QA/Testing at OLPC

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Subjects to Discuss

- What's QA and what's testing - are they the same?
- System testing (vs. hardware, firmware or software testing)
- OLPC-related specifics of organizing test efforts - adopting open source development practice
- Test and release process and how to achieve test coverage - Requirements Traceability Matrix
- Test areas
- Test labs
- Test automation and test tool development
- Building test team
- Test procedures - template
- Testing XOs running other than Linux operating systems
- Today and tomorrow - short plans, long plans

What's QA and What's Testing - Are They the Same?

- Quality assurance - covers possible improvements to the project, *including* testing
  - Example: Improving design - are all necessary (for product use) features have been included in the design?
- Testing - verifies that designed features exist and have been executed according to project specs

System Testing (vs. Hardware, Firmware or Software Testing)

- We do system test - we see hardware, firmware and software bugs through software behavior
- Why not *pure* software test? - Because same software can behave differently while running on different configurations of hardware and firmware

OLPC-Related Specifics of Organizing Test Efforts - Adopting Open Source Development Practice

- Commercial company practice
  - Own (or outsourced under strict control) test team and test facilities
  - Test plan/procedures created by core QA team
  - Fully controlled test/development process
  - "Closed to prying eyes" bug reporting system
  - "Secret" development/release schedules
- OLPC-specific (proposed) practice - OLPC QA team + community testers + "far away" beta-testers
  - Main features (and some compatibility features) of every release should be tested internally as well as (maybe) verified by "community testers" †
  - Test plan/procedures for main features should be designed by OLPC QA team
  - Additional features (compatibility with external wired and wireless devices, activities created by community participants) can be tested by community testers as well as actual dedicated end-users †
  - Test plan/procedures for additional features may be designed by community testers or end-users with consultation provided by OLPC QA team

† **Due to limited resources, some features will be ad-hoc (exploratory) tested (with no formal test procedures designed)**

Test and Release Process

- Requirements traceability matrix - a KEY to achieve test coverage
- Schedule estimates
- Release engineering
  - Internal releases
  - Major (external) releases
  - Release notes - for internal (for test) and external (for field distribution) releases
  - Release criteria
- Defect tracking system - how do we use Trac, how should we use Trac?

Test Areas

- Hardware (robust behavior, ability to operate with user-oriented (touch-pad, keyboard,etc.) and external devices (mouse, etc.)
- Installation of Software (operating system, Sugar, activities) and firmware. Field upgrades

- Sugar GUI
- Datastore
- Activities
- Power management
- Collaboration/Connectivity
  - Between XOs
  - With access points
  - With school server
  - In mixed environment
- Security
- Performance/scalability

- To continue…

Test Areas

- Localization
- Keyboard layout / software correctness
- Correctness of language-specific icon-related text
- User documentation - inside XO and online (wiki) available
- Interoperability with non-XO machines (at file-compatibility and other (?) levels)

Test Automation and Test Tool Development

- Test automation
- Regression testing (smoke tests?) - applied to every “build in test” - may not be possible to automate - Tinderbox?
- Running multiple XOs from single “control center” (?)
- Test tool development/use
- GUI-driven tests - appropriate tools exist for Windows environment - Winrunner, Silk, etc. What about Linux environment? Thoughts to consider
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- Testing in radio-noise-quiet environment
- Alpha-test (simulation of customer-premises environments - “typical school”, “out of school”, etc.)
- Testing “far away” - beta-testing (in real “first-customer” environment)
- Test case and test results management

Test Labs

- Testing at 1CC
  - Testing non-radio-noise dependent features
- Testing at Davis Square facility
  - Testing in radio-noise-quiet environment
  - Alpha-test (simulation of customer-premises environments - “typical school”, “out of school”, etc.)
- Testing “far away” - beta-testing (in real “first-customer” environment)

Building Test Team

- Hiring - Who to Hire? How many? Budget?
- How to Get Team to Speed (Acquiring Technological Knowledge)
- How to use community testers and beta-testers

Test Procedures - Template

- **Number/Title:** #1. Making secured XO unsecured.
- **Objective:** Verify that secured XO can be made unsecured by obtaining developer key online.
- **Feature:** User can obtain developer key online and perform a procedure to switch a secured XO into an unsecured one according to XO's provided instructions.
- **Source:** http://wiki.laptop.org/go/Activation_and_Developer_Keys
- **Approach:** Act as an end-user following the instructions provided by XO.
- **Test Tools:** No test tools required.
- **Test Setup:** One secured XO laptop.
- To continue…

Test Procedures - Template

- **Test Procedure:**
- 1. Follow the XO's provided instructions to obtain and install developer key.
- 2. Reboot XO and check out whether it's now in the unsecured mode.
- **Expected Results & Pass Criteria:** Following the XO's instructed process, developer key can be obtained online and XO can be switched into an unsecured mode.
- **Comments:** None.

Testing XO running other than Linux operating systems

- TBD

Today and Tomorrow - Short Plans, Long Plans

- Today...
- Testing Build 708 as a back-up release candidate (8.1.1) for September G1G1 release
- Tomorrow...
- Testing builds towards 8.2.0 - if successful, will be release candidate for September G1G1 release
- When Davis Square facility is ready - building the “radio-quiet” test lab
- After tomorrow...
- Testing, testing, testing...