



ORACLE

Why Oracle Cloud Infrastructure over Microsoft Azure

November, 2021, Version 1.0
Copyright © 2021, Oracle and/or its affiliates
Public

Oracle Cloud Infrastructure is built for enterprises seeking higher performance, lower costs, and easier cloud migration for their applications. Customers choose Oracle Cloud Infrastructure over Microsoft Azure for several reasons: First, Oracle offers customers a high-performance computing platform for their most resource-intensive and performance-sensitive applications. Second, customers can consume their cloud services in the public cloud or within their own data center with Oracle Dedicated Region Cloud@Customer. Third, customers can migrate and run any workload as is on Oracle Cloud, including Oracle databases, VMware, or bare metal servers. Fourth, customers can easily implement security best practices, controls, and automation to prevent misconfiguration errors. Finally, their workloads achieve better performance at a significantly lower cost with Oracle Cloud Infrastructure. Take a look at what makes Oracle Cloud Infrastructure a better cloud platform than Microsoft Azure.

1. High-performance computing cloud platform

Enterprise customers and their most demanding workloads have pushed us to think differently about designing our cloud platform. Oracle Cloud Infrastructure combines the performance of on-premises environments with the elasticity and consumption-based costs of the cloud. The Oracle Cloud Infrastructure platform includes bare metal compute instances, Exadata systems, flexible compute and storage shapes, low latency cluster networks, high-performance storage solutions and file systems, and network traffic isolation – all built from ground-up to improve latency and reduce performance variability for your most resource-intensive and performance-sensitive applications.

CAPABILITY	OCI	AZURE	EVIDENCE
All services support the Availability Zone model?	Yes	No	All OCI services support the Region and Availability Domain model . For all types of service, Oracle Cloud Infrastructure uses the same set of engineering principles to achieve resilience and availability, because the fundamental engineering challenges of building fault-tolerant, highly-available, scalable, distributed systems are the same for all types of service. Only a limited set of Azure services support the Availability Zone model.
Is the cloud platform designed to deliver consistent and predictable performance?	Yes	No	Leveraging “off-box” or isolated network virtualization, OCI provides near-bare-metal performance without oversubscription of network, compute, or memory resources. As a result, customers benefit from reduced jitter, lower latency, higher packets-per-second, and lower CPU overhead. Customers can run their most important enterprise workloads on OCI knowing that they will get consistent and predictable performance. Unlike OCI, accelerate networking is not enabled by default on Azure and only a limited set of computes instances support it. Additionally, Azure storage has far lower IOPS/throughput performance , limiting the viability of deploying critical apps on Azure.
Customizable compute shapes and storage performance?	Yes	No	OCI supports flexible shapes , which enables you to customize the number of OCPUs and the amount of memory granularly in 1 OCPU or 1 GB increments when launching or resizing compute instances. This helps you precisely match resources to workloads, optimizing performance while minimizing cost. This is especially valuable for applications with special needs like unusual core-to-memory ratios or expensive per-core software licensing. Azure Virtual Machine compute instances are available in predefined sizes with no option to customize vCPU counts or memory sizes. Moreover, Azure managed disks are only available in 14 predefined shapes with specific IOPS/throughput restrictions. This implies that

			customers cannot optimize for performance and minimize costs while choosing Azure compute instances.
Dynamically change performance of a block volume without downtime?	Yes	No	OCI Block Volume service's elastic performance feature enables customers to dynamically configure the volume performance for block and boot volumes without any downtime. In contrast, a conversion between Azure SSD Premium and Standard requires a restart of the virtual machine with downtime . Azure recommends to schedule the migration of disk storage during a pre-existing maintenance window.
Customer Reference	Link	<p>“Our 30-day trial of Oracle Database Cloud Service confirmed its potential to move our customers quickly and easily to a SaaS model. We also evaluated various scenarios with Google, AWS, and Azure, but found that Oracle offered lower risk, stronger application performance, and less complexity when scaling.”</p> <p>— Oscar Glennon, Commercial Manager, Kagool Ltd.</p>	

2. Deploy the same public cloud on-premises

Enterprises choose on-premises infrastructure to help meet their regulatory and data sovereignty requirements, to minimize latency, and to ensure local control of resources. They want to leverage the attributes and benefits of the public cloud while combining them with the isolation and security of on-premises infrastructure.

Oracle gives customers the choice to consume their cloud services in the public cloud or within their own data center with [Oracle Dedicated Region Cloud@Customer](#). Unlike Azure Stack Hub, Oracle brings its complete portfolio of public cloud services into your data center so you can reduce costs, upgrade legacy applications with modern services, and help address your most demanding data sovereignty and latency requirements. Dedicated Region Cloud@Customer gives customers the best of both worlds.

CAPABILITY	OCI	AZURE	EVIDENCE
Does your cloud provider offer the exact same services in your data center as their public cloud?	Yes	No	<p>Oracle Dedicated Region Cloud@Customer is a completely managed cloud region that brings all of Oracle’s public cloud services (and Oracle Fusion SaaS applications) into a customer’s data center, helping address data sovereignty concerns. It enables autonomous operation to reduce human error and help maximize the security of your data. Dedicated Region Cloud@Customer delivers truly elastic services, enabling the highest performance and reduced costs with low consumption-based cloud subscription pricing—all while helping you meet your stringent latency and regulatory goals when connecting to existing data center resources.</p> <p>In contrast, only a limited set of services are available on Azure Stack Hub. Moreover, the actual number of services available is dependent on the customer or service provider.</p>

Is your operations and security model for on-premises the same as the public cloud?	Yes	No	OCI operations teams remotely manages Oracle Dedicated Region Cloud@Customer; customers get new capabilities and security updates the moment they are available in OCI public regions. In contrast, Azure Stack Hub is not fully managed end to end by Microsoft , but by customers. Customers do not get new capabilities and security updates when available in Azure public regions.
Is your billing model for on-premises deployment the same as the public cloud?	Yes	No	Dedicated Region Cloud@Customer uses the same billing model as public OCI, where customers only pay for what they use. Oracle manages capacity at no additional cost, as long as customers meet their spend commitment. Customers need to pay for Azure Stack Hub services and separately for OEM hardware . In addition, they also need to pay separately for installation and upgrades.
Are the on-premises services covered by the same SLAs as the public cloud?	Yes	No	Dedicated Region Cloud@Customer offers the same exact SLAs for availability (99.95% uptime), manageability (API error rate), and performance (disk IOPS, network) as OCI public cloud. Azure does not offer any SLAs for Azure Stack Hub or Azure Stack HCI.
Customer Reference	Link	<p>“The choice was pretty simple – there was no other provider that provided the range of services that comes with the Oracle Dedicated Region. We believe we can deliver a modern, scalable and secure solution to help address the Australian government’s needs.”</p> <p>Rob Kelly, Managing Director, Australian Data Centers</p>	

3. Migrate and run any workload as-is, including those that need bare metal or VMware

On-premises, physical servers enable customers to run workloads directly on bare metal server hardware when performance, latency, or security require it, and they want the same options in the public cloud. Most enterprises also run VMware vSphere in their data centers. They want to migrate the workloads running on these physical servers and VMware environments without rearchitecting applications, change familiar software or IT processes, or introduce complexity to their operations. Oracle makes this easy; Azure does not.

CAPABILITY	OCI	AZURE	EVIDENCE
VMware solution with full administrative control?	Yes	No	<p>Oracle Cloud VMware Solution (OCVS) provides a native VMware-based cloud environment, installed within a customer’s tenancy. In OCVS, customers own the ESXi root credentials, as they do with on-premises deployments. Customers control whether—and when—to upgrade their VMware software. They have complete control with the same VMware tools they’re accustomed to, and can keep the same VMware provisioning, storage, and lifecycle policies in the cloud as they do on-premises. OCVS supports up to 64-node VMware clusters.</p> <p>Azure VMware solution does not allow customers to control patches, upgrades or updates to their VMware environment – this can potentially break certification and support for applications running in Azure VMware environments. Additionally, Azure VMware solution</p>

			does not provide host-level access to the VMware Host Client for ESXi Management.
Bare metal servers suitable for any enterprise application?	Yes	No	OCI offers the largest bare metal servers in the public cloud – up to 128 cores, 2 TB of RAM, and 1 PB of storage. These servers are accessible with the same portal and tools, and live on the same networks with direct access to other Oracle Cloud resources. Azure offers dedicated hosts , but no bare metal as a service offering.
High performance bare metal servers with local storage optimized for use cases like HPC?	Yes	No	OCI high performance computing (HPC) bare metal compute instances have a unique direct memory interconnect for remote direct memory access (RDMA) and fast, dense local storage, and the RDMA cluster network provides < 2 microsecond latency across clusters of tens of thousands of cores. RDMA over Converged Ethernet (RoCE v2) is critical to the performance of tightly coupled HPC workloads that depend on message passing (MPI) to exchange data between cluster nodes during large, long-running computations. Azure doesn't offer native bare metal servers for HPC use cases. It recommends using Cray ClusterStor , a 3 rd party solution for a single-tenant, bare metal HPC environment.
GPUs on bare metal servers?	Yes	No	Oracle's GPU-powered bare metal compute instances offer customers a platform for machine learning, image processing, and massively parallel high-performance computing jobs. OCI BM.GPU4.8 shape provide 8 NVIDIA Tensor Core A100 GPUs, 8 x 200 RDMA networking, and 320 GB of GPU memory. Azure does not offer bare metal GPU instances.
Customer Reference	Link	<p>“Altair delivers engineering simulations at its user’s fingertips by leveraging the flexibility and elasticity of cloud computing. Oracle Cloud can deliver up to 20-25% better price performance for our CFD and Structural Mechanics solvers with its bare metal compute offerings with low latency RDMA networking. This helps our customer improve their product development process and bring product to market faster than their competitors without spending capital on upfront hardware purchase.”</p> <p>—Sam Mahalingam, CTO, Altair</p>	

4. Migrate Oracle workloads with confidence

Customers are increasingly migrating business-critical enterprise applications and databases to the cloud to achieve operation efficiency and improve application performance and availability. Customers want to execute these migrations without changing familiar software or IT processes. Unlike Microsoft Azure, Oracle makes migrations easier.

Oracle Cloud provides the best deployment options, highest performance, best availability, and lowest costs for Oracle databases and workloads. In the case of enterprise apps such as ERP, HCM, etc., Oracle offers customers the ability to ramp-up to a SaaS model.

CAPABILITY	OCI	AZURE	EVIDENCE
------------	-----	-------	----------

<p>The highest scalability for enterprise workloads?</p>	<p>Yes</p>	<p>No</p>	<p>Oracle Databases can scale to many times the compute and storage capacity of Azure, up to 1,600 database server cores and up to 2.5 PB database size (without compression) with Oracle Exadata Cloud Service X8M. Exadata Cloud Service X8M provides 1.6 PB PCI NVMe flash storage and up to 96 TB persistent memory.</p> <p>Azure does not offer a managed Oracle Database service and customers need to deploy an Azure virtual machine from the Oracle marketplace image gallery in order to create an Oracle database. The maximum scale for Oracle database on Azure VM is 80 vCPUs, 640 GiB of RAM and 19.2 TB of local NVMe storage (for the Azure Standard L80s v2 instance).</p>
<p>Options to run a managed Oracle Database?</p>	<p>Yes</p>	<p>No</p>	<p>OCI offers fully managed services for Oracle Database, including bare metal and VM database systems, Oracle Exadata database systems, and Autonomous Databases.</p> <p>In contrast, Azure does not offer a managed Oracle database service. Running Oracle database on Azure is customer managed, which results in higher operational costs.</p>
<p>The highest performance for Oracle workloads?</p>	<p>Yes</p>	<p>No</p>	<p>Oracle workloads have the highest performance running on OCI. Exadata Cloud Service X8M supports an industry-leading 12 million read and 5.6 million write IOPS.</p> <p>Azure does not offer a managed Oracle Database service and customers need to deploy an Azure virtual machine from the Oracle marketplace image gallery in order to create an Oracle database. They also need to properly size the VMs to get the best performance: the current maximum limit for IOPS on Azure VMs is 80,000.</p>
<p>The lowest TCO for Oracle Database and applications?</p>	<p>Yes</p>	<p>No</p>	<p>OCI provides the lowest TCO for Oracle Databases and applications. Oracle offers Universal Credits and BYOL2PaaS to help customers bring their existing Oracle software licenses to OCI. Oracle Bring Your Own License (BYOL) is 50% less on OCI than any other public cloud, including Azure. Oracle provides automation tools to ease the migration of Oracle Applications, Database, and Middleware to OCI.</p> <p>Microsoft Azure does not offer Universal Credits or BYOL2PaaS for Oracle software. The automation tools (such as Oracle EBS Cloud Manager and PeopleSoft Cloud Manager) are not available on Azure.</p>
<p>Oracle RAC and Exadata for mission-critical workloads?</p>	<p>Yes</p>	<p>No</p>	<p>OCI is the only cloud where customers can run fully supported advanced database options, such as Exadata and Oracle RAC, for scalability and high availability. Exadata Cloud Service offers the highest performance of any cloud database service. Oracle RAC offers capabilities that include multicasting, UDP for networking, and shared host access to single block volumes for the storage layer.</p> <p>Microsoft Azure has no similar offering to Exadata Cloud Service and Oracle RAC.</p>

Customer Reference	Link	<p>Oracle's Autonomous Transaction Processing Database is the foundation of our solution. It patches, maintains, and tunes itself, providing a more secure environment. We now have reduced our risk with an always-on, always-patched system.</p> <p>— Mark Carleton, CEO, MESTEC</p>
--------------------	----------------------	--

5. Simplify and automate security with our security-first approach

OCI is designed with a zero-trust, security-first architecture. Unlike Azure, OCI provides you with easy-to-implement security controls and automation to prevent misconfiguration errors and implement security best practices. You can secure your workloads and applications in OCI through a diverse portfolio of security services, including identity and access management, data protection and encryption, unified security controls, infrastructure protection, incident identification, remediation, and compliance services.

CAPABILITY	OCI	AZURE	EVIDENCE
Secure enclaves within accounts for the most sensitive workloads?	Yes	No	<p>OCI Security Zones provide a secure enclave within customer tenancies for the most sensitive workloads, where security is mandatory and always on. This helps ensure compute, networking, storage, and database resources comply with security principles, such as always-on encryption, no public access, and automated backups.</p> <p>Azure does not offer any service or feature equivalent to OCI Security Zones.</p>
Do built-in security posture management capabilities provide prescriptive and automated remediation of findings?	Yes	No	<p>Most cloud security failures result from misconfigurations and human error. Oracle Cloud Guard automatically detects security configuration issues across OCI services and can automatically alert administrators or act directly to remediate issues. Cloud Guard is provided at no additional cost.</p> <p>Azure Security Center provides capabilities like scanning and detecting configuration errors and automated alerts but does not provide automated remediation of security findings – customers are responsible for developing custom response and remediation workflows. This manual effort leads to additional operational overhead.</p>
Security services are included without additional costs?	Yes	No	<p>Unlike OCI Cloud Guard and Security Advisor, Azure Security Center charges for securing compute, storage, database, Kubernetes clusters, and security keys, which increases the total cost of Azure services.</p>
Does the cloud vendor offer a key management service with lifecycle management of keys?	Yes	No	<p>OCI Vault is a managed key management service that lets customers centrally manage encryption keys and secret credentials to securely access cloud resources. It includes complete lifecycle management of keys, including automatic key rotation, automatic key expiration, and ability to bring your own keys.</p> <p>Azure Key Vault is a managed key management service, but it lacks complete life cycle management of keys. Azure Key Vault supports automatic key expiration but does not support automatic key rotation –</p>

			customers have to manually rotate keys outside of Azure Key Vault, which leads to higher risk of the keys being compromised.
Easy management of access policies at enterprise scale?	Yes	No	Managing access policies can be extremely difficult as cloud environments grow. OCI simplifies the process by always enforcing least privilege and zero trust principles using compartments and SQL-like, easy-to-understand identity and access management policies . Azure leverages Azure Active Directory to manage authentication and access controls for Azure resources, including granular role-based access control. Azure's security policy syntax is more complex than OCI policy syntax and is not easily understandable by humans.
Customer Reference	Link	<p>"We were immediately impressed with Oracle Cloud Guard—the setup, ease of use, and immediate results about potential misconfigurations. And, of course we appreciate the fact that this capability is available at no cost above the Oracle Cloud Infrastructure investment."</p> <p>— Chris Pasternak, Managing Director, Accenture</p>	

6. Reduce risks with Oracle's unique SLAs

Enterprises demand more than just availability from their cloud infrastructure. Mission-critical workloads also require consistent performance, and the ability to manage, monitor, and modify resources running in the cloud at any time. Only Oracle offers end-to-end SLAs covering performance, availability, manageability of services.

CAPABILITY	OCI	AZURE	EVIDENCE
Manageability SLAs?	Yes	No	The elasticity and configurability of infrastructure is part of why people move applications to the cloud. Your services need to be manageable all the time to deliver this benefit. Oracle provides manageability SLAs to ensure your ability to manage, monitor, and modify resources. Azure does offer any manageability SLA.
Performance SLAs?	Yes	No	It's not enough for your IaaS resources to be merely accessible. They should consistently perform the way you expect them to. Oracle is the first cloud vendor to guarantee performance , so you can rely on our infrastructure for enterprise applications. Azure does not offer any financially-backed performance SLA.

7. Optimize costs with guaranteed pricing and no hidden fees

One of the most common issues faced by Azure customers is the Azure billing surprise, in which a customer receives a bill and finds they owe more than they expected—and can't easily figure out why.

It happens because Azure pricing is complex, expensive at scale, and penalizes customers for hard to estimate usage elements such as data transfer and storage performance, which involves taking volume size, provisioned IOPs, and throughput into account for volumes such as [Azure Ultra Disk](#).

Oracle Cloud Infrastructure provides better performance at a significantly lower cost than Azure. Our pricing structure is simple, predictable, and transparent, with none of surprises associated with Azure. Additionally, OCI charges the

same flat rate for all regions worldwide, which means there are no hidden cost variances if your business expands globally.

Oracle also provides [Universal Credits](#), which enable customers to use any Oracle Cloud Infrastructure or platform service in any region at a significant savings, with a predictable monthly spend commitment. But just because your spend is monthly, doesn't mean your usage has to be: these credits don't expire at the end of the month — they can be used any time during their 12-month contract window.

CAPABILITY	OCI	AZURE	EVIDENCE
Industry-leading pricing for compute, storage, and networking?	Yes	No	OCI offers consistent, transparent, and low pricing globally. OCI standard Intel-based VMs are 50% cheaper than equivalent Azure instances, Block Storage is 98% cheaper and data egress is 95% cheaper than Azure data egress (as of January 2021). Customers can realize significant savings moving their workloads to OCI. Cost comparison: Azure E2s v4 VM (2 vCPU, 16 GiB RAM) v/s OCI VM.Standard2.1 (1 OCPU, 15 GB RAM), Linux, on-demand, US East; Azure Premium SSD P30 (1 TiB, 5000 IOPS) v/s OCI Block Volume 100 GB (6000 IOPS), US East.
Low, consistent pricing globally?	Yes	No	OCI has globally consistent pricing. Oracle designed OCI for a consistent experience, both in performance and cost, wherever you want to deploy. For customers who have applications and workloads running in multiple regions, it is easy to plan and budget for cloud expenditure. In contrast, Azure charges for the same compute instances differently in different regions, resulting in higher costs when running their applications in multiple regions, especially outside of the US. For example, for Azure, the average price per VM per hour in West Europe is nearly 2X the price in US East.
Industry-leading low-cost data egress?	Yes	No	OCI has very low data egress charges, as the first 10 TB are free, and low cost per GB thereafter. Azure has significantly higher data egress charges . Only the first 5 GB is free, and the cost per GB thereafter are high. For 100 TB data egress, Azure data egress charge is 10X more than OCI's data egress charge. In addition, Azure has a significantly higher inter-region data transfer pricing as compared to OCI.
Rewards program for cloud consumption?	Yes	No	Lower your cloud costs over Azure with OCI. Oracle Support Rewards make OCI even more affordable. For every dollar spent on OCI, Oracle reimburses up to 33 cents on license support. The program is valid for the duration of the customer's contract and can be extended upon renewal. Many customers have the potential to wipe out their support bill completely by migrating a handful of workloads. Azure has no similar offering to Oracle Support Rewards.
Customer Reference	Link		"As video meetings quickly became the connective tissue of today's new world, we saw our user count soar. To support that exponential growth, we looked at several platforms and chose Oracle Cloud infrastructure for its strong security, outstanding price/performance, and world-class support".

— Vik Verma, CEO, 8x8

Click here to start a free Oracle Cloud Infrastructure trial → <https://www.oracle.com/cloud/free/>

Connect with us

Call +1.800.ORACLE1 or visit [oracle.com](https://www.oracle.com). Outside North America, find your local office at: [oracle.com/contact](https://www.oracle.com/contact).

 blogs.oracle.com

 facebook.com/oracle

 twitter.com/oracle

Copyright © 2021, Oracle and/or its affiliates. All rights reserved. This document is provided for information purposes only, and the contents hereof are subject to change without notice. This document is not warranted to be error-free, nor subject to any other warranties or conditions, whether expressed orally or implied in law, including implied warranties and conditions of merchantability or fitness for a particular purpose. We specifically disclaim any liability with respect to this document, and no contractual obligations are formed either directly or indirectly by this document. This document may not be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without our prior written permission.

This device has not been authorized as required by the rules of the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased, until authorization is obtained.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group. 0120