

Cloud Operations for Oracle Cloud Machine

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"We took a piece of the cloud, out of our cloud, lifted it up, and put it in your data center."

LARRY ELLISON
EXECUTIVE CHAIRMAN AND CTO
ORACLE CORPORATION



Introduction

Oracle Public Cloud Machine, also known as Oracle Cloud Machine, delivers Oracle Cloud to your data center. Rather than procuring hardware, installing software, and managing the system, you can easily consume cloud services on your premises on a subscription basis, just like you do with the Oracle Cloud. Oracle provides the hardware, installs the Oracle Cloud software, and manages the day-to-day operation of the Oracle Cloud Machine. It includes a wide range of Oracle Cloud services, from Oracle Compute Cloud to Java Cloud Service and Integration Cloud Service. You can use these cloud services as building blocks to accelerate the development of your innovative applications while maintaining complete control of your data and system.

This whitepaper outlines the comprehensive cloud management and operation support included in the Oracle Cloud Operations Service as part of your subscription to Oracle Cloud Machine. The "Overview of Oracle Public Cloud Machine Whitepaper" provides additional information about Oracle Cloud Machine and the PaaS cloud services available for on-premises.

Oracle Cloud Operations Service Overview

Oracle Cloud Operations enables you to accelerate time to deployment, manage the patching and maintenance schedule, minimize upgrade costs with systematic and proactive change management, and keep full control over data and applications that are critical to business, on your own premises. Oracle Cloud Operations is personalized and proactive mission-critical support for organizations seeking to maximize the availability, performance, and value of their Oracle solutions.

Oracle Cloud Operations Benefits

- » Run the exact same platform and patch level as the Oracle Cloud in your datacenter
- » Operated in your data center for your convenience by Oracle
- » Turn-key experience that allows you to focus on innovative tasks that add business value
- » Reduce risk with Oracle Cloud Operations providing best-in-class service levels

Services Scope Summary

For an easy transition to cloud, Oracle Cloud Operations expertise delivered in your datacenter -- ranging from system installation, cloud administration, life cycle management, and overall day-to-day cloud operations. You subscribe to the infrastructure and platform services that you need. The service hides all the low-level complexities and provides you with the provisioning of tenant, network, compute, storage, and other fundamental infrastructure resources at the IaaS layer as well as the deployment of application platform using automated self-provisioning facility at the PaaS layer -- just like Oracle Cloud. Oracle Cloud Operations provides you with the capabilities to manage your own tenant domain while putting your focus on core business needs.

Figure 1 depicts the delineation of the roles and responsibilities between Oracle Cloud Operations and the customer.

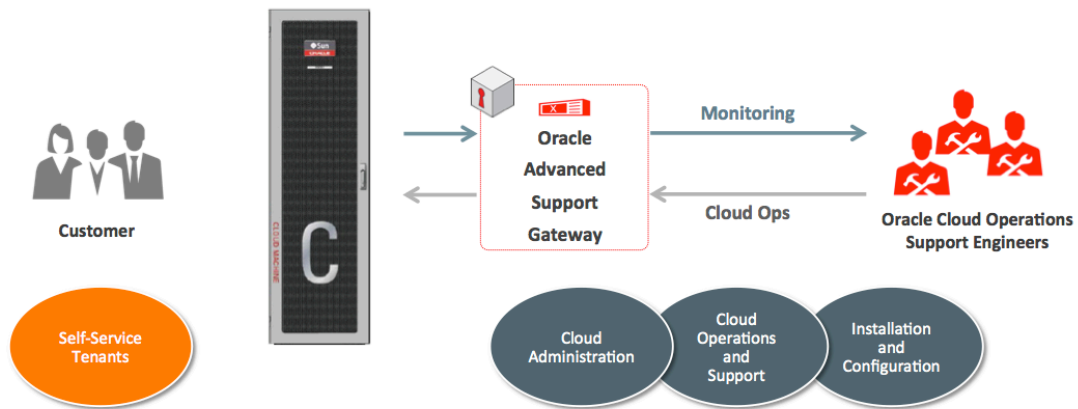


Figure 1: Cloud Operations Roles and Responsibilities

The following services are included with Cloud Operations to supply, operate and maintain the Oracle Cloud Machine in your datacenter.

- Installation and Configuration
 - System installation
 - Oracle Cloud Machine configuration
- Support and Cloud Operations
 - Technical account management
 - Upgrade and patching
 - Monitoring
 - Incident management and resolution
 - Oracle Cloud support
 - Change management
- Cloud Administration as provided in Oracle Cloud
 - Tenant management
 - Shapes management
 - VM Template management
 - Oracle Enterprise Manager management
 - Access management

Installation and Configuration Services

Oracle provides both hardware installation and software configuration, led by an Oracle Technical Account Manager as your single point of contact throughout the duration of the Oracle Cloud Machine subscription period. The hardware installation and software configuration are performed on-site to prepare and configure the Oracle Cloud Machine at your data center for remote management, monitoring and support.

TABLE 1: INSTALLATION AND CONFIGURATION SERVICES – FOR ORACLE CLOUD MACHINE

Service	Service Summary
System Installation	<p>Comprehensive, standard system hardware installation including site audit, installation and configuration planning documentation, and hardware, network, and operating system functionality validation and testing. The following installations are provided:</p> <ul style="list-style-type: none">• Oracle Cloud Machine• Oracle Advanced Support Platform
Oracle Cloud Machine Configuration	<p>Oracle engineers cover all aspects of the required OS and application networking components configuration.</p> <ul style="list-style-type: none">• Oracle Cloud Machine configuration service• Oracle Advanced Support Platform configuration• Oracle Enterprise Manager configuration <p>All configuration settings are documented and delivered to a customer's IT team during the post installation procedures.</p>

Support and Cloud Operation Services

TABLE 2: SUPPORT AND CLOUD OPERATION SERVICES – FOR ORACLE CLOUD MACHINE

Service	Service Summary
Oracle Technical Account Manager	<p>Provides a single point of contact for the Cloud Operation Service, managing the following</p> <ul style="list-style-type: none">• Account management• Cloud operation governance• Quarterly services reviews• Escalation management
Patching	<p>Oracle Cloud Machine must be updated on a quarterly basis to stay compatible with Oracle Cloud. Quarterly patching is performed on the following Oracle Cloud Machine components:</p> <ul style="list-style-type: none">• Hardware: compute nodes, storage nodes, switches• IaaS control plane• PaaS engine <p>When patching may impact the operations of the tenants, Oracle Cloud Machine accommodates you to schedule patching within a specific window.</p>
PaaS Engine Upgrade	<p>Each upgrade includes the on-boarding of additional PaaS Cloud Services and features. The upgrade process does not normally require interruption to end users, but in the event a downtime of some components is necessary.</p>
Monitoring	<p>Predictive monitoring provides 24x7 proactive system monitoring. These services leverage proprietary Oracle technologies and provide coverage for Oracle Cloud Machine from the network layer to the Cloud Service Infrastructure layer. Monitoring services help ensure uptime and deliver increased service levels via early detection of potential issues. Monitoring of the Oracle Cloud Machine includes</p> <ul style="list-style-type: none">• System performance• System availability• Faults• Capacity monitoring
Incident Management and Resolution	<p>Resolution services include proactive monitoring and provide the ITIL-based processes and technological expertise for system administration and incident resolution. A dedicated team of technical experts delivers proactive and preventive maintenance. Incident tickets are used to track and assign priority and severity of all incidents. Key areas covered:</p> <ul style="list-style-type: none">• Incident management• Incident remediation

Oracle Cloud Support	Oracle Cloud Support covers hardware and software components of the Oracle Cloud Machine. Management of product support Service Requests (SR) includes: <ul style="list-style-type: none"> • Response and resolution of SRs • Spare parts • Field dispatch
Change Management	Change management maintains the integrity of the Oracle Cloud Machine environment in a proactive manner by governing introduction of change. Change management tickets are used to create and maintain an on-going record of all changes. Key areas covered: <ul style="list-style-type: none"> • System capacity • System performance • System administration

Cloud Administration as Provided in Oracle Cloud

TABLE 3: CLOUD ADMINISTRATION SERVICES – FOR ORACLE CLOUD MACHINE

Service	Service Summary
Tenant Management	IaaS Management <ul style="list-style-type: none"> • Create tenants • Manage quota • Manage vnet access • Manage service networks • Manage users – promoting, demoting
Shapes Management	<ul style="list-style-type: none"> • Create and manage custom compute shapes
VM Template Management	<ul style="list-style-type: none"> • Manage custom VM templates
Oracle Enterprise Manager Management	<ul style="list-style-type: none"> • Create users and roles • Perform monitoring and reporting
Access Management	<ul style="list-style-type: none"> • Administer password change of cloud infrastructure and system components

Customer Responsibilities

A key part of the successful operation of the Oracle Cloud Machine is the clear understanding and planning of customer responsibilities and requirements, complementing Oracle Cloud Operations. The following is a summary of these customer responsibilities:

TABLE 4: CUSTOMER RESPONSIBILITIES – FOR ORACLE CLOUD MACHINE

Service	Service Summary
Installation and Configuration	<ul style="list-style-type: none"> • Provide space for the Oracle Cloud Machine and Oracle Advanced Support Platform server • Provide and setup network connectivity for the Advanced Support Platform • Provide environment for the cloud services database • Grant Oracle user privileges sufficient to allow Oracle to install and utilize the Oracle monitoring tools on the cloud services database • Identify maintenance windows



Support and Cloud Operations	<ul style="list-style-type: none">• Provide network access and validation to enable monitoring of the Oracle Cloud Machine• Assign a primary point of contact to coordinate Incident management, change management, security management, and problem management• Approve routine patching work schedules• Create and manage customer's own IaaS VMs• Create and manage customer's own PaaS instances• Monitor guest VMs
Cloud Administration	<ul style="list-style-type: none">• Assign a primary point of contact to co-ordinate with the Oracle Technical Account Manager (TAM) to agree and approve changes• Create and maintain a Change Control Board• Creation of change requests, made via the Oracle Advanced Support Portal
Tenant Administration	<ul style="list-style-type: none">• Create and manage tenant users, private networks, IaaS instances, and PaaS instances• Monitor customer's own VMs• Backup and restore all guest VM environments

Services Delivery

Advanced Support Cloud

Oracle Cloud Machine Cloud Operation Services are delivered remotely using a combination of Advanced Support infrastructure and expertise, using a Remote Delivery Architecture detailed below.

» Oracle Advanced Support Cloud

Our Global Centers of Excellence leverage codified best practices and automation to provide a wide range of support services via the cloud

» Oracle Advanced Support Platform

This software toolset is installed in your environment to enable a secure connection to the cloud and advanced support delivery

» Oracle Advanced Support Portal

You have around-the-clock access to the latest status and key metrics for environments serviced by Oracle Advanced Support Cloud

Remote Service Delivery

Oracle Cloud Operations is enabled through the Oracle Advanced Support Platform (Figure 2), comprised of the Oracle Advanced Support Gateway, the Oracle Advanced Support Portal, and internal components for analysis, reporting, configuration management, and change management.

The Oracle Advanced Support Gateway is an essential part of the Oracle delivery architecture for Oracle Cloud Operations. The gateway provides the ability to deliver remote fault monitoring, remote response and restoration, and patch deployment services, as detailed in Figure 4 under 'Remote Delivery Architecture'.

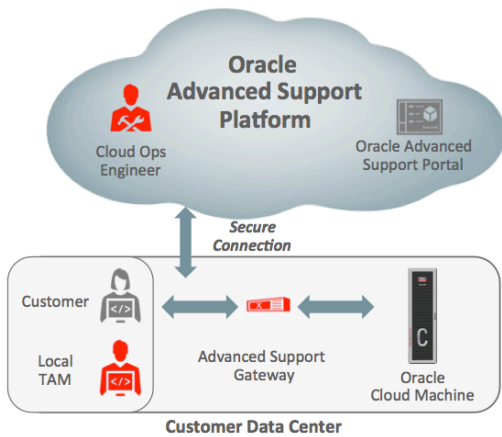


Figure 2. Delivery of Oracle Cloud Operations via Advanced Support Platform

Cloud operations requests, such as Change Management and Incident Management, are made through the secure Advanced Support Portal.

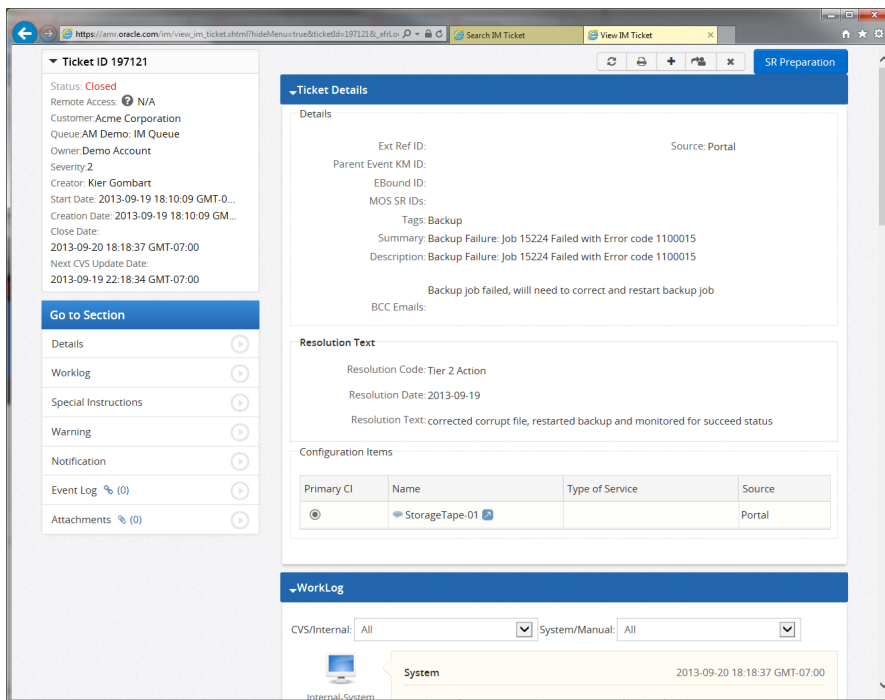


Figure 3. Advanced Support Portal User Interface, Incident Management example

Remote Delivery Architecture

Oracle Advanced Support Platform is based on the IT Infrastructure Library (ITIL) framework. These standards are designed to ensure confidentiality, integrity, and availability of customer data. A strong policy and process framework defines the service delivery with multiple layers of encryption, authorization, access control, and data protection. Procedures are approved and controlled by a high-level Oracle security committee.

Figure 4 and Table 5 provide an overview of the delivery architecture using a secure network connection and protocols. Additional details are provided under 'Security Considerations'.

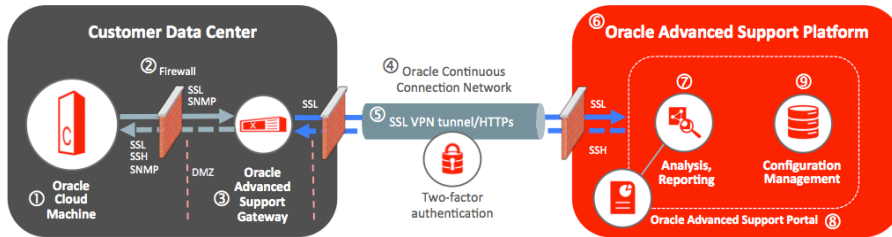


Figure 4. Delivery architecture using a secure network connection

TABLE 5: MAIN COMPONENTS OF ORACLE REMOTE DELIVERY

Name	Function	Security Features
① Oracle Cloud Machine	Oracle Cloud Machine and services monitored or analyzed	Access via Oracle Advanced Support Platform (Gateway) using secure protocols. Data access limited to data that is essential for service delivery.
② Firewall	Secures data flow between <ul style="list-style-type: none"> • Oracle Advanced Support Platform (Gateway) and Oracle Cloud Machine • Oracle Advanced Support Gateway and Oracle Advanced Support Platform 	Detailed firewall rules and templates are provided to the customer during the implementation process.
③ Oracle Advanced Support Gateway	Software appliance for provisioning and delivery of remote Oracle services and tools. Located within the customer's data center on a general-purpose server.	Authentication and encryption. Recommended to be placed into a demilitarized zone (DMZ).
④ Oracle Continuous Connection Network	Secure connectivity between Oracle and customers.	Dedicated private network and separate from Oracle's internal network. Access only by authorized Oracle personnel with two-factor authentication.
⑤ VPN tunnel / HTTPS	Software VPN client within Oracle Advanced Support Gateway to secure and encrypt inbound connections from Oracle to Oracle Advanced Support Gateway. HTTPS for all outbound connections from Oracle Advanced Support Gateway to Oracle.	SSL-based VPN client. Encryption. Failover, backup, and disaster recovery functions. Alternatively, IPSec-based connection can be established. HTTPS with 128-bit SSL transport encryption.
⑥ Oracle Advanced Support Platform	Remote service delivery system by Oracle, based on the ITIL framework.	Extensive physical and virtual security measures. Multiple layers of encryption, role-based authentication, authorization, and data security. AES-256 encrypted audit log records are retained for 90 days.
⑦ Analysis, reporting	Monitoring, analysis, and report generation based on defined thresholds and recommended practices.	Only authenticated Oracle personnel have system access to deliver the contracted services.
⑧ Oracle Advanced Support Portal	API-based web portal for configuring the database, managing monitoring events, handling changes, and documenting customer requests.	Accessible internally by Oracle engineers and online by authorized customers. All sessions are encrypted. Real-time authentication against existing My Oracle Support single sign-on accounts.
⑨ Configuration Management Database (CMDB)	Database within Oracle Advanced Support Platform to store customer data required to deliver the services.	No direct, outside data access. Data is segregated at a customer level through a multi-tenancy security model. Multiple layers of API-based access and authorization controls.



Security Considerations

Security is of the utmost importance when Oracle Cloud Operations accesses the Oracle Advanced Support Gateway for management, monitoring, and patching.

Oracle Cloud Operations access can be summarized with two network traffic types (Figure 4):

- External network traffic originating from Oracle Advanced Support Gateway to Oracle support
 - » Outbound: Remote monitoring (telemetry, configuration, diagnostics) via HTTPS
 - » Inbound: Remote management via SSL VPN requiring two-factor authentication

NOTE: ORACLE DOES NOT REQUIRE CUSTOMERS TO OPEN UP ADDITIONAL INBOUND FIREWALL PORTS

- Internal network traffic between Oracle Advanced Support Gateway and Oracle Cloud Machine
 - » SSL connection between the gateway and the agent hosted within Oracle Cloud Machine
 - » SSH connection from the gateway to Oracle Cloud Machine
 - » SNMP traffic from Oracle Cloud Machine to the gateway for hardware monitoring

Oracle follows strict security principles in its approach to keeping IT environments and information secure. More details on security aspects of Oracle Advanced Support Platform are discussed in the [“Oracle Advanced Support Gateway Security Guide.”](#)

Conclusion

Oracle Cloud Machine solves the challenges of cloud adoption by bringing the benefits of cloud to your organization, to the physical location you specify, and addresses the challenges of cloud adoption. The entire offer, including the hardware, software, and services, is available as a subscription service, like Oracle Cloud but on your own premises. The subscription includes hardware, software, and service. Oracle Cloud Operations delivers PaaS and IaaS services at your datacenter in a comprehensive, secure and cost effective manner. This service enables your IT staff to focus on adding value to your core business activities and competitive edge as you will be able to dictate rate of consumption and related cloud services based on your needs and objectives. Additionally, Oracle will ensure that your Oracle Cloud Machine is fully up to date and compatible with Oracle Cloud providing choice, agility, application compatibility, and flexibility for your business.







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