 P2P Universal Computing Consortium		Page1 (33)
<b>PUCC Metadata Specification – OSGi-based Device</b>		

**PUCC Metadata Specification -  
OSGi-based Device  
(Version 1.0 - March 22, 2012)**

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## 1. Introduction

This document specifies OSGi Device Metadata.

## 2. Terminology

### 2.1. Definition

The following terms are defined in PUCC Device Discovery and Service Invocation Protocol Specification.

- Service;

- Device;

The template for devices and services are defined by "PUCC Device and Service Metadata Template".

### 2.2. Abbreviation

**PUCC** Peer-to-Peer Universal Computing Consortium

**TD** Technical Document

**TS** Technical Specification

**TR** Technical Report

**WG** Working group

## 3. Reference

[PUCC] “Peer-to-Peer Universal Computing Consortium”,

URL: <http://www.pucc.jp/>

[XML] “Extensible Markup Language (XML) 1.0 (Second Edition)”, W3C Recommendation 6 October 2000, T.

Bray et al. URL: <http://www.w3.org/TR/2000/REC-xml-20001006>

[HTTP] “Hypertext Transfer Protocol -- HTTP/1.1”, RFC2616, R. Fielding et al., June 1999.

URL: <http://www.ietf.org/rfc/rfc2616.txt>

[URI] “Universal Resource Identifier”

URL: <http://www.w3.org/Addressing/>

[OSGi] “Open Services Gateway initiative”


URL: <http://www.osgi.org/>

## 4. Goals and Requirements

### 4.1. Goals

The goal of this document is:

- ◆ Specifying OSGi Device Metadata.

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## **4.2. Requirements**

### **4.2.1. Generality**

The metadata description must be independent of particular manufacture.

## 5. OSGi Device Metadata Specification Baseline

OSGi Device is a device based on OSGi Service Platform.

OSGi Service Platform provides Application (OSGi Bundle) management functionalities including dynamic installation/invocation/update/suspension/uninstall without rebooting Java VM.

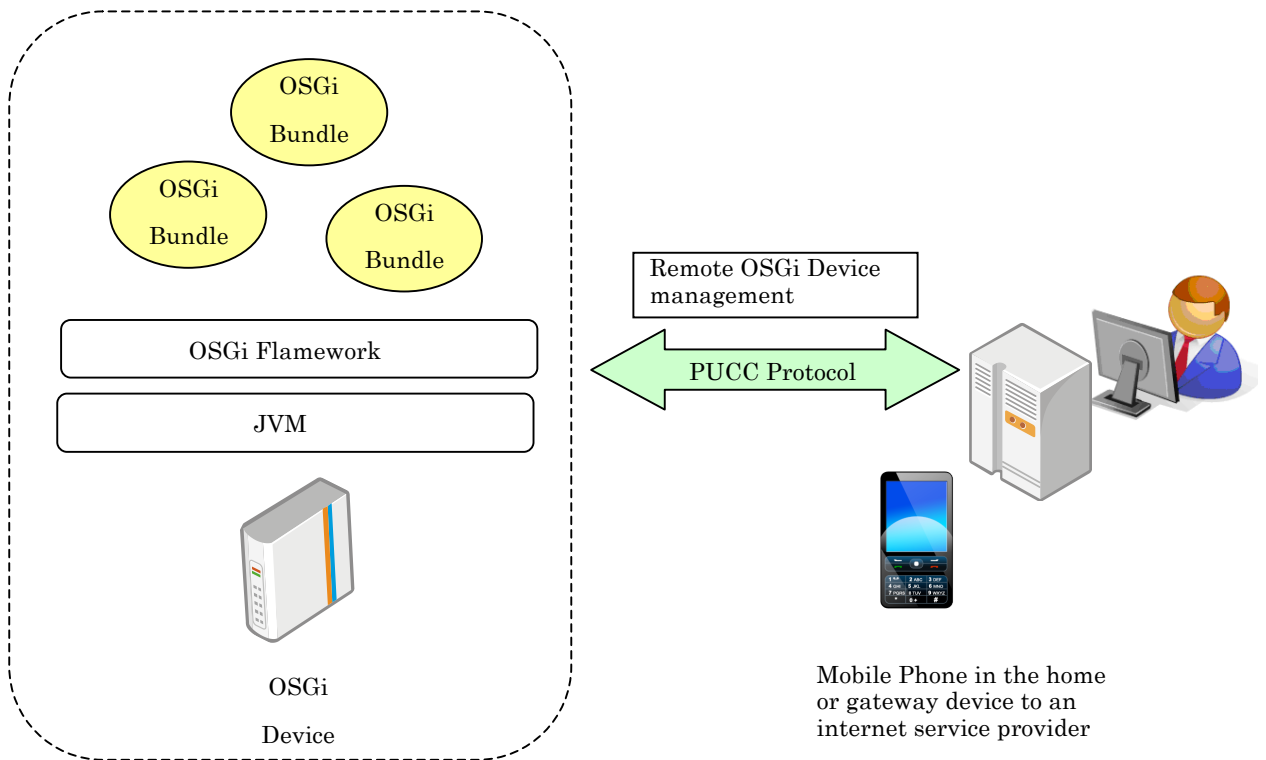


Figure 5-1. OSGi Device management overview

The followings are the features of OSGi Device Model,

- State Variables
  - OSGi Service Platform properties
  - Lists of Installed bundle's information
  - Additional OSGi service platform information
  
- Services
  - Install the new bundle
  - Obtain the list of installed bundle' s information
  - Update installed bundle' s information
  - Invocation/suspension/update/uninstallation of the installed bundles
  
- Event
  - State transition event of Bundle
  - Log event

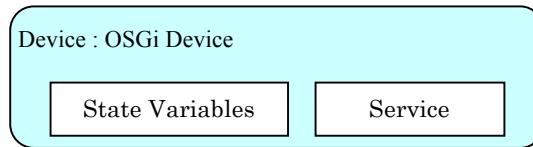
t

## 6. OSGi Device

In this section, OSGi device metadata is specified.

### 6.1. Device Model

The following is the model of OSGi Device



**Figure 6.1-1. OSGi Device Model**

### 6.2. Device Type

The following is the OSGi Device Type identifier.

<http://www.pucc.jp/2012/03/Device/OSGiDevice>



### 6.3. State Variables

The followings are the table of OSGi Device’s State Variables and features.

**Table 6.3-1: OSGi Device State Variables**

	State Variables	Description	Data Type	Event
1	Version	OSGi ServicePlatform Version	string	No
2	Vendor	OSGi ServicePlatform Vendor name	string	No
3	ExecutionEnvironment	Jave ExecusionEnvironment Name on OSGi ServicePlatform	string	No
4	Processor	Processor name used by OSGi ServicePlatform	string	No
5	OsVersion	OS version for OSGi ServicePlatform excusion environment.	string	No
6	OsName	OS name for OSGi ServicePlatform excusion environment	string	No
7	BundleList	Installed Bundle information list to the OSGi Device	array	Yes
8	Bundle	Installed Bundle’s list to the OSGi Device	struct	Yes
9	BundleId	Bundle ID which can be uniquely identified in an OSGi Device.	integer	No
10	Status	Bundle Status	string	No
11	Name	Bundle’s name	string	No
12	Url	URL locating a Bundle	string	No
13	Version	Bundle Version	string	No
14	StartLevel	Requiring Level for starting Bundle.	string	No
15	ImportServiceList	Service name list imported by a Bundle	array	No
16	ImportService	Service name imported by a Bundle	string	No
17	ExportServiceList	Service name list exported by a Bundle	array	No
18	ExportService	Service name exported by a Bundle	array	No
19	ImportPackageList	Package name list imported by a Bundle.	array	No
20	ImportPackage	Package name imported by a Bundle.	string	No

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21		ImportVersion	Package version imported by a Bundle.	string	No
22		ExportPackageList	Package name list exported by a Bundle	array	No
23		ExportPackage	Package name exported by a Bundle.	string	No
24		ExportVersion	Package version exported by a Bundle.	string	No
25		Activator	Bundle's activator class name.	string	No
26		Manifest	Bundle's manifest contents.	string	No
27		Permission	Bundle's permission information	string	No
28		LogList	Log list recording Bundle's activities.	array	Yes
29		dateTime	Log record date and time.	dateTime	No
30		Level	Log output level.	string	No
31		Log	Log messages.	string	No
32		ServiceList	A List of OSGi Services which are subscribed to OSGi ServicePlatform	array	Yes
33		Service	OSGi Service information which is installed on OSGi Device.	struct	No
34		ServiceId	OSGi Service ID subscribed to OSGi ServicePlatform. ServiceId is uniquely identified in an OSGi Device.	integer	No
35		ObjectClass	OSGi Service name (Class name) subscribed to OSGi ServicePlatform.	string	No
36		PropertyList	List of OSGi ServicePlatform properties.	array	Yes
37		Property	A Property of OSGi ServicePlatform	struct	No
38		Key	Property Key	string	No
39		Value	Property Value	string	No
40		DefaultStartLevel	Default Level for starting Bundle.	integer	No
41		MaxLogSize	Maximum number of the log for recording.	integer	No

#### 6.4. Services

The followings are OSGi Device Services.

**Table 6.4-1: OSGi Device Services**

	Service	Description
1	Install	Install a Bundle on OSGi Platform.
2	Update	Update a Bundle on OSGi Platform.
3	GetBundleList	Obtain information list of Bundles installed on OSGi Platform.
4	GetBundle	Obtain a Bundle information installed on OSGi Platform.
5	GetServiceList	Obtain information list of Services subscribed to OSGi Platform.
6	Start	Invoke the Bundle having ID specified by an argument.
7	Stop	Stop the Bundle having ID specified by an argument.
8	Uninstall	Uninstall the Bundle having ID specified by an argument form a OSGi Platform.
9	SetStartLevel	Set Start Level to the Bundle having ID specified by an argument.
10	Refresh	Release package(s) whose exported Bundles do NOT exist on OSGi Platform.
11	Gc	Invoke Java execution Environment's Gabage Correction Process on OSGi Platform.
12	Shutdown	Terminate OSGi Platform process.
13	GetProperty	Obtain matched Property Value with Property Key on OSGi Platform.
14	SetProperty	Set Property Value to the Property matched by Property Key on OSGi Platform.
15	SetDefaultStartLevel	Set Bundle's default Start Level to OSGi PlatformOSGi.
16	SetMaxLogSize	Set maximum number of Logs on OSGi Platform.
17	GetLogList	Output all Log information on OSGi Platform.OSGi.°
18	GetLog	Output a Bundle's Log having an ID specified by an arugument.
19	GetIcon	Obtain OSGi Device's icon picture Obtaine OSGi Device Icon picture data.

Each Service's detailed description are shown in below,

### 6.4.1. Install

(1) Description

This section specifies a Bundle installation on OSGi plat form.

To OSGi Platform.

(2) Service Identifier

<http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Install>

(3) Input parameters

**Table 6.4.1-1: Install service input paraeters**

	Parameter	Related State Variable	Particulars
1	url	Url	-

(4) Output parameters

**Table 6.4.1-2: Install service output paraeters**

	Parameter	Related State Variables	Particulars
1	bundleId	BundleId	-

### 6.4.2. Update

(1) Description

This section specifies a Bundle update on OSGi Platform

(2) Service Identifier

<http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Update>

(3) Input parameters

**Table 6.4.2-1: Update Service output parameters**

	Parameter	Related State Variable	Particulars
1	bundleId	BundleId	-

(4) Output parameters

None.

### 6.4.3. GetBundleList

(1) Description

Obtain information list of Bundles installed on OSGi Platform.

(2) Service Identifier

<http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetBundleList>

(3) Input parameters

None.

(4) Output parameters

**Table 6.4.3-1: GetBundleList service output parameters**

	Parameter	Related State Variable	Particulars
1	bundleList	BundleList	-
2	bundle	Bundle	-
3	bundleId	BundleId	-
4	status	Status	-
5	name	Name	-

### 6.4.4. GetBundle

(1) Description

Obtain a Bundle information installed on OSGi Platform.

(2) Service Identifier

<http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetBundle>

(3) Input parameters

**Table 6.4.4-1: GetBundle service input parameters**

	Parameter	Related State Variable	Particulars
1	bundleId	BundleId	-

(4) Output parameters

**Table 6.4.4-2: GetBundle service output parameters**

	Parameter	Related State Variable	Particulars
1	bundleId	BundleId	-
2	status	Status	-
3	name	Name	-
4	url	Url	-
5	version	Version	-
6	startLevel	StartLevel	-
7	importServiceList	ImportServiceList	-
8	importService	ImportService	-
9	exportServiceList	ExportServiceList	-
10	exportService	ExportService	-
11	importPackageList	ImportPackageList	-
12	importPackage	ImportPackage	-
13	importVersion	ImportVersion	-
14	exportPackageList	ExportPackageList	-
15	exportPackage	ExportPackage	-
16	exportVersion	ExportVersion	-
17	activator	Activator	-
18	manifest	Manifest	-
19	permission	Permission	-

**6.4.5. GetServiceList**

(1) Description

Obtain information list of Services subscribed to OSGi Platform.

(2) Service Identifier

<http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetServiceList>

(3) Input parameters

None

(4) Output parameters

**Table 6.4.5-1: GetServiceListService output parameters**

	Parameter	Related State Variable	Particulars
1	serviceList	ServiceList	-
2	service	Service	-
3	serviceId	ServiceId	-
4	objecstClass	ObjecstClass	-

**6.4.6. Start**

(1) Description

Invoke the Bundle having ID specified by an argument.

(2) Service Identifier

<http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Start>

(3) Input parameters

**Table 6.4.6-1: StartService input parameters**

	Parameter	Related State Variable	Particulars
1	bundleId	BundleId	-

(4) Output parameters

None

**6.4.7. Stop**

(1) Decription

Stop the Bundle having ID specified by an argument.

(2) Service Identifier

<http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Stop>

(3) Input parameters

**Table 6.4.7-1: StopService input parameters**

	Parameter	Related State Variable	Particulars
1	bundleId	BundleId	-

(4) Output parameters

None

**6.4.8. Uninstall**

(1) Description

Uninstall the Bundle having ID specified by an argument form a OSGi Platform.

(2) Service Identifier

<http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Uninstall>

(3) Input parameters

**Table 6.4.8-1: UninstallService input parameters**

	Parameter	Related State Variable	Particulars
1	bundleId	BundleId	-

(4) Output parameters

None

**6.4.9. SetStartLevel**

(1) Description

Set Start Level to the Bundle having ID specified by an argument.

(2) Service Identifier

<http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/SerStartLevel>

(3) Input parameters


**Table 6.4.9-1: SetStartLevelService input parameters**

	Parameter	Related State Variable	Particulars
1	bundleId	BundleId	-
2	startLevel	StartLevel	-

(4) Output parameters

None



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#### 6.4.10. Refresh

(1) Description

Release package(s) whose exported Bundles do NOT exist on OSGi Platform.

(2) Service Identifier

<http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Refresh>

(3) Input parameters

None

(4) Output parameters

None

#### 6.4.11. Gc

(1) Description

Invoke Java execution Environment's Gabage Correction Process on OSGi Platform.

(2) Service Identifier

<http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Gc>

(3) Input parameters

None.

(4) Output parameters

None.

**6.4.12. Shutdown**

(1) Description

Terminate OSGi Platform process.

(2) Service Identifier

<http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Shutdown>

(3) Input parameters

None.

(4) Output parameters

None.

**6.4.13. GetProperty**

(1) Description

Obtain matched Property Value with Property Key on OSGi Platform.

(2) Service Identifier

<http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetProperty>

(3) Input parameters

**Table 6.4.13-1: GetProperty service input parameters**

	Parameter	Related State Variable	Particulars
1	key	Key	-

(4) Output parameters

**Table 6.4.13-2: GetProperty service output parameters**

	Parameter	Related State Variable	Particulars
1	value	Value	-

#### 6.4.14. SetProperty

(1) Description

Set Property Value to the Property matched by Property Key on OSGi Platform.

(2) Service Identifier

<http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/SetProperty>

(3) Input parameters

**Table 6.4.14-1: SetProperty service input parameters**

	Parameter	Related State Variable	Particulars
1	key	Key	-
2	value	Value	-

(4) Output parameters

None.

#### 6.4.15. SetDefaultStartLevel

(1) Description

Set Bundle's default Start Level to OSGi Platform.

(2) Service Identifier

<http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/SetDefaultStartLevel>

(3) Input parameters

**Table 6.4.15-1: SetDefaultStartLevelService input parameters**

	Parameter	Related State Variable	Particulars
1	defaultStartLevel	DefaultStartLevel alue	-

(4) Output parameters

None.

#### 6.4.16. SetMaxLogSize

(1) Description

Set maximum number of Logs on OSGi Platform.

(2) Service Identifier

<http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/SetMaxLogSize>

(3) Input parameters

**Table 6.4.16-1: SetMaxLogSize service input parameters**

	Parameter	Related State Variable	Particulars
1	maxLogSize	MaxLogSize	-

(4) Output parameters

None.

#### 6.4.17. GetLogList

(1) Description

Output all Log information on OSGi Platform.

(2) Service Identifier

<http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetLogList>

(3) Input parameters

None.

(4) Output parameters

**Table 6.4.17-1: GetLogList service output parameters**

	Parameter	Related State Variable	Particulars
1	logList	LogList	-
2	bundleId	BundleId	-
3	dateTime	DateTime	-
4	level	Level	-
5	log	Log	-

#### 6.4.18. GetLog

(1) Description

Output a Bundle's Log having an ID specified by an argument.

(2) Service Identifier

<http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetLog>

(3) Input parameters

**Table 6.4.18-1: GetLog service input parameters**

	Parameter	Related State Variable	Particulars
1	bundleId	BundleId	-

(4) Output parameters

**Table 6.4.18-2: GetLog service output parameters**

	Parameter	Related State Variable	Particulars
1	logList	LogList	-
2	dateTime	DateTime	-
3	level	Level	-
4	log	Log	-

#### 6.4.19. GetIcon

(1) Descriptions

Obtain OSGi Device's icon picture.

(2) Service Identifier

<http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetIcon>

(3) Input parameters

**Table 6.4.19-1: GetIcon service input parameters**

	Parameter	Data Type	Particulars
1	url	anyURI	Icon picture's URL.

(4) Output parameters

**Table 6.4.19-2: GetIcon service input parameters**

	Parameter	Data Type	Particulars
1	mimeType	string	Icon picture's MIME Type
2	base64Data	base64Binary	Icon picture's encoded data by BASE64.

## 6.5. Metadata

### 6.5.1. Device Metadata

The followings are the OSGi Device's metadata.

*Italic strings in red color*: SHOULD be filled in accordance with each OSGi Device instance.

```

<?xml version="1.0"?>
<Device type="http://www.pucc.jp/2012/03/Device/OSGiDevice"
      id="global unique ID for this device" name="short user-friendly title">
  <Specification>
    <URLBase>base URL for all relative URLs</URLBase>
    <Manufacturer>manufacturer name</Manufacturer>
    <ManufacturerURL>URL to manufacturer site</ManufacturerURL>
    <ManufactureDate>date of manufacture</ManufactureDate>
    <ModelDescription>long user-friendly title</ModelDescription>
    <ModelName>model name</ModelName>
    <ModelNumber>model number</ModelNumber>
    <ModelURL>URL to model site</ModelURL>
    <SerialNumber>manufacturer's serial number</SerialNumber>
    <UDN>uuid:UUID</UDN>
    <UPC>Universal Product Code</UPC>
    <IconList>
      <Icon>
        <MimeType>image/format</MimeType>
        <Width>horizontal pixels</width>
        <Height>vertical pixels</height>
        <Depth>color depth</depth>
        <Url>URL to icon</Url>
      </icon>
      XML to declare other icons, if any, go here
    </IconList>
  </Specification>
  <StateVariableList>
    <StateVariable name="Version" datatype="string" sendEvents="no"/>
    <StateVariable name="Vendor" datatype="string" sendEvents="no"/>
    <StateVariable name="ExecutionEnvironment" datatype="string" sendEvents="no"/>
    <StateVariable name="Processor" datatype="string" sendEvents="no"/>
    <StateVariable name="OsVersion" datatype="string" sendEvents="no"/>
    <StateVariable name="OsName" datatype="string" sendEvents="no"/>
    <StateVariable name="BundleList" datatype="array" sendEvents="yes">
      <StateVariable name="Bundle" datatype="struct" sendEvents="no">
        <StateVariable name="BundleId" datatype="integer" sendEvents="no"/>
        <StateVariable name="Status" datatype="string" sendEvents="no"/>
        <StateVariable name="Name" datatype="string" sendEvents="no"/>
        <StateVariable name="Url" datatype="string" sendEvents="no"/>
      </StateVariable>
    </StateVariableList>

```

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```

<StateVariable name="Version" datatype="string" sendEvents="no"/>
<StateVariable name="StartLevel" datatype="string" sendEvents="no"/>
<StateVariable name="ImportServiceList" datatype="array" sendEvents="no">
  <StateVariable name="ImportService" datatype="string" sendEvents="no"/>
</StateVariable>
<StateVariable name="ExportServiceList" datatype="array" sendEvents="no">
  <StateVariable name="ExportService" datatype="string" sendEvents="no"/>
</StateVariable>
<StateVariable name="ImportPackageList" datatype="array" sendEvents="no">
  <StateVariable name="ImportPackage" datatype="string" sendEvents="no"/>
  <StateVariable name="ImportVersion" datatype="string" sendEvents="no"/>
</StateVariable>
<StateVariable name="ExportPackageList" datatype="array" sendEvents="no">
  <StateVariable name="ExportPackage" datatype="string" sendEvents="no"/>
  <StateVariable name="ExportVersion" datatype="string" sendEvents="no"/>
</StateVariable>
<StateVariable name="Activator" datatype="string" sendEvents="no"/>
<StateVariable name="Manifest" datatype="string" sendEvents="no"/>
<StateVariable name="Permission" datatype="string" sendEvents="no"/>
<StateVariable name="LogList" datatype="array" sendEvents="yes">
  <StateVariable name="dateTime" datatype="dateTime" sendEvents="no"/>
  <StateVariable name="Level" datatype="string" sendEvents="no"/>
  <StateVariable name="Log" datatype="string" sendEvents="no"/>
</StateVariable>
</StateVariable>
</StateVariable>
<StateVariable name="ServiceList" datatype="array" sendEvents="yes">
  <StateVariable name="Service" datatype="struct" sendEvents="no">
    <StateVariable name="ServiceId" datatype="integer" sendEvents="no"/>
    <StateVariable name="ObjectClass" datatype="string" sendEvents="no"/>
  </StateVariable>
</StateVariable>
<StateVariable name="PropertyList" datatype="array" sendEvents="yes">
  <StateVariable name="Property" datatype="struct" sendEvents="no">
    <StateVariable name="Key" datatype="string" sendEvents="no"/>
    <StateVariable name="Value" datatype="string" sendEvents="no"/>
  </StateVariable>
</StateVariable>
<StateVariable name="DefaultStartLevel" datatype="integer" sendEvents="no"/>
<StateVariable name="MaxLogSize" datatype="integer" sendEvents="no"/>
</StateVariableList>
<ServiceList>
  <Service name="Install"
    type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Install"/>
  <Service name="Update"
    type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Update"/>
  <Service name="GetBundleList"

```



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```
type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetBundleList"/>
<Service name="GetBundle"
type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetBundle"/>
<Service name="GetServiceList"
type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetServiceList"/>
<Service name="Start"
type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Start"/>
<Service name="Stop"
type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Stop"/>
<Service name="Uninstall"
type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Uninstall"/>
<Service name="SetStartLevel"
type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/SetStartLevel"/>
<Service name="Refresh"
type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Refresh"/>
<Service name="Gc"
type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Gc"/>
<Service name="Shutdown"
type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Shutdown"/>
<Service name="GetProperty"
type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetProperty"/>
<Service name="SetProperty"
type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/SetProperty"/>
<Service name="SetDefaultStartLevel"
type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/SetDefaultStartLevel"/>
<Service name="SetMaxLogSize"
type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/SetMaxLogSize"/>
<Service name="GetLogList"
type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetLogList"/>
<Service name="GetLog"
type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetLog"/>
<Service name="GetIcon"
type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetIcon"/>
</ServiceList>
<PrimitiveDeviceList/>
</Device>
```

### 6.5.2. Service Metadata

The followings are the Service Metadata template in OSGi Device.

#### (1) Install service metadata

```
<?xml version="1.0" ?>
<Service name="Install"
  type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Install">
  <InputParameterList>
    <Parameter name="url" relatedStateVariable="Url"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="bundleId" relatedStateVariable="BundleId"/>
  </OutputParameterList>
</Service>
```

#### (2) Update service metadata

```
<?xml version="1.0" ?>
<Service name="Update"
  type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Update">
  <InputParameterList>
    <Parameter name="bundleId" relatedStateVariable="bundleId"/>
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

#### (3) GetBundleList service metadata

```
<?xml version="1.0" ?>
<Service name="GetBundleList"
  type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetBundleList">
  <InputParameterList/>
  <OutputParameterList>
    <Parameter name="bundleList" relatedStateVariable=" BundleList "/>
    <Parameter name="bundle" relatedStateVariable=" Bundle"/>
    <Parameter name="bundleId" relatedStateVariable=" BundleId"/>
    <Parameter name="status" relatedStateVariable=" Status"/>
    <Parameter name="name" relatedStateVariable=" Name"/>
  </OutputParameterList>
</Service>
```

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## (4) GetBundle service metadata

```
<?xml version="1.0" ?>
<Service name="GetBundle"
  type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetBundle">
  <InputParameterList>
    <Parameter name="bundleId" relatedStateVariable="BundleId"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="bundleId" relatedStateVariable="BundleId"/>
    <Parameter name="status" relatedStateVariable="Status"/>
    <Parameter name="name" relatedStateVariable="Name"/>
    <Parameter name="url" relatedStateVariable="Url"/>
    <Parameter name="version" relatedStateVariable="Version"/>
    <Parameter name="startLevel" relatedStateVariable="StartLevel"/>
    <Parameter name="importServiceList" relatedStateVariable="ImportServiceList"/>
    <Parameter name="importService" relatedStateVariable="ImportService"/>
    <Parameter name="exportServiceList" relatedStateVariable="ExportServiceList"/>
    <Parameter name="exportService" relatedStateVariable="ExportService"/>
    <Parameter name="importPackageList" relatedStateVariable="ImportPackageList"/>
    <Parameter name="importPackage" relatedStateVariable="ImportPackage"/>
    <Parameter name="importVersion" relatedStateVariable="ImportVersion"/>
    <Parameter name="exportPackageList" relatedStateVariable="ExportPackageList"/>
    <Parameter name="exportPackage" relatedStateVariable="ExportPackage"/>
    <Parameter name="exportVersion" relatedStateVariable="ExportVersion"/>
    <Parameter name="activator" relatedStateVariable="Activator"/>
    <Parameter name="manifest" relatedStateVariable="Manifest"/>
    <Parameter name="permission" relatedStateVariable="Permission"/>
  </OutputParameterList>
</Service>
```

## (5) GetServiceList metadata

```
<?xml version="1.0" ?>
<Service name="GetServiceList"
  type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetServiceList">
  <InputParameterList/>
  <OutputParameterList>
    <Parameter name="serviceList" relatedStateVariable="ServiceList"/>
    <Parameter name="service" relatedStateVariable="Service"/>
    <Parameter name="serviceId" relatedStateVariable="ServiceId"/>
    <Parameter name="objectClass" relatedStateVariable="ObjectClass"/>
  </OutputParameterList>
</Service>
```

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(6) Start service metadata

```
<?xml version="1.0" ?>
<Service name="Start"
  type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Start">
  <InputParameterList>
    <Parameter name="bundleId" relatedStateVariable="bundleId" />
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

(7) Stop service metadata

```
<?xml version="1.0" ?>
<Service name="Stop"
  type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Stop">
  <InputParameterList>
    <Parameter name="bundleId" relatedStateVariable="bundleId" />
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

(8) Uninstall service metadata

```
<?xml version="1.0" ?>
<Service name="Uninstall"
  type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Uninstall">
  <InputParameterList>
    <Parameter name="bundleId" relatedStateVariable="bundleId" />
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

(9) SetStartLevel service metadata

```
<?xml version="1.0" ?>
<Service name="SetStartLevel"
  type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/SetStartLevel">
  <InputParameterList>
    <Parameter name="bundleId" relatedStateVariable="bundleId" />
    <Parameter name="startLevel" relatedStateVariable="StartLevel"/>
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

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(10) Refresh service metadata

```
<?xml version="1.0" ?>
<Service name="Refresh"
  type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Refresh">
  <InputParameterList/>
  <OutputParameterList/>
</Service>
```

(11) Gc service metadata

```
<?xml version="1.0" ?>
<Service name="Gc"
  type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Gc">
  <InputParameterList/>
  <OutputParameterList/>
</Service>
```

(12) Shutdown service metadata

```
<?xml version="1.0" ?>
<Service name="Gc"
  type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/Shutdown">
  <InputParameterList/>
  <OutputParameterList/>
</Service>
```

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(13) GetProperty service metadata

```
<?xml version="1.0" ?>
<Service name="GetProperty"
  type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetProperty">
  <InputParameterList>
    <Parameter name="key" relatedStateVariable="Key"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="value" relatedStateVariable="Value"/>
  </OutputParameterList>
</Service>
```

(14) SetProperty service metadata

```
<?xml version="1.0" ?>
<Service name="SetProperty"
  type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/SetProperty">
  <InputParameterList>
    <Parameter name="key" relatedStateVariable="Key"/>
    <Parameter name="value" relatedStateVariable="Value"/>
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

(15) SetDefaultStartLevel service metadata

```
<?xml version="1.0" ?>
<Service name="SetDefaultStartLevel"
  type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/SetDefaultStartLevel">
  <InputParameterList>
    <Parameter name="defaultStartLevel" relatedStateVariable="DefaultStartLevel"/>
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

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(16) SetMaxLogSize service metadata

```
<?xml version="1.0" ?>
<Service name="SetMaxLogSize"
  type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/SetMaxLogSize">
  <InputParameterList>
    <Parameter name="maxLogSize" relatedStateVariable="MaxLogSize"/>
  </InputParameterList>
  <OutputParameterList/>
</Service>
```

1(17) GetLogList service metadata

```
<?xml version="1.0" ?>
<Service name="GetLogList"
  type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetLogList">
  <InputParameterList/>
  <OutputParameterList>
    <Parameter name="logList" relatedStateVariable="LogList"/>
    <Parameter name="bundleId" relatedStateVariable="BundleId"/>
    <Parameter name="dateTime" relatedStateVariable="DateTime"/>
    <Parameter name="level" relatedStateVariable="Level"/>
    <Parameter name="log" relatedStateVariable="Log"/>
  </OutputParameterList>
</Service>
```

(18) GetLog service metadata

```
<?xml version="1.0" ?>
<Service name="GetLog"
  type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetLog">
  <InputParameterList>
    <Parameter name="bundleId" relatedStateVariable="BundleId"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="logList" relatedStateVariable="LogList"/>
    <Parameter name="dateTime" relatedStateVariable="DateTime"/>
    <Parameter name="level" relatedStateVariable="Level"/>
    <Parameter name="log" relatedStateVariable="Log"/>
  </OutputParameterList>
</Service>
```

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(19) GetIcon service metadata

```
<?xml version="1.0" ?>
<Service name="GetIcon"
  type="http://www.pucc.jp/2012/03/Device/OSGiDevice/Service/GetIcon">
  <InputParameterList>
    <Parameter name="url" dataType="anyURI"/>
  </InputParameterList>
  <OutputParameterList>
    <Parameter name="mimeType" dataType="string"/>
    <Parameter name="base64Data" relatedStateVariable="base64Binary"/>
  </OutputParameterList>
</Service>
```



## Appendix A. Version History

Document number	Date	Note
PUCC Metadata Specification – OSGi-based Device	22 March, 2012	Version 1.0