



F5 NETWORKS PROFESSIONAL SERVICES

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Paul Vesper, Director, Consulting, F5 Networks

F5 Makes IPv6 Connectivity a Reality for Interop 2011 Las Vegas Attendees

Interop, one of the world’s best known and longest running IT conferences, promotes network interoperability among diverse technology companies. Its U.S.-based events feature InteropNet, a temporary multi-vendor network built by volunteer engineers to serve attendees and exhibitors.

As a contributing vendor, F5 provided many key services at Interop 2011 Las Vegas. For the first time ever, Interop attendees had IPv6 connectivity, courtesy of F5’s IPv6 to IPv4 gateway and address translation capabilities. F5 also provided a wireless access portal, locally downloadable conference materials, secure remote network access for InteropNet administrators, and replication of network traffic data for use by multiple exhibitors.

Business Challenges

Interop welcomes hundreds of thousands of visitors annually in four separate venues worldwide: Las Vegas, Nevada; Tokyo, Japan; New York, New York; and Mumbai, India. Through seminars, workshops, exhibits, and discussion forums, Interop demonstrates the latest advances and innovations in various areas such as cloud computing, virtualization, security, mobility, and data center operations.

Built within a matter of weeks prior to each event, InteropNet has aptly been called “the most advanced temporary network

in the world.” Vendors supply equipment, and volunteer engineers run the high-speed heterogeneous network that serves thousands of attendees, exhibitors, and organizers during the event. At the heart of InteropNet is the Network Operations Center (NOC), located on the show floor. Colocation sites in California, Colorado, and New Jersey provide redundancy and high availability for the North America venues.

For its 2011 events, Interop needed to solve several challenges. It wanted to provide a wireless access portal for attendees, and

Overview

Industry

Technology

Challenges

- Provide IPv6 gateway capabilities
- Create wireless Internet access portal
- Deliver event materials quickly and easily
- Replicate network traffic for multiple vendors
- Furnish secure remote access

Solution

- F5 Professional Services
- BIG-IP® Local Traffic Manager™
- BIG-IP® Global Traffic Manager™
- BIG-IP® WebAccelerator™
- BIG-IP® WAN Optimization Manager™
- BIG-IP® Access Policy Manager™

Benefits

- Venue-wide IPv6 connectivity
- IPv6 transition strategy
- Accelerated web access and content delivery
- Real-time traffic replication
- Secure remote network access

with many of them now using IPv6 client devices, it also needed to provide IPv6 connectivity. This would require a vendor that could provide seamless IPv6 to IPv4 gateway capabilities, including Network Address Translation (NAT) and Domain Name System (DNS) services. The biggest challenge would be finding a vendor that could provide these capabilities without requiring Interop to migrate its backend servers to IPv6.

Interop also needed an efficient way to deliver content to attendees. In years past, conference materials (such as presentations, white papers, and handouts) had been available to attendees on CDs or USB flash drives, but that delivery method was cumbersome and expensive. For 2011, the goal was to make conference materials downloadable, but Interop needed to ensure that its servers could handle the high traffic volume and that file download times would be reasonable.

Many exhibitors at Interop are vendors of network management and monitoring tools. Interop wanted to give these vendors the ability to monitor InteropNet traffic so they could demonstrate their management and reporting capabilities to attendees using real-time data.

“There are a couple of mechanisms by which device data can be sent to network monitoring systems, among them syslog, Simple Network Management Protocol (SNMP), and NetFlow,” says Ken Bocchino, Consultant at F5 Networks. “These all send data to a collector, but most switches only support one or two destinations to which that data can then be forwarded. This limitation presented a big challenge for Interop because a dozen or so vendors needed this information.”

Finally, Interop wanted vendors participating in InteropNet to have secure external access to the NOC and system management networks. This would enable system and network administrators to remotely manage the equipment and services they provided for the event.

Solution

Every year, Interop organizers hand-select vendors and volunteer engineers to build and manage InteropNet. “Certain vendors are chosen for the very specific functions or services they provide, such as switching or routing,” says Glenn Evans, Lead Network Engineer at Interop. “We chose F5 for the range of innovation and flexibility their solutions provide. With their unique F5® iRules® scripting language, IPv6 gateway capabilities, web acceleration, and network optimization capabilities that are native to the BIG-IP product family, F5 was able to quickly and easily meet many of our specific requirements for InteropNet.”

For its part in InteropNet, the F5 Professional Services team deployed BIG-IP Local Traffic Manager (LTM) and BIG-IP Global Traffic Manager (GTM) on multiple pairs of enterprise-class BIG-IP 8900 and BIG-IP 6900 systems in the NOC and in two of the three colocation sites. BIG-IP LTM intelligently manages network traffic between users and applications; BIG-IP GTM enables traffic to be managed across multiple sites and ensures global availability of critical system services such as DNS.

F5 also deployed BIG-IP WebAccelerator to enable fast access to the wireless portal it provided and quick file downloads. BIG-IP Access Policy Manager (APM) delivered secure, policy-based remote network access for administrators.

To facilitate VMware vMotion demonstrations between the Denver and San Francisco colocation sites, F5 also deployed BIG-IP WAN Optimization Manager (WOM). BIG-IP WOM uses iSessions to create an encrypted and accelerated tunnel between two remote locations, significantly improving data transfer rates and reducing bandwidth usage.

The services F5 provided for Interop included IPv6 connectivity, accelerated web application performance, network traffic replication, and secure external access.

IPv6 connectivity

The F5 BIG-IP product family has natively supported IPv6 for several years, and all BIG-IP devices are dual stacked. As a result, F5 was able to provide two separate IPv6 solutions at Interop. The first one, implemented in the San Francisco colocation, enabled IPv6 users in Las Vegas (and any other users globally) to connect to the Interop.com website through an IPv6 address.

The second implementation enabled Las Vegas conference attendees to experience a truly IPv6-only environment. This solution included support for NAT64 and DNS64—both critical components of IPv6 gateway functionality. For large enterprises, carrier service providers, and Internet service providers, this implementation demonstrated the challenges that BIG-IP LTM can solve with its built-in NAT64 and DNS64 capabilities.

“Because IPv4 and IPv6 are completely incompatible protocols, DNS64 is needed to provide domain name resolution, and NAT64 is needed to provide address translation and mapping,” says Bocchino. “The two work in tandem to enable true IPv6 to IPv4 gateway functionality with address translation.”

To communicate with the IPv4 Internet, IPv6-only clients need IPv6 addresses for the domains they request. A domain that exists only on the IPv4 Internet can't return an IPv6 address to the client because it doesn't have one. DNS64 takes care of that problem by creating a “padded” IPv6 address from the IPv4 address. That padded address includes a pointer to a NAT64 device, which extracts the IPv4 address and connects the client to the destination. NAT64 then keeps track of both addresses so that the session between the two can continue.

Accelerated web application performance

To handle the immense load of more than 13,000 Interop attendees that were accessing and downloading conference materials from the Interop.com website, F5 front-ended several Interop servers using BIG-IP WebAccelerator. This module uses intelligent technologies to overcome

performance problems with web browsers and WAN latency in general. All large, static files, such as speakers' PowerPoint files or PDF documents, were cached on the BIG-IP systems, taking the bulk of the user load off the Interop.com web servers.

Network traffic replication

Interop chose F5 to help enable exhibitors at the show to demonstrate their monitoring and reporting products. These types of products rely on incoming network traffic data from SNMP, syslog, or NetFlow. All devices connected to InteropNet directed this traffic to a destination hosted by F5 BIG-IP devices. F5 used its unique scripting language, iRules, to provide a mechanism to replicate that data and stream it to each vendor that requested it. Through this service, F5 made it possible for multiple monitoring and reporting vendors to demonstrate their product offerings on the show floor.

Secure external access

F5 provided external access to the NOC and system management networks through SSL VPN using F5 BIG-IP Access Policy Manager. This module authenticated users to a resource (such as Active Directory, RADIUS, LDAP, TACACS, SecurID, HTTP, and OAM) and then provided appropriate network access.

Benefits

Because of the flexibility and range of solutions it provides, F5 was able to solve many individual problems that added up to big solutions for Interop.

One of the biggest advantages of F5 solutions is that they are modular; a separate box wasn't required for each feature or capability. This was especially important in the colocation sites where rack space was limited. Overall, the services that F5 provided resulted in better user and vendor experiences and the ability of attendees to test drive IPv6 to IPv4 gateway services.

Venue-wide IPv6 connectivity

Providing IPv6 connectivity was one of the organizers' primary goals for the event—and

"The portal we created gave users a central location where they could easily find event information."

Ken Bocchino, Consultant, F5 Networks

F5 was one of the few network vendors that could deliver a seamless IPv6 gateway solution.

"It's one thing for a vendor to say they support IPv6; it's another thing to have enough confidence in your solution to demonstrate it in a live situation with thousands of real users on a variety of devices," says Paul Vesper, Director, Consulting and lead engineer of the F5 NOC team at Interop. "Interop provided a great opportunity for F5 to demonstrate our native BIG-IP IPv6 gateway capabilities."

IPv6 transition strategy

Many organizations are considering how to transition their own public-facing web services and internal infrastructures to IPv6, and F5 demonstrated a workable solution for gradually moving to IPv6. Because of the unique characteristics of a BIG-IP device—its position in the infrastructure, its full proxy capabilities, its native support of IPv6 (and continued support of IPv4)—it is able to handle all IPv6 traffic regardless of whether backend servers are IPv4 or IPv6. This enabled Interop to make its website available to IPv6 users without migrating any of its backend servers to IPv6.

"For organizations that need to provide IPv6 connectivity immediately but want to gradually transition their internal infrastructures, an F5 solution gives them a huge advantage," says Vesper. "A wholesale migration to IPv6 isn't feasible or desirable for anyone."

Accelerated content delivery

Interop organizers wanted to ensure that attendees had reliable wireless Internet services and that they could download event

materials quickly and easily.

"The portal we created gave users a central location where they could easily find event information," says Bocchino. "BIG-IP WebAccelerator cached 85 percent of the content that users wanted, so they were able to download content significantly faster than they could have across the Internet."

As a result, Interop's origin servers experienced very little additional traffic load, and organizers avoided the trouble and expense of putting content on CDs or flash drives.

Real-time traffic replication

With the traffic replication services that F5 provided, system monitoring and reporting vendors were able to demonstrate their products at the show with live network data. Each vendor received the same network "picture," but they were able to report on the data in whatever way they desired—using their own unique tools and solutions.

"This was an opportunity for F5 to demonstrate the remarkable versatility and capability that iRules provides," says Vesper. "The vendors themselves really appreciated our ability to provide this stream of data so they could demonstrate their products. No other vendor had a mechanism to provide this data in real time to a large number of vendors all at once."

Secure remote access

With the SSL VPN access that F5 provided to the NOC and system management networks, participating InteropNet vendors were able to remotely manage their services, if the need arose.

"Knowing they had secure remote access was a kind of 'insurance policy' for each vendor. It gave them peace of mind," says Vesper.

In fact, a few vendors found it necessary to have experts log in remotely during the event to solve specific issues.

Vesper continues, "The great thing is that F5 was able to provide this secure access across a range of vendors in a completely heterogeneous network."

More Information

To learn more about F5 and IPv6, use the search function on f5.com to find these and other resources.

White paper

[Controlling Your Migration to IPv6: A Gateway to Tomorrow](#)

Technical brief

[Enabling Long Distance Live Migration with F5 and VMware vMotion](#)

Case study

[F5 Enables IPv6 Network Support in Record Time Using Existing F5 Tools, Technologies](#)

Videos

[F5 in the Interop NOC](#)

[F5 in the Interop NOC Follow-up](#)

Deployment guide

[Configuring IP Address Sharing in a Large Scale Network: DNS64/NAT64](#)

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