ganeti-extstorage-dataontap

External storage provider for NetApp's Data ONTAP Systems

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What is ganeti-extstorage-dataontap?

- ExtStorage provider for NetApp's Data ONTAP System
- Created to connect our Ganeti infrastructure with our new storage
- Written in Python
- Supported protocols: iSCSI, FC
- Based on NetApp Data ONTAP drivers for OpenStack Block Storage (Cinder)

Configuration

/etc/ganeti/extstorage-dataontap.conf

```
# If set, debug info will be printed
DEBUG = False

# Log on this file. Ganeti will log everything that is printed to stderr for
# most of the commands, but not attach. This file will have a complete log of
# the provider. If you don't need this, then set it to None
LOGFILE = '/var/log/ganeti-extstorage-dataontap.log'

# The storage family type used on the storage system;
# valid values are ontap_7mode for using Data ONTAP operating in 7-Mode and
# ontap_cluster for using clustered Data ONTAP
STORAGE_FAMILY = "ontap_cluster"

# The storage protocol (iscsi or fc) to be used on the data path with the
# storage system.
STORAGE_PROTOCOL = 'iscsi'

# The hostname (or IP address) for the storage system or proxy server.
HOSTNAME = 'example.org'

# The TCP port to use for communication with the storage system or proxy
# server. If not specified, Data ONTAP drivers will use 80 for HTTP and 443 for
# HTTPS
```

Usage

```
root@gnt8-11:~# gnt-instance add -o noop -t ext --disk=0:size=5G,provider=dataontap test
Tue Sep 20 10:28:43 2016  - INFO: Selected nodes for instance test via iallocator hail: gnt8-10.
Tue Sep 20 10:28:43 2016 * disk 0, size 5.0G
Tue Sep 20 10:28:43 2016 * creating instance disks...
Tue Sep 20 10:29:49 2016 adding instance test to cluster config
Tue Sep 20 10:29:49 2016 adding disks to cluster config
Tue Sep 20 10:29:49 2016  - INFO: Waiting for instance test to sync disks
Tue Sep 20 10:29:50 2016  - INFO: Instance test's disks are in sync
Tue Sep 20 10:29:50 2016  - INFO: Waiting for instance test to sync disks
Tue Sep 20 10:29:50 2016  - INFO: Instance test's disks are in sync
Tue Sep 20 10:29:50 2016 * running the instance OS create scripts...
root@gnt8-11:~#
```

Ganeti ExtStorage Interface

create

```
DataOnTapProvider.client.create_lun(pool_name, lun_name, size, metadata)
DataOnTapProvider.client.map_lun(metadata['Path'], igroup)
```

remove

```
lun = DataOnTapProvider._get_lun_by_name(lun_name)
DataOnTapProvider.client.destroy_lun(lun.metadata['Path'])
```

grow

```
lun = DataOnTapProvider._get_lun_by_name(lun_name)
DataOnTapProvider.client.do_direct_resize(lun.metadata['Path'], size)
```

Ganeti ExtStorage Interface

snapshot

```
lun = DataOnTapProvider._get_lun_by_name(lun_name)
DataOnTapProvider.client.clone_lun(path, clone_path, lun.name, new_name, space_reserved)
```

setinfo

```
lun = DataOnTapProvider._get_lun_by_name(lun_name)
DataOnTapProvider.client.set_lun_comment(lun.metadata['Path'], metadata)
```

detach

```
ISCSI_DETACH_COMMANDS = ()
FC_DETACH_COMMANDS = ()
```

Ganeti ExtStorage Interface

attach (version 1)

- run specified attach commands:

```
ISCSI_ATTACH_COMMANDS = (("iscsiadm", "-m", "node", "-R"), ("multipath", "-r"),
                         ("udevadm", "settle"))
FC_ATTACH_COMMANDS = (("rescan-scsi-bus.sh",), ("multipath", "-r"),
                      ("udevadm", "settle"))
```

- check if device is present (external udev rule must be triggered):

```
LUN_DEVICE_PATH_FORMAT = "/dev/disk/{hostname}/{pool}/{name}"
```

- attach script will return the discovered device:

```
/dev/disk/gnt.example.org/vol0/e43644a9-d442-4c99-ad91-8c1613c592ab.ext.disk0
```

The attach script should be idempotent if the volume is already mapped.

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Ganeti ExtStorage Interface

`attach` (version 2)

- check if device is present
- if not run the appropriate attach commands
- return the discovered device

What if we grow the device?

✓ Grow should force a rescan on the node

What if we migrate the device?

✓ pre-migrate & pre-failover hooks to force a rescan in target node

Ganeti ExtStorage Interface

Hooks

- **pre-migrate** & **pre-failover**: Force a device rescan in target node
- **post-remove**: Perform a cluster-wise cleanup

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Future Work

- Make needed udev rules part of the software
- Make a proxy service to keep the NetApp connection open
- `ganeti-extstorage-cinder`

Thank you

Questions?

src https://github.com/grnet/ganeti-extstorage-dataontap

pkgs deb http://apt.dev.grnet.gr jessie/