

TECHNICAL OVERVIEW OF NEW AND IMPROVED FEATURES OF DELL EMC ISILON ONEFS 8.0

Abstract

This introductory white paper provides a technical overview of the new and improved enterprise grade features introduced in Dell EMC Isilon OneFS 8.0. Isilon OneFS 8.0 includes improvements in security, networking, manageability, and cloud integration.

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Executive summary

Dell EMC Isilon OneFS 8.0 is a major release that expands the data lake strategy with new products and enhanced features. It includes support for new IsilonSD Edge software defined storage and new CloudPools cloud-integrated tiering software. In addition, OneFS 8.0 includes major enhancements like non-disruptive upgrades, support for upgrade rollback, and other core improvements to the OneFS operating system.

This release further expands the scale-out data lake which allows customers to store, manage, and secure their unstructured data for both traditional, second platform workloads as well as emerging, third platform ones. With this release of OneFS, Isilon expands the data lake to the enterprise edge with IsilonSD Edge and to the Cloud with CloudPools software.

Audience

This white paper is intended for Dell EMC Customers, Partners, and Employees. It is aimed at Storage and Windows Administrators that want a high-level overview of the technical features that are new or updated in OneFS 8.0.

Introduction

Dell EMC Isilon is a scale-out enterprise data lake that stores, manages, protects, secures, and enables reporting and analytics on unstructured data for both traditional and for emerging workloads. The Isilon core building blocks which drive today and tomorrow's workloads include the OneFS operating system, the scale-out NAS architecture, the scale-out data lake, and enterprise-grade software features. In addition, Isilon leverages capabilities like data protection, data management, performance management, and security features to provide best in class storage services and data services surrounding the scale-out data lake. Isilon OneFS 8.0 drives innovation to a new level with a focus around enterprise features of performance, security, reliability, and manageability. By blending industry-leading storage efficiency, security, scalability, and simplicity, OneFS 8.0 now provides software defined storage capabilities along with cloud integration to extend the scale-out data lake for today and the future.

New software

CloudPools software

OneFS 8.0 introduces Isilon CloudPools, a cloud storage tiering capability which is built on the Isilon SmartPools® data management framework. CloudPools is a licensed module that enables data to be stored in a cold or frozen data tier or archive, thereby taking advantage of lower-cost, on or off-premise storage including public and private clouds.

In OneFS 8.0, the supported cloud storage options include Amazon S3, Microsoft Azure, Dell EMC Elastic Cloud Storage (ECS), and Isilon to Isilon via the OneFS RAN (RESTful access to namespace API). CloudPools automatically optimizes and protects the transfer of data to cloud storage with the use of both encryption and compression.

Although file data is moved to remote storage, the files remain visible in the OneFS file system. CloudPools accomplishes this by retaining a local SmartLink stub file, which is a pointer to the location of data in the cloud. Through a process referred to as inline access, users can read or edit a SmartLink file, like any other file, via seamless protocol connections (SMB, NFS, HDFS, etc) to the off-premise data. Associated data is automatically accessed from its cloud location, and any local changes to the data are written back to the cloud repository. CloudPools is transparent to users and applications and enables Isilon to scale to large amounts of storage.

In addition to inline access, CloudPools also provides the ability to fully recall files from the cloud, in which case the SmartLink files are replaced by the actual files.

IsilonSD Edge software

OneFS 8.0 introduces Isilon SD Edge, a software only version of OneFS 8.0. IsilonSD Edge runs on top of VMware's ESXi hypervisors on top of your commodity hardware and is installed via a vSphere 5.5 management plug-in. IsilonSD Edge can scale from 3 nodes to 6 nodes and can scale up to 36 TB of storage capacity.

Improved software features

OneFS 8.0 includes a number of improved features like non-disruptive upgrades, non-disruptive operations, upgrade rollbacks, updated event logging mechanism, and other enterprise grade features that are described below.

Non-disruptive upgrades and rollback

From OneFS 8.0 onwards, every new release will be rolling-upgradable from the prior version. An upgrade to OneFS 8.0 will require the reboot of the entire cluster.

Non-disruptive upgrades (NDUs) allow a cluster administrator to upgrade the storage OS while their end users continue to access data without error or interruption. Updating the operating system on an Isilon cluster is a simple matter of a rolling upgrade. During this process, one node at a time is upgraded to the new code, and the active NFS and SMB3 clients attached to it are automatically migrated to other nodes in the cluster. Partial upgrade is also permitted, whereby a subset of cluster nodes can be upgraded. The subset of nodes may also be grown during the upgrade.

Additionally, once you are already on the OneFS 8.0 code base, future upgrades include the ability to rollback an upgrade. This feature provides the ability to return a cluster with an uncommitted upgrade to its previous version of OneFS.

Cluster Event Log v2

The Cluster Event Logging engine (CELOG) is completely redesigned and re-written in OneFS 8.0, providing greater longevity, reliability, stability, and automated maintenance and monitoring. With CELOG v2, the cluster administrator is now easily able to quiet alerts during maintenance, quiesce transient alerts, and control the delivery of customized email alert templates by type and severity. CELOG V2 provides increased management and simplifies day to day administration.

SMB3 continuous availability

Windows 8 and Windows 2012 R2 (or higher) clients can now create persistent connections to SMB shares, enabling them to survive a node outage such as a network-related disconnection or a server failure. When the offline node is brought back online, SmartConnect automatically rebalances the clients across the entire cluster to ensure maximum storage and performance utilization. For periodic system maintenance and software updates, this functionality allows for per-node rolling upgrades affording full-availability throughout the duration of the maintenance window.

NFSv4 failover

With the introduction of NFSv4 failover, when a client's virtual IP address moves, or a OneFS group change event occurs, the client application will continue without disruption. As such, no unexpected I/O error will propagate back up to the client application.

In OneFS 8.0, both NFSv3 and NFSv4 clients can now use dynamic IPs which will give them more service availability and non-disruption during IP migration events or NFS service interruption.

SyncIQ

A new OneFS ChangelistCreate job creates a list of changes between two consecutive SyncIQ snapshots. This removed the need for a full data treewalk with each SyncIQ job run, allowing replication to occur significantly faster.

HDFS protocol auditing

In addition to NFS and SMB auditing, OneFS 8.0 now provides the ability to audit HDFS protocol activity on an Isilon cluster. This allows organizations to satisfy various data governance and regulatory compliance mandates that they may be bound to.

All audit data is stored and protected within the cluster file system, and is organized by audit topic.

Note: The Dell EMC Common Event Enabler (CEE) does not currently support forwarding HDFS protocol events to a third-party application.

File filtering

OneFS 8.0 now introduces new file filtering capabilities. NFS and SMB file filtering allows Isilon administrators to control what type of files can be written via these two protocols to a cluster, based on include or exclude filter lists.

OneFS file filtering can be used across NFS and SMB clients to allow or disallow writes to an export, share, or access zone. This feature allows certain types of file extensions to be blocked, for files which might cause security problems, productivity disruptions, throughput issues or storage clutter. Configuration can be either via a blacklist, which blocks explicit file extensions, or a white list, which explicitly allows writes of only certain file types. For example, to prevent users from saving MP3 files to their OneFS based home directory, a blacklist exclude rule for *.mp3 files can be configured.

SmartDedupe

In OneFS 8.0, SmartDedupe now identifies and deduplicates matching blocks within the same file. Additionally, SmartDedupe also provides more granular job execution and impact manage control, and has been improved to run more efficiently.

Multi-stream NDMP backup

OneFS 8.0 now delivers multi-stream NDMP backup for increased performance. In this case, a backup job can be configured against a top level directory, and a separate NDMP stream will be used to back up each subdirectory in parallel. This drastically increases the throughput of backups and simplicity of configuration, thereby allowing fast job completion and the ability to define tighter recovery objectives. Multi-stream NDMP is supported by both Dell EMC Networker and Commvault Simpana DMAs.

Multi-tenancy – DNS support

OneFS 8.0 now supports the configuration of multiple DNS servers for each access zone so that different tenants operating on the same Isilon cluster can use different DNS servers to perform hostname lookups. DNS servers are configured by a new network object called a groupnet, which lives above a subnet. Each groupnet is associated with a single access zone.

Multi-tenancy – data sharing across access zones

OneFS 8.0 supports the ability to configure Access Zones with overlapping data sets. Previously, the base directory for each access zone had to be unique with no overlap. In OneFS 8.0, you can confirm or force overlapping directories with common authentication providers, allowing users to share data across different access zones.

Summary

This release of OneFS 8.0 enhances the data lake story with support for IsilonSD Edge software defined storage and CloudPools cloud-integrated software. In addition, it provides simplified management, improved security, performance, networking and a host of enterprise grade features.



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