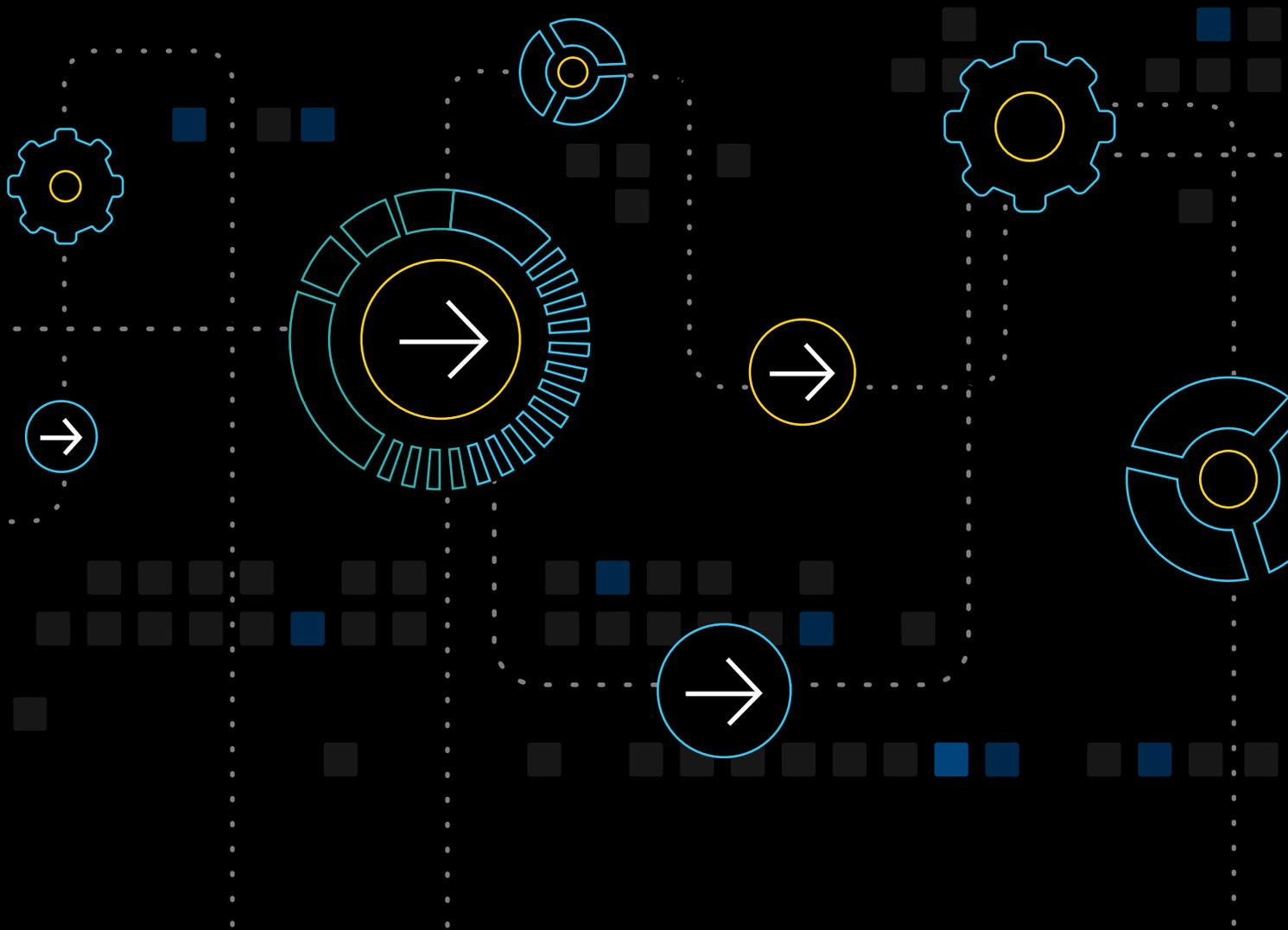


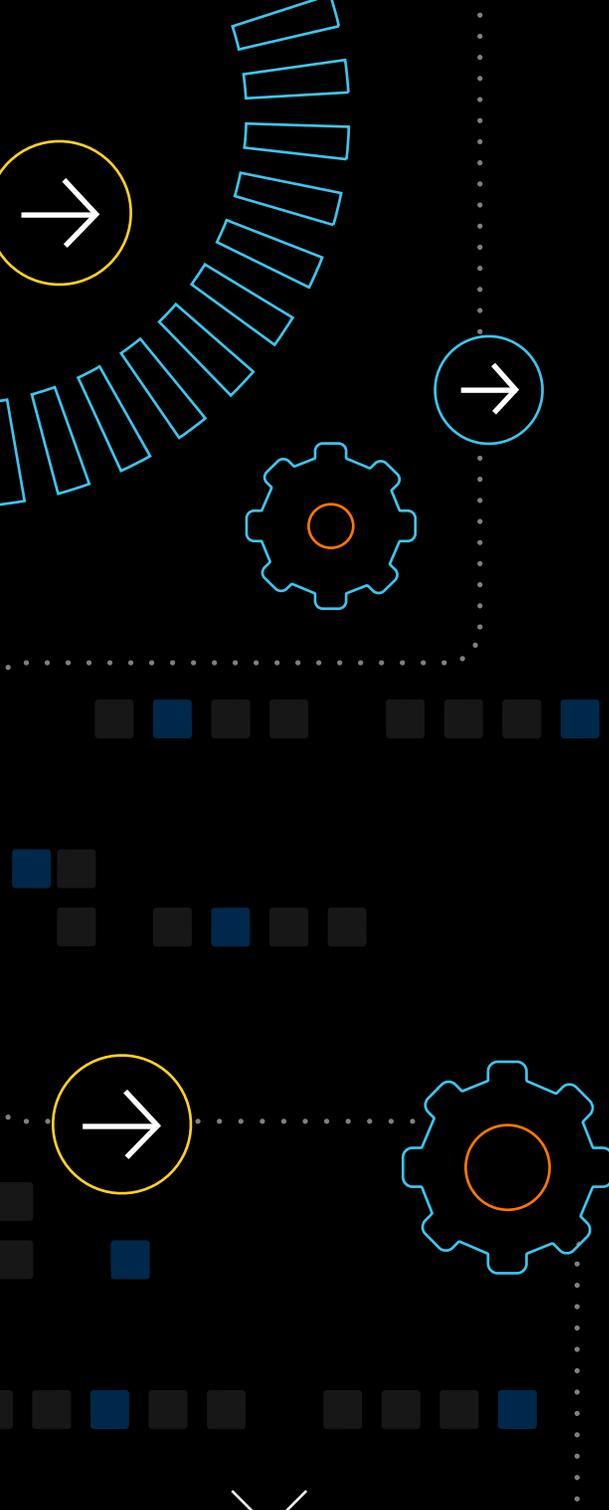
Agile. Scalable. Manageable.

Implement a flexible data center with open networking technologies.



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The shift to open networking standards

IT organizations have leveraged open ecosystems ever since proprietary mainframe architectures gave way to client-server architectures. The arrival of x86-based servers fostered an open computing ecosystem that allowed enterprises to choose applications and operating systems based on specific business requirements.

Proprietary technologies are no longer the most efficient or effective approaches for today's data center. Bandwidth requirements are expanding exponentially as increasing amounts of structured, semi-structured and unstructured data are being transported within the data center, accompanied by a similar increase from the shift toward virtualization and the cloud. Organizations with legacy network infrastructures are unable to capitalize on this shift.

With these factors in mind, organizations are looking for network solutions that are less expensive to build and maintain, while delivering greater levels of agility, scalability and manageability.

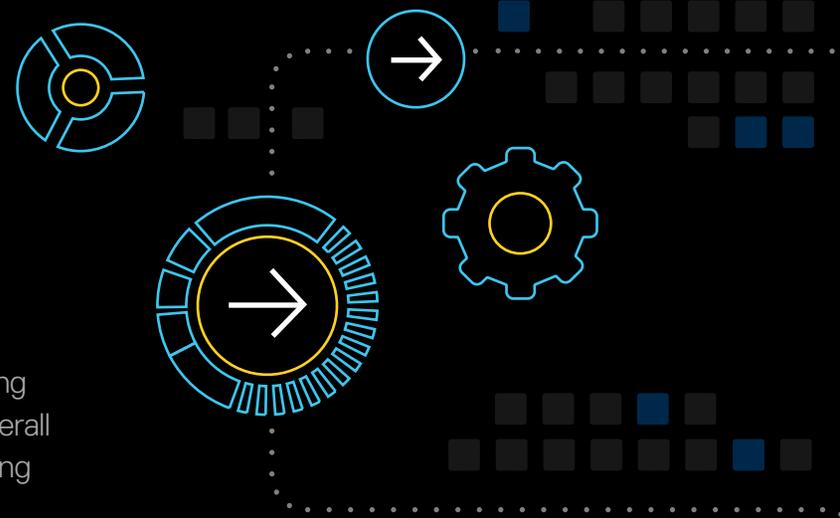
An emerging, open networking ecosystem allows IT organizations to choose from industry-standard networking hardware, software and tools to help simplify network management, orchestration and automation. In particular, disaggregated switches

that support a choice of network operating systems and a variety of software-defined networking (SDN) solutions are now available.

The trend of moving toward open networking standards has provided IT leaders an opportunity to partner with vendors to deploy agile, scalable solutions that lead to more streamlined manageability. Organizations can now enter the open networking era with a choice of effective technologies designed to deliver the flexibility they need to transform their networking and offer a clear path to a software-defined data center.

The future of software-defined networking is open

Software-defined networking disaggregates networking technologies into modular building blocks, bringing customers unprecedented flexibility and innovation. Dell simplifies the overall network and opens the architecture to allow customer choice across the entire networking infrastructure — building highly reliable, flexible and customer-centric solutions.



Three main approaches for implementing open networking SDN

Operating System Solutions

Disaggregating operating system software from hardware enables customers to choose which OS to run on Dell switches to meet their specific requirements.

Network Overlay Solutions

Disaggregating virtual networking from physical networking allows multiple virtual networks to be run on a single physical network — reducing application deployment time and providing deep security capabilities.

Control Plane Solutions

Disaggregating the control plane from the forwarding plane within the network enables centralized, automated control of the network.

“This is a great example of innovation coming from the new Dell. Networking is an industry crying out for disruption. We’ve done this before with PCs and servers, putting us in the best position to offer a choice of network operating systems. Networks are like human minds — they work better when open.”

— Tom Burns, Vice President and General Manager of Dell Networking



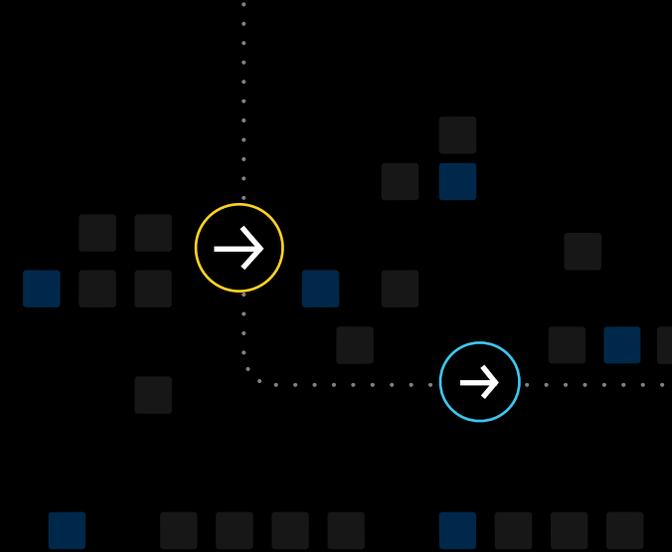
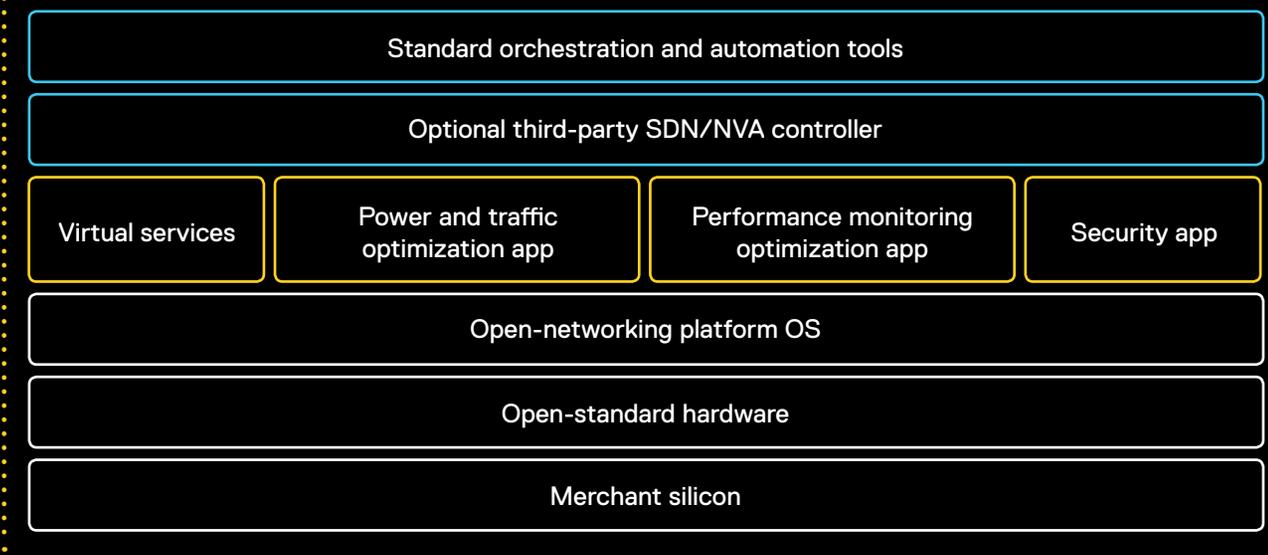
Implementing any of these SDN approaches requires the use of network switches that support SDN technologies and, by using an open, industry standards-based model, enable organizations to incorporate best-of-breed network infrastructure and technology.

Dell's vision of open networking ecosystems

Dell's vision of the new data center networking model is an open ecosystem in which organizations can choose from innovative, industry-standard network applications, operating systems and hardware. New dynamics brought on by the shift to the cloud, resource pooling and the need for serverlike automation have led to the development of high-capacity Ethernet fabrics designed to simplify and automate physical switch networks.

This disaggregated networking model fosters an open networking ecosystem and helps free organizations from being locked into proprietary technology. This innovative model supports the use of different operating systems through use of the Open Network Install Environment (ONIE), which enables zero-touch installation of operating systems onto open networking switches.

The future of networking



A complete open networking ecosystem includes the following components:

Off-the-shelf chips that can be used in a variety of standards-based network switches

A choice of network operating systems built for particular environments

Open-source, standards-based tools, applications and expertise to advance innovation

Optional SDN/NVO controllers for building a true SDN infrastructure

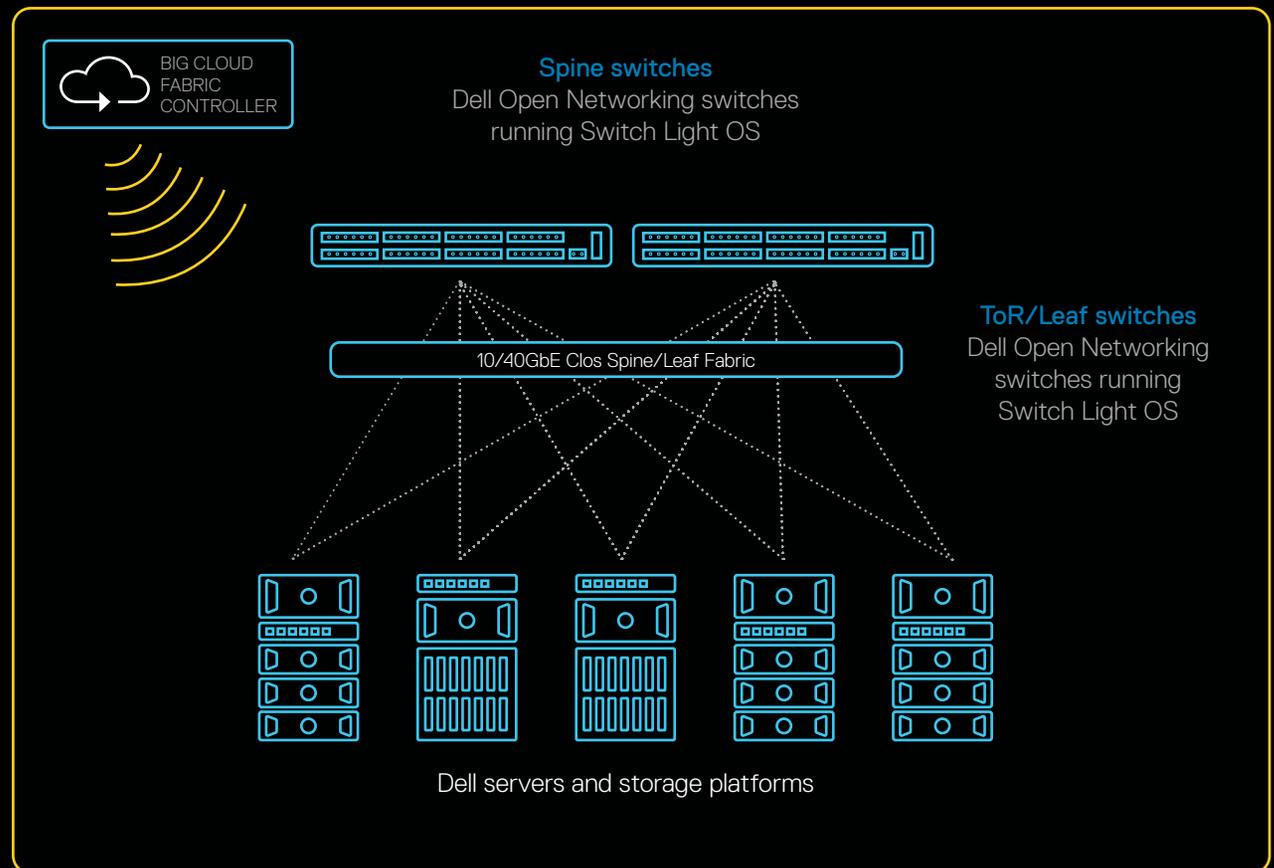
Deploying open networking environments

Data center networks must evolve to meet intensifying enterprise demands for cost-effective innovation. The diagram on the right shows how organizations can deploy an open networking environment as they bridge the gap between traditional networking and software-defined networking.

Benefits of open networking:

- ✓ Embrace the power of choice with best-of-breed solutions
- ✓ Start the transition to SDN with a practical network monitoring solution
- ✓ Manage all monitoring fabric components from a central place

Example architecture of an SDN-based open networking environment



Unprecedented levels of flexibility and efficiency

Disaggregation, SDN and open standards are changing the paradigm in network design from an environment that is dominated by proprietary technologies to one that is open and innovative. Opening the network ecosystem helps lower operational and capital expenditures because organizations are not locked into any one vendor — instead, they can leverage the large ecosystem of Linux and open-source applications.

Open solutions minimize the time and effort required to design, provision and manage networks, helping IT managers reduce costly engineering overhead. Dell believes that open networks stimulate rapid innovation leading to unprecedented levels of flexibility and efficiency.

Dell open platform innovations



SDN-ready switches that enable an SDN implementation of NVO, SDN controller or programmable interface



Open networking switches that are ONIE-enabled to run open networking operating systems from multiple vendors



Third-party network operating systems for Dell open networking switches that can address needs for networking environments such as analysis, cloud infrastructure, SD WAN, and Linux programmability and management.



The Dell commitment

Today, Dell is helping enterprises migrate to software-defined networks that meet specific business and organizational requirements. These SDNs offer the scalability and manageability to quickly take advantage of emerging opportunities.

Dell supports this vision with comprehensive data center solutions for server, storage and networking; single-point accountability for global distribution and fulfillment; and a services portfolio spanning network planning, deployment and support.



Dell.com/networking

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