Cover Sheet

Abstract

The objective of preparing the report is to design the wireless LAN for a large-scale organization. The main aim in designing the Network for the large-scale industry is to make an environment for the staff of the organization to work efficiently and effectively within the organization.

To design the network for the organization all the necessary information of the organization should be detailed. As we are not provided any information regarding the organization the planning of the wireless LAN will be designed according to the reference and assumption of the need for the network for the Large-Scale Organization.

**Assumptions**

Numbers of Departments 6

Number of workstation 300 divided into 6 departments

**Based on the assumption the required equipment is:**

* Server installation
* Firewall for protection
* Backup
* Recovery option
* High-Speed Internet

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# Introduction

* 1. Purpose:

The main purpose of the report is to design and estimate the network for the large-scale organization to make an environment for the staff of the organization to work in an efficient and effective environment. And to design, a feasible network then can reach the company's needs for the next five years.

* 1. Background

According to the assumption the large-scale organization has 300 computer nodes that lie with is the same building. There are six different departments in the organization and the 300 nodes are divided into 6 different departments. The six departments of the company are on a different levels of the building.

The departments of the Large-Scale organization are:

* Administration
* Executive Management
* Marketing
* Accounting and Finance
* Software Development
* Production
  1. Objective

The main objective is to design a wireless LAN for the organization and to meet the requirement so that it maintains the following criteria:

* Confidentiality
* Integrity
* Availability
* Authentication
* Authorization

# Requirement Analysis

Since the network that we are designing are based on software development we have analyzed the requirement that is required in designing the network.

According to our analysis, the large scale may increase the number of staff in future so we have considered 20% expansion for the network as that it can be feasible for next 5 years from the date.

As we have considered that 300 computers are divided into different departments and with 20% expansion there will be 360 computers that are divided into different departments.

The structure of the Organization is presented in the figure below:

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| **Level 6**  Administration |
| **Level5**  Executive Management |
| **Level 4**  Marketing |
| **Level 3**  Accounting and Finance |
| **Level 2**  Software and Development |
| **Level 1**  Production |

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| Level 6: Administration |

**Numbers of users**:10 and 12 including 20% expansion

**Network Hardware requirement**:

**Software Requirements**:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr.No.** | **Software** | **License** | **Quantity** | **Price** |
| 1 | -Windows 10 | **Yes** | **10** | $200 |
| 2 | -MS Office 2016 | Yes | Yes | $100 |
| 3 | -Outlook 2016 | Yes | Yes | $10 |
| 4 | -Adobe Acrobat Reader DC | No | Yes | $0 |
| 5 | -Skype for Business | Yes | As per required | $0 |
| 6 | -Internet Explorer 11 | No | As per System | $0 |
| 7 | -Google Chrome | No | As per System | $0 |
| 8 | -Windows Defender | No | As per System | $0 |
| 9 | -Any other software required by the department  (SAP) | Yes | 1 | $10000 |

**Quality of Service**:

The Quality of Service for the network design for the Administration department is critical. The network design must provide the necessary bandwidth and ensure that the network is reliable and secure. The network design must also be scalable so that it can accommodate the growth of the Administration department. The network design must also be cost-effective. The Administration department is responsible for the day-to-day operations of the company. The network design must ensure that the Administration department has the necessary bandwidth to carry out its duties. The network design must also be reliable and secure. The Administration department is responsible for the security of the company's data. The network design must ensure that the company's data is protected. The network design must also be scalable so that it can accommodate the growth of the Administration department. The Administration department is responsible for the growth of the company. The network design must be able to accommodate the company's growth. The network design must also be cost-effective. The network design must not be too expensive for the company to afford. The network design must also be reliable. The network must be able to handle the company's traffic and not crash.

The quality of service (QoS) of the administration department is very important to the success of the company. The QoS of the administration department should be reliable, consistent, and efficient. The administration department should be able to handle all the requests from the other departments promptly.

The Quality of Service for the Administration department should be high because this is where all the important business functions are coordinated. The employees in this department need to have good access to the network and the internet so that they can do their jobs effectively.

The Quality of Service for the Administration department should be:

* High network availability
* Fast network response times
* Unlimited data bandwidth
* 24/7 customer support

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| Level 5: Executive Management |

**Numbers of Users:**7 and 8 including 20% expansion

**Network Hardware requirement**:

**Software Requirements**:

|  |  |  |  |
| --- | --- | --- | --- |
| **Software** | **Price** | **Quantity** | **Paid** |
| Microsoft Office 365, | $120 per user per year, | 1 | license |
| Microsoft Visio Standard, | $299 | 1 | license |
| Microsoft Project Standard, | $799 | 1 | license |
| Windows 10 Enterprise | $125 per user | 1 | license |

Total: $2,342

**Quality of Service:**

The design of the network for the Executive Management department is critical to ensure that the employees in this department have the quality of service that they need to conduct their business. To design a network that will meet the needs of the Executive Management department, it is important to understand the requirements of this department.

The Executive Management department is responsible for the strategic planning and execution of the company's business operations. This department is responsible for the development and implementation of the company's vision and mission. The employees in this department need access to the company's network resources to conduct their work.

The network design for the Executive Management department should include a high-speed network connection that will allow the employees to access the company's network resources. The network should also be secure so that the employees can safely access the company's data.

The network design for the Executive Management department should also include a backup solution so that the employees will have access to the company's data in the event of an emergency.

The network design for the Executive Management department should include a secure connection between the office and the home office. This will allow the employees to access the company's data from anywhere.

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| Level 4: Marketing |

**Numbers of Users**: 22 and 27 including 20% expansion

**Network Hardware requirement**:

**Software Requirements**:

|  |  |  |
| --- | --- | --- |
| **Software** | **Price** | **Quantity** |
| Microsoft Office 2013 | $149.99 for one license | 10 |
| Adobe Photoshop CC | $9.99 per month for a membership with Adobe Creative Cloud | 10 |
| Google Drive | Free | 5 |
| QuickBooks | ,$299.99 for one license | 1 0 |
| Apple iWork | $19.99 for a package that includes three apps: Pages, Numbers, and KeynoteSugar CRM, $600 for 10 users, a lifetime license | 5 |
| Google Apps for Work | $5/user/month, 1 user license | 5 |
| Salesforce CRM | $75/user/year | 1perpetual license |

**Quality of Service:**

There are many important aspects to consider when designing a network for an Accounting and Finance department. The most important factor is the quality of service that is required for the department. This will vary depending on the specific applications and data that will be used by the department. Other factors that need to be considered include the number of users, the type of devices that will be used, the required bandwidth, and the necessary security features. A well-designed network can help to improve the efficiency and productivity of an Accounting and Finance department.

The main concern for the quality of service for network design for the Accounting and Finance department is security. The department needs to be able to share files securely between employees, as well as access secure online banking and other financial websites. Other considerations for the network design include reliability and speed. The department needs a network that is reliable so that they can continue to work uninterrupted during times of peak activity, such as month-end and year-end. The network also needs to be fast so that employees can quickly download and upload files.

In addition, the department would like the network to be secure. They need a network that is password protected so that unauthorized users cannot access their files. Another factor to consider is security. The department needs a network that is secure so that confidential information is not accessed or stolen by unauthorized users.

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| Level 3: Accounting and Finance |

**Numbers of Users:**10 and 12 including 20% expansion

**Network Hardware requirement**:

**Software Requirements**:

|  |  |  |
| --- | --- | --- |
| **Software** | **Price** | **Quantity** |
| Microsoft Office Professional Plus 2013, | $399.99 | 1 license |
| QuickBooks Pro 2018 | $399.99 | 1 |
| Microsoft Office 365 Home | $99.99, | 1 |
| QuickBooks | $299.99 for one license | 1 0 |
| Adobe Photoshop CC | $9.99/month | 1 |
| TurboTax Deluxe 2018 | $39.99 | 1 |
| FileMaker Pro 17 | $299.99 | 1 |

**Quality of Service:**

The quality of service (QoS) of the accounting and finance department is very important to the overall success of the company. The accounting and finance department is responsible for tracking and managing the company's financial resources, and ensuring that all financial processes and transactions are completed accurately and promptly. The QoS of the accounting and finance department should be reliable, accurate, and efficient. Employees in the department should be able to quickly and easily access the information they need, and be able to complete financial transactions accurately and efficiently. The department should also be able to handle large volumes of transactions without any delays or errors.

If the QoS of the accounting and finance department is not reliable, accurate, or efficient, it can cause major problems for the company. Financial processes and transactions may not be completed accurately, which can lead to financial errors and losses. Employees may not be able to access the information they need, which can delay important financial decisions and transactions. If the financial department is disorganized or inefficient, it can cause major problems for the company. Financial processes and transactions may not be completed accurately, which can lead to financial errors and losses. Employees may not be able to access the information they need, which can delay important financial decisions and transactions. And if the department is not able to keep up with the ever-changing landscape of the financial industry, the company may be at a disadvantage when competing with other businesses.

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| Level 2: Software Development |

**Numbers of Users**: 171 and 205 including 20% expansion

**Network Hardware requirement**:

**Software Requirements**:

|  |  |  |
| --- | --- | --- |
| **Software** | **Price** | **Quantity** |
| Microsoft Visual Studio Enterprise | $5,999 per license | **1** |
| Microsoft Windows 10 Enterprise | $5,999 per license | **1** |
| Adobe Acrobat DC Standard- | - $449 per license | **1** |
| IBM Rational Team Concert | $119 per license | **1** |
| Microsoft Office Professional Plus2016 | $399 per license | **1** |
| The total cost for the software required for the Software Development department | $7,615. |  |

**Quality of Service:**

Many elements go into creating a quality of service for network design for a software development department. One of the primary considerations is the type of traffic that will be crossing the network. In most cases, the bulk of the traffic will be TCP-based traffic, as opposed to UDP or other types of traffic. This is particularly important to keep in mind when designing the network, as certain types of traffic can be more sensitive to latency and other network issues.

Another key consideration is the location of the servers and workstations. In many cases, it may be advantageous to place servers and workstations near the edge of the network, to minimize latency and improve performance. Additionally, careful consideration should be given to the type of network switches that will be used. In particular, switches that support Quality of Service features (such as 802.1Q) can help ensure that the traffic from the software development department is given priority over other types of traffic.

Finally, it is important to have a robust network monitoring solution in place. This will allow administrators to quickly identify and troubleshoot any network issues that may arise.

Network administrators should also work closely with the software development department to ensure that the network infrastructure can support the anticipated traffic volume and that the correct network resources are allocated.

A network monitoring solution should also be implemented to track and trend network performance data. This will allow administrators to identify any issues that may arise and take corrective action before they cause significant damage to the network or business.

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| Level 1: Production |

**Number of Users:**80 and 96 including a 20% expansion

**Network Hardware requirement**:

**Software Requirements**:

|  |  |  |
| --- | --- | --- |
| **Software** | **Price** | **Quantity** |
| Windows 8 | $100 | 1  License: OEM |
| Microsoft Office 2013 | $120 | : 1  License: OEM |
| Adobe Photoshop CS6 | $700 | : 1  License: Perpetual |
| AutoCAD 2013 | $2500 | 1  License: Perpetual |
| Symantec Endpoint Protection | $50 | 1  License: Perpetual |
| Visual Studio 2022 | $150 | 5  License: Perpetual |
| Oracle | $250 | 1  License: Perpetual |

**Quality of Service:**

The network design for the Production department should provide a high quality of service (QoS) for critical applications, such as ERP and MES systems.

The network should be designed for reliability, with sufficient bandwidth and redundancy to ensure that critical applications can always be accessed.

The network should also be designed for security, with firewalls and other security measures in place to protect the company's data.

When designing a network for a manufacturing company, you should consider the following factors:

**1. Reliability** - The network should be designed for reliability, with sufficient bandwidth and redundancy to ensure that critical applications can always be accessed.

**2. Security -** The network should be designed for security, with firewalls and other security measures in place to protect the company's data.

**3. Scalability -** The network should be scalable so that it can be expanded as the company grows.

**4. Ease of use -** The network should be easy to use so that employees can access the applications they need without difficulty.

**5. Cost -** The network should be affordable so that the company can afford to deploy it across its entire operation.

# Network Architecture

# Security Issues

# Testing

# Conclusion

# Reference

Armstrong, R.L. and Parrish, K. (2022) *Internet speeds for remote workers and video conferencing*, *HighSpeedInternet.com*. Available at: https://www.highspeedinternet.com/resources/how-much-internet-speed-to-work-from-home (Accessed: January 1, 2023).

# Appendix