Assessment 2: Case Study

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Introduction

ABC Company, as stated in the case study, is based in the United States but wishes to establish operations in Australia. As a result, it must establish several branches in the key Australian cities of Melbourne and Sydney. There will be network connections as well as network configurations to ensure that the newly established branches function properly and that effective communication within the branches and between the different branches continues. The network must be configured in such a way that the hosts that will be supported by each branch are taken into account. Furthermore, the network must be configured in a way that allows for scalability. Furthermore, the network must be configured in such a way that best practices in computer networking are followed. In section A of this report, I will configure the network using the templates provided for each city, whereas section B will include a discussion of the decision to be made between Microsoft Azure and Amazon AWS when selecting a cloud computing service provider for ABC Company. Furthermore, the network must be configured in a way that allows for scalability.

Task A: Task Specification

The ABC Company wishes to advance information gathering and sharing among its various branches by utilizing cutting-edge network technology. ABC aims to greatly improve user access to various network-related information sources and gain various network technologies that will improve operations, performance, and lower operation costs by commissioning a network capable of handling the institute's current needs and any anticipated future growth.

The network will have two branches: Sydney (172.9.0.0) and Melbourne (172.9.0.0). (which will run on the network 10.9.0.0). Each branch will have its own server that can be accessed from any

of the company's other locations. The Sydney branch is expected to employ up to 300 people, while the Melbourne branch will employ 600 people. The Sydney branch is given the default mask of 20, which leaves 4096 hosts available for use by the branch. This, however, uses more network addresses than are required for the branch.

The network will have two branches: Sydney, which will run on the address 172.9.0.0, and Melbourne, which will run on the network 10.9.0.0. Each branch will have its own server that can be accessed from any of the company's other locations. The Sydney branch is expected to employ up to 300 people, while the Melbourne branch will employ 600 people. The Sydney branch is given the default mask of 20, which leaves 4096 hosts available for use by the branch. This, however, uses more network addresses than are required for the branch.

Sydney	
Allocated Subnet address and Subnet Mask	255.255.240.0 [/20]
Network Address	172.9.0.0
Default Gateway address	172.9.0.1
Valid host address range	172.9.0.1 – 172.9.15.255
Broadcast address	172.9.0.255

As a result, the network is reconfigured in the following manner to make the best use of the available addresses and the needs of the branch in question.

Sydney	

Allocated Subnet address and Subnet Mask	255.255.254.0 [/23]
Network Address	172.9.0.0
Default Gateway address	172.9.0.1
Valid host address range	172.9.0.1 – 172.9.1.255
Broadcast address	172.9.0.255

The subnet 255.255.254.0 configures the network to allow for 512 hosts, which is the bare minimum for a network with 300 hosts. This allows for more efficient address allocation in the network. The server will be given the address 172.9.0.2, and all user terminals and devices will be assigned different IP addresses as needed. The Melbourne branch requires a network that can accommodate 600 hosts. The branch's network address is 10.9.0.0, and all other network configurations will occur from this address. The network will be configured to span the branch as follows with the default assigned network mask of /20:

Melbourne	
Allocated Subnet address and Subnet Mask	255.255.240.0 [/20]
Network Address	10.9.0.0
Default Gateway address	10.9.0.1
Valid host address range	10.9.0.1 – 10.9.15.255
Broadcast address	10.9.0.255

This configuration, on the other hand, leaves a large number of unused hosts, potentially leading to address misuse in the future. As a result, the network is reconfigured to meet the needs of the Melbourne branch as follows:

Melbourne	
Allocated Subnet address and Subnet Mask	255.255.252.0 [/22]
Network Address	10.9.0.0
Default Gateway address	10.9.0.1
Valid host address range	10.9.0.1 – 10.9.3.255
Broadcast address	10.9.0.255

This configuration allows for 1024 hosts, which is the bare minimum for hosting Melbourne's 600 hosts. The server in Melbourne will have an IP address of 10.9.0.2 and will be directly connected to the branch's main switch. The remaining hosts on the branch will be assigned as needed.

The network between Sydney and the ISP contains two devices (Sydney's main router and the ISP port to which it is connected), so only two host addresses are required.

Network between Sydney to ISP	
Allocated Subnet address and Subnet Mask	255.255.255.252 [/30]

Network Address	30.30.30.0
Valid host address range	30.30.30.1 - 30.30.30.3
Broadcast address	30.30.30.3

The network between the Melbourne branch and the ISP meets the same requirements as described above, but it is on a different network.

Network between Melbourne to ISP	
Allocated Subnet address and Subnet Mask	255.255.255.252 [/30]
Network Address	20.20.20.0
Valid host address range	20.20.20.1 - 20.20.20.3
Broadcast address	30.30.30.3

Configuration

The configurations of ABC's network include the step-by-step procedures for meeting the specifications. The commands are entered directly into the device being configured.

i. ASP Router Configuration

configure terminal

interface Serial0/0/0

ip address 30.30.30.1 255.255.255.252

interface Serial0/0/1

ip address 20.20.20.1 255.255.255.252

ii. Sydney Branch Configuration

This is the primary router for the ABC branch in Sydney. Its purpose is to route Sydney's branch traffic to the ISP and to serve as the gateway through which all communication returns to the branch's inner network.

configure terminal

interface GigabitEthernet0/0

ip address 172.9.0.1 255.255.254.0

interface Serial0/0/0

ip address 30.30.30.2 255.255.255.252

iii. Melbourne Branch Configuration

This is the primary router for the Melbourne branch. Its purpose is to route traffic from the Sydney branch as well as all eternal communications.

configure terminal

interface GigabitEthernet0/0

ip address 10.9..0.1 255.255.252.0

interface Serial0/0/0

ip address 20.20.20.2.0 255.255.255.252

Task B:

Any organization interested in utilizing cloud services will most likely want some type of information about the existing providers in order to select the best one. Cloud computing is important in the modern era because many software products, such as enterprise resource planning software and inventory management tools, work better on the cloud. Cloud services enable an organization's resources to be galvanized and all of its tools to operate on a single platform. As a result, a cloud user has the best access to the various resources. While there are numerous cloud service providers on the market, two frequently stand out: Microsoft's Azure and Amazon's Web Services

Comparative Characteristics

Microsoft's Azure cloud is based on the needs of Microsoft environment users for software development. The service was created specifically for the purpose of developing, testing, deploying, managing, and hosting applications for use in Microsoft's run operating systems. Because many Microsoft product users frequently run within the Windows environment, the Azure tool makes various programming languages available here as well. Aside from software development, the tool also supports mobile computing, messaging, Blockchain technology, machine learning, and Internet of Things applications. Microsoft's service, which is specifically run on the Content Delivery Network, enables cross-platform development by different system developers (Kotas, Naughton and Imam, 2018). As a result, it can encourage the development of applications in both small and large computing environments. Microsoft's Azure environment also includes 'Azure Automation,' which automates server management tasks such as Cron Jobs.

Amazon Web Services is a cloud computing service that Amazon provides. In general, Amazon Web Services (AWS) is a platform for Infrastructure as a Service (IaaS) and Platform as a Service (PaaS) that promotes the use of resources over the internet. Indeed, Amazon cloud services are based on a platform for distributing large amounts of computing capacity at a low cost. The company has been one of the most significant and longest-standing investors in cloud computing technology, becoming pioneers in some technologies such as the Simple Queue Service (SQS) and the expansion of cloud storage to have 'limitless' capabilities. Amazon provides users with Elastic Compute Cloud (EC2) and a virtual cluster of computers, allowing them to scale up and down the amount of cloud computing power they require at any time (Bhat and Pham, 2018). Amazon Web Services is one of the most robust cloud computing platforms in the world, thanks to its web servers, graphics processing, and customer relationship management tools.

Service Distinction

Amazon is a dependable cloud computing service provider that manages numerous server farms around the world. The company also invented Infrastructure as a Service (IaaS) and has a sizable market share in the cloud computing industry. Indeed, the Pay-as-you-go model provides consumers with flexibility, with many discounted offers and service considerations on issues such as redundancy, security, and network availability. As a result, service users only pay for the services they use. Subscribers can also purchase a single virtual AWS computer, a dedicated physical device, or a cluster of computers (Toraskar and Borse, 2018). Amazon guarantees the security of these resources to users and ensures that the user or organization gains significantly from whatever resource they request from the provider. Amazon Web Services also ensures that

a security clause is included in the service agreement, opting to accept liability in the event that user data is compromised.

Static caches and REST-based API services are among the capabilities offered by Microsoft's Azure services. In terms of geographic diversity, the service is based on 94 point-of-presence locations worldwide. These are referred to as Edge locations. Indeed, the majority of the services are designed to help developers, with key features such as application insights and Azure DevOps. Regardless, server management, machine learning, and Internet of Things technologies have a lot of support. In contrast to Amazon's Pay-as-you-go model, the service is available on monthly and annual subscriptions. In this regard, the organization can distribute resources to specific users based on the package they select for the specific duration. As a result, many users are provided with dedicated computing services rather than dynamic computing power.

Service Choice and Justification

In comparison to Microsoft Azure services, Amazon Web Services is more likely to suit ABC Company. This is due to the fact that cost is frequently an important consideration when deciding on the best subscription service to use. At the same time, because there are multiple campus locations, the organization will benefit from Amazon's robust services, which include the option of dedicated or dynamic resources. It is also critical to ensure that the organization is capable of dealing with recurring concerns regarding the administration of the various offices; this implies that subnets can be offered various cloud computing resources at a flexible fee (Toraskar and Borse, 2018). Amazon Web Services is more concerned with cost-cutting and flexibility than Microsoft Azure. At the same time, the organization may wish to use some of the resources in the training of its IT technology students.

By utilizing Amazon Web Services, it will be possible to strike a balance between institutions that provide Infrastructure as a Service and those that provide Platform as a Service. It may be necessary to ensure that the organization's development needs are better met with this type of service. Azure can help with development, but it is quite strict about using the Microsoft environment. At the same time, using Azure comes with a specific package selection from which users must choose from a list of available options. This may not be the best course of action for this company. When compared to Microsoft's Azure, Amazon is frequently supportive of the Open Source Community and has fewer compatibility concerns.

Conclusion

The following best networking practices will ensure that there is a computer network that will serve the needs of ABC Company in the first section. Microsoft and Amazon are both competitive cloud computing service providers in terms of cloud hosting. It is critical to consider the organization in question when deciding whether to choose one over the other. In this case, ABC, as an American institution, would need to ensure that their move to Canberra is not jeopardized by a rigid demand for specific operating systems and associated software. The Microsoft environment is likely to lock the company down to a specific set of software options, severely limiting their options. At the same time, the cost implications of selecting Microsoft products may have far-reaching implications in terms of future organizational expenses.

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