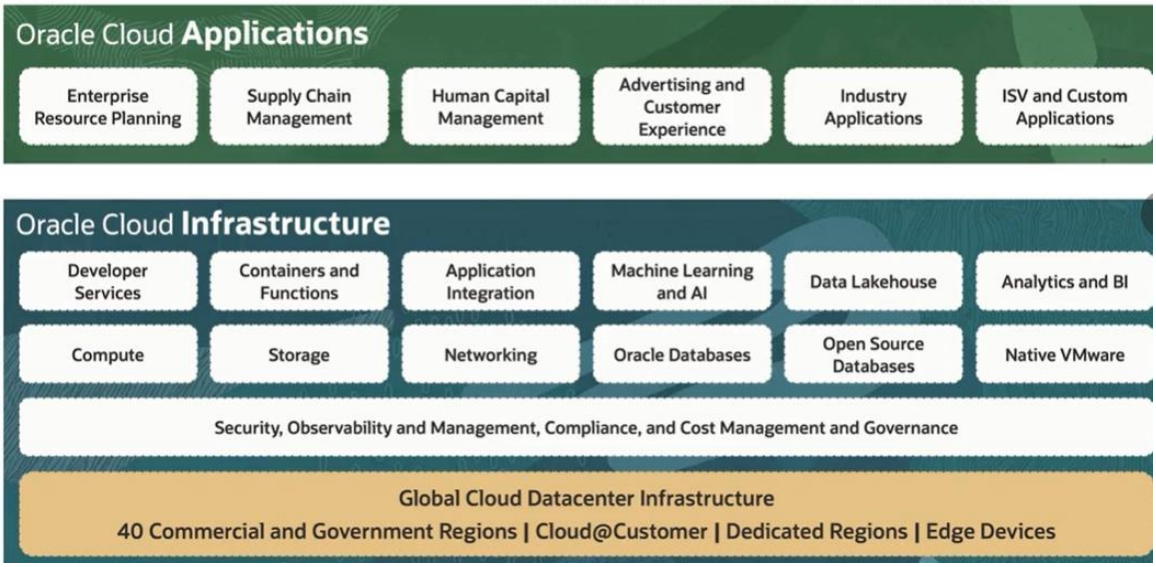
Oracle Cloud is classified into two main categories:

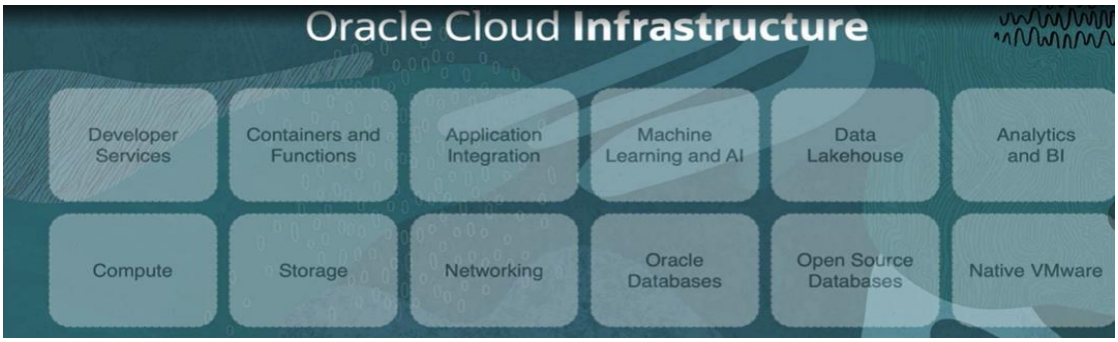
1-Oracle Cloud Infrastructure

2- Oracle Cloud Applications



Oracle Cloud Infrastructure (OCI):

these are infrastructure and platform services that are designed to run any type of application. It could be a modern cloud-native application or service or any other mission-critical workloads.



The global cloud data center infrastructure is the physical foundation organized into geographic regions that comprise the OCI platform.

core services of OCI

1-Compute: provides compute capacity with CPUs and memory, often provisioned as VM.

2- storage:provides different service types for securely storing your data

3-networking: allow you to manage and scale public or private networks, providing all sorts of connectivity options for any internal or external component.

Other critical components:

databases are always a critical component, where you would organize and store information

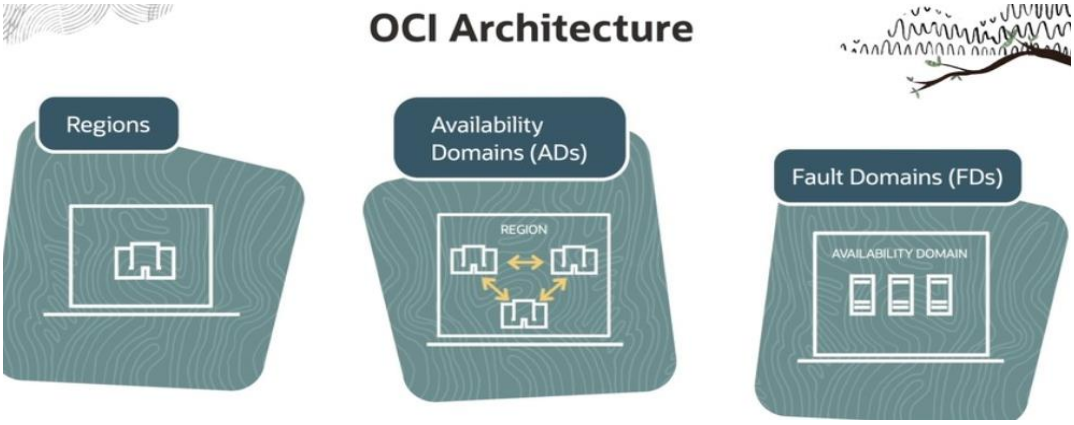
Oracle Cloud applications: suite of SaaS applications with embedded AI bring consistent processes and a single source of truth across the most important business functions , help you improve your customer engagements, increase your business's agility, and react to change faster than ever before

Oracle Cloud infrastructure architecture.

There are three main constructs of this physical architecture of OCI-

1- regions : represents a localized geographic area that is comprised of one or more availability domains
2- availability domains(ADs): set data centers located within the OCI region, These availability domains are connected to each other by a low latency, high bandwidth network.
3- fault domains (FDs):which is a grouping of hardware and infrastructure within each availability domain.

All domains allow you to distribute your cloud resources, such as compute instances to ensure that they are not all running on the same physical hardware within a single availability domain, helping to avoid any single point of failure.



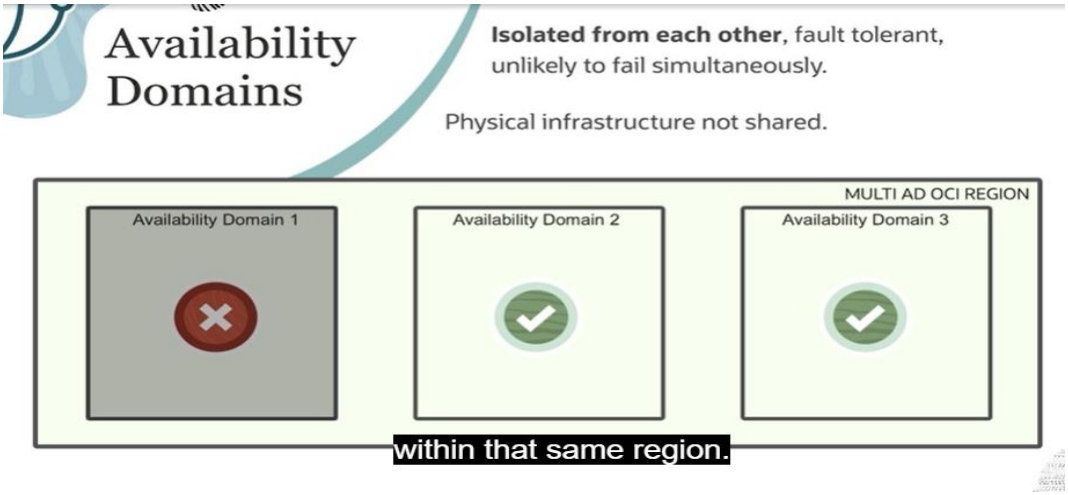
criteria for choosing a particular region:

-location

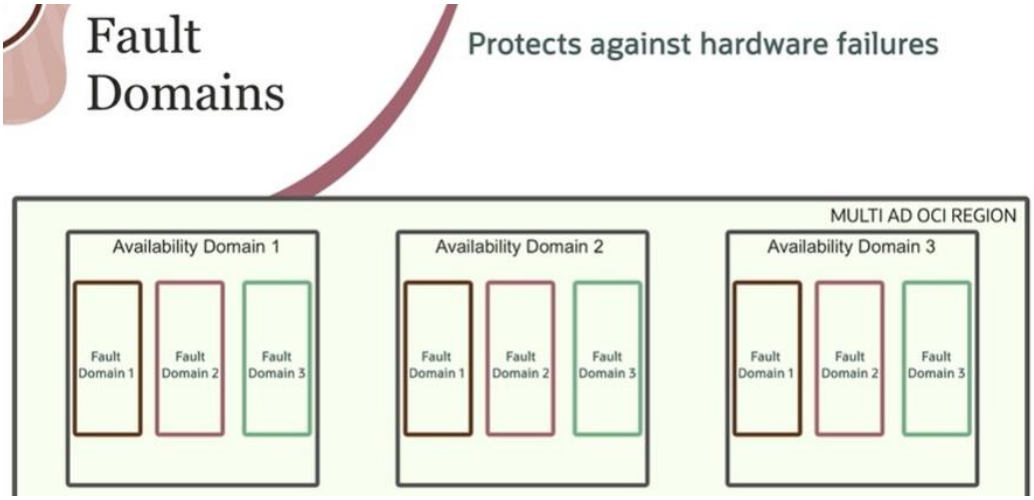
-regulatory compliance :for storing your enterprise data. There are several countries that have very strict data residency requirements. So, of course, you'd select a region located in that country if that was the case.

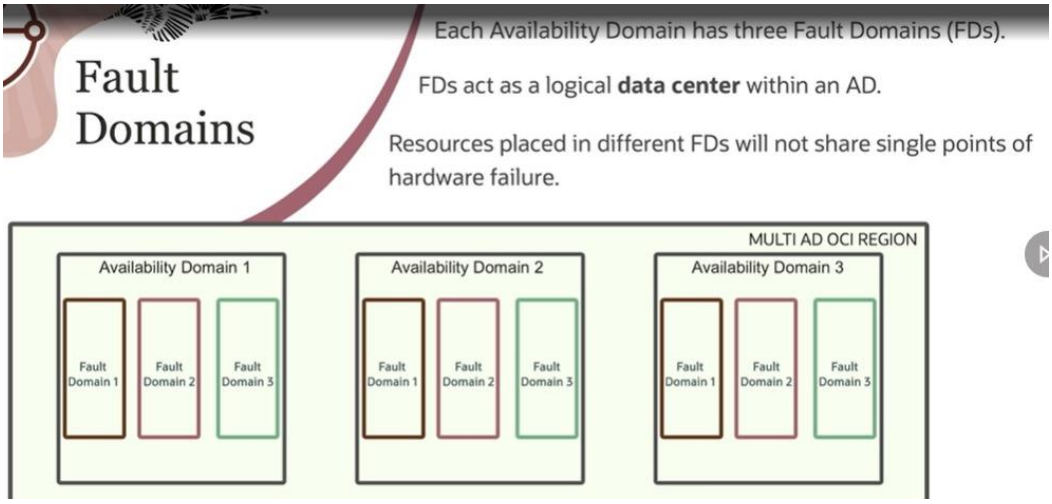
-OCI service availability: some services are not offered everywhere

available domain is one or more data centers located within a region. However, these availability domains are still isolated from each other providing fault tolerance. Therefore, it becomes very unlikely for more than one availability domain to fail at the same time. This is made possible because the physical infrastructure of the availability domain, such as the power or cooling and the internal network, they are not shared with another availability domain. This means that a failure at one availability domain does not impact resources running on other availability domains within that same region.



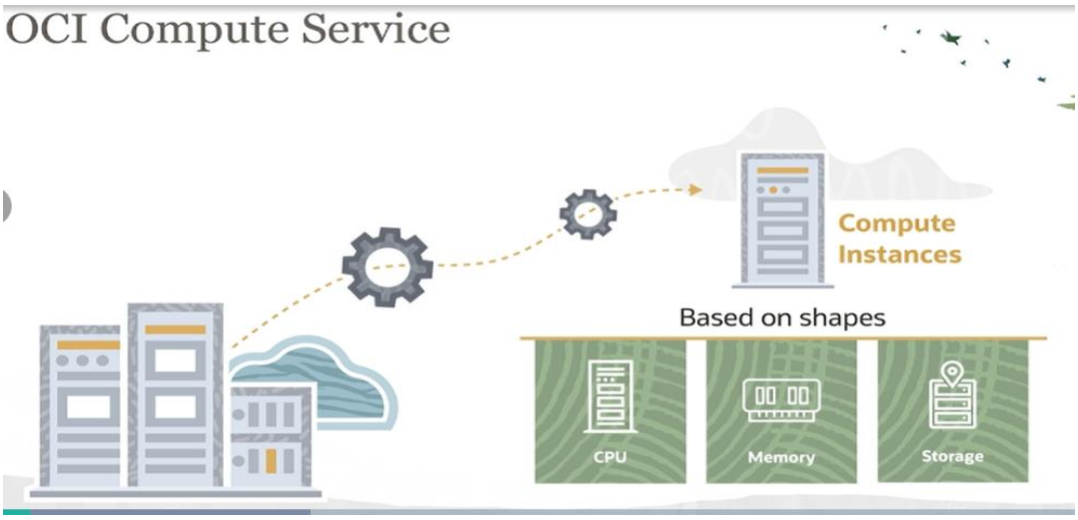
fault domains, is a grouping of hardware and infrastructure within an availability domain. You control the placement of your infrastructure resources, such as VM or cloud storage to specific fault domains as you're configuring the provisioning of those resources.





OCI Compute allows you to create and manage compute resources, which are also known as compute instances. So what are compute instances? Simply put servers.

These are where you can deploy your applications and workloads.

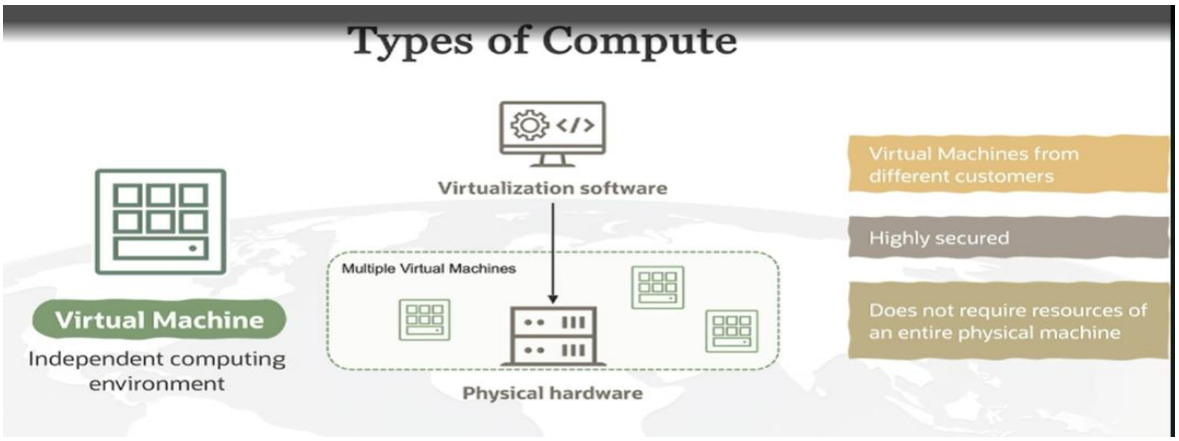


Computers considered as the foundation for many other OCI services, you then simply create an instance, access it securely from your computer, and perhaps install an application. Compute instances are based on shapes that determines the type and number of CPUs, the amount of memory, and for physical machines, the size of their attached storage.

Tenancy (tenant) in cloud computing refers to the sharing of computing resources in a private or public environment that is isolated from other users and kept secret.

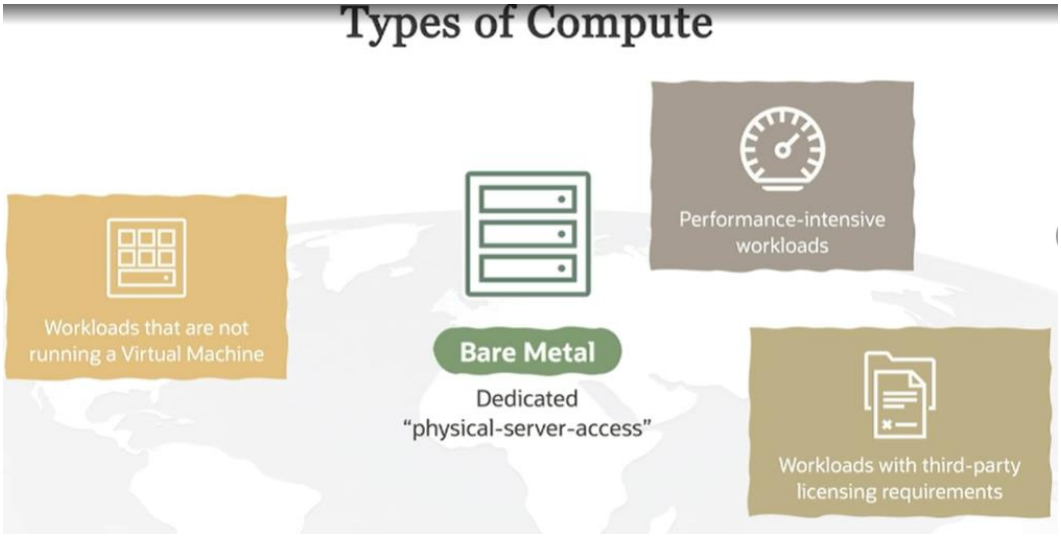
types of compute instances—

virtual machine :is a logical server that runs on top of a physical bare metal server, which means there are multiple VMs that can be running within a single physical server.

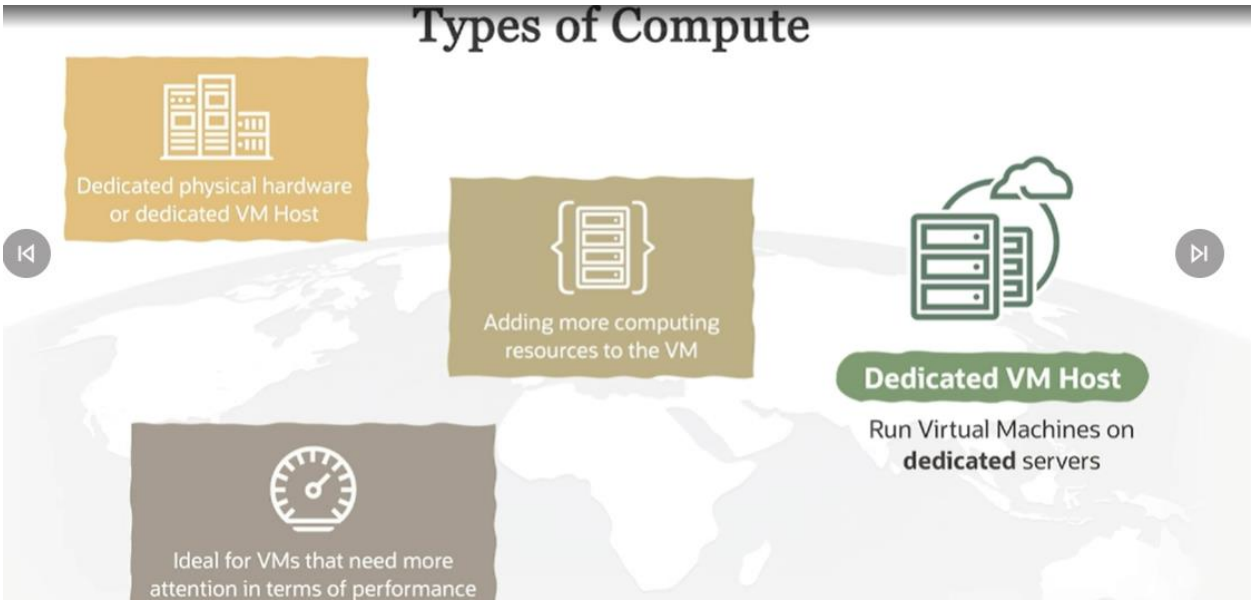


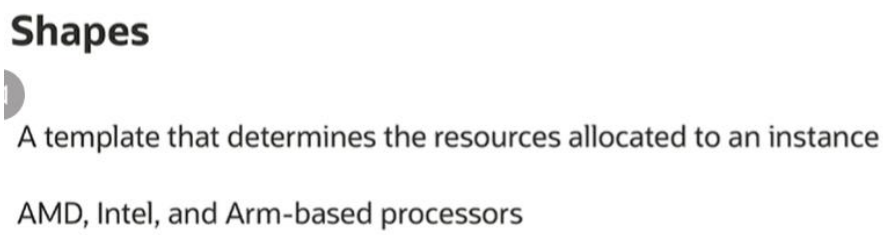
bare metal machine;

Here you're provided a dedicated physical server for the highest performance.You would use bare metal for workloads that are too CPU-intensive to run on a VM or for running third-party apps that require separate hardware, or you might have a requirement to run performance-intensive workloads.



dedicated VM host:allowing you to run your VMs on a dedicated server as opposed to them running on a shared physical server





types of shapes:

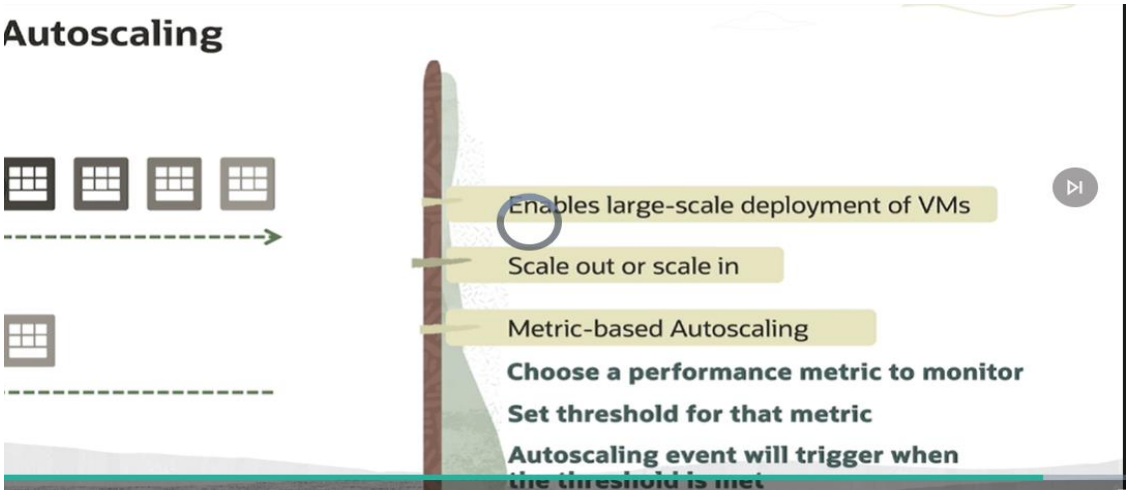
Fixed shapes are a specific number of CPUS in memory and cannot be customized. And this applies to all bare metal physical instances, of course, there are fixed size, but VMs can also select a fixed shape as well.
Flexible shapes allow you to customize the number of CPUs and the amount of memory you nee d, but this is only an option for virtual machines.

Another option for virtual machines is called

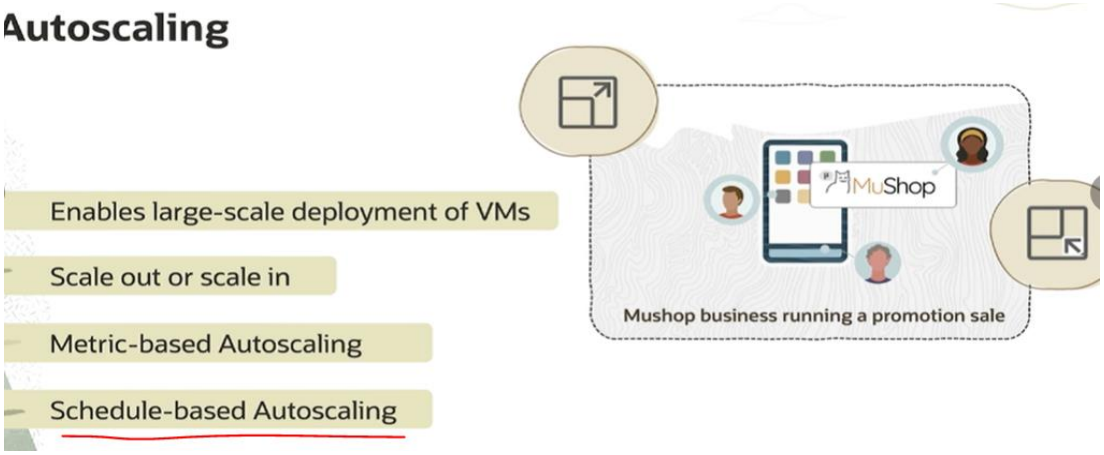
vertical scaling:which allows you the ability to scale up or scale down.this simply means that you can change the shape or size of the VM to something smaller or something larger.

horizontal scaling, which we call autoscaling :

since you can automatically add more compute instances of the same shape,ex: expanding from o ne VM to four virtual machines, or you could also reduce the number of compute instances from four VMs back to one. A primary use case for autoscaling is that it enables large-scale deployments of virtual machines, allowing you to scale out or scale in automatically.



define specific times of the day or perhaps certain days of the week to automatically increase or decrease the number of compute instances



types of storage service:

block volumes:

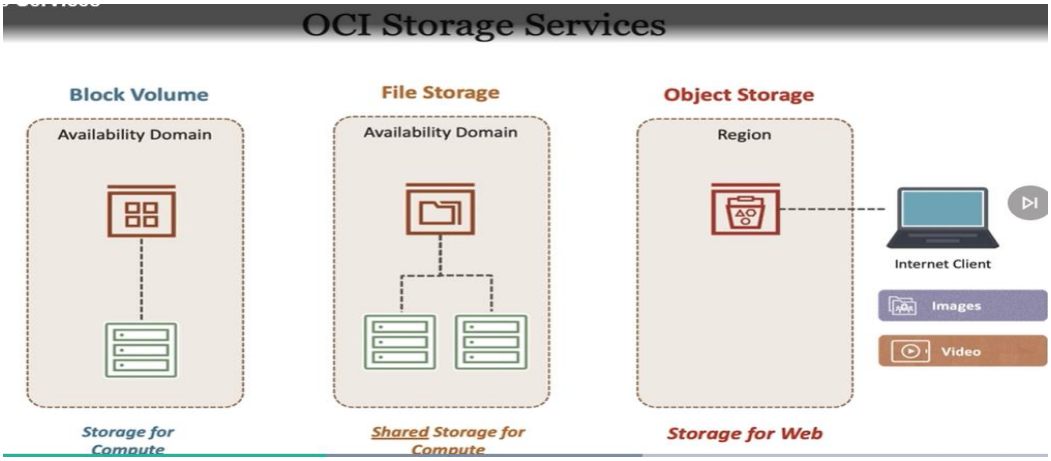
Anytime you have a computer, you usually use a hard drive for storage. But for your provisioned OCI Compute VMs, there is no hard drive. Instead, through the Block Volume service, you can create a virtual logical disk that you can attach to the VM.So like a hard drive, it is only used by t hat compute instance.

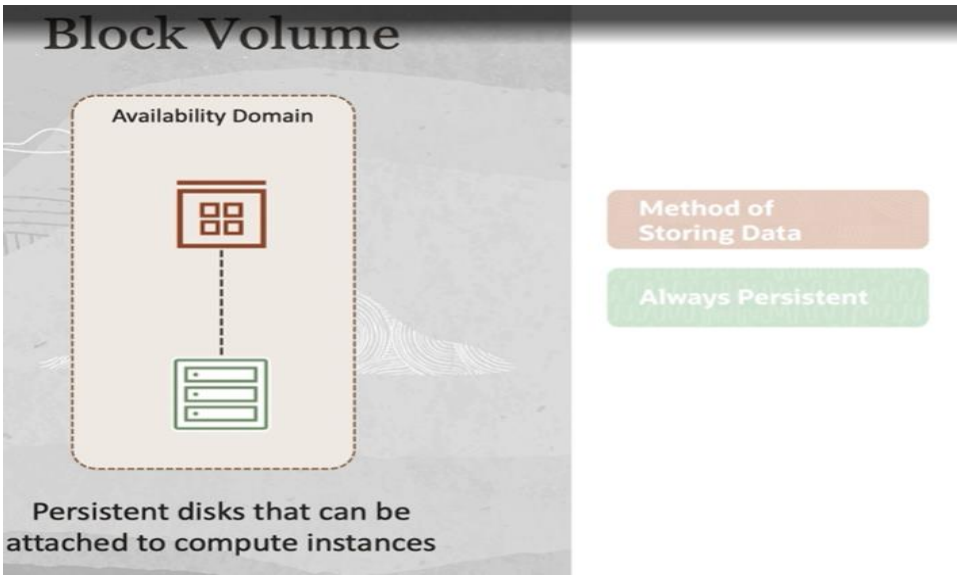
file storage:

This is another type of virtual storage, but this can be accessed from one or more VMs or any oth er OCI Compute instance type, such as bare metal machines

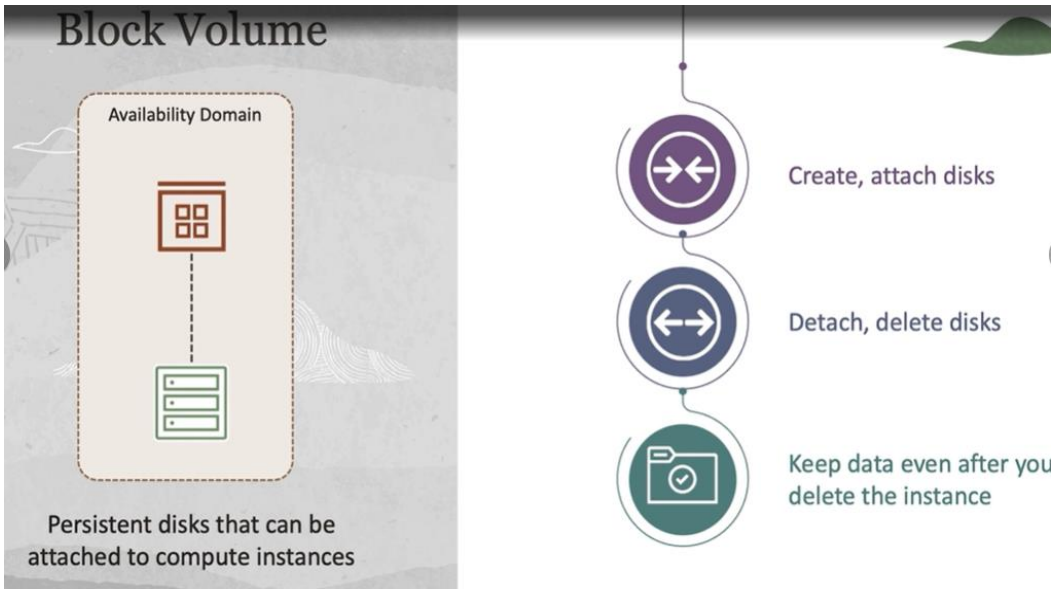
object storage:

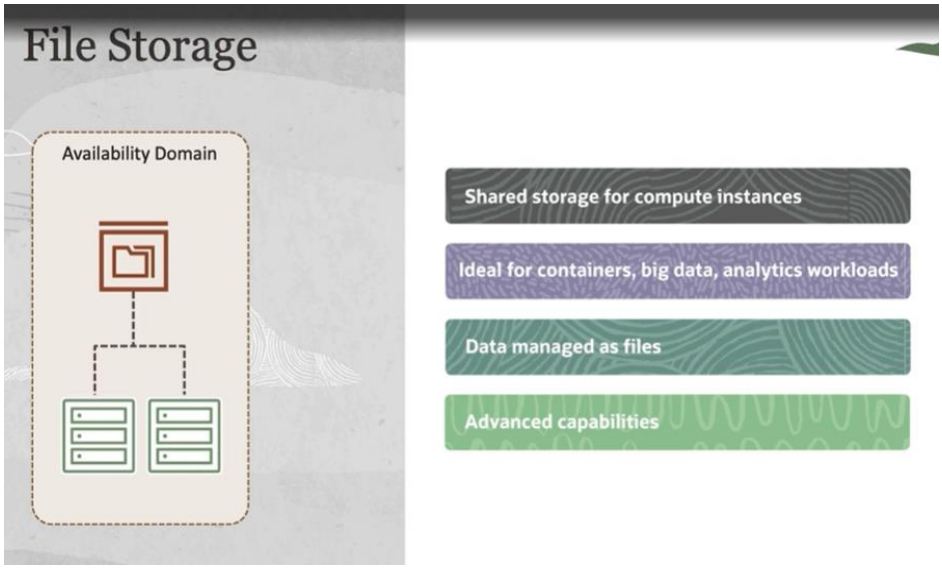
which can be accessed from anywhere to include a remote internet client like a web browser. An other difference is that files are stored as objects, which can be anything to include images, video s, or any other type of file, typically used to support web and mobile-based applications.



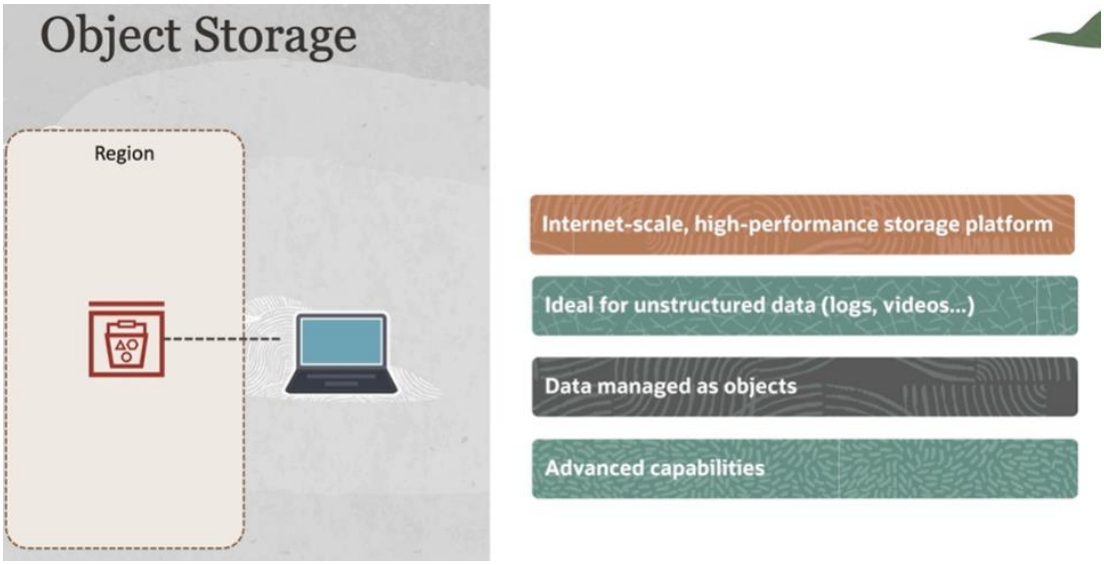


The block volume disk that you attach to your virtual machine compute instance is always persist ent, which means that even after deleting that compute instance, you can still keep that volume di sk intact and use it later for another VM.





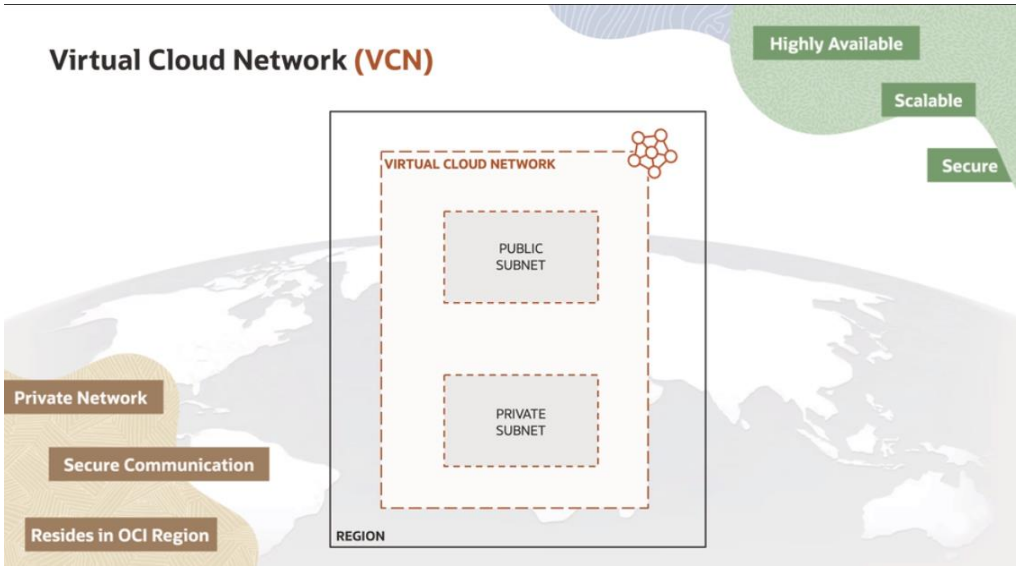
the object storage service provides internet-scale, high-performance storage, which is reliable, and it provides more cost-efficient data durability options. Object storage is most often used for storing unstructured data, such as image files or videos or log files. And as in its name the data is managed as objects where these objects are stored in a construct called buckets. A bucket can be considered similar to a folder that's used to contain these objects, and it provides several advanced capabilities which makes this a reliable and durable storage platform.

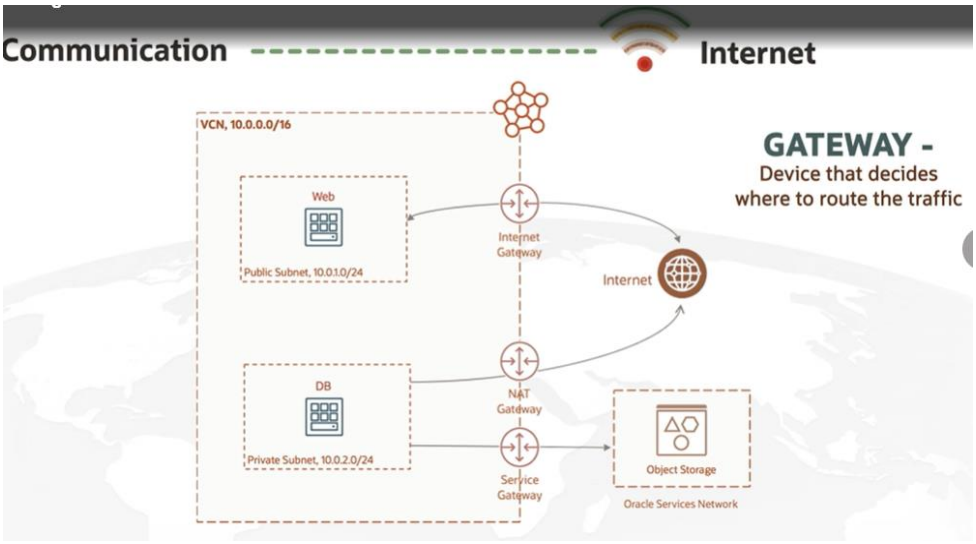


The core resource you can provision for network computing is aptly called a Virtual Cloud Network (VCN)

The VCN represents a traditional network, meaning it has all the features of a physical network. You can configure constructs, such as public subnets and private subnets

the VCN itself is defined as a virtual private network that you can set up for secure communications between resources. It is a regional service, which means a VCN resides in a single OCI region. Fortunately, you can use a VCN across multiple availability domains that belong to that OCI region.

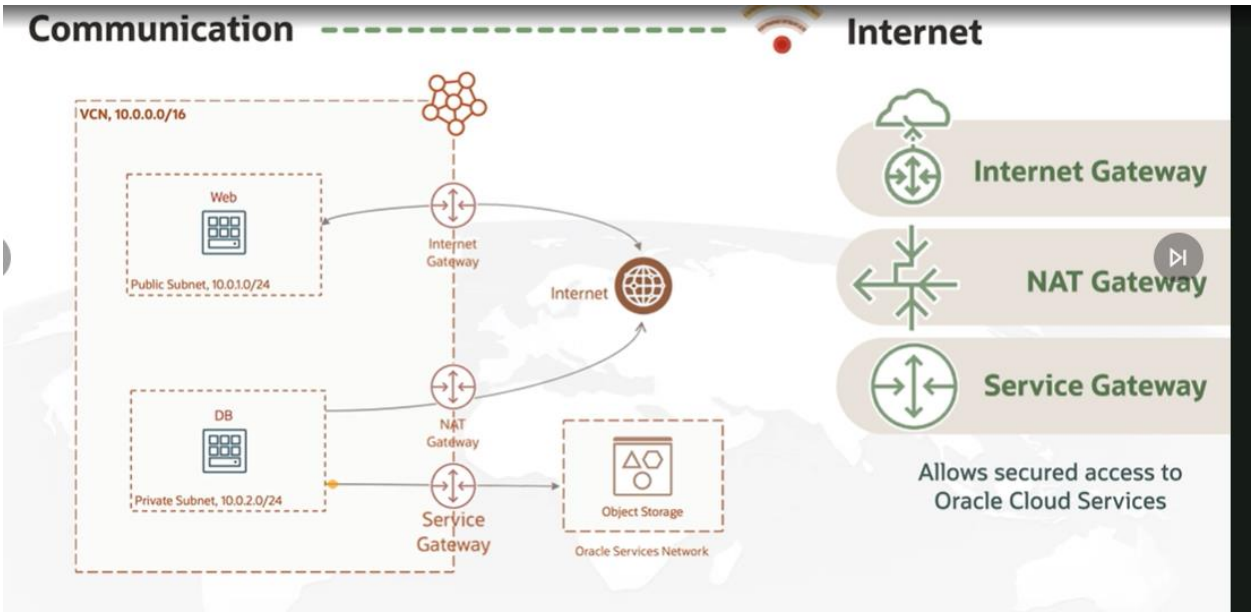




internet gateway is a virtual router that provides internet connectivity for resources inside your VCN as long as they're assigned to a public subnet.

A network address translation gateway is another type of virtual router that's often used by instances running in private subnets. It provides for connections only to the internet. That means it will not receive any inbound connections initiated from external internet clients. You often use the NAT gateway for use cases, such as the need to install updates or patches on your compute instances.

a service gateway allows resources in your VCN, either in a public or private subnet to securely access various other Oracle Cloud Services, such as object storage as shown here through an internal network, and thus bypassing the internet altogether.



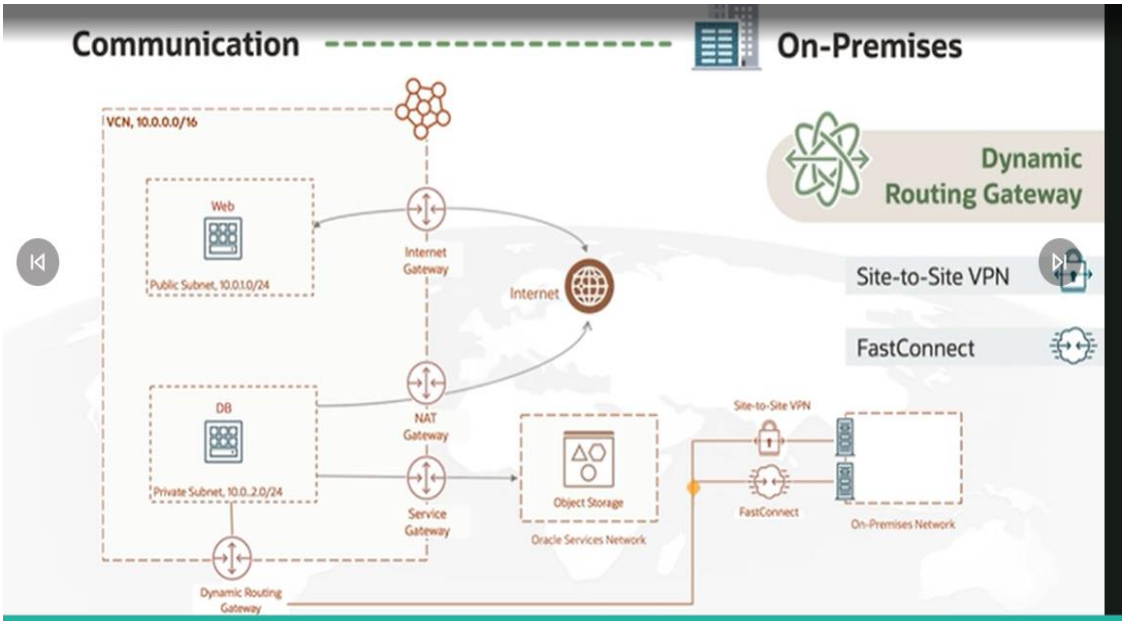
connectivity between resources in your VCN and your on-premises data center.

there are plenty of use cases where your cloud-based applications or services may need to communicate with legacy systems running on your on-premises network.

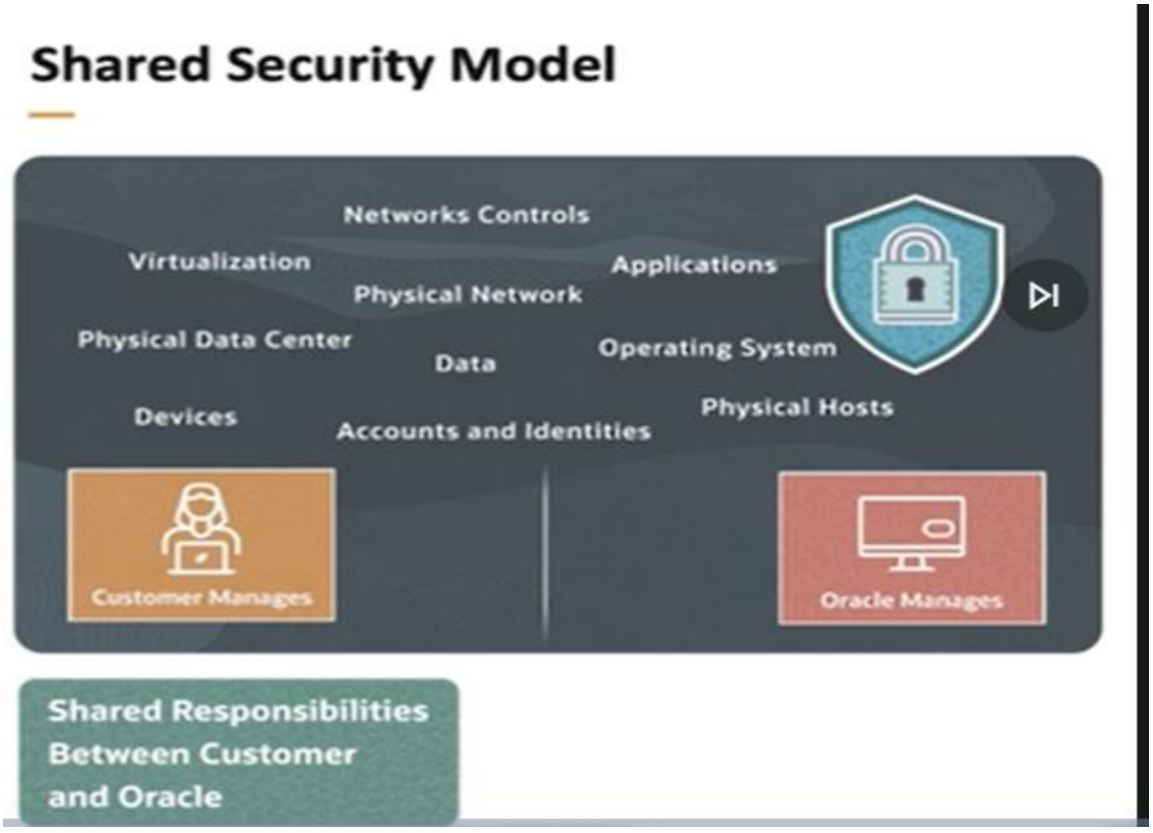
A Dynamic Routing Gateway (DRG): acts as a virtual router, providing a path for traffic between your on-premises networks and VCNs, and can also be used to route traffic between VCNs

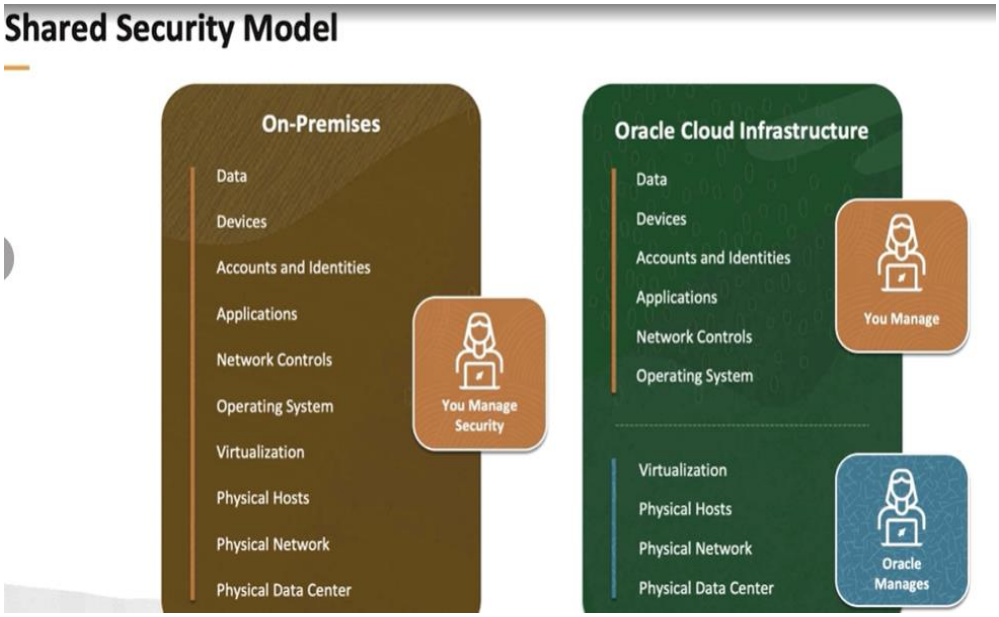
Setting up a site-to-site VPN in (OCI) involves several steps.

1- Create Virtual Cloud Network (VCN): Start by creating a VCN if you haven't already. The VCN acts as the virtual network in which your resources reside.
2- Create Subnets: Within the VCN, create subnets for your different types of resources (public, private, etc.).
3- Internet Gateway (IGW) and Route Tables: Set up an Internet Gateway if your resources need internet access. Configure route tables to direct traffic appropriately.
4- Dynamic Routing Gateway (DRG): Create a DRG, which serves as the connection point for your VPN. Attach the DRG to your VCN.
5- VPN Connect: Configure the VPN connection. You'll need to specify details like the DRG you're using, your remote network's details (such as IP address ranges), and the type of VPN (IPsec VPN or FastConnect).
6- Customer-Premises Equipment (CPE) Configuration: Configure your on-premises router/firewall to establish the VPN connection with OCI. This involves setting up the VPN tunnel with the information provided by OCI, such as IP addresses, encryption settings, and pre-shared keys.
7- Security Lists and Network Security Groups: Define security rules to control traffic flow between your on-premises network and OCI resources. This includes configuring security lists for subnets and Network Security Groups for instance-level security.
8- Testing and Monitoring: Test the VPN connection to ensure connectivity between your on-premises network and OCI resources. Monitor the connection for performance and reliability.
9- Backup and Disaster Recovery: Implement backup and disaster recovery strategies for your VPN configuration to ensure business continuity.



OCI services that provide support for end-to-end security for Oracle Cloud customers.





the network firewall service is a cloud native firewall that can control all types of traffic into your applications. The second layer of security services involves identity and access Management. By default, access to all cloud resources is completely restricted. No one can access them. But you can explicitly grant access to one or more resources using IAM policies. You can create user accounts and groups and set policies to allow them the most restrictive access to just the specific cloud resources they need.

The next layer of protection involves operating systems and workloads. For example, the Bastion service provides a secure way to access target resources in private networks. OS management services allow you to manage and monitor updates and patches for operating system environments.

Data protection is another critical layer for security. Vault key and secrets management services are used to centrally manage and maintain control of encryption keys used to protect enterprise data as well as secret credentials that are used to securely access resources. Data Safe provides a complete and integrated set of features for protecting sensitive and regulated data in Oracle Cloud databases.

there are security services that can be leveraged for detection and remediation. For example, Cloud Guard is a cloud data service that helps customers to maintain a strong security posture in Oracle Cloud. And the Vulnerability Scanning service can be used to routinely check hosts and container images for potential security vulnerabilities.

database services in oracle cloud:

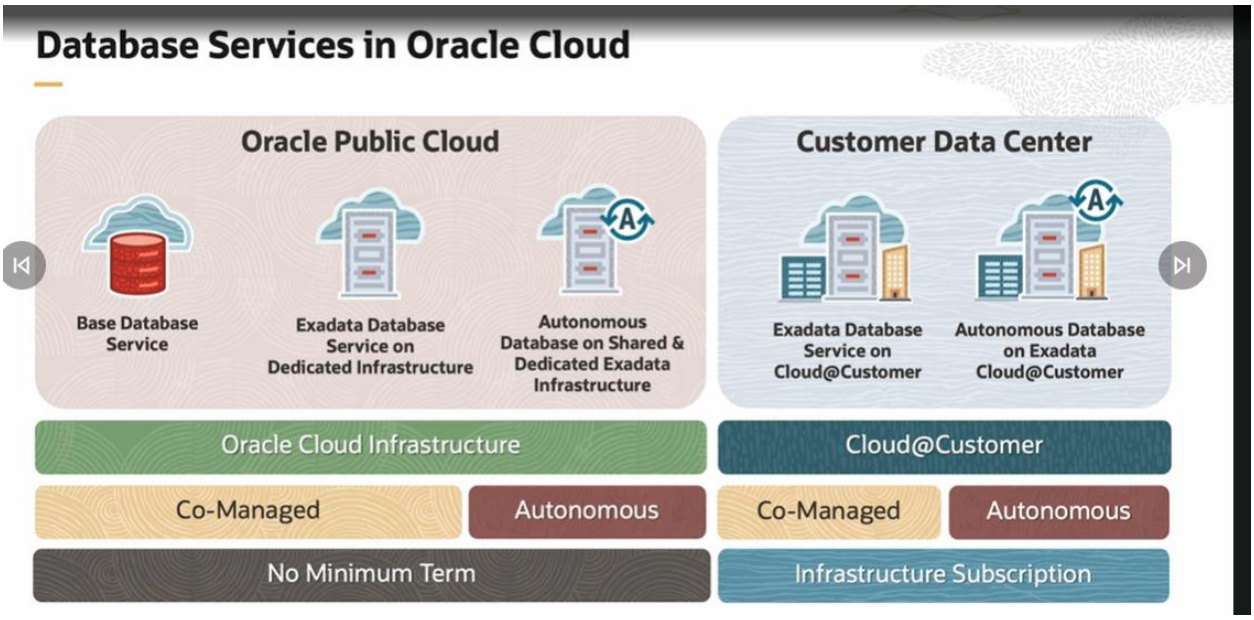
Base Database Service: It is built on standard compute and storage options, and it offers both Oracle Database Standard and Enterprise Edition.

- It's typically for workloads with smaller processing and storage requirements.

Exadata Database Service on dedicated infrastructure in the public cloud and Exadata Cloud@Customer. They are both built on the Exadata platform and, as a result, offer the highest performance scale and availability. Now Exadata Cloud@Customer offers the same cloud economics and cloud automation as Exadata Database Services on dedicated infrastructure in Oracle public cloud. But it's deployed in customer data centers.

Autonomous Database: which is fully autonomous and managed by Oracle and is available both in Oracle public cloud on OCI and in the customer's data center on Exadata Cloud@Customer. Now when you create an Autonomous Database, you can deploy it to one of two kinds of Exadata infrastructure, shared and dedicated.

An autonomous database is a cloud database that uses machine learning to automate database tuning, security, backups, updates, and other routine management tasks traditionally performed by DBAs. Unlike a conventional database, an autonomous database performs all these tasks and more without human intervention.



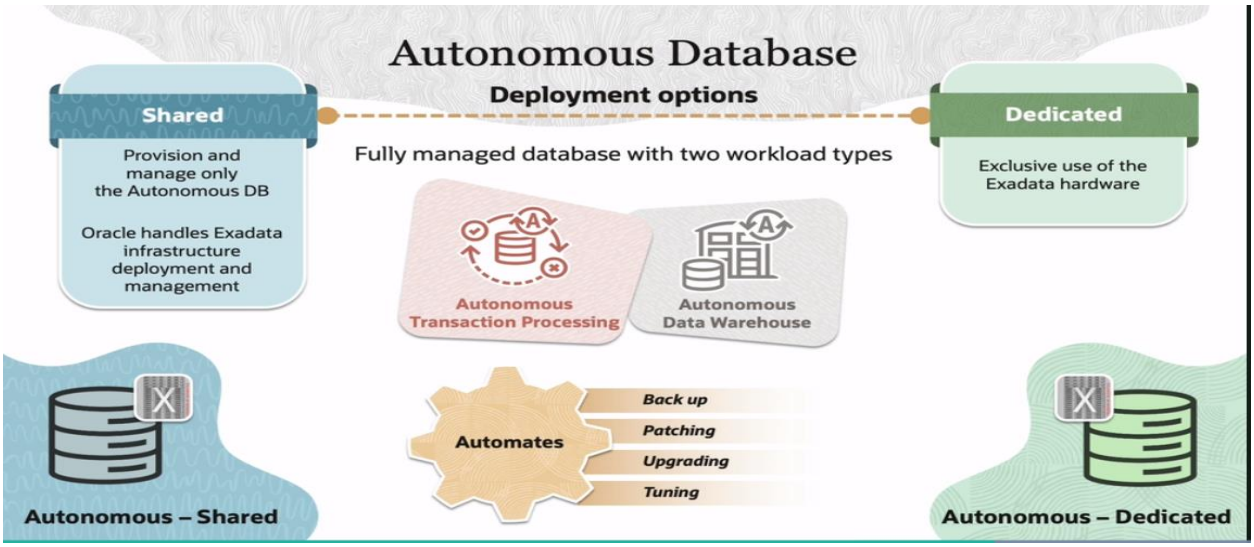
workload types--

1- Autonomous Transaction Processing, which is built for transactional workloads
2- Autonomous Data Warehouse that is built for decision support and data warehouse workloads.

deployment options:

1- dedicated, where you have exclusive use of the Exadata hardware.
2- shared where you can provision and manage only the Autonomous Database, while Oracle is going to handle Exadata infrastructure deployment and management.

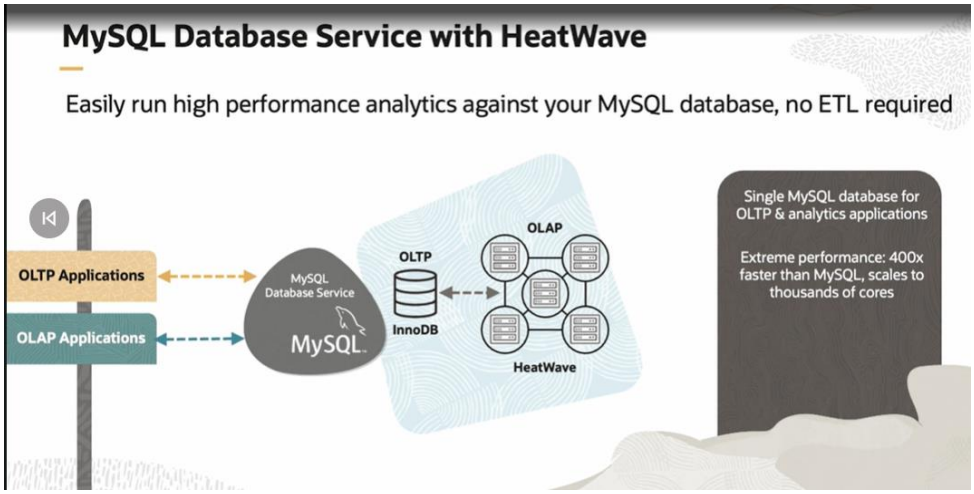
more workload types, which is JSON and APEX, which are supported only on shared infrastructure.



What is Heatwave in MySQL?

One MySQL cloud database service for transactions, real-time analytics across data warehouses and data lakes, and machine learning (ML)—without the complexity, latency, risks, and cost of extract, transform, and load (ETL) duplication.

MySQL HeatWave. It's a fully managed database service that enables customers to run OLTP, OLAP, and machine learning workloads directly from their MySQL database. It's powered by the integrated HeatWave in-memory query accelerator, and it's the only Cloud native database service that combines transactions, analytics, and machine learning services into MySQL database and, in turn, delivering real-time secure analytics without the complexity latency and cost of ETL duplication. And it also accelerates MySQL queries by 400 times.



Developer Services.

Cloud Native :

refers to an application that was designed to reside in the Cloud from the very start

the building blocks of Cloud Native applications:

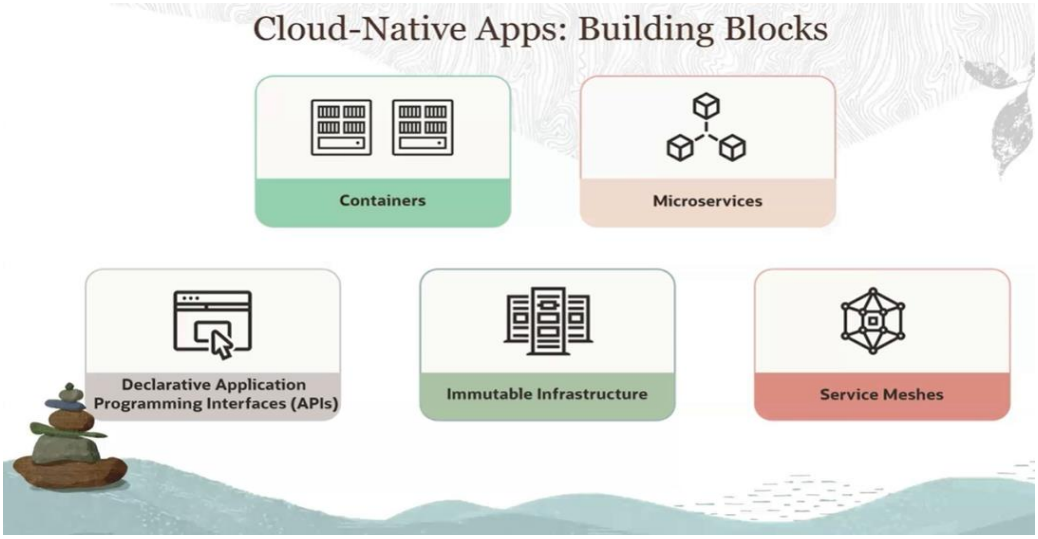
1- Containers are software packages which ideally perform well-defined task.

2- Microservices. Think of it like an approach to software development, where software is composed of independent services that communicate over well-defined APIs.

3- we have Declarative Application Programming Interfaces(APIs). A Declarative API is basically a desired state system. You provide a certain state you want the system to create and you don't care about all the steps that is needed to achieve that state.

4- Immutable Infrastructure. This is an approach to managing services and software deployments on IT resources, wherein components are replaced rather than changed. So whenever any change occurs, the application or service is effectively redeployed.

5- service Mesh. It's basically a way to control how different parts of an application share data with one another. So these features that we discussed enable loosely coupled systems that are resilient and manageable.



Developer Services.

Containers and Artifacts: used for managing containerized applications. They are associated resources and they are deployments.

Functions :hosts applications while abstracting from the actual servers.

OCI also provides a comprehensive set of services to manage the lifecycle of APIs.

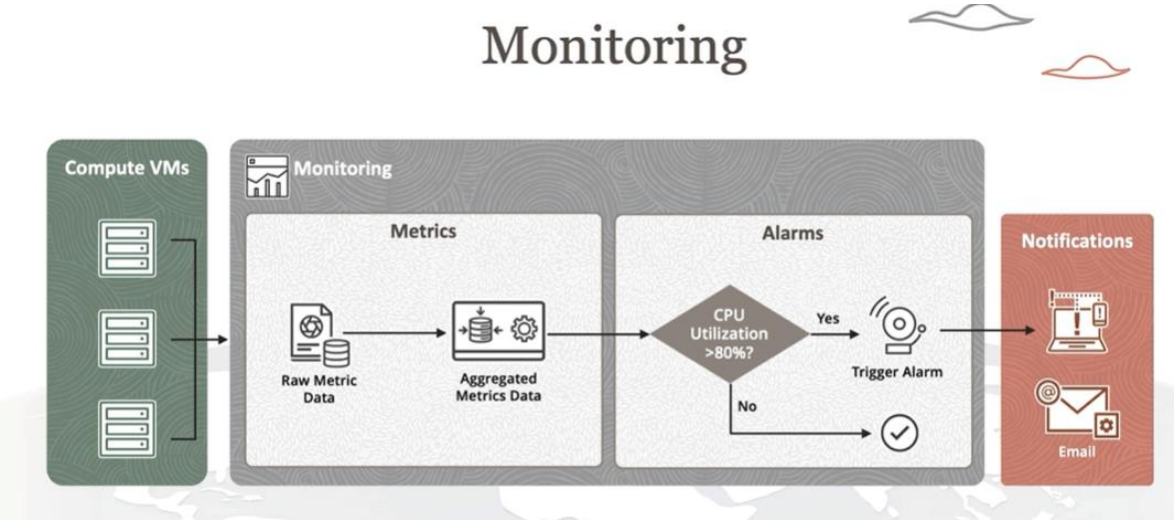
OCI DevOps service, which is a complete continuous integration and continuous delivery platform for developers to simplify and automate their software development lifecycle.

Resource Manager: that lets you deploy infrastructure as code with managed Terraform.

Developer Resources: which are tools for writing applications that leverage OCI directly.

OCI Observability and Management:

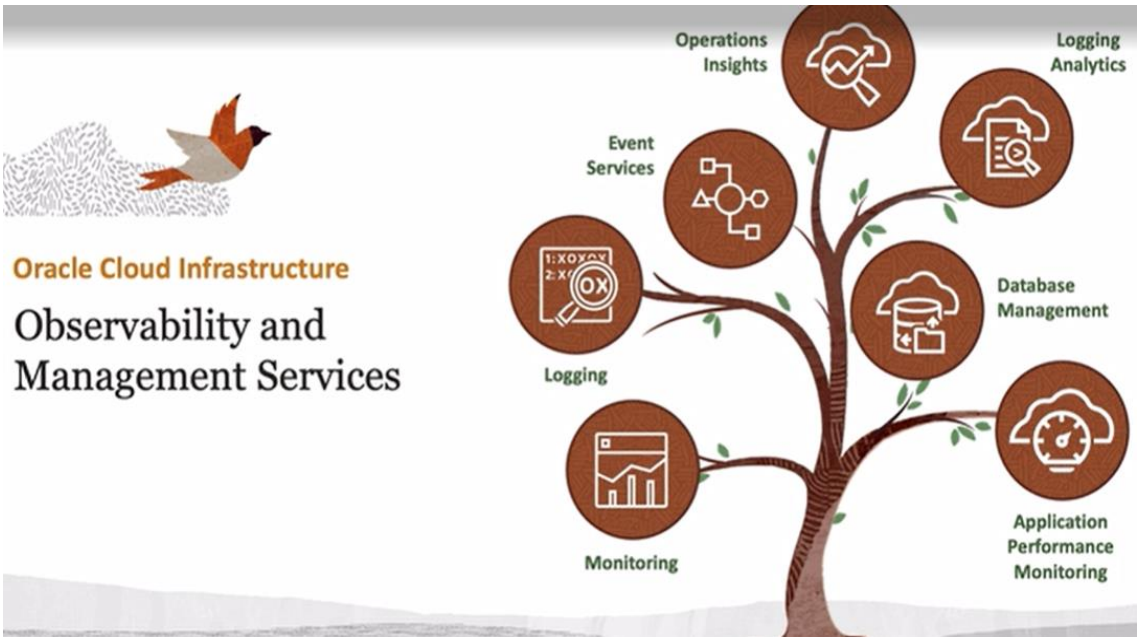
the three foundational services:monitoring, logging, and events

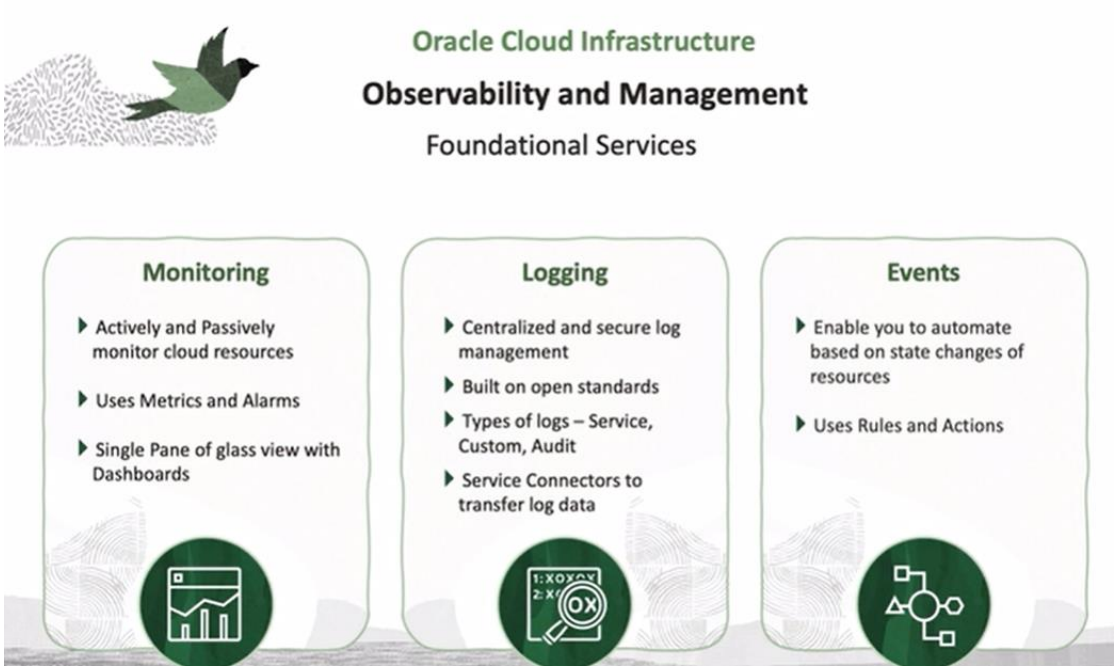


Observability: is the ability to understand the internal state of a system by performing a deeper analysis of the collected dat

there are four conceptual observability pillars of data:

1- **metrics**. is simply raw data about some system or component, such as resource utilization, CPU use, or memory consumption. Or it could be data about the amount of storage that has been used.
2- **Logs**: These are usually created automatically and are used continuously by any system, such as a vms or a network or even an application. It can be anything. These logs typically provide a timestamp and detailed information as to what is happening at that moment in time. For example, if an application is trying to connect to another application, this will be captured in the log.
3- **Traces**: These are similar to logs, except they are not scoped to a single system or application. Instead, traces provide data about how separate components are operating and performing with one another. For example, if a user tries to connect to an application running in a VM, trace information would have details about the connection, such as how they connected and from which device the connection was made.
4- **Events**: Events are similar to both metrics and logs in that they produce data associated with a specific resource but indicate what specific action has occurred. For example, when a new compute VM is created, a VM Create Event is produced with all of the associated metadata about that event. Other examples include deleting a VM, creating or deleting an object storage bucket, or adding a dynamic routing gateway to a VCN.





Monitoring:

Active monitoring involves the collection of raw metrics about a resource. And then you can create alarms to trigger a notification.

Passive monitoring involves the creation of dashboards to collect and display those metrics that provide a graphical view of the collected data. Next, the OCI Logging service gives you a centralized location to collect the logs from any resource service or application that is in your OCI environment. Since this is built on open standards, it makes it easier to quickly search for any issues.

types of logs :

service and audit logs :that are associated with your OCI services and resources

custom logs that could be created for applications or other deployed components.

Logging also has a feature called Service Connector which can be configured to automatically move log data into another service. For example, you may wish to take periodic backups of a particular log and persist it into an object storage bucket.

event

service enables you to take actions associated with any particular event involving OCI resources. It allows you to define rules and corresponding actions based on the event type. For example, let's say that whenever someone creates a new compute VM, you wish to capture that event to automate the sending of an email to the corresponding team. Or you could define an action that automatically makes a backup of that VM configuration.

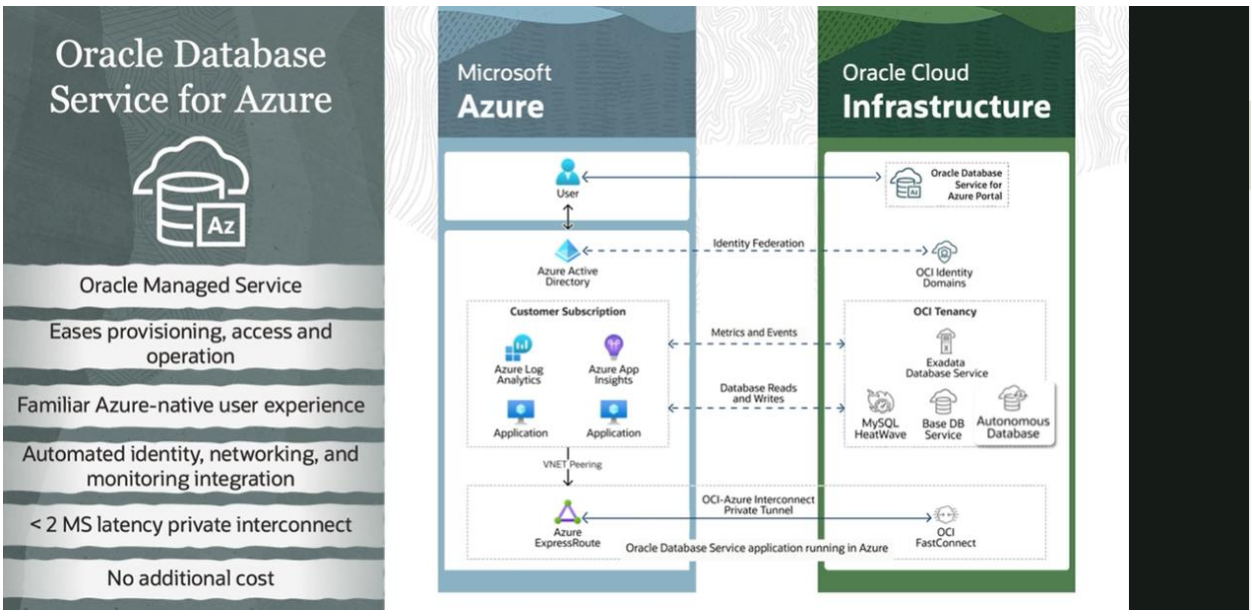
multicloud approach:

- you are not restricted to just a single cloud provider

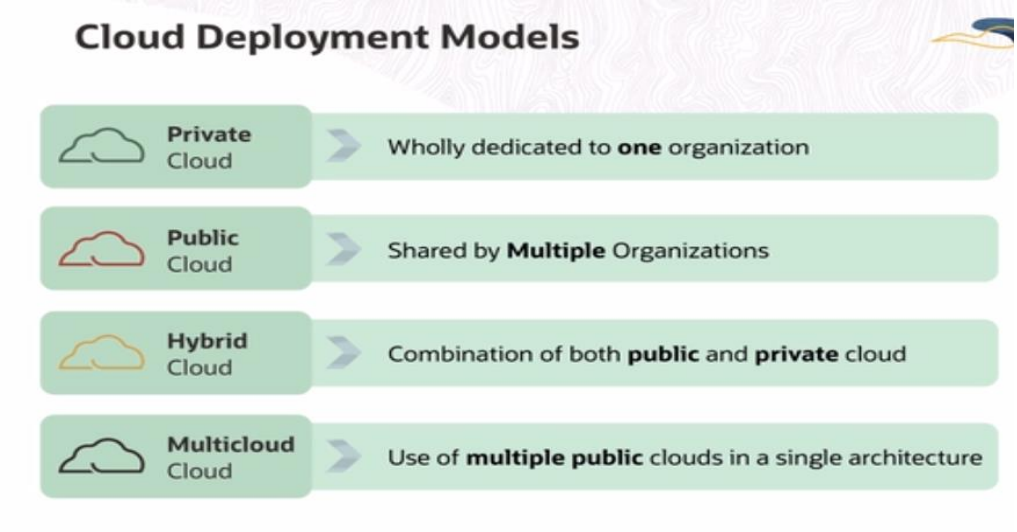
One of the use cases of Oracle Interconnect for Azure is you can have the Autonomous Database s running on OCI. And these can connect to Azure Analytics tools and AI workloads.

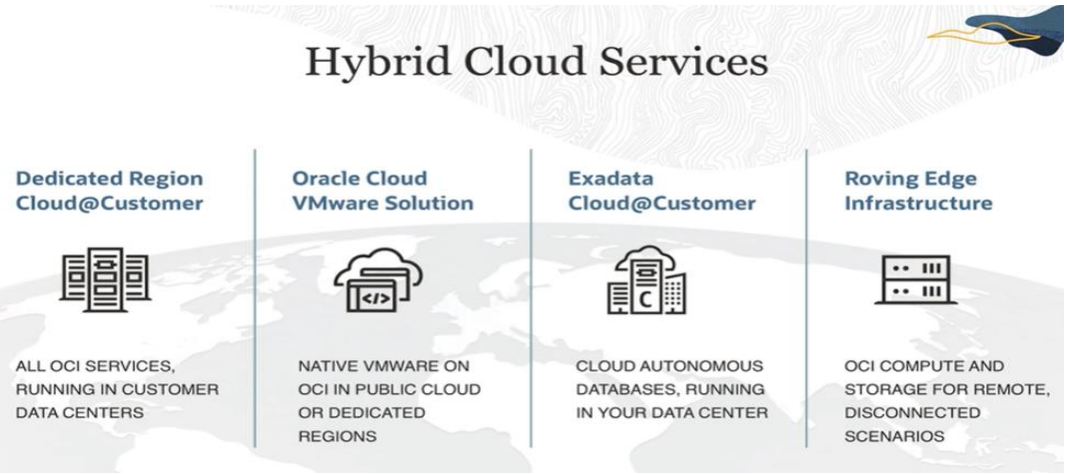
So over to Oracle Database Service for Azure(ODSA). ODSA is an Oracle-managed service that enables customers to easily provision access and operate enterprise-grade Oracle data services in OCI with a familiar Azure-like experience. With ODSA, Azure teams can treat databases running on OCI just like an Azure resource.

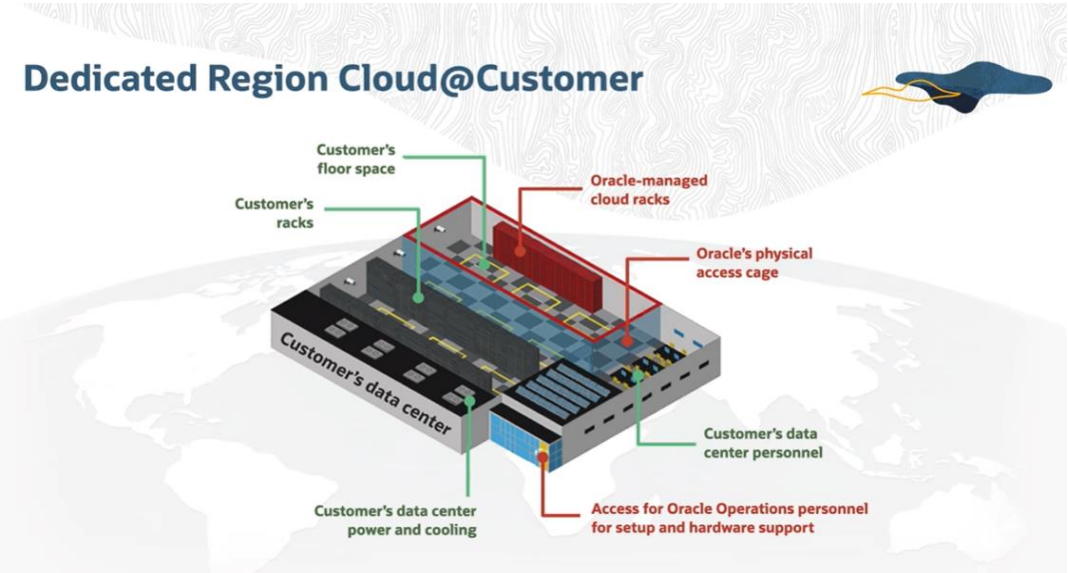
ODSA uses a service-based approach and is an alternative to manually creating complex crosscloud deployments using the interconnect.



Hybrid Cloud:



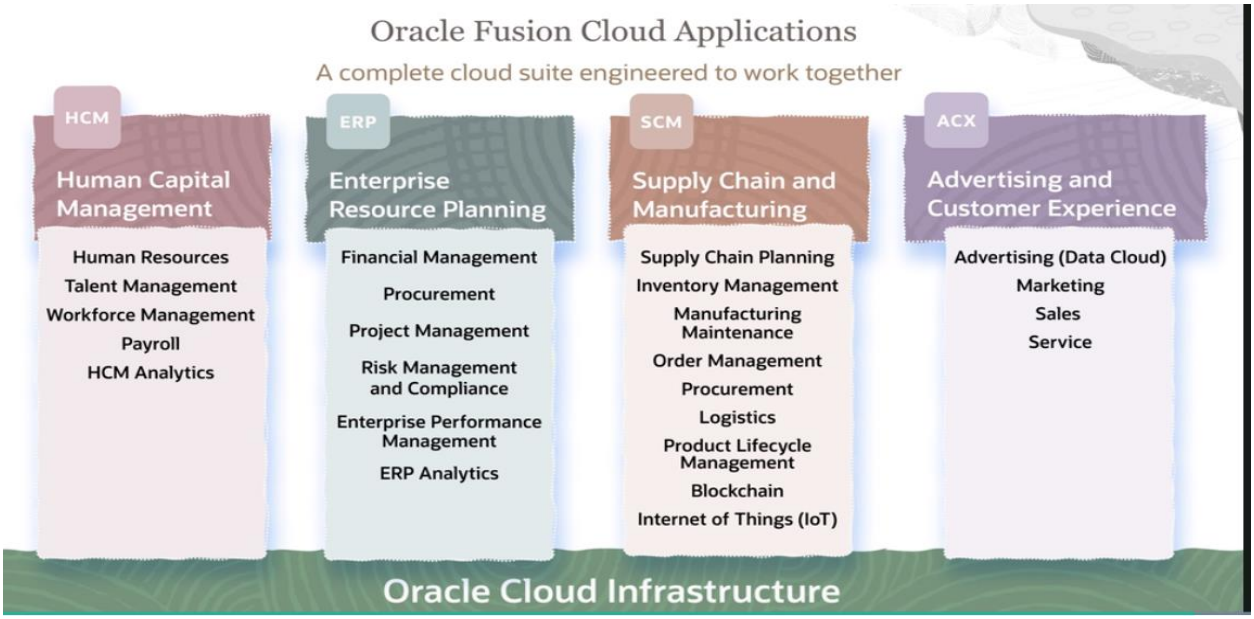


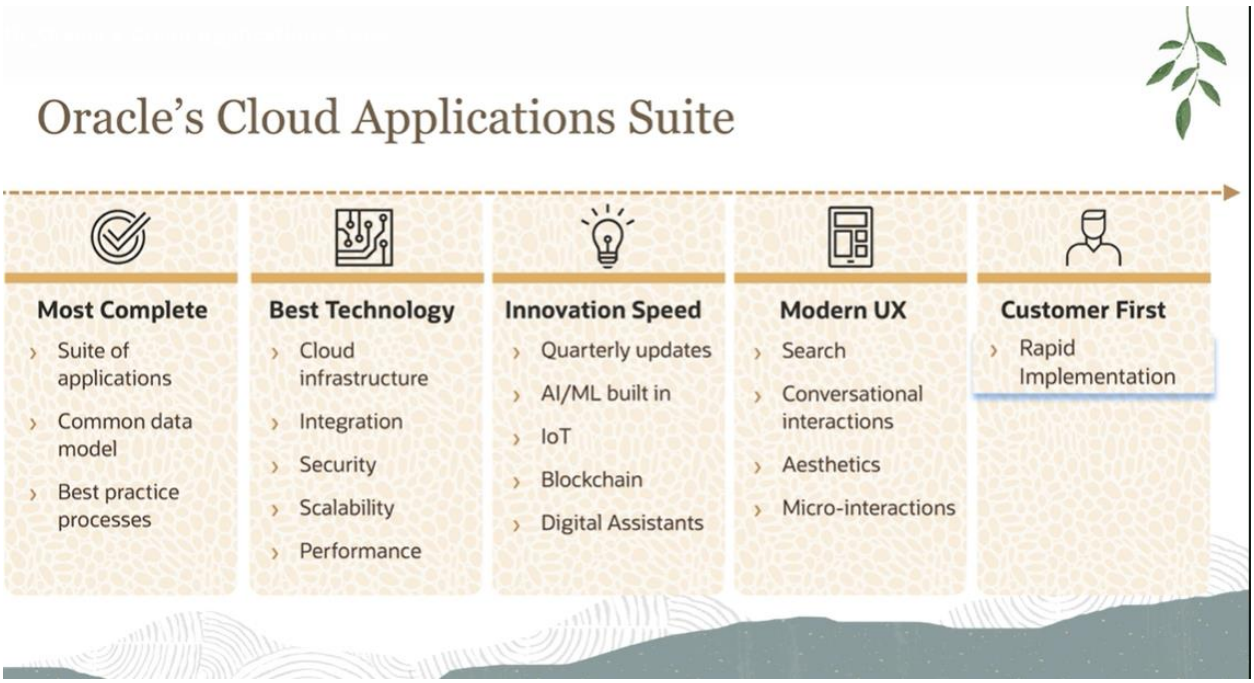


Oracle Cloud Applications:

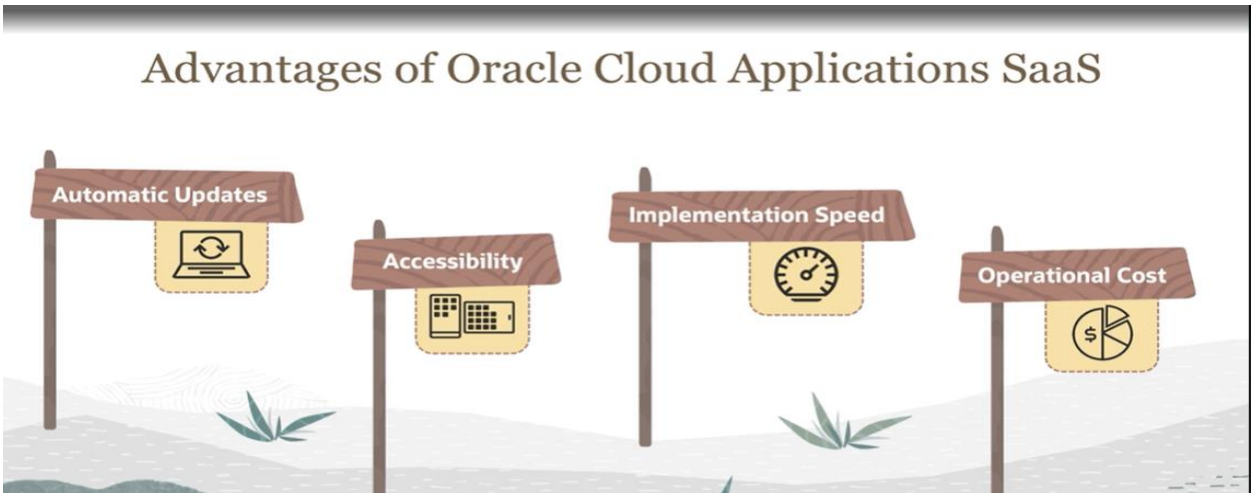
Oracle Fusion Applications (OFA) : are a suite of applications built on Oracle Cloud that include cloud-based applications for enterprise resource planning (ERP), enterprise performance management (EPM), supply chain management and manufacturing (SCM), human capital management (HCM), and customer experience (CX).

Oracle Fusion refers specifically to the suite of business applications developed by Oracle, which can be accessed through Oracle Cloud as part of their Software as a Service (SaaS) offerings.

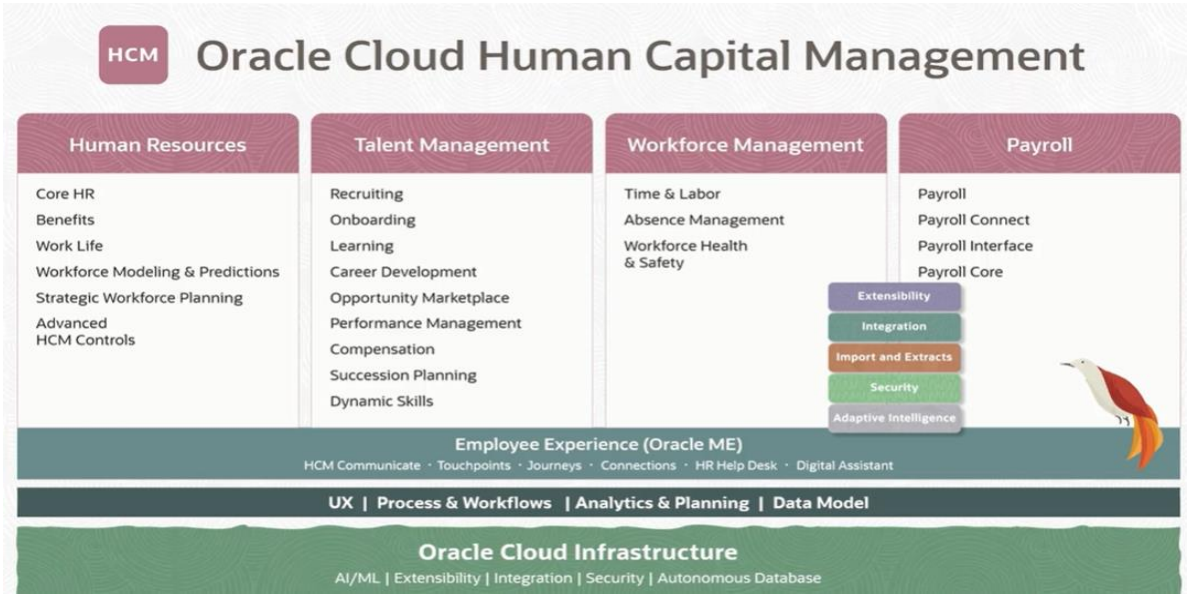




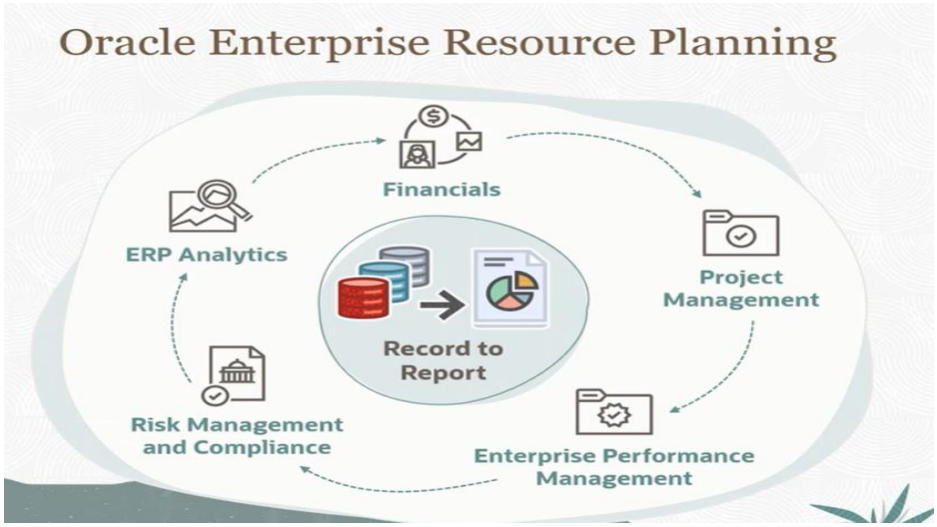
Oracle provides quarterly updates, they're usable immediately. Customers can focus on leveraging the new functionality instead of spending cycles on installing it.Because Oracle hosts the heavy part of the applications and customers access it via thin clients, the applications can be used from nearly anywhere and on a wide range of devices, including your smartphones and your tablets. A lot of the benefits you see here result from Oracle's provider model. Customers aren't spending time on customization, application testing, and report development. Instead, they work on the much lighter and faster tasks of configuration, validation, and leveraging embedded analytics.

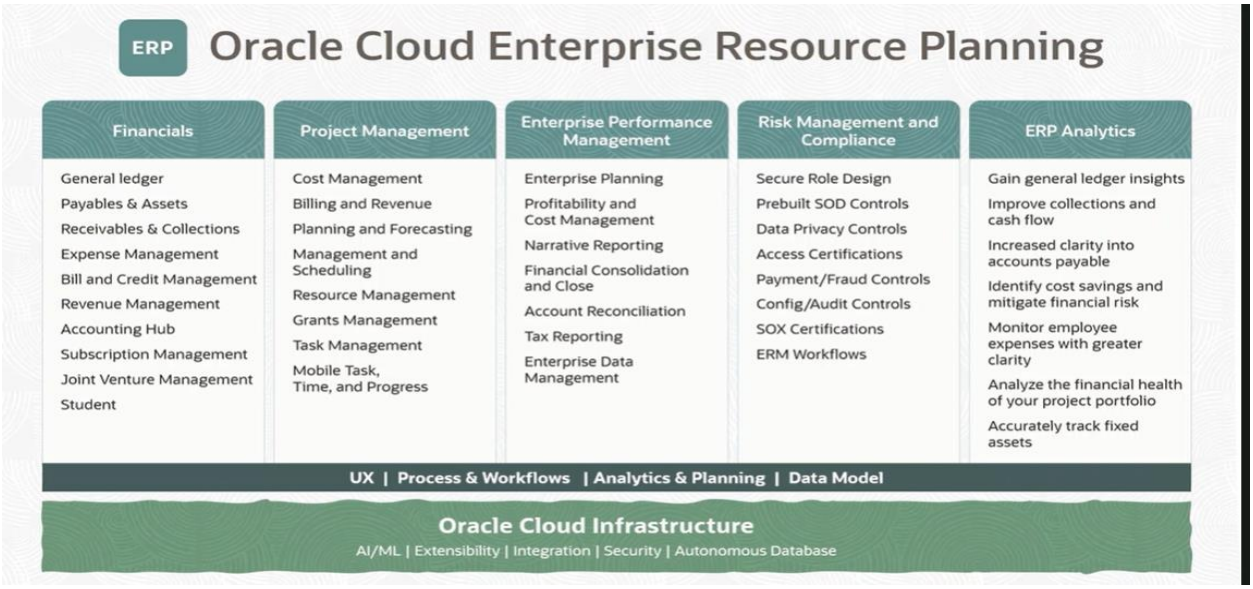


Oracle Fusion Cloud HCM is a complete cloud solution that connects every human resource process and every person across your enterprise

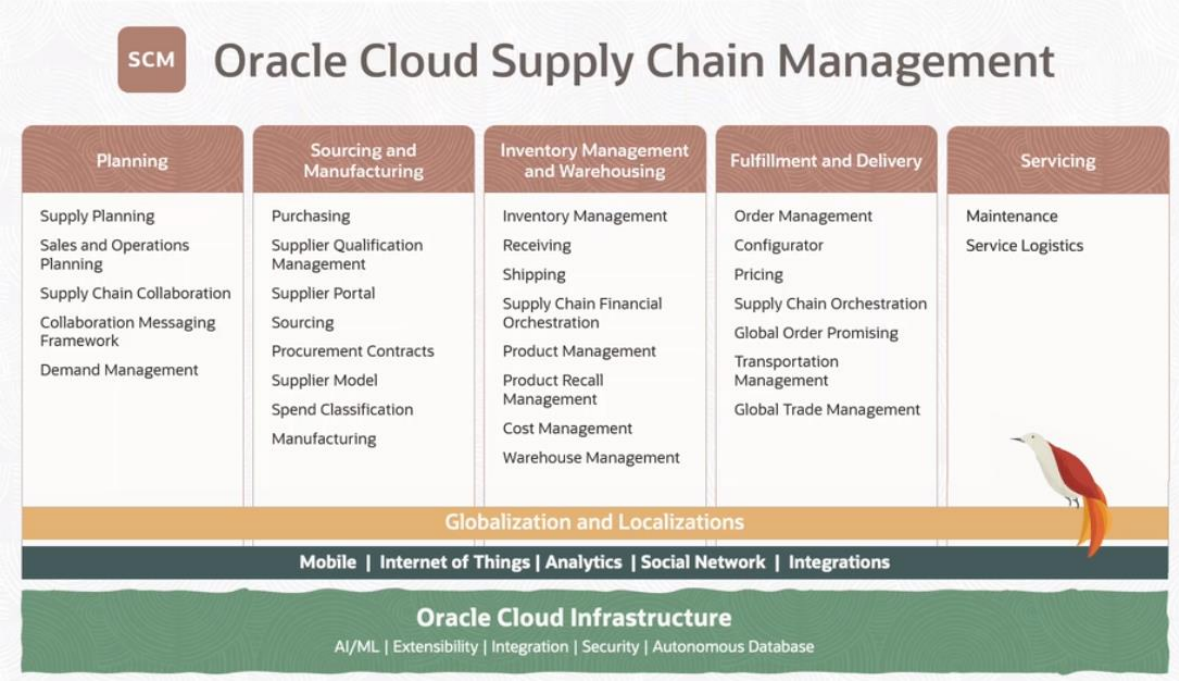


ERP:cloud based end-to-end Software as a service (SaaS) suite that manages enterprise functions including accounting, financial management, project management, and procurement

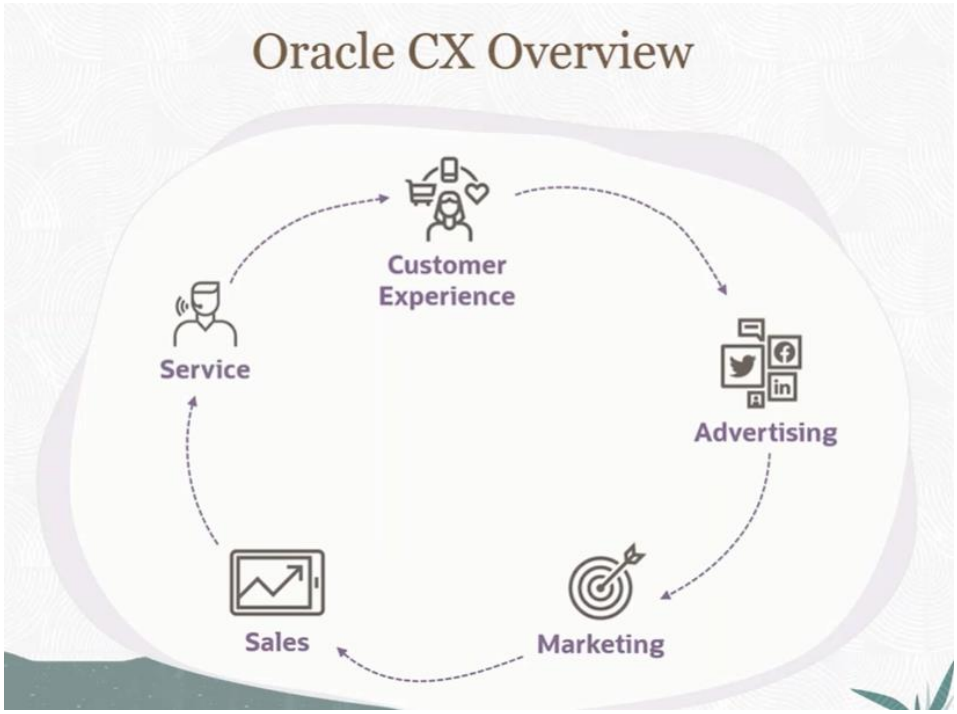


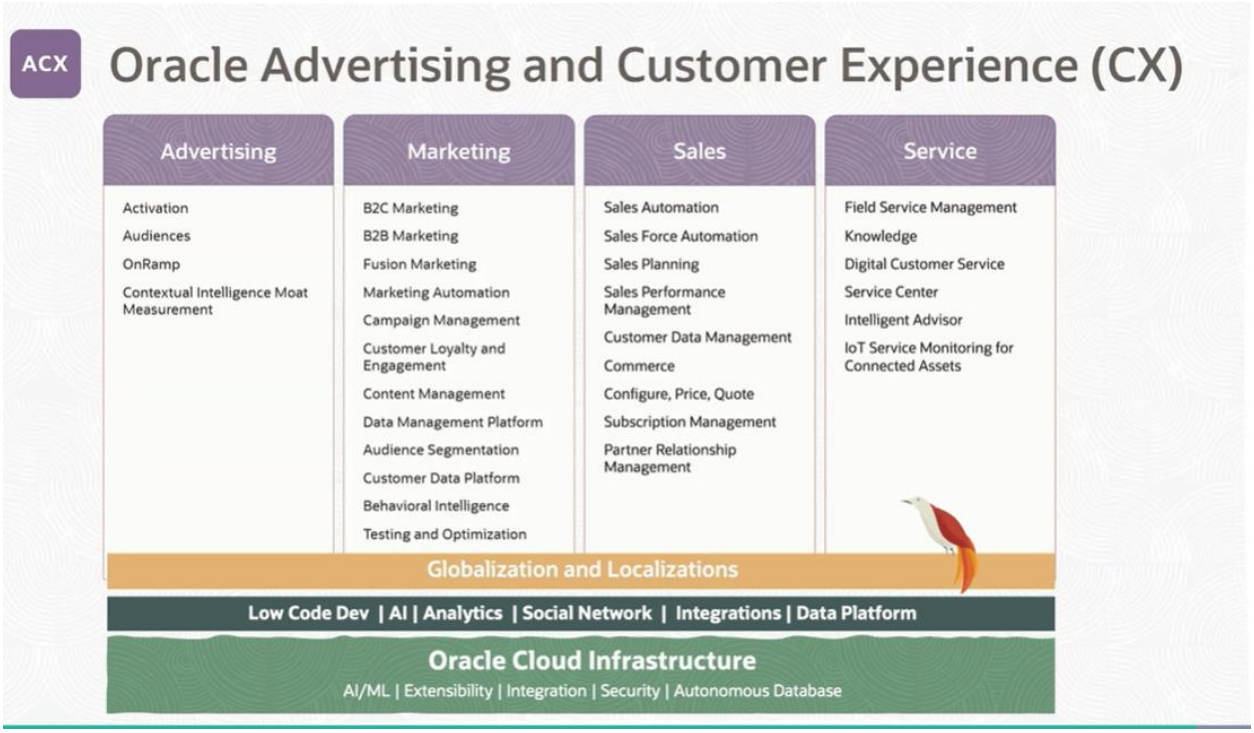


supply chain : is all about having the right products available to ship to the customer at the right time in the right quantities.

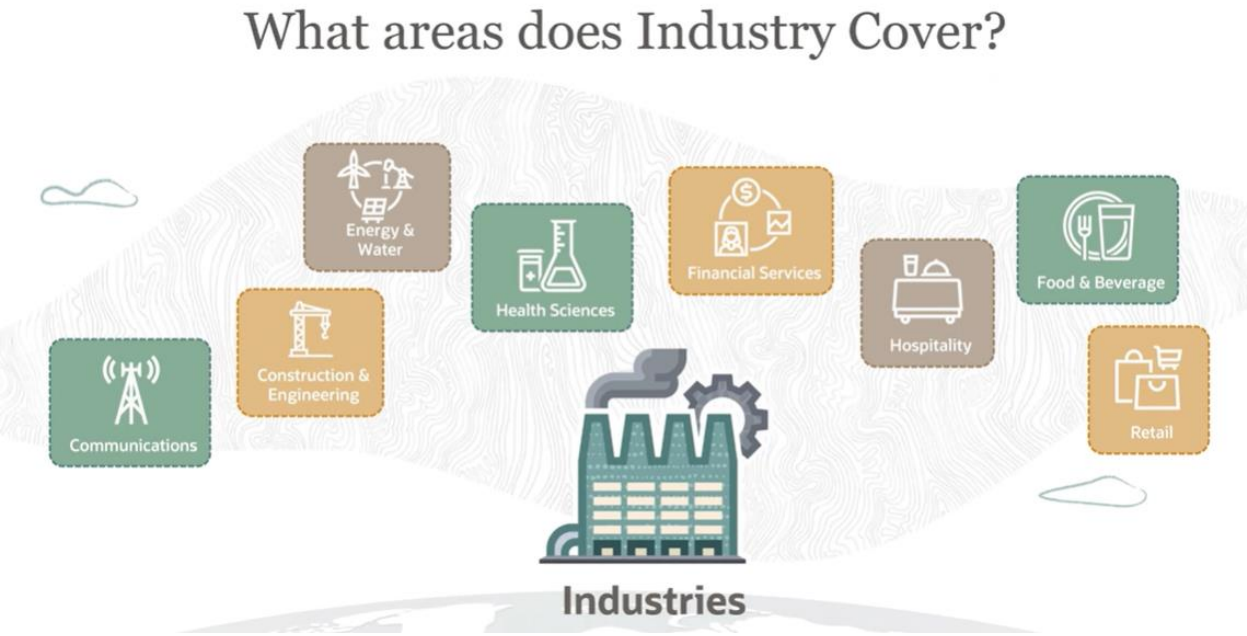


Customer experience (CX) provides the platform and products necessary to capture all customer touch points and interactions and automate the business process from interest and lead generation to the sale and provision of products and services.





industry applications are a collection of vertical applications that aim to meet the specific needs of the major industries. They were built to satisfy their particular needs. Each area have on-premises solutions and are now available on cloud also. The solutions are designed for specific industries to run essential company operations, including revenue operations, product or service operations, and field operations.



Oracle Guided Learning (OGL): is an information and learning interface embedded in a host application.