

Scenarios for Intelligent Operations

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VMware Validated Design 4.3

VMware Validated Design for Intelligent Operations 4.3



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VMware, Inc.
3401 Hillview Ave.
Palo Alto, CA 94304
www.vmware.com

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About Intelligent Operations Scenarios

VMware Validated Design for Intelligent Operations is a subset of VMware Validated Design for Software-Defined Data Center that is focused on an SDDC with proactive monitoring capabilities. The *Intelligent Operations Scenarios* document provides step-by-step instructions that you can use to perform common operational procedures when managing a Software-Defined Data Center (SDDC). These scenarios are built on top of VMware Validated Design for Software-Defined Data Center.

Installing and configuring an SDDC is the first stage for an organization implementing a cloud strategy, be it private, public or a hybrid cloud. After you implement the SDDC, managing it efficiently is important. Use Intelligent Operations solutions to plan, manage and scale your SDDC.

vRealize Operations Manager supports performance and capacity management, log analytics, cost analytics, capacity planning, topology analysis, troubleshooting and automated workload balancing.

The *Intelligent Operations Scenarios* documentation provides detailed instructions for performing operational procedures across both management components and tenant workloads by using vRealize Operations Manager and vRealize Log Insight.

Required VMware Software

VMware Validated Design for Intelligent Operations is compliant and validated with certain product versions. See the *VMware Validated Design Release Notes* for more information about supported product versions.

Intended Audience

The *Intelligent Operations Scenarios* document is intended for cloud architects, infrastructure administrators, and cloud administrators. These users are familiar with VMware software and want to deploy and manage an SDDC that meets their requirements for capacity, scalability, backup and restore, and extensibility for disaster recovery support.

Advantages of VMware Validated Design Scenarios



Just like the VMware Validated Design for the Software-Defined Data Center, each scenario is fully validated, supports the latest product releases, and enables fast standup.

VMware Validated Design scenarios have the following advantages.

One path to SDDC

After you satisfy the deployment requirements, follow one consistent path to deploy an SDDC.

VMware Validated Design for Software-Defined Data Center offers an extensively tested solution path with specific information about product versions, networking architecture, capabilities, and limitations.

Scenario solution paths have also been tested with the product versions and networking architectures specified for the scenarios case.

SDDC design for use in production

The VMware Validated Design for the Software-Defined Data Center has the following features.

- High-availability of management components
- Backup and restore of management components
- Monitoring and alerting
- Disaster recovery of management components
- Protection of management application by using NSX Distributed Firewall

Scenarios have been tested in a more limited environment.

- The following features are fully supported.
 - High-availability of management components
 - Monitoring and alerting
 - Protection of management and example tenant applications by using NSX Distributed Firewall

- The following features are not tested for scenarios, but expansion to an environment that includes the full suite of operations component is possible.
 - Backup and restore of management components
 - Disaster recovery of management components

Validated design and deployment

The prescriptive documentation of a VMware Validated Design is continuously validated by VMware.

Validation provides the following advantages to your organization:

- Validated product interoperability
- Validated SDDC features, such as custom workload churn, high availability of management components, operational continuity, efficient monitoring, and a design with dual-region support in mind
- Reduced risk of deployment and operational problems
- Reduced test effort

Fast SDDC standup

By downloading all SDDC products or all products included in a scenario, you can implement a data center without engaging in design work and product research. To do so, you can follow the detailed design decisions and step-by-step instructions of the SDDC foundation and the scenarios.

Support for latest product releases

Every version of a VMware Validated Design, including a validated scenarios guide, accommodates new product releases. If you have deployed an SDDC according to an earlier version of a VMware Validated Design, you can follow the validated design to upgrade your environment.

Foundation of SDDC deployment scenarios

This VMware Validated Design provides the foundation for scenarios that satisfy the requirements of individual organizations or industry segments, such as VMware Validated Design for Micro-Segmentation, VMware Validated Design for IT Automating IT and VMware Validated Design for Intelligent Operations.

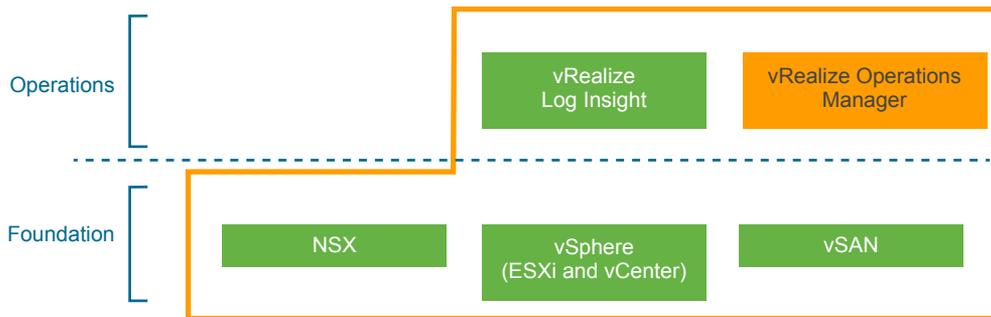
Intelligent Operations Components

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The Intelligent Operations scenarios provides step-by-step guidance for performing proactive monitoring procedures to IT operations teams according to best practices from VMware.

The scenario guidance includes components at the foundation and operations management layers.

Figure 2-1. Components of VMware Validated Design for Intelligent Operations



Foundation Components

At the foundation layer, the scenario guidance includes the following components.

vSphere

As the base layer, ESXi and vCenter Server support infrastructure virtualization.

NSX for vSphere

NSX for vSphere supports the network infrastructure and flexible security policies for the scenarios. The resulting data center supports isolation and segmentation, with drastically improved security.

Operations Management Layer

At the operations management layer, the scenario guidance includes the following components.

vRealize Operations Manager	vRealize Operations Manager streamlines and automates the centralized monitoring and proactive VM placement across the SDDC. You can deliver intelligent operations management from applications to infrastructure across physical, virtual and cloud environments.
vRealize Log Insight	vRealize Log Insight supports log management features that enable you to view and analyze logs by using customizable dashboards.

You can use the Launch in Context capability of these components to access vRealize Log Insight events and dashboards from within the operations interface of vRealize Operations Manager.

Prepare for Performing the Intelligent Operations Scenarios

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The Intelligent Operations scenarios are based on the VMware Validated Design for Software-Defined Data Center. All scenarios in this documentation have been validated with that architecture. Your environment must meet certain prerequisites before you can perform a scenario.

Deploying the Components for Intelligent Operations

To deploy the SDDC components that are required to perform intelligent operations manually, perform all tasks in the following documentation:

Table 3-1. Documentation for Deployment of Intelligent Operations

Region	Documentation
Region A	Planning and Preparation
	Deployment for Region A <ul style="list-style-type: none">■ Region A Virtual Infrastructure Implementation■ Region A Operations Implementation<ul style="list-style-type: none">■ vRealize Suite Lifecycle Manager Implementation in Region A■ vRealize Operations Manager Implementation in Region A■ vRealize Log Insight Implementation in Region A
Region B	Planning and Preparation
	Deployment for Region B <ul style="list-style-type: none">■ Region B Virtual Infrastructure Implementation■ Region B Operations Implementation<ul style="list-style-type: none">■ vRealize Suite Lifecycle Manager Implementation in Region B■ vRealize Operations Manager Implementation in Region B■ vRealize Log Insight Implementation in Region B

Documentation Location

You can find the documentation on the [VMware Validated Design Documentation](#) page.

Monitoring the SDDC Using Out-of-the-Box Dashboards in vRealize Operations Manager

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vRealize Operations Manager contains predefined dashboards for troubleshooting virtual machines and for monitoring workload distribution of hosts, clusters, and datastores, and the capacity of data centers. The dashboards are organized in categories according to the most important areas for infrastructure and application monitoring.

This chapter includes the following topics:

- [Identify a Compute Host That Is Disconnected from the SDDC](#)
- [Identify a VM with Highest CPU and Memory Contention and Disk Latency](#)

Identify a Compute Host That Is Disconnected from the SDDC

When your workloads are not allocated enough resources in a cluster, you must identify the hosts that are not fully operational to keep the workloads working according to business requirements. You examine the **Cumulative Up-time of all Clusters** widget in the **Operations Overview** dashboard, identify a disconnected host and take an action to bring the disconnected host back online.

Use the predefined dashboards of vRealize Operations Manager to troubleshoot capacity issues in a data center and resolve them using generated recommendations.

For this scenario for an SDDC that implements VMware Validated Design for Software-Defined Data Center, assume that a sfo01-w01dc data center is not operating at its full capacity because a host, for example sfo01m01esx03.sfo01.rainpole.local, is disconnected. The sfo01-w01dc data center runs tenant workloads that are provisioned directly on the virtual infrastructure or by using some cloud management platform.

Procedure

- 1 Log in to vRealize Operations Manager by using the operations interface.
 - a Open a Web browser and go to **https://vrops01svr01.rainpole.local**.
 - b Log in using the following credentials.

Setting	Value
User name	admin
Password	

- 2 On the main navigation bar, click **Dashboards**.
- 3 Select **All Dashboards > Getting Started**.
- 4 On the **Getting Started** page, click **Operations Overview** under **Operations**.
- 5 On the **Operations Overview** dashboard, select the **sfo01-w01dc** data center in the **Select a Datacenter (DC)** widget.
- 6 Review the **Cumulative Up-time of all Clusters (in selected DC)** widget.
The data center availability is not 100%.
- 7 Locate the problematic data center object sfo01-w01dc by entering its name in the **Search** box on the navigation bar of vRealize Operations Manager and pressing Enter.
The **Summary** tab for the sfo01-w01dc object opens in the operations user interface.
- 8 Knowing that the cluster availability is not 100% and an issue with one or more of the hosts in the problematic data center exists, in the **Recommended Actions** widget scroll through the tabs and go directly to **Host System**.
- 9 In the **Recommended Actions** widget, select **Alert Type** from the **All Filters** from the drop-down menu, select **Virtualization/Hypervisor** in the **Select Alert Type** drop-down dialog box, and click **OK**.
- 10 Locate the Host has lost connection to vCenter Server alert that is raised for the problematic host.
- 11 Select the alert to view and apply the **Recommendations** for the disconnected host.
- 12 Verify that the cluster availability is running at 100%.
 - a Wait for the appropriate number of collection cycles for the data to be updated in vRealize Operations Manager.
 - b Select **All Dashboards > Getting Started > Operations Overview**.
 - c On the **Operations Overview** dashboard, select the **sfo01-w01dc** data center in the **Select a Datacenter (DC)** widget.
 - d Verify that the **Cumulative Up-time of all Clusters (in selected DC)** widget shows that the data center is operating at its full capacity.

Identify a VM with Highest CPU and Memory Contention and Disk Latency

Examine a list of top 15 VMs in a data center that have the highest average CPU contention, the highest use of memory, and the highest disk latency for the last 24 hours by viewing the Top-N widgets in the **Operations Overview** dashboard.

Procedure

- 1 Log in to vRealize Operations Manager by using the operations interface.
 - a Open a Web browser and go to **https://vrops01svr01.rainpole.local**.
 - b Log in using the following credentials.

Setting	Value
User name	admin
Password	

- 2 On the main navigation bar, click **Dashboards**.
- 3 Click **All Dashboards > Getting Started > Operations Overview**.
- 4 Examine VMs with highest CPU, memory contention, and highest disk latency by viewing following widgets.
 - Top-15 VM Experiencing CPU Contention
 - Top-15 VM Experiencing Memory Contention
 - Top-15 VM Experiencing Disk Latency (ms)
- 5 If you must examine data for a date range in a widget, click the **Edit Widget** icon on the title bar of the widget and configure **Period Length**.
- 6 To understand why a VM on some of the Top-N widgets is experiencing high CPU, memory contention, or disk latency, examine the **Troubleshoot a VM** dashboard.
 - a Click **All Dashboards > Performance Troubleshooting > Troubleshoot a VM**.
 - b Enter the name of the VM that is facing high disk latency into **Search** box in the **Search for a VM** widget and press Enter.
 - c Select the VM in the search results and perform detailed troubleshooting analysis by looking at the widgets and alerts in the **Troubleshoot a VM** dashboard.
 - d Repeat the procedure to troubleshoot the other VMs that are facing high CPU, memory contention, or disk latency.

Monitoring the SDDC at Scale

Use the Intelligent Operations feature of vRealize Operations Manager to monitor your environment at scale by collecting information from all local and global sources in your environment. You can use predefined alerts and dashboards to monitor your production environments.

vRealize Operations Manager contains alert definitions for critical performance, out of capacity, hardware failures, mis-configurations and issues that are identified in logs. You can perform the following monitoring tasks:

- Review critical alerts in several ways to decide which issues to address first, for example, group by time, criticality, type of problem, environment, object type, etc.
- Forward critical alerts to other teams.
- Customize alert definitions to fit specific requirements for monitoring.

Perform each operational task at regular intervals in the SDDC.

For each scenario about monitoring the SDDC at scale in the *Intelligent Operations Scenarios* documentation, follow the step-by-step guidance for pre-configuration, monitoring and fault resolution.

Identify Unused VM Snapshots by Using Alerts in vRealize Operations Manager

You use a snapshot in vSphere to create a point-in-time capture of the state of a virtual machine. Snapshots are useful when you perform upgrades, apply patches, or other types of maintenance. Snapshots kept for prolonged periods can affect the performance of the virtual infrastructure for both the virtual machine and the datastore where the virtual machine is located.

Consider the following best practices for virtual machine snapshots:

- Do not use snapshots as a replacement for a backup solution.
- Maintain snapshots only for a few days (24–72 hours).

Procedure

1 Adjust the Snapshot Alert Definitions

vRealize Operations Manager comes with out-of-the-box alert definitions relating to snapshots, that you can review and adjust according to the requirements of your organization. Adjust the Virtual machine is running on snapshots for more than 2 days alert definition to increase the alert to only trigger after 3 days to align to the recommended maximum period and reduce the number of excessive alerts triggered.

2 Review Snapshot Alerts and Delete the Unused Snapshots

Review the snapshot alerts on a daily basis and when necessary perform the action to remove old snapshots from running virtual machines. Good reasons for the existence of old snapshots could exist and you might need to contact the system owner before running the remove-snapshot action.

Adjust the Snapshot Alert Definitions

vRealize Operations Manager comes with out-of-the-box alert definitions relating to snapshots, that you can review and adjust according to the requirements of your organization. Adjust the Virtual machine is running on snapshots for more than 2 days alert definition to increase the alert to only trigger after 3 days to align to the recommended maximum period and reduce the number of excessive alerts triggered.

Procedure

- 1 Log in to vRealize Operations Manager by using the operations interface.
 - a Open a Web browser and go to **https://vroops01svr01.rainpole.local**.
 - b Log in using the following credentials.

Setting	Value
User name	admin
Password	

- 2 On the main navigation bar, click **Alerts**.
- 3 Modify out-of-the-box Virtual machine has disk snapshot for a long time symptom definition.
 - a In the left pane of vRealize Operations Manager, expand **Alert Settings** and click **Symptom Definitions**.
 - b On the **Symptom Definitions** page, enter **snapshot** in the **Name** search box and press Enter.

- c Select the **Virtual machine has disk snapshots for a long time** symptom definition and click **Edit**.
- d In the **Edit Symptom Definition** dialog box update the symptom definition to cover snapshots older than 3 days instead of older than 2 days and click **Save**.

Symptom Definition Setting	Value
Name	Virtual machine has disk snapshots for a long time (3 days)
Symptom	when property is greater than or equal to 3

- 4 Modify the out-of-the-box **Virtual machine is running on snapshots for more than 2 days** alert definition.
 - a In the left pane of vRealize Operations Manager, expand **Alert Settings** and click **Alert Definitions**.
 - b On the **Alert Definition** page, enter **snapshot** in the **Quick filter (Name)** search box and press Enter.
 - c Select the **Virtual machine is running on snapshots for more than 2 days** alert definition and click the **Edit**.
 - d In **Alert Definition Workspace** dialog box, make the alert name and description relevant to 3-day old snapshots.

Setting	Value
Name	Virtual machine is running on snapshots for more than 3 days
Description	Virtual machine has snapshots that are older than 3 days

- e In **Alert Definition Workspace** dialog box, verify that **Virtual machine has disk snapshots for a long time (3 days)** symptom is displayed under the **Symptoms** section along with **Virtual machine has a snapshot sized more than 1 GB** symptom definition.
- f Click **Save**.

Review Snapshot Alerts and Delete the Unused Snapshots

Review the snapshot alerts on a daily basis and when necessary perform the action to remove old snapshots from running virtual machines. Good reasons for the existence of old snapshots could exist and you might need to contact the system owner before running the remove-snapshot action.

For example, assume that virtual machine snapshots older than 3 days exist in the SDDC.

Procedure

- 1 Log in to vRealize Operations Manager by using the operations interface.
 - a Open a Web browser and go to **https://vrops01svr01.rainpole.local**.
 - b Log in using the following credentials.

Setting	Value
User name	admin
Password	

- 2 On the main navigation bar, click **Alerts**.
- 3 In the left pane of vRealize Operations Manager, click **All Alerts**.
- 4 Group alerts by time to identify alerts by time of occurrence.
- 5 On the **All Alerts** page, enter **snapshot** in the **Quick filter (Alert)** search box and press Enter.
- 6 In the **All Alerts** page, expand **Virtual Machine** alerts and review the list of virtual machines.
- 7 Removed the unused snapshot.
 - a On the **All Alerts** page, select the **Virtual machine is running on snapshots for more than 3 days** alert next to the virtual machine to view the recommendation details.
start with the oldest alert first.
 - b Click **Run Action**.
The **Delete Unused Snapshots for VM** wizard appears.
 - c On the **Retrieve Snapshots** page, increase the **Days Old** to 3 and click **Next**.
 - d On the **Remove Snapshots** page, select the snapshots to remove and click **Begin Action**.
 - e In the **Delete Unused Snapshots for VM** dialog box, click **OK**.