TECHNICAL WHITE PAPER – **SEPTEMBER 2017**

USAGE METER 3.6

Product Detection

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Introduction

This document details the processes used by Usage Meter to detect individual metered products and report their feature usage. It provides Service Providers with insight into how points are allocated by product and feature. It also provides configuration recommendations to ensure deployed virtual machines are metered as expected.

What products are metered by Usage Meter?

Usage Meter 3.6 tracks the usage associated with 9 VMware products listed in Table 1 below. The Units metered and reported by Usage Meter vary by product. Refer to Appendix A for more information related to VMware Cloud Provider products metered by Usage Meter.

Product	Unit Metered
vCenter	Average Capped Billed vRAM GB per VM
VSAN	Monthly average of hourly count of used capacity (datastore space used)
SRM	Number of Protected VMs
vRealize Automation	Monthly average of hourly count of non-unique VMs in the month.
NSX	Avg Capped Billed vRAM GB per VM using NSX features if bundled -- or -- monthly average of hourly count of non-unique VMs serviced for enterprise edition only.
vCloud Director	# VMs under management (bundled only, not available standalone)
vCloud Availability for vCloud Director	# of Protected VMs
vRealize Operations	vRAM if bundled -- or -- monthly average of hourly count of non-unique VMs in the month if standalone
Desktop as a Service	Total Allocated Quota for VDI Connections Total Allocated Quote for RDSH connections High watermark allocated VDI, RDSH quotas of the month. Watermark resets at start of month

Table 1 - Metered Products

VMware products that are deployed and licensed using a VCAN license are metered by Usage Meter. Usage Meter tracks the usage of all virtual machines except the usage meter Appliance itself.

vCenter

Usage meter collects product usage information from all vCenter servers that are registered with Usage Meter.

VMware Cloud Provider Program partners should utilize VCAN licenses for all servers used in the service delivery path or administration control plane. VMware perpetual licenses, including OEM versions can only be utilized to support internal IT operations that are not part of service delivery. In addition, VMware perpetual licenses may not be used to support the management or operations of an environment utilized to host for unaffiliated third parties. Virtual machines running on hosts with perpetual or demo license keys are metered by Usage Meter.

Configuration

The Usage Meter administrator must configure the endpoint and credentials for each vCenter server to be metered using the Usage Meter Administration User Interface as shown in Figure 1.

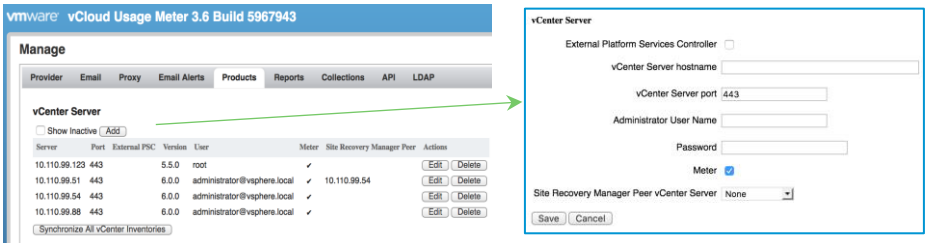


Figure 1

Feature Detection

The vCenter API is the primary access point for most Usage Meter data collections.

When metering vCenter, Usage Meter 3.6 performs two types of usage collections. Event based collections and polling collections.

Event based collections

Usage meter subscribes to vCenter events to detect changes in Virtual Machine running state. Changes in Virtual Machine state are delivered immediately to Usage Meter and recorded. Only running virtual machines are metered.

Poll based collections

Usage Meter polls vCenter servers on an hourly basis to collect inventory information. Usage Meter stores the retrieved information in the UM database. If Usage Meter loses connectivity to the vCenter Server, metric data is not collected which may result in gaps in the metric Data. Usage meter will send an email to the UM administrator if Usage Meter

loses its connection to a registered vCenter server. Emails will be repeated **hourly for the first 24 hours and then the further emails are discontinued.**

For this reason, it is important that UM administrators configure an email server and administrative email address in the Usage Meter (shown below) and that the mailbox for the account is monitored for alerts.

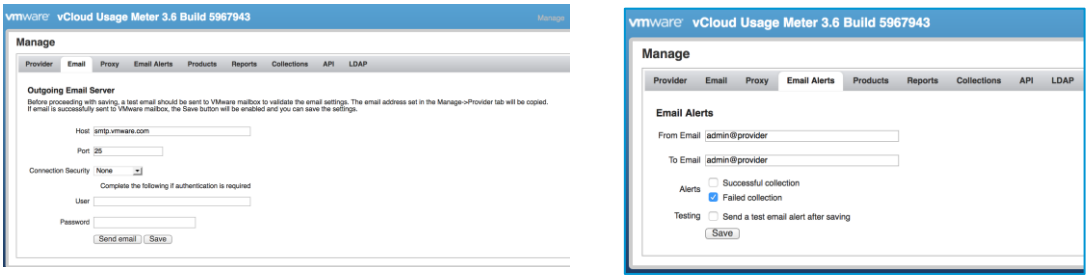


Figure 2

Metering Granularity

For each powered on Virtual Machines managed by vCenter, Usage Meter calculates an Average Capped Billed vRAM (GB) value.

The average is based on the sum of Capped Billed vRAM values collected, divided by the number of successful collections during the reporting month.

Capped Billed vRAM for a powered on VM is taken as the value that is the greater of

- Virtual Machine configured 'Reserved vRAM'
- 1/2 the Virtual Machine configured 'Allocated vRAM'

The resulting value from above is then limited in the following ways:

- The value is capped at a ceiling 24 GB (default) or at the value specified in the UM web console, shown in Figure 3.
- It the value is less than 50% of the vRAM Allocation value, then the value is set to a floor value equal to 50 percent of the vRAM Allocation

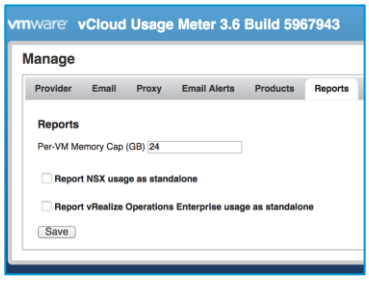


Figure 3 - Per-VM Memory Cap

vCenter Reporting

Bundled - Monthly Report

All vCloud Provider program bundles include a vCenter Server Standard Edition license.

vCenter usage is therefore included in every bundle reported in the Monthly Usage Report.

For example, as shown below in Table 2, vCenter usage is included in the VMware vCloud SP Advanced Bundle.

Monthly Usage Units		
Product	**Unit of Measure**	**Units to be Reported**
VMware vCloud SP Advanced Bundle	Avg Capped Billed vRAM (GB)	6

Table 2

Standalone - Monthly Report

vCenter usage is bundled by default and cannot be reported standalone.

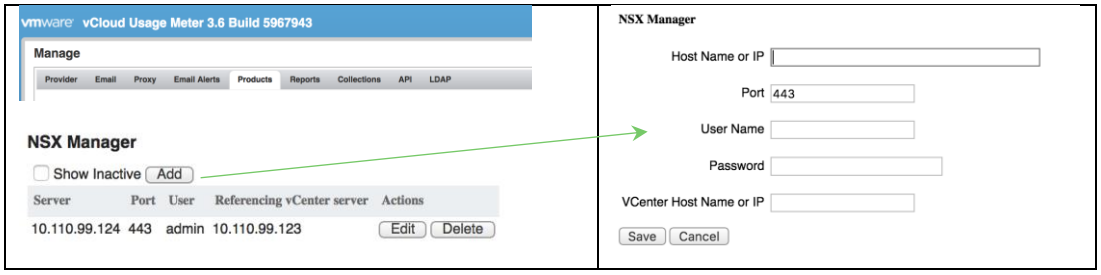
NSX

Usage Meter 3.6 is capable of detecting specific NSX features available to Virtual Machines which determines the NSX edition billed to a VM.

Usage Meter 3.6 tracks NSX usage by Virtual Machine based on the networking services available to the Virtual Machine.

Configuration

The Usage Meter administrator must configure the NSX Manager endpoint and credentials using the Usage Meter Administration User Interface. There is one NSX Manager for each vCenter server instance utilizing NSX.



All virtual machines deployed to a NSX prepared host are candidates for NSX usage. It is important for the administrator to consider partitioning tenant VMs onto networks depending on their NSX usage. To avoid NSX metering for Virtual Machines that are not utilizing NSX, consider deploying the VMs to a vCenter cluster that is not prepared for NSX. Figure 4 below shows two different vCenter clusters within the same vCenter domain. Virtual machines that are not utilizing NSX should be deployed to the cluster that is not prepared for NSX.

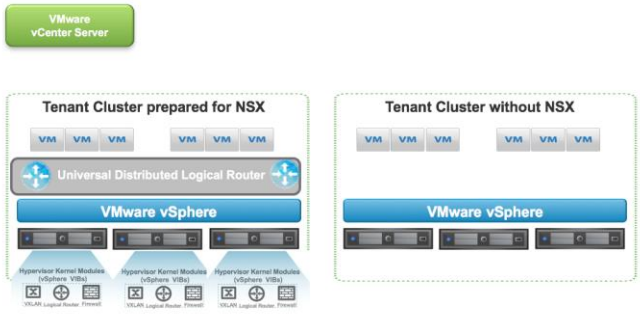


Figure 4 - Clusters with and without NSX preparation

Feature Detection

The fact that a virtual machine has the potential to access a service through the network will result in the VM being metered for the service. A VM will be considered as using NSX for metering purposes if:

- The virtual machine is connected to a network (backed by any type of switch) that has access to an NSX edge.
- The virtual machine is connected to an NSX logical switch or distributed switch on a NSX prepared host.
- The virtual machine is referenced by a non-default distributed firewall rule including groups/polices.
  (Note: The default DFW rule is the 'Allow' Action.)
- The virtual machine is connected to a network (backed by any type of switch) that has access to a distributed logical router.

If a virtual machine has the potential to access an Edge service through the network, the VM will be metered for the service.

UM examines the switches, routers and gateways managed by NSX Manager and creates a graph of connected networks. It then determines the VMs that are connected to each switch. VMs are metered for NSX usage based on their ability to reach a gateway or router through the network. Usage Meter does not examine individual Virtual Machines, network traffic or routing tables to determine actual usage.

Usage Meter examines the list of NSX features available to a Virtual Machine and selects the minimum license needed to enable the features. Each VM is metered based on the NSX edition and the VMs vRAM configuration.

The following table lists the NSX components examined by Usage Meter to determine available NSX features.

Table 3: NSX Editions by Feature

NSX Feature	NSX Edition	VMs declared as using feature	Provided By
Distributed switching and routing	Base	All VMs connected to a Logical Switch	ESXi Hosts prepared
NSX Edge firewall	Base	All VMs on all networks serviced by the edge	Edge gateway
NAT	Base	All VMs on all networks serviced by the edge	Edge gateway
NSX Edge load balancing	Base	All VMs on all networks serviced by the edge	Edge gateway
IPSEC VPN	Base	All VMs on all networks serviced by the edge	Edge gateway
Remote Gateway (also known as L2VPN)	Enterprise	All VMs on all networks serviced by the edge	Edge gateway
Software L2 bridging to physical environment	Advanced	All VMs on all networks serviced by the edge	SW L2 bridging to physical environment
Dynamic routing with ECMP (Active-active)	Advanced	All VMs on all networks serviced by the edge	Edge gateway
Distributed firewalling	Advanced	All VMs referenced in the Source rule or Target rule sections of a firewall rule. Default Firewall rules excluded.	Hosts prepared
Active Directory Integrated firewall	Advanced	Same as Distributed Firewalling	Distributed firewalling
Service insertion (3rd party integration)	Advanced	Same as Distributed Firewalling	Distributed firewalling
Server activity monitoring	Advanced	Same as Distributed Firewalling	Distributed firewalling
Integration with HW VTEPs	Enterprise	All VMs on the LS bridged with HW VTEP	Integration with HW VTEPs
Cross vCenter NSX	Enterprise	All VMs on all networks serviced by the ULS	ULS, UDFW
Multi-Site NSX optimizations	Enterprise	All VMs on the ULS serviced by the edge	ULS, UDFW
SSL VPN	Base	All VMs on the LS serviced by the edge	Edge created

Table 4 - Feature Detection Combination Matrix

Host prepared for NSX?	VM connected to LS?	At least one non-default rule is applicable to a VM	NSX edge available to VM?	NSX edition metered	Scenario in Diagram below
No	n/a	n/a	No	none	
No	No	n/a	Yes	at least* Base Edition	
Yes	No	No	No	none	1
Yes	No	No	Yes	at least* Base Edition+	5
Yes	No	Yes	No	Advanced Edition	
Yes	No	Yes	Yes	at least* Advanced Edition	
Yes	Yes	No	No	Base Edition	1
Yes	Yes	No	Yes	at least* Base Edition	2, 3, 6
Yes	Yes	Yes	No	Advanced Edition	
Yes	Yes	Yes	Yes	at least* Advanced Edition	

* depending upon edge services configured.

+ VM connected to Edge via VLAN backed switch

NSX Scenario Samples

Scenario One: Minimum NSX configurations

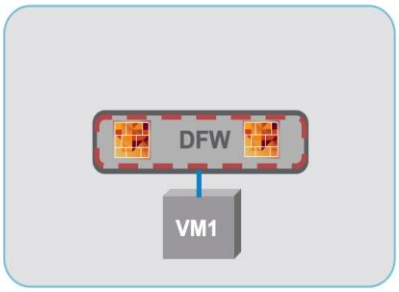


Figure 5

A virtual machine, VM1 is deployed to a vSphere host on an NSX enabled cluster. The virtual machine is not connected to a switch. The VM is automatically connected to the NSX Distributed Firewall.

Metering:
By default the VM is connected to a distributed Firewall. VM1 will not be metered for NSX usage unless the default distributed firewall rules have been modified to reference the VM. If the DFW is in use using non-default rules, then the VM will be metered for NSX Advanced Edition.

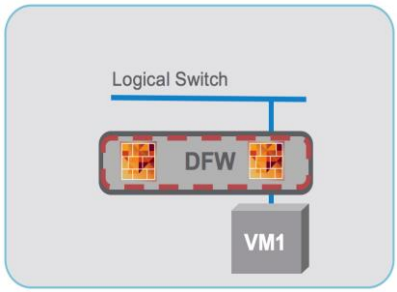


Figure 6

A virtual machine, VM1 is deployed to a host on an NSX enabled cluster. The VM is connected to a switch. The VM is automatically connected to the NSX Distributed Firewall. The administrator has not modified the default DFW rules.

Metering:
VM1 will be billed for NSX (Base Edition) since it is connected to a distributed switch.

Scenario Two: Base Edition Example

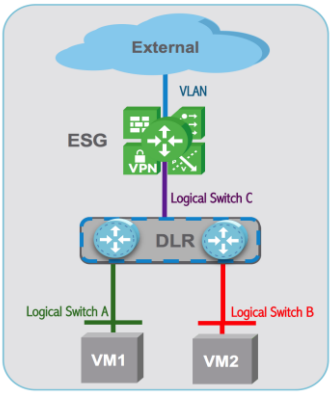


Figure 7

Two virtual machines VM1 and VM2 are connected to different VXLAN backed networks with routing though a Distributed Logical Router.
Both virtual machines have access to a remote network through an Edge Gateway ESG, running a Firewall service. Neither of the VMs are referenced by non-default DFW rules.

Metering:
VM1 and VM2 are both metered for NSX Base edition since both distributed switching and routing and edge firewall are base edition features.

Scenario Three: Active / Active Gateway

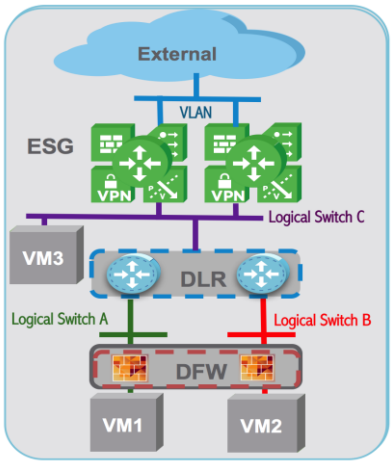


Figure 8

Dynamic routing with ECMP (Active-active) Edge

Metering:

VM1, VM2 and VM3 are billed as NSX Advanced since ECMP is an Advanced Feature and all VMs have potential access to the edge.

This scenario illustrates the feature selection based on the most advanced feature reachable by a Virtual Machine through the network.

Scenario Four: NSX Partitioned by Tenant

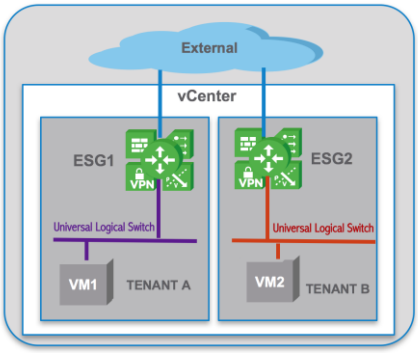


Figure 9

Two different Tenants A and B, each with their own network and ESG. No shared Switch, DLR or ESG.

Metering:

VM1 is metered for NSX usage based on the services running on the ESG1 accessible to VM1.

VM2 is metered for NSX usage based on the services running on the ESG2 accessible to VM2.

Scenario Five: ESG on vSphere Distributed Switch (Not a logical Switch)

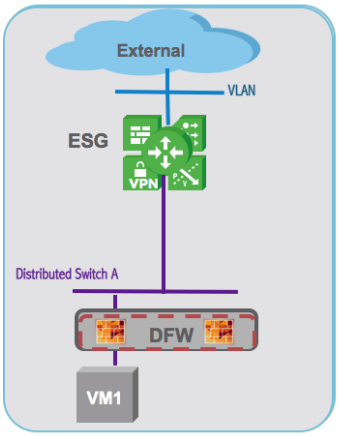


Figure 10

VM1 on a NSX prepared Cluster and attached to vSphere Distributed Switch, not a Logical Switch.

ESG running a load balancer service attached to same vSphere Distributed Switch. VMs are using only default DFW rules.

Metering:

VM1 is metered for NSX (Base Edition) since Edge Load balancing is a Base feature and is accessible to the VM through the distributed switch.

Scenario Six: NSX Cross vCenter shared ESG

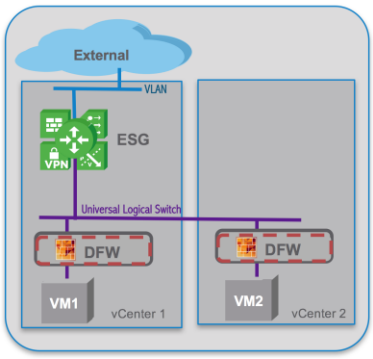


Figure 11

An NSX Edge Gateway, ESG shared between vCenter Domains using a Universal Logical Switch.

Both virtual machines are using only default DFW rules.

Metering:

VM1 and VM2 are both billed as NSX Enterprise since the ESG connects to a Universal Logical Switch, and all VMs have access to the ESG.

NSX Reporting

NSX usage can be included in reports as a license bundle line item or as a standalone line item. Usage reporting is based on bundles unless standalone reporting is requested. Standalone reporting can be configured on the Usage Meter - Manage - Reports tab as shown below.

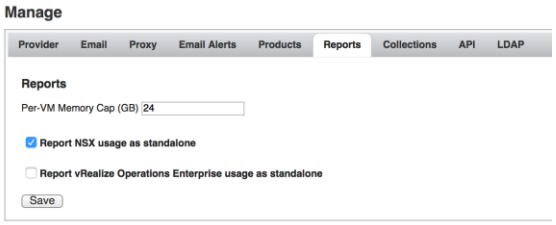


Figure 12 – NSX Standalone report selection

Bundled - Monthly Report

Monthly Usage Units		
Product	Unit of Measure	Units to be Reported
VMware vCloud SP Standard Bundle with Networking	Avg Capped Billed vRAM (GB)	3
VMware vCloud SP Advanced Bundle	Avg Capped Billed vRAM (GB)	2
VMware vCloud SP Advanced Bundle with Networking	Avg Capped Billed vRAM (GB)	1
VMware vCloud SP Advanced with Management	Avg Capped Billed vRAM (GB)	1
VMware vCloud SP Advanced Bundle with Networking & Management	Avg Capped Billed vRAM (GB)	1

Table 5

Standalone Reporting

Monthly Usage Units		
Product	Unit of Measure	Units to be Reported
VMware NSX Enterprise	Avg Number of VMs	10

Table 6

NSX standalone consumption is always reported as ‘NSX Enterprise’ regardless of features used since only NSX enterprise edition may be reported standalone.

NSX Q & A

Question 1:

What are the minimum configurations that Usage Meter will detect as NSX Usage?

- A VM connected to a Logical Switch will be detected as NSX BASE edition. This is the case even when no distributed logical routers or NSX edges are created.
- A VM with a vNIC referenced in a distributed firewall rule (non-default) will cause the VM to be detected as NSX Advance, even if the VM is not connected to a logical switch, distributed logical router or edge.

Question 2:

Are the Virtual Machines that implement NSX functionality (for example NSX Controller VMs and Edge Gateways) billed for NSX usage?

- Yes, NSX management VMs are billed for NSX Base usage. The only VM excluded from metering is the Usage Meter Appliance.

Question 3:

An NSX Edge Gateway can be installed on a vCenter cluster that is not prepared for NSX. In this case, is the NSX Edge and the Virtual Machines utilizing the edge billed for NSX usage?

- Installation of an edge Gateway on unprepared Servers is supported only when the Edge is running the L2VPN Client. It is assumed that the client hosting the gateway will not be metered by Usage Meter.

Question 4:

Does UM infer content of a distributed firewall rule? For example, if two rules cancel out one another.

- No, UM does not examine the relationships between firewall rules. UM will meter the VM for DFW usage if any of the DFW rules in a policy reference the vNIC either directly or through a security group (static or dynamic).

Question 5:

If a VM is connected to multiple networks what rate is metered?

- The VM is metered at the rate of the network with the highest level of service features.

Question 6:

If a VM is listed in the NSX Firewall exclusion list, does Usage Meter bill for Firewall usage?

- No, Usage Meter does not bill DFW usage for VMs in the NSX firewall exclusion list.

Question 7:

On an Edge configured as a Remote Gateway (also known as L2VPN) what VM's are metered for NSX Usage?

- L2VPN can be configured as "Server" and "Client". In both cases all VM's with access to the Edge are metered by Usage Meter.

Question 8:

How does Usage Meter detect if NSX Cross vCenter is configured?

- Usage Meter detects the Universal logical switch configured on a local edge.

Question 9:

Does usage meter detect and bill for NSX vShield Endpoint (guest introspection to support anti-malware) solutions?

- Yes, Usage Meter detects vShield Endpoint as a base NSX feature, which is included in all bundles.

Question 10:

An NSX Edge can be deployed to an ESX Server that is not prepared for NSX. Can the edge be connected to a logical switch?

- No, it is not possible to create a Logical Switch on a server that is not prepared for NSX.

Question 11:

Are Virtual Machines connected to a vNetwork Standard Switch (vSwitch) or vNetwork Distributed Switch (dvSwitch) metered for NSX Usage?

- Yes, all switch types that are serviced by an NSX Edge are metered. Logical switches will be metered even if there is no NSX Edge servicing it.

vRealize Operations

Usage Meter supports a number of vRealize Operations configurations:

- A Service Provider managed vRealize Operations server monitoring a single tenant.
- A Service Provider hosted vRealize Operations server for multiple tenants.
- A Service Provider hosted vRealize Operations server that manages VMs hosted by SP or hosted on customer's premises.
- A vRealize Operations server configured with multiple vCenter servers.

Configuration

Usage Meter 3.6 automatically detects vRealize Operations Servers that are monitoring vCenter Servers registered with Usage Meter. The figure below shows a vRealize Operations Manager that has been detected. It is monitoring the vCenter Sever 10.110.99.123

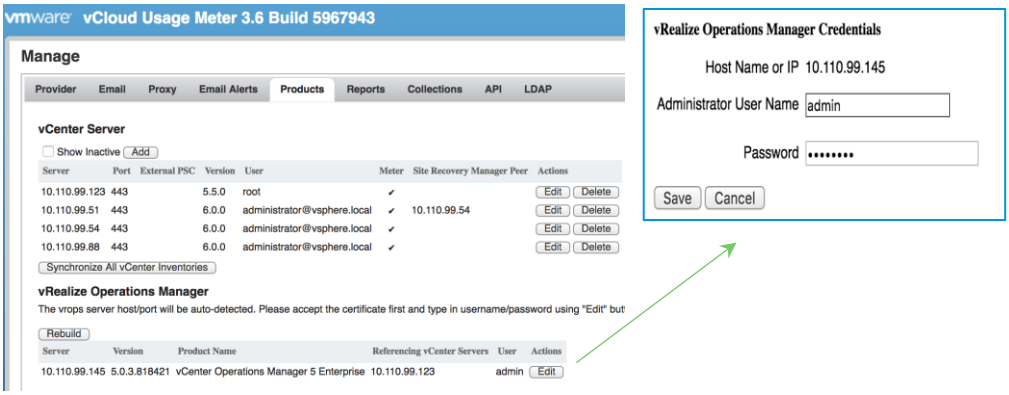


Figure 13

When a vCenter server is registered with Usage Meter, Usage Meter queries the vCenter extension manager for the presence of registered vRealize Operations servers. Each detected vRealize Operations server is listed on the Usage Meter web console product page.
After discovery, the Usage Meter administrator must enter the credentials required to login to each vRealize Operations Server to complete the server registration and begin metering. When UM connects to a vRealize Operations server, it queries for a list of vCenter servers monitored by a the vRealize Operations and the Virtual Machines monitored. Usage meter categorizes the vCenter servers in the list based on whether they are being metered by Usage Meter or not.

vCenter servers monitored by a vRealize Operations server that are also registered with Usage Meter are named "Managed vCenter" servers. VCenter servers monitored by a vRealize Operations server but not registered Usage Meter are named "Unmanaged

Servers". Both Managed and Unmanaged vCenter servers are listed in Usage Meter vRealize Operations report lines.

Usage Meter connects to a vRealize Operations server using the account provided by the UM administrator. UM will meter all VMs that are visible through the provided account.

To meter only a subset of monitored VMs, for example to divide monitoring by Tenant, vRealize operations should be configured to filter the monitored virtual machines to include only a subset of the VMs deployed to the monitored vCenter instance. This is accomplished by creating a new account in vRealize Operations, and configuring Role Base Access Controls to restrict the view of the account to the desired Virtual Machines. The RBAC restricted account and credentials are provided to Usage Meter when the vRealize operations server registration is completed.

Refer to the Product Usage Guide for detailed configuration instructions.

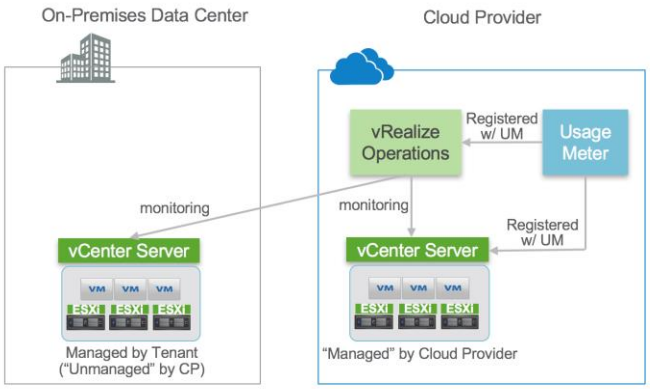


Figure 14

Feature Detection

The vRealize Operations license edition is retrieved by Usage Meter from the vRealize Operations server during each data collection.

vRealize Operations metering is based on Virtual Machines monitored by a vRealize Operations Server. Service providers are responsible for reporting usage forboth monitored VMs and OSI Instances (which represent non-virtualized servers). Usage meter does not track OSI instances monitored by vRealize Operations or add on packages such as Blue Medora.

Metering Granularity

When usage is reported in a bundle, the metric is the Avg Capped Billed vRAM value of the monitored Virtual Machine.

When reported standalone, the metric is the Average Number of Virtual Machines monitored by vRealize Operations during the reporting month.

Scenario Examples

Scenario One: vRealize Operations Server monitoring both SP and Tenant vCenters

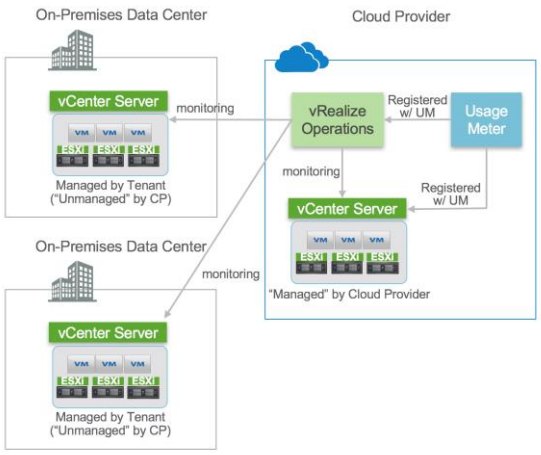


Figure 15

Consider the following reporting scenario:

1. A vCenter server is registered with Usage Meter.
2. Usage meter queries the vCenter extension manager and discovers a vRealize Operations server.
3. Usage Meter queries the vRealize operations server to determine what vCenter Servers it monitors.
4. The vRealize operations server returns a list of three vCenter servers, only one of which is registered with Usage Meter.
5. Usage Meter monthly report will include 2 Unmanaged vRealize Operations Servers and 1 Managed vRealize Operations Server line items.

vRealize Operations Reporting

vRealize Operations Usage reporting is based on bundles or standalone depending on the following rules:

- Virtual machines monitored by vRealize Operations and running on “Unmanaged vCenter servers” are always reported standalone.
- vRealize Operations Standard and Advanced editions are always reported standalone.
- vRealize Operations Enterprise edition is reported according to vSphere host license. The vSphere Enterprise Plus license is the only license that can be included in a bundle line item in a monthly report. Other license editions are reported standalone.
    - If the vSphere server license of the ESX server hosting the monitored VM is a vSphere Enterprise Plus edition then usage is reported in a bundle.
    - If the vSphere server license of the ESX server hosting the monitored VM is an Enterprise with Distributed Network Switch edition then usage is reported standalone.
- vRealize Operations Enterprise may be reported standalone if configured on the Usage Meter - Manage - Reports tab as shown below.

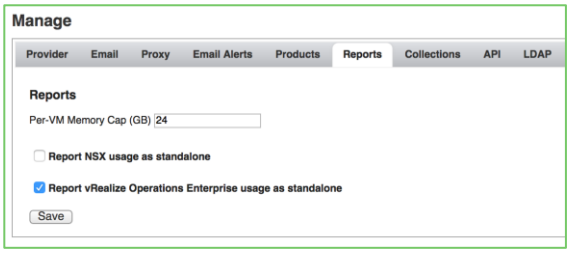


Figure 16

Bundled - Monthly Report

Monthly Usage Units		
Product	Unit of Measure	Units to be Reported
VMware vCloud SP Standard Bundle with Management	Avg Capped Billed vRAM (GB)	5
VMware vCloud SP Advanced Bundle with Management	Avg Capped Billed vRAM (GB)	3
VMware vCloud SP Advanced Bundle with Networking and Management	Avg Capped Billed vRAM (GB)	10

Table 7

Only a vRealize Operations Enterprise Edition license will be included into a bundle.

Standalone Reporting

Monthly Usage Units			
Product	Version	Unit of Measure	Units to be Reported
vCenter Operations Manager 5 Enterprise (managed)	5.x	Avg Number of VMs	2
vCenter Operations Manager 5 Enterprise (unmanaged)	5.x	Avg Number of VMs	5
vRealize Operations Manager Standard (managed)	6.x	Avg Number of VMs	20
vRealize Operations Manager Standard (unmanaged)	6.x	Avg Number of VMs	5
vRealize Operations Manager Advanced (managed)	6.x	Avg Number of VMs	3
vRealize Operations Manager Advanced (unmanaged)	6.x	Avg Number of VMs	8
Realize Operations Manager Enterprise (managed)	6.x	Avg Number of VMs	10
vRealize Operations Manager Enterprise (unmanaged)	6.x	Avg Number of VMs	12

Table 8

As described in the reporting rules above, standalone reporting includes:

- Standard and Advanced edition vRealize Operations Licenses.
- Enterprise vRealize Operations (when host license is not included in a bundle)
- “Unmanaged” vRealize Operations Servers (all license editions)

vCloud Director

Configuration

Usage meter collects product usage information from all vCloud Director endpoints that are registered with Usage Meter. The Usage Meter administrator must configure the endpoint and credentials through the Usage Meter Administration User Interface.

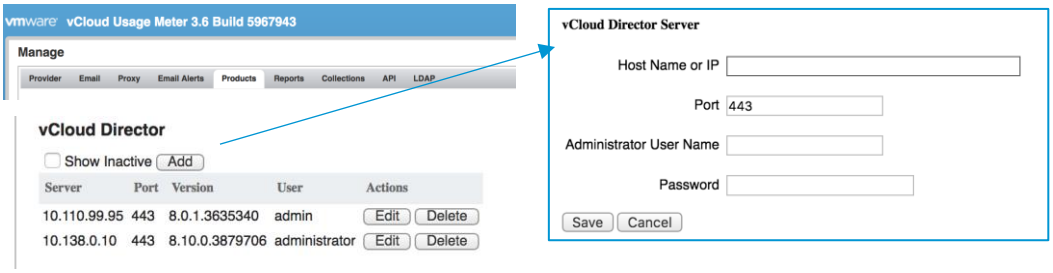


Figure 17

Feature Detection

Usage Meter calculates an Average Capped Billed vRAM (GB) value each Virtual Machine hosted on a vCloud Director server. Refer to the vCenter Server section for a detailed description Average Capped Billed vRAM formula.

When Usage Meter fails to connect with a registered vCloud Director instance, the following actions are taken;

- The failure is logged in the usage meter log.
- An indication of the failure is shown on the Usage Meter Web Application monitoring page.
- An email is sent to the defined UM admin email account

vCloud Director Reporting

Bundled - Monthly Report

vCloud Director is included in a number of VCPP bundles. Usage is reported through a bundle which includes vCloud Director. The example below shows vCloud Director usage reported as part of a SP Advanced Bundle. Refer to the Usage Guide for a complete list.

Monthly Usage Units		
Product	Unit of Measure	Units to be Reported
VMware vCloud SP Advanced Bundle	Avg Capped Billed vRAM (GB)	6

Table 9

Standalone - Monthly Report

vCloud Director usage cannot be reported standalone. But a Monthly report includes a vCloud Directory Summary section as shown below.

vCloud Director Summary											
Hostname	Organization Name	Organization ID	Virtual Datacenter Name	Virtual Datacenter ID	Days	Min vapps	Avg vapps	Max vApps	Min VMs	Avg VMs	Max VMs
Vdc01	Org-1	Fecd…	Org-1-vdc	13v…	0	0	0	0	0	0	0

Table 10

vCloud Availability

Usage Meter 3.6 is capable of detecting protected virtual machines deployed in a replication enabled vCloud Director virtual data center.

Configuration

The vCloud Director instance containing the protected VMs must be registered with Usage Meter. Replication enabled virtual data centers are automatically detected by Usage Meter.

Feature Detection

Usage Meter collects a count of protected virtual machines during the month, but uses the count returned from the last collection in the month as the metered count. Both powered on and powered off protected VMs are counted.
When Usage Meter fails to connect with a registered vCloud Director instance, the following actions are taken;

- The failure is logged in the usage meter log.
- An indication of the failure is shown on the Usage Meter Web Application monitoring page.
- An email is sent to the defined UM admin email account

if metering at the end of the month fails due to vCD not being available or UM not functioning during the last day, Usage Meter will report the last known "Protected VMs" count. If no collections were successful during the month, a count ov 0 “Protected MSs” reported

vCloud Availability Reporting

Bundled - Monthly Report

vCloud Availability is not included in any bundles. All monthly reporting is standalone.

Standalone - Monthly Report

vCloud Availability is reported in a single standalone line item following the vCloud Director instance containing the protected virtual machines

Monthly Usage Units		
Product	**Unit of Measure**	**Units to be Reported**
vCloud Availability for vCloud Director	Protected VMs	0

Table 11

vSAN

Configuration

Usage Meter 3.6 automatically detects vSAN. No additional configuration within Usage Meter is necessary. Detected vSAN clusters appear on the product configuration page. vSAN is enabled on vCenter clusters and is typically deployed with one vSAN cluster per tenant. At least 1 vSAN datastore per cluster and 2 clusters per VC. A total of 2 vSAN datastores per VC with 2 clusters.

Feature Detection

vSAN usage is metered per vSAN enabled cluster and reported aggregated by vSAN license types.

- vSAN usage is metered continuously, with a start time and end time to mark a period in which the usage amount happens.
- vSAN usage is collected on an hourly basis by the vSAN collector. In addition to that, every 24 hours, a full sync of vCenter inventory is done to capture the usage from vSAN data stores.
- vSAN space efficiency and QoS features are detected real time and used to determine the billing rate of vSAN usage.

Four vSAN features are automatically detected by Usage Meter;

- De-duplication
- Erasure coding
- stretched cluster
- IOPS Limit

De-duplication and erasure coding features are space efficiency features that are used to differentiate between advanced edition and standard edition licenses. When either feature is in use, the license edition is advanced, otherwise the edition is standard.

If a vSAN Enterprise edition license is detected, and either stretched cluster or IOPS limit features are enabled then "add-on" rate being added to the edition.

The four features can also be divided into two types:

- Cluster-wide features – Stretch Cluster and de-duplication features are scoped to a cluster. When enabled, the entire cluster is considered to be using the feature.
- Individual virtual machine features - Erasure coding and IOPS limit features are enabled at the individual virtual machine level but scoped at the cluster level. If one or more virtual machines are using the feature, the feature is considered enabled for the entire cluster.

Usage meter examines the both the configured vSAN license and the vSAN features in use to determine the reported license edition.

License Detected	Iops QOS Or Stretch Cluster detected	Space Features: dedup or erasure encoding detected	Report line name
Standard	N	N	vSAN Standard
Advanced	N	N	vSAN Advanced
Enterprise	N	N	vSAN Standard
Enterprise	N	Y	vSAN Advanced
Enterprise	Y	N	vSAN Standard with add-on
Enterprise	Y	Y	vSAN Advanced with add-on

Table 12

Metering Granularity

The vSAN metering calculation for storage is similar to vSphere metering of memory. A Monthly average used capacity = sum of usage samples taken during the month / number of samples. The value can be zero either if no vSAN usage exists or vSAN was not configured.

Average “Used Capacity” means the storage capacity consumed by all virtual machine disks (VMDK) and not available for new allocations in GB averaged during the applicable reporting period.

vSAN Reporting

The following vSAN Editions are included in Usage Meter reports:

- Standard.
- Advanced.
- Add-on to Standard.
- Add-on to Advanced.

Enterprise vSAN licenses are not included in Usage Meter reports. The associated enterprise features are reported as Add-On line items

Bundled - Monthly Report

vSAN Standard and vSAN Advanced line items are determined by a 1-1 mapping of Average GB storage used (checked hourly), rounded down to the nearest whole number.

vSAN is not included in Horizon DaaS bundles.

Monthly Usage Units		
Product	Unit of Measure	Units to be Reported
VMware Virtual SAN Standard	Avg Billed vSAN Storage (GB)	5
VMware Virtual SAN Advanced	Avg Billed vSAN Storage (GB)	4
VMware Virtual SAN Standard with Add-on	Avg Billed vRAM Storage (GB)	2
VMware Virtual SAN Advanced with Add-on	Avg Billed vRAM Storage (GB)	6

Standalone - Monthly Report

vSAN usage cannot be reported standalone, but the monthly report includes a “Virtual SAN by vCenter Server” section.

Virtual SAN by vCenter Server				
Product	vCenter Hostname	Version	License Key	GBs to be Reported
VMware Virtual SAN Standard	xxx.xxx.xxx.xxx	5.0	XXXXX	0
VMware Virtual SAN Advanced	xxx.xxx.xxx.xxx	5.0	XXXXX	0
VMware Virtual SAN Standard with Add-on	xxx.xxx.xxx.xxx	5.0	XXXXX	0
VMware Virtual SAN Advanced with Add-on	xxx.xxx.xxx.xxx	5.0	XXXXX	0

Appendix A

Product available in vCloud Provider Program	Metered by Usage Meter
vCenter, vSphere	Yes
NSX-v	Yes
vSAN	Yes
vCloud Director	Yes
vCloud Availability	Yes
vRealize Operations	Yes
vRealize Automation	Yes
Horizon Desktop As A Service	Yes
Site Recovery Manager	Yes
NSX-T	No
NSX for Desktop	No
vSAN for Desktop	No
vRealize Log Insight	No
vRealize Business	No
vRealize Network Insight	No
vRealize Orchestrator	No
vRealize Hyperic	No
vRealize Operations OSI	No
App Volumes	No
Horizon View	No
Horizon Apps	No
User Environment Manager	No
OnApp	No
Blue Medora True Visibility	No
VMware Mirage	No
ThinApp Client	No
Hyper Converged Infrastructure	No

Table 13