DBaaS using Apprenda and SnapCenter Documentation

Release 1

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CHAPTER 1

Introduction

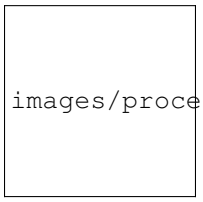
This automated solution simplifies the process of generating multiple copies of databases on-demand for pre-production purposes. The cloning of a pristine database for Dev/Test is instrumented automatically at the application deployment time, using native ONTAP features like snapshots and FlexClones via REST API.

At the compute layer, the integrated solution relies on Apprenda deployment policy engine and the abstraction model that frees the developers from the need to know intricacies of database cloning and reduces the need in meetings. Apprenda policy engine allows the operators to securely segment the platform based on various needs, SDLC environments being one of them. The established policies determine where applications instances are deployed and what databases they are connecting to. The databases similar to the applications themselves are segmented based on the deployment policies ensuring secure separation of pre-production and production environments. Multiple servers can be setup to host cloned databases, in which case Apprenda will be controlling the placement of clones based on the CPU and memory utilization.

CHAPTER 2

Architecture and Installation

This automated database provisioning is conducted in two steps. First, Apprenda Extension for SnapCenter is invoked by Apprenda Deployment Pipeline. It communicates with SnapCenter REST API to perform the desired type of cloning and mounting based on the metadata that accompanies the application. At a later stage of the pipeline, Apprenda Bootstrapper for SnapCenter is called to update the application configuration file with the new connection information, so that the application, once it is containerized by the platform, can connect to the cloned database.



2.1 Pre-Requisites

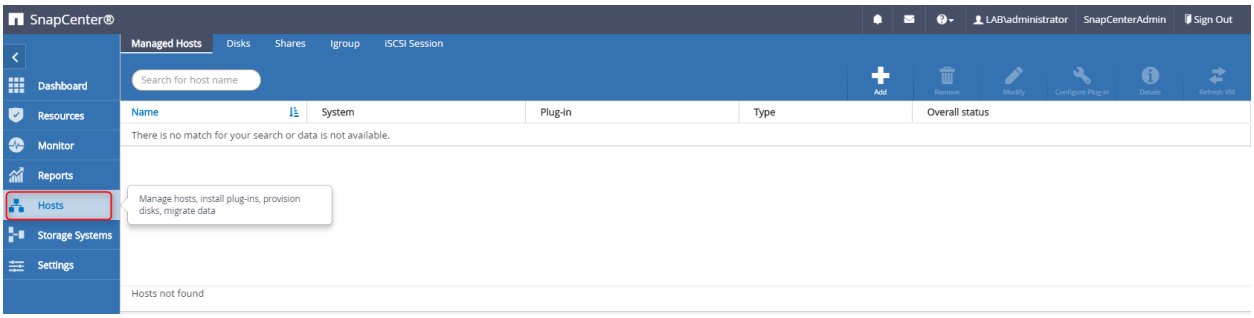
- **A MySQL Database running on NetApp Storage**
  - 1 running instance of NetApp SnapCenter 3.0+
  - 1 running instance of Apprenda 6.8 with atleast 2 Linux Hosts added

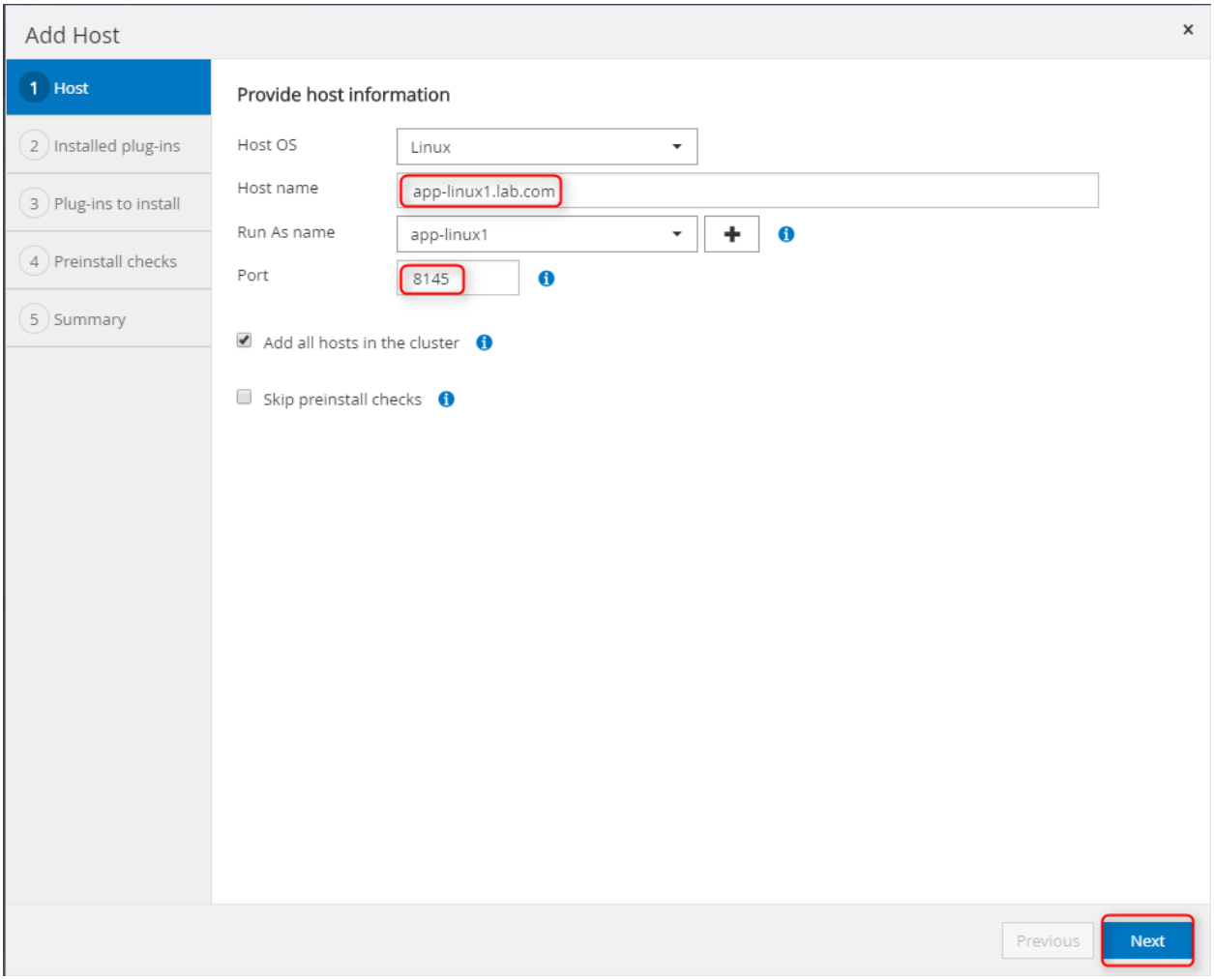
2.2 SnapCenter Configuration

1. **Add hosts in in SnapCenter**

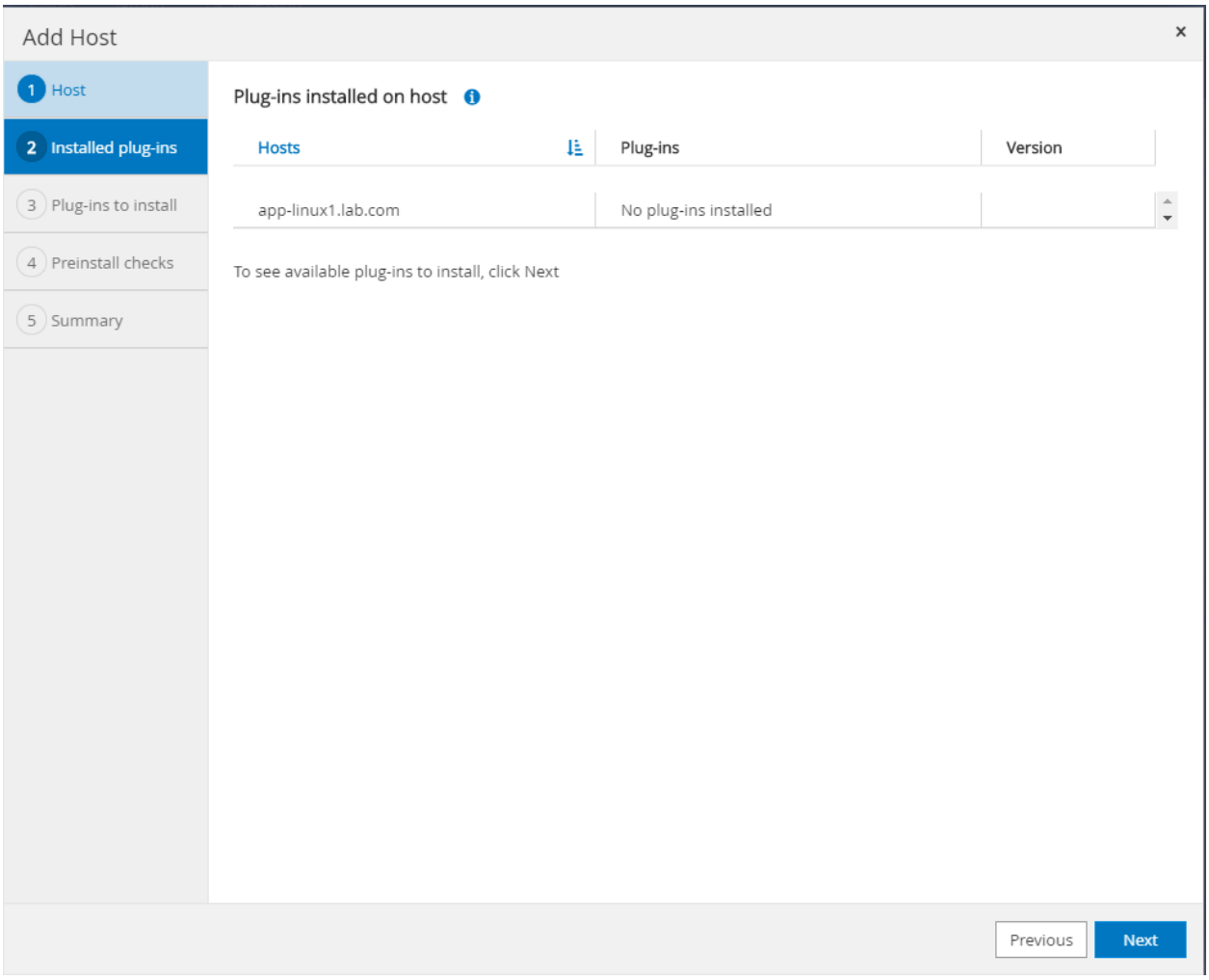
   1.1) Click on the hosts tab in SnapCenter

   1.2) Once the hosts screen pops up, enter the hostname of your linux host and a free port for the snapcenter agent to run and click Next.


SnapCenter®
LAB\administrator
SnapCenterAdmin
Sign Out
Managed Hosts
Disks
Shares
Igroup
iSCSI Session
Search for host name
Add
Remove
Modify
Configure Plug-in
Details
Refresh VM
Dashboard
Resources
Monitor
Reports
Hosts
Storage Systems
Settings
Name
System
Plug-in
Type
Overall status
There is no match for your search or data is not available.
Manage hosts, install plug-ins, provision disks, migrate data
Hosts not found


Add Host
1 Host
2 Installed plug-ins
3 Plug-ins to install
4 Preinstall checks
5 Summary
Provide host information
Host OS
Linux
Host name
app-linux1.lab.com
Run As name
app-linux1
Port
8145
Add all hosts in the cluster
Skip preinstall checks
Previous
Next

1.3) On the next screen, a list of plugins installed on the host will be shown. If a fresh configration is being done, this list will be empty. Verify your linux host name and click Next to view the list of available plugins for installation.



1.4) Select the MySQL plugin checkbox in the Custom Plugins section to install the MySQL custom plugin on the host.

1.5) Click Next to run the pre-install of plugin installation checks on the linux host.

1.6) Check the details in the Summary tab and click Finish to add a linux host with MySQL plugin in SnapCenter

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Note: Add atleast 2 linux hosts in SnapCenter instance

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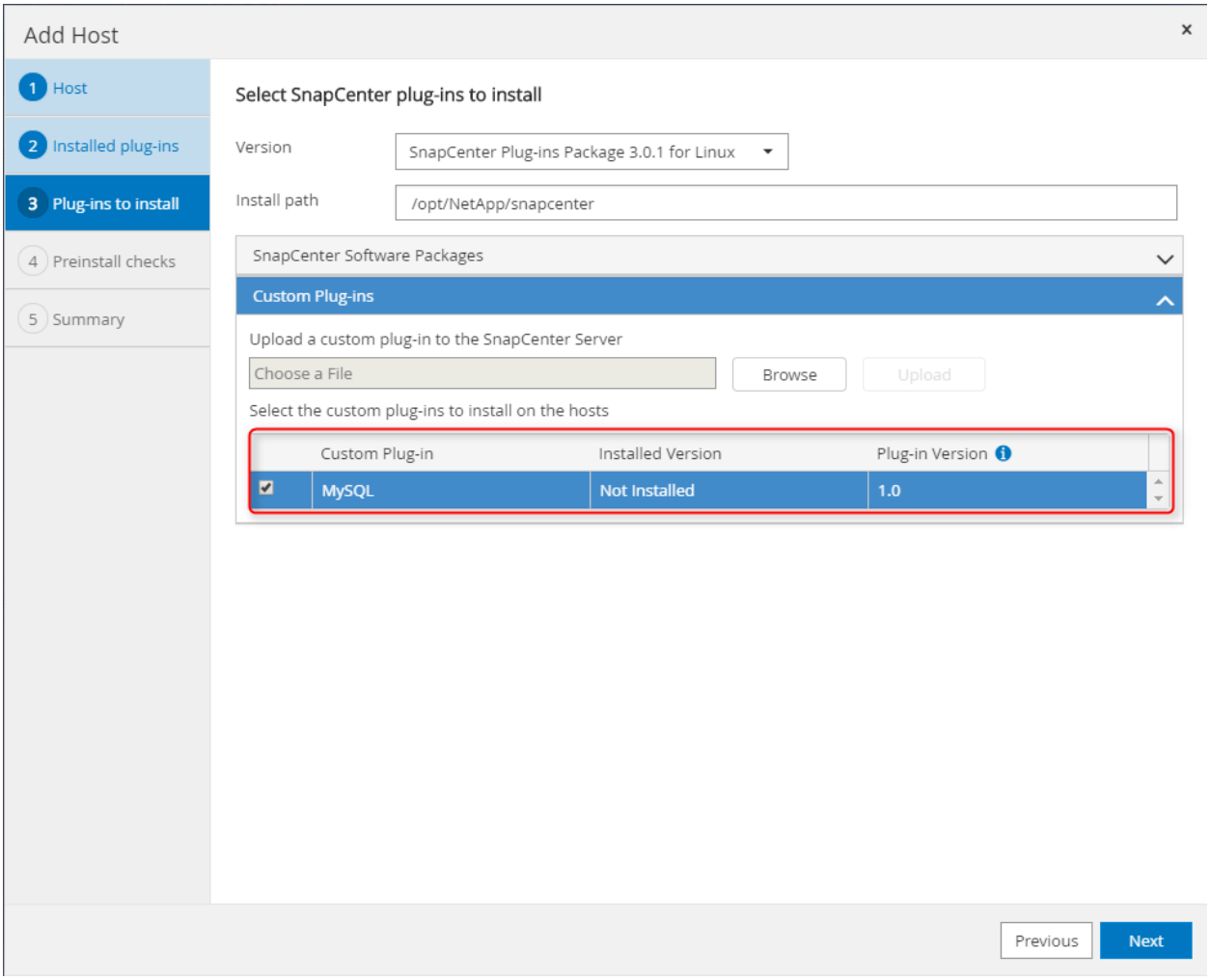
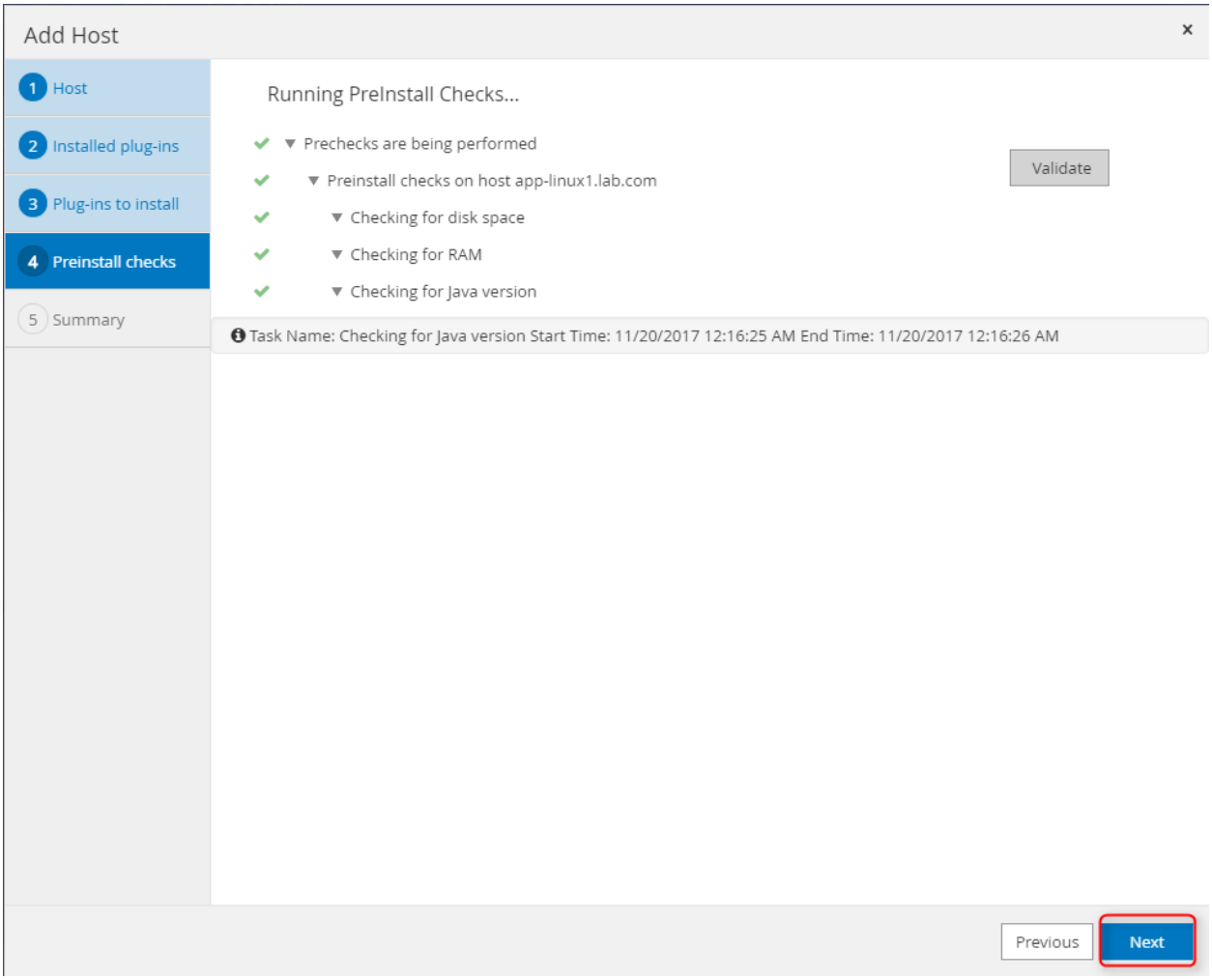
2. **Add Database (Resources) in SnapCenter**

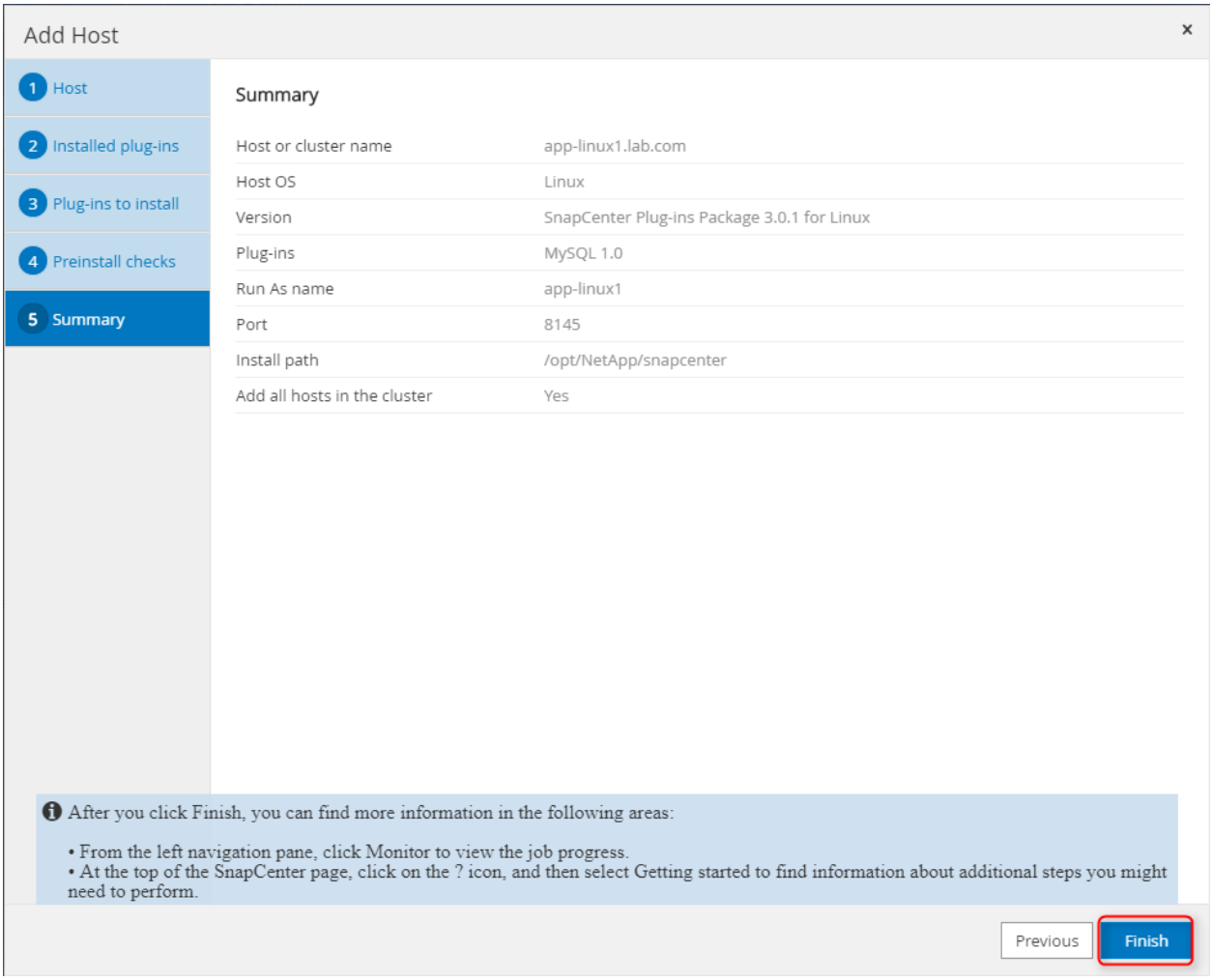
To protect a database with Snapcenter , it needs to be added in SnapCenter using following steps:-

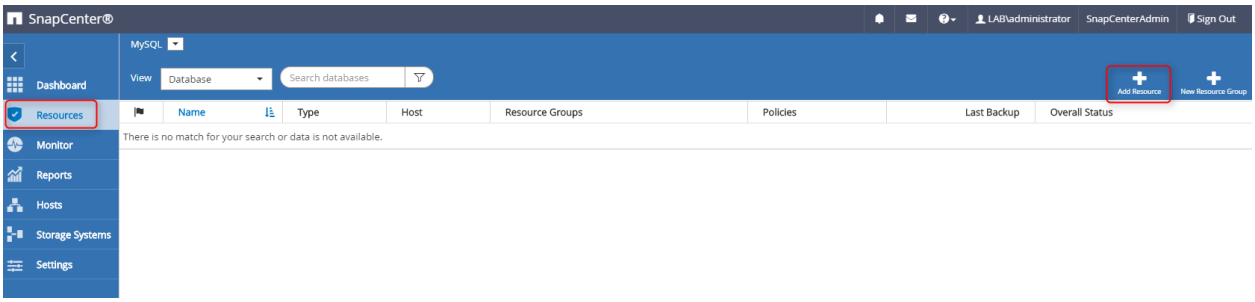
2.1) Click the resources tab in Snapcenter

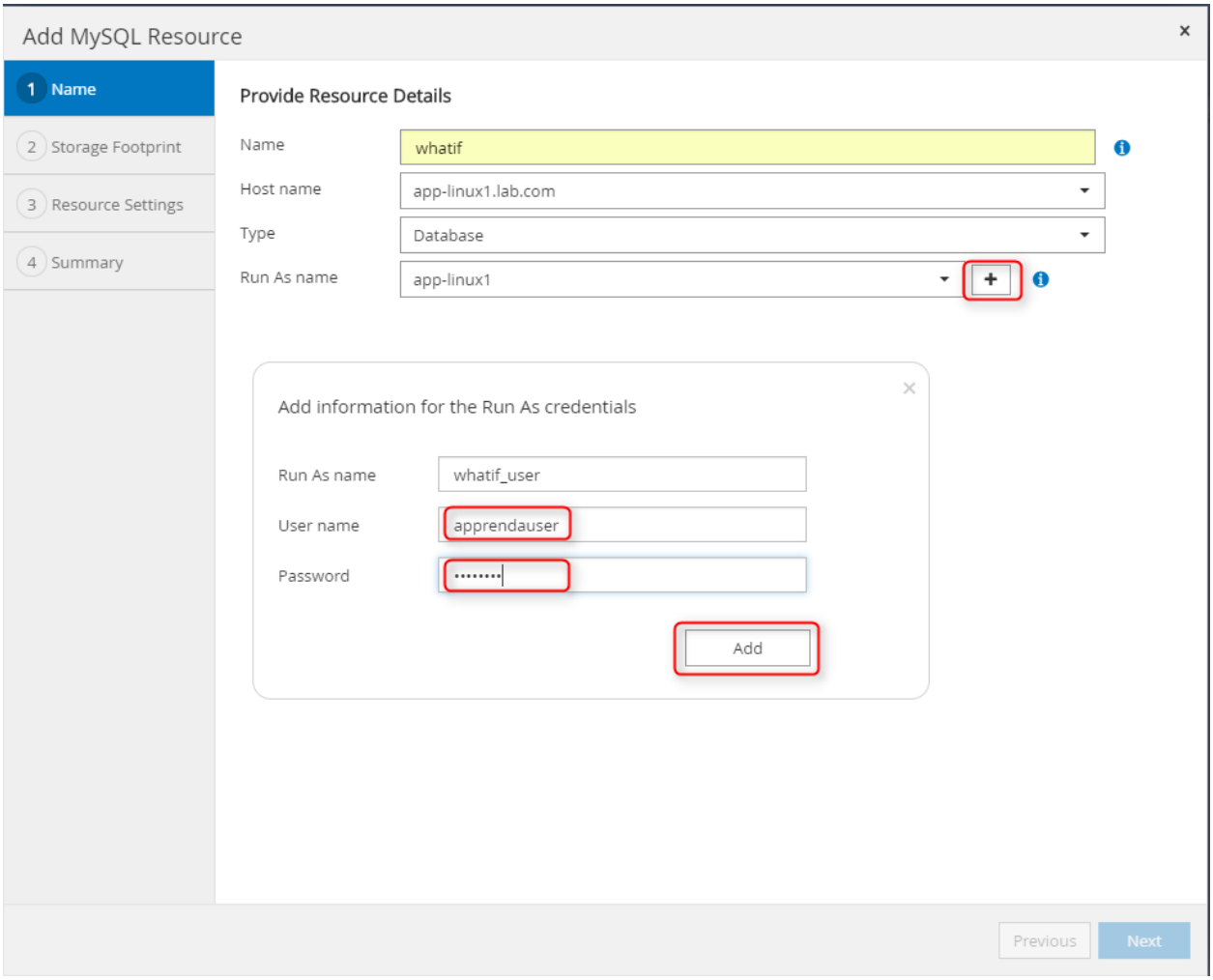
2.2) Provide the following Database(resource) details :-


Add Host
1 Host
2 Installed plug-ins
3 Plug-ins to install
4 Preinstall checks
5 Summary
Select SnapCenter plug-ins to install
Version
SnapCenter Plug-ins Package 3.0.1 for Linux
Install path
/opt/NetApp/snapcenter
SnapCenter Software Packages
Custom Plug-ins
Upload a custom plug-in to the SnapCenter Server
Choose a File
Browse
Upload
Select the custom plug-ins to install on the hosts
Custom Plug-in
Installed Version
Plug-in Version
MySQL
Not Installed
1.0
Previous
Next


Add Host
1 Host
2 Installed plug-ins
3 Plug-ins to install
4 Preinstall checks
5 Summary
Running PreInstall Checks...
Prechecks are being performed
Preinstall checks on host app-linux1.lab.com
Checking for disk space
Checking for RAM
Checking for Java version
Validate
Task Name: Checking for Java version Start Time: 11/20/2017 12:16:25 AM End Time: 11/20/2017 12:16:26 AM
Previous
Next

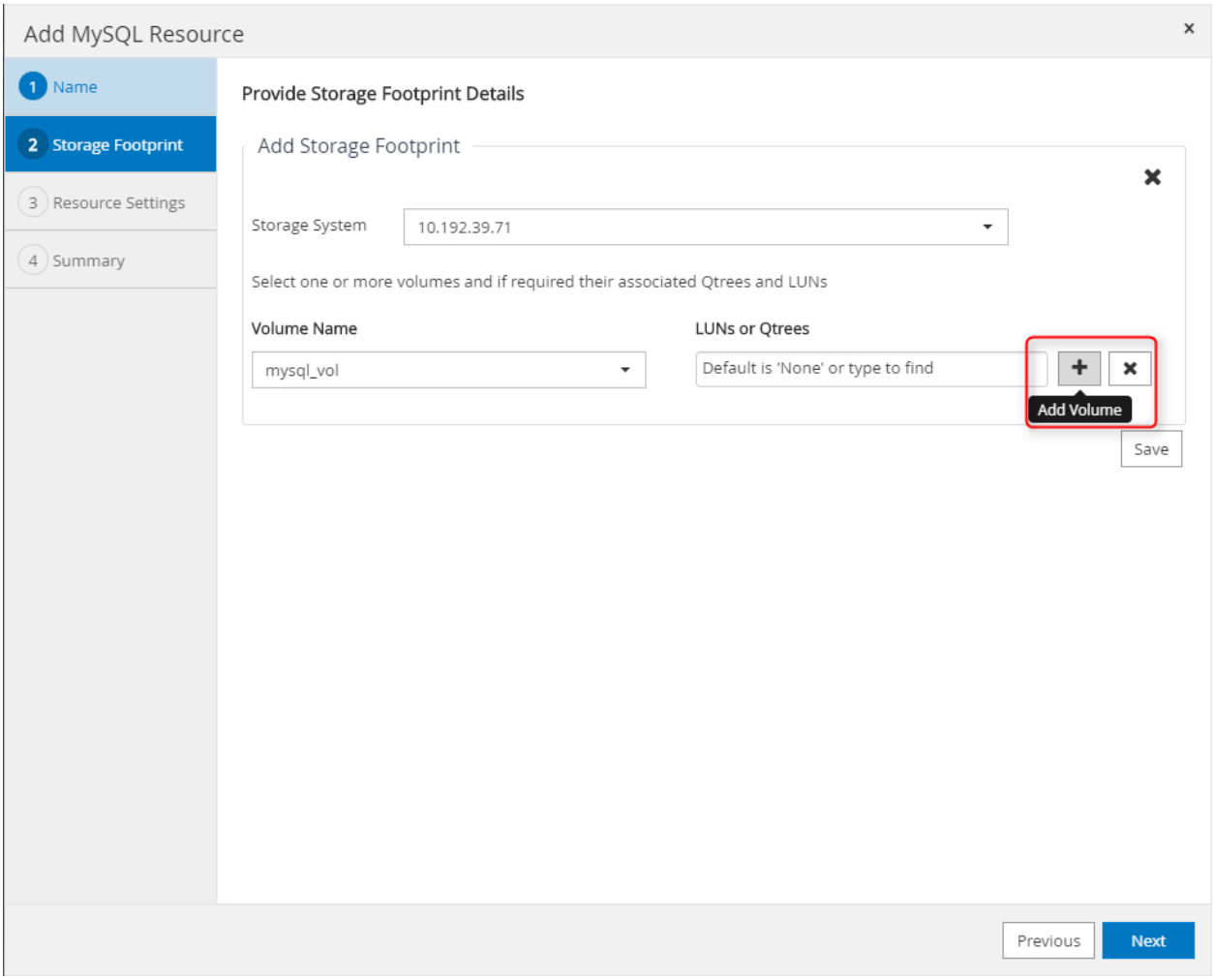

Add Host
1 Host
2 Installed plug-ins
3 Plug-ins to install
4 Preinstall checks
5 Summary
Summary
Host or cluster name
app-linux1.lab.com
Host OS
Linux
Version
SnapCenter Plug-ins Package 3.0.1 for Linux
Plug-ins
MySQL 1.0
Run As name
app-linux1
Port
8145
Install path
/opt/NetApp/snapcenter
Add all hosts in the cluster
Yes
After you click Finish, you can find more information in the following areas:
• From the left navigation pane, click Monitor to view the job progress.
• At the top of the SnapCenter page, click on the ? icon, and then select Getting started to find information about additional steps you might need to perform.
Previous
Finish


SnapCenter®
LAB\administrator
SnapCenterAdmin
Sign Out
MySQL
Dashboard
Resources
Monitor
Reports
Hosts
Storage Systems
Settings
View
Database
Search databases
Add Resource
New Resource Group
Name
Type
Host
Resource Groups
Policies
Last Backup
Overall Status
There is no match for your search or data is not available.


Add MySQL Resource
1 Name
2 Storage Footprint
3 Resource Settings
4 Summary
Provide Resource Details
Name
whatif
Host name
app-linux1.lab.com
Type
Database
Run As name
app-linux1
Add information for the Run As credentials
Run As name
whatif_user
User name
apprendauser
Password
Add
Previous
Next

Field	Value
Name	Database Name
Hostname	Hostname of production database
Type	Database
Run As Name	Credentials of the production database

2.3) Add/Select Storage footprint(Select the NetApp Volume) for the MySQL database



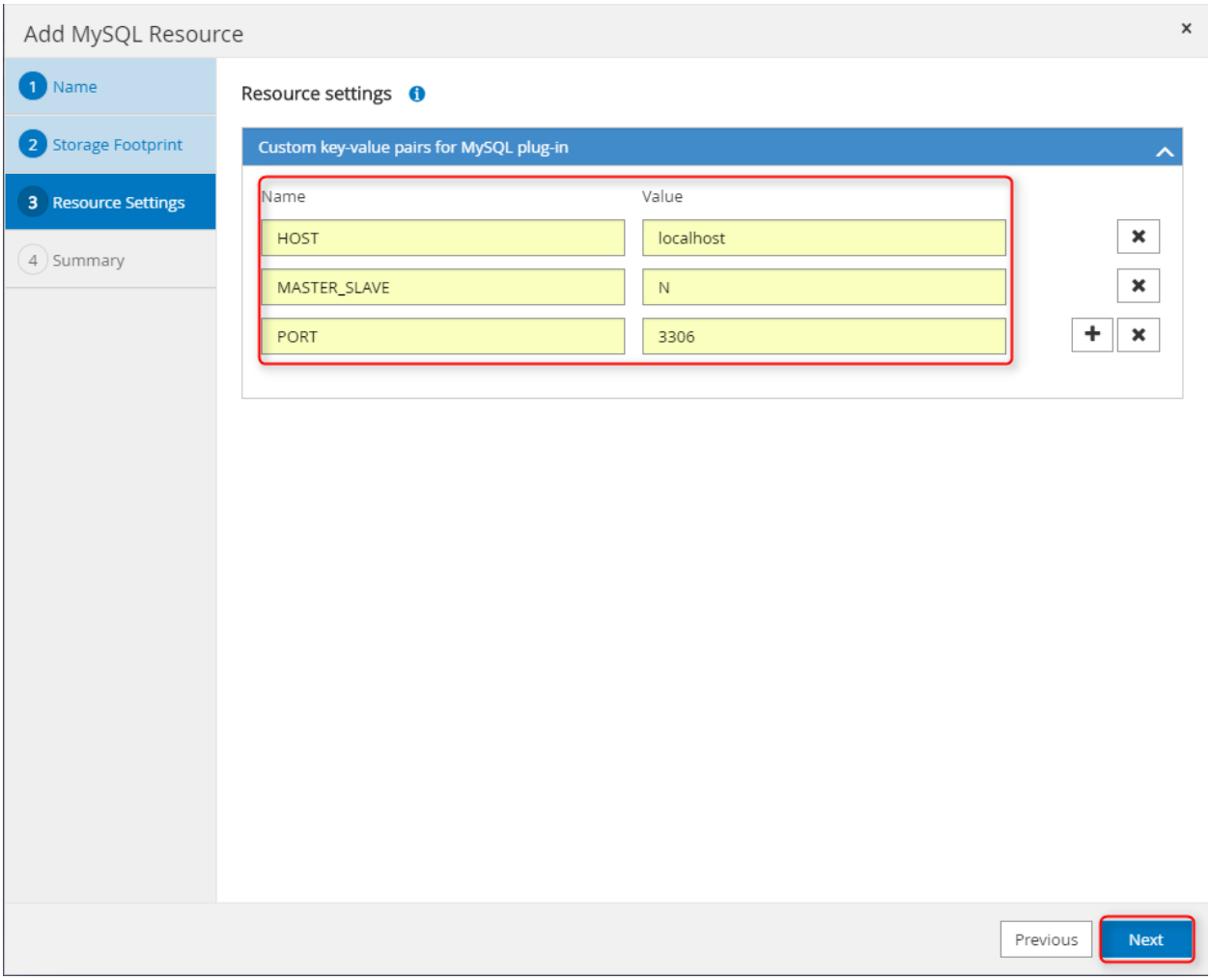
2.4) Add Resource Settings for SnapCenter's MySQL plugin. These are mandatory for the SnapCenter MySQL plugin.

Field	Value
HOST	Database Connection Name
MASTER_SLAVE	N
PORT	Database PORT

3. **Add MySQL start scripts on linux hosts**

This integretions uses a shell script(restart-mysql.sh) on the linux hosts to restart mysql databases during restore process. This script should be present at /var/lib/restart-mysql.sh on all linux hosts.

restart-mysql.sh



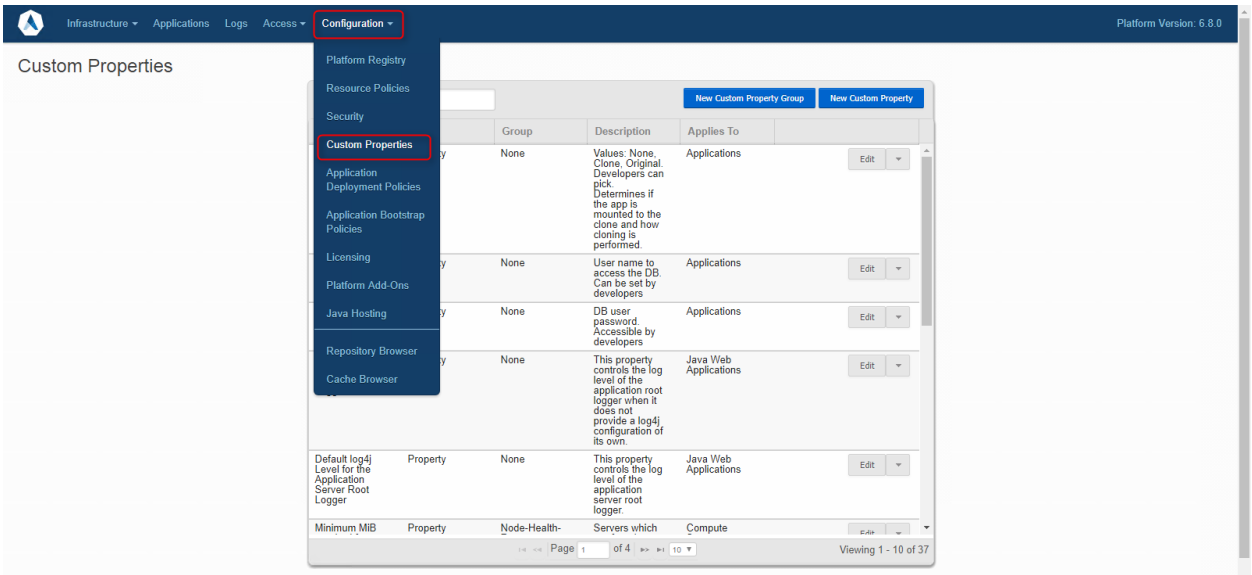

```
[root@app-linux1 ~]# cat /var/lib/restart-mysql.sh
service mysqld stop;
/usr/sbin/mysqld --pid-file=/var/run/mysqld/mysqld2.pid --socket=/var/lib/mysql2/mysql.sock --user=mysql --datadir=/var/lib/
mysql2 &

[root@app-linux1 ~]#
```

```
service mysqld stop;
/usr/sbin/mysqld --pid-file=/var/run/mysqld/mysqld2.pid --socket=/var/lib/
↪mysql2/mysql.sock --user=mysql --datadir=/var/libmysql2 &
```

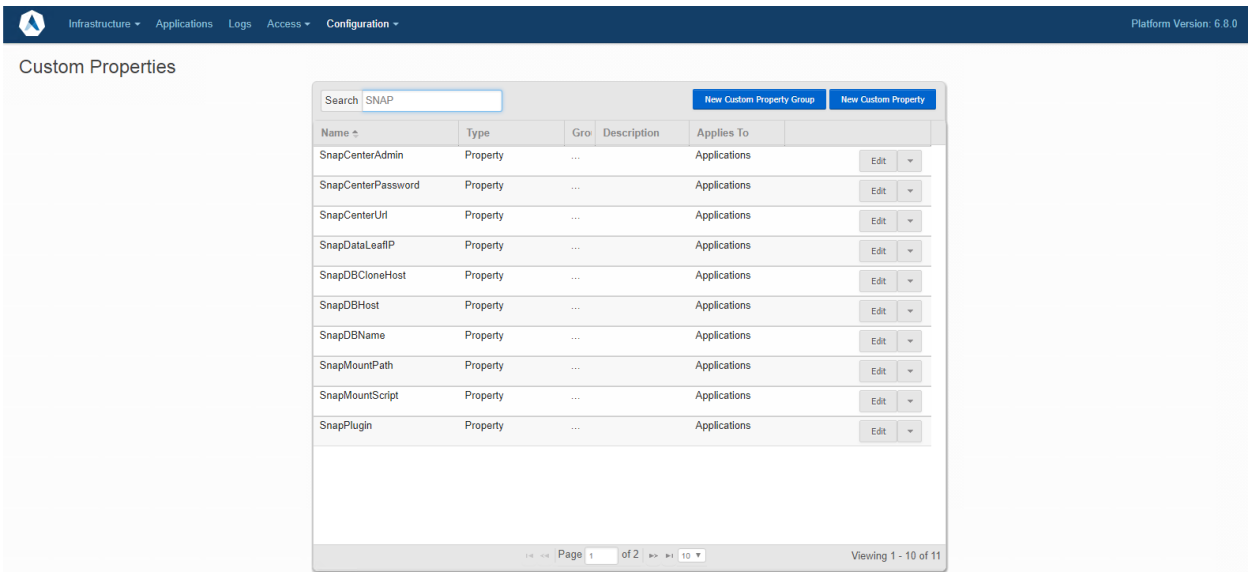
2.3 Apprenda Configuration

1. **Setting up Apprenda Custom Properties**

   Apprenda uses few custom properties in this integretion to interact with Snapcenter To configure these custom properties, 1.1) Login to Apprenda DashBoard 1.2) Select Configurataion in the top menu bar 1.3) Select Custom Properties



Following custom properties need to be setup in this integretion



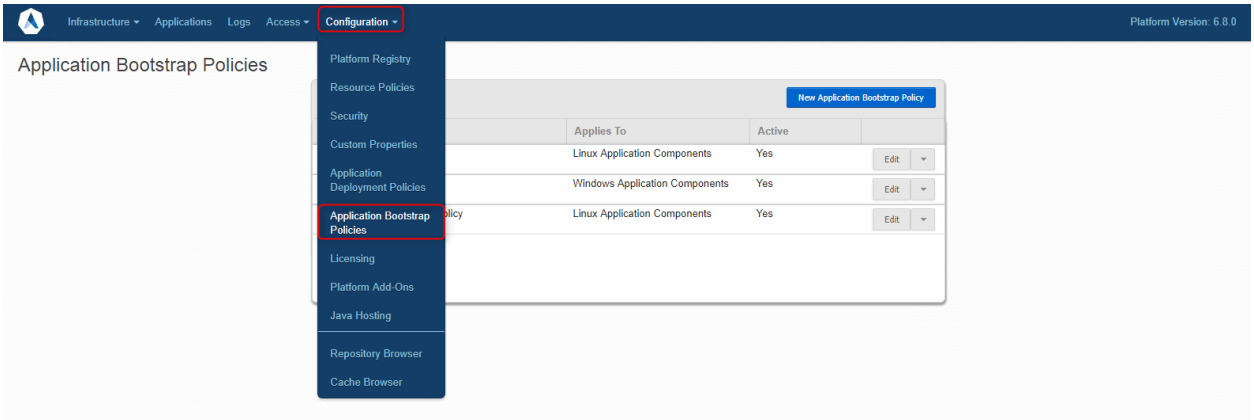
Property	Value	Description
SnapCenter-Admin	<SnapCenter Username>	Enter the SnapCenter username in (DomainUserName) format
SnapCenter-Password	<SnapCenter Password>	Enter the SnapCenter password
SnapCenterUrl	<SnapCenter URL with port>	Enter full SnapCenter URL with port i.e https://ip:port/
SnapDataLeafIP		Enter the DataLIF ip of the storage
SnapDB-Host	<Hostname of production DB>	Enter the Hostname of your production db
SnapDB-CloneHost	<Hostname of clone hosts>	Enter the Hostnames where the clones can be mounted
SnapDB-Name	<Name of Production Database>	Enter name of the procdtion database
SnapMount-Path	<Mount path to mount the clones>	Enter the path to mount the clones
SnapMountScript	<Location of Shell script to restart MySQL Service>	Location of the RestartMySQL script (restart-mysql.sh)
SnapPlugin	MySQL	Currently only MySQL is supported with this integretion

(b) **Setup a Apprenda BootStrap Policy**

2.1) Apprenda Bootstrap policy allows us to select the

2.2) Download the bootstrap policy here

2.3) Upload the BootStrap policy to Configration > Application Bootstrap Policies as shown in below figure:



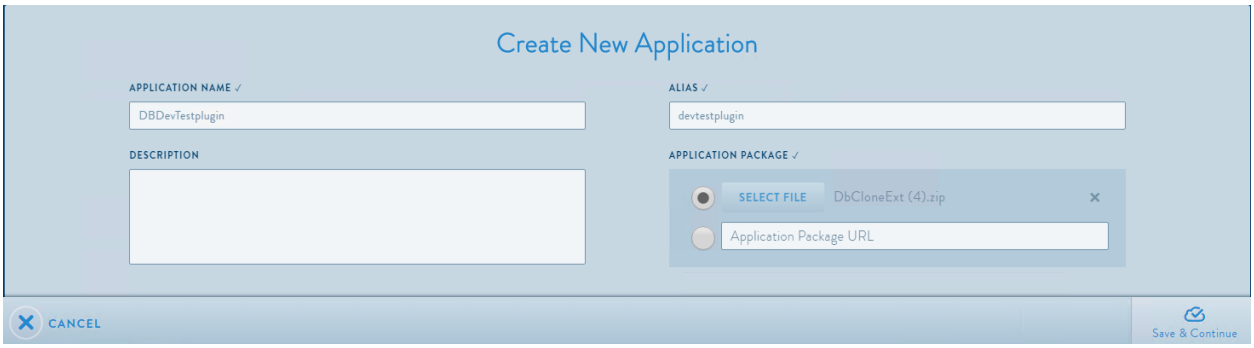
2.4) Click Save

(c) **Adding the DbDevTest Extension in Apprenda**

3.1) Download the extention here

3.2) Create a New app in Apprenda Developer portal(http://<<your-apprenda-url>>/developer

3.3) Click Save and Continue



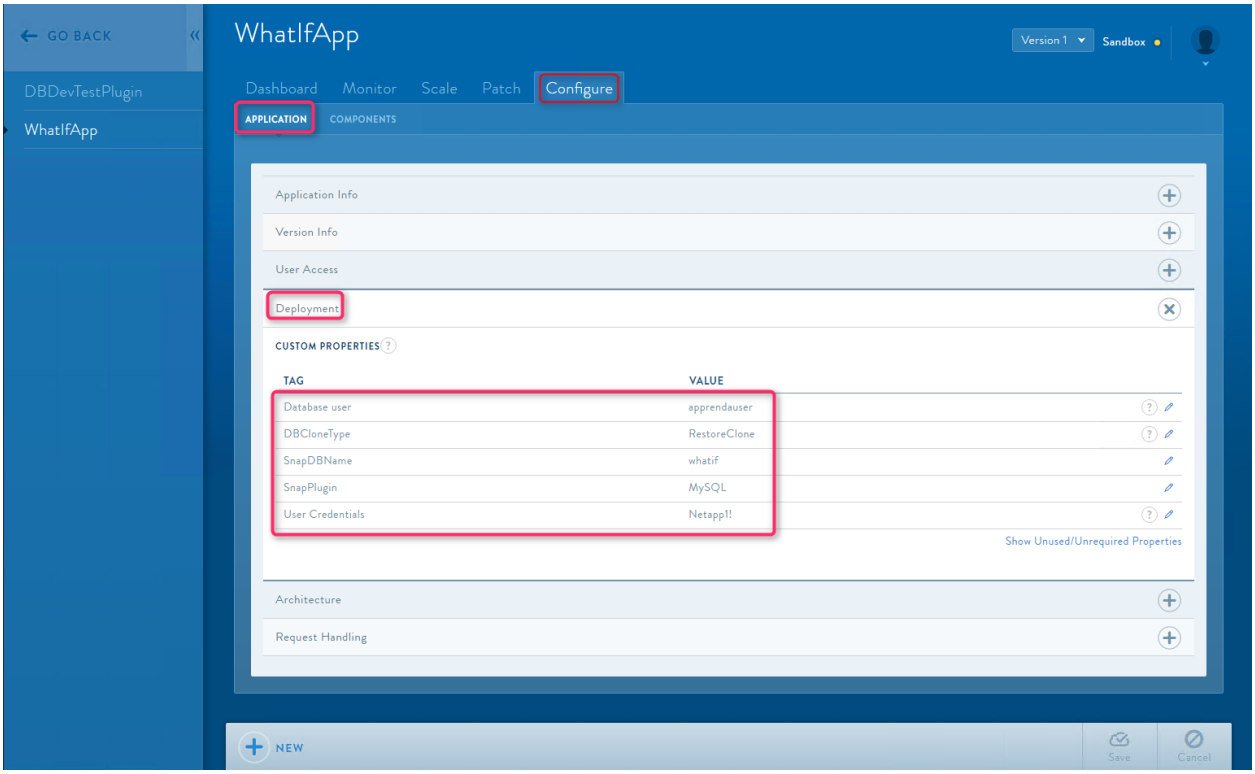
2.4 Configuring an Application on Apprenda to use DBDevTestPlugin

1. Add the following Deployment properties to your Apprenda App from Configure>Application>Deployment tab of your application.

Property	Value	Description
Database User	<Username of MySQL Database>	Enter the mysql username application uses to connect to MySQL Database
SnapDB-Name	<Name of Database used by Application>	Name of Database used by application
DBClone-Type	<Restore-Clone,CloneOrignal>	Select the plugin function to restore/clone via drop-down
SnapPlugin	<MySQL>	Currently only MySQL is supported with this integretion
User Credentials	<Password for MySQL User>	Password for MySQL User

2)If the Application in launched with the custom property DBCloneType as CloneOrignal then the DBDevTest plugin will create a clone

3)If the Application is started with custom property set as Restore clone then, the DBDevTest plugin will restore the application's database to it's orignal state from the latest snapshot.


GO BACK
DBDevTestPlugin
WhatIfApp
WhatIfApp
Version 1
Sandbox
Dashboard
Monitor
Scale
Patch
Configure
APPLICATION
COMPONENTS
Application Info
Version Info
User Access
Deployment
CUSTOM PROPERTIES
TAG
VALUE
Database user
apprendauser
DBCloneType
RestoreClone
SnapDBName
whatif
SnapPlugin
MySQL
User Credentials
Netapp1!
Show Unused/Unrequired Properties
Architecture
Request Handling
NEW
Save
Cancel