtualization Capacity.

The Manual Calculation of Virtualization Capacity rules can be found in the following pages.

To find out if a Eligible Virtualization Technology is supported by ILMT visit Passport Advantage Sub-capacity licensing information:
Manual Calculation of Virtualization Capacity

- **Eligibility Criteria**: Customers must use the IBM License Metric Tool, with the following exceptions
  - ILMT does not support the Eligible Virtualization Environment
  - Customer has fewer than 1000 employees and contractors and Customer server Full Capacity licensing for a PVU product is less than 1000 PVUs (on servers with an Eligible Virtualization Environment) - Tool recommended

- **Requirements**: For the above exceptions, customers must manually manage, track and prepare Audit Reports
  - An Audit Report must be prepared at least once per quarter and identify the following detail: Each Eligible Sub-Capacity Product deployed in each Eligible Virtualization Environment
  - An Eligible Virtualization Environment can be a Single Server or a Group of Servers (Server Cluster)
  - In addition to the above detail, the report should provide a summary total of the required number of PVUs by and for each Eligible Sub-Capacity Product
  - Audit Reports must be prepared as frequently as is required to maintain a history of increases to Virtualization Capacity and Full Capacity
  - Each Audit Report must be **generated**, at least once per quarter

The above is only a summary. For detailed terms please see the Passport Advantage Sub-capacity licensing information (http://www-01.ibm.com/software/lotus/passportadvantage/agreementsandforms.html)
The PVU Virtualization Capacity licensing requirement is based on the maximum number of physical cores available to a product in each server.
## Manual Calculation of Virtualization Capacity - Worksheet Example

### VIRTUALIZATION ENVIRONMENT - SINGLE SERVER

- This worksheet is for one standalone server for one Software Product
- Per the Instructions on the first tab, you may choose to leverage this approach or develop / leverage your own processes and reporting format so long as you capture all the mandatory information below

Enter data in input fields below (shaded area)  

<table>
<thead>
<tr>
<th>Date of this Audit Report *</th>
<th>March 31, 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Name *</td>
<td>IBM WEBSPHERE APPLICATION SERVER NETWORK DEPLOYMENT 5724-H88</td>
</tr>
<tr>
<td>Program Identification Number (57xx-xxx)</td>
<td>DSSWJLL</td>
</tr>
<tr>
<td>P/N Description</td>
<td>Server ID # F6015; Bldg 1, Room 1, Somers, NY</td>
</tr>
<tr>
<td>Part Number</td>
<td>IBM System x</td>
</tr>
<tr>
<td>Server ID / Location</td>
<td>xxxxx</td>
</tr>
<tr>
<td>Server Vendor / Brand</td>
<td>VMware ESX 3.5</td>
</tr>
<tr>
<td>Server Model</td>
<td>Intel Xeon Quad Core Model 35XX</td>
</tr>
<tr>
<td>Virtualization Technology used *</td>
<td>PVUs per core * (A) 70</td>
</tr>
<tr>
<td>Processor Technology (Vendor, Brand,Type,Model#) * (A)</td>
<td>Total Activated Cores on Server * (C) 8</td>
</tr>
<tr>
<td>PVUs per core * (A)</td>
<td>Full Capacity PVUs for Server * (C) 560</td>
</tr>
</tbody>
</table>

### VM, Partition ID *

(whatever identifier used for any subdivision of a server such as LPAR #, IP address, hostname, etc.)  

<table>
<thead>
<tr>
<th>VM, Partition ID *</th>
<th>Cores (B) per Partition or VM*</th>
<th>User Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Sum of Virtual Cores *  
PVUs per core *  
Virtualization Capacity PVUs by Product for Server *  
PVU Licenses required by Product for Server * (C)  

**Mandatory Field**

(A) PVUs required for each physical processor core are listed on the PVU table (see link below, including vendor/brand designations)  

(B) For purposes of "Manual Calculation" of Virtual Capacity, 1 virtual core (or CPU) is equivalent to 1 physical core. Enter values in whole cores.  

(C) Lower of Full Capacity or Virtualization Capacity
Key Web Links

- **PVU**
  - PVU table and other information

- **Sub-capacity**
  - Passport Advantage Sub-capacity licensing information
  - Virtualization Capacity License Counting Rules
  - Passport Advantage Agreement Terms