

Debating Opportunities in Machine-to-Machine

By Ed Finegold

A titanium foot treads upon a skull. Red eyes survey a post-apocalyptic landscape. Armed aircraft hover, scanning their search lights across a post-industrial wasteland. These are the images that come to mind when the term “machine-to-machine” is uttered in my presence, mostly because I’ve watched The Terminator too many times. But despite science fiction’s many warnings about the dangers of autonomous technology, from Hal to Agent Smith, the communications industry is all-in for machine-to-machine services. Murderous devices bent on human annihilation seem distant, so



we are free to focus on more near term dangers, and lucrative vertical-market opportunities, as machine-to-machine services take off.

M2M Emerges

Instances of machine to machine communications have been in place for years. Shipping, manufacturing and retail players, for example, have used purpose-built, machine-to-machine solutions for years to enable package tracking, just-in-time logistics, and other supply chain applications. But those M2M instances “were expensive and not suitable to widespread deployment,” says Ed Pinnes, executive director of consulting solutions for Telcordia. Pinnes cites applications like smart grid, widespread automotive telematics, and

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medical monitoring as emerging areas where M2M is taking off because “costs have come down, bandwidth has gone up, and now there are lots of things that can be done on a M2M basis where the economics makes sense.”

The good news for service providers is that most industrial M2M applications don't consume massive bandwidth and legacy networks can support them. “Most of the mass applications are low bandwidth and yet very powerful,” says Bill Stanley, strategic business developer in Telcordia's OS business unit. The majority of M2M devices and applications can be supported well on 2 or 2.5G types of networks. “If I'm the operator,” says Stanley, “...I'll make sure it [the application] sits on that low-end legacy network, and isn't eating up bandwidth on the high end network, and have it generate cash on that older asset.” He adds that most of these low-bandwidth applications are still purpose-built today, however, and may have trouble scaling. “That will have to scale,” Stanley says, “and you'll need some open environments,” as are so common in the consumer app space.

M2M's emergence, in the shadow of the consumer app explosions, leads to some confusion. “M2M tied up with 4G is hype being tied up with hype,” says Pinnes. He points out that entertainment is driving most of the growth in bandwidth consumption on 4G networks

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but says “M2M is not in the same league.” Operators might remember, however, that a service “doesn't have to use a lot of bandwidth to be highly monetizable;” Pinnes says, “like SMS, which generates a lot of revenue without using much bandwidth.”

Definitive Debate

15 years in OSS/BSS has proven to me that engineers love semantic debates. They are typically important and valuable in defining standards that make technology work. Imagine if there weren't agreement on the basic layers that make up a network; I'll guess there'd be no Internet. Certainly there are times when semantic debates fail to acknowledge the bigger picture. There's a debate brewing in machine-to-machine circles that may just miss the point, and service providers are probably best served to steer clear of it.

Stanley says that in some circles, by definition “M2M is generally a many to one situation” where “the device

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has an affinity to one host” and does not connect to multiple places or make intelligent decisions about where it will connect. An example of this would be automated meter reading systems in increasing use in the electric utility vertical. The meters, in this case, aren’t making intelligent decisions about where to send data; they just monitor and transmit to a fixed point. This type of application can exist in any number of vertical industries where devices are collecting and transmitting data on anything from logistics and telemetry to security and health or network monitoring

But limiting M2M’s definition to purpose-built networks of devices that don’t make intelligent decisions, or don’t have the ability to make autonomous decisions about where to send certain types of data, would seem to overlook both reality and opportunity. What we’re seeing develop in consumer apps provides a glimpse into what’s possible. In a sense, the apps on one’s smartphone or tablet could themselves be considered devices or machines; they may be software-based, but they’re still machines.

We already see examples of apps that can operate autonomously to back up data, photos and videos from a smartphone to the cloud. Once the human user configures the settings, the device can act on its own. It’s not a stretch to think that a user could tell the device to post videos to YouTube, photos to Facebook, and emailed documents to DropBox. The human may not push another button or do anything other than shoot photos and video during a week-long family trip to Orlando; but every night her smartphone uploads her files on its own.

Now, envision multiple apps doing things autonomously in the background without direct user input, based purely on settings. Suddenly, what we think of as one device – a smartphone – becomes multiple devices all capable of acting on their own, thus multiplying bandwidth consumption, introducing new types of user behavior, and impacting networks in ways carriers may or may not have predicted. What happens to the network when everyone’s tablets are uploading and downloading all night on their own? It’ll consume a load of bandwidth, and provide a scenario where M2M applications aren’t just transmitting little bits of data but rather become the major drivers of bandwidth consumption across high-end, 4G (and beyond) networks.

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- Bill Stanley, Strategic Business Development, Telcordia.

Telcordia’s Stanley reminds us of the critical penetration ratio, where we’ve reached 1:1 in terms of people to mobile devices, and says that we are exceeding 1:1 because of the introduction of tablets, netbooks, wireless broadband cards, and the like. He says, however, that “the big explosion goes way beyond 1 to 1; when multiple devices in my house begin communicating, that’s exponential growth.” Certainly this is true; when our smart meters, refrigerators, furnaces, and hot water heaters are able to communicate their status and electrical consumption across communications networks, we will see the ratio jump and growth in bandwidth consumption along with it.

Similarly, and perhaps sooner, we’ll see the ratio jump because of autonomous apps on smartphones and tablets. An individual with a smartphone and a tablet could easily have a personal ratio of 10:1 or greater – two devices with five or more apps each capable of some kind of autonomous communication or transmission to one or more end points.

So, whether we define those autonomous apps as instances of M2M communications or not seems at best irrelevant and at worst short-sighted. The industry needs to recognize that these machines will impact customer experience and perception. If networks slow down under the increased load, as we’ve seen happen in the 3G world, there are business consequences. Further, if people can’t take for granted that the applications are doing their jobs, then customer experience and brand perception will suffer. Here’s the irony – when my app stops working automatically, I’ve already got the device in my hand that lets me and 20 million of my peers rant about it on Twitter and Facebook.

Vertical Opportunities for BSS

Moving beyond the pitfalls, there are clear opportunities that any type of M2M creates for service providers in vertical markets, and BSS can play a high-value role. As more industries adopt devices that can be monitored, managed, and operated remotely, communications services become an integrated component. “You bump into a company that has nothing to do with telecommunications, but they are vertically relevant,” says Stanley, “their way of looking at it is that ‘I don’t care what the communications are,’ but they land a deal to put 6,000 devices in your hospital, there’s a communications ingredient to that...and that it darn well better work is table stakes.”

With devices collecting and transmitting data on that scale, something needs to make sense of all the noise. “Any network is putting out many messages that aren’t that important,” says Pinnes, “and you need to correlate them and translate them into something that is important.” For other vertical industries that will need to solve this exact sort of problem, “this is where experience in OSS/BSS becomes very relevant,” says Pinnes.

Recent news reports have discussed the phenomenon of alarm fatigue in hospitals, where so many electronic machines send out audible alarms that nurses become desensitized to them, raising the risk that a critical alarm will be missed. Problems like this can be solved with analytical tools very similar to those communications providers use not only to filter alarms, but to monitor them, categorize them, and ensure that the right people are alerted directly and respond to them in a timely manner.

“You’re bringing that information in, and teasing meaning out of that data that’s coming to you. That’s a big challenge for the BSS - and a big opportunity - but you need algorithmically to analyze all of that value-added out of that torrent of information, and that can be monetized,” Pinnes says. Setting up all of the logic that drives these kinds of solutions is another area where BSS experience comes into play. And not only does the upfront requirements process have to be executed correctly, but “carriers have great experience in change realization – getting feedback from users and adopting improvements;” says Pinnes, “that’s a value [service providers] can bring to the table.”

Experience with these kinds of problems, and the

technologies and business practices that solve them, gives communications service providers a bigger stake in vertical industries than connectivity alone can provide. There’s a chance to get into the room with the hospital, education system, retailer, or whomever and provide guidance both on how best to leverage communications networks and on how to select, implement, and apply analytical tools most effectively.

Strategic partnership with vertical-specific IT players makes sense here, but because the service provider likely has customer relationships in place with major enterprises – or the brand recognition to get in the door - it’s an ideal channel partner for solution providers to sell through. That moves the service provider higher up in the value chain and gives it a bigger piece of the revenue pie. So, ultimately, because M2M means communications is integral to what other industries want to do to remain on the leading edge, service providers don’t have to be content with just providing the pipe; there is a chance right now to learn from the OTT experience in consumer markets and seize the initiative in M2M.

Remembering the Little People

With all of the focus on M2M and analytics, we can’t forget that ultimately, people need to use solutions and information to drive their decision making and live their lives. “You can’t lose the focus on people just because you’re focused on the machine-to-machine part of it;” says Monica Ricci, Director of Product Marketing for CSG Intec, “you can’t lose site of the fact that there are people on the other end of these devices.”

It’s easy to get so caught up in the technology that we forget about usability. Companies like Apple and Google win because they marry usability and great technology together so well, and communications service providers need to do the same thing here. If they can catalyze partner-based solutions for specific verticals in such a way that implementation of everything from the devices and network components to the dashboards and other user-facing components work seamlessly and are accessible to non-experts, they can win big in M2M. If we all spend too much time arguing over what is and isn’t M2M and miss the big opportunity, however, then we will not have learned what consumer OTT should have taught us by now.