TelephonyServer:1 Device

For UPnP Version 1.0
Status: Standardized DCP (SDCP)
Date: March 22, 2011
Document Version: 1.0
Service Template Version: 2.00

This Standardized DCP has been adopted as a Standardized DCP by the Steering Committee of the UPnP Forum, pursuant to Section 2.1(c)(ii) of the UPnP Forum Membership Agreement. UPnP Forum Members have rights and licenses defined by Section 3 of the UPnP Forum Membership Agreement to use and reproduce the Standardized DCP in UPnP Compliant Devices. All such use is subject to all of the provisions of the UPnP Forum Membership Agreement.

THE UPNP FORUM TAKES NO POSITION AS TO WHETHER ANY INTELLECTUAL PROPERTY RIGHTS EXIST IN THE STANDARDIZED DCPS. THE STANDARDIZED DCPS ARE PROVIDED "AS IS" AND "WITH ALL FAULTS". THE UPNP FORUM MAKES NO WARRANTIES, EXPRESS, IMPLIED, STATUTORY, OR OTHERWISE WITH RESPECT TO THE STANDARDIZED DCPS, INCLUDING BUT NOT LIMITED TO ALL IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT AND FITNESS FOR A PARTICULAR PURPOSE, OF REASONABLE CARE OR WORKMANLIKE EFFORT, OR RESULTS OR OF LACK OF NEGLIGENCE.

Authors[1]	Company
Mahfuzur Rahman	Samsung

---

[1] The UPnP forum in no way guarantees the accuracy or completeness of this author list and in no way implies any rights for or support from those members listed. This list is not the specifications' contributor list that is kept on the UPnP Forum's website.

Contents

List of Tables

List of Figures

1 Overview and Scope

This device definition is compliant with the UPnP Device Architecture version 1.0. It defines a device type referred to herein as *TelephonyServer:1* device.

1.1 Introduction

The *TelephonyServer* device is a UPnP device that allows control points to exploit a set of telephony features such as managing telephony calls, messaging, presence etc via UPnP though other UPnP enabled home network devices. This device provides control points with the following functionality:

- Managing telephony calls including initiation of a call, rejection of a call, acceptance and mofications of a call

- Messaging features including sending and retrieving messages and notifications of incoming messages

- Enabling user friendly input capability

- Configuring of the Telephony Server via phone data model

1.2 Notation

- In this document, features are described as Required, Recommended, or Optional as follows:

  The key words "MUST," "MUST NOT," "REQUIRED," "SHALL," "SHALL NOT," "SHOULD," "SHOULD NOT," "RECOMMENDED," "MAY," and "OPTIONAL" in this specification are to be interpreted as described in [RFC 2119].

  In addition, the following keywords are used in this specification:

  PROHIBITED – The definition or behavior is an absolute prohibition of this specification. Opposite of REQUIRED.

  CONDITIONALLY REQUIRED – The definition or behavior depends on a condition. If the specified condition is met, then the definition or behavior is REQUIRED, otherwise it is PROHIBITED.

  CONDITIONALLY OPTIONAL – The definition or behavior depends on a condition. If the specified condition is met, then the definition or behavior is OPTIONAL, otherwise it is PROHIBITED.

  These keywords are thus capitalized when used to unambiguously specify requirements over protocol and application features and behavior that affect the interoperability and security of implementations. When these words are not capitalized, they are meant in their natural-language sense.

- Strings that are to be taken literally are enclosed in "double quotes".

- Placeholder values that need to be replaced are enclosed in the curly brackets "{" and "}".

- Words that are emphasized are printed in *italic*.

- Keywords that are defined by the UPnP Working Committee are printed using the *forum* character style.

- Keywords that are defined by the UPnP Device Architecture are printed using the **arch** character style.

- A double colon delimiter, "::", signifies a hierarchical parent-child (parent::child) relationship between the two objects separated by the double colon. This delimiter is used in multiple contexts, for example: Service::Action(), Action()::Argument, parentProperty::childProperty.

1.3 Vendor-defined Extensions

Whenever vendors create additional vendor-defined state variables, actions or properties, their assigned names and XML representation MUST follow the naming conventions and XML rules as specified in [DEVICE], Section 2.5, "Description: Non-standard vendor extensions".

1.4 References

1.4.1 Normative References

This section lists the normative references used in this specification and includes the tag inside square brackets that is used for each such reference:

[DEVICE] – UPnP Device Architecture, version 1.0.
Available at: http://www.upnp.org/specs/arch/UPnP-arch-DeviceArchitecture-v1.0-20080424.pdf.
Latest version available at: http://www.upnp.org/specs/arch/UPnP-arch-DeviceArchitecture-v1.0.pdf.

 [RFC 2119] – S. Bradner, RFC 2119: Key words for use in RFCs to Indicate Requirement Levels, 1997.
Available at: http://www.faqs.org/rfcs/rfc2119.html.

[XML] – "Extensible Markup Language (XML) 1.0 (Third Edition)", François Yergeau, Tim Bray, Jean Paoli, C. M. Sperberg-McQueen, Eve Maler, eds., W3C Recommendation, February 4, 2004.
Available at: http://www.w3.org/TR/2004/REC-xml-20040204/.

1.4.2 Informative References

This section lists the informative references that are provided as information in helping understand this specification:

[PHONEARCH] – TelephonyArchitecture:1, UPnP Forum, March 22, 2011.
Available at: http://www.upnp.org/specs/phone/UPnP-phone-TelephonyArchitecture-v1-20110322.pdf.
Latest version available at: http://www.upnp.org/specs/phone/UPnP-phone-TelephonyArchitecture-v1.pdf.

2 Device Definitions

2.1 Device Type

The following service type identifies a device that is compliant with this specification:

urn:schemas-upnp-org:device:*TelephonyServer:1*

TelephonyServer device is used herein to refer to this device type.

2.2 Terms and Abbreviations

2.2.1 Abbreviations

Table 2-1:   Abbreviations

Definition	Description
TS	Telephony Server
TC	Telephony Client
TelCP	Telephony Control Point
IS	Input Service
ICP	Input Control Point

2.2.2 Terms

2.2.2.1 Telephony Server

The term Telephony Server (TS) refers to a logical device that provides common telephony features (e.g. call/video call, messaging, address book) via UPnP to other devices in the home network. A TS is usually connected to a telephony service on its WAN interface, either wire line or mobile. For example, a TS may be a mobile phone or a home gateway with VoIP features.

2.2.2.2 Telephony Client

The term Telephony Client (TC) to a networked logical device that allows the user to enjoy the telephony features provided by the Telephony Server via UPnP. A TC may usually provide input/output features for voice and video. An example of a TC is a networked TV Set.

2.2.2.3 Telephony Control Point

The term Telephony Control Point (TelCP) refers to a software feature able to control the functionalities of both TS and TC. It may be embedded in a TS, a TC or also being a physical device on its own.

2.2.2.4 InputConfig Service

The Term InputConfig Service (InputConfig) refers to a software feature that is able to provide user-friendly input capability via UPnP means and expose interfaces to describe capabilities of sender/receiver of devices to be used for input services and setup the input session between the devices using the matching profile (capability) from the ICP .

2.2.2.5 InputConfig Control point

The Term InputConfig Control Point (ICP) refers to a software feature that is able to control the functionalities of UPnP devices to be used to provide user-friendly input features. The control here refers to getting capabilities of UPnP dveices to be used for input, matching capabilities and selecting the appropriate dveice role such as receiving side or sending side etc.

2.3 *TelephonyServer* Device Architecture

This device is hosted by the Telephony Server and is active on the LAN network interface. The device embeds a number of telephony services including Call Management, Messaging, Presence, Input, Security, Configuration etc. The details for each of these services can be found in the Telephony Architecture document..
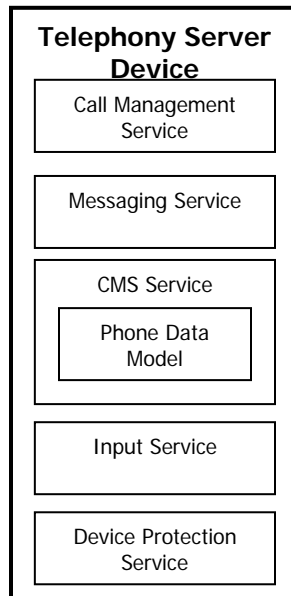

Figure 2-1:   TelephonyServer Device Architecture.

2.4 Device Model

TelephonyServer products MUST implement minimum version numbers of all REQUIRED embedded devices and services specified in the table below. A *TelephonyServer* device can be either a *Root* device or can be *Embedded* in another UPnP device (*TelephonyServer* or other). A *TelephonyServer* device (*Root* or *Embedded*) can in turn contain other standard or non-standard *Embedded* UPnP devices.

Table 2-2:   Device Requirements

DeviceType	Root	R/O[1]	ServiceType	R/O[2]	Service ID[3]
TelephonyServer:1	*Root* or *Embedded*	*R*	*CallManagement:1*	*O*[4]	CaMS
			Messaging:1	*O*[4]	Messaging
			InputConfig:1	*O*	InputConfig
			DeviceProtection:1	*O*	DeviceProtection1

DeviceType	Root	R/O[1]	ServiceType	R/O[2]	Service ID[3]
			ConfigurationManagement: 1	*O*	ConfigurationManagement
			Non-standard services embedded by a UPnP vendor go here.	*X*	*TBD*
Standard devices embedded by a UPnP vendor go here.	*Embedded*	*O*	*Services as defined by the corresponding standard UPnP Device Definition go here.*		
Non-standard devices embedded by a UPnP vendor go here.	*Embedded*	*X*	*TBD*	*TBD*	*TBD*

[1] *R* = REQUIRED, *O* = OPTIONAL, *X* = Non-standard.

[2] *R* = REQUIRED, *O* = OPTIONAL, *X* = Non-standard.

[3] Prefixed by urn:**upnp-org**:**serviceId**:

[4] It MUST be noted that even though all the services for *TelephonyServer:1* device have been listed as "*O*" in the table above, in order to be recognized as a Telephony Server, an implementation MUST have at least either of the *Messaging:1* service or *CallManagement:1* implemented.

2.4.1   Telephony Server Identity Requirements

The identity of a Telephony Server (TS) device is expressed using the standard URI (Unified Resource Identifier) scheme as specified in [RFC 2396]. In case of SIP, the identity of the Telephony Server identity contains the SIP URI. In case of a generic resource identified by a telephone number, the Telephony Server identity contains the TEL URI [RFC 3966] . The identity of a Telephony Server can be retrieved by inoking the *GetTelephonyIdentity()* action either on the *CallManagement:1* service or on the *Messaging:1* service.

2.5   Theory of Operation

A Telephony Server (TS) can provide a number of features including Call Management Service (CaMS), Messaging and presence service, inputConfig service, configuration management service etc. The Call Management Service (CaMS) is a mandatory feature for the Telephony Server (TS) and it provides the basic telephony feature such as initiation of a call, management of a call etc.

The interactions of a Telephony Server (TS) with a Telephony Control Point (TelCP) to provide basic telephony features in shown in Figure 2. The Telephony Control Point (TelCP) invokes action on the Telephony Server (TS) to initiate a call, accept or connect an incoming call or receive notifications for incoming calls and manage media session associated with the call including starting and stoping the media session. The interactions between a Telephony Control Point (TelCP) and the Messaging Service requires a number of UPnP actions to realize the features of sending and receiving messages and notifications for incoming messages.
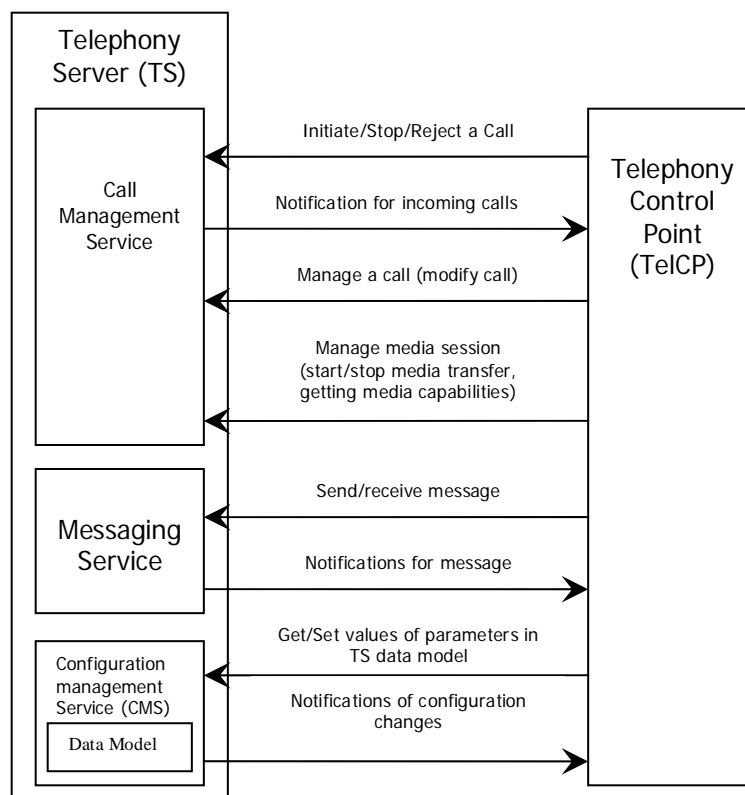
Figure 2-2: Telephony Server (TS) and Telephony Control Point (TelCP) Interactions

The basic architecture for Presence service requires basic UPnP eventing mechanism for notifications of presence information. The interactions between Telephony Control Point (TelCP) and the Presence service also requires a number of UPnP actions to manipulate local presence information and to retrieve other contacts presence. The CMS service in the TS allows the manipulation of configuration parameters, both for retrieving configuration and status information from a managed device (here the TS device) or for changing its configuration; notifications of configuration updates are also available.

3 XML Device Description

```xml
<?xml version="1.0"?>
<root xmlns="urn:schemas-upnp-org:device-1-0">
   <specVersion>
      <major>1</major>
      <minor>0</minor>
   </specVersion>
   <URLBase>base URL for all relative URLs</URLBase>
   <device>
      <deviceType>
         urn:schemas-upnp-org:device:TelephonyServer:1
      </deviceType>
      <friendlyName>A user friendly name for the TS </friendlyName>
      <manufacturer>manufacturer name</manufacturer>
      <manufacturerURL>URL to manufacturer site</manufacturerURL>
      <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>
      <serviceList>
         <service>
            <serviceType>
               urn:schemas-upnp-org:service:CallManagement:1
            </serviceType>
            <serviceId>
               urn:upnp-org:serviceId:CallManagement
            </serviceId>
            <SCPDURL>URL to service description</SCPDURL>
            <controlURL>URL for control</controlURL>
            <eventSubURL>URL for eventing</eventSubURL>
         </service>
         <service>
            <serviceType>
               urn:schemas-upnp-org:service:Messaging:1
            </serviceType>
            <serviceId>
               urn:upnp-org:serviceId:Messaging
            </serviceId>
            <SCPDURL>URL to service description</SCPDURL>
            <controlURL>URL for control</controlURL>
            <eventSubURL>URL for eventing</eventSubURL>
```

```xml
                </service>

                <service>
                    <serviceType>
                        urn:schemas-upnp-org:service:InputConfig:1
                    </serviceType>
                    <serviceId>
                        urn:upnp-org:serviceId:InputConfig
                    </serviceId>
                    <SCPDURL>URL to service description</SCPDURL>
                    <controlURL>URL for control</controlURL>
                    <eventSubURL>URL for eventing</eventSubURL>
                </service>
                <service>
                    <serviceType>
                        urn:schemas-upnp-org:service:ConfigurationManagement:1
                    </serviceType>
                    <serviceId>
                        urn:upnp-org:serviceId:ConfigurationManagement
                    </serviceId>
                    <SCPDURL>URL to service description</SCPDURL>
                    <controlURL>URL for control</controlURL>
                    <eventSubURL>URL for eventing</eventSubURL>
                </service>
                <service>
                    <serviceType>
                        urn:schemas-upnp-org:service:Security:1
                    </serviceType>
                    <serviceId>
                        urn:upnp-org:serviceId:Security
                    </serviceId>
                    <SCPDURL>URL to service description</SCPDURL>
                    <controlURL>URL for control</controlURL>
                    <eventSubURL>URL for eventing</eventSubURL>
                </service>

                <!-- Declarations for standard non-Telephony services
                defined by
                     UPnP (if any)go here. -->

                <!-- Declarations for other services defined by UPnP vendor
                     (if any)go here. -->

        </serviceList>
        <deviceList>

        <!-- Declarations for standard non-Telephony devices defined by
        UPnP
             (if any)go here. -->

        <!-- Declarations for other devices defined by UPnP vendor
             (if any)go here. -->

        </deviceList>
        <presentationURL>URL for presentation</presentationURL>
    </device>
</root>
```

4   Test

No semantic tests have been specified for this device.