

Preparing your network for **digital transformation**

Digital transformation means different things to different organizations. Perhaps it means shifting workloads to the cloud, digging deeper into data analytics, giving your employees more options for mobility, or automating more processes. But one thing's for sure: no matter what your digital transformation strategy looks like, your network is going to be either the hero or a hindrance to your digital transformation efforts.

In this paper, we'll be discussing the primary challenges with digital transformation and how web-scale networking principles like disaggregation, the economy of choice and automation make digital transformation possible and profitable.



The challenge with scalability vs. agility

Agile networks require a deep understanding of your organizational objectives. A one-size-fits-all approach to networking just doesn't work anymore. Your network has to not only be customized to fit your organization's needs, it also needs to be flexible enough to adapt when those needs change. Agility requires responsive, hands-on action from the people who know your network best – your network team.

But just redirecting resources toward network personnel isn't enough. Most networks are composed of tightly-integrated hardware devices and software. That means your network's growth, agility, and performance hinges on three things:

- 1 How powerful the hardware is?
- 2 The features the software provides
- 3 How well the hardware and software work together?

Naturally, each networking vendor presents their solution as having the beefiest hardware and the most cutting-edge software. They claim that because they make both, the hardware and software work together. But hidden in the midst of this seemingly unbeatable combination is a problem. Although the tight coupling of hardware and software by the same manufacturer may ensure compatibility, it kills flexibility. If your network's hardware and software is inflexible and cumbersome, it will always be a hindrance to agility. No matter how dedicated your network team is, they can't change the underlying architecture of a vendor's solution.

Network scalability means growing your network in proportion to your organization's needs. There are different levels of scalability, as well as different ways to achieve it. For example, if you have to triple your network spend to double capacity and performance, your network isn't very scalable. But if you reverse the numbers – double your network spend, and triple your capacity and performance (and do so quickly) – your network is highly scalable. The level of scalability you can achieve depends on the underlying network architecture.

Key principles of scale for digital transformation

Scaling vertically or scaling horizontally might sound like a topic that IT geeks debate over a cup of coffee. But it's a network decision that creates a ripple effect throughout the rest of your organization.

Scaling vertically vs. horizontally

Scaling vertically

Networking vendors have always addressed flexibility and performance concerns by selling the “bigger is better” mentality. You’ve heard this: if you’re not sure that a particular switch model will be beefy enough to meet your growth needs, just opt for the larger (and more expensive) one. To use IT jargon, you would scale up or scale vertically to meet your performance requirements.

That’s not necessarily unreasonable. But when you choose the vertical scaling approach, you’re limited to the biggest box available at the time. And if the monster switch you bought isn’t big enough, then you have to rip it out and replace it. That means downtime.

Scaling horizontally

Instead of buying a large, high-capacity switch, you can combine multiple smaller switches to get the performance you could get from one large switch. This is called scaling out, or scaling horizontally. The advantage of this is that you’re not limited by the power of a single switch. As your needs grow, you can add more smaller switches, and they’ll all work together to share the load.

A happy consequence of scaling out is that you limit the size of your failure domains. If one small switch out of dozens fails, the impact is small. If you’ve got redundant connections, the impact may be minimal – just a temporary drop in performance.

As you might expect, cloud providers use the scaling out approach to achieve performance, reliability, and agility at a massive scale. If you’re serious about digital transformation, your network has to use the same approach.

Freedom of choice in software and hardware

According to Gartner, “the top networking challenge... is improving agility.” Not a big surprise there. But what is surprising is Gartner’s advice to “shift investments away from premium networking products toward [your] existing network personnel.” That’s right: the answer to improving your network’s speed and agility is not by buying expensive, proprietary monster switches and premium automation solutions. Rather, it’s by letting the people who know your network best decide the best way to make your network more agile.

By going with a disaggregated model, you can choose the switches that best suit your business, and even for your specific services, so that your infrastructure is completely customizable and agile. By choosing an open network operating system like Cumulus Linux, you can then choose any applications you need to improve optimization and have them fully integrated with your Linux-based operating system. The result is a network that is more affordable to build, more agile to customize and adjust as your business changes, and light years easier to expand and scale as your business grows. You’ll have more budget to invest in premium engineers to build you innovative infrastructure designs and more room to truly innovate your network.

“Shift investments away from premium networking products toward (your) existing network personnel.”

— Gartner

Automation

Automation is an inevitable part of digital transformation. As your network grows and becomes more complex, manual configurations become increasingly time-consuming, difficult, and risky. Automation is the final piece of the scalability puzzle, and there are a lot of innovative and forward-thinking new ways that organizations could be leveraging automation.

We have several blog posts on the topic if you’d like to take a look.

[View Blog](#)

Unfortunately, the tight coupling of hardware and software limits your automation choices. A proprietary network operating system means either using proprietary automation software or hacking your own automation solution. Again, the one-size-fits-all mentality gets in the way of you achieving your digital transformation goals.

To make your network fast and agile, your network operating system needs to support open-source automation tools like Ansible, Chef, and Puppet. Your networking team needs the freedom to craft customized automation solutions that meet your organizational objectives.



Conclusion

In short, digital transformation is changing the ways businesses think about scalability and agility in their networks. As the demand for more power and speed increases with digital adoption and innovation, these changes will become immediately critical. To stay ahead of the game, we recommend thinking through these changes now by leveraging disaggregation, horizontal scale and automation.

[Learn more about web-scale principles](#)