Session 1-6-7

Designing the Network Topology and Solutions the Existing Network

Top-Down Approach

Objective

- To describes the top-down approach for network design
- Review pilot and prototype test networks
- Describes the components of the design document

Top-Down Approach

Starting your design from the top layer of the OSI model and working your way down

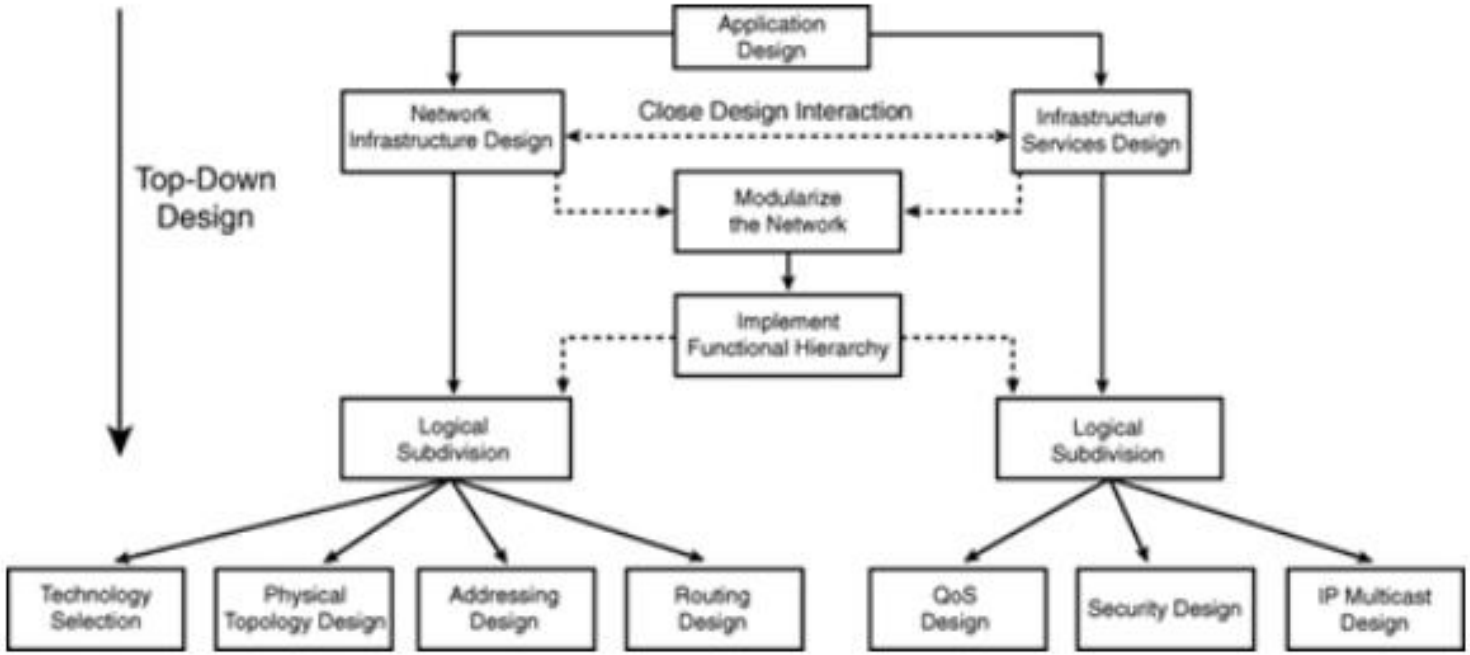
- Network devices and technologies are not selected until the applications' requirements are analyzed
- To complete a top-down design, the following is accomplished:
  - Analysis of application and organization requirements

Top-Down Approach

- Design from the top of the OSI reference model
  - Define requirements for upper layers (Application, Presentation, Session)
  - Specify infrastructure for lower OSI layers (transport, network, data link, physical)
- Gather additional data on the network

Top-Down Approach

Figure 1-6. *Top-Down Design Process*



Top-Down Approach

Table 1-10. *Top-Down Design Compared to Bottom-Up Design*

Design Approach	Benefits	Disadvantages
Top-down	Incorporates the organization's requirements. Provides the big picture. The design meets current and future requirements.	More time-consuming.
Bottom-up	The design is based on previous experience and allows for a quick solution.	May result in inappropriate design. Organizational requirements are not included.

Pilot and Prototype Tests

Best practice - test the new solution before implementation

Two ways of testing:

- prototype -
  - subset of a full design
  - Test - isolated environment
  - No connection to exisiting network
  - Advantage – network testing before deployment
- Pilot
  - "Live" environment as a test site before deployment

Pilot and Prototype

- A pilot allows real-world problems to be discovered before deploying a network design solution to the rest of the internetwork
- Successful testing – design phase complete – implementation phase next
- Failure - correct design – test

Design Document

The design document describes

- business requirements
- old network architecture
- network requirements
- design,
- plan, and
- configuration information for the new network

Design Document

The network architects and analysts use it to document the new network changes, and it serves as documentation for the enterprise business requirements

Design Document

The design document should include the following sections:

- Introduction describes the project's purpose and the reasons for the network design.
- Design Requirements lists the organization's requirements, constraints, and goals.

Design Document

- Existing Network Infrastructure includes logical (Layer 3) topology diagrams; physical topology diagrams; audit results; network health analysis; routing protocols; a summary of applications; a list of network routers, switches, and other devices; configurations; and a description of issues.
- Design contains the specific design information, such as logical and physical topology, IP addressing, routing protocols, and security configurations.

Design Document

- Proof of Concept results from live pilot or prototype testing.
- Implementation Plan includes the detailed steps for the network staff to implement the new installation and changes.
- Appendixes contains list of exiting network devices, configurations, and additional information used in the design of the network.