Request for Comment on Generalization of the Resource Factory Concept

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Preface

In August 2009, the JPEO and its JTRS SCA Next Working Panel, invited the WINNF to assist it in developing the specification of a new release of the SCA whose working title is "SCA Next." The WINNF created a "SCA Next Work Group" to coordinate this work and informed the JTRS SCA Next Working Panel that the WINNF wished to take the lead on developing solutions for two of the previously defined Change Proposals: S047 "Develop CORBA/e and CORBA Services wording" and S013 "SCA Architectural Consistency", as well as offer comments and suggestions for many of the other change proposals.

As part of the consideration of architectural consistency, the WINNF explored the idea of generalizing the Resource Factory concept to allow it to be used to create platform components, such as, Devices and Services, and concluded that this was a useful option for many of the same reasons Resource Factories are useful, especially to allow co-locating platform components into a single address space.

The WINNF SCA Next Work Group is pleased to contribute the attached **document describing the concept and the required changes to the SCA** specification. This document is being sent to you at this time for your consideration and comments. However, the WINNF intends to continue the work and suggest specific wording changes to the SCA specification and modified DTDs to accomplish the changes suggested here. This additional document will be sent to you when we complete that task. Note that this work relates to Change Proposal S013, S011 Deployment Optimizations and S012 Lightweight Components. The WINNF requests your consideration and invite your comments.

Please respond with your comments to the WINNF at office@wirelessinnovation.org and CC to the SCA Next Work Group Chair: Terry Anderson, terry.anderson@itt.com.

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1   Description of Enhancement:

Allow the DeviceManager to co-locate components into a single address space using the concept of a factory. The ResourceFactory currently provides this capability for application Resources.

2   Recommended Change:

Change the specification to allow the DeviceManager to instantiate Device and service components using a generic ComponentFactory. The ComponentFactory creates CORBA Objects that can be narrowed to the proper component type.

This involves changing the SCA Specification document to describe the ComponentFactory and how the DeviceManager may use a ComponentFactory.

The use of a ComponentFactory is optional. Platforms are neither required to use them or to support their use, but if a ComponentFactory is provided it can be used to create any types of component that can be launched via a DCD. For instance the ComponantFactory could create a Device, a Service, a ExecutableDevice, a FileSystem or a FileManager.

A section ComponentFactory should be added under section "3.1.3.3 Base Device Interface". This section will be similar to section "3.1.3.1.7 ResourceFactory". However, the ComponentFactory interface will support (i.e. extend) the LifeCycle interface.

The member functions of the ComponentFactory should be named as follows:

> « readonly » identifier : string(idl)
> initialize(): void
> releaseObject() : void
> createComponent(in componentId : string, in qualifiers : Properties) : Object
> releaseComponent(in componentId : string) : void

Since the Device Manager is already aware of the components being created by the ComponentFactory, individual components do not directly register with the DeviceManager, but the Device Manager shall implicitly add each component to the appropriate list (such as, registeredDevices, registeredServices, etc.). This is similar to the behavior for Resources created by the ResourceFactory.

The "Appendix D: domain profile" document will also need to be changed. The "dtd" for the "DCD", and "SCD" will require modifications to add support for the ComponentFactory.

- SPD and PRF : cosmetic changes in descriptions for how a factory is used and when factoryparams are used

- SCD : add the component type "componentfactory"
- DCD : add a componentfactoryref tag to the DCD partitionning.componentplacement.componentinstantiation.findcomponent.componentfactoryref tag which will be identical to SAD partitionning.componentplacement.componentinstantiation.findcomponent.componentresourcefactoryref tag.
- Note: The componentFactory will always be optional by definition since it is one kind of element in the fincomponent element. This is already the case for the resourceFactory in the SAD.

3 Rationale for Change:

Collocation of several components into a single address space provides significant footprint savings, improves real-time performances, and reduces deployment time of components. Similar savings can be achieved using implementation techniques such as the use of shared libraries. But these techniques are specific to certain operating environments, thus it affects portability of components. The use of a component factory is the only platform-independent technique which provides the benefits of address space collocation.

4 Impacts

On Existing CF/Applications: Minor impact for Core Framework that does not support this optional feature. The impact is related to the new optional tag in the DCD and to a new component type in the SCD.

On in-dev CF/Applications: none.

On existing CP: none.