Tizen Application Validation

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Tizen Validation Team
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1. Introduction of Tizen Validation
Introduction to Tizen Validation

Purpose

- Enable Successful Business for Developers
- Provide Qualified Application for Users
Validation Criteria

- Validation team checks four criteria for acceptance in Tizen store.

To provide Proper Information before app purchase
To offer Enjoyable or Useful apps
To service Working App without stopping
To service Healthy Contents
2. Validation Process
Validation Process: 2 Phases

"WITHIN 3 DAYS"

Phase 1
Initial Inspection & Dynamic Analysis
Tizen Validation System

Phase 2
Content Review & Final Confirmation
Reviewers

App Submission

For Sale
Tizen Validation Process (Phase 1)

**Tizen Validation System**
- Consists of Three systems – Security Analysis, Test Automation, Configuration Mgmt.

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**Phase 1**
Initial Inspection & Dynamic Analysis

1. Request Test
2. Call Both Systems
3. Run Security Analysis
4. Send System Result
5. Report Result

**Phase 2**
Content Review & Final Confirmation

- Reviewers

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- **App Submission**
- **For Sale**
- [Tizen Store System]
- [Configuration Mgmt. System]
- [Security Analysis System]
- [Test Automation System]
Tizen Validation Process (Phase 1)

Security System

- Filters security threats such as Malware, Unauthorized API privilege, Web Attack Patterns

Phase 1
Initial Inspection &
Dynamic Analysis

Phase 2
Content Review &
Final Confirmation

App Submission

Security Analysis System

2. Static Analysis
- Analyze App Package

3. Dynamic Analysis
- Analyze Runtime Behavior

Security Analyst
- Confirm Analysis Result

Tizen Store
- Re-evaluate Static Analysis Result

For Sale
Tizen Validation Process (Phase 1)

Test Automation System

: Tests metadata and application’s basic functions according to test cases

App Submission

- Phase 1
  - Initial Inspection & Dynamic Analysis
  - Test Automation System

- Phase 2
  - Content Review & Final Confirmation
  - Reviewers

For Sale

1. Metadata Checking
   - Forbidden Words, Support Languages
2. App Function Checking
   - Install, Uninstall, Resolution, Resource, Event Handling, Interrupt Checking
Tizen Validation Process (Phase 2)

Final Review

: Makes the final decision depending on system result and content review

- App Submission
- Phase 1
  - Initial Inspection & Dynamic Analysis
    - Test Automation System
- Phase 2
  - Content Review & Final Confirmation
    - Reviewers
- For Sale

Configuration Mgmt. System

- Manual Checking
- Contents Review
  - Device Test
  - System Result

- System Result
  - ✓ Age Rating
  - ✓ Copyrights
  - ✓ Cultural Issues
  - ✓ Application’s Special Features
  - ✓ Application Concept

Test Automation System

Security Analysis System

Reviewers

Age Rating
Copyrights
Cultural Issues
Application’s Special Features
Application Concept
3. Developer Support
3 Types of Validation Guidelines

- Enable developer to understand the publishing process
- Enable developer to check essential points for app function and validation policy
- Enable developer to know mostly detected defects before submission
4. Frequently Reported Defects
Frequently Reported Defects

Privilege defects: are Detected by security analysis system

1. Unused Privilege Problems: Delete an unused privilege
2. Undefined Privilege Problems: Assign proper privileges in a configuration file
Frequently Reported Defects

Function Defects
are Detected by test automation system

1. Installation Error
2. Execution Error

&

31% 29% = 60%
of all functional defects

Tips
Use RTL!

: Developer can use the Samsung RTL (Remote Test Lab) to test and tune the application before submission
Frequently Reported Defects

Contents defects: are checked by Reviewers before confirming the validation

- **Inappropriate Description**
  - Write a description in accordance with Tizen, NOT other platforms

- **Not for All Ages**
  - Make a Metadata (App name, description, icon and screenshots, etc) **for everyone** regardless of age

- **Copyright Infringement**
  - Make sure your application does not infringe someone else’s copyrights
Tizen Application Security Analysis System

Seung Won Ko
Jackson Kang
Security Analysis System
Need for Security Solution (1/2)

Mobile Malware Count
1,600,000 (2013. Dec)

Rapid Increase since 2013

* Source: AhnLab Security Emergency Center (ASEC) 2013.12
Need for Security Solution (2/2)

Google Play

- Basically laissez-faire, Post verification method
- Hard to manage quality and security, most malware apps
- Bouncer Introduction
- Bypass method found, Manufacture and telecommunication companies are conceiving security plan

Tizen AppStore

- New Open source Web platform With progress
- Quality and security needs stabilization
- AhnLab Mobile Security Solution
- Static & Dynamic & Manual Total security solution
- Maintain safe and attractive Tizen ecosystem for developer and user, Contribute platform’s prosperity

Compare to Google Play provide Safer app store

Maintain Clean store status, Benefit for developer and user
Security Solution Overview

Tizen App

Automatic Static Analysis

Pattern Database

Automatic Dynamic Analysis

Reputation Database

Reviewer

Report / Statistics
Static Analysis System (1/2)

Static Feature Analyze

- Package Binary / Signing
- Resource File / Source Code
- Etc.
Static Analysis System (2/2)

- Hash Check
- Sign Check
- Privilege Level Check
- Undefined Privilege Check
- Unused Privilege Check
- Malicious URL Check
- Calendar Use Check
- Contacts Use Check
- Geocoder Use Check
- Device Info. Use Check
- Specified URL Check
- NFC Check
- Specified API Check
- Bluetooth Check
- Specified String Check
- VoIP Check
- Network Use Check
- China Checklist
- Malware Check
- Push Message Check
- White List Check
Dynamic Analysis System (1/2)

1. Original System Log
2. Call / Message Log
3. Network Access Log
4. File IO / DB Query Log

Event Generation
Dynamic Analysis System (2/2)

1st Log (Original)
- Main buffer Log
- Radio buffer Log
- System buffer Log
- TCP Dump File

2nd Log (Analyzed)
- Call Log
- SMS Log
- MMS Log
- Email Log
- File I/O Log
- Network I/O Log
- Private Info DB Access Log

Final Report
- Detect malicious URL connection
- Payment Induction
- Personal information Access
- Call History Access
- Text Message Access
- Email Access
- Network Communication History
- File Access History

Analyst
Update Analysis System

- To apply the latest verification policy and solve urgent security issue on pre-registered app
- Evaluation is not just a single verification test, but periodical purification effort
Dynamic Analysis – Evolution (1/3)

① match template
② image similarity 97.3% area detect
③ event generate & send
④ if hit
⑤ next screen
Dynamic Analysis – Evolution (2/3)

1. Resource string search by character recognizing ex) ‘marketplace’

2. Keyword similarity 99.9% area detect

3. Event generate & send

4. If hit

5. Next action
Dynamic Analysis – Evolution (3/3)

**1st Generation**
- Emulator Introduction
- Dynamic Analysis Automation
  - Automated process of app crawling, installation, execution, termination
  - App execution and log the behavior for predetermined time
- System performance improvement
  - Network packet capture and analysis
  - System resource monitoring
  - Artificial system event occurrence
  - Offer processed summary information
- Limit and Problem
  - Lack of movement and interaction to draw all the functions of the application

**2nd Generation**
- Behavior Induction
- Interaction
- Effective Automation
  - Object targeted Event Generation
  - Pattern Recognition
- Enhanced Report
  - Trace Route Recoding
  - All Screen Capture
- Change of Paradigm
  - From Passive to Active
  - Defense to Unknown App
- Platform Independent
  - Generalizable Model
  - Web platform, Smart TV platform, Etc.

**Next Generation**
- Similar to that of humans
- Effective Automation
- Enhanced Report
- Change of Paradigm
- Platform Independent
Demonstration
Intelligent Dynamic Analysis