Seeking a Common Vision of the Converged Home

BY HEATHER KIRKSEY

As triple play gives way to quad play in the business plans of many service providers, mobile services are joining the already complex mix of voice, video and data.

For service providers, the prospect of multiple new, potentially transient devices suddenly becoming at least part-time members of the home network may be daunting, as both the devices themselves and their impact on the home network undoubtedly will cause problems and drive support calls.

The devices, for example, need to be appropriately configured so that they can securely join the home network (given the difficulty many users have getting Wi-Fi settings configured correctly for other devices, it seems overly optimistic to hope that they won't have similar problems with mobile handsets). To avoid degrading call quality in a congested home network, quality of service (QoS) priorities or other settings may need to be adjusted on other devices (such as the residential gateway) in order to ensure the best service.

If TR-069-based remote management has proven to be one of the key strategies in deploying services and reducing support costs for triple-play services in the home network, it makes sense that service providers would want to apply similar remote management capabilities to their mobile and converged offerings. Fortunately, the mobile industry has already begun work in the area of mobile device management through the Open Mobile Alliance (OMA). OMA was founded in 2002 to address the standardization needs of the growing mobility market, and this group has produced key specifications in the management of mobile or converged devices, including the OMA Device Management (DM) specifications, the OMA Client Provisioning (CP) specifications, OMA Management Objects and Download Over-the-Air (OTA). Viewed in aggregate, they represent the mobile industry's version of the TR-069 management specification family, intended to provide "setting initial configuration, subsequent updates of persistent information, retrieval of management information, and processing events and alarms" capabilities.

Much in these specifications are similar to the work that has gone into the DSL Forum's TR-069 standard. Many of the design goals are similar: agnosticism to the bearer network (GSM vs. CDMA) which is similar to TR-069's access medium agnosticism; a separation between the management protocol and the management objects, which is similar to the delineation between the CWMP Protocol and the various device and service data models in TR-069; and the use of XML for the standardized message exchange. As in TR-069, management sessions do not depend on a persistent connection between the management server and the device, and management capabilities are bi-directional in that the management server can trigger a management session at any given time or the device can initiate a management session based on its own policies.

On the other hand, there are some key differences which generally reflect the evolution of the mobile industry in contrast to DSL's evolution. Compared to the DSL Forum's twelve-year reign as the main standards body for that industry, OMA integrated seven different wireless-oriented organizations into its charger in 2003. The long-term effect on standards consolidation will be positive, but the specifications currently seem to reflect this initial fractured nature, with multiple provisioning schemes described and

interrelated pieces of work proceeding along somewhat separate paths (firmware download and device management are described in separate sets of documents, for example).

Many of the differences can be attributed to the difference in distribution models and problems to be solved. OMA-DM is based on a protocol called SynchML, which is used for both device management and for content synchronization. In the home network, data synchronization is hardly a pressing problem. But because the primary application of most smart phones is real-time access to e-mail, calendar and address book, this capability is one of the most important in the mobile space. As a result, many capabilities and optimizations of the protocol are being designed to address this need rather than management.

The implications of these different distribution models are apparent. Unlike the widespread self-installation model used in the DSL industry, most cell phones are procured by the consumer in person through authorized retail outlets, or by the IT departments of medium to large enterprises, who then distribute to employees. These distribution channels affect the provisioning assumptions: phones can often be partially or fully pre-provisioned at the point of sale before a consumer ever touches them. Enterprise IT organizations may want to control some of the device settings, leading to a shared management agreement between the mobile service provider and the company, which is atypical in the world of home networking devices. The mobile management infrastructure needs to be able to accommodate such needs, and service policies must account for enterprise personnel owning and managing devices that will function as part of the home network environment.

The demands of the mobile world also put different constraints on OMA work than those required for broadband devices. For example, the user interface (UI) of most residential gateways is an afterthought, most used by advanced technophiles to tune device configuration. A smart phone, however, is almost all UI, and users expect to be able to interact with it as well as control it. Mobile phone users might expect to be warned before configuration changes or expect to interact with the management application. Providing a means to prompt user input or display UI notifications is a real need in that market, but unimportant in the wireline industry. Similarly, although broadband device management shouldn't be excessively chatty, the available pipe for management functions is much greater than for OTA functions. The demands of large bandwidth operations, such as firmware or other image downloads on the cellular network, are much different than similar operations across copper or Ethernet, and must be considered accordingly.

Probably the biggest difference between the TR-069 specifications and the OMA-DM documents is the set of available managed objects. In the gateway, VoIP and IP STB data models, the DSL Forum has specified a robust set of parameters that include almost all imaginable pieces of readable or writeable device state. The standardized objects in OMA currently only include baseline information required to communicate with the DM server, and basic network configuration and device properties, such as manufacturer, model and firmware version. Their intention is for device manufacturers to "provide servers with the necessary information they must have in order to manage" their devices by "publish[ing] descriptions of their devices as they enter the market." Relying on margin-obsessed device manufacturers to spend the development effort to identify, make available to management and publish the features has not led to a large number of capabilities being exposed.

Additionally, different handset manufacturers are unlikely to expose additional functionality in the exact same objects or parameters, even if for similar functions or providing similar statistics. This requires server vendors to do far more work to understand the capabilities and different semantics of the models provided by different vendors, a fact which may hinder operators looking to provide management with the same level granular control they are used to with customer premise equipment (CPE).

Understanding the points of standards commonality and differences, as well as their drivers, is an important first step in moving mobile and home networking domains ever closer. Beyond that, however, the operators that find themselves increasingly responsible for both would be well served to ensure that management standards are advancing in common directions. Although some technical details may never converge, as the needs of managing an OTA device are different than those of managing broadband CPE, at the least it is necessary to ensure that the combination of available standards is adequate to serve the needs of quad-play deployment. A common vision of the converged home across the quad-play ecosystem will best serve the service providers, the vendor communities and, most importantly, the consumer. 2.0

The long-term effect on standards consolidation will be positive, but the specifications currently seem to reflect this initial fractured nature, with multiple provisioning schemes described and interrelated pieces of work proceeding along somewhat separate paths.

Heather Kirksey directs the strategy and execution of Motive's device management and digital home standards initiatives, and is a member of the DSL Forum's Board of Directors. She is also co-chair of the DSL Home-Technical Working Group.