

## [Header]: Demystifying Oracle Bare Metal Cloud Services

### [Deck]: The benefits and capabilities of Oracle's next-gen IaaS

By Umair Mansoob

## Introduction

As many organizations look to the cloud as a way to improve agility and flexibility, as well as to try and cut down their infrastructure support and maintenance costs, they are introduced to new cloud terminology: “Bare Metal Cloud,” or “Dedicated Instances.”

Let's start by describing Oracle Bare Metal Cloud Services: A dedicated physical hardware/server with no other tenant residing and running workload on it. Bare Metal Cloud Services basically let you lease or rent dedicated physical hardware resource for running isolated workloads at an optimal cost. Depending on the cloud vendor, billing can be metered (hourly) or non-metered (monthly fixed cost).

When compared to the traditional public cloud, which is a Hypervisor Cloud that has many tenants per physical machine sharing hardware resources, Bare Metal Cloud Services is a dedicated physical hardware resource for isolation and performance comparable to on-premises hardware.

## Benefits

### Flexibility

Flexibility is a key benefit of Oracle Bare Metal Cloud Services. It gives you complete control over cloud resources, so you can setup and customize based on your requirements. Basically, you have direct physical access to the resources when compared to typical cloud offerings where physical resources are hidden behind the hypervisor layer.

Bare Metal Cloud Services also allows a hypervisor on top of the dedicated physical resources, giving you the best of both worlds: allowing you to control the number of virtual machines and the workload on them. It is also important to understand that Bare Metal Cloud Services flexibility comes with a price — it takes a little longer to provision cloud resources, introducing time and complexity to the provisioning process.

Given the added complexity, you might ask why you would opt for Bare Metal Cloud Services. It's the same reason customers opt for IaaS versus PaaS / SaaS cloud models. You have more

## Published in IOUG Select Magazine

control over your environment to install and configure your applications; you start to lose that control as you climb up the cloud stack from IaaS>>>PaaS>>>SaaS models.

Bare Metal Cloud Services offers agility for fast provisioning and on-demand resources, as well as high flexibility to define your servers, network, storage and security based on your requirements. All this makes Bare Metal Cloud Services a great alternative to traditional cloud offerings.

### Performance

Performance is a major concern for organizations when it comes to moving their workload to the public cloud. Migrating to a traditional cloud environment can be considered risky for some environments because going from on-premise dedicated hardware to virtualized shared-cloud resources can introduce performance issues. Also, applications that require high memory and CPU sometimes do not fit well into the traditional cloud model. Bare Metal Cloud Services can offer Memory, CPU and Storage Allocations that the traditional shared-cloud service model cannot.

Though many public cloud vendors have not published concrete performance metrics, performance degradation can often occur due to the introduction of hypervisor layer as well as the inherent performance issues from a fully shared resource. Basically, public cloud is a shared environment where multiple Virtual Machines are fighting for the same physical resources, so performance degradation is to be expected. Therefore, if performance is key to your applications, then Bare Metal Cloud Services is probably the best option to run your application in cloud.

Bare Metal Cloud Services let you run your workload on dedicated physical servers without any noisy neighbors running their workload on the same server. This also allows you to troubleshoot performance issues more easily as you are the sole owner of the physical server, and you exactly understand what other type of workload is being run by other applications.

### Security & Compliance

Like performance, security is a major concern for organizations when considering moving their environments to the public cloud. Cloud security is about requirements and capabilities to provide layers of security. It does not mean that Bare Metal Cloud Services is more secure than a traditional public cloud, but since you have more control, you can install and configure additional layers of security to further improve the security.

Additionally, because Bare Metal Cloud Services is a single-tenant solution, it provides you isolation, which can be an important compliance requirement for your organization. This allows

the possibility that many security-sensitive organizations can move their workload to the public cloud by being able to conform to regulatory compliance requirements.

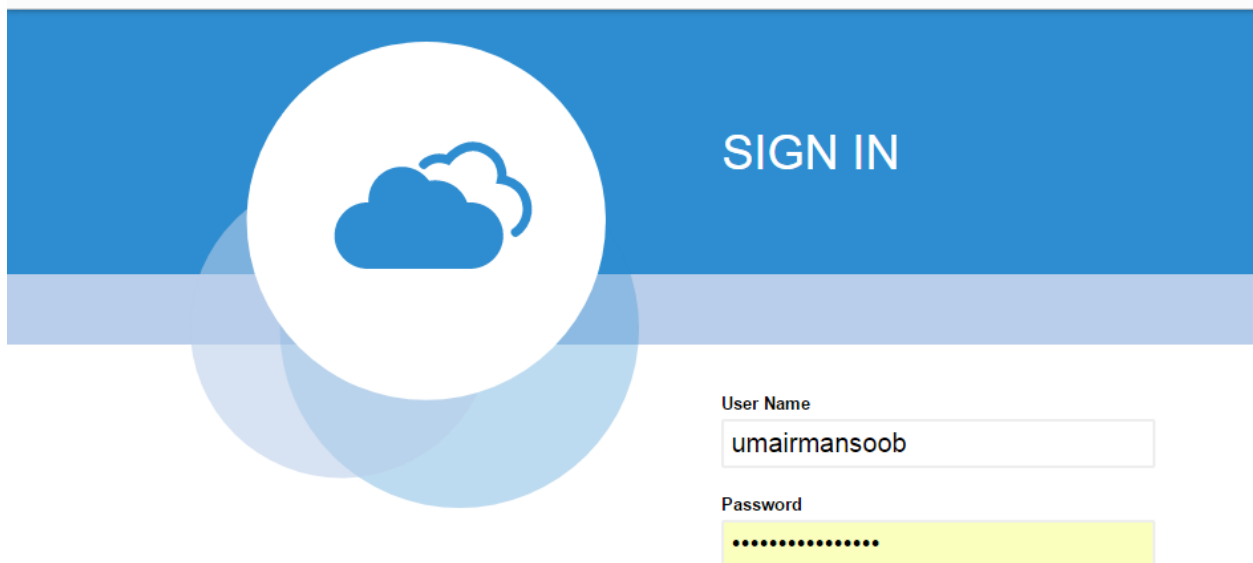
Furthermore, there are some software vendors who do not support or accept licensing on virtualized hardware because of soft partitioning because it's hard to determine actual number of required software licenses for any given virtualized server in cloud. In this scenario, Bare Metal Cloud Services can be considered a viable public cloud option to satisfy licensing requirements for any application or a software vendor.

## Oracle Bare Metal Cloud Services: The Offerings

Oracle is one of the few cloud vendors which offers Bare Metal Cloud Services for its customers. Oracle Bare Metal Cloud Services is an add-on to its existing public cloud service which lets you create a dedicated network, compute service and storage resources for your critical workloads. What differentiates Oracle Bare Metal Cloud Services from other cloud vendors?

It has put network and Block I/O at network layer resulting in a true self-service Bare Metal cloud service. Oracle Bare Metal Cloud Services physical data centers are currently available in one region (Phoenix) and every region is divided into three availability domains to provide failover capabilities.

## ORACLE® Bare Metal Cloud Services



The image shows a sign-in form for Oracle Bare Metal Cloud Services. It features a blue header with a white circle containing a blue cloud icon. To the right of the icon, the text "SIGN IN" is displayed in white. Below the header, there are two input fields: "User Name" with the value "umairmansoob" and "Password" with a masked password represented by a series of dots. The form is set against a light blue background.

**SIGN IN**

User Name  
umairmansoob

Password  
.....

## Published in IOUG Select Magazine

Oracle Bare Metal Cloud Services offers many aspects that work together to provide high-performance compute capabilities. Keeping in mind that Oracle is continuously adding services to its portfolio, Oracle Bare Metal Cloud Services currently offers:

1. Compute.
2. Database.
3. Block Storage.
4. Object Storage.
5. Network.
6. Load Balancing.
7. Audit.
8. IAM.

### Compute

Oracle Bare Metal Cloud Services provide compute service that is design to provide you with the raw compute power in the form of instances. It lets you create a compute node instance per your requirement and assigns custom storage volumes which can retain data even after the instance is being dropped. It is important to understand that, by default, there are some local storage (like boot volume) that are attached to the instance and changes made in those volumes will be lost if you drop an instance.

Oracle Bare Metal Cloud Services offer two types of compute instances:

- **Bare Metal** – A dedicated physical server instance which provides you the highest performance and isolation.
- **Virtual Machine** – A virtual instance on a physical server for those who do not require dedicated resource of a complete physical server.

Additionally, Oracle Bare Metal Cloud Services include locally attached NVMe devices which provides you extremely low latency and high performance. This is ideal and critical in OLTP applications. Note: These NVMe Storage drives are not protected by Oracle Bare Metal Cloud Services as other storages like block volume storage; therefore, it's important to take additional majors to protect and manage the durability of the data on these devices.

---

Launch Instance [help](#) [cancel](#)

---

Launching an Instance will take several minutes. You'll need to wait another minute for the OS to boot before you can SSH to the Instance.

Traffic on this Instance is controlled by its firewall rules in addition to the selected Subnet's Security Lists.

If the image, Virtual Cloud Network, or Subnet is in a different Compartment than the Instance, [click here](#) to enable Compartment selection for those resources.

NAME

AVAILABILITY DOMAIN

IMAGE

SHAPE

VIRTUAL CLOUD NETWORK

## Database

Oracle Bare Metal Cloud Services provide database service that will let you create an Oracle database system called “DB system,” which can be used to host one or more databases. DB system comes with locally attached NVMe flash devices and includes Oracle databases licenses.

You can use DB system to consolidate all of your databases on a single server, thus minimizing idle resources, maximizing efficiency and lowering costs. Database service offers four editions:

- Standard Edition
- Enterprise Edition,
- Enterprise Edition – High Performance
- Enterprise Edition – Extreme Performance

## Published in IOUG Select Magazine

Database service supports two database versions (11.2.0.4 and 12.1.0.2) with planned support for the 12c release 2, shortly. You can have multiple database homes within a DB system and they can all have different versions. But when you select a base edition for DB system, it cannot be changed without re-provisioning the target DB system.

### DB System Information

DISPLAY NAME

AVAILABILITY DOMAIN

SHAPE

ORACLE DATABASE SOFTWARE EDITION

CPU CORE COUNT

The number of CPU cores to enable on the DB System. Specify a multiple of 2, up to 36.

## Block Storage

You can dynamically change provision storage volumes using Oracle Bare Metal Cloud Services' storage service for your compute instances and DB systems. Block volumes are available in two sizes 256 GB or 2 TB and can be dynamically attached, detached and move between different cloud instances.

Additionally, these volumes can be used for migrating large data set between cloud instances because you can disconnect and attach volume to another instance without the loss of data. Oracle Bare Metal Cloud block volume service also comes with a high-availability feature which lets you take point-in-time image backup for whole block volume. These image backups can be

## Published in IOUG Select Magazine

used to completely restore the volume in case of data loss or create new volume using the backup.

Create Block Volume [help](#) [cancel](#)

CREATE IN COMPARTMENT

OBMC

NAME

BKVOL1

AVAILABILITY DOMAIN

Rlsb:PHX-AD-1

SIZE

256.0GB


**Create Block Volume**

## Object Storage

Oracle Bare Metal Cloud Services also offer a storage service called object storage which is designed to store large data sets. Object storage is a cost-effective and reliable internet-scale storage which can be accessed over the internet. You can easily manage object storage through a simple management interface and scale it on demand.

Object storage can be used for a variety of use cases including storing backups, archiving data and storage for Big Data applications. Object storage supports many types of contents including images, logs and videos, which are accessible from virtually anywhere you have an internet connection.

Storage » Object Storage » Bucket Details



## BlockStorage

**Delete**

**Namespace:** meta7poc  
**Compartment:** ...hxzmiq [Show](#) [Copy](#)

*[Developer tools](#) are available for advanced object operations.*

**Upload Object**

## Network

As discussed earlier, flexibility is one key benefit of Bare Metal Cloud Services. Oracle Bare Metal Cloud network service gives you an opportunity to create your own custom Virtual Private Network (VPN). The network is one of the most important components of Oracle Bare Metal Cloud Services. This is a layer of security and needs to be configured before you can start using the service.

Oracle Bare Metal Cloud network service lets you create and define many important network components per your unique requirements. For example:

- You can define/edit a virtual route table for your VPN;
- You can define virtual firewall rules to allow in and out traffic within your VPN;
- You can configure DHCP options for your cloud instances; or
- You can add a virtual router to your VPN.




Resources

### Route Tables in OBMC Compartment

Displaying 1 Route Tables

[Create Route Table](#)

 AVAILABLE	<a href="#">Default Route Table for Network1</a> OCID: ...p66kaa <a href="#">Show</a> <a href="#">Copy</a>	0 RULES	Compartment: OBMC	Created: Tue, 11 Apr 2017 04:52:01 GMT	...
--	---	------------	-------------------	--	-----

## Load Balancer

Load Balancing is a useful technique to scale your application horizontally and introduce fault tolerance by providing multiple application sites. Based on a similar concept, Oracle Bare Metal Cloud Services has introduced an automated load balancing service called load balancer service which allows the distribution of traffic from entry point to multiple application servers.


Load balancer service works by provisioning a public IP address across two subnets to provide high availability. Oracle Bare Metal Cloud load balancer is fully scalable service and lets you configure multiple policies specific to your needs. This service can also be used to reduce your maintenance window by moving your workload to a single site while you troubleshoot issues or perform upgrades on the other site.

umansoob ▾ Support Documentation

## Bare Metal Cloud Services

Home | Identity | Compute | Database | [Networking](#) | Storage | Audit

[Create Load Balancer](#)

 ACTIVE	<a href="#">testing</a> OCID: ...rkajuq <a href="#">Show</a> <a href="#">Copy</a>	Public IP: 129.146.11.33	Created: Mon, 10 Apr 2017 18:50:06 GMT	...
---	--	--------------------------	--	-----

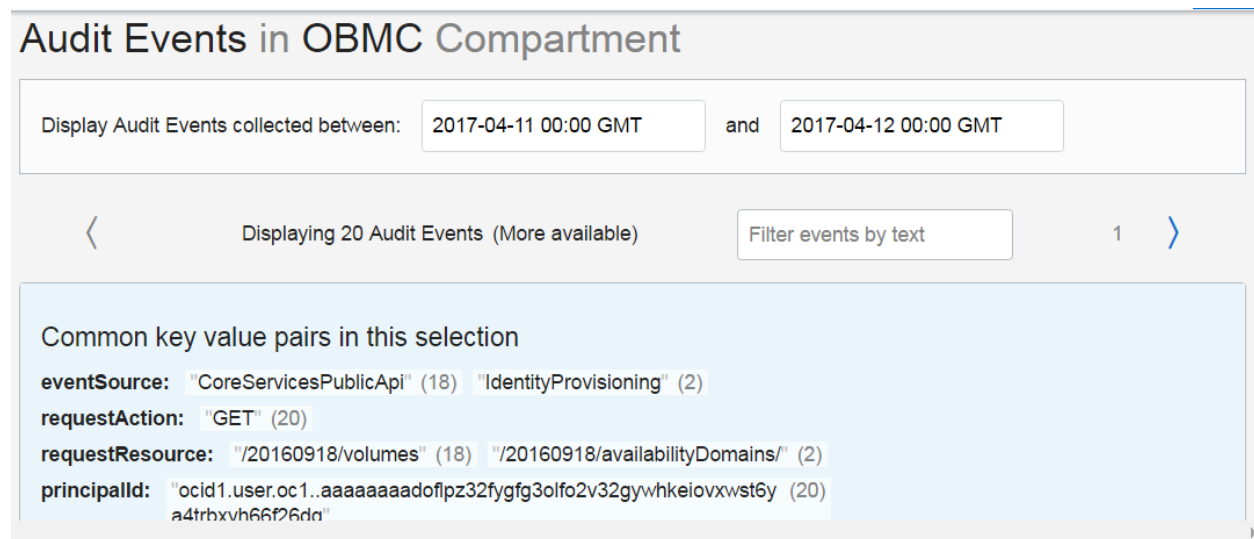
## Audit

Auditing and compliance is another major concern for many cloud customers. With that in mind, Oracle has added an auditing service to its Bare Metal Cloud Services stack which automatically records calls to many Oracle Bare Metal Cloud Services as log events.

## Published in IOUG Select Magazine

As of now, Oracle Bare Metal Cloud audit service supports logging for all the services excluding Object Storage service. The audit service logs many types of events including calls from Oracle Bare Metal Cloud Service Console, Command Line Interface (CLI) and Software Development Kits (SDK).

As seen in the figure below, audit log captures different types of information like activity time, activity target, action performed and responses. An Oracle customer can easily use audit logs to validate their auditing and compliance requirements and help ease their concerns regarding moving applications to cloud.



**Audit Events in OBMC Compartment**

Display Audit Events collected between: 2017-04-11 00:00 GMT and 2017-04-12 00:00 GMT

Displaying 20 Audit Events (More available) Filter events by text 1

Common key value pairs in this selection

- eventSource:** "CoreServicesPublicApi" (18) "IdentityProvisioning" (2)
- requestAction:** "GET" (20)
- requestResource:** "/20160918/volumes" (18) "/20160918/availabilityDomains/" (2)
- principalId:** "ocid1.user.oc1..aaaaaaaadoflpz32fygfg3olfo2v32gywhkeiovxwst6y" (20) "a4trbxvh66f26dd"

## IAM

Access management in your public cloud environment can be a daunting task, especially if your public cloud foot print consists of hundreds of objects including instances, databases and storage volumes. Oracle has introduced an access management service called Identity and Access Management (IAM) to simplify access management task for your cloud environment. You can use IAM service to control access for the following services:

1. Core Services (includes Networking Service, Compute Service, and Block Volume Service).
2. Load Balancing Service.
3. Object Storage Service.
4. Database Service.

## Tenant Admin Policy

Update Version Date

Delete

OCID: ...tcmhda [Show Copy](#)

Version Date: Keep Policy current

Compartment: Meta7POC

Description: Tenant Admin Policy

Created: Mon, 06 Mar 2017 18:53:30 GMT

## Statements

Displaying 1 Statements

Add Policy Statement

ALLOW GROUP Administrators to manage all-resources IN TENANCY

Delete

## Conclusion

Oracle Bare Metal Cloud Services is a next-generation cloud providing you with predictable performance, greater control, greater security and other capabilities you have always used in your on-premise environments at a reasonable cost. It gives you self-provisioned, dedicated and optimized hardware in minutes while satisfying your security and compliance requirements. I hope this article has helped improve understanding and eased some misconceptions and concerns about security and performance in the Oracle public cloud. Good luck!