



Lightbits and Veeam: Backup and Restore Integration

*Implementation Guide for Data Protection with Veeam and Lightbits
Software-Defined Storage*

November 2025

Abstract

This white paper goes beyond simple installation, guiding you through the essential steps to seamlessly integrate the Veeam Data Platform with your existing server and virtual infrastructure running on Lightbits software-defined storage. The paper illustrates how to execute highly reliable backups and restores with confidence, ensuring that all components work together seamlessly. By following this documented approach, you can protect your critical production workloads and simplify disaster recovery—all while leveraging the extreme performance and resource efficiency of Lightbits block storage. Transform your data protection strategy from a complex challenge into a streamlined, automated process.

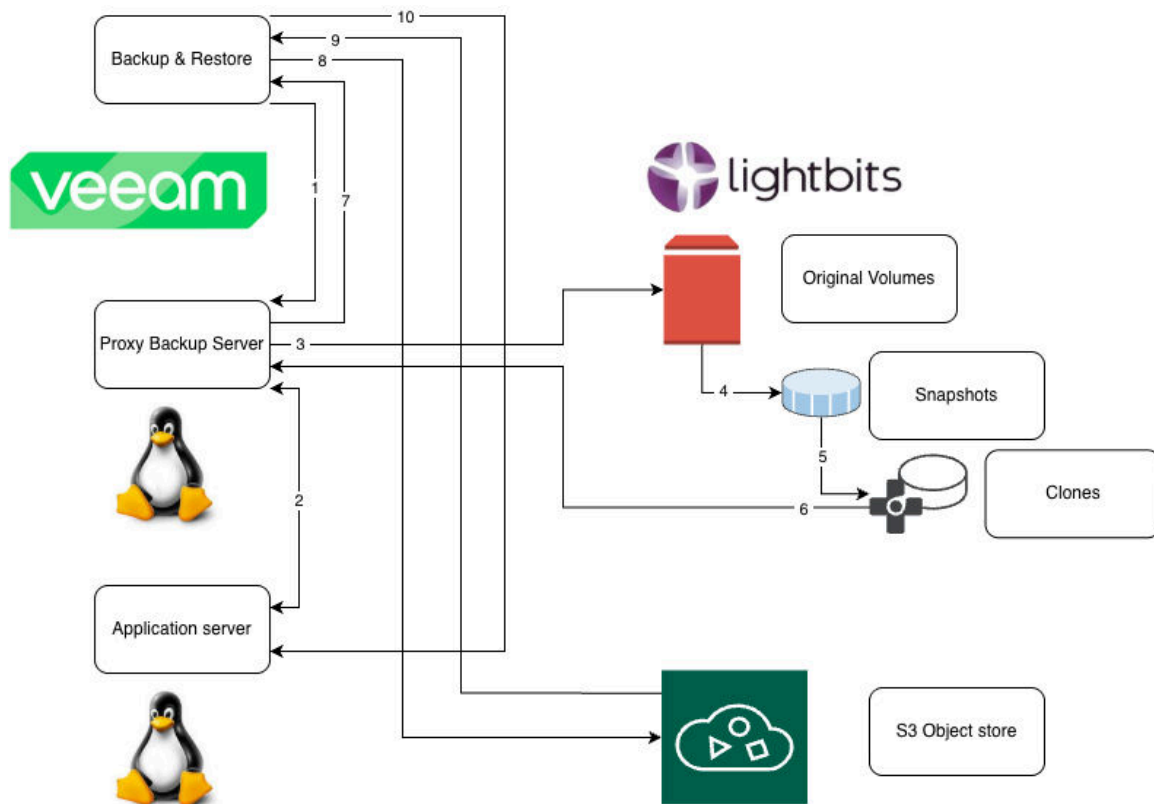
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1. Introduction

This white paper details a method for achieving integrated backup and restore functionality using Veeam Backup & Replication. This approach relies on scripting to manage the creation of snapshots and clones from a proxy server connected to the source server. All backup processing and data handling are executed on the proxy server, offloading the application server, while data restoration is performed directly onto the source server. For this implementation guide, Veeam version 12.3 has been used.

The diagram below illustrates the architecture for this integration:





The steps are shown in the diagram above:

1. Veeam reaches out to the proxy server
2. The proxy backup server requests the volume uuid from the application server
3. The proxy backup server connects to Lightbits
4. The proxy backup server creates the snapshots
5. The proxy backup server creates the clones
6. The proxy backup server mounts the clones
7. The proxy backup provides the information to the Veeam server
8. The Veeam server creates the backup on the S3 object store
9. The Veeam server retrieves the data from the S3 object store
10. The Veeam server restores the data directly on the application server

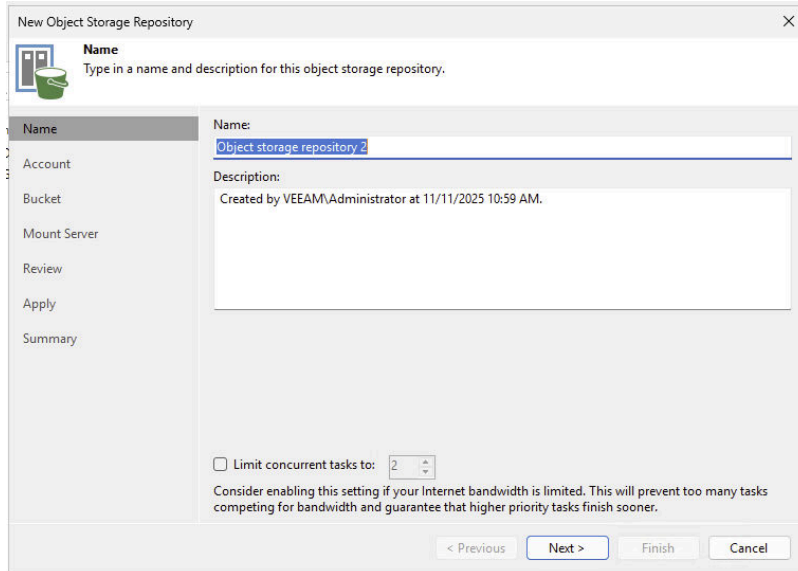
2. Veeam Backup Repository

The initial configuration requires establishing a Backup Repository within Veeam. Since Garage is already deployed within the environment (refer to the "[Backup for Kubernetes](#)" white paper for configuration details), it will serve as the S3-compatible target for the Veeam repository.

2.1. Adding an S3-Compatible Backup Repository in Veeam

To configure the Backup Repository using the S3-compatible storage (Garage), perform the following steps within the Veeam Backup & Replication console:

1. Launch the Veeam Backup & Replication application.
2. Navigate to the Backup Infrastructure section by clicking the corresponding option in the bottom-left navigation pane.
3. Initiate the repository creation process by clicking the "Add Repository" button, typically located in the top-left corner.
4. In the ensuing Add Backup Repository dialog box, select Object Storage.
5. On the next screen, choose the S3 Compatible option.
6. This action will open the New Object Storage Repository wizard, where you will continue configuring the connection details for the Garage storage.



2.1.1 S3-Compatible Repository Configuration

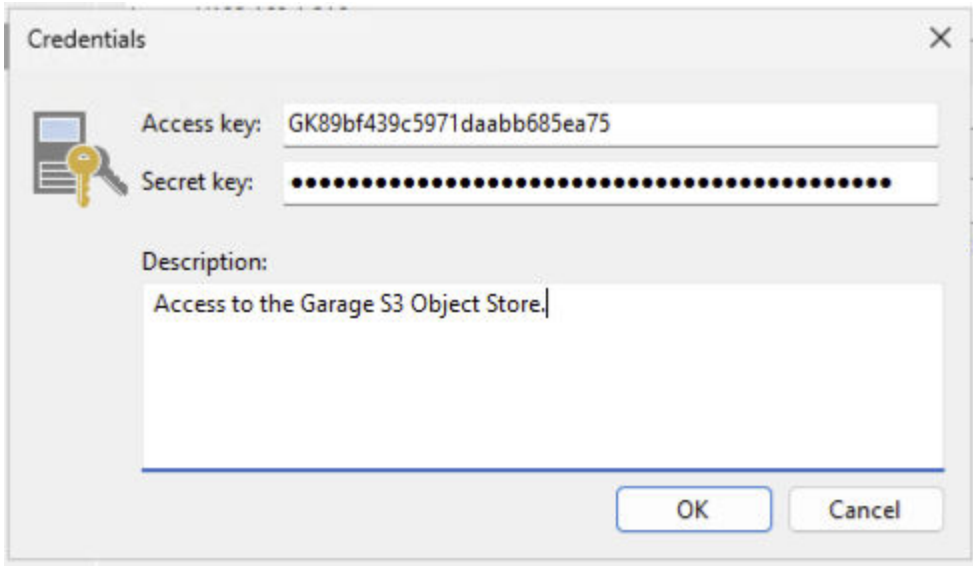
Naming and Service Endpoint

1. In the wizard screen, provide a descriptive name for the new Object Storage Repository and click Next.
2. The subsequent Account screen requires input for the S3 object store connection details:
 - Service Point: Enter the Service Point URL of your S3 object store. In the provided example, this is `https://192.168.1.216`.
 - Region: Specify the Region configured for your S3 object store. For this example, the value used is Garage.

2.1.2 Credential Configuration

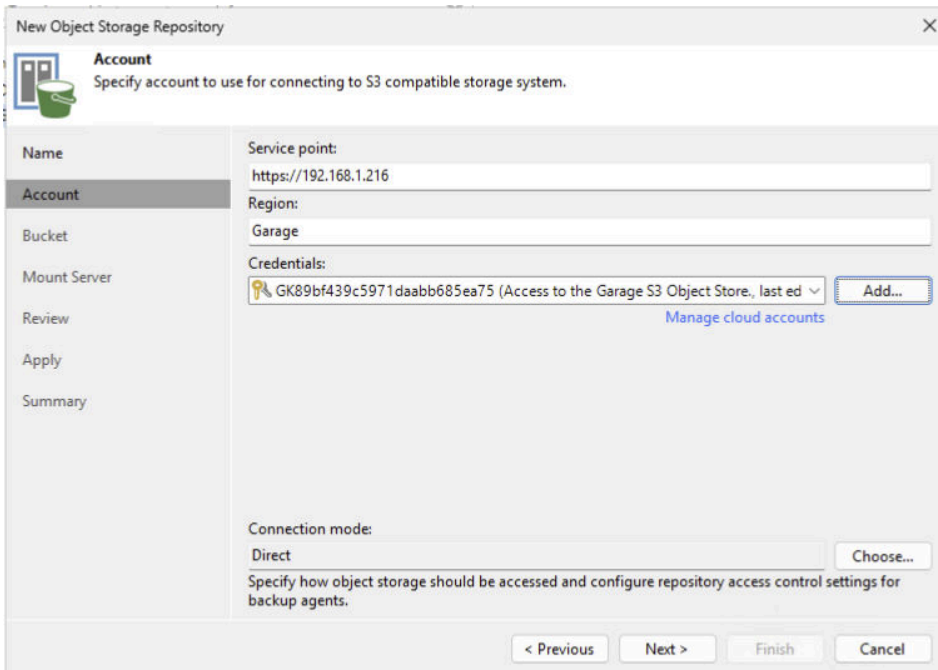
Next, you must supply the appropriate Credentials obtained from your S3 object store (Garage):

- The required credentials are the Access Key ID and the Secret Access Key.
- In the case of Garage, these keys are typically sourced from a configuration file, such as `.awsrc`, which contains the defined `AWS_ACCESS_KEY_ID` and `AWS_SECRET_ACCESS_KEY`.
- Enter these keys into the respective fields in the Veeam wizard.



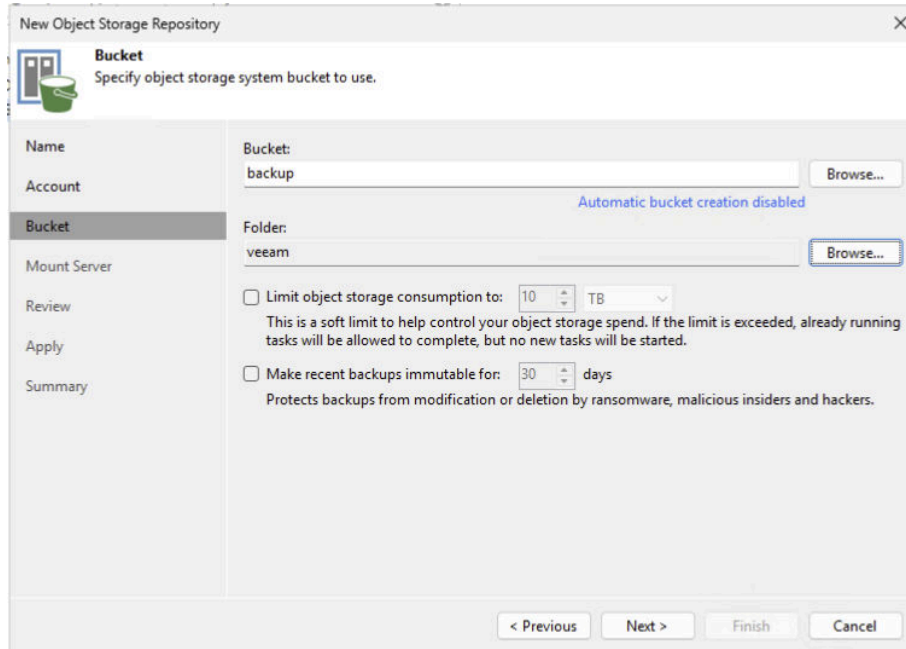
A dialog box titled "Credentials" with a close button (X) in the top right corner. It contains a key icon, an "Access key:" field with the value "GK89bf439c5971daabb685ea75", a "Secret key:" field with a masked password of 20 dots, and a "Description:" text area containing "Access to the Garage S3 Object Store.". At the bottom right are "OK" and "Cancel" buttons.

Click on Ok and click on the Next button in the screen below:



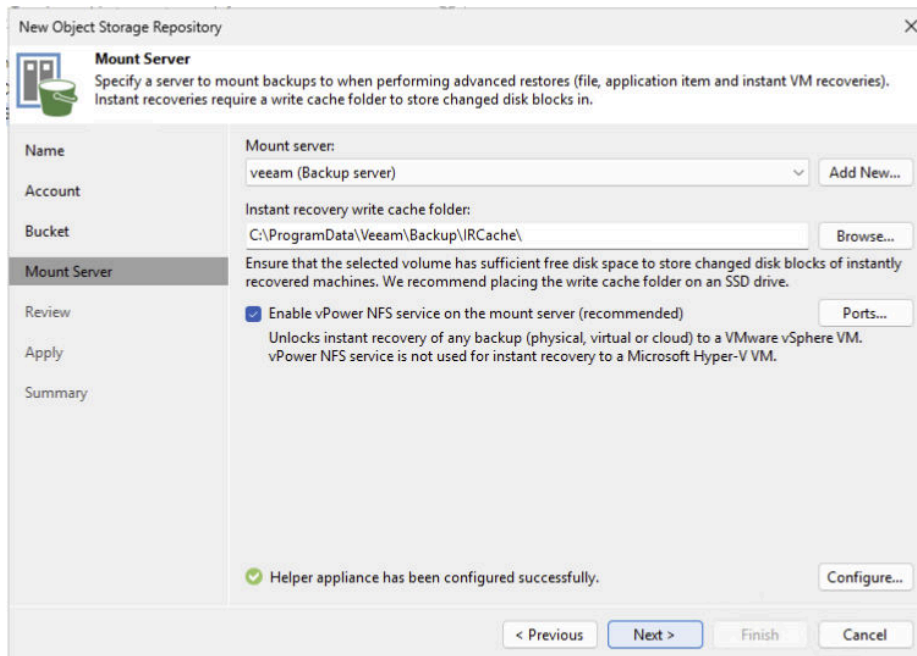
A multi-step dialog box titled "New Object Storage Repository" with a close button (X) in the top right corner. The "Account" step is selected in the left sidebar. The main area shows fields for "Service point:" (https://192.168.1.216), "Region:" (Garage), and "Credentials:" (GK89bf439c5971daabb685ea75 (Access to the Garage S3 Object Store., last ed) with an "Add..." button). A "Manage cloud accounts" link is below the credentials. At the bottom, there's a "Connection mode:" section with "Direct" selected and a "Choose..." button. The bottom of the dialog has "< Previous", "Next >", "Finish", and "Cancel" buttons.

If a certificate needs to be installed, simply follow the installation instructions. The next step is to create a bucket; for this example, we choose 'backup' and 'Veeam' as the folder Name. Click on Next.



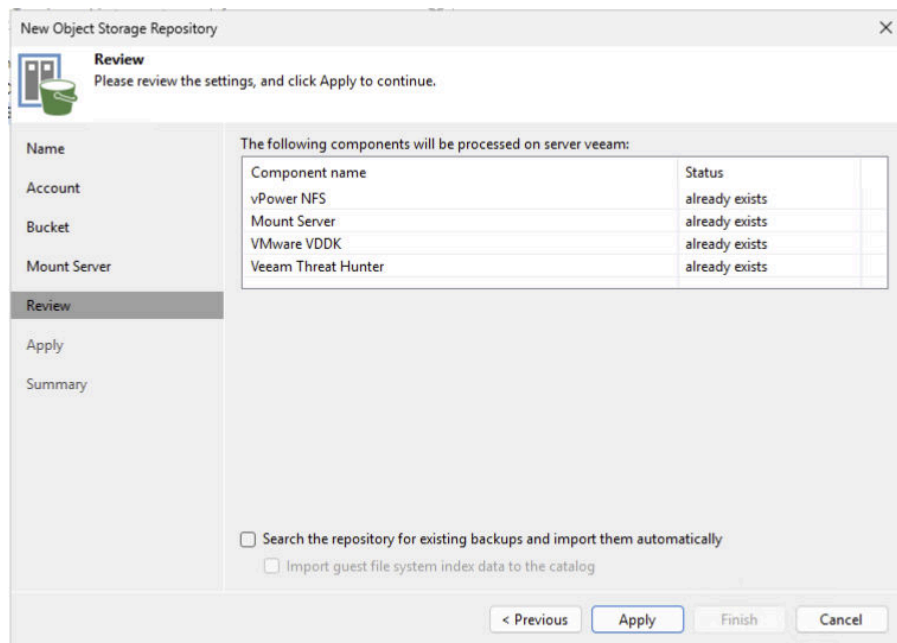
The screenshot shows the 'New Object Storage Repository' wizard, specifically the 'Bucket' step. The left sidebar contains a list of steps: Name, Account, Bucket (selected), Mount Server, Review, Apply, and Summary. The main area is titled 'Bucket' with the instruction 'Specify object storage system bucket to use.' Below this, there are two input fields: 'Bucket:' with the value 'backup' and a 'Browse...' button, and 'Folder:' with the value 'veeam' and a 'Browse...' button. A blue link 'Automatic bucket creation disabled' is visible between the two fields. Below the input fields, there are two checkboxes: 'Limit object storage consumption to: 10 TB' (unchecked) and 'Make recent backups immutable for: 30 days' (unchecked). Each checkbox has a descriptive text block below it. At the bottom of the window, there are four buttons: '< Previous', 'Next >', 'Finish', and 'Cancel'.

On the next screen, keep the default settings and click on Next.



The screenshot shows the 'New Object Storage Repository' wizard, specifically the 'Mount Server' step. The left sidebar contains a list of steps: Name, Account, Bucket, Mount Server (selected), Review, Apply, and Summary. The main area is titled 'Mount Server' with the instruction 'Specify a server to mount backups to when performing advanced restores (file, application item and instant VM recoveries). Instant recoveries require a write cache folder to store changed disk blocks in.' Below this, there are two input fields: 'Mount server:' with the value 'veeam (Backup server)' and an 'Add New...' button, and 'Instant recovery write cache folder:' with the value 'C:\ProgramData\Veeam\Backup\IRCache\' and a 'Browse...' button. Below the input fields, there is a checkbox 'Enable vPower NFS service on the mount server (recommended)' which is checked. To the right of this checkbox is a 'Ports...' button. Below the checkbox, there is a text block explaining the service. At the bottom of the window, there are four buttons: '< Previous', 'Next >', 'Finish', and 'Cancel'. A green checkmark and the text 'Helper appliance has been configured successfully.' are visible above the 'Next >' button.

In the review screen, please double-check the components and click 'Apply' to proceed.



New Object Storage Repository

Review
Please review the settings, and click Apply to continue.

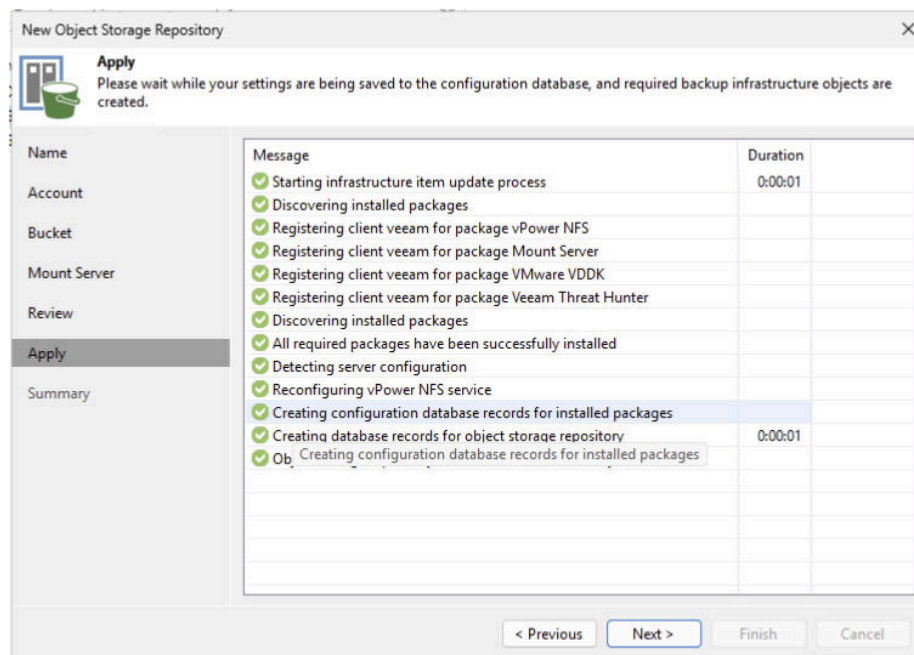
The following components will be processed on server veeam:

Component name	Status
vPower NFS	already exists
Mount Server	already exists
VMware VDDK	already exists
Veeam Threat Hunter	already exists

☐ Search the repository for existing backups and import them automatically
☐ Import guest file system index data to the catalog

< Previous Apply Finish Cancel

Veeam is now constructing the S3 object store, and the output should look similar to this:



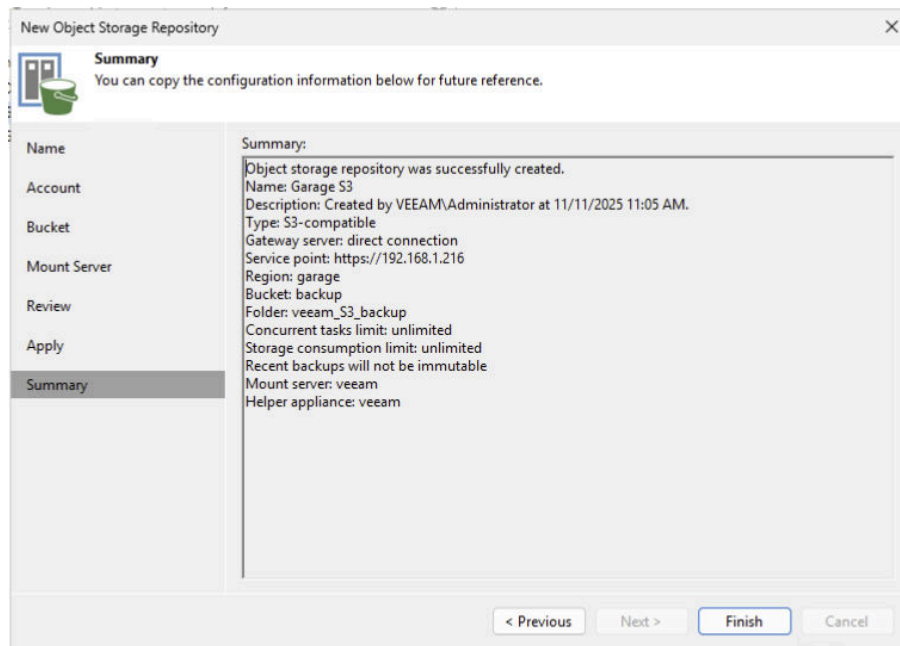
New Object Storage Repository

Apply
Please wait while your settings are being saved to the configuration database, and required backup infrastructure objects are created.

Message	Duration
✓ Starting infrastructure item update process	0:00:01
✓ Discovering installed packages	
✓ Registering client veeam for package vPower NFS	
✓ Registering client veeam for package Mount Server	
✓ Registering client veeam for package VMware VDDK	
✓ Registering client veeam for package Veeam Threat Hunter	
✓ Discovering installed packages	
✓ All required packages have been successfully installed	
✓ Detecting server configuration	
✓ Reconfiguring vPower NFS service	
✓ Creating configuration database records for installed packages	
✓ Creating database records for object storage repository	0:00:01
✓ Ob Creating configuration database records for installed packages	

< Previous Next > Finish Cancel

Click on Next. The next screen will display a summary of the added Object storage repository. Click on Finish, and object storage has been added to your backup infrastructure.



3. Scripting

For the scope of this implementation guide, the integration between Veeam Backup & Replication and Lightbits block storage is implemented via scripting.

Scripting Focus

1. The initial focus will be on developing the script responsible for creating snapshots and volume clones on the Lightbits block storage system.
2. Following this, a second script will be created to delete these snapshots and clones after the backup operation is completed.

Veeam Server Automation

The Veeam Backup server must be configured with a third and a fourth script within the backup job. The purpose of these commands is to remotely invoke the scripts (snapshot/clone creation and cleanup scripts) on the designated server, facilitating the proxy-based backup of the client-1 application server through the VeeamProxy server.

3.1. Script to Create the Snapshots, Clones and Mountpoints

To enhance readability and comprehension, the script is logically partitioned into multiple sections. The script created is called: **GetReadyForBackup.sh**

The first section of the script is dedicated to identifying the necessary volumes on the Lightbits storage system. This is crucial for creating snapshots and clones.

- **Required Data:** The script must obtain the Volume UUIDs (Universally Unique Identifiers) of the volumes that need protection.
- **Data Source:** These Volume UUIDs must be retrieved directly from the application server, designated as Client-1.
- **Execution Location:** Please note that this initial volume identification script will be executed on the Veeam proxy server, which is the machine where all interaction with the Lightbits volumes and Veeam ultimately occurs.

The second section involves creating clones from the snapshots, and the third section consists in mounting the clones on the Veeam proxy server.

3.1.1. First Section

The script to identify the volume UUIDs for Client-1 and create the snapshots on Lightbits is as follows:

Shell

```
#!/bin/bash
```

```
# --- Full Pre-freeze Script for Lightbits Snapshot and Volume Creation ---
# REVISED: This script performs the workflow in three phases: Snapshot, Clone,
# Mount.
# NOTE: Assumes local host starts with 0 Lightbits NVMe devices.
# Path to the log file for troubleshooting

LOG_FILE="./GetReadyForBackup.log"
exec > $LOG_FILE 2>&1 > "$LOG_FILE"
echo "$(date) - Starting Lightbits snapshot and volume creation workflow."
echo "-----"

# --- Configuration for Lightbits API ---
LIGHTBITS_IP="192.168.1.42"
PROJECT_NAME="default"
LB_API_URL="https://\$LIGHTBITS\_IP:443/api/v2/projects/\$PROJECT\_NAME"

# Note: You must manually provide your Bearer Token here

LIGHTBITS_JWT="eyJhbGciOiJSUzI1NiIsImtpZCI6InN5c3RlbTpyb290IiwidHlwIjoiiSldUIn0.eyJpc3MiOiIvaG9tZS9kZW1vL2xpZ2h0b3MtY2VydgG1maWNhdGVzL2N1cnQtbGItYWRTaW4ta2V5LnB1bSIiInJvbmVzIjpbInN5c3RlbTpybHVzdGVyLWFKbWluIl0sImF1ZCI6IkxpZ2h0T1MiLCJzdWIiOiJsaWdodG9zLWNsaWVudCIsIm1hdCI6MTc1NTE2NDQ0NywiZXhwIjoxNzg2NzAwNDQ3fQ.12Ak3cjAUPGkt_cKkaaQF-RP_Ear6bpARyz9U-ngDr2p57TqWgTLYZrF6coU5XK4q92R5cWt1udILGZL88dASim5mMB59Qe50P148t7kQwJKJf-dcr_CInf4vJtSW10eohSimKY5QBQD8XieFMbliuZ5K2uPAhLW1rQNmsR4WGXC1r1Jwks15CYXTGS9L63aurJKTika2je995XyyNlu__Hgalh0wZCGHUwDzFHBIAJvIL-XRk5sb8agIjMwLHH1hTCYGCt0NeRImZUa10MHVZj2ZbtN5xXXQYPsDXKjhUmnA6m-5DHmjYgN5FyU0nB1qLoilYIDlsDsChZeD66iq"
```

```
# --- Configuration for the remote host (Source of NGUIDs) ---
REMOTE_USER="backup"
REMOTE_HOST="client-1"
# --- File paths for UUIDs ---
SNAPSHOT_FILE="./Snapshots"
VOLUMES_FILE="./Volumes"
MOUNTPOINTS_FILE="./Mountpoints"
NGUIDS_FILE="./NGuids"

# --- Script Logic ---
# Clear old output files to ensure fresh data for each run

> "$SNAPSHOT_FILE"
> "$VOLUMES_FILE"
```

```
> "$MOUNTPPOINTS_FILE"
> "$NGUIDS_FILE"

# Check for required tools on the local Veeam client machine

if ! command -v /usr/bin/curl &> /dev/null || ! command -v /usr/bin/jq &> /dev/null; then
    echo "$(date) - ERROR: Required tools are missing. Please install curl and jq on the Veeam client machine."
    exit 1
fi
echo "$(date) - Connecting to '$REMOTE_HOST' to get device info (NGUIDs)..."

# Find all device paths for Lightbits devices on the remote host (source devices)

LIGHTBITS_DEVICES=$(ssh "$REMOTE_USER@$REMOTE_HOST" "sudo nvme list | grep 'Lightbits' | awk '{print \$1}'" 2>/dev/null)

if [ -z "$LIGHTBITS_DEVICES" ]; then
    echo "$(date) - ERROR: No Lightbits NVMe devices found on '$REMOTE_HOST'."
    echo "$(date) - Please ensure 'nvme-cli' is installed and the SSH user has passwordless sudo for 'nvme'."
    exit 1
fi

echo "$(date) - Found the following source devices on '$REMOTE_HOST':"
echo "$LIGHTBITS_DEVICES"
echo "-----"

## Phase 1: Create all the snapshots

echo "$(date) - --- PHASE 1: Starting snapshot creation for all devices --- "
counter=1

# Loop through each device and perform the full workflow

for DEVICE_PATH in $LIGHTBITS_DEVICES; do
    echo "$(date) - --- Processing source device: $DEVICE_PATH ---"

    # Get the NGUID for the current device and format it with sed
```

```
NGUID=$(ssh "$REMOTE_USER@$REMOTE_HOST" "sudo nvme id-ns $DEVICE_PATH | grep
'nguid' | awk '{print \NF}' | sed
's/\(.\\{8\\}\\)\(.\\{4\\}\\)\(.\\{4\\}\\)\(.\\{4\\}\\)\(.\\{12\\}\\)/\1-\2-\3-\4-\5/'"
2>/dev/null)

if [ -z "$NGUID" ]; then
    echo "$(date) - ERROR: Failed to retrieve NGUID for $DEVICE_PATH."
    continue
fi

echo "$NGUID" >> "$NGUIDS_FILE" # Save NGUID of source volume
echo "$(date) - Found NGUID for $DEVICE_PATH: $NGUID"

# --- Create Snapshot via API ---

SNAPSHOT_NAME="snapshot-$(date +%Y%m%d%H%M%S)-$counter"
echo "$(date) - Creating snapshot '$SNAPSHOT_NAME' for NGUID '$NGUID' via
REST API..."

RESPONSE=$(/usr/bin/curl -s -X POST --insecure -H "Accept: application/json"
-H "Content-Type: application/json" -H "Authorization: Bearer $LIGHTBITS_JWT"
-d "{\"name\": \"$SNAPSHOT_NAME\", \"sourceVolumeUUID\": \"$NGUID\"}"
"$LB_API_URL/snapshots")

if [ $? -ne 0 ] || [ "$(echo "$RESPONSE" | /usr/bin/jq -r '.state // empty')"
!= "Creating" ]; then
    echo "$(date) - ERROR: Failed to create snapshot."
    echo "$(date) - API Response: $RESPONSE"
    exit 1
fi

CREATED_SNAPSHOT_UUID=$(echo "$RESPONSE" | /usr/bin/jq -r '.UUID // empty')
echo "$CREATED_SNAPSHOT_UUID" >> "$SNAPSHOT_FILE"
echo "$(date) - Success! Snapshot '$SNAPSHOT_NAME' (UUID:
$CREATED_SNAPSHOT_UUID) has been created."
((counter++))
done

echo "$(date) - All snapshots initiated."
echo
"-----"
"-----"
```

3.1.2 Second Section

Now that the snapshots are created, the second session will use the snapshot UUIDs as input to make the clones from. This script describes the second phase of the process.

Shell

```
## Phase 2: Create all cloned volumes
echo "$(date) - --- PHASE 2: Starting cloned volume creation ---"
SNAPSHOT_UUIDS=$(cat "$SNAPSHOT_FILE")
NGUIDS=$(cat "$NGUIDS_FILE")

if [ ${#SNAPSHOT_UUIDS[@]} -eq 0 ]; then
    echo "$(date) - ERROR: No snapshots were successfully created to clone from."
    exit 1
fi

HOST_NQN=$(sudo cat /etc/nvme/hostnqn 2>/dev/null)

if [ -z "$HOST_NQN" ]; then
    echo "$(date) - ERROR: Could not retrieve the host NQN."
    exit 1
fi

clone_counter=1

# Loop through snapshot UUIDs and corresponding original NGUIDs

for i in "${!SNAPSHOT_UUIDS[@]}"; do
    CREATED_SNAPSHOT_UUID=${SNAPSHOT_UUIDS[$i]}
    CURRENT_NGUID=${NGUIDS[$i]}
    echo "$(date) - Waiting for snapshot '$CREATED_SNAPSHOT_UUID' to become Available..."
    STATE="Creating"
    TIMEOUT=60
    ELAPSED_TIME=0
    while [ "$STATE" != "Available" ] && [ "$ELAPSED_TIME" -le "$TIMEOUT" ]; do
```

```
    SNAPSHOT_STATUS=$(/usr/bin/curl -s -X GET --insecure -H "Accept:
application/json" -H "Authorization: Bearer $LIGHTBITS_JWT"
"$LB_API_URL/snapshots/$CREATED_SNAPSHOT_UUID")
    STATE=$(echo "$SNAPSHOT_STATUS" | /usr/bin/jq -r '.state // empty')
    sleep 2
    ELAPSED_TIME=$((ELAPSED_TIME + 2))
done

if [ "$STATE" != "Available" ]; then
    echo "$(date) - ERROR: Timeout reached. Snapshot did not become Available
within $TIMEOUT seconds."
    exit 1
fi
echo "$(date) - Snapshot is now Available."

# --- Retrieve Configuration for Clone Volume ---
echo "$(date) - Getting original volume size and replica count (NGUID:
$CURRENT_NGUID)..."
VOLUME_INFO=$(/usr/bin/curl -s -X GET --insecure -H "Accept:
application/json" -H "Authorization: Bearer $LIGHTBITS_JWT"
"$LB_API_URL/volumes/$CURRENT_NGUID")
ORIGINAL_SIZE=$(echo "$VOLUME_INFO" | /usr/bin/jq -r '.size // empty')
ORIGINAL_REPLICAS=$(echo "$VOLUME_INFO" | jq -r '.replicaCount // empty')
ORIGINAL_PROJECT_NAME=$(echo "$VOLUME_INFO" | jq -r '.projectName // empty')
ORIGINAL_COMPRESSION=$(echo "$VOLUME_INFO" | jq -r '.compression // empty')

# Check if necessary info was retrieved

if [ -z "$ORIGINAL_SIZE" ] || [ -z "$ORIGINAL_REPLICAS" ]; then
    echo "$(date) - ERROR: Could not retrieve original volume size or
replica count for NGUID $CURRENT_NGUID."
    exit 1
fi

NEW_VOLUME_NAME="volume-from-snapshot-$(date
+%Y-%m-%d-%H%M%S)-$clone_counter"
echo "$(date) - Creating new volume '$NEW_VOLUME_NAME' from the snapshot..."

# API call uses fetched properties (since you included them)

VOLUME_RESPONSE=$(/usr/bin/curl -s -X POST --insecure -H "Accept:
application/json" -H "Content-Type: application/json" -H "Authorization: Bearer
```

```
$LIGHTBITS_JWT" -d "{\"name\": \"$NEW_VOLUME_NAME\", \"sourceSnapshotUUID\":
\"$CREATED_SNAPSHOT_UUID\", \"size\": \"$ORIGINAL_SIZE\", \"replicaCount\":
$ORIGINAL_REPLICAS, \"projectName\": \"$ORIGINAL_PROJECT_NAME\",
\"compression\": \"$ORIGINAL_COMPRESSION\", \"acl\": {\"values\":
[\"$HOST_NQN\"]}}" "$LB_API_URL/volumes")

if [ $? -ne 0 ] || [ "$(echo "$VOLUME_RESPONSE" | /usr/bin/jq -r '.state //
empty' )" != "Creating" ]; then
    echo "$(date) - ERROR: Failed to create a new volume."
    echo "$(date) - API Response: $VOLUME_RESPONSE"
    exit 1
fi

NEW_VOLUME_UUID=$(echo "$VOLUME_RESPONSE" | /usr/bin/jq -r '.UUID // empty')
echo "$NEW_VOLUME_UUID" >> "$VOLUMES_FILE"
echo "$(date) - Success! New volume '$NEW_VOLUME_NAME' (UUID:
$NEW_VOLUME_UUID) has been created."
((clone_counter++))
done

# Run the discovery client to make sure the volumes are mapped to the client

sudo /usr/bin/discovery-client connect-all -t tcp -a 192.168.1.42 -q
nqn.2014-08.org.nvmexpress:uuid:9062bbb0-9b6a-47b6-be09-a9bd037dbe83
echo "$(date) - Waiting 20 seconds for the new volumes to appear on the local
host..."
sleep 5
echo "$(date) - All cloned volumes created and connecting."
echo "-----"
```

3.1.3. Third Section

Now that the clones are created and directly attached to the Veeam proxy server, the third step is to mount the clones in the same order as they were on the Client-1 server.

Shell

```
## Phase 3: Create All Mountpoints (Corrected Logic)

echo "$(date) - --- PHASE 3: Starting Mountpoint Creation ---"
VOLUME_UUIDS=$(cat "$VOLUMES_FILE")

if [ ${#VOLUME_UUIDS[@]} -eq 0 ]; then
    echo "$(date) - ERROR: No volumes were successfully created to mount."
    exit 1
fi

NEW_DEVICE_COUNT=${#VOLUME_UUIDS[@]}
mount_counter=1

# --- Robust Waiting Loop ---

TARGET_DEVICE_COUNT="$NEW_DEVICE_COUNT"
ELAPSED_WAIT=0

# Use a filter that reliably counts NVMe namespaces

NVME_FILTER="grep '/dev/nvme[0-9]n[0-9]'"
while [ $(sudo nvme list | eval "$NVME_FILTER" | wc -l) -lt
"$TARGET_DEVICE_COUNT" ] && [ "$ELAPSED_WAIT" -le 60 ]; do
    echo "$(date) - Status: Only $(sudo nvme list | eval "$NVME_FILTER" | wc
-l) of $TARGET_DEVICE_COUNT devices found. Waiting..."
    sleep 5
    ELAPSED_WAIT=$((ELAPSED_WAIT + 5))
done

if [ $(sudo nvme list | eval "$NVME_FILTER" | wc -l) -ne "$TARGET_DEVICE_COUNT"
]; then
    echo "$(date) - ERROR: Timeout reached. Expected $TARGET_DEVICE_COUNT
devices, but only $(sudo nvme list | eval "$NVME_FILTER" | wc -l) appeared."
    exit 1
fi

echo "$(date) - All $TARGET_DEVICE_COUNT cloned devices are now visible."

# --- End Robust Waiting Loop ---

# Get the list of the new NVMe devices (which should be ALL devices on this
empty host)
```

```
ALL_LOCAL_NVME_DEVICES=$(sudo nvme list | eval "$NVME_FILTER" | awk '{print $1}' 2>/dev/null | sort -V)

# --- CRITICAL FIX: Loop through ALL devices found, as they are all new clones
---
# Since ORIGINAL_DEVICE_COUNT = 0, the first device found is the first clone.

for NEW_DEVICE_PATH in $ALL_LOCAL_NVME_DEVICES; do
    MOUNT_DIR="/mnt/Client-1-Vol-$mount_counter"
    echo "$(date) - Attempting to mount '$NEW_DEVICE_PATH' to '$MOUNT_DIR'
(Clone ${mount_counter})..."
    sudo /usr/sbin/mkdir -p "$MOUNT_DIR"

    # Use 'ro,nouuid' for read-only mounts that ignore duplicate UUIDs
    sudo mount -t auto -o ro,nouuid "$NEW_DEVICE_PATH" "$MOUNT_DIR"

    if [ $? -ne 0 ]; then
        echo "$(date) - ERROR: Failed to mount '$NEW_DEVICE_PATH'. Check dmesg for
filesystem errors."
        exit 1
    fi

    echo "$MOUNT_DIR" >> "$MOUNTPOINTS_FILE"
    echo "$(date) - Successfully mounted '$NEW_DEVICE_PATH' to '$MOUNT_DIR'."
    ((mount_counter++))
done

echo "$(date) - All workflows complete. Exiting with success."
exit 0
```

At this point, the snapshots and clones have been created. The clones are connected to the Veeam proxy server and mounted in the same structure as on the Client-1 server.

The original state on Client-1 server is:

```
/mnt/vol-1
/mnt/vol-2
```

On the Veeam proxy server, after the script has been executed, it will have the following:

```
/mnt/Client-1-vol-1
/mnt/Client-1-vol-2
```

3.2. Script to Unmount the Mountpoints to Delete the Clones and the Snapshots

To enhance readability and comprehension, the script is logically partitioned into multiple sections. The script created is called: **DeleteVolumesSnapshots.sh**

The first section involves unmounting the volumes. The second section involves deleting the snapshots. The third section consists of deleting the volumes (clones). The fourth section is about reporting on the previous three sections.

3.2.1. First Section

The script to unmount the volumes is as follows:

Shell

```
#!/bin/bash
# --- CONFIGURATION ---
# IMPORTANT: Replace these with your actual Lightbits environment details

PROJECT_NAME="default"
LIGHTBITS_MANAGEMENT_IP="192.168.1.42"
LIGHTBITS_API_URL="https://${LIGHTBITS_MANAGEMENT_IP}:443/api/v2/projects/$PROJECT_NAME"

# You MUST define your Authorization token here.
# Replace this placeholder with your actual Bearer Token or API Key.

AUTH_TOKEN="eyJhbGciOiJSUzI1NiIsImtpZCI6InN5c3RlbTpyb290IiwidHlwIjoiSldUIn0.eyJpc3MiOiIvaG9tZS9kZW1vL2xpZ2h0b3MtY2VydGhmaWNhdGVzL2NlcnQtbGItYWRtaW4ta2V5LnBlbSIsInJvbGVzIjpbInN5c3RlbTpybHVzdGVyLWFKbWluIl0sImF1ZCI6IkxpZ2h0T1MiLCJzdWIiOiJsaWdodG9zLWNsaWVudCIsImhhdCI6MTc1NTE2NDQ0NywiZXhwIjoxNzg2NzAwNDQ3fQ.12Ak3cjAUPGkt_cKkaaQF-RP_Ear6bpARyz9U-ngDr2p57TqWgTLYZrF6coU5XK4q92R5cWt1udILGZL88dASim5mMB59Qe50Pl48t7kQwJKJf-dcr_CInf4vJtSW10eohSimKY5QBQD8XieFMbliuZ5K2uPAhLW1rQNmsR4WGX_Clr1Jwks15CYXTGS9L63aurJKTika2je995XyyNlu__Hgalh0wZCGHUwDzFHBIAJvIL-XRk5sb8agI"
```

```
jMwLHH1hTCYGct0NeRIImZUa10MHVZj2ZbtN5xXXQYPsDXKjhUmnA6m-5DHmjYgN5FyU0nB1qLoilYID  
lsDsChZeD66iQ"
```

```
# File paths
UUID_FILE_VOLUMES="./Volumes"
UUID_FILE_SNAPSHOTS="./Snapshots"
UUID_FILE_MOUNTPOINTS="./Mountpoints"
UUID_FILE_NGUIDS="./NGuids"
LOG_FILE="./DeleteVolumesSnapshots.log"

# API Endpoints

VOLUME_ENDPOINT="/volumes"
SNAPSHOT_ENDPOINT="/snapshots"

# =====
# 0. LOG TRUNCATION AND REDIRECTION
# =====

# The 'exec' command redirects all future stdout (1) and stderr (2) to the log
file.
# The '>' operator ensures the log file is CREATED or TRUNCATED (deleted)
before writing.

exec > "$LOG_FILE" 2>&1
echo "=====
echo " Lightbits Deletion Script Started: $(date)"
echo " All subsequent output is redirected to: $LOG_FILE"
echo "=====

# --- SCRIPT START ---
# Basic check for the token placeholder

if [ "$AUTH_TOKEN" == "<YOUR_ACTUAL_LIGHTBITS_BEARER_TOKEN>" ]; then
    echo "Error: Please update the 'AUTH_TOKEN' variable in the script with
your actual token." >&2
    exit 1
fi

echo "Starting Lightbits REST API deletion process..."
```

```
# Initialize global counters

TOTAL_SUCCESS=0
TOTAL_FAILURE=0

# =====
# 1. UMount LOOP
# =====
echo ""
echo "=====
echo "          🚀 Starting unmount          "
echo "=====

# --- Function to display script usage ---
usage() {
    echo "Usage: $0"
    echo "Reads mount points from $UUID_FILE_MOUNTPOINTS and attempts to
unmount them."
    echo "Each mount point should be on a new line in the file."
}

# --- Main script execution ---
# Check if the mount points file exists and is readable

if [[ ! -r "$UUID_FILE_MOUNTPOINTS" ]]; then
    echo "Error: Mount points file '$UUID_FILE_MOUNTPOINTS' not found or is not
readable." >&2
    usage
    exit 1
fi

echo "Attempting to unmount devices listed in '$UUID_FILE_MOUNTPOINTS'..."
echo "-----"

# Read the file line by line

while IFS= read -r MOUNT_POINT; do
    # Skip empty lines and lines starting with '#' (comments)
    if [[ -z "$MOUNT_POINT" || "$MOUNT_POINT" =~ ^[:space:]*# ]]; then
        continue
    fi
```

```
# Remove leading/trailing whitespace
MOUNT_POINT=$(echo "$MOUNT_POINT" | xargs)

# Check if the mount point is not empty after cleanup
if [[ -z "$MOUNT_POINT" ]]; then
    continue
fi

echo "Unmounting: $MOUNT_POINT"

# Execute the umount command
if umount "$MOUNT_POINT"; then
    echo "✅ Successfully unmounted $MOUNT_POINT"
else
    # Log the error and continue to the next mount point
    echo "❌ ERROR: Failed to unmount $MOUNT_POINT (return code: $?)." >&2
    # Possible reasons include: Device not mounted, resource busy, or
    permission denied.
fi
done < "$UUID_FILE_MOUNTPOINTS"

echo "-----"
echo "Umount process complete."
#disconnect all the drives
sudo discovery-client disconnect-all
```

3.2.2. Second Section

The second section involves deleting the snapshots.

Shell

```
# =====
# 2. SNAPSHOT DELETION LOOP
# =====
echo ""
echo "====="
```

```
echo " 🚀 Starting Snapshot Deletion "
```

```
echo "====="
```

```
if [ ! -f "$UUID_FILE_SNAPSHOTS" ]; then
```

```
    echo "Warning: Snapshot list file '$UUID_FILE_SNAPSHOTS' not found.
```

```
    Skipping snapshots."
```

```
else
```

```
    SNAPSHOT_SUCCESS=0
```

```
    SNAPSHOT_FAILURE=0
```

```
    SNAPSHOT_TARGET="${LIGHTBITS_API_URL}${SNAPSHOT_ENDPOINT}"
```

```
    echo "API Target: $SNAPSHOT_TARGET"
```

```
    while IFS= read -r UUID; do
```

```
        UUID=$(echo "$UUID" | xargs)
```

```
        if [ -z "$UUID" ]; then
```

```
            continue
```

```
        fi
```

```
        echo "--- Attempting DELETE for snapshot UUID: $UUID ---"
```

```
        DELETE_URL="${SNAPSHOT_TARGET}/${UUID}"
```

```
        # Execute the DELETE request using curl
```

```
        # -s: Silent mode, -X DELETE: Method, --insecure: for self-signed certs
```

```
(remove if using proper TLS)
```

```
        # -o /dev/null -w "%{http_code}": Ensures ONLY the HTTP code is
```

```
captured.
```

```
        HTTP_CODE=$(curl -s -X DELETE \
```

```
            --insecure \
```

```
            -H "Authorization: Bearer $AUTH_TOKEN" \
```

```
            -H "Content-Type: application/json" \
```

```
            -o /dev/null -w "%{http_code}" \
```

```
            "$DELETE_URL" )
```

```
        # Check the HTTP status code for success (200-204 range)
```

```
        if [[ "$HTTP_CODE" -ge 200 && "$HTTP_CODE" -le 204 ]]; then
```

```
            echo "✅ Successfully deleted snapshot (HTTP $HTTP_CODE): $UUID"
```

```
            SNAPSHOT_SUCCESS=$((SNAPSHOT_SUCCESS + 1))
```

```
        else
```

```
            echo "❌ Failed to delete snapshot (HTTP $HTTP_CODE): $UUID" >&2
```

```
            SNAPSHOT_FAILURE=$((SNAPSHOT_FAILURE + 1))
```

```
        fi
```

```
    done < "$UUID_FILE_SNAPSHOTS"
```

```
TOTAL_SUCCESS=$((TOTAL_SUCCESS + SNAPSHOT_SUCCESS))
TOTAL_FAILURE=$((TOTAL_FAILURE + SNAPSHOT_FAILURE))
echo "Snapshot Deletion Summary: Success: $SNAPSHOT_SUCCESS, Failed:
$SNAPSHOT_FAILURE"
fi
```

3.2.3. Third Section

The third section is to delete the clones:

Shell

```
# =====
# 3. VOLUME DELETION LOOP
# =====
echo ""
echo "===== "
echo "          🗑 Starting Volume Deletion          "
echo "===== "

if [ ! -f "$UUID_FILE_VOLUMES" ]; then
    echo "Warning: Volume list file '$UUID_FILE_VOLUMES' not found. Skipping
volumes."
else
    VOLUME_SUCCESS=0
    VOLUME_FAILURE=0
    VOLUME_TARGET="${LIGHTBITS_API_URL}${VOLUME_ENDPOINT}"
    echo "API Target: $VOLUME_TARGET"
    while IFS= read -r UUID; do
        UUID=$(echo "$UUID" | xargs)
        if [ -z "$UUID" ]; then continue; fi
        echo "--- Attempting DELETE for volume UUID: $UUID ---"
        DELETE_URL="${VOLUME_TARGET}/${UUID}"
```



```
# Execute the DELETE request using curl (same logic as snapshots)
HTTP_CODE=$(curl -s -X DELETE \
  --insecure \
  -H "Authorization: Bearer $AUTH_TOKEN" \
  -H "Content-Type: application/json" \
  -o /dev/null -w "%{http_code}" \
  "$DELETE_URL" )

# Check the HTTP status code for success (200-204 range)
if [[ "$HTTP_CODE" -ge 200 && "$HTTP_CODE" -le 204 ]]; then
  echo "✅ Successfully deleted volume (HTTP $HTTP_CODE): $UUID"
  VOLUME_SUCCESS=$((VOLUME_SUCCESS + 1))
else
  echo "❌ Failed to delete volume (HTTP $HTTP_CODE): $UUID" >&2
  VOLUME_FAILURE=$((VOLUME_FAILURE + 1))
fi
done < "$UUID_FILE_VOLUMES"

TOTAL_SUCCESS=$((TOTAL_SUCCESS + VOLUME_SUCCESS))
TOTAL_FAILURE=$((TOTAL_FAILURE + VOLUME_FAILURE))
echo "Volume Deletion Summary: Success: $VOLUME_SUCCESS, Failed:
$VOLUME_FAILURE"
fi
```

3.2.4. Fourth Section

The fourth section is the summary of the three previous sections:

Shell

```
# =====
# 3. FINAL SUMMARY
# =====
echo ""
echo "--- TOTAL DELETION SUMMARY ---"
```

```
echo "Total successful deletions (Snapshots + Volumes): $TOTAL_SUCCESS"
echo "Total failed deletions (Snapshots + Volumes): $TOTAL_FAILURE"

if [ "$TOTAL_FAILURE" -gt 0 ]; then
    echo "⚠️ Some items failed to delete. Check the output above for errors."
    exit 2
else
    echo "🎉 All specified items processed successfully."
fi

# =====
# 4. CLEANUP SECTION
# =====

echo ""
echo "=====
echo "🧹 Starting Cleanup"
echo "=====

# Clean up ./Mountpoints if it was processed
if rm -f "$UUID_FILE_MOUNTPOINTS"; then
    echo "✅ Cleaned up and deleted mountpoint list file:
$UUID_FILE_MOUNTPOINTS"
else
    echo "❌ Warning: Failed to delete mountpoint list file:
$UUID_FILE_MOUNTPOINTS" >&2
fi

# Clean up ./Snapshots if it was processed
if rm -f "$UUID_FILE_SNAPSHOTS"; then
    echo "Cleaned up and deleted snapshot list file:
$UUID_FILE_SNAPSHOTS"
else
    echo "❌ Warning: Failed to delete snapshot list file:
$UUID_FILE_SNAPSHOTS" >&2
fi

# Clean up ./Volumes if it was processed

if rm -f "$UUID_FILE_VOLUMES"; then
    echo "Cleaned up and deleted volume list file: $UUID_FILE_VOLUMES"
else
    echo "❌ Warning: Failed to delete volume list file:
```

```
$UUID_FILE_VOLUMES" >&2
fi

# Clean up ./NGUIDS if it was processed
if rm -f "$UUID_FILE_NGUIDS"; then
    echo "✅ Cleaned up and deleted volume list file: $UUID_FILE_NGUIDS"
else
    echo "❌ Warning: Failed to delete volume list file: $UUID_FILE_NGUIDS"
>&2
fi

# Set final exit code

if [ "$TOTAL_FAILURE" -gt 0 ]; then
    echo "⚠️ Script completed with some failures."
    exit 2
else
    echo "🎉 Script completed successfully."
    exit 0
fi
```

3.3. Script on the Veeam Server to Start the Script on Veeam Proxy

The script on the Veeam server that calls the first script (**GetReadyForBackup.sh**) on the Veeam proxy server is as follows:

None

```
# Backup-Client-1.ps1
$SSHCommand = "ssh root@veeamproxy /root/GetReadyForBackup.sh"

# Execute the command and capture the exit code
$ExitCode = (Invoke-Expression -Command $SSHCommand 2>&1 | Select-Object -Last
1).ExitCode
```

```
# Force the PowerShell script to exit with the SSH client's exit code
exit $ExitCode
```

3.4. Script on the Veeam Server to Start the Script to Unmount and Delete the Snapshots

The script on the Veeam server that calls the delete script (**DeleteVolumesSnapshots.sh**) on the Veeam proxy server is as follows:

None

```
# CleanUp-Client-1.ps1
$SSHCommand = "ssh root@veeamproxy /root/DeleteVolumesSnapshots.sh"

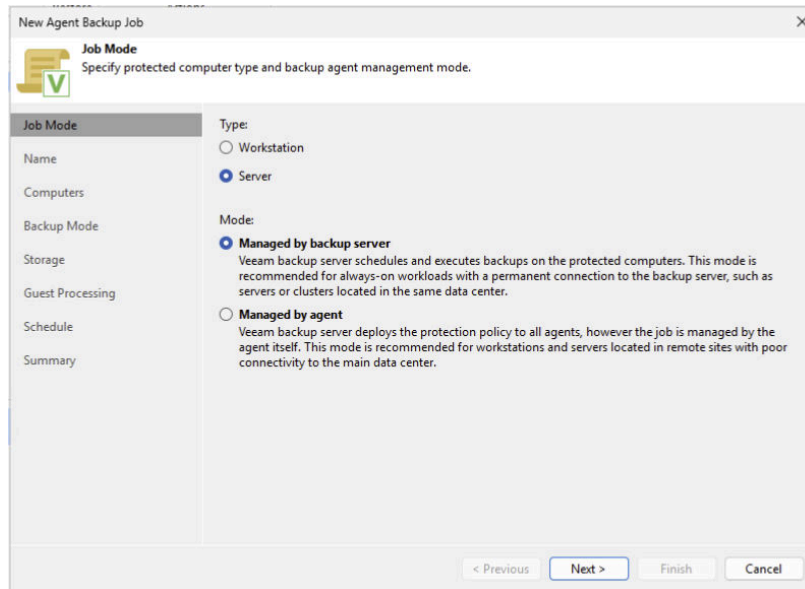
# Execute the command and capture the exit code
$ExitCode = (Invoke-Expression -Command $SSHCommand 2>&1 | Select-Object -Last
1).ExitCode

# Force the PowerShell script to exit with the SSH client's exit code
exit $ExitCode
```

4. Creating the Backup Job on the Veeam Server

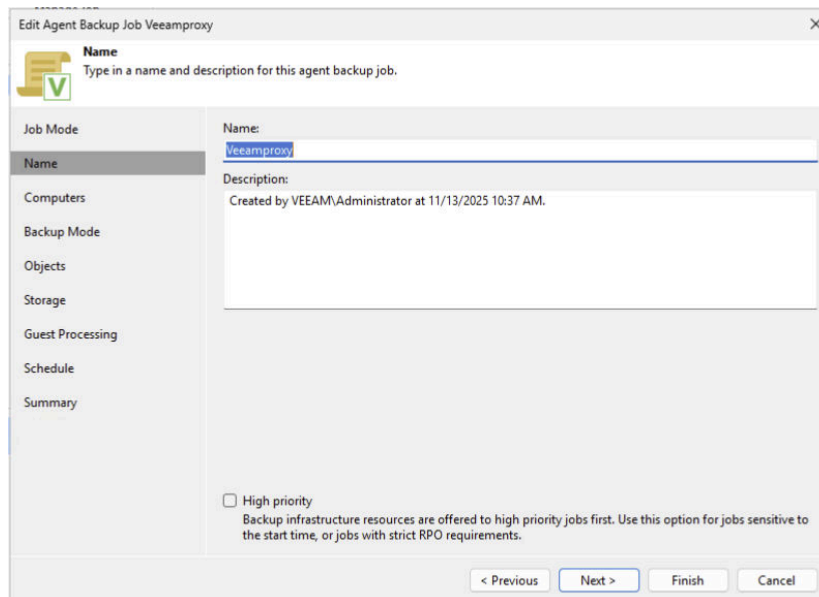
It is now time to configure the backup job in Veeam by using the scripts on the local server. In the top menu bar, click on Home. Then, click on the Backup Job icon and select the Linux computer.

The following screen appears:



The "New Agent Backup Job" dialog box is shown. It has a sidebar on the left with the following items: Job Mode (selected), Name, Computers, Backup Mode, Storage, Guest Processing, Schedule, and Summary. The main area is titled "Job Mode" and contains the instruction "Specify protected computer type and backup agent management mode." Under "Type:", there are two radio buttons: "Workstation" and "Server" (which is selected). Under "Mode:", there are two radio buttons: "Managed by backup server" (selected) and "Managed by agent". The "Managed by backup server" option has a description: "Veeam backup server schedules and executes backups on the protected computers. This mode is recommended for always-on workloads with a permanent connection to the backup server, such as servers or clusters located in the same data center." The "Managed by agent" option has a description: "Veeam backup server deploys the protection policy to all agents, however the job is managed by the agent itself. This mode is recommended for workstations and servers located in remote sites with poor connectivity to the main data center." At the bottom right, there are four buttons: "< Previous", "Next >" (highlighted), "Finish", and "Cancel".

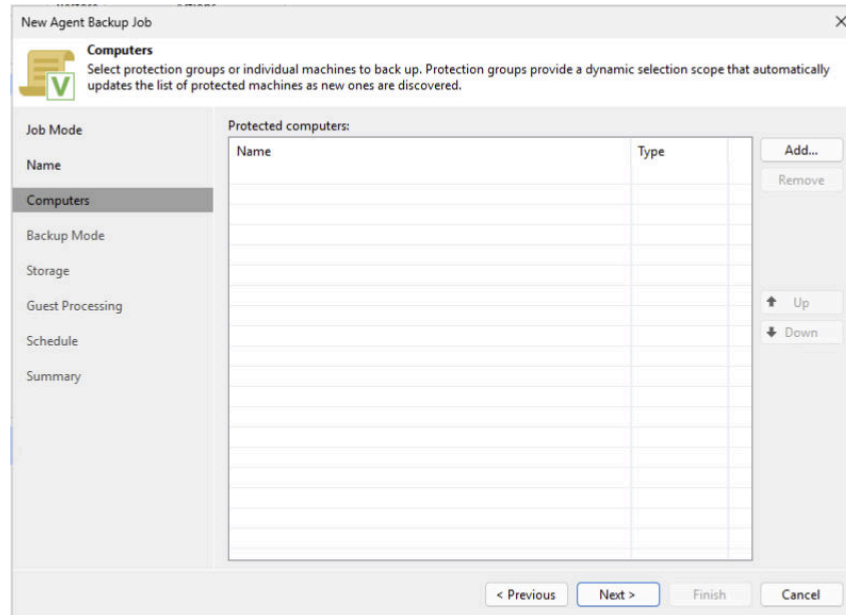
Click on Next. In the following screen, please provide a Name for the backup job. In this example, it is called: Veeamproxy



The "Edit Agent Backup Job Veeamproxy" dialog box is shown. It has a sidebar on the left with the following items: Job Mode, Name (selected), Computers, Backup Mode, Objects, Storage, Guest Processing, Schedule, and Summary. The main area is titled "Name" and contains the instruction "Type in a name and description for this agent backup job." Under "Name:", there is a text box containing "Veeamproxy". Under "Description:", there is a text box containing "Created by VEEAM\Administrator at 11/13/2025 10:37 AM." At the bottom left, there is a checkbox labeled "High priority" with the description: "Backup infrastructure resources are offered to high priority jobs first. Use this option for jobs sensitive to the start time, or jobs with strict RPO requirements." At the bottom right, there are four buttons: "< Previous", "Next >" (highlighted), "Finish", and "Cancel".

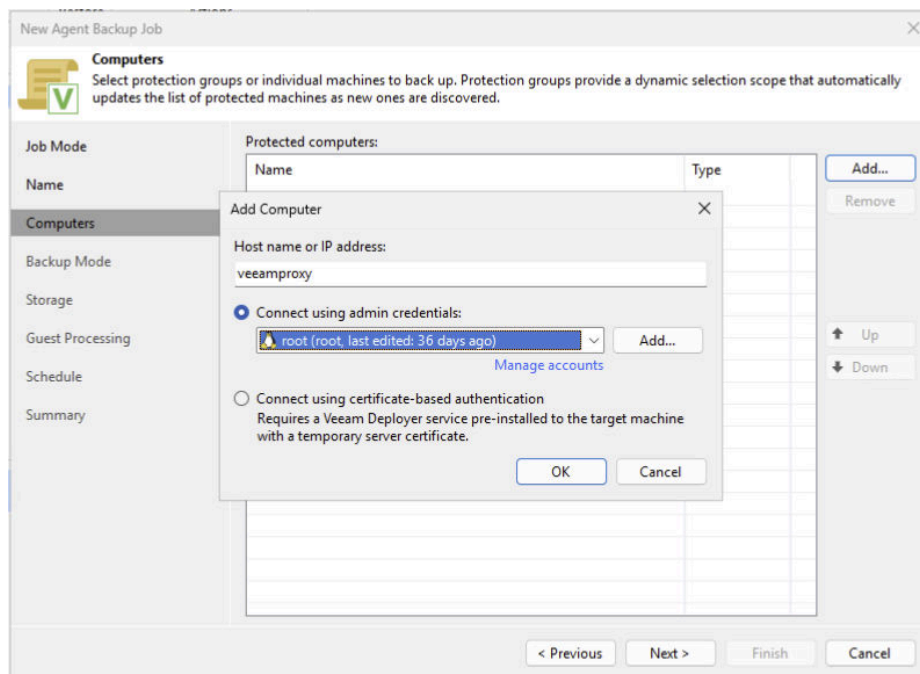
added.

Click on Next. In the following screen, the Veeam proxy server needs to be



The screenshot shows the 'New Agent Backup Job' window, specifically the 'Computers' tab. The left sidebar contains a tree view with 'Computers' selected. The main area is titled 'Protected computers:' and contains an empty table with columns 'Name' and 'Type'. To the right of the table are buttons for 'Add...', 'Remove', 'Up', and 'Down'. At the bottom of the window are buttons for '< Previous', 'Next >', 'Finish', and 'Cancel'.

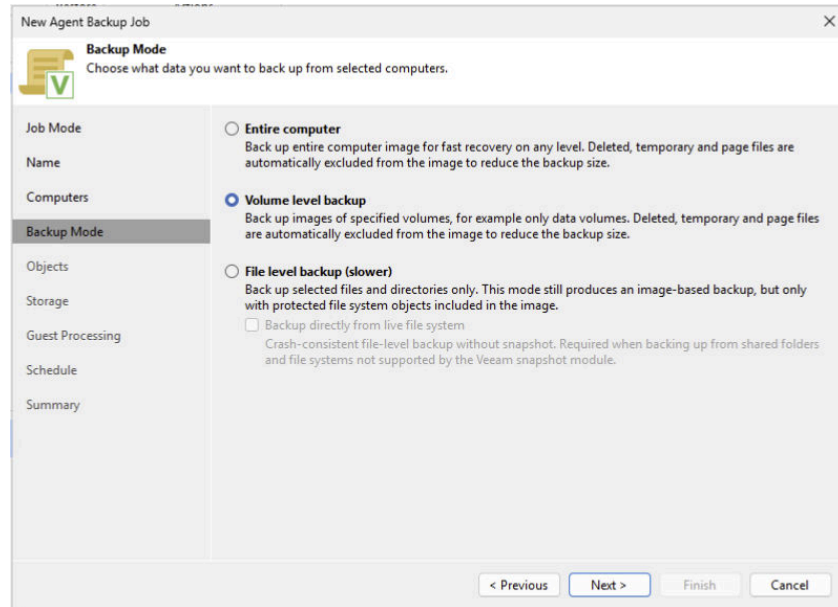
Click the Add button and select 'Individual computer'. Fill in the hostname and the admin credentials to connect to the Veeam proxy server. For this example, the screen will look like this:



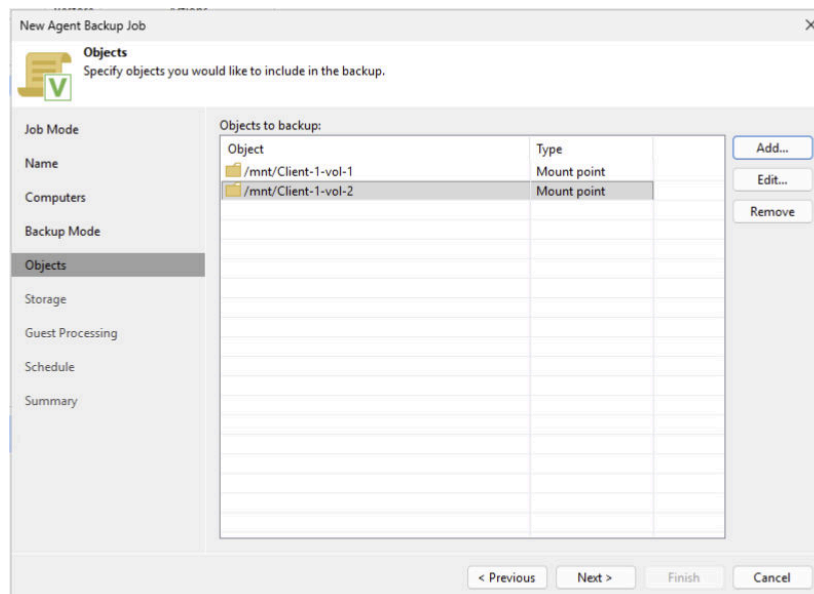
The screenshot shows the 'New Agent Backup Job' window with the 'Add Computer' dialog box open. The dialog has a 'Host name or IP address:' field with 'veeamproxy' entered. Below this are two radio buttons: 'Connect using admin credentials:' (selected) and 'Connect using certificate-based authentication:'. The 'Connect using admin credentials:' option has a dropdown menu showing 'root (root, last edited: 36 days ago)' and an 'Add...' button. A 'Manage accounts' link is also present. The 'Connect using certificate-based authentication:' option has a note: 'Requires a Veeam Deployer service pre-installed to the target machine with a temporary server certificate.' At the bottom of the dialog are 'OK' and 'Cancel' buttons. The background window shows the 'Protected computers:' table and navigation buttons.



Click OK and then click Next. In the Backup mode screen, the Volume level backup is the one required. Select Volume level backup and click on Next.



In the Objects screen, the mount points need to be selected from the Veeam proxy server. In the script to create the snapshots, the mount points in this example are: /mnt/Client-1-vol-1 and /mnt/Client-1-vol-2. Click on Add and select Mount point. Add the mount points. In this example, it looks as follows:





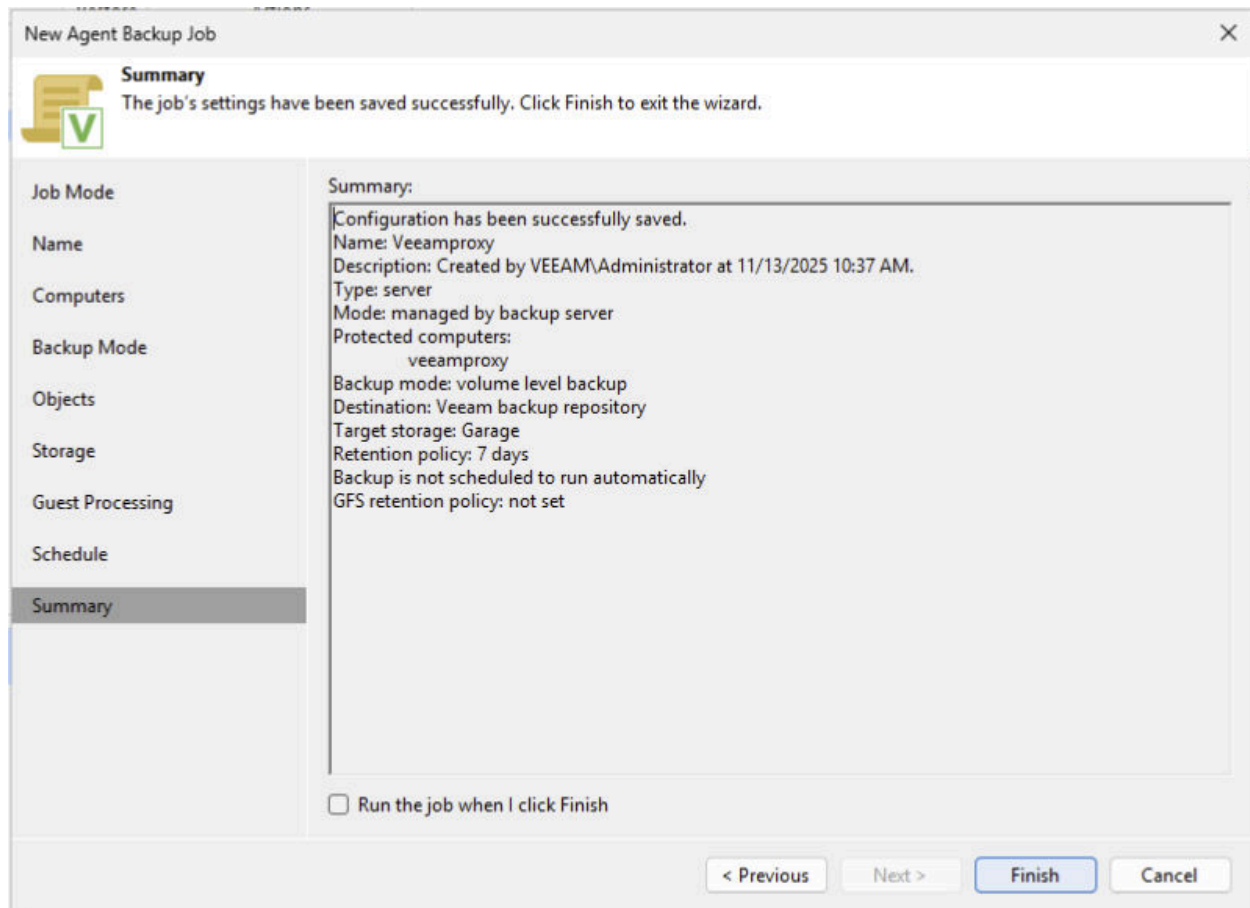
Click on Next. In the Storage screen, the Garage backup repository is directly selected because there is currently only one backup repository. In this screen, click on Advanced.

The screenshot shows the 'New Agent Backup Job' dialog box with the 'Storage' tab selected. The 'Backup repository' dropdown is set to 'Garage (Created by VEEAM\Administrator at 10/7/2025 6:28 AM.)'. The 'Retention policy' is set to '7 days'. There are checkboxes for 'Keep certain full backups longer for archival purposes' and 'Configure secondary destinations for this job', both of which are currently unchecked. The 'Advanced job settings' section at the bottom includes options for backup mode, compression, deduplication, block size, and notification settings. The 'Next >' button is highlighted.

In the Advanced Settings screen, click the Scripts tab. In the Job scripts section, tick both Before the job and After the job. When the jobs are enabled, you can browse and select the scripts from the Veeam server. In this example, the screen will look as follows:

The screenshot shows the 'Advanced Settings' dialog box with the 'Scripts' tab selected. The 'Job scripts' section has two checkboxes: 'Before the job' and 'After the job', both of which are checked. The 'Before the job' checkbox is selected with a blue square. The 'After the job' checkbox is also selected with a blue square. The 'Run scripts every' dropdown is set to '1 backup session'. The 'Run scripts on the selected days only' option is selected with a radio button. The 'Days...' button is visible. The 'Save As Default' button is at the bottom left. The 'OK' and 'Cancel' buttons are at the bottom right.

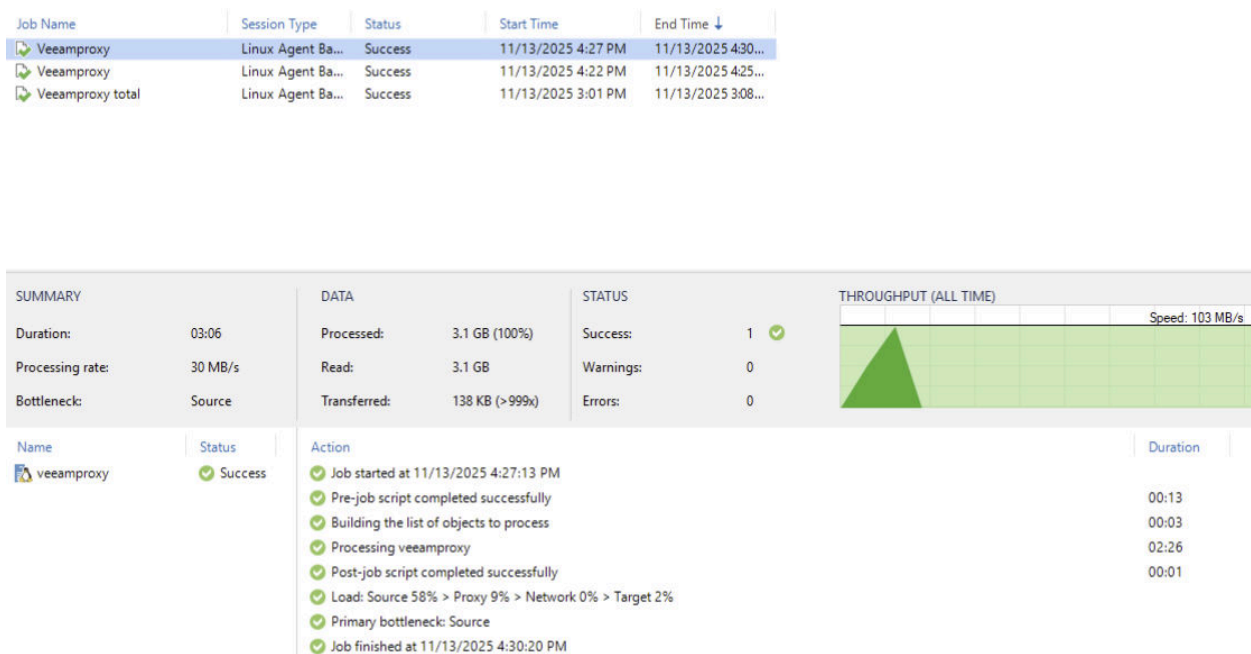
Before the job, the script is executed, which in turn calls the **GetReadyForBackup.sh** script on the Veeam proxy server. After the job is executed, the script is executed, which in turn calls the **DeleteVolumesSnapshots.sh** script on the Veeam proxy server. Click OK, and then click Next to proceed to the Guest Processing screen. On the screen, simply click on Next. In the Schedule screen, you can schedule the job; however, this step is skipped in this example. Click on Apply. The final screen is the summary. The summary for this example looks as follows:



Simply click Finish, and the backup job will be created.

5. Executing the Backup Job

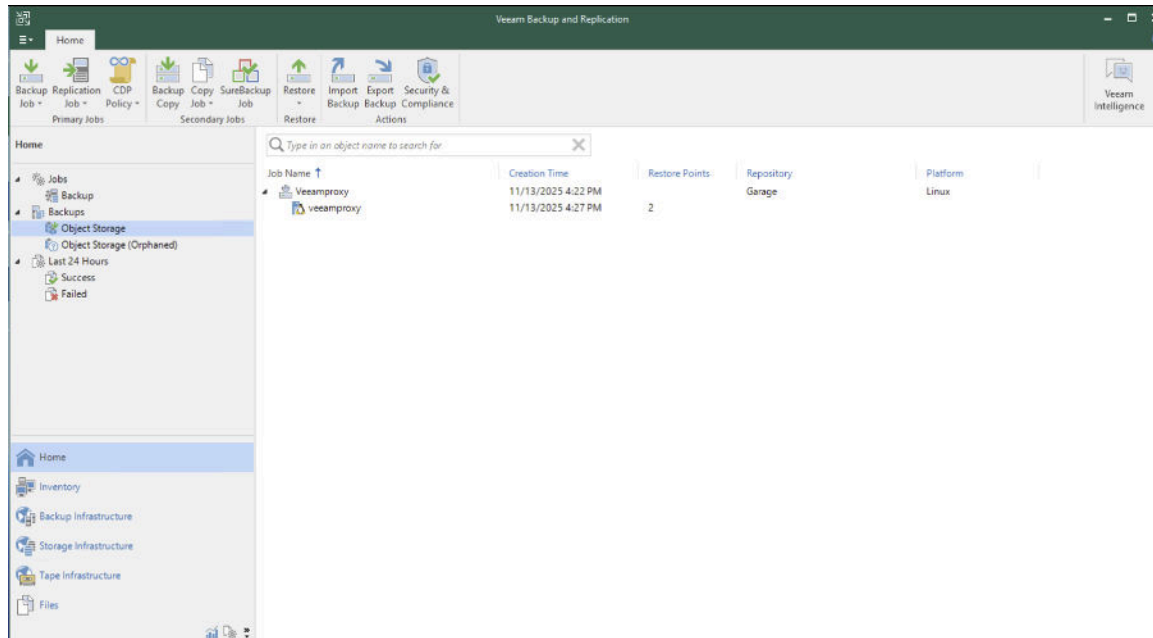
Now that the backup job has been created, hover over the Veeam proxy backup job, right-click on it, and select Start. The job progress will indicate the actions taken. At this point, you should review a successfully completed backup job.



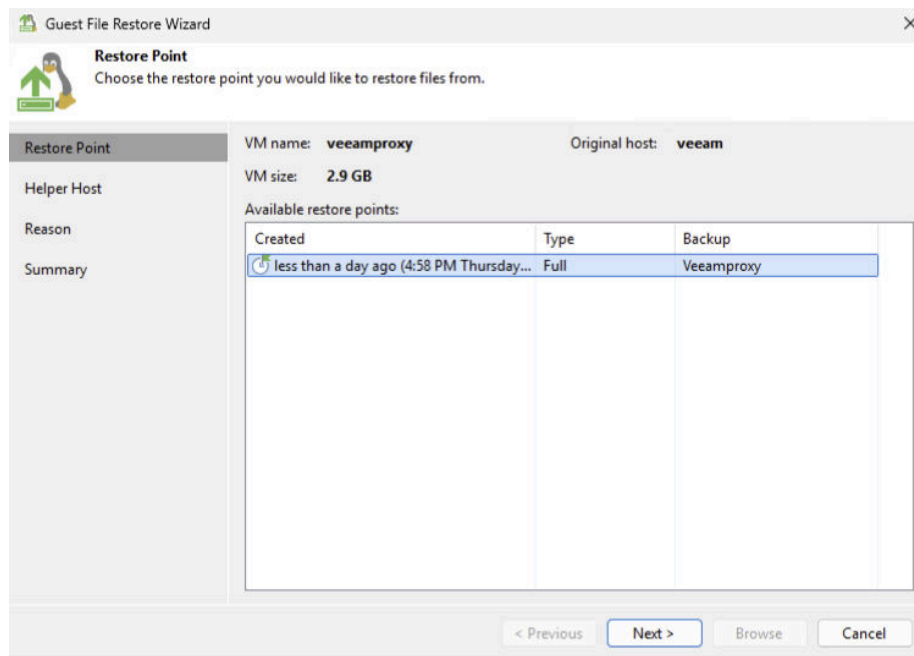
6. Restore the Files Directly to the Original Server Client-1

CommVault allows users to restore files directly from the Veeam proxy server back to the Client-1 server. Guidance follows on how to restore individual files on the original host.

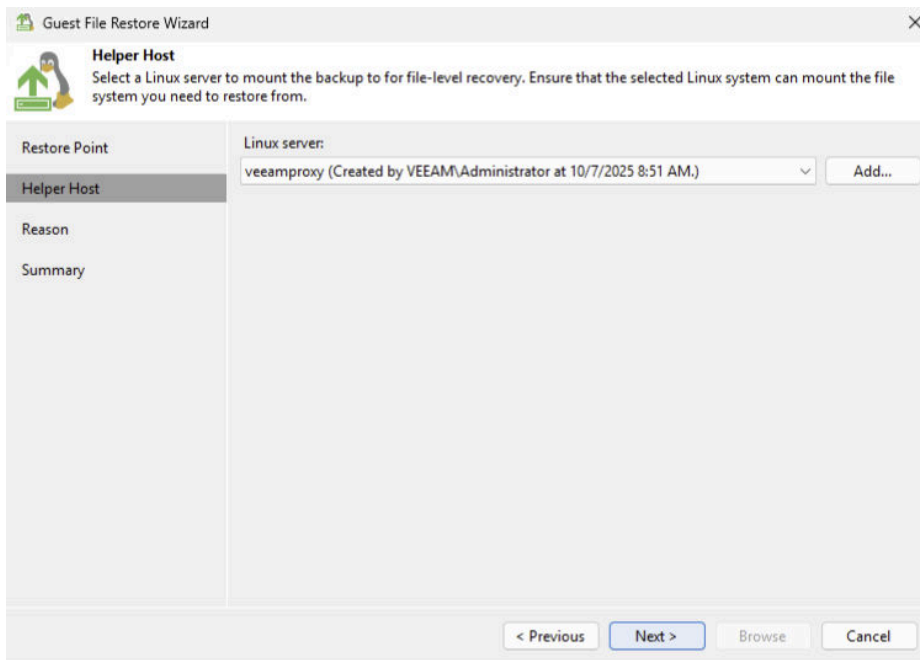
In the top menu bar, click on Home. Then, click "Backups" in the left menu bar, and Object Storage will appear. Click on the Object Storage. In the middle pane, select Veeamproxy. The screen will look like this:



Right-click on the lowest Veeamproxy and select Restore guest files, and click on Linux and other. The following screen appears:

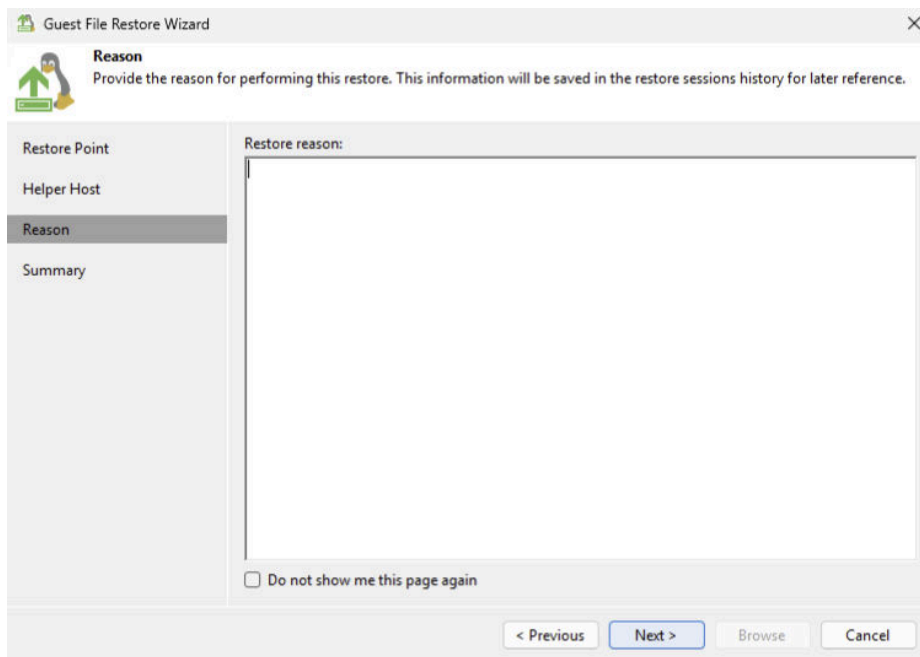


Click on Next. The following screen will appear:



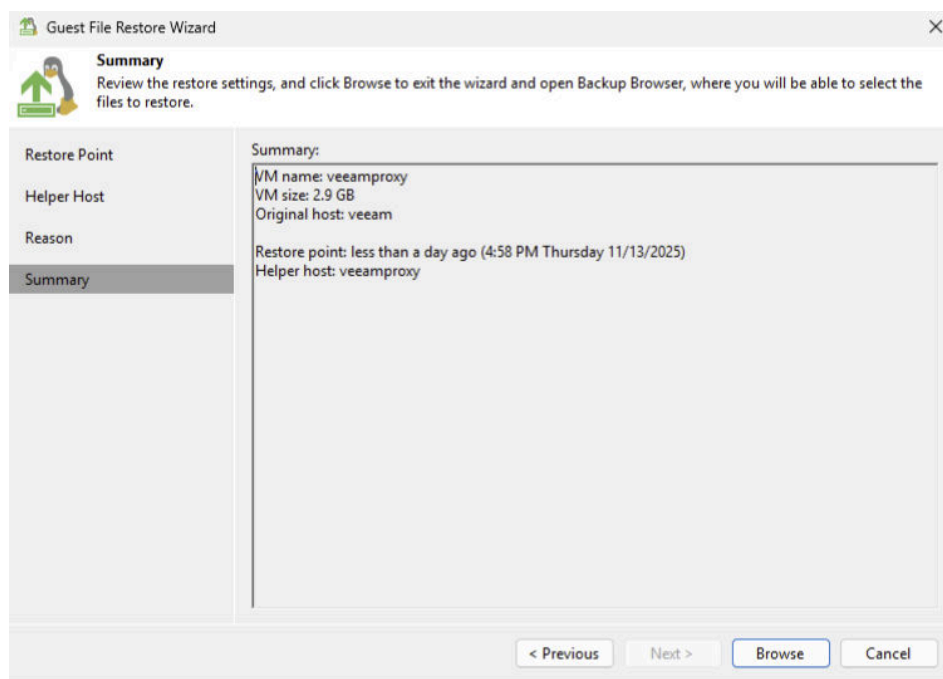
The screenshot shows the 'Guest File Restore Wizard' window. The title bar reads 'Guest File Restore Wizard'. The main heading is 'Helper Host' with a sub-instruction: 'Select a Linux server to mount the backup to for file-level recovery. Ensure that the selected Linux system can mount the file system you need to restore from.' On the left, a sidebar contains four tabs: 'Restore Point', 'Helper Host' (which is selected and highlighted), 'Reason', and 'Summary'. The main area on the right is titled 'Linux server:' and contains a dropdown menu with the text 'veeamproxy (Created by VEEAM\Administrator at 10/7/2025 8:51 AM.)' and an 'Add...' button. At the bottom right, there are four buttons: '< Previous', 'Next >', 'Browse', and 'Cancel'.

Click on Next. The following screen will appear:

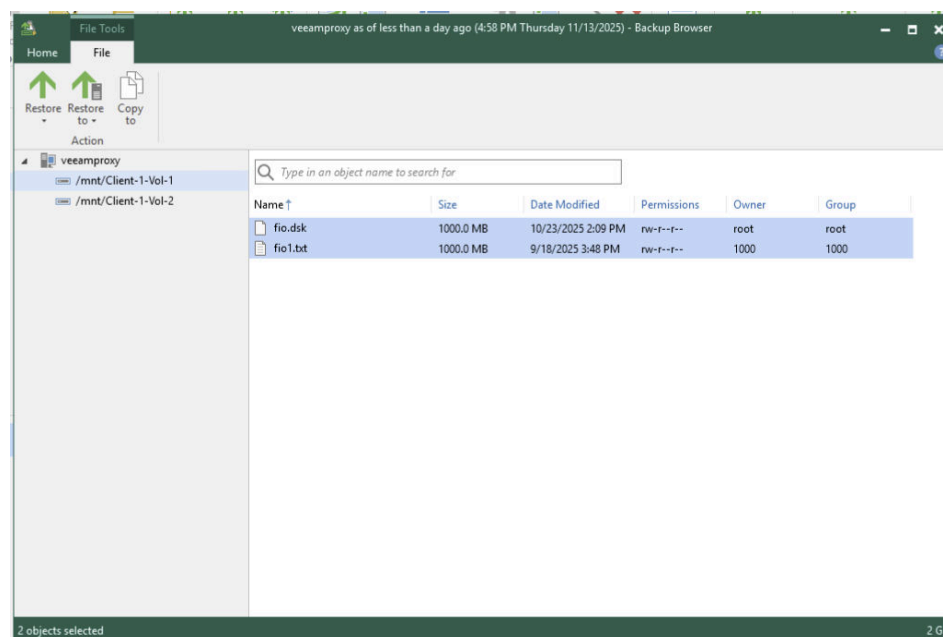


The screenshot shows the 'Guest File Restore Wizard' window at the 'Reason' step. The title bar reads 'Guest File Restore Wizard'. The main heading is 'Reason' with a sub-instruction: 'Provide the reason for performing this restore. This information will be saved in the restore sessions history for later reference.' The left sidebar has four tabs: 'Restore Point', 'Helper Host', 'Reason' (which is selected and highlighted), and 'Summary'. The main area on the right is titled 'Restore reason:' and contains a large, empty text box for input. At the bottom left of this area, there is a checkbox labeled 'Do not show me this page again'. At the bottom right, there are four buttons: '< Previous', 'Next >', 'Browse', and 'Cancel'.

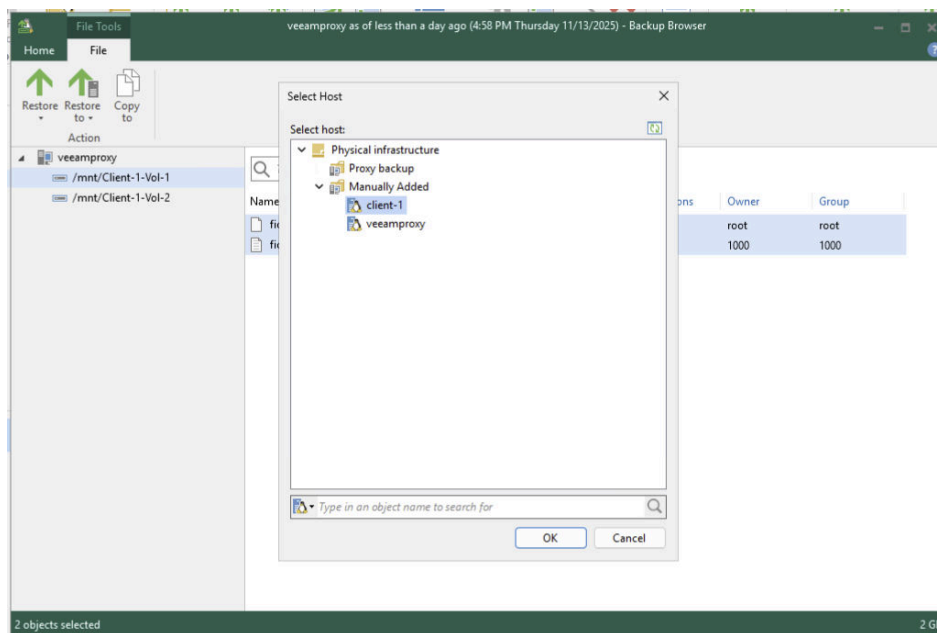
In the “Restore” field, input a reason. Click on Next. The following screen will appear:



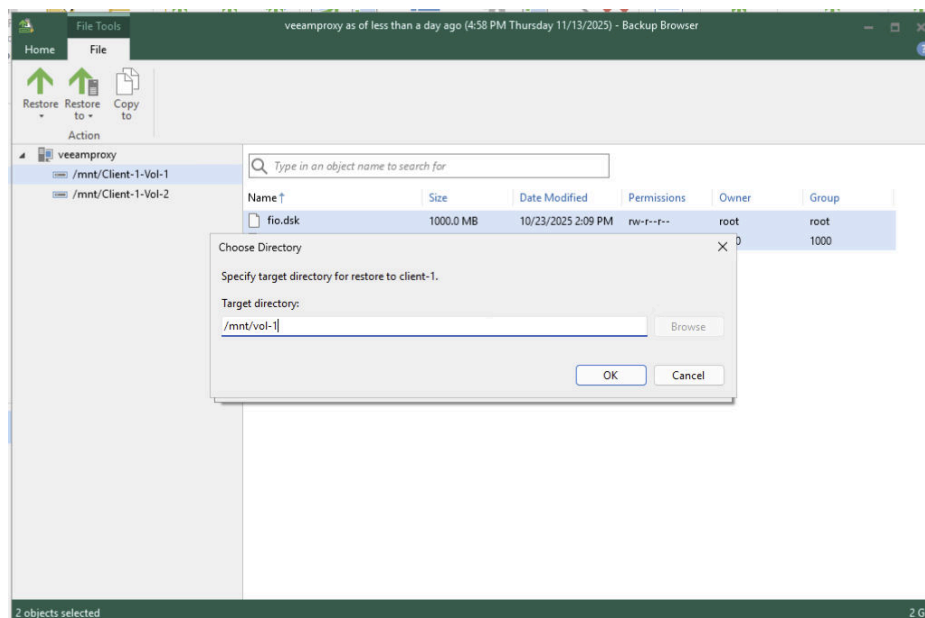
This screen provides a summary. To restore the individual files to another server, click on Browse. The following screen will appear:



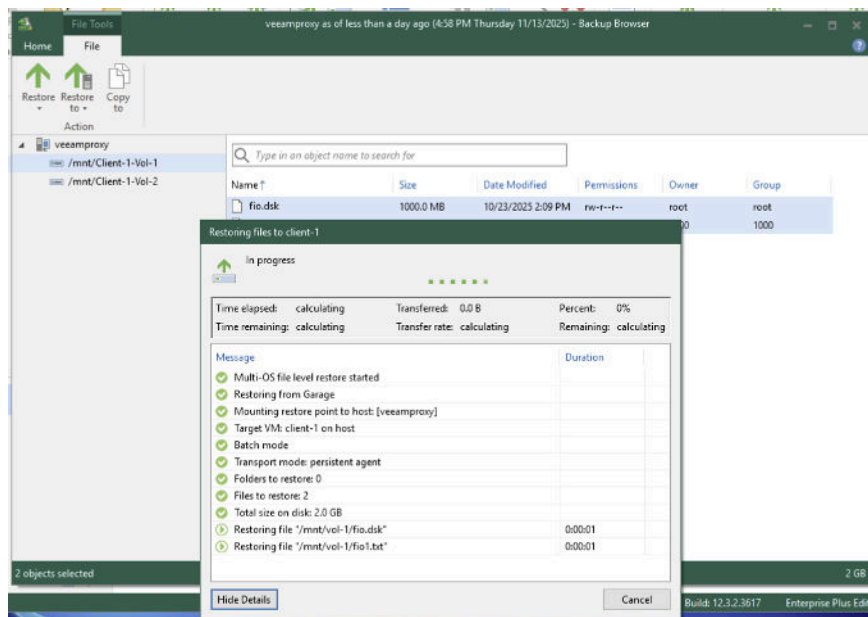
Select the file you want to restore. Click on the "Restore to" button. The following screen appears:



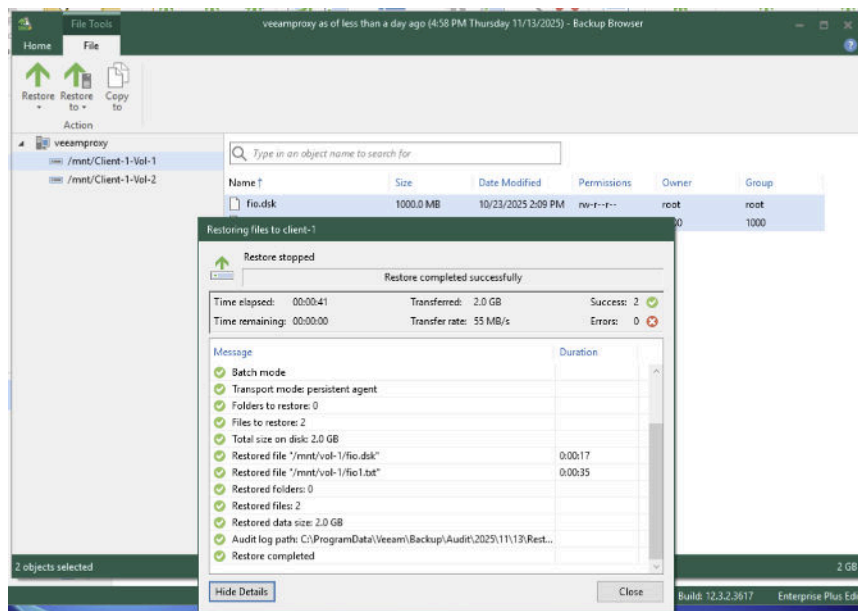
Open the Manual Added and select Client-1. Click the OK button. The target directory needs to be selected, and in this example /mnt/vol-1 is the target directory. Click on the OK button.



Veeam displays the restore progress on the screen below.



Once the restore is complete, click the Close button.



7. Conclusion

Veeam serves as the essential bedrock for modern, comprehensive data resilience, offering an array of capabilities that extend far beyond traditional backup. Its core strengths lie in the Veeam Data Platform's ability to deliver rapid, reliable recovery, cyber resilience, and unparalleled flexibility across virtual, physical, and multi-cloud environments. Veeam provides built-in immutable backups, advanced AI-powered threat detection, and automated orchestration, ensuring crucial capabilities that enable organizations to confidently recover from any incident—especially ransomware. This focus on minimizing downtime and achieving near-zero Recovery Time Objectives (RTOs) makes Veeam the trusted software layer for maintaining business continuity and security in an increasingly volatile digital landscape.

Lightbits Labs revolutionizes data infrastructure by delivering high-performance, software-defined block storage natively designed with NVMe over TCP. Lightbits' unique advantages are centered on its ability to provide consistent, sub-millisecond tail latency and massive throughput over standard, cost-effective Ethernet infrastructure, eliminating the complexity and expense of specialized Fibre Channel or RDMA networks. By enabling the complete disaggregation of compute and storage, Lightbits storage software allows organizations to scale performance and capacity independently. This leads to dramatically improved resource utilization, simplified storage management, and a significant reduction in Total Cost of Ownership (TCO) compared to legacy shared storage arrays.

The integration between Veeam and Lightbits software, as illustrated here, results in a backup and restore solution that delivers superior business value, transforming storage from a passive system into an ultra-fast, high-performance asset. By utilizing Lightbits' ultra-low latency NVMe/TCP storage fabric as the primary backup target, organizations can accelerate every critical operation: backup jobs run faster, and, more importantly, Instant Recovery operations are performed at near-production speeds. This combination ensures that the robust resilience, security, and orchestration of the Veeam Data Platform are optimized by the lightning-fast performance of Lightbits block storage. The result is a future-proof architecture that dramatically tightens RTOs and RPOs, streamlines storage operations, and guarantees instant, reliable recovery, elevating data protection to a true competitive advantage.

About Lightbits Labs

Lightbits Labs® (Lightbits) invented the NVMe over TCP protocol and offers best-in-class software-defined block storage that enables data center infrastructure modernization for organizations building a private cloud or cloud service. Built from the ground up for low consistent latency, scalability, resiliency, and cost-efficiency, Lightbits software delivers the industry's best price-performance value for real-time analytics, transactional, and AI/ML workloads. Lightbits Labs is backed by enterprise technology leaders [Cisco Investments, Dell Technologies Capital, Intel Capital, Lenovo, and Micron] and is on a mission to deliver the fastest and most cost-efficient data storage for performance-sensitive workloads at scale.

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