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White Paper

EMC CentraStar 4.x Upgrade Completion

A Detailed Review

Abstract

Upgrade completion is an action that needs to be taken at the end of every upgrade to EMC® CentraStar® 4.x. This white paper sets out the context and issues with running upgrade completion.

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Executive summary

Upgrade completion is a post-upgrade step in EMC® CentraStar® 4.x that enables new functionality. This step may have a temporary performance impact on some clusters. On most clusters the step will be performed immediately after upgrade, in which case no further actions are required. In some cases, scheduling the upgrade completion at an appropriate time may be required.

Introduction

This white paper presents an introduction to the upgrade completion feature in EMC CentraStar 4.x. When upgrading from a previous CentraStar version, an upgrade completion is required in order to enable new functionalities in CentraStar 4.x.

Audience

This white paper is intended for customers, including storage architects, administrators and others involved in evaluating, acquiring, managing, operating, or designing an EMC networked storage environment.

What is upgrade completion?

The implementation of new hyper technology requires an additional upgrade completion step after the software upgrade to CentraStar 4.x. The upgrade completion will enable the following new/improved features:

- New Location Cache with faster self-healing
- Optimized interaction between initialization of BLOB Indexes and concurrent regeneration, resulting in much faster concurrent self-healing
- Garbage Collection II: You can now schedule this feature
- Improved storage efficiency

What is the impact of upgrade completion?

While it runs, upgrade completion has an impact on read and write performance when compared against absolute maximum attainable performance. It has a larger impact on peak read performance than it does on peak write performance. The majority of production environments will not be noticeably affected because the production load is below that for which a difference could be seen.

In case of a cluster with a high object count, which needs to support a significant sustained read rate of small files, impact on production reads will be proportional to the original read rate on the cluster.

When upgrade completion starts, the maximum reads for 1 KB – 5 KB files will be about 100 files/per second (for Gen3, 40 files/per second) and will then gradually increase to its maximum performance by the time upgrade completion finishes. During the upgrade completion the maximum ingest for 1 KB – 5 KB files will be about 275 files/per second (for Gen3, 185 files/per second).

Duration of the impact will be a maximum of 48 hours on a Gen2/3 system (approximately 16 hours per 10M objects) and 24 hours on a Gen4/Gen4LP (approximately 5 hours per 10M objects). These times take into account the possibility of ongoing self-healing in the cluster, and substantial external load. On a healthy cluster and/or one without load, the duration will be five to 10 times less.

Refer to EMC Centera CentraStar version 4.x for supported hardware versions.

How does upgrade completion concern me?

For the following configurations EMC Global Services will usually perform upgrade completion immediately:

- Clusters with only four nodes
- Clusters with less than 5M objects per node
- Clusters with a sustained read rate lower than 30 clips/s
- Clusters with Gen4/Gen4LP and a sustained read rate lower than 50 clips/s

In these cases, you will not need to take any action.

If you do need to take action, you will receive alert 1.1.12.1.02.01 telling you to schedule upgrade completion.

If you receive alert 1.1.12.1.01.01 (unable to make capacity reservations), EMC Global Services will need to analyze the cluster and make the necessary capacity reservations.

When do I schedule the upgrade completion?

In case the upgrade completion can be assumed to take a long time and potentially has a significant impact, it should be scheduled at a time when this best suits your business. For example:

- If all or most cluster usage occurs during the regular work week, it is advised to schedule upgrade completion to start at the beginning of the weekend to allow the process to complete by the end of the weekend.
- In case the cluster is in use 24/7, look for the time with the least (read) activity and schedule the completion to start at that time; bear in mind that the worst impact is at the beginning of the process and will gradually diminish from there.

If you do not schedule upgrade completion explicitly, it will happen exactly one week after you receive the first alert.

You can confirm the upgrade completion date/time via CLI as shown in Figure 1:

```
Config# set cluster upgradecomplete
WARNING: Enabling the new functionality may have a temporary affect on the
operation of your cluster. Please refer to the CentraStar Documentation for
more information on how to use this CLI command.

New CentraStar functionality will be enabled at Tue Mar 18 18:36:40 EDT 2008.

Schedule the new CentraStar functionality to be enabled at (MM/dd/yyyy) [03/18/2008]:
At what time? [18:36]:
Issue the command?
 (yes, no) [no]:
```

Figure 1. CLI command showing when the upgrade completion is scheduled

How do I schedule upgrade completion?

Use the CLI command "set cluster upgradecomplete" in the CLI window of Centera Viewer; this command will ask you to enter the time you want upgrade completion to begin. Enter the local date and time, that is, if you enter 4 P.M., upgrade completion will start when the clock on the local client shows 4 P.M.

```
Config# set cluster upgradecomplete
WARNING: Enabling the new functionality may have a temporary affect on the
operation of your cluster. Please refer to the CentraStar Documentation for
more information on how to use this CLI command.

New CentraStar functionality will be enabled at Tue Mar 18 18:36:01 EDT 2008.

Schedule the new CentraStar functionality to be enabled at (MM/dd/yyyy) [03/18/2008]:
03/22/2008
At what time? [18:36]: 00:00
Issue the command?
 (yes, no) [no]: yes
```

Figure 2. CLI command changing the default upgrade completion schedule

Constraints and special cases are as follows:

- You cannot schedule in the past. CLI will show an error.
- You can schedule upgrade completion at most one week in the future (from the time you schedule it). If necessary you can repeatedly postpone the completion further, by rescheduling it every few days. Postponing upgrade completion is not recommended, as it is quite important that this step happens as soon as possible.
- When you schedule upgrade completion, you will receive no further alerts. If upgrade completion is not scheduled within four days after an upgrade, you will get alert 1.1.12.1.02.02 (stating that upgrade completion will happen within three days).
- Once upgrade completion has started it cannot be paused or stopped.

Conclusion

Upgrade completion in CentraStar 4.x enables new functionality. Once the upgrade completion step is completed you can take advantage of new functionalities such as Garbage Collection II, which can now be scheduled, and New Location Cache with faster self-healing and improved storage efficiency.