以下对于后端为*NetApp*分析

对于每个service，cinder会为其初始化一个***cinder.volume.manager.VolumeManager***类型，该类型的成员***self.driver.library.lun_table***中可以获得后端的LUN信息。

具体的类型为：

cinder.volume.manager.VolumeManager ---->driver

cinder.volume.drivers.netapp.dataontap.scsi_cmode.NetAppCmodeISCSIDriver ----> library

cinder.volume.drivers.netapp.dataontap.block_base.NetAppBlockStorageLibrary ----> lun_table

lun_table是一个字典，建为LUN名，值为NetAppLun，c-volume每次重启会从后端收集LUN的信息，通过的接口为：

cinder.volume.drivers.netapp.dataontap.client.client_cmode.Client.get_lun_list

该方法返回XML格式的LUN信息，其中包含磁盘大小和使用大小

```
<lun-info xmlns="http://www.netapp.com/filer/admin">
  <alignment>indeterminate</alignment>
  <block-size>512</block-size>
  <class>regular</class>
  <comment/>
  <creation-timestamp>1495568466</creation-timestamp>
  <is-clone>false</is-clone>
  <is-clone-autodelete-enabled>false</is-clone-autodelete-enabled>
  <is-inconsistent-import>false</is-inconsistent-import>
  <is-restore-inaccessible>false</is-restore-inaccessible>
  <is-space-alloc-enabled>false</is-space-alloc-enabled>
  <is-space-reservation-enabled>false</is-space-reservation-enabled>
  <mapped>false</mapped>
  <multiprotocol-type>linux</multiprotocol-type>
  <node>NetApp9000-01</node>
  <online>true</online>
  <path>/vol/linqing_vol/snapshot-b3324fe3-9d89-4866-9668-cf03e7b15b25</path>
  <prefix-size>0</prefix-size>
  <qtree/>
  <read-only>false</read-only>
  <serial-7-mode/>
  <serial-number>80AMB$JaqwqR</serial-number>
  <share-state>none</share-state>
  <size>1073741824</size>
  <size-used>1077977088</size-used>
  <staging>false</staging>
  <state>online</state>
  <suffix-size>0</suffix-size>
  <uuid>1a03e24a-9854-47f6-a86f-91499f3ea880</uuid>
  <volume>linqing_vol</volume>
  <vserver>honghe_io_1_iscsi_1</vserver>
</lun-info>
```

由于get_lun_list方法返回的信息十分复杂，NetAppLun只保留了部分信息：

NetAppLun保留的信息：

```
"""
handle    :    honghe_io_1_iscsi_1:/vol/vol_09052017_153410_4/volume-4b607ebb-1760-4788-8fd7-9d79f01a3a97
name      :    volume-4b607ebb-1760-4788-8fd7-9d79f01a3a97
size      :    1073741824
```

```
metadata :
{
  'Volume': 'vol_09052017_153410_4',
  'UUID': '71dddfce-a631-4f40-9149-9089df11926a',
  'Qtree': None,
  'Vserver': 'honghe_io_1_iscsi_1',
  'SpaceReserved': 'true',
  'OsType': 'linux',
  'Path': '/vol/vol_09052017_153410_4/volume-4b607ebb-1760-4788-8fd7-9d79f01a3a97'
}
"""
```

```
class NetAppLun(object):
    """Represents a LUN on NetApp storage."""

    def __init__(self, handle, name, size, metadata_dict):
        self.handle = handle
        self.name = name
        self.size = size
        self.metadata = metadata_dict or {}

    def get_metadata_property(self, prop):
        """Get the metadata property of a LUN."""
        if prop in self.metadata:
            return self.metadata[prop]
        name = self.name
        LOG.debug("No metadata property %(prop)s defined for the LUN %(name)s",
                  {'prop': prop, 'name': name})

    def __str__(self, *args, **kwargs):
        return 'NetApp LUN [handle:%s, name:%s, size:%s, metadata:%s]' % (
            self.handle, self.name, self.size, self.metadata)
```

获取NetApp在ISCSI环境下，Pool的LUN个数：

预期实现方案，修改netapp的driver，使c-vol每次上报Pool信息时同步上报个c-sch，c-sch使用该信息进行调度。

调用链：

cinder.volume.manager.VolumeManager._report_driver_status ---> 定时上报Pool信息到c-sh

cinder.volume.drivers.netapp.dataontap.iscsi_cmode.NetAppCmodeISCSIDriver.get_volume_stats

cinder.volume.drivers.netapp.dataontap.block_base.NetAppBlockStorageLibrary.get_volume_stats

cinder.volume.drivers.netapp.dataontap.block_base.NetAppBlockStorageCmodeLibrary._update_volume_stats ---> 获取后端的信息

cinder.volume.drivers.netapp.dataontap.block_base.NetAppBlockStorageCmodeLibrary._get_pool_stats ---> 获取单个池的信息