AP Analytica

Access Point Analytics
Iteration Plan

Version 1.3

Revision History

Date	Version	Description	Author
10/22/19	1.0	Initial Draft	Hung Doan, Bradley Schoeneweis, Matt Liddy
11/05/19	1.1	Edited iteration 1	Ryan Finnegan
11/7/19	1.2	Delegated tasks to iteration 1, delegated tasks for week 1, 2, 3, and 4	Bradley Schoeneweis
4/9/2020	1.3	Formatting, edits, transfer W.A.R.	Bradley Schoeneweis

Table of Contents

Iteration Plan

1. Introduction

1.1 Purpose

The purpose of this document is to describe the iteration plan for the Access Point Analytics project, which started on November 4, 2019 and is to be finished on December 2, 2019.

1.2 Scope

This document discusses the plan for development iterations of the AP Analytics project. More information pertaining to the AP Analytics project can be found on the website:

http://riogrande.cs.tcu.edu/1920ItAP/

Those with access to our W.A.R. spreadsheet can view our updated progress via the following link:

https://docs.google.com/spreadsheets/d/11X8sJRJDMYXVVnJsLwNKAWuwl92QVIr4EEjUwCOKO78/edit#gid=2037681314

1.3 Definitions, Acronyms, and Abbreviations

Please refer to the *Glossary* in the References section below.

1.4 References

- Glossary

1.5 Overview

The development plan will be split into iterations. The project will be completed in April, 2020 and be ready for the April Senior Research Symposium (SRS) at TCU.

2. Plan

Iteration 1:

November 4 - November 30, 2019

Phase: Construction

Use Cases:

- 1 - Accessing the Analytics Dashboard
- 2 - Allocating malfunctioned AP's
- 3 - Login (partial)

Week 1: Sunday, Nov 3 - Nov, 9, 2019

- Team Objectives:
  - Finish documentation
  - Contact TCU IT department to get the Virtual Machine (VM) for the team to work on.
  - Determine the overarching UI design of the web application

- Individual Tasks:

- Hung:
    - Edit the layout for the "Deliverables" on Riogrande
    - Finish Section 3 in SDP
    - Learn and understand the web application skeleton
    - Write the first draft for iteration 1 plan in details
- Justis:
    - Edit prototype to consolidate graphy view and dashboard view
    - Present prototype to client and get last thoughts on it and the Vision Doc
    - Add use cases that became apparent from prototype (specific use cases will be detailed in comments at end of week)
    - Create document with "prototype" of KPI table and graph views to present to client
    - Hold meeting with team
- Matt:
    - Successfully connect to development environment
    - Set-up local MySQL database and collaborated with Bradley to finalize schema
    - Set-up mail access on server
    - Read in data from server mail directory
- Bradley:
    - Install FontAwesome, echarts, other libraries
    - Help define database schema
    - Create a MySQL local database and produce a dump file for others to load in
    - Apply a team picked UI template to skeleton
    - Write the plan for iteration 1 (Weeks 1-4)
    - Fixed issue with local environments
- Ryan:
    - -Make 2 additional use cases based on Prototype design (User settings +Admin)
    - Edit Prototype for Client Meeting
    - Review Iteration Plan
    - Meet with Client

Week 2: Sunday, Nov 10 - Nov 16, 2019

- Team Objectives:
    - Have base template of login and logout page
    - Have server set up to ingest data from emails, write to database (if complex preprocessing is not needed)
    - Have dashboard template setup with arbitrary data for look and feel
    - First Code Reviews for everyone in the team
    - Learn unit test best practices, and start testing suite
    - Start work on details page
    - Figure out deployment to TCU VM
- Individual Tasks:
    - Hung:
        - Meet with Ryan on Wednesday: Still discussing what bootstrap and template would work to build the dashboard.
        - Meet with Ryan on Friday: clone git through ssh, learn about table sorter & discuss what to do on the weekend.
        - Learn about merge request and issue board

- Add the user dropdown menu to dashboard
- Add footer to dashboard.
- Justis:
    - Create KPI prototypes
    - Hold team meeting to decide UI template
    - Research security framework within .NET
    - Make NetworkServices icon for website
    - Change icon and scaling on navbar
- Matt:
    - Set-up mail access on server
    - Installed and Set-up MySQL DB on VM
    - Develop model class structure for each KPI
    - Complete Radio Power Fluctuation KPI
    - Complete Radio Channel Fluctuation KPI
    - Write results to database
- Bradley:
    - Apply team picked UI template to skeleton
    - Set up local environment MySQL instance on docker instance
    - Write documentation for using migration scripts, running docker
    - Set up test suite, prepare for CI
    - Pass fake data to echarts, tablesorters for initial look and feel for client
    - Write classes and controllers for malfunctioning AP's
    - Help with dashboard template
    - Bug fix on Riogrande (change all deliverable targets back to "_blank")
    - Determine what is needed in libraries and clean repositories to speed up build
    - Install tablesorter
    - Review Hung's merge request
    - Write script to gather properties (location, is_mesh, is_root) about the AP's and import into MySQL
- Ryan:
    - Setup Dashboard
    - Meeting with Hung on Friday
    - Add dropdown widget
    - Fix Admin/User use cases

Week 3: Sunday, Nov 17 - Nov 23, 2019

- Team Objectives:
    - Complete layout for dashboard template with arbitrary data
    - Complete details page for malfunctioning AP's
    - Acceptance testing
    - User documentation, developer documentation

- Individual Tasks:
    - Hung:
        - Edit and develop dashboard based on Ryan's setup
        - Create a page to view result of malfunctioned AP's
        - Brainstorm a layout to maximize the size of the dashboard
        - Switch button to change table into graph and vice versa.

- Justis:
    - Create user data tables in DB
    - Create login page
    - Make login functional for default admin user
    - Peer review all merges for best security practices
    - Hold weekly meeting
- Matt:
    - Complete Rogue AP KPI
    - Updated schema with Bradley
    - Strategize ways to input real data
    - Strategize ways to purge and update DB to refresh data
- Bradley:
    - Finish AP import script
    - Add models for all DB tables
    - Code Review for Ryan's branch
    - Work on some data visualizations
    - Pass arbitrary data to frontend for initial client look and feel
    - Import current DB into VM MySQL
    - Code Review for Hung's branches (2 reviews in total)
    - Add connection strings to web-app for DB
    - Start Rogue AP index template
- Ryan:
    - Edit dashboard
    - Figure out how to use echarts
    - Start working on transition from tableview to graph view
    - meeting on Sunday
    - Complete merge of my branch

Week 4: Sunday, Nov 24 - Nov 30, 2019

- Team Objectives:
    - Get feedback from clients and adjust
    - Finish login functionality (not user creation)
    - Testing, Deployment
    - Review first iteration

- Individual Tasks:
    - Hung:
        - Create the User Setting Page (Change password)
        - Peer Review Branch
        - Iteration1 Presentation
    - Justis:
        - Finish DB table for user data
        - Finish functionality for login
        - Continue to peer review
        - Hold weekly meeting
    - Matt:
        - Set up role permissions on MySQL server
        - Connect Rouge AP KPI with DB

- Work on iteration 1 presentation
  - Bradley:
    - Finish Rogue AP index page
    - Rework current tables to no longer have hardcoded data
    - Further refine MVC models
    - Adjust schema as needed when more data imports/strategies are defined
  - Ryan:
    - Edit Dashboard and make multiple cards per row with functionality
    - Peer Review branches
    - Implement Graphs

Week 5: Sunday, Dec 1 - Dec 7, 2019

- Individual Tasks:
  - Hung:
    - Finish User Creation Page
    - Merge User Change Password Page
    - Code Review
    - Aid Testing & Preparing for presentation
  - Justis:
    - Finish forum functionality for login feature
    - Continue to peer review
    - Hold weekly meeting
    - Aid in coordinating and executing testing of current iteration
    - Present on Friday
  - Matt:
    - Update MySQL schema
    - Create specialized accounts on DB with appropriate permissions
    - Programmatically connect to DB
  - Bradley:
    - Refactor code to no longer have hardcoded data (Rogue AP pages)
    - Code Reviews
    - DB adjustments for new KPI's
    - Setup next KPI Index Page
    - Help with presentation
    - Redesign Login page
    - Fix bug with user settings page
    - Testing for Demo
    - Group all issues in GitLab to iteration 1 milestone
    - Update system architecture link on Riogrande
  - Ryan:
    - Make Dashboard not just Rogue AP
    - Implement DB into Dashboard
    - Presentation Friday
    - Rehearsal Presentation Mon/Wed

Week 6: Sunday, Dec 8 - Dec 14, 2019

- Individual Tasks:
    - Hung:
        -
    - Justis:
        - Hold weekly meeting
        - Plan iteration for winter break
        - Make "change password" page functional
        - Test login system with multiple users
    - Matt:
        -
    - Bradley:
        - Plan out next KPI
        - Code reviews
        - Data changes
        - Start unit tests
        - Add server side pagination to Rogue AP to make it more scalable
    - Ryan:
        -

Week 6: Sunday, Dec 15 - Dec 21, 2019

- Individual Tasks:
    - Hung:
        -
    - Justis:
        - Hold meeting before break to plan iteration tasks
        - Make "change password" page functional
        - Test login system with multiple users
    - Matt:
        - Review Code
        - Plan for next iteration
    - Bradley:
        - - Plan out next iteration
        - - Finals
        - - Add unit test for Rogue AP controller
    - Ryan:
        -

Week 6: Sunday, Dec 22 - Dec 28, 2019

- Individual Tasks:
    - Hung:
        -
    - Justis:
        -
    - Matt:
        -
    - Bradley:
        - Research ORM server side pagination

- Ryan:

Week 7: Sunday, Dec 29 - Jan 4, 2020

- Week off of development

Week 8: Sunday, Jan 5 - Jan 11, 2020

- Individual Tasks:
    - Hung:
        - Fix my gitlab, learn more about git, and find the way to ssh clone git
        - Add error warning to log in page
    - Justis:
        - Research best practices for user systems and security
    - Matt:
        - Completed & tested data ingestion script to fill rogue_ap table
    - Bradley:
        - Simple (Client-Side) pagination for Rogue AP
        - Make global constants file for project
        - Make weekday trendline dynamic for Rogue AP
        - Create a global random color generator (JS) to fill dynamic charts
    - Ryan:
        - Add jQuery to replace some js
        - Fiddled with css on dashboard page to make it look better
        - Get dashboard connected to DB

Week 9: Sunday, Jan 12 - Jan 18, 2020

- Individual Tasks:
    - Hung:
        - Develop the frontend for user management page
        - Update SDP
    - Justis:
        - Poll for best meeting time to resume weekly meetings by next week
        - Update SDP
        - Pull coverage hole report from Prime to see what can be done with the new report
        - Start code review process with TCU Client & Server group
    - Matt:
        - Added Duplicate Prevention to data Script
        - Strategize ways to implement failed_client_authentication KPI
    - Bradley:
        - Refactor code to use services and interface for dependency injection to keep controllers thin
        - Isolate table and metrics on Rogue AP for specified timeframes, and make data dynamic for those ranges
        - Start next KPI page
    - Ryan:
        - Get Dashboard connected to DB

- Make dashboard cleaner
- Update SDP
- Get dashboard connected to DB

Week 10: Sunday, Jan 19 - Jan 25, 2020

- Individual Tasks:
    - Hung:
        - Write model clientcount.cs
        - Update understandings about the back end
        - Front end info page for client Count
    - Justis:
        - Move controller code into service
        - Finish sessions
    - Matt:
        - Built Script for coverage holes KPI
        - Built Script for client count KPI
        - Updated SQL schema
        - Made Model for new tables
    - Bradley:
        - Isolate Rogue AP metrics to a timeframe
        - Server-side pagination RogueAP
        - Code Reviews
    - Ryan:
        - Work on Coverage Hole KPI page
        - LIMIT 10 on rogue AP dashboard
        - Move js, cs and clean up some code

Week 11: Sunday, Jan 26 - Feb 1, 2020

- Individual Tasks:
    - Hung:
        - Create Context for Client Count
        - Startup for Client Count; Interface for ClientCount
        - Change related parts for Client Count: Access Point model
        - Met with Ryan to discuss about KPI page structure
    - Justis:
        - Finish sessions
    - Matt:
        - Built Script for wireless utilization KPI
        - Built Script for ap utilization KPI
        - Updated SQL schema
        - Installed and set up OpenSSH on VM for SFTP
        - Updated VM firewall rules to allow SFTP
    - Bradley:
        - Rogue AP server-side pagination fully functional (searching, sorting, paging)
        - POST method for ignoring Rogue AP entries
        - Ability to adjust time frame for Rogue AP's table

- Ryan:
    - Finish Coverage Hole KPI Page
    - Figure out LIMIT 10 or get help with it
    - Work on next KPI tbd

Iteration 2:

Week 12: Sunday, Feb 2 - Feb 8, 2020

- Individual Tasks:
    - Hung:
        - Change Client Count Controller
        - Change Client Count Service
        - ClientCount.js
    - Justis:
        - Fix AllowAnonymous error in pipeline to LoginService
        - Add functionality to Add User page
        - Add functionality to Change Password page
    - Matt:
        - Built Script for power_channel KPI
        - Updated SQL schema
        - Working on Anomaly Detection Algorithm
        - Beginning Deployment to VM
    - Bradley:
        - Set up template for another KPI
        - Answer questions about last week's work
        - Code reviews
        - Add documentation for setting up local environments
        - Reroute root of project to home to better work with sessions
    - Ryan:
        - Work on coverage hole page

Week 13: Sunday, Feb 9 - Feb 15, 2020

- Individual Tasks:
    - Hung:
        - Work with Brad to get Client Count work
        - Code Review with Bradley
        - Finalize Client Count KPI
    - Justis:
        - Add functionality to Add User on User Management page
        - Add functionality to Change Password page
        - Add functionality to logout and session expiration
        - Update SDP
    - Matt:
        - Completed Import Scripts
        - Deployed Import Scripts to VM
        - Developed Batch Script to run import scripts
        - Created task to run Batch Script
        - Updated Schema

- Developed MySQL Event to Purge Old Data
- Working on LOF Anomaly Detection Algo.
- Bradley:
  - Finish Channel Utilization KPI
  - Code reviews
  - Unit testing for Rogue AP Controller
  - Fix Rogue AP bug
  - Help others
- Ryan:
  - Work on Coverage Hole Page
  - Help Hung with his page

Week 14: Sunday, Feb 16 - Feb 22, 2020

- Individual Tasks:
  - Hung:
    - Meet with CLient for process review
    - Add Ignore Feature to Client Count KPI
    - Meet with Matt to discuss about the Ignore Function for Client Count
    - Add Ignored Client Count model, access point
  - Justis:
    - Meet with the client and Dr. Wei
    - Add functionality to Delete buttons in User Management page
    - Add error/success messages to various user system pages
    - Start unit testing user system
  - Matt:
    - Developed & Deployed Local Outlier Factor Anomaly Detection Script
    - Developed KNN-based problem probability function to continue to learn from user
    - Updated Rio-grande `Meet the Team` page with bootstrap carousel
    - Refactored and fully documented all import scripts and consolidated in repo
    - Updated & Added ignored tables to schema per client request
  - Bradley:
    - Refine Channel Utilization KPI
    - Unit tests for channel utilization KPI
    - Update developer documentation
    - Have project auto-generate XML documentation on build
  - Ryan:
    - Client meeting
    - Either work on dashboard or new KPI tbd
    - Tests for Coverage Hole

Week 15: Sunday, Feb 23 - Feb 29, 2020

- Individual Tasks:
  - Hung:
    - Finish Client Count basic sort, search
    - Set up for client count ignore

- Justis:
    - Debug user system/unit tests
- Matt:
    - Created Model, View, Controller for Anomaly Detection Page
- Bradley:
    - Implement existing services on Dashboard
    - Code reviews
- Ryan:
    - Clean up ignore feature
    - Add 2nd table for ignore
    - Start the next task (new kpi?)

Week 16: Sunday, Mar 1 - Mar 7, 2020

- Individual Tasks:
    - Hung:
        - Complete Ignore feature for client Count
    - Justis:
        - Finish debugging user system
        - Write unit tests for the testing suite
    - Matt:
        - Anomaly Detection Feature
    - Bradley:
        - Add functionality for all tables on the dashboard
        - Helped people debug
        - Testing peoples changes
    - Ryan:
        - Finish Coverage Holes

Week 17: Sunday, Mar 8 - Mar 14, 2020

- Individual Tasks:
    - Hung:
        - Channel FLux
    - Justis:
        - Write unit tests for the testing suite
    - Matt:
        - Anomaly Detection Feature
    - Bradley:
        - Rogue AP graph on dashboard
        - Channel Utilization graph on dashboard
        - Dashboard refinements
    - Ryan:
        - Implement ignore feature on CovHole (changed to needed table)
        - Fix layout/kpi entity thing in KPI context
        - Start AP Util KPI

Week 18: Sunday, Mar 15 - Mar 21, 2020

- Individual Tasks:
    - Hung:
        - Power/Channel Fluctuation KPI Page set up
        - Update database
        - Client Count unit testing
    - Justis:
        - Testing user system
        - Assist where needed in other features
        - Write initial SRS
        - Hold 3 meetings with team
    - Matt:
        - Finish Anomaly Detection Feature
    - Bradley:
        - Client count graph on dashboard
        - Edit graphs to make current day more visible
        - Various improvements to dashboard and KPI pages (mainly graphs)
        - Add graphs and tiles to client count KPI page
        - Coverage hole graphs to dashboard
        - Coverage hole graphs to KPI page
        - Code Reviews
        - SRS Poster
        - Add Anomaly Detection table and graphs to dashboard
    - Ryan:
        - Finish AP Util KPI
        - Coverage Hole and AP Util Ignore specific tables
        - Sorting for AP Util fix
        - Search for AP Util
        - Create AP Util Ignore Table/Display

Week 19: Sunday, Mar 22 - Mar 28, 2020

- Individual Tasks:
    - Hung:
        - Ignore Client Count
        - Graph for Power/Channel Fluctuation
        - Controller testing for Client Count & Power/Channel Flux
    - Justis:
        - Hold meetings with team
        - Revise SRS
        - Dump the database in the VM when password is fixed
        - Interface with IT to start deployment
        - Somehow get the product in the hands of Craig
    - Matt:
        - Help with Documentation & Verify Code
    - Bradley:
        - Integrate all remaining pieces into the dashboard (tables)

- Power/Channel fluctuation graphs (KPI page and dashboard)
- Coverage Holes graphs (KPI page and dashboard)
- AP Utilization graphs (KPI page and dashboard)
- Rework AP Utilization, Channel Utilization, and Client Count to be aggregated by the time frame (averages and maxes for each AP)
- Testing
- Review SRS
- Code Reviews and cleaning up Master
- Add auto-versioning to all CSS/JS files to avoid cache/hard reloading after new build
- Ryan:
  - Finish Ignore Coverage and AP Util tables
  - Fix anything for merge requests
  - SRS Section 6
  - Clean up code
  - Start Unit Testing
  - Add coveragehole -OUT merge

Iteration 4:

Week 20: Sunday, Mar 29 - Apr 4, 2020

- Individual Tasks:
  - Hung:
    - SRS Section 5
    - Start unit testing
  - Justis:
    - Continue emailing IT to get things deployed
    - Write unit tests
    - Dump database in VM when access is granted
    - Get the product in Craig's hands
  - Matt:
    - Fix Bugs and Start unit-testing
  - Bradley:
    - Update/Add Unit tests
    - Go through code and make sure all documentation is correct
    - Clean up formatting on Master, refactor certain JavaScript code into functions
    - Bug Fixes
    - Code reviews, helping with unit testing, merges
  - Ryan:
    - Section 6 (Today)
    - Finish Ignore Table
    - Testing for Cov Hole/Ap Util

Week 21: Sunday, Apr 5 - Apr 11, 2020

- Individual Tasks:
  - Hung:
    - SRS Section 5

- Unit testing
  - Justis:
    - Unit testing
    - Deployment
  - Matt:
    -
  - Bradley:
    - Complete Developer manual
    - Check unit tests
    - Finish SRS Poster
    - Unified formatting, editing, and additions to the SRS document (also added use cases)
    - Update/edit glossary
    - Start transferring complete deliverables out of google drive to offline on riogrande
    - Update, format, and edit vision document
    - Update, format, and edit Software development plan
    - Update, format, complete Iteration Plan by transferring over the full W.A.R.
    - Update, format, and edit Use Cases document
  - Ryan:
    - Unit Testing progress
    - Ignored Aputil/Cov Hole done

Week 22: Sunday, Apr 12 - Apr 18, 2020

- Individual Tasks:
  - Hung:
    - Test cases
  - Justis:
    - Unit testing
    - Deployment
    - Test cases
    - Assist Craig in fixing Prime
    - Set up SFTP reporting
  - Matt:
    - Logging
    - Deployment
    - Intraday Import Scripts
  - Bradley:
    - Final presentation
    - Review project work
    - Code reviews
    - Formatted, spellchecked Test Cases document
  - Ryan:
    - User Manual
    - Merge Req Ignore tables
    - Toggle to show ignore table
    - Finish testing

Week 23: Sunday, Apr 19 - Apr 25, 2020

- Individual Tasks:
    - Hung:
        - Finish Testing cases document
        - Prepare for presentation
    - Justis:
        -
    - Matt:
        - Logging
        - Deployment
        - Intraday Import Scripts
    - Bradley:
        - Review unit tests
        - Clean codebase
        - Finished the final presentation
        - Recorded all demos for the final presentation
        - Review documentation
    - Ryan:
        - Finish Unit Testing Cov. Hole + Ap Util
        - Finish User Manual
        - Script for Presentation

Week 23: Sunday, Apr 26 - Apr 30, 2020

- Individual Tasks:
    - Hung:
        - Final Presentation
    - Justis:
        - Final Presentation
    - Matt:
        - Deployment
        - Final Presentation
    - Bradley:
        - Adjustments to final presentation
        - Finalize documentation
        - Final presentation
    - Ryan:
        - Final presentation

3. Resources

Necessary resources are: developers, TCU servers, insight from TCU Network Services.

4.   **Use Cases**

    Please refer to the *Use Cases* document.

5.   **Evaluation Criteria**

    Usability, performance, maintainability, reliability, and accuracy.