Security and data encryption

Cloud Volumes ONTAP

NetApp
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Security and data encryption

Encrypting volumes with NetApp encryption solutions

Cloud Volumes ONTAP supports NetApp Volume Encryption (NVE) and NetApp Aggregate Encryption (NAE). NVE and NAE are software-based solutions that enable FIPS 140-2–compliant data-at-rest encryption of volumes. Learn more about these encryption solutions.

Both NVE and NAE are supported with an external key manager.

If you use NVE, you have the option to use your cloud provider's key vault to protect ONTAP encryption keys:

- AWS Key Management Service (beginning in 9.12.0)

New aggregates will have NAE enabled by default after you set up an external key manager. New volumes that aren't part of an NAE aggregate will have NVE enabled by default (for example, if you have existing aggregates that were created before setting up an external key manager).

Cloud Volumes ONTAP doesn't support onboard key management.

What you'll need

Your Cloud Volumes ONTAP system should be registered with NetApp support. A NetApp Volume Encryption license is automatically installed on each Cloud Volumes ONTAP system that is registered with NetApp Support.

- Adding NetApp Support Site accounts to BlueXP
- Registering pay-as-you-go systems

BlueXP doesn't install the NVE license on systems that reside in the China region.

Steps

1. Review the list of supported key managers in the NetApp Interoperability Matrix Tool.

   Search for the **Key Managers** solution.

2. Connect to the Cloud Volumes ONTAP CLI.
3. Configure external key management.
   - AWS: AWS Key Management Service

Manage keys with AWS Key Management Service

You can use AWS's Key Management Service (KMS) to protect your ONTAP encryption keys in a Google Cloud Platform-deployed application.

Key management with the AWS KMS can be enabled with the CLI or the ONTAP REST API.

When using the KMS, be aware that by default a data SVM's LIF is used to communicate with the cloud key management endpoint. A node management network is used to communicate with AWS's authentication

services. If the cluster network is not configured correctly, the cluster will not properly utilize the key management service.

Before you begin

- Cloud Volumes ONTAP must be running version 9.12.0 or later
- You must have installed the Volume Encryption (VE) license and
- You must have installed the Multi-tenant Encryption Key Management (MTEKM) license installed.
- You must be a cluster or SVM administrator
- You must have an active AWS subscription

You can only configure keys for a data SVM.

Configuration

AWS

1. You must create a grant for the AWS KMS key that will be used by the IAM role managing encryption. The IAM role must include a policy that allows the following operations:
   - `DescribeKey`
   - `Encrypt`
   - `Decrypt`
     To create a grant, refer to AWS documentation.
2. Add a policy to the appropriate IAM role. The policy should support the `DescribeKey`, `Encrypt`, and `Decrypt` operations.

Cloud Volumes ONTAP

1. Switch to your Cloud Volumes ONTAP environment.
2. Switch to the advanced privilege level:
   `set -privilege advanced`
3. Enable the AWS key manager:
   `security key-manager external aws enable -vserver` *`data_svm_name`* `-region` *`AWS_region`* `-key-id` *`key_ID`* `-encryption-context` *`encryption_context`*
4. When prompted, enter the secret key.
5. Confirm the AWS KMS was configured correctly:
   `security key-manager external aws show -vserver` *`svm_name`*

Improving protection against ransomware

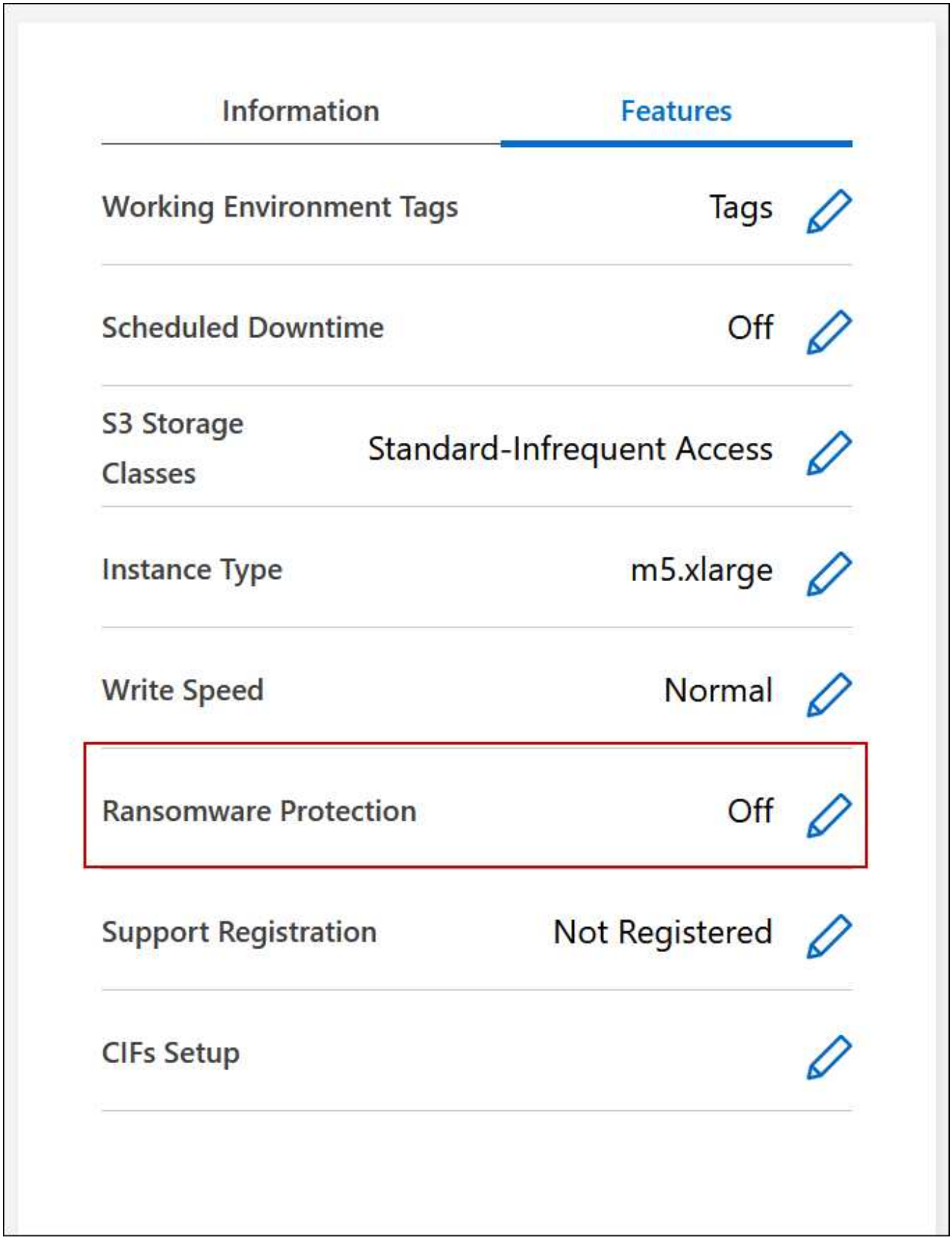
Ransomware attacks can cost a business time, resources, and reputation. BlueXP enables you to implement two NetApp solutions for ransomware: Protection from common ransomware file extensions and Autonomous Ransomware Protection (ARP). These solutions provide effective tools for visibility, detection, and remediation.

Protection from common ransomware file extensions

Available through BlueXP, the Ransomware Protection setting allows you to utilize the ONTAP FPolicy functionality to guard against common ransomware file extension types.

Steps

1. On the Canvas page, double-click the name of the system you configure to ransomware protection.
2. On the Overview tab, click the Features panel and then click the pencil icon next to **Ransomware Protection**.



3. Implement the NetApp solution for ransomware:
   a. Click **Activate Snapshot Policy**, if you have volumes that do not have a Snapshot policy enabled.

NetApp Snapshot technology provides the industry's best solution for ransomware remediation. The key to a successful recovery is restoring from uninfected backups. Snapshot copies are read-only, which prevents ransomware corruption. They can also provide the granularity to create images of a single file copy or a complete disaster recovery solution.

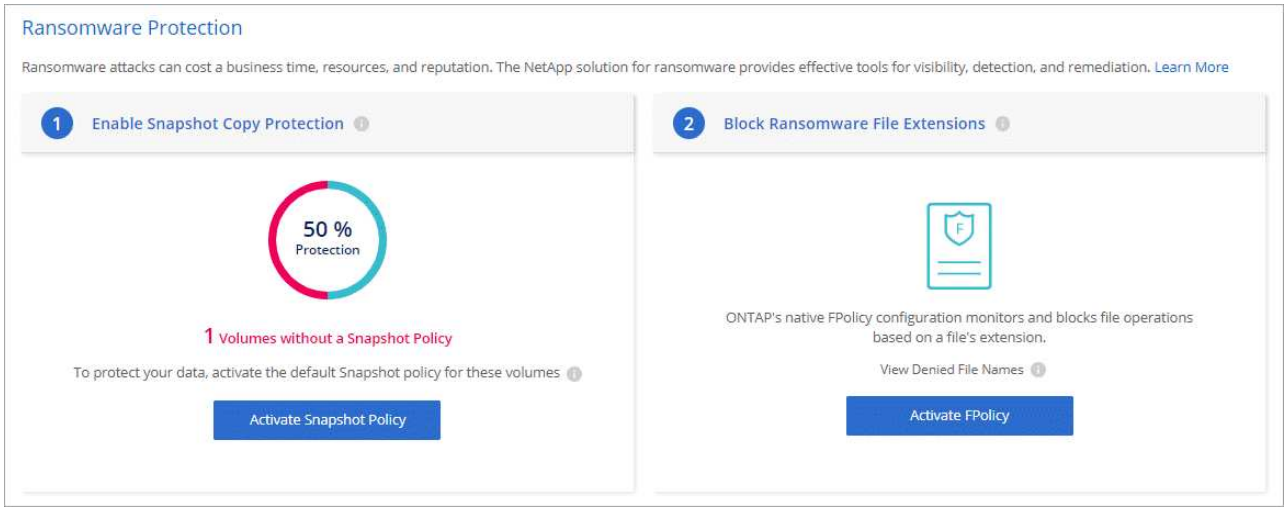
b. Click **Activate FPolicy** to enable ONTAP's FPolicy solution, which can block file operations based on a file's extension.

   This preventative solution improves protection from ransomware attacks by blocking common ransomware file types.

   The default FPolicy scope blocks files that have the following extensions:

   micro, encrypted, locked, crypto, crypt, crinf, r5a, XRNT, XTBL, R16M01D05, pzdc, good, LOL!, OMG!, RDM, RRK, encryptedRS, crjoker, EnCiPhErEd, LeChiffre

   BlueXP creates this scope when you activate FPolicy on Cloud Volumes ONTAP. The list is based on common ransomware file types. You can customize the blocked file extensions by using the *vserver fpolicy policy scope* commands from the Cloud Volumes ONTAP CLI.



Autonomous Ransomware Protection

Cloud Volumes ONTAP supports the Autonomous Ransomware Protection (ARP) feature, which performs analyses on workloads to proactively detect and warn about abnormal activity that might indicate a ransomware attack.

Separate from the file extension protections provided through the ransomware protection setting, the ARP feature uses workload analysis to alert the user on potential attacks based on detected "abnormal activity". Both the ransomware protection setting and the ARP feature can be used in conjunction for comprehensive ransomware protection.

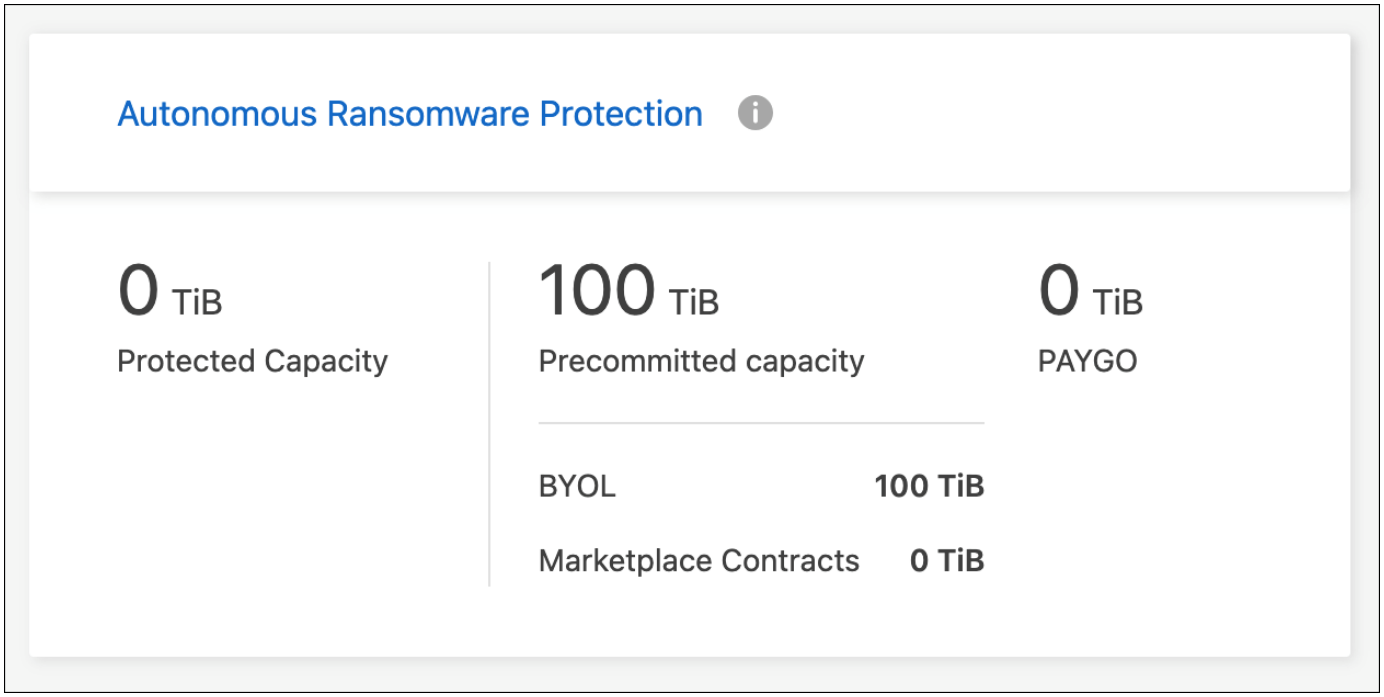
The ARP feature is available for use with BYOL licenses only (one, two, and three year terms) on both node-based and capacity-based licensing models. You must contact your NetApp sales representative to purchase a new, separate, add-on license for use with the ARP feature in Cloud Volumes ONTAP.

Upon purchase of an add-on license and adding it to the Digital Wallet, you can enable ARP on a per volume basis with Cloud Volumes ONTAP. Configuration of ARP for volumes is performed through ONTAP System

Manager and ONTAP CLI.

For more information on how to enable ARP with ONTAP System Manager and CLI, see Enable Autonomous Ransomware Protection.

Support is not available for the use of licensed features without a license.



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