Leaving on a Jet Plane (Instructor Version)

Instructor Note: Red font color or Gray highlights indicate text that appears in the instructor copy only.

Objective

Explain the operation of multiarea OSPF to enable internetworking in a small- to medium-sized business network.

This activity will introduce the concept of regular and core areas and their relation to how backbone, area border, internal and autonomous system boundary routers serve to deliver data from internal to external networks.

Scenario

You and a classmate are starting a new airline to serve your continent. In addition to your core area or headquarters airport, you will locate and map four intra-continental airport service areas and one transcontinental airport service area that can be used for additional source and destination travel.

Use the blank world map provided to design your airport locations. Additional instructions for completing this activity can be found in the accompanying PDF.

Required Resources

- Blank world map diagram
- Word processing software or alternative graphics software for marking airport locations and their connections

Blank World Map Diagram

Directions

Step 1: Design the airport locations.

a. Use the blank world map diagram provided.

b. On your map, place a star in the center of the continent in which you live. This is now the Airport Core Site and will serve as your core transit location. Label it as Airport Core Site. This is your first area of intra-continental service and all airports will be connected to the Airport Core Site.

Step 2: Map airports within your continent to serve your passengers.

a. Map four airport locations within your continent to connect to the Airport Core Site. Call them North, South, East, and West Airport Sites.

b. Place four circles on your continent's map to represent the North, South, East, and West Airport Sites. Some circles may overlap due to the size of the continent and the sites placement on the map.

c. Draw a straight line from each of these airports to the Airport Core Site. These intra-continent locations are your first level of service for your airlines. They are also known as area border airport sites.

Step 3: Identify another continent your airline will serve.

a. On the world map, locate another continent you would like to provide service to and from the Airlines Core Site.

b. Place a circle in the center of the continent you chose for second-level service. This airport will be called Transcontinental Airport Site.

c. Draw a line from your Airlines Core Site to the Transcontinental Airport Site. This airport will be known as an autonomous system border router (ASBR) airport site.

Summary

After completing Step 3, you should be able to see that the airport connections resemble a network topology. Complete the reflection questions, save your work, and be prepared to share your answers with the class.

Reflection

1. While designing your airline travel routes, did you pay close attention to the headquarters location? Why would it be important to have a core site for airline travel?

   Answers will vary. Some groups will mention that most airlines do incorporate a main location to and from which their airplanes fly. The purpose of having a headquarters or a core location allows airlines save costs and time when delivering passengers to and from other locations. Network design also incorporates routers which serve as core delivery areas for network traffic. Some of these routers carry data from many other areas and some carry network traffic from only one area. This type of routing can save costs.

2. Would networks incorporate core, border, and ASBRs into area sites? Justify your answer.

   Answers will vary. If a network is very small, one area will be sufficient to route network traffic. But if there are plans to expand the network, it would be a good idea to map the routers into groups based on functionality and location to make the network scalable.

3. What is the significance of mapping transcontinental areas?

   Mapping transcontinental locations allows airlines to know which main intra-continental areas and external extra-continental routes they serve. In routing, this would indicate major internal router locations for a small-

to medium-sized business and ISP external connections to route external information to and from your small- to medium-sized business location.

4. What is the significance of mapping internal airline destination routes? Compare this to a routing topology.

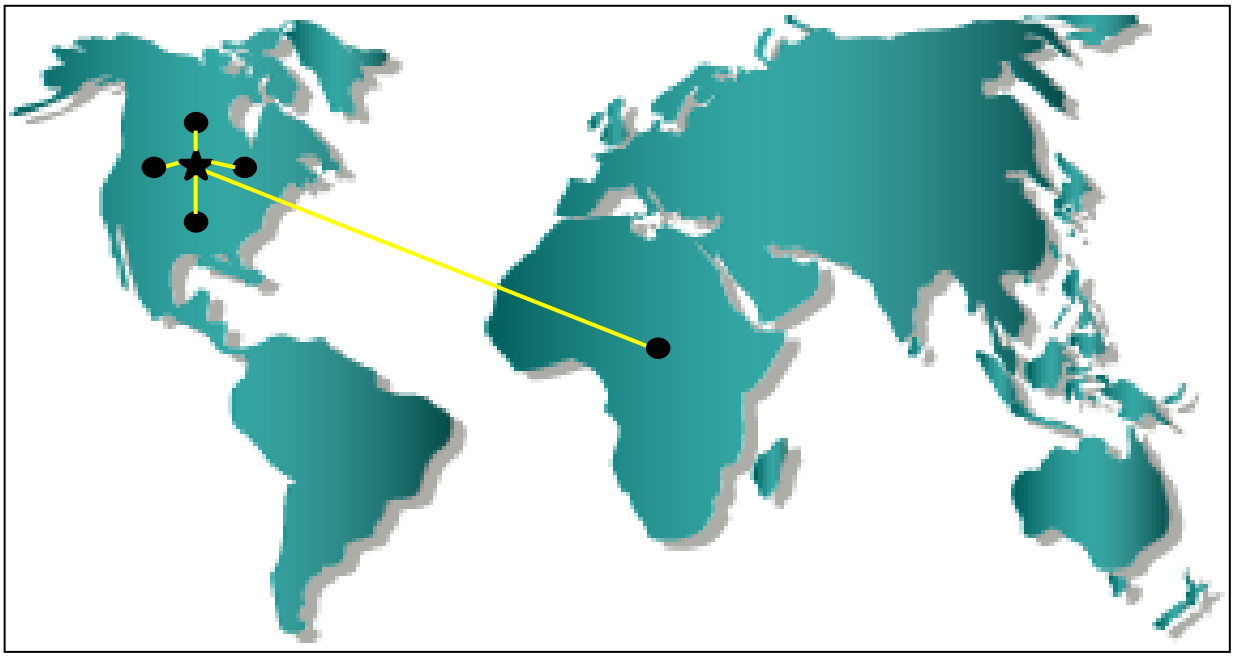
Airlines often will serve fairly close subsidiary airport customers. The same holds true for network data delivery, as sometimes routers are locally situated in order to provide alternate paths or methods (protocols) to be delivered by data routes.

5. Is it possible that the Airlines Core Site could serve several functions for your airlines (network)? Explain your answer.

Core headquarters can serve as a central location for intra-country routing or external transcontinental routing. The same holds true for core routers, as their purpose is to deliver data traffic to areas to which they are directly connected or provide connections to areas outside of their areas or domains.

Instructor Resource Example

The information listed in this section is only one depiction of what students could see as a result of this activity. Other topology designs may vary per student groups.



Identify elements of the model that map to IT-related content:

- Regular, internal routing areas
- Core, backbone areas
- External, autonomous system boundary or border router
- Border area router
- Backbone router
- Cost