

IBM Storage Fusion Backup and Restore for IBM Cloud Pak for Data









IBM Redbooks

IBM Storage Fusion Backup and Restore for IBM Cloud Pak for Data

June 2023

Note: Before using this information and the product it supports, read the information in "Notices" on page v.

First Edition (June 2023)

This edition applies to Version 2, Release 5, of IBM Storage Fusion HCI (5771-PP7).

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Preface

IBM Cloud Pak® for Data can be protected with IBM Storage Fusion. This IBM Redpaper publication covers backing up IBM Cloud Pak for Data with a non-disruptive (online) backup and then restoring to an alternate cluster. During an online backup, normal runtime operations in the Cloud Pak for Data cluster continue while the backup completes. The backup process includes creating policies and automating backups in IBM Storage Fusion, then protecting Cloud Pak for Data, protecting IBM Storage Fusion namespace and the IBM Storage Protect Plus (SPP) catalog. Backup and restore is supported from IBM Storage Fusion HCI to IBM Storage Fusion software as well as from IBM Storage Fusion Software to IBM Storage Fusion HCI.

Note: IBM Spectrum® Fusion[™] HCI and IBM Spectrum Fusion[™] have become IBM Storage Fusion HCI System and IBM Storage Fusion. This edition uses some of the IBM Spectrum brand names and will be updated with the next edition. See Evolving the IBM Storage Portfolio Brand Identity and Strategy to learn more about how IBM Storage Fusion HCI System and IBM Storage Fusion are key to the IBM Storage Portfolio.

IBM Spectrum Fusion must be at 2.3 or higher with "Backup" service installed. If using IBM Storage Fusion 2.5.2, the "Backup (Legacy)" service should be used.

If using Storage Fusion 2.6.x, refer to Chapter 5 Backup and Restore in this Redbooks publication here.

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Summary of changes

This section describes the technical changes made in this edition of the paper and in previous editions. This edition might also include minor corrections and editorial changes that are not identified.

Summary of Changes for IBM Storage Fusion Backup and Restore for Cloud Pak for Data as created or updated on October 24, 2023.

October 2023, First Edition minor updates

This revision includes the following new and changed information.

New information

 Updated supported IBM Storage Fusion levels in 1.1, "Considerations and requirements" on page 2 with the following:

The following must be considered when preparing to protect your Cloud Pak for Data environment on Storage Fusion 2.3.x, 2.4.x, and 2.5.x. If using Storage Fusion 2.6.x, refer to Chapter 5 Backup and Restore in this Redbooks publication here.

Changed information

- Updated IBM Spectrum to IBM Storage
- Updated urls

1



Preparation

This chapter describes the considerations, requirements, and pre-requisites to set up IBM Storage Fusion backup and recovery for the Cloud Pak for Data environment.

1.1 Considerations and requirements

The following must be considered when preparing to protect your Cloud Pak for Data environment on Storage Fusion 2.3.x, 2.4.x, and 2.5.x. If using Storage Fusion 2.6.x, refer to Chapter 5 Backup and Restore in the Redbooks publication here.

- If using Storage Fusion 2.3.x or 2.4.x, 2.5.0 or 2.5.1, the "Backup" service should be installed and utilized
- If using IBM Storage Fusion 2.5.2, the "Backup (Legacy)" service should be installed and utilized
- IBM Storage Fusion Data Protection is enabled (which deploys IBM Storage Protect Plus)
- OpenShift OCP 4.8 and OCP 4.10 are supported, but both source and target clusters must be at the same major version
- IBM Cloud Pak for Data must be at version 4.5.3 or higher
- All services are installed at the same Cloud Pak for Data release
- The Cloud Pak for Data control plane is installed in a single project (namespace)
- Backup and restore of the Cloud Pak for Data instance with tethered namespaces is supported

1.2 Getting pre-requisites ready

Before backing up and protecting the Cloud Pak for Data environment, some pre-requisites must be prepared.

1.2.1 Installing the cpdbr-oadp service

The first item to prepare is the cpdbr-oadp service in the Cloud Pak for Data operators and Cloud Pak for Data instance namespaces.

To install the services, prepare your environment to use cpd-cli, which can be found at the following location: https://github.com/IBM/cpd-cli/releases

Install the cpdbr-oadp service in the Cloud Pak for Data operators and instance namespaces. Reference the Cloud Pak for Data link:

https://www.ibm.com/docs/en/cloud-paks/cp-data/4.7.x?topic=utilities-installing-cp
dbr-service-storage-fusion-integration

In the sample environment, it is an Express install, which has foundational services and Cloud Pak for Data operators in the same **ibm-common-services** namespace. The cpdbr-oadp service was installed by issuing the following command, as shown in Figure 1-1.

```
./cpd-cli oadp install --foundation-namespace=ibm-common-services
--operators-namespace=ibm-common-services --component=cpdbr-ops-hooks
--cpdbr-hooks-image-prefix=icr.io/cpopen/cpd --log-level=debug -verbose
```



Figure 1-1 Install the cpdbr-oadp service in the Cloud Pak for Data operators namespace

Afterwards, we issued **oc get pod -n ibm-common-services** |grep cpdbr to ensure the cpdbr-ops-service pod is running, as seen in Figure 1-2.

\$ oc get pod -n ibm-common-services gr	p cpdbr			
<pre>cpdbr-ops-service-54c54d797c-bhb5z</pre>	1/1	Running	0	44h
\$				

Figure 1-2 Command to ensure the cpdbr-ops-service pod is running

The install of the cpdbr-oadp service will also generate and apply the *ibmcpd-operators* for the IBM Storage Fusion recipe in the Cloud Pak for Data operators namespace, as seen in Figure 1-3.



Figure 1-3 Generate and apply the ibmcpd-operators

Next, the cpdbr-oadp service is installed in the Cloud Pak for Data instance namespace. In the sample environment, the Cloud Pak for Data instance is in the **czen** namespace. The cpdbr-oadp service was installed by issuing the following command, as seen in Figure 1-4.

./cpd-cli oadp install --cpd-namespace=czen --component=cpdbr-hooks
--cpdbr-hooks-image-prefix=icr.io/cpopen/cpd --log-level=debug -verbose



Figure 1-4 Install cpdbr-oadp service in the Cloud Pak for Data instance namespace

Afterwards, we issued **oc get pod -n czen** |**grep cpdbr** to ensure the cpdbr-service pod is running, as seen in Figure 1-5.



Figure 1-5 Ensure the cpdbr-service pod is running

The install of the cpdbr-oadp service will also generate and apply the **ibmcpd** IBM Storage Fusion recipe in the Cloud Pak for Data instance namespace, as seen in Figure 1-6.

```
$ oc get frcpe -n czen
NAME AGE
ibmcpd 20m
$
```

Figure 1-6 ibmcpd IBM Storage Fusion recipe in the CP4D instance namespace

Moreover, the installation of cpdbr-oadp service also triggers the IBM Storage Fusion application to then add additional information to the *spec* area of the Cloud Pak for Data instance application yaml, such as the variables that will be used for the recipe to be able to perform the backup and the restore.

We can view the czen yaml by issuing oc get fapp czen -n ibm-spectrum-fusion-ns -o yaml, as depicted in Figure 1-7.



Figure 1-7 View the czen yaml

1.2.2 Setting up Object Storage

The next step is to add a backup storage location which is required before we set up backup policies. To add a storage location, we go to the **Backup policies** page and click on **Add location** as seen in Figure 1-8 on page 5.

Backup policies Policies Locations Backup storage locations are required to set up backup policies. To protect your applications in the electronic charm more. Backup storage locations are required to set up backup policies. To protect your applications in the electronic charm more. Status: All ~ View All ~ Clsa-catalog-storage : Connected Used Used Connected Used 1,1177.28 GiB Disting backup is in the electronic charm more.
Policies Locations Backup storage locations are required to set up backup policies. To protect your applications in th cluster failure, consider setting up an additional object storage backup location. Learn more. Status: All ~ Type: All ~ Q. Search Connected Used O GiB Dulate Dulat
Policies Locations ems Backup storage locations are required to set up backup policies. To protect your applications in the cluster failure, consider setting up an additional object storage backup location. Learn more. Status: All ~ Type: All ~ Clsa-catalog-storage : Connected : Used GiB Didition tabletage
Backup storage locations are required to set up backup policies. To protect your applications in the even cluster failure, consider setting up an additional object storage backup location. Learn more. Status: All Y Type: All Y Q. Search Connected Ured O GiB Duilors device the event of the even of the event of the event of the even of the even of
Status: All ~ Type: All ~ Q. Search Clsa-catalog-storage : : : : : Connected Used : : : : : Used O GiB : : : : : : District : : : : : : : : District : : : : : : : : District :
Clsa-catalog-storage : Connected : Used O GiB Dutate tabletote
Datisias Applications Datisias Applications
0 0 5 5

Figure 1-8 Add storage location from Backup policies page by selecting Add location

In our example, we named our location **cpst-cos-hciops** and we will be using IBM Cloud Object Storage. We then entered the endpoint and bucket and added the access key and secret key as seen in Figure 1-9.

× IBM Spectrum Fusion				@ ^ Q !!!
Quick start Events Applications Backup policies	Backup policies		Add backup location Backup locations connected to IBM Spectrum application backups created by backup polici	× Fusion provide storage for es.
Remote file systems Services Settings	Backup storage locations are required to set u cluster failure, consider setting up an addition	p backup policies. To protect your applications in the ev al object storage backup location. Learn more.	cpst-cos-hciops Select a type of storage backup location.	
	Status: All V Type: All V	Q Search	Azure Microsoft • Object Storage	IBM Cloud IBM • Object Storage
	Connected Used GiB	© Connected Used 1,117.28 GiB	AWS Amazon - Object Storage	S3 Compliant Any + Object Storage
	Policies Applications 0 0	Policies Applications 5 5	Add your login credentials to connect IBM Sp Endpoint https://s3.us-east.cloud-object-storage.ap	ectrum Fusion to your backup location. pdomain.cloud
			Bucket cp4d-objstore2	
			Access key youraccesskeyhere	Secret key
			Cancel	Add location

Figure 1-9 Complete Add backup location credentials then click on Add location

Once we entered the login credentials, we clicked on **Add location** and we can now see it listed as one of the Locations within the **Backup policies** page as seen in Figure 1-10.

×	IBM Spectrum Fusion								0	ጽ	¢	
Quic Even Appl Back	k start its lications rup policies	Backup po	Dlicies Locations	-								
Rem Serv Setti	ote file systems ices ings	Backup storage loca cluster failure, cons	ations are required to set up ider setting up an additiona) backup policies. To p Il object storage backu	rotect your applications in Ip location. Learn more.	the event of a					88	
		Status: All 🗸	Type: All 🗸	Q Search					Add lo	cation	+	
		Claa-catalog Connected Used GiB	-storage i	© cpd-clusta-b © connected Used 1,117.	ackup i 28 GiB	Connected Used O GiB	hciops	I				
		Policies O	Applications O	Policies 5	Applications 5	Policies O	Applications O					

Figure 1-10 cpst-cos-hciops listed as backup location

1.2.3 Backup policies for Cloud Pak for Data applications

Prior to creating and applying backup policies to the Cloud Pak for Data applications, you must create an S3 compliant backup location in the IBM Storage Fusion UI, which will be used to store the backups and restore data from.

The next step is to log into IBM Storage Fusion UI and go to the **Backup policies** page to create a backup policy which will use an S3 object storage location. From that page, we clicked on **Add policy** and we named the policy **czen-policy** and selected a monthly frequency as seen in Figure 1-11.

X IBM Spectrum Fusion Quick start Events Applications Backup policles Services Settings											0	ጸ	\$	
Quick start Events Applications	Backup po	olicies			Create a backup polic Backup policies define param backup jobs, and the retentio	CY eters that n period f	specif	y the b backed	ackup •up da	locatio ta.	on, fre	quency of		×
Backup policies	Policies	Locations			Policy name									
Services Settings	The following table backup location 18/	contains backup policies cr M Spectrum Fusion will use	reated on this cluster, Backup po to create recurring backups, Led	slicies contain the so arm more.	Frequency Set the frequency in which the	e associat	ed bac	kup jot	bs mus	it run.				
	Backup location:	All - Q Search			Daily	Choos	e a day							
Backup location: All V Q Search Daily Name Backup location Frequency Time		Liany	1	2	3	4	5	6	7					
	c-demo	cpst-cos-hciops	Every 1 of the month	12:00 AM Mol	weekty	8	9	10	11	12	13	14		
	cpd-demo	cpst-cos-hciops	Every day	12:30 AM Mol	Monthly 👌 🌑	15	16	17	18	19	20	21		
	cpd-operators	cpst-cos-hciops	Every 1 of the month	12:00 AM Mol	Custom	22	30	31	25	26	21	28		
	weekly-cos	cpst-cos-hciops	Every Su	12:00 AM Mot		Choos	e a time							
	Items per page: 1	10 - 1-4 of 4 items				12	:00	AM	~	Am	erica/i	Phoenix	`	,

Figure 1-11 Create the backup policy czen-policy

× IBM Spectrum Fusion							@ % & III
Quick start Events	Backup	policies			Create a backup	12:00	AM V America/Phoenix V
Applications Backup policies	Policies	Locations			Backup Location Select a location fo	is or storing the backups.	
Services Settings	The following tal backup location Backup location:	Ne contains backup pol IBM Spectrum Fusion w All ~ Q s	icies created on th vill use to create re earch	is cluster. Ba curring back	In place snaps Snapshots are sto transferred to obje	shot red in place and not ect storage.	Object storage Object storage backup locations protect your applications in the event of a cluster failure.
	Name	Backup location	Frequency	Time			
	cpd-ins-clsa	cpd-clsa-backup	Every day	12:00 A	Q Search		
	cpd-isf-clsa	cpd-clsa-backup	Every day	12:00 A	ö	cpd-clsa-backup ibm	
	cpd-ops-clsa	cpd-clsa-backup	Every day	12:00 A			
	Items per page:	10 ~ 1-3 of 3	items		Ö	cpst-cos-hciops ibm	
					Retention Define how long th Retention 30	ese backup copies will exit	st in the backup storage location. days 🗸 🗸
					Cancel		Create policy

Under the **Backup Locations** section, we selected **Object storage** as seen in Figure 1-12.

Figure 1-12 Select Object storage for backup location

Once the policy is created, it will appear in the **Backup Policies** page under the **Policies** section as seen in Figure 1-13.

× IBM Spectrum Fusion								0	°	¢	
Quick start Events	Backup	oolicies	5								
Backup policies	Policies	Loca	tions								
Services Settings	The following tal backup location	ole contains b IBM Spectrur	ackup policies n Fusion will us	created on this clust se to create recurring	er. Backup policies contain the sched backups. Learn more.	ule and					
	Backup location:	All 🗸	Q Searc	h			\$	Add po		+	
	Name	Backup location	Fr	equency	Time	Retention	Applications				
	cpd-ins-clsa	cpd-clsa-ba	ickup Ev	ery day	12:00 AM Mountain Standard Time	30 Days	cpdz			:	
	cpd-isf-clsa	cpd-clsa-ba	ckup Ev	ery day	12:00 AM Mountain Standard Time	30 Days	ibm-spectrum ns	-fusion-		:	
	cpd-ops- clsa	cpd-clsa-ba	ickup Ev	ery day	12:00 AM Mountain Standard Time	30 Days	ibm-common-	services		:	
	czen-policy	cpst-cos-hc	iops Ev	ery 1 of the onth	12:00 AM Mountain Standard Time	30 Days	0			:	
	Items per page:	10 ~	1-4 of 4 items	5			1 ~ 1	of 1 page	4	+	

Figure 1-13 czen-policy now listed in Backup Policies page

The next step is to go to the IBM Storage Fusion **Applications** page and assign the policy to your application. In our example, we assigned the **czen-policy** we just created to the **czen** application by clicking on **Assign policy** which is under the **Backup policy** column as seen in Figure 1-14.

× IBM Spectrum Fusion							ଡ଼	¢ ‼	
Quick start	Name	Used	Capacity	Backup status	Last backup time	Backup success rate	Backup policy		
Events	baas	< 0.01 GiB	10 GIB	No policy assigned			Assign policy	:	
Applications	cp4d	19.96 GiB	1,147.7 GiB	No policy assigned		-	Assign policy	:	
Backup policies Services	cp4d-ads	0 GiB	0 GiB	No policy assigned		-	Assign policy	:	
Settings	cpd-hadr	0 GiB	0 GiB	No policy assigned			Assign policy	1	
	cpd-hadr-stndby	0 GIB	0 GIB	No policy assigned		151	Assign policy	1	
	cpdz	30.3 GiB	956 GiB	Completed	Dec 14, 2022, 12:48 PM	4/5	cpd-ins-clsa	:	
	czen	0 GiB	0 GiB	No policy assigned			Assign policy	÷	
	default	0 GiB	2 GiB	No policy assigned		1941	Assign policy	1	
	ibm-common-service	0 GiB	0 GiB	No policy assigned			Assign policy	:	
	ibm-common-services	1.47 GiB	81 GiB	Completed	Dec 14, 2022, 10:41 AM	5/9	cpd-ops-clsa	1	

Figure 1-14 Select the Assign policy for the czen application

From the **Assign a backup policy** menu, select the policy you want to apply and click **Assign policy**. In our example, we selected the newly created **czen-policy** as show in Figure 1-15.

× IBM Spectrum Fusion								?	°	¢	
Oulek start	Name	Used	Capacity	Backu	cpd-ins-clsa	Frequency	Time				
Events	baas	< 0.01 GiB	10 GiB	1 NC		Every day	12:00 AM Mountain Standard Time				
Applications	cp4d	19.96 GiB	1,147.7	B NC							
Backup policies			GID	as N/	2×	Location	Location type	Retention			
Services	cp4d-ads	0 GiB	0 GiB	as as		cpd-clsa-backup	IBM	30 Days			
Settings	cpd-hadr	0 GiB	0 GiB	Indexes	cpd-isf-clsa	Frequency Every day	Time 12:00 AM				
	cpd-hadr-stndby	0 GiB	0 GiB	In the second			Mountain Standard Time				
	cpdz	30.3 GiB	956 GiB	🕑 Cc		Location	Location type	Retention			
	czen	0 GiB	0 GiB	No as	cpd-ops-	cpd-clsa-backup	IBM	30 Days			
	default	0 GiB	2 GiB	as No	clsa	Every day	12:00 AM Mountain				
	ibm-common-service	0 GiB	0 GiB	No as			Standard Time				
	ibm-common-services	1.47 GiB	81 GiB	🛛 Cc	Ť	Location	Location type	Retention		•	
	ibm-spectrum-fusion-ns	0 GiB	0 GiB	🗢 Ca	czen-policy	Frequency	Time	30 Days			
	ibm-spectrum-protect- plus-ns	1.4 GiB	400 GiB	In the second		Every 1 of the month	12:00 AM Mountain Standard Time				
	ibm-spectrum-scale	350.44 GiB	50 GIB	No as							
	ibm-spectrum-scale-csi	0 GiB	0 GiB	(B) No as		Run backup now					
	ibm-spectrum-scale-dns	0 GiB	0 GiB	No as							
	ibm-spectrum-scale- operator	0 GiB	0 GiB	No S	Cancel		Assign policy				

Figure 1-15 Assign the czen-policy to the czen namespace

After assigning the policy, now we can see that the **czen-policy** is applied to the **czen** namespace from the Applications page as seen in Figure 1-16 on page 9.

× IBM Spectrum Fusion							ଡ	\$ ∷∷
Quick start	Name	Used	Capacity	Backup status	Last backup time	Backup success rate	Backup policy	
Events	baas	< 0.01 GiB	10 GiB	No policy assigned		۵.	Assign policy	1
Applications	cp4d	19.96 CiD	1,147.7	No policy			Assign policy	1
Backup policies		GID	GIB	- No policy				
Services	cp4d-ads	0 GiB	0 GiB	assigned			Assign policy	1
Settings	cpd-hadr	0 GiB	0 GiB	No policy assigned			Assign policy	1
	cpd-hadr-stndby	0 GiB	0 GiB	No policy assigned		0	Assign policy	1
	cpdz	30.3 GiB	956 GiB	Completed	Dec 14, 2022, 12:48 PM	4/5	cpd-ins-clsa	1
	czen	0 GiB	0 GiB	8 Not backed up		i.	czen-policy	1
	default	0 GiB	2 GiB	No policy assigned		,	Assign policy	1
	ibm-common-service	0 GiB	0 GiB	No policy assigned			Assign policy	1
	ibm-common-services	1.47 GiB	81 GiB	Completed	Dec 14, 2022, 10:41 AM	5/9	cpd-ops-clsa	1
	ibm-spectrum-fusion-ns	0 GiB	0 GiB	Completed	Dec 14, 2022, 10:35 AM	5/5	cpd-isf-clsa	1
	ibm-spectrum-protect- plus-ns	1.4 GiB	400 GiB	No policy assigned		8	Assign policy	1
	ibm-spectrum-scale	350.44 GiB	50 GiB	No policy assigned		÷	Assign policy	1
	ibm-spectrum-scale-csi	0 GiB	0 GiB	No policy assigned			Assign policy	1
	ibm-spectrum-scale-dns	0 GiB	0 GiB	No policy assigned			Assign policy	1
	ibm-spectrum-scale- operator	0 GiB	0 GiB	 No policy assigned 			Assign policy	1

Figure 1-16 Page shows czen-policy assigned to czen namespace

In the **Backup Polices** page, we can also verify that the backup policy has been applied to **czen** namespace/application as seen in Figure 1-17.

×	IBM Spectrum Fusion						0		¢	l
Quick s Events	start	Backup	policies							
Applic	ations									
Backuj	p policies	Policies	Locations							
Service	es									
Setting	şs	The following ta backup location	ble contains backup p IBM Spectrum Fusion	olicies created on this o will use to create recur	luster. Backup policies contain the sched ring backups. Learn more.	ule and				
		Backup location	: All ~ Q	Search			Add	policy	+	
		Name	Backup location	Frequency	Time	Retention	Applications			
		cpd-ins-clsa	cpd-clsa-backup	Every day	12:00 AM Mountain Standard Time	30 Days	cpdz			
		cpd-isf-clsa	cpd-clsa-backup	Every day	12:00 AM Mountain Standard Time	30 Days	ibm-spectrum-fusion- ns			
		cpd-ops- clsa	cpd-clsa-backup	Every day	12:00 AM Mountain Standard Time	30 Days	ibm-common-services	1		
		czen-policy	cpst-cos-hciops	Every 1 of the month	12:00 AM Mountain Standard Time	30 Days	czen		I	
		Items per page:	10 ~ 1-4 of	4 items			l ∽ loflpag	e 4	+	

Figure 1-17 Verify that the backup policy has been applied to czen namespace

We can also list the policies and view the objects that get created via command line by issuing the following command: **\$ oc get fbp, fpa** as shown in Figure 1-18.

<pre>PaceAsis-2:43:53 [cop-a:lbs-spectrum-fuilon-n:] = 5 ec NAME backuppolicy.data-protection.isf.lbs.com/c-demo backuppolicy.data-protection.isf.lbs.com/cpd-demo backuppolicy.data-protection.isf.lbs.com/cpd-spectrum backuppolicy.data-protection.isf.lbs.com/cpd-spectrum backuppolicy.data-protection.isf.lbs.com/cpd-spectrum backuppolicy.data-protection.isf.lbs.com/cpd-spectrum-splicy.</pre>	get fbp,fpa PROVIDER isf-ibmspp isf-ibmspp isf-ibmspp isf-ibmspp isf-ibmspp	BACKUPSTORAGELOCATION cpst-cos-hciops cpst-cos-hciops cpst-cos-hciops cpst-cos-hciops cpst-cos-hciops	SCHEDULE 00 0 1 * * 30 0 * * * 00 0 1 * * 00 0 1 * * 00 0 * * 0	RETENTIO 30 5 30 30 30 30	N RETENTIONL days days days days days days	NIT			
NAME		PROVIDER	APPLICATION		ACKUPPOLICY	RECIPE	RECIPENAMESPACE	PHASE	LASTBA
CRUPIINESIAMP CAPACIT policyassignment.data-protection.isf.ibm.com/cpd-demo-c-	deno	isf-ibmspp	cpd-deno	¢	-deno	ibmcpd	cpd-demo	Assigned	
policyassignment.data-protection.isf.ibm.com/cpst-zen-de	mo-cpd-demo	isf-ibmspp	cpst-zen-demo	c	pd-d en o	ibmcpd	cpst-zen-demo	Assigned	12h
policyassignment.data-protection.isf.ibm.com/czen-czen-p	olicy	isf-ibmspp	czen	c	zen-policy	ibmcpd	czen	Assigned	
<pre>cno values policyassignment.data-protection.isf.ibm.com/ibm-common-</pre>	services-cpd-	operators isf-ibmspp	ibm-common-serv	ices c	pd-operators	ibmcpd-operators	ibm-common-services	Assigned	34h

Figure 1-18 Command line list of policies and objects created

From that command we can see the backup policy we created which is called **czen-policy** and the policy assignment of the **czen** namespace. Furthermore, we can also see the **Recipe** column lists the **ibmcpd** recipe.

Additionally, the **ibm-common-services** namespace was assigned the **cpdops-policy** as seen in Figure 1-19.

× IBM Spectrum Fusion							ଡ	¢	
Quick start	cp4d	19.96 GiB	1,147.7 GiB	No policy assigned			Assign policy	:	
Events	cp4d-ads	0 GiB	0 GiB	No policy assigned			Assign policy	:	
Applications	cpd-hadr	0 GiB	0 GiB	No policy assigned		-	Assign policy	1	
Backup policies				assigned					
Services	cpd-hadr-stndby	0 GiB	0 GiB	 No policy assigned 		-	Assign policy	:	
Settings	cpdz	30.3 GiB	956 GiB	Completed	Dec 14, 2022, 12:48 PM	4/5	cpd-ins-clsa	:	
	czen	0 GiB	0 GiB	Not backed up			czen-policy	:	
	default	0 GiB	2 GiB	No policy assigned			Assign policy	:	
	ibm-common-service	0 GIB	0 GiB	 No policy assigned 			Assign policy	:	
	ibm-common-services	1.47 GiB	81 GiB	Completed	Dec 14, 2022, 5:06 PM	6/10	cpdops-policy	:	
	ibm-spectrum-fusion-ns	0 GiB	0 GiB	Completed	Dec 14, 2022, 10:35 AM	5/5	cpd-isf-clsa	:	
	ibm-spectrum-protect- plus-ns	1.41 GiB	400 GiB	No policy assigned			Assign policy	:	

Figure 1-19 cpdops-policy was also assigned to the ibm-common-services namespace

1.2.4 Backup policy for IBM Storage Fusion application

In the Fusion UI, create a new Backup policy for the IBM Storage Fusion application backup and restore resources. In this case, policy **cpd-isf** was created, as seen in Figure 1-20 on page 11.

× IBM Spectrum Fusion						G) A A ::
Quick start Events	Backup						
Applications Backup	Policies	Locations					
Data Foundation Remote file systems Services	The following table backup location IB	contains backup policies cre M Spectrum Fusion will use t	eated on this cluster. B to create recurring bac	ackup policies contain the schedule and kups. Learn more.			
Settings	Backup location:	All 🗸 Q. Search				۲	Add policy +
	Name	Backup location	Frequency	Time	Retention	Applications	
	cp4dinst	cpst-cpdb	Every day	11:00 PM India Standard Time	30 Days	cp4d	1
	cpd-inst	cpst-cpdb	Every day	12:00 AM India Standard Time	30 Days	0	1
	cpd-isf	cpst-cpdb	Every day	2:00 AM India Standard Time	30 Days	0	1
	cpd-oper	cpst-cpdb	Every day	1:00 AM India Standard Time	30 Days	0	1
	cpdops-policy	cpst-cpdb	Every day	12:00 AM Mountain Standard Time	30 Days	ibm-common-services	1
	czen-policy	cpst-cpdb	Every day	12:00 AM Mountain Standard Time	30 Days	czen	1
	Items per page:	10 🗸 1-6 of 6 items				1 ~ 1 of 1	page ∢ →

Figure 1-20 Backup policy cpd-isf created to backup the IBM Storage Fusion resources

Then assign the policy to the IBM Storage Fusion application. In this example, ibm-spectrum-fusion-ns. Seen in Figure 1-21.

× IBM Spectrum Fusion						(୭ ନ	Ð	
Quick start Events	Applications / ibm-spectrum-fusion-n	IS		Assign backup p Backup policies (6)	olicy				×
Applications Backup Data Foundation Remote file systems	Overview Storage	Backups	Resources	ැති cp4dinst	Location cpst-cpdb Frequency Every day	Location type IBM Time 11:00 PM India Standard Time	Retention 30 Days		
Settings	Backup policy Assign +	Time No items match the cu	Policy	Cpd-inst	Location cpst-cpdb Frequency Every day	Location type IBM Time 12:00 AM India Standard Time	Retention 30 Days		
	No policy assigned Three in a policy associated with this application.			ැති cpd-isf	Location cpst-cpdb Frequency Every day	Location type IBM Time 2:00 AM India Standard Time	Retention 30 Days		•
				Cancel	Run backup now	Location type IBM Assign	Retention 30 Days		

Figure 1-21 Assign backup policy for ibm-spectrum-fusion-ns Application

1.2.5 Backup policy for the IBM Storage Protect Plus catalog

Log into the IBM Storage Protect Plus user interface (SPP UI) to create the SPP catalog backup policy. To get the credentials, you need to get them from the OCP console and go to **Workloads** \rightarrow **Secrets** \rightarrow **spp-connection**. That page lists the URL for IBM Storage Protect Plus as well as the username and password.

From the SPP UI, go to Manage Protection \rightarrow Policy Overview and click Add SLA Policy. Create new SLA policy of type IBM Storage Protect Plus catalog, as seen in Figure 1-22.

€				6	> 🖧	() isfadmin	~
) A	← Back to Policy Overview Add SLA Policy						
ш ~ О	Policy Type Policy Rules Review	Policy Type Select policy type You will not be able to change the Category IEM Spectrum Protect PR	policy type after the policy has been created				
ے ہے ۔ ات		Category Take Spectrum Protect Plus Category Take Spectrum Protect Plus Catalog to a Shap server. This policy includes these functions:	Catalog to Object Storage Backs up IBM Spectrum Protect Plus' catalog direct to cloud storage. This policy includes these functions: - Backup to Object Storage				
						Next	

Figure 1-22 Create SLA Policy to backup the SPP catalog to Object Storage

Select the desired policy rules, such as frequency and retention. Note, the start time must be after the completion time of the Cloud Pak for Data operators, Cloud Pak for Data instance, and IBM Storage Fusion backups, to capture the most recent backups. Select the desired object storage location, which can be accessed by the target cluster. Seen in Figure 1-23.

€			0	0	4	8	sfadmin	~
, 습	← Back to Policy Overview Add SLA Policy							
 ✓ ✓	Policy Type Policy Rules Review	Policy Rules Current Policy Type: Catalog to Object Storage Name catalog-policy Retention 15 - + Days Disable Schedule Repeats Daily Every: 1 - + day(s) Start Time 03/10/2023 01:00 America/Phoenix Destination Object Storage Target Object Storage Catalog Storage Cata						
				Back		Nex	đ	ľ

Figure 1-23 Define the policy rules and storage destination for the SPP catalog backup policy

Now assign the policy for backing up the SPP catalog. In the SPP console, navigate to **Manage Protection** \rightarrow **IBM Spectrum Protect Plus** \rightarrow **Backup**. Find the newly created policy and select it. Click **Save**. Seen in Figure 1-24 on page 13.

				ି ଡ	÷	(2) isfad
SLA	Policy					
				Q, Se	arch Policy	by nam
•	SLA Policy	Frequency	Retention			
	Silver	Every 1 Days at 2:50:53 AM	Backup: 1 Months			
	Bronze	Every 1 Days at 2:50:53 AM	Backup: 1 Weeks			
	spp-cat	Every 1 Weeks on Monday at 4:00:00 AM	Backup: 15 Days			
•	catalog-policy	Every 1 Days at 1:00:00 AM	Backup: 15 Days			
1-5	of 5 items			1 of 1 ;	page 4	· C

Figure 1-24 Assign the SLA policy to backup the SPP catalog

At this point the SPP catalog will backup on the selected schedule.

1.2.6 IBM Storage Protect Plus access credentials for source cluster

The user must document the access credentials for IBM Storage Protect Plus for the source cluster, in the event the source cluster goes down and will be restored to an alternate cluster.

The credentials reside in the **spp-connection** secret in the IBM Storage Fusion namespace. An example command to obtain the credentials is the following:

oc extract secret/spp-connection --to=- -n ibm-spectrum-fusion-ns

2

Backing up the source cluster

Now that the Cloud Pak for Data and the IBM Storage Fusion applications, as well as the IBM Storage Protect Plus catalog, have backup policy assignments, they will begin backing up according to their respective backup policy frequencies. However, an on demand backup of all of the elements can be performed.

This chapter describes the steps to backup the Cloud Pak for Data operators and instance, IBM Storage Fusion namespace, and the IBM Storage Protect Plus catalog. In our example, we installed Cloud Pak for Data platform 4.5.3 with IBM Db2® service. Timings for backup and restore are based on our specific deployment.

2.1 Backing up the Cloud Pak for Data operators

From the IBM Storage Fusion UI, we can start the backup of the IBM Cloud Pak for Data operators. In the sample case, we used the IBM Common Services express installation. To start the backup, we went to **Applications** and selected **ibm-common-services**. Then clicked on the *Backups* tab at the top of the screen. Then, clicked the **Actions** drop-down menu and selected **Backup now** as seen in Figure 2-1.

× IBM Spectrum Fusion							@ ^	Q :::
Quick start Events	Applications / ibm-com	nmon-servic	es			Restore	Actions	^
Applications	Overview	Storage	Backups	Resources			Backup no	N
Backup policies							Back	up now
Services	Usage		Backups					
Settings	131.6 GiB ^{Used}	6 Available backups	Q Search				Ŷ	ø
			Time	Policy	Status	Capacity	Location	
	Backup polic	У	Dec 14, 2022, 5:06 PM	cpdops-policy	Completed	20 GiB	cpst-cos-hciops	1
	cpdops-policy	1	Dec 14, 2022, 10:41 AM	cpd-ops-clsa	Completed	22.35 GIB	cpd-clsa-backup	1
	Retention Total used	30 Days 20 GiB	Dec 14, 2022, 12:27 AM	cpd-ops-clsa	Completed	22.34 GiB	cpd-clsa-backup	1
	Last backup	Dec 14, 2022, 5:06 PM	Dec 13, 2022, 12:09 PM	cpd-ops-clsa	Completed	22.32 GiB	cpd-clsa-backup	

Figure 2-1 Select a backup

Then from the **Run a backup now** window, click on **Run backup policy** as shown in Figure 2-2.

× IBM Spectrum Fusion									<u>۹</u>	\$:
Quick start Events	Applications /	nmor	n-service	es				Restore	Actions	~
Applications	Overview		Storage	Backups	Resource	es				
Backup policies										
Services	Usage			Backups						
Settings	131.6 GiB ^{Used}	6 Avail back	Run a backup now			this backup policy. Ca			ل Location	\$
	Backup polic	У		Location	Location type	Retention	oleted	20 GiB	cpst-cos-hciops	:
	cpdops-policy	1	cpdops-	cpst-cos-hciops	IBM	30 Days	oleted	22.35 GiB	cpd-clsa-backup	:
	Retention Total used	30 Day 20 GiB	poncy				oleted	22.34 GiB	cpd-clsa-backup	:
	Last backup	Dec 14 PM					leted	22.32 GiB	cpd-clsa-backup	:
			Cancel		Run backup policy		t	0 GiB	cpd-clsa-backup	:

Figure 2-2 Run the backup policy cdpops-policy immediately

The next step is to log into the IBM Storage Protect Plus user interface (SPP UI) to watch the progress of the backup job. To get the credentials, you need to get them from the OCP console and go to **Workloads** \rightarrow **Secrets** \rightarrow **spp-connection**. That page lists the URL for IBM Storage Protect Plus as well as the username and password.

After logging into the SPP user interface, click on the **Jobs and Operations** icon on the left-hand side, and in the **Running Jobs** tab, we can see the progress of the scheduled backup job as seen in Figure 2-3 on page 17.



Figure 2-3 View the jobs running

After the job completes, we can go to the **Job History** tab and from there, we can see there are two phases to the backup. The first phase is the **Snapshot** which performs the local snapshot of all the PVCs and resources. In our case, this phase took four minutes and 21 seconds. The second phase is the **Backup** which is a copy of the backup and this phase uploads all information to the selected storage location and this phase took six minutes and 22 seconds. In total, the backup of Cloud Pak for Data operators took ten minutes and 43 seconds to complete as seen in Figure 2-4.

(+)								? L	6	isfadmin	
	Welcome to IBM Spectrum Protect Plus vers	ion 10.1.12. See de									×
ඛ											
\checkmark	Running Jobs Job History 🕄	Active Resources	Schedule	e							
Ū	100% 12 Success Rate Total Jobs	O Sailed	O Warn	▲ ing	12 ×		Job histo period:	ory La	st 12 hours	3 ~	
る											
0	Start ✓ ↑↓ Q Se	arch b	7	<	() and a						
oc ⊡	openshift_cpdops-policy Type: Backup Status: Completed Start Time: Dec 14, 2022 5:02:27 PM End Time: Dec 14, 2022 5:06:49 PM Duration: 0h 4m 21s	Success: Failed: Skipped: Total :	2 0 0	OPENSNI Type: Backup 1 5:06:49 PM	TT_CPCOC	4, 2022 5:02:27 Pi Concurrent Jobs	M End	Time: Dec 14	, 2022 Download	I.zip	
	openshift_cpdops-policy	Success: Failed:	2 0	Failed: 0 Suc	cess: 2 Total: 3	2				7	7
	Type: Backup - Snapshot Status: Completed Start Time: Dec 14, 2022 4:55:25 PM End Time: Dec 14, 2022 5:01:47 PM	SKipped:	U	Status	Time	ID	Descr	iption			
	Duration: Oh 6m 22s	Total :	2	Summary	Dec 14, 2022 5:02:26 PM	CTGGA2398	Starting policy (II IBM Spe	job for policy D:1008). id -: ctrum Protec	openshift_ 1671062!	,cpdops- 546244.	

Figure 2-4 View statistics for snapshot and backup

Once the backup completes, we can see the **Backup status** listed as **Completed** in the **Applications** page of IBM Storage Fusion which shows the status of the most recent backup as shown in Figure 2-5.

× I	BM Spectrum Fusion							@ A	\$	
Quick st	tart	cpd-demo	0 GiB	0 GIB	Not backed up			c-demo	1	
Events		cpd-tether	0 GiB	0 GiB	No policy assigned			Assign policy		
Backup	policies	cpst-zen-br	0 GIB	0 GiB	No policy assigned	Jul 27, 2022, 4:10 PM	3/3	Assign policy	T	
Service	5	cpst-zen-br2	0 GiB	0 GiB	No policy assigned	Jul 21, 2022, 11:09 PM	1/1	Assign policy		
Setting	5	cpst-zen-demo	0 GIB	1,581 GiB	 Completed 	Aug 31, 2022, 10:29 AM	15/34	cpd-demo	1	
		cpst-zen-demo-tethered	0 GiB	1 GiB	No policy assigned			Assign policy	ī	
		cpst-zen-tethered1	0 GiB	0 GIB	No policy assigned			Assign policy	ī	
		cpst-zen-tethered2	0 GiB	0 GiB	No policy assigned			Assign policy	1	
		czen	0 GiB	550 GIB	Not backed up			czen-policy		
		default	0 GiB	11 GiB	No policy assigned			Assign policy		
		dxs-validation-test	0 GIB	0 GiB	No policy assigned			Assign policy		
		ibm-common-services	0 GiB	0 GiB	Completed	Aug 31, 2022, 11:45 PM	19/32	cpdops-policy	1	
		ibm-spectrum-fusion-ns	0 GiB	0 GiB	No policy assigned			Assign policy		
I.		ibm-spectrum-protect-plus-ns	0 GiB	400 GiB	No policy assigned			Assign policy	I	
		ibm-spectrum-scale	327.66 GIB	50 GiB	No policy assigned			Assign policy		
		ibm-spectrum-scale-csi	0 GIB	0 GiB	No onlicy assigned			Assign policy	:	

Figure 2-5 Status of most recent backups

2.2 Backing up the Cloud Pak for Data instance

Now we are ready to do the backup of the Cloud Pak for Data instance, which in our example, the application/namespace is called **czen**. To do so, we went to the **Applications** page within IBM Storage Fusion and clicked on **czen** as shown in Figure 2-6.

×	IBM Spectrum Fusion							@ ^	¢	
Quicl	< start	cp4d	19.96 GiB	1,147.7 GiB	 No policy assigned 		-	Assign policy	:	
Even	ts	cp4d-ads	0 GiB	0 GiB	 No policy assigned 			Assign policy	:	
Appli	ications	cpd-hadr	0 GiB	0 GiB	No policy assigned			Assign policy	:	
Back Servi	up policies ces	cpd-hadr-stndby	0 GiB	0 GiB	No policy assigned			Assign policy	:	
Setti	ngs	cpdz	30.3 GiB	956 GiB	 Completed 	Dec 14, 2022, 12:48 PM	4/5	cpd-ins-clsa	:	
		czen	0 GiB	0 GiB	 Not backed up 			czen-policy	:	
		default	0 GiB	2 GiB	No policy assigned			Assign policy	:	
		ibm-common-service	0 GiB	0 GiB	No policy assigned		-	Assign policy	:	
		ibm-common-services	1.47 GiB	81 GiB	Completed	Dec 14, 2022, 5:06 PM	6/10	cpdops-policy	:	
		ibm-spectrum-fusion-ns	0 GiB	0 GIB	Completed	Dec 14, 2022, 10:35 AM	5/5	cpd-isf-clsa	:	
		ibm-spectrum-protect- plus-ns	1.41 GiB	400 GiB	No policy assigned		-	Assign policy	:	

Figure 2-6 Select namespace czen

Once, inside the **czen Applications** page, we clicked on the **Backups** tab and from the **Actions** drop-down menu, selected **Backup now** as show in Figure 2-7 on page 19.

× IBM Spectrum Fusion					@ ^ \$
Quick start Events	Applications / CZEN			Restore	Actions ^
Backup policies	Overview Storage	Backups	Resources		Backup now
Services	Backup this application To ta	ke advantage of IBM Spectrum Fusio	n data protection, backup	this application using a backu	ıp policy.
Settings	Usage 0 GiB 0 Used Available backups	Backups			7 Ø
	Backup policy	Time Policy	Status	Capacity	Location
	CZEN-pOIICY : Retention 30 Days Total used 0 GiB Last backup N/A	0			

Figure 2-7 Selected Backup now from the czen Applications page

Then from the **Run a backup now** window, we clicked on **Run backup policy** which will utilize the backup policy that was just created as shown in Figure 2-8.

× IBM Spectrum Fusion							?	റ്	¢
	Applications / CZEN					Restore	Actions		~
Applications	Overview	Storage	Backups	Resou	irces				
Backup policies									
	🛕 🛛 Backup this app	plication To take a	dvantage of IBM Spec	ctrum Fusion data pr	rotection, backup this	s application using a back	up policy.		
	Usage O GiB O Used Available b	Run a backu A backup of this a	UP NOW	mediately with this bac	×			7	\$
	Backup policy	Czen-policy	Location cpst-cos-hciops	Location type IBM	Retention 30 Days	Capacity	Location		
	Retention 3				_				

Figure 2-8 Run the backup now for czen-policy

Once it starts, we can see the snapshot creation is in progress as depicted in Figure 2-9.

Spectrum Fusion							?	ዶ 🗘
t	Applications / CZEN		Restor	e Actions	i			
ns licies	Backup in progress Acciliant and a contract of the second and the second							
		0.1						
	Overview	Storage	Backups	Reso	urces			
	Usage 0 GiB 0		Backups					
	Used Availa	ble backups	Q Search					76
	Backup policy		Time	Policy	Status	Capacity	Location	
	czen-policy	:	Dec 14, 2022, 5:10 PM	czen- policy	Snapshot in progress	0 GiB	cpst-cos- hciops	:
	Retention Total used Last backup	30 Days 0 GiB N/A	Items per page: 25 🗸	1-1 of 1	Litem		1∨ 1 of 1 page	4

Figure 2-9 View the Snapshot in progress status

To see the progress of the backup, we went to the IBM Storage Protect Plus UI then went to the **Jobs and Operations** page and clicked the **Job History** tab. In our example, the snapshot took 3 minutes 52 seconds to complete and the copy backup took 3 minutes 51 seconds as depicted in Figure 2-10.



Figure 2-10 Review the progress status of the jobs

So overall, it took under 20 minutes to complete all the phases of the backups for our deployment of **ibm-common-services** and **czen** applications.

We can also see that the SPP job log shows that the execution of recipe hooks and activities from the recipe completed successfully as seen in Figure 2-11.

Θ							🕥 🕐 🗛 阕 istadmin 🕚
>				Failed: 0 Su	ccess: 11 Total: :	11	V
ଜ	openshift_czen-policy Type: Backup - Snapshot Status: Completed	Success: Failed: Skipped:	11 0 0	Status	Time	ID	Description
\checkmark	Start Time: Aug 31, 2022 11:55:51 PM End Time: Sep 1, 2022 12:03:07 AM Duration: 0h 7m 16s	Total :	11	Info	Aug 31, 2022 11:59:06 PM	CTGGK3063	[baas-rest-spp-agent.baas.svc] Snapshot of PersistentVolumeClaim ocp-a:czen:c-db2ottp-1661967716864728-meta succeeded.
Ū	openshift spdans-policy	Success:	1	Into	Aug 31, 2022 11:59:06 PM	CTGGK3063	[baas-rest-spp-agent.baas.svc] Snapshot of PersistentVolumeClaim ocp-a:czen.tempts-c-db2oltp-1661967716864728-db2u-0 succeeded.
L	Type: Backup Status: Completed Start Time: Aug 31, 2022 11:41:23 PM	Failed: Skipped:	0	Detail	Aug 31, 2022 11:59:06 PM	CTGGK3178	[baas-rest-spp-agent.baas.svc] Execution of "group/cpd-instance- volumes" completed successfully.
Ø	End Time: Aug 31, 2022 11:45:38 PM Duration: Oh 4m 14s	Total :	1	Detail	Aug 31, 2022 11:59:06 PM	CTGGK3177	[baas-rest-spp-agent.baas.svc] Executing "hook/br-service- hooks/post-backup"
٨	openshift_cpdops-policy	Success:	uccess: 1	Detail	Aug 31, 2022 11:59:06 PM	UTGGR3235	[baas-rest-spp-agent.baas.svc] exectuing command /cpdor- scripts/cpdbr/checkpoint_backup_posthooks.shinclude- namespaces=czen ⁺ in container main of pod cpdbr-service- 57597dt6c5-89l4s in namespace czen.
Ç	Type: Backup - Snapshot Status: Completed Start Time: Aug 31, 2022 11:36:22 PM End Time: Aug 31, 2022 11:40:37 PM	Skipped:	0	Detail	Sep 1, 2022 12:00:06 AM	CTGGK3166	baas-rest-spp-agent.baas.svc) Command "/cpdbr- scripts/cpdbr/checkpoint_backup_postbooks.shinclude- namespaces-czen* in pod cpdbr-service-57597df6c5-89/4s completed with return code 0
	Duration: 0h 4m 15s	Total :	1	Detail	Sep 1, 2022 12:00:06 AM	CTGGK3178	[baas-rest-spp-agent.baas.svc] Execution of "hook/br-service- hooks/post-backup" completed successfully.
	openshift_cpdops-policy	Success: Failed:	1	Detail	Sep 1, 2022 12:00:06 AM	CTGGK3177	[baas-rest-spp-agent.baas.svc] Executing "group/cpd-instance- resources"
	Type: Backup - Snapshot Status: Completed Auto Refresh 🙄 Displayed: 23 Total: 23 Entry:	skipped: -	+ 10	Detail	Sep 1, 2022	CTGGK3181	Ibaas-rest-spp-agent.baas.svcl Velero backup of namespace(s) Displayed: 85 Total: 85 Entry:

Figure 2-11 SPP job log shows detail of completed phases of the backups

2.3 Backing up the IBM Storage Fusion namespace

From the IBM Storage Fusion UI, we can start the backup of the IBM Storage Fusion namespace. Note: The IBM Storage Fusion application backup is also a recipe based backup, in which only a subset of the Kubernetes resources are backed up, which include the backup storage locations (BSLs), the secrets for the BSLs, the backup policies created in Fusion, and the Fusion applications. To start the backup, we went to **Applications** and selected **ibm-spectrum-fusion-ns**. Then clicked on the Backups tab at the top of the screen. Then, clicked the **Actions** drop-down menu and selected **Backup now** as seen in Figure 2-12.

× IBM Spectrum Fusion								® ^	\$ ∷
Quick start Events	Applications / ibm-spec	trum-fusion-ns	;			R	estore	Actions	>
Applications	Overview	Storage	Backups	Resources				Backup now	Backup now
Backup Data Foundation Remote file systems	Usage	19	Backups						
Services	Used	Available backups	Q, Search					∇	۲
Settings	Backup policy		Time	Policy	Status	Capacity	Location		
	cpd-isf	1	Mar 13, 2023, 1:38 PM	cpd-isf	Completed	< 0.01 GiB	cpst-cpdb		1
	 Available 	19	Mar 12, 2023, 1:38 PM	cpd-isf	Completed	< 0.01 GiB	cpst-cpdb		1
	Total used Last backup	< 0.01 GiB Mar 13, 2023, 1:38 PM	Mar 11, 2023, 1:38 PM	cpd-isf	Completed	< 0.01 GiB	cpst-cpdb		1
			Mar 8, 2023, 1:37 PM	cpd-isf	Completed	< 0.01 GiB	cpst-cpdb		1
			Mar 7, 2023, 1:37 PM	cpd-isf	Completed	< 0.01 GiB	cpst-cpdb		1
			Mar 6, 2023, 1:37 PM	cpd-isf	Completed	< 0.01 GiB	cpst-cpdb		1
			Mar 5, 2023, 1:37 PM	cpd-isf	Completed	< 0.01 GiB	cpst-cpdb		1
			Mar 4, 2023, 1:37 PM	cpd-isf	Completed	< 0.01 GiB	cpst-cpdb		1
			Mar 3, 2023, 1:36 PM	cpd-isf	Completed	< 0.01 GiB	cpst-cpdb		1
			Mar 2, 2023, 1:36 PM	cpd-isf	Completed	< 0.01 GiB	cpst-cpdb		1
			Mar 1, 2023, 1:37 PM	cpd-isf	 Completed 	< 0.01 GiB	cpst-cpdb		1

Figure 2-12 Select Backup now for the ibm-spectrum-fusion-ns Fusion application to initiate an On-Demand backup

The next step is to log into the IBM Storage Protect Plus user interface (SPP UI) to watch the progress of the backup job. To get the credentials, you need to get them from the OCP console and go to **Workloads** \rightarrow **Secrets** \rightarrow **spp-connection**. That page lists the URL for IBM Storage Protect Plus as well as the username and password.

After logging into the SPP user interface, click on the **Jobs and Operations** icon on the left-hand side, and in the **Running Jobs** tab, we can see the progress of the scheduled backup job as seen in Figure 2-13.



Figure 2-13 Monitor SPP running jobs

After the job completes, we can go to the **Job History** tab and from there, we can see there are two phases to the backup. The first phase is the **Snapshot** which performs the local snapshot of all the resources. In our case, this phase took three minutes and 17 seconds. The second phase is the **Backup** which is a copy of the backup and this phase uploads all information to the selected storage location and this phase took four minutes and 17 seconds. In total, the backup of IBM Storage Fusion resources took seven minutes and 34 seconds to complete as seen in Figure 2-14.

€						ି ଡ	Q	(2) isfadmin
。 合	Jobs and Operations							Create job
\checkmark	Running Jobs Job History 🕃 Active Resources	Schedule						
D 3	86.22% 225 Success Rate Tetal Jobs	13 Warning	1 Suc	94 Č		Job history period:	Last 30 d	ays 🗸
Ē	Start - tł Q Search b	⊽ 	enshi	ft_cnd-ist	:			
° Ţ	openshift_cpd-isf Success: Failed: Type: Backup Status: Completed Skipped: Start Time: Mar 13, 2023 2:01:17 PM End Time: Mar 13, 2023 2:01:17 PM	1 Type	: Backup Progress	Start Time: Mar 13,	2023 1:57:00 PM	End Time: Mar 13, 2023 2:01:17 PM	Dow	mload .zip
	Duration: 0n 4m 175 Total :	1 Faile	d: 0 Suci	cess: 1 Total: 1				V
	openshift_cpd-isf Success: Failed: Type: Backup - Snapshot Status: Completed Skipped: Start Time: Mar 13, 2023 1:52:58 PM	0	Status	Time	ID	Description		
	End Time: Mar 13, 2023 1:56:15 PM Duration: 0h 3m 17s Total :	1	Summary	Mar 13, 2023 1:56:59 PM	CTGGA2398	Starting job for policy openshift_cpd-i 1678741019089. IBM Spectrum Prot 302.	sf (ID:1007) ect Plus vers	. id -> ion 10.1.12-
			Info	Mar 13, 2023	CTGGA3109	This job will protect PVCs and resource	es on cluste	15.

Figure 2-14 The SPP backup jobs for ibm-spectrum-fusion-ns completed successfully
2.4 Backing up the IBM Storage Protect Plus catalog

Now that the Cloud Pak for Data operators, Cloud Pak for Data instance, and IBM Storage Fusion backups are complete, we are ready to back up the actual SPP catalog which is required to restore over to the target cluster. In the SPP UI, go to **Manage Protection** \rightarrow **IBM Spectrum Protect Plus** \rightarrow **Backup**. Under SLA Policy Status, click on the **Actions** drop-down menu and select **Start** as seen in Figure 2-15.

\odot								6	0	G	8	sfadmin	
>		Catalog	-vsnap				Backup: 15 Days					Т	
â		Catalog	t-s3	E	very 1 Months on the 1st at 1:00	0:00 AM	Backup: 15 Days						
\checkmark		1-5 of 5 items							1 of 1 pa	gn 4		C	
		Save											
z	_												
đ		SLA Policy Sta	atus										
8													
			Policy	Job Type	Frequency	Next Run	Status						
Ç		÷	Policy catalog-s3	Job Type Backup	Every 1 Months on the 1st at 1:00:00 AM	Next Run Sep 1, 2022 1:00:00 AM	Status		Actions ~	-			
ņ		¥	Policy catalog-53	Job Type Backup	Frequency Every 1 Months on the 1st at 1:00:00 AM	Next Run Sep 1, 2022 1:00:00 AM	Status	Start	Actions	-			
Ü		~	Policy catalog-s3	Job Type Backup	Frequency Every 1 Months on the 1st at 1:00:00 AM	Next Run Sep 1, 2022 1:00:00 AM	Status Idie	Start , Pause	Actions 、	-			
Ţ		×	Policy catalog-s3	Job Type Backup	Frequency Every 1 Months on the 1st at 1:00:00 AM	Next Run Sep 1, 2022 1:00:00 AM	Status	Start , Pause	Actions C	-			
ņ		Ŷ	Policy catalog-63	Job Type Backup	Frequency Every 1 Months on the 1st at 1:00:00 AM	Next Run Sep 1, 2022 1:00:00 AM	Status	Start , Pause	Actions 、	-			

Figure 2-15 Select Start from the Actions drop-down menu to start an SPP catalog backup

Once it starts, we can see the backup is in **Running** State from the **Running Jobs** tab in the **Jobs and Operations** page as seen in Figure 2-16. The SPP catalog backup is meta data only and the backup goes quickly, 1-5 minutes.



Figure 2-16 Review the progress status of the backup job

3

Restoring to the target cluster

Now that everything on the source cluster is backed up, we can move over to the target cluster to perform the restore. As stated in Chapter 1, "Preparation" on page 1, the source and target clusters need to be at the same OCP major version. This chapter will include restoring the IBM Storage Protect Plus catalog, then restoring the IBM Storage Fusion resources, and then finally restoring the Cloud Pak for Data operators and Cloud Pak for Data instance applications.

3.1 Validating the target cluster is ready for restore

Restore of Cloud Pak for Data requires that the namespaces do not exist prior to restore. On the target cluster, we will check that it does not currently contain **ibm-common-services** and **czen** namespaces. To do this, we issue the **\$ oc get ns |grep -v open** and the **\$ oc get ns ibm-common-services czen** commands as seen in Figure 3-1 and the output indicates they do not exist.

20220901-00:17:00 [ocp-b:defoult] - \$ oc	project	
Using project "default" on server "https:	//api.ocp-b.cpst-1	ab.ibm.com:6443".
20220901-00:17:35 [ocp-b:defoult] - 5 oc	get ns larep -v og	en
NAME	STATUS	AGE
baas	Active	10h
csr-auto-approver	Active	51d
default	Active	51d
ibm-spectrum-fusion-ns	Active	39h
ibm-spectrum-protect-plus-ns	Active	10h
ibm-spectrum-scale	Active	37h
ibm-spectrum-scale-csi	Active	39h
ibm-spectrum-scale-operator	Active	39h
kube-node-lease	Active	51d
kube-public	Active	51d
kube-system	Active	51d
rook-ceph	Active	2d12h
20220901-00:17:46 [ocp-b:default] - \$ oc	get ns ibm-common-	services czen
Error from server (NotFound): namespaces	"ibm-common-servic	es" not found
Error from server (NotFound): namespaces	"czen" not found	
20220901-00:17:53 [ocp-b:default] ~ 1 5		
	1	

Figure 3-1 Verify ibm-common-services and czen namespaces do not exist on the target cluster

We also need to verify that none of the Cloud Pak for Data catalog sources exist on the cluster. Issue command **oc get catsrc -n openshift-marketplace**. If any Cloud Pak for Data catalogs exist, then it may cause the restore to fail.

We then need to verify this is a fresh installation of IBM Storage Fusion and that it doesn't have any other existing backups. This is because when the SPP catalog is restored from the source cluster, any existing backups will be lost. To check, we need to log into the SPP UI for the target cluster and we need to get the credentials from the target OCP cluster just like we did earlier. To get the credentials, we need to log into the OCP cluster, and from there, go to **Workloads** \rightarrow **Secrets** \rightarrow **spp-connection**. This page lists the URL for IBM Storage Protect Plus as well as the username and password. Once we attained our credentials, we logged into the SPP UI and went to the **Jobs and Operations** page. As we can see from the Figure 3-2, we do not have any running jobs.

۲					6	0	4	() istadmin	~
>	Jobs and Operations							Create job	
	Running Jobs 😳 Job History Active Resources	Schedule							
~									
Ū	O O O Total Backup Leventory	0 Maintenance	0 Restore						
L.									
đ	Start V 14 Q Sear V	<u>.</u>							
ጸ									
ç	Jobs and Operations Image: Comparison of the Resources of the Resource of th								
	No available jobs			,					

Figure 3-2 Jobs and Operations page of the SSP UI shows no running jobs

From the **Job History** tab, we also checked that there are no previously scheduled backups as seen in Figure 3-3 on page 27.



Figure 3-3 No previous scheduled backups

The other thing we need to verify is that we need to have the original storage classes that we had on the source cluster. To check this, we issued **\$ oc get pvc -n czen** from ocp-a which is our source cluster, as seen in Figure 3-4.

20220901-02:22:54 Cocp-d:ibm-spectrum-fusion-r	15] = 5 00	c get pvc -n czen				
NAME	STATUS	VOLUME	CAPACITY	ACCESS NODES	STORAGECLASS	AGE
activelogs-c-db2oltp-1661967716864728-db2u-0	Bound	pvc-e1962247-71df-4235-8248-b452159bbe1a	108Gi	RNO	ibm-spectrum-scale-rwx	15h
c-db2oltp-1661967716864728-backup	Bound	pvc-56c10e84-bf6f-4aa4-b37e-a4e01adfc540	108Gi	RINX	ibm-spectrum-scale-rwx	15h
c-db2oltp-1661967716864728-meta	Bound	pvc-946e3c96-7c32-4833-ad6f-d4374fa22f4c	108G1	RMX	ibm-spectrum-scale-rwx	15h
data-c-db2oltp-1661967716864728-db2u-0	Bound	pvc-98aa12ea-5e4d-47c9-97e4-f98a7af51eb3	10061	RNO	ibm-spectrum-scale-rwx	15h
data-dsx-influxdb-0	Bound	pvc-@eacaca4-dd7f-4e94-bbcb-1d6a6c32c3f5	1061	RNO	ibm-spectrum-scale-rwo	26h
datadir-zen-metastoredb-0	Bound	pvc-6f45adff-e119-4986-8df4-530411c1eb69	1061	RNO	ibm-spectrum-scale-rwo	27h
datadir-zen-metastoredb-1	Bound	pvc-fd964b83-98df-42a0-9007-18e810be9e28	1061	RNO	ibm-spectrum-scale-rwo	27h
datadir-zen-metastoredb-2	Bound	pvc-3bb31624-4f7d-4641-b445-9f88cc9b010f	1061	RNO	ibm-spectrum-scale-rwo	27h
tempts-c-dbZoltp-1661967716864728-dbZu-0	Bound	pvc-ff3daf62-dee3-4ef0-96a0-e53931ad0d77	108GL	RNO	ibm-spectrum-scale-rwx	15h
user-home-pvc	Bound	pvc-4d64456a-bb42-498b-ac6b-d358ed319a4e	1061	RMX	ibm-spectrum-scale-rwx	27h
20220901-02:23:05 Cocp-a:ibm-spectrum-fusion-	15] ~ 5					

Figure 3-4 Verify the original storage classes on the source cluster

From the **STORAGECLASS** column from Figure 3-4, we can see that we have the IBM Storage Scale storage classes for both RWX and RWO: ibm-spectrum-scale-rwo and ibm-spectrum-scale-rwx. Furthermore, we can also see that we have the same storage classes on ocp-b, which is our target cluster by issuing **\$ oc get sc** as shown in Figure 3-5. If these two storage classes do not exist on both the source and target clusters, the restore will fail.

28228981-82:21:51 Cocp-b:defe	ult] ~ 5 oc get sc	202-yili@ri - 02			
NAME	PROVISIONER	RECLAINPOLICY	VOLUMEBINDINGMODE	ALLOWVOLUMEEXPANSION	AGE
ibm-spectrum-scale-internal	kubernetes.io/no-provisioner	Delete	WaitForFirstConsumer	false	39h
ibm-spectrum-scale-rwo	spectrumscale.csi.ibm.com	Delete	Immediate	true	27h
ibm-spectrum-scale-rwx I	spectrumscale.csi.ibm.com	Delete	Immediate	true	27h
ibm-spectrum-scale-sample	spectrumscale.csi.ibm.com	Delete	Immediate	false	38h
ibm-spectrum-scale-sc	spectrumscale.csi.ibm.com	Delete	Immediate	true	29h
rook-ceph-block	rook-ceph.rbd.csi.ceph.com	Delete	Immediate	true	Zd14h
28228981-82:22:46 Focp-b:defe	ult1 - \$				

Figure 3-5 Verify target cluster storage classes are the same as the source cluster

Additionally, the target cluster must be prepared to install Cloud Pak for Data. Change any node settings that are required to match the source cluster. Reference the following Cloud Pak for Data link:

https://www.ibm.com/docs/en/cloud-paks/cp-data/4.5.x?topic=cluster-changing-requir
ed-node-settings

3.2 Restore the IBM Storage Protect Plus catalog

Once we verified that we have a fresh installation of Storage Fusion and that there are no existing backups on our target cluster, we are ready to restore the SPP catalog from the IBM Cloud Object Storage.

The first thing that must be setup is access to the same s3 object storage where the SPP catalog was backed up on the source cluster. In the SPP UI, go to the **System Configuration** \rightarrow **Storage** page as shown in Figure 3-6.

•										0	G	8	isfadm
		<											
	Dashboard												
~	Jobs and Operations											Create)	ob
Ū	Manage Protection	~											
ಷ	System Configuration	^											
	Storage		All	~				View:	Project				<i>~</i>
	VADP Proxy						Last inventory complete	ed Aug 31	, 2022 2:13	:38 PM	Run Inve	ntory	
	Restore Points				Version		SLA Polic	У					
					Red Hat OpenShift Containe v1.23.5+012e945	er Platform: 4.10.26 Kuber	netes:						
	Global Preferences												
Ē	Reports and Logs	~											
8	Accounts	~											

Figure 3-6 Select Storage under System Configuration

The next step is to select **Cloud storage** \rightarrow **Add cloud storage** and go through the menus as shown in Figure 3-7.

⊕				0	0	Ą,	(2) isfadmin	• ~
>	Storage	Cloud storage						
ຜ	🛃 Sites	olouu ololugo			8	Add	cioud storage -+	
~	Butan	Name	Provider					
Ū	servers	A No entries found.						
Ł	■ OSSM							
Ē	Cloud							
٨	E Repository							
Ç	servers							

Figure 3-7 Select Add cloud storage

In our example, we used IBM Cloud Object storage as the backup storage location. In the first page, we select **IBM Cloud Object Storage** and in the next page, we need to enter the details for location. This will be the same location we performed the backup to on the source cluster so that the target cluster will be able to look up that catalog backup and be able to restore from it. See Figure 3-8 on page 29.

\odot					0	0	4	@ i	ifadmin 🗸
>	← Back to Storage								
â	Add cloud storage								
~	 Cloud type 	Cloud details							
	Cloud details	IBM Cloud Object Storage details							
Ū	O Get buckets	Name	spp-catalog						
Ľ	O Review	Use existing access key							
Ē		Key name	spp-catalog						
8		Access key	1						
ç		Secret key		0					
		Certificate							
		O Use existing certificate	O Copy and paste	 Upload 					
		Choose file	. Select certificate (*.crt) to upload.		Upload				
						Back		Nex	t

Figure 3-8 Enter the Cloud details

Once we entered the **Cloud details**, the **next** page, prompts us to enter the details of the bucket endpoint. In our example, it was IBM Cloud Object Storage, but it could be set to the location of your choice as seen in Figure 3-9.

\odot				0	0	4	8	isfadmin 🗸
) 自	← Back to Storage Add cloud storage							
∿ ₪	Cloud type Cloud details Get buckets	Get buckets Enter an endpoint to update buckets. Endpoint	753.us-south.cloud-object-storage.appdomain.cloud					
& 1111 0	U neview	Update buckets For on-premises IBM Cloud Object be assigned as an Owner of the value	Storage (COS), the user associated with the access key must $$\times$$ it. Learn more					
Ģ								
					Back	c	No	nt

Figure 3-9 Enter the details of the bucket endpoint

In the last page, we reviewed the details we entered, and once we confirmed it was correct, we clicked **Submit** as shown in Figure 3-10.



Figure 3-10 Review and submit to add cloud storage

Now we are ready to restore the SPP catalog. Go to the **Manage Protection** \rightarrow **IBM Spectrum Protect Plus** \rightarrow **Restore** Page as seen in Figure 3-11.

\odot				© 0	ᇯ 🕲 isfadmin 🗸	
ය	Dashboard	ud storage				
~	Jobs and Operations	Name	Provider	4	Add cloud storage +	
U	Manage Protection	spp-catalog	COS			
		• ·				
		^				
	Cloud Management	~				
		~				
		^				
	Backup					
	Resource	s per page: 100 v 1-1 of 1 item		1 ~	oflpage + + C	
ø	System Configuration	~				

Figure 3-11 Select Restore

In this example, we performed the restore from IBM Cloud Object Storage, so we go to the **From cloud storage** tab at the top and click on the storage location **spp-catalog** as seen in Figure 3-12 on page 31.

			0	0 🕹) isfadmin v
estore					
Restore IBM Spectre	Prom VSnap Prom cloud storage Rep Storage Rep Storage				
From vSnap	From cloud storage				
Backup Storage Name		Provider			
C Spo-catalog		cos			
		0			

Figure 3-12 Restore SPP catalog from cloud storage

Then we found the most recent backup we just performed and clicked on **Restore** as shown in Figure 3-13.

			ା ଦ୍ୱ 🕹 🕲	i isfadmin
Restore	Catalog Restore	×		
Restore IBM Spectrum Protect Plu				
From vSnap From c Backup Storage / spp-catalog	A catalog restore will overwrite the IBM Spectrum Protect Plus catalog loud stor IBM Spectrum Protect Plus will be stopped while the catalog is being to interfere will not be accessible. All IBM Spectrum Protect Plus unspitch the catalog backup was run will be lost. Select a restore mode.	on this server. estored. The user ots created after		
8255de80-9691-4d02-a3a5-048bca4	Restore the catalog and suspend all scheduled jobs. Restore edca0 Fxnire in-place spacehots for container workloads	the catalog. talog-s3	Restore	1
0 71570b25-80c2-4974-98eb-926a0315	c001	talog-s3	Restore	
C198d0t8-c599-4d09-9a64-ct39d843	82de	talog-s3	Restore	
C 298892be-cff9-432c-9710-5d603218	Paba Cancel Re	talog-s3	Restore	
1aaa405b-9bbf-4b80-967e-0ed5ac5a	79ta Aug 24, 2022 11:33:17 PM	catalog_catalog-s3	Restore	
3420abf5-003d-44c6-b3c5-d4b15b7f	e990 Aug 25, 2022 2:02:15 PM	catalog_catalog-s3	Restore	
70ce9350-46e6-4b23-86ef-bee3111c	3778 Aug 26, 2022 2:38:31 PM	catalog_catalog-s3	Restore	
b8d3ea61-beb5-42d9-96c9-8237242	24315 Aug 26, 2022 3:04:37 PM	catalog_catalog-s3	Restore	
af5b7f80-e40b-48ec-820e-5c236ae4	Aug 30, 2022 12:03:43 PM	catalog_catalog-s3	Restore	
C ec54c79a-934b-4c8c-801b-bee1371e	1757a Sep 1, 2022.12:10:41 AM	catalog_catalog=\$3	Restore	

Figure 3-13 Restore the most recent spp-catalog

We then left the default values to **Restore the catalog and suspend all scheduled jobs** and we left the **Expire in-place snapshots for container workloads** checkbox selected and clicked on **Restore**.

A warning box asking if you are sure you want to proceed then appeared and by clicking **Yes**, the restore for SPP is started. See Figure 3-14.



Figure 3-14 Select Yes on message box to start the restore for SPP

The restore for SPP took about 20 minutes in our example and we followed the progress via command line within the SPP namespace by following the **sppvirgo** pod logs. To find the name of the **sppvirgo** pod, we issued the following command (see Figure 3-15).

\$ oc get pod -n ibm-spectrum-protect-plus-ns

20220901-00:17:53 [ocp-b:default] -	1.5 00	get pod -n	ibm-spectrum-	protect-plus-ns	
NAME	READY	STATUS	RESTARTS	AGE	
spp-awsebs-5db99995f-s5jx8	1/1	Running	0	18h	
spp-awsec2-7d66b5b55-gsqfd	1/1	Running	0	185	
spp-ingressproxy-54d7dcc67c-vzmks	1/1	Running		18h	
spp-manager-77b7b9f7c9-s1h2b	1/1	Running	0	18h	
spp-operator-7fd9f8c748-mvj2g	2/2	Running	0	10h	
spp-plugins-mongo-66f478dbd7-7svw4	1/1	Running	0	10h	
spp-plugins-redis-6cbb55b57-67jv8	1/1	Running	0	18h	
spp-proxy-755d6bf5c9-2hcws	1/1	Running	0	18h	
sppdbmongo-5c4bc8bcd5-x72d4	1/1	Running	0	18h	
sppdbmongo2-75ff87d96f-zfkv5	1/1	Running	•	18h	
sppdbpostgres-7546d9bfc9-1g47b	1/1	Running	0	18h	
sppkc-6b457df57c-k57kk	1/1	Running	0	10h	
sppnodejs-744fd65b4f-pmddd	1/1	Running	9 (10h ago)	18h	
sppu1-7bc6dd7898-blx5n	1/1	Running	0	18h	
sppvadp-59db565b9-qmwkm	1/1	Running	0	18h	
sppvirgo-58f764f974-5sr9q	1/1	Running	0	18h	

Figure 3-15 Find the sppvirgo pod name

The command to follow the **sppvirgo** pod logs is as follows:

\$ oc logs <sppvirgo-pod-name> -n ibm-spectrum-protect-plus-ns -f --since=1m

In our example the name of our **sppvirgo** pod is **sppvirgo-58f764f974-5sr9q** so we issued the following command as shown in Figure 3-16 on page 33:

\$ oc logs sppvirgo-58f764f974-5sr9q -n ibm-spectrum-protect-plus-ns -f --since=1m

20220901-00:20:26 [ocp-b:default] = 3 oc logs sppvirgo-58f764f97	I-Ssr9q -n ibm-spectrum-protect-plus-ns -fsince=1m	
[2022-09-01T07:20:15.729Z] Syste	m Bundle Shutdown <ke00101< td=""><td>Shutdown initiated.</td><td></td></ke00101<>	Shutdown initiated.	
[2022-09-01T07:20:22.6142] System	m Bundle Shutdown <tc00021< td=""><td>Stopping Tomcat.</td><td></td></tc00021<>	Stopping Tomcat.	
[2022-09-01T07:20:24.515Z] System	m Bundle Shutdown <tc0003i< td=""><td>Stopped Tomcat.</td><td></td></tc0003i<>	Stopped Tomcat.	
[2022-09-01T07:20:26.325Z] INFO . ServiceEvent UNREGISTERING	iLogServiceListener@42b4c7d6 or	g.osgi.service.log.LogService	Bundle org.eclipse.virgo.medic.core_3.7.2.RELEASE, Service 94
[2022-09-01T07:20:26.3252] INFO	iLogServiceListener#42b4c7d6 or	g.osgi.service.log.LogService	Bundle org.eclipse.virgo.medic.core_3.7.2.RELEASE, Service 34
[2022-09-01T07:20:26.325Z] INFO	iLogServiceListener#42b4c7d6 or	g.osgi.service.log.LogService	Bundle org.eclipse.virgo.medic.core_3.7.2.RELEASE, Service 32
[2022-09-01T07:20:26.325Z] INFO	iLogServiceListener@42b4c7d6 or	g.osgi.service.log.LogService	Bundle org.eclipse.virgo.medic.core_3.7.2.RELEASE, Service 33
[2022-09-01T07:20:26.325Z] INFO	iLogServiceListener@42b4c7d6 or	g.osgi.service.log.LogService	Bundle org.eclipse.virgo.medic.core_3.7.2.RELEASE, Service 36
[2022-09-01T07:20:26.325Z] INFO	iLogServiceListener#42b4c7d6 or	g.osgi.service.log.LogService	Bundle org.eclipse.virgo.medic.core_3.7.2.RELEASE, Service 96
[2022-09-01T07:20:26.3262] INFO	iLogServiceListener#42b4c7d6 or	g.osgi.service.log.LogService	Bundle org.eclipse.virgo.medic.core_3.7.2.RELEASE, Service 37
[2022-09-01T07:20:26.326Z] INFO	iLogServiceListener@42b4c7d6 or	g.osgi.service.log.LogService	Bundle org.eclipse.virgo.medic.core_3.7.2.RELEASE, Service 40
[2022-09-01T07:20:26.326Z] INFO	iLogServiceListener@42b4c7d6 or	g.osgi.service.log.LogService	Bundle org.eclipse.virgo.medic.core_3.7.2.RELEASE, Service 39
[2022-09-01T07:20:26.326Z] INFO ServiceEvent UNREGISTERING	iLogServiceListener@42b4c7d6 or	g.osgi.service.log.LogService	Bundle org.eclipse.virgo.medic.core_3.7.2.RELEASE, Service 41

Figure 3-16 Follow the sppvirgo-58f764f974-5sr9q pod logs to check restore progress

From the logs we can see it unregistered everything from the original instance and it is restoring the instance from the source cluster. Once that process completes, we will see the SPP pods, including the sppnodejs pod, in **Running** state as seen in Figure 3-17.

20220901-00:41:02 [ocp-b:default] -	1 5 00	get pod -n	ibm-spectrum-p	protect-plus-ns	
NAME	READY	STATUS	RESTARTS	AGE	
spp-awsebs-5db99995f-s5jx8	1/1	Running	0	10h	
spp-awsec2-7d66b5b55-gsqfd	1/1	Running	0	10h	
spp-ingressproxy-54d7dcc67c-vznks	1/1	Running	0	10h	
spp-manager-77b7b9f7c9-slh2b	1/1	Running	0	18h	
spp-operator-7fd9f8c748-mvj2g	2/2	Running	0	10h	
spp-plugins-mongo-66f478dbd7-7svw4	1/1	Running	0	10h	
spp-plugins-redis-6cbb55b57-67jv8	1/1	Running	0	10h	
spp-proxy-755d6bf5c9-2hcws	1/1	Running	0	10h	
sppdbmongo-5c4bc8bcd5-x72d4	1/1	Running	0	18h	
sppdbmongo2-75ff87d96f-zfkv5	1/1	Running	0	18h	
sppdbpostgres-7546d9bfc9-1g47b	1/1	Running	0	10h	
sppkc-6b457df57c-k57kk	1/1	Running	0	10h	
sppnodejs-744fd65b4f-181rj	1/1	Running	2 (83s ago)	4m38s	
sppui-7bc6dd7898-blx5n	1/1	Running	0	10h	
sppvadp-59db565b9-qmwkm	1/1	Running	0	10h	
sppvirgo-58f764f974-5sr9q	1/1	Running	0	10h	Γ
20220901-00:41:06 [ocp-b:defoult] -	\$				Γ

Figure 3-17 SPP pods show running

The next step is to log back into the SPP UI from ocp-b, which is our target cluster, but this time, our old credentials will not work because the credentials changed after the restore completed and now the credentials are from the original source cluster. Therefore, we need to get the credentials from the source cluster by following the same procedure as before and logging into the OpenShift cluster and from there, go to **Workloads** \rightarrow **Secrets** \rightarrow **spp-connection**. Once we have the credentials, we can log into the SPP UI now that the restore is completed.

Once we log in, the first step is to go into the **Accounts** \rightarrow **User** page and change the **isfadmin** user that IBM Storage Fusion uses and change the password back to what IBM Storage Fusion on the target cluster has recorded for it.

To do this, from the **Users** page, we click on the three dots within the **isfadmin** box and this will bring up the **Change password** window as shown in Figure 3-18.

\odot				ି ଡ	🗛 🛞 isfadmin 🗸
>	User				
@ ∽	Users				
D I	Q. Search for users by name.	Role	🔒 isfadmin		Change Password
Ø	8 istadmin	SUPERUSER	RESOURCE GROUPS		
٨	1-1 of 1 item	lofipage ↔ ♂	Permission 1		~
Ţ					

Figure 3-18 Change the isfadmin user password to what was recorded on the target cluster

Once we enter the password, we click on **Update user** and then a window appears saying we must log in again because the password changed as shown in Figure 3-19. Therefore, we log back in with the credentials from ocp-b, which is our target cluster.

۲				© ®	ᇯ 🕲 isfadmin 🗸
>	User				
â	Modify Settings			_	
~					
	(2) istadmin	Your session has expired.	×		
е е	Password	You must log in to re-establish a connection to the server.			
ы 0	Repeat new password				
• •	Old Password	СК			
Ŧ					
	Cancel				Update N ser

Figure 3-19 Log in again after the password was updated

Once we log into the SPP UI for our target cluster (ocp-b), we go to the **Jobs and Operations** \rightarrow **Job History** tab and we can see that the restore contains all the previous backups that were performed on the source cluster and now they are available on the target cluster as shown in Figure 3-20 on page 35.



Figure 3-20 Verify all the backups from the source are restored on the target cluster

Then we go to **System Configuration** \rightarrow **Storage** \rightarrow **Cloud storage** to confirm the storage locations are also restored from the source cluster as shown in Figure 3-21.

Θ			୍ ଡ	ᇯ 🛞 isfadmin 🗸
>	Storage	Cloud storage		
ធ	📇 Sites			Add cloud storage +
~	l vSnap	Name	Provider	
U	servers	O cpst-cos-hciops	cos	
Ľ	OSSM	O spp-catalog	cos	i
ľ	Cloud storage			
٨	同 Repository			
ç	servers			

Figure 3-21 Confirm the storage locations are also restored from the source cluster

The restore brings over the cluster registration from the source cluster. So first, we need to delete the managed cluster registration from the OpenShift containers section and delete that registration. To do this, from within the SPP UI for our target cluster, we go to the **Manage Protection** \rightarrow **Containers** \rightarrow **OpenShift** page and click on **Manage clusters** as shown in Figure 3-22.

Ð			💿 🛛 🧕 🛞 istadmi	n ~
>	OpenShift			
Ġ	Manage clusters			
~			Create job	
U	OpenShift Backup			
Ś	Q. Search for All V	Vie	w: Project 🗸	
đ	Clusters	Last inventory completed Aug	31, 2022 11:15:25 PM Run Inventory	
٨	Name Name	Version SLA Policy		
Ç	C sP acces	Red Hat OpenShift Container Platform: 4.10.26 Kubernetes: v1.23.5+012e945		
	1-1 of 1 item		loflpage ∢ → C	

Figure 3-22 Go to Manage clusters

Then we clicked on the **trash bin** icon to delete the prior host address, entered the code to confirm deletion and then clicked on **UNREGISTER** as shown in Figure 3-23.

٢				© 0	ᇯ 🕲 isfadmin 🗸
>	OpenShift				
â	Manage clusters				
$^{\checkmark}$					Create job
U	Manage Clusters	Confirm	×		
Z		Are you sure you want to unregister ocp-a?			
Ø	_	To confirm, enter code: ensAU		_	Add cluster O
۵	Host Address	ensAU		OS Type	
-	∠ 🗊 baas-rest-spp-a			Linux	Actions ~
Ç		No	UNREGISTER		

Figure 3-23 Unregister ocp-a

After successful deletion, a message stating **The provider was successfully unregistered** appeared, and we clicked **Ok** as seen in Figure 3-24 on page 37.

\odot) 🕐 🔩 🕲 istadmin 🗸
	OpenShift		
ଜ	Manage clusters		
\checkmark			Create job
U	Manage Clusters		
ø		nfo	×
đ		The provider was successfully unregistered.	Add cluster O
g	Host Address		OS Type
-	No entries found.	ok 🖕	
تي			

Figure 3-24 Successfully unregistered message

The next step is to delete one of the baas transaction manager pods and by doing this, it will cause an automatic re-registration of the local cluster. This will register the baas agent locally and it will go back to being the target cluster (ocp-b), instead of the source cluster (ocp-a). This step is very important to ensure everything is set up and works correctly.

To do this, we first list the pods in the baas namespace as shown in Figure 3-25 by issuing

\$ oc get pod -n baas and then issued \$ oc delete pod -n baas-transaction-manager-5bf458648-6xk2z

20220901-00:41:06 [ocp-b:default] ~ 5 oc get pod -n bag	5			
NAME	READY	STATUS	RESTARTS	AGE
amq-streams-cluster-operator-v2.1.0-4-6ddf4d88fc-sgmvf	1/1	Running	•	10h
baas-entity-operator-84f75b9cdb-tlmns	3/3	Running	0	10h
baas-kafka-ð	1/1	Running	0	10h
baas-minio-0	1/1	Running	0	10h
baas-scheduler-86c96dfdb9-6m4dc	1/1	Running	0	18h
baas-spp-agent-79d565f555-k7gzs	1/1	Running	0	18h
baas-transaction-manager-5bf458648-6xk2z	2/3	CrashLoopBackOff	9 (3m37s ago)	18h
baas-transaction-manager-5bf458648-jc7z8	2/3	CrashLoopBackOff	9 (3m10s ago)	10h
baas-transaction-manager-Sbf458648-lggts	2/3	CrashLoopBackOff	9 (3m13s ago)	18h
baas-zookeeper-0	1/1	Running		18h
baas-zookeeper-1	1/1	Running	0	18h
baas-zookeeper-2	1/1	Running	0	10h
ibmsppc-operator-controller-manager-769494948b-nswzx	2/2	Running	0	10h
openshift-adp-controller-manager-6454c995b9-mbcw2	1/1	Running	0	10h
velero-6d97d7677d-6w62p	1/1	Running	0	10h
20220901-00:42:57 [ocp-b:defoult] - 5 oc delete pod -n	baas baa	s-transaction-manag	er-56f458648-6xk	2z
pod "baas-transaction-manager-5bf458648-6xk2z" deleted				
20220901-00:43:13 [ocp-b:defoult] = \$				

Figure 3-25 Delete one of the baas transaction manager pods to cause local cluster re-registration

Then, we confirmed the **baas transaction manager** pods are recreated and are in **Running** state as seen in Figure 3-26.

nime	DEADY	STATUS	DECTADTO	ACE
	READT	STATUS	RESTARTS	ANE
ang-streams-cluster-operator-v2.1.0-4-6ddf4d88fc-sgmvf	1/1	Running	•	10h
baas-entity-operator-84f75b9cdb-tlmns	3/3	Running		10h
baas-kafka-0	1/1	Running	•	10h
baas-minio-0	1/1	Running	•	10h
baas-scheduler-86c96dfdb9-6m4dc	1/1	Running		10h
baas-spp-agent-79d565f555-k7gzs	1/1	Running	•	10h
baas-transaction-manager-5bf458648-lz6fb	3/3	Running	10 (Zm19s ago)	4m8s
baas-transaction-manager-5bf458648-nsxgn	3/3	Running	10 (Zm9s ago)	4m8s
baas-transaction-manager-5bf458648-z9mz9	3/3	Running	10 (2m15s ago)	4m8s
baas-zookeeper-0	1/1	Running	0	10h
baas-zookeeper-1	1/1	Running	•	10h
baas-zookeeper-2	1/1	Running	0	10h
ibmsppc-operator-controller-manager-769494948b-nswzx	2/2	Running	0	10h
openshift-adp-controller-manager-6454c995b9-mbcw2	1/1	Running	0	10h
velero-6d97d7677d-6w62p	1/1	Running	0	10h
20220901-00:57:47 [ocp-b:default] = \$				

Figure 3-26 baas transaction manager pods are recreated and running

The next step is to go back to the SPP UI from ocp-b, which is our target cluster, and go to the **Manage Protection** \rightarrow **Containers** \rightarrow **OpenShift** page to confirm the creation of the new registration and to perform a test and inventory on it to ensure everything looks as expected.

To perform the test, we clicked on the **Actions** drop-down arrow and clicked on **Test** as shown in Figure 3-27.

Θ		🕤 🔿 💪 🙁 istadmin 🗸
>	OpenShift	
â	Manage clusters 👔	
~		Create job
Ū	Manage Clusters	
Z		
Ē		Add Cluster 🥥
~	Host Address	OS Type
ň	∠ 🗟 baas-rest-spp-agent.baas.svc	Linux Actions 🗸
먚		Testo
		Inventory

Figure 3-27 Perform a test

Once the test completes, the results of the test are displayed as seen in Figure 3-28.



Figure 3-28 Results of the test are displayed in the window

The next step is to run the inventory by clicking on the **Actions** drop-down arrow and selecting **Inventory** as seen in Figure 3-29 on page 39.

⊕				ତ ହ) ᇯ 🕲 isfadmin
>	OpenShift				
ଜ	Manage clusters @				
~					Create job
U	Manage Clusters				
ಷ					
đ					Add cluster 🥥
_	Host A	kddress		OS Type	
Å	∠ 🗊 baas-n	rest-spp-agent.baas.svc		Linux	Actions 🗸
Ç.					Test
					Inventory

Figure 3-29 Select Inventory from the actions drop-down menu

After the inventory job is created, we go to the **Jobs and Operations** \rightarrow **Job History** page and we confirmed that the Inventory completed as seen in Figure 3-30.



Figure 3-30 Confirm the inventory completed

The next step is to go to the Manage Protection \rightarrow Containers \rightarrow OpenShift page and we confirmed that the name of the cluster is no longer ocp-a; it is opc-b now, which is our target cluster as show in Figure 3-31.

\odot				0	0	4	8	isfadmin 🥆
>	OpenShift							
ធ	Manage clusters f8							
\checkmark							Create)	b
Ū	OpenShift Backup							
Ľ								
đ	Clusters	Last invi	view: entory completed Sep 1.	2022 12:58:0	16 AM	Run Inv	entory	<u> </u>
٨	Name	Version	SLA Policy					
ç	EB ocb-p	Red Hat OpenShift Container Platform: 4.10,26 Kubernetes: v1.23.5+012e945						
	•							

Figure 3-31 Confirm the cluster is opc-b our target cluster

3.3 Restore the IBM Storage Fusion application

To restore the IBM Storage Fusion application resources, from the IBM Storage Protect Plus UI, go to **Jobs and Operations** and click **Create job**. Then select **Restore** as seen in Figure 3-32.



Figure 3-32 In SPP, create a restore job for the ibm-spectrum-fusion-ns application

In the restore job view, select **Containers** \rightarrow **OpenShift** and click **Next**, as seen in Figure 3-33 on page 41.

Θ						0	•	4	(2) isfadmin
^ G	C Back to Jobs and Operations Restore - VMware								
\checkmark	Detault Setup		L	(L		1		
0 0	O Select data sources	Exchange	SAP HANA						
e	-O Select matter -O Select magnet	Containers							
ጸ	Seter destination	Kubernetes	OpenShift &						
ç	O Set datastore O Set retractive O Set retractive	File Systems		Cloud Ma	nagement				
	-O Nestare method Preview Restore	Windows		Microsoft 365					
									Next

Figure 3-33 Restore job will be OpenShift restore type

For the restore source, select the source cluster and click the **plus** icon next to **ibm-spectrum-fusion-ns**, as seen in Figure 3-34.

Θ			9	ଡ କ୍	(2) isladmin
° @ ∽	C Back to Jobs and Operations Restore - OpenSh Select source	nift Select source			
	Select data sources	Select the PVC or resource to recover Q. Search tor. Vnew Project ~ Clusters / ocp-a Name	De	**	
ø Å	Source snapthtat O Sectors method Sec centration	Isf-app:/dom-spectrum-fusion-rescald-test 1 Isf-app:/dom-spectrum-fusion-rescald-test 1	- 10	-app.ibm-spectro	un-fusion-ns:bm-spect
¢	Set numerings O Set uptions O Set uptions O Set uptions O Set uptions O Set uptions	Ist-spottern-spectrum-fusion-society-grp4 + Ist-spottern-spectrum-fusion-society-common-services + Ist-spottern-spectrum-fusion-society-common-services +			
	Provise a Restore	1-SofSitems 1oflpage + + C		Back	Next

Figure 3-34 The restore resource will be the isf application for ibm-spectrum-fusion-ns

For the source snapshot, select **From Copy** and **On-Demand**. Then select the desired restore point, in this case the most recent backup. See Figure 3-35.

Θ				0 0	4	8	sfadmin 🕤
° @	C Back to Jobs and Operations Restore - OpenS Source snapshot	Shift					
\checkmark	Default Setup	Source snapshot					
0 0	Select data sources Source type	Select which resource to restore for is5-app.tem	-spectrum-fusion-es.cbm-spectrum-fusion-es.				
~	Select source	Restore Point	SLA Policy	Available			
Ø	-O Source trapsher	O 5ep 23, 2022 12:07:05 AM	opershift_fusion-crs-daily	Backup			
8	Set desirements	O Sep 23, 2022 9:53:47 PH	operahitt_fusion-crs-claity	Backup			
c	Set non settings	O Sep 24, 2022 12:08:33 AM	operahift_fusion-cri-daily	Backup			
	O July cystoms	O Sep 25, 2022 12:08:38 AM	openshift_tusion-crs-daily	Backup			
	O Rovene	O Sep 26, 2022 12:13:07 AM	openshitt_tusion-crs-daily	Backup			
	Preview Restore	O Sep 26, 2022 6:37:35 PM	operabitt_tusion-crs	Backup			
		О Sep 26, 2022 9:08:02 РМ	operahith_tusion-crs	Backup			
				Back		. Take	e

Figure 3-35 Restore type of From Copy and On-Demand

For destination, select **Restore to alternate cluster**, then select the local cluster (ocp-b in this example), as seen in Figure 3-36.

						117284	
Θ				Ø	4	8 ist	idmin 🗸
, 奋	C Back to Jobs and Operations Restore - OpenS Sat destination	Shift					
∿	Contraut Setup						
0 4) 12 2 2	Senest Suits sources Source type Select source Select source Secure snapshot Secure snapshot Sectors method Sectors sectings Secure secures Secure secures Secure secures	Set destination Select a destination to which Restore to original cluste Q. Search for instance Clusters Name © © © ocp-b	Lto restore the selected resources. In				
	Prosten Restore			Bac		Next	

Figure 3-36 Restore to alternate cluster

Use the defaults for the remaining selections and submit the restore job.

From **Jobs and Operations** panel, watch the job progress. For this example, the IBM Storage Fusion namespace restore took five minutes and six seconds, as seen in Figure 3-37 on page 43.



Figure 3-37 Monitor the SPP jobs for the ibm-spectrum-fusion-ns application restore

3.4 Restore Cloud Pak for Data

Before restoring Cloud Pak for Data operators and instance applications, we must install the cpdbr-oadp service in the Cloud Pak for Data operators and instance namespaces on the restore cluster. This will setup the required cluster roles, cluster rolebindings, and permissions for the cpdbr service to perform the restore operations. Reference the Cloud Pak for Data link:

```
https://www.ibm.com/docs/en/cloud-paks/cp-data/4.7.x?topic=utilities-installing-cp
dbr-service-storage-fusion-integration
```

Using cpd-cli, install the cpdbr oadp service for Cloud Pak for Data operators. In this example, it is an Express install, where both the foundation and operators namespaces are ibm-common-services.

Note: The **ibm-common-services** namespace will not yet exist on the restore cluster, this step will only setup cluster permissions.

```
./cpd-cli oadp install --foundation-namespace=ibm-common-services
--operators-namespace=ibm-common-services --component=cpdbr-ops-hooks
--cpdbr-hooks-image-prefix=icr.io/cpopen/cpd --log-level=debug -verbose
```

Then install the cpdbr oadp service for Cloud Pak for Data instance. In this example, the instance is in the **czen** namespace.

Note: The **czen** namespace will not yet exist on the restore cluster, this step will only setup cluster permissions.

```
./cpd-cli oadp install --cpd-namespace=czen --component=cpdbr-hooks
--cpdbr-hooks-image-prefix=icr.io/cpopen/cpd --log-level=debug -verbose
```

3.4.1 Restore the Cloud Pak for Data operators

Now, we are ready to prepare for the restore of the Cloud Pak for Data operators. The first step is to click on **Create job** from the **Jobs and Operations** page as seen in Figure 3-38.

Θ		S 🕐 🔩 🙁 istadmin 🗸
) 습	Jobs and Operations	Create igh
\checkmark	Running Jobs Job History G Active Resources So	eðule
0 V	67.57% 37 Success Rate Faled	8 A Job history period: Last 48 hours ~
۵	Start ~ 11 Q. Search b 🗸	Application Server Inventory
° ₽	Application Server Inventory Type: Inventory Status: Completed Start Time: Sep 1, 2022 12:58:02 AM End Time: Sep 1, 2022 12:58:06 AM Duration: 0h 0m 4s	Type: Inventory Start Time: Sep 1, 2022 12:58:06 AM Concurrent Jobs Download .sip
	Application Server Inventory Type: Inventory Status: Completed	Failed: 0 Success: 0 Status Time ID Description
	Start Time: Sep 1, 2022 12:57:06 AM End Time: Sep 1, 2022 12:58:44 AM	Summary Sep 1, 2022 CTGGA2398 Starting job for policy Application Server Inventory: id ->

Figure 3-38 Select the Create job button

The next page is the **Create job** page and here, we selected **Restore** which brings up the **Restore - VMWare** page and we selected **OpenShift** under the **Containers** section as seen in the Figure 3-39.

\odot					0	® 🔩) isfadmin v
) 습	 Back to Jobs and Operations Restore - OpenShi Source type 	ft					
~	Default Setup	Databases					
D &	Select data sources Source type Select source	Db2	SQL	Oracle	MongoDB	Exchange	
۲ ۲	Source snapshot Set destination Set destination	Containers _{Kubernetes}	OpenShift				
ç	Scheeule Revew Preview Restore	File Systems	Cloud Manage	ement			
							Next

Figure 3-39 Select OpenShift

On the **Select source** menu, we clicked on the **ocp-a** cluster and we clicked on the **plus** icon next to the pvc for **ibm-common-services** and after doing this, it appears under the **Item** list on the right hand side. Afterwards, we clicked on the **Next** button as seen in the Figure 3-40 on page 45.

⊕				🕤 🕐 ᇯ 🛞 isfadmin
் எ	< Back to Jobs and Operations Restore - OpenS Select source	Shift		
~	Default Setup	Select source		
U	O Select data sources	Select the PVC or resource to recover		
Ľ	Source type Select source	Q. Search for View: Project v		
Ē	-O Source snapshot	Name		Item
8	Restore method	🚖 isf-app:ibm-spectrum-fusion-ns.cpst-zen-demo		- isf-app:ibm-spectrum-fusion-ns:ibm-com
C "	Set run settings	2 ist-app://bm-spectrum-fusion-ns:/bm-common-services	- * -	
Ŧ	-O Job options	2 isf-app:lbm-spectrum-fusion-ns:nazar		
	-O Schedule	ය ist-app://bm-spectrum-fusion-ns:czen		
	U			
	Preview Restore	1-4 of 4 items	ofipage ← → C	
				Back Next

Figure 3-40 Select the ocp-a cluster

On the **Source snapshot** page, we expanded the **Origin** drop-down menu and selected **From Copy** as the source of the snapshot and selected **On-Demand** as the **Type of Restore** as shown in Figure 3-41.

\odot				ି ଡ 🖕 ୧	isfadmin
் வெ	Back to Jobs and Operations Restore - OpenS Source snapshot	hift			
~	Default Setup	Source spanshot			
0	Select data sources	Select which resource to restore for isf-app:ibm	espectrum-fusion-ns:ibm-common-services.		
25	Select source				
Ø	O Source snapshot	Restore Point	SLA Policy	Available	
。	-O Restore method	O Aug 4, 2022 10:06:58 AM	openshift_cpd-operators	Backup	
^	Set destination	Aug 8, 2022 1:17:03 PM	openshift_cpd-operators	Backup	
ç	Set run settings	Aug 8, 2022 4:03:14 PM	openshift_cpd-operators	Backup	
	Reverve	Aug 8, 2022 5:10:24 PM	openshift_cpd-operators	Backup	
		Aug 8, 2022 9:36:20 PM	openshift_cpd-operators	Backup	
	Preview Restore	Aug 10, 2022 1:58:28 PM	openshift_cpd-operators	Backup	
		O Aug 12, 2022 9:04:54 AM	openshift_cpd-operators	Backup	
				Back	Next

Figure 3-41 Selected From Copy from Origin menu and On-Demand from Type of restore

Then we scrolled down the page to find and select the most recent snapshot, and then clicked **Next** as can be seen in Figure 3-42.

Θ					ି ଡ	4	8	isfadmin 🗸
) G	< Back to Jobs and Operations Restore - OpenShift Source snapshot							
~	Default Setup	0	Aug 8, 2022 9:36:20 PM	openshift cod-operators	Backup			
U	O Select data sources	0	Aug 10, 2022 1:58:28 PM	openshift_cpd-operators	Backup			
Ł	Source type	0	Aug 12, 2022 9:04:54 AM	openshift_cpd-operators	Backup			
ß	Select source Source snapshot	0	Aug 18, 2022 12:15:32 PM	openshift_cpd-operators	Backup			
	-O Restore method	0	Aug 19, 2022 12:01:46 PM	openshift_cpd-operators	Backup			
Å	Set destination	0	Aug 24, 2022 12:29:22 AM	openshift_cpd-operators	Backup			
Ç.	Set run settings	0	Aug 25, 2022 10:33:14 AM	openshift_cpd-operators	Backup			
	-O Job options Herview	0	Aug 26, 2022 1:04:47 PM	openshift_cpd-operators	Backup			
		0	Aug 30, 2022 11:28:03 AM	openshift_cpd-operators	Backup			
	Draulau Petere	۲	Aug 31, 2022 11:45:37 PM	openshift_cpdops-policy	Backup			
	Preview Restore						8	
						ack	Ne	ixt 🖕

Figure 3-42 Scrolled to find the most recent snapshot then selected Next

On the **Restore method** page, we left the defaults and just clicked **Next** as shown in Figure 3-43.

Θ		ଡ	0	4	8	isfadmin 🗸
	Back to Dobs and Operations Restore method Default Setup Select data sources Source type Select source Source type Source type	It Restore method Production mode is used for all OpenShift restore operations. Use this page to optionally rename the resource that you want to restore. Name Name New PVC				
	Preview Restore		Back		Ne	xt 🖕

Figure 3-43 Accepted the defaults and selected Next

On the **Set destination** page, we selected the radio button next to **Restore to alternate cluster** and also selected the radio button next to our target cluster, ocp-b, and then clicked **Next** as depicted in Figure 3-44 on page 47.

C Back to Jobs and Operations			0	0	4	(2) isfadm
Restore - Opens	Shift					
Default Setup						
Select data sources	Set destination Select a destination to wh	ich to restore the selected resources.				
Source type	Restore to original clu	ster Restore to alternate cluster				
Select source	Q. Search for instance					
Bestore method	Clusters					
O Set destination	Name	Version				
Set run settings	💿 🛢 оср-в	Red Hat OpenShift Container Platform: 4.10.26 Kubernetes: v1.23.5+012e945				
-O Job options						
O Review						
Preview Restore						

Figure 3-44 Select Restore to alternate cluster ocp-b

On the Job options page, we left the defaults and clicked Next as shown in Figure 3-45.

\odot			0	0	4	(2) isfac	dmin 🗸
, 奋	< Back to Jobs and Operations Restore - OpenShift Job options						
\checkmark	Default Setup						
	 Select data sources Source type Select source Source snapshot Restore method Set destination Set un settings Job options Newine 	SOD OPTIONS Configure the options for this restore job. Manage existing PVCs on ont overwrite PVCs v Image: Im					
				Bac	k	Next 🔹	,

Figure 3-45 Accepted the defaults and selected Next

In the last page, we reviewed all our selections and clicked **Submit** as shown in Figure 3-46.

Select data sources Source type: Selected source: Source snapshot: Backup Source Type: Beatom Tome to	OpenShift Ist-app:Ibm-spectrum-fusion-ns:Ibm-common-services Ist-app:Ibm-spectrum-fusion-ns:Ibm-common-services - Aug 31, 2022 11:45:37 PM			
Select data sources Source type: Selected source: Source snapshot: Backup Source Type: Pertore Type:	OpenShift isf-app:ibm-spectrum-fusion-ns:ibm-common-services isf-app:ibm-spectrum-fusion-ns:ibm-common-services - Aug 31, 2022 11:45:37 PM			
Source type: Selected source: Source snapshot: Backup Source Type:	OpenShift isf-app:ibm-spectrum-fusion-ns:ibm-common-services isf-app:ibm-spectrum-fusion-ns:ibm-common-services - Aug 31, 2022 11:45:37 PM			
Backup Source Type:				
Restore Source Type:	From Copy On-Demand Site			
Restore method:	Production			
Set destination				
Destination:	Restore to alternate cluster - ocp-b			
Namespace: Storage Class:	<not set=""></not>			
storage class.	SHOLDEL?			
Set run settings Run cleanup immediately on job failure: Allow session overwrite: Continue with restores of other selected resources even if one fails:	Yes Yes Yes			
Overwrite existing behavior:	Do not overwrite PVCs			
	Set run settings Run cleanup immediately on job failure: Allow session overwrite: Continue with restores of other selected resources even if one fails: Overwrite existing behavior:	Set run settings Run cleanup immediately on job failure: Yes Allow session overwrite: Yes Continue with restores of other selected Yes resources even if one fails: Overwrite PVCs	Set run settings Run cleanup immediately on job failure: Yes Allow session overwrite: Yes Continue with restores of other selected Yes resources even if one fails: Overwrite existing behavior: Do not overwrite PVCs	Set run settings Run cleanup immediately on job failure: Yes Allow session overwrite: Yes Continue with restores of other selected Yes resources even if one fails: Overwrite existing behavior: Do not overwrite PVCs Back Subt

Figure 3-46 Review the selections and submit

The restore job is then created and the confirmation message appears as seen in Figure 3-47.

\odot			🕥 🕐 🗛 🙆 istadmin 🗸
) G	Jobs and Operations		Create job
\checkmark	Running Jobs Job History C Active Resources	Schedule	
U	67.57% 37 4 •	8 4 25	Job history period: Last 48 hours 🗸
z	Success Mate Info	×	
đ	Restore job har screen.	s been created. You can find it in the "Running Jobs" tab in the Jobs and Operations	
٨	Application Server Inventory	ок 🔶	ep 1, 2022 12:58:06 AM
Ċ,	Type: Inventory Status: Completed Start Time: Sep 1, 2022 12:38:02 AM End Time: Sep 1, 2022 12:38:06 AM Duration: 08 0m As	300 Log Concurrent 3005	Download .zip
		Pailed: 0 Success: 0	₽
	Application Server Inventory Type: Inventory Status: Completed Start Time: Sep 1, 2022 12:57:06 AM	Status Time 10 Descriptio	•
	End Time: Sep 1, 2022 12:58:44 AM Duration: 0h 1m 37s	Summary Sep 1, 2022 CTGGA2398 Starting job 1 12:58:02 AM 166201908	ar policy Application Server Inventory. id -> 2146. IBM Spectrum Protect Plus version 10.1.12-120.

Figure 3-47 Message stating the Restore job was created and can be viewed in the Running Jobs tab

To view the progress of our restore job, we went to the **Running Jobs** tab and we can see the job is running in Figure 3-48 on page 49. This restore process involves restoring the catalog sources, the subscriptions, the csv installations and preparing all of the IBM Cloud Pak for Data operators.



Figure 3-48 View the Running Jobs

The Cloud Pak for Data operators are installed in **ibm-common-services** and after a few minutes, we can see the pod in *Running* state by running the following command:

\$ oc get pod -n ibm-common-services

We can also see that the recipe that was part of the backup is also restored by issuing the following command (see Figure 3-49):

\$ oc get recipes.spp-data-protection.isf.ibm.com -n ibm-common-services



Figure 3-49 Check that the pod is running and the recipe is restored

After about an hour and 17 minutes, we can see that the restore job for the Cloud Pak for Data operators completed successfully from the **Jobs and Operations** page in the SPP UI on ocp-b, which is our storage cluster as shown in Figure 3-50. In our source cluster we had several catalog sources and operators that were running on our source cluster and were restored. As such, the amount of time it takes for the restore to complete depends on the number of services and catalogs that are on the Cloud Pak for Data instance.



Figure 3-50 On-Demand Restore completed

We verified the creation of the catalog sources on our cluster (ocp-b) by running **\$ oc get** catsrc -n openshift-marketplace as seen in Figure 3-51.

20220001 02-10-00 Fain hidefeile? - f as ant	entene	_		
NAME	DTSPLAY	TYPE	PURI TSHER	AGE
certified-operators	Certified Operators	arac	Red Hat	514
comunity-operators	Community Operators	arac	Red Hat	514
cnd-nl atform	Cloud Pak for Data	anne	TRM	74-
ibm.cloud-databases_redis_onerator_catalog	ibm.cloud_databases_redis_onerator_catalon	arec	TEM	73.
ibs-cod-ge-operator-cotalog	Cloud Pak for Data TBM Analytics Engine newered by Anache Snark	grac	TRM	72.
ibm-cnd-ccs-onerator-cataloa	COD Common Core Services	grac .	TRM	70.
ibn.cod.dotorofinery_operator_cotolog	Cloud Pak for Data TBN DataPafinary	grpc	TEM	60.
ibm-cod_datastage_operator_catalog	TEN CED DetoStone	grpc	TEN	67m
ibm and it constation actual on	COD TBN Teferretion Conver	grpe	TEN	Ed.
ibm.cod.scheduling.catelog	TPM Cloud Bok for Data Schedular Catalon	grpc	TRM	53.
ibn-cod-skc-onergton-cotolog	CDD W/C	grpc	TEM	530
Ibm-cpd-wkc-operator-catalog	Chand Bale for Data Watson Machine Learning	grpc	100	560
tom-cpa-wmt-operator-catalog	Cloud Pak for Data Watson Machine Learning	grpc	100	10-
1bm-cpa-ws-operator-catalog	CPD IBM Matson Studio	grpc	TBM	498
10m-cpd-ws-runtimes-operator-catalog	CPD watson Stuato Runtimes	grpc	184	400
1bm-db2oaserv1ce-cp4d-operator-catalog	IBM DbZoaservice CP4D Catalog	grpc	IBM	46m
10m-db2oltp-cp4d-operator-catalog	IBM DDZOLED CP4D Catalog	grpc	18M	458
1bm-db2uoperator-catalog	IBM DbZU Catalog	grpc	IBM	43m
1bm-db2wh-cp4d-operator-catalog	IBM Obzwh CP4D Catalog	grpc	IBM	42m
ibm-dmc-operator-catalog	ibm-dmc-operator-catalog	grpc	IBM	41m
ibm-fdb-operator-catalog	IBM FoundationDB	grpc	IBM	39m
ibm-sppc-operator	IBM SPPC Operator	grpc	IBM	12h
isf-catalog	ISF Catalog	grpc	IBM	41h
manta-adl-operator-catalog	MANTA Operator Catalog	grpc	MANTA Software	38m
opencloud-operators	IBMCS Operators	grpc	IBM	21d
redhat-marketplace	Red Hat Marketplace	grpc	Red Hat	51d
redhat-operators	Red Hat Operators	grpc	Red Hat	51d
TRANSPORT AND ADDRESS FOR A DATA PARTY AND ADDRESS				

Figure 3-51 Verify the creation of the catalog sources on ocp-b cluster

Additionally, we also verified the subscriptions on **ibm-common-services** by issuing **\$ oc get sub -n ibm-common-services** as shown in Figure 3-52 on page 51.

TATTACK ALLER For builded of a set of a first second second set			
NAME	PACKAGE	SAURCE	CHANNEL
cod-operator	cod-platform-operator	cod-platform	v3.1
ibm-cert-manager-operator	ibm-cert-manager-operator	opencloud-operators	v3
ibm-common-service-operator-v3-opencloud-operators-openshift-marketplace	ibm-common-service-operator	opencloud-operators	v3
(ba-cod-ge-operator	analyticsengine-operator	(be-cod-ge-operator-catalog	¥2.1
the-end-ces-operator	ibm-end-ces	the-cod-ccs-operator-catalog	v2.1
ibn-cod-datarefinery-operator	ibm-cnd-datarefinery	ibm-cnd-datarefinery-operator-catalog	¥2.1
Ibm-cod-datastage-operator	ibm-cnd-datastage-operator	(hm-cnd-datastage-operator-catalog	v2.1
(ba-rad-lis-operator	ibm-cod-lis	(be-cod-lis-operator-cataloo	v2 1
(bn-cpd-schedu) ing-cata) on-subscription	ibm-cnd-scheduling-operator	ibm-cnd-scheduling-catalog	v1.4
(ba-cod-akc-onerator-cata) on-subscription	ibm-end-ake	ibm-cnd-wkc-operator-catalog	v2 1
(bn-cnd-an)-onerator	ibm-cod-ami-operator	ibm-cod-wal-operator-catalog	v2.1
ibs.cod.er.constator	ibm-cod-er]	the coder connector catalog	-11
ibn.cnd.wr.nutiner.onerator	ibm-cod-we-muntimer	ibe-cod-er-susting-constant-cotalog	V5.1
ibm-db2ostanui ca-cold-onerotor	ibe-db2corenvice-codd-coecotor	ibm-db2ooservice-cold-operator-catalog	12 1
ton-ubzudservice-cp+u-operator	ibm-db2olaservice-cp4u-operator	ibn @ 201te codd approton cotolog	VE.1
tom-dozortp-cp-a-operator-catalog-subscription	ton-ubzottp-cp+u-operator	the dozortp-cp+a-operator-cutatog	VE.1
the dist and months antiles about a	ubzu-operator	the set of a	VE.1
1bm-dozwn-cp+d-operator-catalog-subscription	1bm-db2wn-cp4d-operator	10n-ab2wn-cp+a-operator-catalog	V2.1
10m-anc-operator-subscription	tom-anc-operator	ion-onc-operator-catalog	V1.6
10m-Licensing-operator	10m-L1Censing-operator-app	opencloud-operators	¥3
1bn-namespace-scope-operator	10m-namespace-scope-operator	opencloud-operators	¥3
1bm-zen-operator	1bm-zen-operator	opencloud-operators	V3
operand-deployment-lifecycle-manager-app	1bm-odlm	opencloud-operators	V3
redis-operator	10m-cloud-databases-redis-operator	ibm-cloud-databases-redis-operator-catalog	¥1.5
20220901-02:19:07 [ocp-b:defoult] = 5			

Figure 3-52 Verify the subscriptions on ibm-common-services

3.4.2 Restoring the Cloud Pak for Data instance

Now we are ready to move on to the restore of the Cloud Pak for Data instance. First, we checked that the **czen** namespace does not exist by issuing **\$ oc get ns czen**. Next, we installed cpdbr-oadp service. Note, it does not create that namespace but it will set up the cluster role-bindings and permissions required for **cpdbr-oadp** tool to be restored during the restore phase. To install, we issued the following command as seen in Figure 3-53.

./cpd-cli oadp install --cpd-namespace=czen --component=cpdbr-hooks
--cpdbr-hooks-image-prefix=icr.io/cpopen/cpd --log-level=debug -verbose



Figure 3-53 Check czen namespace does not exist and install cpdbr-oadp service

Now we are ready to go through the same restore process we previously ran. On the target cluster, which is ocp-b in our example, we go to the SPP UI **Jobs and Operations** page and click on **Create job** as seen in Figure 3-54.

\odot) 💿 🖧 🛞 istadmin 🗸
>	Jobs and Operations	Cititate lab
<u>ه</u>	Running Jobs Job History 🕃 Active Resources Sc	iedule
~		
Ū	69.23% 39 4 Success Rate Total Jobs Failed	8 Job history period: Last 48 hours ~
S)		
Ē	Start V 11 Q. Search b	
٨	onDemandRestore_1662019266957 Success: 1	OnDemandRestore Type: Restore Start Time: Sep 1, 2022 1:01:07 AM End Time: Sep 1, 2022 2:18:16 AM
Ç	OpenShift 0 Type: Restore Status: Completed form Ximu Field 2020 2020 2010	
	End Time: Sep 1, 2022 1:0:107 AM End Time: Sep 1, 2022 2:18:16 AM Duration: 1h 17m 8s Total Databases: 1	Job Log Concurrent Jobs Download .zip
		Failed: D Success: 1 Total: 1
	Application Server Inventory Type: Inventory Status: Completed	Status Time ID Description
	Start Time: Sep 1, 2022 1:00:00 AM End Time: Sep 1, 2022 1:01:36 AM	Summary Sep 1, 2022 CTGGA2398 Starting job for policy onDemandRestore_1662019266957 1:01:07 AM (ID:1032): id -> 1662019267183. IBM Spectrum Protect Plus

Figure 3-54 Select create job

On the Create job page, we select Restore as seen below in Figure 3-55.

6			
>	< Back to Jobs and Operations		
۵	Create job	r to restore	data
\checkmark	Select one of the job options, and our wizard	Is will guide	you through the process.
Ū			
es,	8		Ô
A	Ad hoc backup		Restore
	Back up selected resources that are associated with an SLA policy.		Restore data from a specific instance.
8	Select		Select
ç			

Figure 3-55 Select Restore

On the **Restore - OpenShift** page, we select **OpenShift** from the **Containers** section as seen in Figure 3-56.

\odot					0	🕐 💪 🛞 isfadmin
。 合	 Back to Jobs and Operations Restore - OpenSl Source type 	hift				
~	Default Setup	Databases				
	Select data sources	Databases				
Ŋ	Source type Select source	Db2	SQL	Oracle	MongoDB	Exchange
Ē	Source snapshot Restore method	Containers				
۶ ۲	Set destination	Kubernetes	OpenShift			
ç	Job options Schedule	File Systems	Cloud Man	agement		
	Preview Restore	Windows	Microsoft 365			
						Next

Figure 3-56 Restore OpenShift

On the **Select source** page, we selected the PVC to recover by clicking on the ocp-a cluster and that listed the PVCs within it. Then, we clicked on the **plus sign** next to the isf-app:ibm-spectrum-fusion-ns:czen PVC. This added the PVC to the **Item** list on the right hand side and then we clicked **Next** as shown in Figure 3-57 on page 53.

 Back to Jobs and Operations Restore - Open Select source 	Shift		
Default Setup	Select source		
O Select data sources			
Source type Select source	Clusters / ocp-a		
-O Source snapshot	Name		Item
-O Restore method	🚖 isf-app:ibm-spectrum-fusion-ns:cpst-zen-demo	+	- isf-app:ibm-spectrum-fusion-
Set destination	a ist-app://bm-spectrum-fusion-ns://bm-common-services	+	
Set run settings	🛓 isf-app://bm-spectrum-fusion-ns:nazar	+	
-O Schedule	a ist-app://bm-spectrum-fusion-ns:czen		
Review			

Figure 3-57 Select the PVC to recover

On the **Source snapshot** page, we selected the resource to restore by clicking on the drop-down arrow next to **Origin** and we selected **From Copy** and on the **Type of Restore** drop-down arrow, we selected **On-Demand**. This then listed the restore points, and there is only one in our example below. We selected it and then clicked **Next** as shown in Figure 3-58.

۲				ି ଡ ୠ ଓ) isfadmin 🗸
́а	< Back to Jobs and Operations Restore - OpenShift Source snapshot	t			
~	Default Setup	C			
Ū	O Select data sources	Source snapshot Select which resource to restore for isf-app:ibm-sp	pectrum-fusion-ns:czen.		
Ľ	Source type Select source	From Copy V On-Dem	and ~ 08/25/2022 - 09/01/2022		
Ø	O Source snapshot	Restore Point	SLA Policy	Available	
٨	Restore method Set destination	Sep 1, 2022 12:09:09 AM	openshift_czen-policy	Backup	
Ç,	Set run settings O Job options Review		Se	ected: Sep 1, 2022 12:09:09 AM, Backup	2
	Preview Restore				
				Back	Next

Figure 3-58 Selected From Copy, On-Demand, and Restore Point

On the **Restore method** page, we left the defaults and clicked **Next** as seen on Figure 3-59.

G	ବ	0 🕹) isfadmin v
Back to Jobs and Opera Restore - Op Restore method	enShift		
Default Setup			
 Select data sources Source type Select source Source type Select source Source snapshot Restore method Set destination Set options Revore 	RestOPE INERTIOU Production mode is used for all OpenShift restore operations. Use this page to optionally rename the resource that you want to restore. Name New PVC Name of-app:dm-spectrum-fusion-ris.czen		
		Back	Neg

Figure 3-59 Accepted defaults for Restore method

On the **Set destination** page, we selected **Restore to alternate cluster** and ocp-b as depicted in Figure 3-60.

\odot				9	0	4	8	sfadmin 🗸
` ه	 Back to Jobs and Operations Restore - OpenSI Set destination 	hift						
~	Default Setup	Cot doctiontion						
U	Select data sources	Select a destination to which	to restore the selected resources.					
ø	Source type Select source	Restore to original cluster	r 💽 Restore to alternate cluster					
Ē	Source snapshot	Q. Search for instance						
ጸ	Restore method Set destination	Clusters Name	Version					
¢	Set run settings	⊙ ≣ ocp-b	Red Hat OpenShift Container Platform: 4.10.26 Kubernetes: v1.23.5+012e945					
	Revew		x					
	Preview Restore							
					Bac	k	Nex	t

Figure 3-60 Selected Restore to alternate cluster

Also in the **Set destination** page, ensure that **Original Storage class** is selected for the **Storage class for restoring PVCs** and **Original Namespace** is selected for the **Namespace Destination**, as depicted in Figure 3-61 on page 55. Then we clicked **Next**.

Note: We must have the same storage classes on the target cluster that were used on the source cluster, otherwise the restore will fail.

ک ^ ه	< Back to Jobs and Operations Restore - OpenShi Set destination	ft		0 0 🔩 🤅	g) isfadmin 🗸
 ✓ ✓ Ø Ø	 Debuit Setup Select data sources Source type Select source Source snapshot Bestore method Set destination Set nu seturgs Boto apsices Nerveix 	Storage class for restoring PVCs Original Storage class Namespace Destination Original Namespace	Choose from available namespaces	Specify an atternate namespace	Total: 1 😏
				Back	Next

Figure 3-61 Selected Original Storage Class and Original Namespace

On the **Job options** page, we left the defaults and ensured the following options were selected before clicking **Next**: **Do not overwrite PVCs**, **Run cleanup immediately on job failure**, **Allow session overwrite**, **Continue with restores of other selected resources even if one fails** as shown in Figure 3-62.

\odot			0	0	4	(2) isfadmin 🔻
) @ √	 Back to Jobs and Operations Restore - OpenSI Job options Default Setup 	hift				
U S E C I	 Select data sources Source type Select source Source snapshot Restore method Set destination Set run settings Jab options Review 	Sub options Configure the options for this restore job. Manage existing PVCs Do not overwrite PVCs Run cleanup immediately on job tailure Allow session overwrite Allow session overwrite Continue with restores of other selected resources even if one fails				
				Back		Next

Figure 3-62 Accepted defaults and selected Do not overwrite PVCs and checked the boxes

On the **Review** page, we verified our selections were accurate and then clicked **Submit** as seen in Figure 3-63 to perform the restore.

\odot				0	4	0	isfadmin 🤸
° ≙	< Back to Jobs and Operations Restore - OpenS Review	hift					
\checkmark	Default Setup						
Ū	 Select data sources Source type 	Review your selections, and then click Subn	nit.				
25	Select source	Source type:	OpenShift				
đ	Source snapshot	Selected source: Source snapshot: Backup Source Type:	isf-app:lbm-spectrum-fusion-ns:czen isf-app:lbm-spectrum-fusion-ns:czen - Sep 1, 2022 12:09:09 AM From Copy				
٨	Set destination	Restore Type: Restore Source Type:	On-Demand Site				
Ç	 Set run settings 	Restore method:	Production				
	Job options	Set destination					
	C Review	Destination: Namespace: Storage Class:	Restore to alternate cluster - ocp-b <not set=""> <not set=""></not></not>				
	Preview Restore	Set run settings Run cleanup immediately on job failure:	Yes				
				Back		Subm	nit

Figure 3-63 Verified that the selections were accurate

A confirmation then appeared informing us the restore job had been created and we clicked **OK** as seen in Figure 3-64.

θ		S 💿 💫 istadmin 🗸
	Jobs and Operations	Create jub
	Running Jobs Job History 🛇 Active Resources Sch	hedue
	69.23% 39 4	30b history period: Last 48 hours ~
	Info	×
	Start v ti Q	en created. You can find it in the "Running Joos" tab in the Jobs and Operations
	onDemandRestore 1662019266957	OK 1, 2012 2-18-16 AM
ç	OpenShift Skipped. U Type: Restore Status: Completed	
	Start Time: Sep 1, 2022 1:01:07 AM End Time: Sep 1, 2022 2:18:16 AM	Job Log Concurrent Jobs Download .tip
	Duration: 1h 17m 8s Total Databases: 1	Pailed: 0 Success: 1 Total: 1
	Application Server Inventory Type: Inventory Status: Completed	Status Time ID Description
	Start Time: Sep 1, 2022 1:00:00 AM End Time: Sep 1, 2022 1:01:36 AM	Summary Sep 1, 2022 CT0GA2398 Starting job for policy enDemandReatore 1.66201926957 100.07 AM 001:0321 di > 1662019267183 (BH Spectrum Protect Plus

Figure 3-64 Confirmation that the restore job was created

3.5 Verification of the Cloud Pak for Data restore

After the job was completed, we went to the **Job History** tab within the **Jobs and Operations** and saw that this restore took 12 minutes and 6 seconds to complete. The restore included the restore of all of the services, the Cloud Pak for Data platform, and in our example, we had an IBM Db2 instance that was deployed on the original source cluster (ocp-a) and it was also restored and deployed on the target cluster (ocp-b). We verified the creation of all of the pods in the **czen** namespace by issuing **\$ oc get pod -n czen** on our target cluster (ocp-b) as seen in Figure 3-65.

28220981-16:57:24 [ocp-b:default] ~ 5 oc get pod	-n czen			
NAME	READY	STATUS	RESTARTS	AGE
c-db2oltp-1661967716864728-db2u-0	1/1	Running	0	99m
c-db2oltp-1661967716864728-etcd-0	1/1	Running	0	99m
c-db2oltp-1661967716864728-instdb-5b886	0/1	Completed	0	91m
c-db2oltp-1661967716864728-restore-morph-7lvcl	8/1	Completed	0	98m
cpdbr-service-57597df6c5-27wj9	1/1	Running	0	99m
create-secrets-job-wbkf4	0/1	Completed	0	86m
dsx-influxdb-0	1/1	Running	0	99m
dsx-influxdb-set-auth-zrsq9	0/1	Completed	0	77m
ibm-nginx-5f8648bd44-bpffn	1/1	Running	0	96m
ibm-nginx-5f8648bd44-t7hzd	1/1	Running	0	96m
ibm-nginx-tester-79dc8479f4-6pxbn	1/1	Running	2 (95m ago)	99m
setup-nginx-job-ntncw	0/1	Completed	0	79m
userngnt-6c948b4fb7-q2b7n	1/1	Running	0	96m
usermgmt-6c948b4fb7-t5blv	1/1	Running	0	96m
zen-audit-698b8c8f97-fzpwv	1/1	Running	0	99m
zen-core-5769799595-gj282	1/1	Running	0	96m
zen-core-5769799595-tgqq9	1/1	Running	0	96m
zen-core-api-65bd9868cd-4sqdf	1/1	Running	0	96m
zen-core-api-65bd9868cd-qxcsx	1/1	Running	0	96m
zen-data-sorcerer-bb76947f7-vp6qk	1/1	Running	0	99m
zen-database-core-694f984d7-jxfcx	1/1	Running	0	99m
zen-databases-64c6b4f4c9-qbq6j	1/1	Running	2 (96m ago)	99m
zen-databases-64c6b4f4c9-t2t2d	1/1	Running	2 (96m ago)	99m
zen-metastore-backup-cron-job-27701235-8k6x5	8/1	Completed	0	45m
zen-metastore-backup-cron-job-27701250-prpfh	8/1	Completed	0	30m
zen-metastore-backup-cron-job-27701265-r7n2s	0/1	Completed	0	15m
zen-metastore-backup-cron-job-27701280-jmmlx	1/1	Running	0	26s
zen-metastoredb-0	1/1	Running	0	99m
zen-metastoredb-1	1/1	Running	0	99m
zen-metastoredb-2	1/1	Running	0	99m
zen-metastoredb-certs-nsswk	0/1	Completed	•	85m
zen-metastoredb-init-fnkr7	0/1	Completed	0	99m
zen-pre-requisite-job-gqz96	0/1	Completed	0	81m
zen-watchdog-777dd575d4-c7255	1/1	Running	1 (96m ago)	96m
zen-watchdog-post-requisite-job-4p652	8/1	Completed	0	76m
zen-watcher-b79cddd9d-dn55v	1/1	Running	0	968

Figure 3-65 Verified the creation of all the pods in the czen namespace on target cluster ocp-b

Then we verified the IBM Db2 instance deployment by issuing **\$ oc get db2ucluster -n czen** as seen in Figure 3-66.



Figure 3-66 Verified the IBM Db2 instance deployment

We then described **zenservice** by issuing **\$ oc describe zenservice lite-cr -n czen** and verified it is 100% complete as seen in Figure 3-67 on page 58.

UID: 6484f	c84-fc2f-44c9-9c96-c5e53dbff828
Spec:	
Block Storage Class:	ibn-spectrum-scale-rwo
cert_manager_enabled:	true
Cloud Pak Type:	data
Cloudpakfordata:	true
Cs Namespace:	ibn-common-services
File Storage Class:	ibn-spectrum-scale-rwx
Iam Integration:	false
skip_placeholder_init:	true
Version:	4.5.0
zen_pak_version:	3.1.0
zen_vault_enabled:	false
Status:	
Progress: 100%	
Progress Message: The C	urrent Operation Is Completed
Conditions:	
Ansible Result:	
Changed:	60
Completion:	2022-09-01722:53:34.002697
Failures:	
Ok:	618
Skipped:	668
Last Transition Time:	28/2-49-811722:27:382
Message:	Awaiting next reconciliation
Reason:	Successful
Status:	True
Type:	Ruming
Last Transition Time:	2022-09-01122153:542
message:	Lust reconciliation successes
Keuson:	JULLES STUL
Tune	rrae Europareful
lost Territien Times	3000 00.00 00 00 00 00 00 00 00 00 00 00
Lust fransition fine.	EBEE-07-011EE-33-34E
Person:	
Status	Entra
Tune:	Ford June
Current Vention:	
Supported Operand Versio	
ingi -	13. 4.3.8, 4.4.4, 4.4.4, 4.4.5, 4.4.5, 4.4.5, 4.3.6, 4.3.6, 4.3.6, 4.3.6, 4.3.6, 4.3.6, 4.0.6, 4.0.0
Zen Operator Build Numbe	type call approved a cyst fue come of the
Zen Status:	Completed
Events:	
20220901-17:00:58 Fore-htd	efailt] = \$
de de locp e a	

Figure 3-67 Described the zenservice and verified it is 100% complete

Now we can access the instance console for Cloud Pak for Data by first getting the link from our target cluster (ocp-b) by issuing **\$ oc get route -n czen** as seen in Figure 3-68.



Figure 3-68 Get the link to access the instance console for Cloud Pak for Data from ocp-b

Once we log in, we clicked on **View all** from within the **My instances** section in the main page for the IBM Cloud Pak for Data console as shown in Figure 3-69.

IBM Cloud Pak for Data				م
Welcome, adm	in!			
Discover services Extend the functionality of the platform by installing services from the catalog. →	Manage users Connect to your id provider and speci access the platforr →	entity fy who can n.	Stay informed Monitor the services that are running and understand how you are using resources. →	
Overview				9
Quick navigation		My instance	\$	
Databases		Db2-1 db2oltp		
Support		View all		
Documentation				
SA Community				
U Diagnostics				
Ø Share an idea				

Figure 3-69 Selected View all from My instances for the IBM Cloud Pak for Data console

From within the **Instances** page, we confirmed that the instance name is the same as our source cluster (Db2-1) and the **Status** is green and **Running** as shown in Figure 3-70 on page 59.
IBM Cloud Pak for Data										
Instances										
Filter by: Type \checkmark Status \checkmark										
Q. Find instances								٢	New instance	
Name	Туре	Created by	vCPU requests	Memory requests (GIB)	Users	Status	Created on			
Db2-1 Service instance for db2oltp-166196771686	db2oltp	admin	2.20	5.75 Gi	1	atus: Runnin	Aug 31, 2022			1
					Ins	stance create	ed			

Figure 3-70 Confirmed instance name is the same as source cluster (Db2-1)

We then verified that all the PVCs for the **czen** namespace were restored on the target cluster (ocp-b) by issuing **\$ oc get pvc -n czen** as seen in Figure 3-71.

20220901-17:01:08 [ocp-b:defoult] - 5 oc get :	ovc -n cz	en				
NAME	STATUS	VOLUME	CAPACITY	ACCESS MODES	STORAGECLASS	AGE
activelogs-c-db2oltp-1661967716864728-db2u-0	Bound	pvc-3b546421-a4cb-4110-9150-8ec98071e2ae	100Gi	RNO	ibm-spectrum-scale-rwx	105m
c-db2oltp-1661967716864728-backup	Bound	pvc-7a865a18-e65f-4d89-b24d-f38cb9c8f7fa	100Gi	RMX	ibm-spectrum-scale-rwx	105m
c-db2oltp-1661967716864728-meta	Bound	pvc-cb848300-1990-45dc-8733-4848ab250045	100Gi	RWX	ibm-spectrum-scale-rwx	105m
data-c-db2oltp-1661967716864728-db2u-0	Bound	pvc-ef1c5057-9095-4d0b-96ec-3ac9134044ee	100Gi	RNO	ibm-spectrum-scale-rwx	105m
data-dsx-influxdb-0	Bound	pvc-108c2851-b9d5-49b9-957b-d3cfc8c58e2b	10Gi	RNO	ibm-spectrum-scale-rwo	105m
datadir-zen-metastoredb-0	Bound	pvc-1950e7c8-a3b6-422c-9d0f-bbfba81ded80	10Gi	RNO	ibm-spectrum-scale-rwo	101m
datadir-zen-metastoredb-1	Bound	pvc-96084c6c-c7f7-49eb-9b33-b7c0e8bcac5c	10Gi	RNO	ibm-spectrum-scale-rwo	101m
datadir-zen-metastoredo-2	Bound	pvc-ef3ab757-a7a9-4da7-bce9-b5e53c1c8a71	10Gi	RNO	ibm-spectrum-scale-rwo	101m
tempts-c-db2oltp-1661967716864728-db2u-0	Bound	pvc-c8d8420e-8b5f-471b-8995-7bce64296e0c	100Gi	RINO	ibm-spectrum-scale-rwx	105m
user-hone-pvc	Bound	pvc-6f2a5280-1bbe-41a5-9ae7-d1bc422015de	10Gi	RINX	ibm-spectrum-scale-rwx	105m
20220901-17:02:05 [ocp-b:default] - 5						

Figure 3-71 Verified all the PVCs for the czen namespace were restored on the ocp-b

By running all the steps described in this paper, we have completed a successful online backup of the Cloud Pak for Data application and restored it to an alternate cluster using IBM Storage Fusion Data Protection.

Related publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this paper.

IBM Redbooks

The following IBM Redbooks publications provide additional information about the topic in this document. Note that some publications referenced in this list might be available in softcopy only.

- Accelerating IBM watsonx.data with IBM Storage Fusion HCI System, REDP-5720
- ▶ IBM Storage Fusion HCI System Metro Sync Dr Use Case, REDP-5708
- ► IBM Storage Fusion Product Guide, REDP-5688
- Multi-Factor Authentication Using IBM Security Verify for IBM Spectrum Fusion, REDP-5662

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- IBM Documentation IBM Storage Fusion

https://www.ibm.com/docs/en/storage-fusion

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