



Plug and Play Multimedia IP Telephony

UPnP features make IP Multimedia Telephony simpler and richer for end-users, enterprises, and operators

IP Telephony deployment remains a technological challenge because of interoperability and installation issues for IP communication devices.

The emerging SIP protocol helps deploy simpler VoIP infrastructures, however it still lacks at device level a standard Plug and Play mechanism, and a LAN interface to allow interaction with IP communication applications.

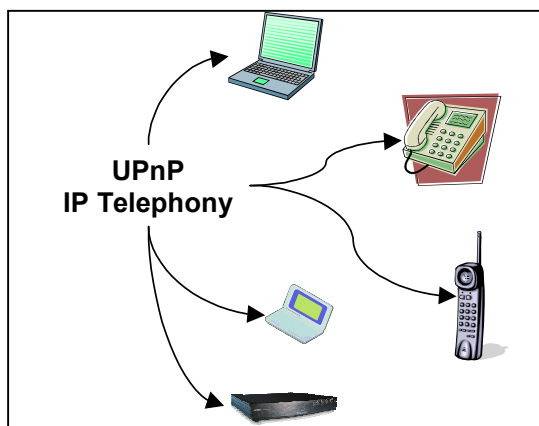
This project proposes a better end-user VoIP experience by defining Plug and Play mechanisms for multimedia IP communications based on UPnP standards.

What UPnP approach for IP Communications?

The UPnP interface defined through the *HomeNet2Run* project provides the following features:

- Automatic discovery of LAN environment (gateway, etc.) and other VoIP devices
- Discovery of device capabilities profile (audio, video, file sharing, etc.)
- Management of end-user profiles, in order to simplify mobility on various networks
- Automatic registration to the IP Communication server
- Implementation of call control, device and media remote management mechanisms

This UPnP interface can be implemented onto various types of multimedia IP telephony devices such as IP Phones, Softphones, VoIP Residential Gateways, PCs, PDAs, etc.



This enables faster, less expensive deployment of IP communication devices and communication services for enterprises and telecom operators.

What are the benefits?

UPnP from an end-user perspective

Current IP telephony environment offers end-users a broad range of devices (corded or cordless phones, GSM, PC/Laptop, PDA, etc) with multiple addresses for one single user: home, office and mobile numbers, email addresses, instant messaging nickname, etc.

This UPnP interface introduces multiple user profiles that facilitate roaming between different VoIP environments, and automatic retrieval of associated user context (phone line, voicemail, etc.).

Furthermore, the end-user is able to establish various call sessions simultaneously using different user profiles.



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UPnP as an enabler for multimedia communications

Every IP communication device can have various multimedia communications capabilities that can be detected and activated depending on the type of initiated call: audio, video or application sharing.

With UPnP mechanisms, a video-originating call is forwarded to the adequate peer device: audio only or audio/video thanks to the device discovery capabilities.

UPnP telephony from a technical standpoint

Based on the UPnP Forum's specifications, every telephony device equipped as such, is capable of:

- LAN environment discovery (residential gateway, DHCP server, etc.)
- Discovering other UPnP devices and devices capabilities (UPnP IGD, other UPnP Phones, etc.)
- Call control interface: to set-up a call, redirect incoming call, add media, add participant, ...
- LAN eventing interface: incoming or outgoing call supervision, user registration and un-registration
- Interaction with any web-enabled device, in order to configure manually the IP telephony device

As a UPnP control point, an application is also able to:

- Discover other telephony UPnP devices, e.g. to manage devices installation and configuration
- Discover and manage device multimedia capabilities, e.g. audio, video, file sharing, in order to orient the calls to the right device type
- Discover, add or remove user profiles on IP telephony devices
- Consequently, manage user and devices WAN and LAN mobility, e.g. home line at the office, office line at home
- Supervise communications, e.g. to display caller information on your TV during your phone conversation.
- Add communication capabilities to your computer or PDA to leverage on their already-installed applications, e.g. user PDA or PC phone book to setup a call on your phone

Current UPnP Actions available

Media capabilities:

- Get device capabilities
- Manage audio source and renderer (gain and mute for microphone, earphone, loudspeaker, handset, hands free, etc.)
- Manage video source and renderer (zoom, mute, contrast, balance, color, etc.)

Profile and Registration management:

- Profile (add, remove, update)
- Registration (register, de-register, status)
- Authentication (request, status)

Session Management:

- Creation (setup, incoming call)
- Actions (answer, redirect, terminate)
- Supervision (get session info)

Remote participant & media management:

- Participant (add, remove, setup session, terminate, redirect, etc.)
- Media (add/remove, setup, terminate)
- Info (get participant/media info)

What's next?

Based on this development, several actions will be taken, in order to:

- Propose these Plug-and-Play features to the UPnP Forum for standardization
- Enlarge UPnP services applied to telephony, e.g. phone directory, localization, MMS & SMS management, QoS, etc.

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