Implementing software-defined everything in the data center

Size: 6400 employees | Industry: Higher Education | Location: Salt Lake City, Utah

Located in Salt Lake City, University of Utah Health is the region's only academic health care system, combining excellence in patient care, the latest in medical research, and teaching to provide leading-edge medicine in a caring and personal setting. The system provides care for Utahns and residents of five surrounding states in a referral area encompassing more than 10 percent of the continental United States. To learn more, visit healthcare.utah.edu.

Challenges

- Modernize data center systems and operations
- Reduce repetitive, manual tasks to pursue new, strategic possibilities
- Improve data segmentation and security

Solutions

- Application-centric, software-defined network
- Application connectivity and dependency mapping

Results

- Increased infrastructure agility and automation
- Transformed network operations and workflows
- Improved application visibility and protection

For More Information

- Cisco® Application Centric Infrastructure (Cisco ACI™)
- Cisco Tetration™ Platform
- Cisco Nexus® 9000 Series Switches

Challenge: Modernize data center operations

Jim Livingston cut his teeth as a software engineer. As his career branched out and settled into the world of networking and data center operations, Livingston—now the CTO of University of Utah Health—often found himself lamenting the rigidity of infrastructure systems. But he didn't want to overreact, move everything to the cloud, and hope it would meet all of the university's needs.

"I've seen too many people try to jump straight from a traditional environment to the cloud, and it just doesn't work," Livingston says. "You really need a core infrastructure that can manage everything, from on-premises systems to cloud services to disaster recovery sites."

With an aging infrastructure supporting four hospitals and 10 community clinics, the university needed a data center refresh. But Livingston didn't want to maintain the status quo. Instead, he tapped into his software roots and initiated a full data center transformation to deliver "software-defined everything."

"If we kept doing things the way we've always done them," he says, "we wouldn't be able to focus on new, more strategic things."

The university wanted agility to support hybrid cloud operations, he explains, and automation to unburden its IT staff from mundane, repetitive tasks. That's why it chose the combination of Cisco ACI, the industry's leading software-defined networking (SDN) solution, and Cisco Nexus 9000 Series switches.

"ACI gives us the flexibility to place workloads wherever it makes sense—not just once, but any time," Livingston says. "And the automation it enables frees us to pursue entirely new possibilities, like artificial intelligence and machine learning."

Learning new skills, working in concert

Comfortable with preexisting processes, some within the university's IT department were wary of a wholesale move to a new, software-defined operating model. But those concerns quickly dissipated once Cisco ACI was installed.

"Our staff is learning new skills like scripting and programming, and apprehension has turned into enthusiasm," Livingston reports. "ACI has really opened up their minds and thought processes. They're coming up with new code, new integrations, new automation possibilities, and new ways to do things."

Software-defined operations have also transformed the interpersonal dynamics and workflows of the university's IT department. Server, network, security, and storage teams that used to operate independently are now working together to provision and manage services across the entire stack. According to Livingston, the "handoff and wait" approach of the past has been replaced by continuous, highly automated workflows.

"ACI spawned a cultural change within the IT department that has been very positive," he says. "It has brought our teams together and helped them work in concert."

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CTO, University of Utah Health

Increasing application visibility, security

The university has also deployed Cisco Tetration platform, which provides unmatched visibility of application connectivity, dependencies, and data flows across a hybrid IT environment. According to Livingston, this level of visibility is essential for a mission-critical application like Epic, which supports all of the university's health records and medical operations.

"Epic is just so big and complex. It's difficult to keep track of all the pieces, how each of them function, and what else can be affected if one of the pieces goes down," Livingston says. "We simply didn't have that type of insight before, but Tetration is providing the answers."

With a better understanding of application behavior and dependencies, the university can create detailed policies and templates in Cisco ACI that ensure each application is fully protected and supported.

"ACI was very appealing to us because of its automation and security capabilities," Livingston notes. "We can define the connectivity and behavior of an application, push the policy from the core to the extended network, and then reuse it as a template for other applications. It gives us more consistency and better security everywhere."

The university is also leveraging the segmentation capabilities of Cisco ACI to further protect its sensitive health, research, and academic data.

"Security is extremely important," Livingston says. "ACI has some cool capabilities that allow us to get very granular with segmentation."

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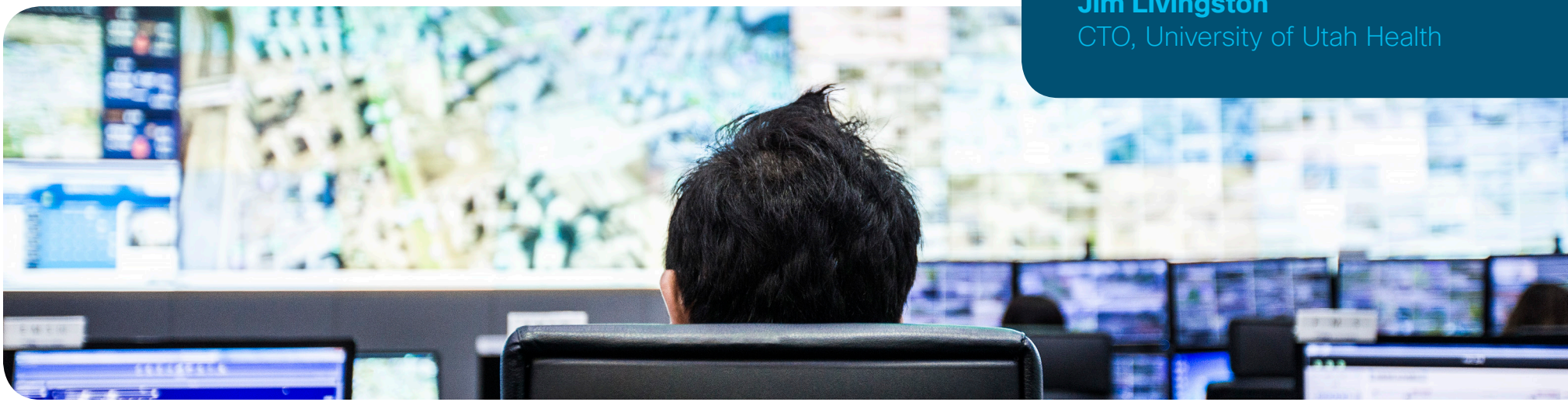
> **Jim Livingston**
> CTO, University of Utah Health



Looking ahead

With its core infrastructure in place, University of Utah Health is now deploying the Cisco ACI Multi-Site capability to link its primary data center in Salt Lake City with its disaster recovery site in St. George, Utah. Connecting the sites logically will immediately improve the redundancy and availability of the university's systems and services.

"Everyone is excited about ACI Multi-Site," says Livingston. "Failover can be extremely painful, with lots of tedious, time consuming, manual work. But we won't have those problems anymore."

For an application like Epic, Livingston says disaster recovery failover can be reduced by several hours using ACI Multi-Site.

"We've had some longstanding problems that, despite our best efforts, we couldn't fix," he notes. "But with ACI, many of those problems have been completely resolved. It's been remarkable, and everyone is ecstatic."

Products

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- Cisco Tetration Platform
- Cisco Nexus 9000 Series Switches