



IBM Passport Advantage Software

## Sub-capacity (Virtualization) License Counting Rules

x86 Virtualization Environment

**NOTE: Please use these rules along with the Passport Advantage Agreement**

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## Full Capacity versus Sub-Capacity licensing

- ▶ If using Full Capacity licensing, the Licensee must obtain entitlements sufficient to cover all activated processor cores in the physical hardware environment made available to or managed by the Program, except for those servers from which the Program has been permanently removed. An Activated processor core is a processor core that is available for use in a physical or virtual server, **regardless of whether the capacity of the processor core can be or is limited through virtualization technologies, operating system commands, BIOS settings, or similar restrictions.**
- ▶ If using Sub-Capacity licensing, according to the [Passport Advantage Sub-Capacity Licensing Terms](#) the Licensee must obtain entitlements sufficient to cover all activated processor cores made available to or managed by the Program, as defined according to the Virtualization Capacity License Counting Rules.

### **PLEASE NOTE:**

- *When using Sub-Capacity licensing, Customers are required to use the IBM License Metric Tool (or other IBM approved tools).*

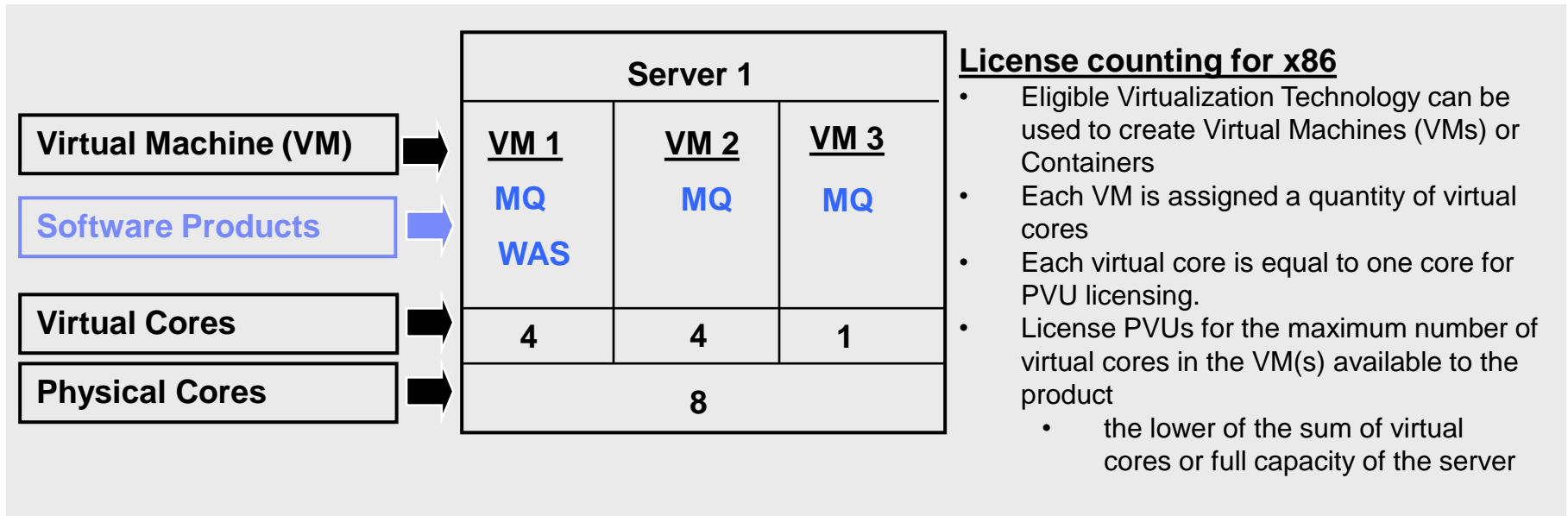
# x86 Virtualization Technology - Definitions

- **VM – Virtual Machine (also Containers)**
  - ▶ 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
  
- **Virtual Core (also vCPU)**
  - ▶ Each VM is assigned a virtual core quantity
  - ▶ Each virtual core is equal to one core for PVU licensing
  
- **Server**
  - ▶ A machine that provides resources (i.e. processor core capacity) to the VMs
  - ▶ Includes single standalone servers or servers within clusters or resource pools
  
- **Cluster**
  - ▶ A group of servers, that are linked together using vCenter Server or Microsoft Failover Clustering Feature to provide resources (i.e. processor core capacity) to the VMs

# x86 Virtualization Technology - Definitions

- **Mobility Event**
  - ▶ Movement of a running VM from one physical server to another
  
- **SMT (Simultaneous Multi-Threading)**
  - ▶ Is a technique for improving the overall efficiency of superscalar CPUs with hardware multithreading. SMT permits multiple independent threads of execution.
  
- **Hyper-threading**
  - ▶ It is Intel's proprietary simultaneous multithreading (SMT) implementation.
  
- **Red Hat OpenShift**
  - ▶ Hybrid cloud application platform powered by Kubernetes
  
- **Red Hat OpenShift Virtualization**
  - ▶ A feature of Red Hat OpenShift, allows IT teams to run virtual machines alongside containers

# License counting in a Server



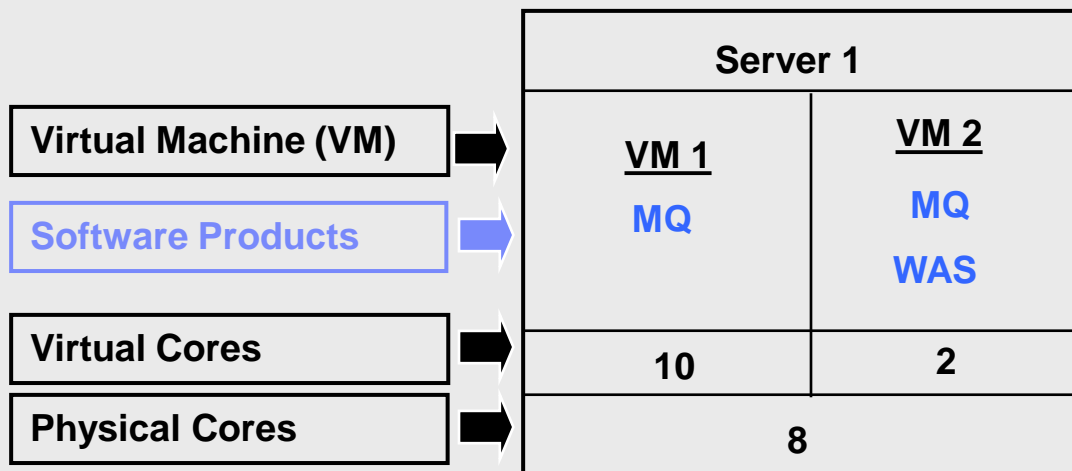
▶ For above example, the PVU Virtualization Capacity licensing requirement is based on the maximum number of virtual cores in the VM(s) available to a product

▶ 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 with SMT/Hyper-threading

1 Server	8 Physical (SMT-enabled) Cores	16 Virtual Cores available for the virtualization manager in total
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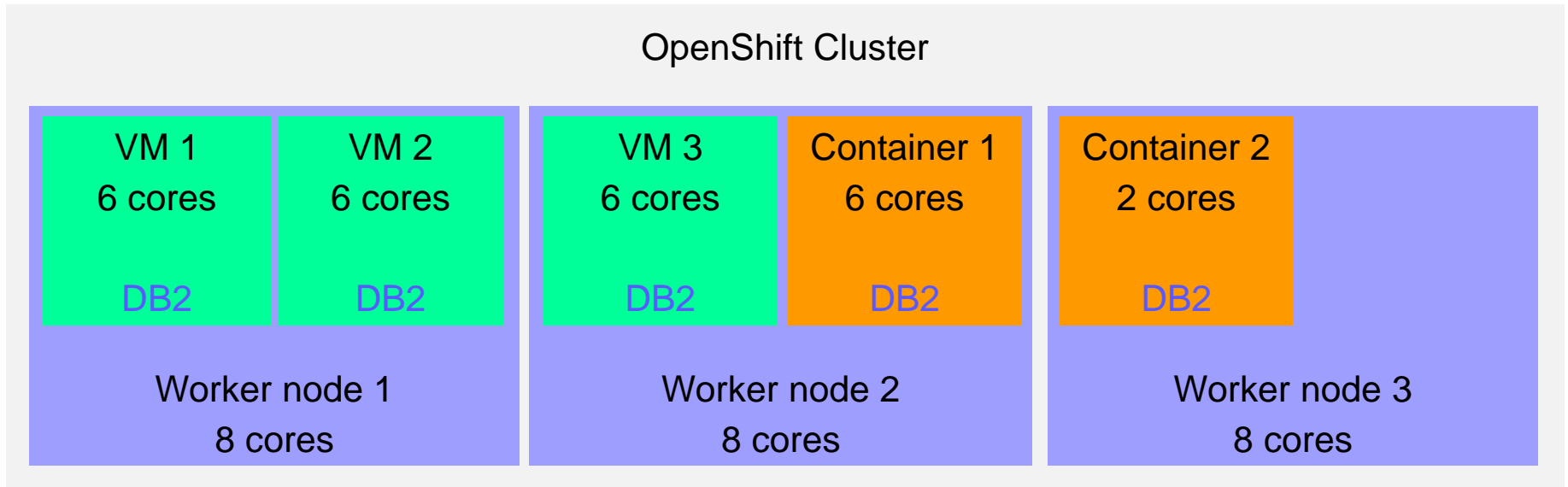
## License counting for x86

- Eligible Virtualization Technology can be used to create Virtual Machines (VMs) or Containers
  - Each VM is assigned a quantity of virtual cores
  - Each virtual core is equal to one core for PVU licensing.
  - License PVUs for the maximum number of virtual cores in the VM(s) available to the product
    - the lower of the sum of virtual cores or full capacity of the server
- So, exactly the same as in previous example without SMT. SMT **does not change** the rules.

In above example for VM2 are assigned 2 virtual cores which in case of SMT 2 can happen to run on the same single physical core, but this **does not change** the counting rules and programs on it will be charged for 2 vCPU.

Cores to License	VM 1	VM2	Virtualization Capacity	Full capacity
MQ software	10	2	12	8
WAS software	2		2	8

# License counting - Red Hat OpenShift Virtualization



In the above example, in addition to OpenShift Virtualization Virtual Machines, there are also classic containers (pods with containers) that run the same program as on VMs. The containerized part of OpenShift is not covered by Sub-capacity (Virtualization capacity) licensing, but by IBM Container Licenses. The license value of containerized products should be calculated separately by License Service and added to the calculated program consumption of the sub-capacity license to obtain the total license consumption.

Db2 cores to license for Sub-capacity VMs part:

$$((6 \text{ (VM1)} + 6 \text{ (VM2)}) \text{ capped to } 8 \text{ (worker node 1)}) + 6 \text{ (VM3)} = (12 \text{ capped to } 8) + 6 = 8 + 6 = 14$$

Db2 cores to license for Containers:  $6 + 2 = 8$

Overall cores to license for Db2:  $14 + 8 = 22$

**\* Note:** Only physical worker nodes are supported



## ILMT Licensing Counting Rules

- ▶ the Virtualization Capacity licensing requirement is based on the maximum number of virtual cores in the VM(s) available to a product
  - ▶ License Rule: lower of the Virtualization Capacity or Full (Physical) Capacity available in the Server

### License Rule for Qualified Mobility:

- ▶ Count the maximum processor core capacity for each program concurrently within an ILMT Region.

### Requirements:

- ▶ Using ILMT 9.2.2 or later version: A single ILMT server can be used to manage each ILMT Region using IBM sub-capacity region functionality
- ▶ Using ILMT 9.2 or earlier version: A minimum of one ILMT server must be installed per ILMT Region where sub-capacity programs are installed

### ILMT Regions:

- ▶ Region 1: North America & South America
- ▶ Region 2: Europe & Africa
- ▶ Region 3: Asia & Australia

## Key Web Links

- [Passport Advantage Sub-capacity licensing information](#)
- [Passport Advantage Container Licenses information](#)
- [PVU table and other information](#)
- [Passport Advantage Agreement](#)