Sub-capacity (Virtualization) License Counting Rules

Citrix XenServer Virtualization Environment

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

July 28, 2009

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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
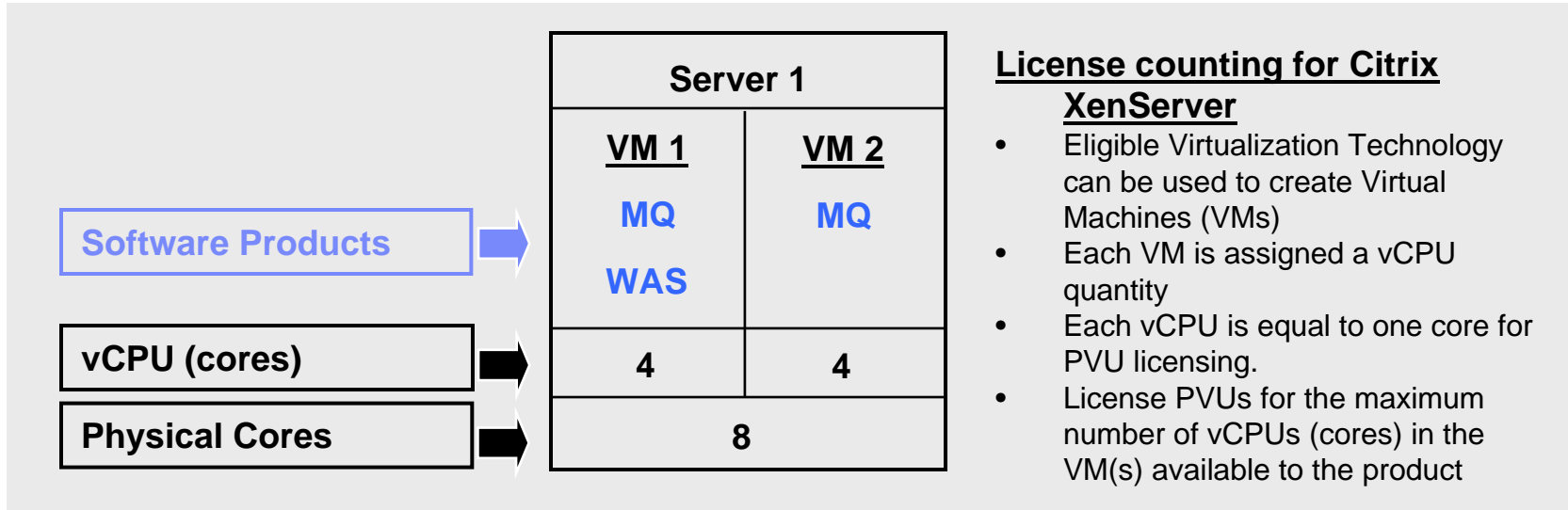

PLEASE   NOTE:

- *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.*

Citrix XenServer 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

- **Resource Pool**
  - ▶ A group of servers, with resource pool master, that provide resources (i.e. processor core capacity) to the VMs.

- **XenMotion**
  - ▶ 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

Software Products ➡

vCPU (cores) ➡

Physical Cores ➡

Server 1	
VM 1	**VM 2**
MQ	MQ
WAS	
4	4
8	

License counting for Citrix XenServer

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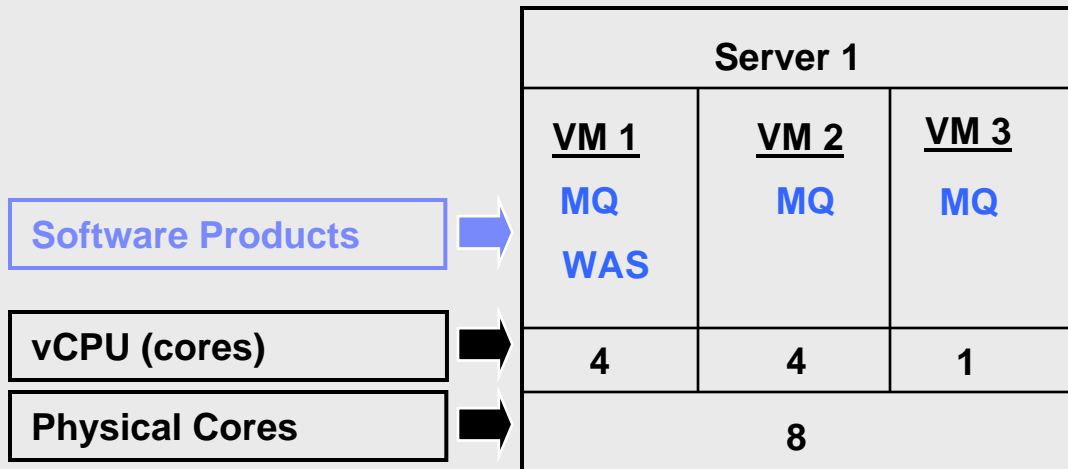
▶ For above example, the PVU Virtualization Capacity licensing requirement is based on the maximum number of vCPUs (cores) in the VM(s) available to a product

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		

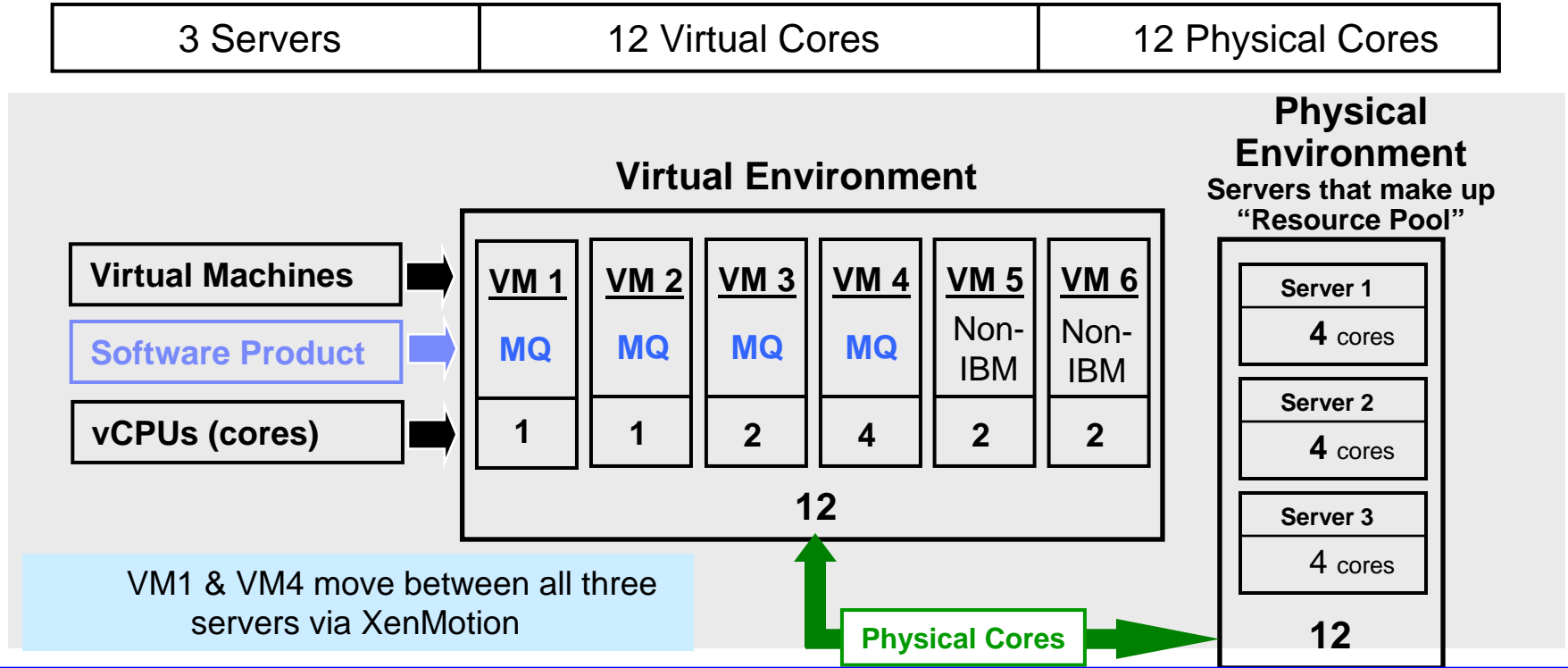### License counting for Citrix

- 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 "Resource Pool"

3 Servers	12 Virtual Cores	12 Physical Cores

Virtual Environment

Physical Environment
Servers that make up "Resource Pool"

	VM 1	VM 2	VM 3	VM 4	VM 5	VM 6
Virtual Machines	VM 1	VM 2	VM 3	VM 4	VM 5	VM 6
Software Product	MQ	MQ	MQ	MQ	Non-IBM	Non-IBM
vCPUs (cores)	1	1	2	4	2	2

12

Server 1	4 cores
Server 2	4 cores
Server 3	4 cores

12

VM1 & VM4 move between all three servers via XenMotion

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 Resource Pool (group of servers)

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

Citrix Virtualization Technology – Licensing Rules

- <u>Single Server:</u>
  - 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

- <u>Resource Pool</u> (A group of servers, with resource pool master, which 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 Resource Pool

  - Virtualization Capacity licensing is available only if
    - all servers are located in the same physical site and
    - a VM (involved in XenMotion) 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

- <u>Eligibility Criteria</u>: 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

- <u>Requirements:</u> 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

- <u>Single Server:</u>
  - 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

- <u>Resource Pool </u>(A group of servers, with resource pool master, which 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 Resource Pool

  - Virtualization Capacity licensing is available only if
    - all servers are located in the same physical site and
    - a VM (involved in XenMotion) 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 "Resource Pool"

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

► ►I \ 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