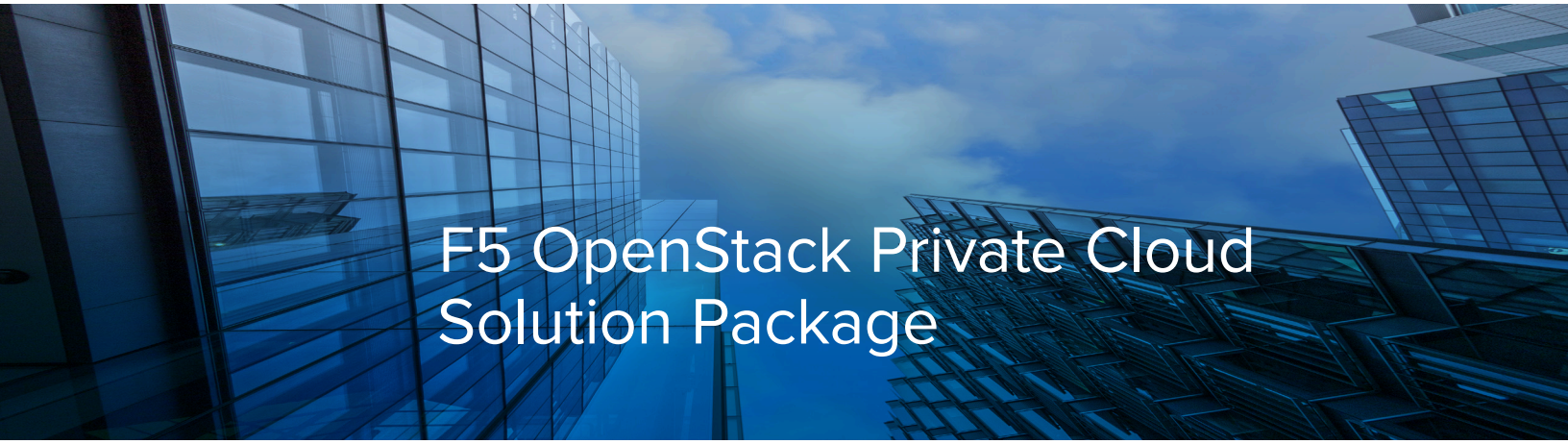
OVERVIEW



F5 OpenStack Private Cloud Solution Package

KEY BENEFITS

- Agile and consistent app services delivery
- Security and compliance, at scale
- DevOps-ready—enabling efficient collaboration between IT and app owners
- Seamless migration of apps from development to production clouds
- Tested and certified solutions, backed by enterprise-grade support
- Simplified procurement
- Professional Services

In today's software-defined economy, businesses have to move faster than their competition. Speed and agility are critical to keeping up with competitive demands for new applications, as well as maintaining existing infrastructure. IT organizations must respond aggressively to meet business needs—and the private cloud can be a primary tool to achieve this objective. It's not surprising, then, that organizations are accelerating their journey to the cloud.

OpenStack for cloud

Many software developers are turning to the OpenStack platform for cloud computing. Its open APIs, flexible architecture, and large commercial ecosystem help enterprises compete in a completely new paradigm of software development. OpenStack is rapidly becoming the dominant cloud platform for delivering Infrastructure as a Service (IaaS). As OpenStack-powered clouds increasingly host mission-critical production applications, advanced application delivery services for layers 4–7 are becoming essential. Enterprise customers are now deploying new applications with these services, and expect them to be available when they transition to a cloud-based architecture.

Planning an OpenStack architecture

F5 is the leading supplier of advanced application delivery services across data center, public, private, and hybrid clouds, including those powered by OpenStack. F5 partnered with Red Hat to help customers accelerate OpenStack deployments. OpenStack and F5 application delivery services and platforms combine to bring production-grade services to OpenStack-hosted applications.

F5 application delivery services can be accessed in two ways within OpenStack: through Neutron Load Balancing as a Service v2.0 (LBaaSv2), and F5's OpenStack orchestration (HEAT). With the combination of OpenStack, F5, and Red Hat, enterprises can transition from traditional data centers to private cloud faster and more efficiently.

Seamless migration to the cloud

The F5 private cloud solution package for OpenStack offers agile application services, delivered by NetOps in an automated and continuous integration environment without compromising corporate security or reliability standards. The solution package enables efficient collaboration between DevOps/application owners and NetOps, while reducing the proliferation of shadow IT. Seamless app migration—from development to production clouds—and consistent delivery of application services facilitates infrastructure-as-code initiatives.

The solution package also offers simplified private cloud rollout and operational confidence with tested and certified solutions, backed by enterprise-grade support. It provides joint certification and testing with Red Hat to orchestrate F5® BIG-IP® Application Delivery Controllers (ADCs) with OpenStack Networking services.

F5 Private Cloud Solution Package for OpenStack

The F5 private cloud solution package for OpenStack represents validated solutions and use cases based on customer requirements utilizing BIG-IP ADC and OpenStack integrations. F5's OpenStack LBaaSv2 integration provides under-the-cloud L4–L7 services for OpenStack Networking tenants. F5's OpenStack orchestration templates provide over-the-cloud, orchestration (NFV) with BIG-IP Virtual Edition version 13 ADC clusters, and F5 iApps® templating for application services deployment. OpenStack installations are highly configurable, and vary greatly. New OpenStack versions are released every six months, creating the continuous need for testing and validation of our solutions. Red Hat OpenStack Platform 10 extends private cloud support for up to five years.

The OpenStack private cloud package described in this overview introduces enhanced use cases with L7 capabilities using Enhanced Service Definitions (ESDS). BIG-IP local traffic management has many load balancing configurations that don't have direct implementation in the OpenStack LBaaSv2 specification. While it's easy to customize BIG-IP LTM settings using profiles, policies, and F5 iRules® scripting language, LBaaSv2 doesn't provide a way to apply these to BIG-IP LTM. Now, Enhanced Service Definitions (ESDs) allow you to apply BIG-IP LTM profiles, policies, and iRules to OpenStack load balancers. The F5 solution validates this use case based on tests utilizing the OpenStack integration. These tests have been validated and certified by Red Hat, and published as part of F5 open source solutions. This enables our customers and their partners to easily deploy the F5 private cloud solution for OpenStack.

Testing the solution

The F5 solution covers multiple use cases for the OpenStack private cloud. These are tested through a series of OpenStack cloud deployments and Tempest tests suites while using Red Hat OpenStack Platform version 10, based on the upstream OpenStack 'Newton' release. Red Hat maintains and supports this platform and has its own test suite for LBaaSv2 certifications. F5 maintains its LBaaSv2 certification with Red Hat as part of its partnership. Red Hat also provides input and validates use case tests for private clouds against the company's own OSP cloud deployments. The successful completion of these tests with each version of Red Hat OSP forms the basis of a documented, validated solution supported by both F5 and Red Hat.

Use Case: Migrating Workloads to OpenStack Private Cloud

As applications migrate from traditional architectures to the private cloud, F5 ADCs can help ease the transition. For the many existing applications currently using F5 ADCs, application policies, and iRules, business logic can be maintained in the migration to the cloud. For other applications, the presence of BIG-IP virtual edition ADCs offers a dynamic pivot for services as they are chained and refactored into new architectures. The first use case focuses on migrating existing workloads to an OpenStack private cloud. This migration is based on tested deployments of Red Hat OSPv10 with F5 LBaaSv2 services—utilizing BIG-IP i5800 ADC devices and deployment of a BIG-IP VE instance within an OpenStack tenant. The F5 OpenStack private cloud package can be expanded to include auto scaling ADC cluster, WAF cluster, and network functions virtualization (NFV) network firewalls utilizing different models of BIG-IP iSeries devices and scale.

Implementing BIG-IP Local Traffic Manager

In this use case, F5 BIG-IP customers implement BIG-IP LTM L4–L7 services through the OpenStack LBaaSv2 API from traditional architectures to private cloud. The use case leverages standard LBaaSv2 load balancers, listeners, pools, members, monitors, and L7 policy and rules. An ESD is included, which can define custom settings for BIG-IP objects. Typically, an ESD applies one or more profiles, policies, or iRules to a BIG-IP virtual server. Features tested include BIG-IP LTM standard virtual servers, client TLS decryption, server context re-encryption, http profiles, multiple pools, cookie persistence, multiple iRule associations, and monitored pool members. Pool member state and virtual service statistics are collected through OpenStack networking APIs. The OpenStack LBaaSv2 API enables the agility to deploy those applications behind BIG-IP iSeries ADCs.

The F5 private cloud solution package for OpenStack includes an edge deployment architecture, using only OpenStack networking provider networks, with F5 agents deployed in global routed mode. In addition, the architecture uses micro-segmentation and tenant networking with F5 agents deployed in L2 adjacent mode.

The BIG-IP hardware devices in the diagram below are cloud-ready i5800 ADCs. The BIG-IP VE tenants are software ADC's, which utilize the F5 BIG-IQ® Centralized Management® license manager for manual licensing of the fixed license pools and provisioning.

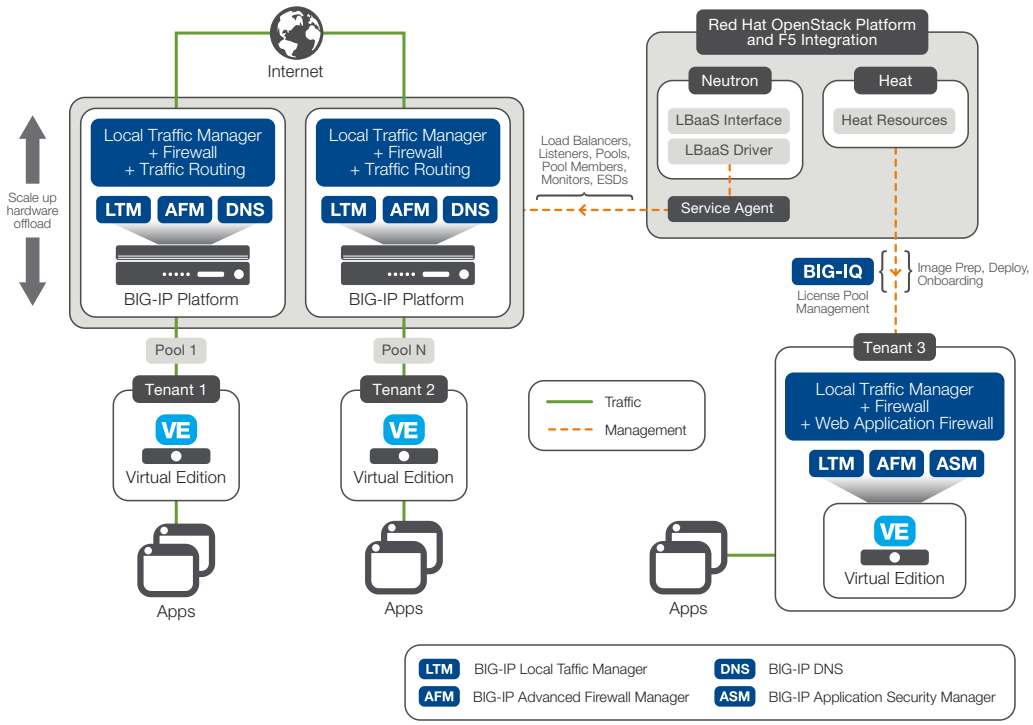


Figure 1: F5 OpenStack deployment test architecture

In the diagram, F5 OpenStack HEAT templates are used to onboard a BIG-IP virtual edition with the OpenStack agent startup script. The startup script includes setting up built-in account passwords and the creation of VLANs and non-floating self IPs for management and tenant networks. The BIG-IP VE adds additional application-specific services for security.

LEARN MORE

For more information about F5 and Red Hat OpenStack solution, visit these resources:

Web pages

F5 and OpenStack
F5 and Red Hat partnership
F5 in GitHub

Deployment guide

F5/Red Hat OpenStack Deployment Guide

Summary

Validated and certified by Red Hat, the F5 private cloud package for OpenStack offers attractive pricing and enterprise-class technical support from F5 experts. F5 and Red Hat product development have selected and tested the most common use cases and created a package that can easily assist with application migration, from traditional architectures to private cloud. Additional use cases, testing, validation, and documentation will follow—expanding on the features and functions described in this overview.

To learn more about how the F5 and Red Hat OpenStack solution works and can be deployed, go to the deployment guide.

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