Digital Advisor documentation

Digital Advisor

NetApp
August 14, 2025

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Digital Advisor documentation

Release notes

What's new in Digital Advisor

The following features and enhancements have been introduced in Digital Advisor:

06 August 2025

Support entitled switches

You can now view information about Brocade Fibre Channel SAN switches that are entitled for support. This includes details about the switch model, serial number, and support status. Learn how to view support entitled switches.

Threshold for RSS AutoSupport data

The Recently Stopped Sending (RSS) limit, in the AutoSupport widget, has been extended from 48 hours (2 days) to 216 hours (9 days) before a system is flagged as RSS. This is done to accommodate platforms like StorageGRID that only send weekly AutoSupport data.

Deprecated API section in Digital Advisor API catalog

A new deprecated API section is available in the Digital Advisor API catalog. It lists the APIs that are scheduled for deprecation, along with deprecation timelines and alternative APIs.

Capacity forecast V2 and End of Support API modules deprecation

The capacity forecast V2 and end of support API modules are scheduled for deprecation. To access the deprecated APIs or to know about the deprecation timelines and alternative APIs, navigate to **API services** → **Browse** → **Deprecated APIs**.

09 July 2025

Upgrade Advisor

- A multi-format download option has been included for Upgrade Advisor plans to simplify ONTAP upgrade planning and address potential blockers or warnings. You can now download upgrade advisor plans in Excel, PDF, and JSON formats.
- In the Excel format of the Upgrade Advisor plan, the following enhancements have been made:
  - You can view the pre-checks performed on the cluster, flagging the results with indicators such as "Passed," "Failed," or "Skipped." This ensures that the cluster is in optimal condition for completing the ONTAP upgrade.
  - You can view the recommended latest firmware updates applicable to the cluster, along with the version shipped with the ONTAP target version.
  - A new tab has been included that offers interoperability checks for SAN clusters. It provides a view of the supported Host OS versions for the selected target ONTAP version.

08 May 2025

AutoSupport widget

The AutoSupport widget has been enhanced to include a pop-up to provide details about systems that have stopped sending AutoSupport data. Enabling AutoSupport reduces downtime risk and supports proactive system health management.

Support contracts report

The support contracts report has been enhanced to include the new ASP/LSG flag field. This field allows you to filter and identify systems covered by an Authorized Support Partner, also known as Lifecycle Services Certified.

Sustainability dashboard

You can now launch the Sustainability dashboard using the link included in the sustainability presentation.

05 March 2025

Upgrade Advisor

- Using the Disk Qualification Package (DQP), you can now automatically update disk controllers and storage device firmware according to predefined health and performance criteria. This reduces potential failures and enhances overall system reliability.
- The Timezone Database (DB) has been introduced to automatically maintain system alignment with the latest time zone definitions. This ensures that time-dependent operations continue smoothly even when time zone rules change.

12 December 2024

Upgrade Advisor

You can now view the storage firmware, SP/BMC firmware, and Autonomous Ransomware Package (ARP) that are recommended for an update. Learn how to view firmware update recommendations.

04 December 2024

AutoSupport widget

The AutoSupport widget has been added to the main dashboard screen to alert customers about the AutoSupport status-related issues.

23 September 2024

Support offerings

NetApp SupportEdge Basic service offering now includes all Digital Advisor features available in SupportEdge Advisor and SupportEdge Expert, except for Full-Stack Topology (VMware), which does not provide visibility into VMware full-stack monitoring, even if enabled.

21 August 2024

Reports

The **7-Mode Upgrade Advisor Plans** report is no longer available as 7-Mode systems have reached the end of limited support. For more information, see Software Version Support. Learn more about upgrading the Data ONTAP storage systems operating in 7-Mode.

04 July 2024

Sustainability dashboard

Environmental indicators that provide insights into the environmental health of your storage systems now provide more precise values for projected power usage, direct carbon usage, and heat emission based on an advanced predictive model. To learn more, refer to Sustainability dashboard overview.

15 May 2024

Sustainability dashboard

Sustainability is now supported on E-Series and StorageGRID systems. You can view a list of recommended actions and environmental indicators that display projections for power, direct carbon usage, and heat from the Sustainability dashboard for these systems. To learn more, refer to Sustainability dashboard overview.

28 March 2024

Upgrade Advisor

The older version of Upgrade Advisor is now deprecated. You can use the enhanced version of Upgrade Advisor to generate upgrade plans for a single cluster and multiple clusters. Learn how to view upgrade recommendations and generate an upgrade plan.

15 March 2024

Wellness

- The Wellness workflow now includes the Sustainability widget, which provides the count of recommended actions at the customer, watchlist, site, and group levels. You can click the number of actions for a detailed view of these recommended actions on the Sustainability dashboard. To learn more, refer to Analyze the sustainability of your storage systems.
- The Security Vulnerabilities and Ransomware Defense widgets in the Wellness workflow are combined into a single widget, which is now called Security & Ransomware Defense.

Health Check dashboard

The timeline for technical cases is enhanced to view the complete case history for 6 or 12 months.

29 February 2024

Watchlist

You can now create a watchlist based on Keystone subscription numbers and search for a Keystone

subscription using the first three characters of a subscription number or watchlist name.

08 February 2024

Sustainability dashboard

You can now access the Sustainability metrics for your default dashboard or watchlist directly by using the Sustainability Dashboard link.

ClusterViewer

You can now view Disk RPM information in the Disk Summary section, which is available in the Storage tab and in ClusterViewer reports.

03 January 2024

Upgrade Advisor

Upgrade Advisor is enhanced to provide automated nondisruptive upgrade plans for a single cluster and multiple clusters. You can view the upgrade recommendation only for a single cluster, which includes a risk summary, a pre-upgrade check report, and information about new features and enhancements. Learn how to view upgrade recommendations and generate an upgrade plan.

16 November 2023

Watchlist

You can now create a maximum of 100 watchlists.

Planning widget

- Tech refresh recommendations are now available in watchlist, site, and group dashboards.
- You can now view potential tech refresh candidates when tech refresh recommendations count is zero.

04 October 2023

Planning widget

Tech refresh recommendation counts are included in the planning widget of the customer level dashboard. These recommendations help plan hardware tech refresh activities when the hardware runs out of support or is nearing end-of-support.

27 September 2023

Upgrade Advisor

- You can access the Upgrade Advisor page for your default watchlist using the Upgrade Advisor link.
- The upgrade plan is optimized to remove redundant upgrade steps and simplify the backout plan. The common steps across all nodes in a cluster are consolidated and available under the general information section within the upgrade plan. Learn how to generate and view the upgrade plan.

16 July 2023

Storage Efficiency

- The label **Storage Efficiency**, which displays the efficiency ratio, is renamed to **Data Reduction**.
- The label **Data saved by Storage Efficiency** is renamed to **Data Reduction Savings**.
- The toggle **Savings without Snapshot Backups** is renamed to **With Snapshot copies** along with a change to its functionality. Learn more.

21 June 2023

Sustainability dashboard

Sustainability dashboard provides valuable insights into the environmental sustainability of your storage system. You can view the information such as sustainability score, carbon mitigation percentage, projected usage of power, direct carbon, and heat. You can adjust the carbon mitigation percentage for specific sites. You can also view the sustainability score at the cluster level. Based on the sustainability score, you can assess the overall efficiency of your storage system and align it with NetApp's recommended actions to enhance sustainability. Learn more.

22 February 2023

Performance charts

You can view average read, write, and other operations in the volume IOPS chart.

Storage Efficiency

SAN and NAS storage efficiency is available, at a node level, for ONTAP systems including AFF A-Series, AFF C190, All SAN Array, and FAS500 running ONTAP 9.10 and later.

12 January 2023

Performance reports

You can view average read, write, and other operations in performance reports at a volume level.

01 November 2022

Digital Advisor integrating with BlueXP

Active IQ Digital Advisor is being changed to Digital Advisor and is now integrated into BlueXP, NetApp's unified management console for hybrid multicloud environments. Learn more.

25 August 2022

Inventory

VMware assets information on vCenters, ESXi hosts, and Virtual Machines are now included in Inventory details, to provide full stack inventory and interoperability checks. Learn how.

Multi-hop Upgrade

For some automated nondisruptive upgrades (ANDU) to non-adjacent releases, you can install the software image for an intermediate release as well the target release. The automated upgrade process uses the intermediate image in the background to complete the update to the target release. For example, if the cluster is running 9.3 and you want to upgrade to 9.7, you would load the ONTAP install packages for both 9.5 and 9.7, then initiate ANDU to 9.7. ONTAP then automatically upgrades the cluster first to 9.5 and then to 9.7. You should expect multiple takeover/giveback operations and related reboots during the process.

14 July 2022

Health Check Dashboard

- You can now view technical case details created for Cloud Volumes ONTAP systems in Health Check Dashboard.
- New platform tabs have been added to help you easily navigate between the KPIs of different platforms.

E-Series systems

You can view the version of SANtricity operating system in the recommended version and Health Check KPIs.

Wellness

Introduced color-coding to quickly and easily identify systems that do not require any software or firmware version upgrades.

Upgrade Workflow

You can now view upgrade recommendations for E-Series systems.

22 June 2022

StorageGRID

Information Lifecycle Management (ILM) for StorageGRID has been included in the GRID Viewer.

Cloud Recommendations

Provides you with recommendations for workloads and their respective volumes that can be moved to NetApp Cloud Volumes ONTAP, NetApp Cloud Volumes Service, and NetApp Cloud Backup (formerly AltaVault) using SnapMirror Data Replication. Learn how.

Reports

- You can now generate reports using the criteria defined for an already generated report.
- You can now make 3 attempts to retry generating failed reports.
- The retention period of reports generated has increased from 3 days to 90 days.

01 June 2022

Inventory

- You can now view the sales representative information for systems in Inventory.
- Astra Control Centre systems are now available in Inventory.

12 May 2022

StorageGRID

Additional capacity metrics are included in StorageGRID Capacity and Capacity Reports.

ClusterViewer

SnapMirror (Data Protection) summary for clusters is now included in ClusterViewer.

Upgrade workflow

You can now use the upgrade workflow to view upgrade recommendations and a summary of new features available in your target E-Series release.

Wellness

- The Ansible Playbooks have been enhanced to mitigate software configuration risks.
- The filters have been consolidated in the wellness actions and risks.

07 April 2022

Wellness

- The scoring of key recommendations for the latest Operating System Version and the '6-month' KPIs for Support Contracts and End of Support has been lowered to align with their reduced urgency to resolve.
- The key recommendations for Remote Management and HA Pair (Recommended Configuration) have been updated to include URLs to the NetApp Support Site for customer self-service.

31 March 2022

StorageGRID

You can view information about Tenants and Buckets in the GRID Viewer.

24 March 2022

Health Check Dashboard

- Enhancements and bug fixes to Health Assessment Executive Summary PPT.
- Ability to generate a minimum recommended version upgrade plan.
- Enhancements to Health Check tiles to identify the number of nodes that require attention for each KPI.

StorageGRID

You can view grid configuration details in the GRID Viewer.

BlueXP

BlueXP users can now open Digital Advisor links in new tabs, wherever applicable, similar to the existing functionality in Digital Advisor.

12 January 2022

Config Drift

- You can clone a template to make a copy of the original template.
- You can share golden templates with other entitled users with read-only or full access to these templates. Learn how.

15 December 2021

Reports

- **Cluster Viewer Report**: This report provides information about a single cluster or multiple clusters at a customer and watchlist level. You can use the ClusterViewer Report to download all the information in a single file. You can generate this report only for watchlist with up to 100 nodes.
- **Performance Report**: This report provides information, at a watchlist level, about the performance of a cluster, node, local tier (aggregate), and volume in a single zip file. Each zip file contains performance data for a single clusters, which helps the user analyze data of each cluster. You can generate this report only for watchlist with up to 100 nodes.

Integration with E-Series systems

You can view the capacity details and performance graph of a selected E-series system in Digital Advisor.

18 November 2021

Storage Efficiency

You can view the storage efficiency details for nodes that are maintained and monitored by NetApp Cloud Insights.

11 November 2021

Health Check Dashboard

- Added icons on those Health Check tiles which are only applicable for systems with the SupportEdge Advisor and SupportEdge Expert support offerings. The enhancements have been made to Recommended Software–Software Currency and Firmware Currency sections, Recommended Configuration, and Best Practices.
- Added a Confidential Data banner for Internal and External (Customers and Partners) users on the Digital Advisor–Reports screen.

Wellness and Upgrade Widgets

Enhanced the dashboard with E-Series upgrade recommendations and risk triggered date added to column in the Wellness Action History.

ClusterViewer

The ClusterViewer Stack Visualization module has been enhanced to include the Zoom in/Zoom out and Save Image feature.

Storage Efficiency

You can view the storage efficiency details for systems that are maintained and monitored by NetApp Cloud Insights.

14 October 2021

Ansible Inventory

You can now generate Ansible inventory files in .yml and .ini file formats at the region and site level. Learn how.

Inactive Data Reporting (IDR)

From the FabricPool Advisor screen, you can activate inactive data reporting (IDR) to monitor aggregates and generate an Ansible Playbook.

Drift Timeline Report

You can compare the AutoSupport data of the last 90 days and generate a drift timeline report. Learn how.

Compliant Systems Toggle

The Health Check dashboard has been enhanced with a toggle for the Minimum OS and Latest OS tabs so that you can view the systems, which are compliant and not compliant with the minimum requirements of the recommended and latest version.

Key Recommendations Summary

On the Health Check dashboard, you can view a summary of the top 5 overall key recommendations.

Tabs for NetApp Cloud Volumes ONTAP and E-Series Platforms

The Health Check dashboard has been enhanced with Cloud Volumes ONTAP ** and E-Series tabs so that you can view the Health Check KPIs and details for those platforms.

A tab for 'ONTAP' has also been added along with the other platforms, which are now enabled.

Capacity

You can view the capacity details about the NetApp Cloud Volumes ONTAP systems in Digital Advisor.

Reports

The reporting timeline has been extended to 12 months. You will also receive a notification when the schedule report is about to expire.

30 September 2021

Customer Qualified Version

Customer Qualified Version helps a Support Account Manager (SAM) manage a portion of their customer's install base, which hosts applications requiring:

- An earlier and sometimes unsupported version of ONTAP
- Or a customer's install base tested and certified to use a certain OS version.

Technical Case Workflow

In both the dashboard and drill down screen, graphical enhancements have been made to the data chart and line graph. You have an option to view that data in a bar graph as well.
In the line-graph window, you can view, select, and deselect graphs for Open, Closed, and Total cases in both these user interfaces.

Performance Graphs

You can now download the performance graphs in PNG and JPG format, in addition to the CSV format.

End of Support (EOS) Controllers Beyond 12 Months

The Health Check Dashboard has been enhanced with a tab displaying controllers with an EOS exceeding 12 months.

16 September 2021

Wellness

- The Ransomware Defense widget is now part of Wellness workflow instead of a standalone widget.
- In the Wellness Review email, you'll find information about the Ransomware Defense instead of Renewals.

Capacity

You can view the capacity details about the NetApp ONTAP® Select systems in Digital Advisor.

ClusterViewer

You can view the cabling faults and other errors in the Visualization tab of ClusterViewer.

06 September 2021

StorageGRID

- View AutoSupport: View the AutoSupport logs for the StorageGRID and the underlying nodes.
- StorageGRID Appliance details: View StorageGRID appliance details such as the node type, appliance

model, drive size, drive type, RAID mode, and so on in the GRID Viewer - GRID Inventory section.

- Renewals: View the list of GRIDs and the underlying nodes that are due for renewal.
- E-series SANtricity risks: View E-series SANtricity risks for the underlying nodes in the GRID Dashboard - Wellness section.

Capacity Forecast

The Capacity Forecast widget has been updated with an improved algorithm that better accounts for system reconfigurations. Learn more.

26 August 2021

Digital Advisor Mobile Application

You can now enable biometric authentication on the Digital Advisor mobile application. The options available for authentication vary, depending on the features supported by your mobile phone.

Download the application to learn more:
Digital Advisor Mobile Application (Android)
Digital Advisor Mobile Application (iOS)

Wellness

Wellness widget has been enhanced with Ransomware Defense attribute. You can now view risks and corrective actions associated with ransomware detection, prevention, and recovery.

16 August 2021

Wellness Review

You can now generate the on-demand report. In addition, you can download the last scheduled report from the Wellness Review Subscription screen.

Inventory

In the Grid Inventory tab, you can now view the node details based on site level in an expandable and collapsible format.

Mixed-Model Cluster Flag

Where clusters have mixed-hardware models, the OS version applied across the cluster is the one which all nodes can use. As a result, the OS version of some nodes of more recent hardware models might be downrev from where they should be. To make these mixed-model clusters more visible, we have applied a "mixed model" icon.

Recommended Configuration / Storage Virtual Machine (SVM) Health: Volume-level Summary

Upon clicking the blue ‘Volume Summary’ box in the SVM table, a "pop-out" displays detailed information about the volumes which are hosted or attached to the specific serial number or physical node.

12 July 2021

System Firmware

You can now view information about the system firmware that is shipped along with the major and patch versions of ONTAP. You can access this feature from the Quick Links menu.

Health Check Dashboard

- The Health Check Dashboard has been enhanced to include a blue banner notifying users that the systems that are not supported by SupportEdge Advisor and SupportEdge Expert will not be factored in while calculating the health score.
- The Recommended Configuration widget has been enhanced to provide an in-depth analysis of the failed checks for your storage VM (SVM) and lets you take the recommended corrective actions for each risk.
- The recommended target ONTAP version is now the same for all nodes in a cluster configured with different hardware models. The target version is supported on all the nodes.
- You can now extend the EOS timeline for controllers, disks, and shelves through the purchase of a PVR. PVR dates and extension details, when purchased, are viewable in the end-of-support widget. The PVR details are also provided as part of the EOSL report.

Inventory

You can view the end dates of the support contracts for your hardware, software, and non-returnable disks on the detailed inventory page.

Support Offering Upgrade

- The user interface has been enhanced to display the specific support offering that you are subscribed to in Digital Advisor.
- You can now raise a request to upgrade your support offering subscription from the system dashboard to access more features. Learn how.

25 June 2021

Keystone Subscription widget

- If you have opted for ONTAP Collector to obtain data on your capacity usage, you can view the details of your file shares and disks in the Shares and Disks tabs. You can save storage space by identifying those nearing committed capacity.
- The capacity usage, shown on the Keystone - Capacity Utilization dashboard and used for billing, is now based on the logical capacity.

17 June 2021

Reports

You can now generate aggregate volume performance reports for all volumes in a storage VM for any day, week, or month.

Wellness review email

The wellness review email has been enhanced to include information about the support and entitlements from the health check and upgrade actions.

Upgrade workflow

- The user interface has been enhanced to provide you with a table view of the information.
- You can now view information about the end of support of the ONTAP version in the Upgrade Details screen.

Config Drift

- Config Drift now supports over 200 AutoSupport sections for creating golden templates and generating drift reports across customer, site, group, watchlist, cluster, and host.
- Config drift allows you to mitigate deviations using Ansible playbooks which are included in the config drift report payload.

Health Check Dashboard

This feature has been enhanced to compare your storage VM (SVM) against a predefined catalog of risks to assess gaps and recommend the associated corrective actions.

09 June 2021

Health Check Dashboard

You can now view the number of systems based on which the health score is calculated. This enhancement is applicable for all the attributes in the Health Check Dashboard.

20 May 2021

Drift Chat for capacity addition requests

For real-time assistance on your capacity addition requests, chat with a salesperson directly from your dashboard. Learn how.

29 April 2021

Protect against hackers and attacks

- Here’s how to protect your systems against hackers and Ransomware attacks. Learn how.
- You can avoid the downtime and possible data loss. Learn how.
- Learn how to avoid a volume filling up to prevent an outage. Learn how.

07 April 2021

Watchlist

When you access Digital Advisor for the first time, you should now create a watchlist instead of a dashboard. You can also view the dashboard for different watchlists, edit the details of an existing watchlist, and delete a

watchlist.

24 February 2021

Config Drift

This release provides the following functionality:

- Ability to edit attributes during template creation.
- Grouping of AutoSupport sections.
- Generate or schedule a config drift report across customer, site, group, watchlist, cluster, and hostname. Learn how.

Reports

You can generate or schedule Capacity and Efficiency reports to view detailed information on the capacity and storage efficiency savings of your system.

10 February 2021

StorageGRID

StorageGRID Dashboard is enabled using the NextGen API framework.

You can use the StorageGRID Dashboard for viewing information at the Watchlist, Customer, Group, and Site level.

This release provides the following functionality:

- **Inventory widget:** View inventory of StorageGRID systems available under the selected level.
- **Wellness widget:** View all the Risks and Actions, including the ones related to StorageGRID if they are applicable based on existing ARS rules for the available systems.
- **Planning widget:**
  - **Capacity Addition:** For any GRID sites that are exceeding the threshold of 70% of existing capacity, you'll be notified. You have the option to add capacity for the StorageGRIDs in the site, for the next 1, 3, & 6 months if the capacity threshold is likely to exceed 70%.
  - **Renewals:** For any StorageGRID systems for which the license contract has expired or is nearing expiration in the next 6 months, you'll be notified. You can select one or more systems to raise a request to the NetApp support team for renewal.
- **GRID dashboard:** The GRID dashboard provides wellness, planning, and configuration details for the selected GRID.
- **Configuration widget:** Provides basic details of the selected StorageGRID in the widget, such as GRID Name, Host Name, Serial Number, Model, OS Version, Customer Name, Shipped Location, and Contact Details.
- **GRID Viewer:** From the **Configuration** widget, you can view the GRID configuration in detail by clicking the **GRID Viewer** link. From the **Configuration** widget, you can download the Site Details and Capacity Details for the selected StorageGRID by clicking the **Download** button in the **Grid Viewer** screen.
- **Site details:** This tab provides the Grid Summary and Storage Nodes available for each site.
- **GRID summary:** Contains basic information, such as License Type, License Capacity, number of installed

nodes, Support Term (Date of termination of license contract), Primary Admin Node, and Primary Site of the Primary Admin Node. This tab also provides the Site name and the number of storage nodes tagged under the corresponding site. In this release, you can view the list of node names upon clicking the hyperlink available for viewing storage nodes for the corresponding site.

- **Capacity Details tab:** Provides the Grid Level and Site capacity details configured for the GRID. The Capacity details, such as Installed Storage Capacity, Available Storage Capacity, Total Used Storage Capacity, and Capacity used for Data and Metadata. These details are available at both the Grid and Site levels.

FabricPool Advisor

The Tier Data button has been added to the FabricPool dashboard, and it lets you tier data to low-cost object storage tiers using NetApp BlueXP.

Cloud ready workloads

You can view the different types of workloads that are available within your storage system and identify the workloads that are cloud-ready.

21 December 2020

Health Check Dashboard

The following widgets have been added to the dashboard:

- Recommended Software: This widget provides a consolidated list of all the software and firmware upgrades and currency recommendations.
- Loss of Signal: This widget provides scores and information about the systems, which have stopped sending AutoSupport data for some reason. It provides information if no AutoSupport data has been received from a hostname within a 7-day period.

12 November 2020

Integrating data using APIs

You can use Digital Advisor APIs to pull data of interest and integrate it directly into your company's workflow. Learn more.

Wellness - Upgrades widget

The enhanced Risk Advisor and Upgrade Advisor tabs enable you to view all the system risks and help you plan for an upgrade for mitigating all the risks.

Health Check Dashboard

The Recommended Configuration widget has been added to the dashboard, and it provides a summary on the number of systems that are monitored for remote management risks, spares and failed drives risks, and HA pair risks.

FabricPool Advisor

You can reduce your storage footprint and associated costs by monitoring your clusters, which have been classified into four categories: inactive local tier (aggregate) data, inactive volume data, tiered data, and those

that are not IDR enabled.

Localization in Simplified Chinese and Japanese

Digital Advisor is now available in three languages – Chinese, English, and Japanese.

Reports

You can generate or schedule ClusterViewer reports to view detailed information on the physical and logical configuration of your systems. Learn how.

15 October 2020

Health Check Dashboard

The Digital Advisor Health Check Dashboard provides a point-in-time review of your overall environment. Based on the health check score, you can align your storage systems to the recommended NetApp best practices to facilitate longer-term planning and improve the health of your installed base.

Config Drift

This feature enables you compare the system and cluster configurations and the detect configuration deviations in near real time. Learn how to add a config drift template.

AutoSupport

You can view your AutoSupport data and review the details.

Wellness Review Subscription

You can subscribe to receiving monthly email notifications that summarize wellness status of systems—that are nearing their renewal dates and require an upgrade for the NetApp products in your installed base. Subscribe now.

Reports

You can use the reports feature to generate reports immediately or schedule a report to be generated on a weekly or monthly basis. Learn how.

Manual AutoSupport Upload

Manual AutoSupport Upload has been enhanced to improve the user experience. An additional column has been provided for remarks on the upload status.

Keystone Subscription widget

You can monitor the committed, consumed, and burst storage capacity for your NetApp Keystone Subscription Service.

30 September 2020

AFF and FAS firmware using Ansible Playbook

The documentation has been enhanced to include information about downloading, installing, and executing the AFF and FAS firmware ansible automation package.

Learn how to update AFF and FAS firmware using Ansible Playbook.

18 August 2020

Performance

Performance graphs have been enhanced to enable you to assess the performance of the volume. You can navigate and toggle between the node tab, cluster tab, the local tier tab, and the volume tab on the same screen. Learn how.

AFF and FAS firmware using Ansible Playbook

The AFF and FAS firmware screen has been enhanced to provide a better user experience.

17 July 2020

Performance

Performance graphs have been enhanced to enable you to assess the performance of the local tier. You can navigate and toggle between the node tab, cluster tab, and the local tier tab on the same screen.

Wellness

The wellness attributes have been enhanced to view all the affected systems without having to drill-down to the actions and risks.

19 June 2020

Generate report for inventory

You can now generate report of the selected watchlist and emails the report to a maximum of 5 recipients. Learn how.

Performance

Performance graphs have been enhanced to enable you to assess the cluster performance of your storage system. You can navigate and toggle between the node tab and the cluster tab on the same screen.

Storage efficiency

The storage efficiency widget has been enhanced to enable you to view the storage efficiency ratio and savings at a cluster level. You can navigate and toggle between the node tab and the cluster tab on the same screen.

Update the default home page

You can now provide your feedback and let us know the reason you are updating the default home page screen for Digital Advisor.

Update to the inventory widget

The inventory widget has been enhanced to improve the user experience, by providing user-friendly date formats, additional columns for end of platform support and end of version support.

19 May 2020

Set the default home page

You can now set the default home page screen for Digital Advisor. You can either set it to Digital Advisor or Classic.

Storage efficiency

You can view the storage efficiency ratio and savings of your storage system with and without Snapshot copies for AFF systems, non-AFF systems, or both. You can view the storage efficiency information at a node level. Learn how.

Performance

Performance graphs enable you to assess the performance of your storage devices in different significant areas.

AFF and FAS firmware upgrades using Ansible Playbook

Update the AFF and FAS firmware using Ansible on your storage system to mitigate the identified risks and to keep your storage system up to date.

Disabling the wellness score feature

The wellness score feature is being temporarily disabled to improve the scoring algorithm and simplify the overall experience.

02 April 2020

Onboarding overview video

The onboarding video helps users to quickly get familiar with the options and features of Digital Advisor.

Wellness score

Wellness score provides customers with a consolidated score of their installed base based on the number of high risks and the expired contracts. Score can be good, average, or poor.

Risk summary

The risk summary provides detailed information about the risk, the impact of the risk, the corrective actions.

Support for acknowledging and disregarding risks

Provides the option to acknowledge a risk if you do want to mitigate or are unable to mitigate the risk.

19 March 2020

Upgrade workflow

You can use the upgrade workflow to view upgrade recommendations and a summary of new features available in your target ONTAP release. Learn how.

Valuable insights

You can view the summary of the benefits that you received through Digital Advisor and your support contract. For selected systems, the value report consolidates the benefits from last one year. View now.

Drill into details

Provides deeper information, which is a powerful way to dig deeper into the data and gain immediate insights into the make-up of aggregated information as required.

Capacity additions

You can proactively identify systems that have exceeded capacity or are nearing 90% capacity and send a request to increase capacity.

29 February 2020

Enhanced user interfaces

The latest Digital Advisor Dashboards offer a personalized experience. It allows smooth and seamless navigation, with its intuitiveness, throughout different dashboards, widgets, and screens. It provides an all-in-one experience. It communicates comparisons, relationships, and trends. It provides insights that help you detect and validate important relationships and meaningful differences based on the data that is presented by different dashboards.

Customizable dashboards

Helps you monitor your systems at a glance by providing key insights and analysis about your data on one or more pages or screens. You can also create up to 10 dashboards and make effective business decisions.

Learn more.

Mitigate risks using Active IQ Unified Manager

You can view the risks and rectify them by using Active IQ Unified Manager. Learn how.

Wellness

Provides detailed information about the status of your storage system that is classified into the following 6 widgets:

- Performance & Efficiency
- Availability & Protection
- Capacity
- Configuration

- Security
- Renewals

See Analyze wellness attributes for more details.

Smarter and faster search

Allows you to search parameters, such as serial number, system ID, host name, site name, group name, and cluster name using the single-system view. You can also search for group of systems, in addition, you can search by a customer name, site name, or group name by group of systems.

Known limitations

Known limitations identify platforms, devices, or functions that are not supported by this release of the product, or that do not interoperate correctly with it. Review these limitations carefully.

The following limitations exist:

- For Data ONTAP storage systems operating in 7-Mode only (Data ONTAP storage systems operating in 7-Mode is nearing End of Support Life)
  - Performance charts
  - Storage efficiency
- Upgrade Advisor will not support upgrade plans for clustered ONTAP earlier than 9.0.

Editing a watchlist may take 60 minutes to reflect in Digital Advisor

Editing a watchlist does not update the information in Digital Advisor immediately. It may take up to 60 minutes for the changes to reflect in Digital Advisor.

A blank report is displayed while scheduling reports

Scheduled reports are available only with a SupportEdge Advisor or a SupportEdge Expert support contract. If your systems are not under SupportEdge Advisor or a SupportEdge Expert support contract, you may get a blank report while scheduling reports.

Acknowledged and unacknowledged risks may take 60 minutes to reflect in Digital Advisor

The status of the risks that are acknowledged and unacknowledged do not reflect immediately in Digital Advisor. It may take up to 60 minutes for the changes to reflect in Digital Advisor and in wellness report.

AutoSupport Widget not available for cluster and serial numbers

The AutoSupport widget will not provide alerts for cluster and serial number searches.

AutoSupport Widget not able to drill down to serial level AutoSupport details

On the AutoSupport Reporting page, clicking on any of the statuses, systems that recently stopped sending, or systems that have AutoSupport turned off does not navigate to the Health Check screen.

Filtering and sorting are not available in the Inventory widget

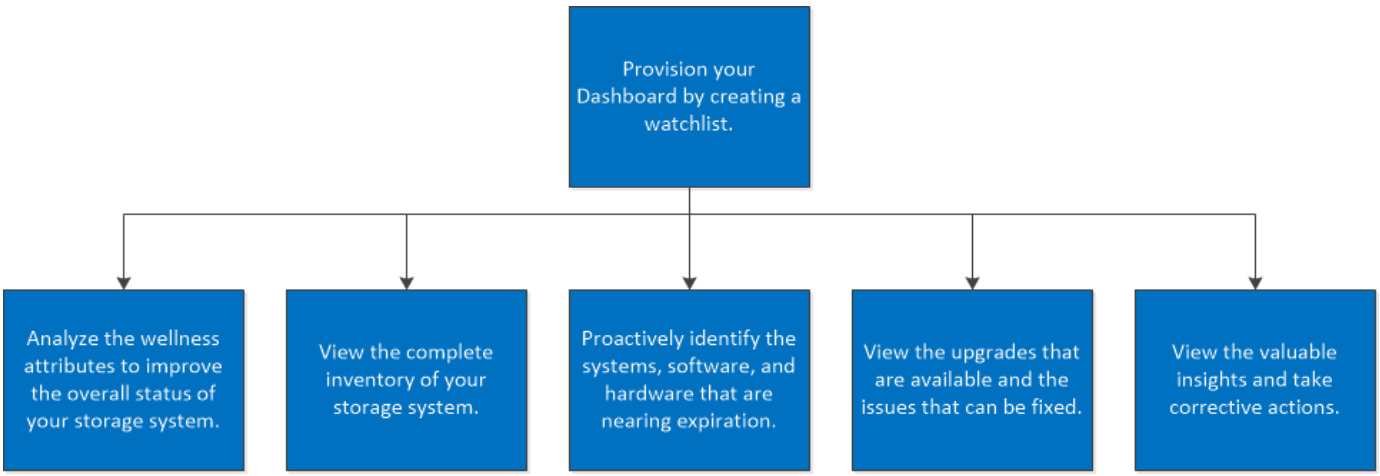
You cannot filter and sort data in the inventory widget. No data is displayed if you select ONTAP AFF, ONTAP ASA, ONTAP Edge, or ONTAP Select in the "Filter by" drop-down.

Get started

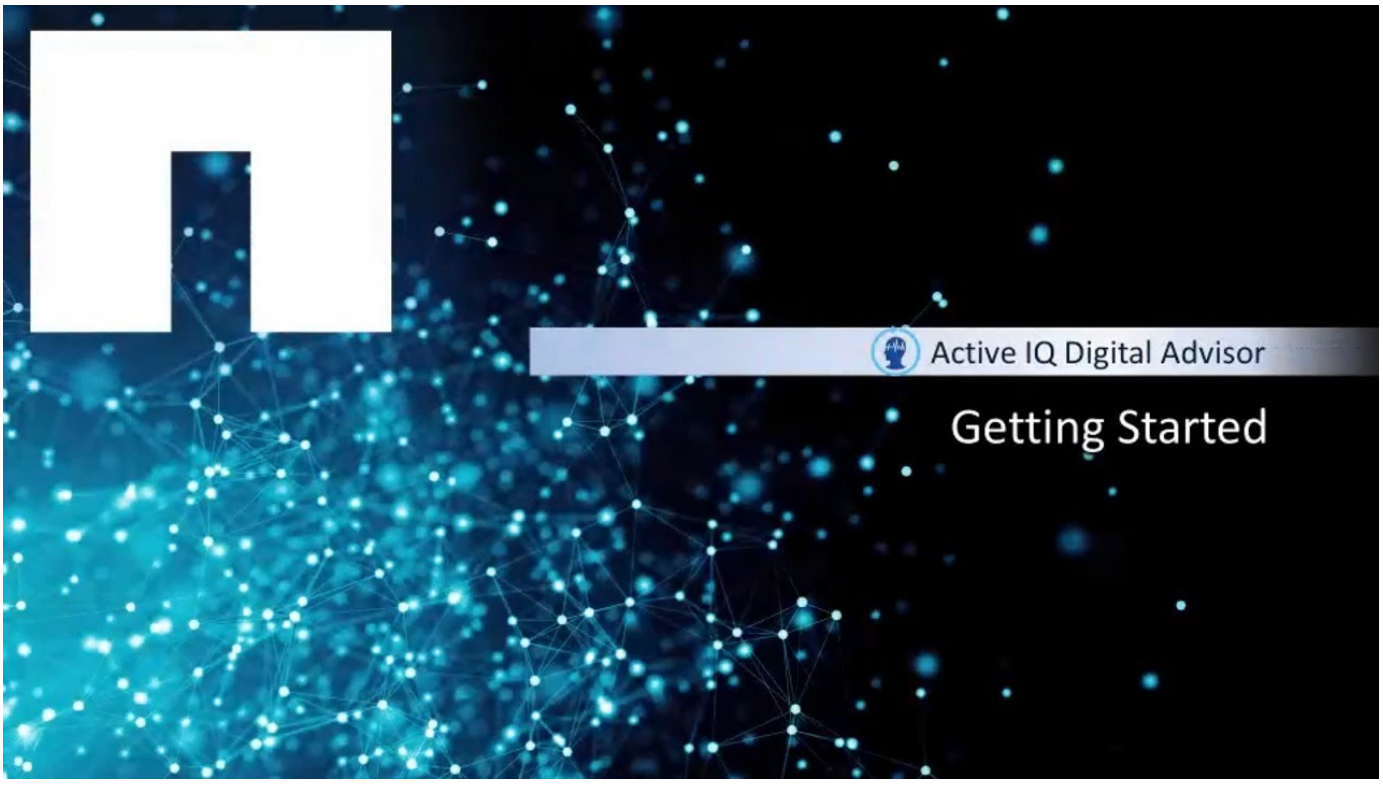
Quick start for Digital Advisor

Digital Advisor has been enhanced and redesigned to help you perform tasks more effectively. The user interface has been developed to guide you to perform your desired goals.

You can look at the following diagram to understand the workflows of Digital Advisor.



You can view the following video to get started with Digital Advisor:



All Digital Advisor widgets are not supported on all platforms. Digital Advisor identifies the platform of your storage system and displays only the set of tasks that can be performed on your storage system.

Read the following information to be aware of the widgets that are supported on your storage system.

Widget	Customer	Cluster	Node
Wellness	Supported on all platforms	Supported on all platforms	Supported on all platforms
Renewals	Supported on all platforms	Supported on all platforms	Supported on all platforms
Capacity Additions	Supported only on clustered Data ONTAP	Supported only on clustered Data ONTAP	Supported only on clustered Data ONTAP
Inventory	Supported on all platforms	Supported only on clustered Data ONTAP	Supported only on clustered Data ONTAP
Upgrades	Supported only on clustered Data ONTAP	Supported only on clustered Data ONTAP	Supported only on clustered Data ONTAP

Understand Digital Advisor features

You can view the overall status of your storage system, high-level information about the wellness of the system, inventory, planning, upgrades, and valuable insights at a watchlist level using Digital Advisor.

When you access Digital Advisor for the first time, you can either create a watchlist or search for a customer name, site name, group name, StorageGRID, hostname, cluster, serial number, or system ID.

You should also be aware of the colors applied to the cards, which indicate the severity and type of risks.

The following are some of the features of Digital Advisor:

- View multiple watchlists, actionable and useful at-a-glance views of information.
- Gain insights regarding all the risks to your storage system and the actions to mitigate the risks.
- Mitigate risks using Active IQ Unified Manager.
- Upgrade your storage system.
- View the sustainability score, and projected usage of power, direct carbon, and heat. Based on the sustainability score, assess the overall efficiency of your storage systems and align with the NetApp's recommended actions to improve the score. Learn more.
- View data reduction ratio, the logical space used, the physical space used, and the total data saved for storage systems running ONTAP 9.1 and later.
- Analyze the performance of your storage devices by viewing the graphical format of performance data.
- Get information about the hardware and software that have expired or are near-expiration within the next 6 months.
- Update your ONTAP firmware using Ansible.
- Get details about systems that have exceeded 90% capacity or are nearing 90% capacity.
- View detailed physical and logical configuration information, including a summary of the cluster and node configuration, the local tier and volume information, the network interface and port information, a stack diagram detailing information about the disks and shelves, and a few cable visualizations.
- Provide cross-stack information and insights that are beneficial for troubleshooting, upgrade assessments, solution validation, and migration.

- Check the compatibility of hosts, and provide upgrade recommendations for host operating systems, drivers, and .
- Arrive at exactly what you want to find in a smarter and faster manner.

You can upgrade the support offering from the **Configuration** widget on the system dashboard to gain insights on your install base and receive personalized support.

Digital Advisor integration with BlueXP

Digital Advisor is now fully integrated with BlueXP. You can now manage your clusters and access all the features of Digital Advisor from the BlueXP user interface (UI).

Using BlueXP, IT experts and cloud architects can centrally manage their hybrid multi-cloud infrastructure. All you need is a NetApp Support Site (NSS) account to access Digital Advisor in BlueXP.

Integration overview

Starting in November 2022, Digital Advisor users will be encouraged to use Digital Advisor in BlueXP. From BlueXP, you'll have access to the same Digital Advisor interface that you're used to, plus more. BlueXP enables you to create and administer cloud storage (for example, Cloud Volumes ONTAP), use NetApp's data services (for example, Cloud Backup), and control many on-prem and edge storage devices.

Access Digital Advisor in BlueXP

You can access Digital Advisor from BlueXP to manage your cluster.

Steps

1. Open a web browser and go to BlueXP.
2. Select **Log in with your NetApp Support Site Credentials** and enter your credentials.

   If you previously created a BlueXP login using an email and password, then you'll need to continue using that login option instead.

3. When prompted, log in with your NetApp Support Site credentials.

   This login is different from the login completed in step 2. In step 2, you logged in to the BlueXP platform. Now you're logging in to Digital Advisor.

Result

All your existing watchlists and configurations show up and you can now use Digital Advisor like you typically do.

Learn more about BlueXP

Go to the BlueXP documentation to learn more

Key concepts

As you start using Digital Advisor, it is important that you understand some of the basic

terms that you can expect to see throughout the Digital Advisor.

- **Watchlist:** Provides you the flexibility to access systems inside Digital Advisor that have already been selected. You can use watchlists to add systems from either one or more customers.
  - **Wellness Dashboard:** Provides an overall status of the systems in the watchlist.
  - **Widgets:** Displays small applications on the Dashboard that provide you a quick summary of the status of the systems.
  - **Risks:** Displays a list of systems with their respective issues. It has different severity levels:
    - High risks
    - Medium risks
    - No risks
  - **Unique Risks:** Displays the risk names and number of systems for a specific risk category.
  - **Actions:** Displays the number of unique actions that you can take to fix the issues.
  - **Color-coded risk status**: Displays risk levels and their color codes that are classified into 3 levels on the basis of their severity levels. The use of colors allows a faster assessment of the levels of risk involved.

Color	Severity
	High
	Medium
	No risks

- **Wellness widget:** Displays information about the performance, efficiency, capacity, configuration settings, security vulnerabilities, and others. It proactively determines the systems that have either exceeded the capacity or are near exceeding 90% capacity. In addition, it provides information about software and hardware that have either expired or set to expire in the next 6 months.
  - **Security & Ransomware Defense:** Provides information about risks and corrective actions associated with security vulnerabilities, ransomware detection, prevention, and recovery.
  - **Performance & Efficiency:** Displays information about the performance and efficiency of the storage system.
  - **Availability & Protection:** Displays information about the availability and protection of the storage system.
  - **Capacity:** Consists of risks with a capacity attribute for impact area values.
  - **Configuration:** Consists of risks with a configuration attribute for impact area values sorted with the highest impact on the top.
  - **Sustainability:** Displays number of recommended actions to improve the sustainability score at the customer, watchlist, site, and group levels.
  - **Wellness History:** Displays information about system risks occurring in the past three months, so that you can learn how they are faring overtime.

    - **Acknowledge Risks (Ack):** Allows you to acknowledge the risks and systems that have been impacted. You can acknowledge these risks and familiarize yourself with the actions that you can perform to mitigate these risks.
    - **Unacknowledge Risks (un-ack):** Allows you to unacknowledge the risks and systems that have been acknowledged.
    - **Fix It:** Fixes the risks to the system using Active IQ United Manager (UM) 9.7 or higher. Click this button to launch UM and perform the steps to mitigate the risks.
- **Inventory widget:** Displays a rollup of total systems you own. This includes both Digital Advisor enabled and non-enabled products.
    - **Generate a report:** Generates the report of the selected watchlist and emails the report to a maximum of 5 recipients.
- **Planning widget:** Displays information about the capacity addition, software, and hardware that needs to be renewed.
    - **Capacity Additions:** Identifies systems that have exceeded or are nearing 90% capacity and GRID sites that have exceeded or are nearing 70% capacity. You can raise a request to increase the capacity of your storage system.
    - **Renewals:** Provides information about the software and hardware that has expired or are near expiration in the next 6 months.
- **Upgrades widget:** Provides the number of upgrades that are available for ONTAP and E-Series systems:
    - For ONTAP systems, you can view information about the number of systems that require an upgrade, and then request for an upgrade plan.
    - For E-Series systems, you can only view information about the number of systems that require an upgrade.
- **Storage Efficiency:** Identifies the storage efficiency ratio and savings of your storage system with and without Snapshot copies for AFF systems, non-AFF systems, or both.
- **Performance graph:** Enables you to analyze the performance of your storage devices by viewing the graphical format of performance data. You can view detailed performance graphs of the ONTAP cluster for the selected node.
- **Valuable Insights widget:** Provides information about the number of support cases, pending software upgrades, storage efficiency savings, risks mitigated, and others. It also proactively lists the risk notifications from the Wellness attribute.
- **AutoSupport:** Enables you to view AutoSupport instances at a high level or in detail. The details include system details, possible reasons for the issue, and suggested actions.

  To access the AutoSupport feature, log in to Digital Advisor and search for a cluster or hostname. The AutoSupport option is available on the left pane.
- **Quick Links:** Provides the list of applications that can be launched using Digital Advisor.
    - **ClusterViewer:** Enables you to see detailed physical and logical configuration information. The details are presented in several easy-to-view tables across multiple tabs that include a summary of the cluster and node configuration, the local tier and volume information, the network interface and port information, a stack diagram detailing information about the disks and shelves, and a few cable visualizations. You can also download the cable visualizations graphics in the SVG format.

      The ClusterViewer feature is not supported on E-Series systems.

- **API Services:** Allows you to pull data of interest and integrate it directly into your company's workflow.
- **AutoSupport Upload:** Enables you to analyze the defects or issues in ONTAP and E-Series systems. The defects or issues are reviewed and fixed manually by Support Site personnel.
- **System Firmware:** Enables you to view information about the system firmware that is shipped along with each major and patch version of ONTAP.
  - **Search:** Allows you to search for systems based on various categories, such as customer name, serial number, cluster, site name, group name, hostname, and others.
- **Customer:** Allows you to view and manage a customer's installed base. Customer Dashboard is the central portal in Digital Advisor.
- **Cluster:** Provides information about ONTAP clusters. The Dashboard also consolidates health, capacity, storage efficiency, and performance insights.
- **Serial Number:** Provides information about the serial number that is assigned to the customer.

What is AutoSupport

AutoSupport is a telemetry mechanism that proactively monitors the health of your system and automatically sends configuration, status, performance, and system events data to NetApp.

This data is used by NetApp Technical Support to speed the diagnosis and resolution of issues, and by Digital Advisor to proactively detect and avoid potential issues. It can also be sent to your internal support organization and a support partner.

Digital Advisor displays AutoSupport related data only for systems whose AutoSupport data is the less than 60 days old.

For ONTAP systems, AutoSupport is enabled by default when you configure your storage system for the first time. You should set up AutoSupport on ONTAP systems to control how the AutoSupport information is sent to technical support and your internal support organization.

If you do not want to enable AutoSupport, you can use the AutoSupport Upload feature to manually upload AutoSupport data to receive recommendations and insights into your storage ecosystem.

AutoSupport data does not contain any user data.

For more information about AutoSupport, refer to the appropriate documentation:

- ONTAP (FAS and AFF)
- StorageGRID
- SANtricity (E-Series and EF-Series)
- Element (NetApp HCI and SolidFire)
- Technical Report - ONTAP AutoSupport and AutoSupport On Demand
- Technical Report - Security and Privacy of NetApp Telemetry Data

Log in to Digital Advisor

You can log in to Digital Advisor from a web-based console for viewing the overall status of your storage system.

Before you begin

You must have a valid NetApp Support site credential to log in to Digital Advisor. If you do not have an account and are getting started, see the following KB article to create an account:
How to register for NetApp Support Site account as a Customer or a Guest user.

Steps

1. Go to the Digital Advisor login page.

   Digital Advisor shows systems with a valid support contract. If contracts expire, a grace period of 90 days is given in which systems continue to be visible. Thereafter, systems are not searchable or visible within Digital Advisor.

2. Provide your username and password and click **Sign In**.

Provision watchlist

Understand watchlist

Watchlists are used to access preselected systems inside Digital Advisor quickly and easily. If you view a certain customer or a set of systems frequently, we recommend you create watchlists. You can create up to 100 watchlists and each watchlist can contain up to 15,000 systems by category or 500 systems by serial numbers.

When you access Digital Advisor for the first time, you can either create a watchlist or search for a customer name, site name, group name, StorageGRID, hostname, cluster, serial number, system ID, or Keystone subscription.

You should also be aware of the colors applied to the cards, which indicate the severity and type of risks.

Create a watchlist

You can create a watchlist to access a set of systems quickly and easily. You can add the systems based on category or serial number.

> You can add a maximum of 15,000 systems under a category and 500 systems under a serial number.

Steps

1. From the left pane, click **Watchlists**

   The **Manage Watchlist** screen is displayed.

2. Click **Create Watchlist**.
3. Provide a name for the watchlist.

4. Select one of the following options to add systems to the watchlist:
   - **Category**: This option enables you to add the entire inventory associated with a specific category, such as customer, site, group, or Keystone subscriptions, to your watchlist.

     The **Keystone Subscriptions** option allows you to include any subscription numbers associated with Keystone subscriptions. On searching by a watchlist, you can view the subscriptions in the **Keystone Subscriptions** widget on the Digital Advisor dashboard. For more information, see Search by Keystone watchlists.

   - **Serial Number**: This option enables you to include inventory in your watchlist based on specified serial numbers. You can either input the serial number directly or select serial numbers from categories like customer, site, or group.
5. Click **Create Watchlist**.

   The watchlist dashboard is displayed.

Manage a watchlist

You can view the dashboard for different watchlists, edit the details of an existing watchlist, and delete a watchlist.

Steps

1. From the left pane, click **Watchlists**.

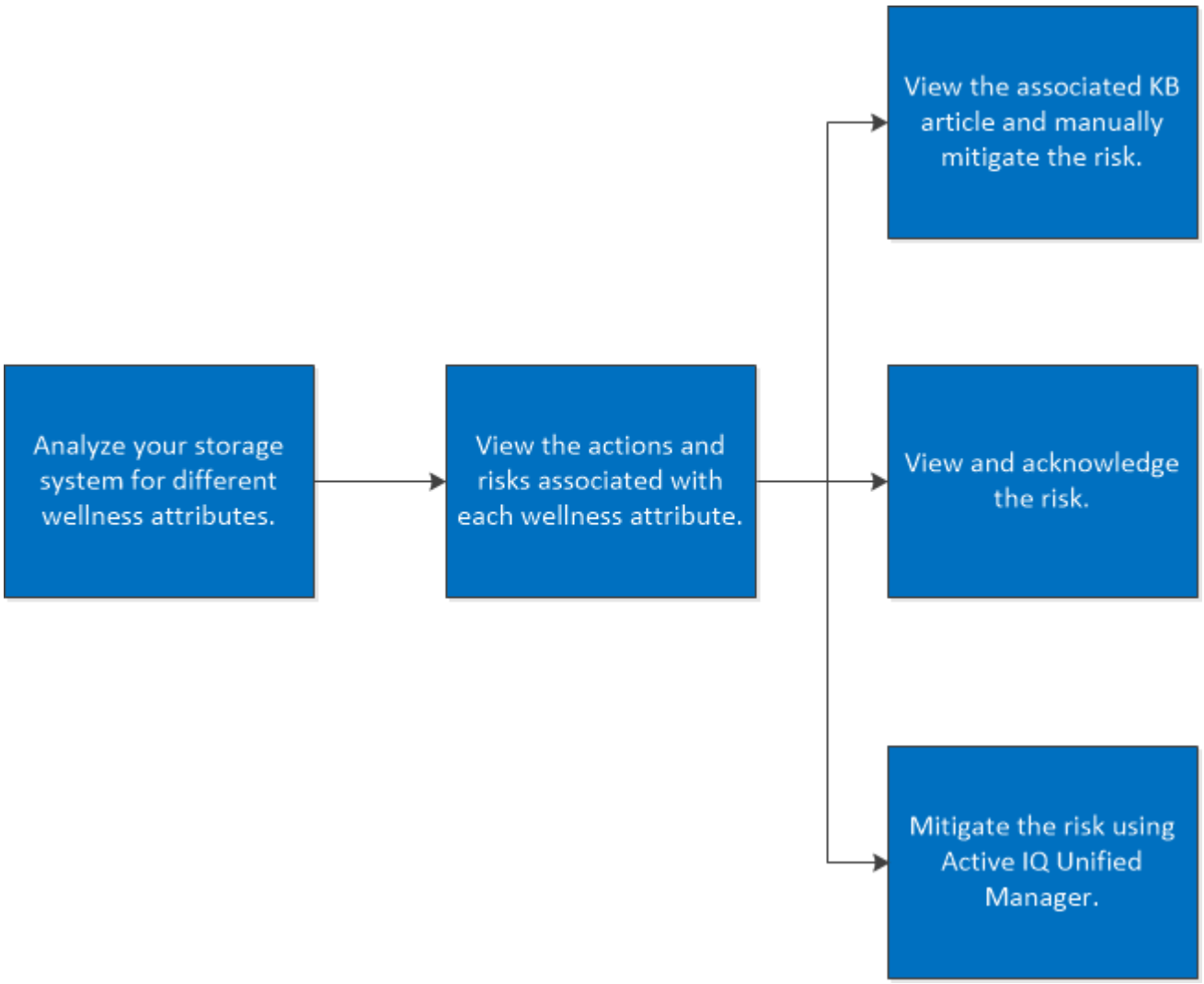
   The **Manage Watchlist** screen is displayed.
2. Click the name of the watchlist to view the dashboard details of the watchlist.
3. Click **Edit** to update the details of the watchlist.
4. Click **Delete** to delete the watchlist.

Use Digital Advisor

Analyze wellness attributes

Understand wellness

Wellness widget provides detailed information about your storage system. It provides information about different attributes of your storage system, such as performance and efficiency, capacity, configuration settings, security vulnerabilities, renewals, and others.



The wellness widget also provides information about the risks and the actions that should be taken to mitigate the risk for each wellness attribute. The following are the types of risks and the associated consequence for each risk:

Risk Type	Consequence
Critical	Data loss, data corruption, cluster data outage, personal safety issue, or potential legal compliance issue.
High	Short-term loss of data access or prolonged loss of node redundancy.

Risk Type	Consequence
Medium	Performance degradation or short-term loss of node redundancy.
Low	Low impact scenarios
Best Practice	Deviations from documented best practices

You can view the following video to understand the importance of the wellness attributes:

View risk and manually take corrective actions

You can analyze the wellness attributes of your storage system by viewing the actions and risks associated with them. You should view the associated corrective actions and manually mitigate the risk.

Steps

1. Click the **Wellness** widget on the dashboard or click **View All Actions** to view the list of all the actions and risks.
2. View the **Actions** and **Risks** associated with the wellness attribute.
3. Click **Actions** to view the risks associated with the actions, click **Risks** to view all the risks, or click **Affected Systems** to view the systems that require attention.
4. Click the risk name to view information about the risk.
5. Click the associated corrective actions and follow the information to resolve the risk.

The steps to mitigate the risks are same for all wellness attributes. You can view the following video to monitor and fix security related issues:

Detect security vulnerability

The NetApp security site is the source of truth for NetApp Product Security: NetApp Product Security

Digital Advisor utilizes telemetry data and published product security advisories to detect security issues for covered* and support-entitled products. Product telemetry data must be transmitted to NetApp via AutoSupport to allow Digital Advisor to detect risks.

For additional NetApp product security information, including products not covered by Digital Advisor, visit NetApp Product Security

*Covered products: ONTAP 9 (on-prem and cloud), SANtricity OS Controller Software, NetApp SolidFire (Element Software), StorageGRID, Active IQ Unified Manager, ONTAP Tools for VMware (OTV)

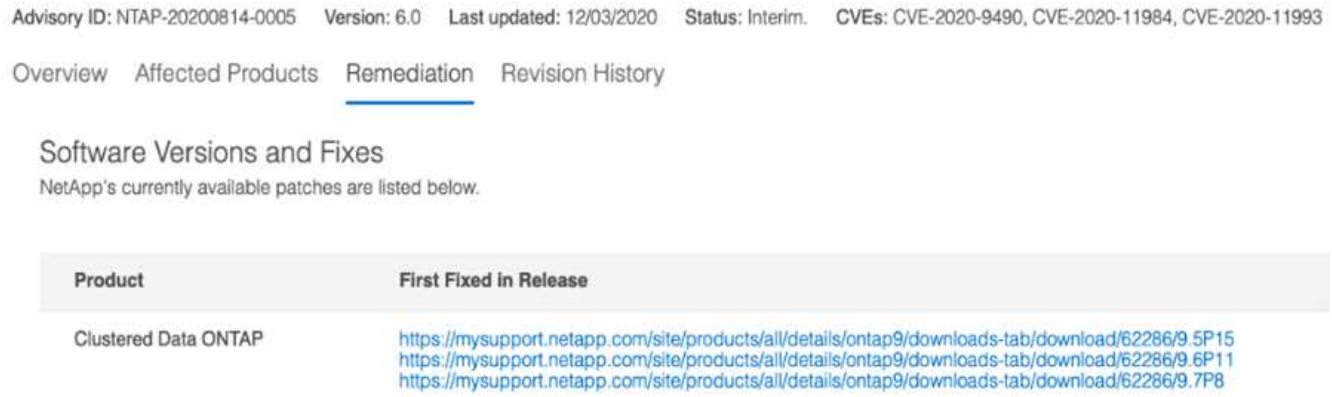
Steps

1. Log in to Digital Advisor.
2. Click **Actions** in the **Security & Ransomware Defense** widget.

3. Clear the **Ransomware Defense** checkbox.

4. For the high-impact security risks, follow the recommended action that is to upgrade the operating system.
5. Click the **Unique Risks** tab, and then click the link in the **Corrective Action** column.

The risk is fixed in ONTAP 9.7P8 and later.



6. The most important step is to plan OS upgrade in the **Upgrade Advisor** in Digital Advisor.

Protect systems against ransomware risks

When you log in to the Digital Advisor, you can view the **Actions** highlighted on the **Security & Ransomware Defense** widget, which shows the risk counts.

You can view the Snapshot creation, retention, and ONTAP FPolicy risks, and then take actions to fix them.

Steps

1. Log in to Digital Advisor.
2. Click **Actions** on the **Security & Ransomware Defense** widget.
3. Clear the **Security Vulnerabilities** checkbox.
4. For the risks that are displayed, check the impact level and follow the recommended actions.
5. Click the Unique Risks tab and link in the **Corrective Action** column.
6. Click the **Affected Systems** tab to view systems with risks.
7. Follow remediation actions that are recommended to protect the systems.

View and acknowledge the risk

You can analyze the wellness attributes of your storage system by viewing the actions and risks associated with them. You should view the corrective actions and manually mitigate the risk.

Steps

1. Click the wellness attribute widget on the dashboard or click **View All Actions** to view the list of all the actions and risks.

2. View the **Actions** and **Risks** associated with the wellness attribute.
3. Click **Actions** to view the risks associated with the actions, click **Risks** to view all the risks, or click **Affected Systems** to view the systems that require attention.
4. Click the risk to view the risk summary.
5. Click **Ack** to acknowledge the risk.

   The detailed risk summary information is provided along with corrective actions that should be manually performed to mitigate the risk.

6. If you do not want to or are unable to mitigate the risk at this time, provide the values for the fields and click **Acknowledge**.

   The risk will be added to acknowledged risks.

If you no longer want a risk to be acknowledged, you can disregard the risk by clicking **Un-Ack** and following the same steps.

View wellness history

You can view system risks occurring in the past three months, so that you can learn how they are faring overtime.

These risks are classified under four types of risks— **Unresolved**, **New**, **Resolved**, and **Acknowledged**. They are represented by different colors. The summary of these risks is represented through a **Risk History** graph.

Steps

1. On the dashboard, in the **Wellness** pane, click **View All Actions**.
2. Click **Wellness History**.
3. In the **Risk History** graph, click the category for which you want to view the risk history.

   When you hover over the colored bars, they display information on the number of risks in each category. Upon clicking the respective risk category, the information gets displayed in the **Risk Information** table.

   You can also download risk summary in an Excel sheet.

View risks that can be automatically mitigated using Unified Manager or Ansible Playbook

You can analyze your storage system by viewing the actions and risks, and mitigate them using Active IQ Unified Manager or Ansible Playbook.

Steps

1. Click **View All Actions** on the dashboard.
2. Click **Actions** to view the risks associated with the actions, click **Risks** to view all the risks, or click **Affected Systems** to view the systems that require attention.

   If the risk can be mitigated using Active IQ Unified Manager, the icon is highlighted and if the risk can be mitigated using Ansible Playbook, the icon is highlighted.

To mitigate the risk using Unified Manager	To mitigate the risk using Ansible Playbook
1. Click the icon. 2. Click **Fix It** to launch Active IQ Unified Manager. 3. Click **Install** to install Active IQ Unified Manager 9.7 or later to use the **Fix It** option. 4. Click **Upgrade** to upgrade to Active IQ Unified Manager 9.7 or later to use the **Fix It** option.	1. Click the icon. 2. Click **Download** to download the AFF and FAS firmware Ansible Automation package.

A SupportEdge Advisor or SupportEdge Expert contract is required to use the **Fix It** option and the Ansible Playbook features.

Avoid downtime and possible data loss

When you log in to the Digital Advisor and notice the red badge on the **Availability and Protection** widget, you can take actions to fix critical risks. Without the firmware fix, these

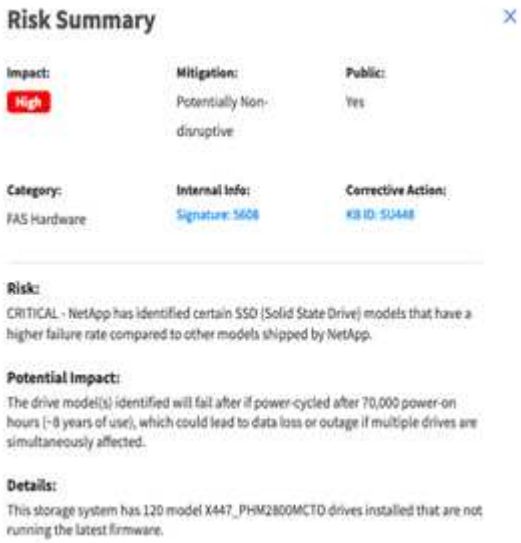
drives are vulnerable to become inoperable after a certain number of hours of being powered on. Fixing this would avoid both the downtime and possible data loss.

Steps

1. Log in to the Digital Advisor.
2. Click **Actions** in the **Availability & Protection** widget.

   For the high-impact security risks, follow the recommended action that is to update disk firmware.

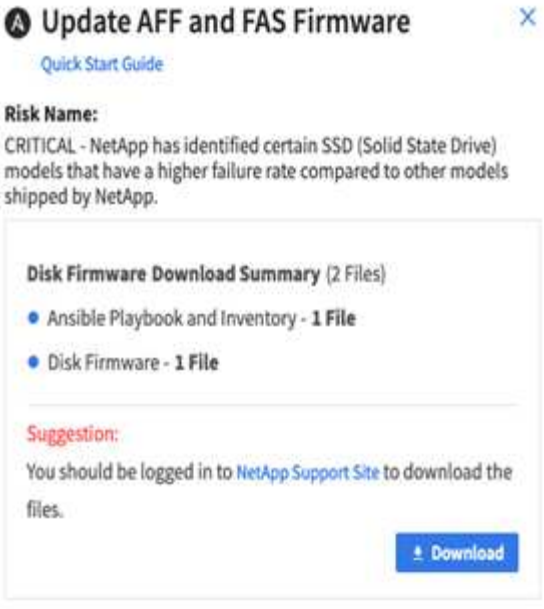
3. Click the **Risk Name** link for viewing risk summary.



4. Click the **Unique Risks** tab, and then click the link in the **Corrective Action** column.

   Digital Advisor generates custom Ansible scripts or playbooks to update the required disk firmware, including the disk firmware files.

5. Click the **Ansible "A"** icon to generate and download the scripts.



Subscribe to wellness review email

You can subscribe to the wellness review email to receive a monthly email that summarizes wellness status, systems that are nearing their renewal dates, systems that require an upgrade for the NetApp products in your installed base.
You will receive a wellness review email so that you can view a monthly summary and take action for your systems.
You also have options to view, edit, share, and delete your subscriptions. At any time, if you decide to not receive the email, you can unsubscribe from getting email as well.

After the subscription is enabled, you should select a start date when adding a subscription.
The monthly email summary provides a view of outstanding wellness, renewal, upgrade, and health check actions. You can confirm the email address and the email is sent to the specified email address.
You also have the option to delete subscriptions.

This feature is available only through NetApp SupportEdge Advisor and SupportEdge Expert service offerings.

Steps

1. From the left pane, click **Wellness Review**.
2. Click **Add Subscription**.
3. Provide the required information in the **Name the Subscription**, **Choose Category**, **Search Customer**, and **Email** fields in the **Add New Subscription** dialog box.
4. Click **Subscribe**.

   Upon successful subscription, you will receive a **Subscription was added** message.

Renew software and hardware of your storage system

You can proactively identify the software and hardware that have expired or are near

expiration in the next 6 months, and send a request to renew the hardware and software.

Steps

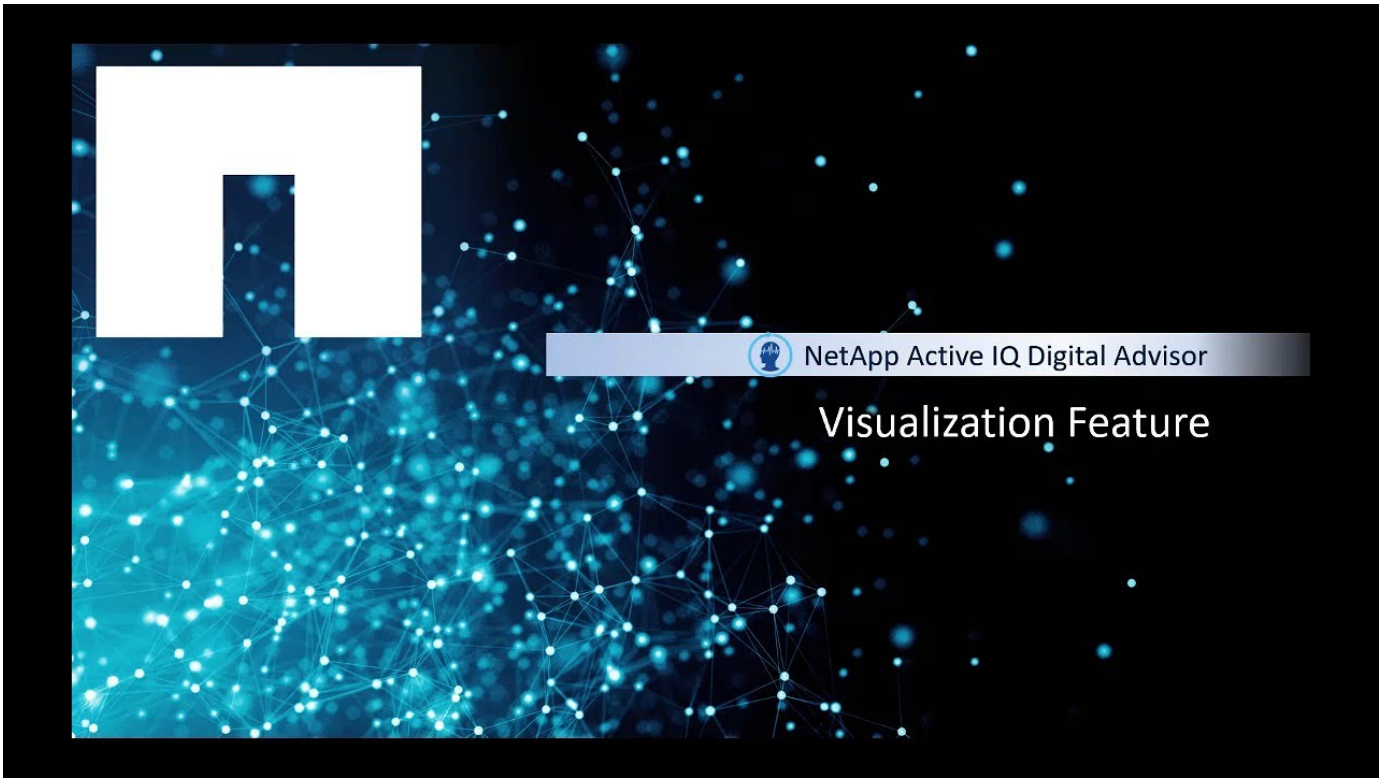
1. Click **Renewals** from the **Planning** widget.
2. Select the systems that you want to renew and click **Renew**.
3. Optionally, provide additional comments.
4. Click **Send**.

Analyze wellness of clusters and nodes

You can analyze the wellness of your clusters and nodes using ClusterViewer, a one-stop source for information on the physical and logical configuration of your clusters and nodes.

ClusterViewer provides information, such as stack diagrams of your nodes, storage usage and efficiency, headroom in hardware capacity, and so on, that helps you take informed decisions to improve the wellness of your clusters and nodes.

You can view visualizations or graphical representations of the physical configuration of your nodes at cable, stack, and RAID Disk levels. You can also download the visualizations in SVG format.



Steps

1. In the **Inventory** widget, select the cluster or node (host) that you want.
2. At the cluster or node level, click **ClusterViewer** next to the **Configuration** widget.
3. Click the **Visualization** tab to view a graphical representation of the cluster.

Analyze the sustainability of your storage system

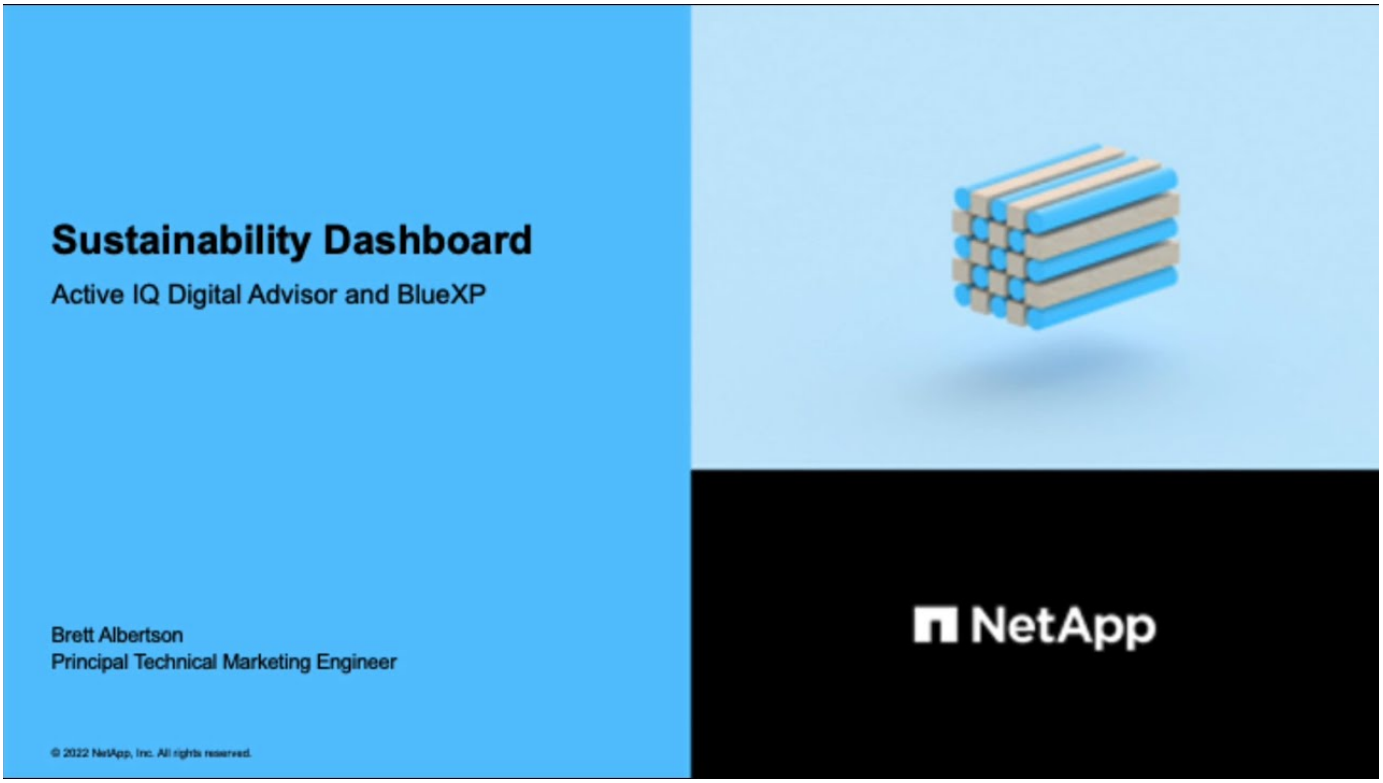
Learn about sustainability

Sustainability, as a service, allows you to reduce the energy consumption and enables you to work towards your environmental goals. This enables you to align your storage systems with eco-friendly practices and achieve the sustainability targets.

You can view the sustainability score, and projected usage of power, direct carbon, and heat from the Sustainability dashboard. You can adjust the carbon mitigation percentage for specific sites. You can also view the sustainability score at the cluster level. Based on the sustainability score, you can assess the sustainability posture and implement NetApp's recommended actions to improve the score. To learn more about the Sustainability dashboard, go to Sustainability dashboard overview.

Sustainability is supported on Cloud Volumes ONTAP, AFF systems (A-Series and C-Series), E-Series, FAS, and StorageGRID systems.

You can view the following video to understand the Sustainability dashboard:



Benefits of sustainability

Sustainability offers the following benefits:

- Accelerate performance by reducing the number of storage devices to store the same amount of data.
- Lower storage costs by optimizing storage systems utilization.
- Reduce carbon footprints by using renewable energy at data centers.
- Improve energy efficiency by implementing energy-efficient policies.

Get started with Sustainability dashboard

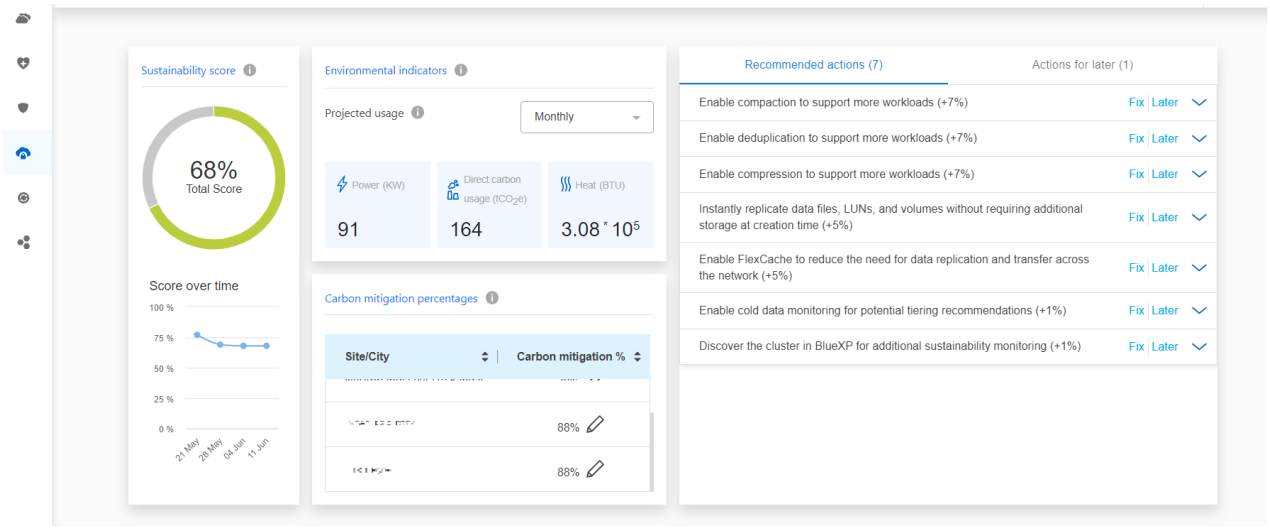
Sustainability dashboard provides AIOps-enabled reporting and scoring with actionable insights to improve your sustainability posture. You can access the Sustainability dashboard through NetApp BlueXP or Digital Advisor.

BlueXP

To log in to BlueXP, you can use your NetApp Support Site credentials or you can sign up for a NetApp cloud login using your email and a password. Learn more about logging in to BlueXP.

Steps

1. Open a web browser, and go to the BlueXP console.
   The NetApp BlueXP login page appears.
2. Log in to BlueXP.
3. From the BlueXP left navigation, select **Governance** > **Sustainability**.
   The Sustainability dashboard appears.



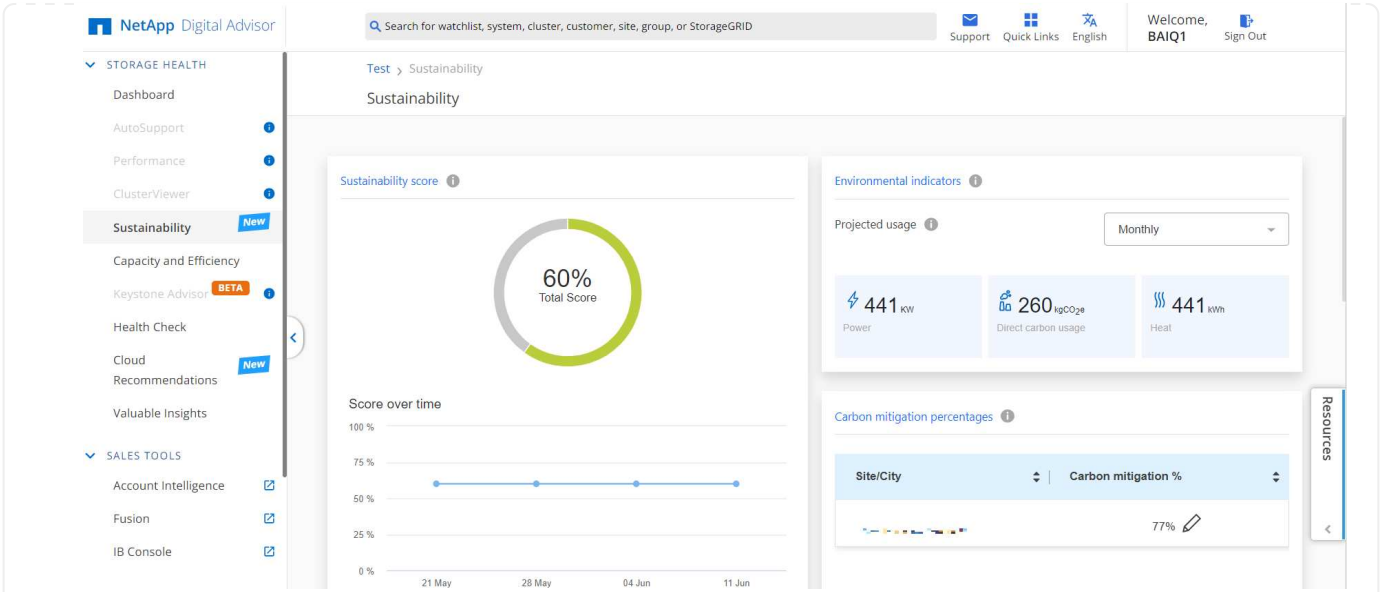
If the Sustainability dashboard is not set up, the option **Add NSS account** appears. Provide your NetApp Support Site (NSS) credentials to view your Sustainability dashboard and the systems associated with your account.

Digital Advisor

To log in to Digital Advisor, you can use your NetApp Support Site credentials.

Steps

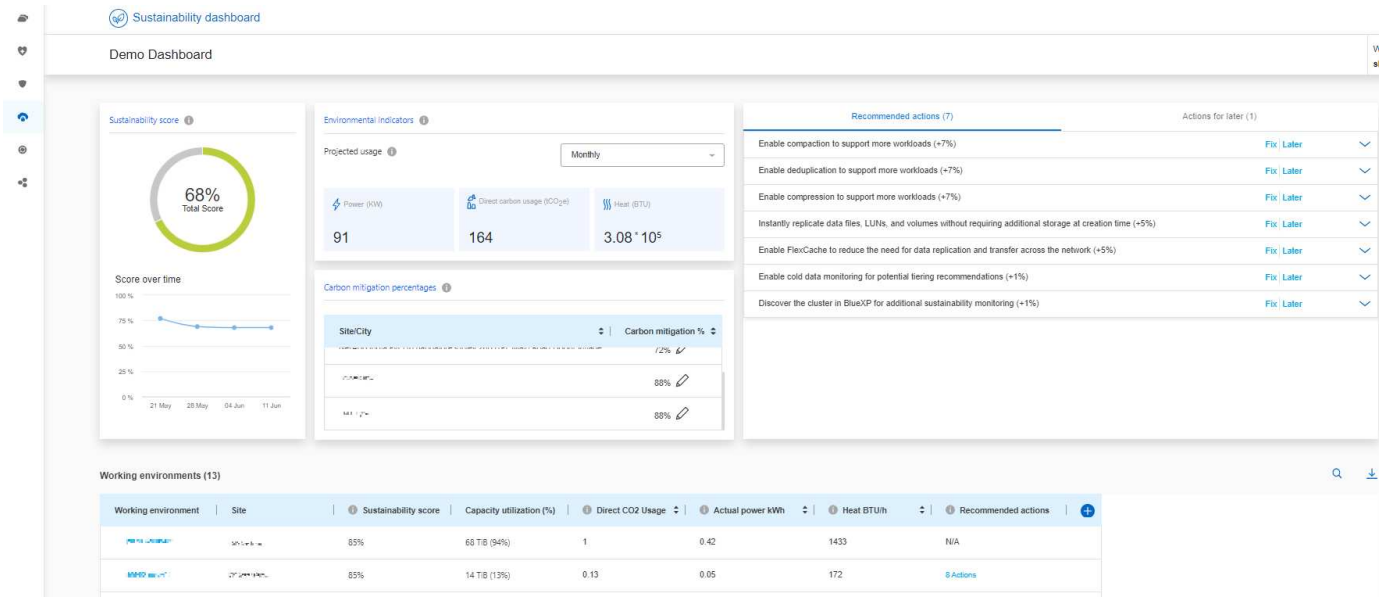
1. Open a web browser, and go to the Digital Advisor login page.
2. Provide your username and password and click **Sign In**.
3. From the left navigation, select **STORAGE HEALTH** > **Sustainability**.



The **Sustainability** option is disabled if the watchlist is not configured. To enable it, you can either create a watchlist or perform a search using customer name, site name, group name, StorageGRID, hostname, cluster, serial number, or system ID. Learn more about watchlist.

Sustainability dashboard overview

Sustainability dashboard provides an environmental assessment of your storage systems and actionable insights for improvement in the form of NetApp's recommended actions.

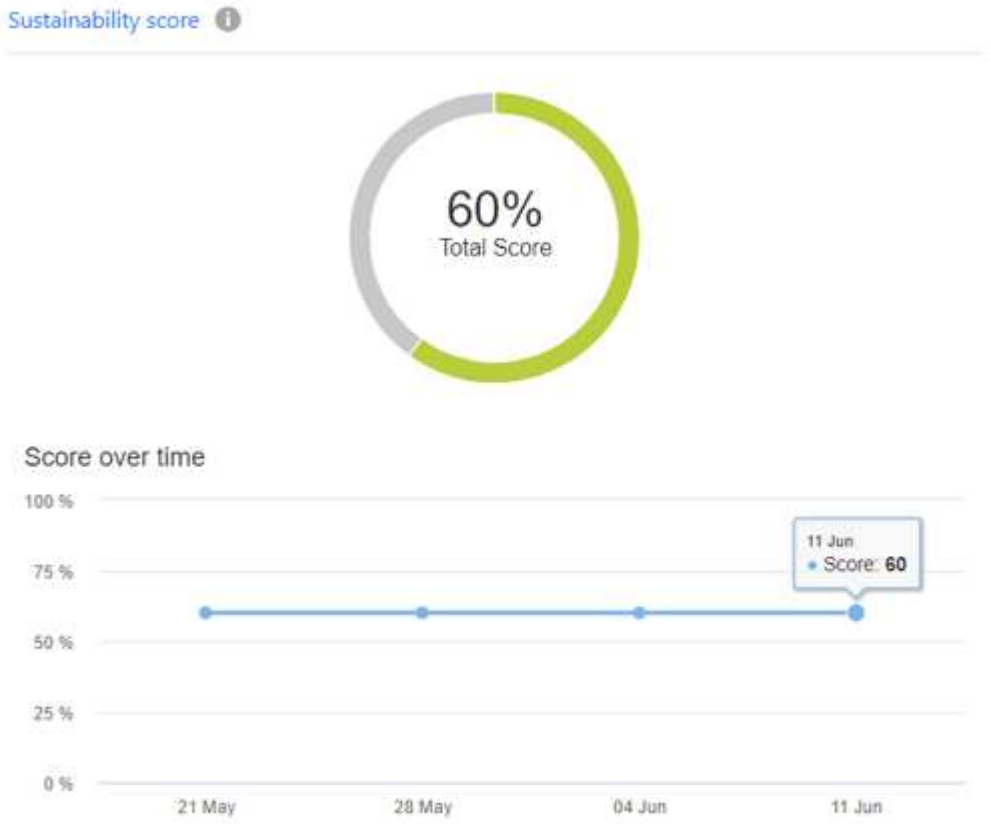


AutoSupport should be enabled for accurate calculation of the sustainability score.

Sustainability score: Displays the total score indicating the environmental sustainability of your storage systems. You can assess the sustainability level of your storage systems based on the following range:

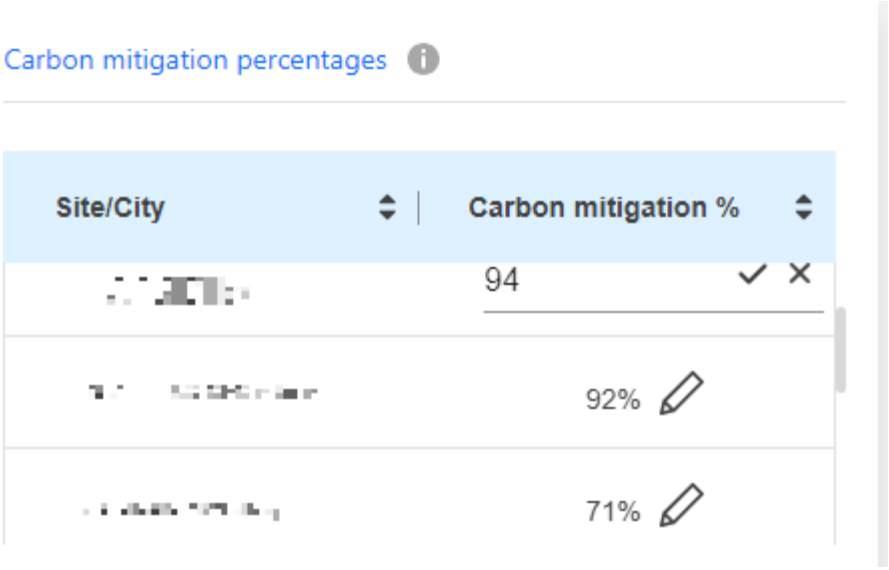
- 76 - 100: Indicates that sustainability is a top priority.
- 51 - 75: Indicates a high level of investment in sustainability initiatives.
- 26 - 50: Indicates good progress towards sustainability initiatives.
- Less than 25: Indicates the need for improvement in sustainability practices.

You can see the graphical representation of the score for up to 5 weeks, which is updated on a weekly basis. You can also see the reason for the increase or decrease in the sustainability score by hovering over the graph.



Environmental indicators: Displays projections for your power, direct carbon usage, and heat emission to evaluate the environmental health of your storage systems. These projections are based on actual power, if unavailable, typical power values. You can view these projections monthly, quarterly, or yearly by selecting the desired option from the drop-down in the top right corner of this section.

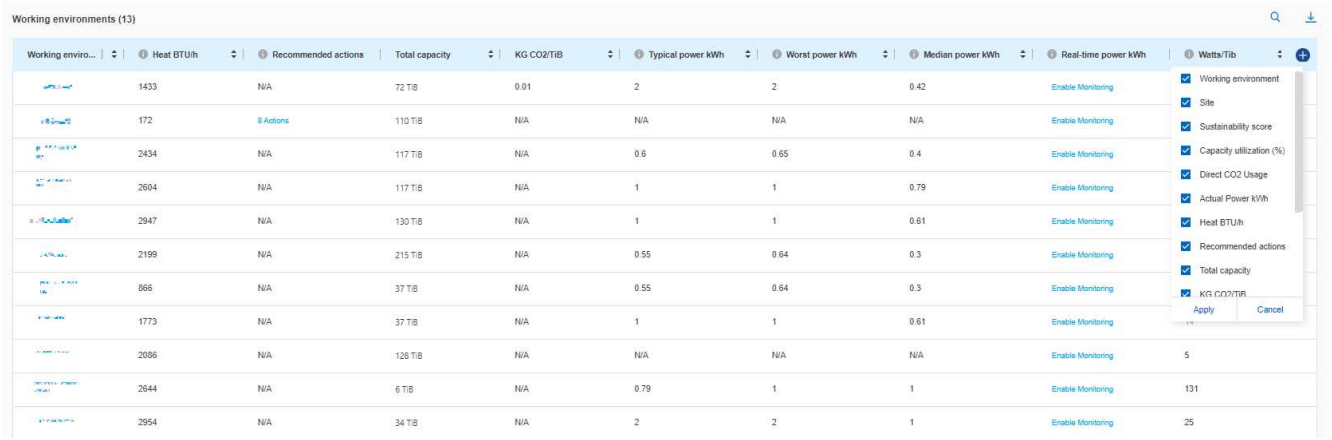
Carbon mitigation percentages: Displays the percentage of carbon mitigation at each site/city, and the presented baseline values are based on your location. You can adjust the carbon mitigation percentage for specific sites by clicking the icon located next to the percentage values, and the carbon numbers will automatically adjust accordingly.



Recommended actions: Displays the list of recommended actions to improve the sustainability score of your storage systems. These actions can be taken immediately, or later.
For more information on how to improve the sustainability score, see Improve sustainability score.

Working environments: Displays environmental parameters in the table that can help in identifying clusters for moving to more efficient storage. From this table, you can:

- View the sustainability score at cluster level, select the cluster name to access **ClusterViewer**, take specific recommended actions to improve the sustainability. For more information, see Improve sustainability score at cluster level.



- Enable monitoring from the **Real-time power** column to view the real-time power details at the cluster level. For more information, see Cloud Insights.

Improve sustainability score

Sustainability dashboard provides recommended actions that you can implement to improve the overall sustainability score and the cluster-level sustainability score.

To get the best results from the dashboard, you must enable AutoSupport. If AutoSupport is not enabled, the data will be based on product specifications. To get real-time power details, you need to enable Cloud Insights. For more information on how to enable Cloud Insights, see Cloud Insights.

Sustainability score computation

The sustainability score is calculated based on a set of rules related to storage systems, with each rule addressing specific risks and providing recommended actions for mitigation. Every rule is given a score to reflect its importance. For example, if there are three rules associated with storage systems: maintaining ambient temperature, ensuring ideal capacity utilization, and using a titanium power supply, with scores of 30, 40, and 30 points, respectively. Adding these scores gives a total of 100 points, which acts as the denominator.

If storage systems meet all criteria perfectly would achieve a sustainability score of 100%. If systems perform at half the optimal level might achieve a score of 50%. The total points serve as a standard, and it is used to compare the actual performance against the ideal performance. You can implement the recommended actions to enhance compliance with these rules, which will improve the sustainability score.

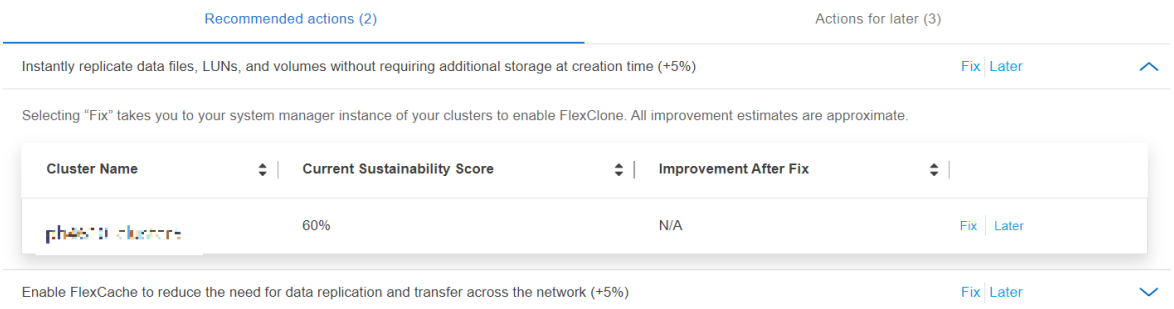
The sustainability score is initially calculated at the cluster level, and then it is aggregated at other levels, such as customer or watchlist level.

Improve overall sustainability score

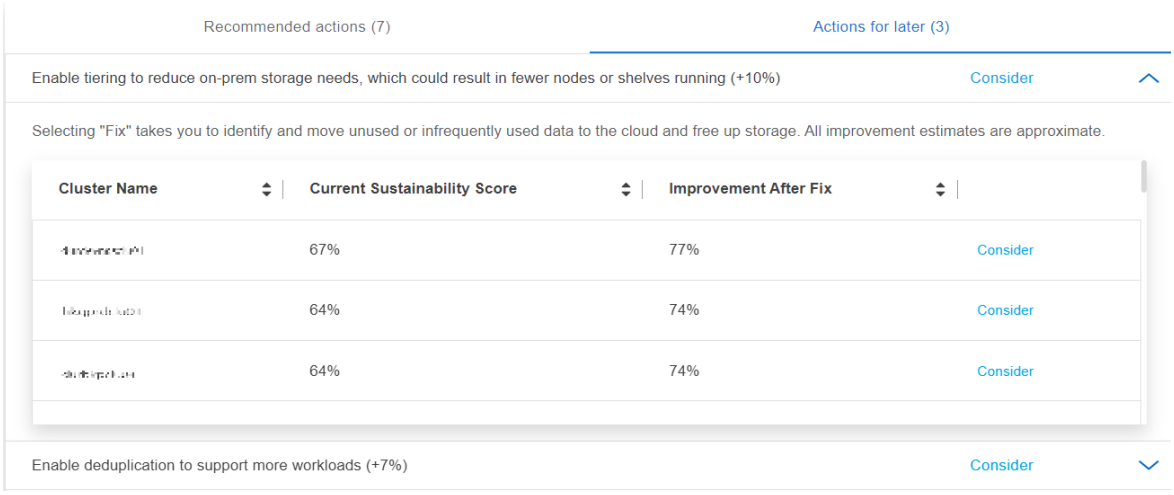
You can follow these steps to improve the overall sustainability score and that focuses on sustainability efforts at company level:

BlueXP

1. Go to **Sustainability** from the **Governance** category available in the BlueXP left navigation.
2. Go to the **Recommended actions** tab.
   - You can select **Fix** to take these actions immediately, or select **Later** to address these actions later.
   - If you plan to address the actions immediately, select **Fix**.
     - It expands the view of the selected recommended action. You can also expand the recommended action view using the down arrow. In the expanded view, you can see the cluster name, the sustainability score, and subsequent increase if you proceed with the **Fix** option.



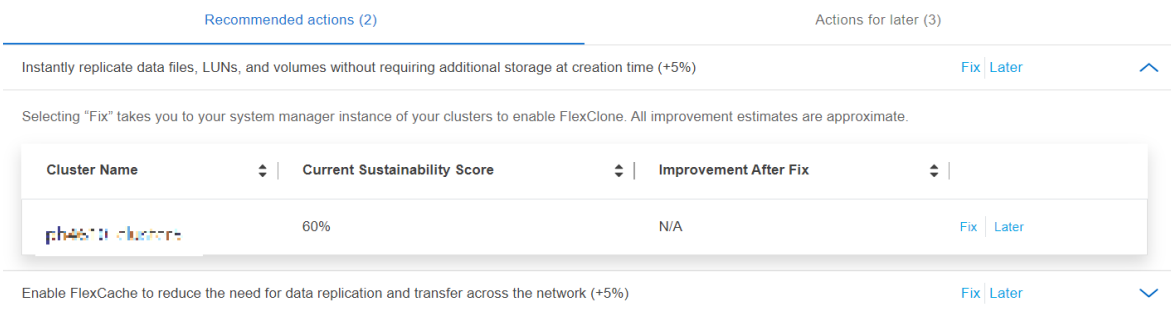
   - If you plan to address the actions later, select **Later**.
     - If you select **Later**, it moves the selected recommended action to the **Actions for later** tab. The selected action will be postponed for 30 days. After 30 days, this action will move to the **Recommended actions** tab.
     - You can also review the postponed actions anytime and can click **Consider** to move them to the **Recommended actions** tab.



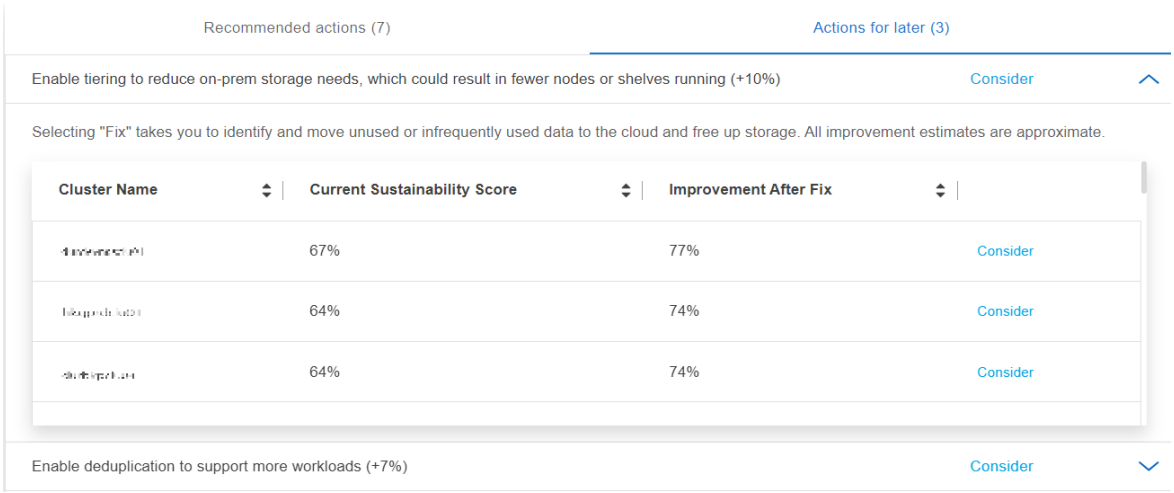
Digital Advisor

1. Go to **Sustainability** from the **STORAGE HEALTH** category available in the left navigation of Digital Advisor dashboard.
2. Go to the **Recommended actions** tab.
   - You can select **Fix** to take these actions immediately, or select **Later** to address these actions later.

- If you plan to address the actions immediately, select **Fix**.
  - The view of the selected recommended action expands. You can also expand the recommended action view using the down arrow. In the expanded view, you can see the cluster name, the sustainability score, and subsequent increase if you proceed with the **Fix** option.



- If you plan to address the actions later, select **Later**.
  - If you select **Later**, it moves the selected recommended action to the **Actions for later** tab. The selected action will be postponed for 30 days. After 30 days, this action will move to the **Recommended actions** tab.
  - You can also review the postponed actions anytime and can click **Consider** to move them to the **Recommended actions** tab.

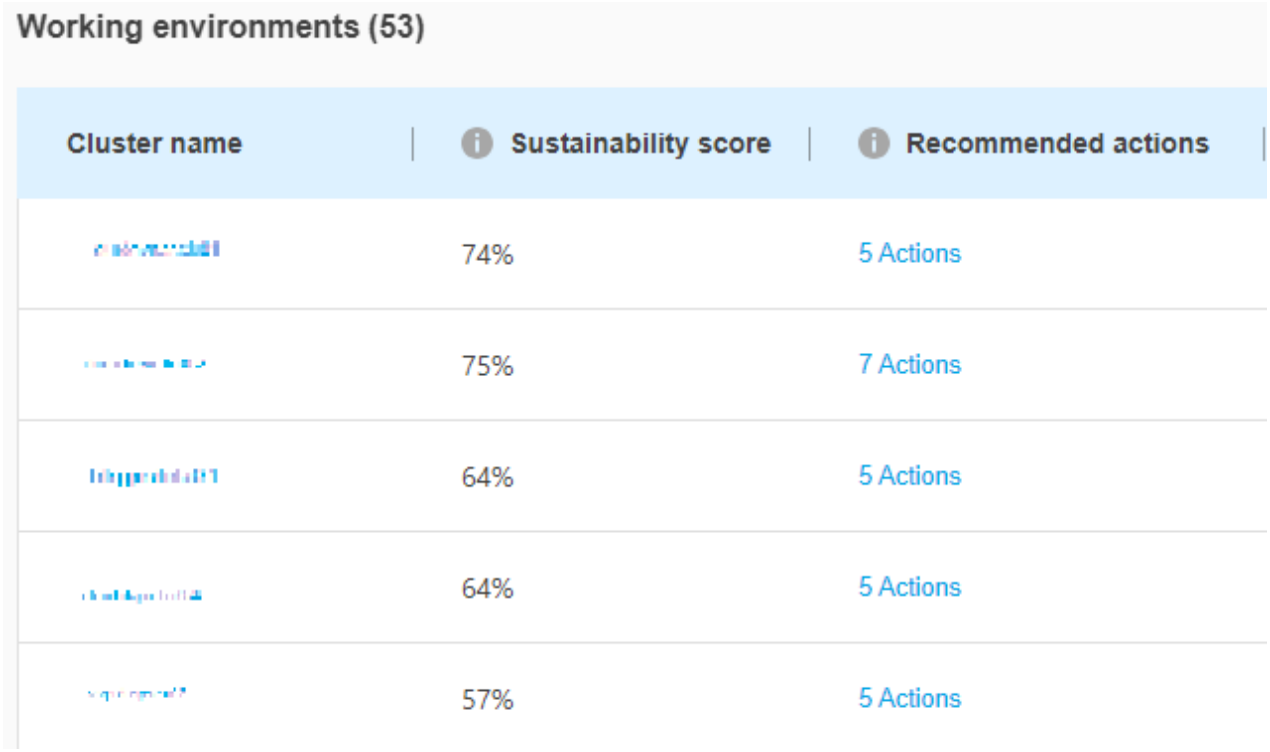


Improve sustainability score at cluster level

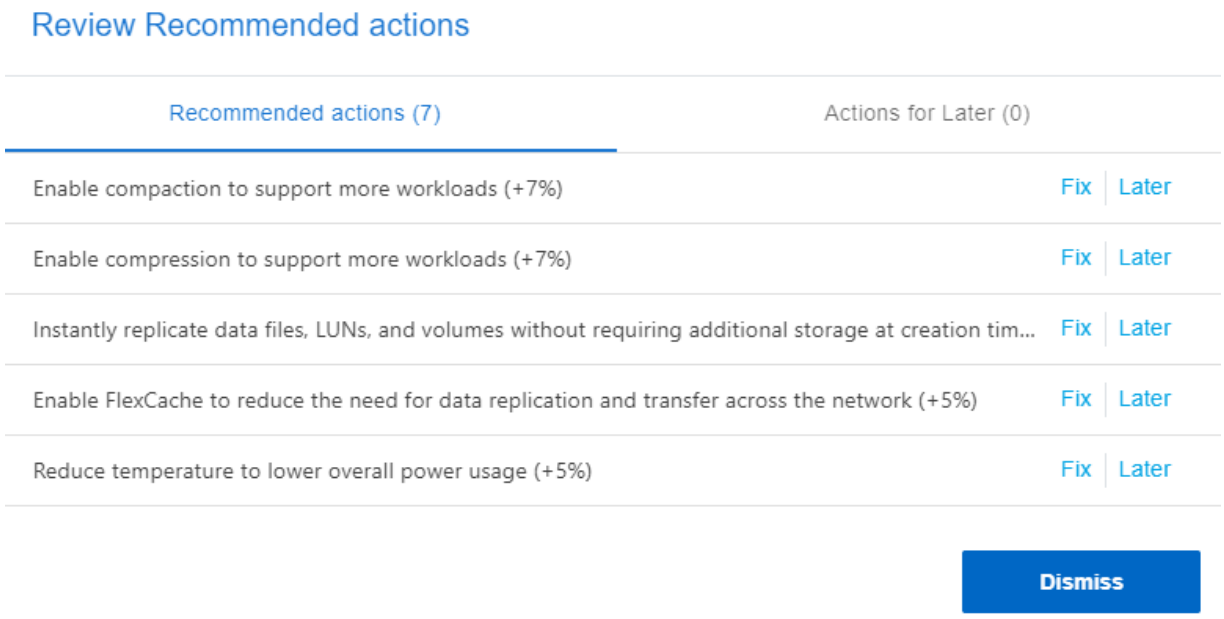
You can follow these steps to improve the cluster-level sustainability score that focuses on improving sustainability for a specific cluster:

BlueXP

1. Go to **Sustainability** from the **Governance** category available in the BlueXP left navigation.
2. Go to the **Working environments** table.
3. Click the number of actions from the **Recommended actions** column for the target cluster.



- You can select **Fix** to take these actions immediately, or select **Later** to address these actions later.



- If you select **Later**, it moves the selected recommended action to the **Actions for later** tab. The selected action will be postponed for 30 days. After 30 days, this action will move to the

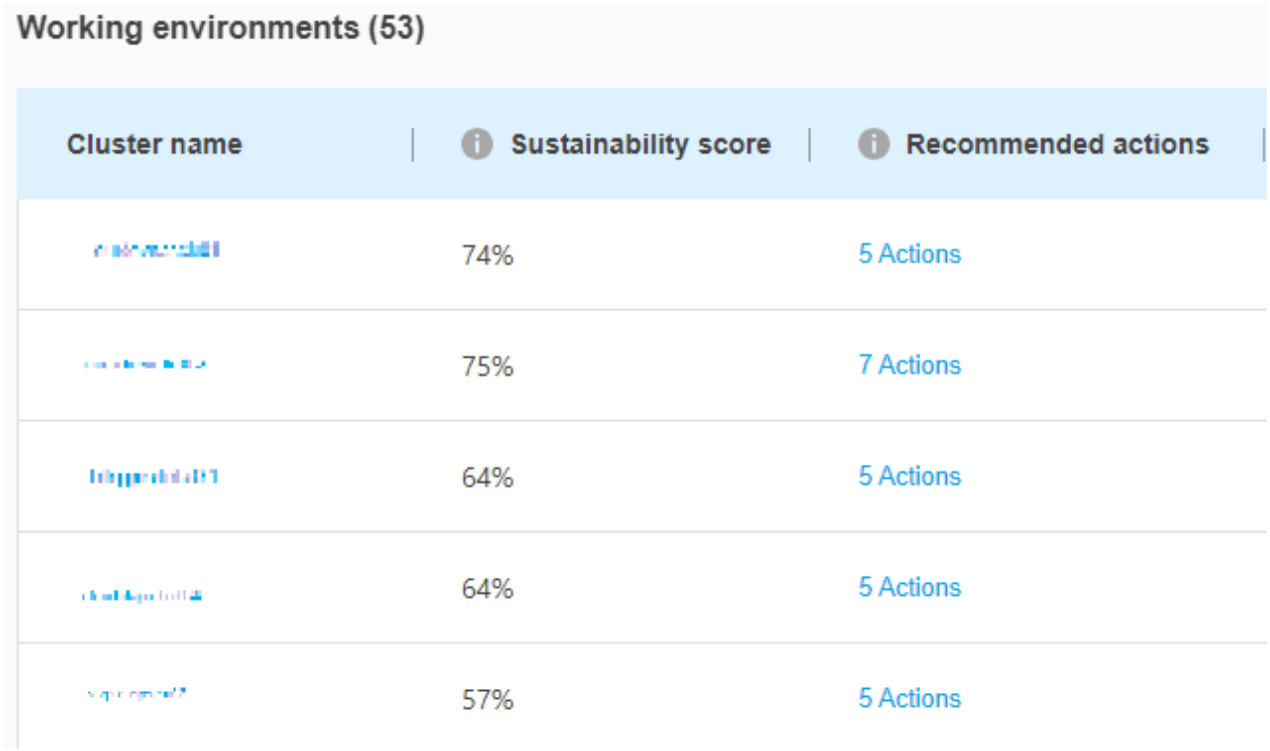
Recommended actions tab.

- You can also review the postponed actions anytime and can click **Consider** to move them to the **Recommended actions** tab.

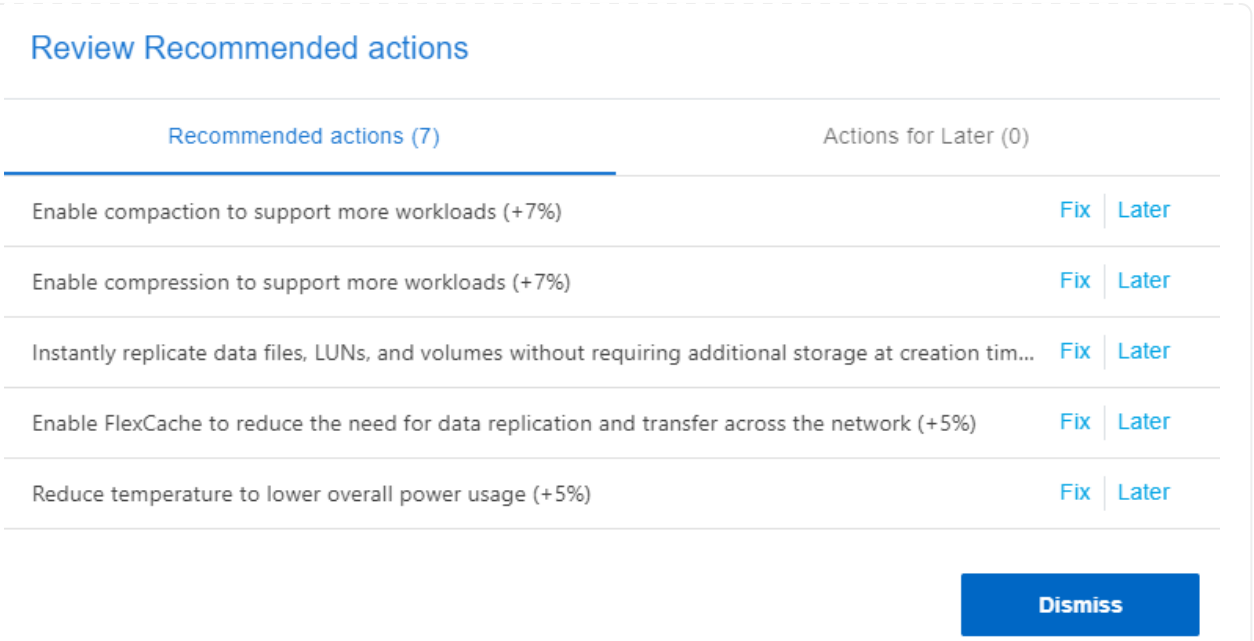
You can add or remove the environmental parameters in the **Working environments** table using the icon, and can export this table in comma-separated values (.csv) format using the icon.

Digital Advisor

1. Go to **Sustainability** from the **STORAGE HEALTH** category available in the left navigation of Digital Advisor dashboard.
2. Go to the **Recommended actions** tab.
3. Go to the **Working environments** table.
4. Click the number of actions from the **Recommended actions** column for the target cluster.



- You can select **Fix** to take these actions immediately, or select **Later** to address these actions later.



- If you select **Later**, it moves the selected recommended action to the **Actions for later** tab. The selected action will be postponed for 30 days. After 30 days, this action will move to the **Recommended actions** tab.
- You can also review the postponed actions anytime and can click **Consider** to move them to the **Recommended actions** tab.

You can add or remove the environmental parameters in the **Working environments** table using the icon, and can export this table in comma-separated values (.csv) format using the icon.

Generate an upgrade plan

Overview

Upgrade Advisor enables you to generate an upgrade plan that includes detailed and step-by-step information required for a successful ONTAP upgrade or revert.

You can generate automated nondisruptive upgrade plans for a single cluster and multiple clusters. You can view upgrade recommendations for a single cluster, which includes a list of risks associated with a cluster, a pre-upgrade check report containing a list of upgrade blockers and warnings, and information about new features and enhancements. The upgrade recommendations are unavailable for multiple clusters. To learn more, see Generate an upgrade plan for single cluster and multiple clusters.

For each cluster in a MetroCluster configuration, generate an individual upgrade plan for complete upgrade instructions.

Before generating an upgrade plan, you should prepare for an ONTAP upgrade. Proper preparation helps in identifying and mitigating potential upgrade risks or blockers before you begin the upgrade process. To learn more, see Prepare for an ONTAP upgrade.

Generate an upgrade plan for single cluster and multiple clusters

You can use Upgrade Advisor to view the list of clusters that are eligible or ineligible for an upgrade. You can view upgrade recommendations for an eligible cluster and generate an upgrade plan. You can fix the issues with an ineligible cluster to make it eligible for an upgrade.

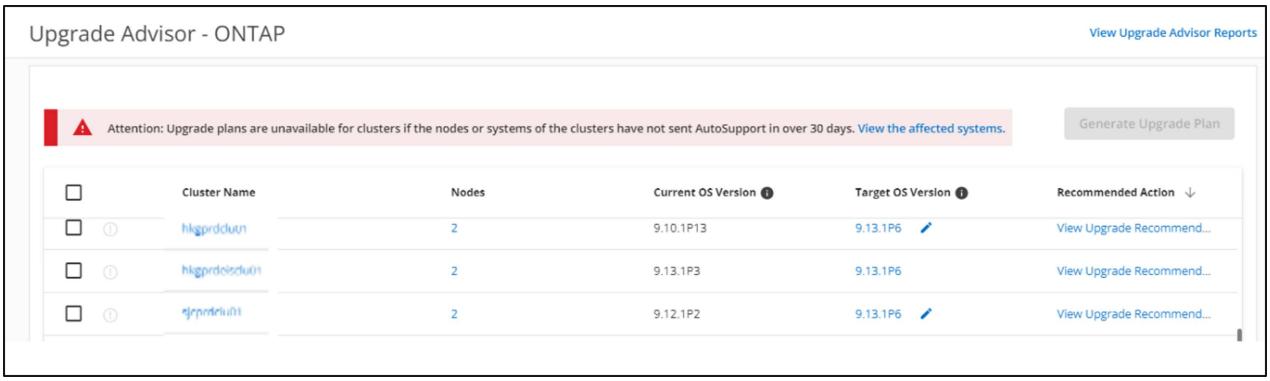
You can follow these steps to generate an upgrade plan for a single cluster and multiple clusters:

Single cluster

1. On the dashboard, click number of clusters in the **Upgrade Advisor** widget.

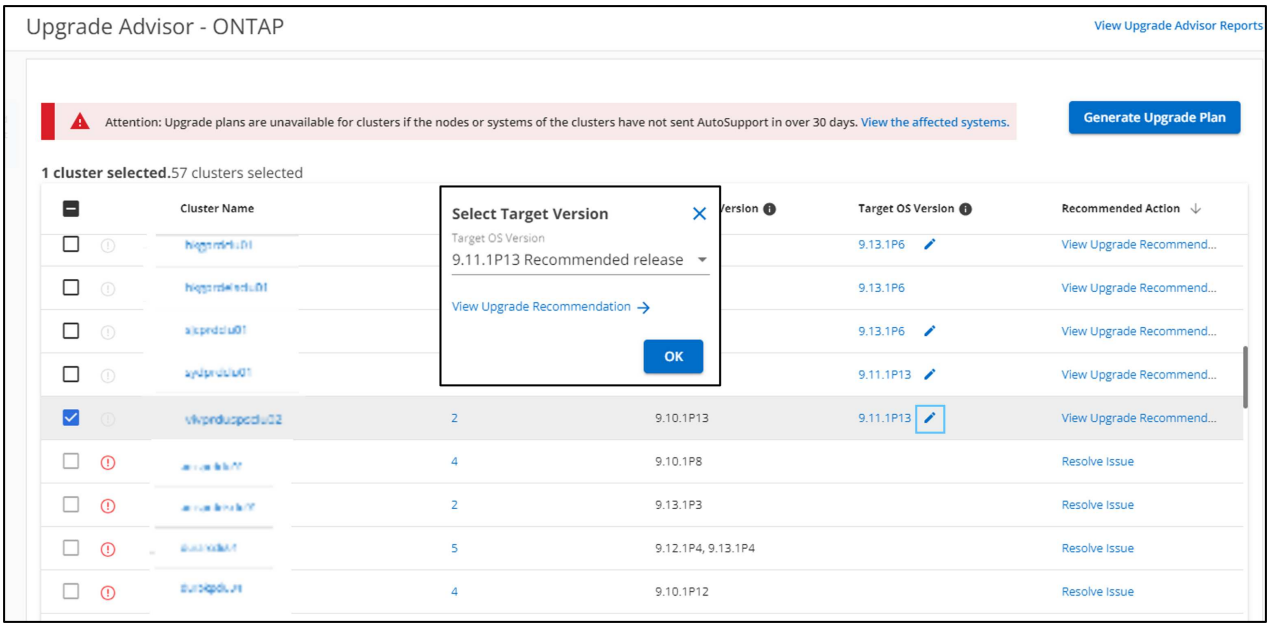
   The **Upgrade Advisor-ONTAP** page appears.

2. You can view a list of eligible and ineligible clusters for an upgrade.

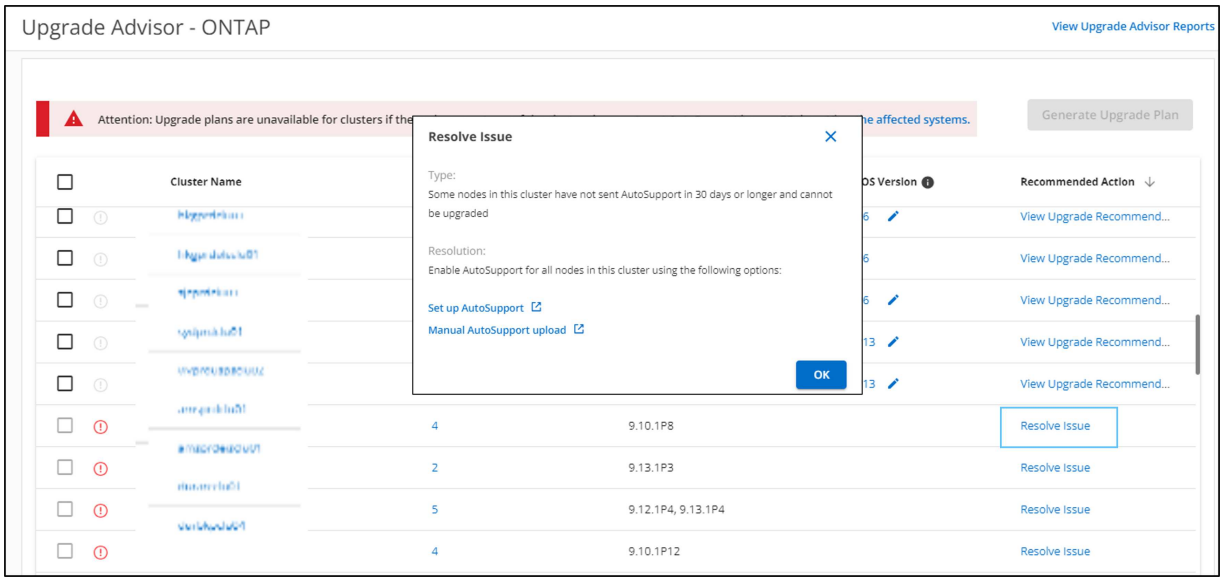


3. Select a cluster for an upgrade.

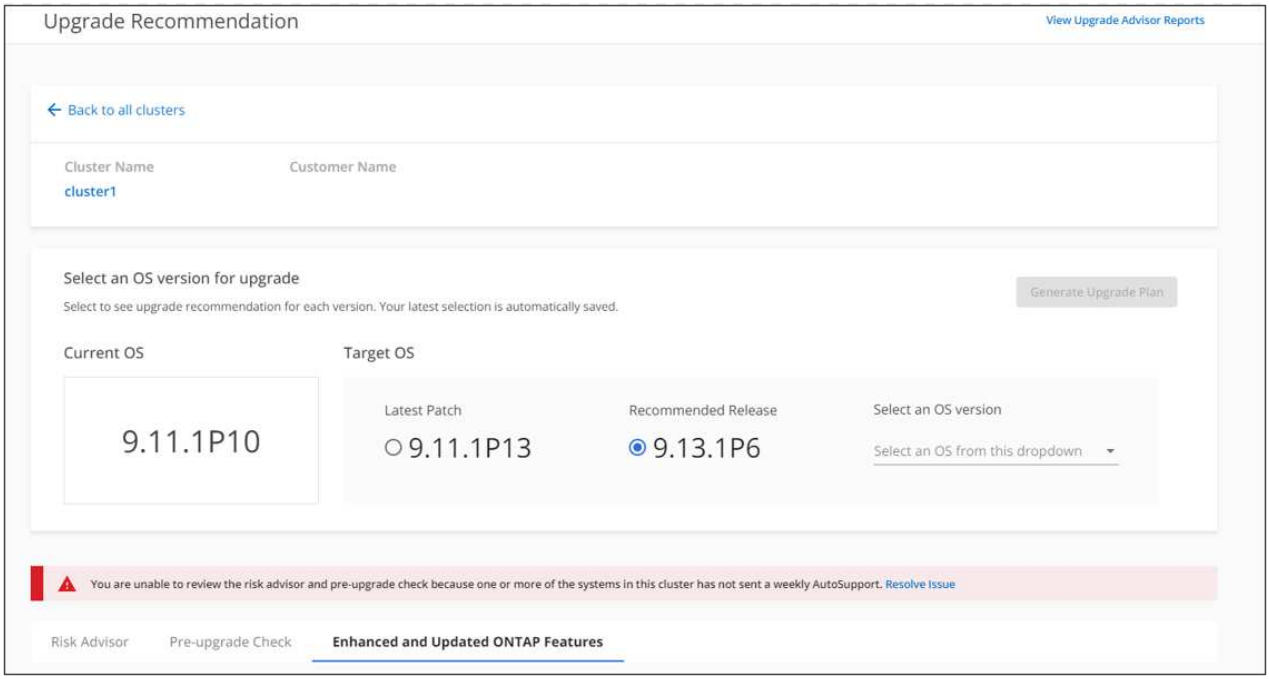
   The **Target OS Version** column displays the recommended target OS version. You can click the icon to select another target OS version of a cluster.



- You can click the number of nodes in the **Nodes** column to see the node summary of a cluster.
- You can click **Resolve Issues** from the **Recommended Action** column to fix the issues with an ineligible cluster to make it eligible for an upgrade.

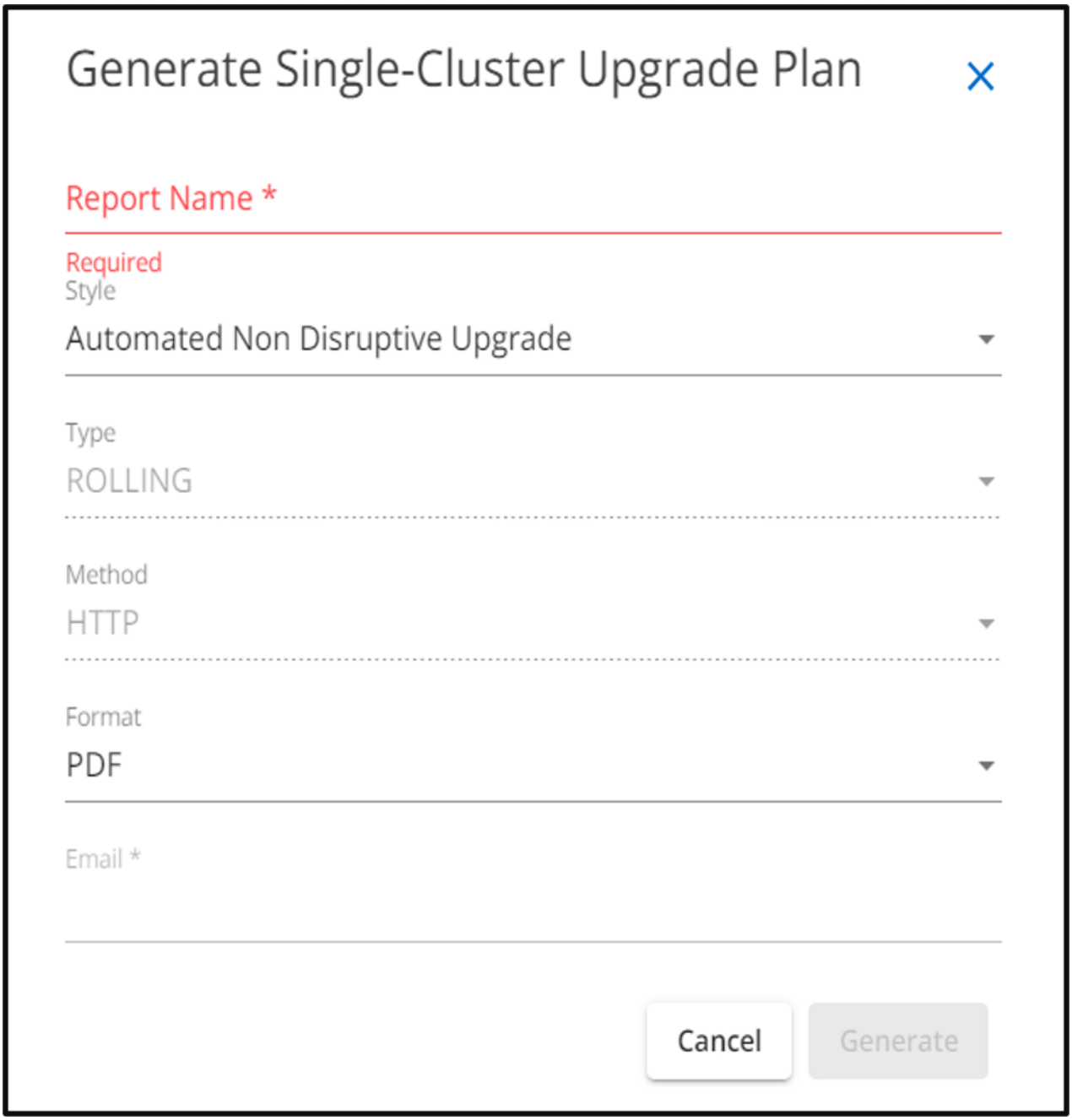


4. Click **Generate Upgrade Plan**.
   You will be redirected to the **Upgrade Recommendation** page.
5. On the **Upgrade Recommendation** page, you can view the details of the risks associated with a cluster through the **Risk Advisor** tab. You can view the upgrade blockers, upgrade warnings, and required actions through the **Pre-upgrade Check** tab, and information about the new features and enhancements that are relevant to the selected target OS version through the **Enhanced and Updated ONTAP Features** tab.



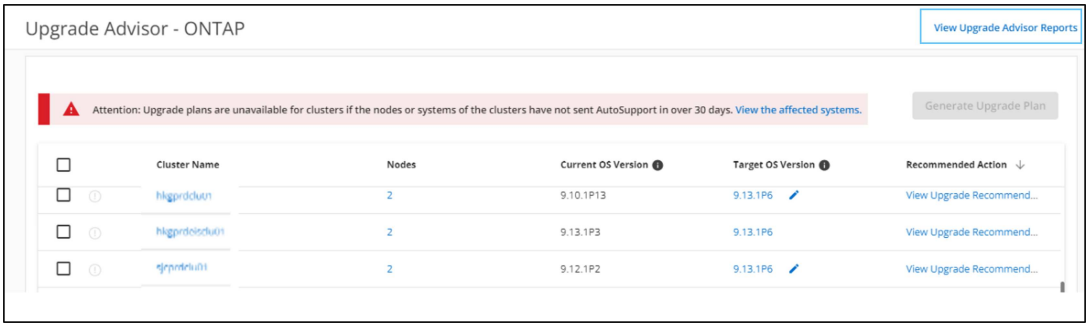
- You can select another target OS version and view the risk summary, pre-upgrade check report, and information on new features and enhancements related to that target OS version.
- You can click the Export icon to export the risk summary to an Excel sheet.

6. Click **Generate Upgrade Plan** from the **Upgrade Recommendation** page.
7. Provide the details in the displayed pop-up.



8. Click **Generate**.
   You will be redirected to the **Reports** page.
9. You can download the upgrade plan from the **Reports** page once it is available.

You can click **View Upgrade Advisor Reports** to go to the **Reports** page.



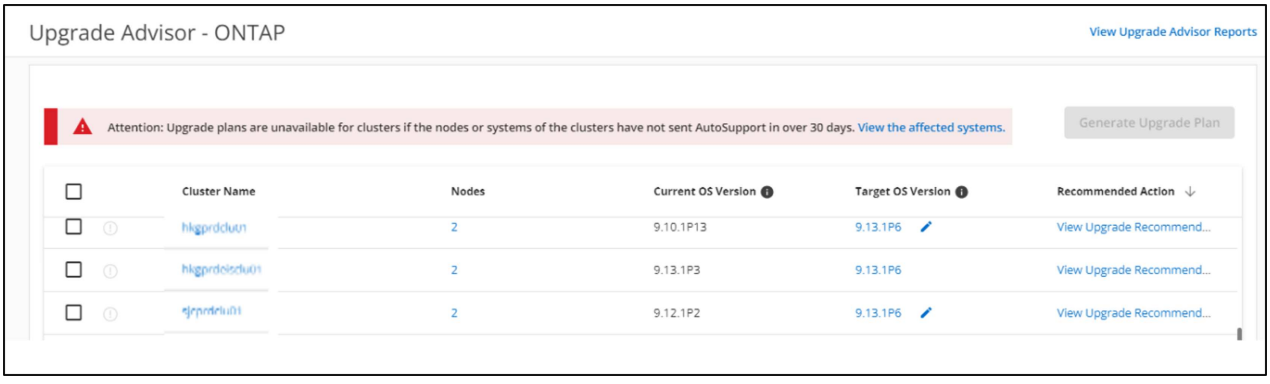
There are some tasks you should perform to confirm the readiness of the cluster after you upgrade ONTAP. To learn more, see What to do after an ONTAP upgrade.

Multiple clusters

1. On the dashboard, click number of clusters in the **Upgrade Advisor** widget.

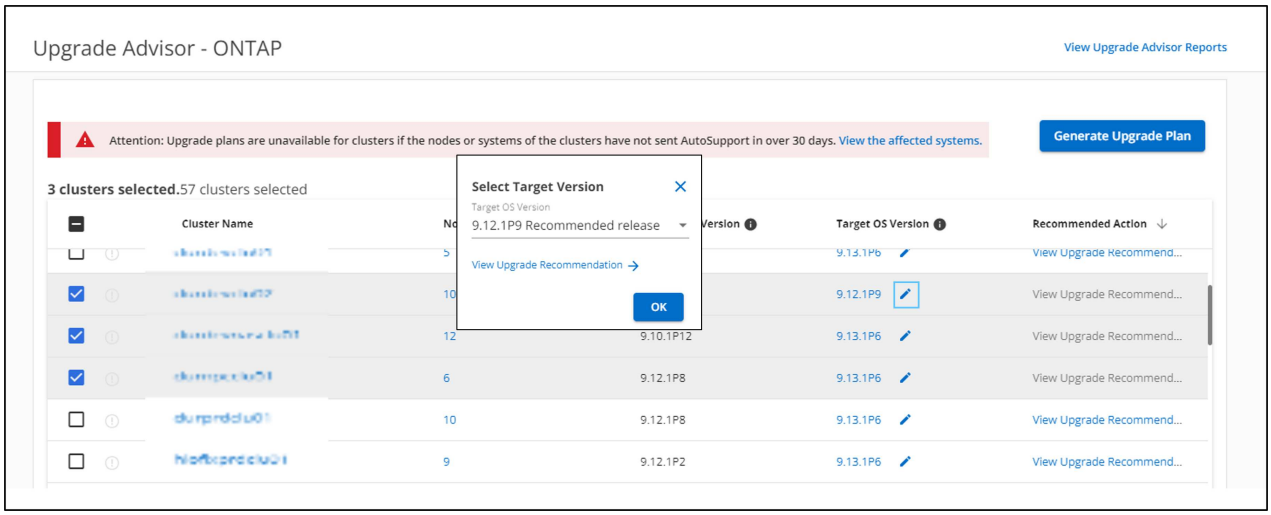
   The **Upgrade Advisor-ONTAP** page appears.

2. You can view a list of eligible and ineligible clusters for an upgrade.

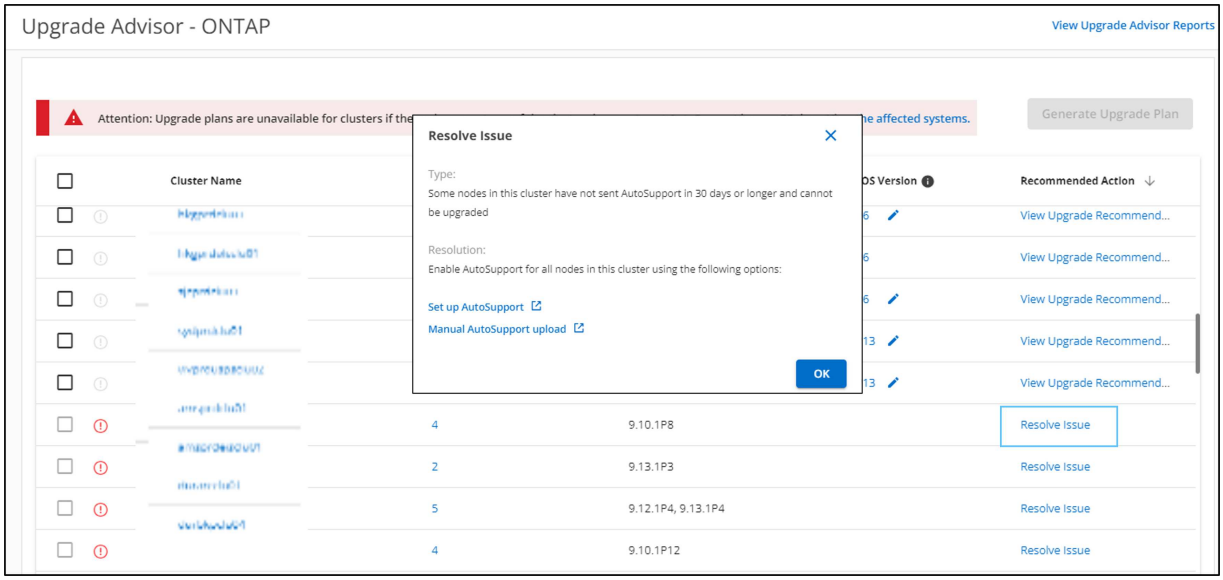


3. Select clusters for an upgrade.

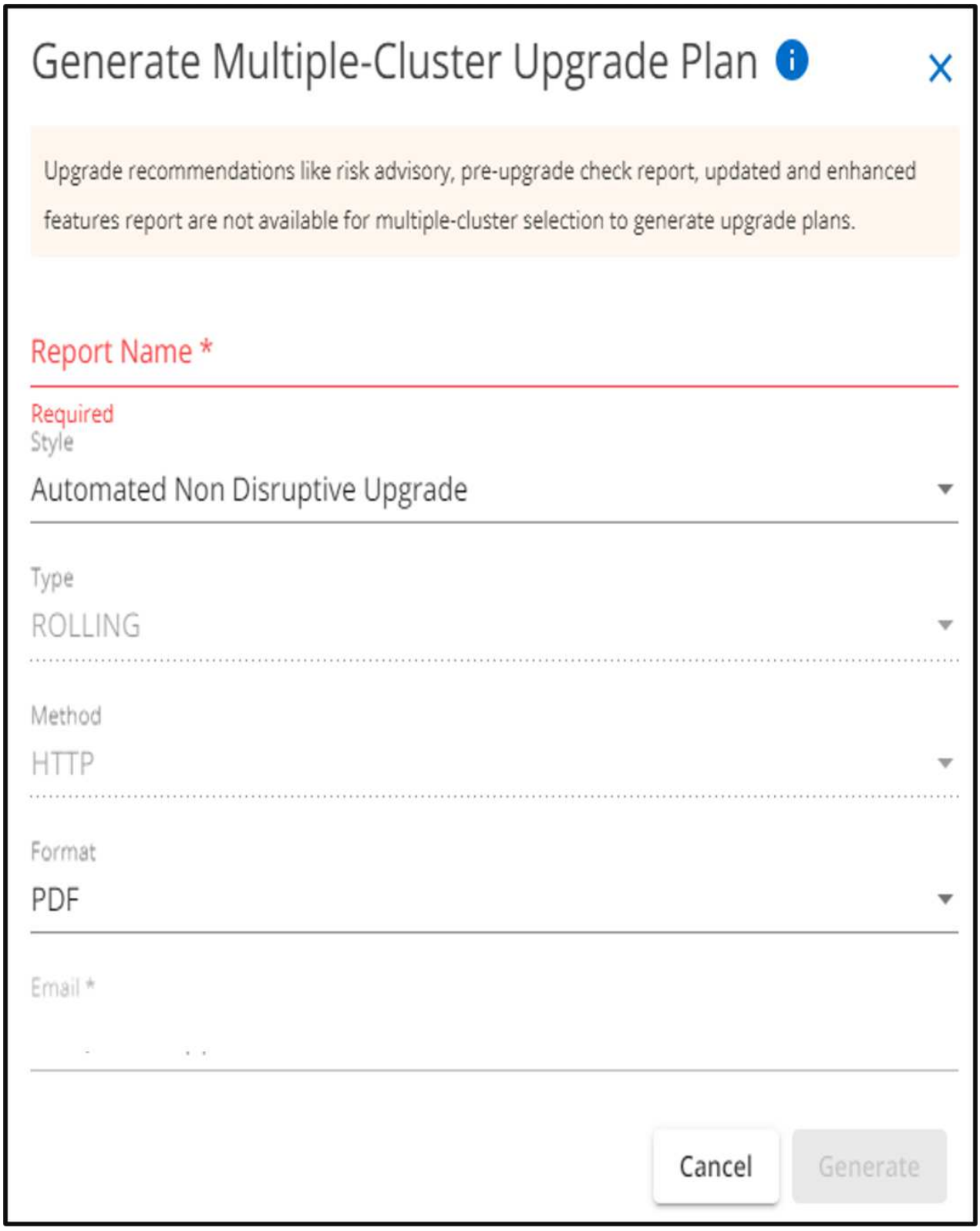
   The **Target OS Version** column displays the recommended target OS version.You can click the icon to select another target OS version of a cluster.



- You can click the number of nodes in the **Nodes** column to see the node summary of a cluster.
- You can click **Resolve Issues** from the **Recommended Action** column to fix the issues with ineligible clusters to make them eligible for an upgrade.

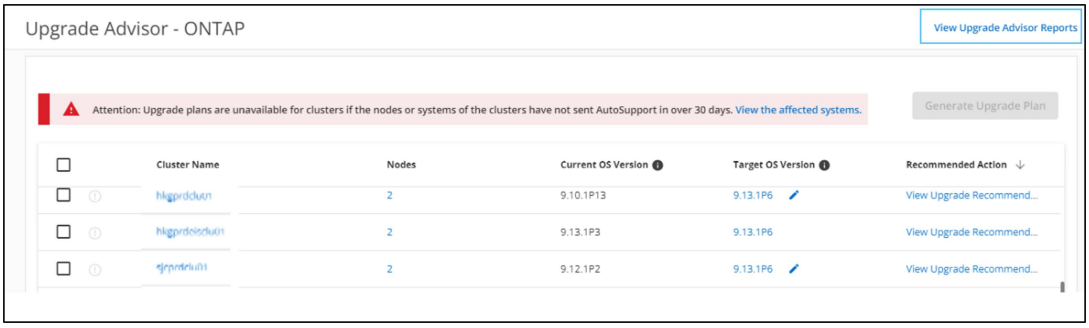


4. Click **Generate Upgrade Plan**.
5. Provide the details in the displayed pop-up.



6. Click **Generate**.
   You will be redirected to the **Reports** page.
7. You can download the upgrade plan from the **Reports** page once it is available.

You can click **View Upgrade Advisor Reports** to go to the **Reports** page.



There are some tasks you should perform to confirm the readiness of the cluster after you upgrade ONTAP. To learn more, see What to do after an ONTAP upgrade.

View firmware update recommendations

Customers can now save time and effort by allowing Control Tower to automatically update their systems with the latest firmware versions, eliminating the need for manual intervention or scheduling. This update reduces the risk of encountering issues due to outdated or incompatible firmware versions, ensuring optimal system performance, stability, and security.

Customers will receive timely notifications and alerts about the status of the firmware updates, with options to enable AutoSupport and auto-update settings.

Steps

1. On the dashboard page, click **Other recommendations** in the **Upgrade Advisor** widget.
2. Click **View recommendations** to view the list of recommendations.
3. In the **Update Status** column, click **See progress** to view the clusters that are eligible for an update.
4. In case of any issues, click on the respective links to view the steps to mitigate the issues.

View system details

View inventory details

The **Inventory** widget provides you with a rollup of the total systems and the support entitled switches that you own. This includes both Digital Advisor enabled and non-enabled products.

You can also generate the report of the selected watchlist and email the report to a maximum of 5 recipients.

View system details

Steps

1. In the **Inventory** widget, click **Systems** to view the system information of all platforms or click the platform type and then click **Systems** to view systems specific to that platform.
2. Click the node or cluster to view detailed information about the system.
3. Download the **Inventory** report to view the system details in .xls format.
4. Download the **Ansible Inventory** report to view the system details in the .yml and .ini formats at the region or site level.

   The Ansible Inventory files can be used with customized Ansible Playbook files to make infrastructure configuration changes.

View support entitled switch details

Steps

1. In the **Inventory** widget, click **Support Entitled Switches** to view information about all the support entitled switches.

Integrating with Cloud Insights to view virtual machines details

Digital Advisor is now integrated with Cloud Insights Basic version to provide a full stack inventory and interoperability checks to customers.

The benefits of this integration are:

- Simplified SaaS monitoring of ONTAP

- Visibility into VMware full-stack monitoring
- Productivity savings for customers through automated interoperability checks to help with ONTAP upgrade planning. This results in smoother ONTAP upgrades and reduces risks of incompatibility with hosts.

This feature is available only for SupportEdge Advisor, SupportEdge Expert, and Digital Advisor Upgrade contracts.

Steps

1. In the **Inventory** widget, click **Virtual Machines** to view the data available in Cloud Insights.
2. Click the **Virtual Machine Overview** tab.
3. Click the **Count of ESX Hosts** to view information about the host.
4. Click the **ESX Name** to navigate to Cloud Insights to view more information.

View valuable insights

The **Valuable Insights** widget provides information about the number of support cases, pending software upgrades, storage efficiency savings, risks mitigated, and others. It also proactively lists the risk notifications from the **Wellness** attribute.

Steps

1. In the **Inventory** widget, click **Systems** to view the system information of all platforms or click the platform type and then click **Systems** to view systems specific to that platform.
2. Click the node or cluster to view detailed information about the system.

   The **Valuable Insights** widget is available on the dashboard.

3. Review the information in the widget to understand the business and technical value received from your

support contract.

View capacity utilization with NetApp Keystone subscription

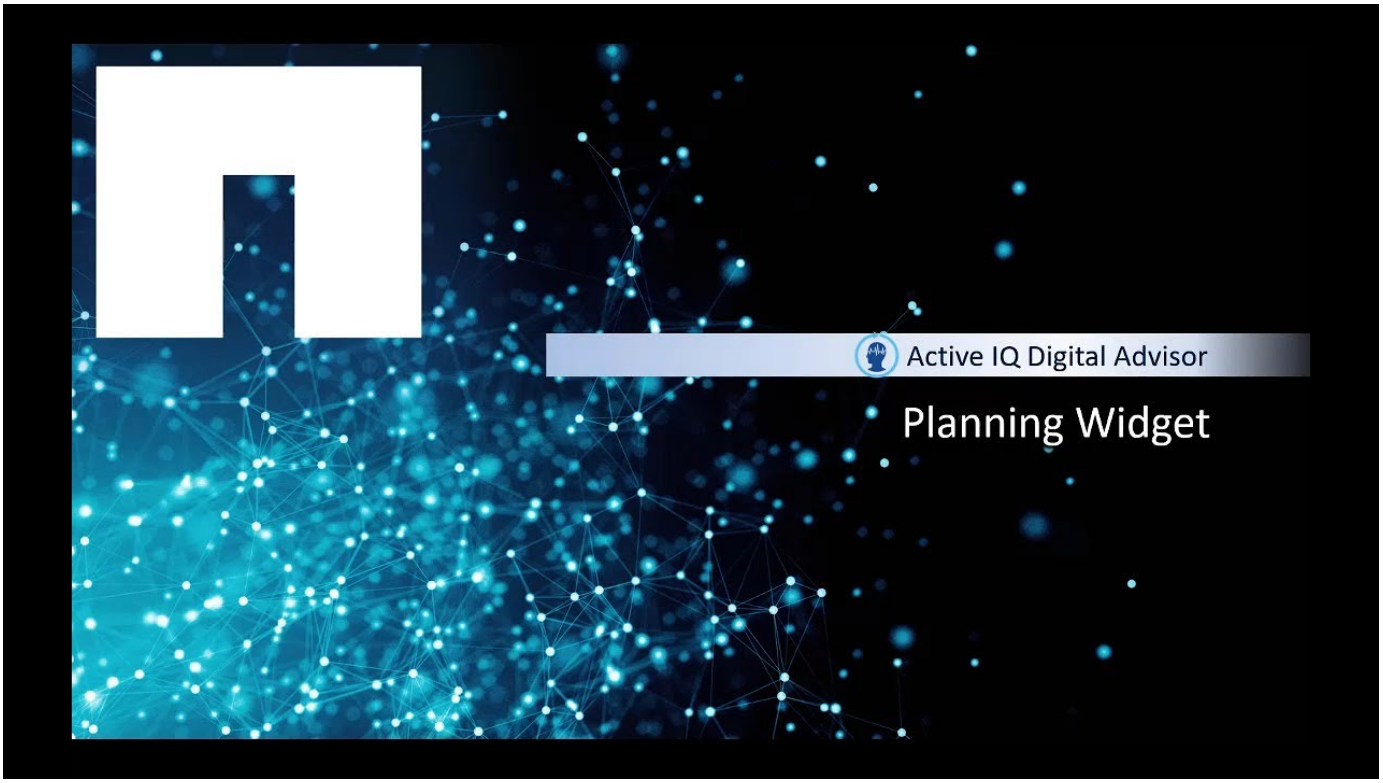
If you are subscribed to NetApp Keystone STaaS services, you can view the Keystone Subscription widget on the Digital Advisor Dashboard.

The Keystone Subscription widget provides you a summary of the capacity usage for your account. It consists of capacity utilization charts with respect to the physical capacity. For more information about the various levels of subscription data and usage information, see Keystone and Digital Advisor.

Identify system requirements proactively

Understand planning

The **Planning** widget helps customers identify capacity requirements that have exceeded 90% capacity or are nearing 90% capacity and identify the software and hardware that have expired or are near expiration in the next 6 months. You can send a request to increase the capacity of your storage system and to renew the hardware and software.



Identify systems reaching capacity limits

Proactively identify systems reaching capacity limits and send a request to increase the capacity of your storage system.

For ONTAP, you can view systems that have exceeded 90% capacity or are to exceed 90% capacity in 1, 3, and 6 months. For StorageGRID, you can view systems that have exceeded 70% capacity or are to exceed 70% capacity in 1, 3, and 6 months.

Steps

1. In the **Planning** widget, click **Capacity Additions**.

   By default, the ONTAP systems that have exceeded 90% capacity or are nearing 90% capacity are displayed.

2. Click **StorageGRID** tab to view the StorageGRID systems that have exceeded 70% capacity or are nearing 70% capacity.
3. Select the systems for which you want to increase capacity.
4. Click **View Capacity Forecast** to view the capacity forecast for the next 6 months.
5. Click **Request to Add Capacity**.
6. Optionally, provide any comments.
7. Click **Send** to send the request to the NetApp storage team to assist with the capacity addition for the selected systems.

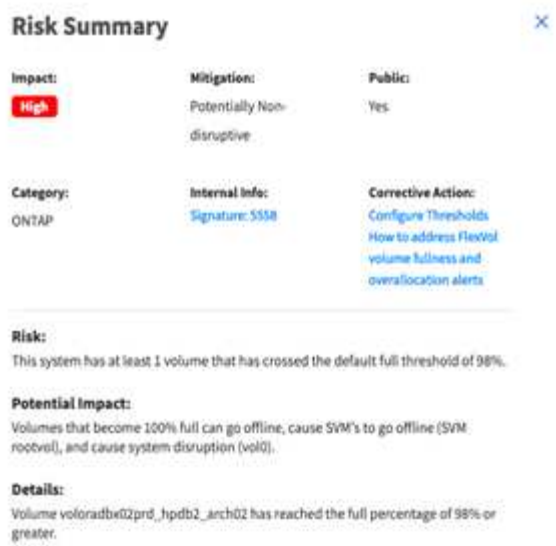
Avoid a volume filling up to prevent an outage

When you log in to Digital Advisor and notice the red badge on the **Configuration** widget. Upon clicking the widget, you see that the volume is 98% full and this might cause an outage. Fixing this issue would avoid a volume filling up, which would make it go read-only resulting in applications accessing it crash and fail.

Steps

1. Log in to Digital Advisor.
2. Click **Actions** in the **Configuration** widget.

3. Click the **Unique Risks** tab. Upon clicking the **Corrective Action** link, you can either change the warning thresholds or allocate more space to the volume.



Evaluate a technology refresh

If you want to identify whether a technology refresh is recommended for your Tech Support contract or hardware, you can use the tech refresh option.

> You can access this feature either through BlueXP economic efficiency (**Governance > Economic efficiency > Tech refresh**) or through NetApp Digital Advisor (**Dashboard > Planning widget > Tech Refresh**).

For more information about this feature, see Evaluate a technology refresh in the BlueXP documentation.

Renew software and hardware of your storage system

You can proactively identify the software and hardware that have expired or are near expiration in the next 6 months, and send a request to renew the hardware and software.

Steps

1. Click **Renewals** from the **Planning** widget.
2. Select the systems that you want to renew and click **Renew**.
3. Optionally, provide additional comments.
4. Click **Send**.

Make informed decisions based on cloud recommendations

Digital Advisor constantly analyzes your system and provides recommendations to improve the performance, efficiency, and health of your system.

> Digital Advisor navigates you to BlueXP to implement the recommendations.

Migration

Provides information about the different types of workloads available within your storage system and identify the workloads that are cloud-ready. Moving workloads to the cloud result in cost savings and provide cloud disaster recovery.

The volumes that meet the following criteria are recommended for migration to Cloud Volumes ONTAP (CVO) and Cloud Volumes Service (CVS):

- Volumes should be using NFS, SMB, CIFS, FCP, or iSCSI protocol
- Root volumes are excluded
- Workloads in the volume are tagged as ORACLE, SAP, SAP HANA, MSSQL, MYSQL, SHAREPOINT, FILESHARE, VIRTUALIZATION and TRIDENT
- System age is greater than 1 year
- Support contract is ending in 6 months

Steps

1. From the left pane, click **Cloud Recommendations**.
2. Click on any one link in the **Migration** pane.
3. Click **Migrate to Cloud** to launch **BlueXP**.

Tiering

Provides information about inactive local tier (aggregate) data, inactive volume data, tiered data, and unmonitored data. You can reduce your storage footprint and associated costs by monitoring and tiering your cold or inactive data to low-cost object storage tiers.

You can enable Inactive Data Reporting (IDR) to generate a zip file with an Ansible Playbook file. This information is available at customer, site, group, watchlist, cluster, and node levels.

The volumes that meet the following criteria are recommended for tiering:

- Volumes should be using NFS, SMB, or CIFS protocol
- Root volumes are excluded
- Inactive Data is more than 50%
- Aggregate Capacity is more than 50%

Steps

1. From the left pane, click **Cloud Recommendations**.
2. Click on any one link in the **Tiering** pane.
3. Click **Tier Data** to launch **BlueXP**.

To learn more about FabricPool, refer to FabricPool Best Practices.

Backup & Archive

Provides information about the systems that should be backed up to the cloud. You can use NetApp Cloud Backup to secure your systems and restore them back when required.

The volumes that meet the following criteria are recommended for backing up to the cloud:

- Root volumes are excluded
- Source volumes and destination systems and volumes that have SnapVault backup are excluded.

Steps

1. From the left pane, click **Cloud Recommendations**.
2. Click on any one link in the **Backup & Archive** pane.
3. Click **Backup to Cloud** to launch **BlueXP**.

Replication

Provides information about the data that should be replicated to the cloud to help in case of disasters.

The volumes that meet the following criteria are recommended for replication to the cloud:

- Root volumes are excluded
- SnapMirror source volumes are excluded
- SnapMirror destination volumes (volume type LS and DP) are excluded

Steps

1. From the left pane, click **Cloud Recommendations**.
2. Click on any one link in the **Disaster Recovery** pane.
3. Click **Replicate to Cloud** to launch **BlueXP**.

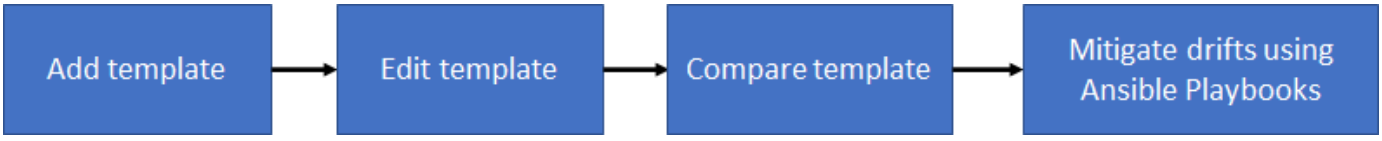
Identify configuration deviation

Understand configuration deviation

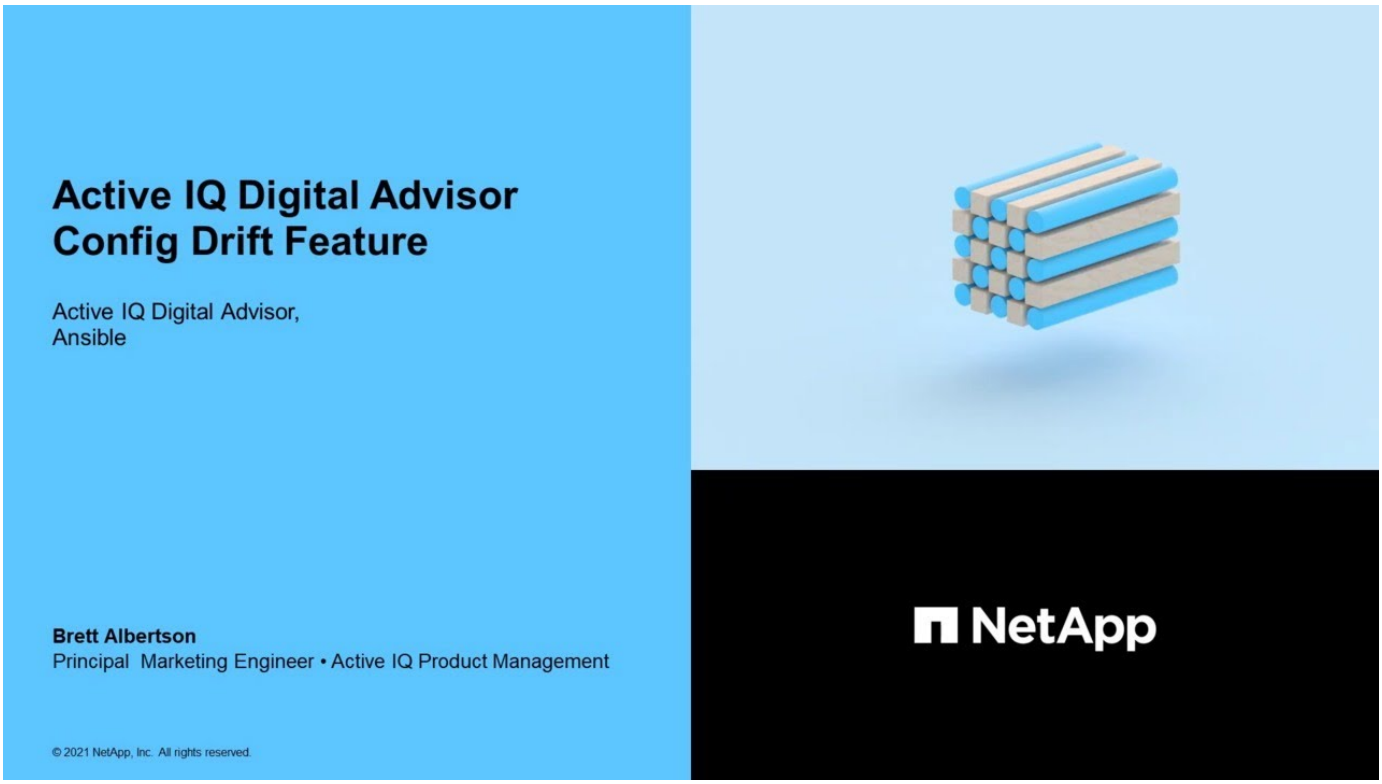
The Config Drift feature identifies configuration deviations by comparing a system template to a “golden” or base system template. You can schedule weekly or monthly drift reports or generate them on-demand. You can mitigate some deviations by using the Ansible Playbooks, which are provided in the config drift report.

This feature is available to systems with Advisor and Expert Support contracts only.

You can look at the following diagram to understand the workflow to identify configuration deviations and generate the report.



You can view the following video to generate and run an Ansible Playbook to fix the configuration deviations:



Add a config drift template

You should add a template to compare the system and cluster configurations and detect the configuration deviations in near real time. The config drift templates are added using systems running AutoSupport data.

About this task

The attributes in a config drift template are editable, and the following groups of the template support regular expressions for some sections:

Group	Section	Attribute
AGGREGATE	AGGR-INFO.XML	name
CLUSTER	CLUSTER-INFO.XML	cluster-name
LUN	LUN.XML	name
VSERVER	VSERVER-INFO.XML	vserver
NETWORK	NETWORK-INTERFACE.XML	vif
DNS	DNS.XML	domains
VOLUME	VOLUME.XML	vol

Using a regular expression, a user can create a config drift report that includes drifts arising from naming inconsistencies of volumes, aggregates, clusters, and so on. For instance, if a regular expression **aggr-name*** is mentioned for the attribute **Name** for the section **AGGR-INFO.XML** in the group **AGGREGATE**, then the values of the attribute without the prefix **aggr-name** are marked as a drift when the config drift report is generated.

Steps

1. From the left pane, click **Config Drift**.
2. Click **Add Template**.
3. Provide the requested values.
4. Optional: You can customize the template by editing the groups or deleting the non-required groups for a template.
5. Click **Add Template**.

Compare a config drift template

You can compare the system and cluster configurations and detect the configuration deviations in near real time.

Steps

1. From the left pane, click **Config Drift**.
2. Select one of the existing templates or click **Add Template** to add a new template.
3. Generate a config drift report

   You can generate a report immediately or you can schedule the report to be generated on a weekly or monthly basis.

To generate a report immediately	To schedule the report to be generated on a weekly or monthly basis
1. Select a category and provide the requested values for the report. 2. Select **Include only drifts** option to download only the configuration deviation changes. 3. Click **Submit**. 4. Download and view the config drift report. 5. Run Ansible Playbook (included as part of the config drift report) to mitigate the drifts.	1. Click the **Schedule Report** tab. 2. Select a category and provide the requested values for the report. 3. Select **Include only drifts** option to download only the configuration deviation changes. 4. Select the frequency of the report. 5. Select the start date and end date for the report. 6. Click **Submit**. 7. Download and view the config drift report. 8. Run Ansible Playbook (included as part of the config drift report) to mitigate the drifts.

An email is sent with the details of the configuration deviation between the selected systems.

Generate a drift timeline report

You can compare the AutoSupport data of the last 90 days and generate a report that provides information about the events and the configuration deviations that have occurred.

Steps

1. From the left pane, click **Config Drift**.
2. Select the **Drift Timeline** report type.
3. Generate a drift timeline report

   You can generate a report immediately or you can schedule the report to be generated on a weekly or monthly basis.

To generate a report immediately	To schedule the report to be generated on a weekly or monthly basis
1. Select a category and provide the requested values for the report. 2. Select **Include only drifts** option to download only the configuration deviation changes. 3. Click **Submit**. 4. Download and view the drift timeline report.	1. Click the **Schedule Report** tab. 2. Select a category and provide the requested values for the report. 3. Select **Include only drifts** option to download only the configuration deviation changes. 4. Select the frequency of the report. 5. Select the start date and end date for the report. 6. Click **Submit**. 7. Download and view the drift timeline report.

Manage a template

You can clone a template, share a template, edit the details of an existing template, and delete a template.

Sharing a template saves the time and effort required to create and customize a template that has already been created by a user. Shared templates can be mutually changed by shared users, allowing several users to make modifications to a single golden template.

About this task

- Access to shared templates can be revoked at any time.
- Shared users can delete this template from their account at any time.

Steps

1. From the left pane, click **Config Drift**.
2. Click  to make a copy of the template.
3. Click  and enter the usernames with whom you want to share the template.

   If you enter the email address of the user instead of the username, the template will not be shared.

4. Click  to update the details of the template.
5.

Click to delete the template.

Improve the efficiency and performance of your storage system

Analyze capacity and storage efficiency savings

You can view the capacity details and the storage efficiency savings of your system and take appropriate actions. The capacity and storage efficiency information can be viewed either at a cluster level or a node level.

This feature is not supported on E-Series systems.

The capacity dashboard displays the capacity details and the capacity forecast of your system. Capacity forecast uses historical capacity information to identify the utilization of each system. Based on the historical data (a year's data, if available) of utilized and allocated capacity, the algorithm considers the current utilization of each system and generates a forecast for the system's utilization over the next 1 through 6 months.

The storage efficiency dashboard displays the data reduction ratio, the logical space used, the physical space used, and the total data saved for storage systems running ONTAP 9.1 and later. The data reduction ratio and savings can be seen with and without Snapshot copies for AFF systems, non-AFF systems, or both. The total data savings across customer storage can be seen per efficiency feature such as volume deduplication, volume compression, compaction, FlexClone volumes, and Snapshot copies. You can view the top 5 storage systems with the best efficiency ratio. You can also view the SAN and NAS efficiency without Snapshot copies at a node level for ONTAP systems including AFF A-Series, AFF C190, All SAN Array, and FAS500 running ONTAP 9.10 and later.

Steps

1. From the left pane, click **Capacity and Efficiency**.

   By default, the **Capacity** tab is selected.

2. View the capacity details at the cluster and node level.
   a. View the capacity forecast at the node level.

      For ONTAP systems, information about RAW capacity is available in ClusterViewer.

   b. Click **Add Capacity** to send a notification to NetApp or your partner to add capacity.
3. View the storage efficiency and the data savings of your storage system.
   a. If the storage efficiency ratio of your storage system is higher than the average storage efficiency ratio, click **Share Your Success Story** to let us know the best practices followed.
   b. If the storage efficiency ratio of your storage system is less than the average storage efficiency ratio, click **Contact Us** to let us know the configurations of your storage system.

For more information about capacity and storage efficiency, see Frequently asked questions about Digital Advisor.

Analyze performance graphs

Performance graphs enable you to analyze the performance of your storage devices. You can view detailed performance graphs for an ONTAP cluster or multiple nodes of an ONTAP cluster and E-Series controllers. These graphs provide historical performance data, which can be used for understanding performance trend and pattern analysis. You can select a date from the calendar to view performance graphs for a day, week, month, two months, and twelve months. You can select multiple nodes to view a particular graph at the same time.

You have an option to set preferences, for example, you can view either one graph for three nodes or two graphs for three nodes.

When the graph is first displayed, a 1-week tab is preselected and it presents data for a 1 week in a graphical format to make it easier to understand large quantities of data and its relationship between different series of data. If you want to reset the date range, for example, you can click 1-month tab and select dates in the calendar.

You also have an option to zoom in performance graph; the individual data points are displayed.

Steps

1. On the Dashboard, click **Performance**.

   For ONTAP systems, you can click the **Node** tab to view the performance of a single node of an ONTAP cluster, click the **Local Tier** tab to view the performance of the local tier, or click the **Volume** tab to view the performance of the volume. By default, the cluster performance is displayed.

   For E-Series systems, you can view the graphs only at a controller level.

2. Select either 1 day, 1 week, 1 month, 2 months, or 12 months, in the calendar, for viewing performance data in a graphical format.

   For example, select 2-months tab to view data for 2 months. This enables you to view specific data for a duration based on your performance requirements.

3. The following performance graphs with required metrics are available for ONTAP clusters and nodes:

For Cluster	For Node	For Local Tier	For Volume
IOPS	CPU Utilization - Peak Performance (Headroom)	Average Throughput	IOPS
Network Throughput	Latency	Average Utilization	Latency
	IOPS		
	Protocol IOPS		
	Network Throughput		

Node latency, local tier (aggregate), and volume performance graphs are supported only on systems that are running ONTAP 9.2 and later.

4. The following performance graphs with required metrics are available for E-Series controllers:
    - CPU Utilization
    - Latency
    - IOPS
    - Throughput

Analyze the health of your storage system

Understand Health Check dashboard

The Digital Advisor Health Check dashboard provides a point-in-time review of your overall environment.

Based on the health check score, you can align your storage systems to the recommended NetApp best practices to facilitate long-term planning. It helps you monitor all the systems running on software and hardware through a centralized user interface. Health Check scores enable you to quickly gain insights about system risks. The key recommendations and best practices help you take actions to improve the health of your installed base.

You can access the Health Check dashboard only through NetApp SupportEdge Advisor and SupportEdge Expert service offerings.

Get started with Health Check dashboard

This dashboard provides an at-a-glance summary of your installed base through the following widgets:

- **AutoSupport Adoption**: Displays the number and percentage of systems with AutoSupport enabled. You can also view systems marked as 'Declined', those with **HTTPS** and **AutoSupport on Demand** enabled, as well as **Loss of Signal** for those systems that have stopped sending AutoSupport data in the last 7 days.
  To view your health check score and information about the systems in your install base, click the **AutoSupport Adoption** widget.
- **Recommended Configuration**: Displays systems that are compliant and non-compliant as per the **Recommended Configuration** widget. It helps you take actions to ensure that your systems are well configured across your installed base. You can view the score provided on the dashboard and take actions based on the key recommendations which are provided in order of priority.
- **Recommended Software**: Displays a consolidated list of all the software and firmware upgrades and currency recommendations. You can view the systems with AutoSupport enabled that should be at either the minimum or latest software or firmware versions.
- **Support & Entitlements**: Displays support contracts that have expired and those that are nearing expiration within 6 to 12 months. It displays end of support platforms, disks, shelves, entitlement compliance, pending expirations, and end of support for platform and hardware is not applicable.
  You can view the health check score provided on the dashboard and take actions based on the key recommendations, which are provided in order of priority.
  To view detailed information about support contracts, click the **Support & Entitlements** widget. You can also renew your support contracts using this widget.
- **Best Practices**: Displays the health check score by assessing the best practices attributes of your storage

system — performance & efficiency, availability & protection, capacity, configuration, and security vulnerabilities. NetApp best practices help sustain system health, which optimizes the performance of your installed base.

- **Technical Cases**: Provides you with a detailed view of your technical case history, by case type and open or closed status, over selectable time ranges. You can drill into case groups as well as view case details through NetApp Support Site or other case portals.

Renew your support contracts

You can view the score and summary of all the active support contracts on the dashboard. You can take actions based on the key recommendations which are provided in order of priority.

Steps

1. On the Health Check Dashboard, click the **Support & Entitlements** widget.
2. If any of your system support contracts have expired or are nearing expiration, then click the **Active Support Contracts** widget.
3. Select the checkboxes and click **Renew** for initiating the renewal process for the selected systems.

Upgrade to optimize your install base

Upgrade the support offering

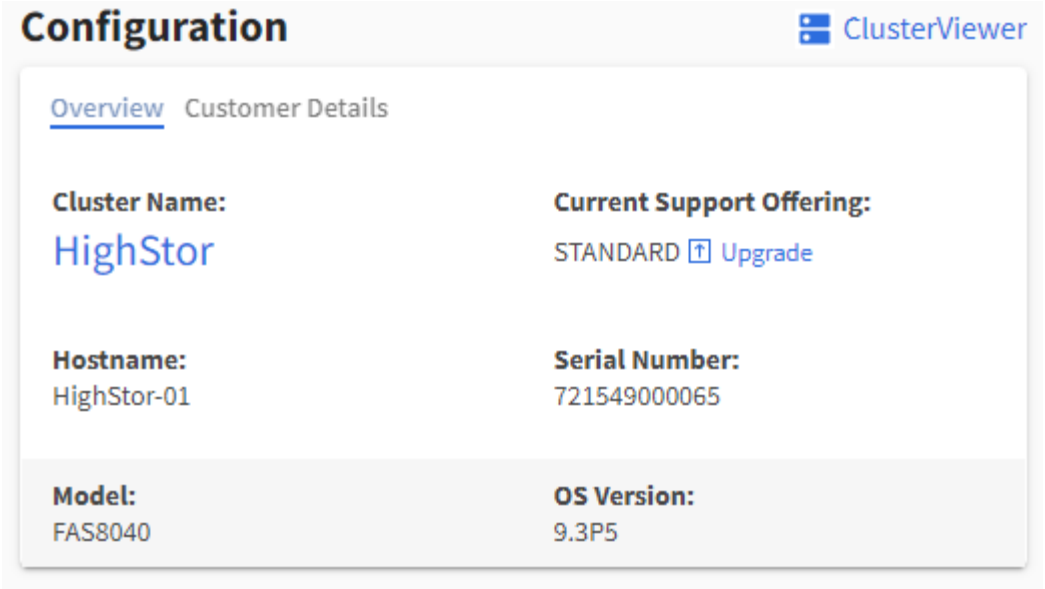
You can purchase an upgrade to the support offering to access more features and functionalities in Digital Advisor.

You can upgrade your current support offering to optimize your install base with the help of recommended practices and fixes, upgrade automation with Ansible playbooks, actionable reports and reviews, personalized support, and so on. The upgrade can be purchased when you renew your support contracts or at any other time from the system (node) dashboard.

You can opt for AIQ Upgrade only if you currently use the SupportEdge Premium or SupportEdge Secure support offerings.

Steps

1. Click **View All Systems** next to the **Inventory** widget.
2. On the Inventory Dashboard, select the node (host) that you want to upgrade.
   You are redirected to the system or node dashboard.
3. Click **Upgrade** in the **Configuration** widget.



4. Optionally, click **Compare Support Offerings** to view the comparison chart and pick the support offering that fits your requirements.
   Alternatively, you can click **Support Offerings** on the left navigation menu to view the comparison chart.
5. Select the type of upgrade that you want.
   a. Add AIQ Upgrade to your SupportEdge Premium or SupportEdge Secure support offerings
   b. Any other upgrade request
6. Add any comments that you have and click **Send**.
   A request to purchase the support offering upgrade is sent to the NetApp Renewals team.

Update your AFF and FAS firmware using Ansible Playbook

Download AFF and FAS firmware Ansible Automation package

You should update the AFF and FAS firmware using Ansible to mitigate the identified risks and keep your storage system up to date.

Before you begin

Before updating AFF and FAS firmware using Ansible, you should:

- Install and set up Ansible on your storage system
- Install Ansible 2.9 with collections on your storage system
- Upgrade your storage system to ONTAP 9.1 or later
- Configure your account with an administrator role

Steps

1. Click any wellness widget on the dashboard or click **View All Actions** to view a list of all the actions and risks.
2. Click **Firmware Upgrade** to view all firmware upgrade risks.
3. Click **Update AFF and FAS Firmware** to view all available update packages or click  next to each risk

to update the package specific to that risk.

4. Click **Download** to download the zip files and update your storage system.

   The zip file contains the following:

   - Ansible Playbook - A YAML file containing the Ansible script to perform the disk, shelf, and service processor firmware updates.
   - Inventory - A YAML file containing the details of the systems that are applicable for firmware updates.
   - Disk, Shelf, and Service Processor/BMC Firmware packages are named as **all.zip**, **all_shelf_fw.zip**, and **<SP/BMC>_<version_number>_fw.zip** respectively.

Manual addition of clusters and controllers to the inventory file is not supported.

Install and execute AFF and FAS firmware Ansible automation package (Experienced Users)

Experienced users can install and execute the AFF and FAS firmware ansible automation package quickly.

Firmware update with Ansible using NetApp Docker Image

Steps

1. Pull the Ansible Docker image to the Linux host:

```
$ docker pull schmots1/netapp-ansible
Using default tag: latest
latest: Pulling from schmots1/netapp-ansible
docker.io/schmots1/netapp-ansible:latest
```

2. Run the docker image as a container on the Linux host:

```
$ docker run -v <downloaded_playbook_path>:/<container_path> -it
schmots1/netapp-ansible:latest /bin/bash
```

The Ansible Playbook and the inventory file should be in the same path.

3. Execute the Ansible Playbook on the Linux host. Firmware updates run in the background for a few hours.

```
$ cd <container_path>
$ ansible-playbook na_ontap_pb_upgrade_firmware.yml

Enter your ONTAP admin username: ****
Enter the password for your ONTAP admin user: ****
Enter the base URL to the firmware package (using HTTP is recommended):
 http://<web-server>/path/
PLAY [ONTAP Firmware Upgrade]
*********************************************************************
```

If the URLs for disk firmware, shelf firmware, and service processor firmware are **http://<web-server>/path/all_shelf_fw.zip**, **http://<web-server>/path/all.zip** and **http://<web-server>/path/<SP/BMC>_<version_number>_fw.zip**, provide **http://<web-server>/path/** as the input for the base URL to the firmware package. If there are a set of clusters with different login credentials, the Ansible Playbook must be run on each cluster. There are no changes required to the inventory file as the Ansible Playbook skips the clusters for which the login has failed.

4. Log in to the cluster as the cluster administrator and verify that the new drive firmware has been installed:

```
::> storage disk show -fields firmware-revision,model
 disk     firmware-revision model
-------------- ----------------- ----------------
1.11.0   NA01              X423_HCOBE900A10
1.11.1   NA01              X423_HCOBE900A10
1.11.2   NA01              X423_HCOBE900A10
1.11.3   NA01              X423_HCOBE900A10
1.11.4   NA01              X423_HCOBE900A10
```

Firmware update if Ansible is already used

Steps

1. Install Python and Ansible and then download the Python packages using PIP:

```
$ pip install netapp-lib requests paramiko

Installing collected packages: netapp-lib, requests, paramiko
Successfully installed netapp-lib-2020.3.12 requests-2.23.0 paramiko-
2.7.2
```

2. Install the NetApp Ansible Collection:

```
To install the collection only for the current user:
$ ansible-galaxy collection install netapp.ontap

For universal installation:
$ ansible-galaxy collection install netapp.ontap -p
/usr/share/ansible/collections
$ chmod -R +rw /usr/share/ansible/collections
```

3. Ensure that the Ansible Playbook and the inventory file are in the same path and then execute the Ansible Playbook. Firmware updates run in the background for a few hours.

```
$ cd <playbook_path>
$ ansible-playbook na_ontap_pb_upgrade_firmware_disk.yml

Enter your ONTAP admin username: ****
Enter the password for your ONTAP admin user: ****
Enter the base URL to the firmware package (using HTTP is recommended):
http://<web-server>/path/
PLAY [ONTAP Firmware Upgrade]
*****************************************************************
```

If the URLs for disk firmware, shelf firmware, and service processor firmware are **http://<web-server>/path/all_shelf_fw.zip**, **http://<web-server>/path/all.zip** and **http://<web-server>/path/<SP/BMC>_<version_number>_fw.zip**, provide **http://<web-server>/path/** as the input for the base URL to the firmware package. If there are a set of clusters with different login credentials, the Ansible Playbook must be run on each cluster. There are no changes required to the inventory file as the Ansible Playbook skips the clusters for which the login has failed.

4. Log in to the cluster as the cluster administrator and verify that the new drive firmware has been installed:

```
::> storage disk show -fields firmware-revision,model
 disk     firmware-revision model
--------------- ----------------- ----------------
1.11.0   NA01              X423_HCOBE900A10
1.11.1   NA01              X423_HCOBE900A10
1.11.2   NA01              X423_HCOBE900A10
1.11.3   NA01              X423_HCOBE900A10
1.11.4   NA01              X423_HCOBE900A10
```

Install and execute AFF and FAS firmware Ansible automation package (beginners)

Host firmware files using web server

After you download the automation package, the firmware files should be hosted on a web server.

The web server can be set up in multiple ways. For instructions to set up a simple web server using Python, refer to Webserver using Python.

Step

1. Save the base URL of the web server. If the URLs for disk firmware, shelf firmware, and service processor firmware are **http://<web-server>/path/all_shelf_fw.zip**, **http://<web-server>/path/all.zip**, and **http://<web-server>/path/<SP/BMC>_<version_number>_fw.zip**, save **http://<web-server>/path/** as the base URL.

The filename is automatically detected by the Ansible Playbook.

Work with inventory file

The inventory file consists of the cluster management LIFs of the systems that are eligible for firmware updates. It contains the list of clusters with disk and shelf firmware filename information wherever applicable.

For service processor firmware update, node hostnames and SP/BMC IP is included in the inventory file.

Inventory file format

The following is a sample inventory file format with both disk and shelf firmware updates:

```
clusters:
  - clustername: <cluster management LIF-1>
    disk_fw_file: all.zip
    shelf_fw_file: all_shelf_fw.zip

  - clustername: <cluster management LIF-2>
    disk_fw_file: all.zip
    sp_nodes:
    - hostname: <node hostname 1>
      sp_fw_file: SP_FW_308-03990_11.5.zip
      sp_fw_type: bmc
      sp_fw_ver: '11.5'
      sp_ip: <BMC IP>
    - hostname: <node hostname 2>
      sp_fw_file: SP_FW_308-03991_5.8.zip
      sp_fw_type: sp
      sp_fw_ver: '5.8'
      sp_ip: <SP IP>
```

In the example, both shelf and disk firmware updates are applicable on cluster-1 and disk and SP/BMC firmware updates are applicable on cluster-2.

Delete a cluster from the inventory file

In case you do not want to apply firmware updates on a particular cluster, you can remove the cluster from the inventory file.

For example, if you do not want to apply disk firmware updates on cluster-2, you can remove it from the inventory file using the following command:

```
clusters:
  - clustername: <cluster management LIF-1>
    disk_fw_file: all.zip
    shelf_fw_file: all_shelf_fw.zip
```

You can observe that all the data for cluster-2 has been deleted.

If you want to apply only disk firmware updates on cluster-1 and not shelf firmware updates, you can do so using the following command:

```
clusters:
  - clustername: <cluster management LIF-1>
    disk_fw_file: all.zip
```

You can see that the *shelf_fw_file* key and value have been removed from cluster-1.

Manual addition of clusters or controllers is not supported.

Execute Ansible Playbook using NetApp Docker image

Before you execute the Ansible Playbook, ensure that the **NetApp_Ansible_***.**zip** file has been extracted and the web server with disk or shelf firmware files is ready.

Before you begin

Before executing Ansible Playbook using NetApp docker, you should:

- Download AFF and FAS firmware Ansible Automation package
- Host the firmware files using the web server
- Work with the inventory file
- Ensure that NetApp Docker is installed.

Steps

1. Set up Docker.
2. Pull the NetApp Docker image from DockerHub by executing the following command:

```
$ docker pull schmots1/netapp-ansible

Using default tag: latest
latest: Pulling from schmots1/netapp-ansible
docker.io/schmots1/netapp-ansible:lates
```

For more information about the docker pull command, refer to the Docker Pull Documentation.

3. Run the Docker image as a container and log in to the container to execute the Ansible Playbook.
4. Copy the path of the folder which contains the extracted Ansible Playbook and inventory files, for example, **downloaded_playbook_path**. The Ansible Playbook and inventory files should be in the same folder for successful execution.
5. Mount the folder as a volume on the Docker container. For example, to mount the folder **container_path**, you should execute the following command:

```
$ docker run -v <downloaded_playbook_path>:/<container_path> -it
schmots1/netapp-ansible:latest /bin/bash
```

The container starts and the console is now at bash shell of the container. For more information about the Docker Run command, refer to the Docker Run Documentation.

6. Execute the Ansible Playbook inside the container using the **ansible-playbook** command:

```
$ cd <container_path>
$ ansible-playbook na_ontap_pb_upgrade_firmware.yml

Enter your ONTAP admin username: ****
Enter the password for your ONTAP admin user: ****
Enter the base URL to the firmware package (using HTTP is recommended):
http://<web-server>/path/
PLAY [ONTAP Firmware Upgrade]
*********************************************************
```

If there are a set of clusters with different login credentials, the Ansible Playbook must be run on each cluster. There are no changes required to the inventory file as the Ansible Playbook skips the clusters for which the login has failed.

For more information about the **ansible-playbook** command, refer to the Ansible Playbook Documentation and to execute the Ansible playbook in check mode (dry run), refer to Ansible: Check mode.

After executing the Ansible Playbook, refer to the Firmware Installation Validations for post-execution instructions.

Execute Ansible Playbook without NetApp Docker image

Steps

1. Install Python and Ansible.
2. Install the required Python packages using **pip**:

```
$ pip install netapp-lib requests paramiko

Installing collected packages: netapp-lib, requests, paramiko
Successfully installed netapp-lib-2020.3.12 requests-2.23.0 paramiko-
2.7.2
```

3. Install NetApp Ansible collection using the **ansible-galaxy** command:

```
To install the collection only for the current user
$ ansible-galaxy collection install netapp.ontap

To do a more universal installation,
$ ansible-galaxy collection install netapp.ontap -p
/usr/share/ansible/collections

$ chmod -R +rw /usr/share/ansible/collections
```

   For more information about the ansible-galaxy command, refer to Ansible Galaxy Documentation and for more information about the NetApp Ansible Collection, refer to the NetApp Ansible Collection page.

4. Execute the Ansible Playbook using **ansible-playbook** command:

```
$ cd <downloaded_playbook_path>
$ ansible-playbook na_ontap_pb_upgrade_firmware.yml

Enter your ONTAP admin username: ****
Enter the password for your ONTAP admin user: ****
Enter the base URL to the firmware package (using HTTP is recommended):
http://<web-server>/path/
PLAY [ONTAP Firmware Upgrade]
*********************************************************************
```

   If there are a set of clusters with different login credentials, the Ansible Playbook must be run on each cluster. There are no changes required to the inventory file as the Ansible Playbook skips the clusters for which the login has failed.

For more information about the **ansible-playbook** command, refer to the Ansible Playbook Documentation and to execute the Ansible Playbook in check mode (dry run), refer to Ansible: Check mode.

After executing the playbook, refer to the Firmware Installation Validations for post-execution instructions.

Validate firmware installation

After the execution of the playbook, log in to the cluster as the cluster administrator.

Validate disk firmware installation

Steps

1. Verify that the drive firmware is installed:

```
::*> storage disk show -fields firmware-revision,model
disk     firmware-revision model
---------------- ----------------- ----------------
1.11.0   NA01              X423_HCOBE900A10
1.11.1   NA01              X423_HCOBE900A10
1.11.2   NA01              X423_HCOBE900A10
1.11.3   NA01              X423_HCOBE900A10
1.11.4   NA01              X423_HCOBE900A10
```

   For more information about the command, refer to storage disk show.

2. Verify that the new NVMe Flash Cache firmware is installed:

```
::*> system controller flash-cache show
```

   For more information about the command, refer to system controller flash-cache show.

Validate shelf firmware installation

Steps

1. Verify that the new shelf firmware is updated:

```
::*> system node run -node * -command sysconfig -v
```

   In the output, verify that each shelf's firmware is updated to the desired level. For example:

```
Shelf 1: IOM6 Firmware rev. IOM6 A: 0191 IOM3 B: 0191
```

   For more information about the command, refer to system node run.

2. Verify that the new ACP firmware is updated:

```
::*> storage shelf acp module show -instance
```

For more information about the command, refer to storage shelf acp module show.

3. Verify that the desired ACP mode is configured:

```
::*> storage shelf acp show
```

For more information about the command, refer to storage shelf acp show.

4. Change the ACP mode (channel):

```
::*> storage shelf acp configure -channel [in-band | out-of-band]
```

For more information about the command, refer to storage shelf acp configure.

Validating SP/BMC Firmware installation

The Ansible Playbook for Service Processor/BMC firmware updates is enabled with an option to verify the installation of latest SP/BMC firmware on the controller. After the verification is complete (the updates could take a maximum time of two hours), the Ansible Playbook applies internal switch firmware updates by connecting to the SP/BMC console.

The failure and success information for SP/BMC firmware and the internal switch firmware installations will be notified at the end of Ansible Playbook execution. Follow the steps mentioned in the Ansible Playbook in case the SP/BMC firmware/internal switch firmware installation fails.

Integrate data using APIs

Understand API Services

Digital Advisor API Services uses automation to add efficiency to your workflows. Inside API Services resides the **API Catalog**, which describes over 100 different API endpoints that are grouped into 20+ different service areas. These APIs are available to you as a NetApp customer and they span different areas of interest, such as system information, storage efficiency, performance, health, and upgrades.

NetApp Digital Advisor is transitioning from REST APIs to GraphQL as its primary API platform to improve performance, flexibility, and scalability. The transition will be phased, with a period of overlap between REST APIs and GraphQL APIs. For each deprecated REST API, a deprecation notice will be published in the Digital Advisor API catalog, and you will have 6 months to migrate that specific endpoint to GraphQL. To review the list of APIs scheduled for deprecation, navigate to **API services → Browse → Deprecated APIs**

APIs are interfaces that enable you to write simple code that can contact Digital Advisor programmatically and bring back data into your compute environment. You can write code in such a way that it contacts Digital

Advisor every day and brings back the latest data in the areas that are of interest to you. You can then use this data to populate your ticketing system or to create your own dashboards, webpages, or reports. The Digital Advisor API Catalog has both code samples and a facility for you to try out the APIs in the browser.

Automation with APIs is a great way to add efficiency and accuracy to daily or weekly tasks. It frees up your resources to perform more complex activities or to automate new workflows. For example, if you have system health risks that need to be fixed, you can automate at least the pullout of those items from Digital Advisor and the push into your ticketing system.

API Catalog

The toggle at the top of the page allows the user to switch between the two modes to view the Catalog. The Code view focuses on the input parameters needed, the content and format of the return data, and code samples to get the user started with putting code in place. The Experiment view offers the user a chance to “try out” the API in the browser using a generated token obtained from the main API Services page.

Either view allows the user to browse through available items using the navigation pane on the left. The items are organized by service in alphabetical order. Within a given service, you can expand the heading to show the individual API Endpoints. Clicking on the service heading or an API Endpoint will take you to that section of the Catalog in the middle pane.

Using the APIs

Once you are authorized and can generate tokens, you can leverage the tokens to make programmatic queries and retrieve data. You can also test out an API from within the API Catalog to see first-hand how the query works and the type of data that is returned. This is a great way to make sure you understand how an API will work prior to building out the code framework in your system.

Generate tokens to use APIs

It is easy to register for API Services and generate tokens.

Steps

1. From the **Quick Links** menu, click **API Services**.
2. Click **Register**.
3. Complete the request for authorization form and click **Submit**.

   Activation is automatic and should be instantaneous. Once you have been authorized to use the Digital Advisor APIs, you can generate tokens to use when making programmatic API calls. You can also use these tokens to execute “try it out” from within the API Catalog. When obtained programmatically, tokens always come in sets of two: An Access Token and a Refresh Token. The Access Token must be passed to successfully use all APIs (except for one - the Refresh Token is used to programmatically obtain a new set of tokens).

4. On the Main API Services page, click **Generate Token** to view and download the access token and refresh token to invoke APIs.

   The portal gives you multiple ways to save one or both tokens in the set. You can copy them to clipboard, download them as a text file, or view them as plain text.

You should download and save the access token and refresh token for later use. Access tokens expire one hour after generation and refresh tokens should be regenerated, manually, every 7 days and installed in the application. To do this, you do not need to log in to the application. However, after 90 days, you need to log in to the application to obtain a new access and refresh token.

Use API Catalog to execute APIs

The API Catalog allows you to browse through categories and the available APIs within each of those categories.

Using a valid Access Token and correct inputs for the required fields, you can make a test call for an API.

Access GraphQL APIs

Steps

1. From the **Quick Links** menu, click **API Services**.
2. Click Browse under the **API Catalog** icon.

   The API Catalog is displayed.

3. Click **GraphQL** and review the documentation.
4. Try out the GraphQL APIs by using the ready-to-run sample queries at Digital Advisor GraphQL Studio.
5. Supply a user token by selecting the authorization field in the Header of the API request
6. Provide the required variables
7. Run the query and review the output

Access REST APIs

Steps

1. From the **Quick Links** menu, click **API Services**.
2. Click Browse under the **API Catalog** icon.

   The API Catalog is displayed.

3. Click **ActiveIQ-Public** and select any API
4. At the top of the page, slide the toggle to “Experiment”.
5. From the left navigation, expand the categories and select any API to view detailed information.
6. Expand the API.
7. Click the **Try it out** button on the right.
8. Provide the required parameters and click **Execute** to view the results.

   You can also examine the **Responses** section of the API to understand the data that will be returned better. You can click on **Example Value** to see the format of the data or click on **Model** and click on the carets to expand the sections to see the definition of each element.

By sliding the toggle to the **Code** view, you can view code samples in various languages.

Generate custom reports

Types of reports

Digital Advisor provides a variety of reporting options that enable you to monitor and manage your system health and operation success.

The following are the types of reports that are available in Digital Advisor:

Report Name	Description	Available in ONTAP	Available in E-Series	Available in Storage GRID
Ansible Inventory	Provides an Ansible inventory file which lists all system inventory details by region or site. This file can be used for automation.	Yes	No	No
Capacity & Efficiency	Provides information about the Capacity and Efficiency details at cluster, customer, site, group, watchlist and node level.	Yes	Yes	Yes
Cloud Recommendations	Provides insights and recommendations for optimizing cloud resources. It includes details on disaster recovery, backup, tiering, and migration.	Yes	No	No
ClusterViewer	Provides information about a single or multiple clusters at a customer and watchlist level. You can generate this report only for watchlist with up to 100 nodes.	Yes	No	No
Config Drift	Allows users to establish a "golden baseline" for system configurations and alerts them when deviations from this baseline occur. It helps identify and address configuration changes that may impact system performance or security.	Yes	No	No
Delivery Logistics	Provides information about the logistics of delivering products and services.	Yes	Yes	No
Health Assessment Executive Summary	Provides information about various Active IQ KPIs in a PowerPoint (PPT) format, with different KPI being described on different slides.	Yes	Yes	No
Inventory	Provides information about the install base for a selected watchlist, customer, site, group levels. This report can be generated either as a direct download from Inventory details page or can be generated from Reports page.	Yes	Yes	Yes
IO Density	IO Density Report provides insights into peak input-output operations for customers in terms of data and meta-data consumption and density.	Yes	No	No

Report Name	Description	Available in ONTAP	Available in E-Series	Available in Storage GRID
Performance	Provides information, at a watchlist level, about the performance of a cluster, node, local tier (aggregate), and volume. You can generate this report only for watchlist with up to 100 nodes.	Yes	Yes	No
Periodic Digest	Summarizes key metrics and insights periodically. It includes data on system performance, capacity, and efficiency.	Yes	No	No
Recommended Configuration	Provides information about the various recommended configuration gaps for Remote Management Configuration, spares and drives, HA Pair, SVM Health, battery status, and recovery guru advisories.	Yes	Yes	No
Support Contracts / Hardware EOS	Provides information about the contract details and the list of controllers, shelves, and disks, that have reached end-of-support (EOS).	Yes	Yes	No
Technical Case Details	Provides a yearly report about all the technical cases and their status.	Yes	Yes	Yes
Upgrade Plan	Offers recommendations for software and firmware upgrades. It includes details on the latest recommended versions, potential issues, and steps for performing upgrades.	Yes	No	No
Upgrade Recommendations (SW & FW)	Multi-tabbed report about the software and firmware currency and recommended versions for each controller or serial in the search criteria.	Yes	Yes	No
Volume Performance	Provides information about the performance details of the volumes at the cluster level.	Yes	No	No
Wellness	Provides information about the outstanding and acknowledged risks, risk details, corrective actions, and affected systems.	Yes	Yes	Yes

Generate reports

You can generate reports immediately or schedule a report to be generated on a weekly or monthly basis. The reports can be generated in different formats. Based on the report selected, the available formats are displayed.

About this task

- You cannot edit the reports in Digital Advisor. You should delete the existing report and create a new report.

Steps

1. From the left pane, click **Reports**.
2. Click **Create Report** to generate a new report.

You can generate a report immediately or you can schedule the report to be generated on a weekly or monthly basis.

To generate a report immediately	To schedule the report to be generated on a weekly or monthly basis
1. Select the type of report and provide the requested values for the report. 2. Select the format of the report. 3. Click **Submit**. The report is saved in Digital Advisor for 3 days.	1. Click the **Schedule Report** tab. 2. Select the type of report and provide the requested values for the report. 3. Select the format of the report. 4. Select the frequency of the report. 5. Select the start date and end date for the report. 6. Click **Submit**. The existing scheduled reports will be replaced when the new reports are generated.

Knowledge and support

Get more information

You can get help and find more information through various resources.

- Troubleshooting information
- Slack workspace
- Email
- Support button in Digital Advisor for support and feedback.

Get more information

You can get help and find more information through various resources.

- NetApp Community
- Documentation resources
- Security and Privacy of NetApp Telemetry Data
- ONTAP AutoSupport and AutoSupport On Demand

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