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## ARM-ing The Enterprise

*The ARM ecosystem is the king of mobility, with the vast majority of smartphones and most tablets being powered by ARM based devices. And while enterprises are adopting ARM powered devices through BYOD, vendors creating solutions to meet enterprise challenges are increasingly broadening the scope and breadth of products. This will expand dramatically over the next 2-3 years as ARM gets serious about enterprise solutions beyond its current niche.*

Certainly the x86 ecosystem is not dead, nor will it simply disappear, and its leading proponent, Intel, is fighting back strongly with next generation Atom chips and software optimizations. But while mobility is leading the charge in expanding ARM's influence in the enterprise, the "Enterprise of Things" (EoT) and the approaching implementation of personal clouds and distributed/local area clouds will have great impact over what gets deployed in the next 2-3 years.

### **Where is the market going?**

Over the next 2-3 years we will see a significant volume market develop for microservers for distributed cloud apps, including both remote office and IT delivered enterprise solutions. BYOS (bring your own server) solutions will follow in the path of BYOD and users will increasingly employ microservers as consolidation points and small processing stations for their expanding mix of devices (we expect users to have 5-6 regularly used devices within 1-2 years). Smartphones often serve this requirement today, but will not be adequate for the longer term needs of more complex devices. Not every device will have a direct connection to the cloud, as this is bandwidth and data inefficient, and the volume of devices/connections presents acute challenges to the enterprise security requirements of VPNs, identity, data integrity, etc. Devices will often connect to personal area cloud servers for staging to broader cloud based services, as well as utilizing localized pre-processing, analytics and data consolidation. While the primary function of these microservers will be I/O intensive, increasingly strong CPU/GPU requirements will come into play for software and application enablement.

Where will the ARM ecosystem find success in emerging enterprise deployments?

We expect many of these microserver, distributed cloud products to be powered by ARM chips, although there will be a significant amount of low powered x86 based solutions as well, particularly in those situations where software availability/compatibility is key. Further, we expect the majority of enterprise-class tablets to be running Android within the next 1-2 years, and most will be powered by an ARM based chip. Windows based tablets, and especially those powered by x86 chips, will remain a minority, with 20-30% of the enterprise market in 3 years. Finally, the majority of emerging "things" will be ARM powered, and enterprise focused "things" will be designed and deployed for special use cases.

However, there will also be some areas that ARM will have great difficulty penetrating. One primary area is in notebook-like enterprise devices. We don't expect clamshell, cloud-only, Chromebook-like devices to be widely popular amounts enterprise users, primarily because not everything will be done in the cloud, and because on-board Microsoft Office will continue to dominate the knowledge worker's workstation needs. Despite some preliminary inroads from Google and others trying to change this behavior, we don't expect it to get beyond a small minority of users (5%-10%).

#### **Which ARM vendors are key to the enterprise?**

There currently is a large ecosystem and many suppliers for ARM technology. But the vast majority is focused on the consumer space. Who is well positioned to carry the ARM banner into the enterprise and lead in supplying enterprise-class chips? The current leader in smartphone and tablet chips, Qualcomm, doesn't seem to be interested in providing more server-centric solutions, at least not at this phase of the market. Leadership (and market enablement) would take a company with expertise in enterprise-level solutions. We believe AMD is in good position to go after the enterprise market, now that they have established their "ambidextrous" philosophy (e.g., produce products that are nearly equivalent with either x86 or ARM cores to meet the needs of its customers). A focus on enhanced CPU and GPU functionality, an area AMD knows well, will be critical to the enterprise marketplace. And with primary relationships already established with enterprise device and server vendors like Dell, HP and Lenovo, who would in any case lead the charge in enterprise deployments, they stand to gain from the expansion of ARM-based solutions tailored for the unique requirements of the enterprise (e.g., computational enhancements, security, manageability, ease of deployment). This is a market where AMD could show leadership and competitive differentiation, while avoiding low margin commodity supplier status for at least for the next 3-4 years.

#### **Is x86 dead?**

Despite the expected expansion of ARM into the enterprise, x86 is not dead by any means. Low power x86 is still attractive in many markets and product areas (e.g., notebooks, Windows tablets and higher end Android tabs, medium to larger servers). Further, microservers based on x86 architecture are making their way into the market. Intel for one is fighting back against ARM's incursions by placing increased emphasis on addressing this market with new targeted products expected over the next 1-2 years. But x86 will increasingly be sharing the enterprise IT space with ARM over the next 2-3 years as ARM's expanding ecosystem invades the traditionally exclusive x86 space.

**Conclusions:** The next 2-3 years will see a large number of enterprise targeted devices in the client and microserver space powered by ARM chips. Chip vendors that best understand and engineer products for enterprise needs will see strong growth, and AMD could be one of the leaders in this area. The change from a mostly x86/Windows marketplace to a more diverse ecosystem will see enterprises going through many of the pains and challenges they have already faced with BYOD. The transition requires that enterprises start to plan now for the groundswell that is coming in the next 2-3 years, and to build the required strategies and expertise needed to meet the challenges.

*Commentary written by Jack Gold, Principal Analyst.*

*For more in-depth comments or analysis on this or other subjects, feel free to contact us.*

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