TECHNICAL ARCHITECTURE

[BIT Monstrosity Inc]

VERSION: [Version 1.0] REVISION DATE: [04/05/2020]

Approval of the Technical Architecture indicates an understanding of the purpose and content described in this deliverable. By signing this deliverable, each individual agrees with the content contained in this deliverable.

Approver Name	Title	Signature	Date
	Monstrosity Inc. Architecture	Ronny Soto	04/05/2020
	Monstrosity Inc. Architecture	Ny Tran	04/05/2020
	Monstrosity Inc. Architecture	Dominic Neal	04/05/2020

Contents

Section 1 DOCUMENT SCOPE

This document describes the Technical Architecture of the Monstrosity Inc. Network System that satisfies business requirements as documented in the Project Plan, 03/08/2020, and implements the functionality and satisfies technical, operational and transitional requirements described in the Requirements Specification document, 03/01/2020.

The goal of this Technical Architecture is to define the technologies, products, and techniques necessary to develop and support the system, and to ensure that the system components are compatible and comply with the enterprise-wide standards and direction defined by the Agency.

This document will also:
Identify and explain the risks inherent in this Technical Architecture;
Define baseline sizing, archiving and performance requirements;
Identify the hardware and software specifications for the Development, Testing, QA and Production environments;
Define procedures for both data and code migration among the environments.

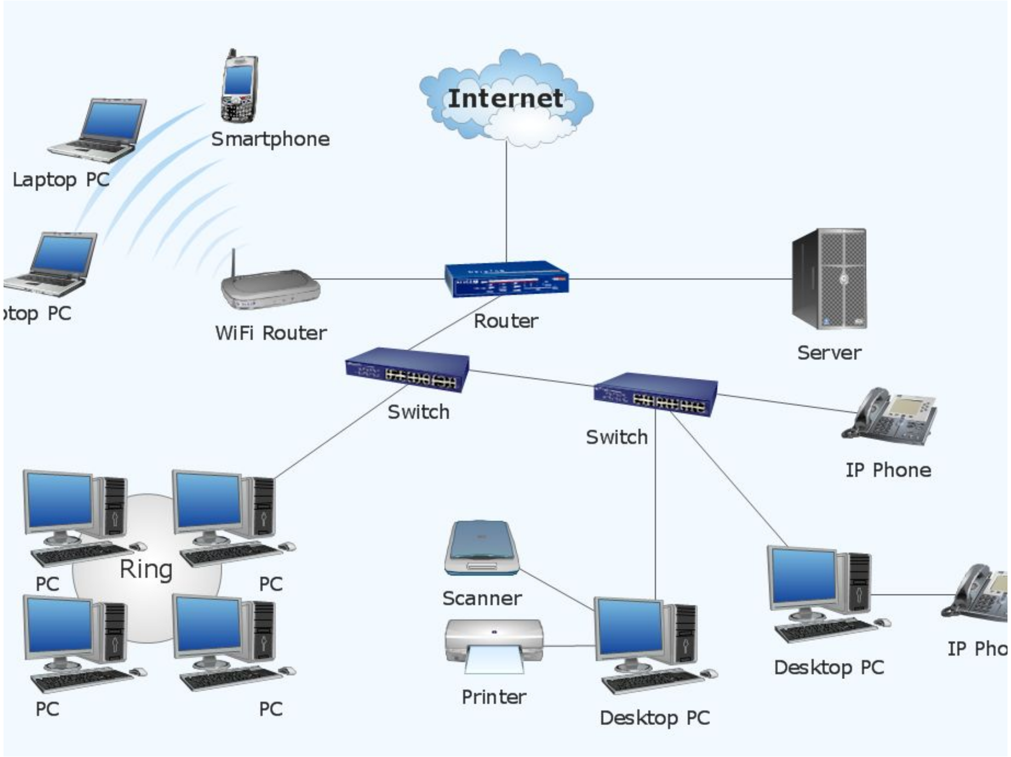
The Document Scope narrative also provides an overview of the efforts conducted to understand the existing technical environment and IT strategic direction and to determine how the system's proposed technical architecture fits into them.

Section 2 OVERALL TECHNICAL ARCHITECTURE

2.1 System Architecture Context Diagram

The **System Architecture Context Diagram** provides the "big picture" view of the system's architecture, and puts it in context with the rest of the Performing Organization's systems portfolio, illustrating how the system's hardware and software platforms fit into the existing environment.

2.2 System Architecture Model



2.2.1 Overall Architectural Considerations

The ***Overall Architectural Considerations*** *section defines how additional technical requirements have been addressed by the architecture. Representative items in this section may include:*

- *Security Strategy*
- *Performance requirements*
- *Accessibility*
- *Database sizing*
- *Transaction volumes*
- *Concurrent user*
- *Data import and export*
- *Data encryption and decryption*
- *Disaster recovery*

2.3 System Architecture Component Definitions

2.3.1 System Architecture Component A

The **Architecture Component Definitions** section provides narrative describing and explaining each architecture component in the System Architecture Model, and identifies specific elements that comprise that component in this system. The following are examples of architecture components and elements:

Architecture Component	**Component Elements**
Database Server	Server Hardware Configuration Server Operating System DBMS
Wi-Fi Router / Router Board	First line of security Networking device Traffic directing functions Intrusion Detection Device communication Network connection
Client/Server Application	Development Tool Online Help Tool Client Characteristics
Switch	Network tool Packet switching Multiple device connections Data flow management Maximize security Traffic flow tool

Section 3 SYSTEM ARCHITECTURE DESIGN

3.1 System Architecture Component A

For each ***System Architecture Component*** *(identified in Section 2.3 above), the narrative describes specific* ***Component Functions****, requirements and other* ***Technical Considerations*** *that were used in the decision-making process, as well as any specific* ***Products*** *selected to implement this component. The* ***Selection Rationale*** *identifies any other products that may have been considered, and provides rationale for the decision.* ***Architecture Risks*** *identifies any potential risks associated with the architecture element.*

3.1.1 Component Functions

Database Server - Through the use of a database application, allows for computers or computer programs to use specific database services. Users are able to access through either back-end or front-end means and request specific data in the database. (Only those that should have access will be able to do this)

Wi-Fi Router - The wi-fi router acts as a wireless point for access to the internet and/or network. Allows for proper forwarding between other devices on a specific network along with traffic direction and accurate delivery to a specific destination.

Client/Server Application - Allows for the partitioning of tasks from where the service is being provided (servers) A request would be sent to the server and the information is relayed back to the requester.

Switch - Allows for the connection of multiple devices on a computer network along with allowing communication between the devices as well.

3.1.2 Technical Considerations

Monstrosity Inc currently has 5 satellite locations and 1 corporate location. With the possibility of this company expanding, we are seeking to implement an architecture that allows for scalability. Reducing the complexity of the architecture while still achieving the desired goals of the company.

We are developing the technical solution, therefore those who adopt and implement this solution should understand our reasoning for how we decided to build the system. When it comes to the operational aspects of the architecture, we want to avoid as many risks as possible. This will allow for Monstrosity Inc. to have less interruptions in their work progress along with mitigating any snowball debt effects in the coming future. Quality and functional hardware should be one of the main areas that receive the most attention when developing this technical architecture.

3.1.3 Selected Product(s)

Database Server & Client/Server Application

Amazon Web Services - Cloud computing platform that will also host required information and applications for the user. Scalability is extremely easy and allows for the company to get precisely what they need and not more. Wide range of services and resources.

Switches

NETGEAR 24-Port Unmanaged Switch - Centralizes the communication of multiple devices on the same network. Quality switch that is easy to use and is efficient at managing the flow of data on the network overall.

Wi-Fi Router / Router Board

microtik ac Lite - Network hardware that acts as a wireless access point and ensures reliable communication between devices on the same network.

3.1.4 Selection Rationale

Database Server & Client/Server Application

Microsoft Azure - One of the options we were looking at for cloud services was Microsoft Azure. We've found that Amazon Web Services has captured a large majority of the market. For future development of this company and possible future acquisitions, it may be easier to collaborate with other companies that also use AWS. Some AWS services are open source which is an advantage. Security with AWS is more secure as it deals with user defined roles. The differences in these cases lead us to go with AWS.

Wi-Fi Router / Router Board

microtik Hex Lite - This option was similar to the microtik ac Lite option that we decided to go with, but this option does not offer wi-fi. Wi-fi is the main way that customers will be able to access the internet, therefore we could not go with this option.

3.1.5 Architecture Risks

Operational Risks - Technology that is implemented doesn't work how it's supposed to. Overall impedes the company and the business processes.

Security Threats - No cybersecurity plan is completely perfect, always the possibility of an attack

Technical Debt - Implementation of unnecessary technology/hardware could snowball costs in the future.

Design Failure - This is the possibility that the architecture doesn't satisfy the needs of the desired goal / outcome or overall slow down the work flow overall.

Section 4 System Construction Environment

*The **System Construction Environment** section details the various environments necessary to enable system construction and testing.*

4.1 Development Environment

4.1.1 Developer Workstation Configuration

The developer workstation will include desktops that are equipped with the necessary applications to troubleshoot the network. In development, we will use GNS3 (Graphical Network Simulator) as we work on building the architecture of the network. We will also use CISCO IOS images inside of GNS3. The images allow us to use routers, switches, and more to imitate a working network.

4.1.2 Supporting Development Infrastructure Configuration

To support our development infrastructure for each workstation, there will be a computer equipped with the needed hardware to run the software/applications efficiently. Switch rooms equipped with KVM setups make it easier on the developers.

4.2 QA Environment

4.2.1 QA Workstation Configuration

Our QA workstations will have the most up-to-date configurations of the network and run tests to help the development team if they see any issues/errors. Slack will be used as the communication application of choice to keep our team members up-to-date with upcoming changes and deadlines.

4.2.2 Supporting QA Infrastructure Configuration

Supporting our QA infrastructure we will use an organized method to keep things clear and concise. A tool that will help us achieve that will be JIRA. JIRA allows us to keep track of our tasks, release dates, and testing.

4.3 Acceptance Environment

*For each environment necessary for system construction (**Development, QA** and **Acceptance**), provide detailed specifications for the **Workstation** and **Supporting Infrastructure** that will be used (including hardware and operating system requirements, all necessary installed packages and tools, and needed directory structures that will be utilized to store all construction components).*

4.3.1 Acceptance Workstation Configuration

Workstation hardware will include:

- OS: Windows 10 Enterprise
- CPU: Intel® Xeon® Scalable 4110
- RAM: 16GB

Workstation software will include:

- GNS3
- CISCO softwares
- AWS softwares
- Azure

4.3.2 Supporting Acceptance Infrastructure Configuration

Workstation hardware will include:

- Storage: 512GB SSD and 2TB HDD on each workstation

Workstation will have access to:

- Network System
- Data center
- Work Servers
- Services / Applications