



RFC-227 Configuration Admin Updates

Draft

10 Pages

Abstract

10 point Arial Centered.

OSGi Configuration Admin is a slightly pedantic but highly effective flexible standardized model to configure applications. This RFC seeks a solution to carry configuration information in a bundle.

0 Document Information

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0.3 Feedback

This document can be downloaded from the OSGi Alliance design repository at <https://github.com/osgi/design>. The public can provide feedback about this document by opening a bug at <https://www.osgi.org/bugzilla/>.

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0.5 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.

0.6 Revision History

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

Revision	Date	Comments
Initial		<i>Initial Version</i> <i>Carsten Ziegeler, Adobe <cziegele@adobe.com></i>

1 Introduction

2 Application Domain

2.1

3 Problem Description

4 Requirements

4.1 Configuration Admin

- C0010 – It must be possible to specify the service.pid value when creating a factory configuration. This implies the need for a get_or_create factory configuration method in ConfigurationAdmin.

5 Technical Solution

5.1 Configuration Admin Enhancements

This chapter contains enhancements to the Configuration Admin Service Specification.

5.1.1 PID Handling of Factory Configurations

The current Configuration Admin Service Specification provides no control over the PID of a factory configuration: a new factory configuration gets assigned a PID generated by the *Configuration Admin*. This makes it hard for any (provisioning) tool to manage such a configuration as it needs to store this generated PID in order to later on update or delete the factory configuration.

Configuration Admin specifies that a “PID should follow the symbolic-name syntax”, however in the examples in table 104.1 non symbolic-names are used. For targeted PIDs it's already defined that the pipe character '|' is used to separate the PID part from the target information which in fact means that a PID must not use this character. This should be more precisely specified in section 104.3.1. In the same way as the pipe character has been introduced as a special character the character '#' is introduced as another special character for the PID handling of factory configurations.

By introducing two new methods on the *Configuration Admin* service, a client of the service can specify the PID of the factory configuration by providing the factory PID and a name:

```
public Configuration getFactoryConfiguration(String factoryPid, String name,
String location) throws IOException;
```

```
public Configuration getFactoryConfiguration(String factoryPid, String name)
throws IOException;
```

These methods require a factoryPID and a name argument. The method still generates a PID however the generated PID has the form: `factoryPid#name`. This ensures that the *Configuration Admin* can still guarantee uniqueness of the PID. If a configuration with the given combination of factoryPID and name already exists, this is returned, otherwise a new factory configuration is returned. The returned configuration has the factoryPID and a generated PID as mentioned above. Location handling, binding and permission checks works as defined for `getConfiguration`.

The name can be used to find a factory configuration using `listConfigurations`:

```
ConfigurationAdmin ca = ...;
ca.listConfigurations("(service.pid=my.factory.pid#myname)");
```

5.1.2 Locking Configuration Records

The *Configuration* interface is enhanced with the following methods:

```
/**
 * Locks or unlocks the configuration.
 * @param flag If {@code true} the configuration is locked,
 * if {@code false} the configuration is unlocked.
```

```
* @throws IOException If the new lock state cannot be persisted.
* @throws IllegalStateException If this configuration has been deleted.
*/
public void setLocked(boolean flag) throws IOException;

/**
 * Check if the configuration is currently locked.
 * @return {@code true} if the configuration is locked, false otherwise.
 * @throws IllegalStateException If this configuration has been deleted.
 */
public boolean isLocked();
```

If the configuration is locked using `setLocked(true)` this state is persisted and the configuration remains locked until it is explicitly unlocked calling `setLocked(false)`. If the configuration is locked and `Configuration.update()`, `Configuration.update(Dictionary)` or `Configuration.delete()` is called, a `LockedConfigurationException` (subclass of `IOException`) is thrown.

5.1.2.1 Security impacts

A new action, LOCK, is added to the configuration permission. In order to lock or unlock a configuration, the caller needs the permission to do so. The verification of the permission is handled in the same way as for the CONFIGURE action as outline in section 104.11.1.

5.1.3 Improving Configuration Updates

Currently, any call of the update method on the Configuration object assumes that the configuration actually changed. The change count is increased, listeners and managed service (factories) are informed.

Configuration Admin should actually check whether the updated configuration is the same as the previous configuration, and if so ignore this operation. This allows all (provisioning) clients to simply update a configuration without reimplementing a complicated change check. Doing it once in Configuration Admin is more efficient and improves the handling for every client.

As configurations should only contain a limited set of types, equals can be called on the property values to find out whether the values are the same. For arrays, equals need to be called on each member of the array.

```
/**
 * Update the properties of this {@code Configuration} object if the
 * provided properties are different than the currently stored set
 *
 * If the properties are the same, no operation is performed, otherwise it
 * stores the properties in persistent storage after adding or overwriting
 * the following properties:
 * <ul>
 * <li>"service.pid" : is set to be the PID of this configuration.</li>
 * <li>"service.factoryPid" : if this is a factory configuration it is set
 * to the factory PID else it is not set.</li>
 * </ul>
 * These system properties are all of type {@code String}.
 *
 * <p>
 * If the corresponding Managed Service/Managed Service Factory is
```

```
* registered, its updated method must be called asynchronously. Else, this
* callback is delayed until aforementioned registration occurs.
*
* <p>
* Also notifies all Configuration Listeners with a
* {@link ConfigurationEvent#CM_UPDATED} event.
*
* @param properties the new set of properties for this configuration
* @throws LockedConfigurationException If the configuration is locked
* @throws IOException if update cannot be made persistent
* @throws IllegalArgumentException if the {@code Dictionary} object
*         contains invalid configuration types or contains case variants of
*         the same key name.
* @throws IllegalStateException If this configuration has been deleted.
*/
public void setProperties(Dictionary<String, ?> properties) throws IOException;
```

5.1.4 Capabilities

The Configuration Admin implementation bundle must provide the `osgi.implementation` capability with name `osgi.cm`. This capability can be used by provisioning tools and during resolution to ensure that a Configuration Admin implementation is present to manage configurations. The capability must also declare a uses constraint for the `org.osgi.service.cm` package and provide the version of this specification:

```
Provide-Capability: osgi.implementation;
                   osgi.implementation="osgi.cm";
                   uses:="org.osgi.service.cm";
                   version:Version="1.6"
```

This capability must follow the rules defined for the `osgi.implementation` Namespace.

The bundle providing the Configuration Admin service must provide a capability in the `osgi.service` namespace representing this service. This capability must also declare a uses constraint for the `org.osgi.service.cm` package:

```
Provide-Capability: osgi.service;
                   objectClass:List<String>="org.osgi.service.cm.ConfigurationAdmin";
                   uses:="org.osgi.service.cm"
```

This capability must follow the rules defined for the `osgi.service` Namespace.

5.2

6 Data Transfer Objects

RFC 185 defines Data Transfer Objects as a generic means for management solutions to interact with runtime entities in an OSGi Framework. DTOs provides a common, easily serializable representation of the technology.

For all new functionality added to the OSGi Framework the question should be asked: would this feature benefit from a DTO? The expectation is that in most cases it would.

The DTOs for the design in this RFC should be described here and if there are no DTOs being defined an explanation should be given explaining why this is not applicable in this case.

This section is optional and could also be provided in a separate RFC.

7 Javadoc

Please include Javadoc of any new APIs here, once the design has matured. Instructions on how to export Javadoc for inclusion in the RFC can be found here: <https://www.osgi.org/members/RFC/Javadoc>

8 Considered Alternatives

8.1

9 Security Considerations

Description of all known vulnerabilities this may either introduce or address as well as scenarios of how the weaknesses could be circumvented.

10 Document Support

10.1 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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10.3 Acronyms and Abbreviations

10.4 End of Document