

INSTITUTE OF ACCOUNTANCY ARUSHA

(IAA)



DEPARTMENT OF INFORMATICS.

BACHELOR OF COMPUTER SCIENCE.

YEAR: 2023/2024.

MODULE: NETWORK MANAGEMENT AND ADMINISTRATION.

CODE: ITU 08105.

MODULE FACILITATOR: KAVUTA (MR. KARISHA).

INDIVIDUAL ASSIGNMENT.

REG NO: BCS/0035/2021

NAME: ALEX KEHONGO MWERA.

1. Requirement analysis is a crucial phase in network design where the goals and constraints of the business are thoroughly examined to ensure that the network solution aligns with the organization's needs. Typical business goals and constraints that should be analysed during network design include

Business Goals:

1. **Performance:** Meeting performance requirements is essential to ensure that users can access resources and applications in a timely manner (V, 2016). Analysing the performance needs of critical applications helps in determining the appropriate network infrastructure and configuration.
2. **Network Applications:** Ensuring that the network can support the specific applications necessary for the business to operate effectively is paramount (Press, Analyzing Business Goals and Constraints of Network Design, 2004). This could include email systems, customer relationship management (CRM) software, video conferencing tools, or industry-specific applications.
3. **Security:** Protecting sensitive data and ensuring the integrity of network communications are top priorities for businesses. This involves implementing security measures such as firewalls, intrusion detection systems, encryption, and access controls to mitigate risks and comply with regulatory requirements.
4. **Cost Efficiency:** Optimizing costs while maintaining the required level of network performance and security is a balancing act. This involves evaluating the total cost of ownership (TCO) of network equipment, considering factors such as acquisition costs, maintenance expenses, and energy consumption.
5. **Compliance:** Adhering to relevant regulatory requirements and industry standards is necessary to avoid legal and financial repercussions. This includes regulations such as the General Data Protection Regulation (GDPR), Health Insurance Portability and Accountability Act (HIPAA), Payment Card Industry Data Security Standard (PCI DSS), and others.
6. **Scalability:** The ability of the network to grow along with the business is a key goal. This involves considering factors such as adding new users, locations, or services without experiencing a significant drop in performance or reliability.
7. **Competitive Advantage:** Leveraging technology to gain a competitive edge in the market is a strategic goal for many businesses. This could involve deploying innovative network solutions that improve efficiency, enhance customer experience, or enable new business models.

8. **Reliability:** Minimizing downtime and ensuring continuous availability of network services is crucial for business operations. Redundancy, fault tolerance, and disaster recovery planning are key components of achieving high reliability (Press, Analyzing Business Goals and Constraints, 2023).

Business Constraints:

1. **Timeframes:** Project deadlines and timelines can impact the design process, requiring trade-offs between speed of deployment and thoroughness of planning. Efficient project management is essential to meet deadlines while delivering a robust network solution.
2. **Corporate Policies:** Organizational policies related to procurement, security, and technology standards must be considered during the design phase. *“it is critical for the network designer to gather information about any policies that might impact a project.”* (DiNicolo, 2007). This ensures that the network solution aligns with corporate objectives and governance requirements.
3. **Budgets:** Financial constraints often dictate the scope and scale of network design projects. Design decisions must be made with a keen eye on cost-effectiveness and return on investment. (Press, Analyzing Business Goals and Constraints, 2023)
4. **Politics and Decision-Makers:** Understanding the organizational hierarchy and decision-making processes is crucial for gaining buy-in and support for network design proposals. Engaging with stakeholders and addressing their concerns can help smooth the approval process and ensure successful implementation.
5. **Personnel:** The availability of skilled IT personnel can influence the complexity and manageability of network solutions. Limited resources may require simplifying network architectures or investing in training programs.

2: When designing a network, several technical goals come into play, each with its own tradeoffs. Let's explore these:

1. Manageability:

- Goal: Simplify network administration, monitoring, and troubleshooting.
- Tradeoffs: Complex designs may be harder to manage. Automation tools can help, but they require initial investment (OpenAI, 2024).

2. Reliability and Availability:

- Goal: Minimize downtime and ensure network uptime.
- Tradeoffs: Redundancy (e.g., backup links, failover) increases reliability but adds complexity and cost. Over-redundancy can lead to inefficiencies.

3. Scalability:

- Goal: Design a network that can handle growth in users, devices, and traffic.
- Tradeoffs: Scalability often requires additional hardware, bandwidth, and complexity. Balancing scalability with cost and manageability is crucial (OpenAI, 2024).

4. Security:

- Goal: Protect data, prevent unauthorized access, and maintain confidentiality.
- Tradeoffs: Stringent security measures (firewalls, encryption) can impact performance. Finding the right balance between security and usability is essential (OpenAI, 2024).

5. Cost Efficiency:

- Goal: Optimize costs while meeting requirements.
- Tradeoffs: Cutting costs too aggressively may compromise performance, security, or reliability.

6. Flexibility and Adaptability:

- Goal: Design a network that can adapt to changing needs.
- Tradeoffs: Highly specialized designs may lack flexibility. Generic solutions may not meet specific requirements.

7. Quality of Service (QoS):

- Goal: Prioritize critical traffic (e.g., voice, video) over less important data.
- Tradeoffs: QoS settings can impact overall network performance. Over-prioritization may lead to resource contention.

8. Performance:

- Goal: Achieve optimal network speed, low latency, and efficient data transfer.
- Tradeoffs: High-performance networks may require expensive equipment or complex configurations. Striking the right balance ensures smooth operations (OpenAI, 2024).

References

- DiNicolo, D. (2007, July 4). *Network Design Step 1: Identifying Business Constraints*. Retrieved from 2000Trainers: <https://www.2000trainers.com/ccda-study-guide/network-design-business-constraints/>
- OpenAI. (2024, Feb 13). *Network Design Tradeoffs*. Retrieved from ChatGPT OpenAI: <https://chat.openai.com/share/07e8b387-d69b-4eac-9525-4ebc0a55ab72>
- Press, C. (2004, Aug 6). *Analyzing Business Goals and Constraints of Network Design*. Retrieved from Cisco Press: <https://www.ciscopress.com/articles/article.asp?p=328773&seqNum=2>
- Press, C. (2010, Aug). *Analyzing Business Goals and Constraints*. Retrieved from OREILLY: <https://www.oreilly.com/library/view/top-down-network-design/9781587140051/ch01.html>
- Press, C. (2023, Sep). *Analyzing Business Goals and Constraints*. Retrieved from Cisco Certified Expert: <https://www.ccexpert.us/network-design-2/chapter-1-analyzing-business-goals-and-constraints.html>
- V, S. (2016, Feb 6). *NET 226 - Designing Internetwork Solutions*. Retrieved from Steve Vincent Info: https://stevevincent.info/NET226_2016_1.htm