# Authentic Assessment Plan

## Executive Summary

Based on the customer’s specification for the purpose of the designed network, the design is focused on designing a large-scale network that meets the dynamism of the business and emerging trends and issues regarding IT. The top-down design approach provides a business-driven approach. The design seeks to increase the profitability of the business by increasing the sales volume of the business. The design complies with the standard IT infrastructure for easier upgrading and easier network design solutions (Dart, Rotman, Tierney, Hester & Zurawski, 2014). The approach does not expose the network to high failures. The design aims to make the business reach its maximum potential and meet the diverse demands of the customers.

## Project Goal

The network design is anchored on the core principles and goals of the business. The core business drivers that the company aims to achieve through the network design are; to attain cost efficiencies in the systems, design elasticity and compliance with the ISO standards. The network design aims to create continuity in the business and provide end-end network confidentiality for access control (Dart, Rotman, Tierney, Hester & Zurawski, 2014). The design would help the business to demonstrate trust and credibility of its services for better competitive advantage. The network design is aiming at reducing significantly the operational expenses which are caused by security breaches of the business information. Another project goal is to improve the operational uptime of the business.

## Project Scope

The design scope is a new network since the business had no prior existing network. The design scope is aiming for integration with the pre-existing external networks, expansion, and optimization. The network design is to span on multiple modules. IP telephony is to be rolled out across the entire business. The rolling out of the IP telephony encompasses the redesigning of the virtual LANs, the redesigning of the QoS across the data center, the WAN, and across the remote access edge (Szigeti, Hattingh, Barton & Briley, 2013). It would also require the need for path isolation. In the optimization of the enterprise edge availability, it would be imperative to add redundant links through the redesigning of the overlay tunnels.

## Design Requirements

The design requirements must incorporate the business requirements as specified by the client. These requirements pertained to the various aspects of the business such as needs, and the business drivers. Understanding the business’ goals, objectives, vision and mission help in the steering the design to be objective-oriented to yield positives results in sales and profitability of the business. The top-down approach requires designing at higher layers. The design requirements must incorporate business continuity, divest, innovation, mergers, accusations and strategic business trends. The functional and technical requirements needed to be captured by design include the various network infrastructure solutions such as network switching, security, routing, and mobility.

Pertaining to business continuity, the business activities should remain operational even if there is a power failure or from failure instigated by natural phenomena such as tornados or fire which can damage the data center. The building design of the business premises must be according to standards that improve and maintain resiliency to unplanned power outages and have a data recovery mechanism. The data storage and servers must be connected to an uninterrupted power supply. The storage of data is to be alternating tapes and in the cloud. The data storage backups must be in a strong room which is resistant to water, fire or unauthorized access. Due to the nature of the BC drivers and their significance, the resiliency of the system must be high. The primary data center is given the highest priority, and the outage could cause any compromise on this center, or any other issue could results to huge financial losses and dent the consumer and investor confidence on the business. The primary data center is therefore designed to have the highest resiliency for business continuity.

Based on business elasticity, the business must be flexible to the changes in the business which can be in the form of mergers, acquisition or a decline in business growth. Addition of new premises within the network topography presents new challenges as such the business must be highly flexible. To make the design flexible, core modules were incorporated into the design. The core modules are purposely added to optimize the design modularity which is needed for business expansion (Nematzadeh, Ferrara, Flammini & Ahn, 2014). Due to this, any extra added to the network or removing a module into the built network would not tantamount to any effect the performance of the pre-existing modules. The anticipation of business growth and any emerging technology and business trends are comprehensively incorporated into these additional core modules. The design is also designed to easily and effectively integration with other different networks which may have been designed with different principles (Hu, 2014). The different design principles from other networks if not taken consideration may present challenges during mergers or acquisitions (scalability). The different designs may have been built on different control plane protocols, approaches or on overlapping IP address space.

The design has an MPLS- based service provider. The provider is required to send stable and reliable VoIP traffic via his or her edge router. The VoIP traffic is sent over 10G fiber link as data traffic is directed over the OC-48 link to support the MPLS-TE. The design must ensure security, integration, and availability of data. For higher levels of availability, the design incorporates the use of FHR protocol. For integration purposes with other networks, the design incorporated the use of NetFlow Collector. And for security features, the design incorporated the use of iACLs (Fangman, Preston & Ryon, 2013).

## Design Solution

Strategic planning approach was used to provide a longer-term solution to the challenges of the business based on the MPLS. The network design is aimed at satisfying the user experience (Dart, Rotman, Tierney, Hester & Zurawski, 2014). It will in the best interest of the customers, the internet users and the business partners. The satisfaction of the customer directly affects the proceeds of the business and as such this must be a priority. The productivity of the users of the internet especially the employees have a crucial bearing on the efficiency of business performance, revenue, and success. Efficacy of the level and nature of the interaction of the partners have the potential of enhancing achieving the strategic goals and objectives of the business. The network design prioritizes the provision of quality of experience to the customers, partners and the internet users.

## Implementation Plan

In the execution of the plan;

1. Connection of the designed network, hierarchical LAN
2. Application of virtualization techniques
3. Integration of security functions and appliances
4. Application of the QoS over physical and virtual networks

The design has to be of the network design principles. These principles include; reliability and resiliency, modularity, simplicity, flexibility, scalability, and manageability (Hu, 2014).

Reliability of the network is guaranteed when every packet of data is accepted by the designed network and is delivered to the right and desired destination within a reasonable time. Reliable and resilient network architecture can pass the test of time and failure of the component without the intervention of the network operator. The resilience and reliability of the network are guaranteed by incorporating a redundant component within the design topology.

## Project Budget

The budgeting has to take account the costs of;

1. Design and engineering fees
2. Construction costs
3. The network costs
4. The costs of server systems
5. Costs of fiber entrance facilities
6. Costs of miscellaneous equipment and,
7. The relocation costs

## Summary of costs

| Relocation Cost | $1,000,250 |
| --- | --- |
| Construction Cost | $8,000,125 |
| Network Equipment Cost | $2,418,689.375 |
| Server System  | $500,000 |
| Fiber Entrance Facilities  | $650,000 |
| Miscellaneous E. Cost | $1,501,230 |
| Design & Engineering Costs | $750,010 |
|  |  |
| **Project Cost** | $**14,820,294.375** |

## Network Equipment Cost

| **Item**  | **Qty** | **Unit Cost** | **Extended Cost** |
| --- | --- | --- | --- |
| Cisco Firewall | 1 | $ 55,000 | $ 55,000 |
| Cisco 7500 Router | 8 | $ 70,000 | $560,000 |
| Other Firewall Systems  | 3 | $40,100 | $120,300 |
| VPN Equipment | 2 | $ 100,000 | $200,000 |
| 19 inch Server Cabinets | 25 | $6,050 | $151,250 |
| Switches  | Several  | $500,000 | $500,000 |
| Console Terminal Servers | 5 | $5,100 | $25,500 |
| Network Cabinets | 12 | $5,050 | $60,600 |
| Coax Patch panels | 15 | $2,000 | $30,000 |
| Modems  | 65 | $1,100 | $71,500 |
| KVM Switches | 30 | $900 | $27,000 |
| Frames & Accessories | 2 | $12,050 | $24,100 |
| Miscellaneous  |  |  | $120,000 |
| Keyboards for Server Cabinets | 25 | $1,300 | $32,500 |
| **Subtotal N. Hardware**  |  |  | $1,977,750 |
|  Tax @8.25% |  |  | $163,164.375 |
| Freight @10 |  |  | $197,775 |
| **Network Consulting and Management**  | 400 | $200 | $80,000 |
|  |  |  |  |
| **Total Cost of N. Equipment** |  |  | $**2,418,689.375** |

## References

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