Learn about the new capabilities available in ONTAP 9.13.1. The release candidate version was made available on June 26, 2023. The general availability was made available on July 26, 2023.

The following features were announced with ONTAP 9.13.1:

Data protection

| **Update** | **Description** |
| --- | --- |
| [Multi-admin verification](https://docs.netapp.com/us-en/ontap/snaplock/index.html#multi-admin-verification-mav-support) | Cluster administrator can explicitly enable multi-admin verification on a cluster to require quorum approval before some SnapLock operations are executed. |
| [Enhanced support for managing consistency groups including volume move and geometry](https://docs.netapp.com/us-en/ontap/consistency-groups/index.html) | You can move volumes between consistency groups, modify the geometry of hierarchical consistency groups, and gain capacity insights into consistency groups. System Manager supports creating a consistency group with new NAS volumes or NVME namespaces. |
| [NDMP restore with SnapMirror Synchronous](https://docs.netapp.com/us-en/ontap/data-protection/snapmirror-synchronous-disaster-recovery-basics-concept.html) | NDMP restore is supported with SnapMirror synchronous. |
| SnapMirror active sync enhancements | * [Non-disruptively add volumes to a consistency group with an active SnapMirror active sync relationship.](https://docs.netapp.com/us-en/ontap/snapmirror-active-sync/add-remove-consistency-group-task.html) * [Utilize NDMP restore with SnapMirror active sync](https://docs.netapp.com/us-en/ontap/snapmirror-active-sync/interoperability-task.html). |
| [Asynchronous SnapMirror support with a single consistency groups](link:../consistency-groups/protect-task.html#configure-asynchronous-snapmirror-protection) | Consistency groups support Asynchronous SnapMirror configurations, allowing vaulting of SnapMirror backups for single consistency groups. |

File access protocols

| **Update** | **Description** |
| --- | --- |
| [NFSv4.x storepool support](https://docs.netapp.com/us-en/ontap/nfs-admin/manage-nfsv4-storepool-controls-task.html) | A few clients consume too many NFSv4.x storepool resources leading to other NFSv4.x clients getting blocked due to unavailability of NFSv4.x storepool resources. You can have the option to enable denying and blocking of clients who consume a lot of NFSv4.x storepool resource in their environments. |

MetroCluster

| **Update** | **Description** |
| --- | --- |
| [Transition from MetroCluster FC to MetroCluster IP using a shared switch for MetroCluster IP and Ethernet attached storage](https://docs.netapp.com/us-en/ontap-metrocluster/transition/concept_nondisruptively_transitioning_from_a_four_node_mcc_fc_to_a_mcc_ip_configuration.html) | You can transition nondisruptively from a MetroCluster FC to a MetroCluster IP configuration (ONTAP 9.8 and later) using a shared switch. |
| [Nondisruptive transitions from an eight-node MetroCluster FC configuration to a MetroCluster IP configuration](https://docs.netapp.com/us-en/ontap-metrocluster/transition/concept_nondisruptively_transitioning_from_a_four_node_mcc_fc_to_a_mcc_ip_configuration.html) | You can nondisruptively transition workloads and data from an existing eight-node MetroCluster FC configuration to a new MetroCluster IP configuration. |
| [Four-node MetroCluster IP configuration upgrades using switchover and switchback](https://docs.netapp.com/us-en/ontap-metrocluster/upgrade/task_upgrade_controllers_system_control_commands_in_a_four_node_mcc_ip.html) | Upgrade controllers in a four-node MetroCluster IP configuration using switchover and switchback with system controller replace commands. |
| [Mediator-assisted automatic unplanned switchover (MAUSO) is triggered for an environmental shutdown](https://docs.netapp.com/us-en/ontap-metrocluster/install-ip/concept_considerations_mediator.html#interoperability-of-ontap-mediator-with-other-applications-and-appliances) | If one site shuts down gracefully due to an environmental shutdown, MAUSO is triggered. |
| [Eight-node MetroCluster IP configurations support](https://docs.netapp.com/us-en/ontap-metrocluster/upgrade/task_refresh_4n_mcc_ip.html) | You can upgrade the controllers and storage in an eight-node MetroCluster IP configuration by expanding the configuration to become a temporary twelve-node configuration and then removing the old DR groups. |
| [MetroCluster IP configuration conversion to a shared storage MetroCluster switch configuration](https://docs.netapp.com/us-en/ontap-metrocluster/maintain/task_replace_an_ip_switch.html) | You can convert a MetroCluster IP configuration to a shared storage MetroCluster switch configuration. |

To learn about platform and switch configuration enhancements for MetroCluster configurations, see the [*ONTAP 9 Release Notes*](https://library.netapp.com/ecm/ecm_download_file/ECMLP2492508).

Networking

| **Update** | **Description** |
| --- | --- |
| [Expanded hardware support for RDMA cluster interconnect](https://docs.netapp.com/us-en/ontap/concepts/rdma-concept.html) | ONTAP supports AFF A900, ASA A900, and FAS9500 systems for cluster interconnect RDMA with an X91153A cluster NIC, helping to reduce latency, decrease failover times, and accelerate communication between nodes. |
| Increased data LIF limits | ONTAP provides greater flexibility by increasing data LIF scaling limits for both HA pairs and clusters. |
| IPv6 support during cluster setup on the A800 and FAS8700 platforms | On the A800 and FAS8700 platforms, you can use the ONTAP CLI to create and configure new clusters in IPv6-only networking environments. |

S3 object storage

| **Update** | **Description** |
| --- | --- |
| [S3 bucket lifecycle management](https://docs.netapp.com/us-en/ontap/s3-config/create-bucket-lifecycle-rule-task.html) | S3 object expiration actions define when objects in a bucket expire. This capability enables you to manage object versions so you can meet retention requirements and manage overall S3 object storage effectively. |

SAN

| **Update** | **Description** |
| --- | --- |
| [Support for NVMe/FC on AIX hosts](https://docs.netapp.com/us-en/ontap/san-admin/create-nvme-namespace-subsystem-task.html) | ONTAP supports the NVMe/FC protocol on AIX hosts. See the [NetApp Interoperability Tool](https://mysupport.netapp.com/matrix/) for supported configurations. |

Security

| **Feature** | **Description** |
| --- | --- |
| [Autonomous Ransomware Protection](https://docs.netapp.com/us-en/ontap/anti-ransomware/index.html) | * [Multi-admin verify functionality with Autonomous Ransomware Protection](https://docs.netapp.com/us-en/ontap/anti-ransomware/use-cases-restrictions-concept.html#multi-admin-verification-with-volumes-protected-with-arp) * [Automatic transition from learning to active mode](https://docs.netapp.com/us-en/ontap/anti-ransomware/enable-default-task.html) * [FlexGroup support](https://docs.netapp.com/us-en/ontap/anti-ransomware/use-cases-restrictions-concept.html#supported-configurations), including analytics and reporting for FlexGroup volumes and operations inlcuding expanding a FlexGroup volume, FlexVol to FlexGroup conversions, FlexGroup rebalancing. |
| [SSH public key authentication with Active Directory](https://docs.netapp.com/us-en/ontap/authentication/grant-access-active-directory-users-groups-task.html) | You can use an SSH public key as your primary authentication method with an Active Directory (AD) user, or you can use an SSH public key as your secondary authentication method after an AD user. |
| X.509 certificates with SSH public keys | ONTAP enables you to associate an X.509 certificate with the SSH public key for an account, giving you the added security of certificate expiration and revocation checks upon SSH login. |
| [FPolicy file access failure notification](https://docs.netapp.com/us-en/ontap/nas-audit/create-fpolicy-event-task.html) | FPolicy supports notifications for access denied events. Notifications are generated for file operation failed due to lack of permission, which includes: failure due to NTFS permissions, failure due to Unix mode bits, and failure due to NFSv4 ACLs. |
| [Multifactor authentication with TOTP (time-based one-time passwords)](https://docs.netapp.com/us-en/ontap/authentication/setup-ssh-multifactor-authentication-task.html#enable-mfa-with-totp) | Set up local user accounts with multifactor authentication using a time-based one-time password (TOTP). The TOTP is always used as the second authentication method. You can use an SSH public key or user password as your primary authentication method. |

Storage efficiency

| **Update** | **Description** |
| --- | --- |
| Change in reporting of primary data reduction ratio in System Manager | The primary data reduction ratio displayed in System Manager no longer includes Snapshot copy space savings in the calculation. It only depicts the ratio between used logical and used physical space. In prior releases of ONTAP, the primary data reduction ratio included significant space reduction benefits of Snapshot copies. As a result, when you upgrade to ONTAP 9.13.1, you will observe a significantly lower primary ratio being reported. You can still see data reduction ratios with Snapshot copies in the **Capacity** details view. |
| [Temperature-sensitive storage efficiency](https://docs.netapp.com/us-en/ontap/volumes/enable-temperature-sensitive-efficiency-concept.html) | Temperature-sensitive storage efficiency adds sequential packing of contiguous physical blocks to improve storage efficiency. Volumes that have temperature-sensitive storage efficiency enabled will automatically have sequential packing enabled when systems are upgraded to ONTAP 9.13.1. |
| Logical space enforcement | Logical space enforcement is supported on SnapMirror destinations. |
| [Storage VM capacity limits support](https://docs.netapp.com/us-en/ontap/volumes/manage-svm-capacity.html) | You can set capacity limits on a storage VM (SVM) and enable alerts when the SVM is approaching a percentage threshold. |

Storage resource management enhancements

| **Update** | **Description** |
| --- | --- |
| Increase in maximum number of inodes | ONTAP will continue to automatically add inodes (at the rate of 1 inode per 32 KB of volume space) even if the volume grows larger than 680 GB. ONTAP will continue adding inodes until it reaches the maximum of 2,147,483,632. |
| [Support for specifying a SnapLock type during FlexClone creation](https://docs.netapp.com/us-en/ontap/volumes/create-flexclone-task.html#create-a-flexclone-volume-of-a-flexvol-or-flexgroup) | You can specify one of three SnapLock types, either compliance, enterprise, or non-SnapLock, when creating a FlexClone of a read/write volume. |
| [Enable File System Analytics by default](https://docs.netapp.com/us-en/ontap/task_nas_file_system_analytics_enable.html#modify) | Set File System Analytics to be enabled by default on new volumes. |
| [SVM disaster recovery fanout relationships with FlexGroup volumes](https://docs.netapp.com/us-en/ontap/flexgroup/create-svm-disaster-recovery-relationship-task.html) | The fanout restriction of SVM DR with FlexGroup volumes is removed. SVM DR with FlexGroup includes support for SnapMirror fanout relationships to eight sites. |
| [Single FlexGroup rebalancing operation](https://docs.netapp.com/us-en/ontap/flexgroup/manage-flexgroup-rebalance-task.html) | You can schedule a single FlexGroup rebalancing operation to begin at a date and time in the future that you specify. |
| [FabricPool read performance](https://docs.netapp.com/us-en/ontap/fabricpool/benefits-storage-tiers-concept.html) | FabricPool provides improved sequential read performance for single and multi-stream workloads for cloud-resident data and tiering throughput. This improvement can send a higher rate of GETs and PUTs to the back end object store. If you have on-premises object stores, you should consider performance headroom on the object store service and determine whether you might need to throttle FabricPool PUTs. |
| [Adaptive QoS policy templates](https://docs.netapp.com/us-en/ontap/performance-admin/guarantee-throughput-qos-task.html) | Adaptive QoS policy templates enable you to set throughput floors at the SVM level. |

SVM management enhancements

| **Update** | **Description** |
| --- | --- |
| [SVM data mobility](https://docs.netapp.com/us-en/ontap/svm-migrate/index.html) | Increases support for migrating SVMs containing up to 200 volumes. |
| Support for recreating SVM directories | The new CLI command debug vserver refresh-vserver-dir -node *node\_name* recreates missing directories and files. For more information and command syntax, see [the ONTAP Command Reference](https://docs.netapp.com/us-en/ontap-cli-9131/). |

System Manager

Beginning with ONTAP 9.12.1, System Manager is integrated with BlueXP. Learn more about [System Manager integration with BlueXP](https://docs.netapp.com/us-en/ontap/sysmgr-integration-bluexp-concept.html).

| **Update** | **Description** |
| --- | --- |
| Change in reporting of primary data reduction ratio | The primary data reduction ratio displayed in System Manager no longer includes Snapshot copy space savings in the calculation. It only depicts the ratio between used logical and used physical space. In prior releases of ONTAP, the primary data reduction ratio included significant space reduction benefits of Snapshot copies. As a result, when you upgrade to ONTAP 9.13.1, you will observe a significantly lower primary ratio being reported. You can still see data reduction ratios with Snapshot copies in the Capacity details view. |
| [Tamperproof Snapshot copy locking](https://docs.netapp.com/us-en/ontap/snaplock/snapshot-lock-concept.html#enable-snapshot-copy-locking-when-creating-a-volume) | You can use System Manager to lock a Snapshot copy on a non-SnapLock volume to provide protection from ransomware attacks. |
| [Support for external key managers](https://docs.netapp.com/us-en/ontap/encryption-at-rest/manage-external-key-managers-sm-task.html) | You can use System Manager to manage external key managers to store and manage authentication and encryption keys. |
| [Troubleshooting hardware problems](https://docs.netapp.com/us-en/ontap/task_admin_troubleshoot_hardware_problems.html) | System Manager users can view visual depictions of additional hardware platforms in the "Hardware" page, including ASA platforms and AFF C-Series platforms. Support for AFF C-Series platforms is also included in the latest patch releases of ONTAP 9.12.1, ONTAP 9.11.1, and ONTAP 9.10.1. The visualizations identify problems or concerns with platforms, providing a quick method for users to troubleshoot hardware problems. |