Backup and Restore an RKE Cluster

Lab 10

What are you Learning?

In this lab you'll backup and restore your RKE Cluster. Please review subsection 1.3.2 for making a backup of RKE. Now that you have Rancher running on the cluster you have a cluster with backing up.

Why is it important?

Disaster happens. While optimally you would love to be able to restore your environment via automation, that's not always possible. Even so, prior to an upgrade, you should know how to backup your RKE cluster. Even if you never have to restore a backup, you should test that you can restore a backup. What good is a backup if it's useless when you actually need it.

Make a Backup of Your RKE Cluster

There are two methods for backing up an RKE cluster. Local backup and backup to S3. In this lab we're going to set RKE up for recurring snapshots. Keep in mind that one-time snapshots are supported.

Backup RKE Locally

1. Review the options you desire for the setup of the snapshot service.
2. Configure the interval hours and retention settings, in the etcd service settings of your rke config file. Here's a very simple single node cluster example.

```
nodes:
- address: 1.2.3.4
  port: "22"
  role:
  - controlplane
  - worker
  - etcd
  user: root
  docker_socket: /var/run/docker.sock
  ssh_key_path: ~/.ssh/id_rsa
services:
  etcd:
    backup_config:
      interval_hours: 3
      retention: 3
```

3. Save the file run `rke up`. You'll notice the etc-rolling-snapshots service gets modified

```
INFO[0010] [etcd] Running rolling snapshot container [etcd-snapshot-
once] on host [104.43.162.0]
INFO[0010] Removing container [etcd-rolling-snapshots] on host
[104.43.162.0], try #1
INFO[0010] [remove/etcd-rolling-snapshots] Successfully removed
```

```
container on host [104.43.162.0]
INFO[0010] Image [rancher/rke-tools:v0.1.56] exists on host
[104.43.162.0]
INFO[0011] Starting container [etcd-rolling-snapshots] on host
[104.43.162.0], try #1
INFO[0011] [etcd] Successfully started [etcd-rolling-snapshots]
container on host [104.43.162.0]
```

4. A snapshot will be saved in /opt/rke/snapshots on a node running etcd.
    a. Part your production process will be to move snapshot off the local server to a safe place.
    b. Another option, would be to have /opt/rke/snapshots mounted to off-machine file share.

```
ssh root@104.43.162.0 sudo ls /opt/rke/etcd-snapshots
2020-04-24T12:38:47Z_etcd.zip
```

Backup RKE to an S3 Bucket

1. Review the options you desire for the setup of the snapshot service.
2. Setup the node running etcd with an appropriate IAM Role to access the S3 bucket.
3. Configure the interval hours and retention settings, and s3 settings, in the etcd service settings of your rke config file. Here's a very simple single node cluster example.

```
nodes:
- address: 1.2.3.4
  port: "22"
  role:
  - controlplane
  - worker
  - etcd
  user: root
  docker_socket: /var/run/docker.sock
  ssh_key_path: ~/.ssh/id_rsa
services:
  etcd:
    backup_config:
      interval_hours: 3
      retention: 3
      s3backupconfig:
        access_key: S3_ACCESS_KEY
        secret_key: S3_SECRET_KEY
        bucket_name: s3-bucket-name
        region: ""
        folder: "" # Optional - Available as of v0.3.0
        endpoint: s3.amazonaws.com
```

4. Save the file run `rke up`. You'll notice the etc-rolling-snapshots service gets modified

```
INFO[0010] [etcd] Running rolling snapshot container [etcd-snapshot-
once] on host [104.43.162.0]
INFO[0010] Removing container [etcd-rolling-snapshots] on host
[104.43.162.0], try #1
INFO[0010] [remove/etcd-rolling-snapshots] Successfully removed
container on host [104.43.162.0]
INFO[0010] Image [rancher/rke-tools:v0.1.56] exists on host
[104.43.162.0]
INFO[0011] Starting container [etcd-rolling-snapshots] on host
[104.43.162.0], try #1
INFO[0011] [etcd] Successfully started [etcd-rolling-snapshots]
container on host [104.43.162.0]
```

5. A snapshot will be saved in the s3 bucket that you specified.

Restoring RKE from Backup

Again, like Backup, restoring RKE, has a method for locally saved snapshots and a method for s3 based snapshots. For the sake of test, I powered down my test cluster and created a new machine.

Restoring RKE from Local Backup.

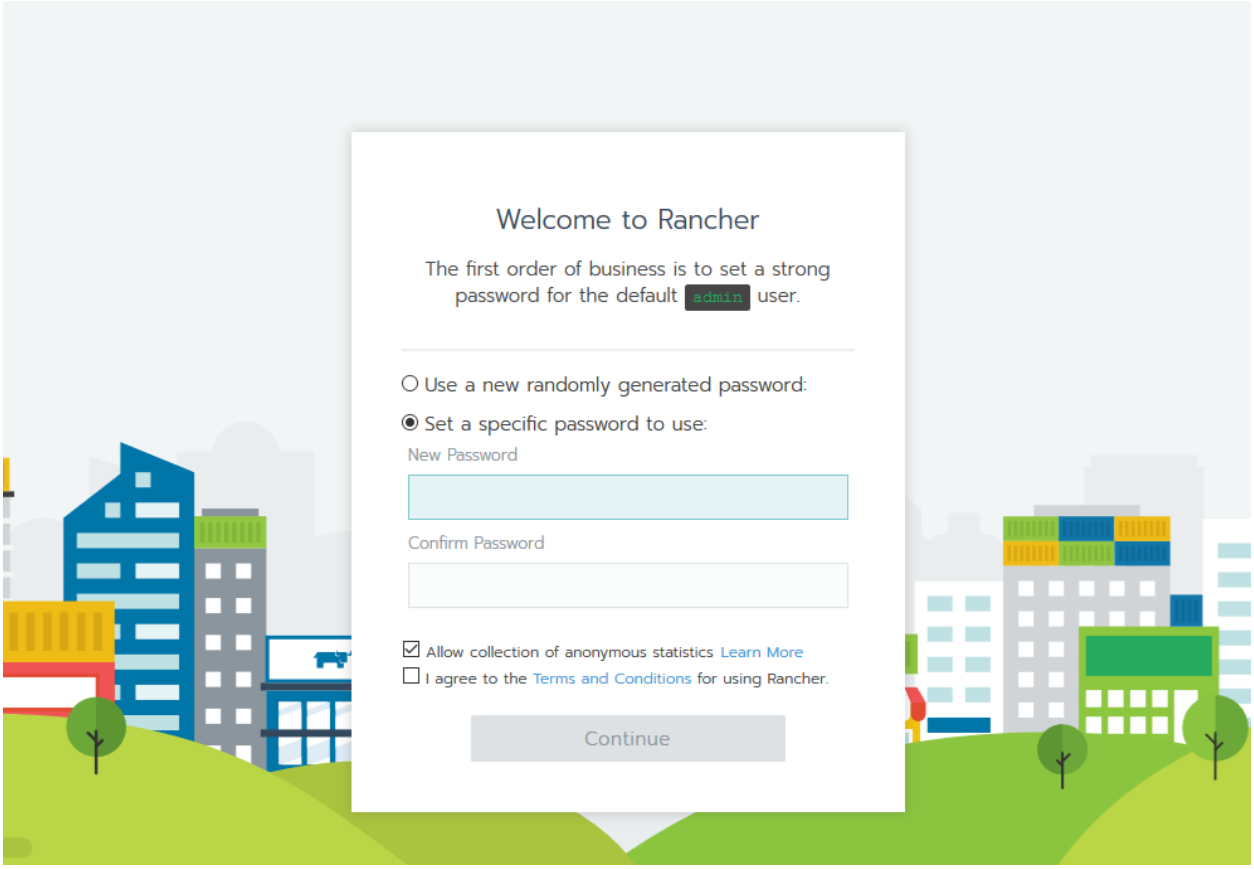
1. The restoration routine will assume that the backup is in /opt/rke/etcd-snapshots, so if the backup file is not there, move it there.
2. Modify the cluster.yml file for the new node.
3. Run rke etcd snapshot-restore to restore etcd to its previous state.
4. Verify the cluster is operating as expected.

Restoring RKE from an S3 Backup

1. Modify the cluster.yml file for the new node.
2. Run rke etcd snapshot-restore to restore etcd to its previous state. Don't forget your S3 credentials.
3. Verify the cluster is operating as expected.

Testing That It Works

1. You should be able to navigate to the Rancher cluster in a browser, via the machine's public IP address, or a DNS address if you redirected it to the new IP.



2.

References

- Recurring Snapshots - https://rancher.com/docs/rke/latest/en/etcd-snapshots/recurring-snapshots/
- One-time Snapshots - https://rancher.com/docs/rke/latest/en/etcd-snapshots/one-time-snapshots/
- Options for the Snapshot Service - https://rancher.com/docs/rke/latest/en/etcd-snapshots/recurring-snapshots/#options-for-the-etcd-snapshot-service
- Configuring the Snapshot Service in YAML - https://rancher.com/docs/rke/latest/en/etcd-snapshots/recurring-snapshots/#configuring-the-snapshot-service-in-yaml
- Etcd - https://rancher.com/docs/rke/latest/en/config-options/services/#etcd
- IAM Support for Storing Snapshots in S3 - https://rancher.com/docs/rke/latest/en/etcd-snapshots/recurring-snapshots/#iam-support-for-storing-snapshots-in-s3
- Restoring from Backup - https://rancher.com/docs/rke/latest/en/etcd-snapshots/restoring-from-backup/

- Add a new etcd node to the cluster - https://rancher.com/docs/rke/latest/en/etcd-snapshots/example-scenarios/#3-add-a-new-etcd-node-to-the-kubernetes-cluster
- Confirm that Cluster Operations are Restored - https://rancher.com/docs/rke/latest/en/etcd-snapshots/example-scenarios/#5-confirm-that-cluster-operations-are-restored