

IoT: Future-Proofing Device Communications

By Scott Lofgren, President of UPnP Forum



The Internet of Things (IoT) is a real game-changer and has the potential to transform and improve our lives, bringing with it the combination of connected devices and intelligent data. The industry is already making strides towards increased interconnectivity with leading research and analysis firm, IDC, estimating that IoT spending will grow to \$8.9 trillion by 2020¹. IDC also expects the installed base of the IoT to be approximately 212 billion “things” globally by the end of 2020, which will include 30.1 billion installed “connected (autonomous) things” driven by smart systems that will be installed and collect data across both consumer and enterprise applications.

The rapidly increasing number of devices – in the home and workplace – and the growing delivery of low

power interconnectivity are undoubtedly factors driving the IoT revolution. Coupled with the need for multi-vendor interoperability, and ease of use and self-install, IoT provides a tremendous opportunity for innovation and growth by bringing together people, processes, data and devices.

Creating harmonization

As exciting as the overall opportunity for the IoT market is, harmonizing the growing number of verticals segments is paramount. Owing to the previous absence of standardization and with convenience and cost in mind, many IoT projects were built vertically. Devices and connectivity were provided by a single vendor, with little or no interoperability with products from other vendors, leading to a fragmentation of the market. The lack of compatibility incapacitated network flexibility and functionality, ultimately limiting consumer choice in the rapidly emerging market.

All of the greatest IoT opportunities – from the connected home, out-and-about mobile interactions, smart meters, the connected car, and smart grid to personal wellness and connected health – have been driven from a vertical market perspective, but require interoperability between those verticals. Nobody wants a different solution for their smart home from their mobile solution or connected car. By definition all the ‘things’ should be internetworked.

Furthermore, users expect fully secure and private access to data and applications anywhere, anytime and on any platform. They increasingly expect to read, analyze and control every network or device from every other network or device. To make this more complicated, only the individual user can determine which software versions and Operating Systems are used. Without multi-vendor interoperability,

- ▶ things might simply come to a grinding halt at any time and the user experience will be, to say the least, unsatisfactory.

To become truly successful, the IoT requires an open means for allowing devices to find one another and communicate. Data has to be able to flow freely between countless applications and platforms, on to any device, however for each sector, the drivers are different. In telecom, we're witnessing a vast uptake of mobile devices, Web 2.0 software and social networking. For office networks, it's the uptake of portable computing, apps and the introduction of new – mobile and offsite – ways of working.

The role of UPnP

To address the vertical challenge, manufacturers need to agree on limited open standards. With billions of devices already deployed and open source implementations on virtually every operating system and in every programming language, UPnP technology is already one of these key standards. The UPnP standard is vendor-neutral and already provides the foundation to complement a variety of management gateways and device control scenarios, incorporating well-vetted mechanisms for security, discovery and service advertisement. UPnP core technology provides a base for IoT, creating bridges to both wide-area networks and non-IP devices. With the recent introduction of UPnP+ by the UPnP Forum, the technology is ready to lead the way for the IoT.

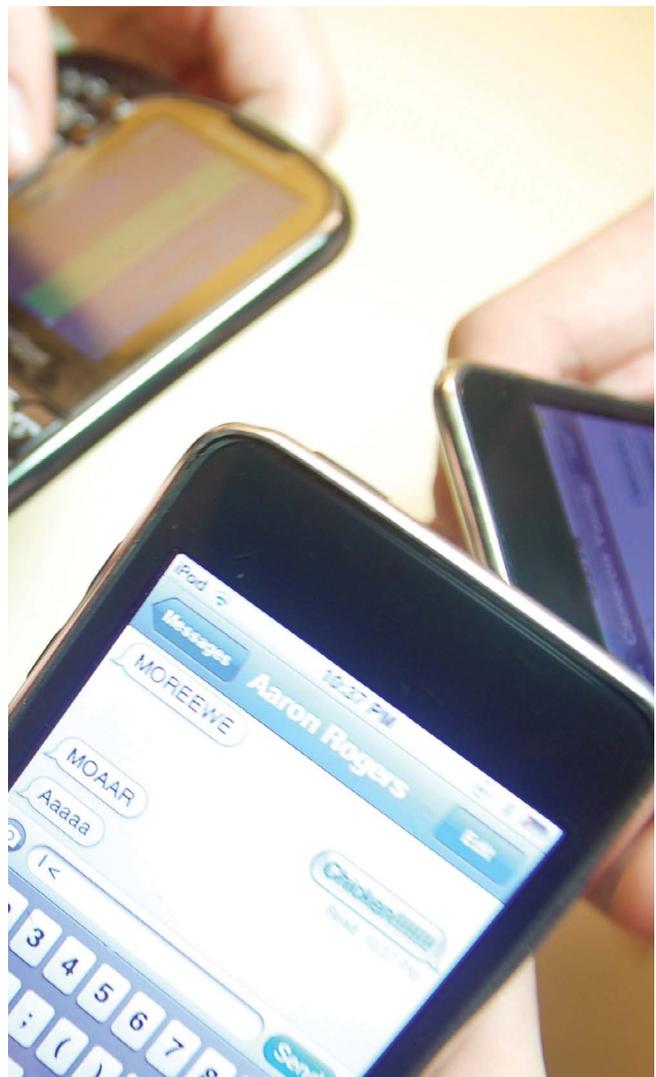
UPnP+ is an evolution of previous UPnP capabilities that will assist devices attempting to integrate new paradigms, such as mobile connected computing, Cloud-based service delivery, Smartphone content sharing, and the IoT. It provides an improved, seamless experience for the consumer and creates new values and opportunities for manufacturers, developers and integrators, leveraging existing UPnP protocols to take them into the Cloud to bridge the IoT, while continuing to support legacy UPnP devices.

It supports the implementation of web browser controls for a wide range of functions, ensuring future connectivity and making new services possible, in areas such as health and fitness, energy management, sensor management, security and sustainability. Incorporating IPv6, capabilities for discovering Cloud services and new grouping/pairing capabilities, UPnP+ includes a host of enhancements and delivers improved interoperability baselines.

This next-generation UPnP+ standard, takes a step beyond consumer media devices and is focused on delivering new technical capabilities to enhance product functionality and provide a more sophisticated, intuitive and deeper user experience across platforms. It takes a step forward to address tomorrow's connectivity requirements to remove boundaries and enable full device and network compatibility for new and exciting experiences.

Achieving total interconnectivity

The pace of development in IoT is astonishing and



represents a huge opportunity for the industry as a whole. However the lack of standards and multi-vendor interoperability, combined with the proliferation of innovative services, still leaves many users flipping between a multitude of applications, or frustrated at the lack of support on their platforms.

As more and more connected devices join the IoT ecosystem, the industry needs to focus on providing safe, reliable interoperable access to services and information regardless of the vertical segment or vendor. Inter-device standardization is a vital requirement and with UPnP+, total interconnectivity and limitless functionality can be achieved, enabling the Internet of Things to reach its potential.

For more information visit:

www.upnp.org

1 IDC October 2013,

<http://www.idc.com/getdoc.jsp?containerId=prUS24366813>