• UPnP Forum Overview
  • About Us, Goals, Participation
  • Structure, Timeline
• UPnP Technology Overview
  • High-level View
  • Architectural Structure
  • Protocol Walk-through
  • DCP Summary
• Certification
• Existing Industry Momentum
• Future and Upcoming UPnP Standards
• Recap of 2011 YTD
• More than a dozen years’ experience developing standards for interoperability between IP-based networked devices; hundreds of millions of UPnP products ship annually, with more than a billion a year to ship by 2014 (In-Stat, September, 2010)

• Open participation, global organization: 950+ members from cross-industry sectors including consumer electronics, IT, automation, industrial applications, telecommunications and service providers

• Member organizations have been building and innovating home networks for years — e.g., home automation and device & service discovery guidelines first published in 2003

• UPnP core specifications and device control protocols first published as international standards (ISO/IEC 29341-x) in 2008
UPnP Forum Goals

• In an open environment, develop standards for interoperable device services using common technologies: TCP/IP, SOAP and XML

• Balance protection of member investment in technology with confidence in ability to implement under royalty-free terms

• Encourage rapid and broad industry deployment of compliant devices
UPnP Forum Membership

- **958 Basic Member companies**
- **126 Implementer Members**
- **Demographics:**

  - **Asia (248)**
    - China (25)
    - Hong Kong (9)
    - India (21)
    - Japan (59)
    - Korea (38)
    - Singapore (4)
    - Taiwan (92)

  - **North America (487)**
    - Canada (32)
    - United States (455)

  - **Australia (10)**
    - Australia (8)
    - New Zealand (2)

  - **Latin America (4)**
    - Brazil (2)
    - Chile (1)
    - Columbia (1)

  - **Middle East (20)**
    - Israel (19)
    - Saudi Arabia (1)

  - **Europe (189)**
    - Austria (4)
    - Belgium (6)
    - Bulgaria (1)
    - Denmark (5)
    - Finland (5)
    - France (37)
    - Germany (42)
    - Greece (2)
    - Iceland (1)
    - Ireland (4)
    - Italy (11)
    - Luxembourg (1)
    - Netherlands (5)
    - Norway (1)
    - Poland (2)
    - Portugal (1)
    - Russia (1)
    - Serbia (1)
    - Slovenia (1)
    - Spain (8)
    - Sweden (11)
    - Switzerland (5)
    - Turkey (3)
    - United Kingdom (31)

*As of October 18, 2011*
Elected Steering Committee:

- Wouter van der Beek, Philips
- Paul Jeon, LG Electronics
- Scott Lofgren, Intel (*Treasurer & Vice President*)
- Panu Markkanen, Nokia (*Secretary*)
- Alan Messer, Samsung (*President & Chairman*)
- Bernard Peigne, France Telecom
- Clarke Stevens, CableLabs

Thank you Steering Committee Members!
Inactive Working Committees or those who have completed their work:

- Appliances, Automation, Basic Device, Camera, Content Sync, Gateway, Low Power, Mobile, QoS, Printing & Imaging, Remote UI, Security, Storage
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>1999</td>
<td>UPnP Forum formed</td>
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<tr>
<td>2000</td>
<td>Windows ships with UPnP</td>
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<tr>
<td>2001</td>
<td>UPnP Device Architecture v1.0 published</td>
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<tr>
<td>2002</td>
<td>UPnP toolkits announced</td>
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<tr>
<td>2003</td>
<td>Gateway DCP published</td>
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<tr>
<td>2004</td>
<td>1st Certified Gateway devices shipped</td>
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<tr>
<td>2005</td>
<td>AV:1, Printer/Scanner and Basic Device standards published</td>
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<tr>
<td>2006</td>
<td>AV:1, Printer/Scanner and Basic Device standards published</td>
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<tr>
<td>2007</td>
<td>AV:1, Printer/Scanner and Basic Device standards published</td>
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</tbody>
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Record number of Implementer Members

New UCTT 2.0 required for MediaServer:1

Formation of New Working Committees: E-Health & Sensors, Home Energy Mgmt. & Smart Grid
UPnP Technologies

- Innovate on established Internet standards
  - XML, UDP/TCP/IP, SOAP
- Create open, flexible architecture for service discovery and control
  - Simple Service Discovery Protocol (SSDP)
  - Generic Event Notification Architecture (GENA)
  - Service Control Protocol Description (SCPD/DDD)
- UPnP Device Architecture (UDA)
  - 0 Addressing: IP assignment on any network (AutoIP)
  - 1 Discovery: Of services/devices (SSDP)
  - 2 Description: Syntax for devices/services (SCPD/DDD)
  - 3 Control: Of device services (SOAP)
  - 4 Eventing: Updates of variables (GENA)
  - 5 Presentation: Access to device HTML page
- Device Control Protocols (DCPs)
  - APIs for various device functionality
  - Described using SCPD syntax and UDA protocols
• Extensible, open architecture
UPnP Technology Interactions

Control Points

1 Discovery
2 Description
3 Control
4 Eventing
5 Presentation

0 Addressing

Controlled Devices

DCP1
DCP2
DCP1
Many Products in the Market
Certifications

- Overall number of publicly displayed certified devices = 723
- Devices certified in 2011 and publicly displayed = 145
- Recent trends:
  - Since 2007, double-digit percentage increase in number of certifications year over year
  - Certified 3 times as many MediaRenderer devices in 2010 over 2009 and have already certified 74% more YTD in 2011 than all of 2010
- Device type breakdown:

- Wide range of software development kits (SDKs) and open source implementations from multiple vendors, multiple languages, multiple platforms

Note: The ability to submit an unlimited number of devices for certification and license the UPnP® Certification Mark is limited to Implementer Members (US$5,000 annually). To become an Implementer Member, visit http://upnp.org/membership/join_implementer/.

As of October 18, 2011
Industry Momentum/Deployment

- Millions of UPnP compliant devices shipped
  - Routers, AV, printers, etc.
- Hundreds of millions of UPnP enabled personal computers already deployed
- Many UPnP compliant networked audio-video devices available on the market
- Bridges demonstrated between UPnP technology and other home automation networks (including Konnex, Echonet, Echelon LonWorks)
- Availability of commercial tools for more than a dozen vendors for many OS and embedded platforms
- Referenced by major standards
  - DLNA Expanded guidelines
  - CEA 2008 (DENi) and CEA 2014 (Remote UI)
  - INCITS URCC (Universal control)
  - CableLabs’ CableHome specification (AV/QoS)
  - DSL Forum TR-064 (Gateways)
  - HGI (Home Gateway Initiative)
  - Open IPTV Forum
  - And more..
• Today, UPnP Forum remains very active
  – **UPnP AV**
    • Continued enhancements to AV scenarios & promotion of existing DCPs
  – **UPnP Device Management**
    • Enhancements to DeviceManagement:1
  – **UPnP E-Health & Sensors (New)**
    • Management of sensor networks, ecosystem specific data aggregation and messaging between devices
  – **UPnP Home Energy Management & Smart Grid (New)**
    • Revision and enhancements to existing and candidate DCPs to support a common Smart Grid solution
  – **UPnP Internet Gateway**
    • Recent publication of DeviceProtection:1 DCP
  – **UPnP Remote Access**
    • Development of whitepaper on RemoteAccess:2 for access and control of UPnP devices from outside the home (e.g. phone)
  – **UPnP Telephony**
    • Enhancements to Telephony:1 (call control, caller ID, address boxes and remote input)
2011 Recap

- Surpassed 125 Implementer Members
- Exceeded 900 UPnP® Certified implementations
- DCP and DCP Framework publications:
  - AV:4
  - DeviceProtection:1
  - RemoteAccess:2
  - Telephony:1
  - UDA 1.1 IPv6 Annex
- Published new test tool for official certification testing for certain device type versions
- Rolled out new Control Point certification testing program
- Continued collaboration with other organizations through liaisons
  - BBF, CABA, DLNA, EPRI, HGI, IGRS, Itophome, JTC1, MoCA, NIST, OMA, ZigBee, and more.
- Formation of new Working Committees:
  - E-Health & Sensors
  - Home Energy Management & Smart Grid
The Foundation of the Connected Home