Exam Objective 5

Back Up and Restore

Back Up and Restore

Objective 5a: Describe the Contents of a Snapshot

Objective 5b: Back Up and Restore the Datacenter

Objective 5c: [Enterprise] Describe the Benefits of Snapshot Agent Features

1	2	3	4	5

Difficulty Level

Introduction to the Consul Snapshot

Consul snapshots are point-in-time snapshots of the Consul state (raft)

- A snapshot is the primary backup and DR solution for Consul
- Snapshots create a gzipped tar archive that includes (but not limited to):
  - Key/Value entries
  - Service catalog
  - Prepared queries
  - Sessions
  - ACLs

Introduction to the Consul Snapshot

By default, snapshots are taken in consistent mode, meaning that the leader performs the snapshot

- The leader validates whether it is the leader first
- A follower can take the snapshot if the –stale flag is used
    - Useful to reduce the load on a leader but could lose data
    - Also useful if a cluster does not have a leader

Back up the Consul Datacenter

- Snapshots can be taken using the API or CLI
- They can be created manually or can be automated by an external process…
- …or by using the Consul Snapshot Agent (Enterprise)
- Requires a valid ACL token to perform

- Manual snapshots could be taken before:
  - Consul upgrades – provides a way to fail back
  - Bootstrap a new identical datacenter with the same name

Restore the Consul Datacenter

- Restoring Consul from a snapshot is usually done when recovering from a disaster recovery scenario
  - Example: Restoring to a fresh set of Consul servers
- A restore is a disruptive process, and it is an "all or nothing" type of action
  - You cannot selectively restore data
- Restoring Consul is also not designed to handle a server failure during the restore process

Back up and Restore using the CLI

The `consul snapshot` command

- `agent` (Ent) – run the snapshot agent as a long-running daemon
- `inspect` – view metadata about an existing snapshot file
- `restore` – restore the referenced snapshot to Consul
- `save` – create a new Consul snapshot

Terminal

```
$ export CONSUL_HTTP_TOKEN=aba7cbe5-879b-999a-07cc-2efd9ac0ffe

$ consul snapshot save backup.snap
Saved and verified snapshot to index 1286
```

Needed if ACLs are enabled

Back up using the API

Create snapshots using the API

- Method: GET
- Endpoint: /snapshot

Needed if ACLs are enabled

Terminal

```
$ curl \
    --header "X-Consul-Token: <consul token>" \
    https://consul.example.com:8500/v1/snapshot -o snapshot.tgz
```

shorthand for -output

Restore using the API

Create snapshots using the API

- Method: PUT
- Endpoint: /snapshot

Terminal

```
$ curl \
    --header "X-Consul-Token: <consul token>" \
    --request PUT \
    --data-binary @snapshot.tgz \
    https://consul.example.com:8500/v1/snapshot
```

Needed if ACLs are enabled

snapshot file name

Consul Snapshot Agent (Enterprise)

Long-running daemon that regularly takes snapshots of the Consul cluster

- Customizable interval (how frequently it takes snapshots)
- Retention configuration (how many snapshots should we keep)
- Multiple options to store snapshots:
  - Local filesystem
  - S3-Compatible storage (Amazon S3 or other)
  - Azure Blob Storage
  - Google Cloud Storage

Consul Snapshot Agent (Enterprise)

Benefits of using the Consul Snapshot Agent:

- Automated snapshots of the Consul cluster
- Manages its own leadership election for high availability
- Provides failover in the event the leader becomes unavailable
- Run the agent across all servers but only get one consistent snapshot per interval
- Registers itself as a Consul service
  - Easy to keep track of status and health using API, UI, or CLI
  - Health checks can alert you of problems so you can take action

Consul Snapshot Agent (Enterprise)

Configuration

Create Consul Snapshot Agent Configuration File → /etc/snapshot.d/snapshot.json

Configure Service on underlying OS → /etc/systemd/system/snapshot.service

Start the service → systemctl start snapshot

Consul Snapshot Agent (Enterprise)

Configuration File Example

```
{
  "snapshot_agent": {
     "http_addr": "127.0.0.1:8500",
     "token": "xxx-xxxx-xxxx-xxx-xxxx",
     "datacenter": "",
     "snapshot": {
        "interval": "30m",
        "retain": 336,
        "deregister_after": "8h"
     },
  "aws_storage": {
    "s3_region": "us-east-1",
    "s3_bucket": "xxxx-bucket-consulsnapshots"
  }
 }
}
```

ACL token with appropriate permissions

Snapshot Configuration

Storage Configuration (AWS)

Consul Snapshot Agent (Enterprise)

Service File Example

```
[Unit]
Description="HashiCorp Consul Snapshot Agent"
Documentation=https://www.consul.io/
Requires=network-online.target
After=consul.service
ConditionFileNotEmpty=/etc/snapshot.d/snapshot.json

[Service]
User=consul
Group=consul
ExecStart=/usr/local/bin/consul snapshot agent -config-dir=/etc/snapshot.d/
KillMode=process
Restart=on-failure
LimitNOFILE=65536

[Install]
WantedBy=multi-user.target
```

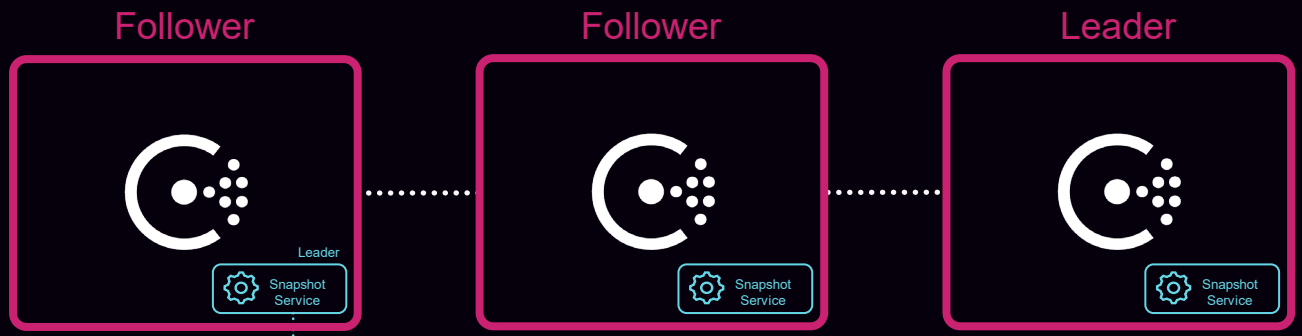
System Account the service will use

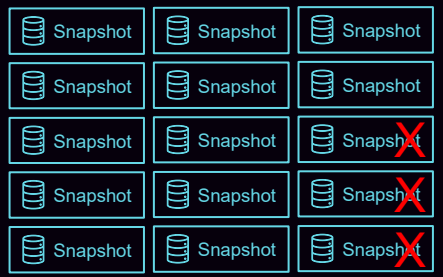
Location of the snapshot config file

Use –config-dir or –config-file

https://github.com/btkrausen/hashicorp/blob/master/consul/consulsnapshots.service

Consul Snapshot Agent (Enterprise)





Delete Old Snapshots (Retention)

Back Up and Restore

Objective 5a: Describe the Contents of a Snapshot

Objective 5b: Back Up and Restore the Datacenter

Objective 5c: [Enterprise] Describe the Benefits of Snapshot Agent Features

1	2	3	4	5

Difficulty Level

END OF SECTION