



Storage Bridge 1.1 Administration Guide

September 29, 2020

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toc

Table of Contents

1	Introduction to Storage Bridge	7
	How It Works	8
	Disaster Recovery	8
	Storage Extension	9
	XProtect Smart Client Integration	10
	Storage Bridge Licensing	10
	System Requirements	11
	Storage Bridge	11
	Storage Bridge Plug-in for XProtect Management Client	12
	Storage Bridge XProtect Smart Client Plug-in	12
	Storage Requirements	12
	Recording Storage/Archive Requirements	12
	Extension/Disaster Recovery Storage Requirements	12
	Extension/Disaster Recovery Storage Prerequisites	13
2	Storage Bridge Installation and Activation	17
	Install Storage Bridge	18
	Uninstall Storage Bridge	23
	Activate Storage Bridge	24
3	Manage Disaster Recovery	27
	Enable Disaster Recovery	28
	Disable Disaster Recovery	30
	Start/Pause Automatic Operations	32
	Monitor Data Backup	35
	Monitor Recording Servers	35
	Monitor the Recording Storage/Archive	36
	Monitor Disaster Recovery Storage	37
	Monitor Data Backup Progress	38
	Recover Backed Up Data	38
	Recover Recording Storage/Archive	38

Recover a Failed Recording Server 42

4 Manage Storage Extensions 49

Enable Storage Extension 50
 Disable a Storage Extension 54
Configure Storage Extension 56
Start/Pause Automatic Operations 60
Monitor Storage Extensions 62
 Monitor Recording Servers 62
 Monitor Recording Storage/Archive 63
 Monitor the Extensions 64

5 Manually Manage Data 65

Manually Manage Data 66
Monitor Manual Jobs Status 69

6 XProtect Smart Client Integration 71

Configure XProtect Smart Client Integration 72
 Enable/Disable the Additional Storage Bridge Timeline Data 72
 Enable/Disable Automatic Data Retrieval 73
 Enable/Disable Manual Data Retrieval 74
Work with the XProtect Smart Client Plug-in 75
 The Storage Bridge Timeline 76
 Work with Nearline or Offline Recordings 77

Table of Contents

1

Introduction to Storage Bridge

<i>How It Works</i>	8
<i>Storage Bridge Licensing</i>	10
<i>System Requirements</i>	11
<i>Storage Requirements</i>	12

Introduction to Storage Bridge

Congratulations on your purchase of Tiger Technology's Storage Bridge. Storage Bridge leverages your Milestone XProtect VMS with flexible disaster recovery capabilities and/or seamless extension of the recording storage and archive's capacity to an external storage tier. By enabling a cloud target, a network share or any local volume to seamlessly integrate into your XProtect storage infrastructure, Storage Bridge allows for increased maximum recording and archive retention limits and further ensures your XProtect VMS against data loss.

How It Works

As soon as you install Storage Bridge on the recording server(s) and the XProtect Management client, you are ready to enable a cloud target, network share or another local volume as an extension and/or disaster recovery storage of a selected recording storage/archive. For the purpose, you should simply provide the credentials for access to the selected extension/disaster recovery storage. As long as Storage Bridge is not paused it immediately begins processing data.

You can enable just extension, just disaster recovery or both on a recording storage/archive. When both are enabled for one and the same recording storage/archive, the same cloud storage provider, network share or local volume is used. You can enable storage extension/disaster recovery on a cloud target for a given recording storage and storage extension/disaster recovery on a network share for the same recording server's archive storage, for example. The two mechanisms are not interchangeable - enabling disaster recovery does not free space on your recording storage/archive and data moved to the extension cannot be used for disaster recovery as it does not include system information, about your recording storage/archive or recording server.

Disaster Recovery

When you enable disaster recovery, Storage Bridge copies all data and metadata from the recording storage/archive to the specified cloud, network share or local volume, starting with the oldest files. The time for complete backup depends on the network characteristics and connection speed to the disaster recovery storage target. You can keep track of the data backup progress in the Storage Bridge interface.

Storage Bridge disaster recovery is meant to provide a safety net in case of an unforeseen failure of a recording storage/archive or the recording server itself. Thus, it keeps backed up data on the disaster recovery storage for as long as you have specified in XProtect. Should a recording storage/archive reach its retention limit, XProtect will start deleting data and Storage Bridge then automatically deletes the counterpart from the disaster recovery storage, freeing space for new data.

In case of a failure of a recording server or its recording storage/archive, you can immediately begin recovering all backed up data and make it usable through XProtect VMS again.

Storage Extension

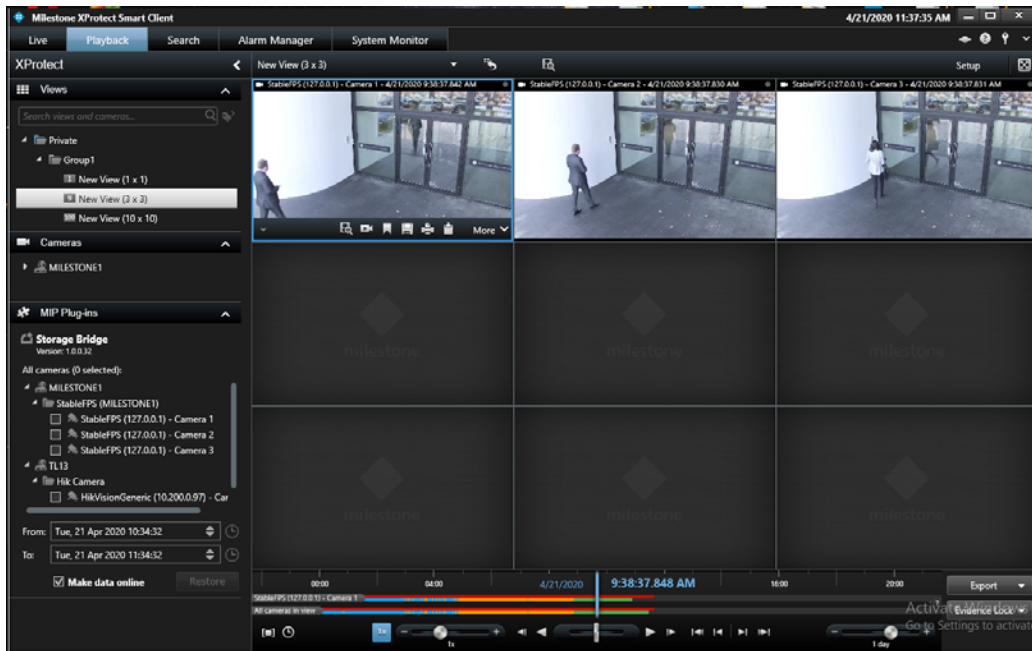
When you extend a recording storage/archive, you simply increase its capacity with the free space on the cloud target, network share, or local volume you have added as an extension. You can expand the capacity of a recording server's storage with a nearline extension, from which data is retrieved as soon as the connection speed allows, or an offline extension (currently, Storage Bridge supports Amazon Glacier, Microsoft Archive and Google Archive), from which data is not retrieved immediately, but must first be rehydrated to an intermediate tier.

Space on the recording storage/archive is freed by moving recordings to the enabled extension. To determine when to move recordings from the recording storage/archive to the nearline extension, Storage Bridge utilizes either the "by size" or the "by age" criteria you specify. With the "by age" method, data is moved to the nearline extension when it has not been accessed for a specified time interval. With the "by size" criteria, Storage Bridge begins moving data when the used space on the recording storage/archive reaches a specified threshold, starting with the least recently accessed files. To determine when a recording should be moved from the nearline extension to the offline extension, if enabled, Storage Bridge utilizes the "by age" criteria i.e. moves files, which have not been accessed for a specified time period.

Once a file is moved to the storage extension, Storage Bridge replaces it with a stub file. Stub files look and act exactly like the actual files they replace, but have almost no size and consume almost no capacity on your local storage/archive. Stub files pointing to actual files on the nearline extension allow immediate and seamless retrieval when playing back and reviewing timeline video. Storage Bridge also allows you to manually move data between the local recording storage/archive and the nearline and offline extensions.

As with disaster recovery, recordings are kept on the nearline/offline extension for as long as the retention limit of the extended recording storage/archive requires. Once the retention limit for a specific recording is reached, both the stub file and its counterpart on the extension are automatically deleted.

XProtect Smart Client Integration



To facilitate the work of XProtect Smart Client users, the administrator of your surveillance system can enable or disable the integration of Storage Bridge. When enabled, each XProtect Smart Client computer running the Storage Bridge plug-in sees an additional timeline visually displaying the original recording storage/archive, the nearline extension, or the offline extension as enabled by Storage Bridge.

Additionally, when the XProtect Smart Client integration is enabled, users can restore recordings from the nearline or offline extension to the recording storage/archive automatically (when reviewing the recording, for example) or manually, for a selected timeframe.

Storage Bridge Licensing

In order to benefit from Storage Bridge, you need to activate it on each recording server. For activation Storage Bridge makes use of a software as a service (SaaS). For more information, refer to “Activate Storage Bridge” on page 24. The license holds information about the maximum number of cameras attached to a recording server.

Note: *When provided for evaluation purposes, a license may be valid only for a specific amount of time.*

You can keep track of the activation status of a recording server, following the steps on page 25.

System Requirements

To benefit from Storage Bridge in your XProtect VMS, you must install the Storage Bridge plug-in on the XProtect Management Client and Storage Bridge itself on each recording server whose storage you want to extend or back up. Additionally, to allow XProtect Smart Client integration, you need to install the Storage Bridge XProtect Smart Client plug-in on each computer you want to integrate.

Storage Bridge

To install Storage Bridge on a recording server whose storage you want to extend and/or back up, it must meet the following minimum requirements:

- PC with 64-bit (x64) processor.

Note: *Storage Bridge actively uses the APIs provided by the target provider. These APIs may take significant amount of CPU depending on connection and the amount of data moved. Please, refer to the minimum CPU requirements of your target provider.*

- 64-bit Microsoft Windows® 7/Server 2008 R2/Windows® 8/Server 2012/Server 2012 R2/Windows® 10/Server 2016/Server 2019.

Important: *Microsoft Windows® 7/Server 2008 R2 computers must run at least Service Pack 1 and have the KB976932 and the KB3033929 security updates installed.*

- 4 GB of physical RAM at least.
- 30 MB of available hard-disk space for Storage Bridge installation.

Note: *Storage Bridge keeps track of the files it manages in a database, stored in the product installation folder. The size of the database grows proportionally to the number of files managed. For example, if Storage Bridge manages 1 000 000 files, the size of the database is approximately 100MB. Unless there's enough free space for the database, Storage Bridge is unable to operate.*

- The following TCP ports must not be blocked by the firewall on the recording server or the computer managing the inbound and outbound traffic on your network:
 - (for communication with object storage target over http connection) **80** - outbound rule only
 - (for SaaS activation and/or communication with object storage target over https) **443** - outbound rule only
 - (for communication with SMB network share target) **445** - outbound rule only
 - **8536** - inbound and outbound rules
 - **8537** - inbound and outbound rules

Storage Bridge Plug-in for XProtect Management Client

You can install the Storage Bridge XProtect Management Client plug-in on a computer running XProtect Management Client 2019 R3 or above.

Note: *Verify that your computer meets the minimum system requirements of XProtect Management Client 2019 R3, by visiting the Milestone website at: <https://www.milestonesys.com/systemrequirements>*

Storage Bridge XProtect Smart Client Plug-in

You can install the Storage Bridge XProtect Smart Client plug-in on a computer running XProtect Smart Client 2019 R3 or above.

Note: *Verify that your computer meets the minimum system requirements of XProtect Smart Client 2017 R3, by visiting the Milestone website at: <https://www.milestonesys.com/systemrequirements>*

Storage Requirements

Recording Storage/Archive Requirements

Currently, Storage Bridge supports only recording storage/archive, which is mounted on the recording server as a local NTFS volume with Read & Write permissions and on which the System account is granted Full Control.

Extension/Disaster Recovery Storage Requirements

Currently, Storage Bridge supports the following storage types for extension and/or disaster recovery:

Note: *Refer to "Extension/Disaster Recovery Storage Prerequisites" on page 13 for specific requirements about each storage type.*

- Amazon S3 object storage
- Microsoft Azure blob storage
- Backblaze B2 cloud storage
- Google cloud storage
- IBM Cloud object storage
- Wasabi Hot Cloud Storage
- S3-compatible object storage (using protocol signature version 2)
- SMB/CIFS network share

- another volume, mounted on the recording server as a local volume with Read & Write permissions

Extension/Disaster Recovery Storage Prerequisites

Amazon S3 Object Storage

- create a separate empty bucket for each recording storage/archive you want to extend and/or back up on Amazon S3 object storage
- provide IAM user credentials to be used by Storage Bridge

Important: *Never provide your AWS account root user credentials. For best practices on securing your AWS resources, refer to the following recommendations for the AWS Identity and Access Management (IAM) service:*

<https://docs.aws.amazon.com/IAM/latest/UserGuide/best-practices.html>

Tip: Storage Bridge does not require that the IAM user has permissions to list other buckets or even to delete the bucket, which will be paired with the recording storage/archive. You can ensure that Storage Bridge operates normally, if you grant the IAM user full permissions over objects in the bucket. Still, if the security policies of your organization are more restrictive, you can use the following bucket policy as a sample for granting the minimum required permissions for a bucket "bucket-name" to user "bridge_user":

```
{
  "Version": "2012-10-17",
  "Id": "S3AllActionsOnTi gerBucket",
  "Statement": [
    {
      "Sid": "AllAllowAllActionOnS3ToTi gerUsers",
      "Effect": "Allow",
      "Principal": {
        "AWS": "arn:aws:iam::your_aws_subscription:user/bridge_user"
      },
      "Action": [
        "s3:GetAccelerateConfiguration",
        "s3:GetBucketLocation",
        "s3:GetBucketVersioning",
        "s3:ListBucket",
        "s3:ListBucketVersions",
        "s3:ListBucketMultipartUploads",
        "s3:PutLifecycleConfiguration"
      ],
      "Resource": "arn:aws:s3:::bucket-name"
    },
    {
      "Effect": "Allow",
      "Principal": {
        "AWS": "arn:aws:iam::your_aws_subscription:user/bridge_user"
      },
      "Action": [
```

Introduction to Storage Bridge

```
"s3: AbortMultiPartUpload",
"s3: DeleteObject",
"s3: DeleteObjectVersion",
"s3: GetObject",
"s3: GetObjectVersion",
"s3: ListMultiPartUploadParts",
"s3: PutObject",
"s3: RestoreObject"
],
"Resource": "arn:aws:s3:::bucket-name/*"
}
]
}
```

Tip: You can find instructions about creating buckets and managing the permissions in the Amazon S3 Console User Guide:

<https://docs.aws.amazon.com/AmazonS3/latest/user-guide/what-is-s3.html>

Microsoft Azure Blob Storage

- a separate empty container for each recording storage/archive you want to extend and/or back up on Microsoft Azure blob storage
- account name and key with at least write access to the respective container on the Azure Blob storage

Backblaze B2 Cloud Storage

- create a separate empty bucket for each recording storage/archive you want to extend or back up on the Backblaze B2 cloud storage
- provide Backblaze application key and keyID for access to each respective bucket

Google Cloud Storage

- create a separate empty bucket for each recording storage/archive you want to extend and/or back up on the Google Cloud storage
- provide a client email and private JSON key of a service account user, which is owner of the respective bucket

IBM Cloud Object Storage

- create a separate empty bucket for each recording storage/archive you want to extend and/or back up on the IBM cloud object storage
- provide access key ID and secret access key with at least write access to the respective bucket

Wasabi Cloud Object Storage

- create a separate empty bucket for each recording storage/archive you want to extend and/or back up on the Wasabi cloud storage

Note: *Region specific target URL may be required.*

- provide the access and secret keys with at least write access to the respective bucket

S3-compatible Object Storage

- a separate empty bucket for each recording /archive storage you want to extend and/or back up on the S3-compatible object storage
- provide access key ID and secret access key, which provide at least write access to the respective bucket on S3-compatible object storage

Network Share

- create an empty folder on the network share for each recording storage/archive you want to extend and/or back up
- provide the user name and password of an account that has Read & Write permissions to the network share

Local NTFS Volume

- provide a unique path on the volume (the root of the volume or a subfolder) for each recording storage/archive you want to extend and/or back up on the local volume

Important: *The root of the volume or the subfolder must not contain any other data. Keep in mind that you cannot use one and the same volume as an extension and/or disaster recovery location to more than one recording storage or archive.*

- make sure that the volume is mounted as a local volume with Read & Write permissions on the recording server

2

Storage Bridge Installation and Activation

<i>Install Storage Bridge</i>	18
<i>Uninstall Storage Bridge</i>	23
<i>Activate Storage Bridge</i>	24

Install Storage Bridge

To fully benefit from Storage Bridge on your Milestone XProtect VMS, you should install the following components:

- Storage Bridge - the primary Storage Bridge application must be installed on each recording server to provide all Disaster Recovery and Storage Extension functionality.
- Storage Bridge XProtect Management Client plug-in - on the XProtect Management Client in order to enable and configure storage extension and/or disaster recovery on a recording server's recording storage/archive.
- Storage Bridge XProtect Smart Client plug-in - on each XProtect Smart Client computer, to display additional timeline data, showing the exact location of recordings. It also allows users to automatically or manually retrieve recordings from the nearline or offline extension.

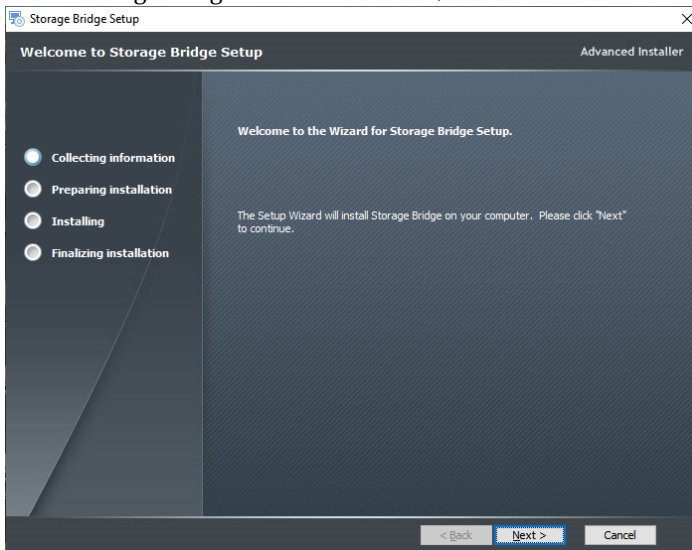
Note: *Even if your XProtect VMS uses a Single Computer installation i.e. all XProtect components are installed on one and the same machine, to benefit from the Storage Bridge workflow you must install both Storage Bridge and the Storage Bridge plug-in for XProtect Management Client and optionally the Storage Bridge plug-in for XProtect Smart Client on the XProtect VMS computer.*

To install Storage Bridge on a recording server:

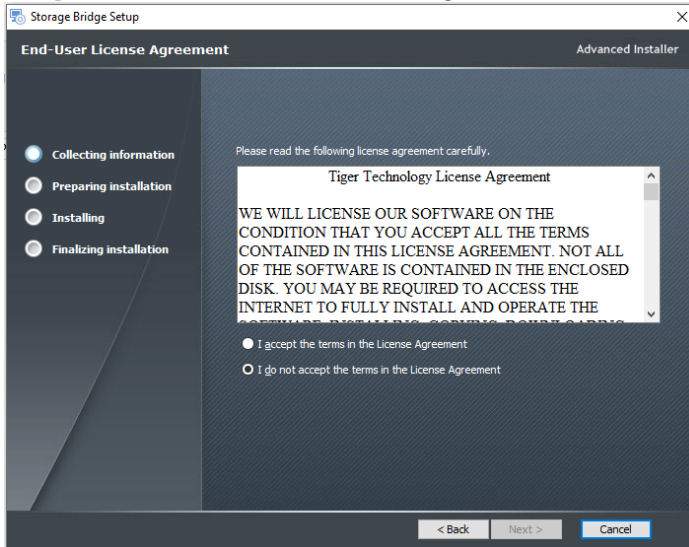
1. Double-click the Storage Bridge installation file.

Note: *If the setup wizard detects that prerequisites needed to run Storage Bridge are not installed on the computer, click next to install them.*

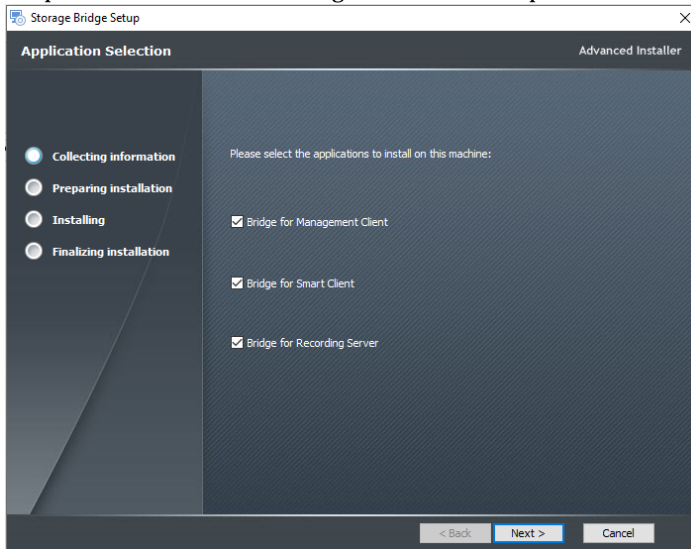
2. In the Storage Bridge installation wizard, click Next.



3. Accept the terms of the software license agreement and click Next.



4. Make sure the “Bridge for Recording Server” check box and the check boxes of all other components that will be running on the same computer are selected, then click Next



Important: *If the recording server does not run XProtect Management Client and/or XProtect Smart Client, clear the check boxes of the corresponding components and install them separately, following the instructions below.*

5. When the installation is complete, click Finish.

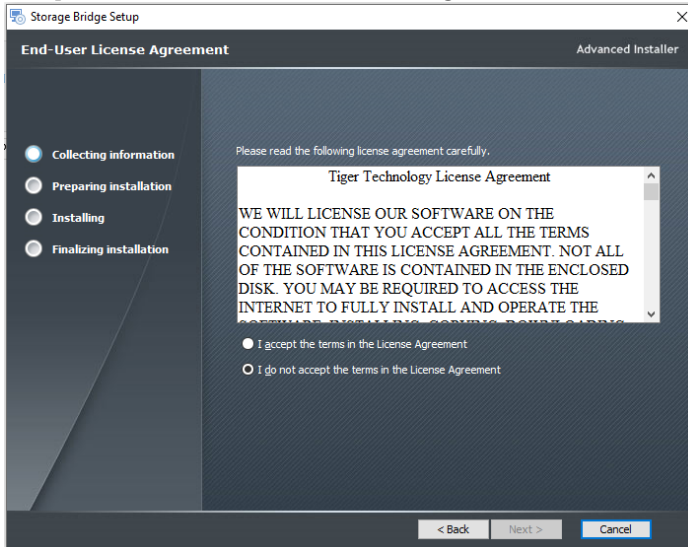
Storage Bridge Installation and Activation

To install the Storage Bridge plug-in on the XProtect Management Client:

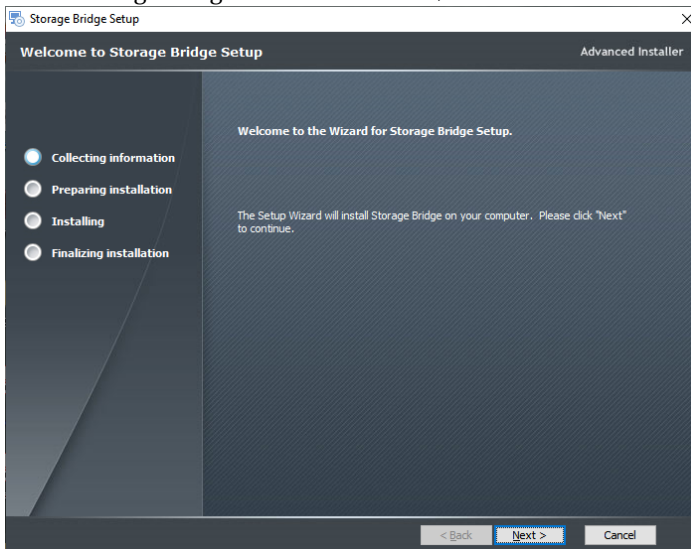
1. Double-click the Storage Bridge installation file.

Note: If the setup wizard detects that prerequisites needed to run the Storage Bridge XProtect Smart Client plug-in are not installed on the computer, click next to install them.

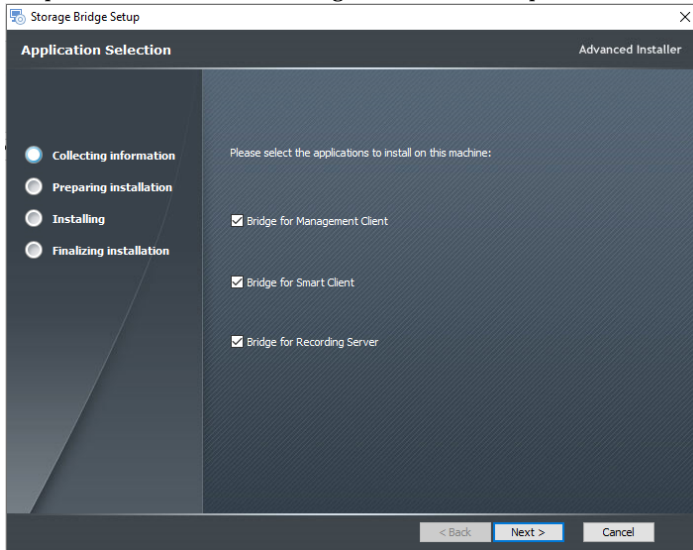
2. Accept the terms of the software license agreement and click Next.



3. In the Storage Bridge installation wizard, click Next.



4. Make sure the “Bridge for Management Client” check box and the check boxes of all other components that will be running on the same computer are selected, then click Next



Important: *If the XProtect Management Client computer does not run XProtect Smart Client and is not set up as a recording server, clear the check boxes of the corresponding components and install them separately.*

5. When the installation is complete, click Finish.

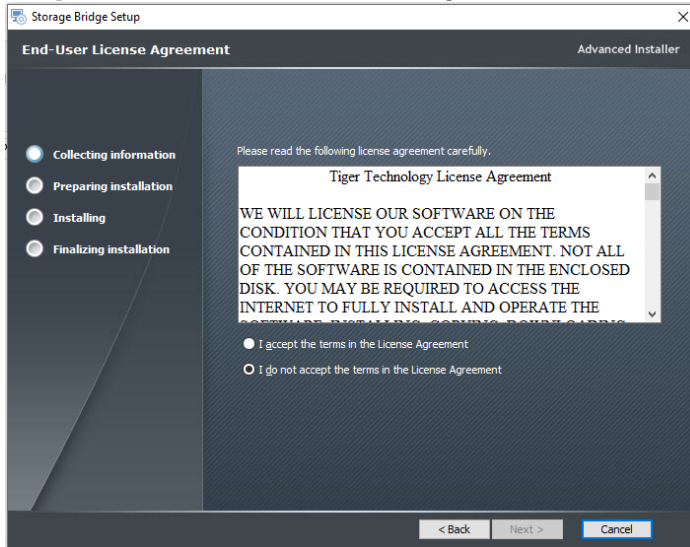
To install the Storage Bridge plug-in on the XProtect Smart Client:

1. Double-click the Storage Bridge installation file.

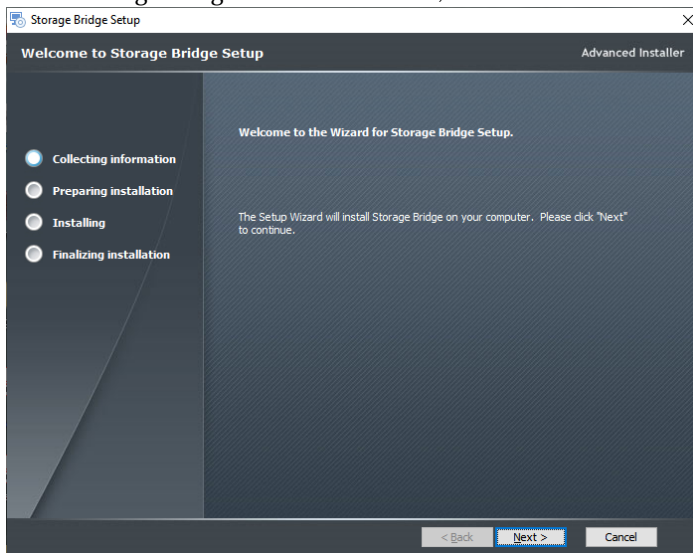
Note: *If the setup wizard detects that prerequisites needed to run the Storage Bridge XProtect Smart Client plug-in are not installed on the computer, click next to install them.*

Storage Bridge Installation and Activation

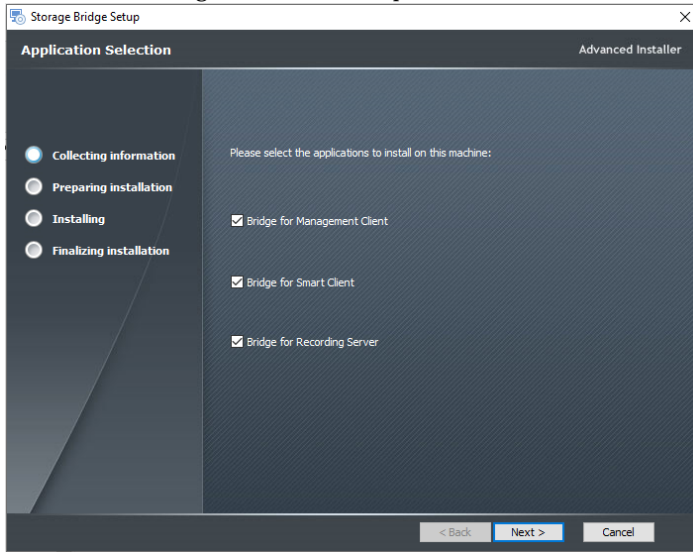
2. Accept the terms of the software license agreement and click Next.



3. In the Storage Bridge installation wizard, click Next.



4. Make sure the “Bridge for Smart Client” check box and the check boxes of all other components that will be running on the same computer are selected, then click Next



Important: *If the computer running XProtect Smart Client does not run XProtect Management Client and is not set up as a recording server, clear the check boxes of the corresponding components and install them separately.*

5. When the installation is complete, click Finish.

Uninstall Storage Bridge

You can uninstall Storage Bridge and any of its plug-ins at any time.

When you uninstall Storage Bridge from a recording server, even if the extension/disaster recovery is not disabled, no further data will be backed up/moved and you will not be able to access already moved data from the extension or recover data from the disaster recovery storage through your XProtect VMS.

On the other hand, if you configure extension/disaster recovery in the XProtect Management Client plug-in and then uninstall it, Storage Bridge will continue to back up/move data from the recording storage/archive to its extension/disaster recovery storage, but you will not be able to change the configuration, to manually move or back up data and to recover data in case of a failure of the recording server or its storage, until you install the XProtect Management Client plug-in again.

Storage Bridge Installation and Activation

Uninstalling the Storage Bridge plug-in from the XProtect Smart Client will simply hide the additional timeline data displaying the exact location of recordings and users will not be able to manually retrieve data from the nearline/offline extension.

To uninstall Storage Bridge from the recording server:

1. In Control Panel, go to Programs and Features.
2. Right-click Storage Bridge and select Uninstall.
3. When prompted to confirm that you want to remove Storage Bridge from the computer, click Yes.

To uninstall the Storage Bridge from XProtect Management Client plug-in:

1. In Control Panel, go to Programs and Features.
2. Right-click Bridge for Management Client and select Uninstall.
3. When prompted to confirm that you want to remove the Storage Bridge XProtect Management Client plug-in from the computer, click Yes.

To uninstall the Storage Bridge XProtect Smart Client plug-in:

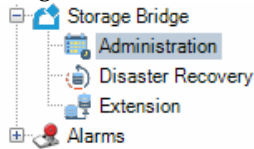
1. In Control Panel, go to Programs and Features.
2. Right-click Bridge for Smart Client and select Uninstall.
3. When prompted to confirm that you want to remove the Storage Bridge XProtect Smart Client from the computer, click Yes.

Activate Storage Bridge

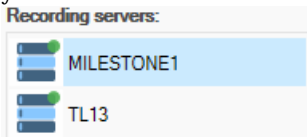
You can activate Storage Bridge using a software as a service (SaaS) license. You need to activate the product on each recording server, whose recording storage/archive you want to extend or back up. To enable more features once you have activated the product, simply repeat the activation procedure again.

To view the activation status of Storage Bridge on a recording server:

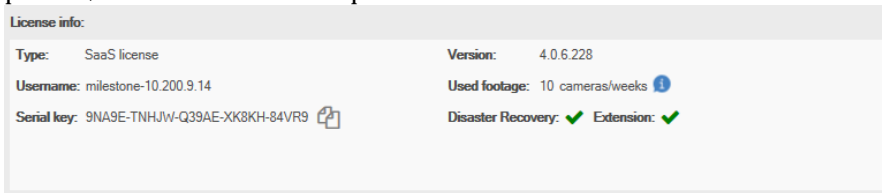
1. In the Site Navigation of XProtect Management Client, click Administration under Storage Bridge.



2. In the right pane under Recording Servers, click the recording server, whose activation status you want to view.

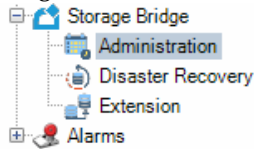


3. The License info pane displays the type of license, your user name, serial key, the version of the product, the number of cameras per week and the activated features.

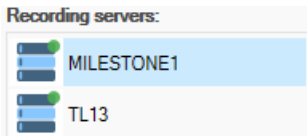


To activate a Storage Bridge on a recording server:

1. In the Site Navigation of XProtect Management Client, click Administration under Storage Bridge.



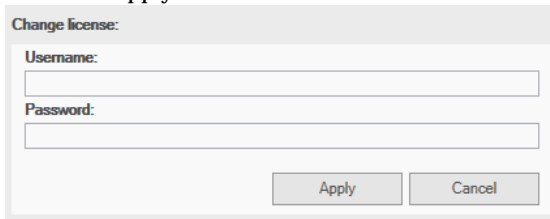
2. In the right pane under Recording Servers, click the recording server, which you want to activate.



Note: If a recording server is displayed in the list with a greyed out icon, it is either offline or does not have Storage Bridge installed.

Storage Bridge Installation and Activation

3. Under Change license, enter the username and password for your software subscription and then click Apply.



A dialog box titled "Change license:" with two input fields. The first field is labeled "Username:" and the second is labeled "Password:". Below the fields are two buttons: "Apply" and "Cancel".

Change license:

Username:

Password:

Apply Cancel

3

Manage Disaster Recovery

<i>Enable Disaster Recovery</i>	<i>28</i>
<i>Start/Pause Automatic Operations</i>	<i>32</i>
<i>Monitor Data Backup</i>	<i>35</i>

Manage Disaster Recovery

To ensure against data loss, you can configure Storage Bridge to automatically copy all data and metadata from a recording storage/archive to a disaster recovery target. For this purpose you need to enable a cloud target, network share, or local volume as your disaster recovery storage, following the steps in “Enable Disaster Recovery” on page 28.

The time for full backup depends on the network characteristics and connection speed to the disaster recovery storage. You can keep track of the progress of data backup following the steps in “Monitor Data Backup” on page 35.

Storage Bridge disaster recovery is meant to provide a safety net in case of an unforeseen failure of a recording server’s recording storage/archive or the recording server itself. In case of a failure, you can immediately begin recovering all backed up data by following the steps in “Recover Backed Up Data” on page 38.

Enable Disaster Recovery

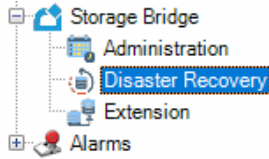
To enable disaster recovery, you should simply provide the credentials for access to the cloud storage, network share or local volume, which will be used for backing data up. If a nearline/offline extension is already enabled for the selected recording storage or archive, the same cloud storage, network share or local volume is also used for disaster recovery and there is no need to provide the credentials for access to the disaster recovery storage.

Important: *Storage Bridge does not allow you to use the same bucket/container (on cloud storage) or folder (on network share or local volume) as a disaster recovery location of more than one recording storage/archive.*

To change the type of disaster recovery storage or the credentials for access to it, you need to first disable disaster recovery, following the steps in “Disable Disaster Recovery” on page 30 and then configure it again. Keep in mind that if you want to change the type of disaster recovery storage or the credentials for access to it, and a nearline/offline extension is also enabled, you must first disable the extension(s), following the steps in “Disable a Storage Extension” on page 54.

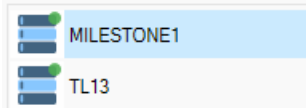
To enable disaster recovery:

1. In the Site Navigation of XProtect Management Client, click Disaster Recovery under Storage Bridge.



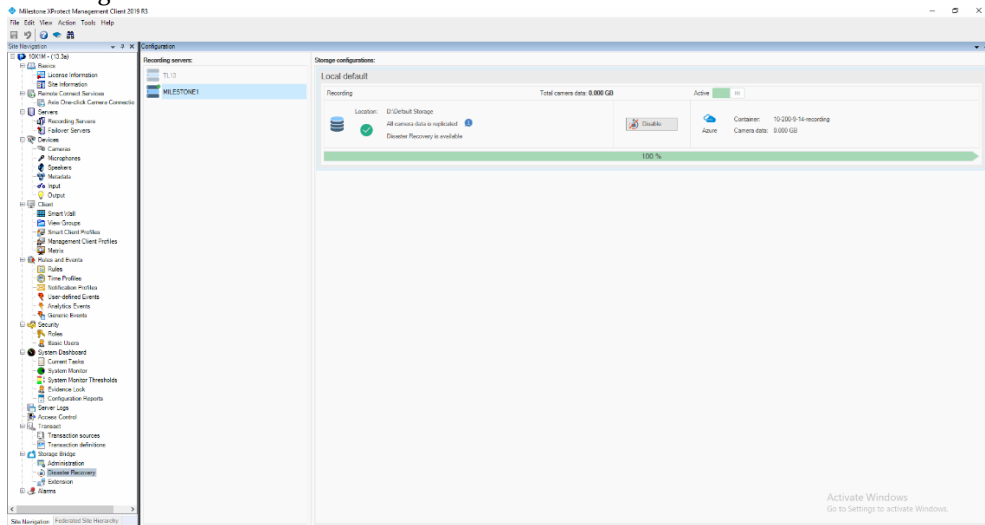
2. In the right pane under Recording Servers, click the recording server, whose recording storage or archive you want to back up.

Recording servers:



Note: If a recording server is displayed in the list with a greyed out icon, it is either offline or does not have Storage Bridge installed.

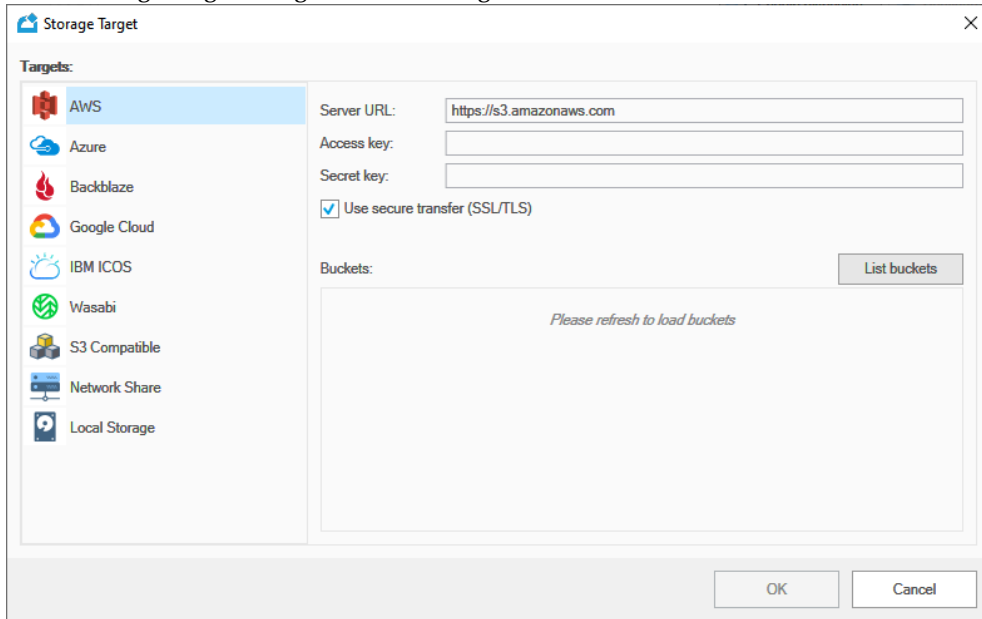
The Storage Bridge plug-in lists all recording storage/archives configured for the selected recording server.



3. Next to the recording storage  or the archive  pane, click Enable.

Note: If nearline/offline extension is already enabled for the selected recording storage/archive, the same storage will be used for disaster recovery.

4. In the Storage Target dialog, do the following:



- Under Targets, select the type of the disaster recovery storage.
- Fill in the details for access to the selected disaster recovery storage.

Important: *Never provide the credentials of your root user.*

- (cloud storage only) Select whether to use secure transfer of data, select the bucket/container, which should be used as an actual extension and then click OK.

Note: *If the account you have specified for access to the disaster recovery storage cannot list all buckets/containers, you must enter the name of the bucket/container manually.*

- (network share only) Enter the name of the folder on the network share, to which data from the recording storage/archive will be backed up and then click OK.
- (local storage only) Browse to and select the folder on the local volume, to which data from the recording storage/archive will be backed up and then click OK.

Important: *By default, all automatic Storage Bridge operations are initially paused. To let Storage Bridge begin automatically back up data, follow the instructions in “Start/Pause Automatic Operations” on page 32.*

Disable Disaster Recovery

When you disable a recording storage/archive’s disaster recovery storage, Storage Bridge stops copying data to it both automatically and manually and all already copied data cannot be recovered

in case of a recording storage/archive failure. Additionally, once you disable disaster recovery, data on it is no longer automatically deleted once the retention limit set for the respective recording storage/archive is reached.

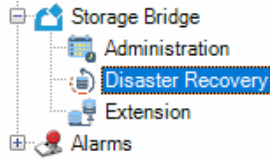
Important: *If the recording storage/archive whose disaster recovery you disable also has nearline/offline extension enabled, Storage Bridge stops backing up data, but the storage extension mechanism continues operation. You are also still able to manually move data to and from the extension, following the steps in "Manually Manage Data" on page 65.*

If you want to disable disaster recovery in order to change the credentials for access to the disaster recovery storage, make sure the new credentials provide access to data already backed up. Otherwise it may remain unavailable for recovery in your XProtect VMS. If you want to disable disaster recovery in order to change the type of disaster recovery storage, it is advisable to first migrate all data from your current disaster recovery storage.

Manage Disaster Recovery

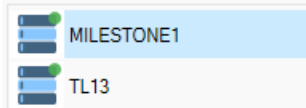
To disable disaster recovery:

1. In the Site Navigation of XProtect Management Client, click Disaster Recovery under Storage Bridge.

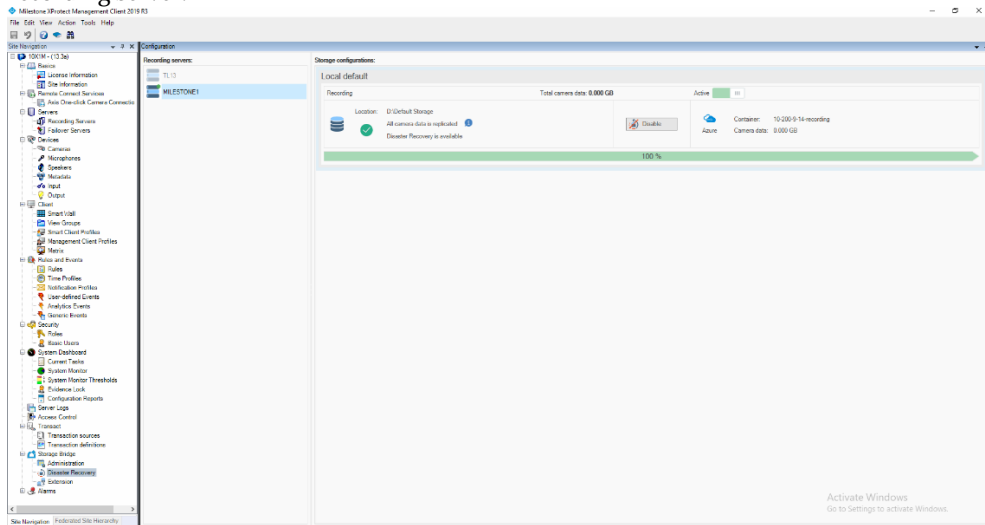




2. In the right pane under Recording Servers, click the recording server, whose recording storage or archive's disaster recovery you want to disable.

Recording servers:



The Storage Bridge plug-in lists all recording storage/archives configured for the selected recording server.



3. In the recording storage  or the archive  pane, click Disable.

Start/Pause Automatic Operations

You can pause and start all automatic operations for a specific recording storage/archive at any time. It's important to keep in mind that pausing/starting automatic operations concerns both backing up data and moving data to the extension if extension is enabled for the same recording

storage/archive. Additionally, even if automatic operations are started for the disaster recovery mechanism, but then you enable storage extension for the same recording storage/archive, by default the automatic operations will be paused, until you manually start them again.

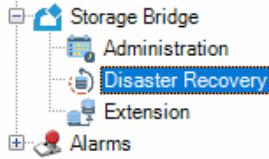
While automatic operations are paused, Storage Bridge stops backing up data to the disaster recovery storage, but already backed up data can be recovered in case of a recording storage/archive failure.

Once you start automatic operations, Storage Bridge immediately resumes processing the queue with files scheduled to be backed up.

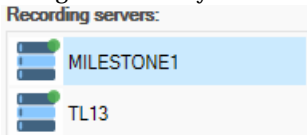
Manage Disaster Recovery

To start/pause automatic operations for a recording storage/archive:

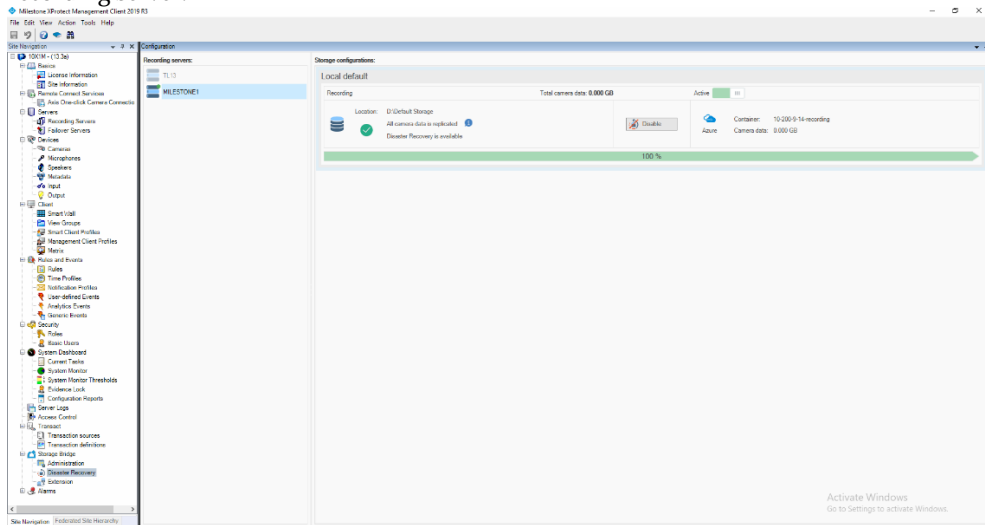
1. In the Site Navigation of XProtect Management Client, click Disaster Recovery under Storage Bridge.







2. In the right pane under Recording Servers, click the recording server, for whose recording storage or archive you want to start or pause the automatic operations.



The Storage Bridge plug-in lists all recording storage/archives configured for the selected recording server.



3. In the upper right corner of the recording storage  or the archive  pane, do one of the following:





- Switch the setting to Active  and when prompted, confirm that you want to start automatic Storage Bridge operations.
- Switch the setting to Inactive  and when prompted, confirm that you want to pause automatic Storage Bridge operations.

Monitor Data Backup

The Disaster Recovery page of the Storage Bridge XProtect Management Client plug-in provides you with all information necessary to keep track of the status of a recording server, its recording storage(s)/archive(s), any enabled disaster recovery storage and the data backup progress.

Monitor Recording Servers

To view the status of all recording servers, in the Site Navigation of XProtect Management Client, click Disaster Recovery under Storage Bridge and then check the Recording servers pane:

icon indicator:	status:	tooltip:
green blinking indicator 	The recording server and its recording storage(s)/archive(s) are operating normally. If a disaster recovery storage is enabled for a recording storage/archive, all data is fully backed up.	Healthy online
yellow blinking indicator 	The recording server is operating normally, but Storage Bridge has detected one or all of the following problems: <ul style="list-style-type: none"> • A disaster recovery storage is inaccessible. Check the panes of the recording storages/archives for this icon  to identify it. For more information, refer to “Monitor the Recording Storage/Archive” on page 36. • One or more files on a recording storage/archive cannot be backed up. Check the panes of the recording storages/archives for this icon  to identify it. For more information, refer to “Monitor the Recording Storage/Archive” on page 36. 	Target is offline

red blinking indicator






<p>The recording server is operating normally, but Storage Bridge has detected one or all of the following problems:</p>	
<ul style="list-style-type: none"> • A recording storage or archive is not responding and Storage Bridge cannot back up any more data from it. To identify it, refer to “Monitor the Recording Storage/Archive” on page 36. 	<p>Storage is not responding</p>
<ul style="list-style-type: none"> • A recording storage or archive has failed. To identify it, refer to “Monitor the Recording Storage/Archive” on page 36. 	<p>Storage is offline</p>
<ul style="list-style-type: none"> • Storage Bridge has failed to perform a scheduled operation. 	<p>Generic error</p>

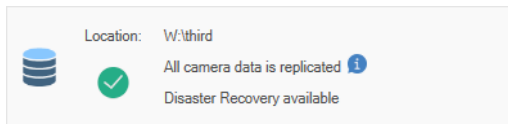
greyed out icon



<p>One of the following problems has been detected:</p>	
<ul style="list-style-type: none"> • Storage Bridge is either not installed or not responding on the recording server. 	<p>Server is offline</p>
<ul style="list-style-type: none"> • The recording server is offline and may need to be recovered. <p>Tip: Refer to “Diagnose a Failed Recording Server” on page 41 to confirm that you need to run the Disaster Recovery Wizard.</p>	<p>Recording server is offline</p>

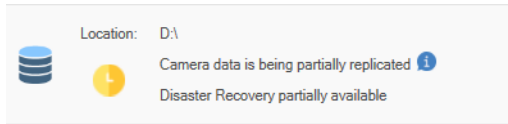
Monitor the Recording Storage/Archive

The Storage Bridge plug-in lists all recording storages  and archives  configured for a selected recording server in the Disaster Recovery page of the XProtect Management Client plug-in. The recording storage or archive pane, gives you information about its mount path on the recording server as well as the status of the recording storage/archive. Click the info button  in the pane, to display a tooltip with additional information.



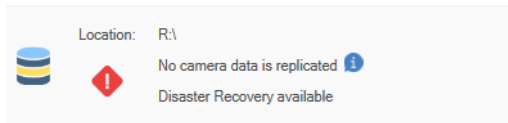
The recording storage or archive is available and as long as disaster recovery storage is enabled for it, all its data is fully backed up.

The recording storage or archive is available and data on it is still being backed up. The data backup progress bar below the pane is displayed in yellow and shows you the percentage of backed up data.



Storage Bridge could not back up one or more files on the recording storage/archive. To confirm this is the problem, check the progress bar below the pane - it should be displayed in pink. For more information, refer to “Monitor Data Backup Progress” on page 38.

The disaster recovery storage of the selected recording storage/archive is inaccessible. Check for changed credentials for access to it or for connectivity problems.



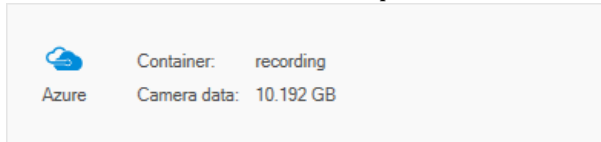
The recording storage or archive has been dismounted from the recording server because it has suffered a failure. If disaster recovery has been enabled, Storage Bridge displays the Disaster Recovery Wizard button below the recording servers’ pane. For more information, refer to “Recover Recording Storage/Archive” on page 38.

The storage on which the selected recording storage/archive is located has failed. The Disaster Recovery Wizard button is not present, if no disaster recovery storage has been enabled.


The storage on which the selected recording storage/archive is located is not responding.

Monitor Disaster Recovery Storage

The disaster recovery storage pane gives you information about the storage type, the name of the container in which data is backed up and the size of the total data already backed up.





Manage Disaster Recovery

Note: If the disaster recovery storage is inaccessible for some reason (changed credentials for access to it or connectivity problems), the pane of the recording storage/archive displays this icon . Refer to “Monitor the Recording Storage/Archive” on page 36 for more details.

Monitor Data Backup Progress

You can view the total size of camera data, which needs to be backed up in the header of a recording storage/archive and keep track of the percentage of already backed up data in the progress bar below.

 all data from the recording storage/archive has been fully backed up

 data from the recording storage/archive is being backed up.

Note: Keep in mind that if cameras are actively recording on the recording storage and data is being constantly sent to the archive, the percentage of backed up data may never reach 100%.

 Storage Bridge failed to back up some data from the recording storage/archive. To identify the exact files, check the logs in Windows Event Viewer.

Recover Backed Up Data

The Disaster Recovery Wizard of Storage Bridge guides you in recovering a failed recording storage, archive or recording server. The wizard becomes available only when a disaster recovery condition is present. That is why it is important to carefully monitor your recording server(s) and storages, before attempting to recover them. Detailed steps about diagnosing a disaster recovery condition are provided below.

To speed up the disaster recovery and reduce downtime, you can prepare your recording server(s) system and storage, following the disaster recovery prerequisites provided below. It is of great importance to adhere to the disaster recovery precautions, provided before the recovery procedures in order to prevent irrecoverable data and metadata.




Recover Recording Storage/Archive

Follow these procedures to recover backed up data from a failed recording storage or archive:

- diagnose the failed recording storage/archive
- prepare the storage for recovery of backed up data
- recover data and metadata with the Disaster Recovery Wizard

Diagnose a Failed Recording Storage/Archive

You can diagnose a recording storage/archive failure in the Disaster Recovery page of the XProtect Management Client plug-in:

- a recording server whose recording storage and/or archive has failed is displayed in the page with a red blinking icon 
- a failed recording storage or archive is displayed in the list with a warning sign 
- the Disaster Recovery Wizard button is available in the recording servers' pane 

Storage Disaster Recovery Precautions and Prerequisites

Once you have ensured that a recording storage and/or an archive has indeed failed, you must take the following precautions in order to ensure that data can be recovered:

1. Do not attempt to recover or mount on the recording server any volume with the same drive letter as the failed one(s), on which a recording storage/archive has been stored.
2. Once you start the disaster recovery procedure, do not restart the recording server until you complete the procedure in the Disaster Recovery Wizard.

The disaster recovery procedure requires that the Wizard temporarily stops the XProtect Recording Server service. As long as a failover recording server is configured, it will take over recording data until the Wizard starts the service again. To speed up the recovery procedure, you can:

- prepare a new disk, on which to recover the failed recording storage/archive

Note: *The capacity of the disk should be enough to accommodate all backed up data. You can easily calculate the needed capacity by checking the Camera data field in the Disaster recovery storage pane of the failed recording storage/archive (see "Monitor Disaster Recovery Storage" on page 37).*

- attach the new disk to the recording server and create an NTFS volume on it, but DO NOT assign a drive letter.

Note: *If you need to recover data from recording storages/archives stored on more than one volume on your recording server, attach as many new NTFS volumes to the server as needed or repeat the recovery procedure for each volume that has failed later on.*

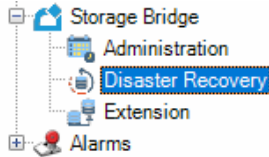
Recover a Recording Storage/Archive Using the Wizard


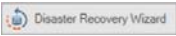
Important: *During the recovery procedure, the Wizard stops the XProtect Recording Server service on the computer and when finished automatically starts it again. As long as there is a failover recording server configured, it will take over recording data from the attached devices until the recovery procedure finishes.*

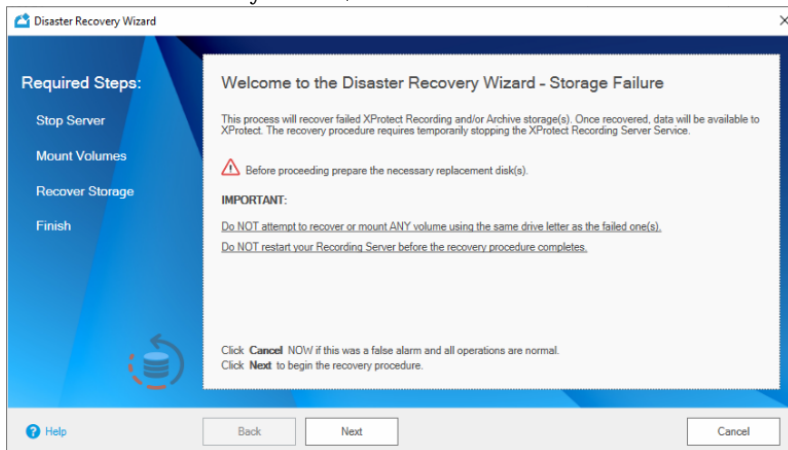
Manage Disaster Recovery

To recover failed recording storage(s)/archive(s) using the Wizard:

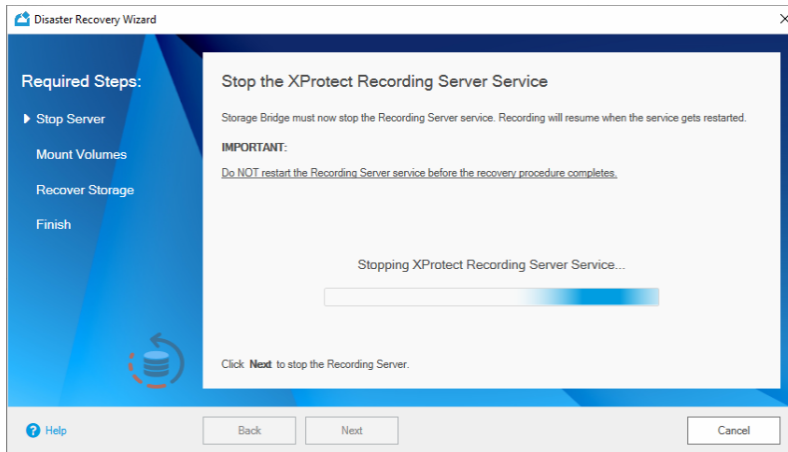
1. In the Site Navigation of XProtect Management Client, click Disaster Recovery under Storage Bridge.



2. In the right pane under Recording Servers, click the recording server, whose recording storage/archive you want to recover. It is displayed with a red blinking icon .
3. Below the list of recording servers, click the Disaster Recovery Wizard button .
4. In the Disaster Recovery Wizard, click Next.

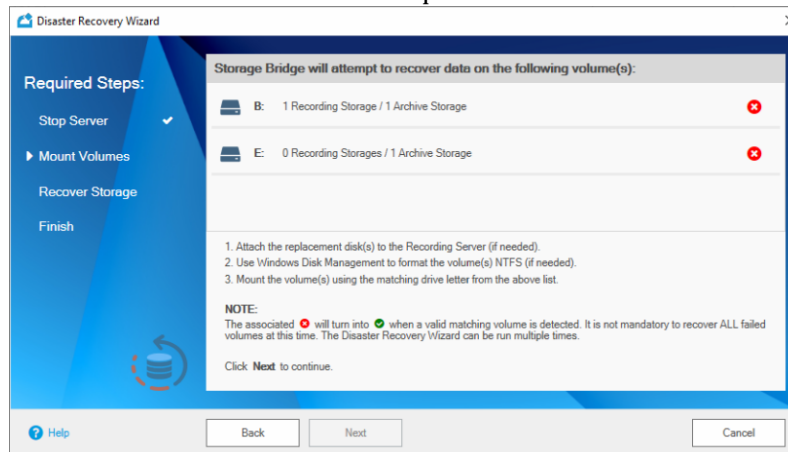


5. To let the Disaster Recovery Wizard stop the XProtect Recording Server service on the recording server, click **Next**.



Important: You must not restart the recording server until the data recover procedure finishes.


The Wizard displays a list of all volumes, on which it has detected a failed recording storage and/or archive for which there is data backup available.



6. In Windows, do one of the following:
- (if the NTFS volumes are already formatted) assign the same drive letters as the ones of the volumes listed in the Wizard.

Manage Disaster Recovery

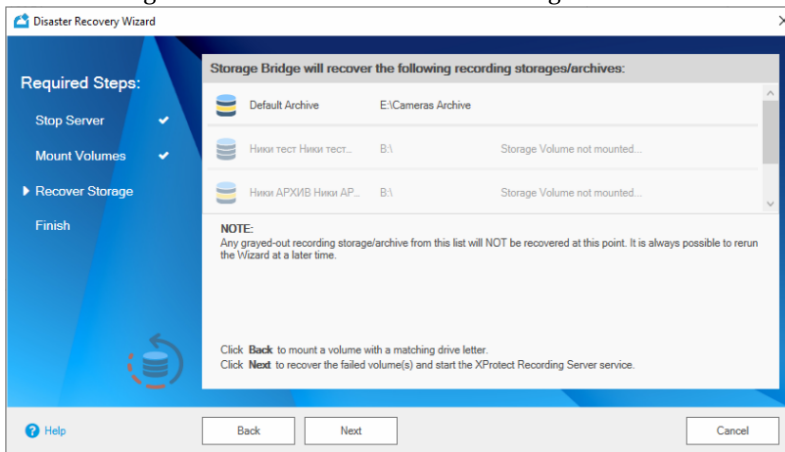
- insert one or more disks, format them to NTFS and assign the same drive letters as the ones of the volumes listed in the Wizard.

The Wizard automatically detects each newly added volume with matching drive letter and updates its status in the list with this icon , designating that it can recover data on it.

Note: *There must be at least one volume with matching drive letter in the list in order to continue. You can run the wizard later on for each volume, which you are not ready to recover now.*

7. Click Next to continue.

The wizard displays a list of recording storage(s)/archive(s), which it can recover. If a recording storage/archive is greyed out, the wizard cannot recover its data as it cannot detect a volume with matching drive letter mounted on the recording server.



Note: *You can click Back in the wizard and repeat the previous step in order to recover data from a recording storage/archive, which is greyed out in the list.*

8. Click Next to confirm that you want to recover data from the listed recording storage(s)/archive(s).

The Disaster Recovery Wizard creates a stub file for each recovered file on the respective recording storage/archive. You can create a manual job for retrieving the actual data from the Disaster Recovery storage, following the steps in “Manually Manage Data” on page 66 or you can retrieve the recordings on demand by previewing them in the XProtect Smart Client (for more information, refer to “Work with the XProtect Smart Client Plug-in” on page 75).


9. In the Disaster Recovery Wizard click Finish to let it start the XProtect Recording Server service.

Recover a Failed Recording Server

Follow these procedures to recover backed up data from a failed recording server:

- diagnose a failed recording server
- prepare the replacement server
- recover the recording server and its recording storage(s)/archives with the Disaster Recovery Wizard

Diagnose a Failed Recording Server

A failed recording server is displayed in the Disaster Recovery page of the XProtect Management Client plug-in with a greyed out icon  in the list and the Disaster Recovery Wizard button is displayed below the servers' list.

Note: *If the Disaster Recovery Wizard button is not present, there is either no backup available for this recording server or Storage Bridge is not installed/not responding on the computer.*

To ensure that you need to recover the recording server, make sure that:

- the recording server is not turned off
- the recording server's network cable is not disconnected

If none of the above resolves the problem with the inaccessible recording server, proceed with preparing for recovery.

Recording Server Recovery Prerequisites

To speed up the recovery procedure, before starting the Disaster Recovery Wizard you can prepare a replacement recording server, which meets the following requirements:

- has at least one empty NTFS volume mounted with the same drive letter as that of a volume, on which a recording storage/archive of the failed server has been stored.

Note: *Once you recover the recording server, you can recover any remaining recording storage(s)/archive(s) stored on other volumes, following the steps in "Recover Recording Storage/Archive" on page 38.*

- XProtect Recording Server is installed and is using a valid license
- no devices (like cameras, for example) are attached to the new recording server in Milestone XProtect

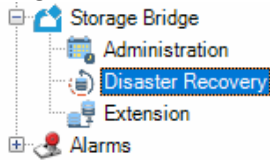
Note: *Once the recovery procedure finishes, all devices previously attached and recording on the failed recording server will automatically be attached to the new one.*



- the computer is turned on and can be accessed through the XProtect Management Client
- Storage Bridge is installed, but is not activated

Recover a Recording Server Using the Wizard

To recover failed recording server using the Wizard:

1. In the Site Navigation of XProtect Management Client, click Disaster Recovery under Storage Bridge.

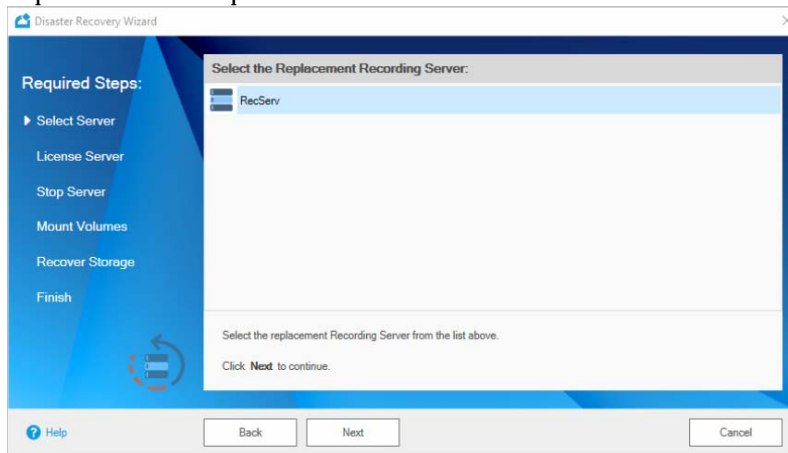


2. In the right pane under Recording Servers, click the failed recording server. It is displayed with a greyed out icon .
3. Below the list of recording servers, click the Disaster Recovery Wizard button .

4. In the Disaster Recovery Wizard, click Next.



The Disaster Recovery Wizard lists all detected recording servers, which match the requirements for a replacement server.

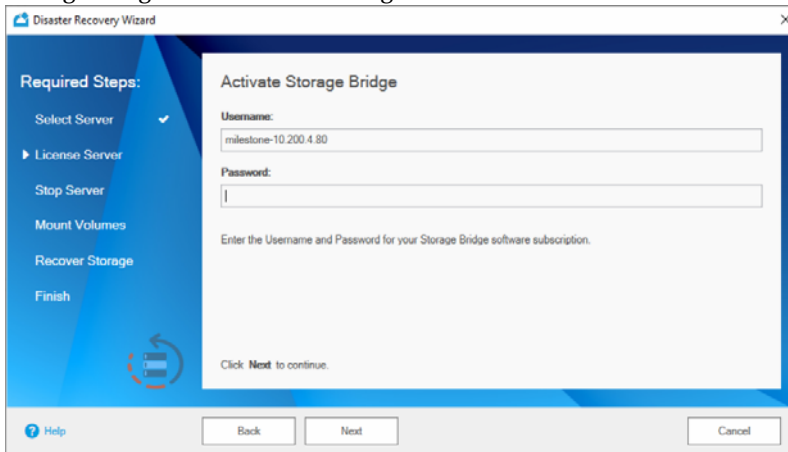


Note: If no suitable recording server is detected, click Back and prepare a computer, which meets the prerequisites outlined in "Prepare the New Recording Server" on page 46, and then click Next in the Wizard.

5. Select the computer, on which to recover the failed recording server and click Next.

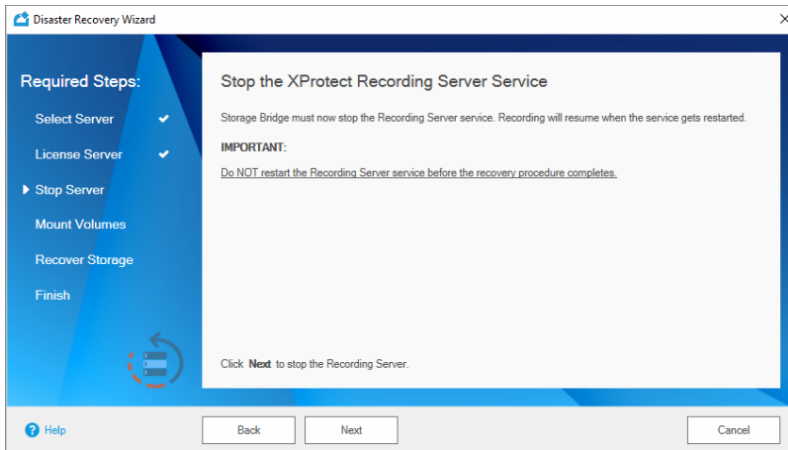
Manage Disaster Recovery

6. Enter the username and password of your Storage Bridge subscription and click Next to activate Storage Bridge on the new recording server.



The screenshot shows the 'Disaster Recovery Wizard' window. On the left, a 'Required Steps' list includes: Select Server (checked), License Server, Stop Server, Mount Volumes, Recover Storage, and Finish. The main area is titled 'Activate Storage Bridge' and contains a 'Username:' field with the value 'milestone-10.200.4.80', a 'Password:' field, and a note: 'Enter the Username and Password for your Storage Bridge software subscription.' Below this is the instruction 'Click Next to continue.' At the bottom, there are 'Help', 'Back', 'Next', and 'Cancel' buttons.

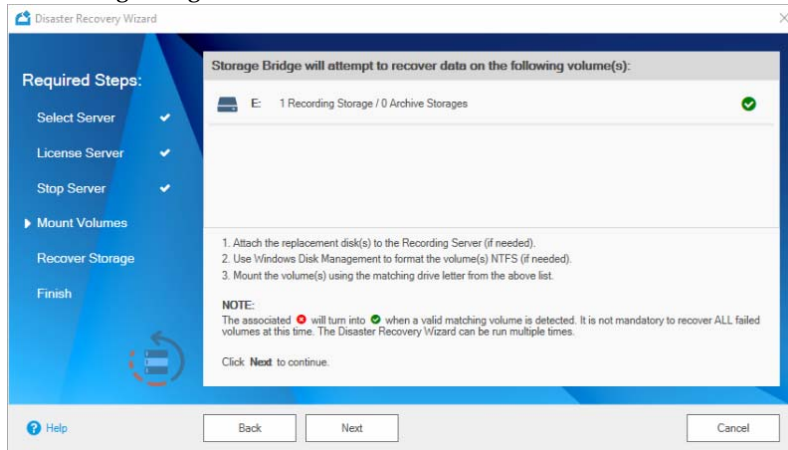
7. To let the Disaster Recovery Wizard stop the XProtect Recording Server service on the recording server, click Next.





The screenshot shows the 'Disaster Recovery Wizard' window. On the left, the 'Required Steps' list is updated: Select Server (checked), License Server (checked), Stop Server (highlighted), Mount Volumes, Recover Storage, and Finish. The main area is titled 'Stop the XProtect Recording Server Service' and contains the text: 'Storage Bridge must now stop the Recording Server service. Recording will resume when the service gets restarted.' Below this is an 'IMPORTANT:' section with the instruction: 'Do NOT restart the Recording Server service before the recovery procedure completes.' At the bottom, there is the instruction 'Click Next to stop the Recording Server.' and 'Help', 'Back', 'Next', and 'Cancel' buttons.


Important: *You must not restart the new recording server until the recovery procedure finishes.*

The Wizard displays a list of all volumes on the failed recording server, on which it can recover a recording storage and/or archive.

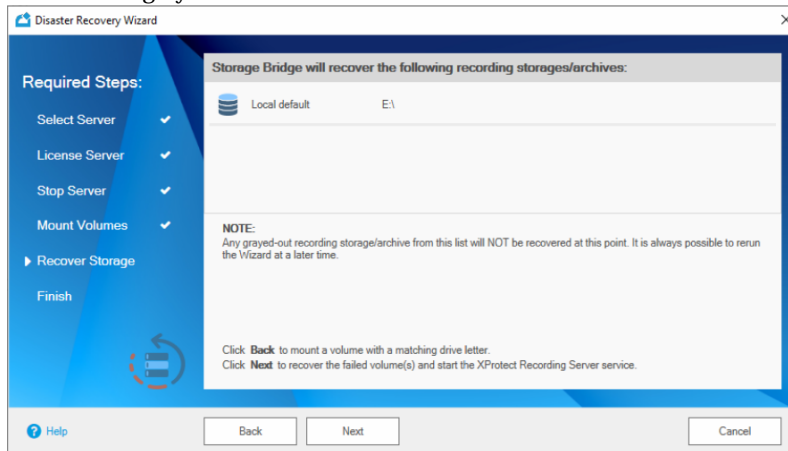


Important: *If a volume is displayed with this icon  in the list, the Wizard cannot recover any recording storage/archive from it as it cannot find a volume with matching drive letter on the new recording server. If you attach an empty NTFS volume with matching drive letter at this point, the Wizard will automatically detect it and change its icon to . As long as there is at least one volume with matching drive letter, you can proceed with the recovery procedure and recover any recording storage/archive on other volumes later on, following the steps in "Recover Recording Storage/Archive" on page 38.*

Manage Disaster Recovery

- Click Next to confirm that you want to recover data only on volumes, displayed with this icon .

The Wizard lists all recording storages/archives it can recover. If a recording storage/archive is listed with a greyed out icon, the Wizard cannot recover it on the new recording server.



- Click Next to confirm that you want to recover data from the listed recording storage(s)/archives.

The Disaster Recovery Wizard creates a stub file for each recovered file on the respective recording storage/archive. You can create a manual job for retrieving the actual data from the Disaster Recovery storage, following the steps in “Manually Manage Data” on page 66 or you can retrieve the recordings on demand by previewing them in the XProtect Smart Client (for more information, refer to “Work with the XProtect Smart Client Plug-in” on page 75).

- In the Disaster Recovery Wizard click Finish to let it start the XProtect Recording Server service on the new recording server.

4

Manage Storage Extensions

<i>Enable Storage Extension</i>	50
<i>Configure Storage Extension</i>	56
<i>Start/Pause Automatic Operations</i>	60
<i>Monitor Storage Extensions</i>	62

Manage Storage Extensions

When you extend the recording storage or archive of a recording server, you simply increase its capacity with the free space on the cloud storage, network share or local volume you have added as an extension. You can expand the capacity of a recording server's storage with a nearline extension, from which data is transparently retrieved as soon as the connection speed allows, or an offline extension, from which data is not retrieved immediately, but must first be rehydrated to an intermediate tier.

Once the retention limit you have specified for the respective recording storage/archive is reached, data is automatically deleted from it and from its nearline/offline extension to make way for newly recorded data.

To extend the recording storage or archive of a recording server, you should do the following:

- enable the storage extension (see “Enable Storage Extension” on page 50).
- configure what data should be automatically moved to the extension and made accessible from there (see “Configure Storage Extension” on page 56).
- turn on automatic Storage Bridge management of data between the extended recording storage/archive and the extension (see “Start/Pause Automatic Operations” on page 60).

Enable Storage Extension

To enable an extension, you should simply provide the credentials for access to the cloud storage, network share or local volume, which will be used as an extension. If disaster recovery is already enabled for the selected recording storage or archive, the same cloud storage, network share or local volume is used as a nearline extension. Thus, there is no need to provide the credentials for access to the extension, but simply configure the extension and enable automatic Storage Bridge operations on it.

The offline extension can only be on the same storage as the nearline extension and uses the same credentials for access. You cannot enable an offline extension of a recording storage/archive, which does not have a nearline extension already enabled. You also cannot enable an offline extension of a recording storage, which has an archive, as moving groomed data to the archive would require unnecessary retrieval of data from the offline extension.

Important: *Storage Bridge does not allow you to use the same bucket/container (on cloud storage) or folder (on network share or local volume) as an extension of more than one recording storage/archive.*

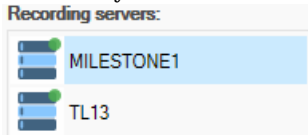
To change the type of storage extension or the credentials for access to it, you need to first disable the current extension, following the steps in “Disable a Storage Extension” on page 54 and then enable it anew. Keep in mind that if you want to change the type of storage extension or the credentials for access to it of a recording storage/archive, which also has Storage Bridge disaster recovery enabled, you must first disable disaster recovery too, following the steps on page 30.

To enable a nearline extension:

1. In the Site Navigation of XProtect Management Client, click Extension under Storage Bridge.

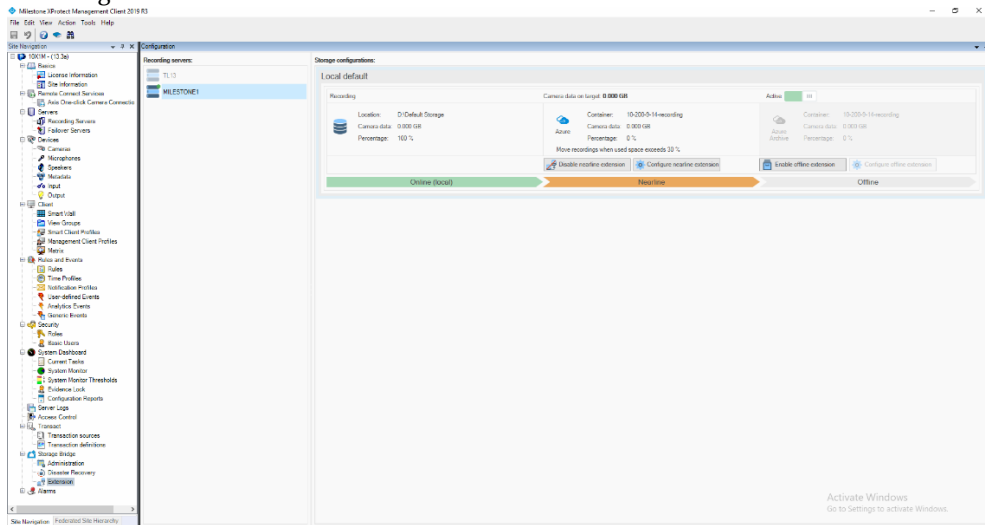


2. In the right pane under Recording Servers, click the recording server, whose recording storage or archive you want to extend.



Note: If a recording server is displayed in the list with a greyed out icon, it is either offline or does not have Storage Bridge installed.

The Storage Bridge plug-in lists all recording storages/archives configured for the selected recording server.

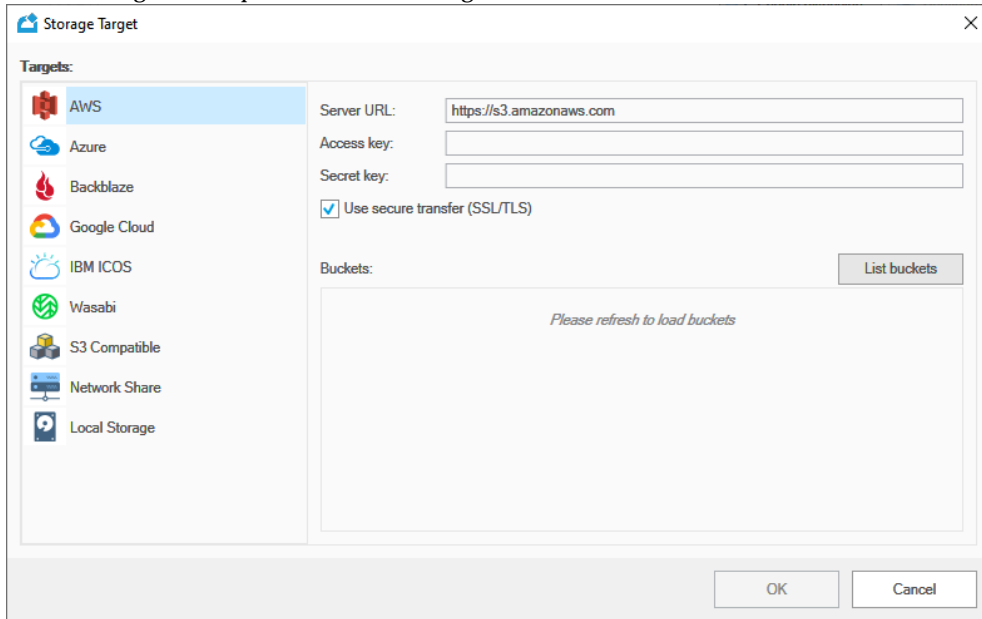


3. In the Nearline pane of the recording storage  or the archive  you want to extend, click Enable Extension.

Note: If disaster recovery is already enabled for the selected recording storage/archive, the same storage will be used as nearline extension. To enable the extension, in the dialog which opens, configure either by size or by age criteria for moving data, following the steps in “Configure Storage Extension” on page 56.

Manage Storage Extensions

4. In the dialog, which opens, do the following:



- Under Targets, select the storage type of the extension you want to enable.
- Fill in the details for access to the selected extension.

Important: *Never provide the credentials of your root user.*

- (☁️ cloud storage only) Select whether to use secure transfer of data, select the bucket/container, which should be used as an actual extension and then click OK.

Note: *If the account you have specified for access to the extension cannot list all buckets/containers, you must enter the name of the bucket/container manually.*

- (🖥️ network share only) Enter the name of the folder on the network share, to which data from the recording storage/archive will be moved and then click OK.
- (💿 local storage only) Browse to and select the folder on the local volume, to which data from the recording storage/archive will be moved and then click OK.

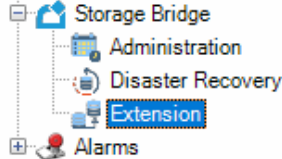
Until you configure the extension, Storage Bridge uses the default parameter - data is automatically moved to the nearline extension and is made accessible from there, when the used space on your recording storage/archive reaches 95%. You can change this default parameter, following the steps in “Configure Storage Extension” on page 56.

Important: *By default, all automatic Storage Bridge operations are initially paused and you can move data to the nearline extension only manually, following the steps in “Manually Manage Data” on page 65. To let Storage Bridge automatically move data, follow the steps in “Start/Pause Automatic Operations” on page 60.*

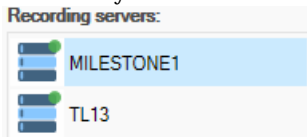
To enable an offline extension:

Important: *You cannot enable an offline extension of a recording storage/archive, which does not have a nearline extension enabled. Additionally, you cannot enable an offline extension of a recording storage, which has a Milestone archive enabled.*

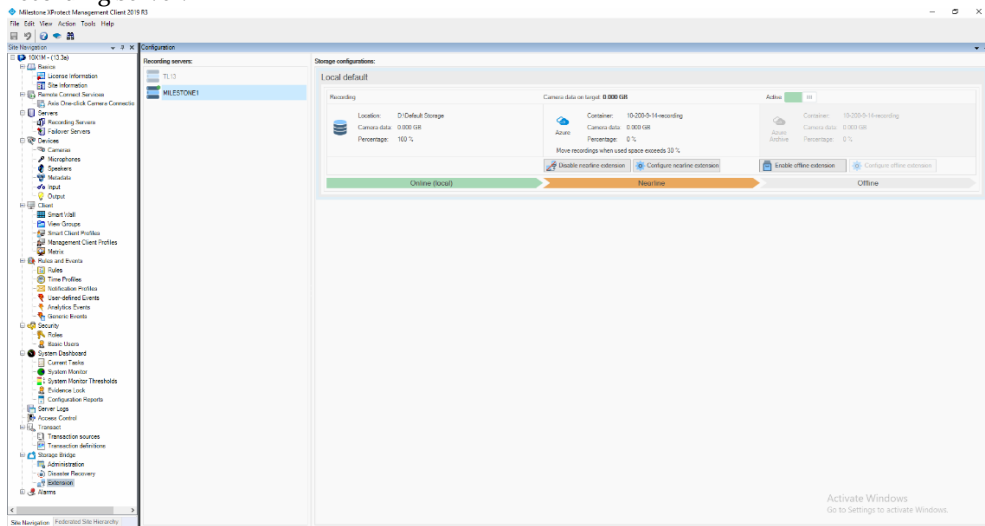
1. In the Site Navigation of XProtect Management Client, click Extension under Storage Bridge.



2. In the right pane under Recording Servers, click the recording server, whose recording storage or archive you want to extend.





The Storage Bridge plug-in lists all recording storage/archives configured for the selected recording server.

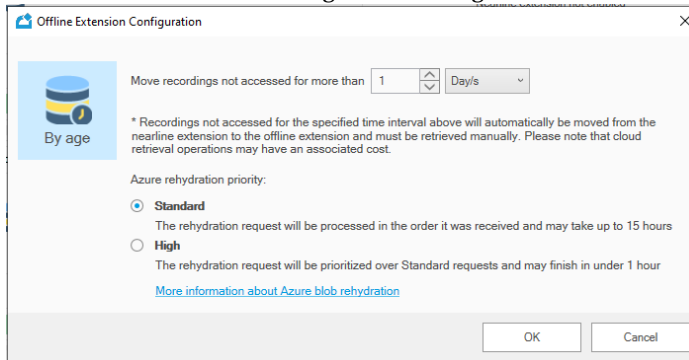


3. In the Offline pane of the recording storage  or the archive  you want to extend, click Enable Extension.

Note: *The button is inactive, if no nearline extension on a supported cloud target is enabled or if you attempt to enable an offline extension of a recording storage, which has a Milestone archive.*

Manage Storage Extensions

4. ( Amazon S3 only) Select the archive retrieval option, choosing between Expedited, Standard or Bulk.
5. ( Azure only) Select whether files from the offline extension should be rehydrated to the Standard or the High tier.
6. In the Offline Extension Configuration dialog, click OK.



Until you configure the parameters for automatically moving data to the offline extension, Storage Bridge uses the default parameter - data is made accessible from there, when it has not been accessed for 1 day on your recording storage/archive. You can change this default parameter, following the steps in “Configure Storage Extension” on page 56.

Important: *By default, all automatic Storage Bridge operations are initially paused and you can move data to the nearline extension only manually, following the steps in “Manually Manage Data” on page 65. To let Storage Bridge automatically move data, follow the steps in “Start/ Pause Automatic Operations” on page 60.*

Disable a Storage Extension

When you disable a recording storage/archive’s extension, Storage Bridge stops moving data to it both automatically and manually and all already moved data is accessible only directly from the extension i.e. cannot be retrieved through your XProtect VMS. Thus, if you attempt to review footage from the extension using XProtect Smart Client, for example, the operation will fail. Additionally, once you disable the extension, data on it is no longer automatically deleted once the retention limit set for the respective recording storage/archive is reached.

Important: *If the recording storage/archive whose extension you disable also has disaster recovery enabled, Storage Bridge stops moving data to the extension only automatically, but the disaster recovery mechanism keeps on copying data based on the criteria you have specified and you are still able to move data to and from the extension manually, following the steps in “Manually Manage Data” on page 65.*

You can disable just the offline extension and leave the nearline extension active. But if you disable the nearline extension, the offline extension is automatically disabled too.

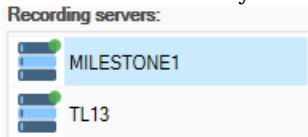
If you want to disable a storage extension, in order to change the credentials for access to it, make sure the new credentials provide access to data already moved there, otherwise it may remain inaccessible in your XProtect VMS. If you want to disable the extension in order to change the type of storage used as an extension, it is advisable to first migrate all data from your current extension to the new one.

To disable an extension:

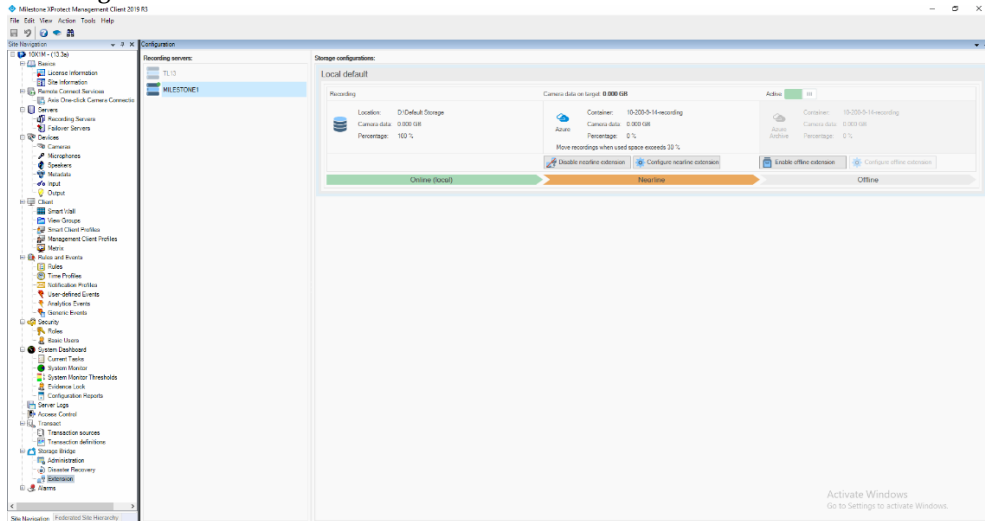
1. In the Site Navigation of XProtect Management Client, click Extension under Storage Bridge.



2. In the right pane under Recording Servers, click the recording server, whose recording storage or archive's extension you want to disable.



The Storage Bridge plug-in lists all recording storage/archives configured for the selected recording server.



3. In the Nearline or Offline pane of the recording storage  or the archive , click Disable Extension.

Configure Storage Extension

To configure a storage extension means to specify the criteria based on which Storage Bridge automatically moves data from the recording storage/archive to the extension. On both nearline and offline extensions you can instruct Storage Bridge to move recorded data to the extension using the “by age” criteria. On the nearline extension you can also utilize the “by size” criteria.



By age — Storage Bridge moves to the nearline or offline extension recordings that have not been accessed on your recording storage/archive for a specified time interval. Once the “by age” interval is reached for a specific recording, Storage Bridge copies it to the respective extension and then replaces it on the recording storage/archive with a stub file, pointing to the copy on the extension and allowing it to be transparently retrieved upon request from the nearline extension or rehydrated from the offline extension.



By size — Storage Bridge moves recorded data to the nearline or offline extension, when the used space on the extended recording storage/archive reaches a specified threshold. Once the threshold is reached, Storage Bridge begins copying data to the extension, starting with the least recently accessed files. Once a recording is copied to the extension, Storage Bridge replaces it on the recording storage/archive with a stub file. The stub file points to the copy on the extension, allowing it to be transparently retrieved upon request from the nearline extension or rehydrated from the offline extension.

By default, nearline extensions use the “by size” method with a used space threshold of 95%. By default, files are moved from the nearline to the offline extension, when they have not been accessed for 1 day. You can change the configuration of the nearline and offline extensions at any time with changes applied immediately.

Additionally, when configuring an Amazon S3 or Azure offline extension, you can configure the following options:



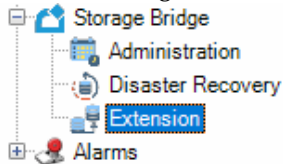
Amazon S3 — change the archive retrieval option, choosing between Expedited, Standard or Bulk.



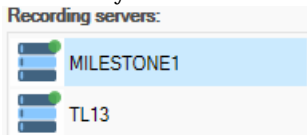
Azure — change the rehydration priority for files on the offline extension, choosing between Standard or High.

To configure a nearline extension:

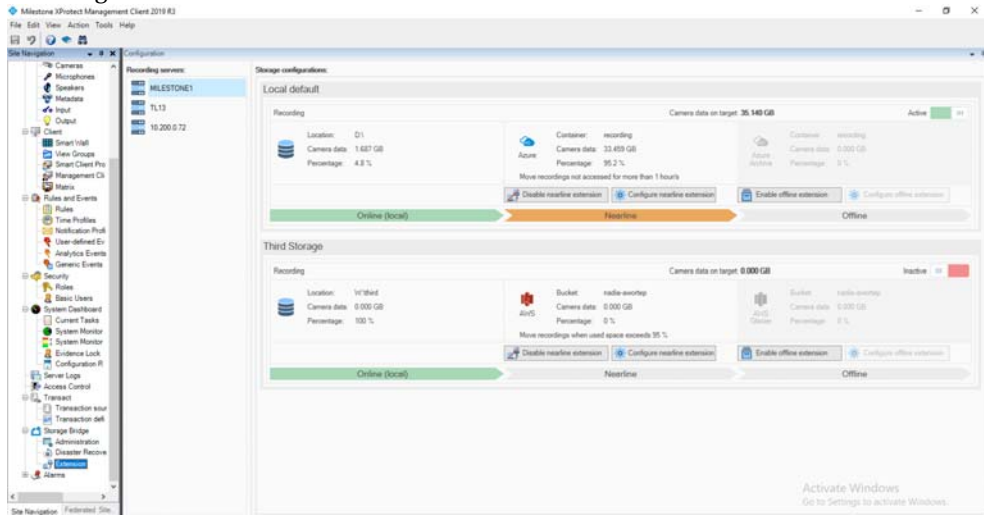
1. In the Site Navigation of XProtect Management Client, click Extension under Storage Bridge.



2. In the right pane under Recording Servers, click the recording server, whose recording storage or archive you want to extend.



The Storage Bridge plug-in lists all recording storage/archives configured for the selected recording server.



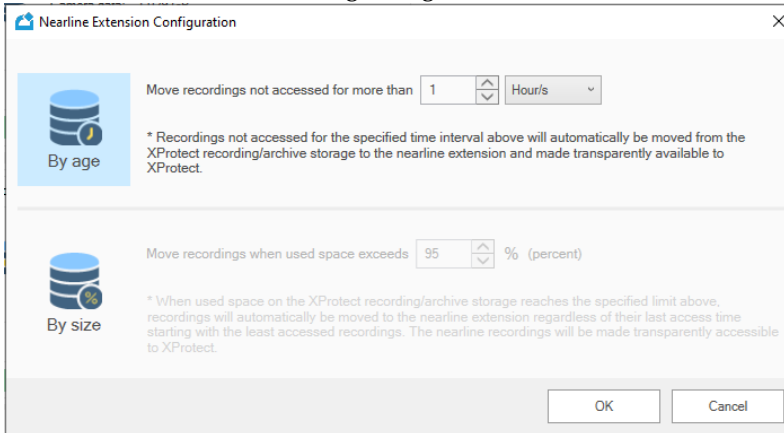
3. In the Nearline pane of the recording storage  or the archive , click Configure nearline extension.

Note: The button is inactive, if the nearline extension has not been enabled.

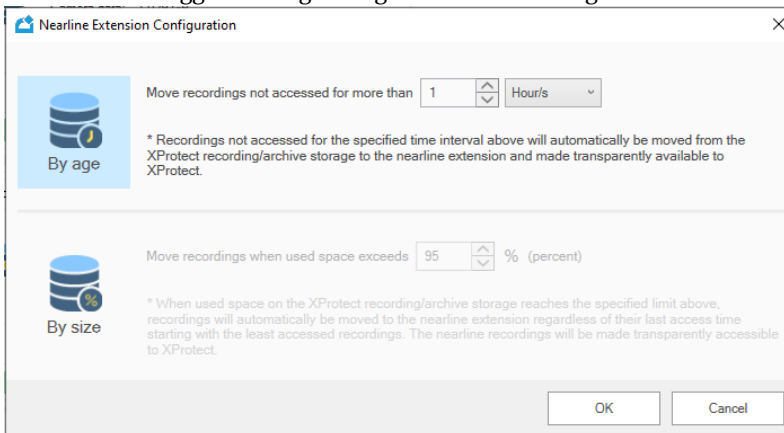
4. In the Extension Configuration dialog, do one of the following:

Manage Storage Extensions

- Click “By age” and specify for how long a recording on the recording storage/archive should not have been accessed for Storage Bridge to move it to the extension.



- Click “By size” and specify the percent of used capacity on the recording storage/archive, which when reached triggers Storage Bridge to move recordings to the extension.



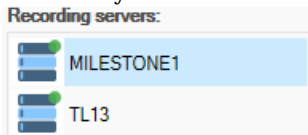
5. In the Extension Configuration dialog, click OK.

To configure an offline extension:

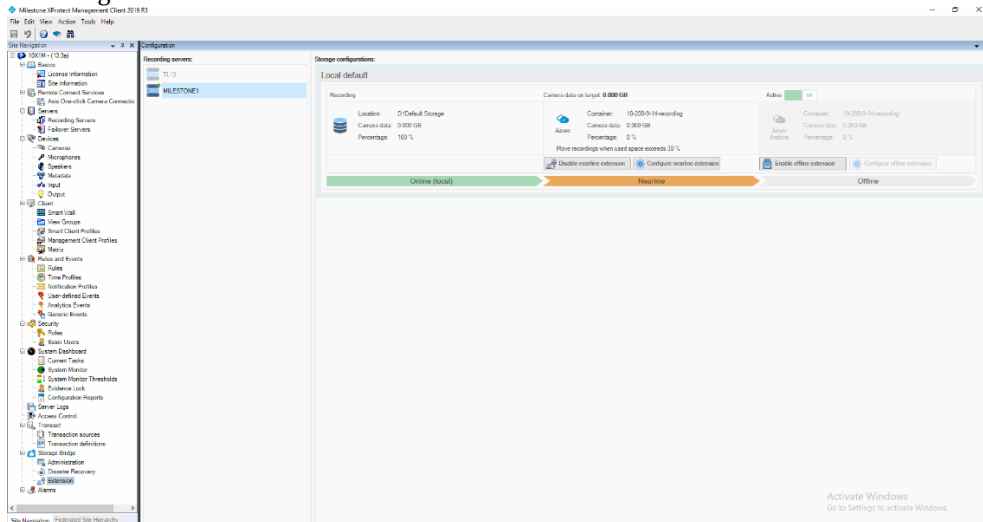
1. In the Site Navigation of XProtect Management Client, click Extension under Storage Bridge.



2. In the right pane under Recording Servers, click the recording server, whose recording storage or archive you want to extend.



The Storage Bridge plug-in lists all recording storage/archives configured for the selected recording server.

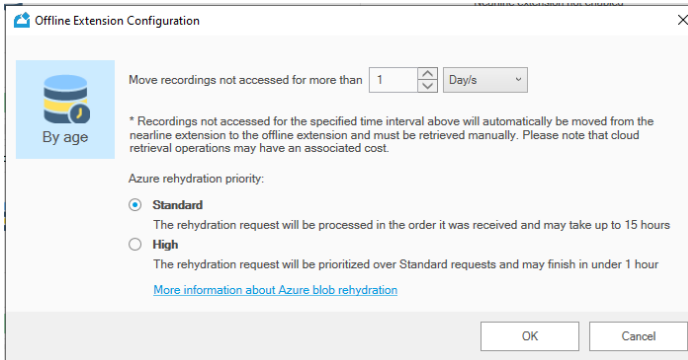




3. In the Offline pane of the recording storage  or the archive , click Configure offline extension.

Note: The button is inactive, if no offline extension has been enabled.

Manage Storage Extensions

4. In the Extension Configuration dialog, specify for how long a recording on the recording storage/archive should not have been accessed for Storage Bridge to move it to the offline extension.



5. (optional) Specify additional options for Amazon S3 or Azure offline extension:
 - ( Amazon S3 offline extension only) Change the archive retrieval option, choosing between Expedited, Standard or Bulk.
 - ( Azure offline extension only) Change whether files from the offline extension should be rehydrated using Standard or High priority.
6. In the Offline Extension Configuration dialog, click OK.

Start/Pause Automatic Operations

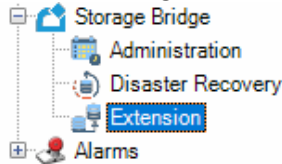
You can pause and start all automatic Storage Bridge operations for a specific recording storage/archive. It's important to keep in mind that pausing/starting automatic operations concerns both moving data to the extension as well as backing up data, if disaster recovery is enabled for the same recording storage/archive. Additionally, even if automatic Storage Bridge operations are started for the extension, but later on you enable disaster recovery for the same recording storage/archive, by default the automatic operations will be paused, until you manually start them again.

While automatic operations are paused, Storage Bridge stops automatically moving any data to the extension, but already moved data remains accessible from the extension, when you want to review it in the XProtect Smart Client, for example. While automatic Storage Bridge operations are paused for a recording storage/archive, you can also manually move data to the extension, following the steps in “Manually Manage Data” on page 65.

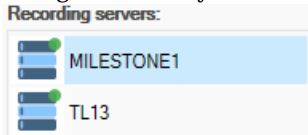
Once you resume automatic operations, Storage Bridge immediately begins parsing data on your recording storage/archive and resumes processing the queue with files scheduled to be moved to the extension.

To start/pause automatic operations for a recording storage/archive:

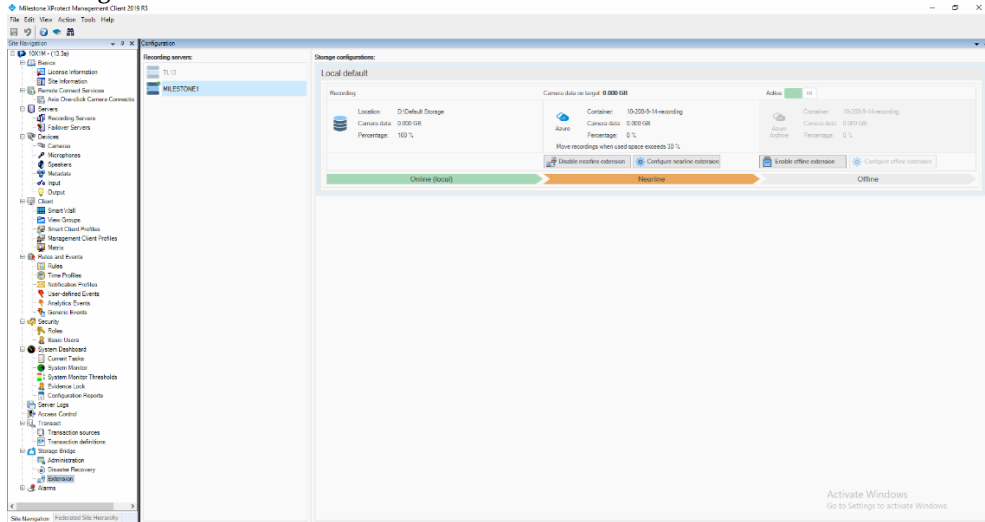
1. In the Site Navigation of XProtect Management Client, click Extension under Storage Bridge.







2. In the right pane under Recording Servers, click the recording server, for whose recording storage or archive you want to start or pause the automatic operations.



The Storage Bridge plug-in lists all recording storage/archives configured for the selected recording server.



3. In the upper right corner of the recording storage  or the archive  pane, do one of the following:




- Switch the setting to Active  and when prompted, confirm that you want to start automatic Storage Bridge operations.
- Switch the setting to Inactive  and when prompted, confirm that you want to pause automatic Storage Bridge operations.

Monitor Storage Extensions

The Extensions page of the Storage Bridge XProtect Management Client plug-in provides you with all information necessary to keep track of the status of a recording server, its recording storage(s)/archive(s), their extension(s) and the distribution of data between them.

Monitor Recording Servers

To view the status of all recording servers, in the Site Navigation of XProtect Management Client, click Extension under Storage Bridge and then check the Recording servers pane:

icon indicator:	status:	tooltip:
green blinking indicator 	The recording server and its recording storage(s)/archive(s) are operating normally. If an extension is enabled for a recording storage/archive, all necessary data is fully copied to the extension.	Healthy online
yellow blinking indicator 	The recording server is operating normally, but either the extension is inaccessible or Storage Bridge could not copy one or more files. Check for changed credentials to the extension or connectivity problems or the Windows Event Viewer log for the paths of the files, which could not be copied.	Target is offline
red blinking indicator 	The recording server is operating normally, but Storage Bridge has detected one or all of the following problems:	
	<ul style="list-style-type: none"> • A recording storage or archive is not responding and Storage Bridge cannot copy its data to the extension. 	Storage is not responding
	<ul style="list-style-type: none"> • A recording storage or archive has failed. 	Storage is offline
	<ul style="list-style-type: none"> • Storage Bridge has failed to perform a scheduled operation. 	Generic error


greyed out icon



One of the following problems has been detected:	
<ul style="list-style-type: none"> Storage Bridge is either not installed or not responding on the recording server. 	Server is offline
<ul style="list-style-type: none"> The recording server is offline. 	Recording server is offline

Monitor Recording Storage/Archive

The pane of a recording storage  or an archive  gives you the following information:



Location: E:\Recovery

Camera data: 0.859 GB

Percentage: 1.07 %

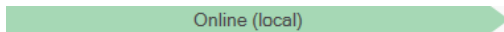
Location — the path on the recording server, on which the respective recording storage/archive is mounted

Camera data — the total size of recordings accessible directly from the recording storage/archive

Tip: *You can view the total size of camera data both on the recording storage/archive and on any of the extensions in the Camera data on target field above each listing.*

Percentage — the percentage of recordings accessible directly from the recording storage/archive

Additionally, the color label below a recording storage/archive's pane shows you its status on the recording server:



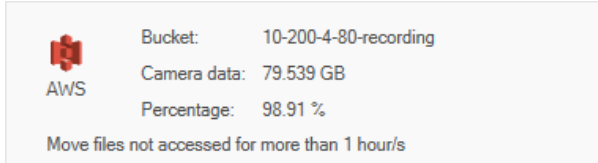
the recording storage/archive is available



the recording storage/archive is not available to the recording server

Monitor the Extensions

The panes of the nearline and the offline extensions, displayed next to the pane of the respective recording storage/archive, give you the following information:



Extension storage type — the pane displays the logo of the storage provider, on which the extension is located

Bucket/Container/Folder — displays the name of the bucket/container/folder, to which data from the recording storage/archive is moved

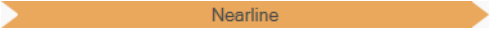
Camera data — the total size of recordings accessible only from the nearline/offline extension

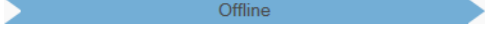
Tip: *You can view the total size of camera data both on the recording storage/archive and on any of the extensions in the Camera data on target field above each listing.*

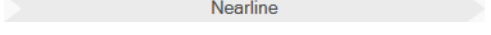
Percentage — the percentage of recordings accessible only from the nearline/offline extension

Note: *Keep in mind that the percentage may never reach 100%, if the cameras recording on the respective recording storage are continuously writing data on it.*

Additionally, the color label below the nearline/offline extension's pane shows you its status:

 - automatic Storage Bridge operations are started for the nearline extension

 - automatic Storage Bridge operations are started for the offline extension

 - the nearline/offline extension is either not enabled or automatic Storage Bridge operations for the extension are paused and you can move data to it only manually

5

Manually Manage Data

<i>Manually Manage Data</i>	66
<i>Monitor Manual Jobs Status</i>	69

Manually Manage Data


Using the Storage Bridge plug-in for XProtect Management Client, you can manually move data between a selected recording storage or archive and its nearline/offline extension. This way you can move data, which does not yet meet the criteria you have specified for the extension. You can perform manual operations for data recorded by all cameras on a selected recording server or just for a selected one. You can also limit the number of recordings you perform the desired manual operation on for a selected time interval only.

Additionally, the manual operations are indispensable for Storage Bridge's disaster recovery mechanism. When you recover backed up data, it is retrieved from the disaster recovery storage in the form of stub files. To retrieve the actual recordings, you should either review them in the XProtect Smart Client (on-demand data retrieval) or by executing a manual data retrieval job, following the steps in "Recover Backed Up Data" on page 38.


You can perform manual data operations even if automatic Storage Bridge operations for the recording storage or archive have been paused. Manually initiated operations take precedence over automatic operations, i.e. until the manual jobs queue is processed, Storage Bridge does not perform any automatic operations.

Manually Manage Data


To manually manage data, you must create a separate job for each of the following operations:


 move data to be available locally - retrieve back selected data from the extension and make it accessible directly from the respective recording storage or archive. You can use this operation to actually recover backed up data, in case of disaster.

Important: *Keep in mind that the operation requires enough free space on your recording storage/archive to accommodate all data retrieved from the extension.*

 bring back offline data - rehydrate recordings from the offline extension of a recording storage or archive and make them accessible from the nearline extension, which allows their automatic retrieval upon request from an XProtect Smart Client computer as soon as the connection speed allows.

Note: *If you execute this job for recordings which are not replaced by stub files on the recording storage/the archive i.e. data is still available locally, Storage Bridge will move these files to the nearline tier of your cloud target, but their status will remain online until they are replaced with stubs, based on the nearline policy.*

 make data nearline to free local storage space - move data to the nearline extension and replace it on the recording storage/archive with stub files, which point to the copies on the nearline extension, but take no space on your local storage.

 make data offline - move data from the nearline extension to the offline extension.

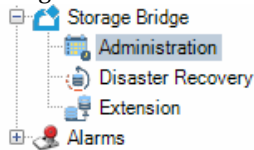
Important: *If you select to perform the above operation for recordings that are still stored on your recording storage or archive, they will first be moved to the nearline extension and only after that to the offline extension.*

Note: *If some data for the specified time period does not yet meet the criteria for space reclaiming, it will remain accessible locally and will be reported as offline only after it is replaced by stub files.*

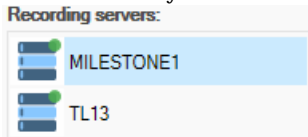
You can create as many manual operation jobs as you wish. Once you create a job, it is automatically added to the end of the jobs queue. Storage Bridge processes the queue one job at a time, starting with the first in line. You can monitor the jobs queue, following the steps in “Monitor Manual Jobs Status” on page 69.

To create a manual data operation job:

1. In the Site Navigation of XProtect Management Client, click Administration under Storage Bridge.

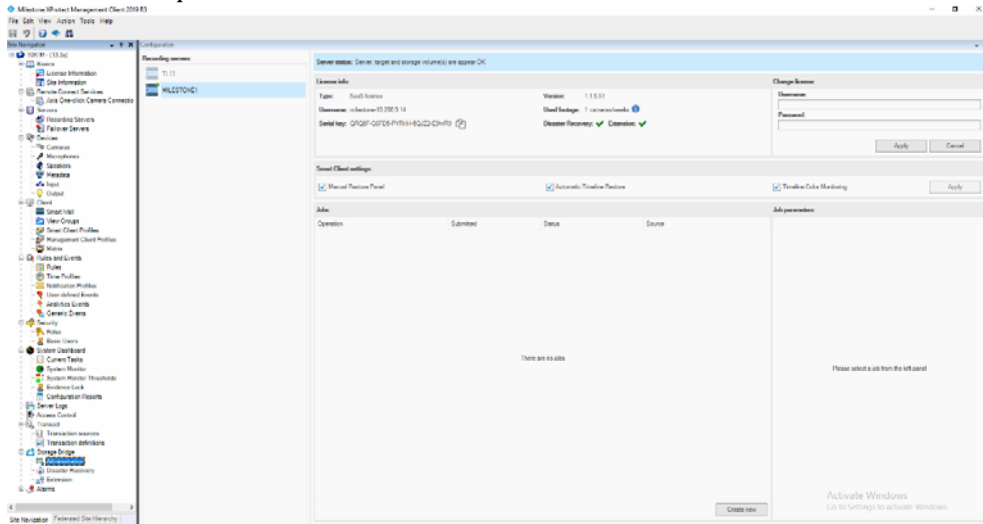


2. In the right pane under Recording Servers, click the recording server, whose recording storage or archive data you want to manually manage.

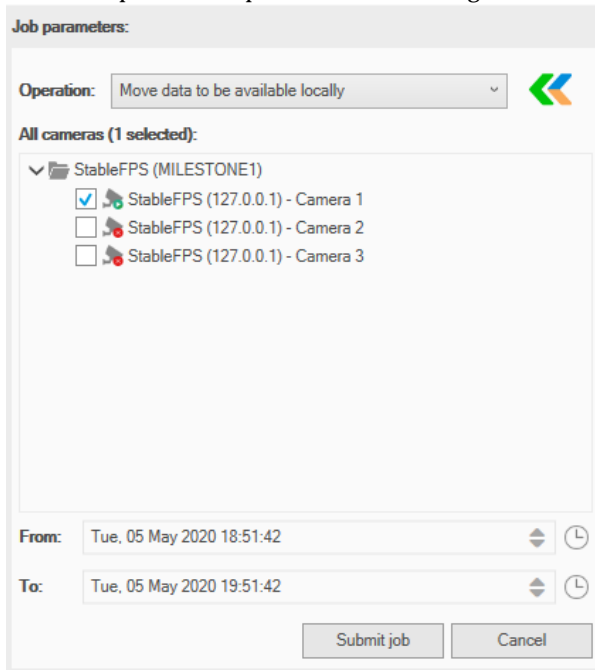


Manually Manage Data

3. Under the Jobs pane, click Create new.




4. In the Job parameters pane, do the following:



- In the Operation drop-down box, select the type of operation.











- Under Cameras, select the camera(s), whose recordings you want to manually manage.
- Select the start and end time of the recordings in the respective boxes.

Tip: Click  next to the From or To box, to display the Calendar and more easily navigate to the respective date or enter the respective start/end time.

5. Click Submit job.
6. When prompted, confirm that you want to manually move the specified amount of data between the recording storage/the archive and the nearline or offline extension.
The job appears on top of the jobs queue pane. You can monitor its status, following the steps in “Monitor Manual Jobs Status” on page 69.

Monitor Manual Jobs Status

The Jobs queue pane displays the list of all jobs, arranged in descending order starting with the most newly added job. If you have allowed users to manually retrieve footage from the nearline/offline extension through the XProtect Smart Client plug-in, the list also includes jobs initiated there.

Jobs:			
Operation	Submitted	Status	Source
 Move data to be available locally	Fri, 17 Apr 2020 18:33:25	<div style="width: 51%;"><div style="width: 51%;"></div></div> 51 %	Smart Client
 Move data to be available locally	Fri, 17 Apr 2020 18:32:53	Completed	Smart Client
 Move data to be available locally	Fri, 17 Apr 2020 18:32:20	Completed	Smart Client
 Move data to be available locally	Fri, 17 Apr 2020 18:31:50	Completed	Smart Client
 Move data to be available locally	Fri, 17 Apr 2020 18:31:11	Completed	Smart Client
 Make data nearline to free local storage space	Fri, 17 Apr 2020 18:30:09	Completed	Management Client
 Make data nearline to free local storage space	Fri, 17 Apr 2020 18:10:37	Completed	Management Client
 Move data to be available locally	Fri, 17 Apr 2020 17:56:22	Completed	Smart Client
 Make data offline	Fri, 17 Apr 2020 17:42:09	Completed	Management Client
 Make data nearline to free local storage space	Fri, 17 Apr 2020 17:41:30	Completed	Management Client

The listing of each job gives you the following information:

- type of the manual operation
- date and time the job has been submitted
- status of the job
 - Completed - the job has been successfully completed

Manually Manage Data

- Pending - Storage Bridge is still processing the manual operation job and may display a progress bar
- Completed (failed) - Storage Bridge's attempt to perform the manual operation has failed. The reason for the failed operation may be temporary inaccessibility of the extension, for example. Click Retry next to a failed job to queue it again in the list.
- source - whether the manual operation job has been submitted through the XProtect Management Client plug-in or through the XProtect Smart Client plug-in.

Note: *To clear the jobs queue, you must restart the respective recording server.*



XProtect Smart Client Integration

Configure XProtect Smart Client Integration 72
Work with the XProtect Smart Client Plug-in 75

XProtect Smart Client Integration

The Storage Bridge plug-in for XProtect Smart Client provides you with the following features:

- additional timeline data that displays the origin of the recording you are reviewing - local, the nearline extension or the offline extension.
- automatic retrieval of recordings from the extension - allows you to retrieve camera in real-time while reviewing it on the timeline.
- manual retrieval of recordings from the extension - allows you to manually retrieve camera data from the extension to the recording storage/archive for a selected time interval.

An administrator of your XProtect VMS can enable or disable any of these features for a specific recording server in the Storage Bridge plug-in for XProtect Management Client. For more details, refer to “Configure XProtect Smart Client Integration” on page 72.

For more information about using the above options on an XProtect Smart Client computer, refer to “Work with the XProtect Smart Client Plug-in” on page 75.

Configure XProtect Smart Client Integration

In the Storage Bridge plug-in for XProtect Management Client, you can enable or disable any of the XProtect Smart Client integration features for a specific recording server. Enabling or disabling any of the features is valid for all XProtect Smart Client computers reviewing footage from the same recording server.

Enable/Disable the Additional Storage Bridge Timeline Data

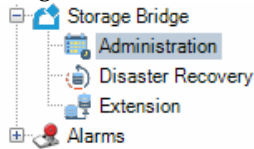
When the Storage Bridge additional timeline data is enabled, it appears right below the default XProtect Smart Client timeline on the Playback tab. It changes color depending on the origin of the recording currently being reviewed indicating to users if the data is from the nearline or offline extension. When manual retrieval of data from the extension is also allowed, Storage Bridge allows users to easily select the section of the recording they want to retrieve locally or to manually rehydrate from the offline extension.

When the additional Storage Bridge timeline data is disabled, but automatic retrieval from the extension is enabled, you can still review footage originating from the nearline extension.

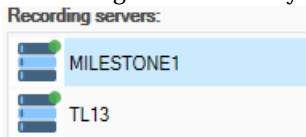
By default, the additional Storage Bridge timeline data is enabled on each recording server.

To enable/disable the additional Storage Bridge timeline data:

1. In the Site Navigation of XProtect Management Client, click Administration under Storage Bridge.



2. In the right pane under Recording Servers, click the recording server, whose XProtect Smart Client integration features you want to manage.



3. Under Smart Client Settings, do one of the following:



- Select the “Timeline Color Monitoring” check box, to allow displaying the additional Storage Bridge timeline data on each XProtect Smart Client reviewing footage from this recording server and then click Apply.
- Clear the “Timeline Color Monitoring” check box, to hide the additional Storage Bridge timeline data on each XProtect Smart Client reviewing footage from this recording server and then click Apply.

Enable/Disable Automatic Data Retrieval

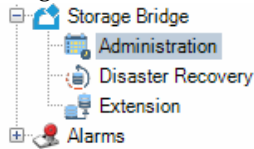
When automatic data retrieval is enabled for a recording server, a user reviewing recordings moved to the nearline extension automatically triggers the retrieval of the currently reviewed data on the recording storage/the archive. The retrieval of data from the nearline extension is typically in real-time as determined by the network and connection characteristics. To retrieve footage from the offline extension, you must first manually rehydrated it to the nearline extension. Storage Bridge is able to partially retrieve data to efficiently play timeline video during reviewing operations.

When automatic data retrieval is disabled, should a user attempt to review footage stored either on the nearline or the offline extension, the XProtect Smart Client player will report that the recording is nearline or offline and will not play it.

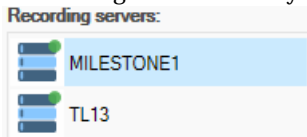
By default, the automatic retrieval of data is enabled on each recording server.

To enable/disable automatic data retrieval:

1. In the Site Navigation of XProtect Management Client, click Administration under Storage Bridge.



2. In the right pane under Recording Servers, click the recording server, whose XProtect Smart Client integration features you want to manage.



3. Under Smart Client Settings, do one of the following:



- Select the “Automatic Timeline Restore” check box, to let Storage Bridge retrieve data run time while users review it, and then click Apply.
- Clear the “Automatic Timeline Restore” check box, to prevent users from retrieving data run time when they attempt to review it, and then click Apply.

Enable/Disable Manual Data Retrieval

When you enable manual data retrieval from the extension, you allow users on XProtect Smart Client to retrieve camera recordings within a selected period from the extension to the recording storage/archive. The operation is identical to manual data retrieve operation initiated in the Storage Bridge plug-in for XProtect Management Client and appears as a job in the manual operation jobs queue.

Enabling manual data retrieval may be especially useful, when automatic retrieval is disabled, but you still want to allow XProtect Smart Client users to be able to work with recordings available only on the extension.

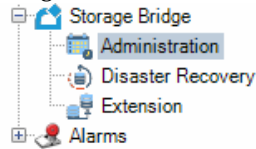
Note: *Manual data retrieval operations retrieve all data for the specified time interval and not just the frames currently being played as is with automatic retrieval of recordings.*

When both automatic and manual data retrieval are disabled, should a user attempt to review a recording stored either on the nearline or the offline extension, the XProtect Smart Client player reports that the recording is nearline or offline and does not play it.

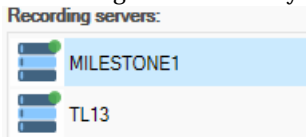
By default, the manual retrieval of data is enabled on each recording server.

To enable/disable manual data retrieval:

1. In the Site Navigation of XProtect Management Client, click Administration under Storage Bridge.



2. In the right pane under Recording Servers, click the recording server, whose XProtect Smart Client integration features you want to manage.



3. Under Smart Client Settings, do one of the following:



- Select the “Manual Restore Panel” check box, to display the manual restore panel in XProtect Smart Client and allow users to manually retrieve data, then click Apply.
- Clear the “Manual Restore Panel” check box, to hide the manual restore panel in XProtect Smart Client and prevent users from manually retrieving data from the extension, then click Apply.

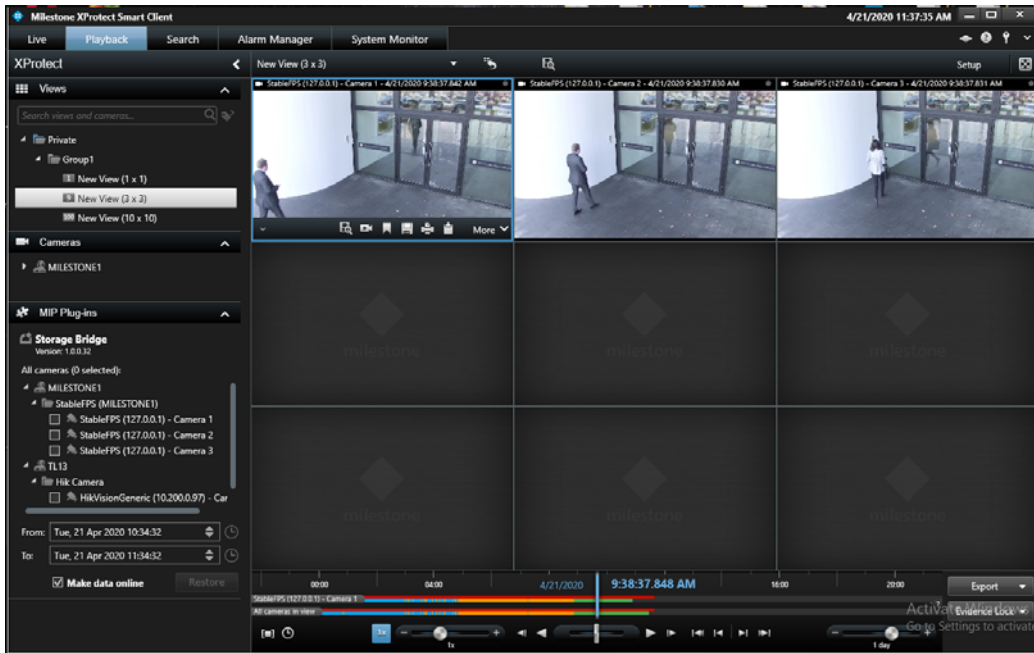
Work with the XProtect Smart Client Plug-in

When the Storage Bridge plug-in is installed on an XProtect Smart Client, it appears in the MIP Plug-ins pane in the Playback tab. It complements your XProtect Smart Client workflow with the following additional features:

- additional timeline data, which shows you whether a recording is accessible from the local recording storage/archive, the nearline extension or the offline extension.
- real-time retrieval of recordings from the nearline extension by reviewing or exporting them in the XProtect Smart Client.

XProtect Smart Client Integration

- panel for manual retrieval of recordings within a specified time range from the nearline/offline extension.






The Storage Bridge Timeline

Note: To be able to view the Storage Bridge timeline information, configure your XProtect Smart Client to display additional timeline data - in Settings, click Timeline and in the Additional data drop-down box, select Show.

When enabled through the XProtect Management Client plug-in, the additional Storage Bridge timeline appears right below the XProtect Smart Client player timeline both for a selected camera in the pane and for all cameras.

It gives you the following information:

-  the recording is accessible directly from the recording storage or the archive.
-  the recording is accessible only from the nearline extension of the recording storage or the archive. Reviewing the recording depends on the setting for automatic and/or manual retrieval of data from the extension.
-  the recording is accessible only from the offline extension of the recording storage or the archive. Reviewing the recording depends on the setting for automatic and/or manual retrieval of data from the extension.

Important: *Whether or not a recording is available locally or only through the extension, the Milestone metadata is kept and the XProtect Smart Client timeline displays the markers for recordings with or without motion.*

Work with Nearline or Offline Recordings

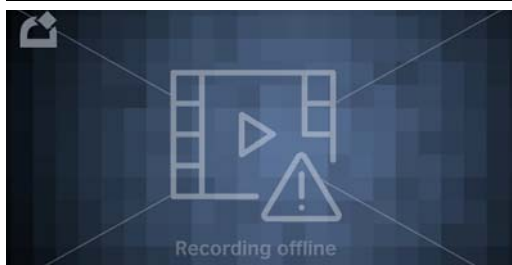
Note: *Keep in mind that retrieving data from most cloud targets may be associated with additional costs.*

As long as automatic retrieval of recordings is enabled for a recording server, you can play, export or lock its recordings as you would normally do with recordings stored on the recording storage or the archive. With nearline recordings (marked in orange in the Storage Bridge timeline) the retrieve operation depends on the network and connection speed to the nearline extension. In most cases this should be in real-time with minimal delay. With offline recordings (marked in blue on the timeline), data must first be retrieved to the nearline storage tier. Once retrieved and in the nearline extension, the timeline data can be retrieved to the local storage and will display green on the timeline.

If automatic retrieval of data is disabled for a Recording server, attempting to play or export or lock recordings available from the nearline or offline extension will fail and the recordings will be displayed in the XProtect Smart Client player with one of the following thumbnails:



A recording on the nearline extension

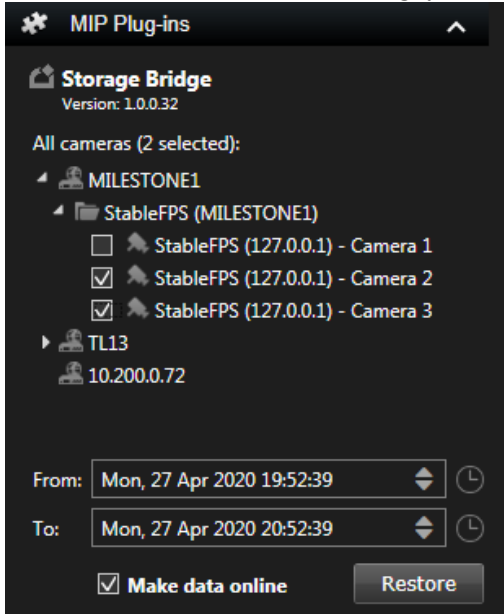


A recording on the offline extension


If manual retrieval from the extension is enabled for the recording server, to play or export such recordings, you must first retrieve them locally, following the steps below.

To manually retrieve nearline or offline recordings:

1. In the Playback tab of the XProtect Smart Client window, expand the MIP Plug-ins pane and navigate to the Storage Bridge plug-in.
2. Under Storage Bridge, expand the node of one or more Recording servers and select the check boxes of the cameras, whose recordings you want to retrieve.



3. In the From and To fields specify the period for which you want to retrieve recordings.

Tip: Click  to display the Calendar and more easily specify the start and end date and time.

Note: Alternatively, on the timeline, click the Time Selection Mode button to select the start and end time of the sequence you want to retrieve.

4. Do one of the following:
 - Select the “Make data online” check box, to retrieve both nearline and offline recordings locally.
 - Clear the “Make data online” check box, to only rehydrate offline recordings within the time selection to the nearline extension.
5. Click Restore.

Storage Bridge begins retrieving the recordings from the respective extension. Once the operation is complete, the recordings are displayed on the timeline with green, if you have selected to make data online, or with orange, if you have selected to only rehydrate offline recordings.