**Scenario**

You will play the role of a network administrator for a fictional company, Bacon Institute. As a new employee, your first task is to develop a Cisco network proposal for the organization while also working toward your Cisco Certified Network Associate (CCNA) certification.

Welcome to Bacon Institute!

You have been recently hired as a network administrator for Bacon Institute, an educational organization that provides educational offerings to nontraditional students. The school realizes that the local systems administrators need help implementing certain technologies at each of the remote locations, as well as final WAN configurations.

Out of the network administrators on staff, you have been asked to move the Cisco Network Proposal forward. You will use background and skills to design, implement, and assist in configurations to support Bacon Institute's topology.

Technologies to implement will differ from site to site, as administrators have begun topology implementations. You will be provided the overall topology as well as certain device configurations in order to determine the best course of action per site/challenge. In addition to helping the school configure its network, Bacon Institute requires that all new network administrators obtain their CCNA certification within 60 days of being hired.

The first part of the project will be to create a network diagram showing a logical design of the network including addressing schemes, devices, servers, etc. This will help when developing and troubleshooting the network.

Network addressing and the TCP/IP Protocol Suite are some of the essential elements of hierarchical design in the workplace. Network addressing will be a big part of the first section of your Cisco Network Proposal assignment.

Network Addressing

As the network administrator for Bacon Institute, you are required to understand enterprise networks. Companies often start small with one site connected to the internet, but a company like Bacon Institute is much bigger and has grown to where it has a primary central location and multiple remote sites around the world.

You understand that enterprise networks require the ability to support multiple types of network traffic. They also must address the diverse business needs for critical applications and provide appropriate mechanisms for centralized administrative control.

Bacon Institute uses a hierarchical design model, which breaks up the overall design into multiple modular layers. This allows each layer to be focused on specific functions, simplifying the overall network design.

As part of your network administrator design responsibilities on the project, you will help to develop and diagram the hierarchical design model including the necessary network addressing scheme. It is vital that this addresses the need for growth at Bacon Institute and includes ease of support. Having enough IP address space within each network will help to prevent a costly network reconfiguration in the future. A good naming scheme is also vital. You have learned that you should avoid naming devices according to staff member or locations, as this information may change frequently, requiring significant maintenance.

You are being tasked with developing and providing a diagram of the network architecture. Like a blueprint of a building, a network diagram shows how a network is built. However, it goes further, addressing how the network works and how different devices interconnect. A diagram helps the engineers and administrators to manage and support the network.

For your first assignment, your task is to develop a network infrastructure design for the organization using diagramming software such as Microsoft Visio.

you will have to ensure that your network infrastructure design meets the requirements above for the company’s remote sites. In addition, the first part of your Cisco Network Proposal will require you to create a diagram of a network for which routing will be supported by your design.

Routing

Bacon Institute has networks located in four locations: Phoenix, Toronto, Orlando, and Miami. As a network administrator, you know the basics of "routing," the process of ensuring that certain packets of information are delivered to the correct location. This process is similar to how the US Postal Service delivers a letter from one mailbox to another. Along the way, mail sorters and handlers (routers) direct the letters (packets).

Routers will keep track of successful paths and maintain those for future use (routing tables). If detours are needed, the routers update these tables dynamically. As the size of the network expands and new locations are added, new routers will need to be added to share the load. Also during maintenance, when one router is being patched, other neighboring routers will be able to dynamically take over the traffic.

The scenario shows that as a network administrator, you will need to ensure that the network design supports the effective use of routing throughout the organization.

# Network Infrastructure Design Template

## Part 1: Complete the Router Networking Tables

Table 1 lists the current Router Networking and Information for the organization. For your Part 1, use the information in this table to complete Tables 2, 3, and 4 below. Add additional rows if necessary.

Table 1: Current Router Networking and Information

|  | **Site number** |  |
| --- | --- | --- |
| Orlando Site Router | 1 | **Management VLAN**  IP - 192.168.1.0  **Production VLAN**  IP - 192.168.11.0  **Internet VLAN**  IP-  **IP Assignments**  Loopback - 10.1.1.1/32  **VPN Tunnels**  TBD - based on requirements |
| Phoenix Site Router 1 | 2 | **Management VLAN**  IP - 192.168.2.0  **Production VLAN**  IP - 192.168.22.0  **Internet VLAN**  IP-  **IP Assignments**  Loopback - 10.2.2.2/32  **VPN Tunnels**  TBD - based on requirements |
| Phoenix Site Router 2 | 3 | **Management VLAN**  IP - 192.168.3.0  **Production VLAN**  IP - 192.168.33.0  **Internet VLAN**  IP-  **IP Assignments**  Loopback - 10.3.3.3/32  **VPN Tunnels**  TBD - based on requirements |
| Toronto Site Router | 4 | **Management VLAN**  IP - 192.168.4.0  **Production VLAN**  IP - 192.168.44.0  **Internet VLAN**  IP-  **IP Assignments**  Loopback - 10.4.4.4/32  **VPN Tunnels**  TBD - based on requirements |

Table 2: Orlando Site

| **Net ID** | **Usable Range** | **Subnet Mask** | **CIDR Value** | **Broadcast** |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Table 3: Phoenix Site

| **Net ID** | **Usable Range** | **Subnet Mask** | **CIDR Value** | **Broadcast** |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Table 4: Toronto Site

| **Net ID** | **Usable Range** | **Subnet Mask** | **CIDR Value** | **Broadcast** |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

## Part 2: Design the Network Infrastructure

Create a network drawing using Visio , specific to this organization listing the network’s topology.

In your diagram, include any necessary hardware. The drawing should include enough detail to show the interconnections of the topology. The viewer should be able to understand the Bacon Enterprises network environment.

All devices require hostnames and should use the following naming conventions:

* Routers: Rx; where x is the site number
* Switches: Sx; where x is the site number
* Include necessary details for high availability.
* Any external source that is consulted should be cited properly.