

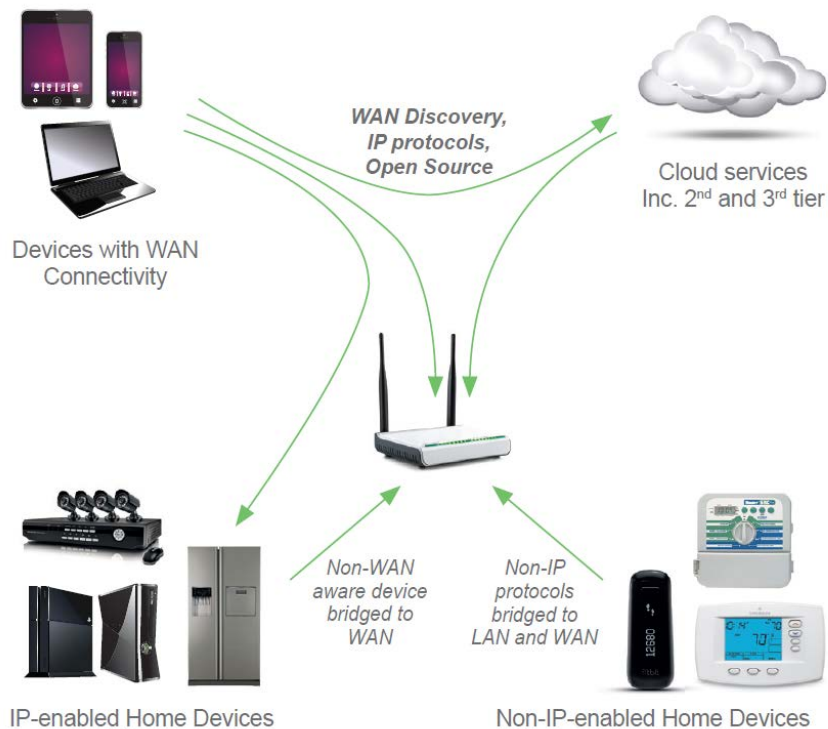


## UPnP: Promoting Interconnectivity

### UPNP® TECHNOLOGIES AND THE CONNECTED HOME

The connected “smart” home has become somewhat of a battleground for device manufacturers, network suppliers, and service providers, all wanting a piece of the action. This is something that continues to grow as even more products become fully connected. Consumers have more options than ever to connect with, interact with, and enjoy digital content from within the home or from mobile devices – all without physical boundaries. It is crucial that the industry works together to create an interoperable ecosystem, be it within the home or on the road, which ensures simplified and secure network connectivity with seamless device-to-device communication – and at the same time doing it with a platform that manufacturers and the development community are willing to embrace.

UPnP Forum<sup>sm</sup> has solved these problems by creating a strategy around using new and existing UPnP Device Control Protocols (DCPs) and UPnP architecture enhancements to provide UPnP protocols specifically for IoT applications. New specifications ratified by UPnP Forum provide a base for IoT by integrating with non-IP connected devices while adding enhanced security, richer audio/video features, and the UPnP®+ Cloud Architecture for virtualizing and enabling secure sharing of devices and content over the Internet. UPnP Forum has already produced DCPs for lights, thermostats, automatic blinds, and security cameras.



Many consumer electronics vendors already have invested in UPnP technologies as a core component of their products, taking advantage of UPnP Forum testing and certification in addition to third party open source development tools. Manufacturers can take advantage of the fact that processes for interoperability testing and certification are well-established and that UPnP protocols provide a neutral platform for facilitating interoperability. Additionally, UPnP certification and compliance gives manufacturers confidence in the interoperability capabilities of their products.

## UPNP TECHNOLOGIES ENABLE NEW USAGE SCENARIOS

### SOCIAL MEDIA INTEGRATION

UPnP technologies already allow someone to find and display content from a media server in the home, present an overview or background information about it, and play back a selected video on a TV, tablet, or phone. Imagine that a user now has the ability to securely invite one or more users in different locations to a “virtual room” and play that same video back for friends and family on their devices, over the Internet. The owner has complete control to configure each participant using role-based access rights including read, write, or full control levels. This level of group interaction is possible using the UPnP®+ Cloud Architecture, which incorporates the industry standard Extensible Messaging and Presence Protocol (XMPP), a communications protocol for message-oriented middleware based on Extensible Markup Language (XML). In conjunction with XMPP, UPnP devices and services that can share content are now available securely in the cloud. Through the user of XMPP, the UPnP+ Cloud Architecture melds the concept of social media and group communications with content and services normally limited to home-based consumption.

### COHESIVE DEVICE INTERACTION AND CONTROL

UPnP SensorManagement provides bridging to other networks (Bluetooth, ZigBee, Z-Wave, CoAP, etc.) by using a UPnP SensorManagement bridge with a north-facing UPnP interface. Home Automation hub vendors have the ability to incorporate UPnP SensorManagement services into their gateway products or centralized hub products. A single web-based control point interface now can interact bidirectionally with not only UPnP devices and services, but also those solutions from vendors providing non IP-based products. It allows the user to have a single window into their connected home and all of the smart sensors, devices, content servers, and appliances, be it through a TV, tablet, phone, or custom controller.

### DEVICE MODELING

Previously, when manufacturers wanted to bring a new device or sensor to market, they would either develop a vendor-specific implementation or have to define the product’s particular characteristics, get that information certified through some technology-specific entity, and wait for approval as part of a certain platform selected to support it. The UPnP ecosystem now provides a framework by which a developer or manufacturer can model the characteristics of a device or even a new appliance as a certain class of device with a given set of attributes. Manufacturers have the freedom to create their own data model or SensorTypes while maintaining complete interoperability and manageability of those characteristics.

## IN SUMMARY

UPnP technologies provide the confidence of proven security, superior interoperability, and new features that make it the most complete and open solution for the connected smart home. They provide the simplest and most complete way to share devices and content securely within the home or across the Internet. UPnP Forum utilizes a certification program that is inexpensive with free open source tools used for validating implementations, which are available TODAY.

UPnP Forum, established in 1999, is an impartial global industry standards body that has paved the way for seamless connectivity between more than a billion devices. Its 1000+ companies and organizations work together to enable device-to-device interoperability in addition to facilitating easier and better home networking. UPnP Forum promotes adoption of uniform technical device interconnectivity standards and certifies devices conforming to these, thus paving the way for seamless connectivity between more than a billion devices in the home running above the IP layer.

UPnP Forum has widened its scope to encompass the cloud, including integration for content and services, as well as bridging to non-UPnP networks (ZigBee, Z-Wave, Bluetooth, ANT+...). This enables a broad range of applications including health and fitness, energy management, and home automation.

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