

[OW2 :: AspireRFID :: UPnP RFID Reader](#)

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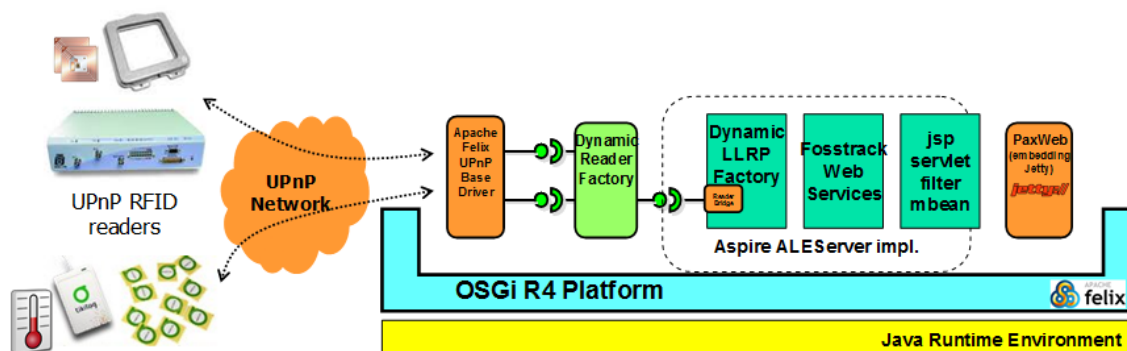
This section describes the bundle emulated an UPnP RFID Reader

1 Context

The installation of new readers and their configuration (ie LRSpec) in the ALE Server is a burden for non-expert people (shop employees for instance) in the context of SOHO. The zero-configuration can be provided by popular service discovery protocols and frameworks such as UPnP and DNS-SD (aka mDNS or Apple Bonjour). [UPnP](#) is the defacto standard for plug-and-play appliances in the small shop and small office (SOHO) context. In order to alleviate the end-user (which is not a RFID integrator or expert), the Aspire middleware will provide a way to taken in account plug-and-play RFID readers (such as shop portals, portable readers, ..) using UPnP. Various implementations of the UPnP specification are available for Java. The Apache Felix UPnP Base Driver provides a bridge between OSGi registry and the UPnP network. It can directly integrated in the OSGi profile of the Aspire ALE Server to discover and to use the UPnP Device.

This project proposes a "zero-configuration" feature for readers communicating with IP (Ethernet, Wifi) using the UPnP infrastructure. It proposes a UPnP device profile (DCP) for RFID Reader. Readers implementing this profile can be discovery automatically by the Aspire ALE server and added (dynamically and without opteraor configuration) as a regular reader thru their LRSpec description.

The following figure depicts the extension of the ALE Server (OSGi profile) in order to add UPnP RFID Device.



The following XML document presents the service description (DCP) of the RFID Readers is `urn:schemas-ow2aspire-org:service:Reader:1`.

- Properties (ro) : properties of the reader (application ...).
- Duration (rw) : duration before two notifications of the report members

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- ReportMembers (subscription only) : tag identifiers scanned during a period (similar to the *ECReport reportMember*). The tag is are comma-separated.

```
<scpd> <serviceStateTable> <stateVariable> <!-- Reader properties --> <name>Properties</name>
<sendEventsAttribute>no</sendEventsAttribute> <dataType>string</dataType> <!-- pairs name-value
x-www-form-urlencoded --> </stateVariable> <stateVariable> <!-- duration between 2 reports -->
<name>Duration</name> <sendEventsAttribute>yes</sendEventsAttribute> <dataType>ui4</dataType>
<!-- in milliseconds --> <defaultValue>1000</defaultValue> </stateVariable> <!-- more parameters
for the reader configuration --> <stateVariable> <!-- Report members -->
<name>ReportMembers</name> <sendEventsAttribute>yes</sendEventsAttribute>
<dataType>string</dataType> <!-- CSV of the hexadecimal representation of EPC identifiers -->
</stateVariable> </serviceStateTable> <actionList> <action> <name>SetDuration</name>
<argumentList> <argument> <name>newDuration</name> <direction>in</direction>
<relatedStateVariable>Duration</relatedStateVariable> </argument> </argumentList> </action>
<action> <name>GetDuration</name> <argumentList> <argument> <name>currentDuration</name>
<direction>out</direction> <relatedStateVariable>Duration</relatedStateVariable> </argument>
</argumentList> </action> <action> <name>GetProperties</name> <argumentList> <argument>
<name>currentProperties</name> <direction>out</direction>
<relatedStateVariable>Properties</relatedStateVariable> </argument> </argumentList> </action>
</actionList> </scpd>
```

Some improvements will coming soon in order to include TDT prefixes, filtering patterns (ie *ECSpec.reportSpec.groupSpec.pattern*), report triggering conditions (ECSpec++), ...

The UPnP Device can also combine the urn:schemas-ow2aspire-org:service:Reader:1 service with other (standardized) DCP ([TemperatureSensor](#), [LowPower](#), ...) as it shows in the following snapshots of the [Intel DeviceSpy tool](#).

The first screenshot shows the details of the 'RFID Reader UPnP Device'. The 'Nom' (Name) column lists various properties like Base URL, Device icon, Device URN, etc. The 'Valeur' (Value) column shows the corresponding values. Below this, a table displays state variables with columns for 'Tem...' (Temperature), 'Source', 'Variable', and 'Valeur' (Value).

Tem...	Source	Variable	Valeur
23.53	RFID Reader UPnP ...	ReportMembers	04d65a59127a00
23.53	RFID Reader UPnP ...	ReportMembers	045f3cf1640280;04d65a59127a00;041f72b9232580
23.52	RFID Reader UPnP ...	ReportMembers	04d65a59127a00;041f72b9232580
23.52	RFID Reader UPnP ...	ReportMembers	04d65a59127a00
23.52	RFID Reader UPnP ...	Duration	10000
23.52	RFID Reader UPnP ...	ReportMembers	045f3cf1640280;041f72b9232580

The second screenshot shows the details of the 'RFID Reader UPnP Device' with a 'TemperatureSensor:1' service. The 'Nom' column lists properties like Methods, Parent presenta..., ParentUDN, etc. The 'Valeur' column shows the corresponding values. Below this, a table displays state variables with columns for 'Tem...', 'Source', 'Variable', and 'Valeur'.

Tem...	Source	Variable	Valeur
15.04	RFID Reader ...	CurrentTemperature	750
15.04	RFID Reader ...	ReportMembers	(Empty)
15.04	RFID Reader ...	CurrentTemperature	700
15.04	RFID Reader ...	ReportMembers	04d65a59127a00
15.04	RFID Reader ...	CurrentTemperature	650
15.04	RFID Reader ...	ReportMembers	045c:8990b0280;044be4f1640280;045f3cf1640280;041f72b9232580
15.04	RFID Reader ...	CurrentTemperature	600
15.04	RFID Reader ...	ReportMembers	045c:8990b0280;044be4f1640280;045f3cf1640280;041f72b9232580
15.04	RFID Reader ...	CurrentTemperature	550
15.04	RFID Reader ...	ReportMembers	04437b9232580;044be4f1640280;045f3cf1640280;041f72b9232580
15.04	RFID Reader ...	CurrentTemperature	500
15.04	RFID Reader ...	CurrentTemperature	450
15.04	RFID Reader ...	CurrentTemperature	500
15.04	RFID Reader ...	CurrentTemperature	550
15.04	RFID Reader ...	CurrentTemperature	600
15.03	RFID Reader ...	CurrentTemperature	650
15.03	RFID Reader ...	CurrentTemperature	700
15.03	RFID Reader ...	CurrentTemperature	750
15.03	RFID Reader ...	CurrentTemperature	800
15.03	RFID Reader ...	CurrentTemperature	850
15.03	RFID Reader ...	CurrentTemperature	900

Various implementations of the UPnP specification are available for Java. The Apache Felix UPnP Base Driver provides a bridge between OSGi registry and the UPnP network. It can directly integrated in the OSGi profile of the Aspire ALE Server to discover and to use the UPnP RFID reader.

2 Demonstrator

A demonstrator of a UPnP RFID Reader is available. It uses the ACR122U reader. The device includes also a fictive [TemperatureSensor](#) service and a [LowPower](#) service for GreenIT purpose. In the demonstration, this service enables the deep sleep and waking up of the PC running the demonstrator (WakeOnLAN must be activate for waking up the PC).

3 Dependencies

This bundle requires :

- OSGi R4 Compendium, available from Felix OBR
- UPnP GenDevice Utils, available from <http://svn.apache.org/viewvc/felix/sandbox/donsez/upnp.devicegen.util/>
- ACR122U client bundle

4 Build

4.1 Sources

- [here](#)

5 Installation

6 Test

7 Configuration

8 Troubleshooting

9 Links

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