

Sub- Capacity

Virtualization
Capacity licensing
for traditional
virtualization
technologies

Licensing Guide

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Version History

Version	Updates
February 2022	<ul style="list-style-type: none">– Initial version
April 2022	<ul style="list-style-type: none">– Explained that IBM posts notifications through IBM Notifications whenever an update to ILMT is made.– Added additional information relating to the recent announcement of Flexera One products and their use in IBM Virtualization Capacity licensing.
February 2024	<ul style="list-style-type: none">– Update to align with the latest IBM Passport Advantage Agreement made available on February 2023. <p>Updated list of IBM accepted tools for IBM Virtualization Sub-Capacity license usage reporting.</p>
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Contents

Overview	4
Key Terms	4
Introduction	5
Detail	5
Scenarios	10
FAQs	11
Further Reading	13

Overview

IBM was one of the first vendors to introduce a licensing model that reflected the increasing use of virtual environments to run software workloads. The model, called “Virtualization Capacity”, allows for significant reductions in the number of licenses required for virtual environments in some circumstances. The license counting rules for IBM software running on a traditional (that is, non-container) virtual environment are known as “Sub-Capacity” licensing.

Sub-Capacity is an area of IBM licensing where clients can easily fall out of compliance either because of the pace of change typically encountered in virtual environments, or by not meeting all the eligibility requirements. We have seen this often in audits, and we hope that this licensing guide will help clients understand how to better manage their software deployments in virtual environments and remain within their license limits.

Sub-Capacity licensing is applicable to some of IBM’s most frequently encountered license metrics, so it is important that clients have a thorough understanding of this topic.

This guide discusses traditional virtual environments only. To learn about Virtualization Capacity licensing in containers, see the ‘Container Licensing’ guide on [this page](#).

This guide is intended as a general licensing knowledge resource. While it may explore scenarios and discuss the licensing implications of hardware configurations, it is not intended to provide advice for specific client circumstances. Always consult your IBM representative should you have any questions or concerns about Sub-Capacity licensing in your IBM estate.

Key Terms

The following terms are used throughout this document and are fundamental to understanding its contents. This is not an exhaustive list, and some concepts may be discussed in other licensing guides or rely on assumed knowledge.

Activated Processor Core

A processor core that is made available to an IBM program, either in a physical or virtual machine, 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.

Full-Capacity

The licensing of all the activated processor cores installed on the physical machine. In other words, the licensing of the full processing capacity of the physical machine.

IBM License Metric Tool (“ILMT”)

An IBM tool used to measure consumption of certain IBM software metrics. Use of ILMT or HCL BigFix Inventory is one of the eligibility requirements for Sub-Capacity licensing.

International Passport Advantage Agreement (“IPAA”)

An agreement which sets out licensing terms for all IBM programs licensed under the Passport Advantage program. It is available [here](#).

International Program License Agreement (“IPLA”)

An agreement setting out the base terms for all IBM programs licensed under PA, PAE and certain mainframe programs. It is available [here](#).

Service Provider

An entity that provides information technology services for end user clients, either directly or through a reseller.

Sub-Capacity

The Virtualization Capacity policy applicable to traditional virtualization technologies. It is not applicable to containerized applications.

Virtualization Capacity

Methodology to measure consumption of licenses only for the CPU cores consumed by the virtual environment(s) where the IBM program is installed. The alternative is Full-Capacity, in which license consumption is calculated based on the entire processing capacity of the physical machine or infrastructure.

Introduction

Sub-Capacity concerns the licensing of IBM programs in “traditional” virtual environments such as VMware, Microsoft Hyper-V and IBM PowerVM. It is especially relevant to IBM programs which are licensed based on the amount of processing capacity made available to the IBM program. Examples of these are the license metrics *Processor Value Unit (PVU)* and *Virtual Processor Core (VPC)*.

Before Sub-Capacity was introduced, licenses for IBM programs had to be bought in sufficient quantity to cover the entire processing capacity of the physical machine. This is known as “Full-Capacity” licensing. As virtualization technologies gained popularity, IBM introduced Sub-Capacity licensing so that licenses required for IBM programs can be limited to the processing capacity made available to the virtual environment. This typically results in a lower number of licenses being required.

A client is not automatically eligible for Sub-Capacity Licensing.

Four criteria must be met. Three are around the technologies involved. The fourth is the requirement to install an approved license metering tool (such as IBM License Metric Tool or HCL BigFix Inventory), to keep this up to date and to record the processing capacity (and therefore the number of licenses) required by each IBM program on a regular basis.

Detail

Assumed Knowledge

This licensing guide assumes that you are familiar with the concepts of virtualization technology across the various platforms supported by IBM, particularly x86-based solutions such as VMware and Microsoft Hyper-V, as well as solutions for Unix-based platforms such as IBM PowerVM LPARs, Solaris Containers, HP nPAR. Concepts such as hypervisors, clustering and virtual machine mobility should be understood.

We also recommend that the following material is read to give a foundational understanding:

- The material located on the Licensing section of [website](#).
- [License Metrics](#)

Measuring License Use

The most important aspect of Sub-Capacity licensing is the processing capacity assigned to a virtual environment (such as a virtual machine or a logical partition) where IBM programs are installed. IBM refers to this capacity as the number of ‘activated processor cores’ available to the IBM software.

The number of activated processor cores that are assigned to a virtual machine can, and often will, change over time in response to need. This change can be made through manual intervention or performed automatically by the hypervisor. The flexibility to change the processing power available to a virtual environment, sometimes without having to restart the environment, is a key benefit of virtualization.

However, this capability brings with it challenges for counting the number of licenses required for the software running on the virtual environment: as the number of available activated processor cores changes, so does the number of licenses required for the IBM software.

A fundamental requirement of Sub-Capacity licensing is the ability to monitor (or ‘meter’) these changes and report the peak license requirement. Being eligible for Sub-Capacity licensing means that this ability is in place, allowing both you and IBM to be confident of the number of licenses required to cover your peak use.

Sub-Capacity Eligibility Requirements

There are four requirements that must be met for clients to qualify for and take advantage of Sub-Capacity licensing:

- | **The IBM program must be eligible**
- | **The virtualization technology and operating system must be eligible**
- | **The IBM program must be running on a processor model that is eligible**
- | **An approved tool must be used to meter the license usage.**

Smaller organizations may qualify for an exemption to this requirement (described later in this document)

If any of these requirements are not met, the IBM program must be licensed on a Full-Capacity basis.

PA and PA Express clients whose versions of the IPAA/IPAEA agreement are older than version 8 must sign a separate Sub-Capacity Attachment to be eligible for Sub-Capacity licensing.

Each of these requirements is discussed in more detail below:

| **The IBM program must be eligible.**

Almost every IBM program that is licensed on a metric that is based on Activated Processor Core is eligible.

There are a small number of exceptions which are discussed in the [PA Sub-Capacity Licensing Eligible Programs](#) document.

The reason the products mentioned in the document are not eligible for Sub-Capacity is because they are typically not capable of being deployed in virtual environments. Either the product is always deployed on a physical server, or the architecture of the product means

that the approved metering tools are unable to monitor license use in the virtual environment. For example, if the program is licensed based on the devices it is managing rather than where the program is installed, the metering tool cannot measure this.

| **The virtualization technology and operating system must be eligible.**

IBM maintains a list of all eligible virtualization technologies [here](#).

As platforms age and their vendors cease mainstream support, IBM will no longer consider them to be eligible for Sub-Capacity licensing. IBM typically waits until 180 days after the vendor has ceased support before removing their eligibility. In practice, this means most clients should already have moved off the platform for security and support reasons.

To help clients plan their technology roadmap and maintain compliance with IBM licensing terms, a list of upcoming changes to the eligible virtualization technologies is maintained within a Technical Note that is update and documented [here](#).

Every quarter, or whenever a new update of ILMT is made available, IBM adds a notification into the IBM Notification support list containing the reference link to the Technical Note which lists the upcoming changes to the eligible virtualization technologies. Please see the Further Reading section for more info on the IBM Notifications.

| **The IBM program must be running on a processor model that is eligible.**

Almost all modern server processor technologies are eligible. For full details, please see the document [here](#).

If you have installed IBM software on a machine which uses a processor technology that is not listed in the document above, that software is not eligible for Sub-Capacity licensing, even if the other eligibility criteria are met.

| **An approved tool must be used to meter the license usage.**

Within 90 days of the first installation of an IBM program in a virtual environment, an approved license metering tool must be configured to monitor the program’s license use. For clarity,

the 90 days begins the first time you **ever** install an IBM program in a virtual environment; the count does not begin anew with each subsequent installation of IBM software.

After 90 days following the first IBM program installation, all future installations must be metered immediately to be eligible for Sub-Capacity licensing, otherwise they must be licensed on a Full-Capacity basis.

The approved Sub-Capacity metering tools include:

- IBM License Metric Tool
- HCL BigFix Inventory
- Flexera One and Flexera One Select for IBM IT Asset Management (by Flexera) – SaaS based solution
- Flexera One and Flexera One Select with IBM Observability IT Asset Management (by IBM) – SaaS based solution

ILMT must continue to be used for the eligible virtualization technologies not supported by Flexera One.

For more information about the eligible virtualization technologies supported by Flexera One, please refer to the *Flexera One* section of the [Sub-Capacity licensing page](#).

For more information about Flexera One with IBM Observability IT Asset Management please visit the [IBM product page](#).

The approved license metering tool must be kept up to date. IBM requires clients to update their installations to new releases within 90 days of the updated version being released. This includes updates to software catalogs and processor definitions and ensures that the reports generated by the metering tool are as accurate as possible.

Completeness of these reports will be verified in a license verification activity such as an audit. Completeness means both the inclusion of all relevant IBM programs and that any errors or warnings have been satisfactorily rectified (or a Support Ticket has been raised).

While it is a requirement to use an approved metering tool to qualify for Sub-Capacity licensing, IBM recommends you also install the tool on environments licensed at Full-Capacity so that the reports generated give a view of your total license consumption, rather than just those measured under Sub-Capacity. This will help you remain within overall entitlement limits.

In addition, if you are running IBM workloads on containerized environments and use IBM License Service Reporter, ILMT can be configured as an input so that your use across both traditional and container environments can be consolidated and reported in one place.

You must generate a report from the license metering tool at least quarterly, demonstrating the license use over the period. These reports must be retained for two years and provided to IBM (or a third-party auditor acting on behalf of IBM) upon request. This requirement is documented in the IPAA and IPAEA as “Client’s Reporting Responsibilities” (clause 9.2.2 of IPAA and clause 8.2.2 of IPAEA).

Using Flexera FlexNet Manager as an alternative metering tool

In addition to the approved license metering tools listed above, IBM recognizes *Flexera FlexNet Manager* (“Flexera”) as an alternative metering tool. However, to use Flexera FlexNet Manager as an alternative to the approved metering tools the following conditions must be met:

1. Additional terms must be signed. These terms take the form of a *Passport Advantage Addendum*. The Addendum is available from IBM upon request; and
2. IBM’s written approval must be obtained.

Failure to sign the Passport Advantage Addendum or obtain IBM’s written approval will mean that you may not use Flexera FlexNet Manager as an alternative Sub-Capacity metering tool.

Clients who qualify as an exception to the requirement to use an approved tool to meter the license usage

The only situations in which the installation of an approved metering tool is not required to qualify for Sub-Capacity licensing are as follows:

- | | |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | <p>When the approved license metering tools <u>do not</u> yet provide support for your eligible virtualization technology</p> <p>This Exception is no longer available!!
If your Enterprise has fewer than 1,000 employees and contractors, and all of the following apply to you:</p> <ul style="list-style-type: none"> ñ You are not a Service Provider ñ You have not contracted with a Service Provider to manage your environment ñ The number of licenses required to license all IBM software running in a virtual environment does not exceed 1,000 PVUs when measured on a Full-Capacity basis (note – IBM software intended to be licensed on a Full-Capacity basis should not be included in this total) |
| 2 | <p>The IBM software is intended to be licensed on a Full-Capacity basis (however IBM recommends using an approved license metering tool in any case to maintain a total view of license consumption)</p> |

For exceptions 1 and 2 above, manual reporting must be maintained for each server. The same rules regarding frequency (at least quarterly) and retention (for at least two years) apply to manual reports. IBM provides a Microsoft Excel spreadsheet designed for this purpose, called the [‘Manual Calculation of Virtual Capacity worksheet’](#).

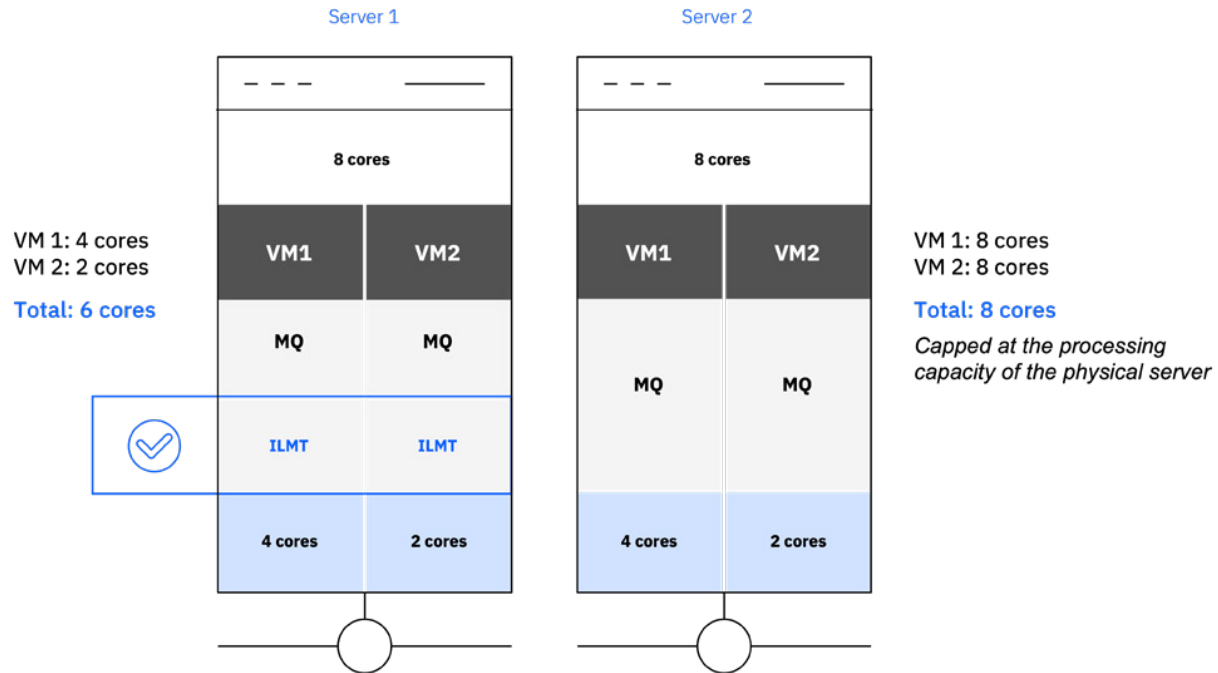
Determining the Number of Activated Processor Cores to License

The methodology to determine how many Activated Processor Cores must be licensed differs depending on the technology used. IBM has prepared a set of instructions intended to assist clients in determining the correct number of activated processor cores to be licensed. These can be found in the Scenarios section.

The following points must be borne in mind when counting Activated Processor Cores regardless of the platform or virtualization technology:

- IBM does not license fractions of an activated processor core; the number of activated processor cores must be rounded up to the nearest whole number. This is particularly relevant for processors which support Simultaneous MultiThreading (SMT) or HyperThreading, or virtualization technologies that allow fractions of a processor to be allocated to a virtual environment such as PowerVM.
- If there are multiple virtual machines residing on the same host, sum all the activated processor cores assigned to all virtual environments on that host and then round up the total. *The rounding should not be applied to each individual machine; doing so will increase the number of activated processor cores that need to be licensed.*
- The minimum number of licenses required is for 1 (one) activated processor core. If the IBM software is licensed by Virtual Processor Core (VPC) then 1 VPC equals 1 virtual CPU (vCPU).

If the IBM software is licensed by *Resource Value Unit for Managed Activated Processor Cores* ('RVU MAPC') then the relevant License Information document should be consulted to determine the number of RVUs required to license the number of activated processor cores available to the software.



The effect of not complying with the requirement to use an approved license metering tool on the number of activated processor cores ("cores") required for an IBM program. The example shows IBM MQ ("MQ")

Scenarios

Counting Activated Processor Cores

The following table lists the location of detailed instructions on how to count the number of activated processor cores for various platforms and virtualization technologies.

Platform	Operating System(s) / Technology
IBM Power Systems	AIX, iOS, Linux
IBM Power Systems	AIX: System WPARs
IBM Power Systems	Processor Deconfiguration and TurboCore to Limit Processor Cores Available
X86	Intel or AMD based servers (for example, Microsoft Windows, Linux, Unix-based Operating Systems)
Sun or Fujitsu	Solaris
HP Integrity	HPUX
IBM System i	i OS
IBM Mainframe	Linux for System z
Multiple	IBM WebSphere CloudBurst Application V2.0 or IBM Workload Deployer V3.0 for Power Systems, System z and Intel or AMD (x86) servers or IBM PureApplication® System W1500/W1700
Multiple	Operating System Commands and BIOS Settings

Sub-Capacity in Public Cloud Infrastructure

If you are using your licenses to deploy IBM software in an Eligible Public Cloud (“EPC”) under the Bring Your Own Software License (“BYOSL”) policy, then PVUs are counted in a different way.

For the most part it is easier, as the PVU per Virtual Processor Core (“VPC”) rating is not dependent upon the processor. However, the concepts of Full-Capacity and Sub-Capacity are slightly different.

Full-Capacity

The ‘contractual capacity’ that you purchased. For example, if the virtual environment you bought comes with 16 vCPUs, the 16 vCPUs would be considered the Full-Capacity of the virtual machine.

Sub-Capacity

If the public cloud provider gives you the ability to reduce the number of virtual CPUs available to the software through configuration settings or similar, then this is the number of Virtual Processor Cores that would be measured using an approved metering tool.

Ensure that you know which virtualization technology is being used by the public cloud provider – only traditional virtual environments follow the Sub-Capacity licensing model; container environments follow the Container Licensing rules.

For more information about deploying IBM software in a public cloud offering, please see the public cloud licensing guide [here](#).

FAQs

Am I required to report my Sub-Capacity license deployments to IBM?

Clients must maintain documentation as evidence of ongoing compliance with the Sub-Capacity terms and to demonstrate their use of IBM software over time. This either takes the form of reports from an approved license metering tool (or manually kept records for those clients who are exceptions to the requirement to install an approved license metering tool). Reports must be generated at least quarterly, kept for two years, and must be made available to IBM upon request. This requirement is documented in the following places:

- IBM Passport Advantage Agreement, clause 9.2.2 (“Client’s Reporting Responsibilities”)
- IBM Passport Advantage Express Agreement, clause 8.2.2 (“Client’s Reporting Responsibilities”)

Is Sub-Capacity licensing available under both Passport Advantage and Passport Advantage Express?

Yes. It is available under both Passport Advantage and Passport Advantage Express.

If only 8 of the 16 cores in my physical machine are activated, is this Sub-Capacity?

No. The 8 cores would be counted as the Full-Capacity measurement of the machine. As additional cores are activated these require additional licenses. Sub-Capacity would only apply if virtual environments ran on the machine with less than 8 activated processor cores available.

Clients are not required to acquire licenses for deactivated processor cores on a machine. Some machines may be delivered with one or more processor cores deactivated (or turned off) to allow for future system growth. Licenses are only required for these additional cores as and when they are activated (or turned on).

How can I be kept up to date with developments on eligibility requirements?

For updates on development of the metering tools, use the [‘IBM Notifications’](#) portal to search for and subscribe to notifications about these products. For example, search for ‘IBM License Metric Tool’ and then select the document types you wish to be notified about as changes occur.

For updates on eligible virtualization technologies, operating systems, processor models and programs, ensure that you have the latest version of this licensing guide for access to the relevant links.

If I qualify as an exemption for using an approved license metering tool, what tools can I use to supplement my effort to complete the manual reporting spreadsheet?

A client may use any tool to assist in the preparation of their manual reporting if it results in an accurate measure of the peak Sub-Capacity for each IBM installation. There are several products available that can perform simple inventory scans; however fewer of these can determine the number of PVUs or VPCs required.

The client is always responsible for ensuring the completeness and accuracy of the manual records and must sign each of them stating that they are accurate.

How often should I generate reports from my approved license metering tool?

The Sub-Capacity terms require quarterly reporting at a minimum. However, most clients choose to perform this on a more frequent basis to keep track of changes to their license requirement. Only clients with stable virtual environments with infrequent change would be able to maintain compliance with IBM licensing by doing quarterly reports.

Each report must be kept for a period of two years and provided to IBM (or to the third-party auditor) on request.

Please also see the ILMT User Guide published on the IBM Licensing & Compliance site for more information specific to ILMT.

How often should I produce manual reports if I qualify as an exemption from the requirement to use an approved license metering tool?

The reporting requirements are the same as those for the use of an approved license metering tool. Manual reports must be produced at least every quarter and retained for two years. These reports must be made available to IBM upon request.

Is Sub-Capacity licensing available for Service Providers?

Yes. However, Service Providers cannot qualify as an exception to the requirement to use an approved Sub-Capacity metering tool. This is detailed in the PA (clause 10.2) and PA Express (clause 9.2) Agreements.

What are the licensing implications if I temporarily increase the number of activated processor cores available to my virtual environment running IBM software?

This would result in the peak measurement of activated processor cores increasing, and the number of licenses required for the IBM software running on that virtual environment would increase as a result. IBM's licensing terms do not allow for an average of processing capacity to be licensed, nor do they offer any grace periods for temporary spikes in workload.

Am I required to use an approved license metering tool even if I have an existing tool that provides the same information?

Yes. The approved license metering tools are the only tools IBM considers capable of performing the ongoing metering of virtual environments to measure the maximum (peak) number of activated processor cores made available to the IBM software, and report these requirements as measured in IBM license metrics such as PVU and VPC.

Are the approved license metering tools “set and forget”?

No. The approved metering tools require detailed configuration to ensure they are reporting a complete and accurate measurement of the IBM software licenses required. In addition, key data sets used by these tools to identify and measure the IBM software are updated periodically, which requires manual intervention. Updates to these data sets and to the program must be installed within 90 days of their general availability.

If there are a multiple instances or packages of a product running in a single virtual environment, how are the licenses calculated?

The licenses are counted based on the activated processor cores available to the IBM software. A virtual environment can have any number of installations of the same program running. IBM does not count multiple instances of the same product; only the maximum (peak) activated processor cores assigned to that virtual environment and made available to the IBM software is measured. If the number of instances deployed causes the virtual environment's activated processor cores to increase, the license metering tool will capture the new count as the peak requirement.

Further Reading

IBM License Metric Tool (“ILMT”)

Information relating to one of the two approved Virtualization Capacity license metering tools, IBM License Metric Tool (ILMT).

<https://www.ibm.com/software/passportadvantage/ibmlicensemetrictool.html>

International Passport Advantage Express Agreement (“IPAEA”)

The agreement relating to software licensed under Passport Advantage Express.

<http://www.ibm.com/terms?id=Z125-6835>

International Passport Advantage Agreement (“IPAA”)

The agreement relating to software licensed under Passport Advantage.

www.ibm.com/terms?id=Z125-5831

HCL BigFix Inventory

The home of HCL BigFix Inventory.

<https://www.hcltechsw.com/bigfix/home>

Manual Calculation of Sub-Capacity Spreadsheet

A template spreadsheet that can be used by IBM clients to manually document their Sub-Capacity licensing requirements if they qualify as an exception to the requirement to deploy an approved Sub-Capacity metering tool, or if their technology is eligible but not supported by one of those tools.

http://public.dhe.ibm.com/software/passportadvantage/SubCapacity/Manual_Calculation_of_Virtualization_Capacity.xls

HCL BigFix Inventory FAQs

Frequently asked questions about HCL BigFix Inventory.

http://public.dhe.ibm.com/software/passportadvantage/SubCapacity/BFI_and_HCL_FAQ.pdf

IBM License Metric Tool (“ILMT”) User Guide

See the user guide at the Software Licensing & Compliance site to read more about ILMT.

www.ibm.com/about/software-licensing/licensing/guides

IBM Notifications

The IBM Portal where you can subscribe to notifications about various documents and keep up to date with the latest news that affects your IBM licensing.

<http://www.ibm.com/support/mynotifications>

Sub Cap Eligible Processor Technologies

A list of processor technologies which are deemed eligible for Sub-Capacity licensing.

http://public.dhe.ibm.com/software/passportadvantage/SubCapacity/Eligible_Processor_Technology.pdf

Sub Cap Eligible Programs

A description of the products that are eligible for Sub-Capacity licensing and a list of products which are not.

http://public.dhe.ibm.com/software/passportadvantage/SubCapacity/Sub_Capacity_Eligible_Programs.pdf

Sub Cap Eligible Virtualization and OS Technologies

A list of virtualization technologies and operating systems which are deemed eligible for Sub-Capacity licensing.

http://public.dhe.ibm.com/software/passportadvantage/SubCapacity/Eligible_Virtualization_Technology.pdf

Technologies No Longer Eligible for Sub Capacity

A frequently updated list of technologies that will no longer be eligible for Sub-Capacity licensing, and the date at which they cease to be eligible.

<https://www.ibm.com/support/pages/node/1079427>

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