# MAP2 Master Test Plan\_Program-Level

# Introduction

Department of Veterans Affairs (VA) Connected Health Office (CHO) is seeking to benefit from advances in mobile technology in order to:

1. Improve the quality of health of Veterans
2. Increase the quality of healthcare available through the VHA
3. Improve the efficiency of providers as well as supporting staff
4. Continuously expand Veterans' overall satisfaction with the Department of Veterans Affairs (VA)

To this end, the VHA CHO has awarded Hewlett-Packard Enterprise Services (HPES) a contract for the Mobile Applications (Apps) Phase Two (MAP2) program to provide Agile mobile application development and enhancement support including program management, application initiation, development, and testing support for ten applications supporting both the VA caregiver community and the external Veteran community. This contract also includes support for compliance testing, field testing, and release support and application deployment.  
The MAP2 program-level Master Test Plan (MTP) will guide all stakeholders through the testing cycle of any application developed or enhanced by the MAP2 program team. Each section will state, at a high level, the 'what and why' of testing and give the managers one place to go to understand the testing approach used by the MAP2 Test team.

## Purpose

The purpose of this program-level MTP for the MAP2 program is to define all test levels that must be performed on MAP2 mobile applications before the application can be deemed ready for submission to the VA Compliance Review and Verification and Validation testing processes. A separate MTP will be developed for each new or enhanced mobile application.

## Test Objectives

This program-level MTP supports the following objectives:

* To provide test coverage for 100% of the documented requirements – functional and non-functional contained in applicable requirement documentation (i.e., the Business Requirements Documents (BRD), the Requirement Specifications Document (RSD), and User Stories)
* To validate the User Story Acceptance Criteria of each mobile application has been met
* To provide coverage for application System Design Document (SDD) elements
* To provide a baseline of needed functionality of the Mobile Application Environment (MAE) test environments
* To perform handoffs with Verification and Validation (V&V), business sponsors, and Compliance bodies for independent testing, compliance reviews, and user functionality testing
* Function as a reference document for mobile application developers on testing standards to be applied to mobile applications entering the MAE

## Acronyms

This section contains a list of acronyms used in this document.

|  |  |
| --- | --- |
| **Acronym** | **Description** |
| ADM | Agile Development Methodology |
| AAP | Ask a Pharmacist |
| A-CHESS | Addiction Comprehensive Health Enhancement Support System |
| ADR | Administrative Data Repository |
| BRD | Business Requirements Document |
| CCB | Change Control Board |
| CDW | Corporate Data Warehouse |
| COR | Contracting Officer's Representative |
| EAS | External Assessment Services |
| ESE | Enterprise Systems Engineering |
| GRECC | Geriatric Research Education and Clinical Center |
| HPES | Hewlett-Packard Enterprise Services |
| IAM | Identity and Access Management |
| ID | Identification |
| IOC | Initial Operating Capability |
| MA | Mobile Application |
| MADW | Mobile Application Development Workflows |
| MAE | Mobile Application Environment |
| MDWS | Medical Domain Web Services |
| MHV | MyHealtheVet |
| MTP | Master Test Plan |
| MVI | Master Veteran Index |
| MHPRO | Mental Health Patient Reported Outcome |
| NFR | Non-Functional Requirement |
| NIST | National Institute of Standards and Technology |
| NSOC | Network Security Operations Center |
| OIA | Office of Information Assurance or Office of Informatics and Analytics |
| OI&T | Office of Information and Technology |
| O&M | Operations and Maintenance |
| PFNMN | Post Falls Note Mobile Nursing |
| PHI | Personal Health Identifiers |
| PII | Personally Identifiable Information |
| PMAS | Project Management and Accountability System |
| RSD | Requirements Specification Document |
| RTM | Requirements Traceability Matrix |
| SDD | System Design Document |
| SQA | Software Quality Assurance |
| SSP | System Security Plan |
| UFT | User Functionality Test |
| URL | Uniform Resource Locator |
| VA | Department of Veterans Administration |
| VA-GDx | VA Genetic Diagnostic Testing |
| VAHA | VA Health Adapter |
| VAMF | VA Mobile Framework |
| VDD | Version Description Document |
| VHA | Veterans Health Administration |
| VistA | Veterans Health Information Systems and Technology Architecture |
| V&V | Verification and Validation |

## Roles and Responsibilities

Table 1 lists the key roles and their responsibilities for this Master Test Plan. The roles defined are members of the HPES MAP2 Program team.   
**Table 1: Roles and Responsibilities**

|  |  |
| --- | --- |
| **Role** | **Description** |
| Developers | Persons that build or construct the mobile application components. Developers will be responsible for unit and component-integration testing. |
| Development Manager | Person responsible for ensuring mobile application components have gone through adequate unit and component-integration testing by development team before turning over to the System Quality Assurance (SQA) Test Team for system testing. Responsible for approving the MTP. |
| Project Manager | Person responsible for overseeing the development and testing of mobile applications under the MAP2 program. Responsible for approving the MTP. |
| Program Manager | Person that has overall responsibility for the successful planning and execution of the MAP2 program. The Program Manager will be responsible for approving the MTP. |
| Stakeholders | Persons that hold a stake in a situation in which they may affect or be affected by the outcome. |
| SQA Test Team | Persons responsible for ensuring full execution of the test process (i.e., test case development, test case execution, etc.) for each mobile application. |
| SQA Test Planner/Engineer | An experienced test analyst or member of the Test Team that leads and coordinates activities (i.e., ensure test environment setup, support Initial Operating Capability (IOC) and V&V testing activities, etc.) related to all aspects of testing for an individual mobile application. Responsible for developing a MTP for each application. |
| Test Environment Team | Persons that establish, maintain, and control test environments. |
| SQA Test Manager | Person that has overall responsibility for developing the program-level MTP. Person responsible for leading and coordinating activities related to all aspects of testing based on the approved program-level Master Test Plan and application–level MTPs and schedules. |

## Processes and References

The processes that guide the implementation of this Master Test Plan are:

* VA's Mobile Application Development Life Cycle
* VA's Mobile Application Project Management Accountability System
* MADW-3 Application Development document
* MADW-4 Verification and Validation
* MADW-5 Compliance Review
* MADW-6 User Acceptance Test
* MADW-7 Field Test (IOC)

The references that support the implementation of this Master Test Plan are:

* Mobile Development Application Life Cycle ([http:/DNS/content/developing-va-apps](http://DNS/content/developing-va-apps))
* ProPath

(<http://DNS/process/propath>)

* Section 508 Office Web Page

(<http://DNS/508workgroup>)

* Privacy Impact Assessment - Privacy Service

(<http://DNS/Privacy_Impact_Assessment.asp>)   
Note: For 508 Compliance, copy and paste the above URLs into your browser to reach each site. Also, the above hyperlinks/URLs prefaced with DNS are only accessible with access to VA network.

# Items To Be Tested

Note: Additional information for the Items to Be Test section will be added/updated in future iterations, as needed.  
This section lists all test items (i.e., functional or features and non-functional requirements derived from the BRD, RSD, User Story documentation, etc.) and interfaces and/or services (i.e., derived from the RSD addendum, SDD addendum, etc.) to be tested for a new or enhanced mobile application as part of the MAP2 program. After delivery and review of the SDD addendum, the HPES SQA Test team will determine the kind of integration testing that needs to occur for a given application in addition to the other system testing to occur on the mobile application.   
The following components and features (and combinations of components and features) will be tested:

 1. Application Source Code Analysis (HPES Fortify Scan tool).

 2.  Mobile application testing (functional and non-functional):

* Rx Refill Delivery Tracking and Image Enhancements
* MyHealtheVet (MHV) Service Conversion
* VA PTSD Coach Phase Two (2)
* Journal Phase Two (2)
* Ask a Pharmacist (AAP) – (New Application)
* Mental Health Patient Reported Outcome (MHPRO) – (New Application)
* VA Genetic Diagnostic Testing (VA-GDx) – (New Application)
* Addiction Comprehensive Health Enhancement Support System (A-CHESS) – (New Application)
* Geriatric Research Education and Clinical Center (GRECC) – (New Application)
* Post Falls Note Mobile Nursing – (New Application)

3. Mobile Adapter testing.

4. Documentation Reviews.

5. Middleware Updates and Additions (i.e., VA Mobile Framework (VAMF), VA Health Adapter).

Refer to [Section 3](#MAP2MasterTestPlan_Program-Level-_Test_) of this document to see the compliance bodies involved in the mobile application reviews based on the risk level that the mobile applications present.

### Application Source Code Analysis

The MAP2 Development team will perform a static code analysis during the application development stage. The HPES Fortify tool will be used for this analysis. Output from the analysis will provide the MAP2 HPES Development team with immediate feedback regarding security vulnerabilities and remediate these issues before sending the application on for further review by other compliance review bodies.

 The MAP2 HPES Development team will execute the HPES Fortify tool against any changed or added services that were created to support the new or enhanced mobile applications as part of the MAP2 program. The critical and high errors will be fixed prior to turning the code over for VA compliance reviews.

### Mobile Application Testing

Each mobile application will include a Master Test Plan (MTP), which will list the testing specific to that mobile application that is performed by the MAP2 Test team. The MAP2 Test team includes both HPES Developers and SQA Testers working within a Scrum team supporting the Agile Development Methodology (ADM) that is being followed by the MAP2 program team. The MTP includes the Test Inclusions (the features or functions to be tested), non-functional requirements, and the detailed test cases and test scripts. It is expected that developers on the Scrum Team are executing the Product Component Tests (unit-level) and Component-Integration Tests for the mobile application.

Next, the HPES SQA tester assigned to the Scrum team will perform feature verification testing during each sprint iteration, which involves testing against the user story's acceptance criteria. Both automated and manual test cases/scripts will be used during this phase of testing.

### Mobile Adapter Testing

If a MAP2 mobile application requires a new Mobile Adapter service or a revision to the service, the MAP2 HPES Development team must test the changes that affect the Mobile Adapter. The MAP2 HPES Development Team must perform a Product Component and Component-Integration Test for the updated or new service. The System Tests will be performed by the MAP2 HPES SQA Test team.

### Documentation Reviews

Prior to submitting a MAP2 mobile application for VA V&V testing and compliance reviews, the MAP2 HPES SQA team will work with the MAP2 HPES Release Manager to ensure the appropriate release forms are filled out accurately and verify supporting documentation is included.

The following is a list of sample release forms or supporting documents that will be reviewed. This is not an all-inclusive list. The application-level MTP will contain the list of release forms and supporting documents that will be reviewed:

* V&V Intake Request Form
* V&V Application Profile Form
* Concept Paper
* Code Review Questionnaire
* Enterprise Security Questionnaire
* Business Requirements Document (BRD)
* Privacy and Security Checklist
* Section 508 Review Form
* Release Management Plan
* Requirements Traceability Matrix
* RSD MA Addendum (User Stories/Acceptance Criteria)
* Software Quality Assurance (SQA) Checklist - only required if VistA changes are made
* SQA Test Scripts/Results and Defect Log
* System Design Document MA Addendum
* System Security Plan Addendum
* User Guide

Again, this documentation is needed prior to entrance into the Compliance Review phase. The Compliance Review phase begins when the application code is handed off to V&V. For more information about VA Compliance Review, please refer to the VA Mobile Application Development web site (<https://DNS/content/va-app-compliance-review>). The HPES SQA Test team will assist the MAP2 Release Manager with review of these documents prior to their turnover to the V&V compliance review body.

### Middleware Updates and Additions

Some mobile applications may have unique requirements based on their architecture defined in the SDD Addendum and SSP Addendum. For example, if the deployment of a mobile application requires a new application server, such as NodeJS or added capacity to the WebLogic cluster, then testing must occur on these new infrastructure pieces. Specifically, security scans must be executed to ensure that the new servers are built to the expected security configurations. The MAE Maintenance Team must execute these tests at the direction of their Contracting Officer's Representative (COR).

## Overview of Test Exclusions

Note: Additional information for the Overview of Test Exclusions section ([Section 2.2](#MAP2MasterTestPlan_Program-Level-_Overv) in this document) will be added/updated in future iterations, as needed.  
The following components and features (and combinations of components and features) will not be tested:

1. Testing of enhancements to VA enterprise services – mobile applications use VA enterprise services, such as the Data Access Services (DAS), VistA, and the Clinical Data Warehouse (CDW). While testing of the mobile application involves testing the integration with these enterprise services, it does not include testing of the service itself. This is the responsibility of the development/SQA team for the enterprise system or service.
2. Non-functional requirements that are not applicable to the new or enhanced application developed by the MAP2 Development team.
3. Non-functional requirements that are not testable.

# Test Approach

Note: Additional information for the Test Approach section of this document will be added/updated in future iterations as needed.

The MAP2 program team will be utilizing an Agile Development Methodology (ADM) as well as using best practices in agile testing techniques for all applications developed as part of the MAP2 program.

Developers assigned to a Scrum team will perform product component or unit testing on their local development workstation and component-integration testing for each sprint iteration in the MAE Development environment. Next, the HPES SQA tester assigned to the Scrum team will perform in-scope feature (functional) verification and non-functional testing in the MAE Development-Demo environment, which involves testing against the user story's acceptance criteria or the non-functional requirements (NFRs) acceptance criteria. In addition, a parallel process of regression testing will occur throughout the sprint iteration. This involves re-running the automated and/or manual product-component tests and feature verification tests from the current sprint iteration and previous iterations via a continuous integration framework. This level of testing will be completed in the MAE Development and Development-Demo environments.

Members of the MAP2 HPES SQA Test team will perform the System Test level, which starts once the first user story is ready for this test level. System testing will consist of executing functional, end-to-end, system-integration, full regression, performance, etc. in the MAE Development-Test environment.

## Testing Processes

The following testing processes will be employed by the MAP2 HPES SQA Test team:

* Develop the Master Test Plan
* Establish the Test Environments
  + MAE Development
  + MAE Development-Demo
  + MAE Development-Test
* Prepare Test Scenarios, Cases, Scripts and Data
* Conduct the Tests
* Verify Test Results
* Document Test Results
* Update the Test Status
* Identify and Resolve Discrepancies
* Retest remediated defects

Representatives of the user-base perform user acceptance testing, and independent VA V&V Test or Compliance Review teams perform verification and validation testing and compliance body reviews. User acceptance and compliance review testing will take place in MAE environments, such as the Integration or Pre-Production environments. These test environments will be setup and maintained by VA resources. While the strategy is standard to best practices in testing, there are some unique aspects to the mobile and MAP2 test approach.

1. The MAP2 program will be following an Agile Development Methodology (ADM), which integrates testing into the entire development process versus a separate test phase at the end of the development cycle as well as promotes constant communication with the business owner's team. This yields application software that implements the intended requirements and will not yield many requirement surprises in the downstream testing levels.
2. The ADM followed by the MAP2 program team promotes the following Agile test-related strategies:

* HPES SQA tester involvement in user story refinement and specification of acceptance criteria as part of story definition
* Automate product component, component-integration, system and acceptance testing as much as possible
* Incorporation of automated tests into the continuous build environment
* Small (minimal) hand-offs between Scrum team (developers, business analyst, testers) members (they work together)
* Lightweight (fast-turnaround) defect tracking and management (defects are identified and fixed within the sprint)
* Exploratory testing
* Test in the same sprint in which the feature is developed
* Track test coverage
* Incorporation of testing into the "Definition of Done"
* Consideration of how various facets of testing will be performed during the Release Cycle (e.g., stronger emphasis on performance testing during 'hardening sprint iterations').
* Separate black-box (behavioral) unit testing from white-box (code-structure based) unit testing:
  + Product component or unit testing is typically the responsibility of developers. However, for agile projects, it is recommended that the responsibility for white-box testing be assigned to developers, while the testers can focus on black-box (feature-driven) unit testing concurrently. This provides complementary but comprehensive focus to unit testing while also enabling early detection of defects that would typically be found in later test levels (e.g., system testing) and reduces cycle time for defect fixes and rework.
* Integrate Automated Tests with the Continuous Integration Build Environment
  + Automated tests should run against the continuous build environment. Typically, this is set-up either on a unique integration server or done in-memory so that these tests do not impact other manual testers.

1. Guidelines for selection of regression test cases for automation are provided below. These should be considered when using the assessed implementation risk for each feature to determine the candidate test cases for automation:

* Feature Smoke tests to verify that the definition of 'done' is achieved, testing the basic transactions. Give these automated test suites to the developers as their 'exit' criteria. Testers run these again in the integration testing environment
* Integration Smoke tests (build smoke tests) to verify that the code is ready for system testing (hardening sprint)
* Solution Smoke tests to verify that the key features developed in one sprint are not broken in subsequent sprint cycles

1. The compliance reviews that must be performed on a mobile application are defined based on the level of risk to VA. The risk level is defined as one of the four levels, as shown in Table 2. The compliance bodies that must review those applications are also shown.

**Table 2: Risk Level Definition**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Mobile Application Classification** | **1a - Very Low: Non-OI&T**\*\* | **1 - Very Low** | **2 - Low** | **3 - Medium** | **4 - High** |
| **Compliance Review Body** | **Does not utilize VA resource or OI&T Funding** | **Does not utilize VA resources** | **Read only access to VA resources** | **Write access to VA or external resources** | **Read and/or write access to VA or external sensitive resources** |
| V&V | Required | Required | Required | Required | Required |
| Business Owner Acceptance | Required | Required | Required | Required | Required |
| Patient Safety Assessment (OIA) | Required | Required | Required | Required | Required |
| 508 Accessibility (OI&T)\* | Required | Required | Required | Required | Required |
| Code Review | Required | Required | Required | Required | Required |
| Usability Testing (OIA) | Required | Required | Required | Required | Required |
| **Mobile Application Classification** | **1a - Very Low: Non-OI&T**\*\* | **1 - Very Low** | **2 - Low** | **3 - Medium** | **4 - High** |
| **Compliance Review Body** | **Does not utilize VA resource or OI&T Funding** | **Does not utilize VA resources** | **Read only access to VA resources** | **Write access to VA or external resources** | **Read and/or write access to VA or external sensitive resources** |
| User Interface (OIA) | Required | Required | Required | Required | Required |
| VA Branding (OPIA) | Required | Required | Required | Required | Required |
| Privacy and Application Security (OIA) | Required | Required | Required | Required | Required |
| Sustainment Plan\* | Required | Required | Required | Required |  |
| System Performance Impact Assessment (OI&T)\* | Required | Required | Required |  |  |
| Enterprise Security | Required | Required | Required |  |  |
| Data and Terminology Standards Compliance (OIA)\* | Required | Required |  |  |  |
| * Not Required for Field Test |  |  |  |  |  |

* In order to qualify for this category, the Mobile Application (MA) must meet the following criteria:
* Does not access Personally Identifiable Information (PII) or Personal Health Identifiers (PHI) data
* Does not access the VA network
* Does not read and/or write to VA or external database
* Does not store data in any VA database
* Does not utilize the VA Mobile Framework
* Does not receive funding (including sustainment and future release funding) from the Office of Information and Technology (OI&T)

Note: The VAMF is considered a VA resource. With this definition, the following is implied:

* If an application is hosted in the VA Mobile Framework (VAMF), it cannot be a Very Low app.  It is at least a Low if it only reads pages within the VAMF or reads data within the VAMF.
* If an application uses a service in the VAMF, but is not installed in the VAMF, then it must be at least a Low app.# The MAE provides development, test, integration, and other environments that provide standardized mobile technologies and toolsets. The Web and Mobile Solutions (WMS) team maintains the MAE. The WMS team has defined and continues to define methods for using the tools to streamline the processes and make the compliance steps and documentation easier to find and read. These processes are intended to speed up the testing process but still maintain quality in order to ensure the products work as intended and pass government regulations, such as National Institute of Standards and Technology (NIST) security and privacy guidelines, 508 compliance, and VA patient safety regulations. Tools, such as JIRA and Confluence (wiki), provide the tracking mechanisms and document management that allow for these streamlined processes.

Each mobile application will document test scripts and test cases in a Microsoft Excel workbook and include the workbook as an attachment to the application's Master Test Plan (MTP). The Requirements Traceability Matrix (RTM) for the mobile application will be updated to map the applicable test case identification (ID) for the test cases that provides test coverage for a user story. The MTP will document the overarching approach and test environment such that the test cases and scripts contained as an attachment to the MTP need to only address specifics of the mobile application being tested. The HPES SQA Test Team will complete the test cases and test scripts for all applicable functional and non-functional requirements in scope for the mobile application being tested.

Currently, the MAP2 program team is forecasting that it should take five sprint iterations to complete all development and testing activities (up through the System Test level) for each new or enhanced application. With this in mind, system testing will be a parallel testing activity that will begin once the user stories from Sprint 1 for a given application have completed feature verification testing and met the definition of "done" by the VA Business Owner of that application. At the earliest, system testing for a given application will begin no earlier than Sprint 2 and will be completed by Sprint 5.

## Product Component Test and Component-Integration Test

The MAP2 developers will perform product component testing or unit testing and component-integration testing using their local development computer workstation and the MAE Development environment. In traditional software development, "units" were more distinct elements that were testable using unit test drivers. The unit test drivers would test individual pieces of code and report the results and separate testing of combined units constituted component-integration testing.

In the mobile technology space, the line between units is blurred, but unit testing by the developer is still required. MAP2 has combined these two test levels into a single test level. Developers are expected to test the components of the application that they are responsible for, and developers assigned to the Scrum team need to test the application components as a whole before turning the application over to the Scrum HPES SQA Test team member for each sprint.

The Product Component Test and Component Integration Test will be known as developer led testing and will occur on the MAP2 Developer's computer workstation and the MAE Development environment. Both environments contain mock services for system interfaces.

After product component and component-integration testing is completed, the application code will be promoted to the Development-Demo environment. The MAP2 HPES SQA Test team member assigned to the scrum team will perform feature verification testing and work with the other scrum team members to ensure all defects identified are fixed and retested or resolved.  
It is expected that manual testing will occur during this level, but that automated test scripts will be written by the MAP2 HPES Development team to facilitate this test level. The MAP2 HPES Development and Test Managers will help determine the scope of automated test script development for this test level.

## System Tests

MAP2 HPES SQA Test team members will test all in-scope functional and non-functional requirements in the MAE Development-Test environment.

The MAE Development-Test environment will contain live interfaces with as many VA enterprise systems and/or services as possible to perform valid system tests. Mock services will only be used where absolutely required (for example, if a given VA system does not have a test environment that can be connected to the MAE). The HPES SQA Test team will be in control of the test data, and developers should not have access to this environment to make changes. It may be required for developers to have read access such that they can debug issues when they arise in system tests.  
Specifically, the HPES SQA Test team will perform the following functions:

 1. Write the test scripts including:

* Test Case Descriptions
* Pre-conditions/Post Conditions
* Test Cases
* Test Script specifications including:
* Procedure steps
* Verification Points (VP)
* Expected Results (ER)
* Comments

2. Update the Requirements Traceability Matrix created earlier by an Business or Technical Analyst adding the Test Case ID to the matrix

3. Execute the test scripts

4. Report results based on the actual results compared to the expected results

5. Create bug issues in JIRA to document defects

6. Perform testing of remediated defects:

* As fixes to the defects are planned (and put into the backlog in JIRA), the Test Team will track them.
* When fixed, the defects will be retested by the Test Team, closed, or reopened depending on the outcome of test execution.
* Regression testing will occur on new builds to ensure that functionality that was working is still working.
* Update the test scripts with possible new tests or new steps to the existing test scripts as the software is modified.

7. Create artifacts needed for release of the software, such as:

* Defect Log (the defect log can be a report output from JIRA)
* Test Execution Summary that provides overall statistics and results about the System Test level (this report will be reported from the Test Case/Script workbook)

In Agile processes, the SQA Test team is involved throughout the process including testing of delivered sprints. However, there is still a specific System Test sprint or sprints included in the agile process to allow for verification of the functional and non-functional requirements prior to turnover to VA Compliance Reviews and V&V Test processes.

## Performance and Load Test

Note: Additional information for the Performance and Load Test section will be added/updated in future iterations as needed.

Performance and load testing will be performed by members of the MAP2 HPES Development and SQA Test teams as required by the MAP2 Performance Work Statement (PWS) document (dated 8/29/2014). The MAP2 program team will review all applicable VA Enterprise NFRs related to performance and load test requirements. If it is determined that a performance and/or load testing is required, performance and/or load test cases and scripts will be developed. The determination to execute a Performance and/or Load Test will be based on factors, such as the number of users to be using the new application, the types of services that will be executed within the environment, and the status of prior performance tests (i.e., have the functions been tested before?). If it is determined that a Performance and Load Test is required, the following are high-level goals to be met for the Performance and Load Test:

* Validate that documented Critical Success Criteria around performance of the integrated system and infrastructure, which map to Critical Success Factors that are visible to and agreed with the customer, have been satisfied
* Assure the system will perform as required under expected usage levels
* Identify points of system degradation or bottlenecks
* Identify system capacity or limitations on specific components
* Reduce implementation risk
* Identify causes of poor performance to the business functions

A System Performance Impact Assessment will be completed based on the performance test results or the fact that no performance impact is expected based on the SDD Addendum review.

## User Functionality Test

Note: Additional information for the User Functionality Test section will be added/updated in future iterations as needed.

User Functionality Test (UFT – also known as User Acceptance Test) requires stakeholders to test the mobile application prior to release. These tests are typically performed by members of the business sponsor organization that have the knowledge of the functional requirements, but they can be performed by actual end users. The objective is to confirm that the product meets the business need or business acceptance criteria. It is the responsibility of the business sponsor to define the contents of the UFT and the methods for performing it. UFT testing will be performed in the MAE Integration and Pre-Production environments. The MAP2 Development and SQA Test team will support this test level as required.

Since the mobile applications are developed using an Agile process, business owner representatives should be involved in the development process, and it is more likely that UFT will be less intense and short in duration.

It is expected that user functionality testing will be done using the user stories developed and refined early in the development phase of the project.

## Enterprise System Engineering Testing

### V&V Test

V&V Test will be used to validate the features or functional and non-functional testing completed by MAP2 HPES SQA Test team. Members of the HPES SQA Test team will work with the MAP2 Release Manager to ensure the application code and any required artifacts (i.e., Test Cases, Test Scripts, updated RTM, etc.) are ready for release to the V&V team.

### ESE Release Process

Members of the MAP2 HPES SQA Test team will coordinate with the MAP2 Release Manager to ensure required documentation is submitted to the Enterprise Systems Engineering (ESE) Compliance body responsible for completing this type of testing on the mobile application-under-test.

## Initial Operating Capability Evaluation

The Initial Operation Capability (IOC) Evaluation will be accomplished through limited release of applications to real users in the production environment. The mobile application must pass all required compliance body reviews and the V&V Test in order to be released to the real end users. The definition of the required compliance bodies is dependent on the mobile application. For example, mobile applications that are "Very Low" systems do not have to be assessed by the Privacy compliance team. The MAP2 Release Management processes will be followed before releasing to production for IOC Evaluation.

# Testing Techniques

## Risk-based Testing

Risk-based testing is a technique for prioritizing testing based on testing the highest risk items first and continuing to test down the risk prioritization ladder as the testing schedule permits. In an Agile process, it is typical to implement high-risk items in early sprints. The MAP2 Scrum teams (i.e., Developers) will perform their internal product component and component-integration testing on these early sprints and continue testing as the agile cycles continue. The MAP2 Scrum teams will identify high-risk areas and the MAP2 Scrum teams (i.e., HPES SQA Testers) will be involved early in the process to test these items prior to the final development sprint.

For System Testing, V&V Testing, and Compliance Testing, all functional, non-functional, and compliance requirements must be met. While risk based testing can be performed to identify high-risk issues first, there is not as much value in this approach as with the User Story features testing done by the MAP2 Scrum teams. In the end, all requirements must be tested in some manner even if it is through inspection versus actual testing.

## Enterprise Testing

### Security Testing

The MAP2 HPES Development and MAP2 HPES SQA Test team will develop tests to validate the security requirements and to ensure readiness for the independent testing performed by the External Assessment Services (EAS) team. The EAS team performs Web Application Security Assessments (WASAs) that are an in-depth penetration test for common vulnerabilities, such as SQL Injection, Authorization Bypass, and Cross-Site-Scripting (CSS). WASAs cannot be started until the EAS team receives a completed questionnaire with working test accounts and a full directory listing. The HPES SQA Test team will ensure applicable application Uniform Resource Locators (URLs) and test accounts work before the questionnaire is submitted to the EAS team.   
In addition to the EAS evaluation, the Network Security Operations Center (NSOC) will scan the application and the code for vulnerabilities. The MAP2 HPES Development team needs to complete the NSOC Intake Questionnaire prior to submitting the application for the EAS evaluation. This penetration test is particularly important for those mobile applications that read and write data to VA systems. All MAP2 applications are classified as "High;" so, these scans will be required.

### Privacy Testing

VHA Privacy and Application Security offices ensure that mobile applications adhere to Privacy regulations and statutes as well as VA policy. The MAP2 HPES Development and MAP2 HPES SQA Test team use the Privacy and Security checklist to determine if data is stored, transmitted, or entered by the user, provider or employee. The MAP2 HPES Development and MAP2 HPES SQA Test team also determine if there is sensitive information, such as PHI or PII stored on the application. If it is, the Data Security branch determines how the application-under-test protects the information.

### Section 508 Compliance Testing

The Office of Information and Technology (OIT) Section 508 tests mobile content to verify that it complies with Section 508 standards including 1194.21 (Software and Platforms), 1194.22 Web, 1194.24 (Multimedia), and 1194.31 Functional Requirements. They work to facilitate access to mobile technologies for anyone with disabilities.

The Section 508 Office will manually test VA platform-specific applications directly on the device using its built-in accessibility features and supported methods. For example, they test with VoiceOver on iOS and Talkback on Android.

The Section 508 Office will perform some automated testing on web-based content, but they also perform manual tests to ensure the (mobile application) properly implements accessibility techniques on the devices browsers.

The MAP2 HPES Development and MAP2 HPES SQA Test teams will perform 508 Compliance testing prior to initiating the Section 508 Program Office to perform their independent testing.  
The MAP2 HPES SQA team will work with the MAP2 Release Manager to register MAP2 applications as early in the Planning or Development phases as possible.

### Multi-Divisional Testing

Multi-Divisional testing is required to ensure that all applications will operate in a multi-division or multi-site environment recognizing that an enterprise perspective while full supporting local health care delivery. If multi-divisional requirements are present in an application's BRD, the MAP2 HPES Development and MAP2 HPES SQA Test teams verify and validate that the application under test complies with the multi-divisional requirements stated prior to initiating the applicable Compliance body to perform their independent testing.

## Test Types

Table 3 lists the following test types that can be performed under MAP2. While all of these test types do not list the MAP2 HPES Development or MAP2 HPES SQA Test teams, the MAP2 HPES Development Team and the corresponding MAP2 HPES SQA Test team must ensure that the mobile application is compliant in the particular area before moving the mobile application past the System Test level.  
**Table 3: Test Types**

|  |  |
| --- | --- |
| **Test Types** | **Party Responsible** |
| Access Control Testing | MAP2 HPES Development and MAP2 HPES SQA Teams, VA V&V Team |
| Build Verification Testing | MAP2 HPES Development Team |
| Code Coverage Testing | MAP2 HPES Development Team, VA Compliance Body |
| Compliance Testing | VA V&V Team and Compliance Bodies |
| Component Integration Testing | MAP2 HPES Development Team |
| Data and Database Integrity Testing | MAP2 HP Development and SQA Teams, VA V&V Team |
| Documentation Testing | VA V&V Test Team |
| Error Analysis Testing | MAP2 HPES Development and MAP2 HPES SQA Teams, VA V&V Team |
| End-to-End Testing | MAP2 HPES Development and MAP2 HPES SQA Teams, VA V&V Team |
| Functional Testing | MAP2 HPES Development and MAP2 HPES SQA Teams, VA V&V Team |
| Information Assurance Testing | MAP2 HPES Development and MAP2 HPES SQA Teams, VA V&V Team |
| Installation Testing | VA MAE Maintenance Team |
| Integration Testing | MAP2 HPES Development and MAP2 HPES SQA Teams, VA V&V Team |
| Integrated Performance and Load Testing | MAP2 HPES Development and MAP2 HPES SQA Teams |
| Privacy Testing | MAP2 HPES Development and MAP2 HPES SQA Teams, VA V&V Team and VA Compliance Bodies |
| Product Component Testing | MAP2 HPES Development Team |
| Regression Testing | MAP2 HPES Development and MAP2 HPES SQA Teams, VA V&V Team |
| Section 508 Compliance Testing | MAP2 HPES Development and MAP2 HPES SQA Teams, VA V&V Team, and VA Compliance Bodies |
| Security Testing | MAP2 HPES Development and MAP2 HPES SQA Teams, VA V&V Team, and VA Compliance Bodies |
| Smoke Testing | MAP2 HPES SQA Test Team, VAV&V Team |
| Usability Testing | VA V&V Team and Compliance Bodies |
| User Functionality Testing | VA Stakeholders |
| User Interface Testing | MAP2 HPES Development and MAP2 HPES SQA Teams, VA V&V Team |

## Productivity and Support Tools

Table 4 describes the tools that will be employed to support this Master Test Plan.  
**Table 4: Tool Category or Types**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tool Category or Type** | **Tool Brand Name** | **Vendor or In-house** | **Version** |
| Test Management | MS Excel | Microsoft | 2013 |
| Defect Tracking | JIRA | Atlassian | 6.2 |
| Code Analyzer | Fortify | Atlassian | 6.2 |
| Document Management | Confluence (wiki) | Atlassian | 6.2 |
| Performance and Load Testing | Apache JMeter | Open Source | TBD |
| Configuration Management | Stash/Git | Atlassian | 6.2 |
| DBMS tools | Oracle & MongoDB | Oracle and 10gen | TBD |
| Functional Test Automation | Selenium | Vendor | 2.5.0 |
| Web Service Test Automation | SoapUI | Open Source | TBD |
| Database Query Tools | TOAD, SQLPlus | Quest, Oracle | TBD |

# Test Criteria

## Process Reviews

The Master Test Plan undergoes three reviews:

* Peer Review – upon completion of the Master Test Plan
* MAP2 HPES Technical Writer Review
* Formal Review – after the HPES MAP2 Program and Project Manager approves the Master Test Plan

The Master Test Plan does serve as an input artifact used for Milestone 1 and Milestone 2 Reviews of the Development phase.  
For more information on the milestone reviews associated with testing, see the required artifacts and templates for PMAS as part of VA's Mobile Application Development Life Cycle.

## Pass/Fail Criteria

Per the Agile Development Methodology (ADM) followed by the MAP2 Scrum team, all defect(s) found for a given user story will be fixed and retested during the sprint the feature(s) were developed. If for some reason the defect(s) for a certain user story cannot be fixed and retested prior to sprint completion, the defect and applicable user story will be addressed in a subsequent sprint.

For the System Test level, pass criteria is defined in each specific test case, but in general, a test is considered as passed when the functionality meets the requirements as defined with no Level 1, Level 2, or Level 3 defects identified. If any test case within the overall test fails, then the whole test fails. It is typical that a product will still be released with some Level 3 and Level 4 defects, but it must be approved by the business owner and the release processes in order to be approved out to production. The open issues are provided as part of the release documentation.   
A test is considered failed when the functionality does not meet the requirements as defined.

## Suspension and Resumption Criteria

The Project Manager at the recommendation of the MAP2 HPES SQA Test team has the authority to suspend testing. Testing will be suspended if:

* Test accounts or verifiable items are unavailable or become unstable
* A failure occurs that prevents the test from continuing or invalidates any additional testing to be performed or corrupts the database
* A defect is discovered that corrupts the data within the database in such a way that proceeding would cause severe damage to the test environment
* The component being tested fails or a major component fails. A major component failure is one that one can reasonable assume will result in other test case failures. If there are so many defects that continuing testing is a waste of resources, testing will be suspended.
* Testing will resume when the component or code has been repaired, rebuilt and versioned, unit tested, gone through system test, and is installed into the test environment by the MAE maintenance team. If the cause of the suspension is due to either unstable or unavailable test environment, testing will resume when the test environment becomes stable and/or available.

## Acceptance Criteria

The following activities must be performed to complete the test and validation process:

* Updates to test documentation have been completed and are under configuration management control on the mobile application wiki page
* All required test types have been completed (i.e., Functional, 508, Security and Regression, etc.)
* Test cases have been executed according to the test plan and any deviations are documented and approved
* All compliance bodies have approved the release or stated that their participation is not required for the specified mobile application being tested
* All defects have been analyzed and changed to the appropriate state
* All closed defects have an assigned defect root cause

After completion of the above activities, the acceptance criterion for release of the application is:

1. For System Test, the application has no Level 1, Level 2, or Level 3 defects except as specifically accepted by the business owner.
2. All defects that are in the product are documented in the software anomalies report as known defects and accepted by the business owner.
3. All MAP2 Release Management activities are carried out.
4. The business sponsor and required compliance bodies have signed off on the release.

# Test Deliverables

Table 5 lists the test deliverables that will be included for each application developed under the MAP2 program.   
**Table 5: Test Deliverables**

|  |  |  |
| --- | --- | --- |
| **Test Deliverables** | **Program/ App level?** | **Responsible Party** |
| Master Test Plan | Program | MAP2 HPES SQA Test Manager |
| Master Test Plans (Iterative) | App level | MAP2 HPES SQA Test Planner/Engineer |
| Test Execution Risks | App level | MAP2 HPES SQA Test Manager and Test Planner/Engineer |
| Test Schedule | App level | MAP2 HPES SQA Test Manager and Project Manager |
| Test Cases/Test Scripts | App level | MAP2 HPES Developers and SQA Testers |
| Test Data | App level | MAP2 HPES Developers and SQA Testers |
| Test Environment(s) | Program | MAP2 HPES SQA Test Manager |
| Test Evaluation Summary | App level | MAP2 HPES SQA Test Planner/Engineer for Sprint Iterations and System Test  HPES V&V Team for V&V Tests and Compliance Reviews |
| Traceability Report or Matrix | App level | MAP2 HPES SQA Test Planner/Engineer for Sprint Iterations and System Test  VA V&V Team for V&V Tests and Compliance Reviews |

# Test Schedule

Table 6 lists the major testing milestones for the MAP2 program. Refer to each mobile applications master project schedule for current planned start and completion dates for testing milestones.  
**Table 6: Testing Milestones**

|  |  |
| --- | --- |
| **Testing Milestones** | **Responsible Party** |
| Deliver Initial MTP and MTP Checklist for all MAP2 Mobile Applications | MAP2 HPES Test Manager |
| Complete Sprint 1 User Story/Unit Test/SQA Testing | MAP2 HPES Developers and MAP2 HPES SQA Testers |
| Complete Sprint 2 User Story/Unit Test/SQA Sprint Testing | MAP2 HPES Developers and MAP2 HPES SQA Testers |
| Complete Sprint 3 User Story/Unit Test/SQA Sprint Testing | MAP2 HPES Developers and MAP2 HPES SQA Testers |
| Complete Sprint 4 User Story/Unit Test/SQA Sprint Testing | MAP2 HPES Developers and MAP2 HPES SQA Testers |
| Complete Sprint 5 User Story/Unit Test/SQA Sprint Testing | MAP2 HPES Developers and MAP2 HPES SQA Testers |
| Complete System Testing | MAP2 HPES SQA Test Team |
| Complete Compliance Reviews, V&V Testing, IOC | VA Compliance Bodies and V&V Test Team |

# Test Environments

A test environment is an environment containing hardware or virtual machines, simulators, software tools, and other support elements needed to conduct a test. Simulators in a service-oriented architecture, such as used in VA, include "mock services," which simulate the behavior of VA services. The MAE contains mock services in some areas to control the interfaces and data retrieved and simulate test scenarios. There are multiple test environments within the MAE to support different levels of testing.

## Test Environment Configurations

The MAE includes the following environments and tools that can be utilized by the MAP2 Program team.   
**Development environment** – this includes the following services and tools:

* **Git/Stash** – code repositories are provided for the mobile application as well as access to the Mobile Adapter (Health Adapter) code repository to provide the development team access to the common services provided
* **Jenkins** – for building the software into deployable units
* **Fortify** – for scanning the software
* **JIRA** – for executing the agile processes, documenting user stories, creating agile boards, documenting software issues, etc. Compliance issues are included in the JIRA project so the development team can track completion of these requirements and attach the appropriate documents.
* **Confluence** – for documenting the mobile application in a wiki format. The wiki can be used to deliver the documents needed by MAP2 and the V&V team
* **Development integration servers** – to include mock services for standard VA enterprise services to be called by the Mobile Adapter services and/or directly from mobile applications

**Development** – developers use this environment for internal component integration not external integration. It allows the users to test deployment of multiple developers' code from the code repository.

Features of this environment are:

* Mock Services for external systems, such as Identity and Access Management (IAM), Master Veteran Index (MVI), Administrative Data Repository (ADR), VistA (or dev VistA), Medical Domain Web Services (MDWS), Corporate Data Warehouse (CDW), etc.
* All test data and fake patients/users

**Development-Demo** – HPES SQA Testers assigned to the Scrum team will perform feature acceptance testing of user stories in this environment as well. Developers use this environment to deploy applications before they are delivered to the business sponsor for the following:

* Allows user communities to use and comment on applications in development
* Allows for testing of applications and services from non-GFE devices
* Demonstrate code to SMEs during sprint reviews
* Allow for collaboration with external agencies or partners

Features of this environment are:

* An isolated environment so it can provide Public Facing IP addresses
* Mock Services for external systems, such as IAM, MVI, ADR, VistA (or dev VistA), MDWS, CDW, etc.
* All test data and fake patients/users
* Quickly re-deploy specific applications and services based on demonstration needs regardless of where they are in the Development cycle

Developers will use this environment to perform component-integration testing and integrate with some VA services prior to system test.   
**Development-Test** – HPES SQA Testers will perform system testing in this environment.

Features of this environment are:

* Real Test Services for external systems, such as IAM, MVI, ADR, VistA (or dev VistA), MDWS, CDW, etc.
* Mock Services used where development integrations are not allowed
* All test data and fake patients/users

**Integration** – This environment will be used for system testing and V&V and Compliance testing. When more resources are obtained, ten this will be a system testing environment.

Features of this environment are:

* Real Test Services for external systems, such as IAM, MVI, ADR, VistA (or dev VistA), MDWS, CDW, etc.
* Mock Services used where needed, such as CDW
* All test data and fake patients/users

**PerfTest** – Performance testing will occur here when this is established so that real data is not used in test scripts and results capture.   
Features of this environment are:

* Mock Services for external systems, such as IAM, MVI, ADR, VistA (or dev VistA), MDWS, CDW, etc.
* Mock Services used where needed, such as CDW
* All test data and fake patients/users

**V&V (future) –** In the future, this environment will be used for V&V and Compliance testing. Since V&V is essentially a pre-compliance check, then this environment is called "Comp-Test" as shorthand.

Features of this environment are:

* Real Test Services for external systems, such as IAM, MVI, ADR, VistA (or dev VistA), MDWS, CDW, etc.
* Mock Services used where needed, such as CDW
* All test data and fake patients/users

**Pre-Production –** Primary purposes:

* Installation of the final package
* Recreation of production issues

Features of this environment are:

* Real Pre-Prod Services for external systems connected to existing pre-prod environments that have production-like PII/PHI data
* Copy of Production Data
* Secure environment in the "High" system boundary of the VAMF
* This environment is not open to the Internet.

Access to these MAE environments is obtained through the Web and Mobile Solution request process. The MAP2 HPES Development and MAP2 HPES SQA Test teams only have access to the MAE Development environments. The MAP2 CM manager must have access to all MAE development environments for auditing purposes. The MAE Maintenance Team maintains all of the MAE environments, and this team should not include any developers from the MAP2 Program team.

## Base System Hardware

Note: Additional information for the Base System Hardware section will be added/updated in future iterations as needed.

Table 7 shows the system resources for the test effort presented in this Master Test Plan.

The specific elements of the test system may not be fully understood in early iterations; so, this section may be completed over time. The test system should simulate the production environment as closely as possible, scaling down the concurrent access and database size, and so forth, if and where appropriate.

**Table 7: System Hardware Resources**

|  |  |  |
| --- | --- | --- |
| **Resource** | **Quantity** | **Name and Type** |
| Database Server |  | TBD |
| Network or Subnet |  | TBD |
| Server Name |  | TBD |
| Database Name |  | TBD |
| Client Test PCs |  | TBD |
| Special Configuration Requirements |  | TBD |
| Test Repository |  | TBD |
| Network or Subnet |  | TBD |
| Server Name |  | TBD |
| Test Development Computers (PCs) |  | TBD |

## Base Software Elements in the Test Environments

Note: Additional information for the User Functionality Test section will be added/updated in future iterations as needed.  
Table 8 describes the base software elements that are required in the test environment for this Master Test Plan.  
**Table 8: Software Elements**

|  |  |  |
| --- | --- | --- |
| **Software Element Name** | **Version** | **Type and Other Notes** |
| Windows | 7.0 | Desktop Operating System |
| IOS | TBD | Apple Operating System |
| Android | TBD | Android Operating System |
| Internet Explorer | 11 | Laptop Internet Browser |
| Chrome | TBD | Mobile Internet Browser |
| Chrome | TBD | Desktop Internet Browser |
| Safari | TBD | Mobile Internet Browser |
| Safari | TBD | Desktop Internet Browser |

# Staffing and Training Needs

Table 9 describes the HPES personnel resources needed to plan, prepare, and execute this Master Test Plan. This document does not apply to any VA user training needed.

**Table 9: HPES Staffing Resources**

|  |  |  |  |
| --- | --- | --- | --- |
| **Testing Task** | **Quantity of Personnel Needed** | **VA MA Development Phase** | **Duration/ Days** |
| Create the Master Test Plan – Program-Level | 1 | Planning | TBD |
| Create/Update Master Test Plan – Application-Level | 1 | Planning/Development | TBD |
| Establish the Test Environment | 1 | Planning/Development | TBD |
| Create/Update Test Cases and Scripts | 5 | Development | TBD |
| Perform Feature Verification/System Tests | 5 | Development | TBD |
| Test Management Reporting | 1 | Development | TBD |
| Coordinate with V&V Test Team and Compliance Bodies | 3 | Development/Compliance Review | TBD |

The MAP2 Program team is responsible for training their developers and test team members on the technologies involved. The MAP2 Program team will be responsible for training on:

1. The MAE Change Control Board (CCB) processes regarding the updates of environments.
2. JIRA and wiki training for program personnel using these tools.

# Risks and Constraints

Risks are tracked in JIRA both at the MAP2 mobile application level and the MAP2 program level. This section will be updated as risks and constraints are identified. Testing related risks will be identified by the HPES SQA Test Manager and submitted to the MAP2 HPES Program Manager for inclusion on the MAP2 Risk Register.

Again, risks are tracked in JIRA both at the mobile application level and the MAP program level. Risks that affect the completeness or effectiveness are the following:

* Lack of Environments – need to ensure VA will be configuring the MAE Integration and Pre-Production environment to match the configuration of the MAE Development-Test environment. This is to fully support integrated system testing, V&V testing, and performance testing. If the configuration is not the same, the overall test approach is compromised.
* If an integrated MAE Development-Test (i.e., CDW, HDR, Vista, etc.) environment is not available, then there is a risk that testing will not be adequate for VA V&V and production release
* Assuming performance and load testing will be performed in the MAE Development-Test environment, and this environment is not a close match to the production environment, then then there is a higher risk that the migrated application will not perform as expected in the Production environment
* In the case of read-only applications, the pre-production environment can be integrated with other pre-production/production environments for UFT testing, but obviously a pre-production environment cannot write to a production environment. This needs to be managed closely on an application by application basis and a method of testing constructed such that it is clear that adequate testing has been performed.

# Test Metrics

Metrics used in testing provide an objective and measurable gauge of the coverage and progress of the test effort as well as the quality of the software itself. Table 10 displays the test metrics that will be captured and provided throughout the MA Test life cycle.  
**Table 10: Test Metrics**

|  |  |  |
| --- | --- | --- |
| **Report Name** | **Report Type** | **Report Description** |
| Projected vs. Actual Test Effort | Project Management | The Estimated vs. Actual Test Effort report provides management with a view of how well the project met its agreed upon delivery timeline determined at project initiation. The data used to construct this indicator is as follows:   * Estimated Hours: estimated hourly effort associated with completing all activities required to meet the exit criteria for a given test phase * Actual Hours: hourly effort associated with completing all activities required to meet the exit criteria for a given test phase |
| Actual Test Effort by Level | Project Management | The Actual Test Effort by level report provides a breakdown of the testing effort by each level for each application in a MA release. |
| Requirement Test Case Coverage | Coverage | Requirements Test Case Coverage report provides a method to measure the percentage of coverage through test procedures. The data used to construct this indicator is as follows:   * Baseline Requirements: the number of requirements approved by the team and client to be addressed in the MA release, iteration, or build under development * Requirements Mapped to Test Scripts: the number of baseline requirements that have been mapped to test scripts for the specified release |
| Overall Test Case/Script Execution Status | Progression | The Overall Test Procedure Execution Status Report details the progression and extent of the test effort at a given point and time and the percentage of test cases executed in addition to:   * Total Test Scripts – the number of test scripts scheduled to be run in the current test cycle. The test cycle will be denoted in the slide * Scripts to be Executed – the number of scripts yet to be run * Currently Passed – the number of scripts for the current cycle that have passed * First Time Passed – the number of "Currently Passed" scripts that passed the first time they were executed |
| Daily Test Execution Status | Progression | The Daily Test Execution Status reports details the daily progression of the testing effort versus the planned progression by reflecting how many scripts have passed and failed on a daily basis. The report captures the following metrics:   * Test Scripts in Release: number of scripts that provide coverage for the release * Test Scripts Passed Cumulative Planned: number of scripts the test team expects to have passed at a given point in time * Test Scripts Passed Cumulative Actual: number of scripts that have actually passed at a given point in time * Test Scripts Passed Daily: number of scripts run in a given day that have successfully passed * Test Scripts Failed Daily: number of scripts run in a given day that failed |
| Open Defects by Severity | Progression | Open Defects by Severity Report captures the ratio of reported defects by the severity level and the:   * Total number of defects identified * Number of defects associated to test case/test script and user stories/requirements * Percentage of defects listed by cause and severity |

# Attachment A – Defect Level Definitions

**Level 1 Critical** - The defect results in the failure of the complete software system, of a subsystem, or of a software unit (program or module) within the system.

* Any defect that compromises patient safety or system security. Examples of system security defects include breach of confidentiality requirements of the Privacy Act, the Health Insurance Portability and Accountability Act (HIPAA), or Federal Tax Information guidelines.
* Loss of system functionality critical to user operations with no suitable workaround, i.e., there is no way to achieve the expected results using the application
* System crash or hang that prevents further testing or operation of the complete application or a section of the application
* Any defect that causes corruption of data from a result of the system (as opposed to user error)
* Any defect in which inappropriate transmissions are consistently generated or appropriate transmissions of HL7 messages fail to be generated
* Loss of functionality resulting in erroneous eligibility/enrollment determinations or communications not being sent

**Level 2 High**- The defect results in the failure of the complete software system, of a subsystem, or of a software unit (program or module) within the system. There is no way to make the failed component(s) function. However, there are acceptable processing alternatives which will yield the desired result.

* A major defect in the functionality that does not result in corruption of data
* A major defect in the functionality resulting in a failure of all or part of the application, where:
* The expected results can temporarily be achieved by alternate means. The customer indicates the work around is acceptable for the short term.
* Any defect that does not conform to Section 508 standards
* Any defect that results in inaccurate or missing requirements
* Any defect that results in invalid authentication or authentication of an invalid end user

**Level 3 Medium** - The defect does not result in a failure, but causes the system to produce incorrect, incomplete, or inconsistent results, or the defect impairs the systems usability.

* Minor functionality is not working as intended and a workaround exists but is not suitable for long term use
* The inability of a valid user to access the system consistent with granted privileges
* Typographical or grammatical errors in the application, including installation guides, user guides, training manuals, and design documents
* Any defect producing cryptic, incorrect, or inappropriate error messages
* Any defect that results from the use of non-standard data terminology in the application or documentation, as defined by the Department of Veterans Affairs
* Cosmetic issues that are important to the integrity of the product, but do not result in data entry and or data quality problems

**Level 4 Low** - The defect does not cause a failure, does not impair usability, and the desired processing results are easily obtained by working around the defect.

* Minor loss of, or defect in the functionality where a long term use exists
* Low-level cosmetic issues

# Attachment B – Test Case/Script – Coverage

The example below can be used by the MAP2 program team members to build test case/scripts, or the Test Case/Script template can be added to this section of the MTP.  
**Test Case:**   
**Description**   
**TC Pre Conditions:**

|  |  |  |
| --- | --- | --- |
| **Pre-Conditions** | **Post-Conditions** | **Acceptance Criteria** |
| The user/tester should have access to all needed areas, such as the store, to download and install the app.  The user/tester should have the app installed on the device.  The user/tester should be familiar with Mobile apps controls, such as slides and spinners. |  |  |

**Test Script:**  
**Test Script Description:**   
**Test Procedure**

|  |  |  |
| --- | --- | --- |
| **Pre-Conditions** | **Post-Conditions** | **Acceptance Criteria** |
|  |  |  |

**Auto Implementation:**   
**Manual Implementation:**   
**Test Inputs:**   
**Test Design**

|  |  |  |  |
| --- | --- | --- | --- |
| **Step** | **Type** | **Note** | **Description** |
| 1 | Step |  |  |
| 2 | VP | . |  |
| 3 | Step |  |  |
| 4 | VP |  |  |