



Saturday Night Live and SANbox® 5200 Switches – Live from New York Through a Fibre Channel SAN

Challenge

Finding a solution for sharing resources between production rooms on the 17th and 8th Floors, and linking up audio and video devices in a high-demand production environment.

Solution

A low-latency SAN with an easy-to-use GUI for switch and device management.

Result

The SANbox 5200s allow sharing of all media resources for SNL's production and post production process.

Components of the SNL SAN

A look into the inner sanctum of SNL's production rooms reveals a virtual labyrinth of devices on the Fibre Channel network, including:

- MAC OS X
- Multiple Xserve RAIDs
- Three QLogic SANbox 5200 stackable switches
- Central Hard Disk Storage
- Five ProTools systems
- Three archiving stations
- Final Cut Pro stations
- DVD authoring stations
- Live Media Ingest Application (customized)
- Video CPUs
- Audio CPUs
- SpectraLogic Tape Library
- 2G Galaxy 60 JBOD and EMC CLARiiON audio storage
- Asante and 3com Ethernet switches

The trick is to archive and retrieve info without disabling the production rooms, and the new SAN makes this a reality.



Headquartered at 30 Rockefeller Plaza in midtown Manhattan, Saturday Night Live is an American comedy institution that is fast approaching its thirtieth anniversary, having made its debut on NBC on 11 October 1975.

Though the focus obviously remains on writing, producing and broadcasting the 90-minute live program, it's no surprise that SNL by now boasts an impressive archive of its television broadcasts from the 1970s, the 1980s, the 1990s and into the 21st Century. The challenge of mixing, editing and archiving shows for repeats and syndication packages, in addition to ongoing live broadcasts, required a SAN solution that would allow for simultaneous execution of tasks and the sharing of resources between production rooms on the 17th and 8th Floors.

"After being on an IP network before, we decided we had to have a shared hard disk system - in order to implement this, we started 7 years ago with a Brocade system at 1Gb to share all the audio editing and mixing stations. At that time, the data rate wasn't high enough to do what we needed to do with video," observed Chris Seeger, New Technology Analyst for Saturday Night Live.

And nowadays, in the world of FinalCut Pro Video Suite and ProTools multi-track digital audio software, recording SNL's live show is no laughing matter. The process involves recording 48 tracks live to disk for three-and-half hours of music sources in one room, plus another 24 tracks of the production sources in another.

These sources include up to 48 tracks of audio information each for the house band and the guest bands that play on the show, plus 24 tracks on the production side, including 10 tracks of dialog and separate tracks for music scoring, sound effects, the audience and video tape playback.

Live from New York, It's Saturday Night...

As the live show is being broadcast, it's also being mixed on the fly by Senior Audio Mixer Robert Paladino (production mix). Other sources feed the production mixer, including Jay Vicari (music), Bill Taylor (sound effects) and Martin Brumbach (music scoring and pre-recorded voiceovers). All audio and video sources are recorded direct to Fibre Channel discs through the production tracking system onto the Apple Xserve RAID. "To record the live show as its happening, we use a customized application (VirtualVTR) as an ingest engine to gang-record 7 machines and 5 cameras, stopping in the commercials to break up the media files and name them individually," Seeger explained. "The show is absolutely live. However, repeats and syndication needs require us to reorder the show, and that's why all tracks are isolated to improve mixes and provide four stereo mix stems."

In addition, censorship issues occasionally come into play. "Sometimes a show will use a phone number or website address that turns out to be real years later when the show is in repeats," Seeger revealed. "We never expected that, so when that happens we have to edit it out."

"Most recently we have added our Photography and Music Departments to the SAN, and this will allow us to construct, share and archive sources that need to be built prior to the live show," added Seeger.

SNL's fast-paced environment and high-volume production needs demanded a solution that would link up disparate audio and video components and individual production rooms in a truly seamless and easy-to-manage way. After deciding to move away from the Brocade system, Seeger arrived at the choice of three QLogic SANbox 5200s and actually implemented the solution personally.

"The SANbox 5200 ultimately allows us to interconnect and share all media resources for the entire show's production and post production process. Everything goes through these switches - every single file."

Chris Seeger, New Technology Analyst, Saturday Night Live

Solution - A Low Latency SAN with Visual Fabric Management

Arriving at the perfect 2Gb Fibre Channel SAN solution was the goal, and Seeger explained what led to the choice of three QLogic 5200 switches: "We did it the simple way to start - basically just making a count of what's on what port, and leaving a few extra ports for expandability."

Another piece of the puzzle when considering strategy was SNL's effort to archive previous shows into storage with high availability, and upgrading the audio and video files where needed to bring the quality of the older programs in line with the standards currently adhered to.

"At the present time, storage of old shows goes back 22 years with multi-track audio, and we want to do that with video as well. We back-up shows on SAIT, which natively stores 500Gb per tape. Each live show requires 1.5 terabytes of storage (5 cameras and production switch, audio elements). Each repeat requires about 100Gb," Seeger said. "We have three FinalCut video stations as well as DVD authoring stations, and the entire repeat/syndication catalogue of shows is built through our SAN with Final Cut Pro and ProTools." Tailoring shows for repeats and syndication at this stage is the same process in reverse of the live show, with the show emerging from storage to be worked on simultaneously by staff in multiple production rooms.

QLogic SANbox 5200 Fibre Channel Switches

"The kind of performance SNL was looking for clearly demanded high I/O throughput, and that's one of the reasons why the SANbox 5200 fits so perfectly with their objectives," commented Ryan Klein, SAN Architect, QLogic Corporation. "Unique in its class, each 5200 switch provides a four-pack of 10Gb ISL ports for high-speed links between switches."

SNL has two QLogic switches on the 8th Floor and one QLogic switch on the 17th Floor through a 2Gb optical port. The 8th Floor switches are linked together through the 10Gb ISL ports and the 17th Floor is linked via a 2Gb ISL. The 10-Gig ISLs deliver not only blazing speed and full non-blocking performance, but also allow SNL to maximize the number of available data ports for devices in the fabric.

The solution, enabled by the 5200 switches, is a low-latency SAN with an easy-to-use GUI for switch and device management. "The number one reason for choosing the SANbox 5200 is that it has the lowest latency of any of the other switches, and when you're using ProTools that can be pretty important" Seeger affirmed. "Also, the graphical user interface (GUI) software is very straightforward. I can watch my firmware between all the devices and visually manage the fabric."

Sharing Resources on the SAN with SANbox 5200s

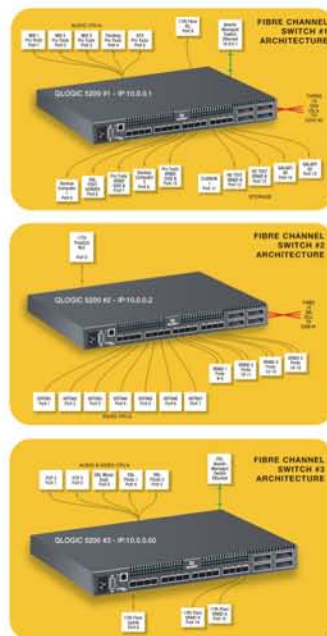
Seeger described the process of building an entire SAN by himself as a challenge, though having control over setup, zoning and configurability was so important that he threw himself into the process enthusiastically, learning a lot along the way and exchanging valuable ideas on optimizing video and audio throughput. "We were lucky enough to have support from Stacey Foster, who has been with SNL for over 20 years overseeing 'all things technical'," Seeger added.

To the question of whether the SANbox 5200s have enhanced productivity and profitability, Seeger was unequivocal:

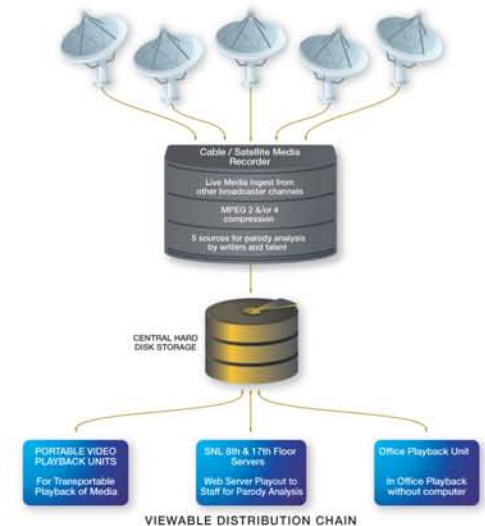
"Absolutely. Without having this sharing of resources we couldn't have done nearly the amount of work with the degree of quality and creativity," he stated. "You can edit the show at the same time someone else is mixing the show, all on the same Fibre Channel disc from separate rooms inside the building. The 5200s make it possible for the network to be continuously available."

At the present time, SNL's storage is at about 20 terabytes, and Seeger revealed that another SNL objective in the IT department is to archive and upgrade the audio and video files for the shows recorded during SNL's celebrated early years between 1975 and 1980. And once again, the move toward greater SAN connectivity that allows individual devices in the fabric to perform at maximum efficiency will help accomplish this project and many others.

"The SANbox 5200 ultimately allows us to interconnect and share all media resources for the entire show's production and post production process," Seeger explained, indicating the central role the 5200s play in the throughput of SNL's valuable audio and video data. "Everything goes through these switches - every single file."



Saturday Night Live Research Workflow



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