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Quick Start Guide for IBM Resiliency Orchestration Integration with EXPRESSCLUSTER X



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About this Guide

This guide provides a hands-on "Quick Start" set of instructions for configuration and setting the EXPRESSCLUSTER X integration with IBM Resiliency Orchestration on RHEL 7.4 / CentOS 7 (1708) operating system with two nodes. The guide assumes its readers to have Linux system administration & EXPRESSCLUSTER X knowledge and skills, installation and configuration of IBM Resiliency Orchestration, EXPRESSCLUSTER X, and Linux Server. The guide includes systematic instructions to integrate and configure of IBM Resiliency Orchestration with EXPRESSCLUSTER X.

Where to go for more information

Refer to additional documentation under the "documentation" directory on the EXPRESSCLUSTER X distribution CD or archive file.

For any further information, please visit the EXPRESSCLUSTER X web site at https://www.nec.com/EXPRESSCLUSTER

The following guides are available for instant support:

<u>GettingStartedGuide.pdf</u> – This guide explains general cluster concepts and overview of EXPRESSCLUSTER functionality.

<u>InstallationGuide.pdf</u> – This guide explains EXPRESSCLUSTER X installation and configuration procedures in detail.

<u>ReferenceGuide.pdf</u> – This is a reference of commands that can be put in EXPRESSCLUSTER X scripts and maintenance commands that can be executed from the server command prompt.

<u>MaintenanceGuide.pdf</u> – This guide is intended for administrators and system administrators who want to build, operate, and maintain. The guide describes maintenance-related information for EXPRESSCLUSTER.

<u>HardwareFeatureGuide.pdf</u> – The guide describes features to work with specific hardware, serving as a supplement to the Installation and Configuration Guide.

<u>LegacyFeatureGuide.pdf</u> – The guide covers topics of EXPRESSCLUSTER X 4.0 WebManager.

The above stated guides can also be found at: https://www.nec.com/en/global/prod/expresscluster/en/support/manuals.html

The EXPRESSCLUSTER X team can also be contacted via the following E-mail address: info@EXPRESSCLUSTER.jp.nec.com

Information about IBM Resiliency Orchestration is available on the below URL. https://www.ibm.com/support/knowledgecenter/ja/SSBK5V_7.3.1/iro731_welcome.html

1 Overview

- 1. This guide describes how to integrate & configure IBM Resiliency Orchestration (hereinafter referred to as "IBM RO") with NEC EXPRESSCLUSTER X (hereinafter referred to as "ECX").
- 2. Perform system planning to determine requirements and specify configuration settings prior to start of actual system installation and configuration.
- 3. Prepare the Primary and Secondary servers including OS installation and configuration if necessary.
- 4. Install, configure, and verify IBM RO on the Primary server.
- 5. Install and configure ECX Server on the Primary and Secondary servers.
- 6. Create and configure ECX failover group to enable continuous protection and automatic recovery for mirror disk resource & floating IP address resource.
- 7. Upload the configuration file on the server and start the cluster to complete the deployment.
- 8. Create and configure IBM RO recovery group and application group.
- 9. Edit and execute workflows of groups in RO.
- 10. View generated reports.

2 System Requirement and Planning

2.1 System Requirements

Machine 1: Primary/RO Server

- EXPRESSCLUSTER X (ECX) 3.3/4.0/4.1
- IBM Resiliency Orchestration (RO) 7.3
- Machine 2: Secondary Server
 - EXPRESSCLUSTER X (ECX) 3.3/4.0/4.1

	Machine 1 Primary/RO Server	Machine 2 Secondary Server	Machine 3 Client system/Desktop					
CPU	1 GHz Pentium 4 or b	etter	1 GHz Pentium 4 or better					
Memory	4 GB or more		1GB or more					
Disk	1 physical disks (havin one for OS, one for cl for data partition) OS disk: 40 GB or mon Mirrored & Data disk (20MB partition avail EXPRESSCLUSTER man The same size for eac	ng at least 3 partitions, uster partition and one re space available : As per requirement able for nagement) h server system	1 physical disk with 40 GB or more space available					
OS	Red Hat Enterprise 7. CentOS-7 (1708)	4	Windows 7 or Later					
Software	Java 1.8.0_212 enable	ed web browser	Java 1.8.0_212 enabled web browser					
Network	2 100Mbit or faster E interface cards	thernet network	1 100Mbit or faster Ethernet network					

3 Base System Setup

3.1 Management Console/Test Client (Machine 3)

Setup a Windows desktop or laptop with specified OS and network configuration from previous section. A Java enabled web browser should also be installed to enable access to ECX WebUI or WebManager.

3.2 Setup the Primary/RO Server (Machine 1)

- 1. If necessary, install required hardware components and a supported OS as specified in Chapter 2.
- 2. Verify basic system boot and root login functionality and availability of required hardware components as specified in Chapter 2.
- 3. Configure network interface names
 - a. Rename the network interface to be used for internal ECX management and data mirroring network communication between servers to **Interconnect**.
- 4. Configure network interface Settings:
 - a. In the "System" tab go to "Administration" further go to "Network".
 - b. In the Network Connections window, double-click Public.
 - c. In the dialog box, click the statically set IP address: option button.
 - d. Type the IP address, Subnet mask, and Default gateway values (see Table 1 System).
 - e. Go back to the Network Connections window. Double-click Interconnect.
 - f. In the dialog box, click the statically set IP address: option button.
 - g. Type the IP address and Subnet mask values (see Table 1 System). Click OK.
 - h. On the terminal, run the command "service network restart".
- 5. Configure the Data Disk:
 - a. Make sure the disk device or LUN is initialized as a Linux Basic disk device.
 - b. Create swap partition of 2*size of RAM.
 - c. Create a mirrored disk cluster partition on the disk with specified size in Table 1 and make sure it is 20MB or greater. Assign partition name as specified in Table 1 to the partition but do NOT format it.
 - d. Create a mirrored disk data partition on the disk with specified size in Table 1. Assign partition name as specified in Table 1 to the partition and format it.
 - e. Verify the mirrored disk cluster and data partitions are visible in command prompt using "fdisk" command under their respective assigned partition names.
- 6. Enable ssh:
 - a. Change "PermitRootLogin" to Yes in /etc/ssh/sshd_config.
 - b. Restart sshd with "systemctl restart sshd"

3.3 Setup the Secondary Server (Machine 2)

Perform steps 1-6 in Section 3.2 on the Secondary Server.

4 EXPRESSCLUSTER Server Installation & Setup

4.1 Install EXPRESSCLUSTER on the Primary & Secondary Server (Machine 1 & 2)

- 1. Install the ECX on Machine 1 & 2.
- 2. Register ECX licenses
 - EXPRESSCLUSTER X for Linux
 - o EXPRESSCLUSTER X Replicator for Linux
- 3. First restart the Primary server and then restart the secondary server.
- 4. Configure a cluster
 - Failover Group: failover
 - fip1: floating IP resource
 - md1: mirror disk resource
 - md2: mirror disk resource
 - Monitoring Resource
 - usrw: user mode monitor resource
 - mdw1: mirror disk monitor resource
 - mdw2: mirror disk monitor resource
 - mdnw1: mirror connect monitor resource
 - mdnw2: mirror connect monitor resource
 - fipw1: floating IP monitor resource
- 5. Start the Cluster & group on cluster manager.

5 Install & Configure Resiliency Orchestration

Please refer to **IBM Resiliency Orchestration 7.3 Installation Guide.pdf** and install the IBM RO on Primary server.

After Installing & configuring the RO software, we can access the RO application from client machine with following URL. <u>http://<RO-server IP address>:8080/PanacesGUI/</u>

• RO homepage & login with support user which you created during the RO installation.



Figure 1 IBM RO Login page

• After Login, you will get following page.



Figure 2 IBM RO WebUI

5.1 Edit sudoers

- Execute visudo command to edit sudoers.
- Add the below 2 lines.

panacesuser ALL=(ALL) ALL

panacesuser ALL=(ALL) NOPASSWD: ALL

5.2 RO Configuration

- 1 Application Group that includes 1 recovery group.
 - $\circ~$ ECX: Application Group
 - TestingECX: Recovery Group
- RO folder path : /opt/panaces/
- Scripts folder path for ECX: /opt/panaces/scripts/ECX/TestingECX
- RO service path: /opt/panaces/bin/

6 Create & Copy Custom scripts on Each Servers.

- 1. Create a folder **/opt/panaces/scripts/ECX** on RO server (Primary server).
- 2. Create a folder /opt/panaces/scripts/ECX/TestingECX on RO server (Primary server).
- 3. Change permission of the folders.

sudo chown panacesuser:panacesusergroup /opt/panaces/scripts/ECX

sudo chown panacesuser:panacesusergroup /opt/panaces/scripts/ECX/TestingECX

sudo chmod 775 /opt/panaces/scripts/ECX

sudo chmod 775 /opt/panaces/scripts/ECX/TestingECX

- Copy ECX_RepInfo.tcl and getrpo.tcl to /opt/panaces/scripts/ECX/TestingECX on RO server and following script will be available on ECX official web page:
- 5. Change owner and owner group and permission of **ECX_RepInfo.tcl** and **getrpo.tcl**.

sudo chown panacesuser:panacesusergroup ECX_RepInfo.tcl

sudo chown panacesuser:panacesusergroup getrpo.tcl

sudo chmod 776 ECX_RepInfo.tcl

sudo chmod 776 getrpo.tcl

- 6. Edit parameters in **ECX_RepInfo.tcl** and **getrpo.tcl** script.
 - **fip** is the floating IP address in ECX cluster.
 - **port** is the port to communicate with WebUI or WebManager.
 - **mdName** is mirror disk resource name.
 - **recoveryGroup** is RO recovery group name you will create.
- 7. Copy **checkstatus.sh** and **movegrp.sh** on both ECX servers {RO server (Primary server) & Secondary server} and following scripts will be available on ECX official web page:
 - Copy scripts to anywhere in both servers & give the executable permission.

7 Create DR Site on RO Dashboard

Follow the below steps to create DR site. Production site has already been created. (SCC_Site).

• After Login to RO dashboard, click **Discover** icon and you will get below screen.



Figure 3 Discover Tab

• Mouse over **Discover** tab on left corner.

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IBM Re	esiliency Orchestration					support	Д <mark>2</mark>	<u>Help</u>	\$	⊡	
\$ \$\$	Discover >								Clear /	AII -	
181	Discover	,									
2	Monitor	(0)	Recovery Groups(0)	Application Recovery (0)						
ſ	Manage					Ap	oplicatior	n Recover	y on AV	ıs 🗲	
\bowtie	Drills			Action		v	'irtual Ap	plication	Recover	y 🔉	
٩	Reports				View All		VM Pro	tection wi	ih Zerto	>	
						Ora	cle Reco	overy with AWS	Datagu	ard on	
						N	ISExcha	inge DAG Wizard	Low To	uch 🔈	
							Discovei	r Recover	y Group	>	
							Discover	Application	on Grou) >	
			©Copyright IBM Corporation	2003, 2018. All Rights Reserved.							
0.0.7.133:	8080/PanacesGUI/app/landing/inc	lex									

Figure 4 Discover tab options

• Inside the **Discover** tab, select **Sites**.

$\leftarrow \rightarrow$	C O Not secure 10	.0.7.133:8080/PanacesGUI/app/applic	ation/appList.htm					
IBM R	esiliency Orchestration					support	¢2	He
888	Discover >							
111	Discover	Sites						
2	Monitor	Subsystems	v Groups(0)	Application Recovery (0)				
	M	Destination Application				A	pplicatio	on Re
6/	manage	Replication Appliance						
	Drills	Credentials		Action			Virtual A	pplica
۲	Reports	Site Controller			View All		VM Pro	otecti
		Converged				Or	acle Rec	overy
		Management Service					_	AV
		ADC Profile					MSExch	ange Wiz
		Vcenter Resource Mapping				-		

Figure 5 Selecting Sites

• Click on **Sites** tab and you will get following screen, wherein default site is SCC_Site (In this document, **SCC_Site** is Production site.)

Sites Subsystems	Replication Appliance	Credentials	Site Controller	Hanagement Service	ADC Profile	Vcenter Happing	Config Honitoring Profi	e Groups	<u>Current Events:</u> 00 00 Use	ensupport
🖄 Sites List	t									
40 ⁰									Create New G	
Sites									Contracting on	Ĩ
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SCC Site				ómað	nin		N/A		2 î	
				(SCopyright IBM Corp	pration 2013, 2008. All Righ	s Rearried			

Figure 6 Default site

• Click on Create New Site

\leftrightarrow \rightarrow C (i) Not secure	10.0.7.133:8080/PanacesGUI/p				4	Incog	nito 🖶 🚦
IBM Resiliency Orchestration	DISCOVER MONITOR	MANAGE DRILL R	EPORTS		Help	¢ 🖻	IBM
Sites Subsystems Replication Ap	opliance Credentials Site Contro	oller Management Service	ADC Profile Vcenter Mapping	Config Monitoring Profile Groups	Current Events:	0 🛛 🕜	0 User:support
🕍 Sites List							
						Create	New Site
Sites							
SITE NAME	ADDRESS	SITE INC	CHARGE	SITE STATUS			
SCC_Site		drmadmi	in	N/A	2 💼		
		-					

Figure 7 New Site

• Input Site Name and Site Address of DR Site & click Save

Resiliency Orchestra	tion DISCOVE	MONITOR	MANAGE	DRILL	REPORTS						Help	¢ 🖻	71
Subsystems Replicat	ion Appliance Cree	Ientials Site Cor	troller Manage	ment Service	ADC Profile	Vcenter Mapping	Config Monitoring Profile	Groups			Current Events	0 0	0 Use
Create Site													
										View Sites	Sites		
Create New Site											SITE NAME	IN-CHAR	GE
ite Name	Secondary-RO		•								SCC Site	drmadmir	1
ite Type	On Premise	<u>•</u>											
ite-in-charge	support	<u>.</u>											
	India												
lite Address													
									Paula	Canaal			
									Save	Calicel			

Figure 8 Creating DR Site

• After creating DR site, you will see the screen below.

÷) C (1)	Not secure	10.0.7.133 :80	80/PanacesG	GUI/pages/D	oCreateSites.do?	menuval=Disc	covery&menusub	val=Sites		ť	r Inco	gnito 🇧	ə :
IBM R	esiliency Oi	rchestration	DISCOVER	MONITO	R MANA	GE DRILL	REPORTS				Help	¢ (I	BM
Sites	Subsystems	Replication Ap	ppliance Crede	entials Site C	Controller M	lanagement Service	e ADC Profile	Vcenter Mapping	Config Monitoring Profile	Groups	Current Events:	000	0 Use	er:support
Ø	Sites Lis	st										Creat	New Si	iite
S	ites													
	SITE NAME				ADDRESS		SITE INCHA	RGE	S	ITE STATUS				
	SCC Site						drmadmin		N	/A	2 î			_
	Secondary	<u>/-RO</u>			India		support		N	/A	2 🗎			
							Copyright IBM Corp	poration 2003, 2018, All Righ	rts Reserved.					

Figure 9 Sites List

8 Create Component Subsystem

The below steps show how to create a Component Subsystem. Component for Primary server has already been created. (AgentNode) You need to create component for Secondary server.

1. Click Discover and Mouse over Discover

$\leftarrow \rightarrow$	C ① Not secure	10.0.7.133:8080/PanacesGUI/app/appli	cation/appList.htm						\$	Incogr	nito 🚭
IBM Re	siliency Orchestration					support	Ц <mark>2</mark>	Help	¢	•	IF
\$\$\$	Discover >								Clear A	MI	
888	Discover	▶ Sites									
2	Monitor	Subsystems	/ Groups(0)	Application Recovery (0)							
1	Manage	Replication Appliance				ŀ	Applicatio	n Recove	ry on AW	/s 🔉	
	Drills	Credentials		Action			Virtual Ap	plication		y 🔉	
	Reports	Site Controller	-		View All			tection w	ith Zerto		
		Converged				Or		overy with	n Datagu	ard on	
		Management Service					_	AWS	_	>	
		ADC Profile						inge DAG	G Low To	uch	
		Vcenter Resource Mapping						vnzaru			
		Configuration Monitoring Profile					Discove	r Recove	ry Group	>	

Figure 10 Subsystem option

2. Select Subsystems

\rightarrow C (0 M	Not secure 10.0.7	.133:8080/F		pages/discove							ង	r I	ncognite	• 🖨
Resiliency Orcl	hestration DISC	OVER	MONITOR	MANAGE	DRILL	REPORTS					Help	\$	₽	IB
s Subsystems I	Replication Appliance	Credentia	ls Site Cont	roller Manage	ement Servic	e ADC Profile	Vcenter Mapping	Config M	Ionitoring Profile Groups		Current Events:	00	0	User:si
Subsyste	ms													
, w														
								Refresh	Create new - Subsystem-	▼ Go	Subsystems			
Subsystems	5										COMPONENT COU	NT		
Components Da	tasets Protection Se	chemes Ne	twork								Components			1
components De	riusees Protection St	cilcilies lie	CHOIR								Components:			1
NAME	IP ADDRESS	TYPE	SITE	STATUS AL	.L •		CREDENTIAL STATUS		PASSWORD REFRESH		Datasets:			0
AgentNode	10.0.7.133	Linux	SCC_Site	ACTIVE			N.A.		N.A	2 💼	Protection Scheme	e:		U
											Networks:			0

Figure 11 Selecting the Subsystem

3. Select Create new drop down & select required components Linux

← -}	C (Not secure	10.0.7.133:808		'pages/discov								\$	Incogni	to 🖨 🗄
IBM R	esiliency O	rchestration	DISCOVER	MONITOR	MANAGE	DRILL	REPORTS						Help	¢ 🕒	IBM
Sites	Subsystems	Replication Ap	opliance Creden	itials Site Cont	roller Manag	ement Servio	e ADC Profile	Vcenter Mapping	Config N	Ionitoring Pro	file Groups		Current Events:	00 00	User:suppo
0	Subsyst	tems													
_									Refresh	Create new	Linux	▼ Go	Subsystems		
S	ubsyster	ns									 Subsystem Component Subsystem AIX 	î 📃	COMPONENT COUL	er 👘	
- J	omponents	Datasets Prot	ection Schemes	Network							Solaris Wan		Components:		1
	NAME¢	IP ADDRES	S\$ ТҮРЕ	E SITE	STATUS A	.L 7		CREDENTIAL STATU	s	PASSWORD	AS400		Datasets:		0
	AgentNode	10.0.7.133	Linu	x SCC Site	ACTIVE			N.A		N.A	OpenVMS Notification	-	Protection Scheme	9	0
											HPUX Windows zOS Network WWA 005000R DVS Database Subsystem DB2 MS Exchange Sybase	Ŧ	Networks:		0
							Copyright IBM Cor	poration 2003, 2018. All Rig	hts Reserved.						



4. Click Go

← → C ③	Not secure 10.0	0.7.133 :8080/F		pages/discove					
IBM Resiliency O	rchestration DI	COVER	MONITOR	MANAGE	DRILL	REPORTS			
Sites Subsystems	Replication Applian	ce Credentia	ls Site Cont	roller Manage	ment Servic	e ADC Profile	Vcenter Mapping Cor	nfig Monitoring Profile Groups	
🐚 Subsyst	ems								
							Refre	esh Create new Linux	▼ Go
Subsystem	ns								
Components	Datasets Protection	Schemes Ne	twork						
NAME¢	IP ADDRESS	TYPE	SITE	STATUS AL	L 7		CREDENTIAL STATUS	PASSWORD REFRESH	
AgentNode	10.0.7.133	Linux	SCC_Site	ACTIVE			N.A	N.A	2 💼

Figure 13 Select Subsystem

5. After clicking on **Go** tab, will get following screen:

← → C ① Not secure 10.0.7.133:8080/Pan						Incogn	nito 🖨
IBM Resiliency Orchestration DISCOVER MOI	NITOR MANAGE DRILL	REPORTS			Help 3	۵ ک	IB
Sites Subsystems Replication Appliance Credentials	Site Controller Management Ser	rice ADC Profile Vcenter Mapping Conf	fig Monitoring Profile Groups		Current Events:	000	User:s
Component Discovery							
				View Subsystem List	Subsystems		
New Component Discovery					COMPONENT LIST		
Type:	Linux •				AgentNode		
IP Address:		 Ping Lookup by name 					
Name:		•					
Component Site:	SCC_Site *						
2	Server Managed Remotely						
Credentials: 🏂	-Select a credential- T	Test Credentials					
Assign to Organization:	Default *						
Cold Capable							
Configuration Monitoring Alert Profile	Select v						
				Save			

Figure 14 Component Discovery

- 6. New Component Discovery
 - o Input IP Address of secondary server
 - o Input Name
 - Select Secondary Site as Component Site
 - Select Add new credential
 - Input root to User Name
 - Input the password of root to Password

→ C () Not secure 10.0.7.133:8080/1	PanacesGUI/pages/discovery					ation=E 🕶 ŋ	2 Incogni	to 贵
M Resiliency Orchestration DISCOVER	MONITOR MANAGE	DRILL REPORTS				Help	≎ 🕀	IBN
tes Subsystems Replication Appliance Credentia	ls Site Controller Managem	ent Service ADC Profile	Vcenter Mapping	Config Monitoring Profile	Groups	Current Events:	00 00	User:supp
Component Discovery								
					View Subsystem List	Subsystems		
Edit Component Discovery						COMPONENT LIST		
Туре:	Linux					AgentNode		
IP Address:	10.0.7.134	• Ping	Lookup by name			Linux 10.0.7.1.		
Name:	Linux_10.0.7.134	•						
Component Site:	Secondary-RO T							
	Server Managed Remotely							
Credentials:	Add new credential	Test Credentials						
User Name::	root	* Edit Credent	ials					
Authentication:	Password SSH V	ault						
Password:	Fetch from vault Select-	- T						
Port No(SSH):	22	*						
Assign to Organization:	Default 🔻 🍍							
Cold Capable								
Configuration Monitoring Alert Profile	All selected	Ψ.						
					« Go Back Save			
		00.11.0000						

Figure 15 Adding credentials for the component discovery

7. After Save the Component Discovery, you can see the subsystem for Primary & Secondary node.

← -) G	③ Not s	ecure 10.0.7	.133:8080										\$	Incognit	• 🖶 i
ІВМ Я	esiliency	Orchestr	ation DISC	OVER	MONITOR	MANAGE	DRILL	REPORTS					Help	۵	₽	IBM
Sites	Subsyster	ns Replic	ation Appliance	Credent	ials Site Con	troller Mana	gement Servic	e ADC Profile	Vcenter Mapping C	Config Monito	oring Profile Groups		Current Events:	0	! @ Ω	User:support
0	Subsy	stems														
									Re	efresh Cre	ate new - Subsystem-	▼ Go	Subsystems	1		
s	ubsyste	ems											COMPONENT CO	UNT		
	Component	Dataset	Protection S	chemes	Network								Components:			2
	NAME¢		IP ADDRESS	i¢ 1	TYPE SITE	s	TATUS ALL	T	CREDENTIAL STATUS	S PA	SSWORD REFRESH		Datasets:			0
	AgentNode		10.0.7.133	L	Linux SCC_Si	ite A	CTIVE		N.A	N.J	A	2 💼	Protection Scher	ne:		0
	Linux 10.0	0.7.134	10.0.7.134	L	Linux Second	dary-RO A	CTIVE		2√	N.J	A	* 📝 💼	Networks:			0

Figure 16 Subsystem ready

9 Create Recovery Group

1. Click Discover and Click Discover Recovery Group

IBM R	esiliency Orchestration				support	Ļ2	Help	¢	•	1
888	Discover >							Clear	All	
	Application Groups(0)	☐ Recovery Groups(0)	Application Recovery (0)							
	туре і 👻			_	A	pplicatio	n Recove	ery on A	vs >	4
	Name No records to display		Action			Virtual Ap	plication	Recove	ry 🔉	4
			View	v All		VM Pro	tection w	ith Zerto	•	
					Or	acle Rec	overy with AWS	h Datagi	ard on	
						MSExcha	inge DAC Wizard		ouch	
									_	
						Discove	r Recove	ry Grou	, ,	
						Discover	Applicat	ion Grou	ip 👂	

Figure 17 Discover Recover Group

After clicking you will get following page:

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M Resiliency Orchestration DISCOVER MONITOR	NAGE DRILL REPORTS	Help	۵	•	IBY
	Curre	nt Events:	0 0	0	Userisupp
🔅 Create Recovery Group					
Group Details					
Group Define Solution Group Details Relationship Details Configurati	5				
Group Name:	·				
Description:					
Group Priority:	TYPE I 🔻				
Solution Signature:	-Choose the DR Solution Signature - 🔹 🔹				
Configured App RPO:	15 Minutes T				
Configured Data RPO:	15 Minutes 🔻 *				
Configured RTO:	50 Minutes T				
Configured Data Lag Objective:	10 HB T -				
	This server is part of a Cluster.				
	Part of FlexPod				
Assign to Organization:	Default v *				
		Next »	-	ancel	

Figure 18 Parameters for recovery group

2. Group Details

- o Input Group Name
- Select VM Replication with OtherReplicator as Solution Signature
- Input EXPRESSCLUSTER X as Other_Replicator
- Check **This server is part of a Cluster.**
- Click Next

	Lescolo, pages citeater cour	
Create Recovery Group		
Group Details		
Group Define Solution Details Relationship Details	Group Configuration	
Group Name:	Test-ECX •	
Description:	ECX Group details	
Group Priority:	TYPE I T	
Solution Signature:	VM Replication with OtherReplicator	
	Other Replicator EXPRESSCLUSTER X	
Configured App RPO:	15 Minutes *	
Configured Data RPO:	15 Minutes *	
Configured RTO:	60 Minutes * *	
Configured Data Lag Objective:	10 MB * *	
	This server is part of a Cluster.	
Cluster timeout:	120 Sec *	
	Part of FlexPod	

Figure 19 Create Recovery group

3. Define Group Relationship

- o Server Component
 - Select Primary server as **PRIMARY COMPONENT**
 - Select Secondary server as Secondary COMPONENT

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													Current	Events:	0	0	User:support
🔅 Create Recovery	Group																
Define Group Relati	onship																
Group Define Details Relationsh	Solution Details	Group Configura	tion														
		🕧 No	te:Primary and Re	emote Subsyster	ms need to be co	figured togeth	ther. Click	on each c	omponent	to configur	group subsy	stems.					
		Configura Step 1: Ser	ation Process ver Component [*] »	» Step2:	Application Datase	*» Step	p3: <u>Data</u>	Protection •	» St	ep4: <u>Netwo</u>	* Re k Component	quired					
		Server	Component*	pplication Dataset*					Applicati Datase	on Con		nt *					
			Data 🕑 Protection*	N. Co	etwork mponent (4)	Network	2	D Prot Networl Compon	ata iection k ent	•		_					
								(9				 « Back	Next »		Cancel	1

Figure 20 Defining Group Relationship

- Network Component
 - Select PRIMARY COMPONENT
 - Select Secondary COMPONENT

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								Current Events:	00 00	User:suppor
🍪 Create Recovery Gr	oup									
Define Group Relation	ship									
Group Define Details Relationship	Solution Details	Group Configuration	Dis	scover Networ	k Component S	ub-system.				
			Select	Component	t s					
		Note:Primary and		OUDONENT	DEMOTE CO	MOONENT	gure group subsystems.			
		Step1: Server Componer	PRIMART C	OPPONENT	REMOTE CO	PPONENT	work Component			
		Server Component		AgentNode- Primary		AgentNode- Primary	rver Component *			
		2 🖷 🚌		Linux_10.0.7.13	4 🖉	Linux_10.0.7.134	≻			
		- 96 🔛		Save	Close Window					
							<u>`</u>			
		Data Protection*								
		88								
			•			(4)				
										_
								« Back Next »	Cancel	
				Copyright IBM Corpo	ration 2003, 2018. All Righ	ts Reserved.				

Figure 21 Selecting Primary and Secondary Component

• Configuration Details: Name

- License
 - Select Recovery [Management, Monitoring]
 - Click Save

← -}	G	(i) Not secur	e 10.0.7.133 :808	0/PanacesGUI,	/pages/Group	sSolutionP	rivate.do?gnam	${\tt ne=TestingECX\&solutionType=BCSVMReplication\&signatureName=VM\%20Replicatio} \qquad \\$	☆	Incognit	• 🖨
IBM R	esilienc	y Orchestratio	n DISCOVER	MONITOR	MANAGE	DRILL	REPORTS	Нер	\$	₽	IBN
								Current Events:	0	l 🚺 🛛	User:supp
<u>نې</u>	Reco	very Grou	p Configura	tion							
C	onfigu	uration De	ails : Testin	gECX							
	Group Details Continuity Please ena	Defin Relation	e Solution Iship Details Drills Events No f the following featu	Grou Configur	P ation IP Business Pr p. Note: The grou	ocesses	cense	TE/UNMANAGED to perform this.			
	Recover	ry [Management, M	onitoring]								
	Test										
										Sa	ve
								В	lack	Finis	h
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Figure 22 Configuring Recovery Group

4. Click Finish

••••										
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вм	Resiliency Orchestration				support	¢2	<u>Help</u>	۵	₽	IBM
11	∲ Discover >							Clear	All	
	Application Groups(0)	E Recovery Groups(1)	Application Re	ecovery (0)	A		n Recove	rv on Al	ws 🔉	
	Name	DR Sites	Cyber DR Sites	Action		Virtual Aj	pplication	Recove	ry 🔉	
	TestingECX DB langing	Primary-RO-		×m×		VM Pro	tection w	ith Zerto	>	
	Divinipalieu	occonduj-reo		View All	Ora	acle Reo	overy with AWS	n Datagu	iard on	
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						Discove	r Recove	ry Grouj	» >	
						Discovei	Applicat	ion Grou	ip 🕨	
										_

Figure 23 Completing configurations

5. Click tool icon (Change Continuity) in Action

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181	}	Discover >							Clear	All	
	_		· · · · · · · · · · · · · · · · · · ·								
	C	ק Application Groups(0)	Recovery Groups(1)	Application Rec	overy (0)						
	1	TYPE I 👻				Ap	oplicatior	n Recove	ry on A\	ws 🔉	
		Name	DR Sites	Cyber DR Sites	Action	V	firtual Ap	plication		ny 🕨	
		Default (1)			<u> </u>		VM Pro	tection w	ith Zerto	>	
		 TestingECX DR Impaired 	Primary-RO- Secondary-RO		ו•						
					View All	Ora	cle Reco	AWS	1 Datagi	ard on	
						N	ISExcha	inge DAC Wizard	G LOW TO	ouch >	j



6. Click Manage Group

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181	Discover >						Clear A	All	
	Application Groups(0)	E TestingECX continuity operation	×						
	Туре і	UNMANAGED	Change Continuity State	A	pplicatior	n Recover	ry on AW	vs 🔈	
	Name		wanaye Group		/irtual Ap	plication	Recover	y >	
	Default (1)				VM Pro	tection wi	th Zerto	>	1
	TestingECX DR Impaired	Primary-RO- Secondary-RO	¥â ✓ View All	Ora	icle Reco	overy with AWS	Datagu	ard on	



7. Click OK

← → C ③ Not secure 10.0.7.133:8080/PanacesGUI/app/app	lication/appList.htm#tab=RG					☆	Incogn	ito
IBM Resiliency Orchestration	10.0.7.133:8080 says		support	¢2	<u>Help</u>	\$	₽	IBM
\$\$\$ Discover >	PAN-SBCM-0271: Failed to change group execution mode for TestingECX. PAN-SBCM-3517: At least one feature should be enabled					Clear /	All	
Application Groups(0) Type I Name Default (1) Type I Current	for the group to be managed. Please contact IBM Resiliency Orchestration technical support OK Int Status : UNMANAGED Manage Gr	oup	A	pplicatior ⁄irtual Ap	Recover	y on AV Recover	vs 🔉 y 🔉	
Default (1)				VM Pro	ection wi	h Zerto	>	

Figure 26 Finishing the configuration

10 Create Application Group

1. Click Discover & then Click on Discover Application Group

Discover >				Clear All
Application Groups(0)	Recovery Groups(1)	Application Rec	overy (0)	
TYPE I				Application Recovery on AWS >
Name	DR Sites	Cyber DR Sites	Action	Virtual Application Recovery
Default (1)				VM Protection with Zerto
TestingECX DR Impaired	Primary-RO- Secondary-RO		X m ✓ View All	Oracle Recovery with Dataguard or AWS
				MSExchange DAG Low Touch Wizard
				Discover Recovery Group
				Discover Application Group

Figure 27 Configuring Application Group

2. Organization Selection Click Next

\leftarrow \rightarrow C (i) Not secure	10.0.7.133:808	0/PanacesGUI/	'pages/Create	ModifyAG.	do?operation=	CREATE_AG&menuval=Discovery&menusubval=Groups 🛧 Incognito 😁	:
IBM Resiliency Orchestration	DISCOVER	MONITOR	MANAGE	DRILL	REPORTS	Help 🌣 🕒 🧾	M
						Current Events: 00 0 User:	support
🎡 Create Applicatio	on Group						
Organization Select	tion						Ľ
Assign to Organization:			Default			×	
						Next *	
					Copyright IBM Cor	poration 2003, 2018. All Rights Reserved.	

Figure 28 Creating new Application group

- 3. Application Group Details
 - Input Application Group Name
 - Select Recovery Groups and click Next

$\leftarrow \rightarrow \mathbf{C}$ A Not secure 10	0.0.7.133 :8080/	/PanacesGUI/	pages/Applica	ationGroup	o.do?methodTo	Call=ne	xtToBasicDe	etails&men	uval=Disc	covery&m	enusubval=	Groups&o	peration=CR	E 3	*	Incognito	- 🖨 i	
IBM Resiliency Orchestration	DISCOVER	MONITOR	MANAGE	DRILL	REPORTS								ł	Help	₽	₽	IBN	
													Current I	events:	0 0	<u>0</u>	User:suppo	at
Create Application	Group																	
Application Group De	tails																	ļ
Application Group Name: Description:			ECX															
Application Group Priority Select Recovery Groups:			TYPE I	T	*	» «	TestingECX	<i>R</i>		*								
					20-11-12-12-12-12-12-12-12-12-12-12-12-12-		0. 2010 All Public						«Back	vext »		Cancel		
					South But The Cold	por evidin 200	o, avais di logno	NEDER VEN										



4. Create Recovery Order - Name

• Drag and drop **Recovery Group Name** to **Recovery Order**

← → C () Not secure 10.0.7.133:8080/Panar	cesGUI/pages/App	licationGroup.do?methodTo	Call=nextToDependency&menuva	l=Discovery&menusubval=G	Groups&operation	n=CRE 😭	Incognito	e :
IBM Resiliency Orchestration DISCOVER MON	ITOR MANAG	E DRILL REPORTS				Help 🌣	Ð	IBM
					Cur	rrent Events: 🕠 🛛	00	User:support
🔅 Create Application Group								
Create Recovery Order - ECX					G	roups		
					-5	how All- * Go		
Using and drop Groups side by side to create a Paralel relationship. Drag and drop Groups one below the other to create a sequential o	rder.[Show Mel]	over at the same time.			3	C TestingECX		
Hans Stational Courses								
Ļ	Kecovery Level	Recovery Order						
Application Group	1st	v v						
Recovery Order		←→ Arrange Groups in parallel	Start Failover Dependency from Here.					
The order of Failover dependencies is taken as top-down in the selection	n i.e., the group appearin	g at the top will be failed over first and th	e group appearing immediately above will be f	ailed-over next and so on.				
				«Back Next » Can	acel			
		@Copyright IBM Corp	oration 2003, 2018. All Rights Raserved.					

Figure 30 Setting recovery order

5. Application Group Details

Input Configured RTO and Configured RPO and Click Finish

$\leftarrow \rightarrow \mathbf{C}$ A Not secure	10.0.7.133:808	0/PanacesGUI/	pages/Applic	ationGroup	.do?methodTo	Call=nextToObjectives&menuval=Discovery&menusubval=Groups&operation=CREA 🛪	7	Incognit	• 🖨 i
IBM Resiliency Orchestration	DISCOVER	MONITOR	MANAGE	DRILL	REPORTS	нер	۵	₽	IBM
						Current Events:	00	0	User:support
🌼 Create Applicatio	on Group								
Application Group I	Details								
Configured RTO:			5	Minutes	•				
Configured RPO:			5	Minutes	*				
RPO Impact:[?]			TestingE	CX.					
						« Back Finish		Cancel	
					@Copyright IBM Corp	poration 2003, 2018. All Rights Reserved.			

Figure 31 Configuring RPO and RTO for the application

6. Click tool icon (Change Continuity) in Action

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888	Discover >						Clear	All	
	Application Groups(1) TYPE1 Name ECX 1 O Becovery group is under maintenance. DR Impaired	Recovery Groups(1)	Application Recovery (0)	iew Alt	Applic Virtus VM Oracle F MSE:	ation Recov II Applicatio Protection 1 Recovery wi AWS kchange DA Wizard	ery on Al n Recove with Zertc th Datage G Low To J	vs > ry > iard on ouch	



7. Click Manage Group and Click OK

IBM Resiliency Orchestration 10.0.7.133:8080 says support Pice Pice Pice <th>← → C ③ Not secure 10.0.7.133:8080/PanacesGU</th> <th>/app/application/appList.htm</th> <th>☆ Incognito 👼</th> <th>:</th>	← → C ③ Not secure 10.0.7.133:8080/PanacesGU	/app/application/appList.htm	☆ Incognito 👼	:
Oracle Recovery with Dataguard on AWS AWS AWS AWS	IBM Resiliency Orchestration	10.0.7.133:8080 says Group Mode Change OperationManage Groupsuccessfully performed	support 🗘 Help 🌣 🕞 🧾	M
Discover Recovery Group	Application Groups(1) TYPE1 Name ECX 0 Recovery group is under maintenance. DR Impaired	Group Mode Change OperationManage Groupsuccessfully performed on groupECX UNMANAGED Current Status : UNMANAGED Manage Group X 🕯 X	Clear All Application Recovery on AWS Application Recovery on AWS Virtual Application Recovery VM Protection with Zerto Cracle Recovery with Dataguard on AWS MSExchange DAG Low Touch Wizard Discover Recovery Group	
Discover Application Group			Discover Application Group	

Figure 33 Finishing the recovery settings

11 Edit BCO Workflow of Recovery Group

The below steps is how to show a list of BCO Workflows.

1. Click Manage



Figure 34 Creating Workflow of Recovery Group

2. Click a group name that you want to edit

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b	۶	Manage >										Clear A	Ш	
(Ş	Sites			Application Groups	₽ Re	covery Groups		€ €	Executir	ng Worl	kflows		
	Т	YPE I	T	Group Health			1							
	R	ecovery Gr	oups	RPO	RTO	Pending	Data	Validation		C	onfig E	xposu	res	
	De	fault (1 / 1)	_											
	•	TestingECX DR Impaired		N/A	N/A	N/A Unknown		No Validation task	execute	з С И С	ritical on ritical	0 0		
														View All
					©Copyright IBM	Corporation 2003, 2018. A	I Rights Reserved.							

Figure 35 Editing Group name

3. After click on Group name, you will get below screen

\leftarrow \rightarrow C (i) Not secure 10.0.	.7.133:8080/PanacesGUI/app/over	view/rgdetail/deta	iil?groupId=1&g	roupName=Te	tingECX&token=TR3	32-PH9D-NKWG-RH8T-5CX3-TV4	S-SLQ2-N6	☆ Ind	cognito 🌧
IBM Resiliency Orchestration						support 🕰	Help 🌣	Ð	IBM
🖉 Manage > 主 TestingE	ecx								
Manage / RG Listing									
TestingECX (VM Replication	ion with EXPRESSCLUSTER X,	DR Impaired)							
RTO	RPO	Pendir	ng Data		Events	Validation	Config	Exposu	res
N/A	N/A	Data Lag Last Updated	N/A Unknown	Critical Serious	0 0	No Validation task executed	Critical Non Critical Last Scan : Scan Now	0	
Relationship	Primary-RO				Secondary-RO				
AgentNode-Primary Linux 10.0.7.133	(Primáry)				(Remoté)	10.0.7.134 134			

Figure 36 Settings actions for workflows

4. Click View all workflows

Need to edit BCO Workflows by clicking a pen icon and publish the workflow. A workflow consists of some actions.

You can edit an action by double-clicking the action icon

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M Resiliency Orchestration				support	Д ² Неір	۰ 🖻	IBM
Manage >							
Manager (DO Lipting (Testing FOV							_
Manage / RG Listing / TestingECX							
BC	O Workflows			BP Workflows			_
	Version Status	Execution Status	Dry Run Status				
NormalFullCopy User-Added	DRAFT Version 0 Updated:	NOT EXECUTED	NOT EXECUTED			•	
NormalCopy User-Added	DRAFT Version 0 Updated:	NOT EXECUTED	NOT EXECUTED			•	
Failover User-Added	DRAFT Version 0 Updated:	NOT EXECUTED	NOT EXECUTED			o,ľ	
Fallback User-Added	DRAFT Version 0 Updated:	NOT EXECUTED	NOT EXECUTED			•	
FallbackResync User-Added	DRAFT Version 0 Updated:	NOT EXECUTED	NOT EXECUTED			•	
ReverseNormalCopy User-Added	DRAFT Version 0 Updiated:	NOT EXECUTED	NOT EXECUTED			01	

Figure 37 Defining Workflows

> NormarlFullCopy

It is needless to edit a workflow because ECX copies data on a mirror disk constantly.

Only publishing is needed.

$\leftarrow \ \rightarrow$	C O Not secure	10.0.7.133:808	0/PanacesG	iUI/app/workf	low/edit?id=30	12&group	old=1&edit=true&token=	TR32-PH9D-NKWG-RI		TV4S-SLQ2	-N6GZ		☆	Incog	inito 💮 🗄
IBM Res	siliency Orchestratior									support	¢2	<u>Help</u>	۵	•	IBM
ß	Manage > 🗊	TestingECX													
	Testing ECX Group	ECX details	\geq		NormalFull BCO	Сору	\rightarrow	Edit Workflow	/	\rangle	F	ublish \	Vorkflo	w	
Add	>	0		a		[Highlight Category	• • • • • • • • • • • • • • • • • • •		Q	€ (⊅ ⊀	夫	88	
s		Custom act Workflo	tion		Custom action Workflow		Custom action Workflow								
Version :	0 Key Value pairs											Save	Now	Export	t Next

• Click Next

Figure 38 Normal Full Copy Workflow

• Click Publish Workflow

← → C ③ Not secure 10.0.7.133:8080/PanacesGUI/app/wo	rkflow/publishWorkflow?id=30128	groupId=1&token=	TR32-PH9D-NKWG-RH8T-5C>	(3-TV4S-SLQ)	2-N6GZ	ĩ	inco ک	gnito 😁
IBM Resiliency Orchestration				support	Д <mark>2</mark> н	Help 🗘	₽	IBM
🧷 Manage > 🗐 TestingECX								
TestingECX ECX Group details	NormalFullCopy BCO	\geq	Edit Workflow	\rightarrow	Put	olish Workf	low	
Key-Value List								
Кеу								
Value								
	Add key Value							
Select approvers for execution								
O drmadmin								
Enable Single Step								
					Save as	draft	ublish Wo	rkflow

Figure 39 Publish Normal Full Copy workflow

> Failover

Here need to define a complete workflow of Failover between Primary & Secondary site, as you will calculate the RTO for this functionality through to ECX.

IBM Resiliency Orchestration			support 🕂 <u>Help</u> 🌣 🖻 🔢 🦷
Manage > 主 Test_ECX			
Test_ECX	Custom	×	Publish Workflow
	Custom	View Help	
	Run-time settings	Action Properties	
	Name	Failover	
	Description(max:255 char's)	Failover group from primary server to secondary server.	
S Fallover Workflow	cor. W		
	Execution Mode	Auto	
	Inform Upon	Inform on failure	
	Skip this action		
	Sync Name		
	Retry on failure		
	Is Retryable	No	
Version : 1 Key Value pairs	Abort upon	No Abort -	Save Now Export Next

• Input Name and Description

Figure 40 Name and Description

- Select a Primary server as Server/Machine Name
- Select Script as Type of Custom Action
- Check Enable Sudo
- Input root as Sudo Username
- Input the path of movegrp.sh as **Command/Script to be executed with absolute path**

IBM Resiliency Orchestration			support 🗸	Hele O IBM
/ Manage > 🔃 Test_ECX	Custom	×		
Test_ECX	Custom	🙆 <u>View Help</u>	Publisi	h Workflow
Add > 0 F1 ft	Run-time settings	Action Properties	Q @ f	
	Server/Machine Name	AgentNode		
	Type Of Custom Action	Command Script IBM Resiliency Orchestration Integration Tcl Script		- Horan Maria - Andrea - Andre
5 E Balow Worklow	Sudo Username	✓ Enable Sudo root (Target Username)		
in the light in his prime is	Command/Script to be executed with absolute path	ro_test/movegrp.sh View Script		
	Log file path for custom script	Title		
	Server Where the Command/Script should be located	AgentNode		
	Timeout (Sec)	180		1-2-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1
Version : 1 Key Value pairs		Enable Dry Run		Save Now Export Next

Figure 41 Defining scripts

- Delete 2nd and 3rd action by clicking trash can icon
- After following the above steps, you will get below screen

IBM Re	siliency Orche	stration													support	Ļ	Help	\$		IBM
I	Manage >	I Test_ECX																		
		Test_ECX		\rangle		Fa	lover ico		\rightarrow		Edit	Workflov	v	\rightarrow		Publish	Workfl	DW		
Add	>		0	Ð	î			(🖰 Highlight	t Category		•			e,	€ 6	¥	¥	88	
s	•		Failover Workflow																	
			•																	
Version	: 2 Key Val	ue pairs															Save	B Now	Expo	rt Next

Figure 42 Failover workflow of recovery group

- Click Next
- Click Publish Workflow

> Fallback

- Input Name and Description
- Select a Secondary server as Server/Machine Name
- Select Script as Type of Custom Action
- No need to check **Enable Sudo**
- Input the path of movegrp.sh as **Command/Script to be executed with absolute path**
- Delete 2nd and 3rd action by clicking trash can icon
- After following the above steps, you will get below screen

IBM Re	siliency Orch	estration													supp	oort	Ļ ⁰	Help	₽	•	IBM
ß	Manage >	I Test_ECX																			
		Test_ECX		\rangle		Fallba	ick		\rangle		Edit W	/orkflow		\rangle		Pul	blish V	Vorkflo	w		
Add	>			0 🗈	î			🕀 Highlig	ht Category	, ,	•]	-	 	Q	Ð,	ð	¥	¥	88	
s	¢		Failback	•																	
			Worktlow	•																	
Version	:1 Key Va	lue pairs																Save	Now	Ехро	rt Next

Figure 43 Fallback workflow of recovery group

- o Click Next
- Click Publish Workflow

> FallbackResync

It is needless to edit a workflow because ECX copies data on a mirror disk constantly.

Only publishing is needed.

- o Click Next
- Click Publish Workflow

12 Edit BP Workflow of Recovery Group

The below steps is how to show a BP Workflows. Mandatory workflow is only **ReplicationInfoWorkflow**.

ReplicationInfoWorkflow is executed to get mirror disk information from ECX.

In this workflow, **ECX_RepInfo.tcl** is executed.

ECX_RepInfo.tcl calculates RPO and Pending Data of mirror disk, and sends these information to RO.

ReplicationInfoWorkflow

• Input Name and Description

			support 📣 <u>Help</u> 🌣 🖻 IBM
Manage > 💽 Test_ECX			
Test_ECX	Custom	×	Publish Workflow
	Custom	2 View Help	
	Run-time settings	Action Properties	
	Name	ECX_RepInfo	
	Description(max:255 char's)	This is Custom action	and a start of the second s
Custom Workflow			
•	Execution Mode	Auto	a hora and a solution of the second second
	Inform Upon	Inform on failure	
	Skip this action		a second to be first of the part of the second s
	Sync Name		
	Retry on failure		
	Is Retryable	Yes -	a manufacture for the second states and the second states and the
Version : 2 Key Value pairs	Abort upon	No Abort -	Save Now Export Next

Figure 44 Name and Description

- Select AgentNode as Server/Machine Name
- Select IBM Resiliency Orchestration Integration Tcl Script as Type of Custom Action
- Input the path of ECX_RepInfo.tcl as Command/Script to be executed with absolute path

IBM Resiliency Orchestration				support	Halp	¢ 🕑	IBM
/ Manage > E Test ECX							
Test_ECX	Custom	×	\rightarrow	Pu	ıblish Work	flow	
	Custom	2 View Help		AA	a +	<u>× 00</u>	
	Run-time settings	Action Properties		4 4		+ 00	1000
	Server/Machine Name	AgentNode -					
S C ECX. Reputs Wadow	Type Of Custom Action	Command Script EM Resiliency Orchestration Integration Tcl Script Enable Sudo					
•	Command/Script to be executed with absolute path	CX/ECX_RepInfb.tcl View Script					
	Log file path for custom script	Title					
	Server Where the Command/Script should be located	AgentNode					
	Timeout (Sec)	180					
		Enable Dry Run					
Version : 2 Key Value pairs					Save	e Now Exp	ort Next

Figure 45 Defining scripts

- $\circ \quad \text{Click Next}$
- Click Publish Workflow

13 Execute BCO Workflows of Recovery Group

After executing 4 BCO workflows that you created in the previous steps, the RTO is displayed on RO dashboard.

Please note that ECX failover group moves if you execute Failover/Fallback workflow.

The below step shows how to execute BCO workflows.

1. Click Manage

\leftrightarrow \rightarrow C (i) Not secure 10.0.7	.133:8080/Pana	cesGUI/app/overview?context=undefined&tab=rec						☆	Incognit	• 🖨 🗄
IBM Resiliency Orchestration					support	Ļ <mark>2</mark>	<u>Help</u>	\$	Ð	IBM
🖉 Manage >								Clear A		
♀ Sites		D Application Groups	Recovery Groups		€ E	xecutir	ng Wor	kflows		
TYPEI	Group Health		1							-
Recovery Groups	RPO	RTO	Pending Data	Validation		C	Config E	Exposu	es	
Default (1 / 1)										
TestingECX DR Impaired	N/A	N/A	N/A Unknown	No Validation task	k executed	C N C	critical Ion critical	0 0		
									V	iew All

Figure 46 Group Health

- 2. Click a group name
- 3. Click Execute in Continuity Workflows

← → C ③ Not secure 10.0.7.133:8080/Panaces								Incog	gnito 😁
IBM Resiliency Orchestration				support	Д ³	Help	¢	⋳	IBM
🧳 Manage > 主 TestingECX									
					J				
Continuity Workflows							View	all workfl	lows
Workflow Name	Version Status	Execution Status	Dry Run Status						
► Failover	PUBLISHED Version: 1 Updated: 19 Jun. 2019	EXECUTING Version: 1 Time Elapsed: 4s	NOT EXECUTED		2 / 3 steps	:		0	
Related Application Group									
Name		Recovery	Groups						
ECX		TestingECX							

Figure 47 Workflow execution

4. Click On Workflow name (Failover) & see the RTO (Time taken)

				support	🕂 Help 🌣 🖻	IBI
Manage > 主 Test_ECX						
Test_ECX (VM Replication with the second	h EXPRESSCLUSTER X, DR Impaired)					
RTO	RPO	Pending Data	Events	Validation	Config Exposures	
00:00:16 01:00:00 RTO Summary Update:: 05 Aug Current RTO-00:00:16 Recov 28 sec	00:00:00 10:00 00:00	Data Lag 0 MB Last Updated 3 minutes ago stion - 0% Configured RTO - 01:00:00	Critical 0 Serious 0	No Validation task executed	Critical 0 Non Critical 0 Last Scan : Scan Now	
16 sec						

Figure 48 RTO on group page

5. You can see the failover on ECX end which is executed by IBM RO.

_												-	o ×
(-)		10.0.7.134:290	03/							- ¢	Search	,o -	습 🕁 🌐 🍕
Clust	er Manager	×	Clus	ter Manag	er		🧉 Cluster Manage	r 🗖	IBM Resilien	cy Orchestration ::			
File E	dit View F	avorites Too	ols Help	, ,			-			,			
File Vi	ew Service	Tool Help			_								
Oper Oper	ation Mode		÷ 🛯	(C)									
RO-0	luster					Group Na	me: failover						Details
و 🖷 ۲	ervers				1		Descertion		Malua				
	RO1					Commont	Properties		value				
	roups					Status		Online					
9	🕽 failover					Started Se	rver	R01					
	– 🏈 FIP					Resource	Status						
	— 🚭 MD					FIP		Online					
🔶 🚞 N	onitors					MD		Online					
× Ŧ								,		-			
Туре	Rece	eived Time			Time 🔻		Server Name	Module Name	Event ID		Message		
	2019/06/20 1	1:08:47.715	20	19/06/20 1	1:08:47	.298	R01	rc	51	Moving group failover has completed.			
<u> </u>	2019/06/20 1	1:08:47.713	20	19/06/20 1	1:08:47	.290	R01	rc	11	Activating group failover has completed	i.		
	2019/06/20 1	1:08:43.705	20	19/06/20 1	1:08:42	.579	R01	rm	1	Monitoring fipw1 has started.			
	2019/06/20 1	1:08:41.695	20	19/06/20 1	1:08:40	.821	R01	rc	10	Activating group failover has started.			
	2019/06/20 1	1.08.40.834	20	19/06/20 1	1.08.40	.812	R02	TC m	21	Stopping group failover has completed			
	2019/06/20 1	1.00.33.071	20	10/06/20 1	1.00.35	866	R02	rc.	20	Stopping group failover has started			
	2019/06/20 1	1:08:33.672	20	19/06/20 1	1:08:32	.618	R01	rc	50	Moving group failover has started			
-	2019/06/20 1	1:08:32.621	20	19/06/20 1	1:08:32	.600	R02	apisy	37	There was a request to move all group	s from the cloarp command(IP=::fff:10.0.7.134).		
1	2019/06/20 1	1:07:23.421	20	19/06/20 1	1:07:23	.397	R02	rc	51	Moving group failover has completed.			
1	2019/06/20 1	1:07:23.408	20	19/06/20 1	1:07:23	.383	R02	rc	11	Activating group failover has completed	1.		
1	2019/06/20 1	1:07:18.662	20	19/06/20 1	1:07:18	.636	R02	rm	1	Monitoring fipw1 has started.			
(i)	2019/06/20 1	1:07:16.662	20	19/06/20 1	1:07:16	.641	R02	rc	10	Activating group failover has started.			
	2019/06/20 1	1:07:17.557	20	19/06/20 1	1:07:16	.635	R01	rc	21	Stopping group failover has completed			
0	2019/06/20 1	1:07:17.555	20	19/06/20 1	1:07:15	.556	R01	rm	2	Monitoring fipw1 has stopped.			
	2019/06/20 1	1:07:09.543	20	19/06/20 1	1:07:08	.448	R01	rc	20	Stopping group failover has started.			
	2019/06/20 1	1:07:08.411	20	19/06/20 1	1:07:08	.385	R02	rc	50	Moving group failover has started.			
	2019/06/20 1	1:07:09.541	20	19/06/20 1	1:07:08	.369	R01	apisv	37	There was a request to move all group:	s from the clpgrp command(IP=::ffff:10.0.7.133).		
	2019/06/20 1	1:02:55.245	20	19/06/20 1	1:02:54	.200	R01	rc	51	Moving group failover has completed.			
0	2019/06/20 1	1:02:55.243	20	19/06/20 1	1:02:54	.186	KU1	rc	11	Activating group failover has completed	1.		

Figure 49 EXPRESSCLUSTER X Cluster Manager

14 Execute BP Workflow of Recovery Group

ReplicationInfoWorkflow is executed every 10 minutes automatically to calculate RPO.

After executing the workflow, the RPO and Pending Data is displayed on RO dashboard. Group page is updated every 10 minutes.

Resiliency Orchestration				support	
9 Manage > 主 Test_ECX					
Test_ECX (VM Replication with	EXPRESSCLUSTER X, DR Impaired				
RTO	RPO	Pending Data	Events	Validation	Config Exposures
© 00:00:16 ┣ 0% ♂ 01:00:00		Data Lag 0 MB Last Updated 4 minutes ago	Critical 0 Serious 0	No Validation task executed	Critical 0 Non Critical 0 Last Scan : Scan Now
			Summary Updated 05 Aug, 2019 15 Current Data RPO : 1	8:10:00 00:00:00	
					Configured Data RPO : 00:15:00
Relationship	SCC_Site (Primary)		test_cent_dr (Remote)		

Figure 50 RPO on group page

BM Resiliency Orchestration				support	4º Help 🌣 🕒 IBM
🖉 Manage > 主 Test_ECX					
Test_ECX (VM Replication with	h EXPRESSCLUSTER X, DR Impaired)				
RTO	RPO	Pending Data	Events	Validation	Config Exposures
© 00:00:16	⑦ 00:00:00 ⋡ 0%	Data Lag 0 MB Last Updated 4 minutes ago	Critical 0 Serious 0	No Validation task executed	Critical 0 Non Critical 0 Last Scan : Scan Now
Replication Info:				Star	Refresh Details
Mirror disks on both servers	are working fine.				
Relationship					
	SCC_Site (Primary)		test_cent_dr (Remote)		
AgentNode			Linux	192.168.137.75	

Figure 51 Pending Data on group page

15 Edit BCO Workflows of Application Group

Failover and Fallback workflow must be edited.

- 1. Click Application Groups in Manage page
- 2. Click a group name that you want to edit
- 3. Click View all workflows

> Failover

• Click Add





• Select VM Replication with OtherReplicator in Select Solution Signature

IBM Resiliency Orchestra	tion						support 🏚	Help 🗘	G IBM
🖉 Manage >	ECX								
	ECX ECX	\rangle	Failover BCO	\rangle	Edit Workflow	\geq	Publish '	Workflow	
Add	< 0			Highlight Category	•		Q, ®, 6	· ¥ ★	88
Actions Action Group	s Workflows								
Select Solution Signature SnapMirror VM Replication with OtherReplicator	A	Custo	im action	Custom Workflow					
VM Replication with ZertoVirtualReplication VMwareVMs to AWS									
zLPAR Protection With CS zLPAR Protection with IB	sm 👔								
Version : 0 Key Value p	pairs							Save Now	Export Next



• Click recovery group name

IBM Resiliency Orchestrati	on										supp	ort 🗘	Help	¢		IBM
🖉 Manage >	ECX															
	ECX ECX		»	Failo BC	ver o	\rangle		Edit Wor	kflow	\rangle		Publish	ı Work	flow		
Add	<	0	Ð 🖬			🕀 High	light Category	•			e,	⊕, (D 7	: ¥	88	
Actions Action Groups	Workflows															
VM Replication with OtherR	epli 🔻															
test	>	e				0.000	•									
Test_ECX	2	ow e	7	Workflow	7	Workflow	•									
	-															
Import Workflo	w															
Version : 0 Key Value pa	airs												S	ave Now	Expo	ort Next

Figure 54 Defining scripts

o Click Failover

IBM Resiliency Orchestration						support 🕂	Help 🌣	e IBM
🧷 Manage > 🛛 🛛 ECX								
ECX	\rangle	Failover BCO	Edit	Workflow	\geq	Publish	Workflow	
Add	< 0 ₽ 8		Highlight Category	•		€, €, 6	D ¥ ¥	88
Actions Action Groups Workflows								
VM Replication with OtherRepli ullCopy								
NormalC 3 +	tion Ow Cust	om action	istom rkflow					
Failover 1								
Fallback 1 🗸	opy Workflow							
Import Workflow								
Version : 0 Key Value pairs							Save Now	Export Next



- o Click Next
- Click Publish Workflow

> Fallback

- o Click Add
- Select VM Replication with OtherReplicator in Select Solution Signature
- Click recovery group name
- o Click Fallback
- o Click Next
- Click Publish Workflow

16 Execute BCO Workflows of Application Group

After executing **Failover** and **Fallback** workflow, you can see RTO on group page.

Please note that ECX failover group moves if you execute Failover/Fallback workflow.

IBM Resiliency Orchestration			support	4 ⁹	<u>Help</u>	¢	•	IBM
Nanage > 🗗 ECX								
ECX (DR Impaired)								
RTO	Events							
© 00:00:13 ► 0% © 00:15:00	Critical 0 Serious 0							
RTO Summary Updated 06 Aug, 2019 09:50:00 (8 seco Current RTO -00:00:13 Recovery Time -06 Aug, 2019 15 sec	Inds ago) 09:50:13 Deviation - 0% Configured RTO - 00:15:00	_						
9 scc 6 scc								
3 sec		Fallover RTO Steps						

Figure 56 RTO on group page

17 Edit Drill Workflows of Application Group

In this section, we will create Drill workflows of application group. After executing Drill workflow, Drill report is generated automatically.

The below steps is how to show a list of Drill Workflows.

1. Click Drill

\leftrightarrow \rightarrow	C (i) Not secure 10.0.7.133:8080/Pa	nacesGUI/app/drill/lis	sting/index						☆	Incogn	ito 😸 🗄
IBM Re	siliency Orchestration					support	́Д ³	<u>Help</u>	\$	₽	IBM
\bowtie	Drills >							CI	ear All		
	Executing			Sche For imme	eduled diate 7 days		Sum	imary			
	Application Groups	T									
	Group Name	Drafts	Published	Executing	Last Executed	Next Sc	heduled	I			
	Group Name ECX DR Impaired	Drafts 4	Published 1	Executing 0	Last Executed Switchover 20 Jun, 2019 13:29:57	Next Sc	heduled	I			

Figure 57 Executing drills

- 2. Click **Summary**
- 3. Click a group name that you want to edit

IBM Resiliency Orchestration	tus Execution Status	Den Den Ander	Create New	suppor	t 🗘	Help	¢	•	IBM
Drills > Drills > C ECX Drill Listing Version Sta Switchover Version 2	tus Execution Status	Des Durs Obstan	Create New						
Drill Listing Version Sta Switchover Version 2	tus Execution Status	Des Due Otatus	Create New					10010000000	100300000000000000000000000000000000000
Version Sta Switchover Version 3	tus Execution Status	Day Dua Status							
Switchover Version: 2		Dry Run Status			O WORK	low Cale	endar		
Template Optimies. 20 Sun, 20	SUCCESS Version: 2 219 Executed: 20 Jun, 2019	NOT EXECUTED	Execute O 🖍		Scheduled 0 Workflov Ongoing w	for today			
Switchback Version: 0 Template Updated:	NOT EXECUTED	NOT EXECUTED	©./		0 Workflov	vs			
FailoverTestExercise Version: 0 User-Added Updated:	NOT EXECUTED	NOT EXECUTED	O .*		Workflov	v Publis	hed by	you	+
IntegrityCheck Version: 0 Template Updated:	NOT EXECUTED	NOT EXECUTED	©./						
BackupHealthCheck Version: 0 Template Updated:	NOT EXECUTED	NOT EXECUTED	O .*						

Figure 58 Defining drill for Application group

For example, we will edit **Switchover** to output the below reports.

- Status of primary server
- Status of secondary server
- Time taken to move ECX failover group (RTO)
- ➢ RPO
- Pending Data of mirror disk
- 1. 1st action: Output status of primary server
 - Input Name and Description
 - Select a Primary server as Server/Machine Name
 - Select Script as Type of Custom Action
 - Check Enable Sudo
 - Input root as Sudo Username
- Input the path of checkstatus.sh as **Command/Script to be executed with absolute path**
- 2. 2nd action: Output status of secondary server
 - Input Name and Description
 - Select a Secondary server as Server/Machine Name
 - Select Script as Type of Custom Action
 - Input the path of checkstatus.sh as **Command/Script to be executed with absolute path**
- 3. 3rd action: Move ECX failover group from primary server to secondary server
 - Input Name and Description
 - Select a Primary server as Server/Machine Name
 - Select Script as Type of Custom Action
 - Check Enable Sudo
 - Input root as Sudo Username
 - Input the path of movegrp.sh as **Command/Script to be executed with absolute path**
- 4. 4th action: Output RPO and Pending Data
 - Input **Name** and **Description**
 - Select AgentNode as Server/Machine Name
 - Select IBM Resiliency Orchestration Integration Tcl Script as Type of Custom Action
 - Check Enable Sudo
 - Input root as Sudo Username
 - Input the path of getrpo.tcl as **Command/Script to be executed with absolute path**

After editing action, you will get the below screen.

IBM Resiliend	y Orchestration				support 🗘	<u>hed</u> 🌣 🕒 <u>IBM</u>
🖈 Drills	> ECX					
	ECX ECX	\rangle	Switchover Drills	Edit Workflow	Publish	h Workflow
Add	>	0 🗈 💼	0	fighlight Category 👻	Q, ®, ć	J ¥ ¥ 8
Se	Primary of Workst	check low	try check Failover Workflow	Get RPO and P Workflow		
				•		
Version · 0	Key Value nairs					Save Now Export Next

Figure 59 Swichover workflow

Click Next and Publish Workflow.

18 Execute Drill Workflows of Application Group

- 1. Click Drill
- 2. Click Summary
- 3. Click a group name
- 4. Click Execute

Resiliency Orchestration						support	൧	Help	\$		TR
] Drills > 🗗 ECX	Image: Not secure 10.0.7.133 8080/PanacesGUI/app/workflowListing/groupWorkflow/2?token=5H0A-MXHA-4HQH-OLB2-AZW9-UG42-NKWH-Z54H#drill=true Image: Nocogetion Comparison Com										
Drill Listing	♥ Not secure 10.0.7133.8080//PanacesGUI/app/workflowListing/groupWorkflow/27token=5HDA-MXHA-4HOH-OLB2-AZW9-UG42-NKWH-Z54H#drill=true ★ Incognite Incognite ● Hency Orchestration support ▲ Leip ▲ Eip ▲ E										
	Version Status	Execution Status	Dry Run Status	Execute X Cancel							
witchouse	PUBLISHED	SUCCESS	NOT EXECUTED	Execute		Sch 0 V	heduled f Vorkflow	for today s			
Template	Version: 2 Updated: 20 Jun, 2019	Version: 2 Executed: 20 Jun, 2019			•						
	DRAFT	NOT EXECUTED	NOT EXECUTED		- /	Oni O V	going wa Vorkflow	rktiows 'S			
Switchback Template	Version: 0 Updated:			•	0	and the second					
	DRAFT	NOT EXECUTED	NOT EXECUTED		~!	Wo	orkflow	Publish	ned by	you	
alloverTestExercise	Version: 0 Updated:										
ntegrityCheck	DRAFT	NOT EXECUTED	NOT EXECUTED		o /						
Template	Updated:				-						
PackupHealthCheck	DRAFT	NOT EXECUTED	NOT EXECUTED		0.						
Template	Updated:			SH0A-MXHA-4HQH-0LB2-AZW9-UG42-NKWH-Z54H#drill=true Incognit support Image: Comparison of the support Image: Comparison of the support Are you sure? eate New Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the support Image: Comparison of the su							

Figure 60 Execute drill workflow for application group

Drill workflow will be stopped if you execute the workflow while any servers or ECX cluster are not running.

You need to restart workflow manually if workflow is stopping.

1. Click AWAITING INPUT

IBM Resiliency Orchestration					support 🞣 <u>Help</u> 🌣 🕞	IBM
Drills > 🗗 ECX						
Drill Listing				Create New	る Workflow Calendar	
	Version Status	Execution Status	Dry Run Status			
Switchover	PUBLISHED	AWAITING INPUT	NOT EXECUTED	1/4 Steps	0 Workflows	
Template	opanio, or say, tore	Terra Lagran. dei San			Ongoing workflows	
Switchback	DRAFT Version: 0 Updated:	NOT EXECUTED	NOT EXECUTED	0.1	1 worknows	
E	DRAFT	NOT EXECUTED	NOT EXECUTED	01	Workflow Published by you	+
Fallover1estExercise User-Added	Varaion: 0 Updated:					
IntegrityCheck	DRAFT Version: 0	NOT EXECUTED	NOT EXECUTED	01		
Template	Updated:					
BackupHealthCheck	DRAFT Version: 0	NOT EXECUTED	NOT EXECUTED	0.ľ		
Tomplate	oponed					
	SCopyris	pht IBM Corporation 2003, 2018. All	Rights Reserved.			

Figure 61 Execute awaiting dril workflow

2. Click Awaiting Input

IBM Resilie	ncy Orc	hestration					support	Ļ	<u>Help</u>	۵	G	IBM
🖈 Dr	^{ills} >	ECX										
< ECX	/ Switc	hover										
ECX		Switchover Version :1	06 Aug, 2019 16:05:51 Ø Start Time	Im: O Time	88s Elapsed	AWAITING INPUT (1) 1 / 4 Executed, 0 F	alled, 2 Not	Executed			
									Θ ,	⊕	Show Ca	invas
		Action	Time Initiated	Time Elapsed	Status							
•		Primary check	06 Aug, 2019 16:05:51	1s	EXECUTED							
		Secondary check	06 Aug, 2019 16:05:52	1m 41s	Awaiting Input							
		Failover			NOT EXECUTED							
		Get RPO and Pending Data			NOT EXECUTED							

Figure 62 Execute awaiting action

3. Click Continue as Success

IBM Resiliency Orchestration Support 🖓 Helip 🌣 🕞 🧾							
06 Aug, 2019 16:05:51 Ø Start Time	Im:38s ⑦ Time Elapsed		AWAITING INPUT (1) 1 / 4 Executed, 0 Failed, 2 Not Executed				
				Q	⊕,	Show Canvas	
Time Initiated	Time Elapsed	Status					
06 Aug, 2019 16:05:51	1s	EXECUTED					
06 Aug, 2019 16:05:52	1m 41s	Awaiting Input					
ompletion is configured. Workflow requires User	Input	uld not read the file					
	06 Aug. 2019 16:05:51 © Start Time Time Initiated 06 Aug. 2019 16:05:51 06 Aug. 2019 16:05:52 onpletion is configured. Workflow requires User	O6 Aug. 2019 16.05.51 Imm. ③ Start Time ③ Tim ① Start Time ③ Tim Immediate Immediate Immediate Time Elapsed 06 Aug. 2019 16.05.51 1s 06 Aug. 2019 16.05.52 1m 41s ompletion is configured. Workflow requires User Input	O6 Aug. 2019 16.05.51 Im:30s ③ Start Time ③ Time Elipsed Time Initiated Time Elipsed 06 Aug. 2019 16.05.51 1s 06 Aug. 2019 16.05.52 1m 41s 06 Aug. 2019 16.05.52 1m 41s 07 Austring trput	Of Aug. 2019 16:05:51 Im 38:s AWAITING HPUT (1) O Bart Time O Time Elapsed Italian Time Initiated Time Elapsed Status 06 Aug. 2019 16:05:51 1s © EXECUTED 06 Aug. 2019 16:05:52 1m 41s O Assuing Input	Clipped Clipped	Ore Aug. 2019 16:05:51 Im:36s AWAITING INPUT (1) Ore Aug. 2019 16:05:51 Time Elapsed MAITING INPUT (1) Time Initiated Time Elapsed Status 06 Aug. 2019 16:05:51 1s © EXECUTED 06 Aug. 2019 16:05:52 1m 41s ① Availing Input	

Figure 63 Continue as Success

19 Confirm Drill Report

We can see Drill reports in **Drill** page.

Resiliency Orch	estration DISCOVER	MONITOR	MANAGE	DRILL REPORTS				Help 🌣 🕒 🔢
								Current Events: 0 0 0 User:sup
Reports						Q Filter		
Advanced Reports	3							-Show All- 🗾 Go
Reports Acro	ss All Groups							test_app
Select Report: DR Drill/Test Rep	ort	-	Date Range: From:	To:	View			All Default GLegen
Compliance R	leports							
Select Report: BCP Test Report	1		Date Range: From:	To:	E			
Select Groups: (Hold Ctrl key to	select multiple)							
				All My Groups- test Test_ECX				
				_			View	
Snapshot Mar	nager Report							
түре	FREQUENCY		SCHEDULE	STATUS		ACTION		
Summary	Not Configured		Not Configured	Disabled	Edit Schedule	Edit email-recipients	24	
Detail	Not Configured		Not Configured	Disabled	Edit Schedule	Edit email-recipients		

Figure 64 Sample report

The Drill report in next page is generated after executing the workflow in section 18 **Time Elapsed** of **Failover** action represents RTO.

Group Name	ECX
Workflow Name	Switchover
Status	SUCCESS
Start Time	Aug 7, 2019, 11:43 AM
End Time	Aug 7, 2019, 11:44 AM
Time Elapsed	00:00:24
Approver Details	
Rejected Details	

Success	Failed	Not Executed
4	0	0

Name	Status	Time Initiated	Time Elapsed	Status Details
Name Primary check	EXECUTED	Time Initiated 2019-08-07 11:43:53.0	Time Elapsed 00:00:01	Status Details Executed the script/command using sudo: /root/ ro_test/checkstatus.sh Additional Details: Exit Code = 0 Output = ================================
				On component AgentNode (192.168.137.40)

Name	Status	Time Initiated	Time Elapsed	Status Details
Secondary check	EXECUTED	2019-08-07 11:43:54.0	00:00:01	Executed the script/command using sudo: /root/ ro_test/checkstatus.sh Additional Details: Exit Code = 0 Output = ================================
Failover	EXECUTED	2019-08-07 11:43:55.0	00:00:19	Executed the script/command using sudo: /root/ ro_test/movegrp.sh Additional Details: Exit Code = 0 Output = Command succeeded. On component AgentNode (192.168.137.40) Provided Reason: test
Get RPO and Pending Data	EXECUTED	2019-08-07 11:44:14.0	00:00:03	Status : Mirror disks on both servers are working fine. RPO : 0 h:0 m:0 s DataLag: 0 MB

Figure 65 Sample report