ENTERPRISE NETWORK DESIGN

CSCI 6649-01

NETWORK CASE STUDY

GROUP - 3

TEAM MEMBERS

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PROJECT DESCRIPTION:

Indian Farmers Mart is one of the biggest stores (grocery and essential items) and it has branches all over the USA. The network is formed by three cities, each with its own head office. Dallas, Seattle, and New York are the three main locations or cities.

Indian Farmers Mart makes use of a variety of applications, including product tracking and order tracking, and collaborates with several departments, including Administration, Marketing, Accounting, Human Resources, Payroll, and Security. Each of these departments works toward its own set of objectives and needs in order to aid in the smooth operation of the organization.

The Indian Farmers Mart is aiming to expand its creative characteristics into the technical domain. We want to use Amazon Web Service (AWS) cloud services to host a few of the company's servers and resources in order to do this. This solution will enable us to construct a virtual private cloud, which will help mitigate some of the vulnerabilities that servers may face while located on campus or in a remote location. This network is being created with the goals of scalability, availability, and security in mind.

Here are a few more important technical objectives which needs to be taken into consideration for a scalable and secure network environment which we are going to follow in our project:

- Availability
- Performance
- Security
- Manageability
- Ease of use
- Solve LAN/WAN bottleneck problems caused by large increases in internetwork
- traffic.
- Provide centralized servers that reside in a data center.
- Make mainframe data accessible to the enterprise IP network.
- Add new sites to support field offices and telecommuters.

- Add new sites and services to support secure communication with customers, suppliers, resellers, and other business partners.
- Network Performance

Customer Goals:

The proposed network will provide real time web services.

Customers can schedule a pickup of products. Customer data is protected through SSH or firewall.

Customer's data is maintained through registers in cloud.

Customers pickup details are sent through email services.

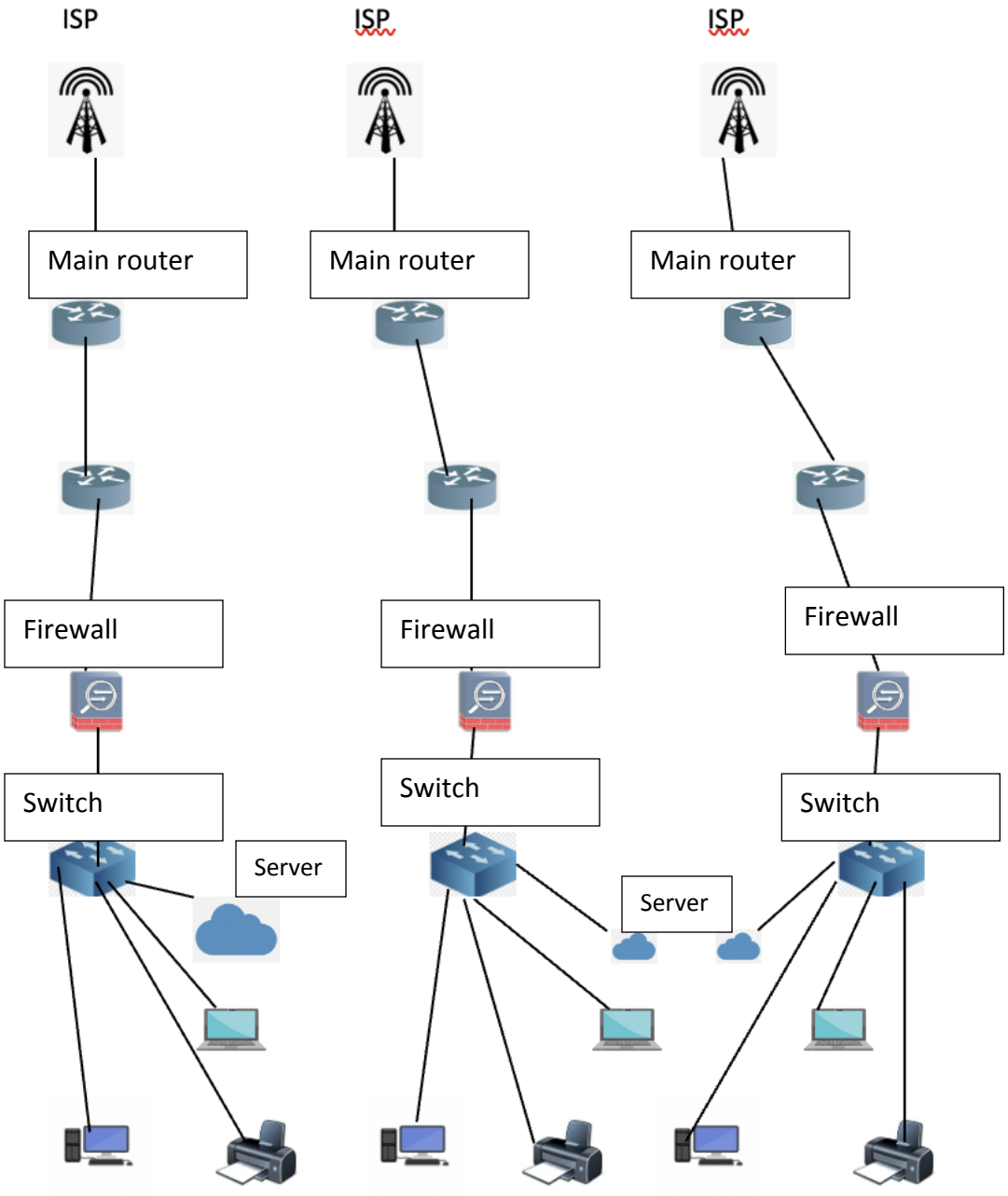
Staff can communicate to customers through secure mail services (SMTP).

Network security is deployed to other services and applications which include the regular servers, file, mail, and web servers.

Network Topology:

The architecture of a network, as well as how distinct nodes in a network are connected to one another and interact, is referred to as network topology. Physical topologies (the physical arrangement of devices on a network) and logical topologies (the way signals operate on network media, or the way data moves across the network from one device to the next) are the two types of topologies.

We'll use three routers in each destination because the grocery shop is in three distinct places. The ISP connects each area's primary router, which is connected to every other router in the network. Our network's main router serves as a gateway. In our WAN architecture, the primary router is connected to many routers through separate serial lines to serve as a backup if the network experiences a surge in traffic on a single serial line. The mesh topology connects all switches in each location.


ISP
ISP
ISP
Main router
Main router
Main router
Firewall
Firewall
Firewall
Switch
Switch
Switch
Server
Server

1. Information:
    a. Client: Grocery Chain
    b. Business: Private Company
    c. Nature of work: Grocery
    d. Location: New York
    e. Budget: 500k
2. Network Applications:

Network applications are an essential part of network design as they perform useful functions for example file transfers within a network. They help transfer data from one point to another within the network. The application may use an existing application layer protocols such as HTTP, SMTP. In this section we have listed few network applications that are hosted within our servers that can be accessed by different users on our network. There are restrictions placed on which type of user has access to specific apps.

1. Email
2. Web search
3. Product Tracking
4. Order Tracking
5. Inventory management
6. Job portal
7. Employee portal
8. Payroll portal
9. CCTV
10. Cloud Apps

Business Goals:

Goals are at the core of success for any enterprise. Without these goals, employees, managers and leaders lack a clear vision of the future of the company. They add meaning to daily work and help teams understand how their work has a larger impact on the company's success. The main aim of any marketing company is, understanding the customers and their needs that will eventually help the company maintain a diverse and competitive workforce.

Likewise, the main goal is to provide members with quality goods and services at the lowest possible prices. The other important goals include continues customer support and services through email, messages and phone calls, achieve excellence as a large-scale company by expanding into a worldwide market, attain customer satisfaction by continuously providing easy access to goods.

3. Estimated Users Count

- New York
    i. Admin Center -100
    ii. Marketing - 8000
    iii. Accounting - 1500
    iv. Employment – 3000
    v. Payroll – 2000
    vi. Customer Service - 8500
    vii. Security – 9500
- Dallas
    i. Admin Center -50
    ii. Marketing - 5500
    iii. Accounting - 650
    iv. Employment – 2500
    v. Payroll – 1000
    vi. Customer Service - 6500

vii. Security – 7500

- Seattle
    i. Admin Center -50
    ii. Marketing - 3500
    iii. Accounting - 500
    iv. Employment – 2000
    v. Payroll – 1000
    vi. Customer Service - 4500
    vii. Security – 6000

4.

a. Availabilities/Capabilities:

Due to the type of business, it is important to make sure that environment is fully available at any given time. We are required to make sure that entire network is designed in such a way that it's Highly Available (HA) to minimize any downtime.

b. Constraints/Limitations:

Depends on the size of data that might need to access from different locations that are spread over geographical area.

5. While designing the environment we will take in account that between both Delivery Network there will be about 5% of growth every year. The growth will be included following:
    a. Number of users
    b. New applications that might be deployed in future

6. LAN

a. Wireless Devices

b. Ethernet

7. WAN – 10 GB Fiber connection to connect all the sites. This should be adequate in this scenario as there will be lot of traffic between all the sites. And users will have enough bandwidth to access required data and applications across the network.