Service Provisioning Of Network In Corporate Companies

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Abstract : A primary server is a server that acts as the first source for Domain Name System (DNS) data and responds to queries. The topology table may be inserted into the router's routing table and can then be used to forward traffic based on information founded. All device STP is a network management protocol that is used to prevent loops in a redundant network topology. Spanning Tree Algorithm (STA) is used to calculate the best switch path through the network. A virtual LAN (VLAN) is any broadcast domain that is partitioned and isolated in a computer network at the data link layer (OSI layer 2). A trunk port is a port that is assigned to carry traffic for all the VLANs that are accessible by a specific switch, a process known as trunking Switches running STP will build a map or topology of the entire switching network.. In this origination is outsourced through Cisco hardware vendor and leased based on the project timeline. The task is to design, deploy, implement security and fully document the proposed Company network.

IndexTerms - Security ,Public Cloud Server ,Proxy, IntegrityChecking,Uploading,Bilinear Pairing,Coherent.

I. INTRODUCTION

The company is implementing a network that should support potential growth over the next five years. The company has eight departments which are operated individually and maintain their data communication securely. The data communication between the departments should be controlled by security policy through layer 3 devices. The VLSM has been designed in such a way that the size of the subnets is expected to have a growth of 80% as the company requirement. According to the branch requirements, separate subnets are allocated to Development group, Software testing group , Human resource management, Technical support group, Customer issue support, Business administration, Production. We provide the network to the client and if there is any issue, we test the connectivity using the Cisco packet tracer for troubleshooting.

II. SERVICE POSITIONING TAXONOMYTYPE STYLE AND FONTS

In topological perspective, service provisioning is divided into two parts: single cloud and intercloud. The cloud computing data center is used by the client who brings several challenges and basic unavailability of cloud service can leave thousands of customers relying solely on limited essential and paid resources[4].

The techniques involved in different service provisioning approaches include the genetic algorithm, game theory, and multi criteria decision-making. Availability, scalability, comparison capability, and the CSP's compliance with the relevant regulations are the basic needed one. In addition, the primary requirements include QoS, web services (WS), security aspects, pricing, and the elastic capability of the services. The essential metrics are divided into three broad aspects: storage, network, and computation. Provisioning is fundamentally based on three core service models: infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS). It may derive from a single cloud or within the multicloud via the interaction of several service providers[5].

III. OBJECTIVES OF SERVICE POSITIONING

The strategic objectives of provisioning cloud services have a paramount importance. We describe the major objectives as follows[3].

3.1. Fair Comparison

One of the objectives of service provisioning is the fair comparison among the available services or with the CSP. Generally, users compare different cloud offerings according to their priorities and along several dimensions to select whatever is appropriate to their needs. However, it is a difficult task to perform an unbiased comparison and evaluation of all services. Several challenges must be addressed to develop an evaluation model that precisely measures the service level of each cloud provider. This study aims to provide a comparable service analysis for the cloud user to choose among desired services [7].

3.2. Compliance

Service provisioning should comply with appropriate policies. The assurance of service compliance comes from the service providers. The CSP assures the customer of their compliance policies such as data protection, data confidentiality, and necessary data security by complying with the international compliance authority. NIST, ENISA, HIPAA, ISO 27001, and CSA are several compliance authorities who provide guidelines to establish the current cloud compliance security standards for the industry. In the Abbreviations Section, the details of the acronyms are presented.

3.3. Prediction

Prediction is important in cloud service provisioning. A service user should be ensured of the elasticity and scalability of the services, even during peak hours or when the user suddenly makes an unusually high demand on the resources . In this situation, one of the objectives of the service provisioning selection is that the request should be instantly fulfilled by the service provider. Therefore, the user should be assured of the available required resources on demand with the predictable elastic and scalable services[8].

3.4. Rank

Selecting the best and most appropriate service is a vital factor for the cloud service user. Selecting services depends on comparing and ranking them suitably. A reasonable and acceptable ranking system helps the cloud customer to make decisions about service selection. Therefore, the cloud service ranking system is an important aspect of a fair cloud service comparison and selection process. However, there is a lack of comparison of services across providers due to a lack of common comparable criteria or attributes[9].

IV. SOFTWARE DESCRIPTION

Cisco Packet Tracer (PT) is teaching and learning virtual networking simulation software developed by Cisco Systems Inc. PT allows creation of realistic scenarios of various networking structures, network system configuration and network troubleshooting. PT is a graphically based (GUI) interactive software, but it also provides students with a text-based CLI (Command Line Interface), available for configuring network devices. The CLI allows students to enter partial Cisco IOS commands. Cisco IOS is network infrastructure software used on most Cisco routers and current switches .There are various benefits and advantages of using a Packet Tracer in learning basic and advanced concepts of computer networks. Because computer networks can be difficult to understand theoretically, PT has lots of features to create various scenario based labs. After doing more practice on a PT networking scenarios, students gain lot of confidence to work on real-time networking devices. Cisco packet tracer is the major network simulation software used for certification exam training (Cisco CCNA and CCNP for example) or network feature test without having to buy expensive real world equipment. The two software have been designed to address different needs.Packet Tracer is a network simulator and embeds only limited real equipment features.

V. SYSTEM IMPLEMENTATION PHASES

5.1 Produce a Logical Network Diagram that includes, for each site:

- Routers and switches, with device names
- Subnet addresses
- Site Identification
- IP addresses will automatically be assigned to PCs/workstations for Business Administration group, Software testing group, and Development group in Coimbatore.
- Development group in Hyderabad
- Development group in Bangalore
- Production group in Chennai
- Customer issue support group at each site
- Human Resource management group at each site
- Technical Support group at each site
- Each VLAN/LAN must have its own printer.
- Server Farm Host addresses will be statically assigned.
- Printer addresses will be statically assigned
- Record the PC and server addressing using the tables below.

5.2 Routing Protocol Planning

The company network will use EIGRP as the routing protocol:

- EIGRP MD5 authentication is required on each link between internal routers
- Indicate bandwidth on all router interfaces
- Set passive interface for relevant interfaces
- Configure a default route to Bangalore ISP

- Advertise default route to other internal routers
- Routers must be accessible via SSH for maintenance by Technical Support group

5.3 VLAN Planning

Switches:

- Reliability and redundancy must be considered
- Rather than use VLAN 1 as the default management VLAN, at each site create VLAN 616 as the Switch Management VLAN. At each site all switches will be in VLAN616.
- Switch ports must be secured
- Switches must be accessible via SSH for maintenance by Technical Support group

At Chennai:

- Production ,Customer issue support group and Technical Support groups are on the ground floor of a single level building
- The Human Resource management group must have access to the network via a wireless LAN.
- Site size 150metres x 200metres
- Building Floor size 20metres x 30metres

5.4 Configure Routers and Routing Protocol

- Refer to Phase 1 for VLSM subnets and IP Address assignment.
- Refer to Phase 2 for details regarding EIGRP.
- The Internet Web Server attached to Chennai ISP has a Class B address. This Web Server represents the "Internet".

5.5 Configure VLANs

- Refer to Phase 1 for Company Requirements.
- Refer to Phase 3 for Switch Details.
- There must be a PC on each VLAN to allowing testing of the network

5.6 Configure DHCP

The company wants to use DHCP.

- DHCP must be configured to provide IP address information to PC workstations.
- Use the information documented in Phase 1 to configure each DHCP pool.
- Connect only 1 PC workstation to a switch for each of the appropriate VLANs . Label the PCs, for example PC Development. This will aid your team and the Tutor in testing the Packet Tracer prototype
- Configure each PC workstation to obtain its IP address automatically

5.7 Configure Frame Relay and PPP

- Configure a Cloud in Packet Tracer as Frame Relay Switch, use it to connect the company's sites
- Configure PPP and CHAP authentication on the link to the ISP

5.8 Wireless LAN

- Determine the number of Wireless Access Routers you need at the Chennai site to support the Human Resource management. Show the details of your calculation.
- With the help of graph paper show to scale the deployment of the wireless routers across the site[11].

5.9 NAT Configuration

- The company wants to use private addresses. The addresses provide by your tutor do not actually belong to the private range, but are sufficient for the purpose of building the prototype network.
- Configure NAT on the router that is acting as your gateway router to the Internet as follows:
- Define the NAT pool. Please use the Class B NAT pool public address given to you by your lab tutor.
- Assign a static address to each of the servers.
- The rest of the address range can be used with the NAT pool.
- Define an access control list, which will permit all IP traffic from permitted internal addresses.
- Overload your NAT pool
- Test that NAT is working from a host on any LAN or VLAN. The host should be able to ping and browse to the Internet Web Server.

5.10 Security Access Policies

- SSH access must be configured to access all routers and switches
- All unallocated switch ports must be shutdown
- The company requires the implementation of ACLs to control the flow of IP traffic within its network and to the Internet.
- Before you implement the ACLs, test that each PC is able to browse and ping the Internet Web Server, all the Internal Servers and PCs on other VLANs [12].

VI. SPANNING TREE PROTOCOL

The Spanning Tree Protocol (STP) is a network protocol that builds a loop-free logical topology for Ethernet networks. The basic function of STP is to prevent bridge loops and the broadcast radiation that results from them. Spanning tree also allows a network design to include backup links to provide fault tolerance if an active link fails.As the name suggests, STP creates a spanning tree within a network of connected layer-2 bridges, and disables those links that are not part of the spanning tree, leaving a single active path between any two network nodes. Spanning Tree Protocol (STP) is a Layer 2 protocol that runs on bridges and switches. The specification for STP is IEEE 802.1D. The main purpose of STP is to ensure that do not create loops when you have redundant paths in your network. Loops are deadly to a network. A blocked port can be reactivated if another port goes down. This allows STP to maintain redundancy and fault-tolerance. However, because ports are blocked to eliminate loops, STP does not support load balancing unless an Ether Channel is used.

VII. CONCLUSION

The proposed network design document has been handed over to service delivery team and project management team to implement in live network. In-house service management tools are updated based on the services delivered throughout the project. The Service provider escalation procedure documents passed to clients to contact for any emergency issues within the network. The company support team members are trained to give on-going support on 24/7 roster[10].

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