

The rise of the machines

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While I must admit that I borrowed the title of this article from the *Terminator* franchise folks, I assure the reader this is no horror story. On the contrary, for both investors and those of us living in an increasingly connected world, this promises to be a story with a happy, and dare I say *profitable* ending.

What I am talking about is the admittedly delayed emergences of wide scale M2M (Machine to Machine) networks all around us. While forward thinking industry pundits have forecast this for some time, we seem to be approaching a tipping point driven by innovation along three fronts: cost effective technology, emergence of applications and finally allocation of capital. Let's consider each in turn.

Beginning with technology, here at Near Earth we can't help but notice that the development of this industry is mimicking the onset of the Space Age, which developed simultaneously, and some would say symbiotically with the Computer Age. Some of these important technology drivers behind M2M are:

- **Cheap WiFi transceivers** – Thanks to learning curve effects, a robust equipment ecosystem and a deep well of relevant engineering expertise, prices have fallen sharply. With collective production runs now nearing one billion units *per year*, and pricing in the single digits, when it is combined with cost effective broadband backhaul, WiFi greatly extends the reach of the machines.
- **Emergence of Personal Area Networks (PANs)** – Using the newer 802.15 standard extends much of the functionality of WiFi to applications where low cost and long battery life are critical – extending the network of the machines to a multitude of “lower priority” locations where extending a power line or requiring frequent battery changes is impractical. With a similar adoption curve to WiFi, ABI Research projects PAN device sales will grow from \$15 million in 2008 to approximately \$500 million in 2014 – an impressive 79.6% CAGR – and a lot more machines to talk to.

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- **Buildout of wireless broadband data networks** – At the other end of the performance spectrum are the cellular networks, which provide near ubiquitous mobile coverage (especially when enhanced by a satellite component!), thanks to their multibillion dollar networks. At the cost of somewhat high power consumption and more costly terminals, and thanks to new 3G and emerging 4G standards, these networks also provide substantial capacity.
- **Rapid reductions in GPS software and chipset pricing** – Following a trajectory similar to WiFi, GPS technology has become widely available at low cost, and thanks to improved sensitivity and more powerful satellites, faster position solutions are available in more locations than ever before. Combined with MEMS technology, GPS receivers can continue to keep track of their locations even where there is no GPS coverage. More and better position information means more for the machines to talk about, and to act on.
- **Widespread availability of geospatial data sets** – It's not enough to just know where something is – it's also critical to know where other things are too. These data sets provide a critical step in transforming information into knowledge.

With these building blocks in place, bright people have started to fashion networks that address a wealth of applications. While we think the range of applications is close to unlimited, some of the most promising areas in M2M today are the following:

- Mobile asset monitoring and tracking (construction equipment, trucking, locomotives, rail cars)
- Smart energy grids (automated metering, load management, routing)
- Remote monitoring and control (SCADA pipelines, automated meter reading, wind farms, wireless towers)
- Security and safety (OnStar, maritime shipping Automatic Identification System, building security, border security)

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With a growing array of applications, and dollars chasing them, the financiers have begun to respond, both in a bottom up and top down fashion.

- **Consolidation of service providers to meaningful scales** – Starting with the bottom up case, it's no great secret that M2M



and M&A go together like bread and butter (In fact, here at Near Earth, you might say they *are* our bread and butter!). While some of this is simply the normal consolidation of an emerging industry, in the case of M2M the extensive sales cycles and significant risks that unsuccessful M2M deployments pose to their customers demand a greater degree of scale – and the market has responded. In fact, M2M magazines M&A tracker recently topped over 100 transactions since 2004. Industry leaders such as GE, Numerex, Wireless Matrix, Siemens, Wavecom and Digi, among others have proven to be serial acquirers, and we expect this trend to accelerate as the financial thaw continues and markets become more accommodating.

- **Gaining mindshare with large carriers** – As noted above, in many cases M2M networks employ the infrastructure of the major cellular carriers. Through both open network initiatives (with some prodding from our friends at the FCC, and Google for that matter), and more recently explicit alliances and JVs that directly address M2M the big boys are starting to pay attention to M2M. Consider the following tie-ups:
 - AT&T/ Jasper Wireless
 - Verizon Wireless/Qualcomm
 - Sprint/Datasmart
 - T-Mobile/Sierra Wireless

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Why all this attention? Because the big carriers are starting to become victims of their own success. As wireless penetration has grown to where it approaches 100% (currently over 90%) and ARPU has stagnated near \$50, the industry has employed innovative billing (i.e. prepaid) models and service models (\$99 all-in-one plans) to maximize their revenues, but these can only go so far.

Clearly, the industry needs new ways to rejuvenate itself – and what better way than to have subscribers that aren't people? When you have Verizon Wireless' Ivan Seidenberg declaring, at the CTIA keynote address that "...500% penetration is achievable.", it's clear where he thinks the world is headed. Here at Near Earth, we think that not only is he right, but when other forms of connectivity such as PANs, WiFi and others are considered, the total addressable market for M2M is more like the 60 billion devices that Jasper Wireless says could benefit from M2M deployments. As these



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firms begin to really penetrate that opportunity, it will truly mark the beginning of the age of the machines.

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