Table Of Contents

[1 Introduction 3](#_Toc5697109)

[1.1 Objectives 3](#_Toc5697110)

[1.2 Background 3](#_Toc5697111)

[1.3 Scope 3](#_Toc5697112)

[1.4 Product Configurations 5](#_Toc5697113)

[1.5 References 5](#_Toc5697114)

[1.6 Definitions and Acronyms 5](#_Toc5697115)

[2 Features and Requirements 6](#_Toc5697116)

[3 Verification Approach 6](#_Toc5697117)

[3.1 Software Verification for Shanghai Kiosk SQE Team 6](#_Toc5697118)

[4 Detailed Approach 7](#_Toc5697119)

[4.1 Statistical methodology/sampling plans to be applied 7](#_Toc5697120)

[4.2 User/Service Documentation Test Descriptions 7](#_Toc5697121)

[4.3 Software / Firmware Test Descriptions 7](#_Toc5697122)

[4.3.1 Feature / Functional Testing 8](#_Toc5697123)

[4.3.2 Systems Integration Testing 9](#_Toc5697124)

[4.3.3 Performance Testing 9](#_Toc5697125)

[4.3.4 Regression Testing 10](#_Toc5697126)

[4.3.4.1 Risk Areas 10](#_Toc5697127)

[4.3.4.2 Critical Tests 10](#_Toc5697128)

[4.3.5 Acceptance / Smoke Testing 10](#_Toc5697129)

[4.3.6 System / Reliability Testing 11](#_Toc5697130)

[4.3.7 Human Factors/Usability Testing 11](#_Toc5697131)

[4.3.8 DICOM and Connectivity to OEM Devices Testing 11](#_Toc5697132)

[4.4 Hardware Test Descriptions 11](#_Toc5697133)

[4.4.1 Color Printer Stability Test 11](#_Toc5697134)

[4.5 BVT Test 11](#_Toc5697135)

[4.6 Application Test 11](#_Toc5697136)

[4.7 Installation Test 11](#_Toc5697137)

[4.8 Service Tools Test 12](#_Toc5697138)

[4.9 Automation Testing 12](#_Toc5697139)

[4.10 Ad Hoc Test 12](#_Toc5697140)

[4.11 Error Handling and Reporting 12](#_Toc5697141)

[4.12 Compatibility Test 12](#_Toc5697142)

[4.13 Stress Test 12](#_Toc5697143)

[4.14 Serviceability 12](#_Toc5697144)

[5 Defects/Enhancement Resolved 12](#_Toc5697145)

[6 Product Features Not to Be Tested 12](#_Toc5697146)

[6.1 Software: 12](#_Toc5697147)

[6.2 Hardware: 13](#_Toc5697148)

[7 Defect Management 13](#_Toc5697149)

[8 Test Entrance Criteria 13](#_Toc5697150)

[9 Pass / Fail Exit Criteria 13](#_Toc5697151)

[10 Suspension Criteria and Resumption Requirements 13](#_Toc5697152)

[10.1 Suspension Criteria 14](#_Toc5697153)

[10.2 Resumption requirements 14](#_Toc5697154)

[11 Test Deliverables 14](#_Toc5697155)

[12 Test Preparation 15](#_Toc5697156)

[12.1 Responsibilities 15](#_Toc5697157)

[12.2 Staffing Requirements 16](#_Toc5697158)

[12.3 Training Requirements 17](#_Toc5697159)

[12.4 Environmental/Equipment Needs 17](#_Toc5697160)

[12.5 Tool Needs 18](#_Toc5697161)

[12.6 Test Facility Needs 18](#_Toc5697162)

[12.7 Security Needs 19](#_Toc5697163)

[13 Schedule 19](#_Toc5697164)

[13.1 Software testing schedule 19](#_Toc5697165)

[14 Risks and Contingencies 20](#_Toc5697166)

# Introduction

## Objectives

This Verification Test Plan defines the need for a systematic method*,* and the high level product verification activities that will be completed to ensure that Puma MR3 will meet the expected quality, regulatory, safety and customer goals when released for customer availability.

This plan will define the scope, approach, resources and schedule for the planned testing activities. The responsibility for and location of, the lower level test plans and reports are detailed in the sections below.

Software testing will be detailed in section 3.1/4.3 /13.1

Software reliability testing will be detailed in section 4.3.6

Hardware verification, Hardware reliability, IT and RMS testing is not applicable for Puma MR3 system.

## Background

MR3 is released as the Third Maintenance Release of Puma which scope is shown as below:

* Support new installation solution with DB SQL 2016 on Server 2016
* Database performance improvement
* MR3 upgrade package for legacy site
* Address enhancements from sites and defects which have been identified as must-be-fixed in this release by DRC.
* Merge payment feature & MR2 hotfixes change

For details on these defects/enhancements to be fixed, please see Section 5, Defects Resolved. All changes can refer to PS Release notes R1156521.

Upon successful QA test completion, this release will be issued as a general release for all supported 3rd party info system.

The upgrade solution is list below:

* Upgrade Puma MR2HF3 (3.0.4.3.3103) to Puma MR3 (On Win Server 2008 64bit OS)

The release include new installation package and upgrade package and will be made available to all existing Puma MR2 customers.

**The following product offerings will be available:**

| # | Product Offering | Components |
| --- | --- | --- |
| 1 | Print Server upgrade scenario | SQL Server 2008 |
| 2 | Print Server new installation scenario | SQL Server 2016 |
| 3 | Terminal (software and hardware) | Windows 7&Windows 10 |

## Scope

This Quality Test Plan describes the Verification activities in the Current Product Engineering process to establish that the MR3 release of Carestream Puma System, meets the product requirements.

The Quality Engineering group will work closely with the Development Engineering group, Core Team and DRC to understand the functionality and communicate any defects found. Additionally QE will work with Service Engineering to communicate findings with any user or service documentation.

This document is the master Verification plan for the Puma MR3 product. This release (PS ECN016796) will support K2/K3/E1 Terminal and K2/K3 terminal combined with color printer, print server.

Quality Test Plan

Software Verification

(Shanghai QE)

SW Performance Test

Test Procedures

Test Results

SW Functional Test

SW Reliability Test

Hardware Verification (No Activity)

Test Summary Report

IT (No Activity)

RMS

(No Activity)

Diagram 1.3 Verification activities by Function

Verification testing will only be covered by the Shanghai Kiosk QE groups and responsible for the listed testing:

|  |  |  |
| --- | --- | --- |
| **Group** | **Location** | **Detail Activities** |
| Kiosk QA Team | Shanghai R&D | Test Procedure |
| Software Verification (New Features and legacy features) |
| Software Performance Test |
| Software Reliability Test |
| Software Test Log, Test Summary Report |
| Review User / Service Documentation |

Table 1.3 Responsibility

## Product Configurations

Supported Configurations:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Product | **PS OS** | **PS DB** | **E1 Terminal OS** | **K2/K3 Terminal OS** | **K2/K3 Terminal OS** | **Terminal Software** |
| **Puma MR3 upgraded from Puma MR2HF3** | Windows Server 2008 | SQL Server 2008R2 SP3 | Windows 10 | Embedded Windows 7sp1 | Window 10 | * Puma terminal software TSMR4HF1(B350x) * Puma terminal software TSMR2HF2(B2902) * K2UI |
| **Puma MR3 new installation** | Windows Server 2016 Standard | SQL Server 2016 SP2 | Windows 10 | Embedded Windows 7sp1 | Window 10 | * Puma terminal software TSMR4HF1(B350x) * Puma terminal software TSMR2HF2(B2902) * K2UI |

## References

| Part # | Revision # | Document Name |
| --- | --- | --- |
| SOP-000085 | B | Glossary |
| SOP-000051 | B | Software, Firmware, Hardware Release Criteria |
| SOP-000055 | A | Problem Severity Criteria Procedure |
| SOP-000084 | B | Defect Tracking Procedure |
| WI-000043 | A | Standard Test Methods for Packaging, Transportation, and Storage |
| AE4743 | G | Design Input Document(PRS)-PUMA |
| R1156521 | A | Carestream\_KIOSK Puma MR3\_Software Release Notes |

## Definitions and Acronyms

| Acronym | Meaning |
| --- | --- |
| DRC | Defect Review Committee |
| PRS | Product Requirement Specification |
| CRD | Customer Requirement Document |
| TPM | Technical Project Manager |
| HW | Hardware |
| QA | Quality Assurance |
| QE | Quality Engineering |
| SOP | Standard Operating Procedure |
| SW | Software |
| HW | Hardware |
| CPE | Current Product Engineering |
| OS | Operation System |
| DB | Data Base system |
| BVT | Build Verification Test |
| PS | Print Server  The portion of the kiosk system that manages all of the data interaction between: Terminals, hospital 3rd-party systems |
| TS | Puma Terminal Software |
| K2/K3 Terminal | The kiosk device that the patient user directly interacts with for obtaining kiosk output (film, paper report). |
| E1 Terminal | The kiosk device that the patient user directly interacts with for obtaining paper report of different department |

# Features and Requirements

Puma MR3 product is an extension of the existing Kiosk product amount PS/CS/TS. This includes existing Print Server as the baseline and traditional K2/K3 terminal, and support new installation solution and enhancements to meet Puma requirements. The testing of Puma MR3 product will focus on the workflow, performance test, and those new features/enhancements involved. Also the legacy Kiosk method will be included in the testing.

The Test Matrix in chapter 3 shows which features/requirements and combinations of features/requirements will be tested during MR3 QA testing. Refer to the chapter 5.

# Verification Approach

## Software Verification for Shanghai Kiosk SQE Team

| Test Description | Design Verification  Phase 2 | Test Sections(s) |
| --- | --- | --- |
| Feature/Functional Testing | √ | 4.3.1 |
| Software integration Testing | √ | 4.3.2 |
| Performance Testing | √ | 4.3.3 |
| Reliability Testing | √ | 4.3.6 |
| Regression Testing | √ | 4.3.4 |
| Acceptance Testing /Smoke Testing | √ | 4.3.5 |
| Human Factors / Usability | √ | 4.3.7 |
| User / Service Documentation | √ | 4.2 |

# Detailed Approach

## Statistical methodology/sampling plans to be applied

No HW Reliability Demonstration procedure will be constructed for MR2.

SW PS is based on server work mechanism so that Defense Handbook for Reliability Test Methods MIL-STD-781D is not applicable for PS reliability testing. As an internet product, we plan the system can support 7\*24 work stress. Detail info refers to 4.3.6.

## User/Service Documentation Test Descriptions

The following service documents will be verified by the Kiosk QE Team via internal quality testing. These documents must be approved in PIL.

* Terminal User manual for Puma MR3
* Print Server User Manual for Puma MR3
* Service Manual for Puma MR3

## Software / Firmware Test Descriptions

Shanghai R&D Kiosk QE team will focus on the features claimed in existing Kiosk product requirement specification and new features for Puma MR3.

Puma Software:

Puma Print Server/Puma Terminal software

Third-party/off the shelf software:

RIS system /PACS system

Equipment:

E1 and K2/K3 terminals with color printer are used in Shanghai R&D for software verification testing.

### Feature / Functional Testing

Feature / Functional Testing will be performed in each drop focus on the newly supported features combined with regression testing for bug fixing.

| Software Test Module Description | Design Verification | Notes: |
| --- | --- | --- |
| Software Installation | **√** | * PS new installation package on Win server 2016 * PS upgrade package * Terminal installation package. |
| Upgrade | **√** | Run regression test on below upgrade environments   * Upgrade Puma MR2HF3 (3.0.4.3.3203), to Puma MR3 (On Win Server 2008 64bit OS) |
| Alert Tool | **√** | Light Regression test on Win server 2016  Light Regression test on Win server 2008 |
| Auto Forward Rule | **√** | Light Regression test on Win server 2016  Light Regression test on Win server 2008 |
| Central printing | **√** | Light Regression test on Win server 2016  Light Regression test on Win server 2008 |
| E-film worklist | **√** | Light Regression test on Win server 2016  Light Regression test on Win server 2008 |
| E-Bulletin Config Tool | **√** | Light Regression test on Win server 2016  Light Regression test on Win server 2008 |
| Incomplete Task | **√** | Light Regression test on Win server 2016  Light Regression test on Win server 2008 |
| Integration free solution | **√** | Light Regression test on Win server 2016  Light Regression test on Win server 2008 |
| LRU | **√** | Light Regression test on Win server 2016  Light Regression test on Win server 2008 |
| Multi Report | **√** | Light Regression test on Win server 2016  Light Regression test on Win server 2008 |
| OCR | **√** | Light Regression test on Win server 2016  Light Regression test on Win server 2008 |
| Print Server | **√** | Light Regression test on Win server 2016  Light Regression test on Win server 2008 |
| PS Configuration | **√** | Light Regression test on Win server 2016  Light Regression test on Win server 2008 |
| PS monitor page | **√** | Light Regression test on Win server 2016  Light Regression test on Win server 2008 |
| PS Statistics Report | **√** | Light Regression test on Win server 2016  Light Regression test on Win server 2008 |
| Terminal | **√** | Light Regression test on Win server 2016  Light Regression test on Win server 2008 |
| User & Role Management | **√** | Light Regression test on Win server 2016  Light Regression test on Win server 2008 |
| Payment | **√** | Light Regression test on Win server 2016  Light Regression test on Win server 2008 |
| Documentation | **√** | User docs, service docs, installation and upgrade instructions. |

### Systems Integration Testing

According to the PRS, Puma will provide interfaces to integrate with the following systems:

RIS system/ PACS system

So Shanghai Kiosk SQE team will verify these interfaces with above systems to insure interface functions can work well.

Note: Dev team and QE team have develop some simulators for SQE to do the integration testing.

### Performance Testing

Kiosk SQE will parse the Performance Requirements of Puma MR3, and then design the Performance Test Case according to performance PRS for PS. And also run regression test for terminal performance.

Refer to software performance test plan for detail information.

### Regression Testing

The cases for system verification of Puma MR3 will be organized by functional module.

Before the beginning of each drop of Regression Testing, QE will firstly review the internal release notes from Developers, to decide the scope of that drop. Regression testing of each functional module should at least cover:

* New or updated or changed features
* Features related with resolved defects
* And verified features, which will be mostly influenced by defect resolving

For the round of testing, which only covers above items, we call it as light regression testing.

A full regression testing of one module means that all test cases which cover PRS should be performed in that round. This happens when all the major features of the module are ready for testing, or when there are significant changes on existing features.

### Critical Tests

The Critical Test scope is determined based on the new feature and change requirement mentioned in PHRMP\_Puma\_AE4741.doc that it is in PLI.

### Acceptance / Smoke Testing

Kiosk SQE team will work together with developer team to perform the Smoke Testing, which will cover the basic workflow and functional points of Puma MR3. Once the new build from developer passes the Smoke Testing, QE will accept the build and begin the formal testing on it.

### System / Reliability Testing

In automation test, the typical workflow of Print Server combined with color printer will be invoked repeatedly, to check if PS reliability is acceptable or not.

Refer to Software Reliability Test plan for detail information.

### Human Factors/Usability Testing

N End user behavior will be simulated in such testing; this can be done via UI verification test in lab.

### DICOM and Connectivity to OEM Devices Testing

Such tests will be included in functional testing, according to the items listed in DICOM Conformance Statement\_AE4757.

## Hardware Test Descriptions

No applicable. Puma MR3 only release software.

## BVT Test

Kiosk QE team will work together with Developer Team to do BVT test which will cover the basic workflow and functional points before internal release of each drop. Only when the new build from developer passing the testing, QE will accept the build and begin the formal testing.

## Application Test

The application test will be conducted along with the typical workflow testing that combined with different features used in daily work.

## Installation Test

The installation test will be conducted along with the functional and regression testing.

## Service Tools Test

Not applicable. There is no separate tool released along with the Puma MR3 product. Most of the service features are included in the main application that will be conducted along with the regression testing.

## Automation Testing

Kiosk SQE will develop and update the scripts which used on the Reliability Testing for Print Server, and the reliability testing will be conducted on prepared PCs by automation to meet the requirement.

## Ad Hoc Test

Not applicable. Ad Hoc test will be done based on resolved defects by development team before new sprint is released.

## Error Handling and Reporting

The error handling and reporting of the Puma MR3 product will be checked during functional testing, which includes error handling for exceptional cases, and system logging for each kind of error.

## Compatibility Test

The dashboard of Puma will be tested on different IE versions, based on requirements.

## Stress Test

Stress test will be included as part of the performance testing.

## Serviceability

Testing will be focused on the ability for service to install, configure, and monitor modules during functional testing.

# Defects/Enhancement Resolved

The postponed defects which remaining on Puma MR2HF3 must-to-be fixed on Puma MR3 will be reviewed by DRC. The following list shows which defects and enhancement will be resolved and verified. For the detail defect info please refer to the PIL defect tracking database for additional details.

The defect list refers to the attachment.

# Product Features Not to Be Tested

## Software:

Puma will provide interfaces to integrate with the following RIS/HIS/LIS/PACS etc. Since there is no real 3rd party system in lab Kiosk SQE team will only verify these interfaces with above systems to insure interface functions can work well. Integration test for different integration solution should be handled by integration team at site.

## Hardware:

Not applicable; Puma MR3 only release software product.

# Defect Management

The product/project defects and issues will be documented in a defect tracking database PLI. Defects / issues are dispositional by the Defect Review Committee (DRC) at weekly DRC meetings. Each defect / issue is assigned and communicated to an appropriate engineer for impact analysis and then correction. Defects / issues are reviewed and tracked until resolved and verified or postponed. Postponed defects will be reviewed in future projects.

For further defect management process details, refer to the Site’s Configuration Management Plan and the Defect Tracking Procedure- SOP-000084. For details on using PLI to track and report on defects / issues in PLI, refer to the appropriate PLI User Guide in the Training Modules section of the SOP Library.

# Test Entrance Criteria

Following is a list of criteria required before QA can begin testing a delivery from design during phase 2 or phase 3:

* An e-mail communication to the project team has been sent regarding the availability of an Engineering Tested version of QA test software and QA Readiness.
* Software Installation Instructions are delivered to QA at the time the software QA test software is provided.
* Internal Release Notes are written in compliance with the *Internal Release Notes Template -SOP-000311* and delivered to QA at the time that the test software is provided.
* All known problems are classified within the Release Notes according to the *Problem Severity Criteria* SOP - SOP-000055.

# Pass / Fail Exit Criteria

**Following is a list of criteria required to exit from verification testing and to be ready for product launch/release:**

* Testing is completed and the Core Team has reviewed results.

Testing is repeated as necessary to accommodate design changes.

* All known problems are classified, evaluated and resolved, in accordance with the *Problem Severity Criteria* SOP-SOP-000055.
* The final Test Summary Report has been approved and released.
* Verified product is delivered to manufacturing according to the build and release procedure for the applicable product, in accordance with *Software/Firmware/Hardware Release Criteria* = SOP-000051 . (See section 5.2 of SOP-000051)

# Suspension Criteria and Resumption Requirements

## Suspension Criteria

If a problem makes it impossible to perform meaningful testing or creates a safety hazard, testing will be suspended. If any major component of the product becomes inoperative with no other work around available, testing will be suspended.

## Resumption requirements

Testing will resume when the problem has been corrected. The fix for the problem will be analyzed to determine if all or some of the already completed tests should be re-run. The norm is that all tests will be re-run unless there is compelling evidence that the fix could not affect the functionality that was already tested.

# Test Deliverables

Test Cases include manual procedures and automated test scripts. Each automated test script will have a corresponding manual procedure. Test Cases will be identified in accordance with HI-ACT Test Automation Standards.

Because software and hardware continue to evolve/change over the life of a product, test procedures are considered living documents constantly being modified based on these changes. To improve the efficiency of test procedure approvals between QA releases, the lead Quality Engineer has the authority to approve minor test procedure changes in the project’s document repository (e.g. Document Manager). Because Document Manager requires a minimum of 2 signatures, the second approver may be the person making the change or another Quality Engineer. Minor changes include:

* Correction of test steps
* Clarification of test steps
* Formatting modifications

Any major changes to test procedures will follow the formal approval process as documented in the project’s DDP. Major changes include:

1. Addition or removal of PRS requirements
2. Addition of Test cases that address defects
3. Addition of New feature test cases or test cases that have not been through the formal approval process
4. Removal of obsolete test cases
5. Reorganization of test cases within a test procedure

Additionally, all test procedures must be approved following the formal approval process prior to the product’s release during the project’s commercialization.

Problem Reports will be written as necessary throughout the testing process. The Requirements Traceability Matrix traces test cases back to the product requirements. The Test Summary Report, written upon completion of the testing, describes what was tested and when it was tested, and characterizes the defects found during testing.

Defects / Issues will be tracked as described in Section 5. Test records will be maintained in accordance with the document control plan defined in the project DDP.

The Shanghai Kiosk SQE Team members will generate the following documents:

| Part # | Test Deliverable | Location |
| --- | --- | --- |
| AJ5751 | Test Plan (this document) | PLI\MyVue Center\ Design Output \ Verification Test Plan \ |
| AE7191  AE7192  AE7193  AE7194  AG7039  AE7195  AE7197  AE7200  AE7202  AE7196  AE7203  AE7204  AE7205  AE7206  AE7207  AE7208  AE7209  AE7210  AE4753  AJ5762 | Auto Forward  Central Printing  E-film worklist  E-Bulletin Config Tool  Documentation  Incomplete Task  Integration free solution  LRU  Multi Report  Alert Notification Tool  OCR  Performance  Print Server  PS Configuration  PS Statistics Report  Terminal  User & Role Management  Puma\_Upgrade  PS Monitor Page  Payment | PLI\MyVue Center\Design Output \ Verification Test Procedure-Cases \ |
| AJ5849 | Puma MR3\_Verification Test Summary Report | PLI\MyVue Center\Design verification&validation \ Verification Test Summary Report |
| AJ1547  AJ5850  AJ5852  AJ5853 | Puma MR3 Verification Test Logs Drop32  Puma MR3 Verification Test Logs Drop33  Puma MR3 Verification Test Logs Drop34  Puma MR3 Verification Test Logs Drop35 | PLI\MyVue Center\ Design verification&validation \ Verification Test Log \ |

# Test Preparation

## Responsibilities

**The Shanghai R&D Kiosk QE Group is responsible for:**

* Working closely with design and assisting, where possible, in making this product meet and/or exceed the established goals of the program.
* Assisting design as necessary in tests that facilitate any design of experiments or reliability analyses.
* QE team leader will draft the schedule for the items listed below and corresponding staff that is responsible for each specific item.
* Test Cases/Test Procedures must be ready before the system level verification begins. Here ‘Ready’ means the Test Cases/Procedures have been reviewed and approved by related person in Core Team. Any major updates on Test Cases/Procedures according to the software design changes should also be reviewed and approved by above persons.
* Performing strict configuration control of all test units.
* Issuing Testing Status Reports and other interim test data and reports to project leadership and other involved functions for immediate follow-up.
* Test results for each drop of regression test will be created and submitted for core team review after the drop is finished.
* Entering all problems found during testing in the Defect Tracking Database.
* Conducting regular corrective action meetings to address these problems.
* Completing all required QA documentation.
* Providing input to and reviews of non-QA documentation as necessary, including the Customer Publications, and Service Publications.

**The Shanghai R&D Puma Development Group is responsible for:**

* Performing engineering testing on all components prior to delivery to QA.
* Reviewing test deliverables (e.g., test plan, test procedures, test logs, test summary reports).
* Reviewing and correcting defects identified by QA.
* Creating and delivering software releases, including corresponding engineering release notes

**The Puma Systems Project Team is responsible for:**

* Participating in the development of the Puma MR2 Verification and Validation plans and reports.
* Reviewing test deliverables (e.g., test plan, test procedures, test summary reports).
* Reviewing and correcting defects identified by QA.

## Staffing Requirements

The table below identifies the QA staffing plans for this program:

| Name | ORG | Role Technician/Engineer | Testing Type | Skill Set Needed | Phase Needed |
| --- | --- | --- | --- | --- | --- |
| Yunfei Zhu | Shanghai R&D | Quality Leader | Quality Planning and Reporting  SW Functional test(case design and execution) | Quality Engineering | 4 |
| Hao Wang | Shanghai R&D | Quality Engineer | Software reliability/performance Planning and Reporting  SW reliability/performance test(script development and execution) | Quality Engineering | 4 |
| SQEs | Shanghai R&D | Quality Engineer | SW Functional test(case design and execution) | Quality Engineering | 4 |

## Training Requirements

Experience or knowledge with following aspects should be required for Puma SW QA before formal testing; they can be conducted via formal or informal training:

* Experience with current Kiosk product
* Knowledge of DICOM tags
* Knowledge of DICOM Storage , DICOM Query/Retrieve and DICOM Print
* Knowledge of Presentation State and Look Up Table
* Knowledge of HL7 (ADT messages, ORM message, ORU message)

## Environmental/Equipment Needs

The following equipment is needed to establish the testing environment and to perform the testing tasks:

| Qty  HW | Qty SW | Environmental/Equipment Needs | Phase Needed | Comments |
| --- | --- | --- | --- | --- |
| 5 |  | PC | 4 | Five PC already available in Shanghai Lab |
| 1 |  | Network switch | 4 | Already available in Shanghai Lab |
| 5 |  | LCD Monitor | 4 | Five are already available in Shanghai Lab |
| 2 |  | E1 Terminal | 4 | Already available in Shanghai for SW verification |
| 2 |  | K2 Terminal | 4 | Already available in Shanghai for SW verification |
| 2 |  | K3 Terminal | 4 | Already available in Shanghai for SW verification |
| 1 |  | HP Color LaserJet Pro CP5225n | 4 | Already available in Shanghai for SW verification |
| 1 |  | HP Color LaserJet Enterprise M855 | 4 | Already available in Shanghai for SW verification |
|  | 4 | Windows Server 2008 Standard for PS upgrade | 4 | Already available in Shanghai Lab |
|  | 4 | Windows Server 2016 Standard for PS new installation | 4 | Already available in Shanghai Lab |
|  | 4 | Windows 10 | 4 | Two are installed in E1 terminal, one is installed in K2 terminal, and the other is installed in K3 terminal.  All are available in Shanghai R&D. |

## Tool Needs

The following hardware/software tools are needed to establish the testing environment and to perform the testing tasks:

| Qty  HW | Qty SW | Environmental/Equipment Needs | Phase Needed | Comments | Need Validation? |
| --- | --- | --- | --- | --- | --- |
|  | 1 | DCMTool v0.7 | 4 | Simulating SSCU | No |
|  | 1 | QTP | 4 | Editing and running scripts,  For Reliability | No |
|  | 1 | CS Broker 2.1 (GC Gateway 2.1) | 4 | Simulating MWL\_SCP | No |
|  | 1 | Microsoft SQL Server Management Studio | 4 | Create, edit and run SQL scripts | No |
|  | 1 | Ultra VNC1.0.5 | 4 | For remotely connecting with the system. | No |
|  | 2 | LoadRunner V12.0 | 4 | Trial version, used for performance test | No |
|  | 2 | SoapUI 5.0.0 | 4 | Open source API testing tool for SOAP APIs offers SOAP Web Services functional testing | No |

## Test Facility Needs

The following facilities are needed to establish the testing environment and to perform the testing tasks:

| Location | Lab Needs | Phase Needed | Comments |
| --- | --- | --- | --- |
| Shanghai | Kiosk Lab | 2/3 | For Puma SW testing |

**Note:** All available safety guidelines must be posted in each HG lab used for product testing.

## Security Needs

No special security requirements and restrictions for staff, facilities and deliverables.

# Schedule

Up to date development release plans and project schedule shall be maintained by the project TPM and reviewed weekly.

## Software testing schedule

Below is current test schedule for reference, which might be updated according actual release.

| Testing Milestone | Target Date | Major Testing Activities |
| --- | --- | --- |
| Drop 31 | 2019/08/01-2019/08/09 | * Informal regression test of legacy features on Win Server 2016. * Cases design for resolved enhancements/defects and update the old cases |
| Drop 32 | 2019/08/15-2019/08/27 | * Defect verification on Win Server 2016 * **Functional testing on the new enhancements** on Win Server 2016 * Light regression for the cases which related with fixed defects on Win Server 2016 * Core case testing of legacy Kiosk feature on Win Server 2016 |
| Drop 33 | 2019/09/02-2019/09/13 | * Update the cases accordingly * Defect verification on Win Server 2008 * Core case testing of legacy Kiosk feature on Win Server 2008 * **Upgrade Test for Win Server 2008** * **Performance test for PS** |
| Drop 34 | 2019/09/16-2019/09/30 | * Update the cases accordingly * Defect verification on both Win Server 2008 and Win Server 2016 * Core case testing of legacy Kiosk feature on Win Server 2008 * **Performance test for PS** * **Reliability test for PS** * **Upgrade Test for Win Server 2008** |
| Drop 35 | 2019/10/08-2019/10/18 | * Update the cases accordingly * Defect verification on both Win Server 2008 and Win Server 2016 * Light regression for the cases which related with fixed defects on both Win Server 2008 and Win Server 2016 * **Performance test for PS if necessary** * **Reliability test for PS if necessary** |
| Documentation |  | * Review for test summary report and submit for approval * Review service manual and user guide. |

**Estimated SW Drops:**

| Phase | # Of SW Releases | Frequency / Duration |
| --- | --- | --- |
| 4 | 5 drops | About 10 working days for each drop on average |

**Schedule Assumptions:**

* All test equipment is available when needed.
* Schedule includes one complete software test cycle(s) through the test cases.
* All hardware, firmware, and software releases are complete and available for installation in the test systems before QA testing begins.
* Software/Hardware development engineers participate in the review of test procedures.
* QA participates in the review of the Engineering Test Plan.
* There is an intermediate release to support Trade Trial sites.
* Requirements and Design Specifications are complete, accurate, and signed off prior to the completion of the first Test Procedure.
* The release to QA meets all test entrance criteria specified in Section 8, .
* Dedicated test resources are available to support the Puma Testing when needed.

# Risks and Contingencies

Following is a list of risks and associated mitigation strategies and contingency plans that affect the planning for or performing of testing activities. See the program Product Hazard Risk Management Plan and Report and the Project Risk Analysis for the complete lists of prioritized risks and their status.

| # | Critical Risk Description | Mitigation Strategy | Contingency Plan |
| --- | --- | --- | --- |
| 1 | * MR4 schedule maybe impact by Tux project because QA resource is shared. * For some unpredictable reasons, the related QE maybe absent. | Make sure the steps of test cases are detailed enough to be readable to a new team member | * 1. Confirm a backup QE   2. Work overtime at weekend. |
| 2 | * Since it will share resource from other Kiosk project, MR3 schedule maybe impacted by release of terminal payment. * Besides if there are any urgent issues or new features need be addressed or implemented from CPE site, currently Puma MR2 HF3 will impact MR2 schedule | Adjust test strategy and test scope of regression test.  Develop automation script for some stable features. | Adjust test schedule which maybe delay. |
| 3 | PS performance and reliability may meet some unexpected result which means test schedule may be delayed if performance and reliability is poor. | Deploy performance and reliability test for several drops. | Adjust test schedule which maybe delay. |

End of Document