

# Safeguarded Snapshots

**Safeguarded Copy is now Safeguarded snapshot:**

In IBM Storage Virtualize 8.7, the functionality previously called *Safeguarded Copy* is now referred to as *Safeguarded snapshot*.

Redbook: Data Resiliency Designs: A Deep Dive into IBM Storage Safeguarded Snapshot

# JLR – Cyber attack

The attack began on August 31

complete shutdown of production lasting for five weeks.

Damage: -

Financial: -

JLR Losses from production - £485m

JLR additional costs of addressing the attack - £196m

Supply chain disruption £??m

Government loan to stabilise – £1.5 billion

Estimated total economic impact - £1.9 billion

Reputation:-

Severe...

Grand operational planning (the '00')

All new EV models delayed at least 6 months





## Eddie Chaffin

Group Enterprise Architect  
ABP Food Group

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Web: [abpfoodgroup.com](http://abpfoodgroup.com)

# About Me

Started work in 1985. Out of work for 2 hours 20 minutes. (Food 32 / 41 Years)

- Associated British Foods (Food 5 Years)
- Rank Hovis McDougal (RHM) -> Tomkins (Food 10 Years\*)
  - Food Hygiene / Safety
  - Set up ERP / Later KPI measurement and Management Information Systems
  - Technical / Hygiene trouble shooter for group
- Bestfoods -> Unilever Bestfoods (Food 3 Years\*)
- Outsourced Procurement / Manufacturing efficiency (Non-Food 5 Years\*)
- ABP UK (Food 3 Years\*)
- Rexel UK / Northern Europe (Non-Food 4 Years\*)
- ABP Food Group (Food 11 Years\*)

\* = IBM I / Power systems

# About Me

The usual disclaimer.

I have produced this pack to try and assist anybody trying to us Safeguarded Copy / or, after V8.7 Safeguarded Snapshot.

I have tried to make the information accurate and not have any recommendations or suggestions that will cause harm.

Please take all reasonable care and check in the reference materials I have included links to. There is no prize for 1<sup>st</sup> over the cliff. \*\* Try restoring BOTH thin and thick snapshots – read the redbook.



# About ABP

One of Europe's leading food processors, ABP Food Group

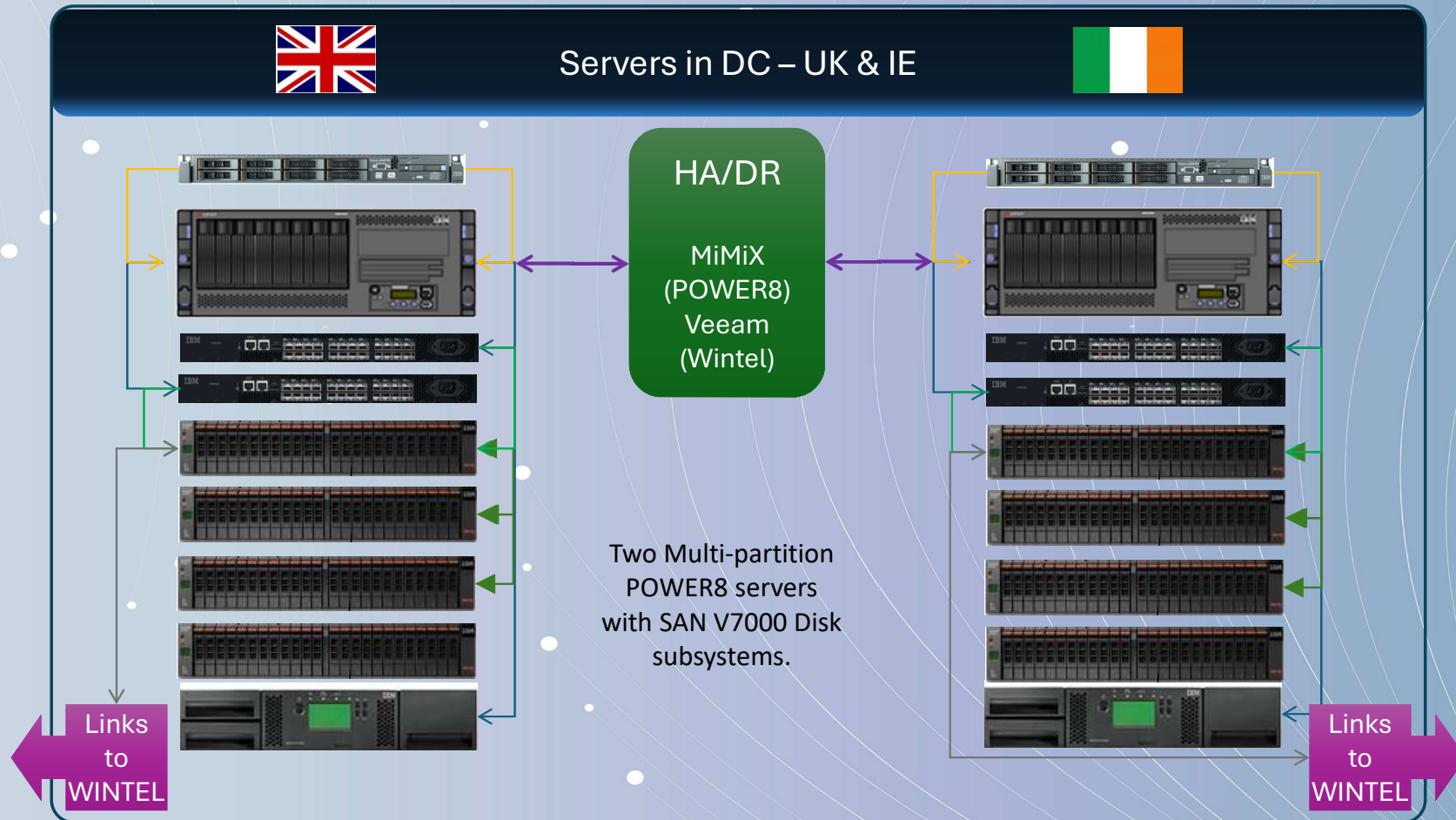
- Beef / Lamb / Proteins / Renewables / Pet Food
- Established 1954 and is **privately owned** (72 years)
- > 45,000 Farmers – paid on the day of delivery
- > 50 locations in 9 countries
- >14,000 Colleagues
- >€ 5bn

# 2015 - I rejoined ABP



- ABP Divisions (Beef / Lamb / Proteins / Renewables / Pet Food) operate independently in a federated structure.
- The main board authorised an approach to consolidate three aged and unsupported IBM systems with a single platform and common ERP
- Data segregation was an absolute requirement

# 2015 – new hardware

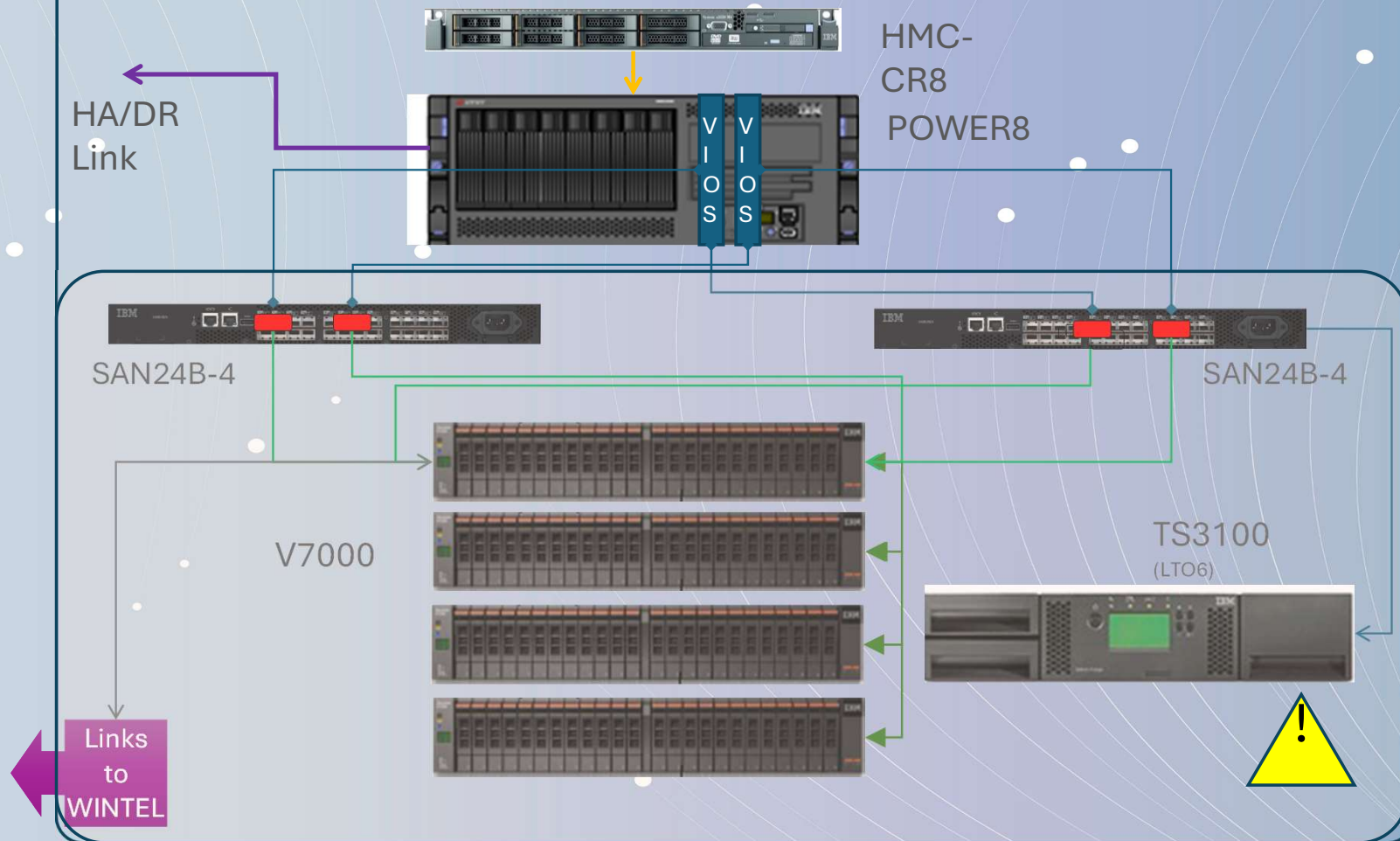




# The awareness of Cyber Attacks

- 2019 – no reliable estimate but generally recognised as increasing
- 2020      111 M incidents
- 2021      227 M incidents
- 14 May 2021 – Major attack on the Irish Health Service

# 2021 - Scope for replacement



iUG had discussed the FlashSystems

Steve Bradshaw  
had spoken about  
the unbelievable  
performance

They sounded too  
good to be true

But experience has proven his assessments to be sound and reliable

He had told us the same database queries on V7R2 compared to V7R1 were upto 15 times faster using the same hardware and database.

On that basis I had changed the roadmap for ABP to use V7R2 rather than keep everybody back at V7R1 until ERP was standard.

Reading the blurb on the FlashSystems, two factors really stood out as needing proof.

FlashSystems  
performance

Ransomware  
recovery

IBM offered a no obligation opportunity to test real hardware, in the configuration you believe you want, without any obligation.

So we did a POC

# The POC showed us

- The I/O was so fast that we couldn't max it out
  - Instead we hit the BUS limit on the POWER9 system hosting the LPAR
- We were able to recover Safeguarded copies and start the systems without any adverse effects.
- It did what it said on the tin.

# What the POC could not show us

- We couldn't establish the precise level of compression and deduplication; No customer data could be loaded (T&Cs), but we could see it was there was little impact on the storage for the TBs loaded. **Spoiler – it was 3.7:1 (73%)**
- With multiple systems each using multiple volumes I had an open question around the number of volume / generation / copies. Safeguarded copy had a limit of 4096.
- Question – with faster volumes, could I reconfigure the LPARS to have fewer, larger volumes allowing more copy generations?

What we bought:

UK

2 x FS5200s

IE

2 x FS5200s

# Planning the implementation.

- The migration was reasonably uneventful. I didn't want LPM.
- Once the basic move was completed, I referred to the literature. To understand how to implement Safeguarded copy.
- Now I would recommend the two redbooks shown on the next slide. There are links to three additional books

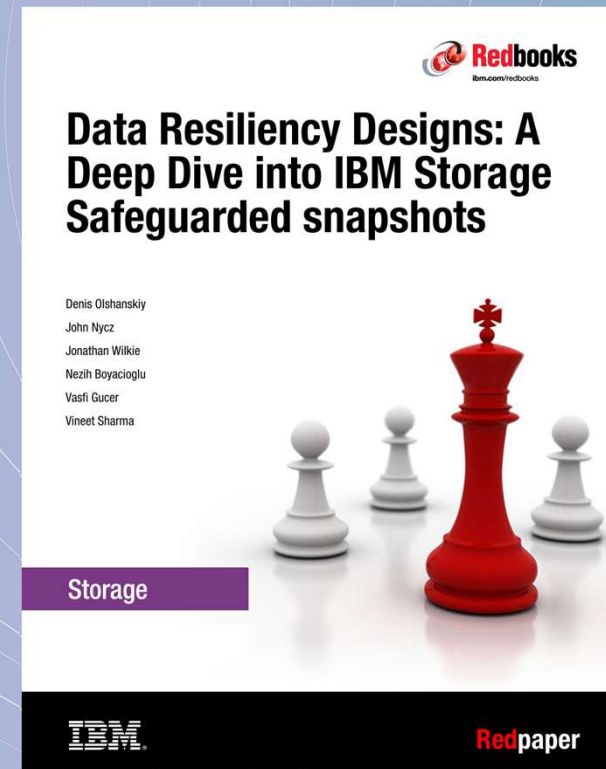
[IBM FlashSystem Safeguarded Copy Implementation Guide \(redp5654\)](#)

[Data Resiliency Designs: A Deep Dive into IBM Storage Safeguarded Copy \(redp5737\)](#)

[IBM Storage DS8000 Safeguarded Copy: Updated for DS8000 Release 10.1 \(redp5506\)](#)

[Ensuring Business Continuity with Policy-Based Replication and Policy-Based HA \(sg248569\)](#)

[IBM Storage DS8000 Safeguarded Copy: Updated for DS8000 Release 10.1 \(redp5506\)](#)



# Planning the implementation.

- I wanted to get one system set up with Safeguarded copy.
  - I did this and set a copy once a day to be retained for 1 week.
  - The system had 64 volumes.
- There was no negative impact.
- And the point of this was that with  $\frac{1}{4}$  of the number of volumes, frequency can be increased and retention extended.

# Volume count reduction (4096 limit)

- I took performance graphs of the system for a one week period
- I expanded volumes 1-32, and then drained volumes 49-64 still on-line, and available in case I caused an issue.
- Performance over the subsequent week showed no negative impact, even on the busiest days.
- I drained volumes 33-48.
- Performance over the subsequent week showed no negative impact, even on the busiest days.
- Further expansion and more gradual reductions were undertaken

# Volume count reduction (4096 limit)

- On my systems, running our ERP and processes, Flash systems can use one quarter of the number of volumes compared to the traditional spinning / SSD.
- This was the result of cautious trials, supported by performance taken across a full weekly cycle

# Planning considerations (1)

- You no longer need a separate storage pool assigned to SG Copy
- Read the Red Books and make notes
- [Data Resiliency Designs: A Deep Dive into IBM Storage Safeguarded Copy \(redp5737\)](#)
- Start small – don't go mad. It's a learning process. Check things work as you expect. Some examples in the 2<sup>nd</sup> half.
- Safeguarded snapshots (new name) will not break your system .
  - There are risks if you continue to use a separate storage pool that runs out of capacity... Read the book. If you use the main storage pool, the system will keep things working.

# Planning considerations (2)

- Confirm the scope and plan for all of it and avoid last minute changes
- If Wintel environments are associated with IBM i, look into Flashsystem grid. This allows synchronous copies across all the linked platforms... **Red Books**
- Develop your process and document it.
- New equipment has AI support – but you need to understand what it is proposing

# Planning considerations (3) Recovery

- Have a dummy LPAR you can attach the recovered volumes to. TEST on a separate VLAN. I used a verification LPAR created during the migration process
- If you are taking SG snapshots of Wintel or combined IBM i and Wintel, have the necessary hardware to test the restore process.
- Develop the procedures if you face an attack. **Spoiler ..**You will see that the system can initiate a Safeguarded snapshot if an attack is detected.
- Assign responsibilities for the actions. One person can't own it all
- Consider how to establish the last safe copy and the process to return to production

# Long term impact

- This is a dashboard of a SAN running three production systems. After 4.5 years of storage growth, SG Copies (old name on V8.6) taken every 3 hours and every day.
- Storage is achieving phenomenal capacity savings



# Latest version of Copy Service Manager CSM

- The latest version shows the capacity used for SG Snapshots. This will help you plan the impact of an implementation

Snapshot Info Thin Clone Info

Total Number Snapshots: 9 Total Recoverable Snapshots: 9 Total Unrecoverable Snapshots: 0 Total Safeguarded Used Capacity: 56.2 GiB

Snapshot Time	Snapshot Name	Snapshot ID	State	Recoverable	Copy Sets	Used Capacity	Last Result	Expiration	Safeguarded	Threat Detect...
2026-05-30 21:59:58 BST	csm_TaskID36_1780174800	1780174800	active	Yes	5	20.7 GiB	✓ IWNR2885I	2026-06-01 21:59:58 BST	Yes	No
2026-05-31 12:29:57 BST	csm_TaskID37_1780227000	1780227000	active	Yes	5	1.8 GiB	✓ IWNR2885I	2026-06-01 12:29:57 BST	Yes	No
2026-05-31 13:30:01 BST	csm_TaskID37_1780230600	1780230600	active	Yes	5	1.8 GiB	✓ IWNR2885I	2026-06-01 13:30:01 BST	Yes	No
2026-05-31 14:29:59 BST	csm_TaskID37_1780234200	1780234200	active	Yes	5	1.8 GiB	✓ IWNR2885I	2026-06-01 14:29:59 BST	Yes	No
2026-05-31 15:29:58 BST	csm_TaskID37_1780237800	1780237800	active	Yes	5	6.4 GiB	✓ IWNR2885I	2026-06-01 15:29:58 BST	Yes	No
2026-05-31 16:30:01 BST	csm_TaskID37_1780241400	1780241400	active	Yes	5	41.3 MiB	✓ IWNR2885I	2026-06-01 16:30:01 BST	Yes	No
2026-05-31 17:30:00 BST	csm_TaskID37_1780245000	1780245000	active	Yes	5	41.3 MiB	✓ IWNR2885I	2026-06-01 17:30:00 BST	Yes	No
2026-05-31 18:30:04 BST	csm_TaskID37_1780248600	1780248600	active	Yes	5	7.2 GiB	✓ IWNR2885I	2026-06-01 18:30:04 BST	Yes	No
2026-05-31 22:00:04 BST	csm_TaskID36_1780261200	1780261200	active	Yes	5	16.5 GiB	✓ IWNR2885I	2026-06-02 22:00:04 BST	Yes	No



# Other uses for SG Snapshots

- Attach to a dummy LPAR and upgrade O/S
  - Gives timing and shows any missing or problem PTFs
- Ad-hoc recovery of recently corrupted / deleted production data
- Verification/Testing of archive or similar processes

The background is a gradient of blue, transitioning from a lighter shade on the left to a darker shade on the right. It features several white dots of varying sizes scattered across the field. Thin, white, curved lines sweep across the background, creating a sense of motion or a network. The overall aesthetic is clean and modern.

**A brief diversion of the latest**

# Spec-sheet Summary - FlashSystem 2026

	FlashSystem grid			
	 FlashSystem C200	 FlashSystem 5600	 FlashSystem 7600	 FlashSystem 9600
Type of media	NVMe	NVMe	NVMe	NVMe
Rack Units	2U	1U	2U	2U
Drive slots	24 drive slots	12 drive slots	32 drive slots	32 drive slots
Physical / Effective	1.1PB / 2.3 PBe	403TB / 2.42 PBe	1.22PB / 7.29 PBe	2.43PBu / 11.88 PBe
Achieved with	FCM 4 – 46 TB (XL)	FCM 5 – 52.8 TB (XL)	FCM 5 – 52.8TB (XL)	FCM 5 – 105.6 TB (XXL)
CPU info per system	4x10 core	2x12 core Ice Lake D	2x16 core AMD Epyc	2x48 core AMD Epyc
CPU cores per system	40 cores	24 cores	32 cores	96 cores
High-speed bus	PCIe Gen 4	PCIe Gen 4	PCIe Gen 5	PCIe Gen 5
Max Cache Hit IOPs	1.5M	2.6M	4.33M	6.37M
Max 70/30/50 IOPs 16KB	-	388K	700K	1.75M
Max Read Miss Bandwidth	23GB/s	30GB/s	60GB/s	86GB/s
Max HBA slot per system	4	4	8	8
Max FC ports/system	16 – 32Gb FC ports	32 - 32Gb FC ports 12 - 64Gb FC ports	32 - 32Gb FC ports 12 - 64Gb FC ports	32 - 32Gb FC ports 12 - 64Gb FC ports
Mac Ethernet ports/system	8 -10BgE on-board 8 – 25GbE ports	4 - 25GbE on-board 16 – 25GbE ports	32 – 25GbE ports	32 – 25GbE ports

# FCM5

- New Enterprise Datacenter Form Factor (EDSFF)
- Latest 2Tb QLC NAND Flash Technology
- Increased Raw Capacity
- Increased Effective Capacity
- Increased Performance
- Increased Computational Offload
- Increased Security
- Increased Data Reduction
- Same FlashCore Reliability



**E3.L 1T Form Factor**

*\*FCM 2XL is capable of 6:1 addressability, however FlashSystem DRAID addressability is restricted to 4:88:1  
 \*\*Requires DRAID code changes to support max DRAID geometry*

Capacity Points in TB	Small	Medium	Large	XL	2XL
Form Factor	1T	1T	1T	1T	1T
RAW Capacity	6.6	13.2	26.4	52.8	105.6
Physical Capacity (1:1)	5.6	11.2	22.4	44.8	89.6
Max Data Reduction	6:1	6:1	6:1	6:1	6:1*
Effective Capacity	33.6	67.2	134.4	268.8	438.0*
Platform Support	x600	x600	x600	x600	9600

# Coffee

The background of the slide is a gradient of blue and teal. It features several white dots of varying sizes scattered across the space. Thin, light-colored curved lines sweep across the background, creating a sense of motion and depth. The overall aesthetic is clean, modern, and minimalist.

# In this half I'll look at the mechanics

- Assuming you already have an LPAR on the SAN.

# On the SAN, Create a volume group

The screenshot displays the IBM FlashSystem 5200 dashboard. The top header shows 'IBM FlashSystem 5200' and 'Dashboard'. A left-hand navigation menu is visible, with 'Volume Groups' highlighted. The main content area shows performance metrics for latency, bandwidth, and IOPS, with read and write values for each.

Performance		
Latency	read	write
1.63 ms	1.35 ms	3.85 ms
Bandwidth	read	write
1,162 MBps	1,131 MBps	29 MBps
IOPS	read	write
14.2k IOPS	12.7k IOPS	1,575 IOPS

Navigation Menu:

- Dashboard
- Monitoring
- Pools
- Volumes**
- Hosts
- Copy Services
- Policies
- Access
- Settings

Sub-menu for Volumes:

- Volumes
- Volumes by Pool
- Volumes by Hosts and Clusters
- Cloud Volumes
- Volume Groups**

# Create a volume group

## Create Volume Group

Select how to assign volumes to a new volume group. You can specify from existing volumes or select a snapshot of volumes in another volume group.

Enter name (optional)

Volume group name

Assign volumes (optional)

Choose existing  
volumes



Choose an existing  
snapshot from a  
volume group

Cancel

# I gave it a name, but didn't screenshot that

## Create Volume Group

Select the volumes to include in the volume group.

Volume group name

The system assigns a name for the volume group.

Name	State	Pool	Volume Group	Protocol Type	Capacity
AFGPoc02_01	✓ Online	AFGUK_FS1Pool		SCSI	100.00 GiB
AFGPoc02_02	✓ Online	AFGUK_FS1Pool		SCSI	100.00 GiB
AFGPoc02_03	✓ Online	AFGUK_FS1Pool		SCSI	100.00 GiB
AFGPoc02_04	✓ Online	AFGUK_FS1Pool		SCSI	100.00 GiB
AFGPoc02_05	✓ Online	AFGUK_FS1Pool		SCSI	100.00 GiB

## Create volume group

Synchronizing memory cache.

100%



▼ View more details

Task started.	8:47 PM
Running command:	8:47 PM
<code>svctask mkvolumegroup</code>	8:47 PM
The task is 100% complete.	8:47 PM
The volume group (ID 8) was successfully created.	8:47 PM
Synchronizing memory cache.	8:47 PM

Cancel

Close

# And that did absolutely nothing...

## Create Volume Group

Select the volumes to include in the volume group.

Volume group name

AFG\_POC2


Name	State	Pool
AFGPoc02_01	✓ Online	AFGUK_FS1Pool
AFGPoc02_02	✓ Online	AFGUK_FS1Pool
AFGPoc02_03	✓ Online	AFGUK_FS1Pool
AFGPoc02_04	✓ Online	AFGUK_FS1Pool
AFGPoc02_05	✓ Online	AFGUK_FS1Pool

# This time it shows volumes being added

Create volume group

Synchronizing memory cache.

83%



View more details

THE TASK IS 80% COMPLETE.	8:50 PM
Adding volume (ID 484) to new volume group	8:50 PM
Running command:	8:50 PM
<code>svctask chvdisk -volume group 9 484</code>	8:50 PM
The task is 83% complete.	8:50 PM
Adding volume (ID 485) to new volume group	8:50 PM
Running command:	8:50 PM
<code>svctask chvdisk -volume group 9 485</code>	8:50 PM
Synchronizing memory cache.	8:50 PM

Cancel Close

# Copy Service Manager

**IBM Copy Services Manager** | Overview | Sessions | Storage | Paths | Notifications | Console | **Settings 1**

- Advanced Tools
- Active/Standby Servers
- Administration
- Alert Notifications
- 2 Scheduled Tasks**
- Server Properties

### Session Overview

Remote copy source volumes (not cascaded):	0	( 0.0 KiB )
FlashCopy or Snapshot source volumes:	85	( 48.5 TiB )
Volumes protected by Safeguarded Copy:	90	( 50.5 TiB )
Volumes used as targets:	956	( 506.7 TiB )
Total licensable source data replicated (non-G10):	50.5 TiB	

8 Normal | 0 Warning | 0 Severe | 8 Inactive

### Storage Systems

Volumes in sessions: 1051  
Volumes not in sessions: 582  
Total volumes found: 1633

- ✓ Connections to local server  
All storage systems connected
- ✓ Connections to remote server  
All storage systems connected

### z/OS or z/TPF Connections

**Configure**

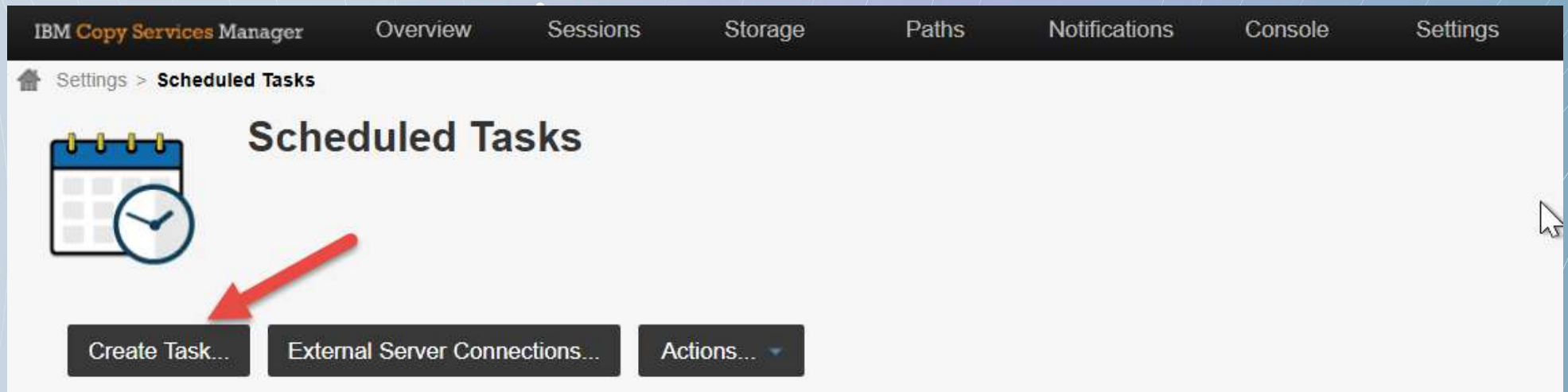
### Active/Standby Connection

✓ Connections to remote server Synchronized

# Copy Service Manager

The screenshot displays the Copy Service Manager interface. On the left is a dark sidebar menu with the following items: Settings (marked with a red circle containing '1'), Advanced Tools, Active/Standby Servers, Administration, Alert Notifications, Scheduled Tasks (marked with a red circle containing '2'), and Server Properties. The main content area on the right is titled 'Session Overview' and features an illustration of server racks with a stream of green binary code (0s and 1s) flowing from them. At the bottom of the Session Overview panel, there are two status indicators: a green checkmark icon followed by the text '8 Normal', and a grey warning triangle icon followed by the text '0 Warning'.


# Scheduled Task → [Create Task]



The screenshot displays the IBM Copy Services Manager interface. At the top, a navigation bar includes the following items: IBM Copy Services Manager, Overview, Sessions, Storage, Paths, Notifications, Console, and Settings. Below this, a breadcrumb trail shows 'Settings > Scheduled Tasks'. The main content area is titled 'Scheduled Tasks' and features a calendar and clock icon. A red arrow points to the 'Create Task...' button, which is the first of three buttons in a row: 'Create Task...', 'External Server Connections...', and 'Actions...'.

# Create a Scheduled Task

## Create a Scheduled Task



**Create a Scheduled Task** ?

Task Name:


Description:

Create a PE package if error occurs running the task

◀ Back Next ▶ Cancel

# Create a Scheduled Task

## Create a Scheduled Task



**Create a Scheduled Task**

Task Name:

Description:

Create a PE package if error occurs running the task

Product Engineering

# Scheduled Task

## Create a Scheduled Task



When do you want the task to run?

### On Event

Run Task on a Threat Detection Event

### Scheduled

No schedule

Hourly

Every (mins/hours/days):

Daily / Weekly

Sun  Mon  Tue  Wed  Thu  Fri  Sat

Time [GMT+1]:


## On Event

Run Task on a Threat Detection Event

# Create a Scheduled Task → Add Action

## Create a Scheduled Task

What action would you like to perform?

 **Add Action** Modify Action Remove Action Up Down

Step #	Action type	Session	Action
--------	-------------	---------	--------

Run the following task if successful:

Run the following task on failure:

## Create a Scheduled Task



What a

Add A

Step #

Run the f

Run the f

### Add Action

What action will the task perform?

Type:

Which session will the action run against?

Show All

Name	Type
SNAP_AFG_POC1_AFGUKFSN1	Snap
SNAP_AFG_POC2_AFGUKFSN1	Snap

What command do you want to issue?

Command:

- Command
- Command
- Wait For State
- Wait For Percent Complete
- Validate Role Pair Consistency
- Validate Data Exposure
- Run External Script

OK

Cancel

Cancel

# Choose the session [1] and dropdown [2]

**Add Action**

What action will the task perform?

Type:

Which session will the action run against?

Show All

Name	Type
SNAP_AFG_POC1_AFGUKFSN1	Snap
SNAP_AFG_POC2_AFGUKFSN1	Snap

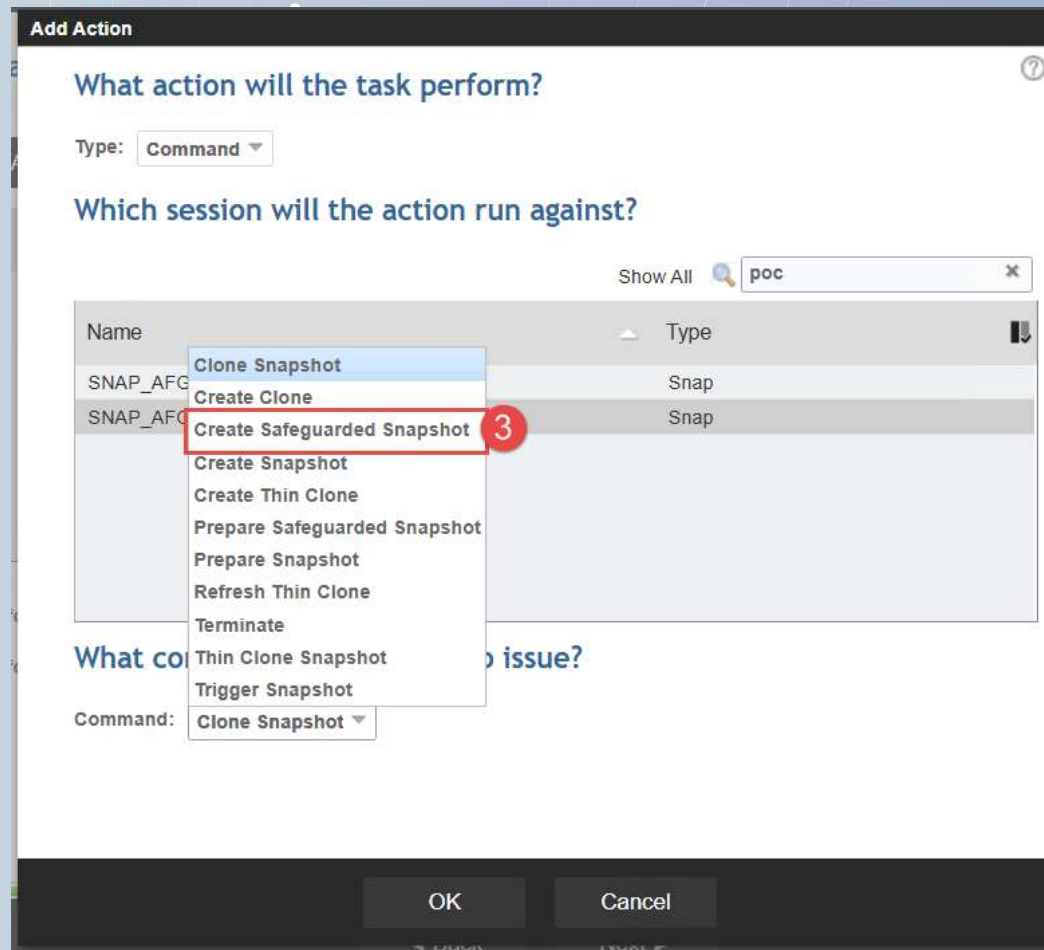
What command do you want to issue?

Command:

OK Cancel

**1** **2**

# Option {Create Safeguarded Snapshot}



# Change the retention days [4] to value 2 days

**Add Action**

What action will the task perform?

Type:

Which session will the action run against?

Show All


Name	Type
SNAP_AFG_POC1_AFGUKFSN1	Snap
SNAP_AFG_POC2_AFGUKFSN1	Snap

What command do you want to issue?

Command:

How many days should each backup or snapshot be retained?

Retention (days):  **4**


 Retention (days):

OK Cancel

# Summary – note the progress bar. [Finish]

## Create a Scheduled Task

### Scheduled Task Summary



**Task Name:** POC02\_4Hr\_2Dy

**Description:** POC02 4Hr Snapshot, retain 2 days

**List of Actions:**

- Step 1: Issue 'Create Safeguarded Snapshot' to 'SNAP\_AFG\_POC2\_AFGUKFSN1' session with a retention of '2' days

**Run the following task on failure:** Do not run a Task


**Run the following task if successful:** Do not run a Task

**Scheduled:** Sun, Sat at 10:00 PM [GMT+1]

**Run Task on a Threat Detection Event:** Yes

**Sessions Monitoring for Threat Detection Events:** SNAP\_AFG\_POC2\_AFGUKFSN1

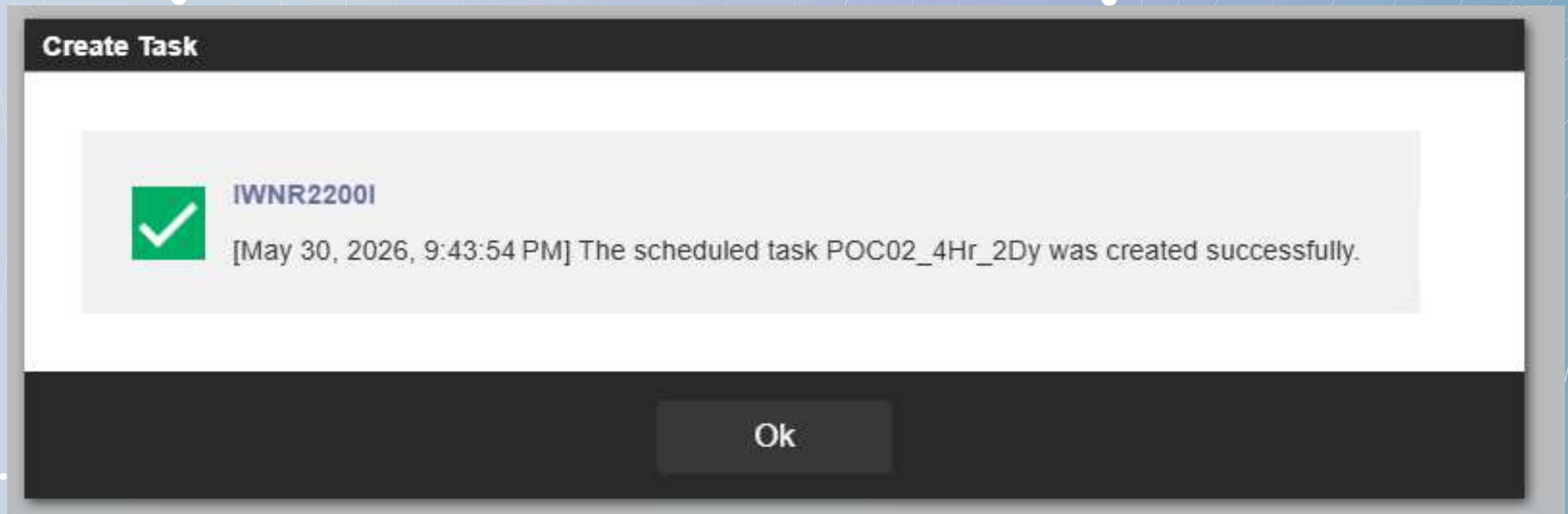
**Collect PE package if error occurs running the task:** No



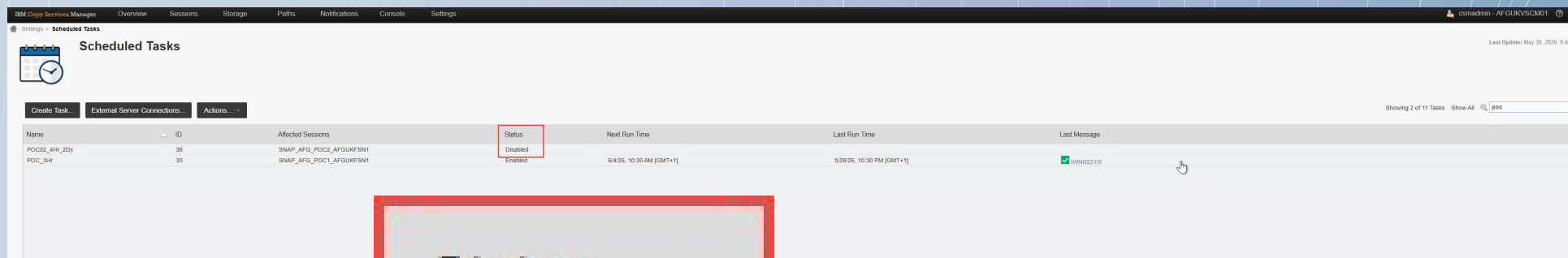
Progress bar: A green progress bar at the bottom of the summary card, which is nearly full, indicating the task is almost finished.

Navigation buttons: Back, Finish, Cancel

# Confirmation... always reassuring



# The new task exists but is safely disabled.



The screenshot shows the 'Scheduled Tasks' page in the IBM Copy Services Manager. The page has a navigation bar at the top with 'Overview', 'Sessions', 'Storage', 'Paths', 'Notifications', 'Console', and 'Settings'. Below the navigation bar, there are buttons for 'Create Task...', 'External Server Connections...', and 'Actions...'. The main content area displays a table with the following data:

Name	ID	Affected Sessions	Status	Next Run Time	Last Run Time	Last Message
POC02_4Hr_2Dy	36	SNAP_AFG_POC2_AFGUKFSN1	Disabled			
POC_3Hr	35	SNAP_AFG_POC1_AFGUKFSN1	Enabled	6/4/26, 10:30 AM [GMT+1]	5/28/26, 10:30 PM [GMT+1]	[✓] WNR2212L

Status  
Disabled

# Enable the task

IBM Copy Services Manager Overview Sessions Storage Paths Notifications Console Settings

Settings > Scheduled Tasks

## Scheduled Tasks

Create Task... External Server Connections... Actions...

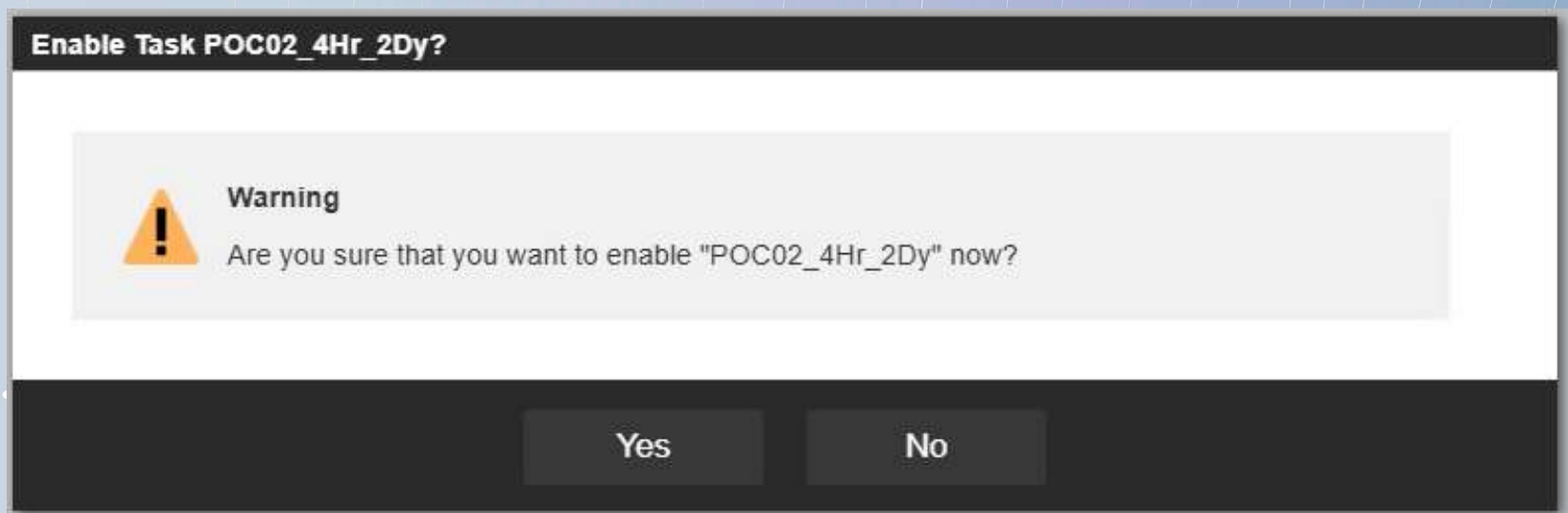
Name	ID	Affected Sessions	Status	Next Run Time
POC02_4Hr_2Dy	36	SNAP_AFG_POC2_AFGUKFSN1	Disabled	
POC_3Hr	35	SNAP_AFG_POC1_AFGUKFSN1	Enabled	6/4/26, 10:30 AM [GMT+1]

- Modify Task
- Modify Schedule
- Remove Task
- Cancel Task
- Run Task
- Enable Task**
- Disable Task
- Duplicate Task
- Select All
- Deselect All
- Clear Filter

Run Task	▶
<b>Enable Task</b>	<b>▶</b>
Disable Task	
Duplicate Task	

Now
At specified time

# Just in case you want to back out !




# Now it is enabled and the run time is filled in

IBM Copy Services Manager Overview Sessions Storage Paths Notifications Console Settings

Settings > Scheduled Tasks

## Scheduled Tasks



Create Task... External Server Connections... Actions...

Name	ID	Affected Sessions	Status	Next Run Time
POC02_4Hr_2Dy	36	SNAP_AFG_POC2_AFGUKFSN1	Enabled	5/30/26, 10:00 PM [GMT+1]
POC_3Hr	35	SNAP_AFG_POC1_AFGUKFSN1	Enabled	6/4/26, 10:30 AM [GMT+1]

And now for something completely different

The background is a gradient of blue, transitioning from a lighter shade on the left to a darker shade on the right. It features several white dots of varying sizes scattered across the field. Thin, white, curved lines sweep across the background, creating a sense of motion and depth. The overall aesthetic is clean and modern.

# I created a library

```
Work with Libraries

Type options, press Enter.
 1=Create  2=Change  3=Copy   4=Delete  5=Display  6=Print
 8=Display library description  9=Save     10=Restore
11=Save changed objects       12=Work with objects  14=Clear

Opt  Library      Attribute  ASP Device      Text
---  -
IUG2000  PROD          Base Library created 30/05/2026

Bottom

Parameters for options 1, 2, 3, 5, 8, 9, 10, 11 and 12 or command
===>
F3=Exit   F4=Prompt  F5=Refresh  F9=Retrieve  F11=Display names only
F12=Cancel F16=Repeat position to  F17=Position to

MA  A 21/007
```

# I added tables

```
Display Library

Library . . . . . : IUG2000      Number of objects . : 169
Type . . . . . : PROD          Library ASP number . : 1
Create authority . : *SYSVAL     Library ASP device . : *SYSBAS
                                   Library ASP group . : *SYSBAS

Type options, press Enter.
  5=Display full attributes  8=Display service attributes

Opt Object      Type      Attribute      Size  Text
--  -
  - ABPFX        *FILE    PF             53248
  - ALLOBJECTS  *FILE    PF             40960
  - ALLZEROS    *FILE    PF             40960  used in environment c
  - ARCFILE001  *FILE    PF             40960  Tables in archive lib
  - ASB1        *FILE    PF             40960
  - BACKUPCAL   *FILE    PF             40960
  - BADBOYS    *FILE    PF             40960
  - BKUPCAL2    *FILE    PF             221184
  - BKUPCTL     *FILE    PF             225280
  - BKUPCTLLOG  *FILE    PF             53248

More...

F3=Exit  F12=Cancel  F17=Top  F18=Bottom
(C) COPYRIGHT IBM CORP. 1980, 2021.
MA  A 12/003
```

# I created a schedule to create new libraries

```
Work with Job Schedule Entries                                AFGPOC02
                                                            30/05/26 22:28:40 BST

Status:  RLS

Type options, press Enter.
  2=Change  3=Hold  4=Remove  5=Display details  6=Release
  8=Work with last submission  10=Submit immediately

-----Schedule-----
Opt  Job          Status  Date       Time       Frequency  Recovery  Next
-----
    IUG2002      SCD     31/05/26   03:00:00  *ONCE     *SBMRLS   31/05/26
    IUG2003      SCD     31/05/26   07:00:00  *ONCE     *SBMRLS   31/05/26
    IUG2004      SCD     31/05/26   11:00:00  *ONCE     *SBMRLS   31/05/26

Bottom

Parameters or command
===>
F3=Exit  F4=Prompt  F5=Refresh  F6=Add  F9=Retrieve
F11=Display job queue data  F12=Cancel  F17=Top  F18=Bottom

MA  A                                     A                                     12/002
```

# Meanwhile

While I was setting up the JOBSCDE to create copies of IUG2000

The schedule ran, so I manually created IUG2001.

- IUG2000 existed for snapshot #1
- IUG2001 exists in time for snapshot #2
- IUG2002 exists in time for snapshot #3
- IUG2003 exists in time for snapshot #4
- IUG2004 exists in time for snapshot #5
- **....or so I thought (I will explain in a bit)**

# On the CSM - Session shows a recoverable copy

IBM Copy Services Manager Overview Sessions Storage Paths Notifications Console Settings

## Sessions

0 severe  
0 warning  
9 normal

Create Session... Session Actions: ▾

Name	Group Name	Status	State	Type	Volume Group	Active Host	Active Site	Recoverable	Progress	HyperSwap	Hardened ...	Copy Sets
SNAP_AFG_POC1_AFGUKFSN1	Automatically Generated S...	✓ Normal	Protected	Snap	AFG_POC1	H1	Site 1	Yes	N/A			10
SNAP_AFG_POC2_AFGUKFSN1	Automatically Generated S...	✓ Normal	Protected	Snap	AFG_POC2	H1	Site 1	Yes	N/A			5

Create Session... Session Actions: ▾

Name	Group Name	Status	Volume Group	Active Host	Active Site	Recoverable	Progress
SNAP_AFG_POC1_AFGUKFSN1	Automatically Generated S...	✓ Normal	AFG_POC1	H1	Site 1	Yes	N/A
SNAP_AFG_POC2_AFGUKFSN1	Automatically Generated S...	✓ Normal	AFG_POC2	H1	Site 1	Yes	N/A

# SNAP\_AFG\_POC2\_AFGUKFSN1

Session Actions: ▾

**Status**  Normal

**State** Protected

**Session Type** Snapshot

**Active Host** H1

**Recoverable** Yes

**Description** Automatically created  
SnapshotSVC session(modify)

**Copy Sets** 5 (view)

**Group Name** Automatically Generated Session



**Snapshot Schedule** [Sun, Sat] 10:00 PM [GMT+1]

**Last Recoverable Snapshot** 2026-05-30 21:59:58 BST

**Volume Group Name** AFG\_POC2

Snapshot Info

Thin Clone Info

Total Number Snapshots: 1 Total Recoverable Snapshots: 1 Total Unrecoverable Snapshots: 0

Snapshot Time	Snapshot Name	Snapshot ID	State	Recoverable	Copy Sets	Last Result	Expiration	Safeguarded	Threat Detect...
2026-05-30 21:59:58 BST	csn_TaskID36_1780174800	1780174800	active	Yes	5	<input checked="" type="checkbox"/> IWNR2885I	2026-06-01 21:59:58 BST	Yes	No

# SAN: Volume properties shows snapshots

AFGPoc02

2 Ports  
5 Mapped Volumes

Generic

Mapped Volumes Port Definitions

Create Volumes Actions All Volumes

Name	State	Pool	Volume Group	Protocol Type	UID	Capacity
AFGPoc02_01	Online	AFGUK_FS1Pool	AFG_POC2	SCSI	600507681281006FD8000000000F...	100.00 GiB
AFGPoc02_02	Online	AFGUK_FS1Pool	AFG_POC2	SCSI	600507681281006FD8000000000F...	100.00 GiB
AFGPoc02_03	Online	AFGUK_FS1Pool	AFG_POC2	SCSI	600507681281006FD8000000000F...	100.00 GiB
AFGPoc02_04	Online	AFGUK_FS1Pool	AFG_POC2	SCSI	600507681281006FD8000000000F...	100.00 GiB
AFGPoc02_05	Online	AFGUK_FS1Pool	AFG_POC2	SCSI	600507681281006FD8000000000F...	100.00 GiB

Properties for Volume

Volume Overview Copy 0 **Snapshots**

Search

Snapshot	State	Snapshot Expiration	Time Created	Safeguarded	Mirrored
csm_TaskID36_1780174800	Active	6/1/2026 9:59 PM	5/30/2026 9:59 PM	Yes	no

Items per page: 25 1-1 of 1 item 1 1 of 1 page

Close

# Volume properties show SG Snapshot(s)

The screenshot shows a 'Properties for Volume' dialog box with a close button (X) in the top right corner. Below the title bar, there are three tabs: 'Volume Overview', 'Copy 0', and 'Snapshots', with 'Snapshots' being the active tab. A search bar with a magnifying glass icon and the text 'Search' is located above the table. To the right of the search bar is a gear icon for settings. The table below has six columns: 'Snapshot', 'State', 'Snapshot Expiration', 'Time Created' (with a downward arrow), 'Safeguarded', and 'Mirrored'. There is one row of data with the following values: 'csm\_TaskID36\_1780174800', 'Active', '6/1/2026 9:59 PM', '5/30/2026 9:59 PM', 'Yes', and 'no'. Below the table is a pagination bar showing 'Items per page: 25', '1-1 of 1 item', '1', and '1 of 1 page' with navigation arrows. A 'Close' button is located in the bottom right corner of the dialog box.

Snapshot	State	Snapshot Expiration	Time Created ↓	Safeguarded	Mirrored
csm_TaskID36_1780174800	Active	6/1/2026 9:59 PM	5/30/2026 9:59 PM	Yes	no

# The following day...

- I still only had one snapshot – what went wrong?

## Modify a Scheduled Task

When do you want the task to run:



### On Event

Run Task on a Threat Detection Event

### Scheduled

No schedule

Hourly

Every (mins/hours/days):

### Daily / Weekly

Sun  Mon  Tue  Wed  Thu  Fri  Sat

Time [GMT+1]:

Time [GMT+1]:

Time [GMT+1]:

Time [GMT+1]:

Time [GMT+1]:

Time [GMT+1]:

◀ Back

Next ▶

Cancel

# Scheduled Task

## Create a Scheduled Task



When do you want the task to run?

### On Event

Run Task on a Threat Detection Event

### Scheduled

No schedule

Hourly

Every (mins/hours/days):

Daily / Weekly

Sun  Mon  Tue  Wed  Thu  Fri  Sat

Time [GMT+1]:

## On Event

Run Task on a Threat Detection Event

# Once the Schedule was altered

- The next run time was starting next week, not today.
- Corrected by [Scheduled tasks → Actions → Disable /Enable]

Settings > Scheduled Tasks



## Scheduled Tasks

Create Task...

External Server Connections...

Actions...

Name	ID	Affected Sessions	Status	Next Run Time
POC02_1Hr_1Dy	37	SNAP_AFG_POC2_AFGUKFSN1	Disabled	5/31/26, 1:30 PM [GMT+1]
POC02_4Hr_2Dy	36	SNAP_AFG_POC2_AFGUKFSN1	Enabled	5/31/26, 10:00 PM [GMT+1]
POC_3Hr	35	SNAP_AFG_POC1_AFGUKFSN1	Enabled	6/4/26, 10:30 AM [GMT+1]

# The scheduled task shows the last run time.



## Scheduled Tasks

Create Task...

External Server Connections...

Actions...

Name	ID	Affected Sessions	Status	Next Run Time	Last Run Time
POC02_4Hr_2Dy	36	SNAP_AFG_POC2_AFGUKFSN1	Enabled	5/31/26, 10:00 PM [GMT+1]	5/30/26, 10:00 PM [GMT+1]
POC02_1Hr_1Dy	37	SNAP_AFG_POC2_AFGUKFSN1	Enabled	5/31/26, 3:30 PM [GMT+1]	5/31/26, 2:30 PM [GMT+1]
POC_3Hr	35	SNAP_AFG_POC1_AFGUKFSN1	Enabled	6/4/26, 10:30 AM [GMT+1]	5/28/26, 10:30 PM [GMT+1]

# And the Sessions shows the detail

Sessions > SNAP\_AFG\_POC2\_AFGUKFSN1 Last Update: M

## SNAP\_AFG\_POC2\_AFGUKFSN1

**Session Actions:**

**Status**  Normal

**State** Protected

**Session Type** Snapshot

**Active Host** H1

**Recoverable** Yes

**Description** Automatically created SnapshotSVC session(modify)


**Copy Sets** 5 (view)

**Group Name** Automatically Generated Session

**Snapshot Schedule** 2 Scheduled Tasks

**Last Recoverable Snapshot** 2026-05-31 15:29:58 BST

**Volume Group Name** AFG\_POC2



Site 1

Snapshot Info

Thin Clone Info

**Total Number Snapshots:** 5 **Total Recoverable Snapshots:** 5 **Total Unrecoverable Snapshots:** 0 Filter...

Snapshot Time	Snapshot Name	Snapshot ID	State	Recoverable	Copy Sets	Last Result	Expiration	Safeguarded	Threat Detect...
2026-05-30 21:59:58 BST	csm_TaskID36_1780174800	1780174800	active	Yes	5	<input checked="" type="checkbox"/> IWNR2885I	2026-06-01 21:59:58 BST	Yes	No
2026-05-31 12:29:57 BST	csm_TaskID37_1780227000	1780227000	active	Yes	5	<input checked="" type="checkbox"/> IWNR2885I	2026-06-01 12:29:57 BST	Yes	No
2026-05-31 13:30:01 BST	csm_TaskID37_1780230600	1780230600	active	Yes	5	<input checked="" type="checkbox"/> IWNR2885I	2026-06-01 13:30:01 BST	Yes	No
2026-05-31 14:29:59 BST	csm_TaskID37_1780234200	1780234200	active	Yes	5	<input checked="" type="checkbox"/> IWNR2885I	2026-06-01 14:29:59 BST	Yes	No
2026-05-31 15:29:58 BST	csm_TaskID37_1780237800	1780237800	active	Yes	5	<input checked="" type="checkbox"/> IWNR2885I	2026-06-01 15:29:58 BST	Yes	No

# Additional “Safeguarded Snapshots”

**Snapshot Info**    **Thin Clone Info**

**Total Number Snapshots: 5    Total Recoverable Snapshots: 5    Total Unrecoverable Snapshots: 0**

Snapshot Time	Snapshot Name	Snapshot ID	Expiration
2026-05-30 21:59:58 BST	csm_TaskID36_1780174800	1780174800	2026-06-01 21:59:58 BST
2026-05-31 12:29:57 BST	csm_TaskID37_1780227000	1780227000	2026-06-01 12:29:57 BST
2026-05-31 13:30:01 BST	csm_TaskID37_1780230600	1780230600	2026-06-01 13:30:01 BST
2026-05-31 14:29:59 BST	csm_TaskID37_1780234200	1780234200	2026-06-01 14:29:59 BST
2026-05-31 15:29:58 BST	csm_TaskID37_1780237800	1780237800	2026-06-01 15:29:58 BST

# We have snapshots and libraries created at various times.

```
Work with Objects

Type options, press Enter.
  2=Edit authority      3=Copy   4=Delete  5=Display authority  7=Rename
  8=Display description 13=Change description

Opt  Object      Type      Library  Attribute  Text
---  ---
   1  IUG2000     *LIB      QSYS     PROD       Base Library created 30/05/
   1  IUG2001     *LIB      QSYS     PROD       30/05/26  22:19:11
   1  IUG2002     *LIB      QSYS     PROD       31/05/26  03:00:00
   1  IUG2003     *LIB      QSYS     PROD       31/05/26  07:00:00
   1  IUG2004     *LIB      QSYS     PROD       31/05/26  11:00:00
   1  IUG2005     *LIB      QSYS     PROD       31/05/26  13:00:00
   1  IUG2006     *LIB      QSYS     PROD       31/05/26  14:00:00
   1  IUG2007     *LIB      QSYS     PROD       31/05/26  15:00:00

Bottom
```

# Recovery of snapshot @ 13:30

**Snapshot Schedule** 2 Scheduled Tasks  
**Last Recoverable Snapshot** 2026-05-31 15:29:58 BST  
**Volume Group Name** AFG\_POC2

**Snapshot Info** Thin Clone Info

Total Number Snapshots: 5 Total Recoverable Snapshots: 5 Total Unrecoverable Snapshots: 0

Snapshot Time	Snapshot Name	Snapshot ID	State	Recovery
2026-05-30 21:59:58 BST	csm_TaskID36_1780174800	1780174800		
2026-05-31 12:29:57 BST	csm_TaskID37_1780227000	1780227000		
2026-05-31 13:30:01 BST	csm_TaskID37_1780230600	1780230600		
2026-05-31 14:29:59 BST	csm_TaskID37_1780234200	1780234200		
2026-05-31 15:29:58 BST	csm_TaskID37_1780237800	1780237800		


```
Work with Objects
Type options, press Enter.
  2=Edit authority      3=Copy    4=Delete  5=Display authority  7=Rename
  8=Display description 13=Change description

Opt Object      Type      Library   Attribute Text
---
  _ IUG2000 ✓ *LIB     QSYS     PROD     Base Library created 30/05/
  _ IUG2001 ✓ *LIB     QSYS     PROD     30/05/26 22:19:11
  _ IUG2002 ✓ *LIB     QSYS     PROD     31/05/26 03:00:00
  _ IUG2003 ✓ *LIB     QSYS     PROD     31/05/26 07:00:00
  _ IUG2004 ✓ *LIB     QSYS     PROD     31/05/26 11:00:00
  _ IUG2005 ✓ *LIB     QSYS     PROD     31/05/26 13:00:00
  _ IUG2006 ✗ *LIB     QSYS     PROD     31/05/26 14:00:00
  _ IUG2007 ✗ *LIB     QSYS     PROD     31/05/26 15:00:00

Bottom
```

# Session-> {Select} -> [Session Actions] ...Commands -> Create Clone

SNAP\_AFG\_POC2\_AFGUKFSN1



Site 1

**Session Actions:**

- Commands ▶ Prepare Snapshot
- View/Modify ▶ Prepare Safeguarded Snapshot
- Remove Session Create Snapshot
- Active Host** Create Safeguarded Snapshot
- Recoverable** Create Thin Clone
- Description** Refresh Thin Clone
- Copy Sets** Create Clone
- Group Name** Restore From Snapshot
- Refresh States
- Delete Snapshot

**Snapshot Schedule**

**Last Recoverable Snapshot**

**Volume Group Name** AFG\_POC2


**Snapshot Info** **Thin Clone Info**

Total Number Snapshots: 5 Total Recoverable Snapshots: 5 Total Unrecoverable Snapshots: 0

Snapshot Time	Snapshot Name	Snapshot ID	State	Recoverable
2026-05-30 21:59:58 BST	csm_TaskID36_1780174800	1780174800	active	Yes
2026-05-31 12:29:57 BST	csm_TaskID37_1780227000	1780227000	active	Yes
2026-05-31 13:30:01 BST	csm_TaskID37_1780230600	1780230600	active	Yes
2026-05-31 14:29:59 BST	csm_TaskID37_1780234200	1780234200	active	Yes
2026-05-31 15:29:58 BST	csm_TaskID37_1780237800	1780237800	active	Yes

# Create clone of SNAP – choose carefully

**Create Clone SNAP\_AFG\_POC2\_AFGUKFSN1?**

 **IWNR1927W**  
[May 31, 2026, 4:25:01 PM] This command will clone the snapshot from session SNAP\_AFG\_POC2\_AFGUKFSN1. When you clone a snapshot, a new Snapshot session will automatically be created on the server which can be used to manage snapshots against the new volume group. A cloned volume group is considered a new volume group and has no reference to this session. Do you want to continue?

Filter...

Snapshot Time	Snapshot Name	Copy Sets	Safeguarded	
2026-05-31 15:29:58 BST	csm_TaskID37_1780237800	5	Yes	
2026-05-31 14:29:59 BST	csm_TaskID37_1780234200	5	Yes	
2026-05-31 13:30:01 BST	csm_TaskID37_1780230600	5	Yes	
2026-05-31 12:29:57 BST	csm_TaskID37_1780227000	5	Yes	
2026-05-30 21:59:58 BST	csm_TaskID36_1780174800	5	Yes	

Select the Snapshot again - caution, the sort order here is reversed compared to previous screen

Yes No

# Create clone – completed in a few seconds

The screenshot displays the IBM Copy Services Manager interface. At the top, there are navigation tabs for 'Overview', 'Sessions', and 'Storage'. Below the navigation, the breadcrumb path is 'Sessions > SNAP\_AFG\_POC2\_AFGUKFSN1'. A red box highlights a notification message: 'Create Clone : IWNR1026I : Success : (Open Console) : Completed'. Below this, the session name 'SNAP\_AFG\_POC2\_AFGUKFSN1' is displayed. A 'Session Actions:' dropdown menu is visible. At the bottom, the 'Status' is shown as 'Normal' with a green checkmark icon.

IBM Copy Services Manager Overview Sessions Storage

Sessions > SNAP\_AFG\_POC2\_AFGUKFSN1

✓ Create Clone : IWNR1026I : Success : (Open Console) : Completed

SNAP\_AFG\_POC2\_AFGUKFSN1

Session Actions: ▾

Status ✓ Normal

# Original volumes & cloned SG Snapshot vols.

⊕ Create Volumes | ⋮ Actions ▾ | All Volumes ▾

Name	State	Pool	Volume Group	Protocol Type
AFGPoc02_01	✔ Online	AFGUK_FS1Pool	AFG_POC2	SCSI
AFGPoc02_02	✔ Online	AFGUK_FS1Pool	AFG_POC2	SCSI
AFGPoc02_03		AFGUK_FS1Pool	AFG_POC2	SCSI
AFGPoc02_04		AFGUK_FS1Pool	AFG_POC2	SCSI
AFGPoc02_05		AFGUK_FS1Pool	AFG_POC2	SCSI
AFGPoc02_01-0		AFGUK_FS1Pool	AFG_POC2-0	
AFGPoc02_02-0		AFGUK_FS1Pool	AFG_POC2-0	
AFGPoc02_03-0		AFGUK_FS1Pool	AFG_POC2-0	
AFGPoc02_04-0		AFGUK_FS1Pool	AFG_POC2-0	
AFGPoc02_05-0		AFGUK_FS1Pool	AFG_POC2-0	
AFGPoc02_04-1		AFGUK_FS1Pool	AFG_POC2-1	
AFGPoc02_05-1		AFGUK_FS1Pool	AFG_POC2-1	
AFGPoc02_01-1		AFGUK_FS1Pool	AFG_POC2-1	
AFGPoc02_02-1		AFGUK_FS1Pool	AFG_POC2-1	
AFGPoc02_03-1		AFGUK_FS1Pool	AFG_POC2-1	

Take Snapshot

Rename...

Map to Host or Host Cluster...

Modify Volume Capacity

Modify Capacity Savings...

Modify Mirror Sync Rate...

Cache Mode...

Remove Private Mappings...

View Mapped Hosts...

View Member MDisks...

View Safeguarded Backups...

Modify I/O Group...

Cloud Volumes

Capacity Savings

# Original volumes & cloned SG Snapshot vols.

## Remove Private Mappings

Do you want to remove the following **5** mappings?

2,	AFGPoc02_03,	AFGPoc02
1,	AFGPoc02_02,	AFGPoc02
3,	AFGPoc02_04,	AFGPoc02
0,	AFGPoc02_01,	AFGPoc02
4,	AFGPoc02_05,	AFGPoc02

Verify the number of mappings that this operation affects:

Cancel Remove

## Remove Private Mappings

Task completed.

100%

[View more details](#)

```
svctask imvdisknostmap -nost 1/ 484 4:35 PM
The task is 80% complete. 4:35 PM
Removing the mapping for volume AFGPoc02_05 to host AFGPoc02 4:35 PM
Running command: 4:35 PM
svctask imvdiskhostmap -host 17 485 4:35 PM
The task is 100% complete. 4:35 PM
Synchronizing memory cache. 4:35 PM
Task completed. 4:35 PM
```

Cancel Close

# These are the volumes I want to map to host

The screenshot shows a 'Volumes' management interface with a table of storage volumes. The table has columns for Name, State, Pool, Volume Group, and Prot. The 'Volume Group' column for the last five rows is highlighted with a red box.

Name	State	Pool	Volume Group	Prot
AFGPoc02_01	✓ Online	AFGUK_FS1Pool	AFG_POC2	
AFGPoc02_02	✓ Online	AFGUK_FS1Pool	AFG_POC2	
AFGPoc02_03	✓ Online	AFGUK_FS1Pool	AFG_POC2	
AFGPoc02_04	✓ Online	AFGUK_FS1Pool	AFG_POC2	
AFGPoc02_05	✓ Online	AFGUK_FS1Pool	AFG_POC2	
AFGPoc02_01-0	✓ Online	AFGUK_FS1Pool	AFG_POC2-0	
AFGPoc02_02-0	✓ Online	AFGUK_FS1Pool	AFG_POC2-0	
AFGPoc02_03-0	✓ Online	AFGUK_FS1Pool	AFG_POC2-0	
AFGPoc02_04-0	✓ Online	AFGUK_FS1Pool	AFG_POC2-0	
AFGPoc02_05-0	✓ Online	AFGUK_FS1Pool	AFG_POC2-0	
AFGPoc02_04-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1	
AFGPoc02_05-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1	
AFGPoc02_01-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1	
AFGPoc02_02-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1	
AFGPoc02_03-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1	

# Select the host

Create Volumes Actions All Volumes Default Contains

Name State

- AFGPoc02\_01 Online
- AFGPoc02\_02 Online
- AFGPoc02\_03 Online
- AFGPoc02\_04 Online
- AFGPoc02\_05 Online
- AFGPoc02\_01-0 Online
- AFGPoc02\_02-0 Online
- AFGPoc02\_03-0 Online
- AFGPoc02\_04-0 Online
- AFGPoc02\_05-0 Online
- AFGPoc02\_04-1 Online
- AFGPoc02\_05-1 Online
- AFGPoc02\_01-1 Online
- AFGPoc02\_02-1 Online
- AFGPoc02\_03-1 Online

### Create Mapping

Create Mappings to:

- Hosts
- Host Clusters

Select hosts to map to AFGPoc02\_01-1

Default Contains Filter

Name	Status	Host Type	Host Mappings
ABPFGARK	Online	Generic	Yes
ABPFGMGT	Online	Generic	Yes
AFGPoc01	Online	Generic	Yes
AFGPoc02	Offline	Generic	No
AFGUKPDESX01	Online	Generic	Yes

Showing 22 hosts | Selecting 1 host

Would you like the system to assign SCSI LUN IDs or manually assign these IDs?

- System Assign
- Self Assign

Cancel Back Next

# I always add the load source volume 1st

Map Volumes to AFGPoc02: Summary

The following volumes will be mapped to AFGPoc02:

Name	SCSI ID	Caching I/O Group ID	New Mapping
AFGPoc02_01-1	0	0	New

Cancel      ◀ Back      Map Volumes

Modify Mappings

Task completed.  
100%

▾ View more details

Task started. 4:43 PM  
Creating the mapping for volume AFGPoc02\_01-1 to host AFGPoc02 4:43 PM  
Running command: 4:43 PM  
`svctask mkvdiskhostmap -force -host 17 -scsi 0 1079` 4:43 PM  
The task is 100% complete. 4:43 PM  
Synchronizing memory cache. 4:43 PM  
Task completed. 4:43 PM

Cancel      Close

# There it is. Now for the others

The screenshot shows a 'Volumes' management interface. At the top, there are buttons for 'Create Volumes' and 'Actions', and a dropdown menu for 'All Volumes'. Below this is a table with columns for Name, State, Pool, Volume Group, Protocol Type, and UID. The table lists 18 volumes, all in an 'Online' state. The volume 'AFGPoc02\_01-1' is highlighted, and its 'SCSI' protocol type is enclosed in a red box.

Name	State	Pool	Volume Group	Protocol Type	UID
AFGPoc02_01	✓ Online	AFGUK_FS1Pool	AFG_POC2		600
AFGPoc02_02	✓ Online	AFGUK_FS1Pool	AFG_POC2		600
AFGPoc02_03	✓ Online	AFGUK_FS1Pool	AFG_POC2		600
AFGPoc02_04	✓ Online	AFGUK_FS1Pool	AFG_POC2		600
AFGPoc02_05	✓ Online	AFGUK_FS1Pool	AFG_POC2		600
AFGPoc02_01-0	✓ Online	AFGUK_FS1Pool	AFG_POC2-0		600
AFGPoc02_02-0	✓ Online	AFGUK_FS1Pool	AFG_POC2-0		600
AFGPoc02_03-0	✓ Online	AFGUK_FS1Pool	AFG_POC2-0		600
AFGPoc02_04-0	✓ Online	AFGUK_FS1Pool	AFG_POC2-0		600
AFGPoc02_05-0	✓ Online	AFGUK_FS1Pool	AFG_POC2-0		600
AFGPoc02_04-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1		600
AFGPoc02_05-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1		600
AFGPoc02_01-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1	SCSI	600
AFGPoc02_02-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1		600
AFGPoc02_03-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1		600


# Select all other volumes & Map to Host

AFGPoc02_04-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1	✓
AFGPoc02_05-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1	
AFGPoc02_01-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1	SCSI
AFGPoc02_02-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1	✓
AFGPoc02_03-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1	

# Review and click map volumes.

Map Volumes to AFGPoc02: Summary ✕

The following volumes will be mapped to AFGPoc02:

Name	SCSI ID	Caching I/O Group ID	New Mapping 
AFGPoc02_02-1	1	0	<a href="#">New</a>
AFGPoc02_03-1	2	0	<a href="#">New</a>
AFGPoc02_04-1	3	0	<a href="#">New</a>
AFGPoc02_05-1	4	0	<a href="#">New</a>
AFGPoc02_01-1	0	0	

[Cancel](#) [◀ Back](#) [Map Volumes](#)

# Ta daa

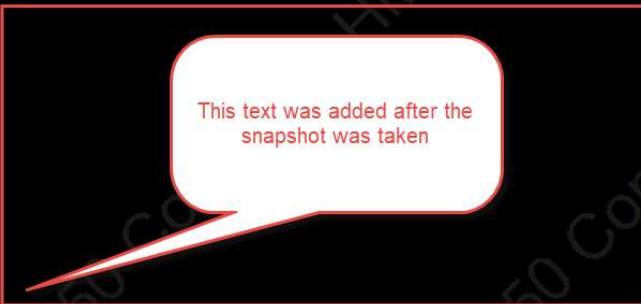
Volumes				
<a href="#">+</a> Create Volumes	<a href="#">☰</a> Actions	All Volumes		
Name	State	Pool	Volume Group	Protocol
AFGPoc02_01	✓ Online	AFGUK_FS1Pool	AFG_POC2	
AFGPoc02_02	✓ Online	AFGUK_FS1Pool	AFG_POC2	
AFGPoc02_03	✓ Online	AFGUK_FS1Pool	AFG_POC2	
AFGPoc02_04	✓ Online	AFGUK_FS1Pool	AFG_POC2	
AFGPoc02_05	✓ Online	AFGUK_FS1Pool	AFG_POC2	
AFGPoc02_01-0	✓ Online	AFGUK_FS1Pool	AFG_POC2-0	
AFGPoc02_02-0	✓ Online	AFGUK_FS1Pool	AFG_POC2-0	
AFGPoc02_03-0	✓ Online	AFGUK_FS1Pool	AFG_POC2-0	
AFGPoc02_04-0	✓ Online	AFGUK_FS1Pool	AFG_POC2-0	
AFGPoc02_05-0	✓ Online	AFGUK_FS1Pool	AFG_POC2-0	
AFGPoc02_04-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1	SCSI
AFGPoc02_05-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1	SCSI
AFGPoc02_01-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1	SCSI
AFGPoc02_02-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1	SCSI
AFGPoc02_03-1	✓ Online	AFGUK_FS1Pool	AFG_POC2-1	SCSI

# Now to start the LPAR.. And the library name text is missing.

```
Work with Objects

Type options, press Enter.
2=Edit authority      3=Copy  4=Delete  5=Display authority  7=Rename
8=Display description 13=Change description

Opt  Object      Type      Library      Attribute      Text
---  ---
IUG2000  *LIB      QSYS      PROD          Base Library created 30/05/
IUG2001  *LIB      QSYS      PROD
IUG2002  *LIB      QSYS      PROD
IUG2003  *LIB      QSYS      PROD
IUG2004  *LIB      QSYS      PROD
IUG2005  *LIB      QSYS      PROD
IUG2006  *LIB      QSYS      PROD
IUG2007  *LIB      QSYS      PROD
```



# An explanation.

- The job scheduled entry created libraries without text.
- The text was added later, but the snapshot used for recovery was made before the test.
- The last two libraries were not present in the snapshot but have been added by the system, showing a different time than the original created time.

Display Object Description - Full

Library 1 of 1  
Object . . . . . : IUG2006            Attribute . . . . . : PROD  
Library . . . . . : QSYS            Owner . . . . . : EDDIEC  
Library ASP device . . : \*SYSBAS        Library ASP group . . : \*SYSBAS  
Type . . . . . : \*LIB            Primary group . . . . : \*NONE

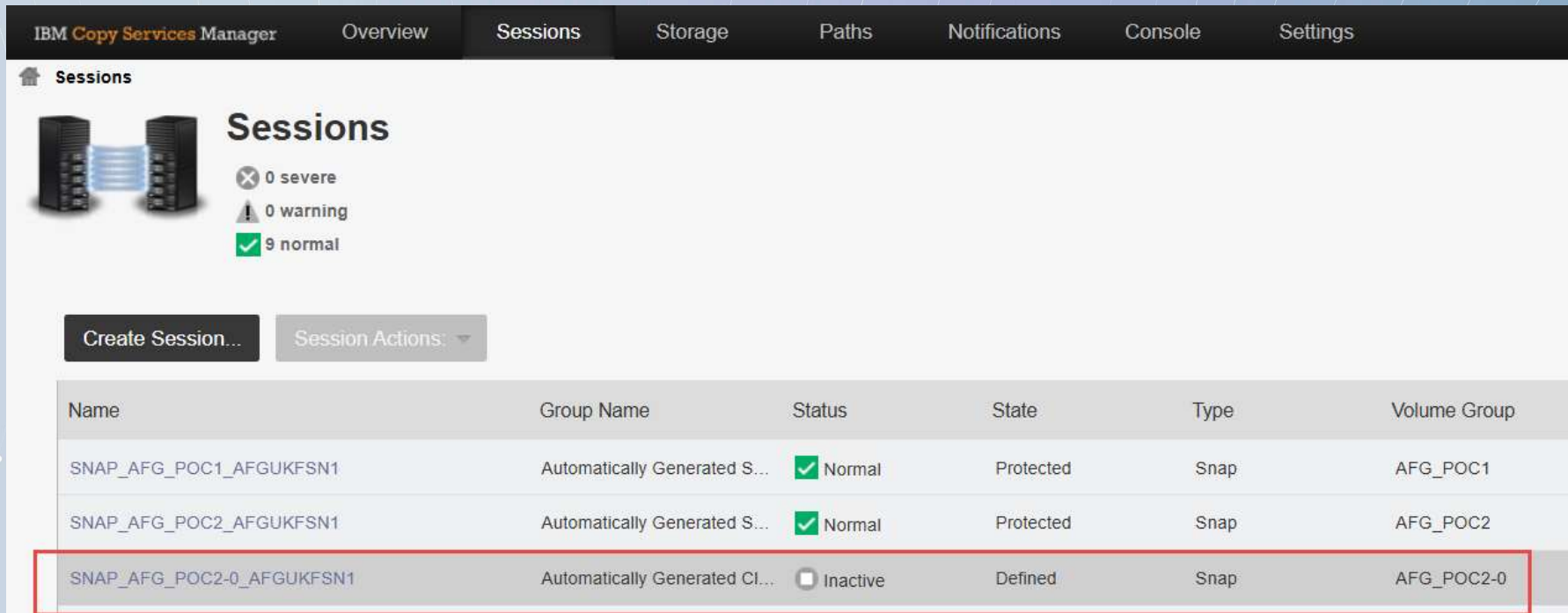
User-defined information:

Attribute . . . . . :  
Text . . . . . :

Creation information:

Creation date/time . . . . . : 31/05/26 16:56:04  
Created by user . . . . . : EDDIEC  
System created on . . . . . : AFGPOC02  
Object domain . . . . . : \*SYSTEM

When the SG snapshot was recovered, we were advised that a separate volume group and session had been created. See below for the session.




The screenshot shows the IBM Copy Services Manager interface. The top navigation bar includes 'Overview', 'Sessions', 'Storage', 'Paths', 'Notifications', 'Console', and 'Settings'. The 'Sessions' page displays a summary of session counts: 0 severe, 0 warning, and 9 normal. Below this, there are buttons for 'Create Session...' and 'Session Actions:'. A table lists the sessions with columns for Name, Group Name, Status, State, Type, and Volume Group. The session 'SNAP\_AFG\_POC2-0\_AFGUKFSN1' is highlighted with a red box, showing it is 'Automatically Generated Cl...', 'Inactive', 'Defined', and belongs to the 'AFG\_POC2-0' volume group.

Name	Group Name	Status	State	Type	Volume Group
SNAP_AFG_POC1_AFGUKFSN1	Automatically Generated S...	Normal	Protected	Snap	AFG_POC1
SNAP_AFG_POC2_AFGUKFSN1	Automatically Generated S...	Normal	Protected	Snap	AFG_POC2
SNAP_AFG_POC2-0_AFGUKFSN1	Automatically Generated Cl...	Inactive	Defined	Snap	AFG_POC2-0

# A final word.

The new functionality in the software to make snapshots is fast and effective.

The Copy Services Manager makes it easier to track the capacity consumed by these functions



Snapshot Info Thin Clone Info

Total Number Snapshots: 9 Total Recoverable Snapshots: 9 Total Unrecoverable Snapshots: 0 **Total Safeguarded Used Capacity: 56.2 GiB**

Snapshot Time	Snapshot Name	Snapshot ID	State	Recoverable	Copy Sets	Used Capacity	Last Result	Expiration	Safeguarded	Threat Detect...
2026-05-30 21:59:58 BST	csm_TaskID36_1780174800	1780174800	active	Yes	5	20.7 GiB	✓ IWNR2885I	2026-06-01 21:59:58 BST	Yes	No
2026-05-31 12:29:57 BST	csm_TaskID37_1780227000	1780227000	active	Yes	5	1.8 GiB	✓ IWNR2885I	2026-06-01 12:29:57 BST	Yes	No
2026-05-31 13:30:01 BST	csm_TaskID37_1780230600	1780230600	active	Yes	5	1.8 GiB	✓ IWNR2885I	2026-06-01 13:30:01 BST	Yes	No
2026-05-31 14:29:59 BST	csm_TaskID37_1780234200	1780234200	active	Yes	5	1.8 GiB	✓ IWNR2885I	2026-06-01 14:29:59 BST	Yes	No
2026-05-31 15:29:58 BST	csm_TaskID37_1780237800	1780237800	active	Yes	5	6.4 GiB	✓ IWNR2885I	2026-06-01 15:29:58 BST	Yes	No
2026-05-31 16:30:01 BST	csm_TaskID37_1780241400	1780241400	active	Yes	5	41.3 MiB	✓ IWNR2885I	2026-06-01 16:30:01 BST	Yes	No
2026-05-31 17:30:00 BST	csm_TaskID37_1780245000	1780245000	active	Yes	5	41.3 MiB	✓ IWNR2885I	2026-06-01 17:30:00 BST	Yes	No
2026-05-31 18:30:04 BST	csm_TaskID37_1780248600	1780248600	active	Yes	5	7.2 GiB	✓ IWNR2885I	2026-06-01 18:30:04 BST	Yes	No
2026-05-31 22:00:04 BST	csm_TaskID36_1780261200	1780261200	active	Yes	5	16.5 GiB	✓ IWNR2885I	2026-06-02 22:00:04 BST	Yes	No

# A final word.

On the SAN itself, the snapshot names are included in the volume copy. This is a vast improvement on the original naming convention.

- Memory is used in operations. As part of the scrutiny to assess impact, consider the memory used <See next slide>

# SAN: Settings->System->Resources

System

Date and Time

Licensed Functions

Update System

VMware Virtual Volumes (vVols)

Volume Protection

Resources

IP Quorum

I/O Groups

Transparent Cloud Tiering

Automatic Configuration

External Scheduling Applications

Remote-copy Bandwidth Limit

### Resources

Use the Resources page to manage per I/O group memory limits for specific functions.

io\_grp0 io\_grp1

#### Flashcopy Memory Limits:

Enter a value to assign the memory limit for the FlashCopy function. The total assigned cannot exceed 2048 MiB.

FlashCopy  - + Total Assigned: 2048 MiB

384 MiB Used Memory (18%) 1664 MiB Unused Memory

#### Other Memory Limits:

Enter a value to assign to each of the following functions. The total memory assigned cannot exceed 2088 MiB.

Remote Mirroring  - + Total Assigned: 100 MiB

43 MiB Used Memory (43%) 57 MiB Unused Memory

Volume Mirroring  - + Total Assigned: 32 MiB

0 MiB Used Memory (0%) 32 MiB Unused Memory

RAID  - + Total Assigned: 350 MiB

80 MiB Used Memory (22%) 270 MiB Unused Memory

#### Total Combined Memory

Total Assigned: 482 MiB / 2088 MiB

1537 MiB will be allocated for policy-based replication when enabled.

Thank you.

The background is a gradient of blue, transitioning from a lighter shade on the left to a darker shade on the right. It features several white dots of varying sizes scattered across the field. Thin, white, curved lines sweep across the background, some originating from the bottom right and curving upwards and to the left, while others are more horizontal or vertical. The overall effect is a clean, modern, and artistic design.