**Review of Existing Products and Solution**

Cloud computing has become a demanding industry. Lot of companies are moving to cloud as it made data processing efficient and with new advance support to networking system. Cloud computing system consist of 4 factors mainly: User Layer: it is the user interface, Application Layer: involves system application function, Service Layer: used for production and operational schedules and Resource Layer: consist of virtualised resources. (Golightly et al., 2022). Considering these factors, we have short listed top 3 Cloud service provider that Would be a good fit for our organisation. Listed below are few components, features and benefits of each of them.

**Microsoft Azure:**

Microsoft offers wide range of networking products including operating systems and Entra ID which helps in integrating On-premises user to cloud. It supports different networking capabilities making integrating easier with existing system and infrastructure. Listed are some key components in Azure:

* **Azure Resource Group**: It is a container that is used to maintain or stored Azure resources for application. It includes virtual machines, storage, Virtual Network, database, firewall etc.
* **Azure Virtual Network:** This is a isolated network that enables the resources in azure to communicate with each other. In Vnets users can define and control their network tropology. **Key Features include** customised IP address range and subnets, Network security group to control inbound and outbound traffic and create secure connection to azure services.
* **Azure express route:** Express routes are used to provide Site to site connection between azure and on-premises network. **Key Feature includes** bypassing public IP address to reliability and security, high bandwidth, offering multiple connections.
* **Azure Load balance:** Help in load balancing network traffic across different azure resources. **Key feature includes** support both internal and external load balancing.
* **Azure firewall:** Azure firewall acts as a gatekeeper and helps protects azure resources. Using firewall polices we can implement security policies to monitor the traffic. **Key features include** Threat intelligence, TLC inspection, Logging and monitoring.
* **Azure Front Door:** it acts as a global scalable entry point for web server. Key features include build in web application firewall.

**Benefits of Azure**

* Azure network is scalable and can cater to increasing networking demand.
* Network security group, work from home setup and express route enhances the security.
* Azure has vast network of data centres which helps achieve low latency.
* Azure have wide varity of subscription and pay as you go can allow companies to manage operational cost.
* Azure offers seamless integration with networking services.

**AMAZON WEB SERVICES – (AWS)**

Amazon have grown significantly in 2 decades. They have more than 200 datacentres across the globe and offers wide range of products including storage options, networking capabilities and increase computing power. They have infrastructure as a service, platform as a service and software as a service making it a good choice for developers and system admins. Listed below are key components of Amazon:

* **Amazon Virtual Private Cloud – VPC;** it is an isolated virtual network within AWS cloud. **Key feature includes** subnetting to organise the resources, network access control and routing table.
* **AWS Direct Connect:** It provides isolated network connectivity from on premise to AWS cloud. **Key features include** high bandwidth, secure data transfer and multiple range of connection options.
* **Elastic Load balancing:** Distributes the incoming traffic across multiple VPC. OCI provides Fast Connect and VPN solutions for hybrid cloud setups. **Key features include** Application load balancing, network load balancing and gateway load balancing.
* **Route 53:**  Is a domain name system web service that translate web address to IP address.

**Benefits of Azure**

* Azure provides edge networking services like CloudFront, AWS global acceleration reduces latency and helps with better data transfer rates.
* Amazon provides global availability with datacentres in 25 regions and 81 availability zone.
* Integration is easy with other AWS and on-premises devices.

**ORACLE Cloud**

Oracle cloud has been in cloud computing space for past 10 years and have made a significant improvement. They have improved the performance, reliability and enterprise readiness. Below listed are key components of oracle Cloud computing:

* **Virtual Cloud Network- VCN:**  Its isolated network with subnets and networking component. **Key Features include** customised IP address range and subnets, Network security group to control inbound and outbound traffic and create secure connection to azure services
* **Fast Connect:** It provides isolated network connectivity from on premise to AWS cloud. **Key features include** high bandwidth, secure data transfer and multiple range of connection options
* **Oracle VPN Connect**: provide Site to site connection between azure and on-premises network. **Key Feature includes** bypassing public IP address to reliability and security, high bandwidth, offering multiple connections

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| --- | --- | --- | --- |
| **Feature** | **AWS** | **Azure** | **Oracle Cloud** |
| **Networking Services** | Offers VPC (Virtual Private Cloud), Route 53 for DNS, and Direct Connect for dedicated connections | Features Virtual Network (VNet), Azure DNS, and ExpressRoute for private connections to Azure data centres. | Provides Virtual Cloud Network (VCN), Fast Connect for dedicated connections, and comprehensive DNS and load balancing services. |
| **Global Reach** | 25 regions and 81 availability zones | 60+ regions | 38 regions with 58 availability domains |
| **Load Balancing** | Elastic Load Balancing (ELB) | Azure Load Balancer | Oracle Cloud Load Balancer |
| **Private Connectivity** | Direct Connect for dedicated network connections | ExpressRoute for private connections | Fast Connect for dedicated connections |
| **DNS Services** | Route 53 | Azure DNS | Oracle Cloud Infrastructure DNS |
| **Network Security** | Security Groups, Network ACLs | Network Security Groups (NSGs), Azure Firewall | Security Lists, Network Security Groups |
| **Network Monitoring** | Amazon CloudWatch | Azure Monitor | Oracle Cloud Infrastructure Monitoring |
| **Integration with On-Premises** | Strong integration capabilities with on-premises networks through Direct Connect and VPN. | Seamless integration with on-premises environments via ExpressRoute. | OCI provides Fast Connect and VPN solutions for hybrid cloud setups. |
| **Site-to-Site VPN** | AWS VPN | Azure VPN Gateway | Oracle VPN Connect |

**REFERENCE**

**1**.Golightly, L., Chang, V., Xu, Q.A., Gao, X. and Liu, B.S. (2022). Adoption of cloud computing as innovation in the organization. *International Journal of Engineering Business Management*, [online] 14(1), pp.1–17. Available at: <https://journals.sagepub.com/doi/full/10.1177/18479790221093992>.