The Roundtable - The Cloud

How do you feel the Cloud will most impact product development in the coming year?

Jake Galbreath, VP Wireless Systems, MicroStrain, www.microstrain.com **[1]**

The cloud provides new solutions and opportunities for dealing with a wave of big data generated by machines, sensors, mobile devices, and the Internet of Things (IoT). The value of data storage in the cloud has been established, and now many hardware manufacturers and OEM's are exploring how to further leverage the cloud to provide added value for their customers. Over the next year, the cloud will likely spur product development trends in the areas of security, storage, accessibility, and analytics.

First and foremost, security is the foundation for any cloud connected system, embedded hardware and stack providers are likely to continue to lower barriers for implementing secure web communications (HTTPS/SSL/TLS/SSH) on inexpensive embedded systems. Second, customers have a growing expectation for syncing their data to the cloud, and the cloud will help reduce local storage capacity requirements by allowing manufacturers to test the market with cheaper, leaner devices. Third, as customers get more comfortable with QR codes we will start to see smarter product linking from dynamically generated QR codes on small inexpensive displays. At MicroStrain, dynamic QR codes on our newest wireless sensors make it easier for customers to quickly review events of interest on our SensorCloud platform. Finally, the cloud's elastic resource scalability makes it a great place to implement analytics and extract meaningful, actionable information from large quantities of raw data. MicroStrain is strongly committed to this concept and we are currently releasing an application development environment that allows our SensorCloud customers to develop and deploy cloud-hosted data processing apps in python, octave, and R. There is strong indication that we will see an increasing trend to push processing intensive analytics and data crunching tasks to the cloud, where access to high-end parallel computing resources is inexpensive.

Raj Pawate, Texas Instruments, www.ti.com **[2]**

System-on-chip technology is bringing massive computing capacity to the cloud at very low power and cost.With high bandwidth access to the cloud, development teams benefit from convenience; lower development costs; and secure access to large computing resources. As a result, development can occur around the world and around-the-clock.Before use of the cloud was widespread, it was necessary for a product development team to be localized to one physical location with members from different disciplines next to each other. The cloud has removed this necessity, enabling easy communication and information sharing with best-in-class experts across the globe. The cloud will continue to decrease the cost of development due to centralization of infrastructure. For example, instead of buying expensive test equipment and moving it to the team's location, this equipment can now be centralized in one location and shared by different teams on various sites. Secure access to the cloud with encryption of data over links and secure boots significantly alleviates concerns over protected information. Engineers can work from home or a location of their choice and access intellectual property previously restricted to specific physical locations. The cloud has also enabled Voice-over-Internet-Protocol (VoIP), decreasing basic communication costs to nearly free and catapulting development team collaboration to the next level. Peer-to-peer voice and video communications on clients enables multiple teams to collaborate as if they are in the same room. Teams can easily and securely access resources and communicate with others around the globe, and operations and interactions can occur around the clock. With the cloud, the sun will never set for global product development teams.

Cary Stronach, Director Cloud Strategy, Digi International, www.digi.com **[3]**

In 2012, the evolution of the Internet of Things (IoT) will gain significant momentum.

Poised to drive the next level of growth for all types of infrastructure services including, Internet throughput, Big Data, wireless carrier network utilization, security and cloud services; the Internet of Things will be a profound driver of innovation. Within ten years, there will be over 50 billion M2M devices using the Internet of Things to interact with millions of applications. These applications will require an order of magnitude and greater Internet throughput than what exists today. Wireless carriers will also have to significantly grow the bandwidth to handle the load. The data requirements of large deployments of Home Energy Management solutions, just one type of IoT solution, will dwarf the Big Data services we use today. Security solutions that address access points of devices and device-hosted malware will also move forward dramatically. A key solution in the Internet of Things ecosystem is the Device Cloud. To deploy large Internet of Things solutions, infrastructure that is economical, reliable, scalable and secure is paramount. The Device Cloud provides a layer of abstraction between the highly fragmented world of devices and the ever-changing and evolving world of applications. In a sense, the Device Cloud provides the means to manage change, without investing large amounts of capital to build the infrastructure, one enterprise application at a time.

David Raun, Senior Executive Vice President and General Manager, PLX Technology, www.plxtech.com **[4]**

The growing influence and popularity of cloud services is changing the requirements for system-level, software and semiconductor solutions. Inherent in the cloud concept is the necessity for performance, scalability and security, so all players in its ecosystem must focus on delivering these three crucial attributes.

The requirements are less focused on legacy compatibility, which currently is key with corporate data centers. This opens up the potential use of new superior technologies to address the increased performance and efficiency demands. With new high-performance processors like Intel’s Romley Xeon E5-2600 family with Gen3 PCI Express native on every device, the market leaders will push “the network” to the top of the rack by building extremely efficient ExpressFabric clusters with scalable 8G to 64Gigabit connections. This doesn’t meanthe advantages of and continued investment in 10Gigabit Ethernet for “the network” go away; it just allows these cloud centers to be built more cost-effectively to assist with the business ROI challenges of cloud providers.

The need for 10Gigabit Ethernet from the top of the rack and within most other parts of the cloud data center will take advantage of the maturity of 10GBase-T technology to allow up to 100-meter connections, as well as the latest low power consumption for short-reach applications.

PLX’s road maps are focused on servicing these new changing requirements and opportunities to help fuel and capitalize on the expected explosive growth in cloud services.

Chris Cope, CEO of SlimWare Utilities, www.slimwareutilities.com [5]

The true benefit of the cloud is that it provides a decentralized, managed platform that allows for nearly limitless scalability of resources. In the coming year, as the cloud continues making large datasets easy to store and access quickly, we can expect an increase not only in the sheer number of applications coming to market, but also in the quality of those applications.

We'll see more companies, like SlimWare Utilities, bringing ideas to market at a faster rate and using the cloud’s nimbleness and scalability to change, update and re-release their products based on customer feedback, for a “just in time” response to market needs. Derivative products leveraging each other’s data will become common. And, venture capital money will flow readily into small or “unknown” businesses as developers focus more on writing the code that executes their idea, rather than spending time evaluating their idea’s computing resource needs.

And, with endless resources to power applications on a pay-as-you go infrastructure, new ideas and businesses will begin to open up the product design process to include platform planning -- such as API’s -- to other developers, to expand an application's reach.

In addition, as more applications move to the cloud, browsers will increasingly become the target – and the preferred delivery method – for bloatware, malware and other items that can slow down or compromise a PC. With the continued growth in SaaS, IaaS and more cloud-based services, browser bloat and browser management will become even more important.

And finally, as cloud computing continues to mature in general, traditional IT services across the industry will adopt a more user-generated approach, using the cloud to deliver more customized, personalized product lines based on community feedback and input.

Greg Scherer, VP of Server and Storage Strategy, Broadcom Corporation, www.broadcom.com **[6]**

Data Center infrastructure exists to run Business and Consumer Applications. Those applications have been migrating into a Cloud operational model aggressively since 2010. By 2015, 57% of workloads will be processed in the Cloud per CISCO Cloud index.

Public Cloud developers have led the industry in defining the architecture of next generation IT infrastructure. They have exploited Open Source software and designed highly scalable Data Center hardware infrastructure for running Cloud workloads.

Open Source software has provided low costs, community resources, and fast time to market. This development process has already produced new proven software infrastructure technologies such as OpenStack and Hadoop.

Successful Public Cloud deployments were derived from very skilled network architects. These developers were able to design the entire hardware infrastructure for scalability. They used Ethernet for solving this distributed computing problem but architected using a much more efficient unified fabric vs. a bifurcated traditional LAN/SAN topology. Ethernet has proven to be fast, workload agnostic, interoperable, easy to manage, open, and low cost.

Enterprise developers challenge within the coming years is to leverage the above proven architecture practices of Public Cloud Computing. The new Cloud developer must have strong networking skills since all Data Center system elements will connect into this scalable fabric based on Ethernet.

Broadcom, the leader of merchant market networking provides Ethernet NIC's, Switches, and Physical Layer connectivity used in most major Cloud Data Centers today.

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