



White Paper

# Unified Communications Needs Unified Infrastructure

Disconnected management of communication protocols in UCS deployments can disrupt performance and availability and lead to higher operational costs. An F5 UCS solution ensures resiliency and performance while maximizing operational efficiency.

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## Introduction

As technology solutions converge, resulting systems' supporting infrastructure tends to fragment. This dichotomy is clearly present in the data center with respect to unified communications systems (UCS) implementations based around Microsoft Lync Server 2010.

The fragmentation of supporting infrastructure tends to occur because previous generations of infrastructure focused on only a subset of the protocols and functions required by one part of the system. When diverse systems converge, their infrastructure must also converge in terms of support for the unified system. This is particularly true as mobile and virtual desktops become more prevalent and bring with them their own UCS implementation challenges.

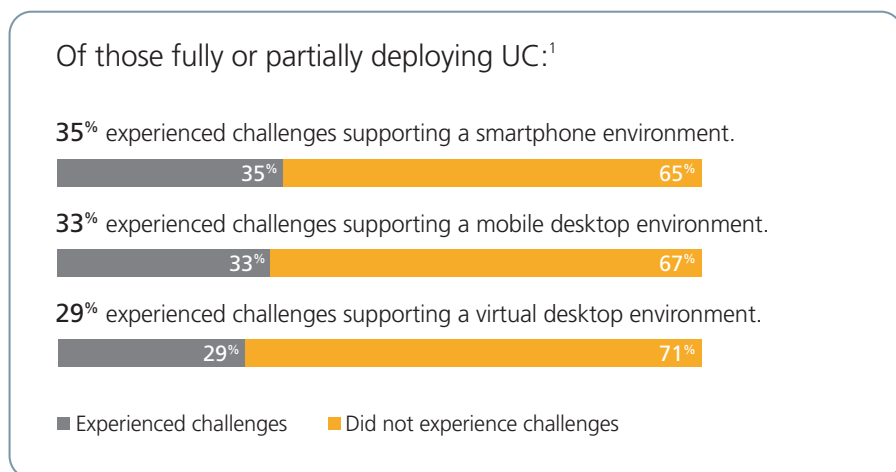


Figure 1: Challenges associated with UCS and mobile devices in the enterprise.

In the case of Microsoft Lync Server 2010 and the implementation of UCS, two diverse protocols have converged: SIP (Session Initiation Protocol) and HTTP. While both protocols have long been supported by varying infrastructure components, an organization would be hard-pressed to find a solution that supports both simultaneously.

## The Need for Unified Infrastructure

The lack of unified infrastructure support for both SIP and HTTP is an operational nightmare. The disjointed nature of using different solutions for managing HTTP and

<sup>1</sup> CDW 2011 Unified Communications Tracking Poll.



SIP traffic incurs separate operational processes and procedures, which in turn increases costs associated with deployment and long-term maintenance. Capital expenditures are also affected because organizations must ensure resiliency through redundancy, requiring twice as many components.

The business-critical nature of UCS deployments requires a high degree of availability, which is enabled through resiliency at every layer of the data center. UCS may be available, but if a poorly performing Internet connection impairs usability or makes the service otherwise unavailable, the consequences can have a profound impact on the company's bottom line or brand reputation. A complete UCS solution cannot comprise merely HTTP and SIP load balancing services; rather it must support a comprehensive, holistic strategy tailored for availability at every layer of the data center—and beyond. Global load balancing, ISP link load balancing, and access management and security, as well as HTTP and SIP traffic management, must all be considered.

Given the number and reach of solutions required to successfully implement a reliable, high-performance UCS, it is no surprise that in many cases they are pulled together from multiple sources, resulting in a disjointed network infrastructure. This also increases complexity of the network and total solution, introducing more opportunity for misconfiguration and human error that can lead to downtime or expose the organization to unacceptable levels of risk.

The lack of a unified network infrastructure to support a UCS deployment impairs the ability of its components to communicate effectively and ensure availability. Monitoring and managing distributed UCS components and endpoints require multiple infrastructure systems that can collaborate and share status and performance information. Without standards, this collaboration is impossible unless the underlying UCS infrastructure framework is itself standardized on a single, unified platform.

The F5® BIG-IP® system is that platform. By supporting both SIP and HTTP, and sharing a common operational model across the disparate components that make up a unified infrastructure, F5's UCS solution can ensure the performance, resiliency, and operational efficiency required to achieve a successful UCS deployment.



# The F5 UCS Solution

The F5 UCS solution comprises multiple components to provide the comprehensive reliability required for a successful UCS implementation. While organizations can support UCS by cobbling together services across multiple infrastructure solutions, the resulting performance and functionality is often limited and does not offer the consistent operations necessary to maintain a modern data center within modern budgetary constraints.

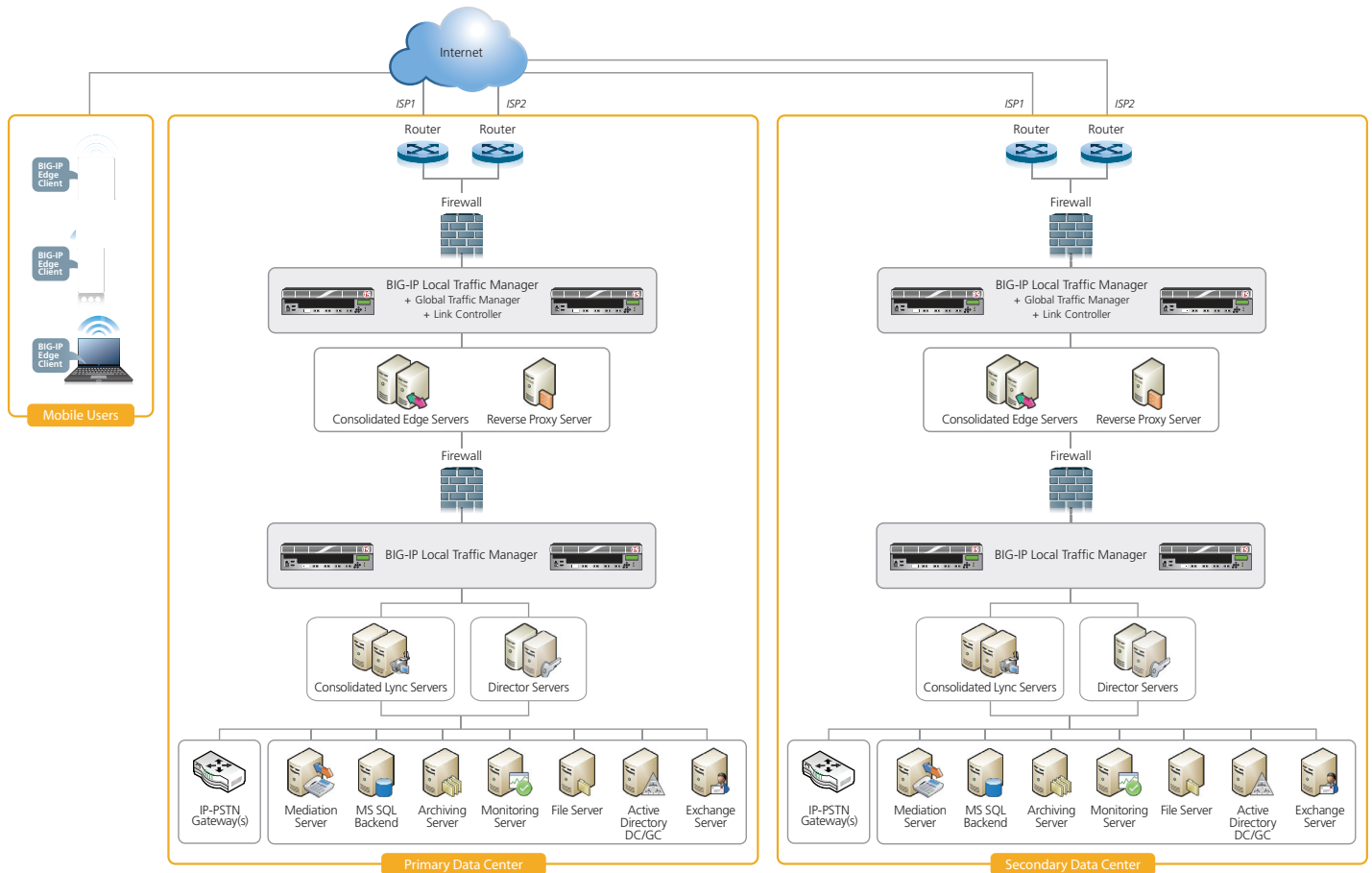


Figure 2: A comprehensive UCS solution based on the BIG-IP system supports high availability, performance, and security.



## **BIG-IP Components of the F5 UCS Solution**

The F5 UCS solution comprises F5 BIG-IP® Global Traffic Manager™ (GTM), BIG-IP® Local Traffic Manager™ (LTM), and BIG-IP® Link Controller.™

### **Link load balancing with BIG-IP Link Controller**

The rise of mobile platforms and an increasingly mobile workforce highlight the importance of ISP connectivity to service availability. The importance of UCS to business operations means a single connection to the Internet may not be enough to maintain the performance and availability of communications; a multi-homed data center approach is necessary.

But merely providing two paths to the Internet does not ensure availability or performance. Organizations must have a solution that can monitor and intelligently route communications traffic via the optimal path. BIG-IP Link Controller can not only load balance traffic over multiple ISP links, but it does so intelligently by considering performance-related factors specific to the application and protocol. Communication traffic is highly sensitive to jitter, and BIG-IP Link Controller also takes this into account when making routing decisions. Conversely, HTTP traffic is largely unaffected by jitter, but network congestion can cause undesired delays in delivery and trigger a cascading retransmission effect that further clogs Internet connections and degrades performance. BIG-IP Link Controller recognizes the conditions that can negatively affect application performance and chooses the optimal path to ensure performance and reliability are maintained.

### **Site resiliency and performance with BIG-IP GTM**

Lync Server is an integral component in the Microsoft Unified Communications platform that makes it much easier for people to communicate, no matter where they are. The real-time nature of Microsoft Unified Communications, combined with the business-critical status of its underlying applications, makes reliability a high priority for IT departments implementing Lync Server 2010.

BIG-IP GTM provides global load balancing services in a multi-site UCS deployment. BIG-IP GTM's deployment on the shared TMOS® operating system enables meaningful collaboration with locally deployed BIG-IP LTM devices across data centers or cloud computing environments. By gathering performance and availability data, BIG-IP GTM can ascertain the optimal location to which any user should be directed.



BIG-IP GTM can also analyze this data, further enabling it to direct users to alternative sites in the event of a failure, to ensure business continuity and prevent costly service disruptions.

### **Availability and performance with BIG-IP LTM**

The F5 UCS solution provides the best possible experience to both users and administrators by creating a highly available and scalable platform that achieves the highest levels of reliability through network optimization. Unified communications client applications are made more responsive by the F5 solution because the application health monitoring, intelligent load balancing, and session- to site-level network optimization ensure the most reliable delivery of Lync Server services.

BIG-IP LTM employs a wide variety of optimization techniques and has innate hardware-assisted capabilities to ensure optimum performance for all users, local and remote. Its intelligent health monitoring and load balancing capabilities reach beyond HTTP to SIP, so it can make highly specific routing and performance-based decisions based on real-time SIP characteristics. The ability to monitor SIP, particularly over TLS, is paramount to achieving a secure and highly available UCS deployment. While many solutions can monitor SIP, none but the F5 solution can monitor SIP over TLS, rendering them ineffective as they cannot ensure the resiliency and performance of SIP-based communications.

Additionally, F5 leverages hardware-assisted cryptographic services that offer dramatic improvements to UCS deployments. By offloading SSL for HTTP, BIG-IP LTM enhances the capacity of UCS-supporting servers as well as overall performance. When scaling out, BIG-IP LTM enables graceful on-boarding via slow ramping connections, which ensures servers are not suddenly overwhelmed. Conversely, the ability to quiesce connections from servers provides non-disruptive maintenance windows, enabling emergency patching and updates as required. Unfortunately the common practice of using DNS load balancing services to support scalable UCS deployments impedes organizations' ability to provide these services—and it affects the overall health of UCS services.

### **DNS load balancing**

While DNS load balancing services can be—and often are—used to distribute SIP traffic in UCS deployments, there are a number of challenges associated with this approach, including that it prevents organizations from considering the health or performance of SIP servers when selecting a server. DNS load balancing is limited in its algorithmic options when selecting servers and generally allows only a “round



robin” approach. BIG-IP LTM supports all industry standard load balancing algorithms as well as dynamic, real-time algorithms that consider health, load, performance, and other factors that can adversely affect availability and performance. This greater flexibility in load balancing algorithms allows organizations to mitigate operational risk by optimizing server selection.

Deploying DNS load balancing servers for SIP does not obviate the need for a hardware load balancer for HTTP traffic, which results in a disconnected operational model and the inability to share pertinent data to improve performance, node and site selection, and overall availability of UCS services.

Additionally, in the past DNS load balancing was far easier to configure than hardware load balancing services, including the BIG-IP system. But with the introduction of F5 iApps™ technology, this is no longer the case. iApps is a unique application-centric deployment packaging technology that enables simple, repeatable configuration on a per-application basis. It encapsulates an optimal Microsoft Lync Server configuration deployment and requires only minimal effort on the part of administrators to deploy. iApps further enables repeatable deployments such that on-demand scalability of UCS services becomes almost trivial in nature. It also enables a smoother transformation to cloud-based deployments (private or public) of not only UCS, but all enterprise-class applications, such as Microsoft VDI<sup>2</sup> solutions.

## A Foundation for the Future

As unified communications and cloud computing have become commonplace, the IT community has indicated a high level of interest in using private cloud computing as a solution to the scalability challenges inherent in UCS deployments.

Traditional load balancing solutions and cobbled-together architectures comprising multiple components cannot establish the flexible and scalable infrastructure foundation necessary to transform traditional static data centers into private cloud computing environments.

Several technologies and features were introduced in BIG-IP version 11 specifically to assist organizations that want to lay the foundation for private cloud computing. iApps is one of those technologies, with which authentication, data protection, traffic management, and acceleration can be provisioned as application services

### Additional SIP Resources

- [Deploying BIG-IP LTM for SIP Traffic Management](#)
- [F5's BIG-IP SIP Load Balancing Solution Takes Internet Telephony's Product of the Year Award](#)
- [F5's Application Ready Solution Guide for Microsoft Lync Server 2010](#)
- [Scaling SIP](#)

“According to the Osterman Report, public cloud Unified Communications services are not considered ready for prime time by most mid-to-large enterprises. However, the survey did reveal that many decision makers view private cloud UC infrastructures as superior to public cloud options, based largely on their robust customization, flexibility, and more mature security benefits.”

*Scott Gode, vice president of product management and marketing for Azaleos<sup>3</sup>*

<sup>2</sup> <http://www.f5.com/pdf/white-papers/f5-microsoft-vdi-wp.pdf>

<sup>3</sup> [Azaleos News Release, June 15, 2011.](#)



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rather than as individual devices and objects. These services are packaged into an iApp and are easily replicated across both physical and virtual BIG-IP instances. This dynamic data center capability is but one of the technologies<sup>4</sup> available with BIG-IP v11 supporting a cloud-based UCS infrastructure.

Organizations can also integrate BIG-IP® Edge Gateway™ with the F5 UCS solution for secure access management and to provide single sign-on and seamless application access to mobile, virtual, and traditional UCS clients no matter where they may roam.

## Conclusion

A unified communications effort requires a unified supporting infrastructure that has the visibility and collaborative capabilities to span multiple deployment locations and servers. By leveraging a common infrastructure platform, BIG-IP components form a comprehensive, collaborative solution that enables highly resilient, scalable, and secure UCS deployments.

The F5 UCS solution ensures availability of every data center tier by closely monitoring both SIP and HTTP traffic intelligently. The F5 solution will scale transparently across data centers and geographic locations to ensure multi-site resiliency and business continuity in the face of poor network or data center conditions using iApps technology and a combination of physical and virtual BIG-IP editions.

An F5 unified infrastructure supporting UCS deployments improves performance, ensures resiliency, and manages SIP traffic intelligently for an enhanced user experience, all without increasing the burden on operators and administrators.

<sup>4</sup> <http://www.f5.com/products/big-ip/v11.html>

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