



IBM Passport Advantage Software

Sub-capacity (Virtualization Capacity) Licensing

Overview for Customers

July 1, 2008



Notice

This presentation contains relative processor core performance estimates and includes technology upgrade examples which are based on relative processor core performance estimates. While these estimates are calculated by IBM using a blended average of industry standard performance benchmarks, actual performance may vary based on each customer's unique server configuration and workload, among other factors.

Any errors in the presentation are unintentional and will be corrected immediately upon being brought to IBM's attention. Should any such errors occur, this does not relieve customers from their responsibility to obtain licenses for, and to be in compliance with, the required level of authorized use for each product.

Why Sub-capacity Licensing is Important to You

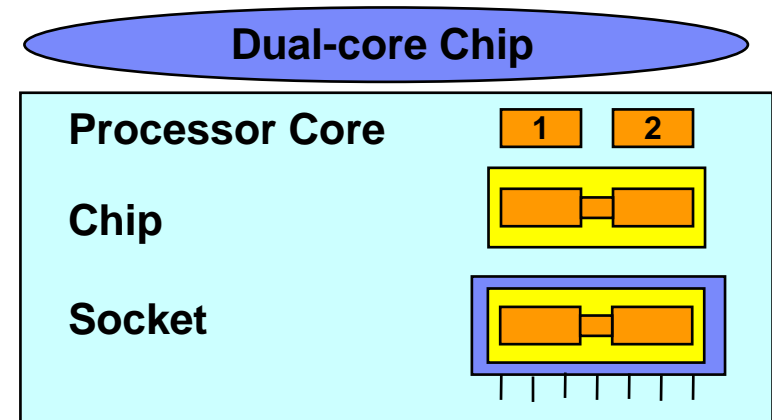
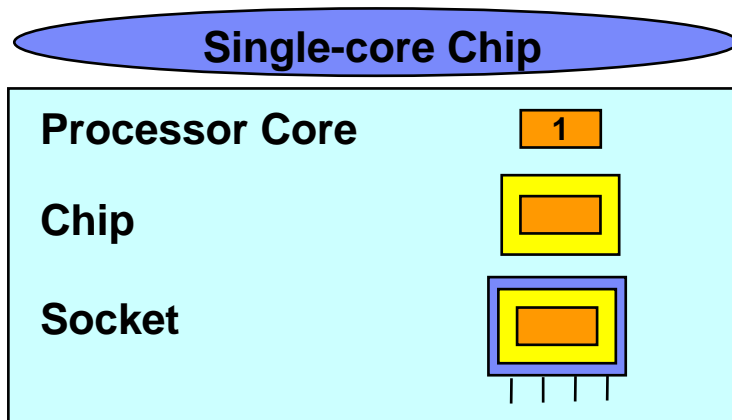
- Without Sub-capacity Licensing, customers must license to the full capacity of the server or group of servers
- Sub-capacity licensing compliments Processor Value Unit (PVU) licensing
 - PVUs provide a fair price for value received, and are based on the performance capacity of one processor core
 - Sub-capacity licensing lets customers license to a subset of the server capacity, down to one core, by leveraging eligible virtualization technologies
- As x86 (Intel/AMD) multi-core chips add more cores per chip, customers can use Sub-capacity licensing to reduce the number of cores licensed
- As RISC based servers continue to become more powerful, customers can leverage virtualization technologies to optimize their system design and improve their overall Total Cost of Ownership

Agenda

- Processor Value Units (PVUs) licensing overview
- Sub-capacity licensing overview and example scenarios
- Sub-capacity licensing requirements and eligible technologies

Terminology

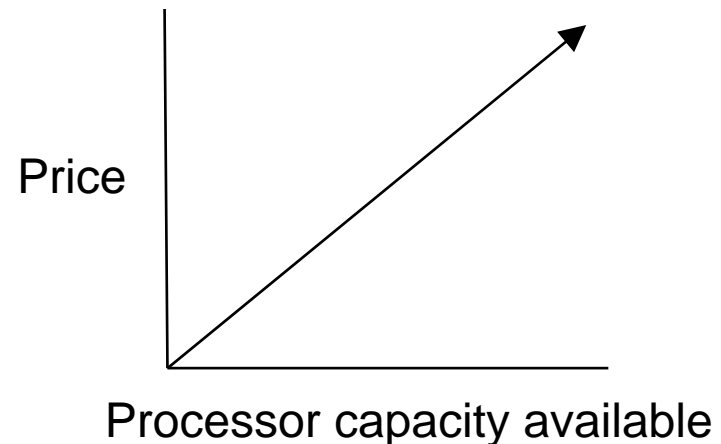
- Multi-core chips have more than one processor core on the chip



IBM Software continues to define a processor = core

IBM PVU Licensing Principles are Simple

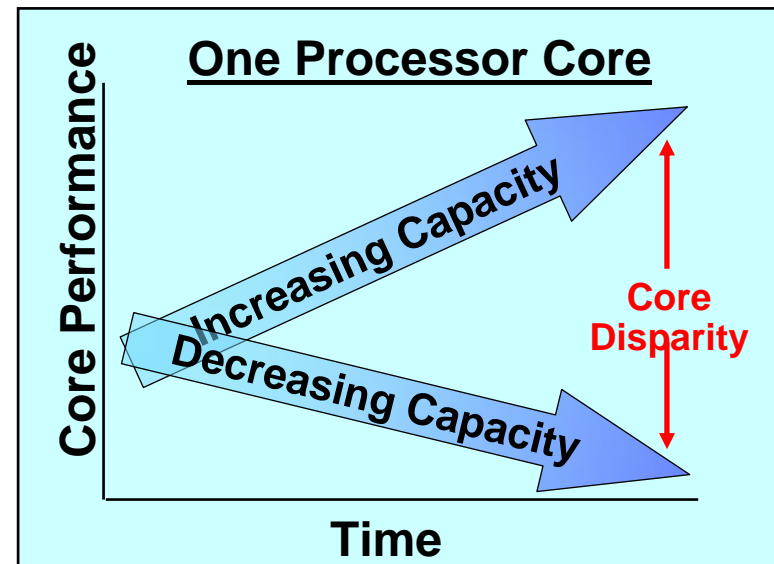
- ▶ Price scales to value
- ▶ Fair price based on performance
- ▶ Balance precision with simplicity
- ▶ Price Competitively



- ▶ Why not charge based on processor usage or utilization?
 - ▶ Customers are licensing today for processor capacity available. A transition to processor usage or utilization would require prices to be reset based on average system utilization
 - ▶ Average system utilization is estimated @ 5-20%, but every customer is different
 - ▶ Customers with higher than average utilization would pay more, lower than average would pay less

Why IBM changed from 'per processor' to PVUs

- Changes in underlying hardware technology caused “per processor” to no longer be a “fair” licensing metric
 - ▶ Multi-core chips:
 - IBM POWER dual-core (2001)
 - x86 dual-core (2005) / x86 quad-core (2006)
 - Sun Niagara octi-core (2005)
 - ▶ Diverging performance characteristics of processor cores (Core disparity)
 - IBM POWER very fast
 - x86 and Sun Niagara relatively slower
- Unique software licensing requirements needed for differing technologies
 - ▶ Virtualization technologies gaining wider adoption
 - ▶ Sub-capacity licensing compliments PVU licensing granularity
- More complex software licensing structures result



Processor Value Unit (PVU) Licensing

- Each middleware program has a unique price per PVU
- PVUs are transferable among systems, by product, within the enterprise
- Acquire the appropriate number of PVUs for each processor core

Processor Technology

IBM Power6 cores

All Single-core and most RISC dual-core

x86 Dual or Quad-core

Example PVU entitlements
per processor core *

120

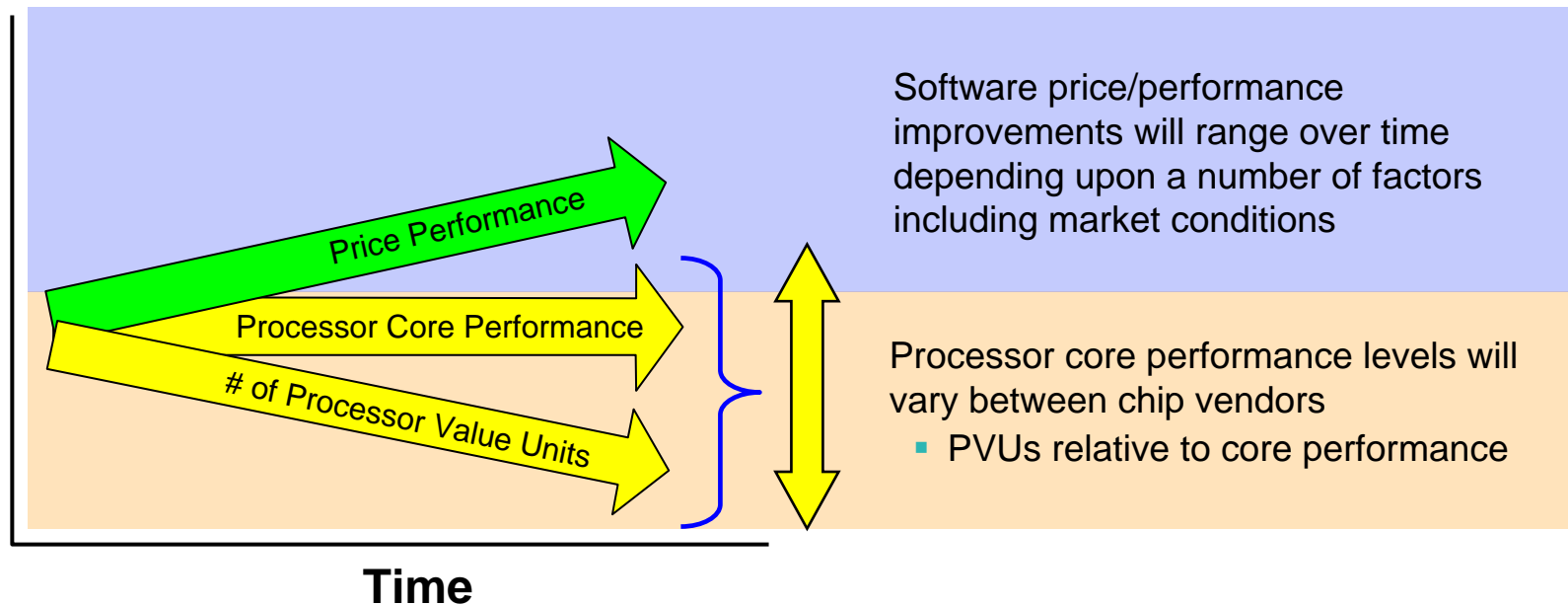
100

50

- A complete list of PVUs by processor technology is available at:
[IBM PVU Website](#)

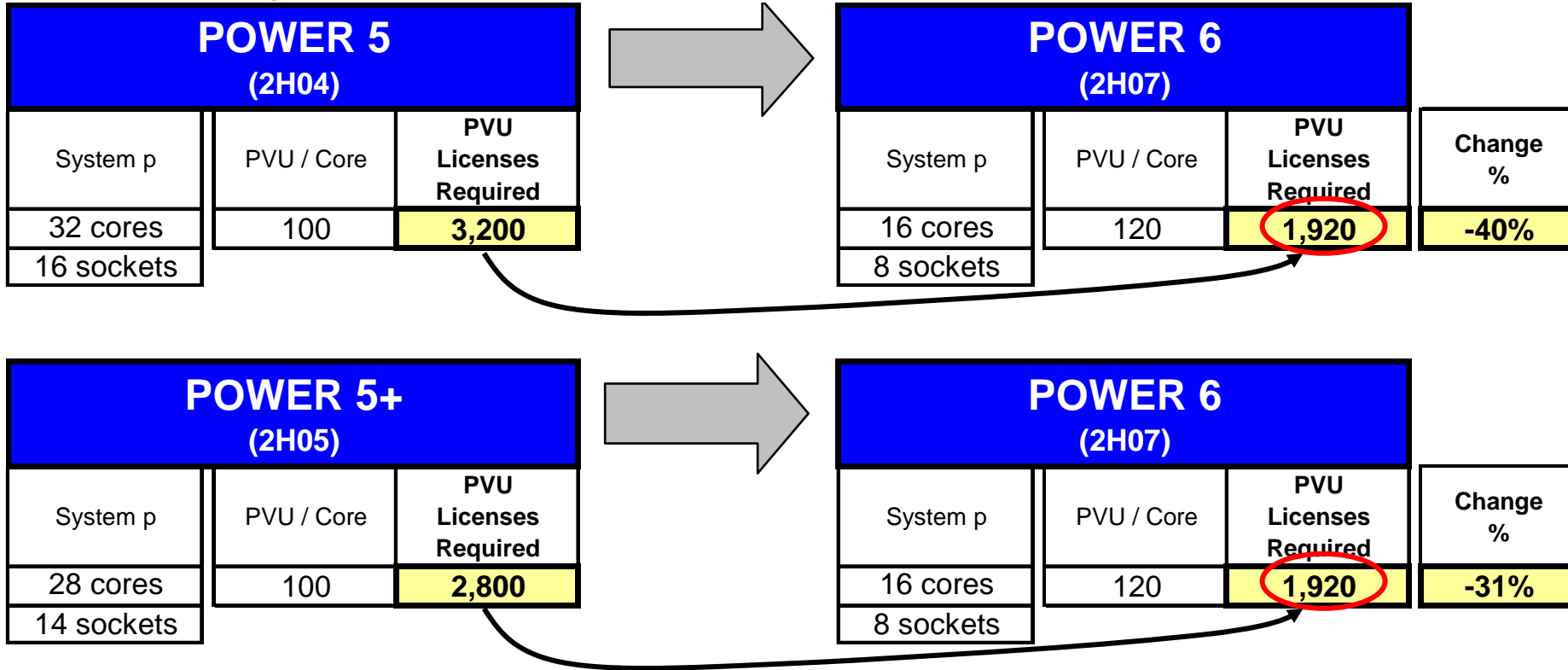
PVUs Provide Flexibility Through Granularity

- ▶ Continue licensing at the processor core level
 - ▶ PVUs adaptable to any change in processor core performance
 - ▶ More granular measure of processor performance capacity available
- ▶ Flexibility to deliver software price performance improvements for new processor technologies



Customer Technology Upgrade Examples*: IBM POWER6

- Assuming Equivalent Software Workload:



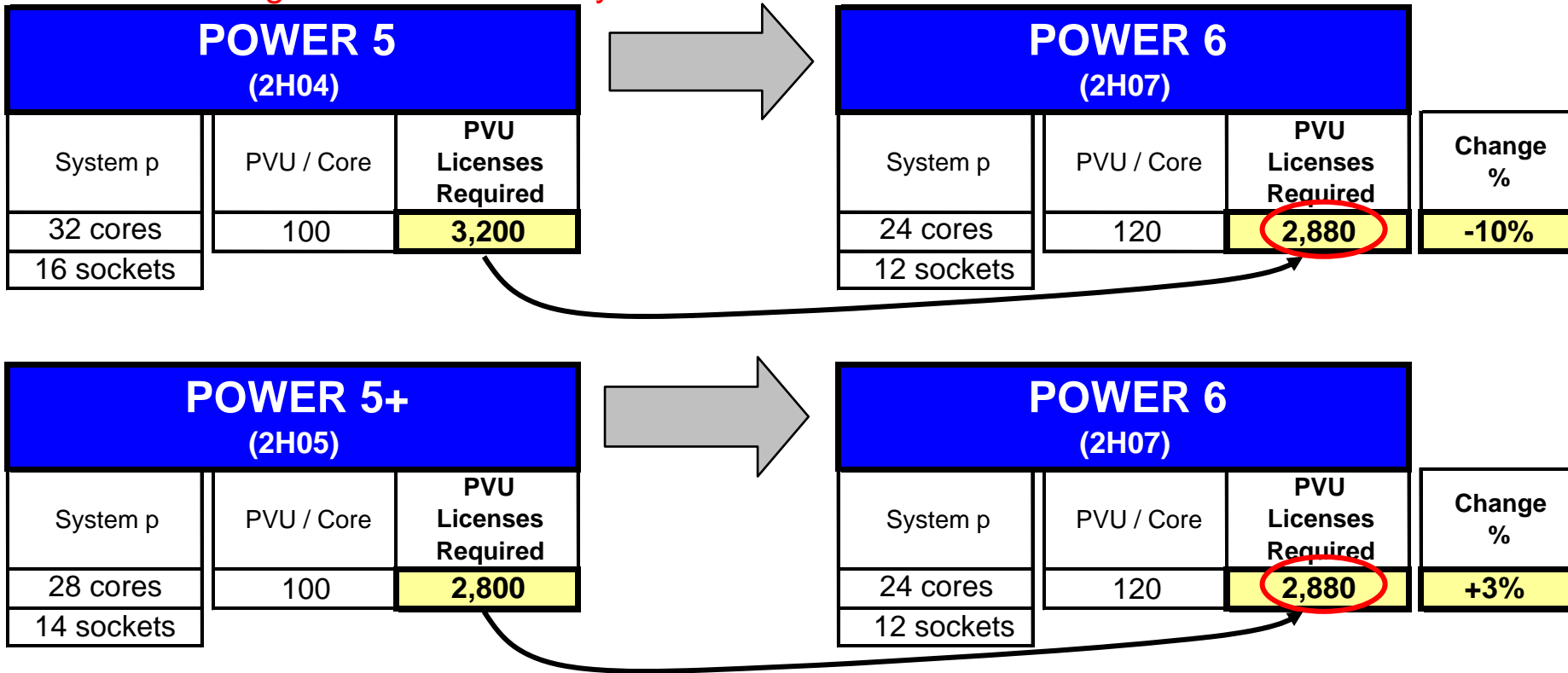
Decreasing # of PVU Licenses for equivalent workload:

- ✓ Significant SW Price Performance improvements as customers migrate to new technology

*Based on Externally Published Industry Benchmarks

Customer Technology Upgrade Examples*: IBM POWER6

- Assuming Workload Grows by 50%:



Significant SW Price Performance improvements as customers migrate to new technology

*Based on Externally Published Industry Benchmarks

Benefits Of The Processor Value Unit Structure

- Provides flexibility and granularity
 - ▶ Fair price for software value on multi-core technology
 - Continue to deliver software price performance improvements
 - ▶ Easy transition from per processor licensing
 - Maintain license transferability across distributed systems
 - ▶ Enables sub-capacity licensing at processor core

- Licensing which can adapt to virtualization
 - ▶ Necessary granularity for technology trends



Sub-Capacity (Virtualization Capacity) Licensing Overview

▶ Full capacity licensing

- Customers acquire licenses for all the physical processor cores

▶ Sub-capacity (Virtualization Capacity) licensing

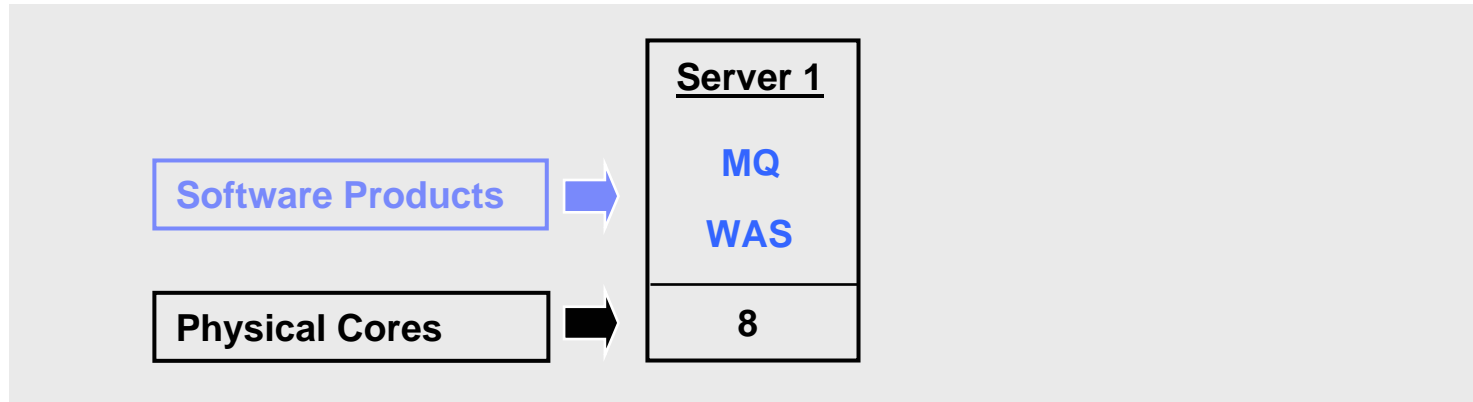
- Customers acquire licenses for the lower of Virtualization Capacity or Full Capacity of the server, or group of servers
- Virtualization Capacity License Counting Rules differ by Virtualization Technology, see specific rules for your Virtualization Technology Environment:

[Virtualization Capacity License Counting Rules](#)

Example Licensing Scenarios Follow

Full Capacity: Physical Cores on One Server

1 Server	8 Physical Cores
----------	------------------

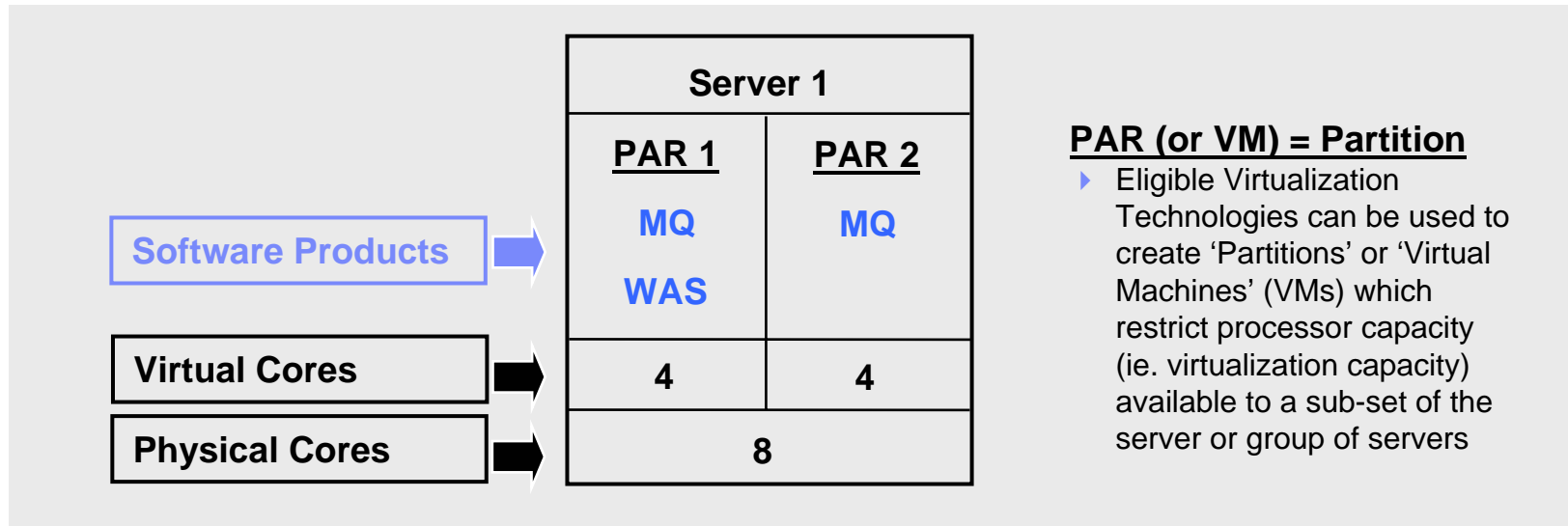


- ▶ Customers must acquire licenses for the Full Capacity (all physical processor cores) in the server available to the software products:

Cores to License	Full Capacity
MQ software	8
WAS software	8

Virtualization Capacity: Virtual Cores on One Server

1 Server	8 Virtual Cores	8 Physical Cores
----------	-----------------	------------------



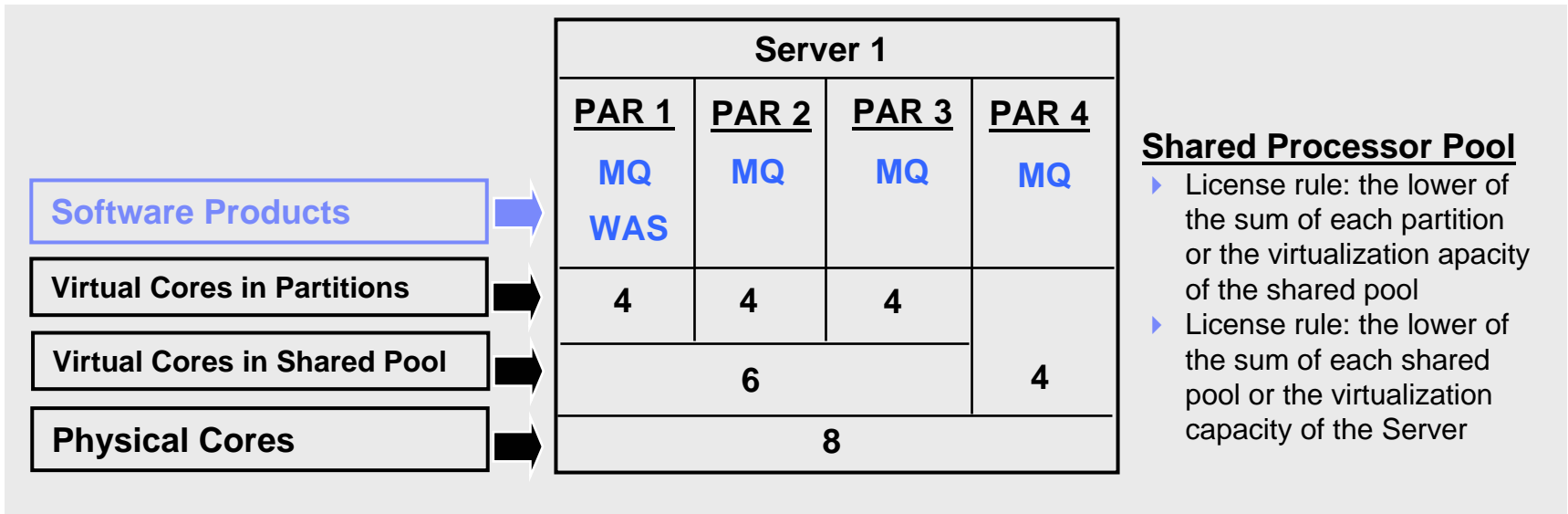
- License for the lower of Virtualization Capacity (using LPARs, Partitions, Virtual Machines) or Full Capacity available in the Server.

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

Virtualization Capacity : Virtual Cores on Server w/ Shared Pool

(this example is applicable for selected Virtualization Technologies only)

1 Server	16 Virtual Cores	8 Physical Cores
----------	------------------	------------------



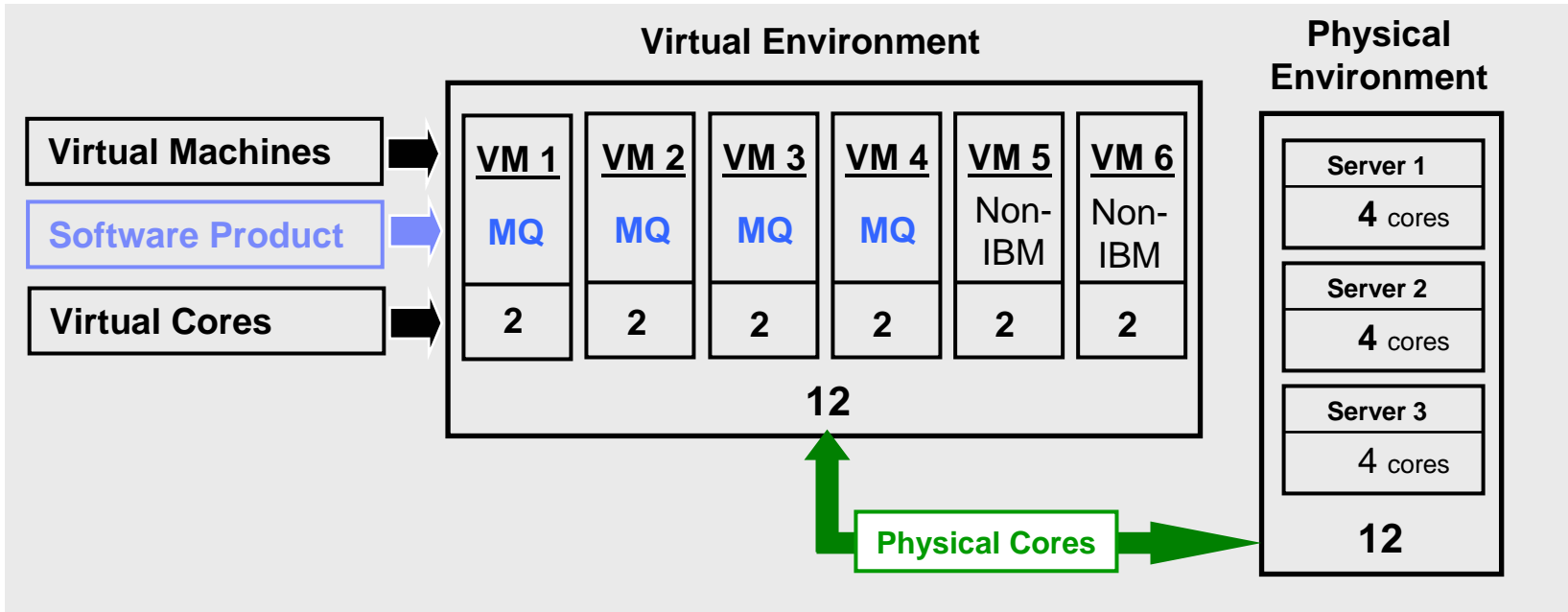
- ▶ License for the lower of the Virtualization Capacity (using Shared Pools, LPARs, DLPARs, Partitions) or the Full Capacity available in the server

Cores to License	PAR 1	PAR 2	PAR 3	Sum of PARs 1-3	Shared Pool Capacity	PAR 4	Virtualization Capacity	Full Capacity
MQ software	4	4	4	12	6	4	10	8
WAS software	4	-	-	4	6	-	4	8

Virtualization Capacity : Virtual Cores on Server Cluster

(this example is applicable for selected Virtualization Technologies only)

3 Servers	12 Virtual Cores	12 Physical Cores
-----------	------------------	-------------------



- ▶ License for the Virtualization Capacity (using Virtual Machines) or Full Capacity available in a group of servers (Cluster)

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

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 the Eligible Virtualization Environment(s)
 - Use Eligible Sub-capacity Products, with sub-capacity part numbers
 - Use Eligible Virtualization Technologies
 - Use Eligible Processor Technologies
 - Use the IBM License Metric Tool (ILMT) and maintain report documentation
 - Certain ILMT use exceptions may apply

Detail information for each of the above requirements can be obtained at this link:
[Passport Advantage Sub-capacity Licensing](#)

Eligible Virtualization Technologies

- A high level summary list of Eligible Virtualization Technologies:
 - IBM Power Systems, System p, System i PowerVM (with AIX and iOS)
 - LPAR, DLPAR, Shared Processor Pools, Micro-Partitioning
 - IBM System z (with Linux): LPAR, zVM
 - Sun Micro and Fujitsu servers (with Solaris)
 - Dynamic System Domains, Containers/Zones inside Dynamic System Domains and node OS
 - HP Integrity and 9000 Servers (with HPUX): nPar& vPar
 - x86 (Intel / AMD) based servers, using the following virtualization technology:
 - VMware Single server, Server Cluster, and VMotion

A detail listing of Eligible Virtualization Technologies is published at this link
(see table at bottom of this webpage):

[Passport Advantage Sub-capacity Licensing](#)

Why Virtualization Capacity Licensing is Important to You

- Virtualization Capacity licensing compliments Processor Value Unit (PVU) licensing
 - PVUs provide a fair price for value received
 - Virtualization Capacity licensing lets customers license to as little as one core
- As the number of cores per chip increases on x86, customers can reduce the number of cores licensed
- Customers can use virtualization technology to optimize their larger systems and improve their overall total cost of ownership



Summary of links in this presentation:

[IBM PVU Website](#)

[Virtualization Capacity License Counting Rules](#)

[Passport Advantage Sub-capacity Licensing](#)