RFP 54 - MEG Non-Functional Requirements

Draft

8 Pages

0 Document Information

0.1 Table of Contents

0.2 Terminology and Document Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY" and "OPTIONAL" in this document are to be interpreted as described in [1].

`Source code is shown in this typeface.`

User – The human actor who uses the device

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OSGi – Open Service Gateway Initiative

MEG framework – The newly defined framework sitting on top of OSGi

CDC – Connected Device Configuration, defined in J2ME (Java 2 Micro Edition)

FP – Foundation Profile, defined in J2ME (Java 2 Micro Edition)

CDC VM – Java Virtual Machine for CDC

UE – Unit of execution (defined in the MEG Application WS RFP)

UDL – Unit of delivery (defined in the MEG Application WS RFP)

Device management operation – Installing, upgrading, downgrading, removing, configuring an UDL; setting up or retrieving permissions; retrieving value of performance indicator

Device management system – Incorporates the device management server, the managed device(s) and the used management protocol

Underlying UEs for UE *A* – All the UEs which are transitively requires by the *A*

Integrity of an UE – All the files of the UE are available on the device at their valid location with valid content and the integrity of underlying UEs is not broken. It is required to perform an UE successfully

Revision History

The last named individual in this history is currently responsible for this document.

Revision	Date	Comments
V 0.1	Feb 06, 2004	Robert Fajta, Nokia, robert.fajta@nokia.com Initial version
V 0.2	Feb 11, 2004	Robert Fajta, Nokia, robert.fajta@nokia.com According to comments some requirements were deleted, others have been clarified.
V 0.3	Feb 25, 2004	Robert Fajta, Nokia, robert.fajta@nokia.com According to comments some requirements were deleted, others have been clarified. Chapter 1, 2 and 3 were added.
V 0.4	Feb 26, 2004	Robert Fajta, Nokia, robert.fajta@nokia.com According to comments some requirements were deleted, others have been clarified.
V 0.5	Feb 26, 2004	Robert Fajta, Nokia, robert.fajta@nokia.com According to comments some requirements were refined. Security and KPI related requirements were transferred to Security and DM WSs. Usability requirements were removed.
V 0.6	Mar 24, 2004	Robert Fajta, Nokia, robert.fajta@nokia.com Suggestions made on the f2f meeting accommodated. Comments from Erkki Rysä incorporated.
V 0.9	23 April 2004	BJ Hargrave, hargrave@us.ibm.com Formatted for external review.

1 Introduction

This document is part of overall effort of the *Mobile Expert Group* (MEG) under OSGi to come up with use cases and requirements for a new platforms based on CDC configuration of J2ME and OSGi. The effort is subdivided into several vertical *Work Streams* (WS) as follows:

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- Application model
- Device Management
- Policies
- Deployment

It also encompasses two horizontal efforts, which affect all vertical aspects of the platform:

- Security
- Non-functional requirements

This document is devoted to consideration of non-functional requirements.

2 Application Domain

Originally OSGi has been designed as a very generic and horizontal services framework, with its design centered on flexibility of service deployment and consumption. Aiming at a wide variety of application domains, it could not (and should not) have addressed in detail the question of how to make application development more straightforward and convenient. This task belongs to the vertical domains, now expanding their use of OSGi.

Mobile devices area is the latest newcomer to the OSGi world. The only well-defined application model today for such devices is MIDP, a very important but limited platform, specifically designed to make Java available for small applications development, but unsuitable for using Java to build re-usable programmatic services. Our task is to define a framework that serves the new approach.

This document postulates non-functional requirements, which affect the other horizontal and vertical components of the newly defined MEG framework. For better understanding the requirements listed here, it is highly recommended to read the documents of the other Work Streams.

3 Problem Description

The MEG framework is intended to address several issues that are specific to an OSGi-based application model, device management, policies, deployment model and availability of MIDP for mobile devices. The assumptions

collected in this document have to regulate the capabilities and behavior of the MEG framework from the aspect of non-functional requirements.

4 Use Cases

5 Requirements

5.1 Device Management

5.1.1. The management system of the MEG framework should not assume that it is the only or the monopolistic management system on the mobile device. The management system of the MEG framework should be prepared the possible impacts of the other management system. The management system of the MEG framework may cooperate with the other management system. The other management system may reside on the native side, installed by the manufacturer, network operator or enterprise operator, but a bundle, which installs other bundles can also be treated as another management system. For example, the management system of the MEG framework installed and UDL, then the other management system deletes an installed file of this UDL. If the management system of the MEG framework attempts to manage the UDL then it should be able to recognize that one of the files of this UDL were deleted and it may reinstall it. Other example, if a management bundle deletes an UDL then the management system of the MEG framework should recognize it and not to attempt an upgrade operation on the deleted UDL.

5.2 Integrity

5.2.1. Device management operation or any other UDL or UE must not break the integrity of an UDL or UE.
5.2.2. The system must support the approach of atomicity in device management operations. For example, a failed device management operation must not leave any UE in unusable state so its effects must be rolled back.

5.3 Performance

5.3.1. The protocol should use efficiently the network connectivity between the device management server and the managed device.

5.3.2. If a permission *P* is independent from an UDL or UE *A* needs then the permission *P* should not have negative impact on the overall performance of *A*, i.e. *A* should not run slower because of P. For example, if a permission is set to an UDL then the performance of other UDLs or UEs should not be affected by that permission.

5.4 Memory Requirements

5.4.1. Usage of volatile and non-volatile memory should be used efficiently and be kept as small as possible. Volatile memory is not expected to retain its contents when the device is turned off. Hint: it should be possible to run the MEG framework on a device, which contains at least 8 MB non-volatile memory and at least 8 MB volatile memory for the CDC VM, FP, OSGi and MEG framework.

5.5 Supportability

5.5.1. MEG should be able to run on a system consisting of CDC version 1.0, FP version 1.0 and OSGi R3 to preserve the investment of the device vendors.

5.5.2. The MEG framework should be OS agnostic.

5.5.3. Protocol used by the device management system should be agnostic to the connectivity protocol and bearer type.

5.6 Usability Requirements

5.6.1. The CDC VM, OSGi and MEG framework should not make the device or the MEG framework hang up for a long time in order not to destroy the user experience. For example, garbage collection in the VM should not hang up the device or the MEG framework for a long time.

5.6.2. Should make an effort to keep the negative impact of the device management operations minimal on the overall device performance and user experience. Negative impacts of performing a device management operation may be:

- The managed functionality of the device becomes temporarily unavailable for the user and the UEs based on the managed functionality
- Performing the device management operation requires device resources (like processor time, memory, network connection bandwidth, etc.) thus may deteriorate the overall device performance
- Device management operation may require input from the user

A device management operation should run in the background to affect the user experience minimally. For example, during device management operation the user should still receive and should be able to react to an incoming call, except when the device management operation somehow involves the call handling functionality

5.6.3. MEG framework must gracefully scale up to manage large (more than 100) number of bundles.

5.6.4. The startup time of the MEG framework should not have hard impact on the overall startup time of CDC VM, OSGi and MEG framework, in order not to destroy the user experience. Hint: using a device with similar performance as iPAQ 3630 with 206 MHz Intel StrongARM 6 processor the booting time of the CDC virtual machine, the OSGi framework and the MEG framework should be less than 4 seconds.

5.6.5. It should be possible to install new UDLs without rebooting the virtual machine, OSGi framework or the MEG framework.

5.7 License Requirements

Any license required should come here

6 Document Support

6.1 References

[1]. Bradner, S., Key words for use in RFCs to Indicate Requirement Levels, RFC2119, March 1997.

[2]. Software Requirements & Specifications. Michael Jackson. ISBN 0-201-87712-0

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6.3 Acronyms and Abbreviations

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