Technical Primer

Dell Unity OE 5.2: Technical Primer

Technical overview

Abstract

This primer serves as an overview of features for the Dell Unity OE 5.2 release.

April 2022

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Revisions

Date	Description
April 2022	Initial release

Acknowledgments

Author: Kenneth Avilés Padilla

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1 Release Overview

Dell Unity™ is targeted for midsized deployments, remote or branch offices, and cost sensitive mixed workloads. Unity systems are designed for all-Flash, deliver the best value in the market, and are available in purpose-built (All Flash or Hybrid Flash), converged deployment options (through VxBlock), and a software-defined virtual edition.

1.1 Dell Unity OE 5.2 Release

The following features which are new in Dell Unity OE 5.2 release:

- Platform:
  - Data-In Place (DIP) Conversions
  - I/O Module Conversions
- Dynamic pools
  - Dynamic Pools for Hybrid systems
- Data Reduction
  - Data Reduction for Hybrid pools
- Replication
  - New replication topologies
  - Snapshot replication
  - System level replication actions
- NAS Capabilities
  - LDAP Aliases

2 Feature Details

This section gives more information about the new features in Unity OE 5.1 release. For detailed information, please refer to the product documentation for Dell Unity or related white paper available on Dell Technologies Info Hub.

2.1 Platform

2.1.1 Data-In-Place (DIP) Conversions

Dell Unity OE Version 5.2 introduced the ability to perform both offline and online data-in-place (DIP) conversions which allows users to convert physical Unity XT 480/F and 680/F systems to any higher model of the same type without losing any data or system configurations. Unity XT 380/F systems are exempt from DIP conversions because the Unity XT 380/F systems use a different physical chassis than the 480/F, 680/F, and 880/F models. The DIP process involves swapping the storage processors in a given system with new storage processors of a higher model while reusing the same I/O modules, SFPs, and power supplies from the replaced storage processors. For Unity XT system that use low-line power (100v-120v) and are being upgraded to an 880/F model, a step-up transformer is required since Unity XT 880/F systems only support high-line power (200v-240v). If installing a step-up transformer within a rack, the step-up transformer will require additional rack space.

This conversion process supports both offline and online procedures and is fully customer installable. The estimated time for a full data-in-place conversion is 150 minutes. For an online conversion, each storage processor is upgraded one at a time and data remains accessible during the procedure. For an offline conversion, data will be inaccessible during the procedure as the system is completely powered down and both storage processors are upgraded at the same time. Typically the offline conversion will complete faster as both storage processers upgrade at the same time. Customers can choose online or offline conversion based on their preference. The target model must be the same type as the source model. For example, you can convert from a Unity XT 480 to Unity XT 880, but not from a Unity XT 480 to a Unity XT 880F system.

For more information about the Dell Unity and Unity XT model data-in-place conversions, please see the technical guide titled *Dell Unity Family Data-in-Place Conversion Guide* on Dell Online Support.

2.1.2 I/O Module Conversions

Dell Unity OE version 5.2 introduced the ability to perform an online conversion of the 16Gb Fibre Channel I/O module to the 32Gb Fibre Channel I/O module. The 32Gb I/O module was introduced in Dell Unity OE version 5.1. The I/O module conversion feature allows customers to upgrade their existing 16Gb Fibre Channel I/O module and benefit from a 32Gb Fibre Channel environment while data remains online and accessible. The process involves replacing the existing I/O module one storage processor at a time with the new I/O module. The procedure is Command-Line Interface (CLI) driven using the **svc_change_hw_config** service script and it is recommended to use Dell Deployment Services to perform the upgrade on behalf of the customer. The upgrade procedure is supported for Unity XT systems, including the 380/F, 480/F, 680/F, and 880/F models.

For more information about the Dell Unity XT model I/O conversions, please see the technical guide titled *Dell Unity™ 380/F, 480/F, 680/F, and 880/F Field Replacement Guide* on Dell Online Support.

2.2 Dynamic Pools

2.2.1 Dynamic Pools for Hybrid systems

Within a hybrid system, adding flash, SAS, and NL-SAS drives into a multi-tiered pool is common. As each drive partnership group can only contain a single drive type, flash, SAS, and NL-SAS drives will be placed into their own drive partnership groups. Furthermore, different speed spinning drives can be added to the same dynamic pool but will be placed into their own drive partnership groups for performance reasons. For example, 10K RPM and 15K RPM drives residing in the same pool will be placed into different drive partnership groups regardless of the drive size as shown in the figure below. In this example, the 6TB and 12TB NL-SAS drives are placed in the same drive partnership group as they have the same speed rating.

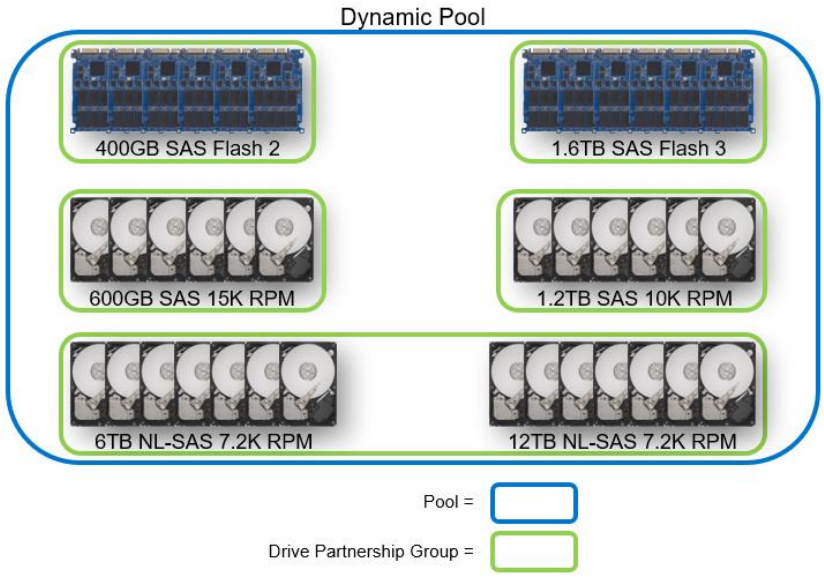

Figure 1 Drive partnership group example with multiple drive types

2.2.2 Hybrid flash systems

In Dell Unity OE 5.2 and later, changes have been made to the **System Settings** > **Storage Configuration** > **Drives** page for hybrid systems. Along with the traditional and dynamic pool information that is displayed for all-flash systems, hybrid systems also display the **FAST Cache** column. The **FAST Cache** column displays how many drives are currently configured in FAST Cache. An example of the **Drives** page can be seen in Figure 2.

Also shown in Figure 2, the total number of **Available** 1.2 TB SAS 10K drives is 12, while the **Total** drive count within the system is 16. In this system 1.2 TB SAS drives are used as the system drives. As SAS and NL-SAS system drives are not allowed in a dynamic pool, four drives are not available. These drives can be placed into a traditional pool if required.

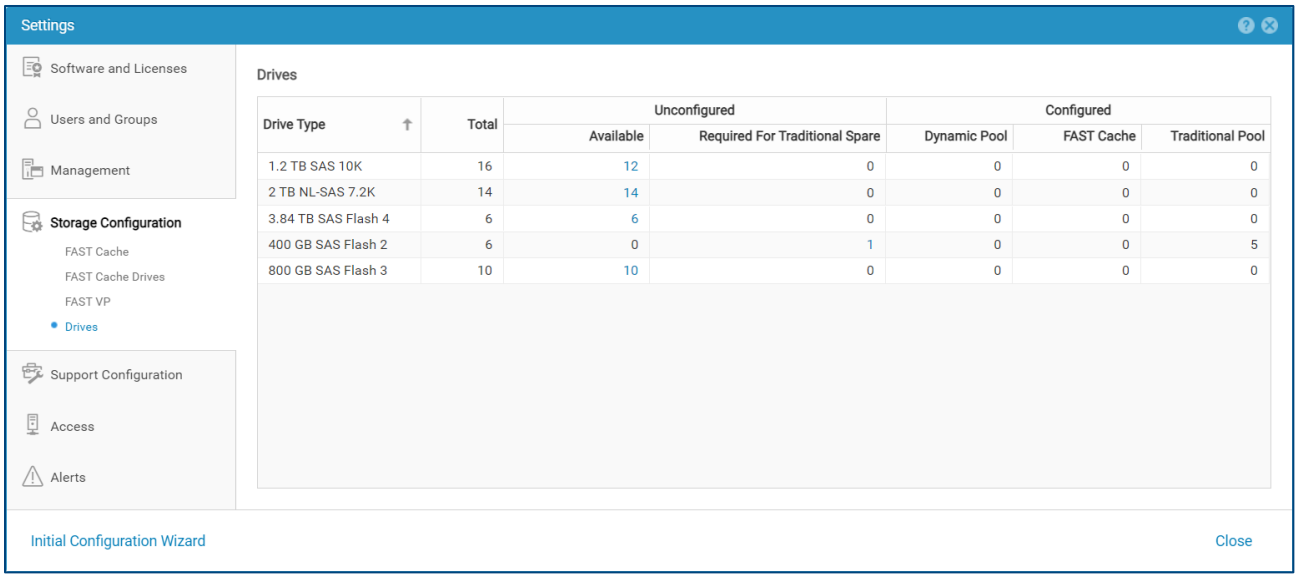

Figure 2 System Settings > Storage Configuration > Drives (Hybrid-flash system)

For more details see the *Dell Unity: Dynamic Pools* white paper on the Dell Technologies Info Hub.

2.3 Data Reduction updates

2.3.1 Supported Configurations

In Dell Unity OE 5.2 and later, hybrid (mixed drive type) pools created on Unity XT model systems also support Data Reduction with and without Advanced Deduplication enabled. The pool type can either be Traditional or Dynamic. To support Data Reduction, the pool must contain a flash tier and the total usable capacity of the flash tier must meet or exceed 10% of the total pool capacity. Once a system is upgraded to OE version 5.2 or later, Data Reduction can be enabled on an existing resource if the flash capacity requirement is met.

For more details see the *Dell Unity: Data Reduction* white paper on the Dell Technologies Info Hub.

2.4 Replication Technologies

2.4.1 New replication topologies

In Dell Unity OE version 5.2 and later, new file replication topologies are supported. The new supported configurations provide even more flexibility than in previous releases and allows for additional replication destinations. The following topologies can be configured on a given file storage resource when all systems within the topology are running Dell Unity OE version 5.2 or later:

- One or more asynchronous replication sessions to another system or locally within the same system
  - A file resource supports up to a maximum of 4 replication sessions
- One synchronous replication session to another system
  - Local replication within the same system is not supported for synchronous replication
- One synchronous replication session to a 2nd system and one or more asynchronous replication sessions to additional destinations, up to a maximum of 4 total replication sessions
  - Only 1 synchronous replication session is supported per resource

- The asynchronous replication sessions can include a combination of local and remote replication
- A single system cannot be a destination of synchronous and asynchronous replication from the same resource

One of the new replication configurations can be referenced as bridge mode, as shown in Figure 3. By using a bridge mode configuration, the main site is replicated synchronously to a near site, to then hopping the replication over an asynchronous replication. While replicating the main site to a second site over an asynchronous replication session. By doing this, we can have additional copies of the same data while expanding the fault domains.

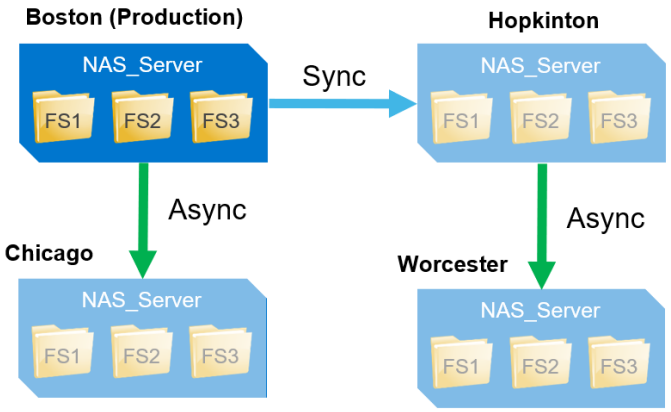

Figure 3 Bridge mode

Additionally, with Dell Unity OE 5.2 we can have a star mode configuration, as shown in Figure 4. With the main site being replicated synchronously to one site, and asynchronously replicated up to three additional sites.

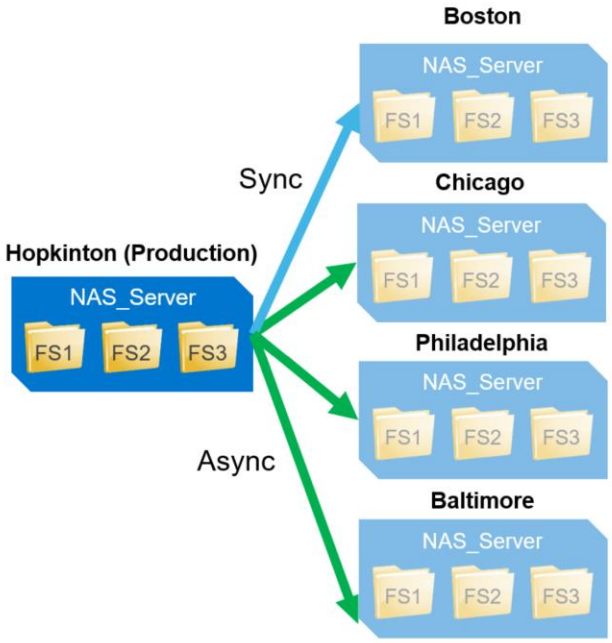

Figure 4 Star mode

As a recommendation to ensure no issues are seen, all the systems should be running the same OE version. But as bare minimum requirement, to use the star and bridge modes we need to ensure that the systems

participating in the synchronous replication session need to be running OE version 5.2 or greater. The systems participating in the asynchronous replication sessions could potentially be running older OE versions.

For more details, see the *Dell Unity: Replication Technologies* white paper on the Dell Technologies Info Hub.

2.4.2 Snapshot replication

In Dell Unity OE version 5.2 snapshot replication has been updated to include the new supported topologies. Read-only snapshots can be replicated to each destination resource. Snapshot replication is also supported with advanced file replication topologies which supports a single resource being replicated in a fan-out configuration or in a cascade configuration. For more information about snapshot replication and advanced file replication topologies, review the *Dell Unity: Replication Topologies* white paper on the Dell Technologies Info Hub.

2.4.3 System level replication actions

In Dell Unity OE version 5.2 and later, the Failover option is available at the replication connection level. This option issues a failover operation on all NAS servers and their file systems replication sessions which replicate from the selected remote system to the local system. The Failover option can be found under More Actions on the replication Connection page in Unisphere.

For more information on the cabinet level command and the replication connection Failover option, see the *Dell Unity Family Configuring Replication* Guide on Dell Online Support and *Dell Unity: Replication Technologies* white paper on the Dell Technologies Info Hub.

2.5 NAS Capabilities

2.5.1 LDAP Aliases

When configuring an LDAP server manually an IP address must be entered. In OE version 5.2 and later, a Fully Qualified Domain Name (FQDN) can also be entered in place of an IP address. When an FQDN is specified, an accessible DNS server must be configured on the NAS server. After configuring an LDAP server using an FQDN, a DNS lookup is used to determine the LDAP server's IP address. DNS is also periodically polled to ensure that if the IP ever changes, it will automatically be updated on the NAS server. Entering the LDAP server's FQDN rather than the IP address is suggested to reduce the operational overhead required when changing an LDAP server's IP address.

Note: When utilizing replication, it is recommended that the source and all destination systems are running OE version 5.2 or later when replicating a NAS server that utilizes a Fully Qualified Domain Name for an LDAP server. If a replication Failover occurs and the NAS server is replicating from a pre-OE version 5.2 system to a system running OE version 5.2 or later, any changes to the LDAP server configuration will not be replicated.

See the *Dell Unity: NAS Capabilities* on the Dell Technologies Info Hub for more details.

A Technical support and resources

Dell.com/support is focused on meeting customer needs with proven services and support.

The Dell Technologies Info Hub provide expertise that helps to ensure customer success on Dell storage platforms.

A.1 Related resources

- Dell Unity XT: Introduction to the Platform White Paper
- Dell Unity: Dynamic Pools White Paper
- Dell Unity: Data Reduction White Paper
- Dell Unity: Replication Technologies White Paper
- Dell Unity: NAS Capabilities White Paper