



CASE STUDY

## JUNIPER NETWORKS

SVSI Fulfills Juniper's CTO Vision



### BRAVE NEW MATRIX

"We had bold aspirations for the new headquarters, and the matrix was a novel design. We took a sensible risk and I'm delighted. This is the way of IT today."

**Gary Clark**  
IT CTO & VP  
Technology Services

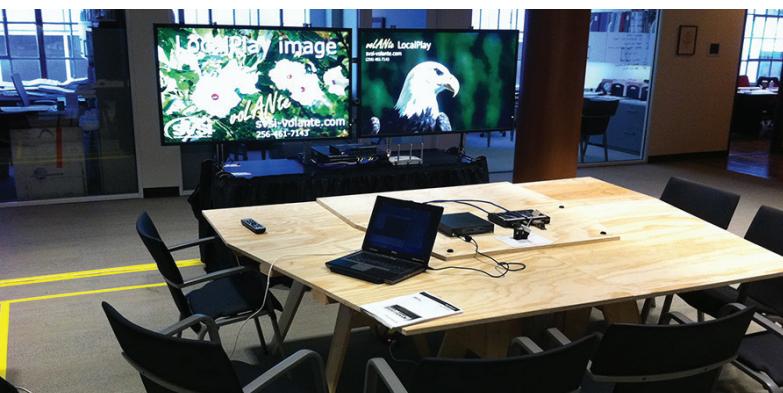
Before Juniper Networks unveiled plans for its brand new Sunnyvale CA campus, furnished with 300-plus conference rooms, no one had envisioned, much less attempted, such a tremendous deployment of AV-over-IP multicast on a network. SVSI, an established industry leader and pioneer in IP-based AV distribution and switching solutions, was integral in ensuring the success of this ambitious project. Every device on the Juniper campus, every projector, display, projection screen, CODEC, and echo canceller has a network connection.

Initially, Juniper was engaged in a more traditional design for its project but decided to reevaluate in order to maximize the conferencing experience and rein in the budget, says Joey D'Angelo, Vice President, Charles M. Salter Associates, San Francisco. "We quickly recognized that a standard AV integration design wasn't what Juniper wanted."

Now completed, Juniper's AV matrix, the largest in the world, moves the AV industry one-hundred percent onto the network, underscoring a seismic shift in networking implementation. Juniper's goal was to use the network to handle all video inputs and switching for their new headquarters. Their design includes a number of mini-conference rooms providing immersive teleconferencing from one space to another.

## SVSI FULFILLS JUNIPER'S CTO VISION

SVSI is true AV-over-IP. The system converts media to IP bitstreams that can be transported and delivered from anywhere to anywhere on a standard data network together with the control commands, unlike technologies such as HDBaseT that have been erroneously described as such yet only the control element is IP and the media is proprietary.



"We've found that more useful video conferences are smaller – if you try and fit 12 people onto the screen, they all look like they're the size of a postage stamp," says D'Angelo. "We call what we provided the networking company with 'semi-presence.' We did that by getting the plywood out, experimenting with different distances from the camera, and we saw that fish-eye set in at about 75 degrees. So we set about finding how many people would fit in so you can see people across the table, and the number we arrived at is five."



"During a video teleconference, it looks like you're sitting across the table from them. Now this company is making those exact tables, along with the monitors and cameras we specified, the standard globally" D'Angelo added.

To accommodate these spaces, Salter's team experimented with a new prototype for the system, mocking up several different types of conference rooms using plywood, sawhorses, and SVSI encoders and decoders, D'Angelo says. "We used various table shapes and tried about 30 different camera types; the camera's field of view had to be specific. This SVSI prototype worked so well in the various mockups that we advised Juniper to apply it to the entire campus rather than including even a single traditional switcher."

The entire matrix features nearly 600 SVSI Encoders as input sources with more than 400 Decoders for output, 120 ATR Audio Transceivers, and 25 Windowing Processors. SVSI's involvement signals an open door for progressive integrators, IT professionals, and CEO's/CIO's of entities large and small to consider embracing this approach. The long-term impact of the Juniper project extends to architects, who should feel confident in designing buildings with capable network infrastructure and future-proofing.

"The key principle in our vision was to enable everything on an IP network, highlighting a different way of executing an AV project," says Gary Clark, Juniper IT CTO & Vice President, Technology Services. "We hear constantly about how the internet is merging into our consumer lives, into our thermostats and home appliances. Yet the AV industry still harbors the notion of RS232 controllers. We wanted to drag AV into this century with this project."

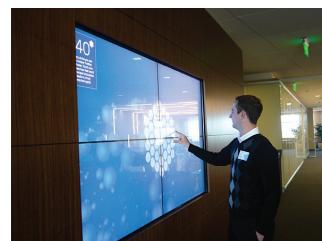
As a networking company, Juniper was the ideal candidate for taking this risk. "We wanted to show that you could make a reasonable, cost-effective system to share expensive components on the network and to stream data over that network. The challenge was to IP-enable everything; the realization was in finding vendors who had IP capable product, and SVSI had a solid product base."

Juniper's system is all open IP connection capable, not intended to be a closed design. "We're not in the AV business," Clark says, "We have high speed networks handling voice and video of demanding loads. This matrix, part of an evolutionary process, brings to realization one fully integrated, properly designed system from a networking perspective. There's only one LAN for the whole building. It enables us to do centralized management; we can engage and monitor it all remotely as it has robust management capability."

The SVSI Conductor Server was touted to be able to control an unlimited number of SVSI devices at once, but there was no feasible way to test how they would perform while receiving commands for hundreds of touch panels, he says. "We needed firmware changes; SVSI was rewriting code overnight to solve problems. They were onsite when we needed them, and every time there was a tech issue they were there, resolving it quickly."

The AV industry is trying to develop new multimedia standards, and since SVSI uses the IGMP protocol, its products will work on all the network switches already on the market. They were the only company at the time to deliver a completely IP-based virtual switching solution.

D'Angelo says that for projects such as Juniper's, the cost versus a traditional AV design is roughly one-half, and if a solution for ad hoc, inbound videoconference calls can be found the cost could drop to one-third because CODECs can be virtually switched reliably to anywhere they are needed. "This could have huge ramifications for the hardware-based CODEC market," he says. "If you are doing a smaller project with 50 video conference rooms, that's a lot of money."



D'Angelo used SVSI's Networked AV System to encode and distribute sources onto the existing IP network and make that stream available to any endpoint in the facility. "Instead of using a switcher, this approach uses standard networking protocols and hardware to do all of the control routing of the media in the system," he says. "This way, you can share devices between meeting spaces.



Aiding all those iPads controlling the system was a Power Over Ethernet (PoE) to USB charger developed by FSR specifically for the project. "They just have to drop their network cable, and the iPads get their power from the network," D'Angelo notes. "The alternative would have been a complicated electrical design – this PoE to USB innovation provided \$750,000 in savings right there."



SVSI encoders' encode and distribute sources of almost any format onto an existing IP network offering the ultimate in flexibility, redundancy, expandability and serious cost savings. CODECs can be virtually switched reliably to anywhere they are needed.

Before Juniper, SVSI knew its proven technology could scale to large sizes but there had never been a network on which to test it. "This was the perfect combination for us and for Joey, who is revolutionary in his thinking," Sharp says.

Juniper's many mini conference rooms, providing immersive teleconferencing from one collaborative space to another, allow for an "all hands on deck" presentation, he says. "The game changer is that this video can come from anywhere to anywhere, to overspill rooms, from a presenter in one room pulled into another room, pulled from satellite TV feeds, or onto video walls in the executive areas."

The Juniper system was integrated by AVI-SPL, using iPads exclusively. "They were nervous about it at first, but as soon as they realized that it was possible to have more than 1,000 of our devices on this network, working as one big system with centralized control and database management, we could see them get excited," Sharp says.

SVSI has always maintained absolute faith in its products, he says. "There are not a lot of early adopters in the AV world, and we were evangelizing new technology. But we have stayed the course and embraced this heaven-sent opportunity for a client in the networking industry. The project has been a learning curve for Juniper and they've gained from it as well: their new campus also is a showroom for them. And this project will light a spark for the industry to dig deeper."



The entire control system is networked. As a result, the entire campus requires only 80 or so processors controlling over 360 individual systems. All connectors and cables are off-the-shelf and plug-and-play.



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