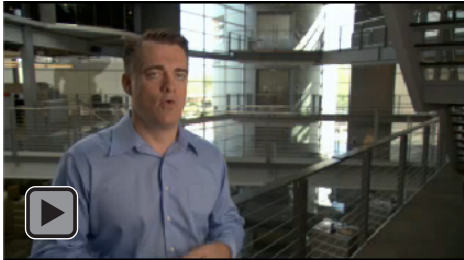


Service Provider Transforms Evidence Management in Law Enforcement

TASER Virtual Systems provides online access to petabytes of evidence using Unified Computing System.



Note: Adobe Acrobat Reader 9 is required to view this video.

Challenge

A division of TASER International, TASER Virtual Systems was founded in 2009 to apply technology to increasing officer safety, improving policing resource allocation, and enhancing the interaction between law enforcement agencies and the public. The company delivers an innovative cloud service, EVIDENCE.COM, that global law enforcement agencies use to store, retrieve, and analyze video of police officers' encounters as well as data from the electronic control devices (ECDs). "The context leading up to the use of force is often lost," says Jas Dhillon, chief strategy officer and general manager, TASER Virtual Systems. "Video enables law enforcement agencies to back up their version of events."

Executive Summary

TASER Virtual Systems, a division of TASER International, Inc.
 Law Enforcement Support
 Santa Barbara, California
 350 employees at TASER International

Challenge

- Introduce innovative service to transform policing and digital multimedia evidence management
- Scale to manage exabytes of evidentiary data
- Protect sensitive law enforcement information from unauthorized disclosure and protect integrity of evidence

Solution

- Deployed Cisco Unified Computing System in redundant data centers
- Provided lossless 10 Gigabit Ethernet connectivity from the core to the server
- Engaged Cisco Advanced Services for planning, deployment, and knowledge transfer

Results

- Helped law enforcement agencies increase operational excellence and administrative efficiency
- Saved US\$900,000 in up-front capital costs and \$37,000 in annual energy costs
- Planned and deployed complete infrastructure in 98 days

Many law enforcement agencies worldwide already capture video, but they must expend increasing resources managing ever-growing physical tape, DVD, or magnetic media libraries and complying with retention policies. TASER Virtual Systems envisioned a brand-new type of service, a virtual data warehouse on a massive scale. The goal: Enable law enforcement agencies worldwide to store their video and ECD data according to their own retention policies, access it securely over the Internet on demand, and use powerful mapping and analytics software to mash up video with location information and more. "Our vision is to empower law enforcement to manage the deluge of information from on-officer cameras, in-car cameras, and fixed surveillance cameras," Dhillon says.

The vision, which would have been economically impossible until very recently, requires a massively scalable platform that remains easy to manage as it expands. The company conservatively projects that it will attract tens of thousands of global law enforcement agencies, which will collectively generate millions of video streams annually. "We needed a platform with the capacity to initially manage 10 petabytes [10,000 terabytes] of video and ECD data, increasing to 200 petabytes within the first three years of operation," says Vince Stephens, vice president of network operations, TASER Virtual Systems. To deliver a service on this scale with the reliability and performance that law enforcement customers demand, the company needed an advanced platform with:

- Scalable processing
- Scalable storage access
- End-to-end encryption
- Fault tolerance
- Reliable user access

"Cisco's comprehensive services reduced the risk of introducing a transformational service using a brand-new, best-in-class technology."

—Rick Smith, Chief Executive Officer, TASER International

Solution

After considering multiple platforms, TASER Virtual Systems selected the Cisco® Unified Computing System (UCS), which unifies network, compute, storage access, and virtualization into a single, cohesive system. "Cisco met our needs for financial stability, innovation, and ability to support our business for the long term," says Dhillon. "The economics of the Cisco UCS and Cisco Nexus switch platform are superior and will become even more so as our service grows. And Cisco is a trusted name to potential customers."

When Stephens was hired, he had only 98 days to launch the EVIDENCE.COM service. "I couldn't take risks," he says. The company engaged Cisco Advanced Services to help ensure that the Cisco UCS deployment proceeded smoothly and on schedule. The Cisco team provided design, planning, and deployment services, including:

- Installing VMware ESX on the server blades
- Configuring the system for fault tolerance
- Documenting operational procedures to give TASER's IT department the knowledge to effectively operate the EVIDENCE.COM environment
- Advising on how to organize the IT department to account for the fact that the Cisco UCS integrates compute, network, storage access, and virtualization in a single system

"Working with Cisco Advanced Services gave us the confidence that we could implement a new technology and introduce the EVIDENCE.COM service on time," says Stephens.

Cisco Advanced Services deployed identically configured Cisco UCS in two geographically dispersed data centers. Either can take over for the other in the event of a failure, helping to ensure uninterrupted service. Each Cisco UCS server connects over 10 Gigabit Ethernet to redundant Cisco Nexus 7000 Switches, providing the bandwidth needed to quickly move large volumes of video to and from customers (see Technical Implementation). To help ensure that evidence cannot be altered, or accessed by unauthorized people, the company developed a robust defense-in-depth strategy with eight levels, using solutions such as Cisco firewalls, Cisco Intrusion Prevention System, and Cisco physical security solutions to monitor the facility.

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—Vince Stephens, Vice President of Network Operations, TASER Virtual Systems

Results

No other company offers a comparable multimedia storage, retrieval, and analysis system, for any industry, according to Rick Smith, chief executive officer for TASER International. "Cisco's comprehensive services reduced the risk of introducing a transformational service using a brand-new, best-in-class technology," Smith says.

Business Process Transformation for Law Enforcement

Launched in July 2009, the EVIDENCE.COM service is helping law enforcement agencies meet their goals for operational excellence and administrative efficiency. "EVIDENCE.COM has the potential to transform law enforcement by enabling agencies to focus on better policing resource allocation, safer communities, and improved overall safety," says Dhillon. When a law enforcement agency subscribes to the EVIDENCE.COM service, officers capture video of encounters with a small head-mounted video camera. At the end of their shift, officers dock the unit to upload the encrypted video over a secure link. Video and ECD data are stored according to each agency's retention policies, usually from three months to 20 years, and authorized users need only a broadband connection to retrieve their video on demand. Shift commanders can view all incidents by type, superimposed on a map. Then they can just click the incident marker to view the video. "The goal is to make more informed decisions to improve policing and officer safety, and gain earlier awareness of emerging hot spots," says Dhillon.

Cost Avoidance

Integrated 10 Gigabit Ethernet switching in the Cisco UCS eliminated the need for separate switches, saving US\$200,000. "Together, the Cisco UCS, Cisco Nexus, and Cisco security technology cost 35 percent less than the next closest option, saving \$900,000 in upfront capital costs," says Stephens. Cost savings will increase over the lifetime of the Cisco UCS because the company can purchase industry-standard RAM.

The system saves energy, as well. Each Cisco UCS chassis requires only one 30-amp circuit, not two like the other systems under consideration. "We are saving \$770 monthly on energy costs for each chassis, for \$37,000 in annual energy savings," says Stephens. "Reducing energy consumption also supports TASER's commitment to environmentally sustainable business practices."

Support for Massive Business Growth and Innovation

TASER configured the Cisco UCS to meet expected volume for the first year, or 10 petabytes of storage. The company can add capacity whenever needed by simply adding more chassis and server blades. "Scaling would be far more complex in a multivendor environment," Stephens says. "With its scalable processing, huge memory capacity, and tight integration with VMware, the Cisco UCS can meet our needs for the foreseeable future."

High Performance

The Cisco UCS and Cisco Nexus platform provide 10 Gigabit Ethernet access from the server to the core network, enabling users to retrieve video very quickly. What's more, the 384 GB of on-board memory in the Cisco UCS eliminates slowdowns during database access, usually the slowest aspect of cloud services. "We can address memory in nanoseconds instead of the milliseconds we would need with any other server, providing the responsiveness that users expect in the Web 2.0 era," says Stephens.

Simplified Management

The IT department can manage all chassis and integrated switching equipment from a single interface on the Cisco UCS Manager. Cable management is easier, as well, because the Cisco UCS connects to the network over two 10 Gigabit Ethernet links instead of 16 Gigabit Ethernet links.

Enhanced Disaster Recovery

Built-in support for virtualization in the Cisco UCS simplifies disaster recovery. In the event of a failure in one data center, TASER Virtual Systems can systematically begin using virtual machines in another data center.

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—Jas Dhillon, Chief Strategy Officer of TASER International and General Manager of TASER Virtual Systems

Next Steps

As the EVIDENCE.COM subscriber base grows, TASER Virtual Systems can meet the demand by simply adding new chassis and blades. Growth will not add to the IT department's workload because all chassis and blades are managed as one.

The company is also inviting third-party application developers to use the EVIDENCE.COM service as a platform for value-added services such as real-time tracking, global positioning system (GPS) marking, and analytics. "Our goal is to enable law enforcement agencies to mash up additional sources of information and use mapping and analytical tools to make better decisions on resource allocation and improve overall policing," says Dhillon. "Other types of organizations in other industries that need to keep evidentiary records are starting to take notice."

Smith concludes, "The next step is to unlock the collective evidence of all of our subscribers by making it actionable, searchable, and integrating it into a social network. We have the technology platform in the Cisco UCS and Cisco Nexus switch."

Technical Implementation

Cisco Advanced Services configured the Cisco UCS with two chassis containing 16 blades. The Cisco UCS connects to dual Cisco Nexus 7000 Switches that provide a redundant 10 Gigabit Ethernet core switching fabric. The Cisco Nexus 7000 Switch connects to the storage area network (SAN) by way of a Cisco MDS 9124 Multilayer Switch, and to Gigabit Ethernet servers by way of Cisco Catalyst® 4900 Series Switches. Later, TASER Virtual Systems plans to take advantage of Fibre Channel over Ethernet (FCoE) support in the Cisco UCS to unify its data and SAN fabrics, further reducing costs.

Product List

Services

- Cisco Pre-Production Pilot
- Cisco Unified Computing Support Service
- Cisco SMARTnet® Service

Data Center

- Cisco Unified Computing System
- Cisco Nexus 7000 Series Switch (network core)
- Cisco Catalyst 4900 Series Switch
- Cisco MDS 9124 Multilayer Switch

Security

- Cisco Intrusion Prevention System
- Cisco Adaptive Security Appliance 5540

For More Information

To find out more about Cisco Unified Computing System, visit: www.cisco.com/go/ucs

To find out more about Cisco Nexus family, visit: www.cisco.com/go/nexus

To find out more about Cisco Advanced Services, visit: www.cisco.com/go/services



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