AP Analytica

Access Point Analytics
Vision Document

Version 1.1

Revision History

Date	Version	Description	Author
06/10/19	1.0	Initial Draft	Matthew Liddy 1-2, 4-6 Justice Clark 3
4/8/2020	1.1	Revisions, formatting, editing document wide	Bradley Schoeneweis

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Vision

1. Introduction

The purpose of this document is to collect, analyze, and define the business requirements, i.e. high-level needs, desired ultimate business outcomes, and features of the Access Point Analytics web application project. It focuses on the capabilities needed by the stakeholders and the target users, and why these needs exist in the first place. The details of how the Access Point Analytics solution fulfills these needs are detailed in the use-case and supplementary specifications.

1.1. Background

The TCU Network Services Department currently utilizes Cisco Prime to manage the 3,200 wireless access points (AP's see glossary section 2.1.1) campus-wide. Cisco Prime is primarily used to consolidate network data and run reports. However, these reports are neither intuitive to generate nor simple to analyze. In turn, the current manual process leads to longer response times and remedies for network issues. The answer to this problem is to create an automated solution that will routinely fetch Cisco Prime Data, analyze the data and create specific key performance indicators (KPIs see glossary section 2.2), and display the data on a local web application.

1.2. References

Currently no external references in use.

2. Positioning

2.1. Business Opportunity/Problem Statement

This project will take the place of the TCU network engineer's current manual task of generating reports from Cisco Prime, analyzing the data, and visualizing key performance indicators. The solution will streamline this time-consuming process and create a centralized place to visualize the results.

The problem of	The manual process of gathering reports from Cisco Prime and analyzing the data for KPIs
affects	Network Engineers at the TCU Network Services Department
the impact of which is	Slow and tedious task of evaluating AP Data, leading to a longer response time for network issues
a successful solution would be	an automated system that will gather, analyze, and display network data of specific KPIs in a top ten format

2.2. Product Vision/Position Statement

This project will provide a custom solution for the TCU Network Services Department by automating a currently time-consuming process as well as provide specific KPIs in an easy to read format tailored to the needs of the department.

For	Network Engineers at the TCU Network Services Department
Who	use Cisco Prime to gather and analyze data manually
The (product name)	is an Analytics Terminal Webpage
That	gathers AP Data, analyzes, and displays specific KPIs in a clear and informative format

Unlike	the manual process of generating reports and analyzing individual CSV files to produce key performance indicators
Our product	Automatically gathers Cisco Prime AP Data, Analyzes the data for specific KPIs, and displays the details in a clear and informative webpage

3.   Stakeholder Profiles and User Descriptions

3.1.   Stakeholder Summary

Name	Description	Major Value or benefit from this product	Main Features of interest	Constraints that must be accommodated	Direct User or not?
Craig Baugh	Primary User	Streamline process, improve usability and make process more proactive	All KPI top 10 views	Maintainability Security	Yes
Tony Fleming	Head of Network Services	Executive view to streamline business processes	Data visualization via graphs and charts	Maintainability	Yes
Other	Five other Network Services Employees	Improved productivity	Users and login Top 10 lists	Accessibility	Yes
Ben Crenshaw	Software Engineer at TCU IT	Will be maintaining the project	.NET Core MVC	Maintainability	No

3.2.   User Environment

There are currently seven employees of the Network Services department of TCU. Tony Fleming, Craig Baugh, and five others. Currently, employees of the department have to generate reports and go through mass amounts of data to find issues that constitute action. This current process causes issues to go unnoticed for a time. The software will be only accessible from inside the Pond office, and will have minimal access to the outer internet. Any connections to the outside internet will need to be documented and approved for security purposes. The current software in use is Cisco Prime Infrastructure and Solar Winds, one monitoring and controlling the wireless equipment and the other one the switches and other wired equipment, respectively. Our solution will only receive reports from Cisco Prime; it will not communicate to Prime, nor will it receive or communicate to SolarWinds.

3.3.   Summary of Key Stakeholder or User Needs

Craig Baugh is the primary stakeholder and contact for KPI specifications. Craig Baugh is in charge of the wireless equipment on campus and is only interested in wireless related KPIs. Craig's problem currently is the lack of a top 10 view for each KPI of interest to him. This inconvenience leads to the tedious exercise of manually searching lengthy reports for issues. To remedy this, an automated solution could gather, search, and detect issues in a timely fashion. In turn, our solution would provide a better user experience for TCU students and faculty. Tony Flemins is another key user and will be interested in an executive view of the overall network. Tony is also interested in the KPIs.

3.4. **Alternatives and Competition**

Network Services are not looking at alternatives and do not view the issue as worth looking at other options. Network Services primarily use Cisco hardware, and Cisco hardware only works well with Cisco management software. Interfacing with Cisco software to aggregate data is a custom solution that is not offered by any other provider. With a development team at their disposal, they can tailor each KPI to their exact specifications following either industry standards or satisfying their own particular needs.

4. Product Overview

This section provides a high level view of the Access Point Analytics web application, system capabilities and configurations.

4.1. **Product Perspective**

This diagram illustrates the pipeline required to gather data, analyze data, and display the information generated.

Cisco Prime   SFTP Server   Data Analysis   Web Application
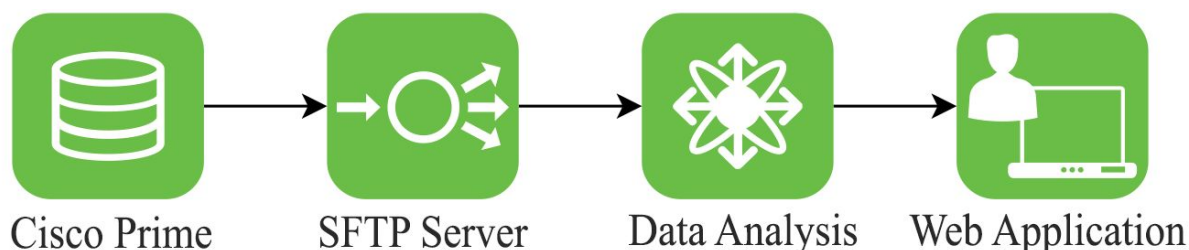
4.2. **Deployment Considerations**

The final solution will be deployed on a Windows Server Environment on top of a VMware 2016 instance. This will require consistent testing on a Windows Server virtual machine (VM) to ensure a successful deployment.

4.3. **Assumptions and Dependencies**

The following assumptions and dependencies relate to the capabilities of the Access Point Analytics web application as outlined in this Vision Document:

● Users will view the webpage through a defined subnet
● The system will be dependent on the current version of Cisco Prime
● The system will run on a windows server virtual instance

5. Product Features / Scope

5.1 Data Gathering

The system will automatically and securely collect reports from the Cisco Prime Server.

5.2 Data Analysis

The system will perform data analysis on the data gathered and will generate the required KPIs. The system will store the data generated in a web accessible format.

5.3 Analytics Web Application

The user will connect to the webpage through a strict subnet. The following are the KPIs (see glossary 2.2) available to the end-user through the AP Analytics Web Application:

- Anomaly Detection
- Access Point Utilization
- Channel Utilization
- Client Counts
- Coverage Holes
- Power/Channel Fluctuation
- Rogue Access Points

These KPIs will be displayed in a top ten format on a configurable dashboard; as well as, showcased on their own specific KPI page with a full table and respective data visualizations

6. Other Product Requirements

- Access to a Windows Server Virtual Instance
- Access to Cisco Prime SFTP Functionality
- Write the application in C# /.NET Core for maintainability purposes
- The system will reside behind a firewall with no open ports