PUNE INSTITUTE OF COMPUTER TECHNOLOGY

Information Technology Department

Cloud Computing Laboratory

Case Study No. : 03
Tools for Building Private Cloud

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1. What is private cloud?

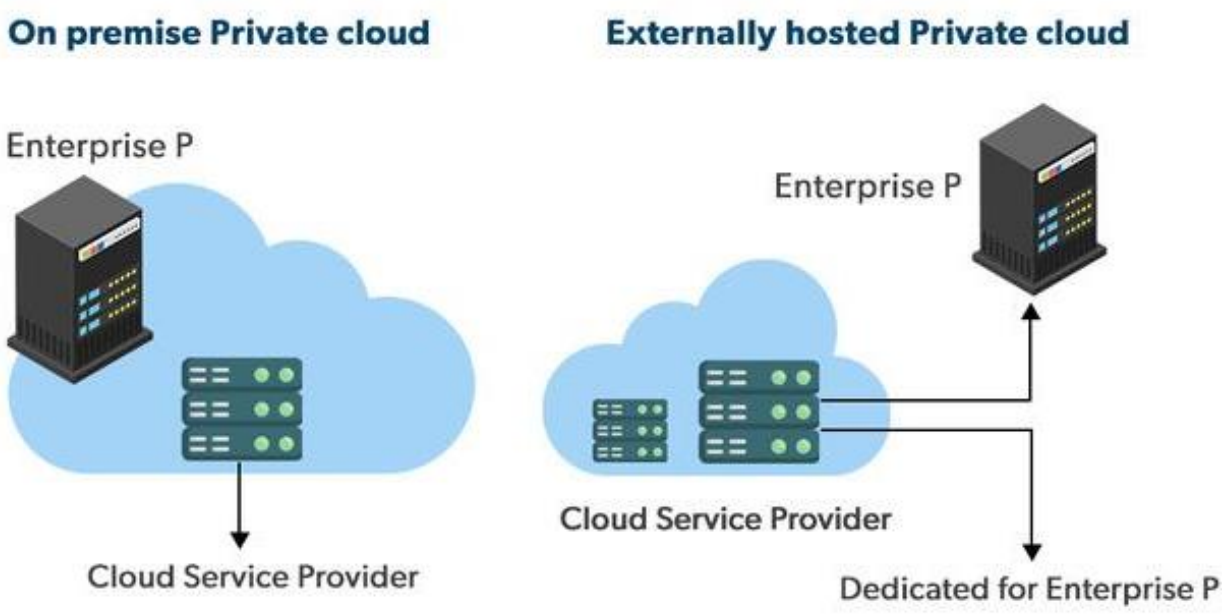
- The private cloud is defined as computing services offered either over the Internet or a private internal network and only to select users instead of the general public.
- Also called an internal or corporate cloud, private cloud computing gives businesses many of the benefits of a public cloud - including self-service, scalability, and elasticity - with the additional control and customization available from dedicated resources over a computing infrastructure hosted on-premises.
- In addition, private clouds deliver a higher level of security and privacy through both company firewalls and internal hosting to ensure operations and sensitive data are not accessible to third-party providers.
- One drawback is that the company's IT department is held responsible for the cost and accountability of managing the private cloud. So private clouds require the same staffing, management, and maintenance expenses as traditional datacentre ownership.

2. Comparison between private cloud , public cloud.

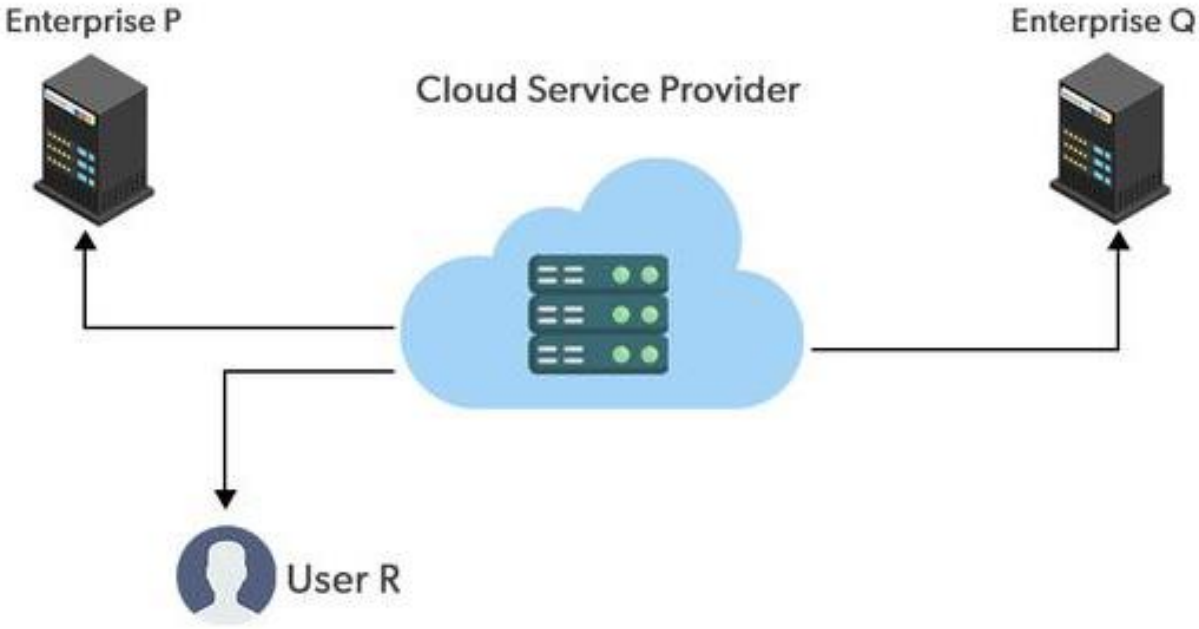
Parameters\Type	Public Cloud	Private Cloud
Description	In public cloud, services are available for public users.	Private cloud is build up with existing private infrastructure. This type of cloud has some authentic users who can dynamically provision the resources.
Scalability	Very High	Limited
Reliability	Moderate	Very High
Security	Totally Depends on service provider	High class security
Performance	Low to medium	Good
Cost	Cheaper	High Cost
Examples	Amazon EC2, Google AppEngine	VMWare, Microsoft, KVM, Xen

3. Draw necessary diagrams for both private cloud and public cloud.

- **Private Cloud:**



- **Public Cloud:**



4. List the Tools for building private cloud.

The following are the various tools for building private cloud:

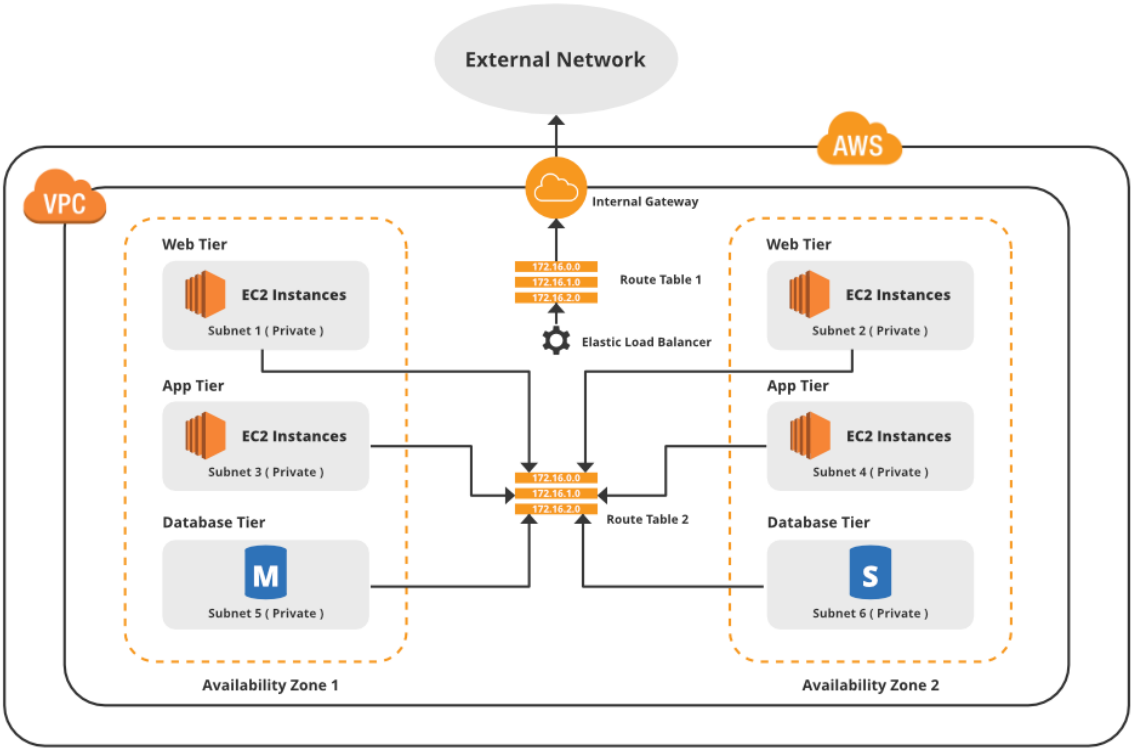
- BMC Software
- VMware
- Microsoft Cloud
- IBM Bluemix Cloud
- SAP HANA Cloud Platform
- Dell Cloud
- Citrix Cloud
- Cisco Systems
- Amazon Virtual Private Cloud
- Google Cloud VPC
- Wolfram Private Cloud

5. Explain any Tool for building private cloud with necessary diagram and explanation.

The tools for building private cloud are as follows:

a. Amazon Virtual Private Cloud:

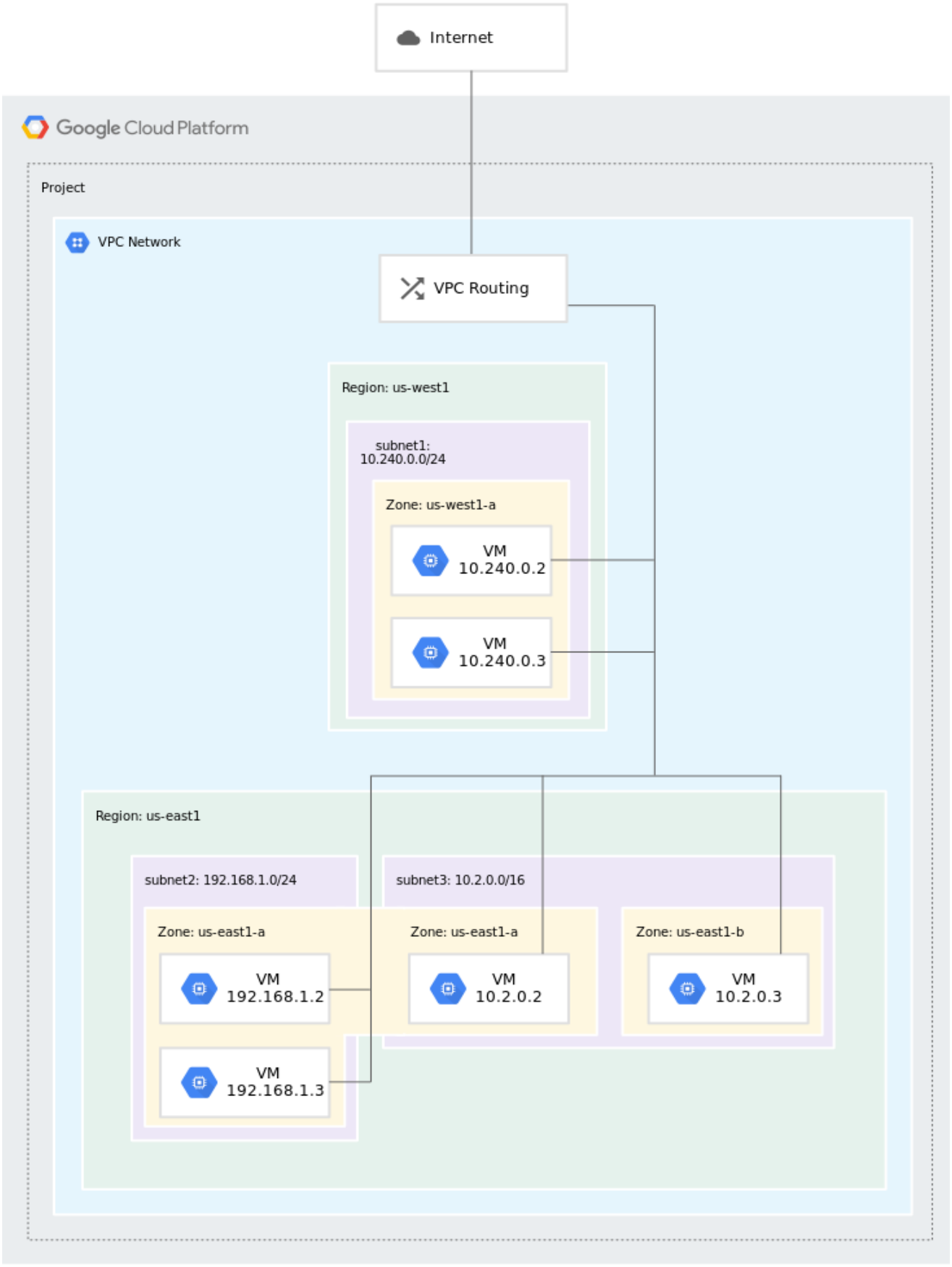
- Amazon Virtual Private Cloud aims to provide a service similar to private clouds using technology such as OpenStack or HPE Helion Eucalyptus. However, private clouds typically also use technology such as OpenShift application hosting and various database systems.



- Cloud security experts warned there can be compliance risks, such as a loss of control or service cancellation in using public resources which do not exist with in-house systems.
- If transaction records are requested from Amazon about a VPC using a national security letter they may not even be legally allowed to inform the customer of the breach of the security of their system. This would be true even if the actual VPC resources were in another country.
- The API used by AWS is only partly compatible with that of HPE Helion Eucalyptus and is not compatible with other private cloud systems so migration from AWS may be difficult. This has led to warnings of the possibility of lock-in to a specific technology.
- Amazon Virtual Private Cloud (Amazon VPC) enables you to launch Amazon Web Services resources into a virtual network you've defined. This virtual network resembles a traditional network that you'd operate in your own data center, with the benefits of using the scalable infrastructure of AWS.

b. Google Cloud VPC:

- Virtual Private Cloud (VPC) provides networking functionality to Compute Engine virtual machine (VM) instances, Google Kubernetes Engine (GKE) clusters, and the App Engine flexible environment.
- VPC provides networking for your cloud-based resources and services that is global, scalable, and flexible. A Virtual Private Cloud (VPC) network is a virtual version of a physical network, implemented inside of Google's production network, using Andromeda.
- A Google Cloud VPS is global, shareable and expandable. Using a VPC gives you managed, global networking functionality for all of your Google Cloud resources through subnetworks, known as subnets, hosted in Google Cloud data centers. Each subnet is assigned to a specific region.
- A single Google Cloud VPC and its subnets can span multiple regions without ever communicating to the public internet. It remains isolated from the outside world and is not associated with any specific region or zone.
- Concerning security, you can control traffic to and from a VPC’s VM instances with network firewall rules on the VMs themselves. Upon creation, every VPC has two implied firewall rules. These rules allow all egress (VPC access to remote resources) and deny all ingress (preventing remote access to the VPC). Any additional permissions need to be predefined.



Google Cloud VPC

6. Conclusion:

Hence, I understood what are private and public cloud with their structure and also compared them. I also listed various tools for building private cloud and explained the tool in detail.