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SDN Predictions 2014: How SDN Will Transform IT

By [TMCnet Special Guest](#)[Eric Johnson](#), Chairman of the Board/CEO, ADARA

2013 has seen the start of a generational shift in computing and networking; by comparison, 2014 will be a tectonic shift for the entire industry.



Prediction #1 – The Real Pain will start for Legacy Network Equipment Vendors

Legacy Network equipment vendors will suffer major downturns in customers, revenues, units, market share and certified professionals. The networking market has been the last to undergo commoditization and accordingly virtualization. The transformation will see ODM's start to successfully replace OEM's in significant amounts, claiming double digit market percentages by the end of 2014.

Some telling signs to watch for include:

- OEMs sales projections will miss or be unavailable
- OEMs own Application Defined/SDN messaging will create a boomerang "FUD" against their existing platforms, cannibalizing their own sales
- Ultra low-latency becomes standard in merchant silicon offerings
- Complete disaggregation of software from networking devices becomes standard
- The end of completely vertically integrated platforms in networking occurs; we see the end to buying H/W, S/W and support from same vendor

Prediction #2 – Software Defined Networking (SDN) Finds Strong Traction with Customers

SDN discovers the "must have" reasons the market requires for SDN to gain serious traction

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Software-defined network is considered by many to be one of the most important, and potentially disruptive, developments in networking since the rise of the Internet. To date, networks and connectivity have come first, and applications have followed. SDN turns this model on its head, approaching networking from an apps-first standpoint.

In this SDN pre conference at ITEXPO Miami, we will define SDN, look at the technologies and components involved in SDN, the use cases of SDN, the players involved in moving SDN forward, and what this all means for networking as we know it.

HOT TOPICS

Software-Defined Networking 101

The Big Switch to SDN

Prediction #2 – Software Defined Networking (SDN) Finds Strong Traction with Customers

SDN discovers the “must have” reasons the market requires for SDN to gain serious traction in the market; huge economic improvement over the status quo. Recent market surveys consistently list Cost Reduction, Simplified Network Architecture, and Reduced Management Complexity and Intelligent Automated Management as the key reasons for SDN adoption; Network Programmability is a side benefit.

All of these “must-haves” are based in reductions in CAPEX and OPEX, are all delivered by SDN through its coupling with architectures that are new to Data Center Networking. Clos architectures are based upon principles first recognized in the 1950’s; Fat Tree networks, a special topological instance, have been used in the telecommunications’ industry since the 1980’s, they have been used in Supercomputing, and they have been actively researched for the past few years by the largest as well as the most advanced companies.

These architectures have not been widely employed in Data Center networks due to issues with manual management complexity, scalability, communication overhead, varying port densities / form factors and inefficiencies of legacy switching and routing in these environments’.





In addition, these networks lend themselves to re-packaging using identical merchant silicon replicated throughout the Data Center. Combining these networks, merchant silicon and SDN, enables a breakthrough. First are staggering cost benefits; a 95 percent reduction in Capital Expenditures due commodity merchant silicon 1U switches, a 90-95 percent reduction in Operational Expenses from savings in real estate, power, cooling, cabling reduction, service, support and more. Second, we see simplification of the network from traditional models down to simple 2-tier network, and with it, the elimination of proprietary systems, and CLIs. The benefits include full use of bisectional bandwidth at every level, and a network that is completely non-blocking; perfect for parallel processing in Virtual, Cloud and Enterprise Data Center Computing.

Advances in lightweight network control messaging enables graceful scaling. Simplicity even extends to the Hypervisor; encapsulation logically moves almost exclusively to SDN enabled switching silicon, along with other network functions, and the hypervisor returns to its role as a pedestrian Virtual Machine Monitor. Third we receive Ease of Management, and Automated Management; complete de-coupling of software from hardware occurs, enabling the Super Intelligent Applications required to manage this kind of network to be deployed on open platforms that operate from boot-up in a completely automated manner. In 2014, the long promised economic benefit of SDN finally arrives and with it, serious commercial market penetration.

Some telling signs to watch for include:











- Sharply increasing use of 1U TOR type switches
- Collapse of the Core/Distribution/Access model to a simpler 2-tier model
- Optical double digit market share growth penetration of the access edge as well as

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Some telling signs to watch for include:

- Sharply increasing use of 1U TOR type switches
- Collapse of the Core/Distribution/Access model to a simpler 2-tier model
- Optical double digit market share growth penetration of the access edge as well as the core with 10Gb and 40Gb standard on edge switches with 48/64 port densities as standard
- SDN managed Networking extends from virtual switches to physical switches, with network functions such as encapsulation firmly rooted in switching silicon
- MPLS fully implemented in virtual switches
- OpenFlow implemented in switching silicon
- Rejection of STT (Stateless Tunneling Transport) as a viable approach

Other, more industry segment specific developments will occur. They will be fallouts from the broader industry changes described above, but each of these developments will be pivotal in their own right, with each trend accelerating as the year progresses:

Prediction #3 – Northbound Interfaces will be Standardized/Productized

- Productized NBI's will emerge from market not ONF
- RESTful APIs will be implemented on switching silicon

Prediction #4 – New Southbound Interfaces will emerge in addition to OpenFlow

- OF itself is expanded

Prediction #5 – Software Defined Networking (SDN) causes Storage to accelerate to all-IP

- Use of FibreChanel and other storage technologies starts to erode

Prediction #6 – Network Functions Virtualization becomes a Standard Architecture

- Erodes sales of middleware vendors
- Erodes sales of middleware boxes / appliance vendors

Prediction #7 – Kernel Operating Systems will be fully opened and compressed

- Proprietary operating systems that now exist from at layers 1 through layer 3 (DWDM Fabric, SONET/SDH, Layer 2, Layer 3) will all become open or lose market share
- Programming will be increasingly move from kernel to User Space; Netmap and libzero, etc.

Prediction #8 – Packet/Optical Integration Gains Traction

- Abstraction above the optical equipment; optical transport becomes commoditized

Prediction #9 – New Class of Service Level Agreements will Emerge

- Recognition of a capability gap between what customers want and need/ what

- Recognition of a capability gap between what customers want and need/ what providers can currently deliver
- Current SLAs no longer hold value:
 - Mean Time Between Failure (MTBF)
 - Mean Time To Repair/Mean Time To Recovery (MTTR)
- New class of SLA emerges:
 - Focus moves from uptime to dynamic data center requirements:
 - VM Initializations, deployed workloads, dynamically created services
 - Driven by:
 - RDMA over Converged Ethernet (RoCE); Zero copy approaches, requiring high-throughput and low-latency

Prediction #10 – Full Automation of Choreography and Orchestration

- Differentiated by intelligence; software is 100 percent of the value
- Driven by DevOps, automated testing, deployment, production

In 2014, the world we know will not just look radically different, it will be different. It will be a once-in-a-lifetime ride for the industry; seatbelts are highly recommended.



Eric Johnson serves as president and CEO of [ADARA](#). He conceived and managed development of the ADARA SDN and Cloud Computing Platform effort for Verizon, alongside Hewlett Packard and Intel. Unveiled at the Open Networking Summit that platform remains the industry leader. He also is the ADARA Chief Technical Authority on the \$12 Billion IT Acquisition Contract, the Veterans Affairs Department's Transformation Twenty-One Total Technology (T4), and the \$20 billion CIO-SP3 IT Acquisition Contract.

Edited by [Cassandra Tucker](#)

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