

UNCLASSIFIED

Created: 29 March 2010
Last Modified: 8 August 2012
Document Revision 1.6

**Cherry Bomb:
Cherry Blossom Test Plan
For Cherry Blossom Version 5.0

(CDRL 13)
(U)**

Prepared for US Govt. by:
XXXXX Y

.

For contract:
2010*0529525*000

UNCLASSIFIED

Revisions

Version	Description of Version	Date Completed
1.0	Initial draft – derived from TestProcedures.doc	19 April 2010
1.1	Updated based on sponsor feedback.	7 September 2010
1.2	Added Test Procedure types and Corresponding Documents section and other minor updates based on sponsor feedback.	16 November 2010
1.3	Added System Validation and Verification Report and renumbered test procedure and V&V documents.	16 December 2010
1.4	Added CB v5.0 info	6 March 2012
1.5	Updated for Aug 13 FAT event	19 July 2012
1.6	Added “FAT Test FIELD”	8 August 2012

Table of Contents

1 INTRODUCTION.....4

2 TEST APPROACH.....6

3 SPECIFIC TEST PLANS.....11

1 Introduction

1.1 Purpose

This document describes system test plan for the Cherry Blossom project of the Cherry Bomb (CBomb) program. This document is referred to in the CBomb contract as CDRL 13.

This document discusses the system test plan for the Cherry Blossom component only – the system test plan for the Claymore component is contained in a separate document.

For more information, see the Cherry Bomb Quality Assurance Plan (CDRL 3).

1.2 Program Overview

The CBomb program (contract end 31 August 2012) is a follow-on to the Cherry Blossom project (contract ended 28 February 2010). CBomb encompasses the prior Cherry Blossom project work and specifically partitions Claymore work (which was started on the prior Cherry Blossom contract) into a separate project.

Figure 1 shows the CBomb program/project/product hierarchy.

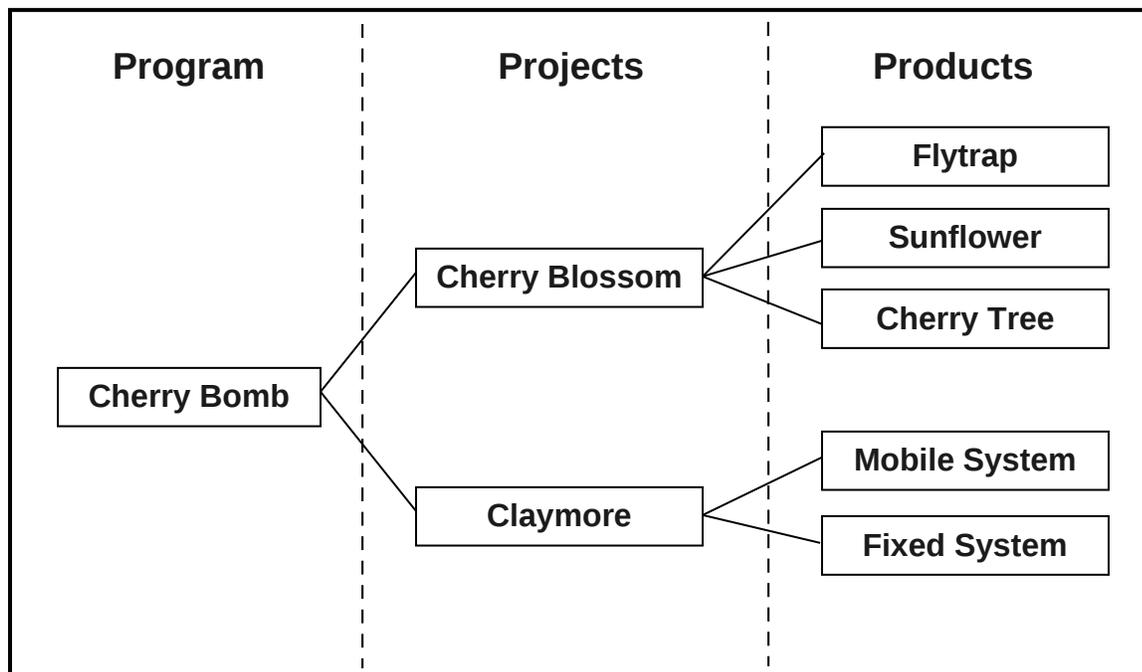


Figure 1: Cherry Bomb Product Hierarchy

The CBomb program consists of two major projects, Cherry Blossom (CBlossom) and Claymore. The CBlossom project has three major products, a frontend “Flytrap”, a

Cherry Bomb Program

Cherry Blossom Test Plan

“Sunflower” development kit, and a backend “Cherry Tree” server. Note that Sunflower is a joint effort with another contractor, referred to hereafter as the Sunflower Other Contractor (SOC). The Claymore project also has two major products, a “Mobile” system and a “Fixed” system.

1.3 Points of Contact

Points of contact for the CBomb project include:

- Justin – sponsor – COTR
- Karl S. – contractor – PM
- Matt R. – contractor – Lead Engineer

1.4 Applicable Documents

The following table shows related documents:

- Cherry Bomb Contract
- Cherry Bomb Statement of Work
- Cherry Bomb Quality Assurance Plan (CDRL 3)
- Cherry Bomb: Cherry Blossom User’s Manual (CDRL 12)
- Cherry Blossom System Verification and Validation Report (CDRL 15)
- Cherry Blossom FAT Procedures (CDRL 14a) [and FAT Procedures FIELD]
- Cherry Blossom FAT Verification and Validation Report (CDRL 15a)
- Cherry Blossom Cherry Tree Upgrade Test Procedures (CDRL 14b)
- Cherry Blossom Cherry Tree Upgrade Verification and Validation Report (CDRL 15b)
- Cherry Blossom Internal Test Procedures (CDRL 14c)
- Cherry Blossom Internal Verification and Validation Report (CDRL 15c)

2 Test Approach

This section discusses the test approach for products of the Cherry Blossom project of the Cherry Bomb program. The different test procedures (and corresponding test documents) are discussed, and then the test approach for each Cherry Blossom product is discussed. Note that specific test plans for particular Cherry Blossom releases (for example, release version 5.0) are discussed in section 3.

2.1 Test Procedure Types and Corresponding Documents

The Cherry Blossom project has three different test procedure types:

1. **FAT** – Test procedures for the Factory Acceptance Test (FAT). The FAT is the most critical of the test procedures because it is the final test of the end-to-end production system in a real-world environment. The FAT exercises all major Cherry Blossom features over all components of the production system, including Flytrap (or Sunflower), Cherry Tree, and the supporting sponsor network infrastructure. The FAT also focuses on testing system features and components that cannot be exactly reproduced in the contractor’s internal test environment (for example, communications that must traverse the supporting sponsor network infrastructure). The FAT is done in conjunction with sponsor IV&V personnel.
2. **Cherry Tree Upgrade** – Test procedures performed when a production Cherry Tree server is upgraded.
3. **Internal** – Test procedures performed by the contractor on the contractor’s internal test environment prior to a FAT and/or Cherry Tree Upgrade. The Cherry Blossom system has a huge range of parameters and features which cannot be FAT tested in a timely fashion. Many of the parameters and features can be exactly reproduced in the contractor’s internal test environment (i.e., there is no difference between the “real-world” environment of the FAT and the internal test environment) -- the Internal test procedures cover these fine-grained parameters and features. To reduce the likelihood of test failures during the FAT, the Internal test procedures also cover all major features tested in the FAT.

Each test procedure type has a corresponding “test procedures” document and “validation and verification (V&V)” document. The “test procedures” document includes a detailed discussion of all tests to be performed. The “V&V” document records the results of performing each of the tests in the “test procedures” document. The following table lists test document information for each test procedure type:

Test Procedure Type	Test Procedures Document Name	Test Procedures CDRL	V&V Document Name	V&V CDRL
FAT	CherryBomb_CherryBlossom_FAT_Procedures_CDRL-14a.doc	14a	CherryBomb_CherryBlossom_FAT_VAndVReport_CDRL-15a.doc	15a
Cherry Tree Upgrade	CherryBomb_CherryBlossom_CherryTreeUpgrade_TestProcedures_CDRL-14b.doc	14b	CherryBomb_CherryBlossom_CherryTreeUpgrade_VAndVReport_CDRL-15b.doc	15b
Internal	CherryBomb_CherryBlossom_Internal_TestProcedures_CDRL-14c.doc	14c	CherryBomb_CherryBlossom_Internal_VAndVReport_CDRL-15c.doc	15c

Note that there is also a “CherryBomb_CherryBlossom_FAT_Procedures_FIELD.doc” that is now used by the testers at the non-attributable site.

2.2 System Verification and Validation Report

Once all of the test procedures of section 2.1 have been performed, the “Cherry Blossom System Verification and Validation Report (CDRL 15)” is created. This document summarizes all of the test activities, and details any issues found during the test procedures.

2.3 Flytrap Product

This section discusses the generalized test approach for the Flytrap product. The Flytrap product has four release types:

- Firmware: Production Test (aka Production Test Firmware)**
 Firmware suitable for IV&V/FAT and installation on sponsor test Flytraps. Firmware typically configured for short initial beacon (IB) and telnet daemon. IB to production system.
- Firmware: Production Release (aka Production Release Firmware)**
 Firmware suitable for fielding or obfuscation analysis. Firmware typically configured for longer IB, no debug info, and no telnet daemon. IB to production system.
- Wireless Upgrade Package: Production Test**

(aka Production Test Wireless Upgrade Package)

Wireless upgrade package with firmware suitable for IV&V/FAT and installation on sponsor test Flytraps. Firmware typically configured for short IB and telnet daemon. IB to production system.

- **Wireless Upgrade Package: Production Release**

(aka Production Release Wireless Upgrade Package)

Wireless upgrade package with firmware suitable for fielding. Firmware typically configured for longer IB, no debug info, and no telnet daemon. IB to production system.

The contractor first prepares a Production Test Firmware or Production Test Wireless Upgrade Package. Next, the contractor performs the “Internal” test procedures (see) of all relevant sections (Unit Tests, Automated System Tests, Flytrap Tests, Extended/Periodic Time Tests, and Upgrade Tests) of the Cherry Blossom Internal Test Procedures (CDRL 14c). Test results are tabulated in the Cherry Blossom Internal Verification And Validation Report (CDRL 15c).

Once all “Internal” test procedures have passed, the contractor delivers the Production Test Firmware/Wireless Upgrade Package and also, if requested by the sponsor, delivers a representative Production Release Firmware/Wireless Upgrade Package suitable for sponsor obfuscation analysis. At this point, the Production Test Firmware/Wireless Upgrade Package is ready for IV&V/FAT. It should be noted that under Cherry Blossom, IV&V and FAT are a conjoint event – i.e., sponsor IV&V personnel participate in/observe the FAT.

To perform the IV&V/FAT, test procedures in the Cherry Blossom FAT Procedures (CDRL 14a) are followed. Test results are tabulated in the Cherry Blossom FAT Verification And Validation Report (CDRL 15a).

If the release passes IV&V/FAT, the contractor marks this Subversion revision as ready for fielding. This means that at any time, the sponsor can request a “Firmware: Production Release” or “Wireless Upgrade Package: Production Release” built from this revision. The sponsor will indicate release parameters [as described in the Cherry Blossom User’s Manual (CDRL 12), e.g., IB time] to build into the firmware/package. The contractor builds the firmware/package, and then runs Flytrap Upgrade Tests from the Cherry Blossom Internal Test Procedures (CDRL 14c). [Note that because this firmware/package is built from a revision that has undergone full IV&V/FAT, and only the release parameters (specified by the sponsor) are different, only Flytrap Upgrade Tests are necessary]. The contractor delivers the firmware/package, and the sponsor/customer can perform whatever range of tests they deem necessary before fielding.

2.4 Sunflower Product

This section discusses the test approach for the Sunflower product.

The contractor first prepares a Sunflower SDK based on a “stable” subversion revision. In this case, stable means that the Sunflower product has passed all tests in all relevant sections (Unit Tests, Automated System Tests, Flytrap Tests, Extended/Periodic Time Tests, and Upgrade Tests) of the Cherry Blossom Internal Test Procedures (CDRL 14c). Test results are tabulated in the Cherry Blossom Internal Verification And Validation Report (CDRL 15c).

The contractor delivers the Sunflower SDK to the Sunflower Other Contractor (SOC). The SOC coordinates and runs the IV&V/FAT of Sunflower release.

2.5 Cherry Tree Product

This section discusses the test approach for the Cherry Tree product.

The contractor first prepares a CherryTree release. Next, the contractor performs the “Internal” test procedures (see 2.1) of all relevant sections (Unit Tests, Automated System Tests, Cherry Tree Tests, and Extended/Periodic Time Tests) of the Cherry Blossom Internal Test Procedures (CDRL 14c). Test results are tabulated in the Cherry Blossom Internal Verification And Validation Report (CDRL 15c). The contractor also verifies that the Cherry Tree has passed all relevant tests from the Cherry Blossom Cherry Tree Upgrade Test Procedures (CDRL 14b) in the contractor’s internal test environment. Test results are tabulated in the Cherry Blossom Internal Verification And Validation Report (CDRL 15b). Finally, the contractor verifies that any previously released (i.e., different revision) Flytraps pass all relevant Flytrap Tests from the Cherry Blossom Internal Test Procedures (CDRL 14c) against the Cherry Tree server. Test results are tabulated in the Cherry Blossom Internal Verification And Validation Report (CDRL 15c).

Once all “Internal” test procedures have passed, the contractor delivers the Cherry Tree release to the sponsor, and the sponsor coordinates a time for the Cherry Tree upgrade and IV&V/FAT. It should be noted that under Cherry Blossom, IV&V and FAT are a conjoint event – i.e., sponsor IV&V personnel participate in/observe the FAT.

At the IV&V/FAT event, the contractor upgrades the **backup** Cherry Tree server (to minimize production system down time) and then runs (in conjunction with IV&V personnel) tests from the Cherry Blossom Cherry Tree Upgrade Test Procedures (CDRL 14b). Test results are tabulated in the Cherry Blossom Cherry Tree Upgrade Verification And Validation Report (CDRL 15b).

If Cherry Tree Upgrade tests fail, the server is used to diagnose and correct the issue – if the problem cannot be resolved quickly, the server is restored to its prior version.

UNCLASSIFIED

Cherry Bomb Program

Cherry Blossom Test Plan

If Cherry Tree Upgrade tests pass, the contractor (in conjunction with IV&V personnel) then runs the Cherry Blossom FAT Procedures (CDRL 14a) against the Cherry Tree server. Test results are tabulated in the Cherry Blossom FAT Verification And Validation Report (CDRL 15a).

If FAT tests fail, the server is used to diagnose and correct the issue – if the problem cannot be resolved quickly, the server is restored to its prior version.

If FAT tests pass, the contractor performs the same procedures (upgrade, Cherry Tree Upgrade tests, FAT tests) on the **primary** Cherry Tree production server.

3 Specific Test Plans

This section discusses test plans for specific Cherry Blossom release versions. Any information not generic enough to be included in the Test Approach of section 2 is included in this section.

3.1 Cherry Blossom Version 5.0

This section discusses the specific test plan for the Cherry Blossom Version 5.0 release. The IV&V/FAT for the version 5.0 release will test the following Cherry Blossom products:

- Production Test Firmwares/Wireless Upgrade Packages (Version 5.0) for the Linksys WRT54GL v1.1 firmware 4.30.11 ETSI
- Cherry Tree Production Release (Version 5.0)

3.1.1 Schedule

This section lists the schedule of events related to the Cherry Blossom Version 5.0 release.

- TRR – 2 August 2012
- FAT/IV&V – 13-17 August 2012

3.1.2 Test Prerequisites

The following are TRR prerequisites:

- Completion of Internal test procedures for Cherry Tree (Version 5.0) and Firmware/Wireless Upgrade Package (Version 5.0) for the Linksys WRT54GL v1.1 firmware 4.30.11 ETSI
- Completion of Cherry Blossom Version 5.0 Release Package Binder
- Approved non-attributable test site (see 3.1.3)
- Approved FAT/IV&V personnel (see 3.1.3)

The following are FAT/IV&V prerequisites:

- Successful TRR

3.1.3 FAT/IV&V Approach and Tentative FAT/IV&V Agenda

This section outlines the test approach and presents a tentative FAT agenda.

First, the backup CB Production Server will be upgraded with the Cherry Tree Production Release (Version 5.0). The test procedures in Cherry Blossom Cherry Tree Upgrade Test Procedures (CDRL 14b) will be completed on the backup, tabulating results in the Cherry Blossom Cherry Tree Upgrade Verification And Validation Report (CDRL 15b). Then, the primary CB Production Server will be upgraded and tested following the same procedures.

Cherry Bomb Program

Cherry Blossom Test Plan

Next, the Cherry Blossom FAT Procedures (CDRL 14a) will be run against the Linksys WRT54GL v1.1 firmware 4.30.11 ETSI, and tabulated in the Cherry Blossom FAT Verification And Validation Report (CDRL 15a).

The time required for the FAT/IV&V is predicted to be 3 days:

- 1 day to upgrade the production Cherry Tree servers (primary and backup) and complete Cherry Tree Upgrade test procedures (CDRL 14b)
- 1 day to complete the FAT test procedures (CDRL 14a)
- 1 day for troubleshooting if required

The tentative FAT schedule is as follows:

Monday August 13:

- Contractor personnel travel day

Tuesday August 14:

- Meeting at sponsor site with all involved parties
- Production Cherry Tree server upgrade and upgrade tests

Wednesday August 15:

- FAT procedures for Linksys WRT54GL v1.1 firmware 4.30.11 ETSI

Thursday August 16:

- Troubleshooting if required
- Cleanup
- Post-FAT/IV&V meeting

Friday August 17:

- Contractor personnel travel day

3.1.4 Test Environment

This section outlines the test environment for the FAT/IV&V.

3.1.4.1 Location

The acceptance tests will require contractor and IV&V personnel at two locations:

- Sponsor facility (for Cherry Tree operations/command & control)
- Non-attributable site (for Flytrap operations)

The suggested non-attributable site is the Wingate, Chantilly.

3.1.4.2 Personnel

The personnel required for the FAT/IV&V event is described in the Cherry Blossom FAT Procedures (CDRL 14a).

3.1.4.3 Required Test Equipment

Required test equipment is the Cherry Blossom test kit, which includes the Linksys WRT54GL v1.1, a squid laptop, a target laptop, hub, and necessary cabling/power

supplies. The contractor will pre-ship a CB test kit prior to FAT. The sponsor has a test kit as well which can be used as a spare.

The following test procedure documents are also required:

- Cherry Blossom FAT Procedures (CDRL 14a) [and “FAT Procedures FIELD”]
- Cherry Blossom FAT Verification And Validation Report (CDRL 15a)
- Cherry Blossom Cherry Tree Upgrade Test Procedures (CDRL 14b)
- Cherry Blossom Cherry Tree Upgrade Test Procedures (CDRL 15b)

3.1.5 General Setup

The setup procedure is described in Cherry Blossom FAT Procedures (CDRL 14a). Note that the testers at the non-attributable site use the “FAT Procedures FIELD” document, while the testers at the sponsor site use the Cherry Blossom FAT Procedures (CDRL 14a).

3.1.6 General Cleanup

When the tests are completed, all hardware is powered-down/disconnected, and returned to the CB test kit.

3.1.7 System Verification and Validation Report

Immediately following the FAT/IV&V, the Cherry Blossom System Verification and Validation Report (CDRL 15) will be completed by the contractor and delivered to the sponsor (see 2.2).

3.1.8 Test Problems

Should problems arise during the FAT/IV&V, they will be categorized accordingly, with the following actions taken:

- **Configuration Problem** – A problem can be resolved with a configuration change which does not require a rebuild of software. This problem will be fixed by the contractor on site, allowing FAT/IV&V to continue.
- **Sponsor Network Problem** – A problem requires the configuration/modification of the sponsor network. This problem will be fixed by the sponsor (potentially with the help of the contractor) on site, allowing FAT/IV&V to continue. If the problem is severe and requires significant time, the COTR will advise.
- **Software Problem** – A problem cannot be resolved without a rebuild of software. The contractor will determine the schedule impact on the FAT/IV&V, and if the problem is severe and requires significant time, the COTR will advise.
- **Hardware Problem** – A piece of test hardware is faulty, and the problem cannot be resolved without new hardware. The sponsor has a spare CB test kit to mitigate this problem. If a spare is not available or also not operational, the contractor will determine the schedule impact on the FAT/IV&V, and if the problem is severe and requires significant time, the COTR will advise.