IBM Passport Advantage Software

Sub-capacity (Virtualization) License Counting Rules

Microsoft Hyper-V Virtualization Environment

NOTE: Please use these rules along with the Sub-capacity licensing attachment

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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 V7.2 (TADd) may be used in lieu of IBM License Metric Tool V7.2
    - Certain ILMT / TADd use exceptions may apply

PLEASE NOTE:

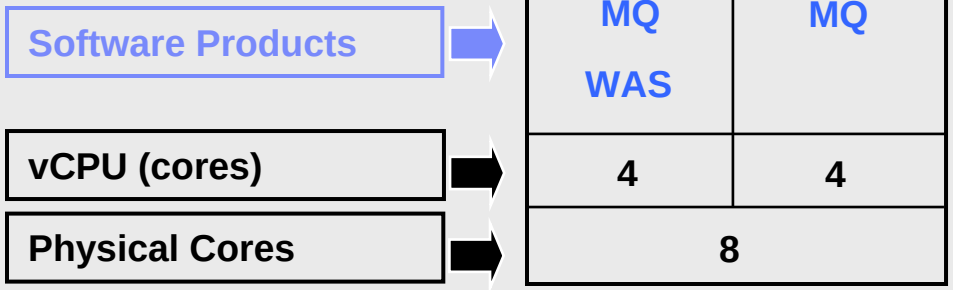
- *The above is only a summary. For details about sub-capacity licensing requirements, see the Sub-capacity Attachment and other information referred to above, at* ***Passport Advantage Virtualization Capacity website***
- *Customers are responsible for the installation of the IBM License Metric Tool and for the server it runs on.*

Microsoft Hyper-V Server Virtualization Technology - Definitions

- **VM – Virtual Machine**
  - A VM represents a complete system with processors, memory, disk and network resources
  - Multiple VMs can share physical resources and run side by side on the same server
- **vCPU – Virtual CPU**
  - Each VM is assigned a vCPU quantity
  - The processing capacity of a vCPU cannot be more than one physical processor core
  - Each vCPU is equal to one core for PVU licensing
- **Single Server**
  - A stand alone server that provides resources (i.e. processor core capacity) to the VMs
- **Cluster**
  - A group of servers, that are linked together using Microsoft Failover Clustering Feature to provide resources (i.e. processor core capacity) to the VMs
- **Quick Migration**
  - Allows the movement of a running VM from one physical server to another.

License counting in a “Single Server”

1 Server	8 Virtual Cores	8 Physical Cores



License counting for Microsoft

- Eligible Virtualization Technology can be used to create Virtual Machines (VMs)
- Each VM is assigned a vCPU quantity
- Each vCPU is equal to one core for PVU licensing.
- License PVUs for the maximum number of vCPUs (cores) in the VM(s) available to the product

- For above example, the PVU Virtualization Capacity licensing requirement is based on the maximum number of vCPUs (cores) in the VM(s) available to a product

Cores to License	VM 1	VM 2	Virtualization Capacity	Full Capacity
MQ software	4	4	8	8
WAS software	4	-	4	8

License counting in a "Single Server"

Virtualization Capacity greater than Full (Physical) Capacity

1 Server	9 Virtual Cores	8 Physical Cores

	Server 1		
	VM 1	**VM 2**	**VM 3**
Software Products	**MQ** **WAS**	**MQ**	**MQ**
vCPU (cores)	**4**	**4**	**1**
Physical Cores	**8**		

License counting for Microsoft

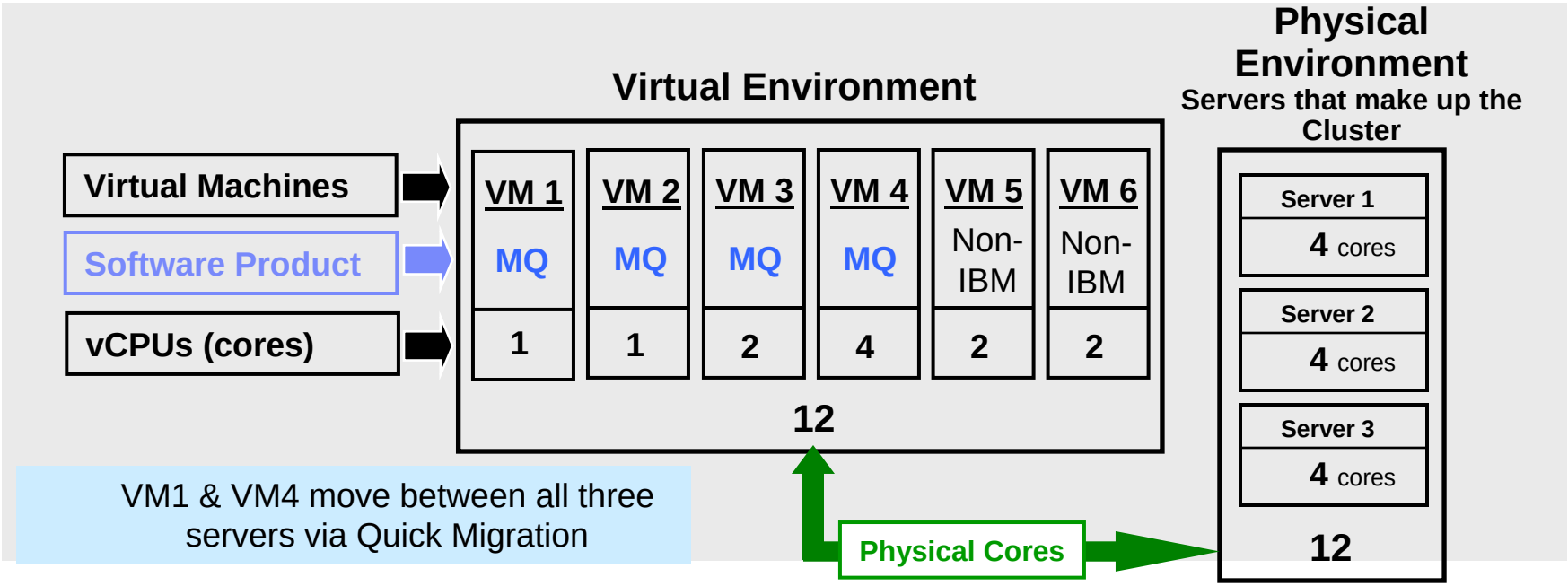
- Eligible Virtualization Technology can be used to create Virtual Machines (VMs)
- Each VM is assigned a vCPU quantity
- Each vCPU is equal to one core for PVU licensing.
- License PVUs for the maximum number of vCPUs (cores) in the VM(s) available to the product
  - the lower of the sum of vCPU or full capacity of the server

- For above example, the PVU Virtualization Capacity licensing requirement is based on the maximum number of vCPUs (cores) in the VM(s) available to a product
  - License Rule: lower of the Virtualization Capacity or Full (Physical) Capacity available in the Server

Cores to License	VM 1	VM 2	VM3	Virtualization Capacity	Full capacity
MQ software	4	4	1	9	8
WAS software	4	-		4	8

License counting in a server "Cluster"

3 Servers	12 Virtual Cores	12 Physical Cores



- For above example, the PVU Virtualization Capacity licensing requirement is based on the maximum number of vCPUs (cores) in the VM(s) available to a product
  - License Rule: lower of the Virtualization Capacity or Full (physical) Capacity available in the Cluster (group of servers)

MQ software	VM1	VM2	VM3	VM4	VM5	VM6	Virtualization Capacity	Full Capacity
Virtual Cores	1	1	2	4	-	-	8	12

Microsoft Virtualization Technology – Licensing Rules

- Single Server: (A stand alone server that provides resources (i.e. processor core capacity) to the VMs)
  - License PVUs for the maximum number of vCPUs (cores) in the VM(s) available to the Eligible Product
    - lower of the sum of vCPU or Full (physical) Capacity of the server
- Cluster: (A group of servers, that are linked together using Microsoft Failover Clustering feature to provide resources (i.e. processor core capacity) to the VMs
  - License PVUs for the maximum number of vCPUs (cores) in the VM(s) available to the product
    - lower of the sum of vCPU or Full (physical) Capacity of the Cluster
  - Virtualization Capacity licensing is available only if
    - all servers in the Cluster are located in the same physical site and
    - a VM (involved in Quick Migration) is not running in two servers simultaneously

- 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 - Tool recommended
  - 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 **signed and date stamped**, at least once per quarter

*The above is only a summary. For detailed terms please see the **Passport Advantage Sub-capacity licensing information***

Manual Calculation of Virtualization Capacity – Rules

- Single Server: (A stand alone server that provides resources (i.e. processor core capacity) to the VMs)
  - License PVUs for the maximum number of vCPUs (cores) in the VM(s) available to the Eligible Product
    - lower of the sum of vCPU or Full (physical) Capacity of the server
- Cluster: (A group of servers, that are linked together using Microsoft Failover Clustering feature to provide resources (i.e. processor core capacity) to the VMs
  - License PVUs for the maximum number of vCPUs (cores) in the VM(s) available to the product
    - lower of the sum of vCPU or Full (physical) Capacity of the Cluster
  - Virtualization Capacity licensing is available only if
    - all servers in the Cluster are located in the same physical site and
    - a VM (involved in Quick Migration) is not running in two servers simultaneously

Manual Calculation of Virtualization Capacity - Worksheet Example

Worksheet has 3 tabs

- Instructions & Information
- Single Server
- Group of Servers "Cluster"

Web Link: Worksheet for Manual Calculation of Virtualization Capacity

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 of the information below
- Enter data in input fields below (shaded area)

* Mandatory

Date of this Audit Report *	March 31, 2009
Product Name *	IBM WEBSPHERE APPLICATION SERVER NETWORK DEPLOYMENT
Program Identification Number (57xx-xxx)	5724-H88
P/N Description	IBM WEBSPHERE APPLICATION SERVER NETWORK DEPLOYMENT PROCESSOR VALUE UNIT (PVU)
Part Number	D55WJLL
Server ID / Location	Server ID # F6015; Bldg 1, Room 1, Somers, NY
Server Vendor / Brand	IBM System x
Server Model	xxxxx
Virtualization Technology used *	VMware ESX 3.5
Processor Technology (Vendor, Brand,Type,Model#) * (A)	Intel Xeon Quad Core Model 35XX
PVUs per core * (A)	70
Total Activated Cores on Server * (C)	8
Full Capacity PVUs for Server * (C)	560

DO NOT DELETE ROW

VM, Partition ID * (whatever identifier used for any subdivision of a server such as LPAR #, IP address, hostname, etc.)	Cores (B) per Partition or VM *	User Comments
A	4	
B	4	
C	2	
D	2	

Sum of Virtual Cores *	12
PVUs per core *	70
Virtualization Capacity PVUs by Product for Server *	840
PVU Licenses required by Product for Server * (C)	**560**

* Mandatory Field

(A) PVU's required for each physical processor core are listed on the PVU table (see link below, including vendor/brand designations)
http://www-01.ibm.com/software/lotus/passportadvantage/pvu_licensing_for_customers.html

(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

Instructions + Information | Single Server | Group of Servers "Cluster"

Key Web Links

- PVU
  - PVU table and other information

- Sub-capacity
  - Passport Advantage Sub-capacity licensing information
  - Virtualization Capacity License Counting Rules
  - Sub-capacity licensing attachment