



Automated Oracle Data Protection

NetApp Solutions

NetApp
June 07, 2022

This PDF was generated from https://docs.netapp.com/us-en/netapp-solutions/databases/db_protection_getting_started.html on June 07, 2022. Always check docs.netapp.com for the latest.

Table of Contents

Solution Overview	1
Automated Data Protection for Oracle Databases	1
Getting started	2

Solution Overview

Automated Data Protection for Oracle Databases

Organizations are automating their environments to gain efficiencies, accelerate deployments, and reduce manual effort. Configuration management tools like Ansible are being used to streamline enterprise database operations. In this solution, we demonstrate how you can use Ansible to automate the data protection of Oracle with NetApp ONTAP. By enabling storage administrators, systems administrators, and DBAs to consistently and rapidly setup data replication to an offsite data center or to public cloud, you achieve the following benefits:

- Eliminate design complexities and human errors, and implement a repeatable consistent deployment and best practices
- Decrease time for configuration of Intercluster replication, CVO instantiation, and recovery of Oracle databases
- Increase database administrators, systems and storage administrators productivity
- Provides database recovery workflow for ease of testing a DR scenario.

NetApp provides customers with validated Ansible modules and roles to accelerate deployment, configuration, and lifecycle management of your Oracle database environment. This solution provides instruction and Ansible playbook code, to help you:

On Prem to on prem replication

- Create intercluster lifs on source and destination
- Establish cluster and vserver peering
- Create and initialize SnapMirror of Oracle volumes
- Create a replication schedule through AWX/Tower for Oracle binaries, databases, and logs
- Restore Oracle DB on the destination, and bring database online

On Prem to CVO in AWS

- Create AWS connector
- Create CVO instance in AWS
- Add On-Prem cluster to Cloud Manager
- Create intercluster lifs on source
- Establish cluster and vserver peering
- Create and initialize SnapMirror of Oracle volumes
- Create a replication schedule through AWX/Tower for Oracle binaries, databases, and logs
- Restore Oracle DB on the destination, and bring database online

For more details or to begin, please see the overview videos below.

AWX/Tower Deployments

- Part 1: TBD

video

- Part 2: TBD

video

After you are ready, click [here for getting started with the solution](#).

Getting started

This solution has been designed to be run in an AWX/Tower environment.

AWX/Tower

For AWX/Tower environments, you are guided through creating an inventory of your ONTAP cluster management and Oracle server (IPs and hostnames), creating credentials, configuring a project that pulls the Ansible code from NetApp Automation Github, and the Job Template that launches the automation.

1. The solution has been designed to run in a private cloud scenario (on-premise to on-premise), and hybrid cloud (on-premise to public cloud Cloud Volumes ONTAP [CVO])
2. Fill out the variables specific to your environment, and copy and paste them into the Extra Vars fields in your job template.
3. After the extra vars have been added to your job template, you can launch the automation.
4. The automation is set to be ran three phases (Setup, Replication Schedule for Oracle Binaries, Database, Logs, and Replication Schedule just for Logs), and a forth phase to recovering the database at a DR site.
5. For detailed instructions for obtaining the keys and tokens necessary for the CVO Data Protection visit [Gather Pre-requisites For CVO and Connector Deployments](#)

Requirements

On-Prem |

Environment	Requirements
Ansible environment	AWX/Tower
	Ansible v.2.10 and higher
	Python 3
	Python libraries - netapp-lib - xmlltodict - jmespath
ONTAP	ONTAP version 9.8 +
	Two data aggregates
	NFS vlan and ifgrp created
Oracle server(s)	RHEL 7/8
	Oracle Linux 7/8
	Network interfaces for NFS, public, and optional mgmt
	Existing Oracle environment on source, and the equivalent Linux operating system at the destination (DR Site or Public Cloud)

CVO

Environment	Requirements
Ansible environment	AWX/Tower
	Ansible v.2.10 and higher
	Python 3
	Python libraries - netapp-lib - xmlltodict - jmespath
ONTAP	ONTAP version 9.8 +
	Two data aggregates
	NFS vlan and ifgrp created
Oracle server(s)	RHEL 7/8
	Oracle Linux 7/8
	Network interfaces for NFS, public, and optional mgmt
	Existing Oracle environment on source, and the equivalent Linux operating system at the destination (DR Site or Public Cloud)
	Set appropriate swap space on the Oracle EC2 instance, by default some EC2 instances are deployed with 0 swap

Environment	Requirements
Cloud Manager/AWS	AWS Access/Secret Key
	NetApp Cloud Manager Account
	NetApp Cloud Manager Refresh Token

Automation Details

On-Prem |

This automated deployment is designed with a single Ansible playbook that consists of three separate roles. The roles are for ONTAP, Linux, and Oracle configurations.

The following table describes which tasks are being automated.

Playbook	Tasks
ontap_setup	Pre-check of the ONTAP environment
	Creation of Intercluster LIFs on source cluster (OPTIONAL)
	Creation of Intercluster LIFs on destination cluster (OPTIONAL)
	Creation of Cluster and SVM Peering
	Creation of destination SnapMirror and Initialization of designated Oracle volumes
ora_replication_cg	Enable backup mode for each database in /etc/oratab
	Snapshot taken of Oracle Binary and Database volumes
	Snapmirror Updated
	Turn off backup mode for each database in /etc/oratab
ora_replication_log	Switch current log for each database in /etc/oratab
	Snapshot taken of Oracle Log volume
	Snapmirror Updated
ora_recovery	Break SnapMirror
	Enable NFS and create junction path for Oracle volumes on the destination
	Configure DR Oracle Host
	Mount and verify Oracle volumes
	Recover and start Oracle database

CVO

This automated deployment is designed with a single Ansible playbook that consists of three separate roles. The roles are for ONTAP, Linux, and Oracle configurations.

The following table describes which tasks are being automated.

Playbook	Tasks
cvo_setup	Pre-check of the environment
	AWS Configure/AWS Access Key ID/Secret Key/Default Region
	Creation of AWS Role
	Creation of NetApp Cloud Manager Connector instance in AWS
	Creation of Cloud Volumes ONTAP (CVO) instance in AWS
	Add On-Prem Source ONTAP Cluster to NetApp Cloud Manager
	Creation of destination SnapMirror and Initialization of designated Oracle volumes
ora_replication_cg	Enable backup mode for each database in /etc/oratab
	Snapshot taken of Oracle Binary and Database volumes
	Snapmirror Updated
	Turn off backup mode for each database in /etc/oratab
ora_replication_log	Switch current log for each database in /etc/oratab
	Snapshot taken of Oracle Log volume
	Snapmirror Updated
ora_recovery	Break SnapMirror
	Enable NFS and create junction path for Oracle volumes on the destination CVO
	Configure DR Oracle Host
	Mount and verify Oracle volumes
	Recover and start Oracle database

Default parameters

To simplify automation, we have preset many required Oracle parameters with default values. It is generally not necessary to change the default parameters for most deployments. A more advanced user can make changes to the default parameters with caution. The default parameters are located in each role folder under defaults directory.

License

You should read license information as stated in the Github repository. By accessing, downloading, installing, or using the content in this repository, you agree the terms of the license laid out [here](#).

Note that there are certain restrictions around producing and/or sharing any derivative works with the content in this repository. Please make sure you read the terms of the [License](#) before using the content. If you do not agree to all of the terms, do not access, download, or use the content in this repository.

After you are ready, click [here for detailed AWX/Tower procedures](#).

Copyright Information

Copyright © 2022 NetApp, Inc. All rights reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means-graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system-without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

RESTRICTED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.277-7103 (October 1988) and FAR 52-227-19 (June 1987).

Trademark Information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.