Architecture

Subsystem Architecture Specification

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# Document control

## References

|  |  |  |  |
| --- | --- | --- | --- |
| Tag | Document name | Document ID | Repository (with hyperlinks) |
| ArchGoals | Architecture Goals |  | [http://wikis.in.nokia.com/MaemoSoftware/ArchitectureGoals](https://maemo.research.nokia.com/archtool/wiki/ArchitectureGoals) |
| ArchStudies | Architecture Studies |  | <http://wikis.in.nokia.com/MaemoSoftware/ArchitectureStudies> |

## Glossary

|  |  |
| --- | --- |
| Acronym or term | Description |
| API | Application Programming Interface |
| DUI | Direct UI |
| IPC | Inter-process communication |

# Introduction

This document is subsystem architecture specification of system UI. System UI is part of Harmattan and it implements various user interfaces including but not limited to: PIN/PUK query, shutdown dialog, screen lock, profiles, settings views, and battery indications.

From production owner perspective System UI is two hold. Part of the product belongs to cellular, such as PIN query and cellular settings, while rest belongs to system software, such as screen lock.

# Requirement

## User requirement

PIN/PUK query:

* As a user, I want to enter PIN code.
* As a user, I want to enter PUK code if needed.
* As a user, I want to toggle if PIN query is required. [move to settings]
* As a user, I need to be able to do emergency call from PIN query.
* As a user, I may live in country where emergency number is different from 112.
* As a user, I want to skip (cancel) PIN query.
* As a user, I want to unlock my SIM from operator lock.

Screenlock:

* As a user, I want to lock my screen to prevent accidental touches.
* As a user, I want a slider to unlock the screen.
* As a user, I want to see if I have missed an email.
* As a user, I want to see if I have missed a call.
* As a user, I want to sett if I have missed a message.
* As a user, I want to see if someone is calling even when screen lock is on.
* As a user, I don’t want to show events’ contents when device locking is in use.
* As a user, I want screenlock to go on on short power key press.
* As a user, I want to control playback volume when screenlock is on.

Energy UI:

* As a user, I want to have notification when battery is low.
* As a user, I want to be asked if Power Save Mode shall be used.
* As a user, I want to see indication of Power Save Mode on home button.
* As a user, I want notification charger connect/disconnect.
* As a user, I want a reminder of removing charger.
* As a user, I want to see battery animation when charger is connected.

Shutdown dialog:

* As a user, I want to see shutdown dialog after a long power key press.
* As a user, I want to see the next alarm in shutdown dialog.
* As a user, I want to slide to shutdown.
* As a user, I want to press long the power key to shutdown.
* As a user, I want to provide home button so that user can go to homescreen.

Offline UI:

* As a user, I want to be able to close connections from status indication view.
* As a user, I want to open connections from status indication view.
* As a user, I want just WLAN to be opened from status indication view.
* As a user, I want to be asked to continue in online mode if action requires it.
* As a user, I want status indicator to indicate my offline/online status.

Profiles:

* As a user, I want to select a suitable profile from normal, beep, silent and loud.

Settings – Display:

* As a user, I want to adjust brightness.
* As a user, I want to adjust the time to switch off screen lights.
* As a user, I want to toggle screen lights during charging.

Settings – Battery

* As a user, I want to see talk time left.
* As a user, I want to see stand-by time left.
* As a user, I want to toggle if Power Save Mode is used.
* As a user, I want to adjust when Power Save Mode is switched.
* As a user, I want to toggle when Power Save Mode is manual/automatic.

Settings – LED

* As a user, I want to toggle led indication of idle illumination light on/off.
* As a user, I want to toggle led indication of incoming events on/off.

Settings – Profiles:

* As a user, I want to adjust volume level of each profile.
* As a user, I want to hear immediate feedback of volume change.
* As a user, I want to toggle vibration per profile.

Settings – Cellular:

* As a user, I want to toggle if caller id is shown.
* As a user, I want to select a network.
* As a user, I want to select data usage as always/ask/newer.
* As a user, I want to use provisioning method to get data settings.
* As a user, I want to use roaming on networks.

[? Describe here the basic user requirement: what is the exact need, and why is it needed. Format can be either a description of the requirement or use case. ?]

## Technical requirements

[? Describe the technical requirements derived from user requirements, i.e. what is needed to fulfill the user requirements. Important aspects, for example:

* Security: Does the architecture have a plugin loading mechanism? How does it ensure malicious plugins don't compromise the security of the whole system?
* Quality: Reliability, performance and related issues. ?]

# Architecture

## Structural view

[? Describe your architecture proposal as UML package diagrams and explanations about entities included in the diagrams. In UML diagrams, subsystems are represented as packages and components as classes. Draw two diagrams:

* System context describes the subsystem as one package, and shows as dependencies the interfaces you are using from other subsystems. Highlight the proposed changes to dependencies in text.
* System decomposition describes the internal structure of a subsystem, dependencies between them, and the new and/or changed interfaces they implement. Mark in this diagram or its description the licenses and copyrights involved used by components.

If your changes affect multiple subsystems, include them all in the diagrams. Highlight changes in work split between subsystems, new subsystems or removed subsystems.

?]

## Behavioral view

[? Describe the main use cases as UML activity or sequence diagrams. Focus on explaining the work split between your subsystem and other subsystems involved in the use case. ?]

## Licensing and IPR view

[? Licensing: **Priority one for X1 is to describe here proprietary components and their dependencies, if any.** Rest of the dependencies are automatically checked at a later program milestone with the Architecture Navigator tool. ?]

[? IPR: Statement about Open Source component availability for the feature or some parts of the feature described in this document. If OSS is used, further analysis on what part of code should be given back to the OSS community. If own software is developed, explain why. ?]

## Development

[? This chapter describes the applicability of the Subsystem in SDK/emulator environment: Are there any differences between the functionality of the Subsystem in SDK/emulator environment and terminal, between ARM and x86? Is there any specific implementation or other support needed to run this subsystem in SDK/emulator environment or what is required from SDK to be able to develop using this feature? Why can’t this subsystem possibly be run in SDK/emulator?

## User Data and Settings

[? This chapter describes what kinds of data and settings should be stored, e.g. for backup/restore, content engine, and software upgrade, and how they should be stored. ?]

## Configurability

[? If there are requirements for configurability, their implementation needs to be explained here. ?]

# Performance

[? At CS1 the main purpose is to identify potential performance problems, bottlenecks or risks in your project, and show that you have some feasible ideas for solving them (or at least know if some questions are still open).

For details you can list whatever estimates you have (or leave them for later if you really can't estimate anything at this point). You don't have to count every kilobyte, process and IPC message, but communicate what you know - even your rough estimates are probably better than a pure guess by someone else. Think from the perspective of finding the big issues that could have impact for system performance. ?]

## General Performance Considerations

[? Consider following items:

* Hardware capability
* Real time requirements if any
* How does the architecture scale down and up?
* What is the complexity for typical data sets?
* What is the estimated maximum size of the data set?
* What is the plan to reach performance requirements?
* What do you assume about the performance of other software components, or issues already known about them.

?]

## Memory

|  |  |  |
| --- | --- | --- |
|  | Explanation | Size [kB or number of items] |
| Flash/OneNAND | [? Explanation of key factors affecting to OneNAND consumption. OneNAND is assumed to have unix filesystem semantics. Only system critical files should reside in OneNAND. ?] | [? Estimated impact of the feature to OneNAND size or number of items stored in OneNAND. ?] |
| Flash/eMMC | [? Explanation of key factors affecting to eMMC consumption. eMMC is assumed to have FAT filesystem semantics. User data should reside in eMMC. ?] | [? Estimated impact of the feature to eMMC size or number of items stored in eMMC. ?] |
| RAM/Idle | [? What is the impact of the feature to idle state RAM consumption, what libraries need to be loaded, what other services are required by this feature? ?] | [? Estimated impact of the feature to idle RAM, or number of items in memory at once. ?] |
| RAM/Peak | [? Explanation of key factors affecting to peak RAM consumption. ?] | [? Estimated impact of the feature to peak RAM usage, or peak number of items in memory at once. ?] |

## Runtime

[?Describe

* Number of daemons and IPC traffic involved in typical use cases
* Periodic activities required
* Impact to boot time
* Application start time

?]

## Power Consumption

[? List here all known or estimated impacts this feature has to power consumption. Are there any configuration options or user settings related to this feature having impact on talk/standby time? ?]

# Security Impact

[? Does this area have potential for higher security-related risk? If there is, please flag it as a project risk (in CS1 milestone project risk collection), and describe the risk here.

Usually, higher security-related risk is associated with one or more of the following. If you think that there is obvious risk, you can describe it here in free form. This is not a full threat analysis.

- Features that require high (admin / root) permissions or are a part of trusted computing base (kernel, etc.)

- User data or personally identifiable information (PII) is handled

- Network connections are used or relied on

- Externally supplied data is being processed

- Financial transactions are processed or billable events are created

- Cryptographic functionality (algorithms, random number generators, protocols) are used or a 'security feature' is being implemented

- Operational environment of a component or expectations of its operation change ?]

# Open Items

[? Describe any open items, or conditions. ?]