AllJoyn™ Onboarding Service Framework Interface Definition

Version 14.06 Update 1

September 29, 2014

Contents

Figures

Tables

1 Introduction

1.1 Purpose

This document describes the specification of the AllJoyn™ Onboarding interface. This interface is used by an Onboarder application to provide the Wi-Fi configuration data to another device.

1.2 Scope

This document is targeted to the developers to build the Onboarding service framework or extend the provided Onboarding service framework codes.

1.3 Release history

Release version	Date	What changed
14.02	2/28/2014	Onboarding interface version 1 was added.
14.06	6/30/2014	
14.06 Update 1	9/29/2014	■ Updated the document title and Overview chapter title (changed Specification to Definition). ■ Added the release version number to the title for version tracking. ■ Added a note in the Definition Overview chapter to address the AllSeen Alliance Compliance and Certification program. ■ Added a Mandatory column for method and signal parameters to support the AllSeen Alliance Compliance and Certification program.

1.4 References

Except for supporting information, the following are reference documents found on the AllSeen Alliance web site's Docs/Downloads section.

- *AllJoyn™ Framework Tutorial*
- *Introduction to AllJoyn™ Thin Library*
- *AllJoyn™ Data Type Signature*

1.5 Acronyms and terms

Term	Definition
AllJoyn device	A device that supports the AllJoyn framework and can connect to a personal network.
Onboardee	A device that requires credential information to join the personal Wi-Fi network.
Onboarder	An application that provides credential information to onboard other device to the personal Wi-Fi network.
Onboarding service framework	An AllJoyn service framework on the onboardee that receives Wi-Fi credentials.
Personal AP	Personal or home Wi-Fi access point.
Soft AP mode	The device can provide a software-enabled access point.

2 Definition Overview

The Onboarding interface is implemented by an application on a target device, referred to as an onboardee. A typical onboardee is an AllJoyn thin client device. This interface allows the onboarder to send the Wi-Fi credentials to the onboardee to allow it to join the personal access point. *Figure 1* illustrates the relationship between an onboardee and an onboarder.

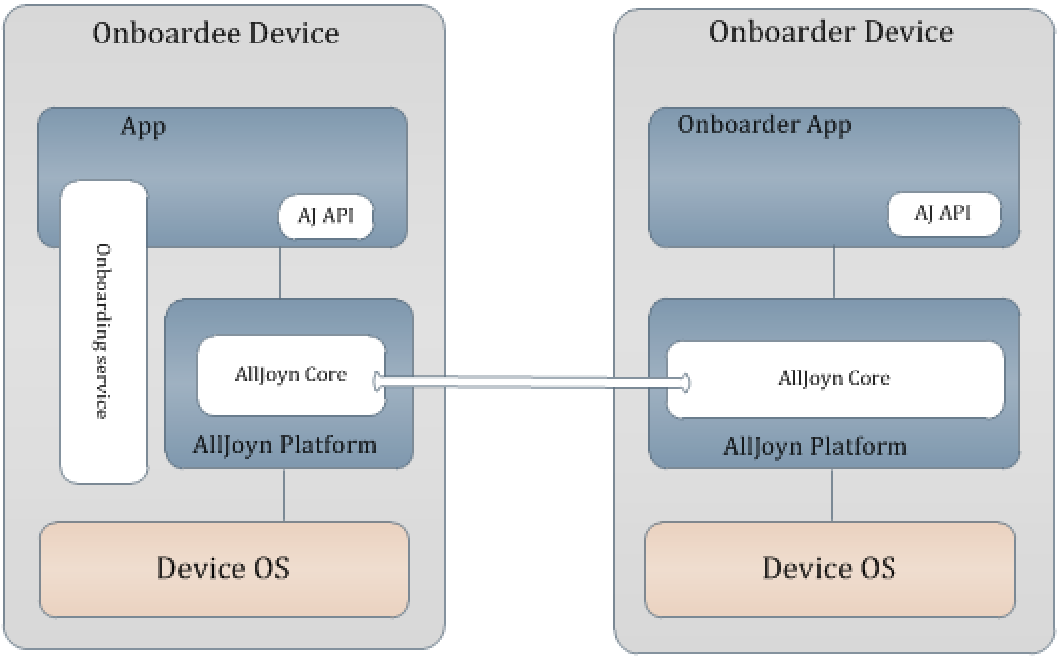

Figure 1: Onboarding service framework architecture within the AllJoyn framework

Note All methods and signals are considered mandatory to support the AllSeen Alliance Compliance and Certification program. Individual parameters for a given method or signal may be considered mandatory or optional, and are specified accordingly in this document.

3 Onboarding Call Flows

3.1 Onboarding call flow using an Android onboarder

Figure 2 illustrates a call flow for onboarding an onboardee using an Android onboarder.

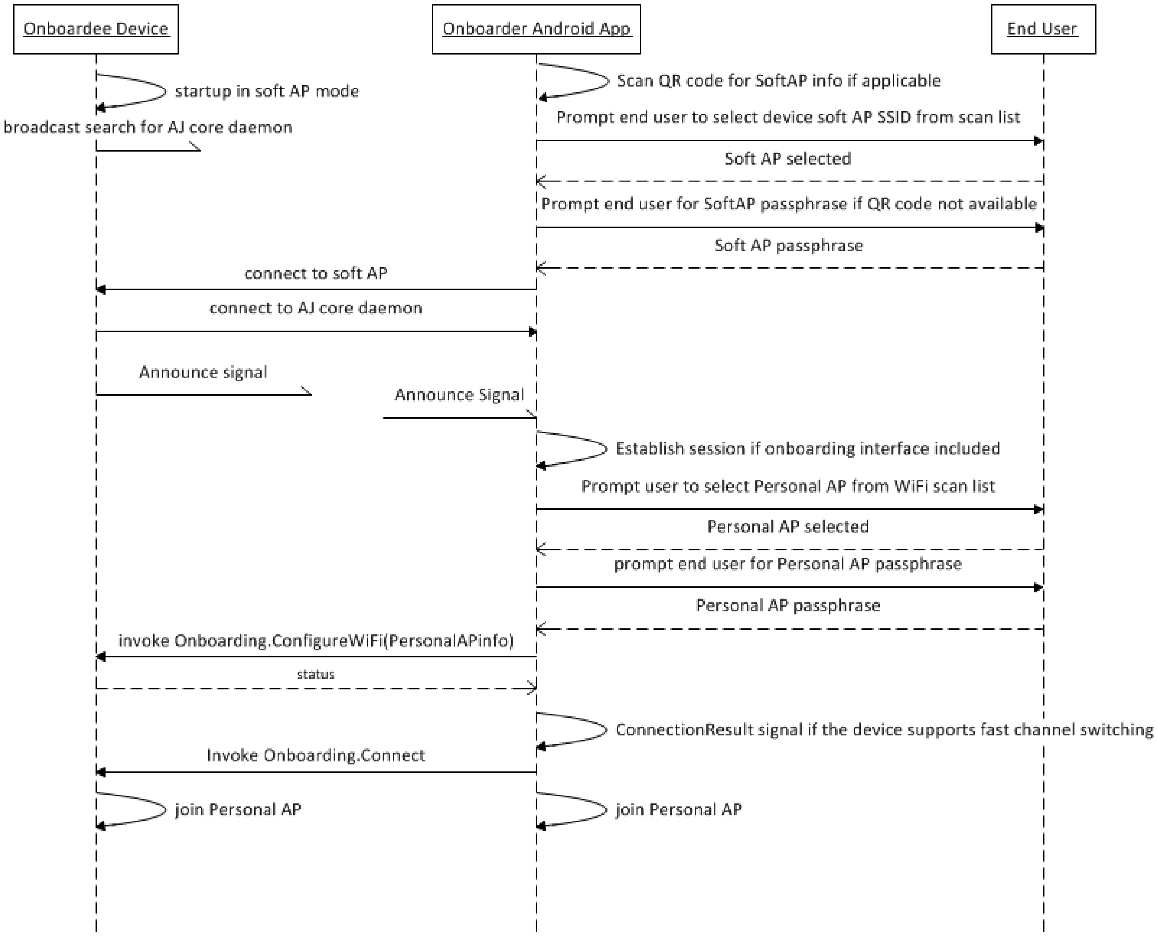
Onboardee Device
Onboarder Android App
End User
Scan QR code for SoftAP info if applicable
startup in soft AP mode
Prompt end user to select device soft AP SSID from scan list
broadcast search for AJ core daemon
Soft AP selected
Prompt end user for SoftAP passphrase if QR code not available
Soft AP passphrase
connect to soft AP
connect to AJ core daemon
Announce signal
Announce Signal
Establish session if onboarding interface included
Prompt user to select Personal AP from WiFi scan list
Personal AP selected
prompt end user for Personal AP passphrase
Personal AP passphrase
invoke Onboarding.ConfigureWiFi(PersonalAPinfo)
status
ConnectionResult signal if the device supports fast channel switching
Invoke Onboarding.Connect
join Personal AP
join Personal AP

Figure 2: Onboarding a device using an Android onboarder

3.2 Onboarding call flow using an iOS onboarder

Figure 3 illustrates a call flow for onboarding an onboardee using an iOS onboarder.

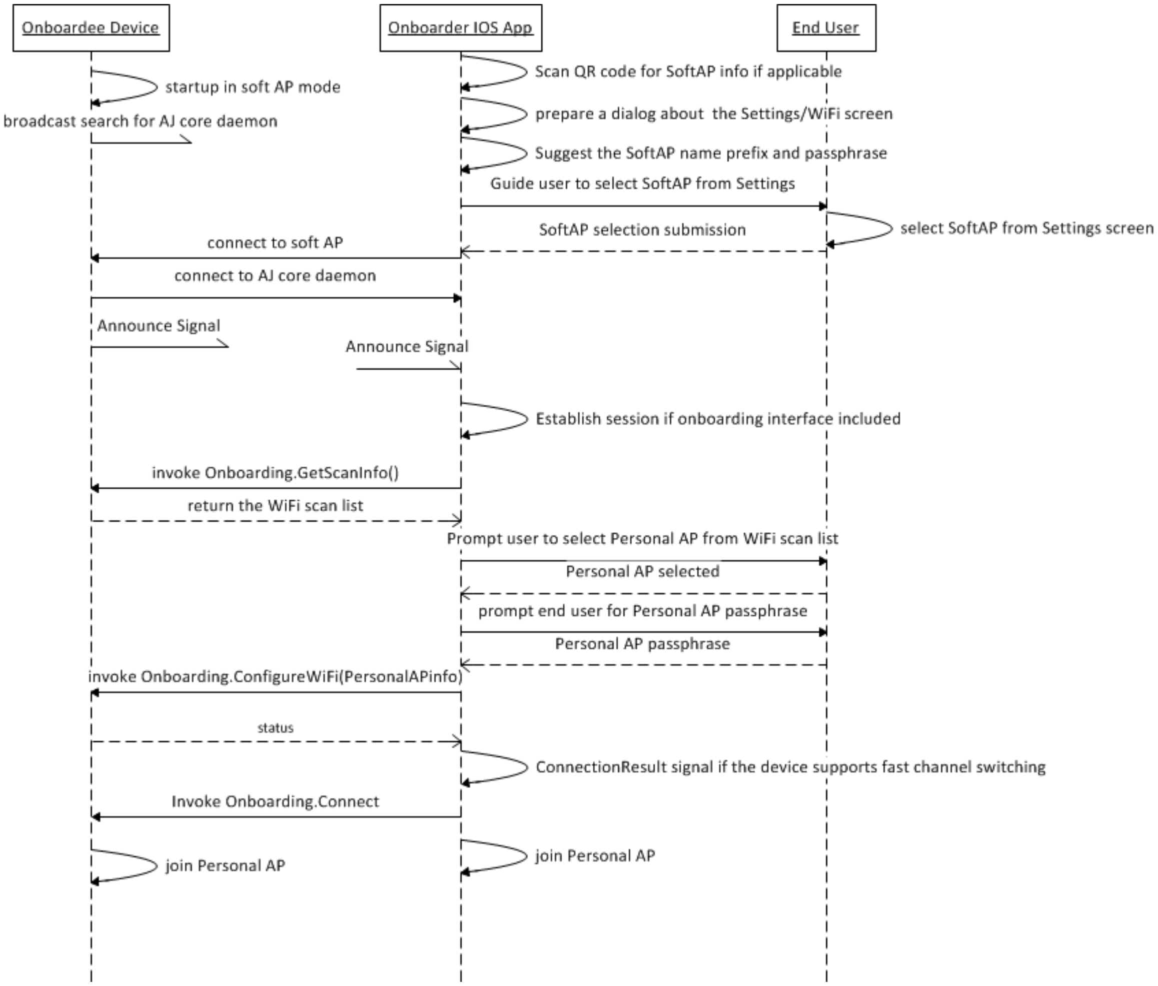
Onboardee Device
Onboarder IOS App
End User
Scan QR code for SoftAP info if applicable
startup in soft AP mode
prepare a dialog about the Settings/WiFi screen
broadcast search for AJ core daemon
Suggest the SoftAP name prefix and passphrase
Guide user to select SoftAP from Settings
SoftAP selection submission
select SoftAP from Settings screen
connect to soft AP
connect to AJ core daemon
Announce Signal
Announce Signal
Establish session if onboarding interface included
invoke Onboarding.GetScanInfo()
return the WiFi scan list
Prompt user to select Personal AP from WiFi scan list
Personal AP selected
prompt end user for Personal AP passphrase
Personal AP passphrase
invoke Onboarding.ConfigureWiFi(PersonalAPinfo)
status
ConnectionResult signal if the device supports fast channel switching
Invoke Onboarding.Connect
join Personal AP
join Personal AP

Figure 3: Onboarding a device using an iOS onboarder

4 Error Handling

The method calls in the Onboarding interface use the AllJoyn error message handling feature (ER_BUS_REPLY_IS_ERROR_MESSAGE) to set the error name and error message.

Table 1 lists the possible errors raised by the Onboarding interface.

Table 1: Onboarding service framework interface errors

Error name	Error message
org.alljoyn.Error.OutOfRange	Value out of range
org.alljoyn.Error.InvalidValue	Invalid value
org.alljoyn.Error.FeatureNotAvailable	Feature not available

5 Onboarding Interface

5.1 Interface name

Interface name	Version	Secured	Object path
org.alljoyn.Onboarding	1	yes	/Onboarding

5.2 Properties

Property name	Signature	List of values	Writable	Description
Version	q	Positive integers	no	Interface version number
State	n	■ 0 – Personal AP Not Configured ■ 1 – Personal AP Configured/Not Validated ■ 2 – Personal AP Configured/ Validating ■ 3 – Personal AP Configured/ Validated ■ 4 – Personal AP Configured/Error ■ 5 – Personal AP Configured/Retry	no	The configuration state
LastError	ns	■ 0 – Validated ■ 1 – Unreachable ■ 2 – Unsupported_protocol ■ 3 – Unauthorized ■ 4 – Error_message	no	The last error code and error message. Error_message is the error message received from the underlying Wi-Fi layer.

5.3 Methods

The following methods are exposed by a BusObject that implements the Onboarding interface.

5.3.1 ConfigWiFi

Inputs

Parameter name	Mandatory	Signature	List of values	Description
SSID	yes	s		Access point SSID
passphrase	yes	s		Access point passphrase
authType	yes	n	■ -3 – WPA2_AUTO ■ -2 – WPA_AUTO ■ -1 – Any ■ 0 – Open ■ 1 – WEP ■ 2 – WPA_TKIP ■ 3 – WPA_CCMP ■ 4 – WPA2_TKIP ■ 5 – WPA2_CCMP ■ 6 – WPS	Authentication type. ■ When it is equal to any, the onboardee must attempt all possible authentication types it supports to connect to the AP. ■ When it is equal to -3 or -2 (WPA2_AUTO or WPA_AUTO), the onboardee attempts to connect to the AP with TKIP cipher and then AES-CCMP cipher. ■ WPA_TKIP indicates WPA with TKIP cipher, ■ WPA2_CCMP indicates WPA2 with AES-CCMP cipher. ■ If the value is invalid, the AllJoyn error code org.alljoyn.Error.OutOfRange will be returned.

Output

Parameter name	Mandatory	Return signature	Description
status	yes	n	The possible values for the connection result status are: ■ 1 – Current SoftAP mode will be disabled upon receipt of Connect. In this case, the Onboarder application must wait for the device to connect on the personal AP and query the State and LastError properties. ■ 2 – Concurrent step used to validate the personal AP connection. In this case, the Onboarder application must wait for the ConnectionResult signal to arrive over the AllJoyn session established over the SoftAP link.

Description

Send the personal AP information to the onboardee. When the authType is equal to -1 (any), the onboardee must try out all the possible authentication types it supports to connect to the personal AP.

If authType parameter is invalid, the AllJoyn error code org.alljoyn.Error.OutOfRange will be returned in the AllJoyn method call reply.

5.3.2 Connect

Inputs

None.

Output

This method does not have any reply message. It's a fire-and-forget method call.

Description

Tell the onboardee to connect to the personal AP. It is recommended that the onboardee use the concurrency feature, if it is available.

5.3.3 Offboard

Inputs

None.

Output

This method does not have any reply message. It's a fire-and-forget method call.

Description

Tell the onboardee to disconnect from the personal AP, clear the personal AP configuration fields, and start the soft AP mode.

5.3.4 GetScanInfo

Inputs

None.

Output

Parameter name	Mandatory	Output signature	Description
age	yes	q	Age of the scan information in minutes. It reflects how long ago the scan procedure was performed by the device.
scanList	yes	a(sn)	Scan list. It's an array of records holding SSID and authType.

Description

Scan all the Wi-Fi access points in the onboardee's proximity.

Some devices may not support this feature. In such a case, the AllJoyn error code org.alljoyn.Error.FeatureNotAvailable will be returned in the AllJoyn response.

5.4 Signals

5.4.1 ConnectionResult

Parameters

Data type	Description
ns	Connect result code and message. The list of values for the result code is: ■ 0 – Validated ■ 1 – Unreachable ■ 2 – Unsupported_protocol ■ 3 – Unauthorized ■ 4 – Error_message

Description

This signal is emitted when the connection attempt against the personal AP is completed. The signal is sent over the AllJoyn session established over the SoftAP link.

This signal will be received only if the concurrency feature is supported by the onboardee.

6 Introspection XML

The following XML defines the Onboarding interface.

```
<node
      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

xsi:noNamespaceSchemaLocation="http://www.allseenalliance.org/schemas/introspect.xsd">

     <interface name="org.alljoyn.Onboarding">
        <property name="Version" type="q" access="read"/>
        <property name="State" type="n" access="read"/>
        <property name="LastError" type="(ns)" access="read"/>
        <method name="ConfigureWifi">
            <arg name="SSID" type="s" direction="in"/>
            <arg name="passphrase" type="s" direction="in"/>
            <arg name="authType" type="n" direction="in"/>
            <arg name="status" type="n" direction="out"/>
        </method>
        <method name="Connect">
 <annotation name="org.freedesktop.DBus.Method.NoReply" value="true" />
         </method>
        <method name="Offboard">
            <annotation name="org.freedesktop.DBus.Method.NoReply" value="true"
/>
        </method>
        <method name="GetScanInfo">
            <arg name="age" type="q" direction="out"/>
            <arg name="scanList" type="a(sn)" direction="out"/>
        </method>
        <signal name="ConnectionResult">
            <arg type="(ns)" />
        </signal>
    </interface>
</node>
```