

Network Design Steps

Marc S. Galli

Walden University

Professor Dr. Farhan Siddiqui

ITEC 1020: Networking Fundamentals

September 6, 2020

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Network design is crucial prior to implementing a computer network. Instead of buying a piece a technology and fitting it in, choose to plan and design before implementing. The concept coincides with a design methodology which is top-down. The notion, top-down, refers to the seven OSI layers, where the seventh layer is the application layer. Calling our network design methodology the top-down method implies that we start with a firm comprehension of the businesses goals before selecting technology devices to install and first consider how the end-users will actually use the network. By way of example, let us consider a network built for a team of video-editors. We would never implement a 10/100-baseT network or wireless 802.11 architecture for the video-editors' edit-bay computers. Gigabit ethernet would be the minimum speed at which all network interface cards, switches, and routers should operate at. This is an example of the top-down approach in considering the end-users need before selecting equipment. To appropriately apply the top-down network design methodology, determine the users' requirements and draft/propose a structure for the network focusing on data flow, data types, and processes that will access or change the data. Focus on understanding the needs of the end-users, the business' goals and constraints, technical goals and tradeoffs, and then develop a network map conceptually and logically prior to ever purchasing equipment. Lastly, equipment specifications will be determined in accordance with the end-users' usage needs and requirements, a topology will be selected and solutions can be documented. If this is an upgrade or an existing network, then the network designer can gather information about the existing network equipment and use auditing tools and perform a network assessment based upon a checklist (Skillsoft, 2019). Technical goals must be carefully considered such that none of the following will be overlooked: scalability, availability,

network performance, security, manageability, usability, adaptability, and affordability (Oppenheimer, 2011).

Four phases are involved in network design, to wit: planning, creation, testing, and optimization. The phases are often referred to as a system's development life cycle. First, in the planning phase, the network architect must analyze the requirements of the business and the customer's needs. He will interview users and information technology systems administrators to understand business and technical goals for the new system. He will analyze the current network traffic, including traffic flow and load, which protocols are used, and what quality of service requirements may exist (Sandberg, 2015).

Second, in the creation phase, the network architect should seek to design the network from a logical and conceptual vantage point. He should consider network layer addressing and naming as well as protocols for switching and routing. This is the stage where security planning will take place and a method for network management will be discussed. If the method of internet connection will be chosen, re-selected, or if multiple choices for providers exist in the area, then consideration can be given as to wide-area-network and remote access requirements.

Third, in the testing phase, the network architect must design the physical topology. During this, specific equipment and technologies that can achieve the logical/conceptual design are selected and an internet service provider should be selected at this time.

Fourth, and last, in the optimization phase, the network architect should test the now fully configured network, optimize it, and document the design. These final steps of the fourth phase conclude the top-down network design methodology.

## References

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