

# How to Access and Use vRealize Operations

## Document Revision History

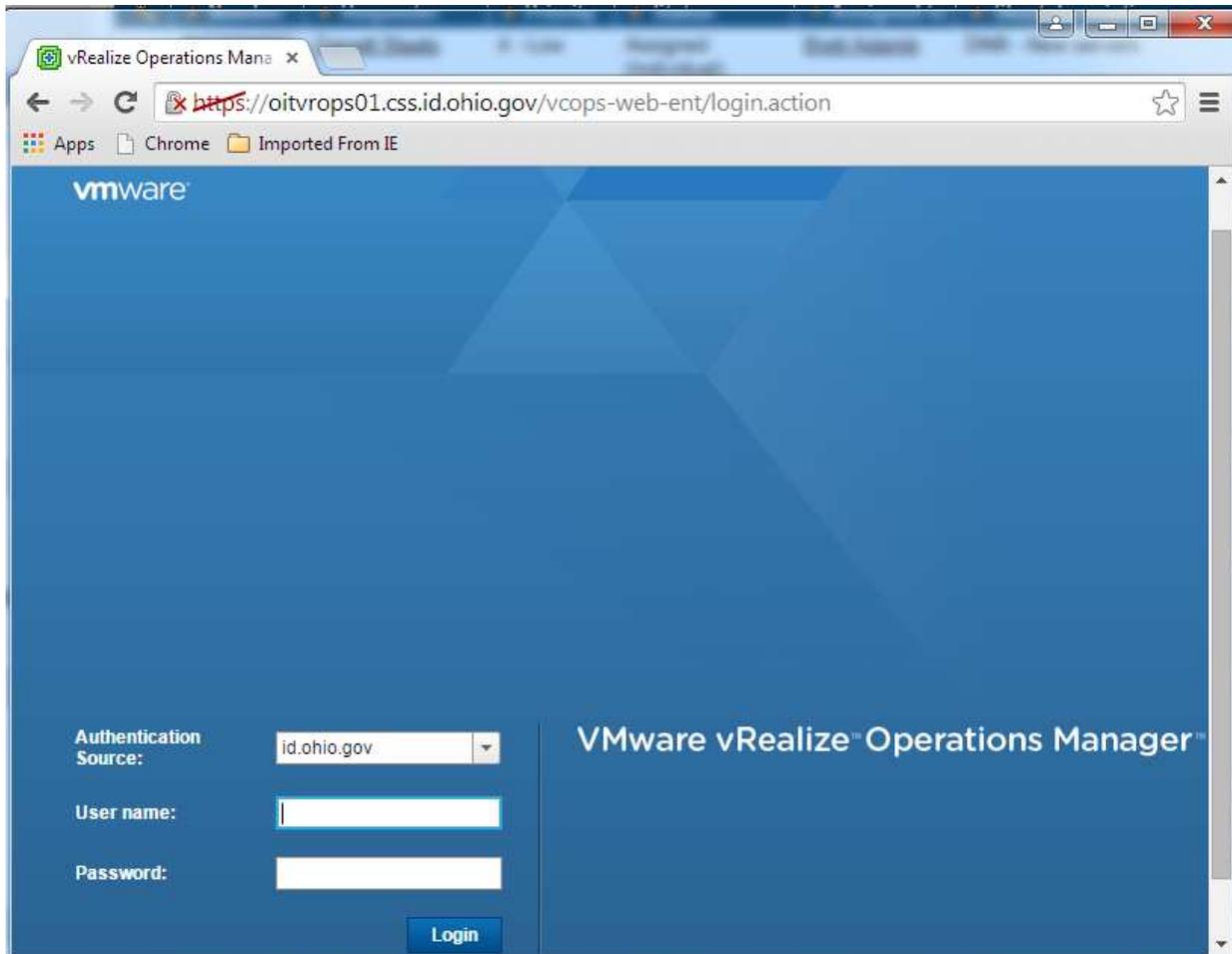
Date	Version	Status	Author
4/22/2014	1.0	Original draft for new service feature	Praveen Kommera
1/15/2015	2.0	Update to vRealize	Bob Strang
10/19/2015	3.0	Update	Praveen Kommera, Todd Wulfhorst

## Connecting to vCenter

You will connect to DAS/OIT VMWare vRealize Operations Manager (vROPS) using the web URL below

<https://oitvrops01.css.id.ohio.gov>

Your screen should look similar to the screen shot below



Your credentials to login to vRealize Operations Mgr.

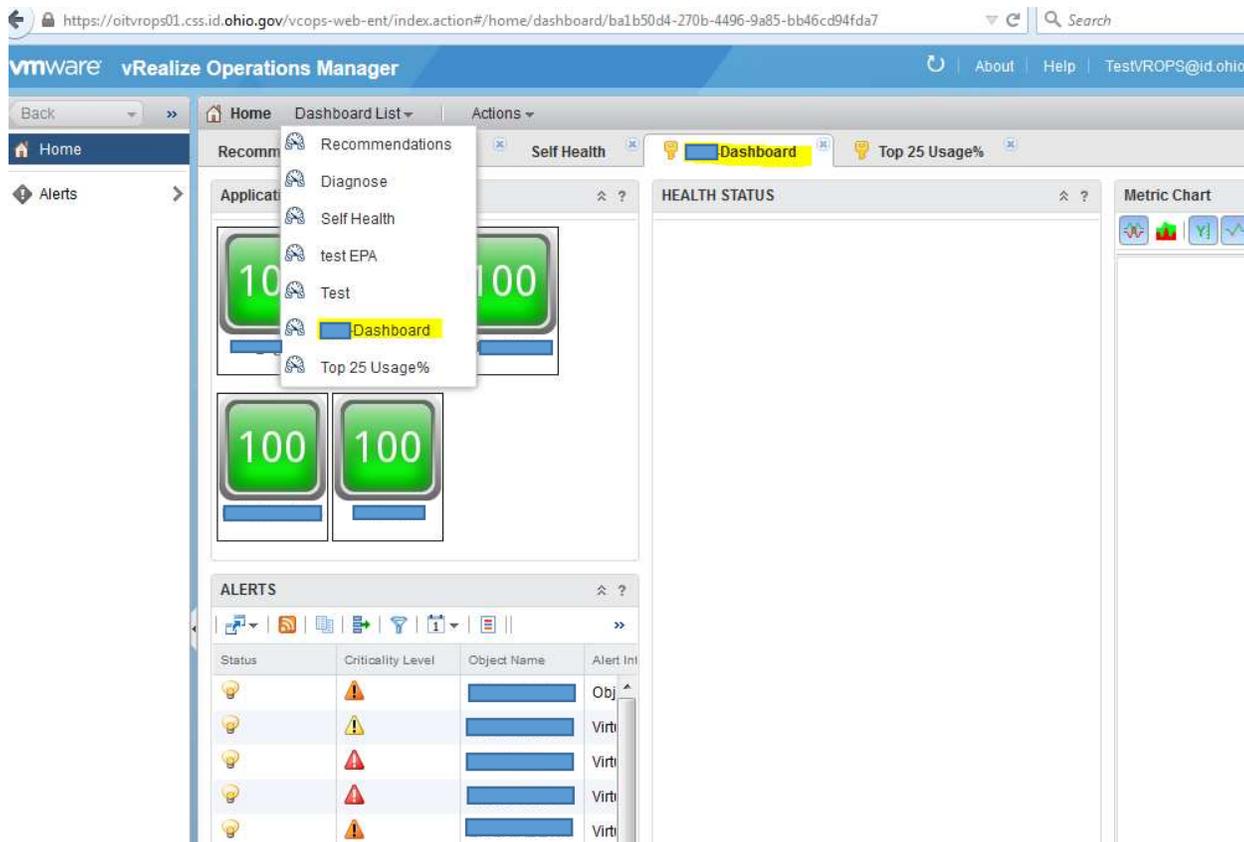
Authentication Source: id.ohio.gov

User Name: <OAKSID>@id.ohio.gov

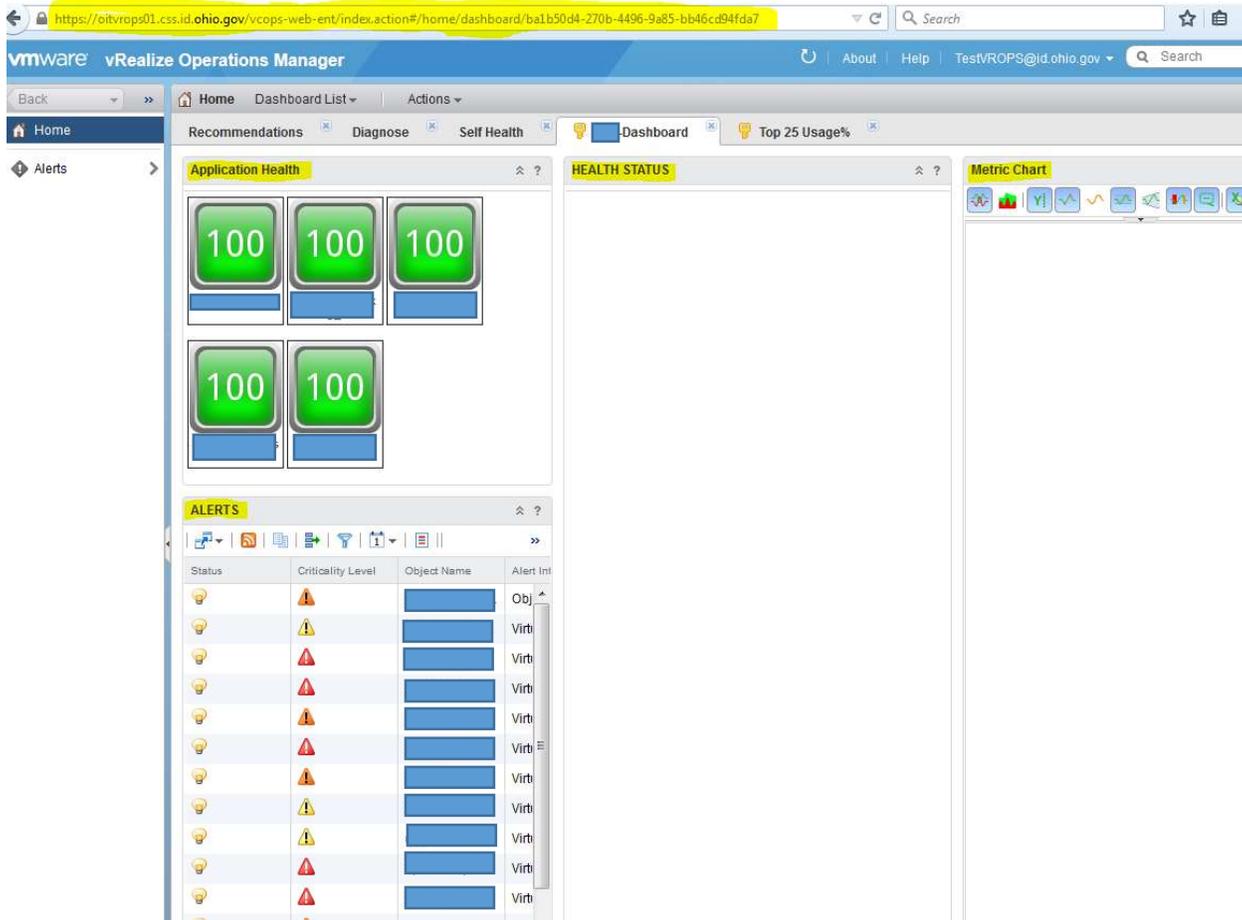
Password: OAKS Password

Once you are in the vROPs, you can access your agency specific Dashboard(s) from 'Home' menu, or from the 'Dashboard List' drop down menu. We have used "EPA-Dashboard" as an example; you will actually see your Agency Dashboard when you login.

Inside the dashboard you will find Widgets.

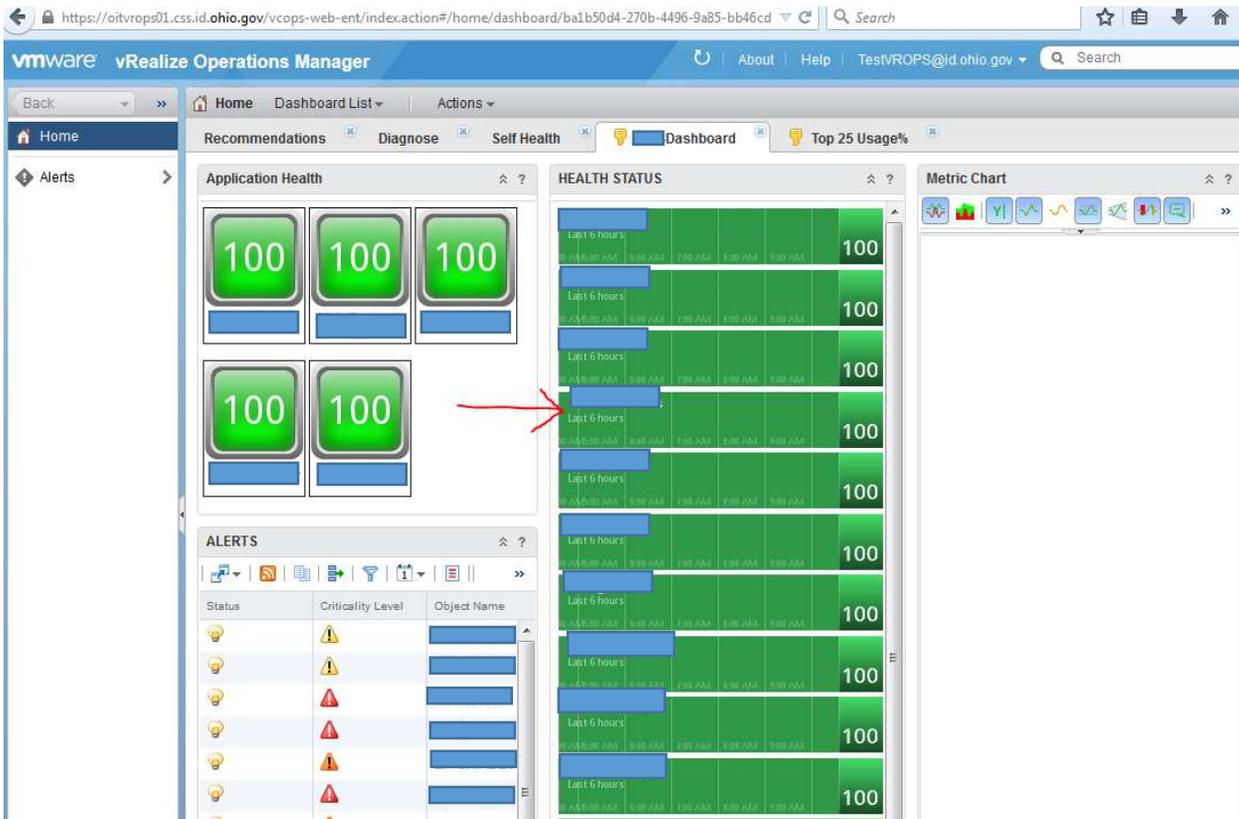


In the screen shot below, we have four widgets - Application Health, Health Status, Metric Graph and Alerts. When you first open the dashboard you will only see Application Health widget with objects in it (as below)

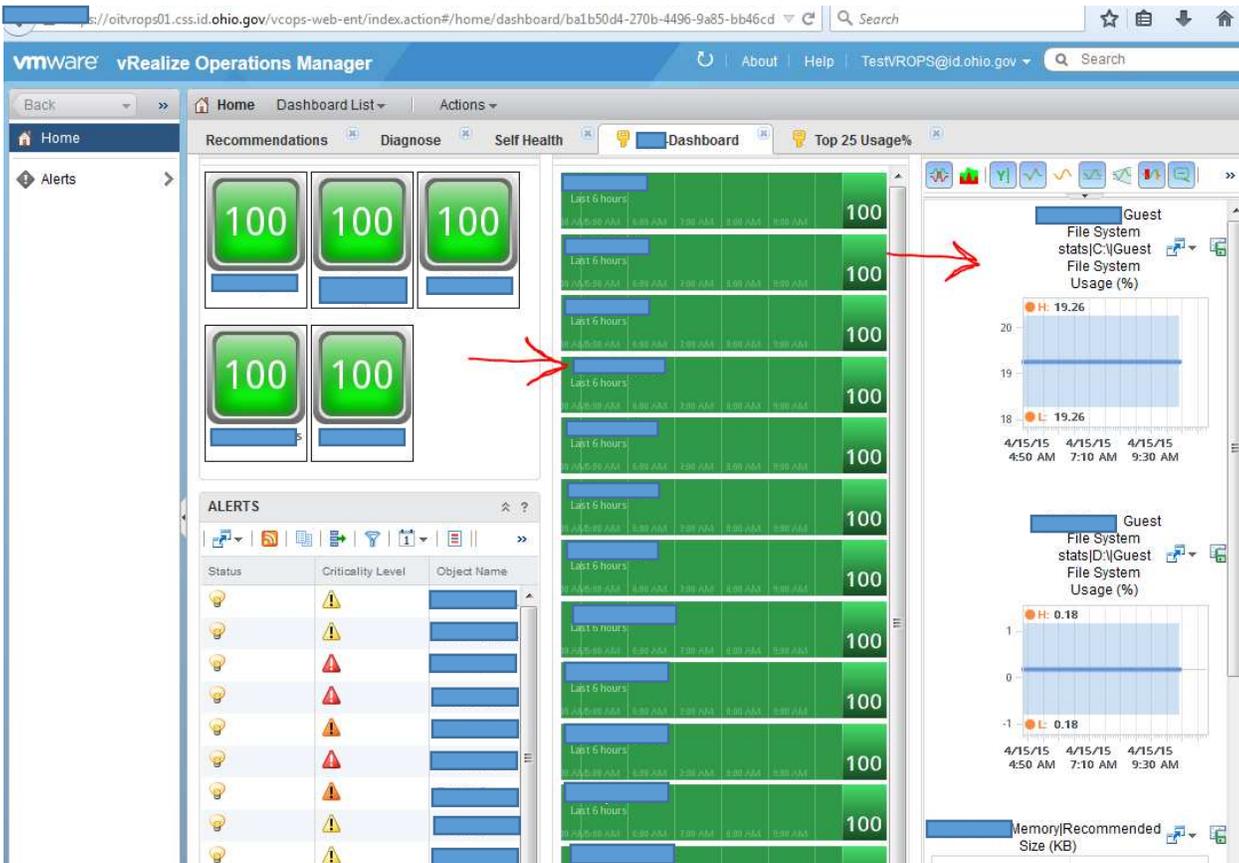


You will need to click once on each object under Application Health widget in order to see its members and their health status.

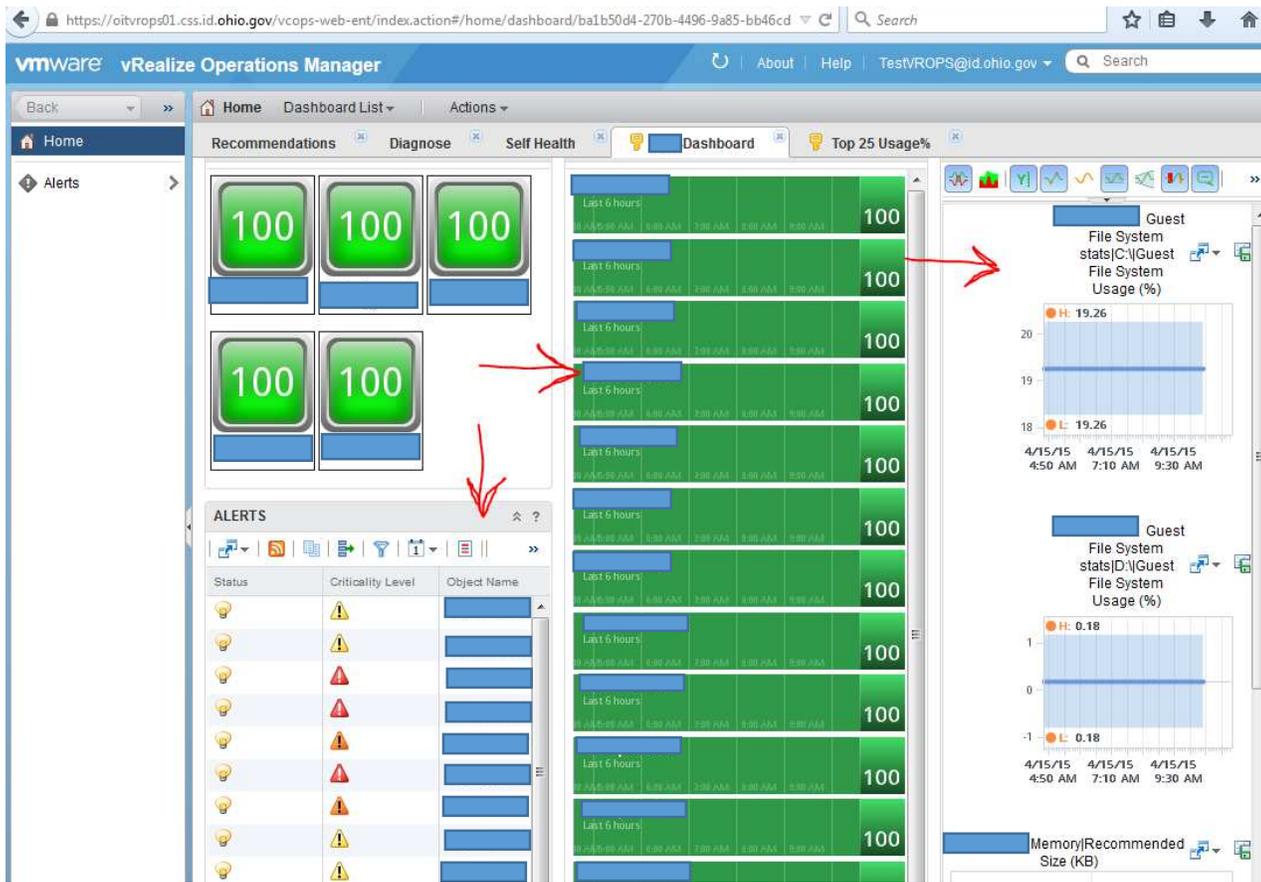
Interactions are set such a way that “Health Status” widget gets its input from the parent widget “Application Health” (as below)



Similarly, “Metric Graph” gets its input from “Health Status” widget.



Also, "Alerts" widget gets input from "Application Health" widget.



## **How is the badge scoring done in vROPs.**

### **Badge Definitions in vRealize Operations Manager**

vRealize Operations Manager uses badges to visualize derived metrics to give you a high level, broad view of the performance and the condition of your virtual environment.

The score of each badge is a comprehensive summary of thousands of raw metrics and derived metrics. vROPs performs calculations on combinations of related metrics to create a single value to track a particular aspect of the performance of an object.

Badges are organized in simple hierarchy in which the scores of minor badges contribute to the scores of major badges.

The scores of major badges are calculated using the geometrically weighted scores of their minor badges. Weights are equal for all minor badges within a major badge.

For example, the major badge Health contains the minor badges Workload, Anomalies, and Faults, which contribute to the score of the Health badge.

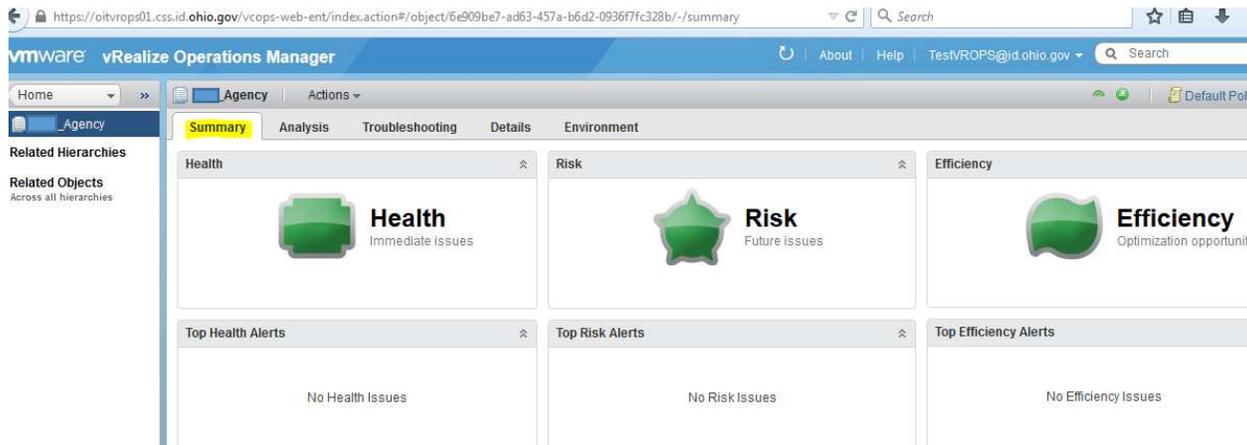
Unlike major badges, which are functions of their minor badges and have relatively similar computations, the ways minor badges are calculated vary considerably. The scores for some badges are computed by the vCenter Server adapter and others by the vCenter Operations analytics algorithms.

### **Badge Colors:**



If you double click on an object in the Application Health widget or on any Server name in the Health Status widget, you can view the respective object's performance. You will see Summary, Analysis, Troubleshooting, Details and Environment tabs.

## Summary Tab:



Summary Tab has major badges listed

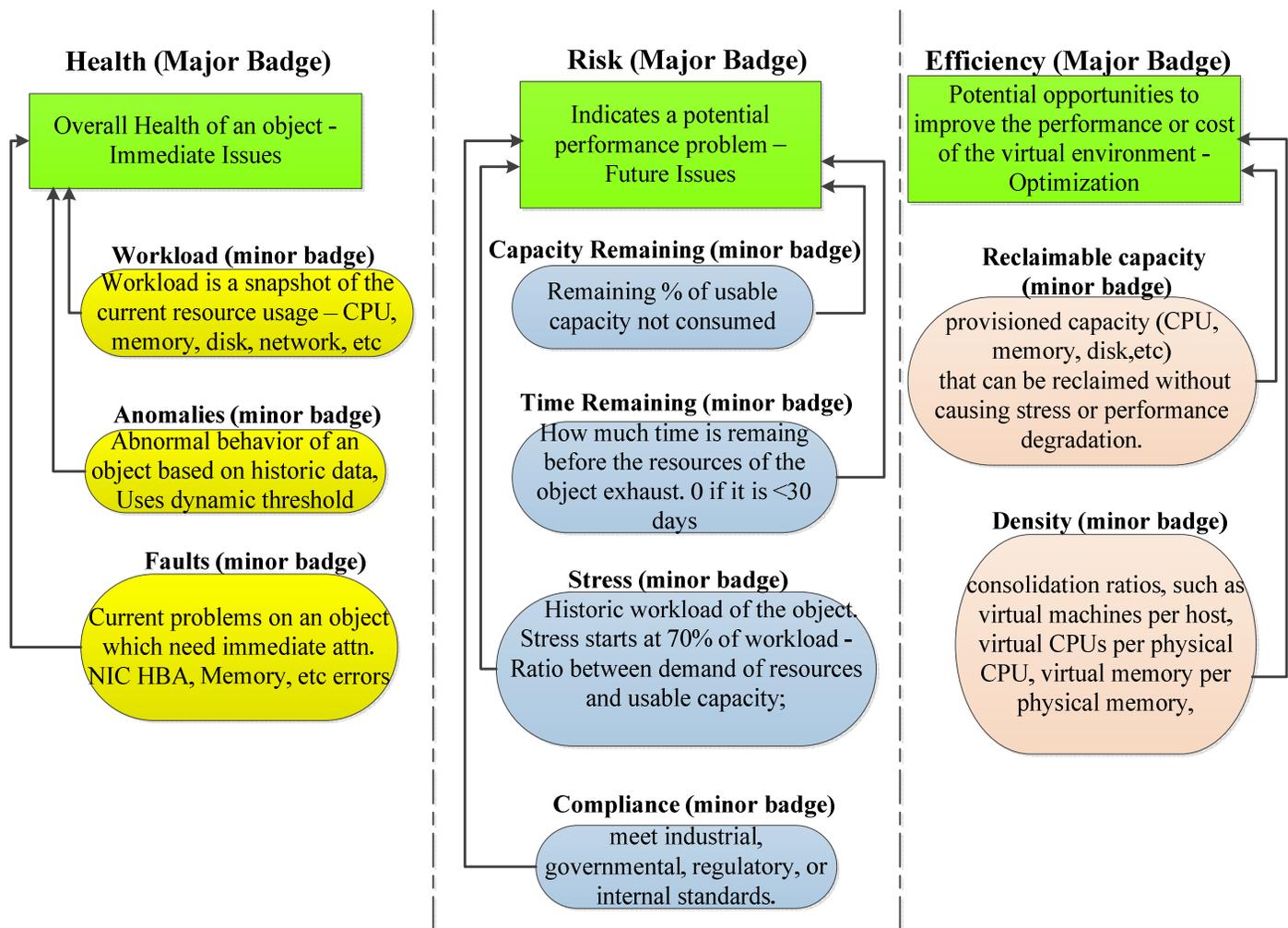
Health – Immediate Issues ; Risk—Future Issues ; Efficiency – Optimization Opportunities

## Major Badges in the Summary Tab:

- ❖ **Health** - Overall score for health. Combines minor badges Workload, Anomalies, and Faults to assess the overall health and to determine whether the workload level is expected in that environment. A low health score might indicate a potential problem. The overall health score for an object ranges from 0 (bad) to 100 (good). Sub-badges under health include Workload, Anomalies, and Faults.
- ❖ **Risk** - Indicates a potential performance problem in the near future that might affect the virtual environment. vRealize Operations Manager calculates the risk score using the scores of its minor badges Capacity Remaining, Time Remaining, Stress and Compliance. The overall Risk score for an object ranges between 0 (no risk) to 100 (serious risk).
- ❖ **Efficiency** - Identifies the potential opportunities to improve the performance or cost of your virtual environment. Efficiency is for Optimization. A large amount of wasted resources combined with a low density ratio generates a poor efficiency score. The Efficiency score ranges between 0 (bad) and 100 (good). Minor badges under Efficiency are 'Reclaimable Capacity' and 'Density'.

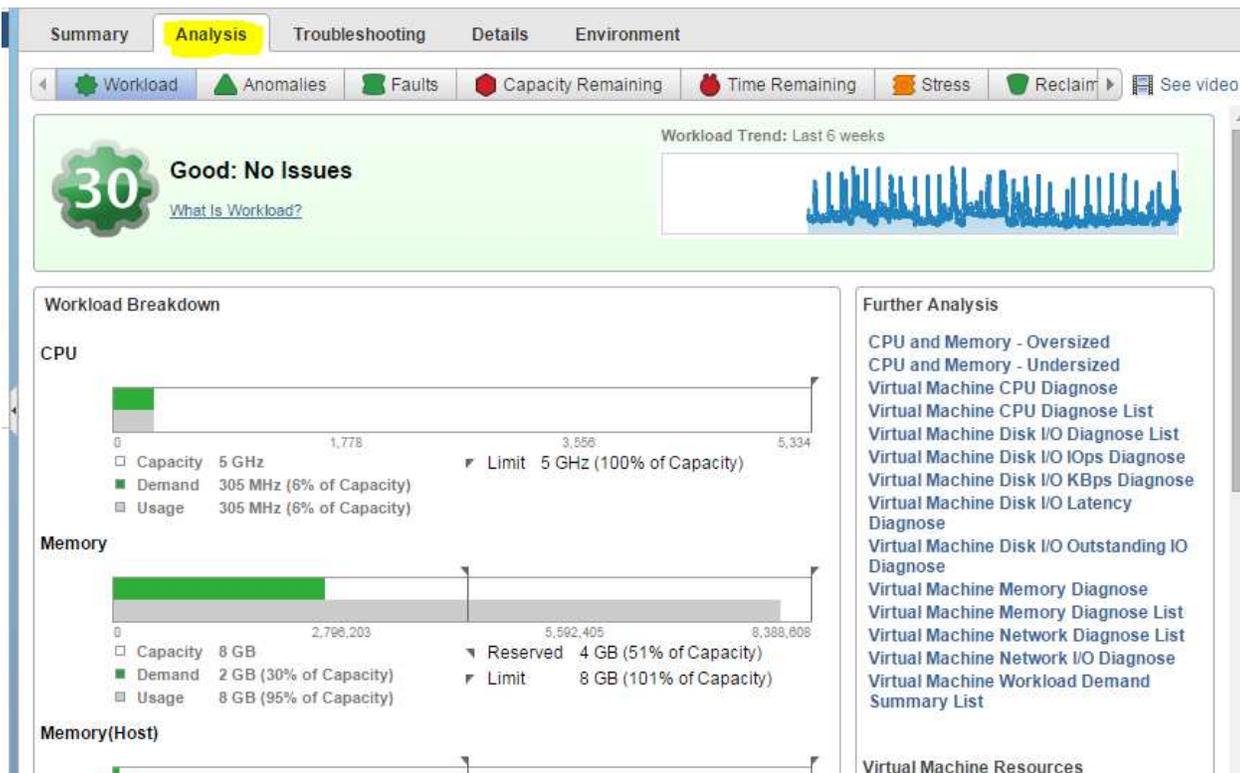
Minor badges are seen in Analysis tab.

## Badges in vRealize Operations Manager 6.0



### Analysis Tab:

This tab has minor badges 'Workload, Anomalies, Faults, Capacity Remaining, Time Remaining, Stress, Reclaimable Capacity, Density and Compliance' badges..



## Minor Badges in the Analysis Tab:

### **The Workload Badge:**

The vRealize Operations Manager Workload analysis badge measures how hard an object must work for resources. It is the demand for resources that an object wants versus the actual capacity the object is able to access. The Workload badge value is a score based on how hard an object must work for resources. Use the Workload value as an investigative tool when you are researching capacity constraints or evaluating the general state of objects in your environment.

Workload is the immediate % of capacity consumed of the most constrained of several key resource containers. Since workload changes every collection cycle, you can set how many cycles it takes to trigger or clear an alert. vRealize Operations Manager indicates the workload by a colored icon that is based on the defined badge score thresholds.

The Workload score ranges from 0 (good) to over 100 (bad).

#### Object Workload States

Badge Icon	Description	User Action
	Workload on the object is not excessive.	No attention required.

	Object is experiencing some high-resource workloads.	Check the details and take appropriate action.
	Workload on the object is approaching its capacity in at least one area.	Check the details and take appropriate action as soon as possible.
	Workload on the object is at or over its capacity in one or more areas.	Act immediately to avoid or correct problems.
	The object is offline or no data is available.	

### The Anomalies Badge:

The vRealize Operations Manager Anomalies badge score represents how abnormal the behavior of the object is, based on its historical metrics data. vRealize Operations Manager indicates Anomalies by a colored icon that is based on the defined badge score thresholds.

When evaluating badge scores, a high number of anomalies might indicate a potential issue. A low Anomalies score indicates that an object is behaving in accordance with its established historical parameters. vRealize Operations Manager calculates dynamic thresholds for each metric that is collected for an object. vRealize Operations Manager also analyzes the number of metrics that are violating their dynamic thresholds to determine trends and normal levels of threshold violations. Based on these trends, the Anomalies analysis score is calculated using the total number of threshold violations for all metrics for the selected object and its child objects.. As more metrics breach the thresholds, anomalies continue to increase.

Anomalies involves the number of statistics that fall outside of the expected behavior trends while Workload involves an absolute measurement of how hard an object works for resources. Both Anomalies and Workload are useful when attempting to find a probable cause and troubleshooting performance problems.

The Anomalies score ranges between 0 (good) and 100 (bad).

#### Object Anomalies States

Badge Icon	Description	User Action
	The Anomalies score is normal.	No attention required.

	The Anomalies score exceeds the normal range.	Check the details and take appropriate action.
	The Anomalies score is very high.	Check the details and take appropriate action as soon as possible.
	Most of the metrics are beyond their thresholds. This object might not be working properly or might stop working soon.	Act immediately to avoid or correct problems.
	The object is offline or no data is available.	

## The Faults Badge:

The Faults badge measures the degree of problems that the object might experience based on events retrieved from the vCenter Server. The Faults score is calculated based on events published by the vCenter Server. This score includes events like loss of redundancy in NICs or HBAs, memory checksum errors, HA failover problems, CIM events, and so on. Faults are included in the health score because they require immediate resolution, while items that contribute to the risk score might not be immediate, but still require your attention.

Each resource in vRealize Operations Manager has a faults score ranging from 0 (no faults) to 100 (critical faults). The scores are computed based on the severity of the underlying problems. When more than one fault-related problem exists on the resource, the faults score is based on the most severe problem.

The higher the Faults score, the lower the resulting health for that resource. Resolution of the problem indicated by the Fault will restore the resource's health score.

Unlike other badges in vRealize Operations Manager, the Faults badge does not have an alert generated from its threshold score. Instead, each problem generates its own fault alert, and resolution of the problem both clears or cancels the alert and lowers the badge score.

The Faults score ranges between 0 (good) and 100 (bad).

### Object Faults States

Badge Icon	Description	User Action
	No faults are registered on the selected object.	No attention required.

	Faults of low importance are registered on the selected object.	Check the details and take appropriate action.
	Faults of high importance are registered on the selected object.	Check the details and take appropriate action as soon as possible.
	Faults of critical importance are registered on the selected object.	Act immediately to avoid or correct problems.
	The object is offline or no data is available.	

### The Capacity Remaining Badge:

vRealize Operations Manager calculates the Capacity Remaining score as a percentage of the remaining capacity count compared to the total amount of capacity that can be deployed on the selected object.

Object Capacity States		
Icon	Description	User Action
	The capacity remaining for the object is at normal level.	No attention required.
	The capacity remaining for the object is less than the normal level.	Check the details and take appropriate action.
	The capacity remaining for the object is at seriously low level.	Check the details and take appropriate action as soon as possible.
	The object is expected to run out of capacity soon or has already run out of capacity.	Act immediately to avoid or correct problems.
	The object is offline or no data is available for any of the metrics for the time period.	

### The Time Remaining Badge:

The Time Remaining score indicates how much time is remaining before the resources of the object exhaust.

The time remaining score is calculated per resource type for an object. For example, CPU usage or disk I/O is based on the historical data for the object type. Based on this historical data, the time remaining score represents the estimated time remaining. The Time Remaining score allows you to plan the provisioning of physical or virtual resources for the selected object, or change the workload to adjust the needs of the resources in your virtual environment.

vRealize Operations Manager calculates the Time Remaining score as a percentage of time that is remaining for each compute resource compared to the provisioning buffer you set in the Configuration dialog box. By default, the Time Remaining score provisioning buffer is 30 days. If even one of the compute resources has less capacity than the provisioned buffer, the Time Remaining score is 0.

For example, if the provisioning buffer is set to 30 days, and the object that you selected has CPU resources for 81 days, memory resources for 5 days, disk I/O resources for 200 days, and network I/O resources for more than one year, the Time Remaining score is 0, because one of the resources has capacity for less than 30 days.

The Time Remaining score ranges between 0 (bad) and 100 (good).

Time Remaining States		
Badge Icon	Description	User Action
	The number of days that remain is much higher than the score provisioning buffer you specified.	No attention required.
	The number of days that remain is higher than the score provisioning buffer, but is less than two times the buffer you specified.	Check the details and take appropriate action.
	The number of days that remain is higher than the score provisioning buffer, but approaches the buffer you specified.	Check the details and take appropriate action as soon as possible.
	The number of days that remain is lower than the score provisioning buffer you specified. The selected object might have exhausted some of its resources or will exhaust them soon.	Act immediately to avoid or correct problems.
	The object is offline or no data is available for the Time Remaining score.	

## The Stress Badge:

Stress analysis is how vRealize Operations Manager calculates the amount of demand an object demands over a period of time. This analysis looks at the object's workload against its capacity. This helps in sizing the object to meet the resource demands.

The Stress score indicates the historic workload of the selected object. While the Workload score shows a snapshot of the current resource usage, the Stress score analyses the resource usage data for a longer period.

The Stress score is calculated as a ratio between the demand for resources and the usable capacity for a certain period.

The Stress score helps you identify hosts and virtual machines that do not have enough resources allocated, or hosts that are running too many virtual machines. A high Stress score does not imply a current performance problem, but highlights potential for future performance problems.

The Stress score ranges between 0 (good) and 100 (bad).

### Stress States

Badge Icon	Description	User Action
	The Stress score is normal.	No attention required.
	Some of the object resources are not enough to meet the demands.	Check the details and take appropriate action.
	The object is experiencing regular resource shortage.	Check the details and take appropriate action as soon as possible.
	Most of the resources on the object are constantly insufficient. The object might stop functioning properly.	Act immediately to avoid or correct problems.
	The object is offline or no data is available for the Stress score.	

## The Reclaimable Capacity Badge:

Reclaimable capacity is the amount of provisioned capacity that be reclaimed without causing stress or performance degradation. Reclaimable Capacity is calculated for each resource type like CPU, memory, and disk, for each object in the environment. It identifies the amount of resources that can be reclaimed and provisioned to other objects in your environment.

For groups, Reclaimable Capacity is the amount of disk space that can be reclaimed from the virtual machines in the group that are considered waste, based on the policy settings for the powered off and idle state. If the virtual machine is idle, all its resources are considered reclaimable. If a group does not contain any virtual machines, but contains datastores, the value for Reclaimable Waste is 0, even if the datastore contains virtual machines that are wasting resources based on the **Powered off and idle VMs** settings.

The Reclaimable Capacity score indicates over-provisioning in your virtual infrastructure or for a specific object.

The Reclaimable Waste score ranges between 0 (good) and 100 (bad).

Reclaimable Waste States		
Badge Icon	Description	User Action
	No resources are wasted on the selected object.	No attention required.
	Some resource can be used better.	Check the details and take appropriate action.
	Many resources are underused.	Check the details and take appropriate action as soon as possible.
	Most of the resources on the selected object are wasted.	Act immediately to avoid or correct problems.
	The object is offline or no data is available for any of the metrics for the time period.	

### The Density Badge:

The Density score indicates the consolidation ratios, such as virtual machines per host, virtual CPUs per physical CPU, virtual memory per physical memory, and so on.. You can use the Density score to achieve higher consolidation ratios and cost savings. When you understand the behavior and performance of your virtual machines and applications, you can maximize the consolidation in your virtual environment without affecting the performance or service-level agreements.

The Density score ranges between 0 (bad) and 100 (good).

Object Density States		
Badge Icon	Description	User Action
	The resource consolidation is good.	No attention required.
	Some resources are not fully consolidated.	Check the details and take appropriate action.
	The consolidation for many resources is low.	Check the details and take appropriate action as soon as possible.
	The resource consolidation is extremely low.	Act immediately to avoid or correct problems.
	The object is offline or no data is available for any of the metrics for the time period.	

### The Compliance Badge:

Compliance is about ensuring that objects in your environment meet industrial, governmental, regulatory, or internal standards. The standards are made up of rules about how objects should be configured to comply with best practices and to avoid security threats.

The badge value is a stepped score based on the criticality of the triggered symptoms for different object types. The badge displays one of the following values:

- 100 if there are no triggered standards. The badge color is green.
- 75 if the most critical triggered standard is Warning. The badge color is yellow.
- 25 if the most critical triggered standard is Immediate. The badge color is orange.
- 0 if the most critical triggered standard is Critical. The badge color is red.

You must customize a policy to enable alert-based compliance. If the compliance alerts are not enabled, the **Compliance** badge value is 100 and it is green, and there are no standards in the standards list.

## Troubleshooting Tab:

This tab has Symptoms, Timeline, Events and All Metrics.

Criticality	Symptom	Status	Triggered On	Created On	Canceled On	Information
Warning	Virtual Machine Time Remaining with committed projects is critically low	Lightbulb	[Progress Bar]	3/2/15 9:00 AM	-	0 <= 0
Warning	Virtual Machine Time Remaining is critically low	Lightbulb	[Progress Bar]	3/2/15 9:00 AM	-	0 <= 0
Warning	Virtual Machine Capacity Remaining is critically low	Lightbulb	[Progress Bar]	3/2/15 9:00 AM	-	0 <= 0
Warning	Virtual Machine Stress is moderately high	Lightbulb	[Progress Bar]	4/17/15 9:31 PM	-	40.13 >= 35
Warning	Virtual machine disk space time remaining high	Lightbulb	[Progress Bar]	1/22/15 5:01 PM	-	253402214400000 > 60
Warning	Virtual Machine has low CPU swap wait	Lightbulb	[Progress Bar]	3/2/15 9:00 AM	-	0 < 3
Warning	Virtual machine has at least one snapshot	Lightbulb	[Progress Bar]	4/13/15 12:00 AM	-	0.02 > 0
Warning	Recommended number of vCPUs to add	Lightbulb	[Progress Bar]	3/2/15 9:00 AM	-	1 > 0

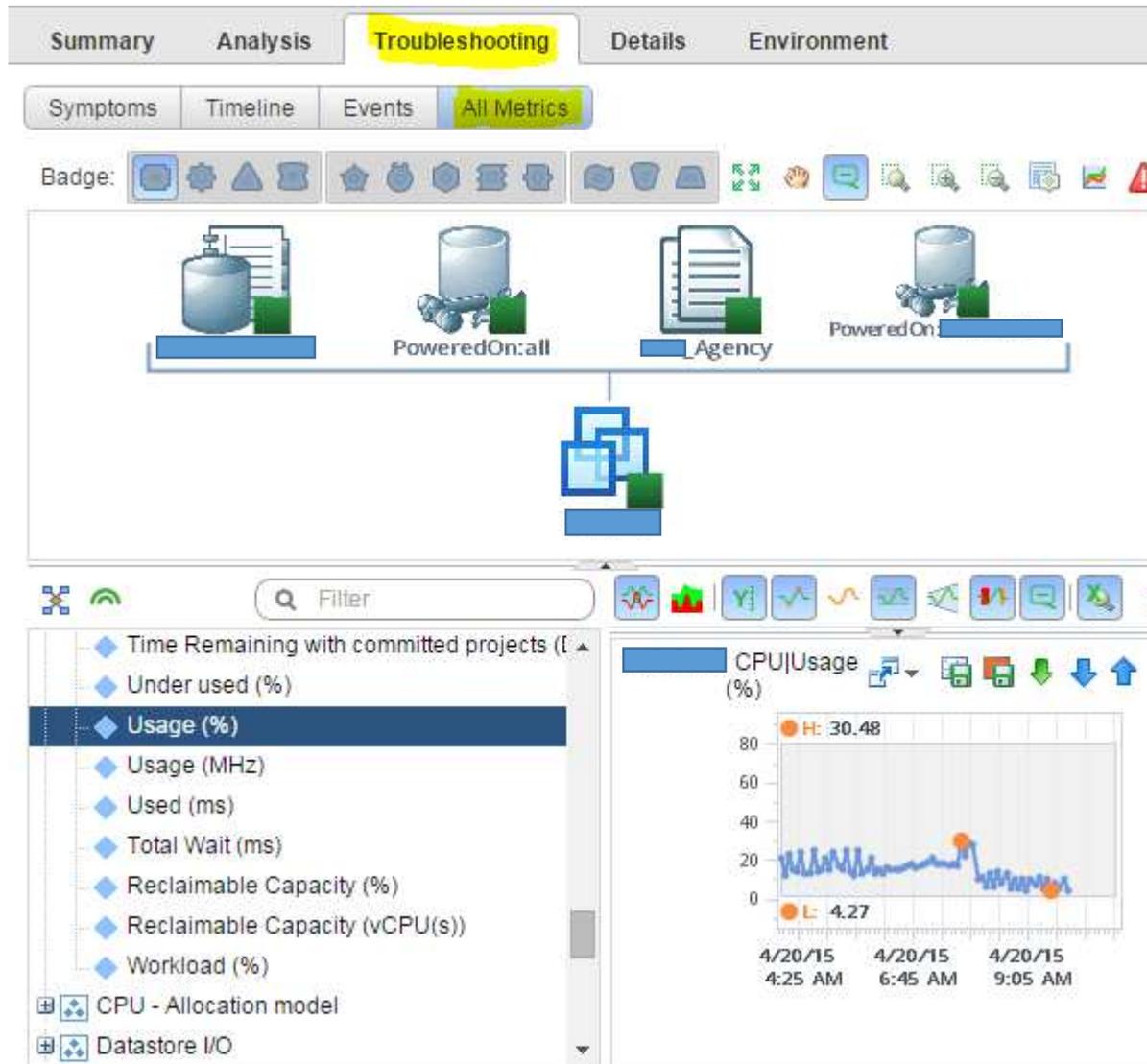
**Symptoms** -- You can view a list of triggered symptoms for the selected object. You use the symptoms when you are troubleshooting problems with an object.

**Timeline** – The timeline provides a view of the triggered symptoms, generated alerts, and events for an object over a period of time. You use the timeline to identify common trends over time that are contributing to the current status of objects in your environment.

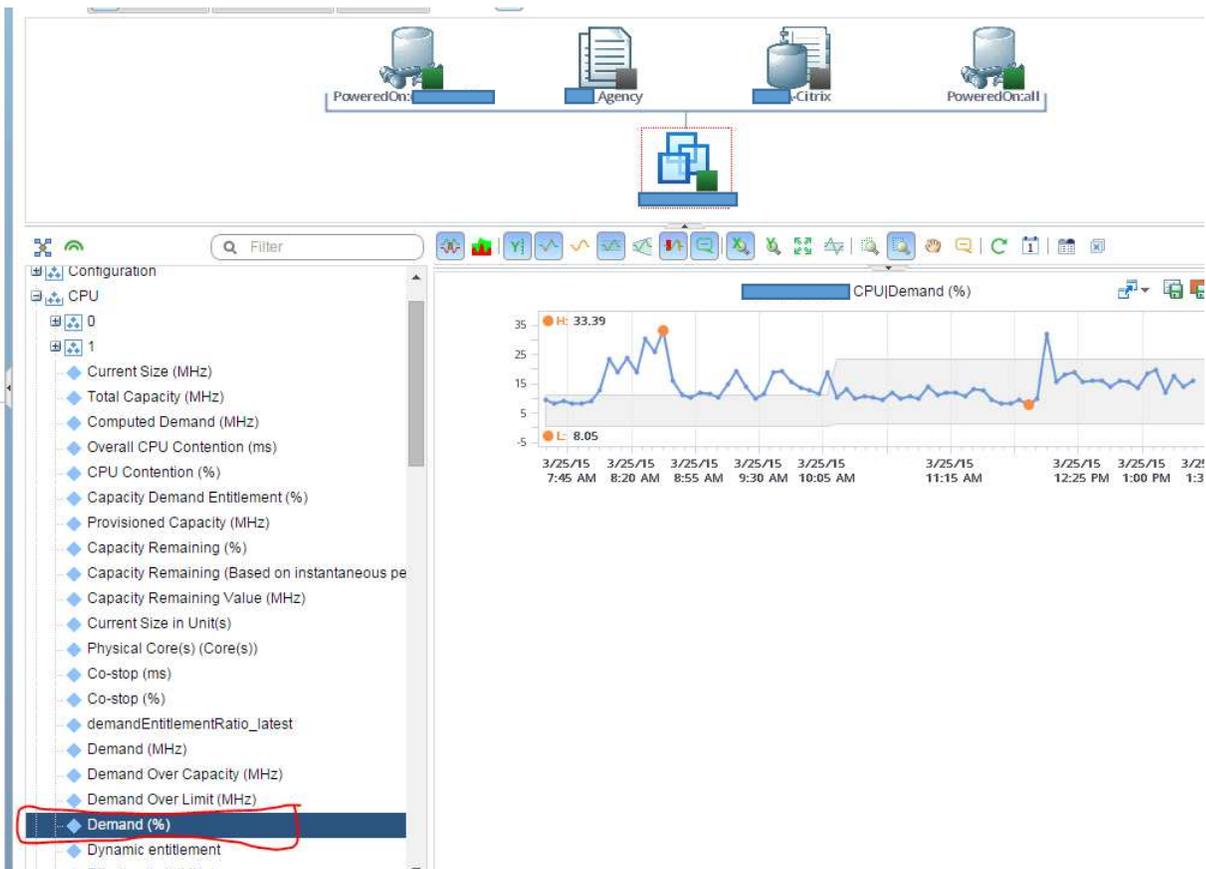
**Events** – An event is any change to an object that is identified by a change in the vRealize Operations Manager metrics for that object. You can compare changes to an object with symptoms and other data to identify a possible cause for a generated alert.

**All Metrics** – The All Metrics tab provides a relationship map and user-defined metric charts. The topological map helps you evaluate objects in the context of their place in your

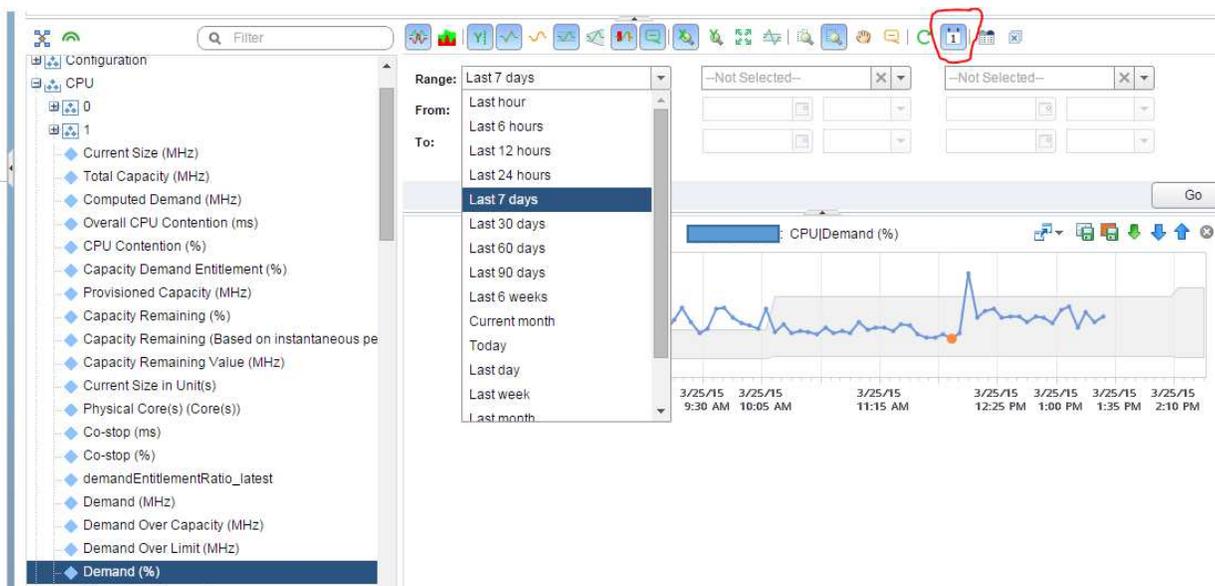
environment topology. The metric charts are based on the metrics for the select object that you think will help you identify the possible cause of a problem in your environment.



You can pick any metric value, in this example, we have CPU demand%. CPU demand is what virtual machine wants to use.



You can also get historic report for one or many metrics by going to the 'Date Control' tab as shown below



These reports can then be saved as snapshots with .png extentions.

## Details Tab:

This tab has 'Views' and 'Heatmaps'

The screenshot shows the 'Details' tab interface. At the top, there are navigation tabs: 'Summary', 'Analysis', 'Troubleshooting', 'Details' (highlighted), and 'Environment'. Below these are sub-tabs for 'Views' and 'Heatmaps'. A filter section includes 'All Filters' and a 'Quick filter (Name)' input. The main area contains a table of alerts:

Name ▲	Type	Description	Subject	Owner
Alerts that are cu...	List	Show alerts for t...	Alert	admin
CPU and Memor...	List	List of VM's for R...	Virtual Machine	\$DAS-vCOPs-D...
CPU and Memor...	List	This is a list of V...	Virtual Machine	\$DAS-vCOPs-D...
CPU Contention %	Trend		Virtual Machine	\$DAS-vCOPs-D...
CPU Ready % (...)	Trend	Virtual Machine ...	Virtual Machine	\$DAS-vCOPs-D...

Below the table is a pagination control showing 'Page 1 of 2' and 'Displaying 1 - 50 of 59'. The bottom section is titled 'Alerts that are currently active' and includes a table with columns: 'Name', 'Alert Type', 'Alert Sub-Type', and 'Criticality Level'.

## **Views:**

The View tab is available when you select an object from the Environment icon in the left pane and click the Details tab.

The View tab is divided in two panels. The bottom panel updates, depending on what you select on the top panel.

In the top panel you can create, edit, delete, clone, export, and import views. The views list depend on the object you select from the environment. Each view is associated with an object.



## **Other Dashboards:**

Apart from your Agency Dashboard, you will also see other Dashboards when you login.

- “**Recommendations**” Dashboard – gives a quick view of Health, Risk and Efficiency information for your Agency Servers.
- “**Diagnose**” Dashboard – gives a quick view of Topology graph, badge scores and Server metric information of any Server once you select a Server in the left hand side.
- “**Top 25 Usage%**” Dashboard – gives a quick view of top 25 Servers with high disk space, Memory and CPU Usage.

Dashboards are customizable, we can modify info in a dashboard or add/remove widgets or dashboards if needed as per Agency’s requirement. Please let us know.

**Contact Info:** If you have any question on vRealize Operations Manager, please send us an email to “DAS-Server.Team@das.ohio.gov”