VoIP Infrastructure in Service Provider Networks with BIG-IP Devices

F5® BIG-IP® devices offer scalability and flexibility for the Session Initiation Protocol (SIP) employed in IP Multimedia Subsystem (IMS) for VoIP services, giving service providers the ability to integrate new voice and multimedia services with greater ease and confidence. F5 products and solutions enable service providers to build a strong foundation that maximizes the use of resources and improves service manageability, while remaining agile enough to support both existing and future network architectures as well as new user devices.

Scaling VoIP

VoIP can be considered either a lucrative opportunity or a competitive threat, depending on a service provider’s current business model. Either way, VoIP is inevitable for all service providers—even for those traditional mobile and wireline providers that continue to prefer traditional voice technologies.

According to a study by Frost & Sullivan, mobile VoIP alone (excluding fixed VoIP) will constitute a $30 billion business worldwide by 2015—up from just $600 million in 2008. For this reason, Frost & Sullivan is encouraging all mobile providers to begin embracing VoIP, as does research firm Ovum, based on its separate evaluation of the mobile market.

F5 has been helping service providers successfully implement and scale their VoIP offerings for nearly a decade. Support for VoIP, IMS, and SIP is integral to F5’s solutions for service providers, and was designed specifically to satisfy the needs of even the world’s largest network operators.

The key to enabling a truly scalable integrated messaging network is by offering intelligence and flexibility throughout the Service Delivery Network (SDN), an architecture designed to manage service delivery to users and devices. F5’s BIG-IP platform acts as the strategic point of control for F5’s entire Service Delivery Network—including the service provider-class, NEBS-compliant F5 VIPRION®. VIPRION provides scalability and mission-critical high availability with both local and global load balancing. A single VIPRION chassis holds up to four hot swappable blades, and is capable of supporting up to 64 million concurrent sessions—and millions more subscribers.

BIG-IP solutions also support separate Message-Based Load-Balancing (MBLB), purpose-built for messaging protocols used for subscriber management and signaling. MBLB provides full support for load-balancing individual SIP messages that are routinely aggregated into shared TCP or Stream Control Transmission Protocol (SCTP) connections. While doing so, BIG-IP products must accurately aggregate/disaggregate the triplet combinations of IP address and port and session ID employed by SIP to identify individual sessions.

MBLB carefully preserves both the SIP message sequencing and stateful session persistence for individual VoIP calls throughout their duration. The result is improved scalability and

Key features

- **IMS Management**—Offers large scale and HA of VoIP services for local and global call load balancing
- **MBLB and SIP Awareness**—Provides support for message disaggregation and preservation
- **SIP Proxy**—Offloads SIP servers, proxies, and session border controllers, improving performance
- **Scalable Architecture**—Supports millions of active call sessions on a single platform
- **NEBS Compliant**—Offers specific hardware certification for service provider networks

Key benefits

- **IMS Migration**—Evolves VoIP offerings by adding new services and capabilities based on the IP Multimedia Subsystem architecture
- **Full Proxy Mode Support**—Assures interoperability of SIP request/response protocol throughout the VoIP infrastructure
- **Service Provider Scalability**—Scales incrementally and virtually without limit to handle subscriber calls simultaneously
- **Service Provider-Grade Reliability**—Incorporates redundancies for enhanced reliability
- **Enhanced User Experience**—Improves performance of SIP signaling and call quality to increase customer satisfaction
performance of SIP servers, session border controllers, and SIP proxies by relieving them of the responsibility of performing session separation. BIG-IP devices further offload the SIP servers by performing hardware-accelerated encryption/decryption of Secure Sockets Layer (SSL) and Transport Layer Security (TLS) packets, thereby improving server performance by up to 50 percent.

By integrating these key SDN functions into the same, shared platform—along with other key features such as rate shaping, application proxying, and IP/device management—F5 BIG-IP solutions deliver a unified, single point of control for all services.

High-availability load balancing is only part of the role of BIG-IP solutions in supporting the VoIP and messaging infrastructure. SIP is fairly extensible, which can create interoperability issues between IMS services. Operating as a proxy, BIG-IP devices can transform the SIP requests and/or responses as necessary to ensure compatibility end-to-end throughout the VoIP infrastructure. With support for the Real Time Streaming Protocol (RTSP), Real-time Transport Protocol (RTP), and media gateways that interface with the public switched telephone network, BIG-IP solutions provide traffic steering services for voice and data improving Quality of Service (QoS) throughout the SDN.

BIG-IP devices offer iRules®—an event-driven scripting language—to give operators additional flexibility to change how SIP messages are directed and transformed. For example, iRules could be used to proxy between an existing authentication server and a home subscriber server or other IMS service. Inspection into the SIP packet provides access to the entire call control context, including call ID, session ID, and caller ID.

**“Mobile VOIP Demand on the Rise, Report Says”, eWeek.com**