In-Place InfoScale Upgrades Across RHEL Major Versions Using Red Hat Leapp Utility

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Contents

Executive summary

InfoScale provides enterprise-grade resiliency and software-defined storage for mission-critical applications across physical, virtual, and cloud platforms. This white paper describes a validated, low-downtime approach for performing major Red Hat Enterprise Linux (RHEL) upgrades in-place using Red Hat's Leapp utility while preserving InfoScale availability. This approach reduces operational risk, eliminates the need for full re-provisioning and restoration cycles, and simplifies major-version operating system (OS) upgrades across a wide range of critical businesses.

Background and problem statement

Historically, moving between major RHEL releases required reinstallation and data restore, causing significant downtime and operational overhead.

Due to limited InfoScale scope and Red Hat limitations, InfoScale upgrades were earlier unsupported along with major OS upgrades across supported RHEL versions. You had to back up data, reimage the OS, and restore the data along with reconfiguring applications, which required considerable downtime. Upgrades between major OS versions (for example, from RHEL 7 to RHEL 8 or RHEL 8 to RHEL 9) were not supported. If you planned to move between major OS versions, you needed to reinstall the product.

The InfoScale installer supports the following types of upgrades:

- **Full upgrade**: This method ensures that the file systems are clean, performs the upgrade, updates the configuration, and confirms the startup.
- **Rolling upgrade**: This method minimizes the downtime of a cluster during an upgrade to the amount of time that it takes to fail over a service group. InfoScale 8.0.2 and later versions let you configure clusters with systems that run on different versions of the VCS engine. To support such configurations, the installer provides a rolling upgrade option for InfoScale components, which upgrades the kernel RPMs and the VCS agent-related RPMs in the same process. The rolling upgrade may involve minimum application downtime for systems that participate in upgrade. Although there is minimum-to-no cluster downtime, the rolling upgrade has two main phases where the installer upgrades the kernel RPMs.

  A rolling upgrade enables cluster systems to be upgraded one at a time, while the remaining systems continue to host and serve the application workloads. This approach is fundamental to achieving high availability (HA) and minimal application disruption during platform- and OS-modernization initiatives.

Arctera has validated a coordinated approach where InfoScale and OS upgrades are conducted with minimal application disruption using a rolling upgrade pattern combined with Red Hat's Leapp in-place upgrade utility. You now can seamlessly upgrade major OS versions with the coexisting InfoScale upgrades.

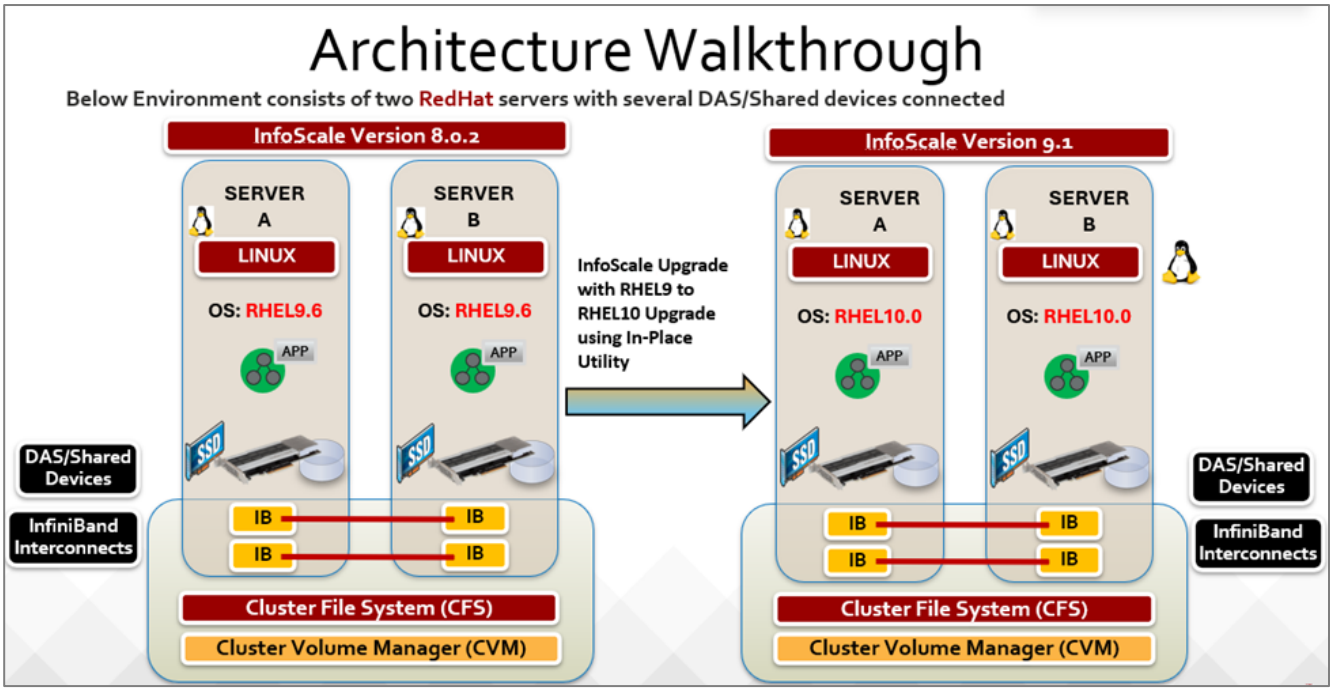
Purpose and scope

This document describes a validated process to perform major RHEL upgrades (for example, from RHEL 9 to RHEL 10) in InfoScale clusters using Red Hat's Leapp utility together with InfoScale upgrade procedures. You can follow a similar process for upgrades from other RHEL platforms, like RHEL 7.x and 8.x.

InfoScale releases support upgrades from specific RHEL versions to the latest released version. To look for supported upgrade versions, visit: https://sort.veritas.com/arctera/platformlookup.

For details on how to upgrade RHEL using the Leapp utility for specific versions refer to the Red Hat article at: https://www.redhat.com/en/resources/leapp-explained-detail.

Architecture



Sample InfoScale upgrade scenario using Red Hat Leapp utility

Note: The InfiniBand (IB) cards illustrated in this graphic are not mandatory.

Solution overview

Implementing this solution involves the following tasks:

1. Prepare the cluster and the service groups for a rolling upgrade.
2. Use the Leapp preupgrade checks with an enabled InfoScale repository to detect and remediate inhibitors.
3. Perform the Leapp upgrade, which installs the OS and InfoScale RPMs and reboots into the new major RHEL release along with the new InfoScale version.
4. Re-enable InfoScale services using the `upgradestart` command option and validate the cluster health.

Perform these tasks on each InfoScale system in a controlled rolling fashion to maintain service availability.

High-level process (rolling upgrade method)

The high-level process for simultaneously upgrading from InfoScale 8.0.2 to InfoScale 9.1 and RHEL 9.6 to RHEL 10 using the rolling upgrade method involves the following steps. You can follow a similar process for upgrading from earlier InfoScale and RHEL versions to the latest supported versions. For details on the supported software versions, refer to the appropriate *InfoScale Software Compatibility List*.

Step 1: Prepare the system for upgrade using Red Hat Leapp

Switch failover service groups.

1.1 Move all failover service groups from the system being upgraded to another healthy system in the cluster.

```
# hagrp -switch <failover_service_goup_name> -to <system_name>
```

Take all the parallel service groups offline.

Take all the parallel service groups, including the CVM service group, offline on the systems that you want to upgrade first.

```
# hagrp -offline <parallel_service_goup_name> -sys <system_Name>
```

Stop the InfoScale services on the selected systems.

Stop InfoScale on the systems that are being upgraded in this phase. For example, in a four-node cluster, stop the product on two systems while the remaining two systems continue to serve workloads.

```
# /opt/VRTS/install/installer -stop <system1_name> <system2_name>
```

Step 2: Upgrade OS and InfoScale using Leapp

Perform the following steps on all the systems selected for the first upgrade phase.

2.1 Preserve the LLT configuration—temporarily rename the `llttab` file before starting the OS upgrade.

mv /etc/llttab /etc/llttab.save

2.2 Update the system to the latest supported kernel version.

Red Hat recommends using the latest supported kernel version for major OS version upgrades using the Leapp utility. For the latest kernel versions, refer to the Red Hat article at: https://access.redhat.com/articles/red-hat-enterprise-linux-release-dates .

Update the existing OS packages and reboot the system. For example, for RHEL 9.4 to RHEL 9.6, upgrade to the latest supported Leapp kernel directly using YUM or DNF and reboot the system.

```
# dnf update -y
```

```
# reboot
```

2.3 Install the Leapp utility, which is the `leapp-upgrade` package.

```
# dnf install leapp-upgrade -y
```

2.4 Configure the InfoScale repository.

Create the InfoScale repository file corresponding to the target InfoScale version.

```
# cat /etc/yum.repos.d/infoscalerepo.repo
[InfoScale91_rhel10]
enabled=1
baseurl=https://path_to_binaries_url/rpms/
gpgcheck=0
```

2.5 Run the Leapp pre-upgrade checks.

Run the Leapp pre-upgrade utility, which enables the InfoScale repository to validate all the prerequisites.

```
# leapp preupgrade --enablerepo <infoscale_repo_name> --target 10.0
```

Analyze the pre-upgrade reports in the `/var/log/leapp/leapp-report.txt` file.

Resolve all the errors and inhibitors, if any.

Re-run the pre-upgrade command until no blocking issues remain.

Important: Ensure that the InfoScale repository is correctly detected and consumed by Leapp during the pre-upgrade phase.

2.6 Perform the OS and InfoScale upgrade.

Initiate the Leapp upgrade process.

```
# leapp upgrade --enablerepo <infoscale_repo_name> \
--target 10.0 -reboot
```

Leapp downloads and installs all the required OS and InfoScale RPMs.

The system reboots automatically.

The upgrade continues from the console and completes with the system booting into the new OS and InfoScale versions.

Step 3: Post-upgrade tasks on the upgraded systems

Once the system is back online after the upgrade, perform the following steps.

3.1 Restore the LLT configuration using the `llttab` file that you backed up.

```
# mv /etc/llttab.save /etc/llttab
```

3.2 Add the InfoScale installation scripts.

For example, for InfoScale 9.1.0, run:

```
# /opt/VRTS/install/bin/UXRT910/add_install_scripts
```

Note: This step manually generates and installs the installer scripts for the configuration. It is necessary as the upgrade is performed outside of the common product installer (CPI).

3.3 Start InfoScale using the `upgradestart` option.

Bring the InfoScale services online on the upgraded systems.

```
# /opt/VRTS/install/installer -upgradestart <system1_name> \
```

```
<system2_name>
```

Note: The cluster becomes operational in mixed mode, as VCS supports this environment from InfoScale 8.0.2 onwards.

For example, the following mixed-mode configuration is supported during the rolling upgrade window:

- The upgraded systems are on RHEL 10 with InfoScale 9.1.0.
- The systems that are not yet upgraded remain on RHEL 9.6 with InfoScale 8.0.2.

3.4 Upgrade the remaining systems.

Repeat these post-upgrade tasks on the remaining systems until all the cluster systems are upgraded to the target OS and InfoScale versions.

Step 4: Post-upgrade validation (all systems)

Ensure that the OS + InfoScale upgrade is successful. After completing the upgrade tasks across the entire cluster, perform the following validations.

4.1 Verify that the OS and InfoScale have been successfully upgraded on all the systems.

```
# cat /etc/redhat-release and #uname –a
```

```
# ./installer –version
```
>>>> this is an interactive script

or

```
# rpm –qa | grep –i vrts
```

Confirm that the cluster is stable and running by verifying the following:

a. Disk groups are imported successfully.

```
# vxdg list
```

b. VxFS file systems are mounted.

```
#mount |grep –i vx  or # df –h
```

c. Service groups are online.

```
#hagrp –state
```

4.2 Perform I/O validation on the mounted file systems to confirm data accessibility and stability.

Assumptions

This solution makes the following assumptions:

- An InfoScale cluster with two or more systems is being upgraded.
- All the systems have network and repository access to the InfoScale RPMs required for the target release.
- The architecture supports service-group failover across systems (HA is configured).
- InfiniBand or other specialized hardware may be present but is not mandatory; validate vendor drivers and firmware prior to upgrading.
- Co-existence or co-sync upgrades are supported wherever Red Hat supports third-party packages through the Leapp framework.

Rollback and recovery considerations

- Leapp provides migration and recovery hooks; however, rolling back a major OS upgrade is not trivial.
- Maintain backups and an emergency remediation plan (reimage + restore) if a catastrophic failure occurs.
- Keep systems that are not yet upgraded available as fallback during the rolling upgrade process.

Best practices and recommendations

- Perform sandbox validation for a full upgrade procedure in a staging environment that mirrors your production environment, with applications, if any.
- Schedule upgrades in a small maintenance window and upgrade one system or a subset of systems at a time.
- Validate hardware support, third-party drivers, and custom kernel modules for compatibility with the target RHEL version.

Summary

Combining InfoScale's rolling upgrade capabilities with Red Hat's Leapp in-place upgrade utility creates a validated, minimum-to-zero downtime path for major RHEL upgrades. This approach simplifies operations, reduces downtime, and enables organizations to keep InfoScale clusters current without entire re-provisioning.

References

- Support for InfoScale installation and upgrade on various platforms

  https://sort.veritas.com/arctera/platformlookup

- InfoScale documentation

  https://sort.veritas.com/arctera/documents

- Red Hat articles
  - https://www.redhat.com/en/resources/leapp-explained-detail
  - https://access.redhat.com/articles/red-hat-enterprise-linux-release-dates
  - https://docs.redhat.com/en/documentation/red_hat_enterprise_linux/10/html/upgrading_from_rhel_9_to_rhel_10/index
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