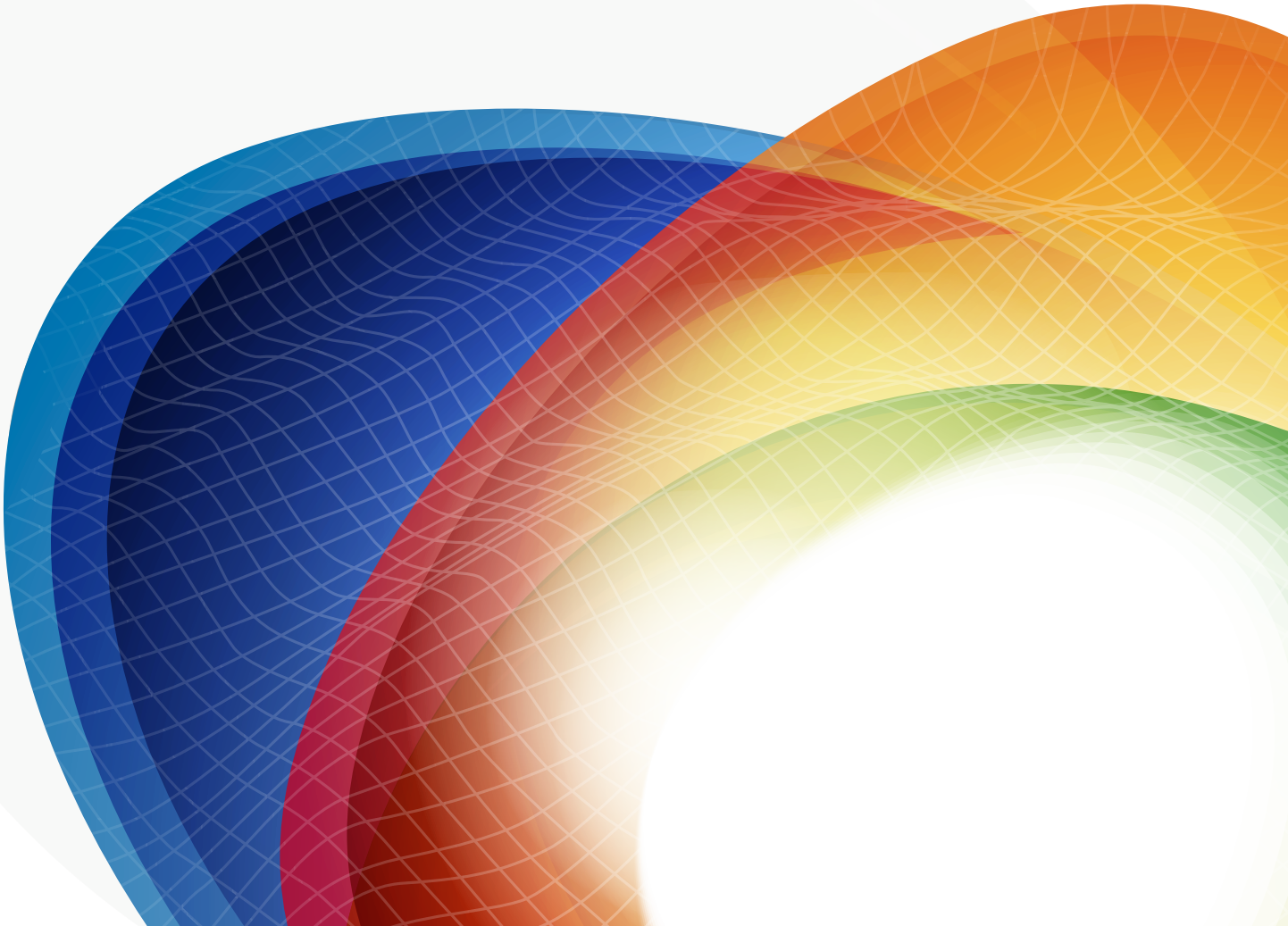
WHITE PAPER

F5 Synthesis: Applications without Constraints

F5 Synthesis is a new architectural vision for delivering application services without constraints. By leveraging a high-performance services fabric, F5 Synthesis delivers the applications businesses depend on securely, rapidly, and reliably.

by Nigel Burmeister



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Introduction

Applications are the lifeblood of any business. If you spent time or budget to develop or acquire an application, then it's important—and it should work. However, tectonic shifts in technology are making it increasingly difficult to achieve this simple objective.

To start, the way people access applications has changed. Today the majority of applications are accessed via the web.[1] This is largely driven by a meteoric move to mobile that will see 2.7 billion mobile devices shipped in 2017, and 40 percent of the workforce becoming mobile.[2]

The way applications are developed and delivered is also rapidly changing. Cloud has become the preferred application development platform,[3] and many organizations are adopting a DevOps approach, which enables a closer collaboration between development and operations teams to improve both the speed and the quality of application development.

Against this backdrop of change, the sheer volume of applications is staggering. In 2012 there were more than 48 billion applications—many of them mobile (more than 1 million applications were running on iOS alone). And application growth is not limited to the consumer. Organizations must support hundreds if not thousands of applications. Yet even these quantities will seem insignificant as we move into the era of the Internet of Things (IoT).

Given these rapid, staggering changes, organizations are left to grapple with how to deliver applications in a secure, timely, and reliable manner.

Current Constraints

Part of the problem is that applications are delivered by network architectures that fundamentally haven't kept pace with application trends.

Most network infrastructures that convey applications are still only superficially application-aware. They are based on complex topologies and rigid architectures that don't easily scale and require increasingly rare systems expertise to configure and operate. Furthermore, these networks largely comprise proprietary hardware and software elements that are often individually licensed, resulting in high costs per application.

[1] 64 percent of all applications are delivered via HTTP according to internal F5 iHealth data surveys.

[2] "Gartner Says Worldwide PC, Tablet and Mobile Phone Combined Shipments to Reach 2.4 Billion Units in 2013." Gartner press release, April 4, 2013.

[3] 70 percent of respondents cited the Internet/Web as their software product and application development platform (ExecutiveBrief 2012 Software Development Trends Survey).

Layer 4–7 application services, when they do exist, are typically siloed and static. They lack the ability to dynamically optimize data center and network infrastructure; provide protection against known and unknown threats; and reliably deliver applications across a portfolio of public and private clouds.

While virtualization has transformed compute and storage infrastructures, evolution in the network infrastructure has lagged behind. Initiatives like SDN (software defined networking) have emerged to address these challenges, but even these approaches fall short. While seeking to address the network-centric challenges inherent in today's network fabrics, they lack comprehensive support for application (layer 4–7) services. Since the network exists to support the applications that use it, any new network architecture needs to address both network layer challenges and application layer challenges.

These constraints make it time-consuming, costly, and resource-intensive to deliver the range of applications with the reliability, security, and speed that today's businesses demand. The result is that only highly critical applications warrant an organization's limited resources, and other applications simply get left behind.

A New Model for Application Services

Now is the time for a different approach. One that is application-centric, not just device- or network-centric. This new approach must deliver applications without constraints to anyone, anywhere, at any time—and it must do it securely, rapidly, and reliably. Finally, this approach should be easy to use and easy to procure for a variety of business models.

This new model for application services is here. F5 Synthesis™ is an architectural vision for delivering device, network, and application services without constraints. F5 Synthesis comprises three major elements:

- A high-performance services fabric
- Intelligent services orchestration
- Simplified business models

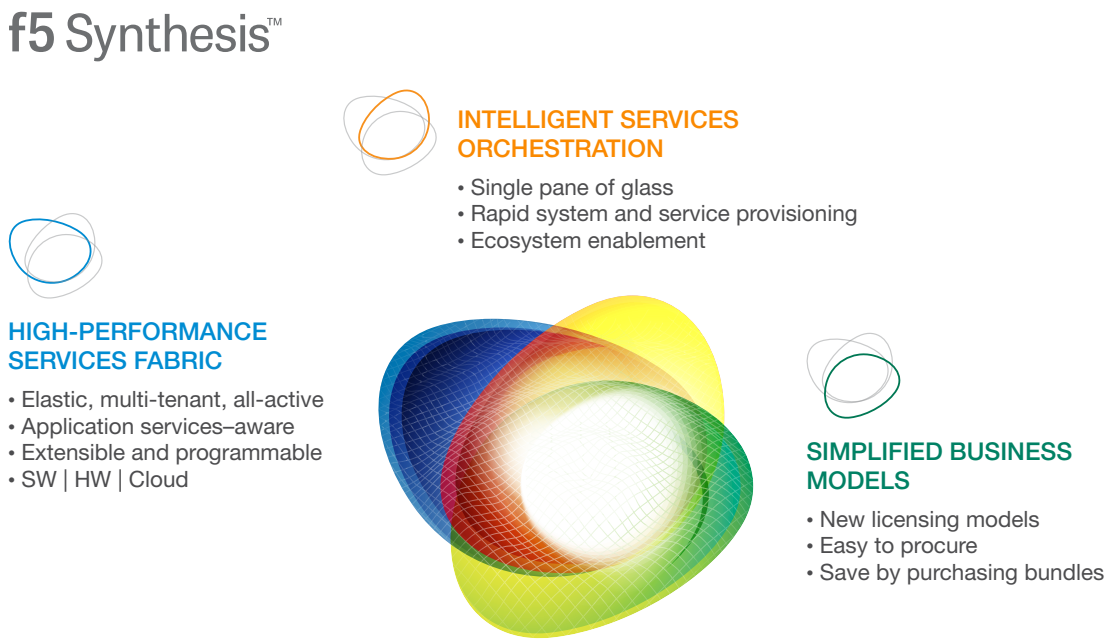

Figure 1: The three primary elements of F5 Synthesis

High-Performance Services Fabric

The high-performance services fabric is focused on delivering higher-layer services—a set of Software Defined Application Services™ (SDAS). Consequently the services fabric does not seek to replicate or replace the functionality of the lower layer elements; instead F5 Synthesis will work with a range of underlying network architectures, from traditional Ethernet to SDN.

The services fabric is elastic, programmable, and multi-tenant-capable. It comprises F5 physical and virtual elements that are application-aware. These elements can scale horizontally or vertically with the F5® ScaleN™ technology, and can be deployed across any combination of hardware, software, or cloud. The services fabric is inherently fault-tolerant with availability, failover, and clustering capabilities focused on application needs. It is also highly programmable across both control and data planes to ensure a highly responsive, extensible system.

The services fabric delivers a catalog of application services focused on security, mobility, access, performance, and availability.

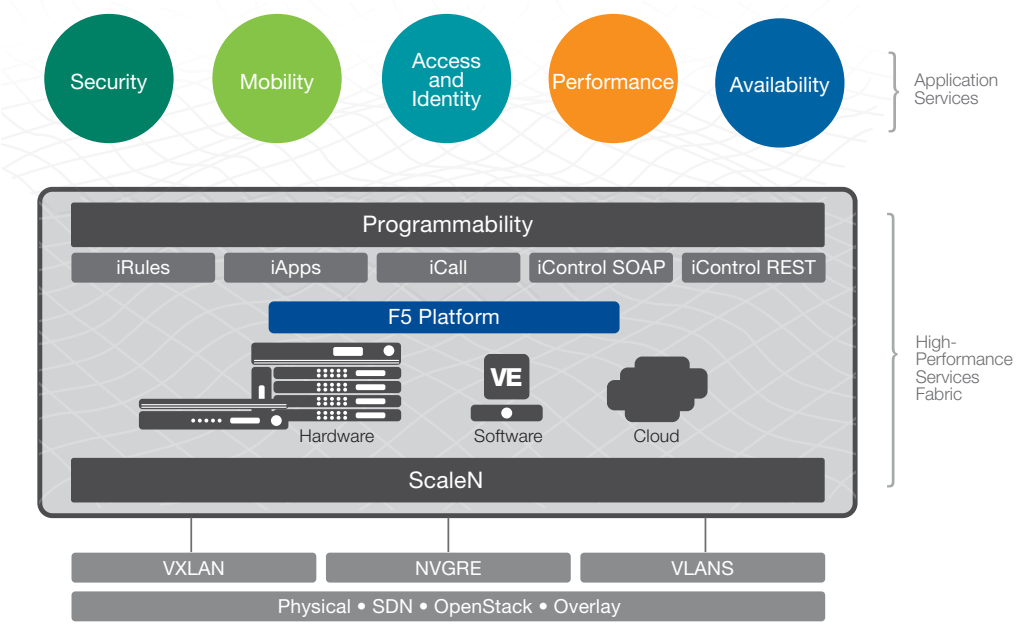

Figure 2: A rich set of programmable services delivered by a high-performance services fabric enable Software Defined Application Services

Intelligent Services Orchestration

Automated service and system provisioning is essential to enabling services across all applications. F5 Synthesis orchestration capabilities enable organizations to seamlessly provision, manage, and scale a rich set of application services irrespective of form factor (hardware, software, cloud) or deployment model (on-premises, private/public cloud, hybrid). The orchestration component also supports integration with other ecosystem participants such as public cloud providers (Amazon Web Services, VMware) and orchestration engines (VMware, Cisco, OpenStack) through a set of open APIs.

Complementing the multi-tenant capability of the services fabric is a multi-tenant approach to management. This allows organizations to move closer to IT as a Service without concern that it might affect the stability or security of the services fabric.

Simplified Business Models

Application services should not only be easy to provision, they should be easy to procure. When it comes to IT, a variety of deployment and purchasing models exist today. Through innovative licensing and product bundling practices, F5 Synthesis is designed to support the deployment of flexible services with cloud, hybrid, and usage-based IT models.

Benefits

F5 Synthesis delivers business benefits in three primary areas: service velocity, operational risk, and costs.

Increase service velocity. Service automation and orchestration are critical for organizations to realize continuous delivery and improve service velocity. F5 Synthesis not only embraces programmability to enable rapid provisioning and service orchestration, it exposes that programmability and allows organizations to extend and create new services. Open programmability affords F5 Synthesis a rich ecosystem of integrated tools and solutions that enables organizations to move toward a software defined data center, increasing the rate at which businesses can evolve.

Reduce operational risk. Standardizing on a service platform can significantly reduce operational risk and improve business continuity. F5 Synthesis allows organizations to centrally deploy and manage application service topologies consistently, resulting in predictable and repeatable application deployments with fewer errors.

Lower costs. The F5 Synthesis multi-tenant, elastic, high-performance services fabric supports deployment on hardware, software, and cloud form factors. This enables organizations to choose the business model best suited to each application—without compromising on the critical application services that ensure security, scalability, and reliability.

Conclusion

Designed to address today's significant application development and delivery challenges, F5 Synthesis combines a high-performance services fabric, intelligent services orchestration, and simplified business models to enable organizations to achieve new economies of scale from both a cost savings and operational perspective. Leaving no application behind, F5 Synthesis delivers vital business benefits amidst high-impact trends and shifts in technology.

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