

Oracle® Communications Application

Orchestrator

Release Notes

Release 1.1, 1.1M1, 1.1M2, and 1.1M3

January 2017

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About This Guide

This document and other product-related documents are described in the Related Documentation table.

Related Documentation

Table 1: Oracle Communications Application Orchestrator Library

Document Name	Document Description
Release Notes	Contains feature support information, and known issues pertaining to this release.
Installation Guide	Contains instructions for installing Oracle Communications Application Orchestrator as a standalone application or installing Oracle Communications Application Orchestrator together with Oracle Communications Session Delivery Manager.
Plug-in Guide for Session Delivery Network Elements	Describes how to use Oracle session delivery product plug-ins with Oracle Communications Application Orchestrator.
User Guide	<p>Describes how to centrally manage and automate your virtual and physical network environment of composite network functions (CNFs). The Oracle Communications Application Orchestrator application is implemented by doing the following:</p> <ul style="list-style-type: none">• Use the Security Manager to create new users and new user groups, and set group-based authorization.• Configure X.509 certificate authentication.• Add a virtual infrastructure management (VIM) system to manage VNF life-cycles.• Register an Element Manager (EM) with Oracle Communications Application Orchestrator in order to stage a CNF from its CNF descriptor (CNFD).• Manually use the CNF onboarding workflow to choose, stage, and promote a pre-existing CNF plug-in, and configure the CNF to deploy and make this CNF operational.• Automate the manual process of making a CNF operational by using the hierarchical service configuration (HSC) feature.• Monitor Oracle Communications Application Orchestrator real-time KPI thresholds, device status and performance information for CNFs.• Use the Fault Manager to view events, alarms and trap event settings.
REST API Guide	The Oracle Communications Application Orchestrator REST API interface interacts with the Northbound Interface (NBI) to get the available fault alarms.
Security Guide	<p>Provides the following security guidelines and topics:</p> <ul style="list-style-type: none">• Guidelines for performing a secure installation of Oracle Communications Application Orchestrator on your server, which includes methods for securing the server, firewall settings, system support for encryption and random number generators (RNG), using HTTPS, and password guidelines.• An overview of the Security Manager features that are used to configure groups, users, operations, privileges, and manage access to the system.

About This Guide

Document Name	Document Description
	<ul style="list-style-type: none">• Security maintenance, which includes a checklist to securely deploy Oracle Communications Application Orchestrator on your network, maintaining security updates, and security considerations for developers.

Revision History

Date	Description
August 2015	<ul style="list-style-type: none">• Initial release
April 2016	<ul style="list-style-type: none">• The <i>Introduction to Application Orchestrator Release 1.1</i> section changed to <i>Release Notes for Application Orchestrator Release 1.1</i> section.• The <i>Overview</i> section was renamed to <i>About Application Orchestrator</i>.• The <i>Check System Requirements</i> section was added.• The <i>Release Upgrade Requirements</i> section was added.• The <i>Installation and Patch Updates</i> section was added.• The <i>New and Changed Features</i> section was renamed the <i>New Features</i> section.• Changes specific to the 1.1M1 release were made.
September 2016	<ul style="list-style-type: none">• Changes specific to the 1.1M2 release were made.
January 2017	<ul style="list-style-type: none">• The <i>Check System Requirements</i> section in the <i>Pre-installation Tasks</i> chapter was updated to indicate that the server on which Oracle Communications Application Orchestrator is installed requires a 300 GB hard drive.• Changes specific to the 1.1M3 release were made.

Release Notes for Application Orchestrator


Read and understand the sections in the Oracle Communications Application Orchestrator Release Notes before installing, upgrading or using this product.

About Application Orchestrator

Oracle Communications Application Orchestrator provides a core management platform for communications service providers (CSPs). This platform supports a composite network function (CNF) that can be any combination of a virtualized network function (VNF) and physical network function (PNF) that runs as part of a network to provide one or more public, private, or hybrid cloud computing solutions.

Check System Requirements

Oracle has certified the following hardware and software server platforms as well as client requirements for use with Oracle Communications Application Orchestrator.

 **Note:** Other hardware configurations might work with Oracle Communications Application Orchestrator, but Oracle has verified the configurations listed here.

Oracle Communications Application Orchestrator Server Requirements

- CPU: 4-core 2.1 GHz processor or better
- 16 GB RAM minimum, 24 GB RAM recommended
- 300 GB hard drive minimum

Certified Operating Systems

- Oracle Linux 6.3, 6.4, 6.5, 6.6, 6.7 64-bit
- Red Hat Linux 6.3, 6.4, 6.5, 6.6, 6.7 64-bit
- CentOS 6.3, 6.4, 6.5, 6.6, 6.7 64-bit

Client Requirements

- We recommend Internet Explorer versions 11.0 and later, Mozilla Firefox versions 26.0 (10.0 Linux) and later, or Google Chrome version 44.0 or later.
- A Flash player compatible with your browser that is installed locally.

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- If the server is not part of your DNS domain, the hosts file on each client must be edited to include the host name and IP address of the Oracle Communications Application Orchestrator server.

Language Requirements

On the Linux server, ensure that the US English language UTF-8 character encoding method is specified.

Application Orchestrator Software Distribution Media

Application Orchestrator Software Distribution Media for Release 1.1 GA

Software distribution media files are provided for Oracle Communications Application Orchestrator, Release 1.1 GA.

File Name	Description
NNC75OracleLinux63_64bit.tar.gz	NNC 7.5 installation file for Oracle Linux OS.
NNC75RHEL63_64bit.tar.gz	NNC 7.5 installation file for Red Hat Linux OS.
MIBs_NNC75.zip	NNC7.5 release MIBs zip file, which contains the ap-ocao.mib that has SNMP support for event types that are associated with syslog messages.

Application Orchestrator Software Distribution Media for Release 1.1M1

Software distribution media files are provided for Oracle Communications Application Orchestrator, Release 1.1M1.

File Name	Description
NNC75M1OracleLinux63_64bit.tar.gz	NNC 7.5M1 installation file for Oracle Linux OS.
NNC75M1RHEL63_64bit.tar.gz	NNC 7.5M1 installation file for Red Hat Linux OS.
MIBs_NNC75M1.zip	NNC7.5M1 release MIBs zip file, which contains the latest ap-ocao.mib that has SNMP support for event types that are associated with syslog messages. This distribution media supersedes previous versions that were released with your device software.
NNC75M1RESTClient.zip	NNC7.5M1 REST client for Oracle Communications Application Orchestrator.

Application Orchestrator Software Distribution Media for Release 1.1M2

Software distribution media files are provided for Oracle Communications Application Orchestrator, Release 1.1M2.

File Name	Description
NNC75M2OracleLinux63_64bit.tar.gz	NNC 7.5M2 installation file for Oracle Linux OS.
NNC75M2RHEL63_64bit.tar.gz	NNC 7.5M2 installation file for Red Hat Linux OS.
MIBs_NNC75M2.zip	NNC7.5M2 release MIBs zip file, which contains the latest ap-ocao.mib that has SNMP support for event types that are associated with syslog messages. This distribution media supersedes previous versions that were released with your device software.
NNC75M2RESTClient.zip	NNC7.5M2 REST client for Oracle Communications Application Orchestrator.

Application Orchestrator Software Distribution Media for Release 1.1M3

Software distribution media files are provided for Oracle Communications Application Orchestrator, Release 1.1M3.

File Name	Description
NNC75M3OracleLinux63_64bit.tar.gz	NNC 7.5M3 installation file for Oracle Linux OS.
NNC75M3RHEL63_64bit.tar.gz	NNC 7.5M3 installation file for Red Hat Linux OS.
MIBs_NNC75M3.zip	NNC7.5M3 release MIBs zip file, which contains the latest ap-ocao.mib that has SNMP support for event types that are associated with syslog messages. This distribution media supersedes previous versions that were released with your device software.
NNC75M3RESTClient.zip	NNC7.5M3 REST client for Oracle Communications Application Orchestrator.

Application Orchestrator Documentation Distribution

The documentation library that is available for Oracle Communications Application Orchestrator is distributed on the [Oracle Communications Application Orchestrator, Release 1.1 Documentation](#) web page. See the *Related Documentation* section of the *About This Guide* section for a complete description of the Oracle Communications Application Orchestrator documentation library.

Release Upgrade Requirements

When you upgrade Oracle Communications Application Orchestrator you must undeploy and delete any operational CNFs. See the Oracle Communications Application Orchestrator User Guide for more information on doing these cleanup tasks.

Installation and Patch Updates

GA and Maintenance Releases

See the *Oracle Communications Application Orchestrator Installation Guide* for more information about installation and database migration instructions.

Patch Releases and Patch Management Tool

You do not need to perform a new installation for patch releases. See the *Install Software Patches* chapter of the *Oracle Communications Application Orchestrator Installation Guide* for more information on the patch management tool.

New Features

This section covers the new features that appear in the documentation for each Oracle Communications Application Orchestrator release.



Note: See the Revision History table in the *About This Guide* section in each document for more information about any changes that were made to that document.

Table 2: Oracle Communications Application Orchestrator, Release 1.1 GA New Features

Feature	Description
X.509 Certificate Authentication	The Oracle Communications Application Orchestrator server can use trusted certificates in its trust store to authenticate Transport Layer Security (TLS) connections to a southbound (interface) network function (NF) when Transport Layer Security (TLS) communication is required.
Virtual Infrastructure Manager	Oracle Communications Application Orchestrator manages the life-cycle of a VNF through the Oracle OpenStack virtual infrastructure manager (VIM) or VMWare vCloud Director VIM. The VIM is an orchestration engine that manages a data center, and is required for deploying a CNF.
Capacity Planner	A capacity planner is used to determine overall capacity of the NF groups. A capacity planner is assigned to each NF group to process KPI statistics that determine whether to scale in or scale out DU instances. The capacity planner uses the threshold crossings and the KPI statistics to determine and indicate if scaling process needs to be performed. The algorithms for capacity determination is provided through the vendor plug-in being used.
Composite Network Function	A Composite Network Function (CNF) is a type of network function introduced to extend the infrastructure of a network to support and manage both physical and virtual components together as a single hybrid solution. A CNF that is composed of all virtual components fits the limited European Telecommunications Standards Institute Management and Orchestration (ETSI MANO) definition of a complex VNF. However, a CNF extends this definition to support physical components. A CNF contains the following parts: NF group, deployment unit (DU), VNF and PNF.
Network Function Group	The NF Group is the heart of the PNF and VNF scaling and management system of any combination of virtual network functions (VNFs) or physical network functions (PNFs) that comprise a CNF. It provides the monitor, capacity planner, and policies that cater to the specifics of the NF component that it is entrusted to manage.
Physical network functions	A PNF represents the physical appliance. It is a base unit and is indivisible.
Virtual network functions	The VNF is defined by the European Telecommunications Standards Institute of Management and Orchestration Organization (ESTI-MANO) as being comprised of one virtual network function component

Feature	Description
	(VNFC) instance or multiple VNFC instances. Multiple VNFC instances can each contain multiple VMs. Oracle Communications Application Orchestrator handles either single VNFC instance or multiple VNFC instances as a single, complex VNF, which is managed by the CNF. Oracle Communications Application Orchestrator handles either a single VNFC or multiple VNFCs as a single, seamless VNF.
Pre-existing CNF	You can stage any pre-existing CNF that is available in the CNF catalog and promote the CNF that you choose to a configurable CNF.
Oracle Communications Application Orchestrator REST API	Oracle Communications Application Orchestrator provides a REST API interface that allows a northbound client application, such as a network service orchestrator (NSO), to interact with Oracle Communications Application Orchestrator.

Table 3: Oracle Communications Application Orchestrator, Release 1.1M1 New Features

Feature	Description
Web server security	The following web security features were added to the <i>Oracle Communications Application Orchestrator Security Guide</i> and <i>Oracle Communications Application Orchestrator Installation Guide</i> : <ul style="list-style-type: none"> • Maximum upload file size limitations • HTTP certificate support • HTTPS is now the default installation option for your Web server.
Hierarchical Service Configuration (HSC)	The Hierarchical Service Configuration (HSC) helps Oracle Communications Application Orchestrator automate the deployment, scaling and resizing of a CNF. The HSC must be configured before you can configure the REST API for the northbound client (such as a northbound service orchestrator (NSO)). Once the HSC and REST API are configured, the northbound client can be used to operationalize a CNF. <p>The following HSC features were added:</p> <ul style="list-style-type: none"> • HSC folder permissions were added to the Security Manager chapter of the <i>Oracle Communications Application Orchestrator User Guide</i>. • The Build the Hierarchical Service Configuration chapter was added to the <i>Oracle Communications Application Orchestrator User Guide</i>.
Alarm synchronization	The <i>Synchronize an External Trap Receiver</i> section was updated in the Fault Manager chapter in the <i>Oracle Communications Application Orchestrator User Guide</i> .

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Feature	Description
	Alarms on the Oracle Communications Application Orchestrator can be resent (forwarded) out of the northbound interface to the connected destination trap receiver (device) in order to synchronize alarms.
Heartbeat Trap	The <i>Add the Heartbeat Trap to Monitor Server Availability</i> section was added to the Fault Manager chapter in the <i>Oracle Communications Application Orchestrator User Guide</i> to provide configuration information for the heartbeat trap (apOCSDMServerHeartbeatReachable) that is used to periodically monitor the availability of the Oracle Communications Application Orchestrator from the northbound interface.
EM Registry	The <i>Register an Element Manager</i> chapter was added to the <i>Oracle Communications Application Orchestrator User Guide</i> . An Element Manager (EM) must be registered with Oracle Communications Application Orchestrator in order to stage a CNF from its CNF descriptor (CNFD). An EM supports a targeted CNF to determine resource usage requirements for the CNF and its collaboration with Oracle Communications Application Orchestrator.
VIM support	<p>The following VIM support was added:</p> <ul style="list-style-type: none"> • The <i>Add Data Center to Oracle OpenStack VIM</i> and <i>Add Data Center to VMware vCloud Director VIM</i> sections in the <i>Configure a VIM for Application Orchestrator</i> chapter were updated with a new Caution field that contains important configuration information. • The <i>Guidelines for Provisioning Oracle OpenStack</i> section in <i>Appendix A: Guidelines for Provisioning Your VIM</i> was updated with Oracle OpenStack 2.0 information and a new subsection <i>OpenStack Configuration Drive Requirements and Guidelines</i>.
REST API support expanded	<p>The <i>Oracle Communications Application Orchestrator REST API Guide</i> was expanded to include the following chapters:</p> <ul style="list-style-type: none"> • VIM and VDC Resource Operations—Use the REST API to perform both virtual infrastructure manager (VIM) and virtual data center (VDC) operations. • VM Image Retrieval—Use the REST API to list VM images and retrieve VM image information • NF Operations—Use the REST API to configure NF operations, including HSC inputs, on your northbound service orchestrator (NSO). • Application Orchestrator Scaling Events—Use the REST API to support Scaling, ScalingRequest, and StateChange push event notifications, which are sent

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Feature	Description
	to a registered northbound service orchestrator (NSO) by way of its event registration callback URI.

Application Orchestrator Plug-in and VIM Support

This chapter shows you where to go find information for the pre-existing plug-ins that come with Oracle Communications Application Orchestrator, where to go for vendor plug-in information, and the guidelines you need to provision either an Oracle OpenStack Virtual Infrastructure Manager (VIM) or vCloud Director VIM on your system (which is a prerequisite for configuring your VIM(s)).

About Application Orchestrator Plug-ins

Oracle Communications Application Orchestrator has pre-existing plug-ins. See the *Plug-in Guide for Oracle Communications Application Orchestrator Session Delivery Network Elements* for more information.

Oracle Communications Application Orchestrator accepts vendor-defined CNF and EMS plug-ins. See the vendor-specific plug-in documentation for more information.

Guidelines for Provisioning Oracle OpenStack

Use the following guidelines to provision Oracle Openstack VIMs.

- Use the following links to find OpenStack user documentation:
 - [Oracle OpenStack for Oracle Linux Release 1](#)
 - [Oracle OpenStack for Oracle Linux Release 2](#)
- Oracle Communications Application Orchestrator uses the following services:
 - **Keystone**—An identity management system responsible for user and service authentication. Keystone is capable of integrating with third-party directory services and the Lightweight Directory Access Protocol (LDAP).
 - **Nova**—A computing service responsible for creating instances and managing the life cycle of these instances, and managing the chosen hypervisor to which it is connected.
 - **Neutron**—A network service responsible for creating network connectivity and network services. It is capable of connecting with vendor network hardware through plug-ins. Neutron comes with a set of default services implemented by common tools. Network vendors can create plug-ins to replace any one of the services with their own implementation, adding value to their users.
 - **Glance**—An image service responsible for managing images uploaded by users. Glance is not a storage service, but it is responsible for saving image attributes, and making a virtual catalog of the images.

Application Orchestrator Plug-in and VIM Support

- Use Neutron for networking. Networks should be *flat provider* networks, backed by Openvswitch or LinuxBridge networking agents. Use `firewall_driver = neutron.agent.firewall.NoopFirewallDriver`, and disable `iptables` on compute nodes when testing initial connectivity. `iptables` can be used later after configuring security groups.
- Oracle Communications Application Orchestrator uses **Domain**, **Project**, and **User** fields for authentication. Enable multi-domain support, or use **default** for Domain.
- Oracle Communications Application Orchestrator does not support floating IPs currently. A floating IP address is a service provided by Neutron that does not use any DHCP service or is not configured statically within the guest VM.
- When a new virtual machine (VM) is deployed, Oracle Communications Application Orchestrator looks for an existing *flavor* virtual hardware template in OpenStack that matches the required CPU, memory, and disk allocations. If one does not exist, Oracle Communications Application Orchestrator attempts to create a flavor template. This requires the OpenStack user to have the Nova permission: `compute_extension:flavormanage`. Have an administrator add the required *flavor* hardware template, or add this permission to the Nova `json.policy` file for the OpenStack user.

OpenStack Configuration Drive Requirements and Guidelines

To use Configuration Drive with libvirt, XenServer, or VMware, you must first install the genisoimage package on each compute host, or instances do not boot properly. Use the `mkisofs_cmd` flag to set the path where you install the genisoimage program. If genisoimage is in same path as the nova-compute service, you do not need to set this flag.

Guidelines for Provisioning vCloud Director 5.5

Use the following guidelines and the [vCloud Director User's Guide](#) to provision the vCloud Director 5.5 VIM.

- The vCloud user must have the **Catalog Author** permissions or higher.
- Organization Virtual Data Centers (Org vDCs) registered with Oracle Communications Application Orchestrator must have **Fast Provisioning** disabled.
- Org vDCs registered with Oracle Communications Application Orchestrator should use the *allocation pool* resource allocation model, with 100 percent of allocated resources with a certain percentage guaranteed. Other allocation models can result in poor performance because of the over-provisioning of resources.
- Use the following anti-affinity rules for HA pairs:
 - Direct access to the vCenter server that provides resources for the underlying vCloud provider vDC is required.
 - The vCenter user must have permissions to create an anti-affinity DRS rule on the Cluster where the VMs are deployed.
 - The Cluster must be backed by *shared* storage, or the DRS rule can fail to move live, running virtual machines from one host to another while maintaining continuous service availability (vMotion).
 - When configuring the Oracle Communications Application Orchestrator VIM Datacenter, make sure to select a vCloud storage profile that contains only shared storage volumes.



Note: This vCloud storage profile must be configured in advance by a vCloud administrator.

Known Issues

This chapter describes the known issues in Oracle Communications Application Orchestrator. The status column identifies what release the defect or caveat was closed, or if it was closed because it was non-reproducible, or some other state. See the Oracle external database (Bug DB) defect tool for more information about defect states.

Table 4: Oracle Communications Application Orchestrator Known Issues

Defect Number	Found	Description/Workaround	Status
None	AO 1.1 GA	Oracle Communications Application Orchestrator is not supported in a clustered environment. Workaround: None.	Unchanged for AO 1.1M1
23039346	AO 1.1M1	A resynchronization of the Hierarchical Service Configuration (HSC) can cause added parameters to be mismatched intermittently. Workaround: None.	Fixed in AO 1.1M2
24296362	AO 1.2M2	During the installation, the setup installation application can at times complete processing, but not exit gracefully, giving the appearance that the installation is in a hung state. Workaround: If the setup installation application appears to hang, check the setup_config.ini file, which is located in <NNC-Installation-Folder>/AcmePacket. If the value for 'VERSION' in the setup_config.ini file is the latest NNC version (for example, NNC75M2), the hung script (that is, process) can be stopped safely.	

