

# IBM PureApplication System

## License tracking and management



© 2012 IBM Corporation

This presentation describes the license tracking and management capabilities that are available in IBM PureApplication™ System.

## Table of contents

- Overview of license tracking
- License awareness in IBM PureApplication System
- IBM License Metric Tool overview
- Configuring PureApplication System to use the License Metric Tool
- Summary and references

This presentation shows an overview of license tracking and awareness for IBM PureApplication System. License awareness comes in two flavors – first, integration with the IBM License Metric Tool, and second, native license awareness capability that is built directly into the PureApplication System. The first part of this presentation focuses on the native license tracking and license aware placement capabilities in the PureApplication System. Then you see how to use the IBM License Metric Tool with PureApplication System. You see an overview of the License Metric Tool and then an overview of the configuration process for PureApplication System to use the License Metric Tool. The presentation ends with a summary of the topic.

## ***Overview of license tracking***

This section of the presentation shows an overview of license tracking in PureApplication System.

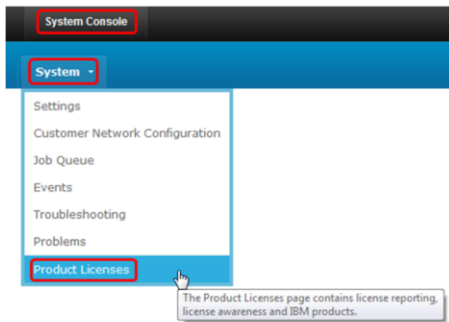
## Goals of license awareness

- In cloud environments, license usage can be volatile
  - Hard to understand how licenses are being consumed over time
  - Easy to inadvertently overuse purchased licenses
- License awareness offers these benefits:
  - Generate reports to monitor usage
  - View all product licenses and entitlements
  - Enforce deployment behavior based on license usage
  - Spread subsets of licenses you own across users
  - Control software cost

The license awareness capabilities in PureApplication System are designed to help you monitor license usage, which ultimately helps you to control software cost. Using these license tracking features, you can track licenses that are being consumed, and view all of your product licenses and entitlements. Optionally you can enforce deployment behavior based on the number of licenses that you have available. For example, you can prevent a virtual machine deployment if the required licenses are not available. Taken together, this functionality helps you with your short- and long-term plans for software spending, allowing you to better control your software cost.

It is important to understand that these license awareness capabilities are not designed to help you minimize your license usage. That is, the PureApplication System is not actively making deployment decisions that help you to reduce your overall license consumption. Before deploying any virtual systems, you purchased the additional licenses required for the products that are not included in the “all you can eat” PureApplication System license. Once you own these additional licenses, you want to use as much of your entitlement as needed to support your operating environment. The license tracking implementation is designed to help you use all the licenses that you have without going over the license pool that you have purchased. Additionally you can also receive warnings when you are approaching the limit of your license allocation and view reports of your license usage over time.

## User roles and product licenses page



Permission that allows <b>View</b> on <i>product licenses</i> page	Permission that allows <b>View and Update</b> on <i>product licenses</i> page
Workload resources administration (Read-only)	Workload resources administration (Full permission)
Hardware administration (Read-only)	Hardware administration (Full permission)
Cloud group administration (Read-only)	

- **System Console > System > Product Licenses**
  - Page that provides product licenses information for PureApplication System
- IBM License Metric Tool permission
  - To run licensing scripts or agents
  - Start tool-related REST API calls to manage product licensing

Within PureApplication Server, the Product Licenses page shows you a total system summary of license reporting, license awareness and a list of products. Depending on your authority level you can access this page to view the information or additionally update fields on this page. You access it from the Systems Console, expanding the **System** pull down and clicking **Product Licenses**. This page also provides access to the IBM License Metric Tool settings. There are several permission settings that provide you access to the Product Licenses page, shown in the table on this slide. Note that if you give the “IBM License Metric Tool” permission to a user account, this only allows that particular user to run licensing scripts or agents related to licensing, without providing the user any additional access permissions.

## License awareness, two parts (1 of 2)

### 1. ILMT section – discussed later

System Console > System > Product Licenses

**Product Licenses**

License reporting

- Track license usage **1**
- Download license usage

License awareness

- Notify virtual image owners when license usage reaches the thresholds set below **2**

IBM products

Below are the products that can be deployed from this system. The list is generated by checking the contents of your virtual images against the product list in the IBM Software Catalog. When enabled, license awareness will alert you when PVU or SERVER license usage approaches a given threshold.

Update IBM Software Catalog

Rack capacity (PVU): 36960

Product	Product ID	License type	Enforcement	Licenses owned	Notify if usage reaches	Licenses in use	Licenses reserved	In the cloud now
WebSphere Service Registry and Repository	5724-N72	PVU	Ignore	0	90.0 %	1330	1960	24 virtual systems
IBM Tivoli Composite Application Manager for Application Full Agent Pack	5724-V09	PVU	Ignore	0	90.0 %	0	0	0 virtual systems
IBM WebSphere App Srv Hypervisor Edition for Red Hat Enterprise Linux Svr	5725-A26	PVU	Ignore	0	90.0 %	210	280	12 virtual systems

6

License tracking and management

© 2012 IBM Corporation

The first part of license awareness provided with the PureApplication System is integration with the IBM License Metric Tool, which is a separate no-charge product used for license tracking across a broad range of IBM software products. IBM License Metric Tool is discussed later in this presentation.

## License awareness, two parts (2 of 2)

### 2. Native license tracking in PureApplication System

- Configure pools of licenses for software products in your virtual images
- Determine license type
- Monitor license usage
- Determine placement based on license availability
- Generate audit reports of license usage in the cloud

**System Console > System > Product Licenses**

**Product Licenses**

License reporting

Track license usage 1

Download license usage

License awareness

Notify virtual image owners when license usage reaches the thresholds set below 2

IBM products

Below are the products that can be deployed from this system. The list is generated by checking the contents of your virtual images against the product list in the IBM Software Catalog. When enabled, license awareness will alert you when PVU or SERVER license usage approaches a given threshold.

Update IBM Software Catalog

Rack capacity (PVU): 36960

Product	Product ID	License type	Enforcement	Licenses owned	Notify if usage reaches	Licenses in use	Licenses reserved	In the cloud now
WebSphere Service Registry and Repository	5724-N72	PVU	Ignore	0	90.0 %	1330	1960	24 virtual systems
IBM Tivoli Composite Application Manager for Application Full Agent Pack	5724-V09	PVU	Ignore	0	90.0 %	0	0	0 virtual systems
IBM WebSphere App Srv Hypervisor Edition for Red Hat Enterprise Linux Svr	5725-A26	PVU	Ignore	0	90.0 %	210	280	12 virtual systems

7

License tracking and management

© 2012 IBM Corporation

In addition to the IBM License Metric Tool integration, the PureApplication System contains native capabilities for license tracking. You can configure your license entitlement by product, determine the type of license tracking, and track license usage. You can determine where to place virtual machines based on license availability. For auditing, you can download records of your license consumption.

## ***License awareness in PureApplication System***

This section of the presentation describes key terms related to license tracking and then describes how to configure and use the license awareness features in PureApplication System.



## Licensing terminology

- **Processor value unit (PVU) licensing:** pricing structure for software
  - Determined by type and number of processors available to installed products
  - Licenses tracked in PVUs
    - Not as a simple count of the number of instances of a product
  - For PureApplication System, number of PVUs consumed depends on:
    - Rack model: total available cores, depending on system offering
      - 608, 384, 192, or 96
    - Number of virtual processors assigned to the virtual machines
    - Number of virtual machines deployed
- **Server licensing:** restricts number of processors and memory a virtual machine can use
  - Simpler licensing model than PVU model
  - One server license represents single deployment
  - PVU-based or server-based licensing determined by your IBM purchase agreement
- **Software catalog:** IBM-maintained list of signatures for IBM software products – product, version, release, component
- **PVU table:** IBM-maintained list of conversion ratios for pricing with different types of processors. (Not needed for IBM PureApplication Server.)

PVU licensing is a licensing model based on a “PVU”, or a “processor value unit. A PVU is a measure of license consumption based on the number and type of processors in the physical machine where you are running your software products. IBM tracks licenses using PVUs and not as a simple count of the number of instances of a product. For PureApplication System, the total possible PVU consumption depends on the system offering and model, and thus the number of CPUs available, which ranges from 608 down to 96. The number of PVUs consumed by products on PureApplication System depends on the number of virtual processors assigned to the virtual machines for the products, and the current PVU consumption. In PureApplication System, PVUs are counted against a product ID, or PID.

Server-based licensing capability is a simpler licensing model than the PVU model which allows you restrict the number of processors and memory a virtual machine can use. For example, one server license represents a single system deployment. Whether you use PVU-based or server-based licensing is determined by your license purchase agreement with IBM.

The software catalog is an IBM-maintained list of signatures for all IBM software products, including the product name, ID, version, release, and component. IBM provides several virtual images that the PureApplication System can deploy, and sometimes these images contain multiple products for which you can track licenses. These products are identified in the virtual image by a product ID field that is a part of the image metadata. This table is maintained using a link on the Product Licenses page.

Finally, the PVU table is an IBM-maintained list of conversion ratios for pricing with different types of processors. Updating the PVU table is not needed for IBM PureApplication Server since all processors are exactly the same within the PureApplication System. The PVU capacity of the rack is determined by the model of PureApplication Server you purchase, which determines the number of processors available in the PVU count.

# Product licenses page

## System Console > System > Product Licenses

### Product Licenses

#### License reporting

- Track license usage **1. Downloading license usage data**
- Download license usage

#### License awareness

- Notify virtual image owners when license usage reaches the thresholds set below

#### IBM products

Below are the products that can be deployed from this system. The list is generated by checking the contents of your virtual images against the product list in the IBM Software Catalog. When enabled, license awareness will alert you when PVU or SERVER license usage approaches a given threshold.

- Update IBM Software Catalog **3. Updating the software catalog**

Rack capacity (PVU): 36960

*Note: Rack capacity (PVU) depends on the rack model*

Product	Product ID	License type	Enforcement	Licenses owned	Notify if usage reaches	Licenses in use	Licenses reserved	In the cloud now
IBM Tivoli Monitoring	5724-C04	PVU	Ignore	0	90.0 %	0	0	0 virtual systems
IBM WebSphere Application Server Network Deployment	5724-H88	PVU	Ignore	0	90.0 %	0	0	0 virtual systems
WebSphere Service Registry and Repository	5724-N72	PVU	Ignore	0	90.0 %	70	70	4 virtual systems
IBM WebSphere Application Server Hypervisor Edition	5724-X89	PVU	Ignore	0	90.0 %	0	0	0 virtual systems

- 4. Adding products to the product list**

- 5. Working with license enforcement options**

10

License tracking and management

© 2012 IBM Corporation

The Product License page in the administrative console is the central location for configuration license tracking options and monitoring overall license usage. The rest of this section of the presentation focuses primarily on the data and activities shown on this page and on the environment profile page. This includes, one, downloading license usage data for audit purposes, two, configuring email notifications for license usage, three, updating the software catalog on your PureApplication System, four, adding products to the product list, and five, working with license enforcement options. While the product list is shown on the Product Licenses page, the resulting list is derived from the products and parts within your virtual image catalog. Also, note that the Rack capacity, shown in the middle of the page, is dynamically calculated by PureApplication System and depends on the model you have purchased.

## Downloading license usage data

- For each chargeable component, the PureApplication System maintains maximum license consumption data
  - Tracked on a daily, weekly, monthly, lifetime basis
  - Monitor usage over time to assist with license planning
  - Provide audit records to IBM
- Download usage data in CSV format, filter by product or date
- Even products for which you have unlimited use are tracked
- Suitable for tracking subcapacity license usage

In the console, go to **Workload Console > System > Product Licenses** then expand **Download license usage**

Download license usage

Download all data

Generate highwater mark usage data by selecting a product and a date range.

Product: IBM Tivoli Composite Application Manager for Application 3 Agent Pack (Product ID: 5724-V09, Licen

Start date: Jun 17, 2012

End date: Jul 17, 2012

Download filtered data

11

License tracking and management

© 2012 IBM Corporation

For products that are not included in the “unlimited usage on the rack” agreement, IBM expects you to maintain audit records that show you have been attempting to stay within your license entitlement. One way to do this is to periodically download and store these usage logs and keep them for auditing purposes. For each chargeable component associated with an image on your PureApplication System and found in the IBM Software Catalog, the PureApplication System keeps a record of maximum license consumption data. This data is available on a daily, weekly, monthly, and lifetime basis. The lifetime maximum value reflects the highest PVU usage or server license usage ever recorded since the license was first recognized by the PureApplication System and populated on the Product Licenses page. You can use this license usage data to assist you in license planning and provide an audit record of your license consumption to IBM. License are tracked as being either in use or reserved. Only licenses that are actually in use are recorded in the audit logs; reserved licenses do not count against your entitlement. The license usage data is available in CSV format, so you can filter the download by product or date. Access these options from the Product Licenses page in the Download license usage section. License tracking is performed for all products in the catalog, even if they are products for which you have unlimited use. This report is suitable for tracking subcapacity license usage.

## Configuring email notifications for a warning threshold

- System can optionally email cloud administrator when license consumption reaches specified threshold
- Enable notifications on the **System Console > System > Product Licenses** page by:
  - Selecting the check box next to **Notify virtual image owners when license usage reaches the thresholds set below**
    - Provide the license pool and warning threshold for the product for which you want to receive warnings
    - Independent of license enforcement configuration

### License awareness

Notify virtual image owners when license usage reaches the thresholds set below

### IBM products

Below are the products that can be deployed from this system. The list is generated by checking the contents of your virtual images against the product list in the IBM Software Catalog. When enabled, license awareness will alert you when PVU or SERVER license usage approaches a given threshold.

[Update IBM Software Catalog](#)

Rack capacity (PVU): 35840

Product	Product ID	License type	Enforcement	Licenses owned	Notify if usage reaches	Licenses in use	Licenses reserved	In the cloud now
IBM WebSphere App Svr Hypervisor Edition for Red Hat Enterprise Linux Svr	5725-A26	PVU	Warn	1500	90.0 %	0	0	6 virtual systems
IBM WebSphere Appl Server Hypervisor Edition Intelligent Management Pack	5725-A27	PVU	Ignore	500	90.0 %	0	0	0 virtual systems

12

License tracking and management

© 2012 IBM Corporation

If you want to receive warnings when you are getting close to your product license limit, you can configure the PureApplication System to send you email notifications. The warning threshold is set as a percentage of the total number of PVUs or licenses that you own for a particular product. In order to receive threshold email notifications, you must do two things. First, select the box labeled **Notify virtual image owners when license usage reaches the thresholds set below**. This box is not enabled by default and must be set manually to enable these email warnings. Second, for the products for which you want to receive threshold notifications, you need to set the Licenses owned field in the console. Optionally, you can adjust the notification threshold percentage field, set by default to the 90% threshold. When your license usage reaches the specified threshold for the products you are tracking, an email notification is sent to all of the users who have the Create new catalog content role. These notification emails are sent regardless of the enforcement option that you have selected.

## Updating the software catalog

- Keep your PureApplication System up-to-date by periodically importing the latest software catalog
- From the **System Console > Cloud > Product Licenses**:
  - 1) Click **Browse** and download the latest copy of the configuration file from IBM using the links provided
  - 2) Point to the downloaded and selected file and click **Update**

Update IBM Software Catalog

You should download and import the IBM Software Catalog on a regular basis so that the system has access to the latest licensing data. These are machine-readable files that contain the entire list of IBM products for known processor types, respectively. These files are updated periodically at [www.ibm.com](http://www.ibm.com).

[Download IBM Software Catalog](#) **1**

**Import IBM Software Catalog (XML or ZIP file)**

**2**

IBMSoftwareCatalog\_canonical\_form\_20120630.xml was last updated on Jul 10, 2012 4:37:04 AM (117001.05 KB)

Rack capacity (PVU): 35840

13 License tracking and management © 2012 IBM Corporation

License tracking in the PureApplication System relies on the software catalog that contains the list of products for which you want to track licenses. Periodically, IBM updates the software catalog to include new software products and types of processor cores, so it is a good practice to periodically import an updated catalog to keep your PureApplication System up-to-date. PureApplication Server firmware updates the PVU table when changes to the PVU table are needed.

IBM maintains the software catalog files and makes them available for download. From the Product Licenses page, the Download IBM Software Catalog link opens an FTP server connection. From that server, you can download the latest copy of the software catalog. Always download the catalog that has the string “canonical\_form” in the file name. Once you have downloaded the software catalog to your local system, use the console to locate the file and upload it to your PureApplication System.

## Adding products to the product list

- Products are added to the product list by:
  - Importing a new image into the catalog
    - Products included in the image are automatically added to the list
  - Manually adding a product ID to an existing image
    - Go to **Workload Console > Catalog > Virtual Images**, select a virtual image, and edit the **Product IDs** field
    - Product IDs can be added or deleted as long as no deployments are in the cloud
    - Only IBM Product IDs are supported

IBM WebSphere Application Server	
Description:	Set server license
Created on:	Aug 15, 2012 10:22:52 AM
Current status:	Read-only
Updated on:	Aug 15, 2012 10:33:03 AM
License agreement:	Accepted [view...]
Intelligent Management Pack:	Disabled <input type="checkbox"/> Enabling advanced features may result in additional cost. Please refer to the license agreement.
Hypervisor type:	PureSystems_ESX
Operating system:	RedHat Enterprise Linux 64-Bit, version 6 (RedHat Enterprise Linux 6)
Version:	8.0.0.3.1
Image reference number:	cca201233.0
Product IDs (e.g., 5724-X89):	5725-A26 (PVU license) ✕ 5724-X89 (PVU license) ✕ <a href="#">Click to add</a>

The list of products on the Product Licenses page is based on the product IDs that are associated with the virtual images in your PureApplication System catalog. IBM tracks these products according to a product ID (PID) string. WebSphere® Application Server Hypervisor Edition on Red Hat, for example, is associated with product ID 5725-A26. Virtual images have a Product IDs field that lists all of the products that are associated with that image. To add new products to the product list on the Product License page, you must import an image that already contains that product. Alternatively, you can modify the product IDs field for an image in your catalog so that it contains the PID for the product that you want to track. For example, you run “Extend” on one of the IBM-supplied virtual images. Then you install DB2® inside your image and capture that back to your PureApplication System. If you want to track DB2 licenses when you deploy patterns based on your new image, all you need to do is add the appropriate DB2 product ID to your image. The Product IDs field is only editable until you deploy a pattern based on this image. After a copy of this image exists in your cloud, the product IDs field is locked. You cannot create a product ID for a non-IBM product; therefore, only IBM Product IDs are supported.



## Adding products to the product list – Choose PVU or Server

- When you **Click to add**
  - Choose license type of **PVU** for PVU license model, or
  - Choose license type of **Server** for service license model

Image reference number: 32663.115

Product IDs (e.g., 5724-X89):

- 5725-C04 (PVU license)
- 5725-A27 (PVU license)
- 5725-A26 (PVU license)

[Click to add](#)

PVU

Describe the product ID you want to add.

Product ID:

License type:

OK Cancel

Server

Describe the product ID you want to add.

Product ID:

License type:

Fill in the limits for this license.

CPU count:

Memory (GB):

OK Cancel

Supply CPU count and Virtual memory

15

License tracking and management

© 2012 IBM Corporation

When you click to add the product to a catalog image, you have a choice of license types in PureApplication System. If you type the license number and let the license type default to PVU, you have added the product using PVU based licensing. This type of license is dependent on factors such as physical processor and number of virtual processors.

If you select Server based licensing, you must then provide the maximum CPU count and the maximum virtual memory that you allow for deployments using this part in the catalog image. The type of license you choose is based on your product license agreement with IBM at the time you purchase the license.

## Server based license management

- PVU based licensing is based on the type of physical processor and number of virtual processors allocated to the deployed virtual machine
- Server based licensing is based per deployed virtual machine
  - Server based licensing restricts the number of virtual processors and memory a virtual machine can use
- System Console > System > Product Licenses
  - Cloud capacity table
  - Shows both license types in entries

Product	Product ID	License type	Enforcement	Licenses owned	Notify if usage reaches	Licenses in use	Licenses reserved	In the cloud now
WebSphere Service Registry and Repository	5724-N72	PVU	Ignore	0	90.0 %	1680	1750	35 virtual systems
Product with Server Licensing	57XX-XXX	Server	Warn	4	90.0 %	4	4	2 virtual systems
IBM WebSphere App Svr Hypervisor Edition for Red Hat Enterprise Linux Svr	5725-A26	PVU	Warn	1000	90.0 %	700	910	21 virtual systems

16

License tracking and management

© 2012 IBM Corporation

Server based licensing is based on a virtual machine as a whole. For example, the same single virtual machine deployment can consume 75 PVU or one Server license. Server based licensing restricts the number of processors and memory a virtual machine can use. As you can see Server based licensing is a much simpler licensing model that avoids the complexity of the PVU model. A virtual image can be configured to use either PVU or Server based licensing, but remember that your licensing agreement with IBM for specific products determines how you must configure the license type for the virtual image.

In the Cloud capacity table snapshot, you see an entry for a deployment of a virtual image using the **Server** license type and the **PVU** license type. For the **Server** license type, notice that the number of licenses in use is “4.” Below that entry is an entry for a deployment using the previously-existing “PVU” license type. The number of licenses in use is expressed for that entry as a PVU value – in this case, “700.”



## Working with license enforcement options

- From the **IBM Products** section of the **System Console > System > Product License** page, you can configure, per product:
  - Enforcement option (ignore/default, warn, enforce)
  - Number of licenses owned (PVUs or Server licenses)
  - Warning threshold (used for email notifications configured above)
- PureApplication System maintains a count of licenses in use and license reserved, based on currently deployed virtual systems
  - Reserved licenses include licenses in use and those reserved for virtual machines that are stopped
- Hover over virtual systems link to view a pop up list of virtual systems consuming licenses from this pool

Product	Product ID	License type	Enforcement	Licenses owned	Notify if usage reaches	Licenses in use	Licenses reserved	In the cloud now
IBM Transactional Database Pattern for Non Production Environment	5725-F36	PVU	Warn	150	90.0 %	140	140	<a href="#">1 virtual systems</a> <a href="#">RPT_license_server</a>

17

License tracking and management

© 2012 IBM Corporation

The Product Licenses page contains a list of all of the IBM software products that your PureApplication System is able to track licenses for. Each product has an associated product ID, license type, enforcement option, number of licenses owned, notification threshold, and a count of licenses in use and reserved. To the right of the entry is a link if there are virtual systems currently in the cloud that contain the product.

The enforcement option, licenses owned, and notification threshold are configurable options. For enforcement, you can choose ignore, warn, or enforce; the option selected influences the PureApplication System's behavior at deployment time. The enforcement options are explained in more detail on the next page. The Licenses owned value represents the number of licenses or PVUs of the product that you have purchased from IBM, or your product entitlement. The email notification threshold indicates when your catalog administrators – those users with “Create new catalog content” permission - receive notifications as you approach the limit of your license entitlement.

The remaining fields are not configurable; they are maintained by the PureApplication System. As you deploy patterns from PureApplication System, the virtual machines that are running in your cloud consume licenses against your entitlement for the products that you deploy. The PureApplication System keeps track of the number of PVUs or licenses that you have in use or reserved per product. Licenses in use are for virtual machines you have actively running in your cloud; reserved licenses represent the active virtual machines plus any additional PVUs or licenses that are consumed if you started your stopped virtual machines. Reserved licenses are not included in audit reports and do not count against your entitlement. Regardless of the license enforcement option you have selected, the PureApplication System keeps track of your licenses currently reserved and in use, as shown in the screen capture here. The “In the cloud now” column contains a link to all of the virtual systems that you currently have in your cloud that contain the product listed. Hover over or click the hyperlinked text and the console displays a pop-up menu that allows you to directly navigate to the virtual system details page for the systems that are consuming licenses for that product.

## Comparing enforcement options

	Ignore	Warn	Enforce
Generate audit reports of license usage	✓	✓	✓
Email catalog administrators when license usage exceeds warning threshold (if enabled)	✓	✓	✓
Email deployer and catalog administrators when enforcement is triggered		✓	✓
Note in logs/history that license pool was exceeded		✓	✓
Make placement decisions to avoid exceeding license pool when approaching full utilization			✓
Force deployment failure when new deployment exceed available licenses			✓

The table on this page shows the differences in behavior for the license enforcement options. Ignore is the default option. When this option is selected, the PureApplication System still tracks license usage and generates audit reports, but no action is taken at deployment time to warn users or to restrict virtual machine creation. When the warn option is selected, deployments that exceed your license entitlement are allowed to proceed. Additional warning messages are issued in the virtual system history and log files, and administrators are notified that the license limit has been exceeded. Note that the email notifications sent to administrators and deployers when the license pool has been exceeded are not the same as the threshold notifications that are also configured from the Product Licenses page. The threshold emails are sent only to catalog administrators when the specified license usage threshold has been reached (for example, 90%), regardless of the enforcement option selected. The email notifications that are sent under the warn enforcement option are sent to both the deployer and the catalog administrators, and happen when the deployment causes the license pool to be exceeded. When the enforce option is selected, deployments that exceed your license entitlement are not allowed. In addition, as you approach your license limit, the PureApplication System makes placement decisions that helps you avoid exceeding your entitlement.

## Enforcement option example: Enforce

### Step 1

- Navigate to **Workload Console > Cloud > Product Licenses**
- Set the **Enforcement** option for your product to **Enforce**
- Configure the number of **Licenses owned**

Product	Product ID	License type	Enforcement	Licenses owned	Notify if usage reaches	Licenses in use	Licenses reserved	In the cloud now
IBM WebSphere Application Server Hypervisor Edition	5724-X89	PVU	Enforce	300	90.0 %	300	300	1 virtual systems

### Step 2

- Deploy a pattern that exceeds your license allotment
- Deployment fails with a message saying **One or more licenses will exceed its total allocation**

LW WebSphere Small Cluster 2		Refresh	Start	Stop	Store	Service	Delete
<b>Created on:</b>	Aug 15, 2012 1:20:15 PM						
<b>From pattern:</b>	<a href="#">LW license test</a>						
<b>Using Environment profile:</b>	<a href="#">envProfile18</a>						
<b>Deployment priority:</b>	High						
<b>Current status:</b>	One or more licenses will exceed its total allocation						

When the enforce option is turned on, any deployment that exceeds the total license allocation is going to fail. During the deployment process, licenses are treated like other virtual system resources including memory and disk space. One of the first things that happens as the PureApplication System attempts to deploy is a resource check to make sure that there are sufficient resources available to host the virtual machines for the image. As a part of this check, the PureApplication System also verifies license availability. If sufficient licenses are not available and the enforce option is configured, the deployment fails as shown in the screen capture here.

## Enforcement option example: Warn

**Step 1**

- Navigate to **System Console > System > Product Licenses**
- Set **Enforcement** option for your product to **Warn**
- Configure the number of **Licenses owned**

**Step 2**

- Deploy a virtual system that exceeds license allocation
- On deployment details page, observe deployment is successful
- License warning message logged in virtual system history

**Step 3**

- Navigate to **System Console > System > Product Licenses** page
- Observe **Licenses in use** and **Licenses reserved** shows error condition

When the warn enforcement option is selected, deployments are allowed to continue, even if they cause you to exceed your license allocation. When licenses are exceeded, a warning is recorded in the virtual system history and logs, and email notifications are sent to the deployer and catalog administrators. On the Product Licenses page, the licenses being used and reserved include PVUs or server licenses for the virtual system that generated the warning. In this example, a red status indicator on the product licenses page indicates the licenses are in use and reserved by this virtual system and that they exceed the number of licenses owned.

## Virtual machine state and license consumption

- Virtual machines can have licenses in use or licenses reserved (or both)
- Whether licenses are used or reserved depends on virtual machine state

Virtual machine state	Licenses in use?	Licenses reserved?
Inactive (deploying)	No	Yes
Starting or started	Yes	Yes
Stopped (VS) Stopped (DB) Terminated (VA)	No	VS – Yes DB – Yes VA - No
Stored (VS only)	No	No
Deleted (VS, VA) / Destroyed (DB)	No	No

**VS** = Virtual System  
**VA** = Virtual application  
**DB** = Database instance

21

License tracking and management

© 2012 IBM Corporation

The license tracking capabilities in the PureApplication System report licenses as being either in use or reserved, depending on the state of the underlying virtual machine. In general, licenses are only consumed for virtual machines that are active – for example, while starting or in a started state. While the virtual machine is being created or when it is stopped, licenses are not consumed, but they are still reserved. Reserved licenses do not count against your entitlement pool for audit purposes. However, knowing how many licenses are reserved helps you understand how many licenses are consumed if all of your virtual machines became active at the same time. When a virtual machine is stored or deleted, its licenses are no longer in use or reserved.

## Command-line interface for license awareness (1 of 2)

- License awareness object contains fields and methods to work with license tracking and reporting
- **Example:** Enabling email notifications for a warning threshold
  - `admin.licenseawareness.thresholdalert=True`
- **Example:** Importing a software catalog
  - `admin.licenseawareness.ibmsoftwarecatalog.import('tmp/IBMSoftwareCatalog.xml')`
- **Example:** Displaying the list of product IDs for an image
  - `deployer.virtualimages["webSphere Application Server Hypervisor Edition 8.0.0.3"][0].productids`
    - Result: `[{'u'license'': 'u'Server', 'u'mutable'': 'u'T', 'u'productid'': 'u'5724-X89', 'u'license'': 'u'4096L', 'u'license'': 'u'4L'}, {'u'license'': 'u'PVU', 'u'mutable'': 'u'T', 'u'productid'': 'u'5725-A26', 'u'license'': 'None', 'u'license'': 'None'}]`

The capabilities that are available in the web user interface to configure license tracking and reporting are also exposed through the command line interface. The license awareness object supplies fields and methods for working with license usage data, email notifications, and importing the software catalog. Examples of the syntax for these operations are provided on this page.

## Command-line interface for license awareness (2 of 2)

- **Example:** Adding a product ID to an image
  - `deployer.virtualimages["WebSphere Application Server Hypervisor Edition 8.0.0.3"][0].productids=['5765-F41']`
- **Example:** Displaying the product list
  - `admin.licenseawareness.products`
- **Example:** Update license data for a product
  - `admin.licenseawareness.products[0].enforcement='w'`
    - 'E'=enforce, 'W'=warning, 'I'=ignore
  - `admin.licenseawareness.products[0].totalallocation=30000`
  - `admin.licenseawareness.products[0].warningthreshold=20.0`

The virtual images object in the command-line interface can display product IDs associated with an image and supports programmatically modifying the product IDs for an image. When setting the product IDs field from the command-line interface, the default product IDs cannot be removed. The license awareness object also provides the ability to work with the product list. You can list information about the products, or chargeable components, that are currently being tracked by your PureApplication System, and then set configurable options. These options include enforcement, total PVUs available, and warning threshold.



## Virtual image part product IDs

- Product IDs are now associated with the virtual image part rather than at the virtual image level
  - Allows for more fine grained control over licensing and associated fees

Contains parts:	Administrative agents	[part product IDs...]
	5724-X89	
	<a href="#">Click to add</a>	
	Custom nodes	[part product IDs...]
	Deployment manager	[part product IDs...]
	IBM HTTP servers	[part product IDs...]
	5725-C00	
	<a href="#">Click to add</a>	

In PureApplication System, product IDs are associated with the virtual image part. This allows finer control over how licenses are consumed based on how the virtual machine is being used, rather than what virtual image was used to create the virtual machine.

To view or add product IDs to virtual image parts navigate to Catalog->Virtual Images->your\_virtual image. Located in the “Contains parts” section is the list of virtual image parts associated with this virtual image. Click the “part product IDs...” link to the right of the part to view its current product IDs. To add an addition product ID click the field marked “Click to add” and enter the product ID. The product ID must already be defined in the product license page located at Catalog->Product Licenses.



## Hypervisor licenses

- Located at very bottom of **Product Licenses** page
- IBM supplies the license keys you need
  - Normally are pre-configured for you after purchase
  - If required, you can type in the IBM-supplied keys

The screenshot shows the 'Product Licenses' page in the IBM PureApplication System console. The page is divided into sections for 'License reporting' and 'Vmware licenses'. The 'Vmware licenses' section is highlighted with a red box and contains the following information:

License Name	ID	PVU	Status	Usage	Systems
IBM DB2 Enterprise Server Edition	5765-F41	PVU	Ignore	0 / 90.0 %	23 virtual systems

At the bottom of the page, the 'Vmware licenses' section is highlighted with a red box and contains the following information:

License Name	Key
vCenter key:	(none)
ESXi key:	(none)

A red arrow points to the bottom of the page with the text 'Scroll to bottom'.

IBM supplies you the hypervisor license keys that you need after you purchase PureApplication Server. In most cases the hypervisor licenses are pre-configured for you. You can see these license keys at the very bottom of the Product Licenses page. If you need to type in the license keys which IBM supplies, you can do so if you are logged in with as a workload resources administrator with full permission or a Hardware administrator with full permission.

## ***IBM License Metric Tool overview***

This section provides an overview of the License Metric Tool and how it integrates with the PureApplication System.

## Integration with IBM License Metric Tool

- PureApplication System communicates with the IBM License Metric Tool server
  - IBM License Metric Tool server available as a no-charge product
  - Installed separately to the PureApplication System
- IBM License Metric Tool agent is included in deployed virtual systems
  - Agent sends license usage data to the server for reporting
- License Metric Tool generates audit reports so you can track enterprise-wide license usage

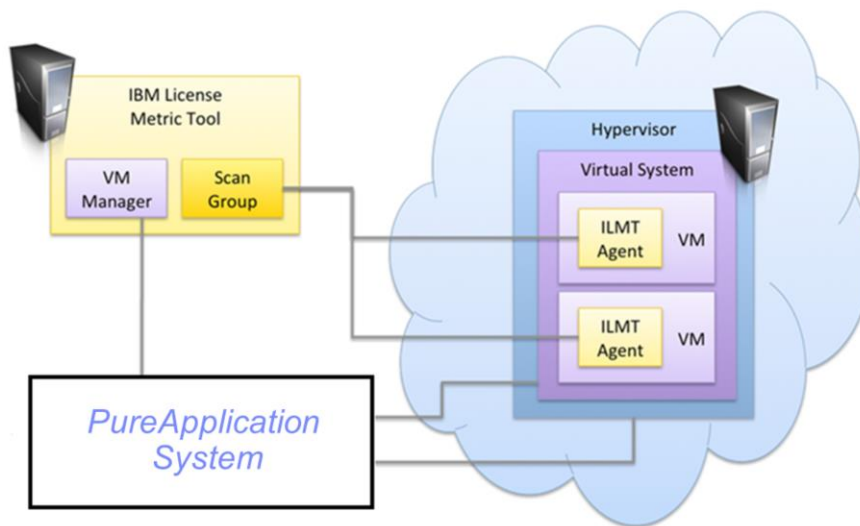
The IBM License Metric Tool is a no-charge product used for license tracking across a broad range of IBM software products. This means that the License Metric Tool is packaged on its own and available as a software download from IBM, apart from the PureApplication System. The PureApplication System supports communication with the IBM License Metric Tool to produce enterprise-wide license usage reports. To use this feature, you must point to an IBM License Metric Tool server in the PureApplication System configuration. The virtual images that the PureApplication System deploys include the IBM License Metric Tool agent. This agent runs on the VMs that are deployed in the cloud and collects data about the software running there along with the licenses being consumed. The agent then sends this information to the License Metric Tool server.

## Terminology for the License Metric Tool

- To enable license tracking with the IBM License Metric Tool requires an installation of **IBM License Metric Tool server**
  - Server component that communicates with agents running in cloud
  - Maintains a database of installed software products
- When license tracking with IBM License Metric Tool is enabled, every virtual machine deployed contains the IBM License Metric Tool agent
  - Runs on your virtual machine
  - Gathers information about installed software
- Configuration objects in the IBM License Metric Tool server required for use with PureApplication System:
  - **VM manager**: collects information about virtual machines that are installed in your infrastructure
  - **Scan group**: collection of related agents that are regularly scanned to discover new software

To understand how to use the License Metric Tool with the PureApplication System, you need to be familiar with the software components and configuration objects that make up the IBM License Metric Tool environment for PureApplication System. Before enabling license tracking with the IBM License Metric Tool, you need to install the License Metric Tool server. The server component is an application that runs on top of WebSphere Application Server and stores information about the software products you have installed and the quantity of PVUs being consumed by those products. The server stores information about your software consumption in a DB2 database instance. After enabling license tracking on your PureApplication System, new virtual systems that you deploy contain the IBM License Metric Tool agent. The agent runs in each of your deployed virtual machines and communicates information about installed software products back to the License Metric Tool server. The IBM License Metric tool requires two configuration objects to support license tracking with the PureApplication System: a VM manager and a scan group. The VM manager's job is to collect information about the virtual machines that have been deployed by the PureApplication System. Those virtual machines each contain an instance of the IBM License Metric Tool agent. A scan group is a collection of related agents that are scanned regularly to discover new software.

## IBM License Metric Tool with PureApplication System



*Note: For subcapacity license auditing, use the PureApplication System-generated license audit reports*

29

License tracking and management

© 2012 IBM Corporation

IBM License Metric Tool helps you maintain an up-to-date inventory of the IBM distributed software assets in your IT infrastructure and to measure the processor value units (PVU) available to them. Virtualization technologies aid in optimizing hardware and software maintenance costs by sharing and dynamically managing assets. The IBM License Metric Tool offers license models that support virtualized environments and allow for calculating license fees based on the available processor power (the measure of processor usage is the processor value unit, or PVU). Information about installed software is collected from monitored virtual machines and stored on a central server. The software data can be accessed through preconfigured reports in the IBM License Metric Tool server available through a browser interface. The audit reports generated can be used to assess your position relative to your entitlement as specified in your license agreement. The IBM License Metric Tool cannot be used measure sub-capacity licensing; however, the PureApplication System-generated license audit reports is used for that purpose.

In the context of PureApplication System, IBM License Metric Tool provides visibility into your license usage and reporting and auditing capabilities. This diagram shows the structure of the IBM License Metric Tool server (the yellow box in the upper left). It shows how the License Metric Tool connects to the PureApplication System through a VM manager, accessing information about deployed software packages from the IBM License Metric Tool agent running in deployed virtual machines. The License Metric Tool does not have functionality to control how the PureApplication System handles placement of virtual system components based on actual license consumption.

## ***Configuring PureApplication System to use the License Metric Tool***

This section describes how to configure PureApplication System to use the IBM License Metric Tool for license tracking.

## Configuring the IBM License Metric Tool for use with the PureApplication System

- Prerequisite: IBM License Metric Tool server is already installed
- Configuration steps:
  - In the IBM License Metric Tool:
    - Add a VM manager that points to your PureApplication System
      - Use address of the form: `https://<MGMT_IP>/resources/topology`
    - Create a scan group to hold the agents for virtual machines in your cloud
  - In the PureApplication System console:
    - Navigate to **System Console > System > Product Licenses** page
    - Provide the License Metric Tool server address and scan group information

### Product Licenses

#### License reporting

<input type="checkbox"/> Track license usage		Upgrade the IBM License Metric Tool agent that is added to your virtual machines:	
<input checked="" type="checkbox"/> Track processor value units (PVUs) with IBM License Metric Tool		Browse...	
Server name	172.16.15.246		
Scan group	IPAS822	Upgrade	

Before configuring license tracking with the IBM License Metric Tool, you need to have an instance of the IBM License Metric Tool server installed and available on your network. In the server, define the PureApplication System as a VM manager and create a scan group to point to all of the agents running in your cloud. Then, in the PureApplication System, go to the Product Licenses page and select the option to track PVUs with the IBM License Metric Tool. Specify the host name or IP address of your License Metric Tool server and provide the name of your scan group. If the specified scan group is not found, the License Metric Tool tracks all of your agents in the default scan group.

## Upgrading the IBM License Metric Tool agent

- Provides a method to upgrade ILMT agent stored on PureApplication Systems
  - Version supplied is 7.2.2.1
  - ILMT Agent stored on PureApplication Systems is included in each deployment
- Upgrade steps:
  - Click **Browse**, navigate to the upgrade package and select it
  - Click **Upgrade**
- After an upgrade, subsequent deployments use the new version of the ILMT agent
- For ILMT upgrade instructions for existing deployments, visit ILMT Information Center
  - <http://pic.dhe.ibm.com/infocenter/tivihelp/v53r1/index.jsp>
  - Optionally, redeploy the virtual systems or applications to use the new ILMT level

### Product Licenses

#### License reporting

##### Track license usage

Track processor value units (PVUs) with IBM License Metric Tool

Server name 172.16.15.246

Scan group IPAS822

Upgrade the IBM License Metric Tool agent that is added to your virtual machines:

Browse...

Upgrade

When you deploy a system on PureApplication System, the IBM License Metric Tool agent stored in the system is added to the deployment for license tracking purposes. PureApplication Server initially provides V7.2.2.1 of the License Metric Tool agent so this is the level that is initially installed into each deployment. If this agent needs to be upgraded, you can use the graphical interface found under “Track license usage” to upgrade the level of the agent stored in PureApplication Server. This does not upgrade the level of the agents already deployed, but subsequent deployments have the new License Metric Tool agent level automatically installed. For upgrade instructions for the License Metric Tool agents already installed on existing deployments, visit the information center for the IBM License Metric Tool linked from this page.



## VM manager in the IBM License Metric Tool server console

- IBM License Metric Tool and PureApplication System check with each other every thirty minutes
  - May take up to 30 minutes for the status of the VM manager to change to **OK**

The table lists VM managers used in your IT infrastructure. Polling interval refers to the amount of time between two communication attempts.

Polling interval: 30 min

Select	Operation Status	Manager Type	Web Address	User Name	Last Successful Operation	Comments
<input type="checkbox"/>	OK	WebSphere CloudBurst	https://9.3.75.157/resources/topology	cbadmin	Mar 4, 2010 7:45:46 PM	There are no problems with the VM manager.

Page 1 of 1      Total: 1   Filtered: 1   Displayed: 1

The License Metric Tool and the PureApplication System only check in with each other every 30 minutes, so it can take up to 30 minutes for changes to appear in the server console. This slide shows a screen capture from the administrative console for the IBM License Metric Tool server of a VM manager for a PureApplication System. This VM manager has connected successfully and learned about deployed virtual systems.

## Scan groups in the IBM License Metric Tool server console

- Agents in the cloud are discovered and added to the scan group

Scan Groups

Manage Scan Groups > Scan Details

Scan Details

The table shows the status of each agent for the chosen software scan. The Scan date above the table refers to the agent time.

To add agents to a scan group, [go to the Agents panel](#).

Scan group name: DEFAULT

Software Scan Status	Host Name	Operating System	Server ID	Last Software Scan
OK	aimcp138	Linux 2.6.16.60-0.39.3-vmi	IBM aimcp123_2	Mar 3, 2010 6:02:00 PM
OK	aimcp137	Linux 2.6.16.60-0.39.3-vmi	TLM_VM_VMware-56 4d 59 5a 41 27 77 3c-8e 20 73 d5 44 56 6a cb	Mar 3, 2010 6:02:00 PM
OK	aimcp136	Linux 2.6.16.60-0.39.3-vmi	TLM_VM_VMware-56 4d 8e a2 c7 dd e2 3f-54 ad de dc f5 59 c1 06	Mar 3, 2010 6:02:01 PM
OK	aimcp140	Linux 2.6.16.60-0.39.3-vmi	IBM aimcp123_2	Mar 3, 2010 6:02:00 PM

Page 1 of 1 Total: 4 Filtered: 4 Displayed: 4

[Download as PDF](#)

After the License Metric Tool server has connected to the PureApplication System, it can locate the virtual machines in your cloud and talk to the IBM License Metric Tool agents running on those VMs. Agents are discovered on a regular basis - approximately every thirty minutes. But software scan status does not show as complete until after the scan group has run a full software scan of all the agents in the group. The software scan schedule is a configurable parameter in the scan group. After the agents have been discovered by the IBM License Metric Tool server, you can track usage in the server and generate detailed audit reports.

Section

## ***Summary and references***

This section contains a summary and references.

## Summary

- License awareness in PureApplication System allows you to:
  - Track license usage in your cloud and generate audit reports
  - Understand how many license you need to purchase to make the most use of your cloud
  - Enforce placement decisions based on available licenses
  - Spread subsets of “licenses owned” across environment profiles
- IBM License Metric Tool is made up of a centralized server that gathers software usage information from specialized agents
  - PureApplication System includes the agent in deployed virtual machines, identifies new virtual machines to the server
  - License Metric Tool tracks license consumption across deployed virtual machines, generates audit reports
    - Exception: subcapacity license usage is tracked using the PureApplication System-generated license audit report

PureApplication System provides built-in capabilities for license tracking and reporting. The PureApplication System allows you to track license usage, generate audit reports, and enforce placement decisions based on license availability. Having knowledge of how you are consuming product licenses can help you understand how many licenses you need to purchase to make the most use of your cloud. Using license tracking can also help you to keep from inadvertently going over your license entitlement. Using the environment profiles, you can spread subsets of licenses of your own across environment profiles.

The IBM License Metric Tool is made up of a centralized server that gathers software usage information from specialized agents. When license tracking with the License Metric Tool is enabled, PureApplication System includes the IBM License Metric Tool agent in new deployed virtual machines. These agents report license consumption information back to the License Metric Tool server. With the exception of subcapacity license usage, the IBM License Metric Tool server tracks license usage information in its central database and generates audit reports to meet IBM’s license tracking requirements.

## References

- IBM License Metric Tool  
<http://www.ibm.com/software/tivoli/products/license-metric-tool/>
- IBM software catalog  
– [ftp://ftp.software.ibm.com/software/tivoli\\_support/misc/CandO/TivoliCatalog/ibm/SwKBT/](ftp://ftp.software.ibm.com/software/tivoli_support/misc/CandO/TivoliCatalog/ibm/SwKBT/)
- PVU table  
[http://www.ibm.com/software/lotus/passportadvantage/pvu\\_licensing\\_for\\_customers.html](http://www.ibm.com/software/lotus/passportadvantage/pvu_licensing_for_customers.html)
- Virtualization capacity license counting rules  
[http://www.ibm.com/software/lotus/passportadvantage/Counting\\_Software\\_licenses\\_using\\_specific\\_virtualization\\_technologies.html](http://www.ibm.com/software/lotus/passportadvantage/Counting_Software_licenses_using_specific_virtualization_technologies.html)

This page provides links to additional license-related resources.

## Trademarks, disclaimer, and copyright information

IBM, the IBM logo, ibm.com, DB2, PureApplication, and WebSphere are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of other IBM trademarks is available on the web at "[Copyright and trademark information](http://www.ibm.com/legal/copytrade.shtml)" at <http://www.ibm.com/legal/copytrade.shtml>

Other company, product, or service names may be trademarks or service marks of others.

THE INFORMATION CONTAINED IN THIS PRESENTATION IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. WHILE EFFORTS WERE MADE TO VERIFY THE COMPLETENESS AND ACCURACY OF THE INFORMATION CONTAINED IN THIS PRESENTATION, IT IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. IN ADDITION, THIS INFORMATION IS BASED ON IBM'S CURRENT PRODUCT PLANS AND STRATEGY, WHICH ARE SUBJECT TO CHANGE BY IBM WITHOUT NOTICE. IBM SHALL NOT BE RESPONSIBLE FOR ANY DAMAGES ARISING OUT OF THE USE OF, OR OTHERWISE RELATED TO, THIS PRESENTATION OR ANY OTHER DOCUMENTATION. NOTHING CONTAINED IN THIS PRESENTATION IS INTENDED TO, NOR SHALL HAVE THE EFFECT OF, CREATING ANY WARRANTIES OR REPRESENTATIONS FROM IBM (OR ITS SUPPLIERS OR LICENSORS), OR ALTERING THE TERMS AND CONDITIONS OF ANY AGREEMENT OR LICENSE GOVERNING THE USE OF IBM PRODUCTS OR SOFTWARE.

© Copyright International Business Machines Corporation 2013. All rights reserved.