

White Paper Arcserve Backup Greatly Reduces the Cost of Backup Using All-Flash Arrays with the Latest LTO Ultrium Technology —Unlimited Backup Capacity and Number of Generations—

Adoption of all-flash arrays is increasing steadily, but from a cost-effectiveness point of view, the backup capacity and the number of generations must be taken into consideration.

Arcserve Backup, which is widely used in Windows environments, allows backups using the latest LTO tape technology while lowering costs.



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Preface

In recent years, all-flash arrays have become mainstream, but the price of flash memory remains high. For example, even though flash memory provides high speed performance, that benefit is offset by the cost of increasing the number of backup generations.

A solution to this problem is to combine the all-flash array with LTO tape technology.

This method consists of changing the storage destination of the backup data in the all-flash array from the backup dedicated flash storage to LTO tape cartridges.

Because LTO tape cartridges are cheaper than flash memory, cost concerns are eliminated even if a large number of backup generations are required.

A data protection product (backup software) is required to store backup data to LTO tape cartridges.

This document describes the characteristics of the procedure for backing up the data from the ETERNUS AF series and the ETERNUS DX series to the LTO tape unit using Arcserve Backup (data protection product) with the ETERNUS LT series and ETERNUS SF AdvancedCopy Manager. In addition, the system configuration for backup operations, the environment configuration procedure, and the backup operation procedure are also provided.

The verification results described in this document are current as of September 2018.

The product lineup and product information stated in this document are current as of November 2019.

Target Audience

This document targets the following audience:

- Those who want to install an all-flash array while minimizing the Total Cost of Ownership (TCO)
- Those who want to learn more about Arcserve Backup to help select a data protection product for their all-flash arrays
- Those who want an overview of the tape backup tasks using Arcserve Backup

Applicable Series

This document covers the following storage systems:

- FUJITSU Storage ETERNUS AF150 S3, AF250 S3/S2, and AF650 S3/S2
- FUJITSU Storage ETERNUS DX100 S5/S4, DX200 S5/S4, DX500 S5/S4, DX600 S5/S4, DX900 S5, and DX8900 S4
- FUJITSU Storage ETERNUS LT series

Terminology

The following terms are used in this document:

- Storage system	A storage system consisting of flash storage
- Tape unit	A device that reads data from and writes to magnetic tape
	(Includes tape libraries that have a "robot mechanism" for moving tape cartridges)
- Advanced Copy function	A function of the FUJITSU Storage ETERNUS AF series and ETERNUS DX series that transfers data in the storage system at high-speed without using the CPU of the server to copy data

Naming Conventions

The following abbreviations are used in this document:

- FUJITSU Storage ETERNUS AF series All-Flash Arrays	ETERNUS AF series
- FUJITSU Storage ETERNUS DX series Hybrid Storage Systems	ETERNUS DX series
- FUJITSU Storage ETERNUS LT series	ETERNUS LT series
- ETERNUS SF AdvancedCopy Manager	ACM

1. Back-up Challenges and Solutions for All-Flash Arrays

1.1. Flash to Flash Backup Issue

For data backups within the all-flash array, increasing the number of generations in the backup destination raises cost concerns. High speed performance is not a requirement for flash storage used for backups, but as the use of inexpensive media such as Nearline HDDs is not an option, the purchase of additional flash storage to accommodate a higher number of backup generations increases the cost. Because the business data can be transferred at high speed from flash storage to the backup dedicated flash storage, business downtime is not an issue since disruptions due to securing backup points are negligible.



Figure 1-1 Flash to Flash Backup

1.2. Flash to Tape Backup Issue

For data backups directly from the all-flash array to an LTO tape cartridge, there is no limit for the number of generations in the backup destination and even if the number of generations is increased, the cost benefit remains since low-cost LTO tape cartridges are used. The cost of combining tape units, data protection products, and LTO tape cartridges is considerably less than purchasing additional flash storage required for a higher number of backup generations to save the all-flash array backup data.

However, the benefits of using LTO tape cartridges are somewhat offset by business downtime to restrict access to the business data during a backup from the all-flash array to the LTO tape unit.



Figure 1-2 Comparison of Flash to Flash Backup and Flash to Tape Backup

1.3. Flash to Flash to Tape Backup Solution

This method can solve the issues inherent to both flash to flash backups and flash to tape backups by backing up the business data from flash storage to the backup dedicated flash storage and then backing up the data to LTO tape cartridges. Details of the flash to flash to tape solution are as follows.

Storing backup generations to LTO tape cartridges resolves the issue of flash to flash backups where all backup generations are stored in the all-flash array. With the cost per storage volume of the LTO tape cartridge being less than flash storage by a factor of two, LTO tape cartridges are more economical than flash storage. For LTO tape cartridges, there is no limit for the number of generations in the backup destination and the cost is minimal even if the number of generations is increased.

Business downtime, which is associated with flash to tape backups (backups directly from the all-flash array to an LTO tape cartridge), is unnecessary since the business data is backed up quickly to the backup dedicated flash storage using the all-flash array function. Furthermore, other than when a backup is running, a restore can be completed instantly because the most recent backup is stored in the backup dedicated flash storage.

If no backup data is stored in the backup dedicated flash storage, the backup data must be restored from the LTO tape unit, which requires extra time. If a long restore time is not a problem, the cost advantages of flash to flash to tape backups outweigh the disadvantages.



Figure 1-3 Comparison of Flash to Flash Backup and Flash to Flash to Tape Backup

1.3.1. Latest Trend in LTO Tape Formats

The latest generation of LTO formats is the 8th generation (LTO-8).

The merits of adopting LTO-8 are explained below based on comparisons with previous generations in terms of cost and performance.

LTO-8 can store up to 30 TB (compressed) per cartridge. Backup and restore times have been greatly reduced as well as the cost compared to previous generations.

As a cost comparison, a backup capacity of 60 TB can be realized with just two LTO-8 cartridges compared with ten LTO-6 cartridges, a reduction of approximately 80%. In addition, although a 20-cartridge tape unit is required for LTO-6, an 8-cartridge entry model can be selected for LTO-8 and LTO-7. LTO-8 does not require higher end tape units or a large number of cartridges which adds to the cost savings.



Figure 1-4 Cost Comparison of LTO-8 with Previous Generations

On the performance side, although the calculations are based on the catalog specifications, the transfer performance of LTO-8 is nearly double compared with LTO-6, so backups can be completed in almost half the time.

Performanc	e comparison			LTOB backup time 47% reductio	
• Time req	uired for back	ing up 12 TB	of data*	ompared with	LT06)
Required number	0	Approx	. 11 hrs	Approx. 21 hrs	Approx. 24 hrs
LTO Ultrium 8	Backup with LTO Ultr	ium 8 half-height t	ape drive: 1,080 GB/h		
LTO Ultrium 7	Backup with LTO Ultriur	n 7 half-height tape dr	ve: 1,080 GB/h		
2					
LTO Ultrium 6	Backup with LTO Ultriur	π 6 half-height tape dri	ve: 576 GB/h		
5					
LTO Ultrium 5	Backup with LTO Ultriur	π 5 half-height tape dri	ve: 504 GB/h		
8					
- Martine					
*: Not compresse	d				

*: Value calculated based on catalog specs, depends on use environment

Figure 1-5 Performance Comparison of LTO-8 and Previous Generations

Some LTO tape cartridges are read-only or incompatible with certain generations of LTO Ultrium tape drives. Selecting cartridges with the latest LTO Ultrium generation is recommended because older generations may not be supported by the tape unit.

Furthermore, since LTO units are magnetic tape units, the dust generated from the magnetic tape or fine dirt entering the device will inevitably adhere to the magnetic head of the tape drive. This may cause errors and failure. To ensure stable operation, the drive must be cleaned periodically.

For this reason, a cleaning cartridge is provided to clean the magnetic head of the tape drive and can be used up to 50 times. Instructions on how to use the cleaning cartridge are provided in the appendix.

2. Arcserve Backup Overview

Arcserve Backup is a data protection product that allows backup and restore in various platforms, as well as central management with a backup server where Arcserve Backup Manager is installed. Arcserve Backup supports both small-scale and large-scale environments consisting of one or more devices.

Because the backup destination can be hard disks, tape, or the cloud, the most appropriate storage location can be selected based on your environment.





Because Arcserve Backup operations are performed using the user-friendly Arcserve Backup Manager GUI, users can easily manage media, such as tape cartridges and hardware devices, configure backup and restore jobs, execute jobs, and check job statuses. The following is an example showing the Home screen of Arcserve Backup Manager.

ar	CSETVE [®] Backup		
Default	: Server and Security	Quick Start	
Domain Default	n MGRSV01 Server: MGRSV01	Job Status Manager Monitor jobs and check logs.	
Uxer Ne	ms: MGRSV01\Administrato 🎊	Backup Manager Configure and submit backup jobs.	
Click he	ere to change the server or user	Configure and submit archive jobs.	
<u>∎</u> ∰⊔	ast Backup Status Report	Restore Manager Perform complete data recovery.	
10	Dashboard Infrastructure Visualization	Server Admin Manage Arcserve services.	
Techni	cal Support	Dashboard View snapshots of the backup infestivuture and the storage resource management(SRM) environment.	
	Arcserve Backup on the Web Find out about this premier data protection	Infrastructure Visualization See the relationships among the machines, servers, and devices in your network.	
6	Understanding your Europart	Monitor & Reports	
1	Support Maintenance programs and offerings.	Protaction & Recovery	
	Registering for Support Arcserve Support online registration.	Administration	
	Accessing Technical Support Easy access to "One Stop" Support.	Ublittes	
0	Live Chat		

Figure 2-2 Home Screen of Arcserve Backup Manager

3. Backup/Restore Verification Using ACM and Arcserve Backup

This section describes the backup and restore verification of an all-flash array and LTO tape combination.

3.1. Verification Details

A verification is performed to confirm that the three-generation backup of the production volume on the all-flash array is stored to the LTO tape unit and that the restore is completed successfully.

The production volume in the all-flash array is backed up to the backup volume in the all-flash array with the Advanced Copy function QuickOPC and is then backed up to the tape library (LTO tape unit) with Arcserve Backup for generation management. In this verification, two backup types to the LTO tape unit are verified: Full backup and incremental backup. The restore operation consists of restoring full backup data from the LTO tape unit to the backup volume of the all-flash array, and then restoring the data of the backup volume to the production volume with the Advanced Copy function OPC.

In the verification environment, a backup and restore of the production volume is performed with ACM. ACM is a storage management software that allows high-speed backups/restores and replication operations with the Advanced Copy function. Configure the ACM agent in the business server and the ACM Manager/agent in the backup server, and use them for backup and restore operations.



Use the following procedure to perform backups with ACM and Arcserve Backup.

- 1. Execute QuickOPC from ACM Manager to back up data from the production volume to the backup volume.
- 2. From Arcserve Backup Manager, perform a full or incremental backup of the data from the backup volume to the LTO tape cartridges.

The production volume backed up by QuickOPC is currently stored in the LTO tape cartridges.

- Use the following procedure to restore data from the LTO tape cartridges to the production volume.
- 3. Perform a restore from Arcserve Backup Manager to restore data from the LTO tape cartridges to the backup volume.
- 4. Execute OPC from ACM Manager to restore data from the backup volume to the production volume.

Full backup verification

Verification of a full backup consists of backing up the production volume to the backup volume and then backing up the backup volume of each generation to the LTO tape cartridges with the backup jobs of Arcserve Backup.

To back up the production volume, execute QuickOPC with **swsrpmake** (replication creation command) of ACM.

Arcserve Backup automatically starts the backup job of each generation at a fixed interval.

The full backup verification method is shown below.

Backup	Backup Method		LT0	Remark
Generation	Production volume \rightarrow Backup volume	Backup volume \rightarrow LTO tape cartridge	media	
			name	
1st generation	Execute QuickOPC with swsrpmake	Start backup job #1 of Arcserve Backup	FULL001	Backup jobs of Arcserve Backup start automatically at a
_	_	(full backup)		fixed interval.
2nd generation	Execute QuickOPC with swsrpmake	Start backup job #2 of Arcserve Backup	FULL002	
_	_	(full backup)		
3rd generation	Execute QuickOPC with swsrpmake	Start backup job #3 of Arcserve Backup	FULL003	
_	_	(full backup)		

Table 3-1 Full Backup Verification Method

Incremental backup verification

Verification of an incremental backup consists of backing up the production volume to the backup volume and then backing up the backup volume to the LTO tape unit, but only the differential data from the last backup, with a backup job of Arcserve Backup. To back up the production volume, execute QuickOPC with **swsrpmake** of ACM.

Arcserve Backup automatically starts the backup job of each generation at a fixed interval.

The incremental backup verification method is shown below.

Backup	Backup Method		LTO	Remark
Generation	Production volume \rightarrow Backup volume Backup volume \rightarrow LTO tape cartridge		media	
			name	
1st generation	Execute QuickOPC with swsrpmake	Start backup job #1 of Arcserve Backup	INC001	Backup jobs of Arcserve Backup start automatically at a
_	_	(incremental backup)		fixed interval.
2nd generation	Execute QuickOPC with swsrpmake	Start backup job #2 of Arcserve Backup	INC002	
		(incremental backup)		
3rd generation	Execute QuickOPC with swsrpmake	Start backup job #3 of Arcserve Backup	INC003	
		(incremental backup)		

 Table 3-2 Incremental Backup Verification Method

Restore verification

Verification of a restore consists of restoring data from the LTO tape cartridge, which is the full backup data of the second generation, to the backup volume with Arcserve Backup.

To restore data from the backup volume to the production volume, execute OPC with **swsrpmake** of ACM.

The restore verification method is shown below.

Restore	LTO	Restore Method	Remark	
Generation	media	LTO tape unit \rightarrow Backup volume	Backup volume \rightarrow Production volume	
	name			
Full backup of the 2nd	INC002	Start the restore job by specifying the full backup session of Arcserve Backup	Execute OPC with swsrpmake	Arcserve Backup restore job starts immediately.

Table 3-3 Restore Verification Method

3.2. System Configuration

The system configuration of the verification environment is described below.

Connect the business server, backup server, all-flash array, and tape library via the SAN.

Install ACM agent on the business server.

On the backup server, install ACM Manager/agent and Arcserve Backup Manager.

Use Windows Server 2016 for the OS on both the business server and the backup server.

The system configuration of this verification environment and the list of devices used are shown below.



Figure 3-2 System Configuration Diagram

Model	Remark
PRIMERGY RX2540 M1	Fibre Channel interface × 2
PRIMERGY RX2540 M1	Fibre Channel interface × 2
ETERNUS AF250 S2	Flash storage × 4 (RAID 5)
	Fibre Channel interface × 4
ETERNUS LT20 S2	Tape drive × 1, slot × 8
	Fibre Channel interface × 1
	Model PRIMERGY RX2540 M1 PRIMERGY RX2540 M1 ETERNUS AF250 S2 ETERNUS LT20 S2

Table 3-4 Device List

The management LAN and operation terminals are omitted from the diagram. The business server, backup server, all-flash array, and tape library must be connected via the same management LAN. A Fibre Channel switch connected to the SAN is also required.

A FIDRE Channel switch connected to the SAN is also require

Software and licenses

- Windows Server 2016 × 2 licenses (for the business server and backup server)
- Arcserve Backup r17.5^{*} for Windows × 1 license
- ETERNUS SF Storage Cruiser Standard Edition 16 Tier1 × 1 license
- ETERNUS SF AdvancedCopy Manager Standard Edition 16 Tier1 × 1 license
- *Arcserve Backup 17.5 SP1 must be applied to use LTO8.

3.3. System Construction

An overview of the system construction is described below.

SAN connection

Connect each device to the Fibre Channel switch to enable communication between the business server and the all-flash array, between the backup server and the tape library. In an actual environment, zoning is set in the Fibre Channel switch according to security requirements.

<u>All-flash array</u>

For the all-flash array, configure a RAID with flash memory and assign the production volume and backup volume used by the business server to the RAID. Assign the same size for the production volume and the backup volume.

Format the production volume from the business server and assign a drive letter. The backup volume must be visible from the backup server.

To perform a copy using the functions of ETERNUS with ACM, create a software role account and register the following licenses in the ETERNUS using ETERNUS Web GUI.

- ETERNUS SF Storage Cruiser Standard Edition license

- ETERNUS SF AdvancedCopy Manager Standard Edition license

<u>Tape library</u>

In the tape library, insert six tape cartridges (LTO) and a cleaning tape cartridge.

ACM installation and initial settings

On the backup server, perform a standard installation of ACM Manager and ACM agent. Perform a standard installation of ACM agent on the business server. On the Windows Server 2016 backup server, create a user account for ETERNUS SF Storage Cruiser.

Arcserve Backup installation and initial settings

On the backup server, perform a standard installation of Arcserve Backup Manager.

No additional configuration is required for Arcserve Backup other than the installation. Arcserve Backup will automatically recognize the backup volume and tape library.

List of system setting values

The following table shows the system setting values for the verification environment. The following values are used for backups/restores with ACM and Arcserve Backup.

Item	Target	Setting Value	Remark
Windows computer name for	Business server	GYOM01	
the verification server	Backup server	MGRSV01	
Volume name	Production volume	g1d2p1	Mount the volume in the business server and assign it with driver letter (E:)
	Backup volume	g1d4p1	Mount the volume in the backup server and
			assign it with drive letter (J:)

Table 3-5 List of System Setting Values

List of backup job setting values of Arcserve Backup

The following table shows the backup job setting values used for Arcserve Backup verifications.

ltem	Target Job	Setting Value			Remark
		Job Name	Target Folder	Backup Destination Slot Media Name	
Backup job	Full backup 1st generation Full backup 2nd generation	Full_Backup1 Full_Backup2	J:\backup	Slot: 1 FULL001 Slot: 3 FULL002	On the Backup screen, click the Schedule tab and then select Full (Clear Archive Bit) as the backup method.
	Full backup 3rd generation	Full_Backup3		Slot: 5 FULL003	Overwrite same media name, or blank media for First backup media.
	Incremental backup 1st generation	Inc_Backup1		Slot: 2 INC001	On the Backup screen, click the Schedule tab and then select Incremental as the backup method.
	Incremental backup 2nd generation	Inc_Backup2		Slot: 4 INC002	On the Global Options screen, select Append to media for First backup media.
	Incremental backup 3rd generation	Inc_Backup3		Slot: 6 INC003	

Table 3-6 Backup Job Setting Values of Arcserve Backup

3.4. Verification Procedure

3.4.1. Backup Verification Procedure

This section describes the backup verification procedure using ACM and Arcserve Backup.

3.4.1.1. Configuration of ACM

(1) Check the device name

On ETERNUS SF Web Console, confirm the device names of the business server (GYOM01) and backup server (MGRSV01). Click **Server** on the **Global Navigation** tab of ETERNUS SF Web Console.

Correlation Correlation Correlation					Filter		Server Register Delete Modity
Correlation VMware vCenter Server Correlation UList of servers. Filter Setting Setections: 0			_		Filter		+ Register X Delete Modify
Correlation Filter Setting Selections. 0					Filter		X Modify
Selections. 0					Filter		
Selections. 0						Clear	Reset Password
		Total 2	records << < 1/1 pag	es > >> 1	page Go Display 10	✓ records	Backup Wizard:
			lo.	VMware			for Exchange Server for SQL Server
Name IP A	Address OS	OS Version	IBA Server Type	Host IP Address	Function Level	Status	Restore Wizard:
GYOM01 192	2.168.0.200 Windows2016	-	2 Stand-alone	14	AdvancedCopy Manager	Normal	for SQL Server
MGRSV01 192	2.168.0.201 Windows2016	•	2 Stand-alone		AdvancedCopy Manager	Normal	

On the main pane of the Overview screen, click GYOM01 under the **Name** column of the operation target server, then click **Device** in the **Category** pane and check the device name of the business server.

TERNUS SF	Dashboard User ID : e	sfroot <u>Loqout</u> FUjiTSU
Normal 🔤 🛇 1		0 .
tain Storage Network	Server Map View Scheduler Log System	
GYOM01	Device	→ Action
Cverview	▼ Information	Devices:
Volume	(j) List of the Disk Array Devices.	🙀 Discover/Reload
Advanced Copy	▶ Filter Setting	×
Correlation	Filter Clear	
	Selections: 0 Total 1 records << < 1/1 page Go Display 10 v records	If the device name is not displayed, click
	Device Name Block Device Name Point System Type Size ETERNUS Name Box ID	Discover/Reload.
	g1d2p1_disk1p1_E: NTFS_Disk/Partition/Slice_500.00 GB2	
Job Status		

On the main pane, click MGRSV01 under the **Name** column of the operation target server, then click **Device** in the **Category** pane and check the device name of the backup server.



(2) Set the source and destination volumes

Set the source and destination volumes to be used for backups.

Execute **swsrpsetvol** (replication volume information setting command) from the command prompt of the backup server, set the device name g1d2p1 as the source volume (business server) and the device name g2d4p1 as the destination volume (backup server).

C:¥>C:¥ETERNUS_SF¥ACM¥bin¥swsrpsetvol -n -o ORG -u gld2pl@GYOMO1 g2d4p1 swsrpsetvol completed

Execute **swsrpvolinfo** (replication volume information display command) to confirm the settings.

C:¥>C:¥ETERNUS_SF¥ACM¥bin¥swsrpvolinfo -h GYOM01 Server OriginaT-Volume Size Replica-Volume Size Copy Op-Server GYOM01 g1d2p1@GYOM01 499.9 Gbyte g2d4p1@MGRSV01 599.8 Gbyte uni-direction original

3.4.1.2. Backup Job Settings of Arcserve Backup

Arcserve Backup will set up backup jobs according to the navigation on the Backup Manager screen.

(1) Set a backup job to perform a full backup

Select **Backup Manager** on the Home screen of Arcserve Backup. In Backup Manager, perform the settings in the following order: **Start**, **Source**, **Schedule**, and **Destination**. In the **Start** tab, select **Normal backup** as the backup type.



In the left pane of the **Source** tab, select the folder to be backed up from the tree.

HT Arcserve Backup - [Backup]			<u>5.4</u>	
属 File Quick Start View Backup Window He	lp.			- 8 ×
Jab Tape DB MGRSV01	Submit Options Filter V	انوس 🗸		
Group View Customize Group	Sérver Name:	Subnet × × ×	Agent Type Update	Reset
Client Agent MGRSV01 (0.0.0.0) C: D: D: D: D: D: D: D: D: D: D	Name 🔺	Type File Folder	Size Last Modified Date 6/26/18 12:08 PM	Creation Dat 6/26/18 12:1
Support Nicrosoft SharePoint Server Cracle Server Cracle Server Sybac Server NAS Agent NAS Agent Cher Applications Arcserve Replication Scenarios Arcserve UDP Agent for Windows v Cher Application Scenarios	k backup	Properties Additional Information Path Directory Name	\\MGRSV01\D: backup	, , , , , , , , , , , , , , , , , , ,
	Default Server:MGRSV01	Domain: MGRSV01 Logged or	n: MGRSV01¥Administrator	2:41 PM

In the **Schedule** tab, set the repeat method and the backup method. Select **Custom Schedule** and set the repeat method to **Every** and **Every 6 Hour(s)**. For full backups, select **Full (Clear Archive Bit)** as the backup method. The following shows the **Schedule** to perform full backups.

🗰 Arcserve Backup - [Backup]			-	
🟓 File Quick Start View Backup Windo	ow Help			- 8 ×
MGRSV01 Set	Submit Options Filter	View -		
Start > Source > Schedule ~	Destination >			
Custom Schedule Use Rotatio	on Scheme			î
Repeat Method Every ~	~			-
Every 6 🗘 Hour(s) V				
Append6© day(s)				
Backup Method				
O Full (Keep Archive Bit)				
Full (Clear Archive Bit)				
O Incremental O Differential				
	D. C. N.C. MODOLAI			~

In the **Destination** tab, select the backup destination medium.

In the left pane, select the device group (PGRPO); and on the main pane, select the tape cartridge of the backup destination from the displayed slots.

Assign a name to an unformatted media. Enter the name in the **Media** field to format it during job execution. Refer to "Table 3-6 Backup Job Setting Values of Arcserve Backup" for the media name of each job.

The following screenshot shows that "FULL001" is specified as the media name.

-	Arcserve Backup - [Backup]				– 🗆 🗙
2	File QuickStart View Backup Window Help				_ <i>8</i> ×
Navi	MGRSV01 Sub Tape DB Subm	t Options Filter	🔯 🗸 View		
gat	Start > Source > Schedule > Destination				
ion Bar	Multietreaming Max Number of Streams 4	Use Any Group Group PGRP0	Media:	FULL001	
	Servers MGRSV01 MGRSV0 MGRSV MGRSV01 MGRSV01 MGRSV01 MGRSV01 MGRSV01 MGRSV0	o not show empty slo ULL001 ULL002 NC002 ULL003 NC003 <lt0066l8> FUI</lt0066l8>	LLOO1		^
	Connections	Media Infor	mation		
Sut	Devices	Sequence No.		1	
bo	m Manage Disk-based	ID		B7F7	
Ŧ	Devices	Write Protect		No	
	Manage Device	Media Pool Serial No		BACKUP01	×
	Groups	Senar No.		LIGODOLO	
	Default S	erver:MGRSV01	Domain: MGRSV01	Logged on: MGRSVU1¥Administrator	11:59 AM

Set the options for the backup. Select the **Options** button at the top of the Backup Manager screen to display the Global Options screen. In the **Backup Media** tab, select **Overwrite same media name, or blank media** for **First backup media** and then click the **OK** button. For full backups, select to overwrite the media.

	Adva	nced	Volume S	hadow Copy S	ervice	Enc	ryption/Comp	ession
Backup Media	Verification	Retry	Operation	Pre/Post	Agent Op	tions	Job Log	Alert
The following opti migration stage. If you are using a and the Additiona First backup med O Append to n O Overwrite s	ons let you contri rotation scheme, I backup media o la media ame media name	the rotation ptions spec	rvie Backup m rules specified fied below.	nenages media	during the ba	ckup sta	age and the	a
Overwrite s	ame media name	, or blank m	edia first, and t	then any media				
Timeout:	5	Minute(5)		J			

After all the settings are completed, click the **Submit** button.

III Arcserve Backup - [Backup]		<u></u>	□ ×
🙈 File Quick Start View Backup Window Help			- 8 ×
MGRSV01 Submit	Options Filter View		
Start > Source > Schedule > Destination	un/Schedule		
Multistreaming Max Number of Streams 4	Use Any Group Media: aroup PGRP0 Media pool:	FULL001	
□ ⊕ Servers Current Filter (Default): Do To □ ⊕ MGRSV01 □ ≤lot: 1 > <lt0066l8> FULL □ ≤ Slot: 2 > <lt0067l8> INCC □ ≤ Slot: 3 > <lt0068l8> FULL □ ≤ Slot: 5 > <lt0070l8> FULL □ ≤ Slot: 6 > <lt0071l8> INCC □ ≤ Slot: 6 > <lt0071l8> INCC □ ≤ Slot: 1 > <lt0068l8> FULL □ ≤ Slot: 5 > <lt0071l8> INCC □ ≤ Slot: 6 > <lt0071l8> INCC</lt0071l8></lt0071l8></lt0068l8></lt0071l8></lt0071l8></lt0070l8></lt0068l8></lt0067l8></lt0066l8>	ot show empty slots 001 002 002 003 003 003		······ ^
Manage Cloud	Summary Details		
Manage Cloud-based	Media Information		
G Devices	Sequence No.	1	
To Manage Disk-based	ID	B7F7	
Devices	Write Protect	No	
Manage Device	Media Pool	BACKUP01	~ ~
Groups	Serial No.	LTO066L8	
Run/Schedule Job			12:01 PM

The Security and Agent Information screen is displayed. Click the **OK** button.

Please edit or confirm the fo for this job.	llowing security	and agent ir	nformation	ОК
Object	User Name	Password	Agent	Cancel
🚅 MGRSV01(0.0.0.0)	Administrati	*****	<ip>0.0</ip>	Security
				Agent
1			,	Help

The Submit Job screen is displayed.

Set Job Name and Job Execution Time on the Submit Job screen.

In Job Name, set a unique job name that indicates full or incremental backup and the generation.

In **Job Execution Time**, select **Run On** to specify a date and time for each backup generation. By selecting **Run Now**, a backup job can be started immediately after the job is created.

Refer to "Table 3-6 Backup Job Setting Values of Arcserve Backup" for the job names.

Click the **OK** button to create a backup job.

		COD Execution Time
Job Type		O Run Now
Backup		🖲 Run On
Scheduled Job		
Execution time : 6/26/2018		672672018 ~
		2:44:05 PM 🚔
Source Nodes		
		Submit on Hold
MGRSV01 (0.0.0.0) Through Agent		
Destination Node	100	Source Priority
Group Name PGRP0	~	Save Job
bb Name:		Save Template
'ull_backup1		Preflight Check

	Arcserve Backup - [Job Sta	ntus]	,	,	I		o x
1	File Quick Start View	Job Status Window Help					- 5 ×
≈ Navi	MGRSV01	Jeb Tape DB	Modify Resche Stop	Custom Delete	S G Refresh Print	🖋 🗸	
gati	Arcserve Backup	Job Queue 🗸 Job History >	Activity Log > Audit Log	>			
9	MGRSV01	Show jobs with the status:	Active Ready	Hold Waiting	for target 🗹 Done	Update	8
Bar		Job Name Database pruning job Database protection job Full_backup1	Backup Se J ▲ Job ID MGRSV01 1 4 MGRSV01 2	Status READY HOLD ACTIVE	Execution Time 6/27/2018 12:00 PM 6/23/2018 11:00 AM Backing up files	Job Type DB Pruning Backup (R Backup	Last Resul Prinishe
		< Tob Detail Job Log					,
		Job Summary					
		Host Machine		MGRSV01			
		Job Owner		MGRSV01\Admini	strator		
		Owner Password		*******	*		
		Domain Name		MGRSV01			
10		Source Targets					
Ě		MGRSV01		Windows System	Machine		
Po		D:\backup					
구		Destination Target					
		MGR SV01		Windows Machine			~
	< >	Device Group		PGRPO			
		Defau	It Server:MGRSV01 Dor	nain MGRSV01 Logged on: N	/IGRSV01¥Administrator		2:45 PM

You can check the status of the backup job on the Job Status screen. The Job Status screen is displayed from the Job Status menu.

(2) Set a backup job to perform an incremental backup

The settings are performed in the same manner as a full backup. Start **Backup Manager** and then perform the settings in the following order: Start, Source, Schedule, and Destination.

Incremental backups use methods that are different from full backups to back up data and to add or overwrite media. The following sections describe the settings that are different from full backups. For other procedures, refer to "(1) Set a backup job to perform a full backup".

In the **Schedule** tab of the Backup screen, select **Incremental** as the backup method.

Hrcserve Backup - [Backup]			-	
属 File Quick Start View Backup Window	Help			- 8 ×
→ Job Tape D MGRSV01	Submit Options Filter	View -		
Start > Source > Schedule ~	Destination >			
Custom Schedule Use Rotation	Scheme			
Support Backup Method Full (Keep Archive Bit) Full (Clear Archive Bit) Full (Clear Archive Bit) Incremental				
	Default Server:MGRSV01	Domain: MGRSV01 Logged on: MGRSV01WAdministrator		11:47 AM

In the **Backup Media** tab of the Global Options screen, select **Append to media** for **First backup media**.

Backup Media Verfication Retry Operation Pre/Post Agent Options Job Log Alert The following options let you control how Arcserve Backup manages media during the backup stage and the migration stage. If you are using a rotation scheme, the rotation rules specified for the scheme will override the First backup media and the Additional backup media options specified below. First backup media Image: Control how Arcserve Backup media options specified below. First backup media Image: Control how Arcserve Backup media options specified below. First backup media Image: Control how Arcserve Backup media options specified below. First backup media Image: Control how Arcserve Backup media options specified below. First backup media Image: Control how Arcserve Backup media Overwrite same media name, or blank media Image: Control how Arcserve Backup media Image: Control how Arcserve Backup media first, and then any media Image: Control how Arcserve Backup media Overwrite same media name, or blank media Overwrite same media name, or blank media Overwrite same media name, or blank media first, and then any media Image: Control how Arcserve Backup Minute(s) Image: Control how Arcserve Backup Minute(s) Image: Minute(s) Image: Control how Arcserve Backup Minute(s) Image: Contrewrite Backup Minute(s) Ima	Media Exporting	Adv.	anced	Volume	Shadow Copy S	ervice	Encryption/Comp	ression
The following options let you control how Arcserve Backup manages media during the backup stage and the first backup media and the Additional backup media options specified below. First backup media Append to media Overwrite same media name, or blank media Minute(s) 	lackup Media	Venfication	Retry	Operation	Pre/Post	Agent Options	Job Log	Alert
	The following opu migration stage. If you are using a and the Additiona First backup med	ions let you cont i rotation scheme il backup media dia	rol how Ard	cserve backup on rules specifi ecified below.	manages meana ed for the schem	during the backup) stage and the First backup med	ia
Overwrite same media name, or blank media Overwrite same media name, or blank media first, and then any media Imeout: 5 Additional backup media @ Overwrite same media name, or blank media Overwrite same media name, or blank media first, and then any media Trmeout: €0 Minute(s) Minute(s) Distinguish media by name only	Append to	media						
 Overwrite same media name, or blank media first, and then any media Timeout: 5 Minute(s) Additional backup media Overwrite same media name, or blank media Overwrite same media name, or blank media first, and then any media Timeout: 60 Minute(s) Minute(s) ✓ Distinguish media by name only 	Overwrite s	same media nam	e, or blank	media				
Imeout: 5 Minute(s) Additional backup media Image: State of the same media name, or blank media Image: State of the same media name, or blank media first, and then any media Image: Timeout: 60 Minute(s) Image: Distinguish media by name only	Overwrite s	same media nam	e, or blank	media first, and	then any media	ť.		
Additional backup media Overwrite same media name, or blank media Overwrite same media name, or blank media first, and then any media Timeout: 60 Minute(s) Distinguish media by name only	Timeout:	5	Minut	e(s)				
Additional backup media Overwrite same media name, or blank media Overwrite same media name, or blank media first, and then any media Timeout: 0000 Minute(s) Distinguish media by name only	• Life - al basis							
Overwrite same media name, or blank media first, and then any media Overwrite same media name, or blank media first, and then any media Trmeout: 60	Additional backu	ip media	- as black					
Overwrite same media name, or blank media trist, and unen any media Timeout: 60 \$\overwrite media by name only Distinguish media by name only	Overwrite s	Jame media nam	e, or blank	media first and	d there are small as			
☐ Timeout: 60,‡ Minute(s) ☑ Distinguish media by name only	O Overwrite s	ame media nam	e, or blank	media first, and	then any media	1		
Distinguish media by name only			12110					
	Distinguish	media by name	Minut only	te(s)				

The following Job Status screen is displayed after an incremental backup job is added to a full backup job.

🖬 4 🔊 F	Arcserve Backup - [Job Sta File Quick Start View	tus] Job Status Window Help						-	×			
≈ Nav	MGRSV01	Job Tape DB	Modify Re	sche	Custom D	elete Refresh	Print -	and the second s				
igati	Arcserve Backup	Job Queue 👽 Job History	Activity Log	> Audit Log	>							
9	MGRSV01	Show jobs with the status:	Active	Ready	Hold (Waiting for target	Done	Update	8			
Bar		Job Name	Backup Se	J 🛋 Job ID	Status	Execution T	ime	Job Type	Last Result			
		🕙 Database pruning job	MGRSV01	1 4	I> READY	6/27/2018	12:00 PM	DB Pruning	Finishe			
		Database protection job	MGRSV01	2	HOLD	6/23/2018	11:00 AM	Backup (R				
		Full_backup1	MGRSV01	3 9	HOLD	6/27/2018	2:10 PM	Backup	_			
		Inc Backup1	MGRSV01	5	READY	6/27/2018	3:10 PM	Backup				
		Job Detail Job Log							*			
		Backup to Media										
		Host Machine	MGRSV0	MGRSV01								
		Job Owner			MGRSVO	MGRSV01\Administrator						
		Owner Password										
_		Domain Name			MGRSV0	1						
S		Source Targets										
Ð		MGRSV01	Windows System Machine									
Po		D:\backup										
7		Destination Target										
		MGRSV01			Windows	Machine			~			
	< >>	Device Group Defa	It Server:MGRS	/01 Dor	PGRP0 nain: MGRSV01 Lo	cced on: MGRSV01¥A	dministrator		2:45 PM			

(3) Job status after backup jobs are set

	Arcserve Backup - [Job Status] File Quick Start View Job Sta	tus Window Heln			J - - - -			2)	
Nav	MGRSV01	Jab Tape DB O O O O Load Model	fy Resche	(a) Stop C	ustom Del	ete Refresh	🚔 🔹 🦨 🗸		
igati	Arcserve Backup Domain	Job Queue 🗸 Job History 🗧	Activity Los	> Audit L	.oz >				
Si E	MGRSV01	Show jobs with the status:	Active	Ready	Hold	<u>₩</u> aiting for t	arget 🗹 Done 🛛 Upda	te	8
ã		Job Name	Backup Se	Job No. 🔺	Job ID	Status	Execution Time	Job Type	Last Result
_		Patabase pruning job	MGRSV01	1	4	READY	6/27/2018 12:00 PM	DB Pruni	Finished
		Full backup1	MGRSV01	3	13	READY	6/27/2018 4:10 PM	Backup [Finished
		Mainc_Backup1	MGRSV01	6	43	READY	6/27/2018 10:10 AM	Backup	Finished
		Full_Backup2	MGRSV01	7	15	READY	6/27/2018 5:10 PM	Backup	Finished
		Mainc_Backup2	MGRSV01	8	45	READY	6/27/2018 11:10 AM	Backup	Finished
		Full_Backup3	MGRSV01	9	17	READY	6/27/2018 6:10 PM	Backup	Finished
		Pelinc_Backup3	MGRSV01	10	41	READY	6/27/2018 9:10 AM	Backup	Finished
		<							2
		lob Detail Job Log							
		Job Detail							^
Support									
									~
	< >>	J	Default Server	MGRSV01	Domain M	IGRSV01 Logged on:	MGRSV01¥Administrator		8:28 AM

For verification, create jobs with three generations of full backups and incremental backups. The following Job Status screen is displayed after all the jobs are configured.

Set backup jobs according to the actual operation. Examples of actual operations are as follows: operations that require alternating full backups and incremental backups with various generations on a weekly basis, operations that require reusing the same media, and operations that require removing media from the tape unit every week or every month and storing it in a storeroom for one year. In addition, media has different life expectancies depending on the use count and the used environment. If the same media is reused, regular replacement of the media should be planned according to the operations requirements.

The following example shows backup jobs for acquiring three generations of backups where weekly full backups and daily incremental backups are performed with one week being regarded as a single generation. In the fourth week, the job for the first generation is executed and the media is overwritten.

Week: Generation	Job Name	Execution	Media	Target	Backup	Write to Backup	Schedule	Submit Job
		Day of Week	Name	Folder	Method	Media	(job execution	Run On
					(Pages 16	(Pages 17 and 20)	interval)	(Page 18)
					and 19)		(Pages 16 and 19)	
1st week: 1st	full_Backup1	Sunday	FULL001	J\backup	Full*2	Overwrite*3	Three weeks	9/2 1:00
generation	inc_Backup1_mon	Monday	INC001		Incremental	Overwrite*3	Three weeks	9/3 1:00
	inc_Backup1_tue	Tuesday				Append to media	Three weeks	9/4 1:00
	inc_Backup1_wed	Wednesday					Three weeks	9/5 1:00
	inc_Backup1_thr	Thursday					Three weeks	9/6 1:00
	inc_Backup1_fri	Friday					Three weeks	9/7 1:00
	inc_Backup1_sat	Saturday					Three weeks	9/8 1:00
2nd week: 2nd	full_Backup2	Sunday	FULL002		Full*2	Overwrite*3	Three weeks	9/9 1:00
generation	inc_Backup2_mon	Monday	INC002		Incremental	Overwrite*3	Three weeks	9/10 1:00
	inc_Backup2_tue	Tuesday				Append to media	Three weeks	9/11 1:00
	inc_Backup2_wed	Wednesday					Three weeks	9/12 1:00
	inc_Backup2_thr	Thursday					Three weeks	9/13 1:00
	inc_Backup2_fri	Friday					Three weeks	9/14 1:00
	inc_Backup2_sat	Saturday					Three weeks	9/15 1:00
3rd week: 3rd	full_Backup3	Sunday	FULL003		Full*2	Overwrite*3	Three weeks	9/16 1:00
generation	inc_Backup3_mon	Monday	INC003		Incremental	Overwrite*3	Three weeks	9/17 1:00
	inc_Backup3_tue	Tuesday				Append to media	Three weeks	9/18 1:00
	inc_Backup3_wed	Wednesday					Three weeks	9/19 1:00
	inc_Backup3_thr	Thursday					Three weeks	9/20 1:00
	inc_Backup3_fri	Friday					Three weeks	9/21 1:00
	inc_Backup3_sat	Saturday					Three weeks	9/22 1:00

Table 3-7 Setting Example of a Three Generation Backup with Full and Incremental Backups

*2 Select either Full (Keep Archive Bit) or Full (Clear Archive Bit).

*3 Select Overwrite same media name, or blank media.

3.4.1.3. ACM Backup Execution

(1) Check the backup volume name

Check the name of the backup volume (J:) on the OS.

From the command prompt of the backup server, execute the **mountvol /L** command. C:¥>mountvol J:¥ /L

Confirm that the volume name is displayed. The volume name is used to mount the backup volume (J:).

(2) Unmount the backup volume

Before performing a backup with ACM, unmount the backup volume (J:) from the backup server to prevent access to the backup volume. From the command prompt of the backup server, execute the **mountvol** /P command.

C:¥>mountvo∣	J:¥	/P		I	,				
C:¥>									

(3) Execute a backup

From the command prompt of the backup server, execute **swsrpmake** to perform a backup from the source volume (g1d2p1) to the destination volume (g2d4p1).

The -I option of swsrpmake specifies QuickOPC.	
C:¥> C:¥>C:¥ETERNUS SF¥ACM¥bin¥swsrpmake -h GYOMO1 -T g1d2p1@GYOMO1 g2d4p1@MGRSV01 FROM=g1d2p1@GYOMO1, TO=g2d4p1@MGRSV01 swsrpmake completed	
Ç:¥>	
After everyting the command mount the hedrin values	

After executing the command, mount the backup volume.

(4) Check the progress of the backup

Check the progress of the backup by executing **swsrpstat** (operation status display command).

You can check the progress of the replication under the **Execute** column.

C:¥C:¥ETERNUS_SF¥ACM¥bin¥swsrpstat -h GYOM01 -L g1d2p1@GYOM01 Server OriginaT-Volume Replica-Volume Direction Status Execute Trk Update Rcv Split Xfer Snap-Gen GYOM01 g1d2p1@GYOM01 g2d4p1@MGRSY01 regular snap 97% on ---- ---- ----

When the backup is completed, the **Status** and **Execute** columns become "----".

C:¥C:¥ETERNUS_SF¥ACM¥bin¥swsrpstat -h GYOM01 -L g1d2p1@GYOM01 Server OriginaT-Volume Replica-Volume Direction Status Execute Trk Update Rcv Split Xfer Snap-Gen GYOM01 g1d2p1@GYOM01 g2d4p1@MGRSV01 regular ---- on 0% ---- ----

*For incremental backups with Arcserve Backup, the files marked with the archive file attribute are backed up.

Clear the attribute after a backup is performed.

Therefore, in order to perform an incremental backup after a backup is performed with ACM, clear the archive attribute of the source volume from the command prompt of the business server by executing the **attrib** command.

The following example shows that the archive attribute of all the files in "E:¥backup¥" is cleared using the **attrib** command.

C:¥>attrib -A E:¥backup¥*.* /S

C:¥>

Note that the **attrib** command cannot clear the archive attribute of hidden files such as system files. Therefore, hidden files are always backed up.

(5) Mount the backup volume

From the command prompt of the backup server, execute the **mountvol** command to mount the destination volume (g2d4p1) as the backup volume (J:).

Specify the driver letter (J:) and the volume name checked in "(1) Check the backup volume name" for the options of the mountvol commar	nd.
C:¥>mountvol J:¥ ¥¥?¥Volume{xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx}}¥	
C:¥>_	

The items checked for the first backup are "(1) Check the backup volume name" and "(4) Check the progress of the backup". For the second and subsequent backups, perform "(2) Unmount the backup volume", "(3) Execute a backup", and "(5) Mount the backup volume". For incremental backups, execute the **attrib** command and then perform "(5) Mount the backup volume".

3.4.1.4. Verification of the Backup Results

Check the result of the jobs set in the backup job settings of Arcserve Backup. Select the Job Status menu to display the Job Status screen. Check that "Finished" is displayed in the Last Result column

circo			c cordinini.						
	Arcserve Backup - [Job Status]							- 0	×
1	File Quick Start View Job Stat	tus Window Help							- 5 ×
» N	MGRSV01	Jab Tape DB	TC.	(a)	tion Dalut	Pafrash	🖨 🕳 🦨 🗸		
AK.		Load Modif	y Resurie	Stup G	usiom Deleo	Refresh	Princ Log		
gatio	Arcserve Backup Domain Arcserve Backup Domain Arcserve Backup Domain	Job Queue 💛 Job History >	Activity Log	> Audit L	oe >				
E E	MGRSV01	Show jobs with the status:	🗹 Acti <u>v</u> e	Ready	Hold	₩aiting for t	arget 🗹 Done 🛛 Update		8
ar		Job Name	Backup Se	Job No. 🔺	Job ID	Status	Execution Time	Job Type La	st Result
		Natabase pruning job	MGRSV01	1	4	READY	6/27/2018 12:00 PM	DB Pruni 🕄	Finished
		Matabase protection job	MGRSV01	2		HOLD	6/23/2018 11:00 AM	Backup (
		PE Full_backup1	MGRSV01	3	13	READY	6/27/2018 4:10 PM	Backup 😣	Finished
		Mainc_Backup1	MGRSV01	6	43	READY	6/27/2018 10:10 AM	Backup	Finished
		Full_Backup2	MGRSV01	7	15	READY	6/27/2018 5:10 PM	Backup 😱	Finished
		Mainc_Backup2	MGRSV01	8	45	READY	6/27/2018 11:10 AM	Backup 🔅	Finished
		Full_Backup3	MGRSV01	9	17	READY	6/27/2018 6:10 PM	Backup 🕘	Finished
		Mainc_Backup3	MGRSV01	10	41	READY	6/27/2018 9:10 AM	Backup 😱	Finished
									>
		Job Detail Job Log							
REAL									
S									
들									
õ									
+									
									~
			Default Server	MGRSV01	Domain: MG	RSV01 Logged on:	MGRS\/01¥Administrator	8	28 AM
			Derdant Derver	manovur	Dottigin Mai	TO YOT LOEBED OIL	incirios or Frantinis (alor		20 100

3.4.2. Restore Verification Procedure

This section describes the restore verification procedure using ACM and Arcserve Backup.

3.4.2.1. Restore Job Settings of Arcserve Backup As preparation, empty the restore destination folder in Windows Explorer.

← → → ↑ 📙 → This PC →	New Volume (D:) > backup		v Ö	Search backup	م
 Quick access This PC C on CONNECTION2 Desktop Documents Downloads E on CONNECTION2 Music Pictures Videos Local Disk (C;) New Volume (D;) Vetwork 	Name	Date modified This folder is em	Type pty.	Size	
0 items					1823 F

Arcserve Backup will set the restore job according to the navigation on the Restore Manager screen and then execute a restore. Select **Restore Manager** on the Home screen of Arcserve Backup to display the restore screen. On the Restore screen, perform the settings in the following order: **Source**, **Destination**, and **Schedule**.

In the **Source** tab, select the session to be restored.

	Arcserve Backup - [Restore]			– 🗆 🗙
3	File Quick Start View Restore Window Help			_ & ×
Navigati	MGRSV01 Jub Tays DB Submit Submit Filter Source Destination Schedule Schedule Schedule	View -		
8	Restore by Session			
Bar	Media Name: Date: Last 🛩	14 🖶 Davis) 🛄 🛄 🛄	date Reget	
	Sessions Name Image: Sessions Sessions Image: Sesions <t< th=""><th>Type File Fold File Fold tore Manager (Session Metho Properties</th><th>Size Lest Modified Date 6/26/18 12:08 PM ler 6/27/18 10:16 AM</th><th>^</th></t<>	Type File Fold File Fold tore Manager (Session Metho Properties	Size Lest Modified Date 6/26/18 12:08 PM ler 6/27/18 10:16 AM	^
		Additional Informa	tion	
		Media Name	FULL002[S/N:LTO068L8]	
		ID	119F	
		Sequence No.	1	
S		Session No.	1	
Pp		Backed Up On	6/27/18 11:12 AM	
9		Source Path	D:\backup	
+		Session Status	Finished	
		Session Type	NTFS	\sim
		Session Method	Full (Clear Archive Bit)	
	Default	Server:MGRSV01 Domain: MGR	SV01 Logged on: MGRSV01¥Administrator	2:08 PM

In the **Destination** tab, confirm that the **Restore files to their original location(s)** check box is selected.

-	Arcserve Backup - [Restore]					- 🗆 🗙
2	File Quick Start View Restore Window Help					- 5 ×
Navig	MGRSV01 Jub Teser DO Submit	Options Filter View				
atio	Source > Destination > Schedule >					
	Restore files to their original location(s)			1.0	- time from	
Ĩ	(Uliginal Location)			<u> </u>	esti faiti to	
	Nestore files to their original location(s)	Name 🔺	Туре	Size	Last Modified Date	Creation Date
			There are no items to o	display in this view	w.	
		Restore Manager				<u>^</u>
Support						
						~
	2	Default Server:MGRSV01	Domain MGRSVII Lo	gged on: MGRS	V01¥Administrator	2:08 PM

Arcserve Backup - [Restore]	-	
Rile QuickStart View Restore Window Help		- 8 ×
MGR3V01 Jab Taree DB Submit Options Filter View Source > Destination > Schedule V		
ion Ba		^
Regreat Method Dince		
		- 1
		- 1
Subboul		
Run/Schedule Job		2:11 PM

In the Schedule tab, confirm that the Repeat Method is set to "Once".

Click the **Submit** button at the top of the Restore Manager screen. The Restore Media screen is displayed. Confirm that the medium to be restored is correct and then click the **OK** button.

	Serial No.	Sequence No.	Session No.	Accessible Servers	
FULL002 [119F]	LT0068L8	0001	0001	MGRSV01	
ease choose a server wh	ere you want to do a re	estore from			
lease choose a server wh 4GRSV01	iere you want to do a re	estore from			

The Session User Name and Password screen is displayed. Click the **OK** button.

Session	n User Name and Passy	word			×
For ea - User - Sess - IP Ar Mac	ach tape session, enter: Name and Password for sion Password for passwo ddress for agent restore o hine	the destination. ord-protected tape only.	sessions only.		
8	Media	S/N	Session No.	Path	User N
	FULL002 [119F]	LTO068L8	0001	¥¥MGRSV01¥D:¥b	Administra
<			_		>
				1 276 5	
		Cancel	Edit	Help	

The Submit Job screen is displayed.

Set **Job Name** and **Job Execution Time** on the Submit Job screen. In **Job Name**, set the automatically entered value or enter a value.

In Job Execution Time, select Run Now or select Run On to specify a date and time.

Click the **OK** button to create the restore job.

Job Type	
Restore Run Now Job <u>Destination Node</u> ¥¥MGRSV01¥D:¥backup Through Agent	Run Now Run On 6/27/2018 2:11:55 PM Submit on Hold
	Save Job
Name:	Save Template

On the lob Status screen, check the restore job execution status.

Arcserve Backup - [Job Status] - □ × If lie Quick Start View Job Status Window Help - □ × Image: Status View Job Status Window Help - □ × Image: Status View Job Status Window Help - □ × Image: Status View Job Status Window Help - □ × Image: Status View Job Status Window Help - □ × Image: Status View Job Status Window Help - □ × Image: Status View Job Status Window Help - □ × Image: Status View Job Status View Job Status View Job History > Activity Log > Audit Log > - □ × Image: Status View Job Status View Job Status View Job Status View Job No: A Job ID Status Execution Time Job Type Last Result DB Punul ③ Finished Backup Status View Job No: A Job ID Status Execution Time Job Type Last Result DB Punul ④ Finished Backup I Image: Status Provide View Job Status Provide View Job No: A Job ID Status Execution Time Job Type Last Result DB Punul ④ Finished Backup I MGRSV01 2 Image: Provide View Job No: A Job ID Status Execution Time Job Type Last Result DB Punul ④ Finished Backup I MGRSV01 3 57 FEADY 6/22/2018 11:00 AM Backup I Status Punul ④ Finished Backup I Finishe
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Show jobs with the status: Active Ready Hold Waiting for target Done Update Job Name Backup Se Job No. Job ID Status Execution Time Job Type Last Result Job Database pruning job MGRSV01 1 52 FREADY 6/28/2018 12:00 PM DB Pruni Finished Database protection job MGRSV01 2 If HOLD 6/23/2018 11:00 AM Backup (Full_backup1 MGRSV01 3 57 FREADY 6/27/2018 4:10 PM Backup (Full_backup2 MGRSV01 7 50 If HOLD 6/27/2018 2:10 PM Backup (Full_backup2 MGRSV01 9 53 If HOLD 6/27/2018 2:10 PM Backup (Full_Backup2 MGRSV01 9 53 If HOLD 6/27/2018 2:10 PM Backup (Full_Backup2 MGRSV01 16 59 97% Restoring files Restore V Job Log Job Log Job Log Job Log Job Log Job Log <
Job Name Backup Se Job No △ Job ID Status Execution Time Job Type Last Result Database pruning job MGRSV01 1 52 ▲ READY 6/28/2018 12:00 PM DB Pruni ④ Bruni ④ Finished Database protection job MGRSV01 2 ▲ HOLD 6/28/2018 11:00 AM Backup (Comparison MGRSV01 3 57 ▲ READY 6/27/2018 4:10 PM Backup ④ Finished Comparison MGRSV01 7 50 ■ HOLD 6/27/2018 2:10 PM Backup ④ Finished Comparison MGRSV01 9 53 ■ HOLD 6/27/2018 2:10 PM Backup ④ Finished Comparison MGRSV01 9 53 ■ HOLD 6/27/2018 2:10 PM Backup ④ Finished Comparison MGRSV01 16 59 ● 97% Restoring files Restore Comparison NGRSV01 16 59 ● 97% Restoring files Restore
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Kerker Languise Media Required FullL002

Upon completion of the restore, a pop-up is displayed. Check that the restore completion message is displayed and then click OK.



3.4.2.2. Verification of the Restore Results

On the Job Status screen, check that the status of the restore job is displayed as "DONE".

	Arcserve Backup - [Job Status]						– 🗆 X
R Nav	MGRSV01	Jab Tape DB O O O Load Modif	y Resche Stop	Custom	Delete Refresh	Print Log	· - d' >
igatior	Arcserve Backup Domain	Job Queue 👽 Job History >	Activity Log > A	udit Log >			
	MIGKSVUT	Show jobs with the status:	Active Rea	dy V Hole	d Vaiting for	target [V]Done U	pdate
4	1 7	Job Name	Backup Se Job No.		Status	Execution Time	Job Type Last Result
	(🚰 Database pruning job	MGRSV01 1	52	READY	6/28/2018 12:00 PM	DB Pruni 🤤 Finished
1	(Batabase protection job	MGRSV01 2		HOLD	6/23/2018 11:00 AM	Backup (
ļ	(Tull_backup1	MGRSV01 3	57	READY	6/27/2018 4:10 PM	Backup 😨 Finished
ļ	1 7	Tull_Backup2	MGRSV01 7	50	HOLD	6/27/2018 2:10 PM	Backup 😨 Finished
1	(P	Sel Full Backup3	MGRSV01 9	53	HOLD	6/27/2018 3:10 PM	Backup ③ Finished
)	(P	1 Restore on 2018-06-27	MGRSV01 16	59	DONE	<run now=""></run>	Restore 🔍 Finished
		Job Detail Job Log					
	1 7	Job Summary					*
ļ	1 7	Restore from Media					
	6 7	Host Machine			MGRSV01		
60	(7	Job Owner			MGRSV01\Administrate	or	
Ę	(7	Owner Password			*****		
8	(7	Domain Name			MGRSV01		
Ξļ	(7	Source Targets					
	(7	Media Required					
	(< >)	Media Name			FULL002		
			Default Server:MGRSV0	J1 Dom	ain: MGRSV01 Logged o	n: MGRSV01¥Administrator	2:15 PM

🔒 🗌 🚽 = 🛛 backup × Home Share View 6 ・ 小 - This PC > New Volume (D:) > backup > ✓ ひ Search backup P Name Date modified Size Type A Quick access data001 6/27/2018 2:14 PM File folder This PC data002 6/27/2018 2:15 PM File folder C on CONNECTION2 Desktop E Documents Downloads E on CONNECTION2 h Music E Pictures Videos Local Disk (C:) - New Volume (D:) Network 8==

In Explorer, display the restored folders and confirm that the backed up folders are displayed.

3.4.2.3. Configuration of ACM

(1) Delete the source and destination volumes

From the command prompt of the backup server, delete the settings for the source and destination volumes used for the backup by executing swsrpdelvol (replication volume information deletion command)



(2) Set the source and destination volumes

Set the source and destination volumes to be used for the restore.

Execute **swsrpsetvol** to set the device name g2d4p1 as the source volume (backup server) and the device name g1d2p1 as the destination volume (business server).

Execute swerpyolinfo to confirm the setting					
swsrpsetvol completed	-n -0) UKG	-u g204p	ol glazpiesiumu	
C.V.C.VETEDNIUS SEVACHYD in Yowornootyol	-0 -0	ODC.	-11 mindle	1 ~1 d2~100VOWO	1

Execute swsrpvolinto to confirm the settings.

C:¥>C:	¥ETERNUS_SF¥ACM¥b	in¥swsr	pvolir	nfo -h GYOMO1				
Server	OriginaT-Volume	Size		Replica-Volume	Size		Сору	Op-Server
GYOM01	g2d4p1@MGRSV01	599.8 (Gbyte	g1d2p1@GYOM01	499.9	Gbyte	uni-direction	original

3.4.2.4. ACM Restore Execution

(1) Execute a restore

Execute a restore from the source volume (g1d2p1) to the destination volume (g2d4p1) by executing **swsrpmake**. For swsrpmake, specification of the -T option is not available so OPC is executed. SF¥ACM¥bin¥ 2d4p1@MGRSV01 g1d2p1@GYOM01 :¥>C:¥ETEKNUS SF¥AUM¥bin¥swsrpmake gzd4p10MGKSvUT grdzpr ROM=g2d4p10MGRSV01, TO=g1d2p10GYOM01 swsrpmake completed (2) Check the progress of the restore

Check the progress of the restore by executing **swsrpstat** (operation status display command). You can check the progress of the replication under the **Execute** column. :¥>C:¥ETERNUS_SF¥ACM¥bin¥swsrpstat_g2d4p1@MGRSV01 erver_Original-Volume Replica-Volume Direction Status Execute GRSV01_g2d4p1@MGRSV01_g1d2p1@GYOM01_regular_snap_94%

When the restore is completed, the Status and Execute columns become "----".

Server Original-Volume Replica-Volume Direction Status Execute MGRSV01 g2d4p1@MGRSV01 g1d2p1@GYOM01	C:¥>C:¥E	TERNUS_SF¥ACM¥bi	in¥swsrpstat g20	d4p1@MGRSV()1	
MGRSV01 g2d4p1@MGRSV01 g1d2p1@GYOM01	Server	Original-Volume	Replica-Volume	Direction	Status	Execute
	MGRSV01	g2d4p1@MGRSV01	g1d2p1@GYOM01			

3.4.2.5. ACM Restore Result Verification Upon completion of the restore, confirm that the restored data exists in the restore destination folder of the business server. The following shows an example of the restore destination folders in the business server.

= 🔄 📑 ╤ File Home Share View	Drive Tools New Volume (J:) Manage		– – × ~ @
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This PC	data002	6/27/2018 2:15 PM File fi	older
C on CONNECTION2			
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🚆 Documents			
Downloads			
E on CONNECTION2			
Music			
E Pictures			
🔛 Videos			
🏪 Local Disk (C:)			
New Volume (J:)			
data001			
data002			
💣 Network			
2 items			

3.5. Verification Result

For the production volume on the all-flash array used with ACM and Arcserve Backup, the three-generation backup was acquired and both full and incremental backups were successfully acquired for each generation.

A restore was performed to the business volume using the backup data in the LTO tape unit via the backup volume and a successful restore was confirmed.

Full backup verification result

Backup	Backup Method		LT0	Verification Result
Generation	Production volume \rightarrow Backup volume	Backup volume \rightarrow LTO tape cartridge	Media	
	·	1 1 5	Name	
1st generation	Execute swsrpmake	Start backup job #1 of Arcserve	FULL001	Successful completion of swsrpmake
-		Backup (full backup)		Backup job #1 of Arcserve Backup started automatically and
				was successfully completed.
2nd	Execute swsrpmake	Start backup job #2 of Arcserve	FULL002	Successful completion of swsrpmake
generation		Backup (full backup)		Backup job #2 of Arcserve Backup started automatically and
-				was successfully completed.
3rd	Execute swsrpmake	Start backup job #3 of Arcserve	FULL003	Successful completion of swsrpmake
generation		Backup (full backup)		Backup job #3 of Arcserve Backup started automatically and
				was successfully completed.

Incremental backup verification result

Backup	Backup Method		LT0	Verification Result
Generation	Production volume \rightarrow Backup volume	Backup volume \rightarrow LTO tape cartridge	Media	
	·		Name	
1st generation	Execute swsrpmake	Start backup job #1 of Arcserve	INC001	Successful completion of swsrpmake
-	-	Backup (incremental backup)		Backup job #1 of Arcserve Backup started automatically and
				was successfully completed.
2nd	Execute swsrpmake	Start backup job #2 of Arcserve	INC002	Successful completion of swsrpmake
generation	-	Backup (incremental backup)		Backup job #2 of Arcserve Backup started automatically and
-				was successfully completed.
3rd	Execute swsrpmake	Start backup job #3 of Arcserve	INC003	Successful completion of swsrpmake
generation	-	Backup (incremental backup)		Backup job #3 of Arcserve Backup started automatically and
-				was successfully completed.

Restore verification result

Restore	LT0	Restore Method	Verification Result	
Generation	Media	LTO tape unit \rightarrow Backup volume	Backup volume \rightarrow Production volume	
	Name			
Full backup of the 2nd	FULL002	Start the restore job by specifying the target Arcserve Backup full backup session	Execute OPC	Successful completion of Arcserve Backup restore job
generation		··· ··· · · · · · · · · · · · · · · ·		Successful completion of swsrpmake The backed up production volume was restored.

4. Conclusion

Performing backups using an all-flash array and an LTO tape unit reduces the purchase cost associated with generation backup storage by replacing flash storage with LTO tape cartridges. In addition, since the business data stored on the flash storage can be saved to the backup flash storage at high speed, this method has the benefit of no business downtime. Use of the data protection product Arcserve Backup allows users to set tape units and perform backup and restore operations with a user-friendly UI.

Reduce backup costs by taking advantage of the benefits provided by the all-flash array, LTO tape unit, and Arcserve Backup combination.

Appendix Cleaning Operation Procedure

Tape libraries require periodic cleaning of the tape head.

Arcserve Backup has an automatic cleaning function that uses a cleaning tape cartridge for tape libraries. The setup procedure for the automatic cleaning is described below.

First, place the cleaning tape cartridge in an empty magazine slot of the tape library. Open Arcserve Backup Manager and from **Administration** on the navigation bar, click **Device** to display the Device screen. Select and right click the tape unit. From the pull down menu, select **Library Properties**.

Arcserve Backup - [Device] File Quick Start View Device Win	dow Help			•			5 <u>65</u>		
	Cloud Conn Cloud-bas	e Disk-baser	d Device Grou	Group Pro	Browse Clo	Scan Devices	Library Pro	Format »	
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	Browse Cloud							~	
Library Properties								4:26 PM	

On the Library Properties screen, click the **Cleaning** tab.

Select the **Automatic tape cleaning** check box and set the **Clean drive after** (hour(s) of usage).

Library:		NUS LT S2					
Clean Slots Ø <slot 8=""> <clnu01l1> <clean< th=""><th>1> <cleaning< th=""><th colspan="5">Available Slote</th></cleaning<></th></clean<></clnu01l1></slot>		1> <cleaning< th=""><th colspan="5">Available Slote</th></cleaning<>	Available Slote				
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Clean By Clean	Barcode Barcode Prefix(a)						
A	itomatic tape cleani	ng	hour(e) of used				
Ciec	an unve alter		noui(s) or usag				

Cleaning starts according to the total usage time of the tape head.

Upon completion of the cleaning, a pop-up is displayed. Check that the cleaning completion message is displayed and then click the **OK** button.

Arcserve B	ackup	×
1	Device <2> Tape Head Cleaning complete!	
	ОК	

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