The networking industry is undergoing profound change. This transformation is driven by the shift from hardware to software, programmable networks, and a potentially game-changing technology called intent-based networking.

Network visionaries and leading practitioners speaking at VMware’s second-annual future:net conference on August 30–31 in Las Vegas are fired up over the future of networking. “This is a very exciting time to be in the networking industry,” says Peter DeSantis, vice president of global infrastructure for the Amazon Web Services (AWS) cloud service.
Programmable networking technologies such as software-defined networking (SDN) and the software-defined wide-area network (SD-WAN) have gained traction in recent years, changing the networking industry in significant ways. Increasingly, network functionality has moved into software that is independent of underlying hardware devices. One of the latest developments to emerge in this direction is a technology known as intent-based networking.

“Intent-based networking is the true automation of networking,” explains David Cheriton, founder of and chief scientist for Apstra, a developer of intent-based network operating systems. With intent-based networking, users tell the network what they want, and the network essentially figures out how to achieve that goal.

As keynote speaker Ratul Mahajan, CEO of Intentionet, a networking startup, points out, there is a huge gap today between the network manager’s policy intent and actual runtime behavior. Intent-based networking creates a closed loop; a network manager expresses intent, and the network verifies that the intent was achieved.

It’s still early for this technology, and traditional Fortune 500 companies are unlikely to deploy intent-based networking until it matures. However, digital-native companies such as Google, Amazon, and Facebook have embraced network automation using (mostly homegrown) software for many years. They shared insights with attendees at the invitation-only event, as did speakers from Netflix, LinkedIn, Bloomberg, Electronic Arts, Oracle, and VMware.

The key themes at future:net included the rise of open source software as a platform for innovation, and the issue of build versus buy when it comes to a networking strategy, and the dramatic shift from hardware to software in order to achieve greater efficiency and flexibility. Businesses are able to move faster and at a reduced cost when they move to a software-based system.

**Trendsetters: Netflix and Bloomberg**

Netflix clearly demonstrates what a company can accomplish when IT focuses on the business rather than on infrastructure. For example, Netflix runs entirely on Amazon Web Services, which means that Netflix has exactly zero employees configuring routers and switches. IT resources are freed up to develop the thousands of micro-services that run in the background, including the ones that decide which movies to recommend to Netflix’s 100 million customers. When it’s Christmas Eve and demand for movies spikes, the Netflix network automat-
Manish Mehta, senior security software engineer at Netflix, says automatically scales up with no human intervention.

Bloomberg, the financial services technology company, owns a complex, mission-critical legacy network—15,000 customer-premises equipment (CPE) routers and its own global Internet Protocol (IP)/Multiprotocol Label Switching (MPLS) network. Truman Boyes, Bloomberg’s head of network architecture, says his goals are to reduce complexity and to reuse and recycle where it makes sense to do so, instead of trying to manage everything in-house.

Boyes says his guiding principles are to automate everything in the data center, use open source in situations where the company wants to make changes, use virtualization and containers for all applications, and use the cloud to scale the business.

Rajiv Ramaswami, VMware’s chief operating officer for products and cloud services, says, “The future is all about software.”

Brenden Blanco, staff engineer at VMware, recalls when he started out as a software developer, as part of a team of 250 people that delivered two major release cycles a year. Cloud computing puts pressure on IT organizations to become more flexible and scalable. All eyes turned to application developers to help build the next generation of software. Today, software engineers like Blanco work in small teams and use new, agile methodologies with short life cycles to create innovative programs faster.

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Cloud Security Insights

Security remains a core issue. This is true both for enterprises determining which workloads they will move to the cloud and for service providers whose reputations depend on ensuring the safety of customer data.

Oracle has deployed a three-tier system of “defense in depth,” says Pradeep Vincent, an architect for Oracle’s Infrastructure as a Service (IaaS) cloud. This includes narrowing the interface to the virtualization layer, creating multiple points of routing decisions, and building multiple trust zones to isolate high-risk devices from internal systems.

Another common theme at the conference was whether network executives should continue to buy hardware and software or build some network components in-house. Rob Sherwood, network engineer at Facebook, suggests companies start thinking about what they might be able to build on their own, beginning with orchestration software and moving to network management.

In his closing keynote, DeSantis recalled his early years at Amazon, when the network was considered “an unreliable entity.” However, that perception is changing. “The cloud has transformed the way users and practitioners interact with the network in cool and exciting ways,” he says.

His parting words of wisdom: “Once you can rely on the network, exciting things can happen.”

For more on the need for enterprises to take a fresh look at networking as a software-based endeavor, visit Radius (www.vmware.com/radius).