



Environment Build-up Guide For
**NetBackup 7.7.1 And
Cloudian HyperStore Backup Evaluation**

Table of Contents

About This Document.....	3
This document.....	3
Readers	3
Disclaimer.....	3
NetBackup Cloud Storage-related Products	4
NetBackup	4
Cloudian HyperStore cloud storage	4
Cloudian HyperStore Cloud Storage Evaluation Environment	5
Configuration of the evaluation environment	5
Preparations.....	6
Setup of Cloudian HyperStore.....	7
Installation of Cloudian HyperStore	7
Creation of NetBackup disk pool administrator, and confirmation of access key ID	10
Setup of A NetBackup Server	15
Installation of NetBackup server software	15
Configuration of a Cloud Storage server.....	16
Configuration of a disk pool.....	22
Setup of A NetBackup Client.....	27
Installation of NetBackup client software	27
Backup to Cloud Storage	29
Creation of backup policies.....	29
Execution and confirmation of backup	34
Execution of Restore	36
Execution and confirmation of restore	36

About This Document

This document

This document describes procedures to build an environment for evaluation of functional linkage of on-premises cloud storage service and NetBackup cloud storage.

Readers

This document intends for engineers of partner companies who sell Veritas products. Also, readers are assumed to have basic knowledge on concept and operations of NetBackup and Cloudian HyperStore, who do not require explanation about basic operations.

Disclaimer

Information contained in this document is subject to change without any notice in the future. Also, configuration provided in this document is prepared for the sake of convenience to confirm the functionality of NetBackup cloud storage, and it thus should not be deemed in any way that it is applicable in an actual environment on an as-is basis. Readers are kindly requested to refrain from making inquiries about details of the document.

NetBackup Cloud Storage-related Products

This chapter describes products and features that are relevant to the linkage of NetBackup and cloud storage service.

NetBackup

NetBackup

NetBackup provides a variety of platforms, including Windows, UNIX and Linux systems, with complete, flexible solutions for data protection.

NetBackup administrators can configure scheduling for clients inside networks to execute automatic, unattended backup based on a regular or calendar basis. Through appropriate scheduling of backup, peak times of network usage can be avoided to optimize communication volume. Backup can be planned over a certain period and completely executed. Executable backup is Full or Incremental Backup. Full Backup is to back up all client files. Incremental Backup is only to back up files that have changes from the last backup.

NetBackup Cloud Storage

When a cloud storage service is used for off-site data protection or replacement of tapes, a new cloud connector, which is compliant with Amazon Simple Storage Service (Amazon S3) protocol, enables access not only to Amazon Web Services (AWS) but also other S3 API-compliant cloud storage services. Please see the latest version of NetBackup Hardware Compatibility List (HCL) for supported cloud storage providers.

This document describes procedures to build Cloudian HyperStore, an S3 API-compliant cloud storage system, as NetBackup cloud storage.

Cloudian HyperStore cloud storage

Cloudian HyperStore¹

Cloudian HyperStore® is a packaged software product selected for commercial cloud storage services. It complies with AWS S3 API, which is a de facto standard in the cloud storage space. A NOSQL database is used to provide high scalability, flexibility, reliability and availability, and proprietary HyperStore (TM) technology improves its performance and hardware disk usage. It includes features such as statistics, billing, user group management, and QoS, which can accelerate time to market for cloud service operators to launch S3 API-compliant cloud storage services. Commodity IA servers can be used to build an economical cloud object storage system, and enterprises can use it as complementary or replacement of NAS and SAN and as private cloud that is compatible with public cloud.

¹ <http://cloudian.jp/cloud-storage-products/>

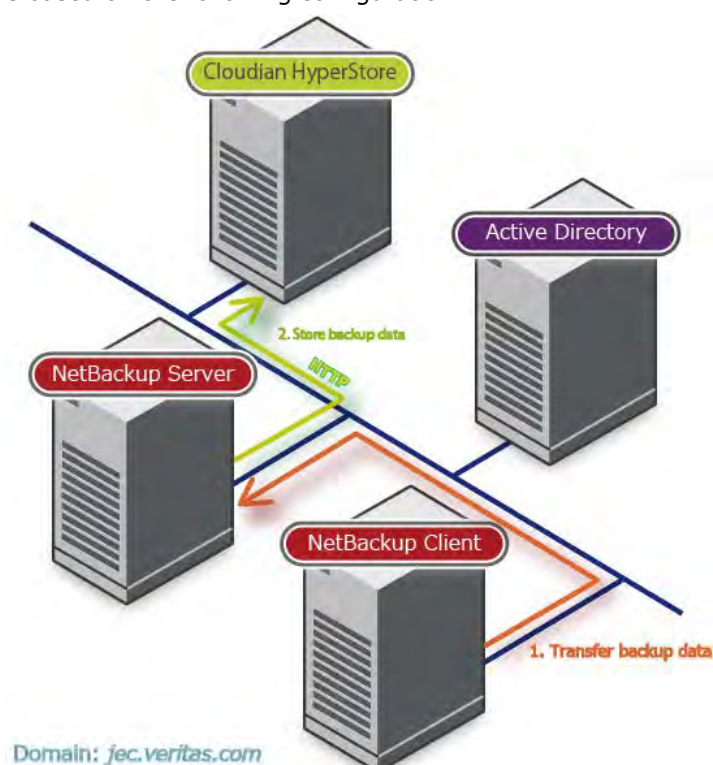
Cloudian HyperStore Cloud Storage Evaluation Environment

This chapter provides high-level description of an evaluation environment, which will be built to confirm the functionality of NetBackup cloud storage and its linkage with Cloudian HyperStore.

Configuration of the evaluation environment

High-level evaluation environment

The environment is based on the following configuration.



*To install Cloudian HyperStore, the environment needs to access to the Internet.

Configured servers		
Description	Host name	IP address
Cloudian HyperStore	hyperstore	192.168.10.11
Active Directory	ad	192.168.10.1
NetBackup Server	nbuserver	192.168.10.21
NetBackup Client	nbuclient	192.168.10.22

- Cloudian HyperStore
 - Install Cloudian HyperStore.
 - For the evaluation environment, a single node of Cloudian HyperStore is configured. Note that, otherwise, the minimum number of nodes is two, and three is recommended.

- Active Directory
 - Install Active Directory domain service and role of DNS server.
 - NetBackup Server
 - Install functionality of NetBackup master server and media server.
 - NetBackup Client
 - Install client functionality of NetBackup.
- * It is also OK not to build NetBackup Client but use NetBackup Server as a client.

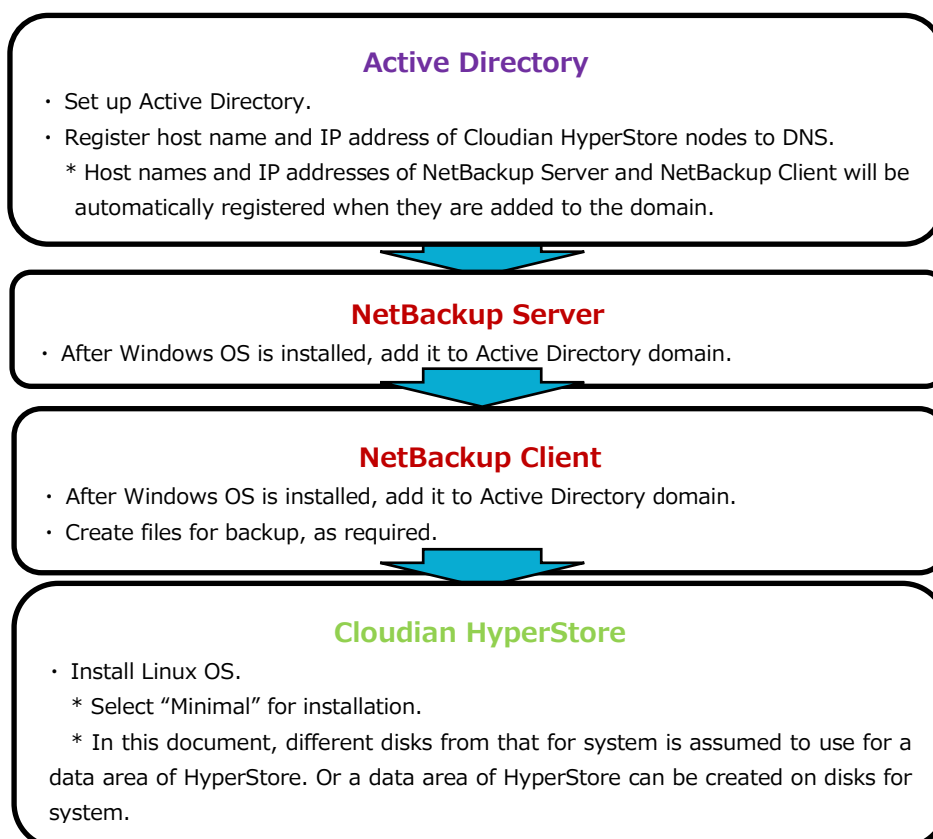
Software configuration

Here is a list of software products used in the environment. Please see the “Symantec NetBackup Enterprise Server and Server 7.7 – 7.7.x Hardware Compatibility List” for software versions and access methodology of devices supported by NetBackup Cloud Storage.

Cloudian HyperStore	Red Hat Enterprise Linux Server release 6.7 Cloudian HyperStore v5.2.1
Active Directory	Microsoft Windows Server 2012 R2 Datacenter
NetBackup Server	Microsoft Windows Server 2012 R2 Datacenter Symantec NetBackup 7.7.1
NetBackup Client	Microsoft Windows Server 2012 R2 Datacenter Symantec NetBackup 7.7.1 Client

Preparations

The following tasks need to be completed before building an evaluation environment to back up to Cloudian HyperStore cloud storage.



Setup of Clouidian HyperStore

This chapter provides high-level description on setup of Clouidian HyperStore.

Installation of Clouidian HyperStore

Installation of Clouidian HyperStore will be executed on a “Clouidian HyperStore” host as in the illustrated environment on the previous page. While two nodes are required for minimum configuration, or three is recommended by Clouidian, a single node is used for this evaluation.

Use a root user for installation of HyperStore.

Installation of HyperStore

1. Disable SELinux and iptables.

2. Ensure to install required packages for HyperStore installation.

Install, if not yet, the following four packages before installing a HyperStore package.

- ① openssh-clients
- ② bc
- ③ bind-utils
- ④ ntp

3. Create a data storage area for HyperStore.

After creating an ext4 file system on a disk for a data storage area, create and mount a “/cloudian” mount point.

4. Deploy HyperStore package.

Store granted Hyperstore installation module and evaluation license file in the same directory.

Note that the directory should not be temporary, such as “/tmp”, but permanent (e.g., “/root/ClouidianPackages”).

Execute the following command to deploy a HyperStore package.

```
sh ./ClouidianHyperStore-5.2.1.bin cloudian_NNNNNNNNNNNN.lic
```

※ “NNNNNNNNNNNN” represents an evaluation license number.

When the deployment is completed, various setting files of HyperStore are created in this directory, “/etc”, “/opt” and others.

※ Installation of HyperStore is not yet completed at this stage.

5. Create a survey file.

Create a survey.csv in the directory deployed in Step 4, and set the following entries.

- ※ As a sample of a survey file, “sample-survey.csv” is deployed in the same directory. You can copy and edit the file.
- ※ Each field of a survey file corresponds to “(region name), (node host name), (node IP address), (data center name), (rack name).”
- ※ **Uppercase letters are not allowed to use** in the first field (region name) and the second field (host name) of a survey file.

- ※ For IP address in the third field, an address to be assigned as I/F to provide service should be configured. Since a single-node configuration is used in the evaluation environment, a network is not separated for service and internal communication.

```
tokyo,hyperstore,192.168.10.11,DC1,RAC1
```

6. Set a directory for a data area.

Set a parameter of "hyperstore_data_directory" of "/etc/cloudian-5.2.1-puppet/manifests/extdata/common.csv".

```
hyperstore_data_directory,/cloudian
```

This setting allows to configure the data storing area created in Step 3 as an area to store BLOB data of HyperStore.

- ※ You can distribute data by setting multiple paths. In that case, it is necessary to parenthesize a value with "".
- ※ For areas other than a data area, default directories are used.
- ※ In addition to a data area, directories can be also configured in meta data and NOSQL database areas. (Please contact Cloudian for details.)

7. Set NTP of the HyperStore node.

Date and time of HyperStore node and NetBackup Server must be consistent. Any significant discrepancy in date and time may cause an installation failure.

Edit "/etc/ntp.conf" of the HyperStore node to set an Active Directory server on an NTP server for which time is synchronized.

8. Execute an install script.

Designate "survey.csv", which was created in Step 5, to activate an installer.

```
./cloudianInstall.sh -s survey.csv
```

Now a text based, interactive installer is activated.

Select "1) Install Cloudian Hyperstore" from an installation menu to execute installation.

Then, configure the following parameters through intellectual steps.

- Setting point (1)

When there are multiple I/F's on a HyperStore node, the installer will ask which I/F to use for internal communication of HyperStore. For a single-node configuration in this evaluation environment, no setting of I/F for internal communication is required. So, press "Enter" without typing anything.

Please enter one of the interface names [ethX,ethY] for internal services: []: **<blank>**

- Setting point (2)

When the installer asks a replication strategy, since a required value can be read from the survey.csv which was created in Step 5, please press "Enter" with no typing.

Please enter the service metadata replication strategy for tokyo [DC1:1]: **<blank>**

- Setting point (3)

Enter a domain which the HyperStore node belongs to. For this evaluation environment, type "jec.veritas.com".

A subdomain that represents an S3 endpoint of HyperStore will be determined based on this setting value and a region name configured in the 1st field of survey.csv.

S3 endpoint: s3-**{region name}**.**{FQDN of a domain}**

For this evaluation environment, an S3 endpoint is “**s3-tokyo.jec.veritas.com**”.

Cloudian HyperStore(R) S3 service endpoints are based on your desired top level DNS domain name. For example, yourcompany.com.

Please enter your top level domain name [mycloudianhyperstore.com]: **jec.veritas.com**

9. Confirm HyperStore cluster configuration.

Confirm configuration of the installed HyperStore cluster from a “Review cluster configuration” menu.

Review current basic configurations in each region	
----- Configurations for tokyo -----	
Default region:	tokyo
Cassandra cluster name:	Clouidiantokyo
Number of data centers:	1
Number of hosts in DC1:	1
Replication factor:	DC1:1
Internal network interface:	
S3 service URL:	s3-tokyo.jec.veritas.com:80
S3 service Web endpoint:	s3-website-tokyo.jec.veritas.com:80
S3 Admin service endpoint:	s3-admin.jec.veritas.com:18081
Management Console URL:	http://cmc.jec.veritas.com:8888
Admin host:	hyperstore (192.168.10.11:18081)
Admin audit host:	hyperstore (192.168.10.11)
Cronjob host:	hyperstore (192.168.10.11)
Cassandra seed host(s):	hyperstore (192.168.10.11:9160)
Cloudian Management Console (cmc):	all (http:8888, https:8443)
Redis credentials master host:	hyperstore (192.168.10.11:6379)
Redis QOS master host:	hyperstore (192.168.10.11:6380)
Redis monitor primary host:	hyperstore (192.168.10.11:9078)
Redis monitor backup host:	
Credentials and QOS read primary hosts in DC1:	
Redis credentials (no slave in tokyo):	hyperstore (192.168.10.11:6379)
Redis qos (no slave in tokyo):	hyperstore (192.168.10.11:6380)

Confirm listed values of HyperStore cluster configuration, such as “S3 service URL” and “Management Console URL”. “S3 service URL”, in particular, will be used for “Configuration of a cloud storage servers” of NetBackup to verify linkage of HyperStore and NetBackup.

These steps complete installation of Cloudian HyperStore.

Validation test after installation

A simple operation test can be executed as follows after successful installation of HyperStore.

1. Execute an installation script without any argument.
2. Select “2) Cluster Management” from an installation menu.
3. Select “d) Run Validation Tests” from a submenu of “Cluster Management”.

When “d) Run Validation Test” is selected and executed, details of testing are displayed. Press any key to start testing.
You can see a progress of testing on the screen. “Test successfully completed.” will be shown when no output error is detected.

Creation of NetBackup disk pool administrator, and confirmation of access key ID

To use a bucket of Cloudian HypserStore as a disk pool of NetBackup Cloud Storage, it needs to create a CMC user who owns a bucket on Cloudian HyperStore, and confirm access key ID and secret key of this user.





Addition of DNS entry

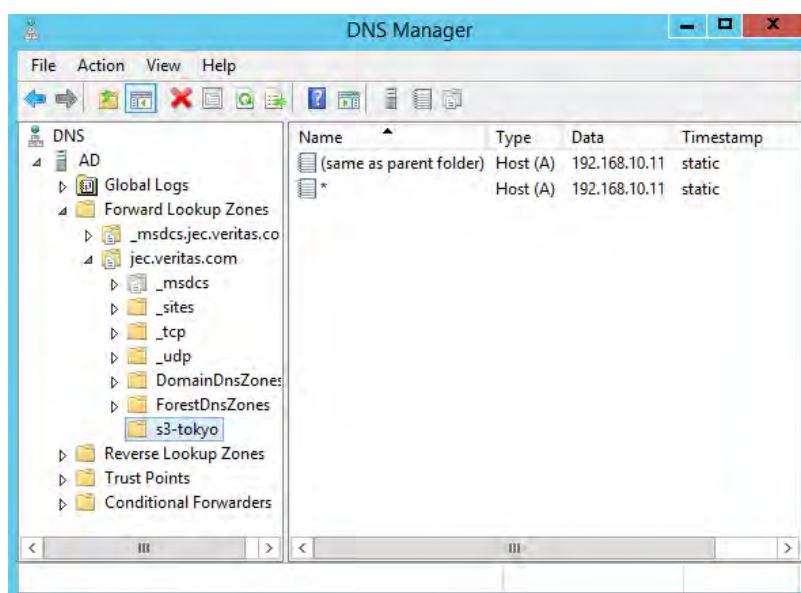
DNS entry should be added on an “Active Directory” host (see the illustrated evaluation environment) to access S3 service created when Cloudian HyperStore was installed.

Please note that an S3 endpoint of HyperStore should be registered as a subdomain of a domain which the HyperStore node belongs to, and that wild-card setting is require for the subdomain. This is because S3 access to HyperStore will be executed with either of

“http(s)://{bucket name}.{S3 endpoint}”or

“http(s)://{S3 endpoint}/{bucket name}”.

 s3-tokyo		
 s3-admin	Host (A)	192.168.10.11
 s3-website-tokyo	Host (A)	192.168.10.11
 cmc	Host (A)	192.168.10.11



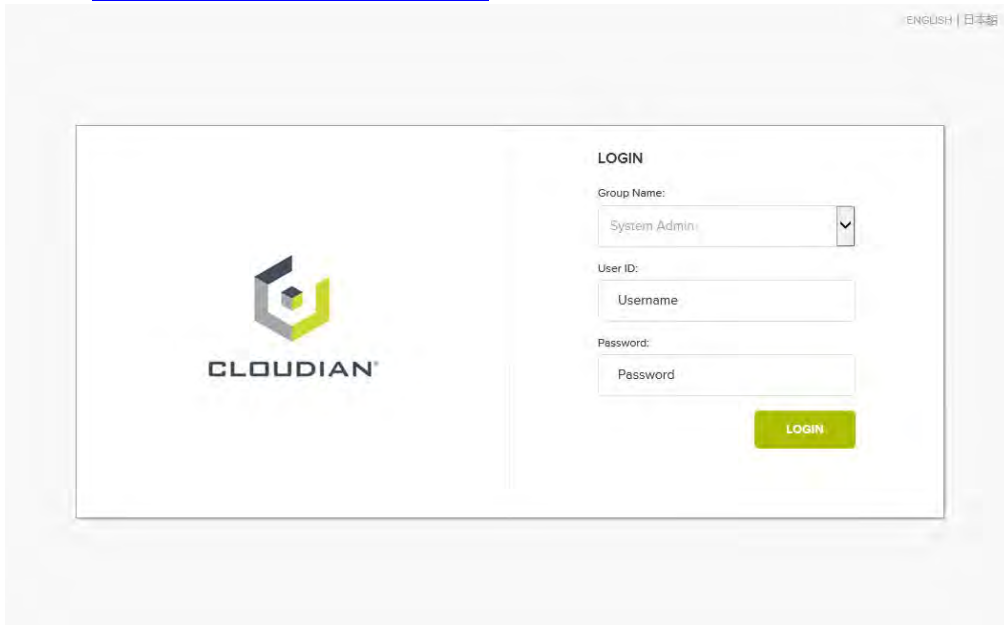
Since Cloudian HyperStore is configured as a single node in this document, an IP address resolved by a wild card of an S3 endpoint registered to DNS is an IP address of the HyperStore node.

This completes addition of DNS entry on Active Directory.

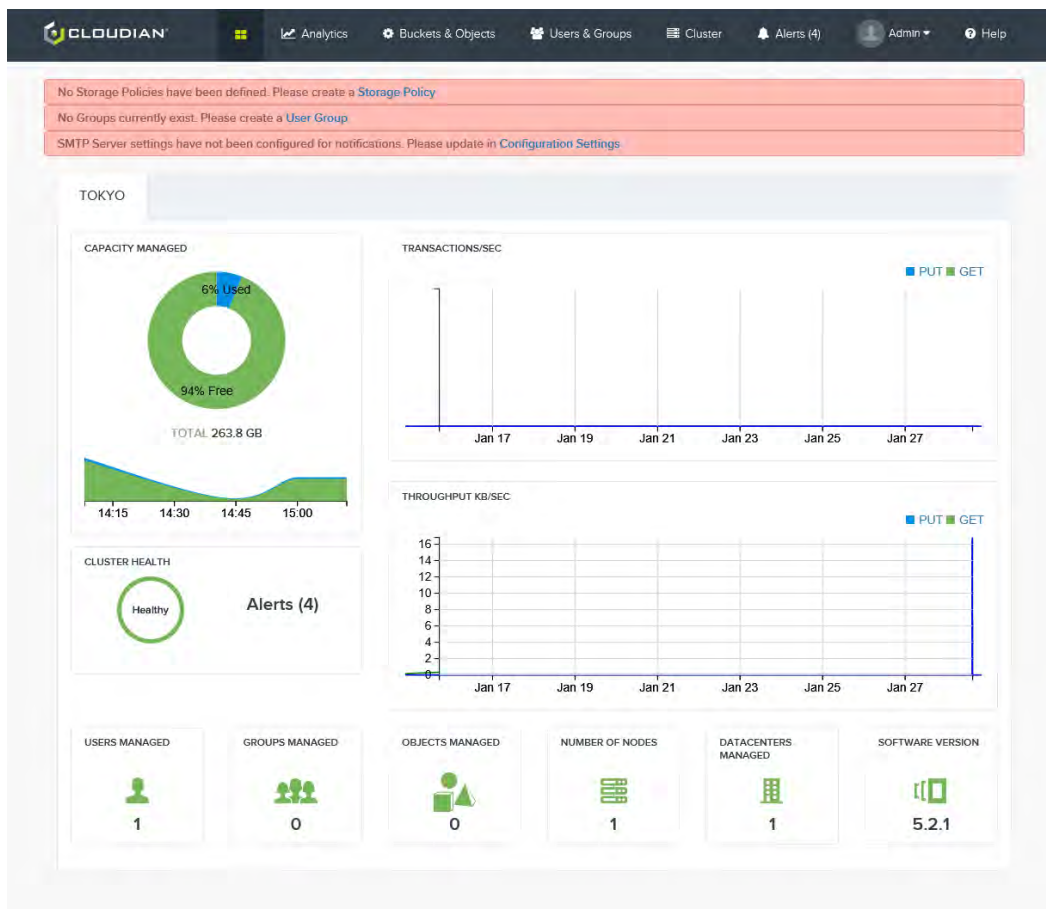
Creation of an user on Clouidian HyperStore

Create a user owns a bucket for NetBackup Cloud Storage on Clouidian HyperStore.

1. Access <https://cmc.jec.veritas.com:8443> from a web browser.



2. Enter "admin" for User ID and "public" for Password, and make initial login.



3. Create storage policies.

Click the "Cluster" tab and then "STORAGE POLICIES". Select "CREATE STORAGE POLICY". To create a new policy, fill in "Policy Name" and "Policy Description". For other items, keep default values. In this example, "StoragePolicy" is entered under both "Policy Name" and "Policy Description".

The following message is shown after a storage policy is created. "PENDING" under "STATUS" will soon be turned to "ACTIVE".

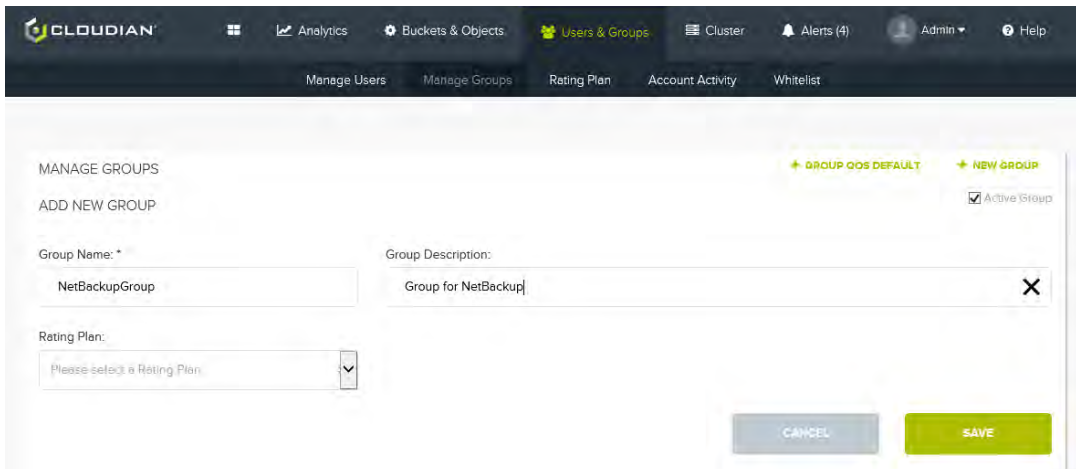
Policy: StoragePolicy has been created.

STORAGE POLICIES								+ CREATE STORAGE POLICY
<input type="checkbox"/>	REGION	STATUS	NAME	DESCRIPTION	DATA DISTRIBUTION POLICY	NO OF REPLICAS	LOCAL EC	
<input type="checkbox"/>	tokyo	PENDING	StoragePolicy	StoragePolicy	Single DC	1	N/A	View/Edit

[DISABLE](#) [DELETE](#)

4. Create a user group.

Click the “Users” tab and then “MANAGE GROUPS”. Select “ADD NEW GROUP”. To create a user group, fill in “Group Name” and “Group Description”. For other items, keep default values. In this example, “NetBackupGroup” is entered under “Group Name”, and “Group for NetBackup” under “Group Description”.

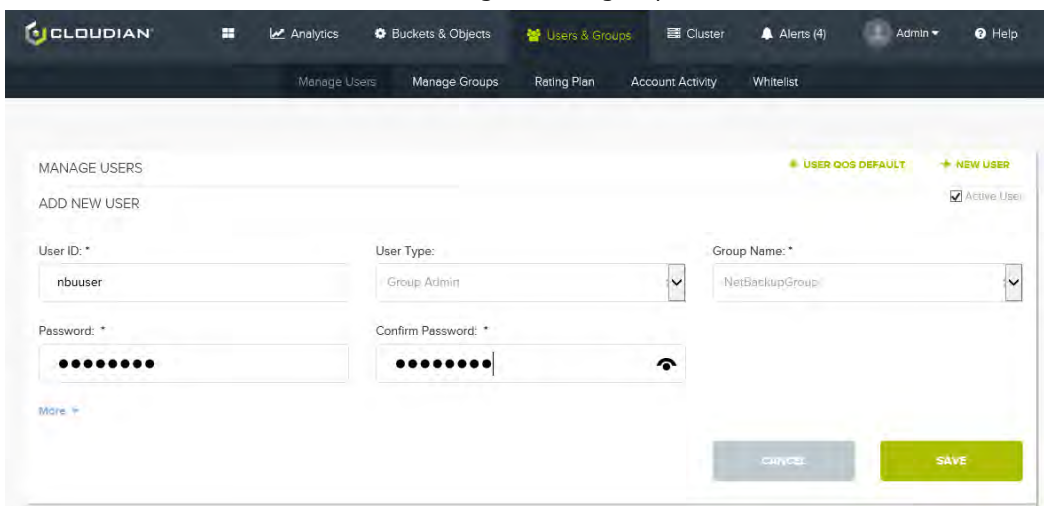


The screenshot shows the Cloudian web interface with the 'Users & Groups' tab selected. The 'MANAGE GROUPS' section is active, and the 'ADD NEW GROUP' form is displayed. The form includes fields for 'Group Name' (filled with 'NetBackupGroup'), 'Group Description' (filled with 'Group for NetBackup'), and 'Rating Plan' (set to 'Please select a Rating Plan'). There are 'CANCEL' and 'SAVE' buttons at the bottom right. The top navigation bar shows 'Cluster', 'Alerts (4)', 'Admin', and 'Help'.

5. Create a user.

Click the “Users” tab and then “MANAGE USERS”. Select “ADD NEW USER”. To create a user, fill in “User ID”, “User Type”, “Group ID” and “Password”. In this example, “nbuser” is entered under “User ID”, and “Group Admin” is selected from a drop-down menu of “User Type”. Also, “NetBackupGroup” is selected from a drop-down menu of “Group ID”, and a certain string of letters is entered under “Password”.

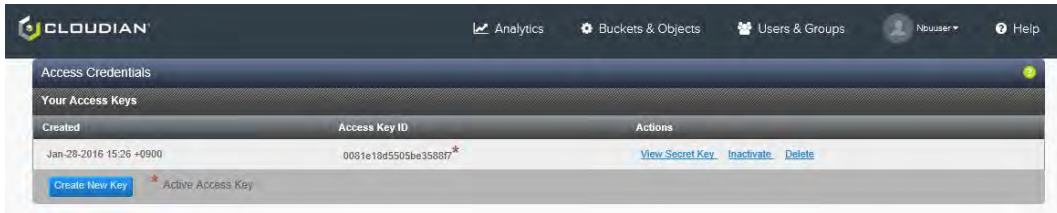
A “User Type” of users who acquire access and secret keys that are necessary to configure Cloud Storage on NetBackup is not necessarily required to be “System Admin” or “Group Admin”. S/he can be a “User” who belongs to that group.



The screenshot shows the Cloudian web interface with the 'Users & Groups' tab selected. The 'MANAGE USERS' section is active, and the 'ADD NEW USER' form is displayed. The form includes fields for 'User ID' (filled with 'nbuser'), 'User Type' (set to 'Group Admin'), 'Group Name' (set to 'NetBackupGroup'), 'Password' (masked with dots), and 'Confirm Password' (masked with dots). There are 'CANCEL' and 'SAVE' buttons at the bottom right. The top navigation bar shows 'Cluster', 'Alerts (4)', 'Admin', and 'Help'.

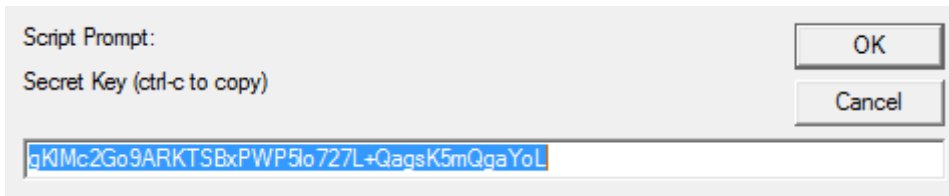
Confirm access key ID and secret key

1. Open " <https://cmc.jec.veritas.com:8443>" from a web browser to access CMC (Cloudian Management Console).
2. Select "NetBackupGroup" from a drop-down menu for "Group ID". Enter "nbuser" as User ID and a password of "nbuser" as Password to log in.
3. Click a tab identified as "Nbuser▼". Select "Security Credentials" to show an access key ID under "Access Credentials".



In this example, an Access Key ID is shown as "0081e18d5505be3588f7".

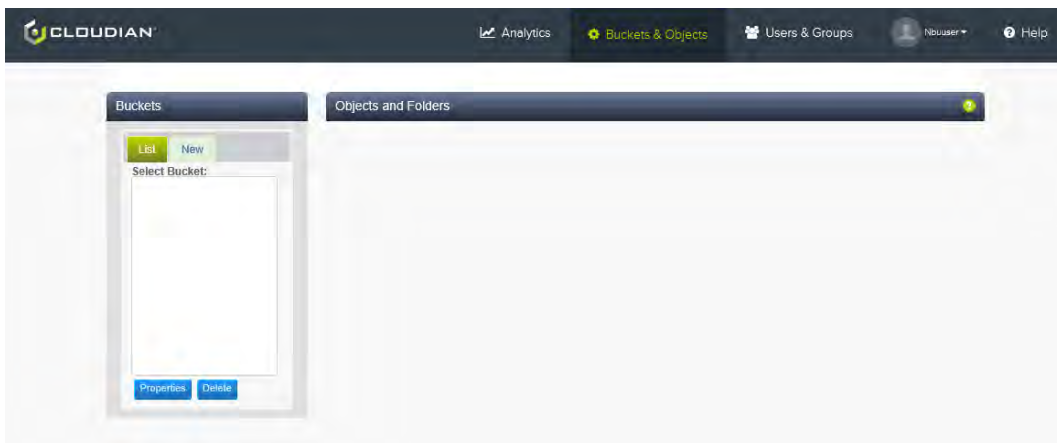
4. Select "View Secret Key" to confirm a secret key.



In this example,

a Secret Key is shown as " gKIMc2Go9ARKTSBxPWP5lo727L+QagsK5mQgaYoL".

5. Click the "Objects" tab to confirm a bucket. In this example, since it is immediately after creation of a user, nothing is shown in "Buckets".



This completes creation of a user and confirmation of access key ID and secret key on HyperStore.

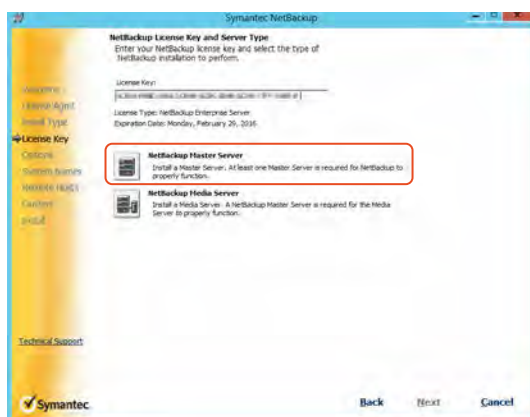
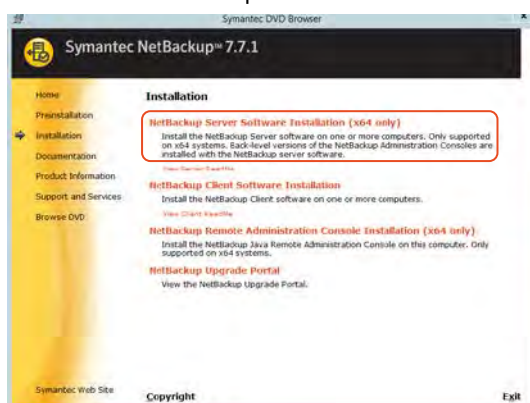
Setup of A NetBackup Server

This chapter describes setup of NetBackup on a NetBackup server.

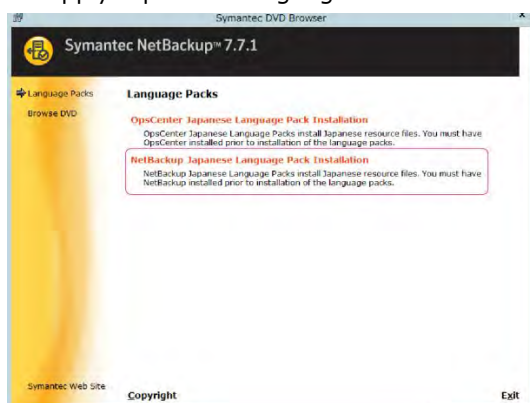
Installation of NetBackup server software

Install NetBackup server software.

1. Select “NetBackup Server Software Installation (x64 only)”, and follow its installation wizard to install “NetBackup Master Server”.



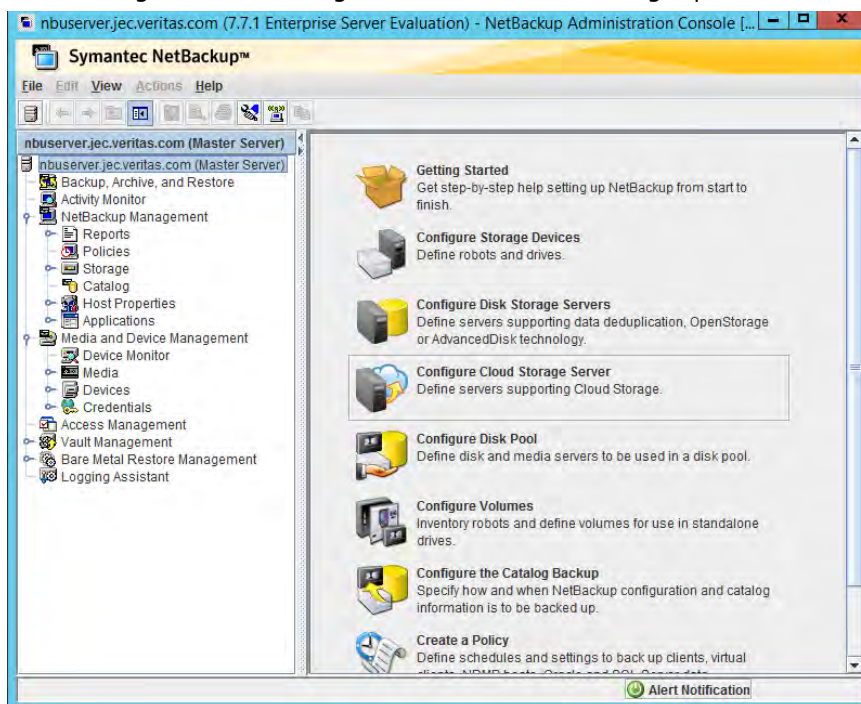
2. Select “NetBackup Japanese Language Pack Installation” from NetBackup “Language Packs” to apply Japanese Language Packs.



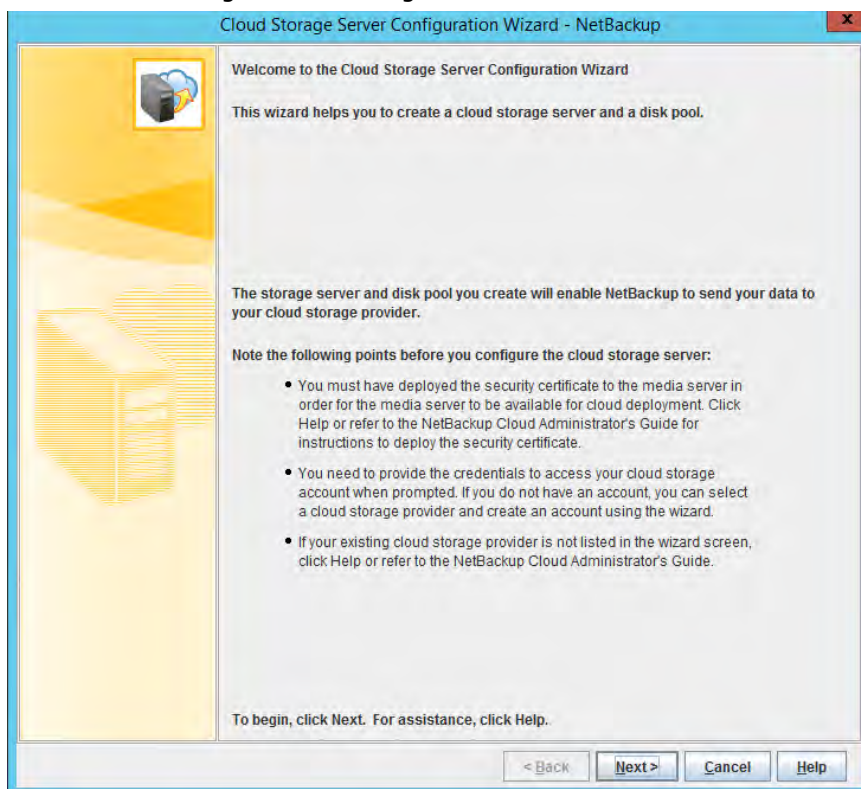
Configuration of a Cloud Storage server

Configure Cloudian HyperStore as a Cloud Storage server.

1. Activate “NetBackup Administration Console”. After selecting “Master Server” on the left pane, click “Configure Cloud Storage Server” shown on the right pane.

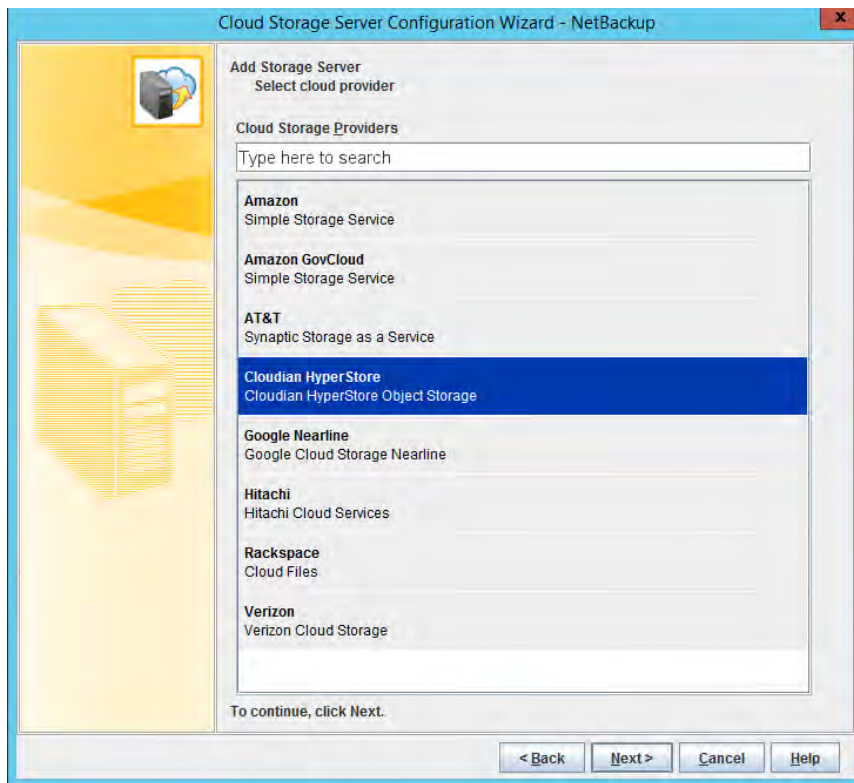


2. Then “Cloud Storage Server Configuration Wizard” starts.

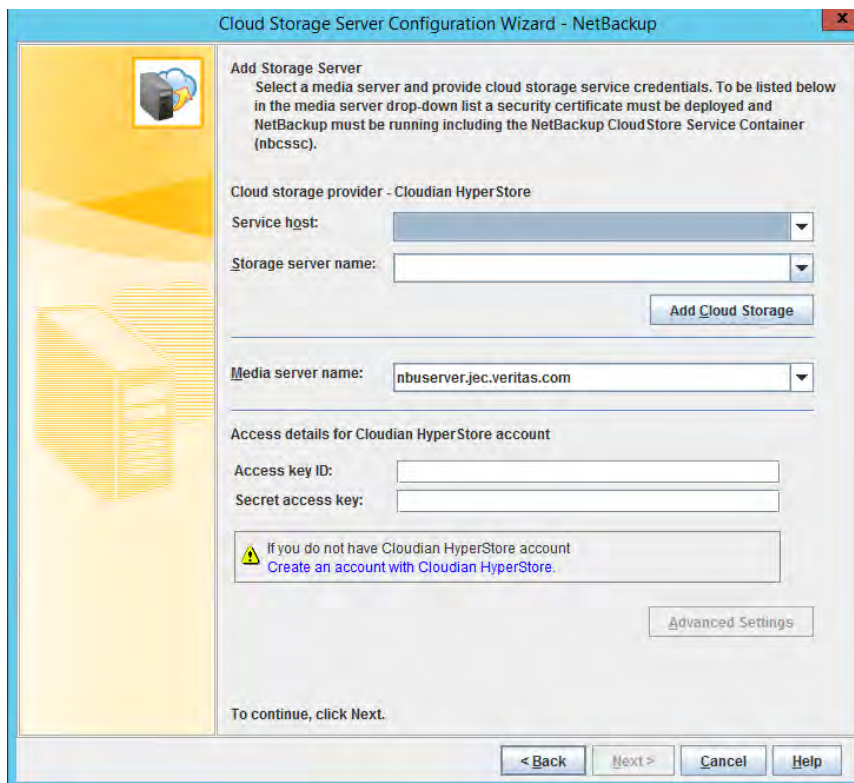


After confirming notes, click the “Next” button.

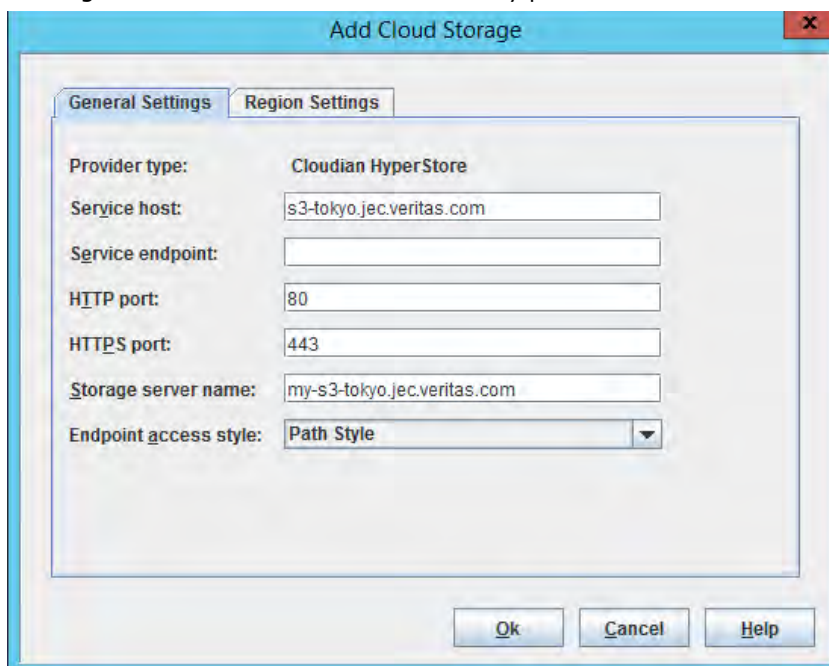
3. Now a screen to add “Cloud Storage Providers” is shown. After selecting “Cloudian HyperStore”, click “Next”.



4. Now a screen to select a Cloud Storage provider is shown. In default configuration, no item is included in its drop-down menu. Click the “Add Cloud Storage” button.



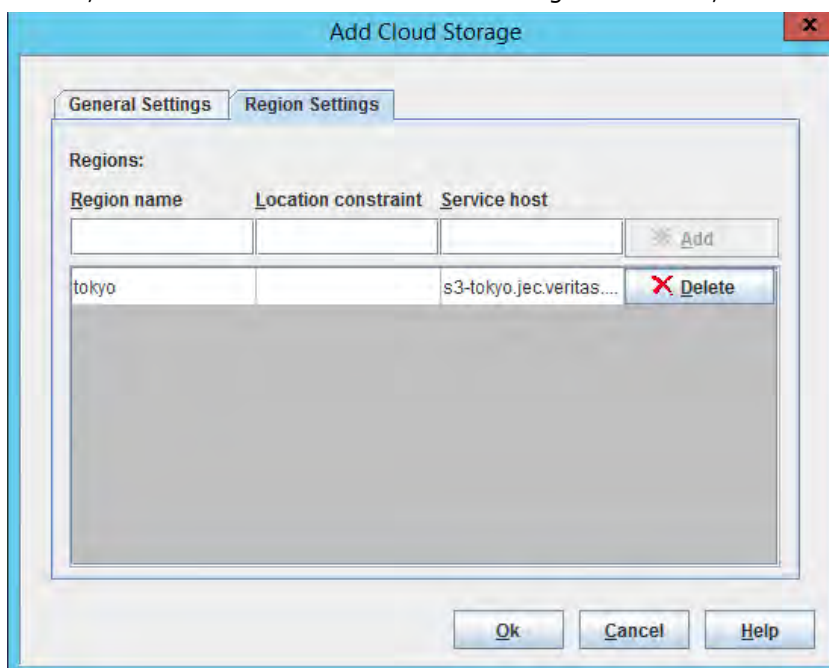
5. Now a window to “Add Cloud Storage” is shown. After selecting the “General Settings” tab, fill in items as per a given environment. In this example, “s3-tokyo.jec.veritas.com” is entered as a “Service host”, which is an “S3 service URL” that was shown on the “Review cluster configuration” screen of Cloudfian HyperStore. When “Service host” is filled in, “Storage server name” will be automatically provided.



The screenshot shows the "Add Cloud Storage" dialog box with the "General Settings" tab selected. The "Provider type" is set to "Cloudfian HyperStore". The "Service host" field contains "s3-tokyo.jec.veritas.com". The "Service endpoint" field is empty. The "HTTP port" is set to "80" and the "HTTPS port" is set to "443". The "Storage server name" field contains "my-s3-tokyo.jec.veritas.com". The "Endpoint access style" is set to "Path Style". At the bottom are "Ok", "Cancel", and "Help" buttons.

Provider type:	Cloudfian HyperStore
Service host:	s3-tokyo.jec.veritas.com
Service endpoint:	
HTTP port:	80
HTTPS port:	443
Storage server name:	my-s3-tokyo.jec.veritas.com
Endpoint access style:	Path Style

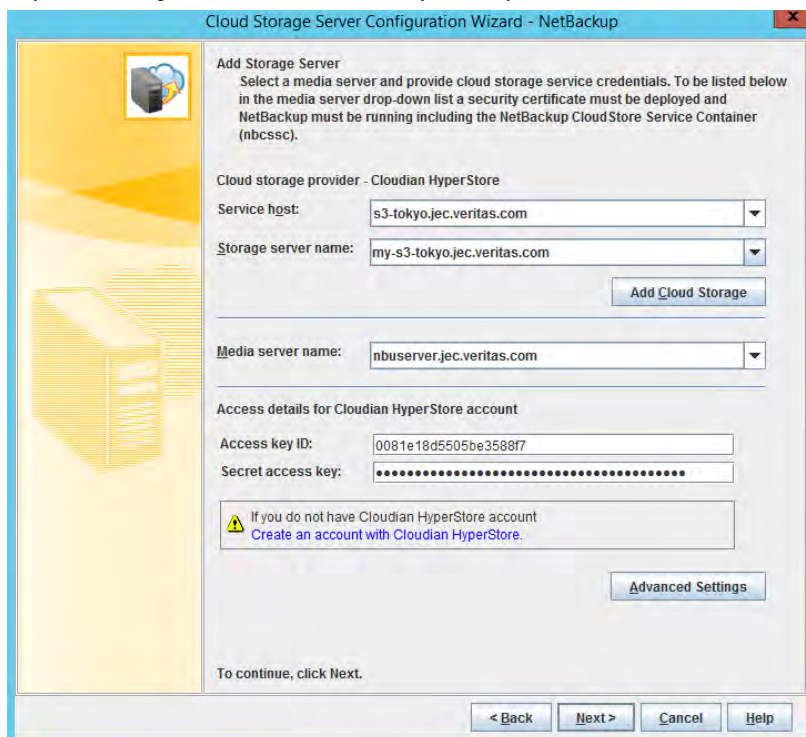
6. Next, after selecting the “Region Settings” tab, fill in items as per a given environment. In this example, “tokyo” is entered as a “Region name”, which is a “Region” value that was configured in the “survey.csv” file during installation of Cloudfian HyperStore. Also, “s3-tokyo.jec.veritas.com” is entered as a “Service host” as in the previous screen. After making entries, click the “Add” button. After confirming the addition, click “Ok”.



The screenshot shows the "Add Cloud Storage" dialog box with the "Region Settings" tab selected. It displays a table with columns "Region name", "Location constraint", and "Service host". The first row contains "tokyo" and "s3-tokyo.jec.veritas....". There are "Add" and "Delete" buttons next to the table. At the bottom are "Ok", "Cancel", and "Help" buttons.

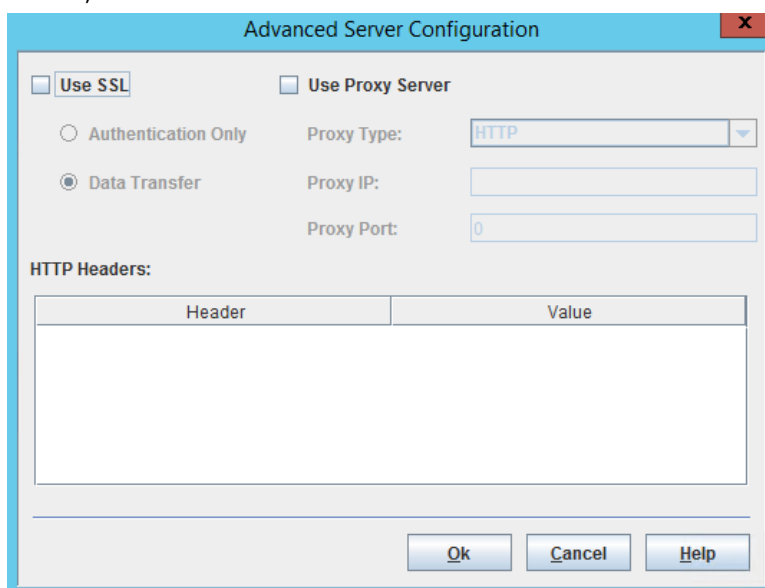
Region name	Location constraint	Service host
tokyo		s3-tokyo.jec.veritas....

7. Configured values are automatically shown in “Service host” and “Storage server”. Next enter “Access key ID” and “Secret access key” under “Access details for Cloudian HyperStore account” on the same screen. In this example, access key ID and secret key of “nbuser” of Cloudian HyperStore, which was previously confirmed, are entered. In this document, “00b8b8a7fb870073a856” is entered in “Access key ID”, and “EpGMn/ORDjMoWkSdtnr6CKb0J4kyFOCrZpAXLMCC” in “Secret access key”.



The screenshot shows the 'Cloud Storage Server Configuration Wizard - NetBackup' window. The 'Add Storage Server' section is active, showing the 'Cloud storage provider' as 'Cloudian HyperStore'. The 'Service host' is 's3-tokyo.jec.veritas.com' and the 'Storage server name' is 'my-s3-tokyo.jec.veritas.com'. The 'Media server name' is 'nbuser.jec.veritas.com'. Under 'Access details for Cloudian HyperStore account', the 'Access key ID' is '0081e18d5505be3588f7' and the 'Secret access key' is masked with dots. A warning message states: 'If you do not have Cloudian HyperStore account Create an account with Cloudian HyperStore..'. There are buttons for 'Add Cloud Storage', 'Advanced Settings', '< Back', 'Next >', 'Cancel', and 'Help'.

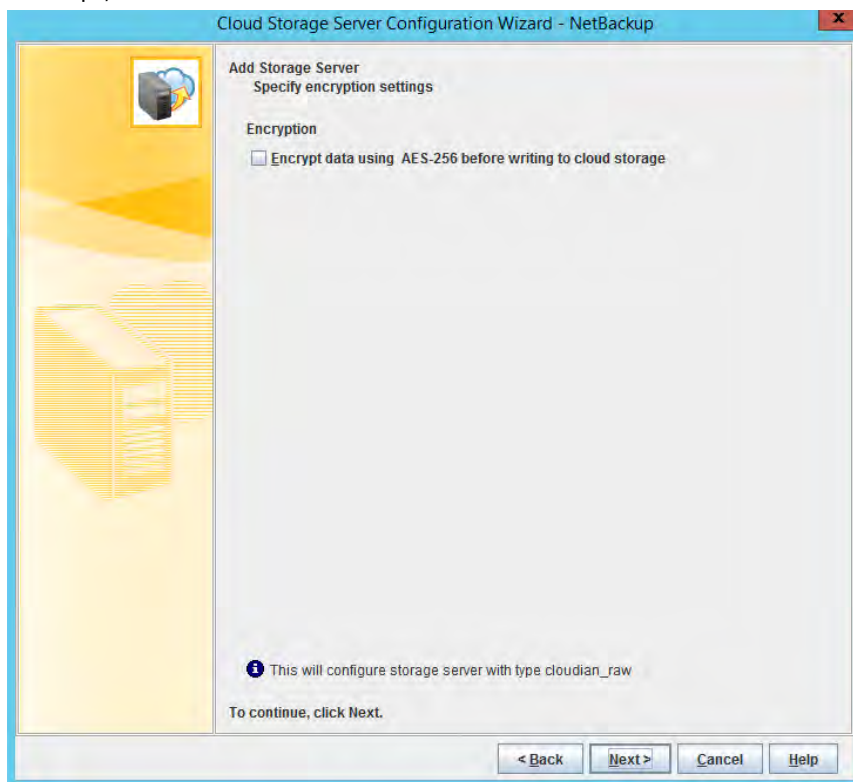
Also, since HTTP will be used for communication this time, click the “Advanced Settings” button, and uncheck the “Use SSL” checkbox.



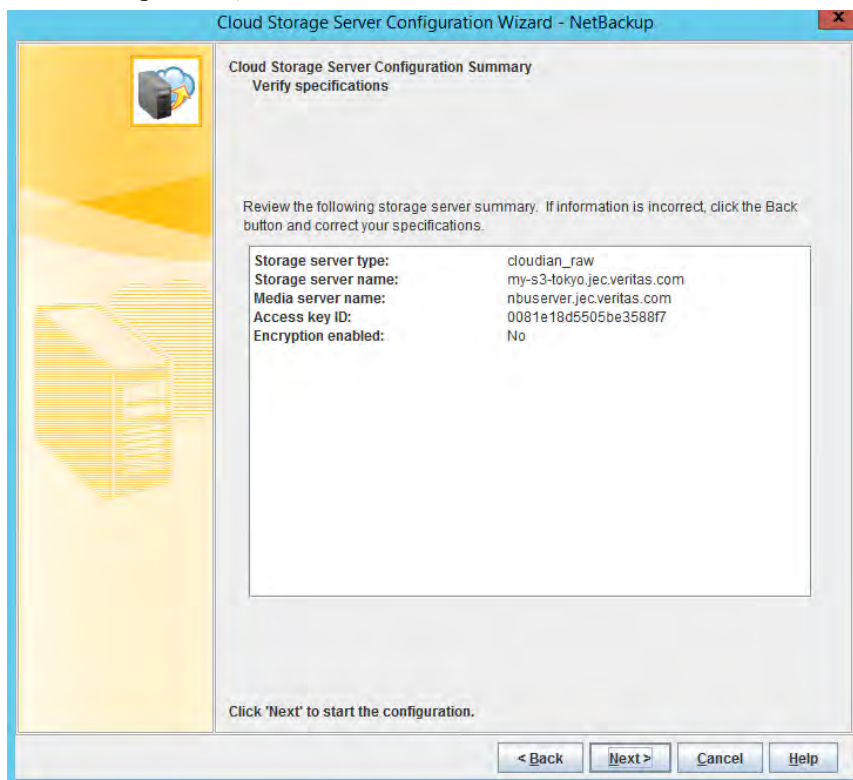
The screenshot shows the 'Advanced Server Configuration' window. The 'Use SSL' checkbox is unchecked, and the 'Use Proxy Server' checkbox is also unchecked. Under 'Authentication Only', the 'Proxy Type' is 'HTTP'. Under 'Data Transfer', the 'Proxy IP' and 'Proxy Port' are empty. The 'HTTP Headers' section is empty. There are buttons for 'Ok', 'Cancel', and 'Help'.

After making all entries, click “Next”.

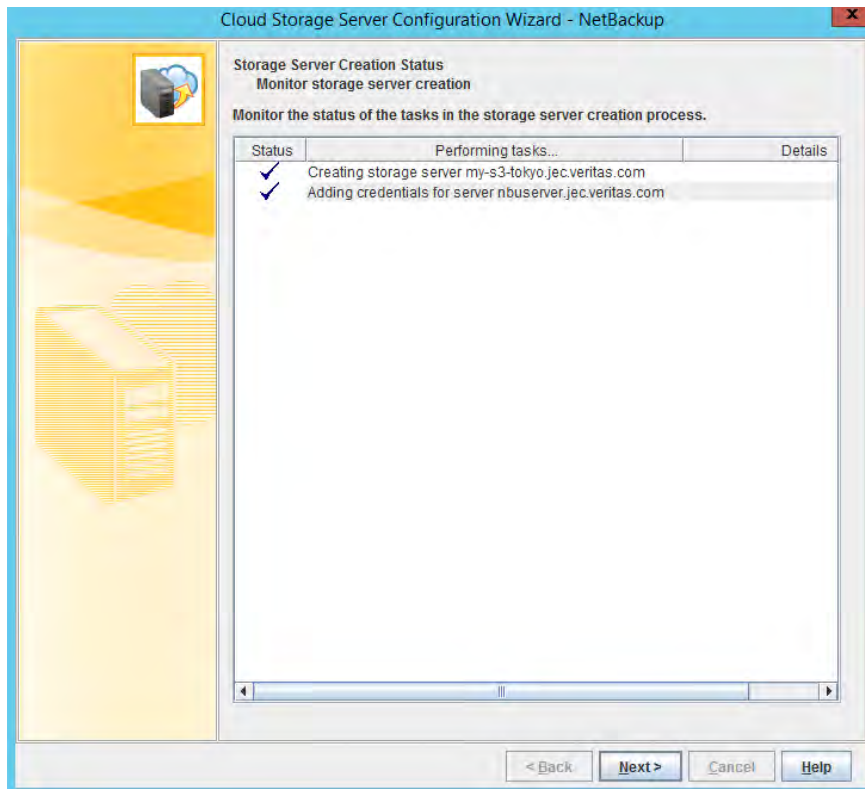
8. Now a screen to set encryption of a storage server is shown. In this example, default settings are kept, and click “Next”.



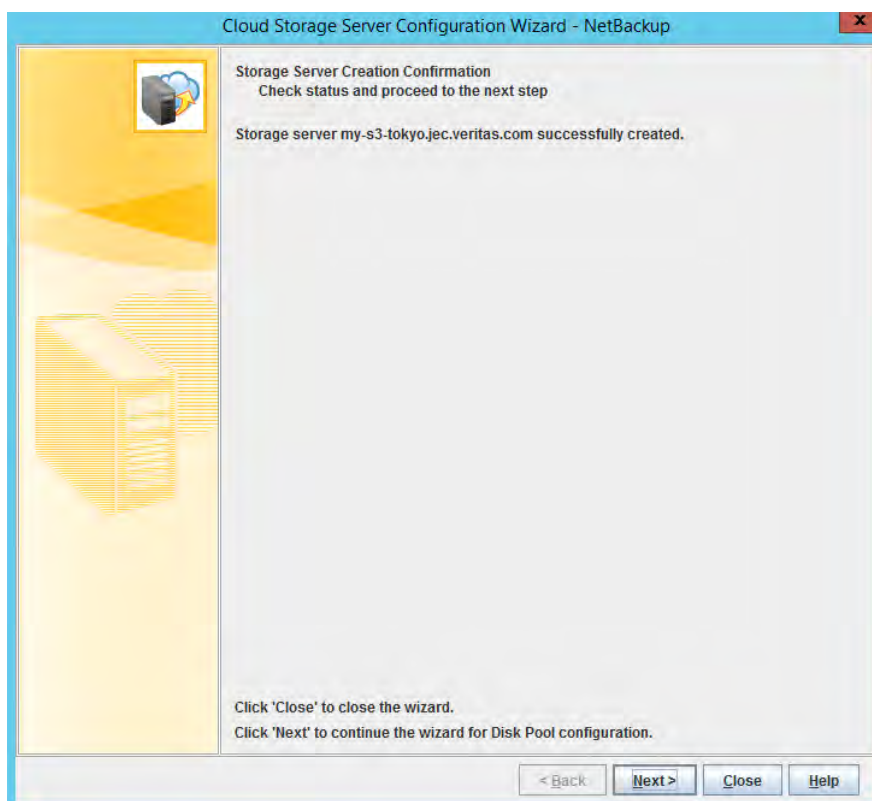
9. Now the “Cloud Storage Server configuration Summary” screen is shown. If there is no issue in the configuration, click “Next”.



10. Confirm that the storage server is successfully created.



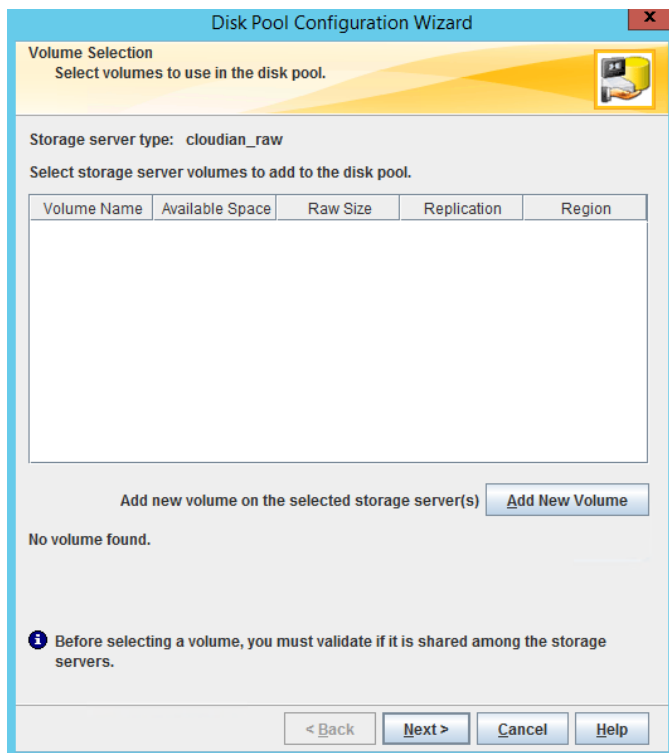
11. This completes creation of the Cloud Storage server.



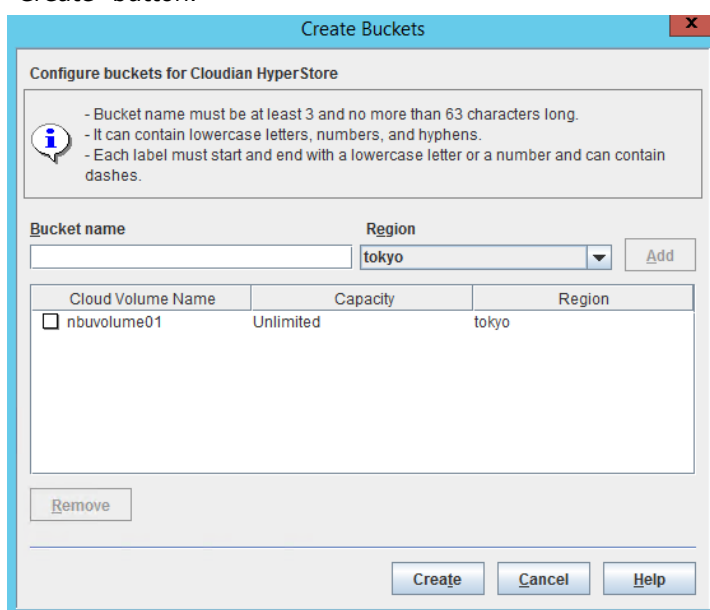
Click "Next" for disk pool configuration.

Configuration of a disk pool

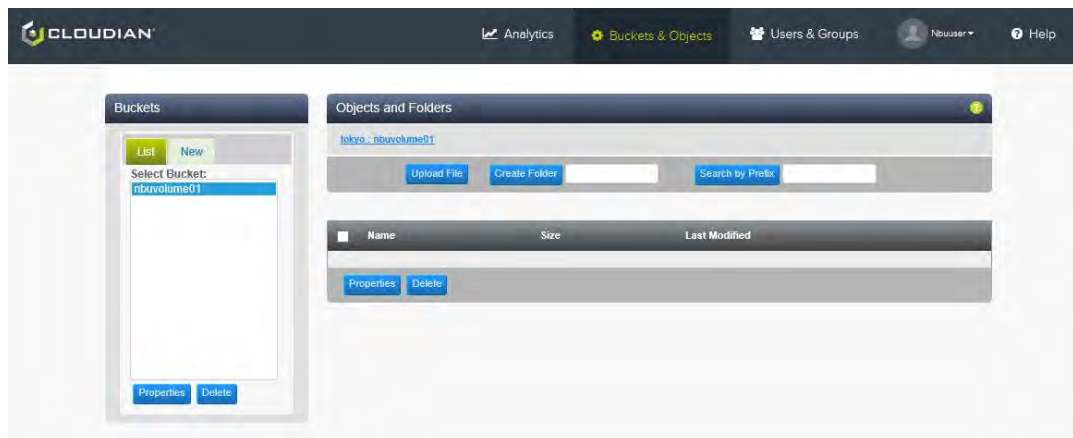
1. Now “Disk Pool Configuration Wizard” is shown. Since there exists no bucket of “nbuuser” at this point, nothing is shown as storage server volumes.



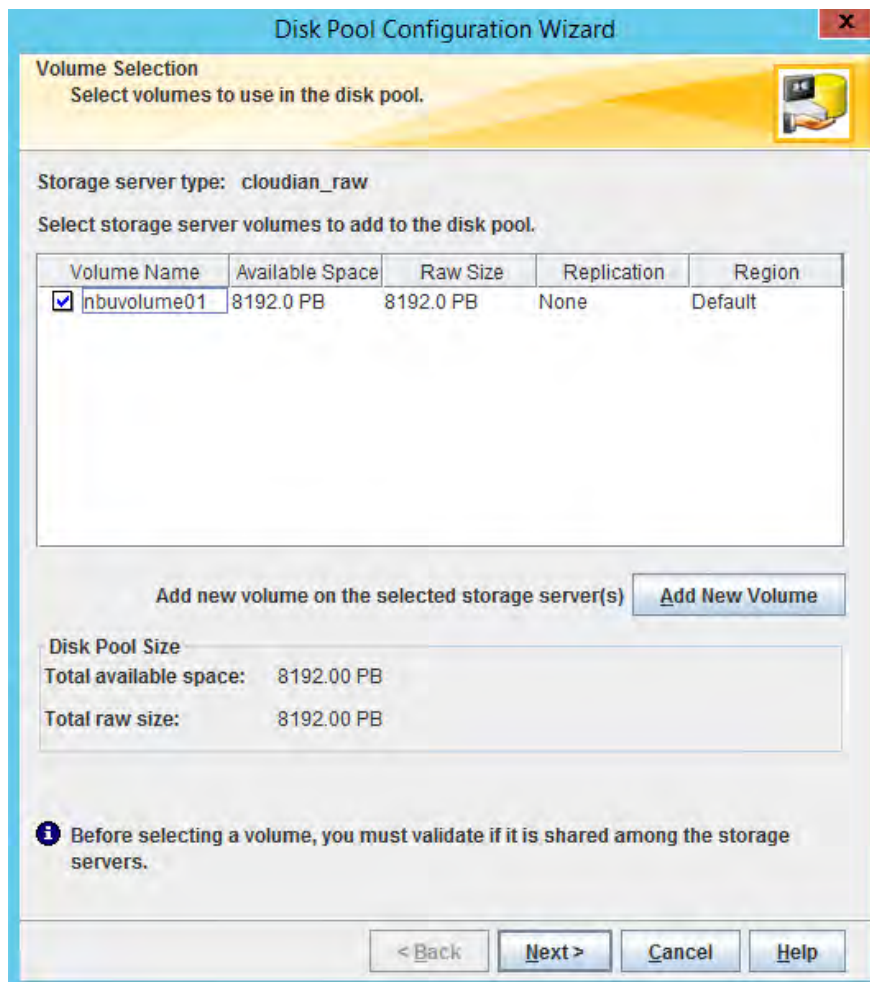
2. To create storage server volumes, click the “Add New Volume” button to show the “Create Buckets” window and create a bucket for NetBackup cloud volumes. In this example, “nbuvolume01” is provided for “Bucket name”, and “tokyo” in “Region”. Click the “Add” button. After confirming “Bucket name” is successfully shown as “Cloud Volume Name”, click the “Create” button.



After completing the previous step, “nbuvolume01” is shown as a bucket of “nbuser” of Cloudian HyperStore.



- Now a storage server volume can be selected. Select an applicable volume, and click “Next.”



- Designate additional information, such as “Disk Pool name”. In this example, “cloudian_diskpool” is provided as “Disk Pool name”, and for other items, default values are kept.

Disk Pool Configuration Wizard

Additional Disk Pool Information
Provide additional disk pool information.

Storage server type: cloudian_raw

Disk Pool Size
Total available space: 8192.00 PB
Total raw size: 8192.00 PB

Disk Pool name: cloudian_diskpool

Comments:

High water mark: 98 %
Low water mark: 80 %

Maximum I/O Streams
 ⓘ Concurrent read and write jobs affect disk performance.
 Limit I/O streams to prevent disk overload.
☐ Limit I/O streams: per volume

< Back Next > Cancel Help

5. "Disk Pool Configuration Summary" is shown on the screen. If there is no issue in its configuration, click "Next".

Disk Pool Configuration Wizard

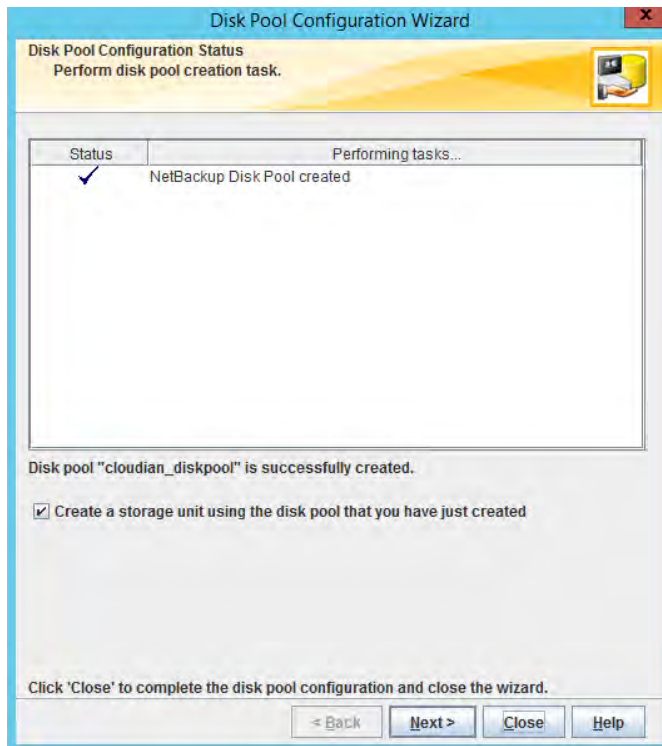
Disk Pool Configuration Summary
Verify the disk pool configuration.

Review the disk pool configuration summary. You can change the configuration, if required.

Storage server:	my-s3-tokyo.jec.veritas.com
Storage server type:	cloudian_raw
Volumes:	nbuvolume01
Disk Pool Details:	
Disk Pool name:	cloudian_diskpool
High water mark:	98
Low water mark:	80
Maximum IO Streams:	Unlimited
Comments:	

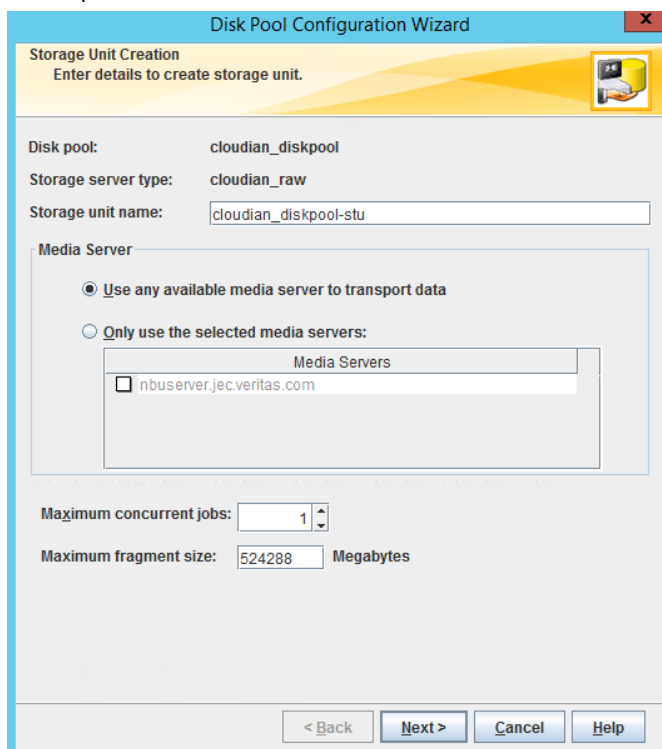
< Back Next > Cancel Help

6. Confirm that Disk Pool is successfully created.



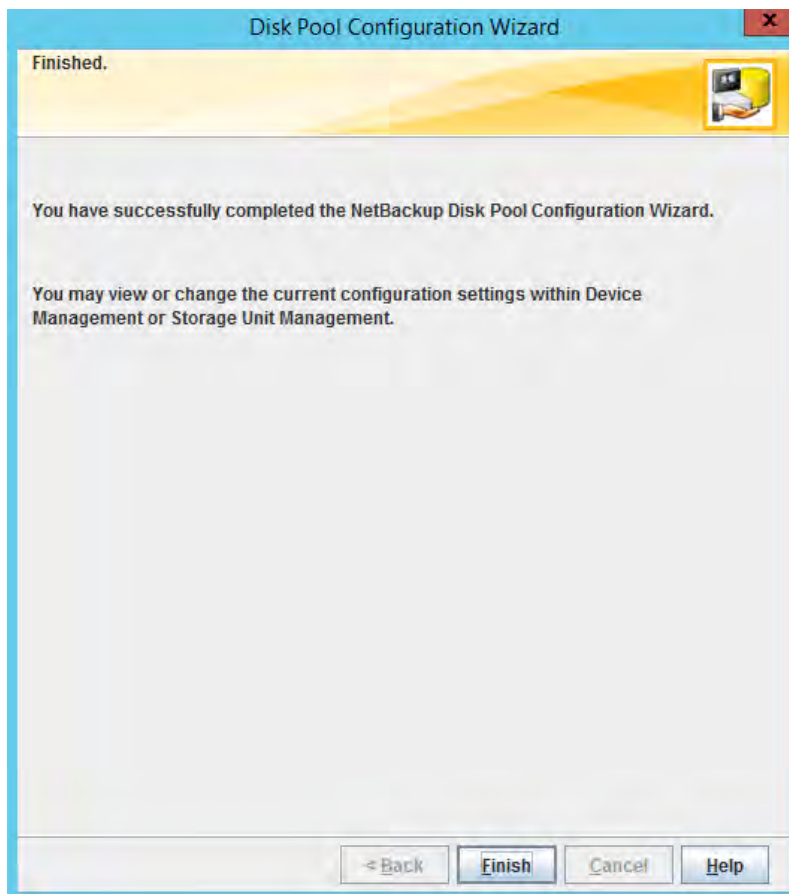
This completes creation of a Cloud Storage server. Click “Next” to create a storage unit.

7. “Disk Pool Configuration Wizard” is shown. In this example, an initial value of “cloudian_diskpool-stu” is provided as “Storage unit name”. For other items, default values are kept.



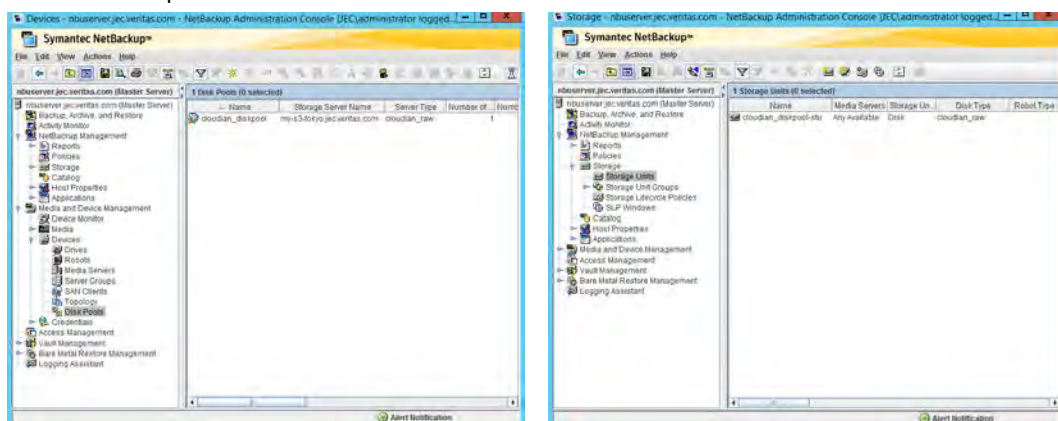
Click “Next”.

8. This completes NetBackup disk pool configuration.



Click “Finish” to complete the “Disk Pool Configuration Wizard”.

After the procedure, disk pool and storage unit, using Cloudian HyperStore Cloud Storage, are create on NetBackup.



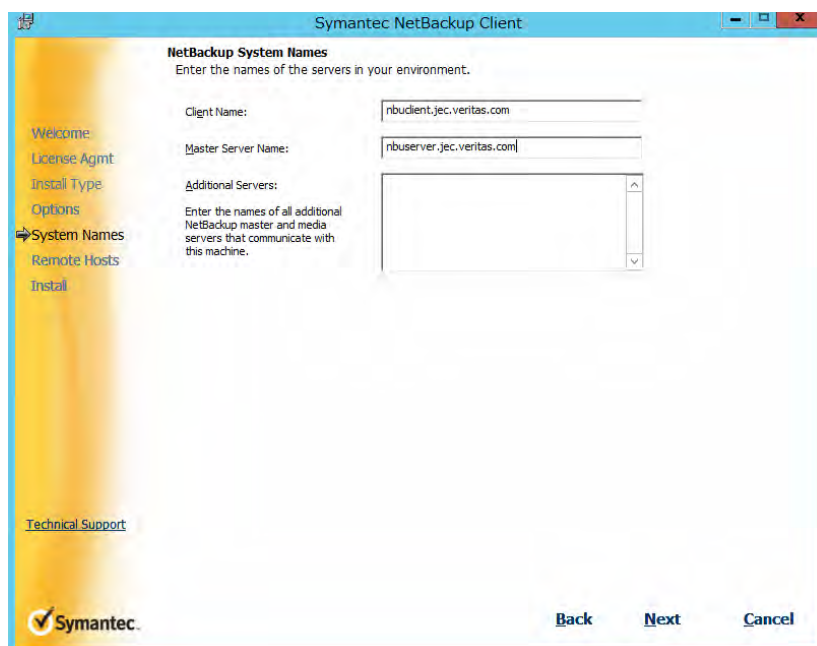
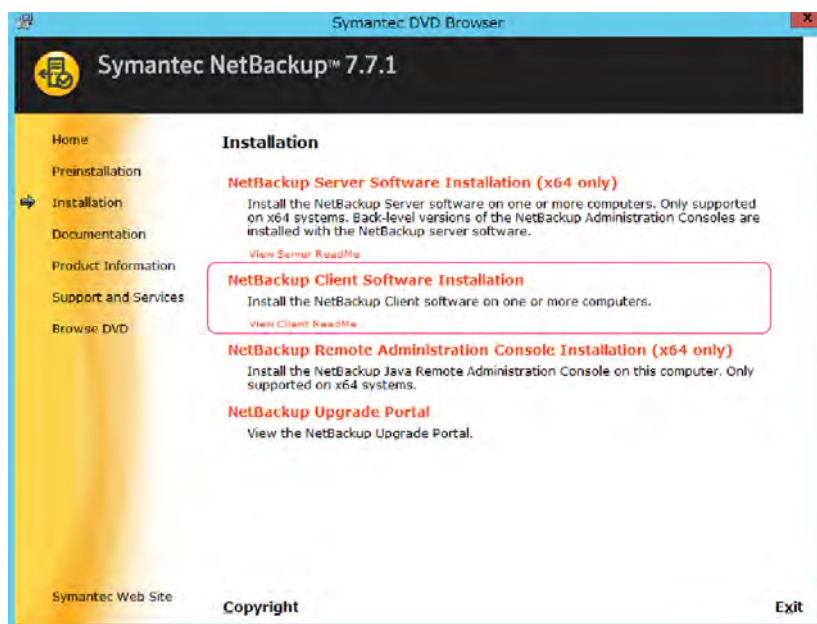
Setup of A NetBackup Client

This chapter describes setup of NetBackup on a NetBackup Client.

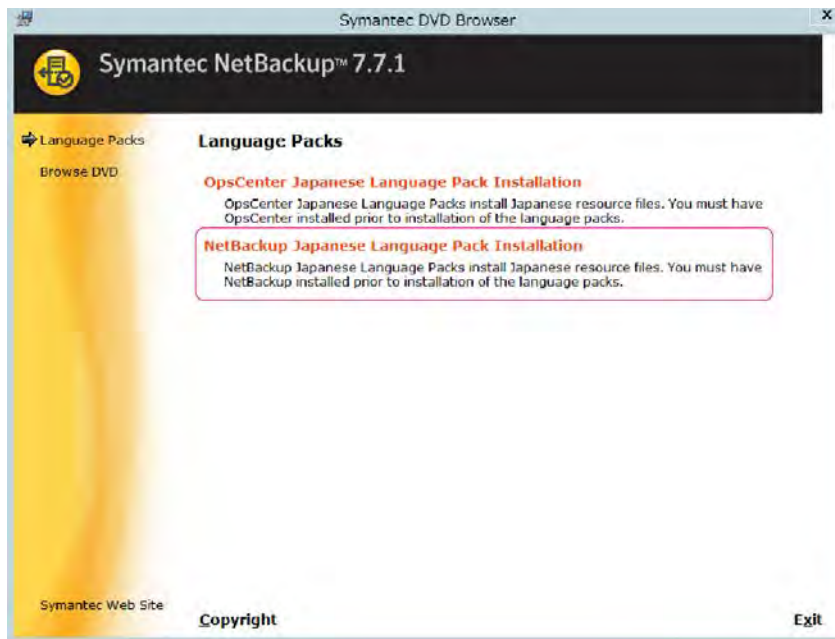
Installation of NetBackup client software

Install NetBackup client software.

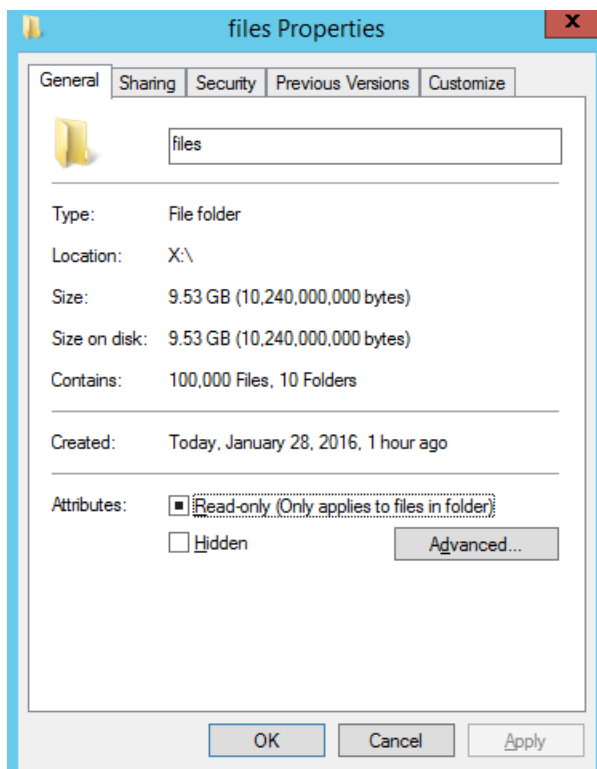
1. Select “NetBackup Client Software Installation”. Follow its installation wizard to designate “Master Server Name” for installation.



2. Select “NetBackup Japanese Language Pack Installation” under “Language Packs”, and apply Japanese language packs.



3. Create files to back up which will be used for this evaluation. In this example, 100,000 files of 100KiB volume are created under “X:¥files”.

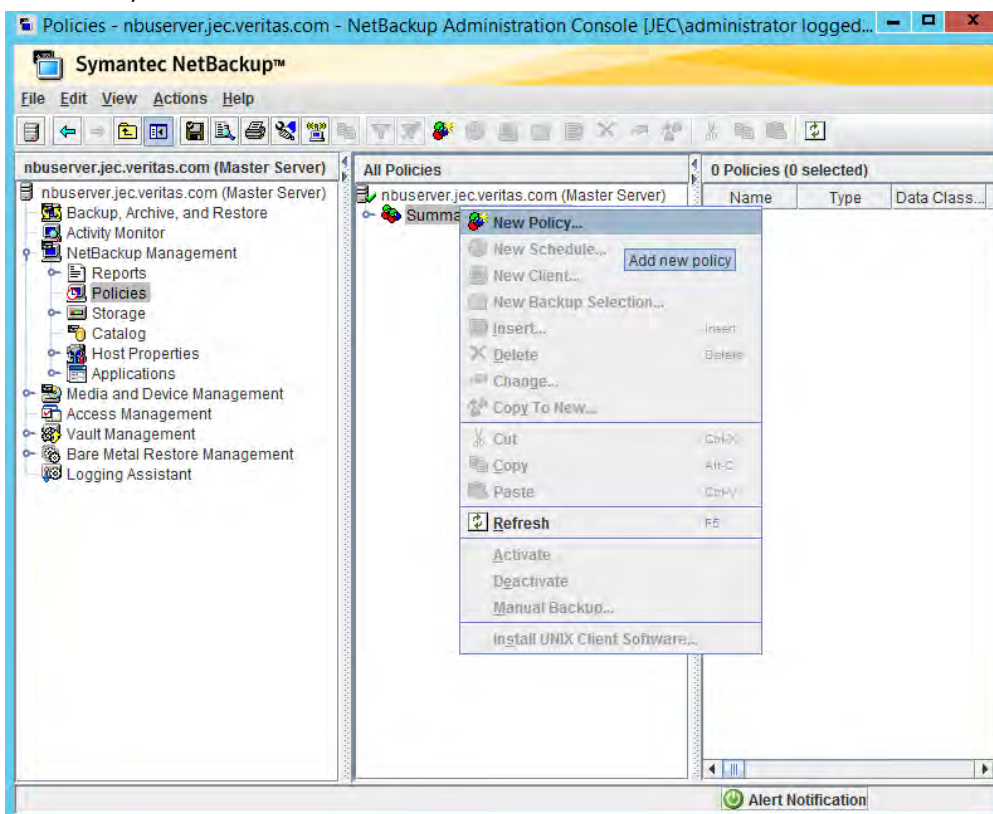


Backup to Cloud Storage

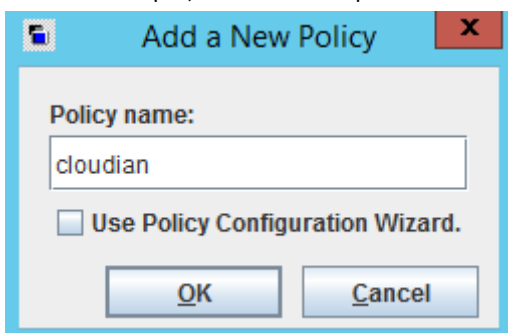
This chapter describes creation of backup polices and execution of backup.

Creation of backup policies

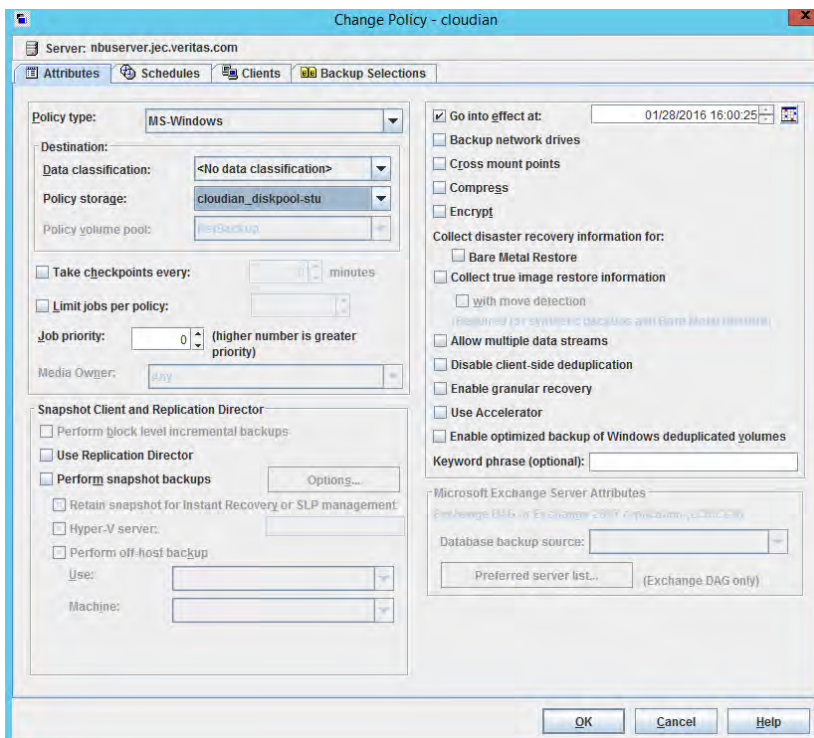
1. In the left pane on “NetBackup Administration Console”, choose “NetBackup Management” and then “Policies”. Right-click “Summary of All Policies” in the central pane, and then click “New Policy”.



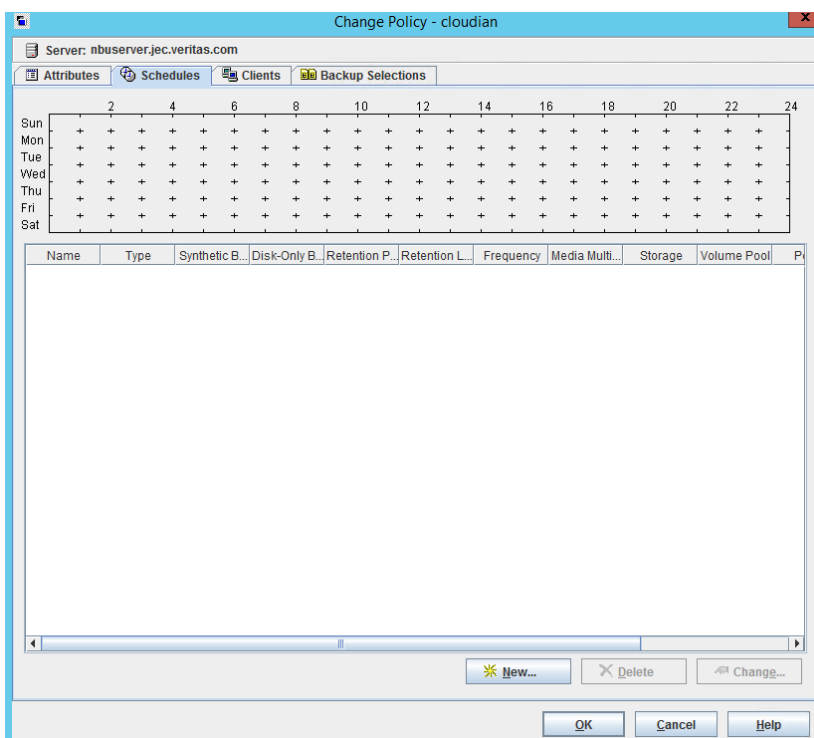
2. Provide a unique name of a new policy in a dialog box of “Add a New Policy”, and click “OK”. In this example, “cloudian” is provided.



3. For “Policy type, designate “MS-Windows”. For “Policy storage”, designate “cloudian_diskpool-stu”, which is a storage unit created in “Configuration of a disk pool” of the “Setup of A NetBackup Server” chapter in this document. For other items, default values are kept.



4. Next step is to configure a new backup schedule by using the “Schedules” tab. Click the “New” button.



5. Next, define name, type of backup, and schedule on the “Add Schedule” window. After filling arbitrary name, select a type of backup from a drop-down menu of “Type of backup”. If necessary, also select the “Start Window” tab to set a time of day for backup. In this example, “Full” is provided as a name of schedule, “Full Backup” is selected under “Type of backup”,

and a default value is kept for a time of day for backup. After confirming configuration, click “OK”.

Server: nbuserver.jec.veritas.com

Attributes Start Window Exclude Dates

Name: Full

Type of backup: Full Backup

☐ Synthetic backup

☐ Accelerator forced rescan

Schedule type:

☐ Calendar

☐ Retries allowed after runday

☒ Frequency:

1 weeks

Destination:

☐ Multiple copies Configure...

☐ Override policy storage selection:

☐ Override policy volume pool: NetBackup

☐ Override media owner:

Retention: 2 weeks (Retention Level 1)

Media multiplexing: 1

Instant Recovery:

☒ Snapshots and copy snapshots to a storage unit

☐ Snapshots only

Add OK Cancel Help

6. Confirm that the configured schedule is registered.

Server: nbuserver.jec.veritas.com

Attributes Schedules Clients Backup Selections

Name	Type	Synthetic B...	Disk-Only B...	Retention P...	Retention L...	Frequency	Media Multi...	Storage	Volume Pool	P...
Full	Full Backup	No	No	2 weeks	1	1 week	1			cloud

New... Delete Change...

OK Cancel Help

7. Next, use the “Clients” tab to register a client for backup under the policy. Click the “New” button, which will activate the “Add Client” panel. Provide a name of a client for backup under “Client name”, check-mark a box of “Detect client operating system”, and click the “Add” button. In this example, “nbuclient” is provided under “Client name”.

Add Client - Policy cloudian

Server: nbuserver.jec.veritas.com

Client name: nbuclient

☒ Detect client operating system

Hardware and operating system: HP-UX-IA64, HP-UX11.31

Buttons: Add, OK, Cancel, Help

After confirming the client name, click “OK”.

8. Confirm that the selected client is registered.

Change Policy - cloudian

Server: nbuserver.jec.veritas.com

Attributes Schedules **Clients** Backup Selections

Client Name	Hardware	Operating System	Resiliency
nbuclient	Windows-x64	Windows	

9. Next, use the “Backup Selections” tab to designate a folder for backup. Click the “New” button, which will activate the “Add Backup Selection” panel.

Add Backup Selection - Policy cloudian

Server: nbuserver.jec.veritas.com

Construct a list of pathnames (and directives, if applicable) to add to the selection list.

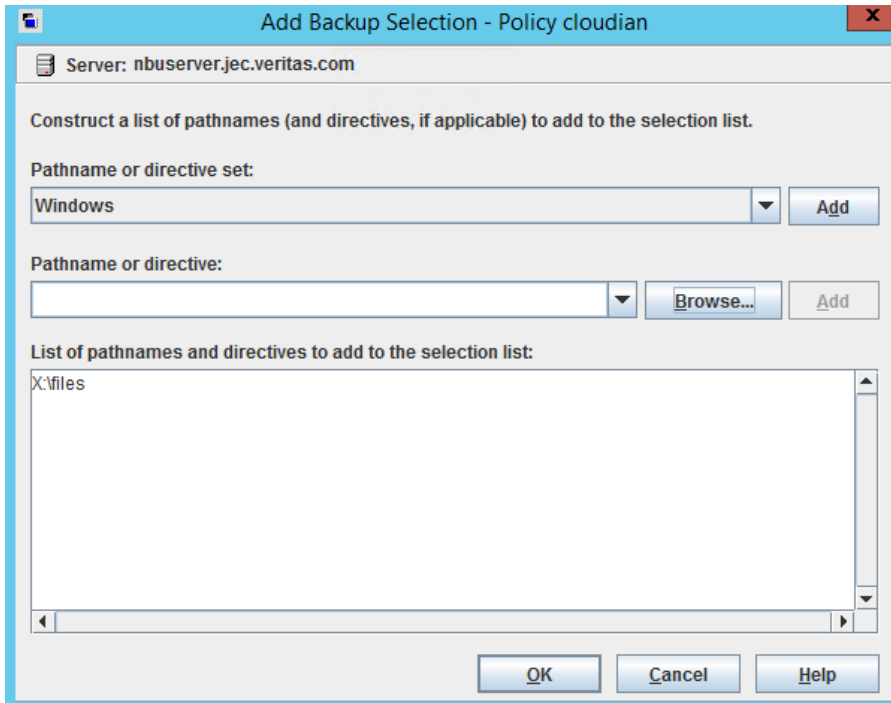
Pathname or directive set: Windows

Pathname or directive:

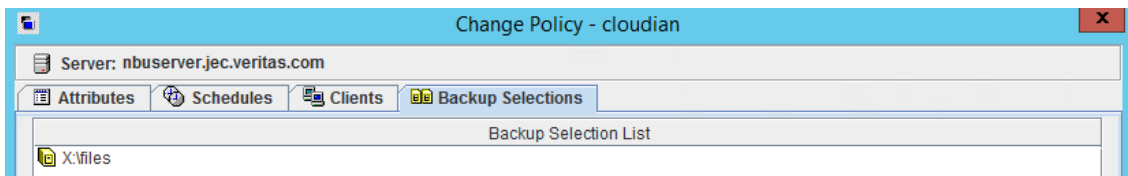
List of pathnames and directives to add to the selection list:

Buttons: Add, Browse..., OK, Cancel, Help

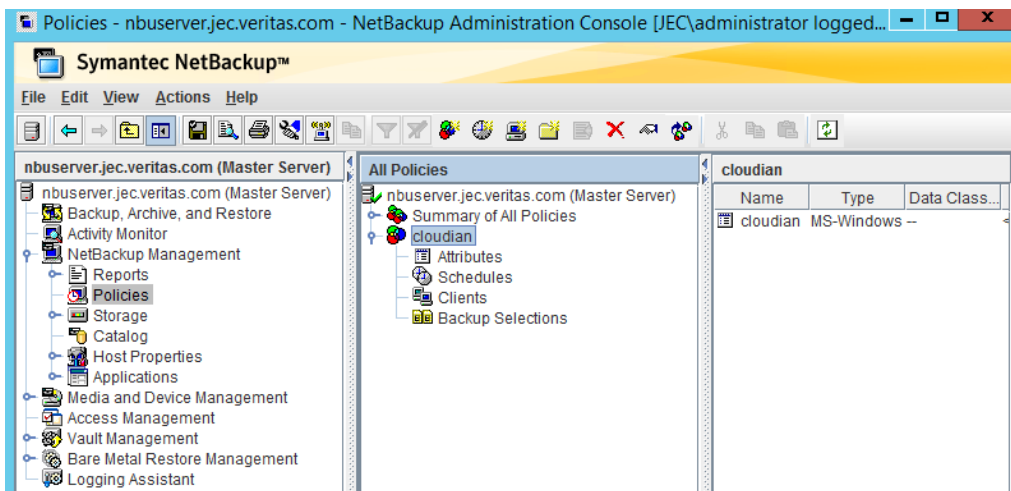
10. Click the “Browse” button on the “Add Backup Selection” panel, which will show files on NetBackup Client. Designate a folder for backup, and click “OK”. In this example, “X:¥files” is selected.



11. Confirm that the volume selected in the “Backup Selection” is registered. Click “OK” to complete policy creation.



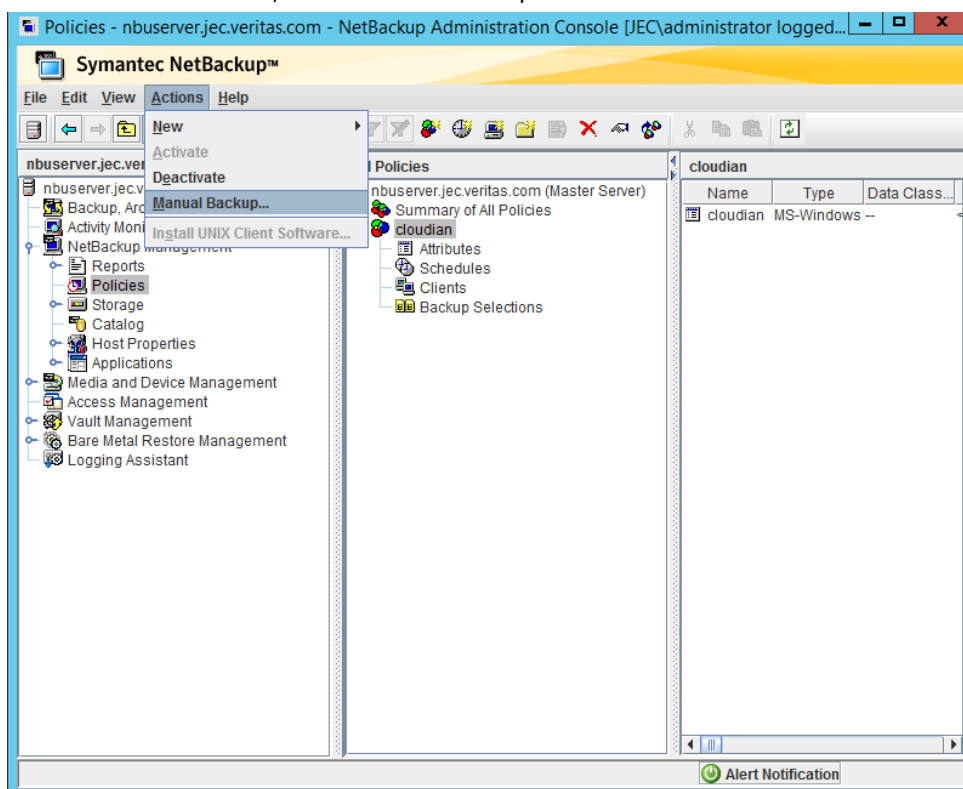
12. In the left pane on the “NetBackup Administration Console”, select “NetBackup Management” and then “Policies” to confirm creation of the backup policy.



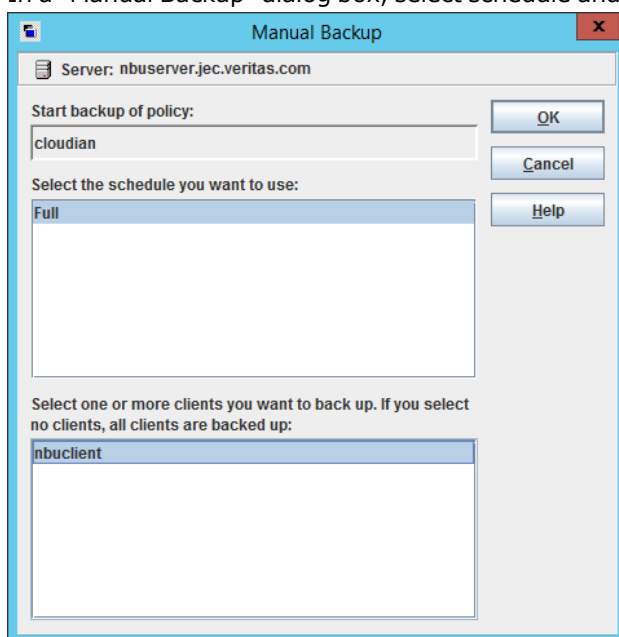
Execution and confirmation of backup

Execution of backup

1. In the left pane on “NetBackup Administration Console”, select “NetBackup Management” and then “Policies”.
2. In the central pane, select a policy name.
3. In a menu of “Actions”, click “Manual Backup”.



4. In a “Manual Backup” dialog box, select schedule and client for backup. Click “OK” for backup.



Confirmation of backup jobs

1. In the left pane on “NetBackup Administration Console”, click “Activity Monitor” to confirm that backup jobs are successfully completed.

1 Jobs (0 Queued 0 Active 0 Waiting for Retry 0 Suspended 0 Incomplete 1 Done - 1 se...						
Job Id	Type	State	State Details	Status	Job Policy	Job Sche
4	Backup	Done		0	cloudian	Full

2. If details of a backup job need to be confirmed, double-click the job, and click the “Detailed Status” tab.

Job ID: 4

Job State: Done (Successful)

Job Overview

Detailed Status

Job Hierarchy

Attempt: 1

Job PID: 2528

Storage Unit: cloudian_diskpool-stu

Media Server: nbuserver.jec.veritas.com

Transport Type: LAN

Attempt Started: 01/28/2016 16:16:04

Attempt Elapsed: 00:04:07

Attempt Ended: 01/28/2016 16:20:11

KB/Sec: 47995

Status:

01/28/2016 16:16:16 - Info bptm (pid=2280) start backup
01/28/2016 16:16:29 - Info bptm (pid=2280) backup child process is pid 2936.4892
01/28/2016 16:16:29 - Info bptm (pid=2936) start
01/28/2016 16:16:29 - begin writing
01/28/2016 16:20:02 - Info bptm (pid=2280) waited for full buffer 11144 times, delayed 12436 times
01/28/2016 16:20:08 - Info bptm (pid=2280) EXITING with status 0 <-----
01/28/2016 16:20:09 - Info bpbkm (pid=2528) validating image for client nbuculent
01/28/2016 16:20:10 - Info bpbkar32 (pid=1332) done. status: 0: the requested operation was successfully completed
01/28/2016 16:20:10 - end writing. write time: 0:03:41
the requested operation was successfully completed (0)

Current Kilobytes Written: 10250029

Estimated Kilobytes: 0

Current Files Written: 100011

Estimated Files: 0

Current File:

Troubleshooter...

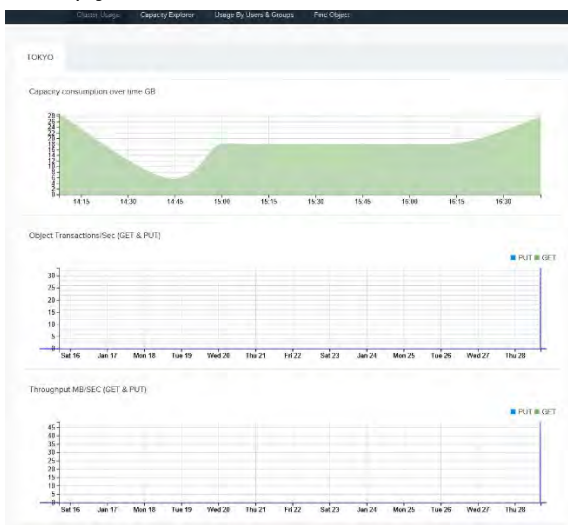
Percent Complete: 100%

Refresh

Close

Help

3. To confirm changes of capacity consumption, transaction performance and throughput driven by backup data, log into a web browser of Cloudian HyperStore as a system admin group. Click the “Analysis” tab, and select the “Cluster Usage” tab.
The following figure shows increase of capacity consumption by PUT request issued during backup jobs.



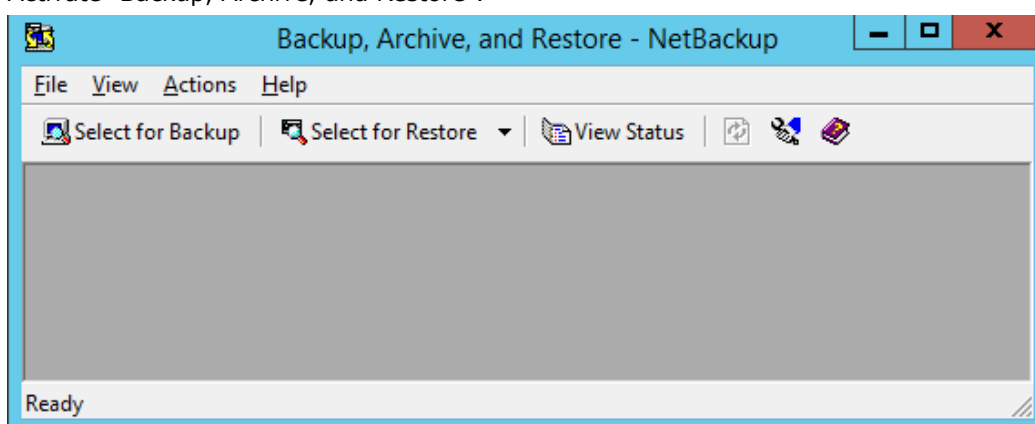
Execution of Restore

This chapter describes procedures of restore from backup. In this example, the same volume with that of backe up is designated as a destination for restore.

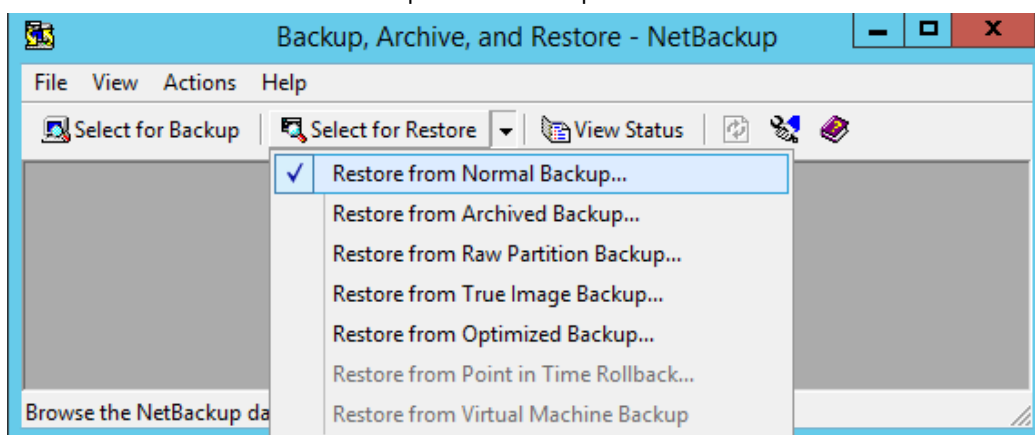
Execution and confirmation of restore

Execution of restore

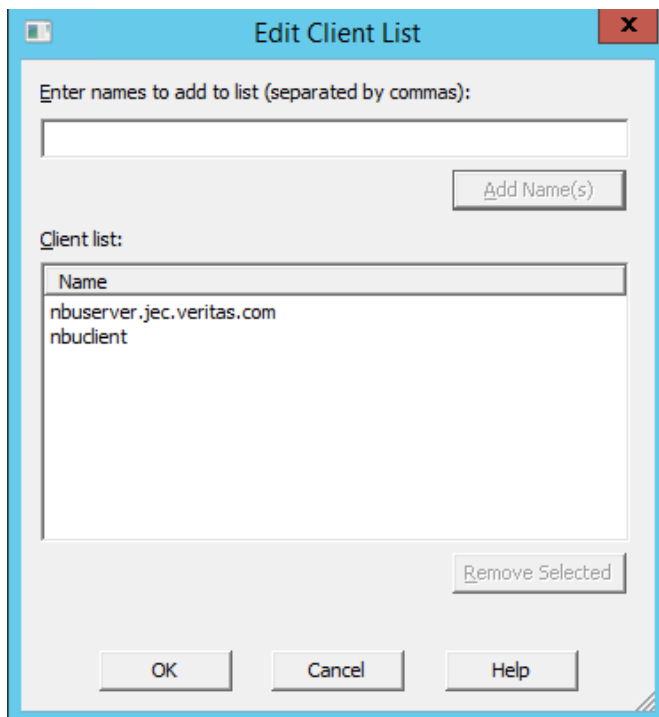
1. To execute restoring in the same volume with backup on NetBackup Client, delete or rename files in the backup volume beforehand.
2. Activate “Backup, Archive, and Restore”.



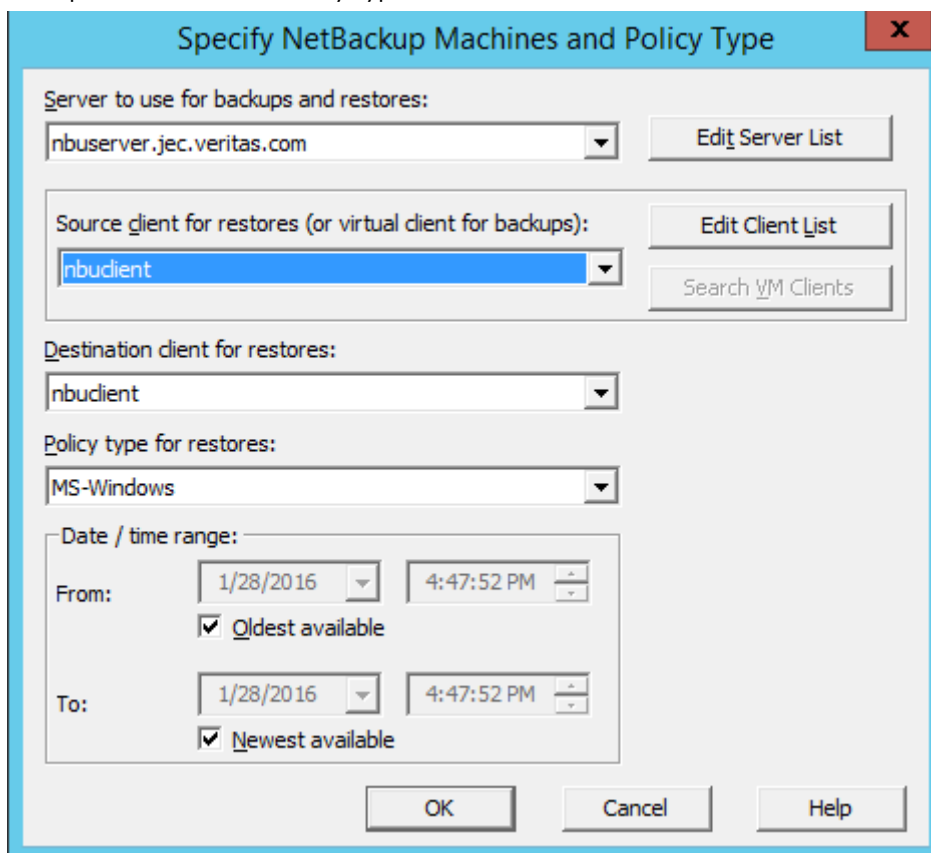
3. Select “Restore from Normal Backup...” from a drop-down menu of “Select for Restore”.



4. When the “Specify NetBackup Machines and Policy Type” window is shown, click the “Edit Client List” button, and fill in a name of NetBackup Client on the “Edit Client List” panel. Then, click the “Add Name(s)” button. After confirming that NetBackup Client name is added to the Client list, click “OK”. In this example, “nbuclient” is added as NetBackup Client.

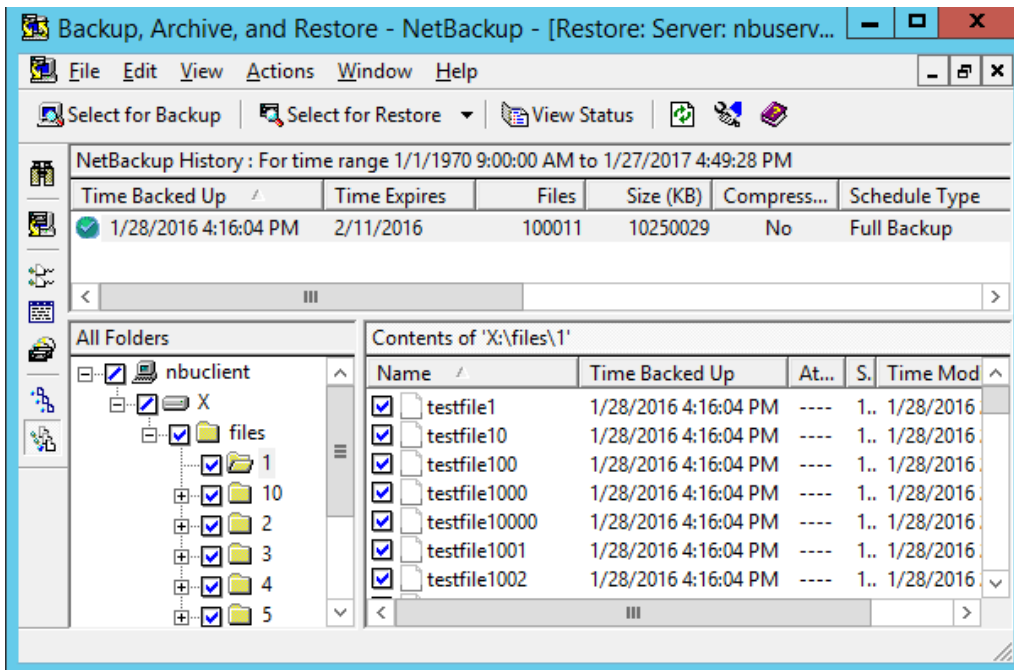


5. Designate NetBackup Client from drop-down menus of “Source client for restores (or virtual client for databackups)” and “Destination client for restores”. Also, select “MS-Windows” from a drop-down menu of “Policy type for restores”.

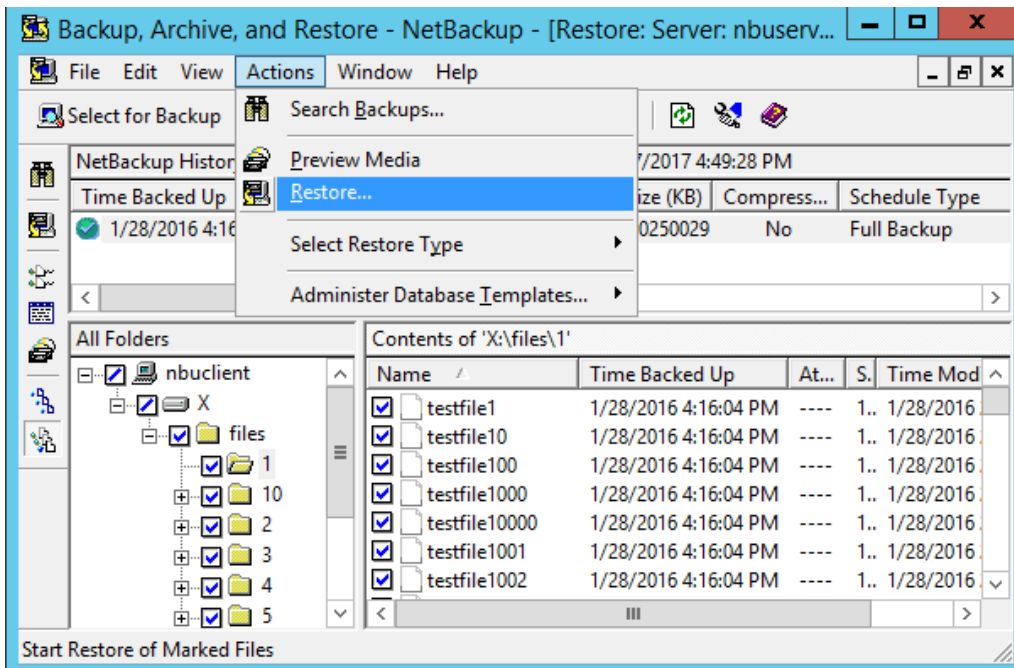


When all entries are completed, click “OK”.

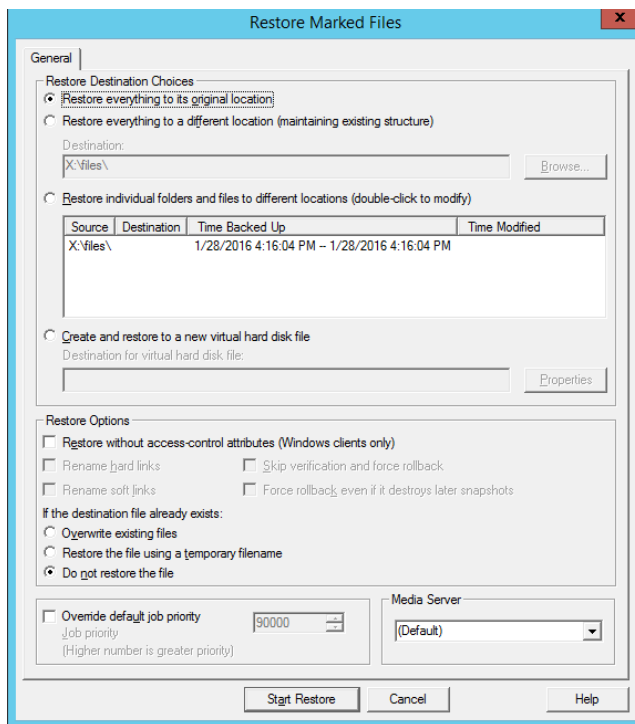
6. When a list of backup files is shown, select files for restore.



7. Select "Restore..." from an "Actions" menu.



8. When the "Restore Marked Files" window is shown, after choosing a destination for restore and making a change, such as an overwrite option, as required, click the "Start Restore" button. In this example, default values of setting items are kept so as to restore to the backup volume.

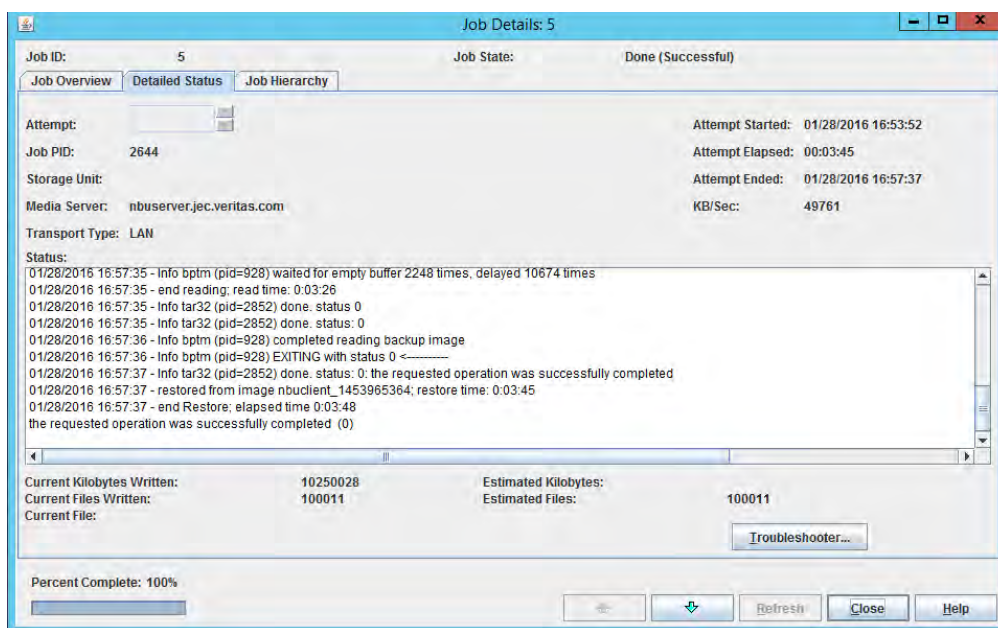


Confirmation of restore jobs

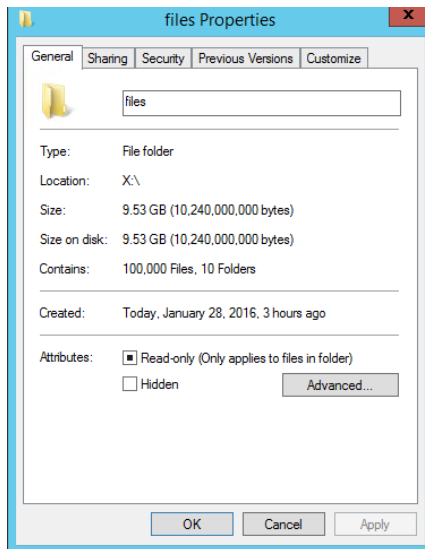
1. In the left pane on “NetBackup Administration Console”, click “Activity Monitor” to confirm that restore jobs are successfully completed.

2 Jobs (0 Queued 0 Active 0 Waiting for Retry 0 Suspended 0 Incomplete 2 Done - 1 se...						
Job Id	Type	State	State Details	Status	Job Policy	Job Sched
5	Restore	Done		0		

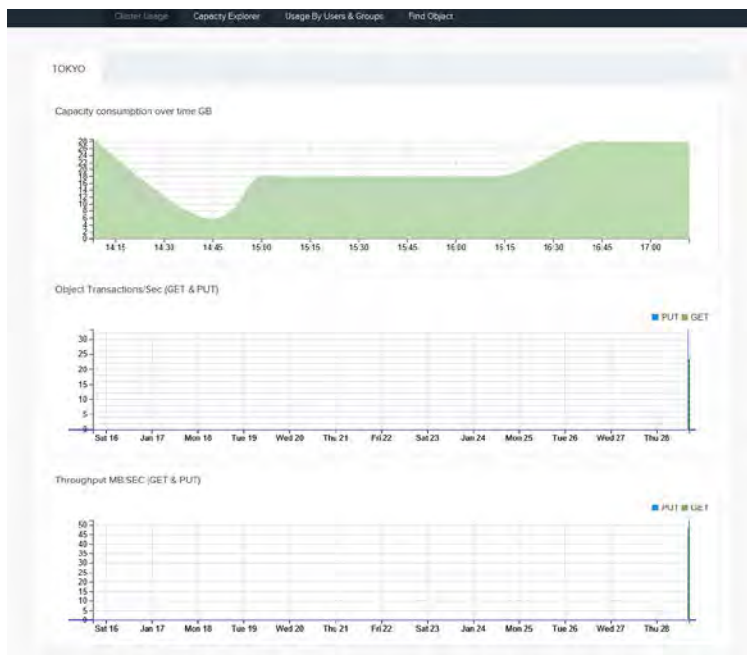
2. If details of a restore job need to be confirmed, double-click the job, and click the “Detailed Status” tab.



3. Confirm that files are restored on NetBackup Client.



4. To confirm changes of capacity consumption, transaction performance and throughput driven by backup data, log into a web browser of Cloudian HyperStore as a "System Admin" group. Click the "Analysis" tab, and select the "Cluster Usage" tab. The following figure shows issuance of GET request under restore jobs.



This completes restoring of files.

The entire procedure verifies in the evaluation environment that Cloudian HyperStore can be used as NetBackup Cloud Storage.



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