

SOFTWARE COMMUNICATIONS ARCHITECTURE SPECIFICATION

APPENDIX F: UNITS OF FUNCTIONALITY AND PROFILES



01 October 2012
Version: 4.0.1

Prepared by:

Joint Tactical Networking Center (JTNC)
33000 Nixie Way
San Diego, CA 92147-5110

Statement A - Approved for public release; distribution is unlimited (18 November 2013)

REVISION SUMMARY

Version	Revision	Date
Next <Draft>	Initial Draft Release	30 November 2010
Candidate Release	Initial Release	27 December 2011
4.0	ICWG Approved Release	28 February 2012
4.0.1	Incorporated transition to JTNC and applied SCA 4.0 Errata Sheet v1.0	01 October 2012

TABLE OF CONTENTS

F.1	SCOPE	5
F.1.1	Overview	5
F.2	CONFORMANCE	5
F.2.1	UOF and Profile Conformance on the Part of an SCA Product	5
F.2.2	Sample Conformance Statement.....	5
F.3	CONVENTIONS.....	6
F.4	NORMATIVE REFERENCES.....	6
F.5	INFORMATIVE REFERENCES.....	6
F.6	UNITS OF FUNCTIONALITY	6
F.6.1	Target Operating Environment Units of Functionality.....	6
F.6.2	ComponentBase Units of Functionality	7
F.6.3	Application Related Component Units of Functionality	8
F.6.4	ComponentBaseDevice Units of Functionality.....	9
F.7	SCA PROFILES.....	10
F.8	ATTACHMENTS	12

LIST OF FIGURES

Figure 1: Component Base Units of Functionality	8
Figure 2: Application Components Units of Functionality	9
Figure 3: Device Components Units of Functionality	10
Figure 4: SCA Profiles with OE Units of Functionality	12

APPENDIX F UNITS OF FUNCTIONALITY AND PROFILES

F.1 SCOPE

This appendix defines Units of Functionality (UOFs) and Profiles used to achieve scalable levels of conformance with the SCA defined in the main specification.

F.1.1 Overview

A UOF is characterized by a set of related SCA requirements. In many cases a UOF represents a collection of optional requirements to be incorporated or omitted as a whole from a component realization.

Individual UOFs often provides capabilities that are complementary to those of another UOF. Because of that fact this appendix also includes defined profiles. A profile comprises a set of UOFs. The SCA profiles contain related UOFs that are aligned with common real world scenarios.

Profiles are applicable to a platform realization and its resident Framework Control Components. All SCA components and defined profiles may be overlaid with additional UOFs. This appendix describes the relationships between implemented components, defined platforms and the primary UOFs. The entire collection of UOFs is identified in the attachment referenced in F.8.

F.2 CONFORMANCE

F.2.1 UOF and Profile Conformance on the Part of an SCA Product

The elements of this specification are not required to be used solely for a particular platform or application. SCA Products are developed in accordance with the requirements defined within the SCA specification. The SCA is written in a style that asserts all of its requirements as mandatory. This specification provides the means by which a conformant SCA Product may be relieved from the responsibility of implementing certain SCA requirements.

Conformance for an SCA Product is defined at a profile level as follows:

- An SCA Product needs to be conformant with all requirements identified by the Units of Functionality that comprise the Profile as defined within this appendix.

Conformance for an SCA Product is defined at a Unit of Functionality level as follows:

- An SCA Product needs to be conformant with all requirements identified by the Unit of Functionality defined within this appendix.

The capabilities of any SCA product is often extended by incorporating additional Units of Functionality provided the Unit of Functionality conformance rules are adhered to.

F.2.2 Sample Conformance Statement

An SCA product can be identified as being conformant to a specific version of the SCA and the specific technology that the product realizes.

- “Product A is an SCA conformant waveform ApplicationResourceComponent in accordance with the controllable and configurable UOFs.”

- “Product B is an SCA conformant Operating Environment (OE) in accordance with the SCA Medium Profile containing an SCA Lightweight Application Environment Profile conforming POSIX layer and an SCA Full CORBA Profile transfer mechanism.”

F.3 CONVENTIONS

N/A

F.4 NORMATIVE REFERENCES

The following documents contain provisions or requirements which by reference constitute requirements of this specification. Applicable versions are as stated.

- [1] OMG Lightweight Log Service Specification, Version 1.1 formal/05-02-02, February 2005.
- [2] OMG Event Service Specification, Version 1.2 formal/04-10-02, October 2004.

F.5 INFORMATIVE REFERENCES

N/A

F.6 UNITS OF FUNCTIONALITY

F.6.1 Target Operating Environment Units of Functionality

A Target Operating Environment (OE) on a platform provides a core set of functionality that is available for use by the components that will be deployed on that platform. The Target OE may provide capabilities such as SCA services, support for the underlying RTOS or middleware support. The following UOFs are applicable to the Target OE:

- | | |
|---|---|
| • AEP Provider | – provides the SCA Application Environment Profiles (AEP) capability |
| • <u>Application Backwards Compatible</u> | – <u>Provides SCA V2.2.2 Application backwards Compatibility capability</u> |
| • Deployment | – provides capability to deploy PlatformComponents and ApplicationComponents |
| • Management Registration | – provides the interfaces for registering components to domain and device manager components capability |
| • Management Un-Registration | – provides the interfaces for unregistering components from domain and device manager components capability |
| • Management Releasable | – provides the device manager releasing capability |
| • CORBA Provider | – supports one or more SCA CORBA profiles |
| • Channel Extension | – provides the concepts of platform channels and deployment of applications |

- Event Channel – provides event channels and the event service capability in the SCA OE
- Log Capable – provides the log service capability within the SCA OE
- Application Installable – provides capability for dynamic application installation and un-installation
- Log Producer – produces logs using the *LogProducer* interface defined in [1]
- Nested Deployment – extends the deployment UOF by providing the capability to deploy installed nested applications and manage instantiated nested applications. Note: The domain profile (accardinality attribute) indicates whether the platform supports a single or multiple assembly controllers.
- PlatformComponentFactory Deployment – provides the capability of deploying components via a PlatformComponentFactoryComponent.

F.6.2 ComponentBase Units of Functionality

SCA components that are derived from ComponentBase such as, ApplicationManagerComponent, DeviceManagerComponent, DomainManagerComponent, and ResourceComponent may comprise a wide range of UOFs as shown in Figure 1. The following UOFs are applicable to the components that derive from ComponentBase:

- LifeCycle – provides life cycle management capability via the *LifeCycle* interface
- AEP Compliant – adheres to one of the AEPs defined in Appendix B
- Controllable – provides a control capability via the *ControllableComponent* interface
- CORBA Compliant – provides a CORBA communication capability that adheres to one of the CORBA profiles defined in Appendix E
- Connectable – provides port connection management via the *PortAccessor* interface
- Configurable – provides configure and/or query functionality via the *PropertySet* interface, or defines configure and/or query properties
- Event Consumer – consumes events using the *PushConsumer* interface defined in [2]
- Event Producer – produces events using the *PushSupplier* interface defined in [2]
- Interrogable – provides interrogation capability via a component specified interface (i.e. *ApplicationDeploymentData*, *ComponentIdentifier*, *DeviceManagerAttributes*,

- Log Producer – produces logs using the *LogProducer* interface defined in [1]
- Component Registration – provides a registration capability via the *ComponentRegistry* interface
- Component Un-Registration – provides an un-registration capability via the *FullComponentRegistry* interface
- Testable – provides a testing capability via the *TestableObject* interface and test properties (or *DeviceAttributes*)

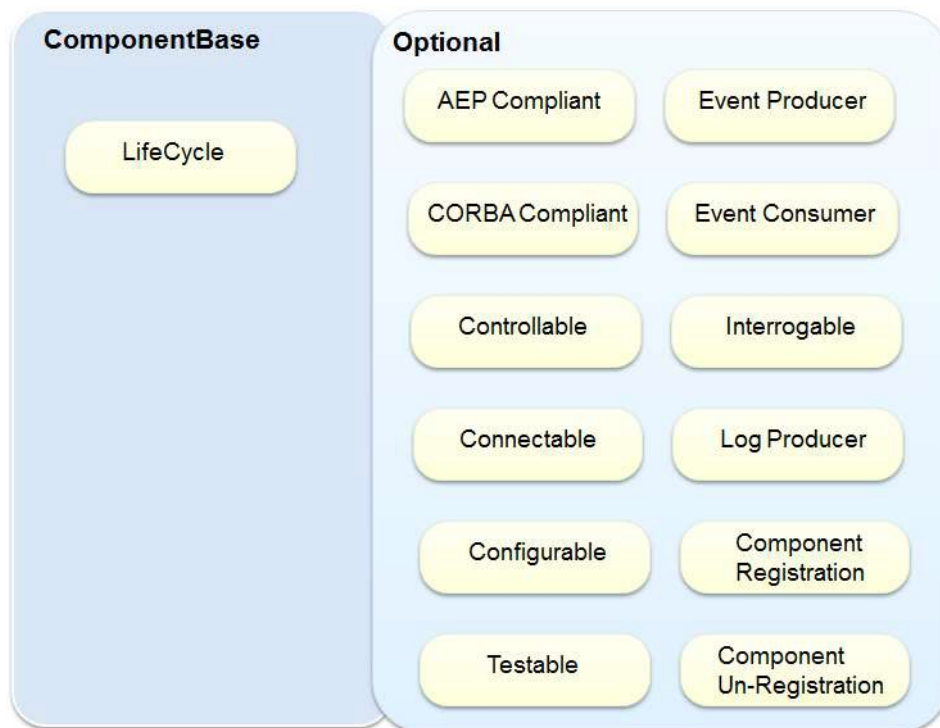


Figure 1: Component Base Units of Functionality

F.6.3 Application Related Component Units of Functionality

Application Related Components incorporate the ComponentBase optional UOFs as shown in Figure 2.

- ResourceComponent is based upon ComponentBase UOFs.
- ApplicationResourceComponent extends the ResourceComponent with mandatory AEP UOF.
 - AssemblyControllerComponent extends the ApplicationResourceComponent with mandatory Controllable UOF.

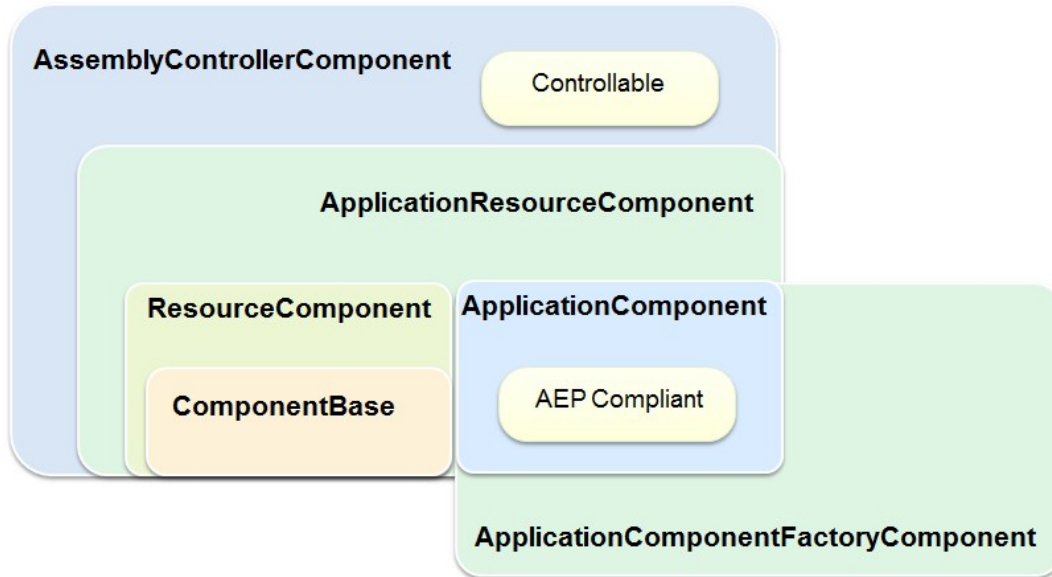


Figure 2: Application Components Units of Functionality

F.6.4 ComponentBaseDevice Units of Functionality

All `ComponentBaseDevices` have additional optional UOFs beyond those provided by `ComponentBase` as shown in Figure 3.

- `ComponentBaseDevice` extends `ComponentBase` UOFs with a mandatory `DeviceReleasable` UOF.
- `LoadableDeviceComponent` definition extends `ComponentBaseDevice` with a mandatory `Loadable` UOF.
- `ExecutableDeviceComponent` extends the `LoadableDeviceComponent` with mandatory `Executable` UOF.

The following additional UOFs are applicable to `ComponentBaseDevices`:

- **Loadable** – provides the load management capability via the *LoadableObject* and *LoadableDevice* interfaces
- **Executable** – provides an execution management capability via the *ExecutableDevice* interface
- **Aggregatable** – provides an aggregation capability via the *ParentDevice* interface; a parent composite device with children devices
- **Allocatable** – provides capacity management via the *CapacityManager* interface and allocation properties that are managed along with usage state
- **Manageable** – provides administration capability via the *ManageableComponent* interface and administrative state behavior

- Device Releasable – provides a release capability via the *Device::releaseObject* behavior; a device that is releasable

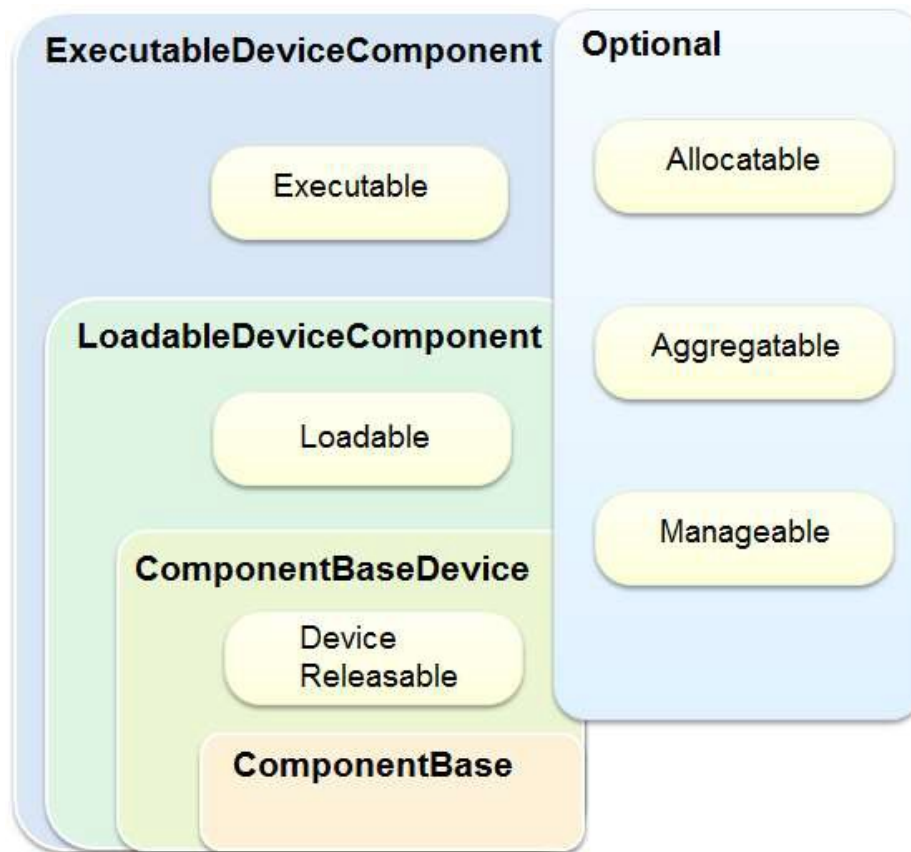


Figure 3: Device Components Units of Functionality

F.7 SCA PROFILES

In Figure 4 three profiles are shown which are applicable to implementations of the SCA Framework Control Components that are not implemented by an application provider (i.e. DomainManagerComponent, DeviceManagerComponent and ApplicationManagerComponent), they are defined as follows are:

SCA Lightweight Profile

- Supports the UOFs of AEP Provider and Deployment.
- Is suited for radio platforms where the hardware modules are a static configuration.
- Provides a minimum set of functionality which is applicable for resource (e.g. SWAP) constrained platforms.

SCA Medium Profile

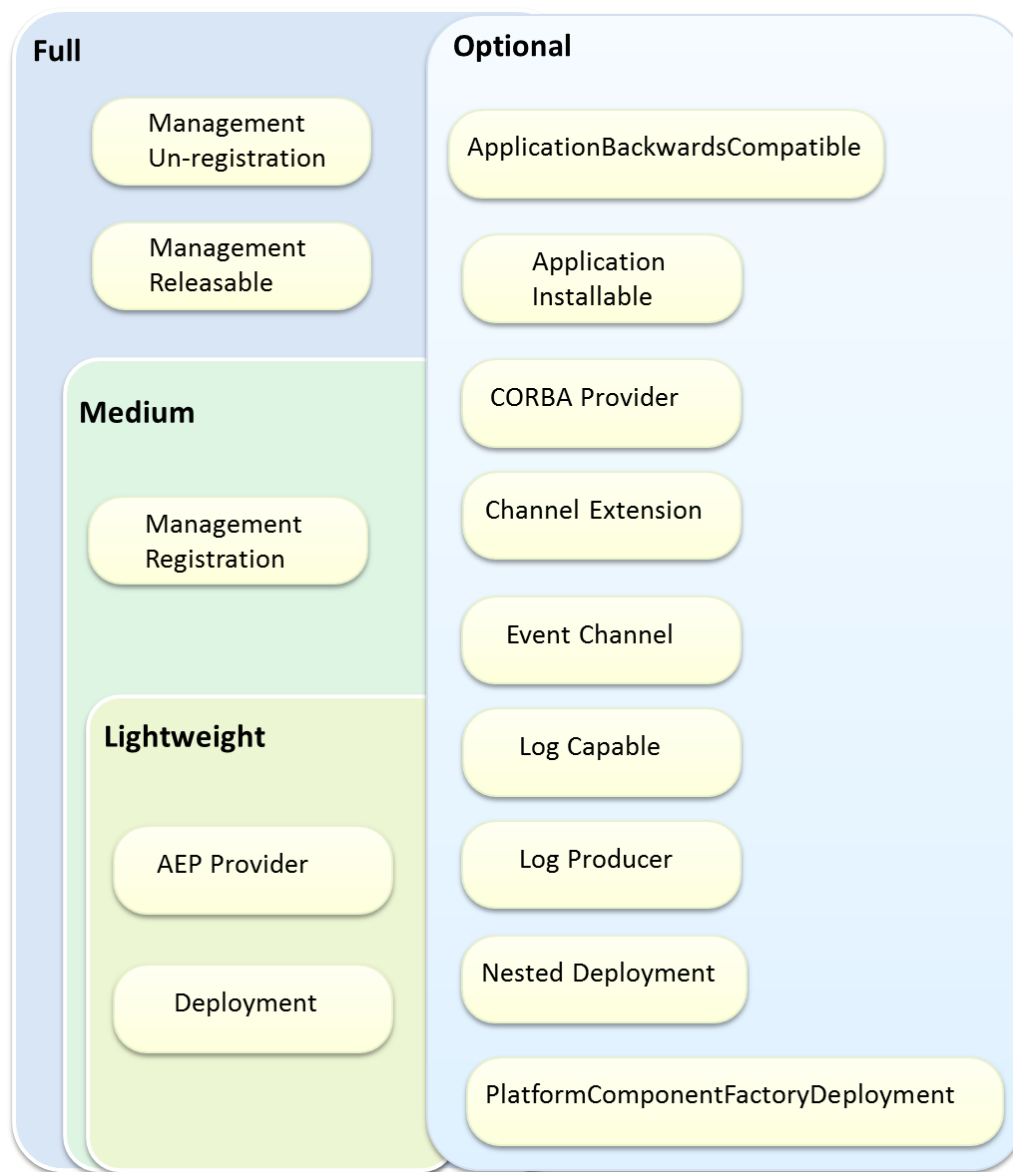
- Supports the additional UOF of Management Registration beyond SCA Lightweight Profile.
- Is suited for radio platforms where the hardware modules are plug-and-play but cannot be removed.

- Still rather lightweight but it introduces a configurable, dynamic aspect to the platform.
- May be the most flexible one in that it provides the lightest weight realization of a platform that supports the deployment model introduced in earlier SCA versions.

SCA Full Profile

- Supports the additional UOFs of Management Un-Registration and Management Releasable beyond SCA Medium Profile.
- Is suited for radio platforms where the hardware modules are plug-and-play that can be removed.
- Incorporates the SCA Medium Profile and provides the full breadth of SCA deployment and management capabilities
- Aligned to support prime power, multi-channel sets

The SCA profile hierarchy, core profile capabilities and associated optional capabilities are depicted in Figure 4.



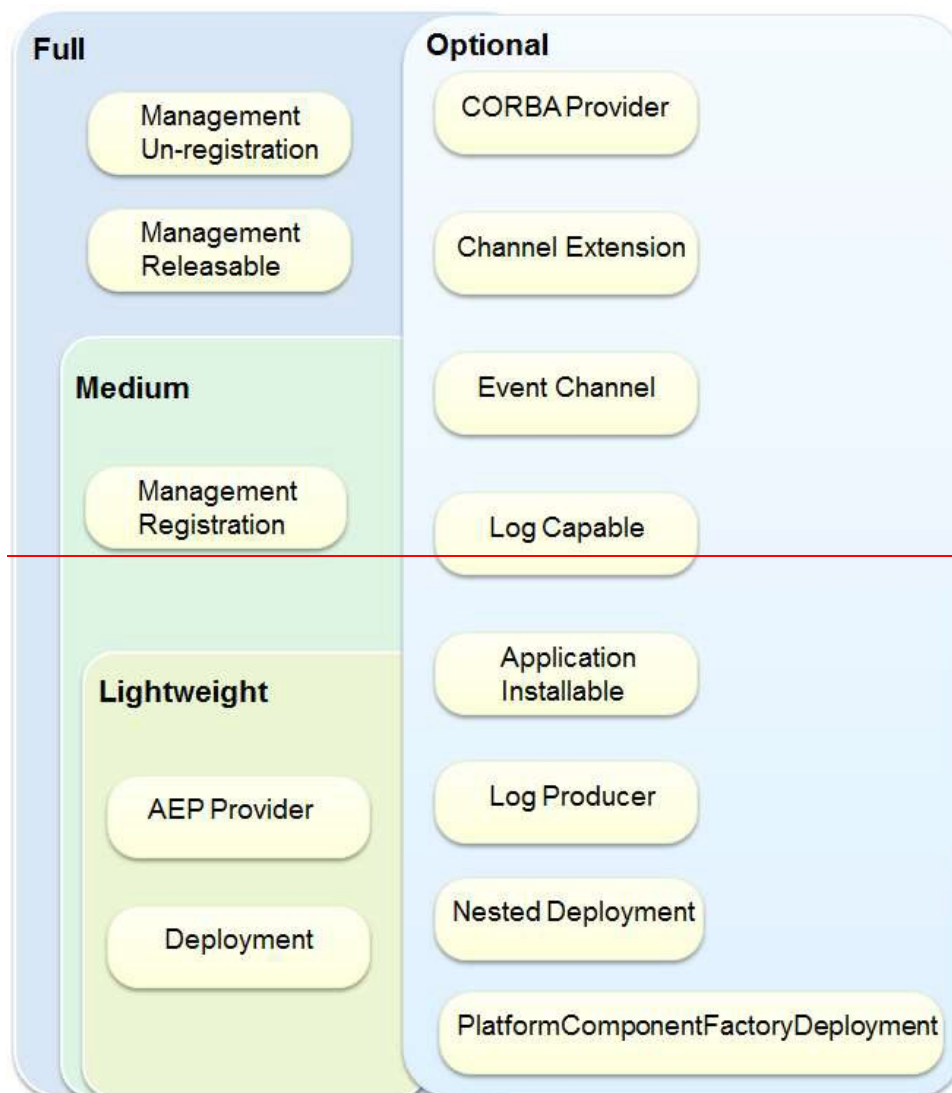


Figure 4: SCA Profiles with OE Units of Functionality

F.8 ATTACHMENTS

This appendix includes the following SCA requirements mapping:

- APPENDIX F Attachment 1: SCA Conformance mapping

This attachment includes all the SCA requirements mapped to UOFs and component(s). When a requirement is mapped to UOFs (one or more) that requirement is only applicable if all of the referenced UOFs are implemented. When a requirement is not mapped to any UOFs that requirement is always applicable.