



F5 White Paper

# BIG-IP Live Install and Logical Volume Manager

Use management and hardware virtualization to quickly and transparently stage offline system upgrades and patches.

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## Introduction

One of the least used virtualization technologies in the data center is management virtualization, yet this is one of the core tenants of any complete virtual data center solution. Before any new virtualization technologies are introduced to the data center they need to be a manageable part of the complete virtual solution, meaning that once they're deployed they can be controlled throughout the virtual lifecycle. Nowhere is this truer than with application delivery and service virtualization: two technologies that encompass multiple components of the data center with the singular goal of delivering applications outside the data center.

F5® BIG-IP® Application Delivery Controllers (ADC) have included management and hardware virtualization features since the introduction of F5's carrier-class ADC blade controller, VIPRION®. Management and hardware virtualization, used in BIG-IP's Clustered Multiprocessing, administrative domains, and resource provisioning, can help build and control a complete virtual application delivery solution through the ADC. Through hardware virtualization, the Live Install feature, new to BIG-IP v10, extends F5's management virtualization solution to include virtualizing installation partitions and system image management.

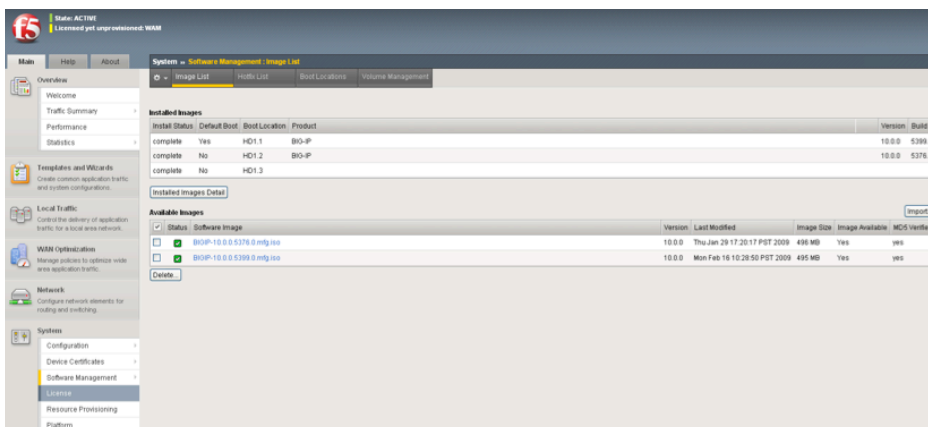
## Live Install

One of the challenges that has long troubled system, network, and application administrators is how to manage upgrades and patches on mission-critical systems. The BIG-IP system, for example, is normally deployed in redundant pairs which, along with providing a hardened and fault-tolerant application delivery solution, provide flexibility for staging major and minor updates. This amounts to updating the secondary, starting to bleeding traffic from the primary to test that the upgrade was successful, making the secondary the primary, and repeating. This staging procedure works well, but requires a substantial amount of maintenance time to upgrade both devices and move application traffic between devices. This is most apparent when the upgrades involve more than simple patches—when there are core ADC software upgrades or major version releases. Enter Live Install, a virtual staging solution for managing upgrades in real-time, in parallel, with live application traffic.



Live Install is a management virtualization solution that enables BIG-IP administrators to install and patch the currently running system image in a separate partition without impacting the currently running system or application traffic running through the BIG-IP device. The administrator is able to stage the new install/upgrade on each box, on their own schedule, without worrying about interrupting application traffic. The install/upgrade can be loaded, installed, and staged at any time, not just during a singular maintenance window. The administrator can simply load a new system image on a newly created virtual volume and walk away. Once the install/upgrade has been staged, it can be quickly applied during the normal maintenance period with just a reboot. This saves upgrade time and gives administrators more time for testing and verification. After the new image has been applied, administrators can test application traffic and verify the new image is working as expected. If there is a problem, the pre-upgrade image can be rolled back with another reboot and the process can repeat. This process drastically minimizes the risk exposure to application traffic.

Another key feature of Live Install is the ability to reset a BIG-IP device to a baseline default configuration, such as the factory default or any set configuration in the device's life cycle. This is a handy feature for moving or repurposing BIG-IP devices throughout the organization. As devices are moved and reallocated from one department to another, configurations can be easily reset so that the BIG-IP device can start in a new role, without legacy configuration settings.



BIG-IP Live Install Configuration Screen



## Logical Volume Manager

Live Install is based on Logical Volume Manager (LVM), a hardware virtualization tool that enables you to dynamically add virtual storage space on the fly to your BIG-IP operating system. New images, upgrades, and patches are loaded into a new dynamic storage volume while the current system is still live and processing application traffic. These dynamic volumes are stored as long as needed; the administrator is able to choose which volume is mounted as the boot partition during the reboot process, selecting from any number of previously installed Live Install partitions. Older stored volumes can also be dynamically removed during run-time, if no longer needed, once new images are validated. Administrators are able to keep a nearly limitless number of previous installations and configurations live on the BIG-IP device by using names specific to their internal release management and naming conventions. Not only is this a unique and critical solution for live BIG-IP devices in production, it's also a key feature for testing and QA environments that need to test the performance of various BIG-IP versions and configurations with other applications.

## Controlling Configuration Data

Either one of these technologies alone would be a powerful tool. The combined solution of these two technologies is at the heart of F5's powerful ADC, helping to better manage application delivery in the data center. The combination of hardware virtualization (LVM) and management virtualization (Live Install) enables the granular management of the configuration of physical data stored on BIG-IP devices. This results in easier simplified management and configuration platform, focused on application delivery. The combination of LVM and Live Install bring a long list of features and benefits:

- Running System Image Management—Enables system images and snapshots to be loaded while the system is running on multiple virtual volumes. These images and snapshots can be used to store “last known good” images, hotfix and incremental system versions, and testing and QA images.
- Virtual Volumes for Modules—LVM virtual volumes on BIG-IP devices can be allocated to both the core system for configuration images as well as individually to specific modules such as the BIG-IP® Application Security Manager™ (ASM) and WebAccelerator™ modules. These modules can

use their private virtual volumes to store specific configuration information, such as policies and cached data (WebAccelerator) and logs (BIG-IP ASM).

- Unique RAID Volume Management—LVM virtual volumes can be bound to and spread across multiple RAID configurations, enabling the administrator to choose the level of data fault tolerance and redundancy down to the volume level.

## Conclusion

BIG-IP devices have long been a tool for applying “rolling upgrades” to the applications and systems that sit behind the BIG-IP device. With Live Install, this “stage->reboot->go live” sequence can now be applied to the BIG-IP device directly, creating a rolling upgrade scenario like those of the application systems behind it. Live Install also enables snapshot versioning for future versions of the BIG-IP system, a critical feature for both production and testing environments. Controlling stateful data and staging BIG-IP devices has never been easier; by implementing both hardware and management virtualization, Live Install enables “point in time” configurations that persist through future upgrades as well as drastically reduce the planned upgrade and testing time required during maintenance windows. Live Install is yet another BIG-IP solution for enterprise-, carrier-, and cloud-class application delivery virtualization.

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