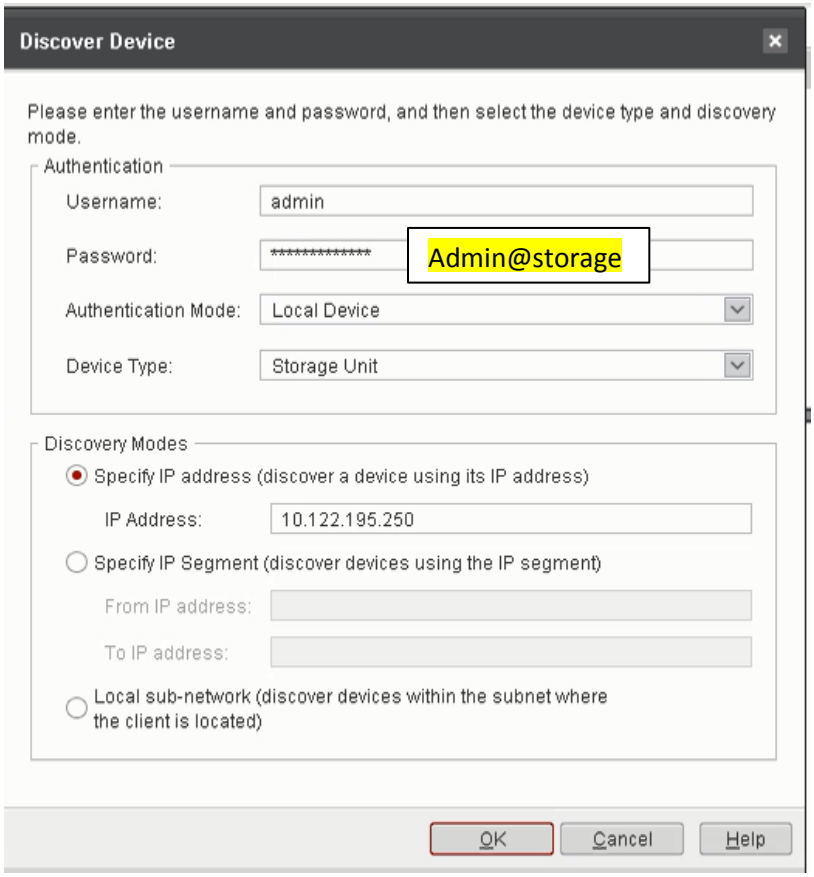
Connect a SUSE Linux host to OceanStor over an iSCSI network

On an IP SAN, the service network port on the application server functions as an initiator that sends iSCSI program requests from the application server to the storage system.

1. Launch the OceanStor ISM: https://10.122.195.250



2. Preparations Before Configuration

   (1) HBA Identification on a host: before connecting a host to a storage system, make sure that the host HBAs are identified.

```
# lspci | grep Fibre
# cat /sys/class/scsi_host/host*/model*name
# cat /sys/class/fc_host/host*/port_name  // View HBA WWN info
```

```
ptadm@fw0008859:~> /sbin/lspci | grep Fibre
02:00.2 Fibre Channel: Emulex Corporation OneConnect 10Gb FCoE Initiator (be3) (rev 03)
02:00.3 Fibre Channel: Emulex Corporation OneConnect 10Gb FCoE Initiator (be3) (rev 03)
03:00.2 Fibre Channel: Emulex Corporation OneConnect 10Gb FCoE Initiator (be3) (rev 03)
03:00.3 Fibre Channel: Emulex Corporation OneConnect 10Gb FCoE Initiator (be3) (rev 03)
ptadm@fw0008859:~> cat /sys/class/scsi_host/host*/model*name
OCe11100
OCe11100
OCe11100
OCe11100
ptadm@fw0008859:~> cat /sys/class/fc_host/host*/port_name
0x1000e0979600e194
0x1000e0979600e198
0x1000e0979600e160
0x1000e0979600e164
ptadm@fw0008859:~>
```

The output indicates that the host has identified four Fibre Channel host ports and that the HBA model is Emulex.

(2) Check the connection

```
ptadm@fw0008859:~> ping 10.122.195.250
PING 10.122.195.250 (10.122.195.250) 56(84) bytes of data.
64 bytes from 10.122.195.250: icmp_seq=1 ttl=64 time=2.93 ms
64 bytes from 10.122.195.250: icmp_seq=2 ttl=64 time=0.525 ms
64 bytes from 10.122.195.250: icmp_seq=3 ttl=64 time=0.485 ms
64 bytes from 10.122.195.250: icmp_seq=4 ttl=64 time=0.489 ms
64 bytes from 10.122.195.250: icmp_seq=5 ttl=64 time=0.517 ms
64 bytes from 10.122.195.250: icmp_seq=6 ttl=64 time=0.555 ms
64 bytes from 10.122.195.250: icmp_seq=7 ttl=64 time=0.507 ms
64 bytes from 10.122.195.250: icmp_seq=8 ttl=64 time=0.525 ms
64 bytes from 10.122.195.250: icmp_seq=9 ttl=64 time=0.496 ms
^C
--- 10.122.195.250 ping statistics ---
9 packets transmitted, 9 received, 0% packet loss, time 7998ms
rtt min/avg/max/mdev = 0.485/0.781/2.931/0.760 ms
ptadm@fw0008859:~>
```

```
ptadm@fw0013550:~> ping 192.168.1.206
PING 192.168.1.206 (192.168.1.206) 56(84) bytes of data.
64 bytes from 192.168.1.206: icmp_seq=1 ttl=64 time=0.168 ms
64 bytes from 192.168.1.206: icmp_seq=2 ttl=64 time=0.131 ms
64 bytes from 192.168.1.206: icmp_seq=3 ttl=64 time=0.061 ms
^C
--- 192.168.1.206 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 1998ms
rtt min/avg/max/mdev = 0.061/0.120/0.168/0.044 ms
ptadm@fw0013550:~>
```

3. Establishing iSCSI Connections

SUSE Linux hosts and storage systems can be connected over an iSCSI switch-based network using Ethernet switches. IP addresses and iSCSI services need to be configured before you establish iSCSI connections. The procedure for establishing iSCSI connections is as follows:

1. •Confirm that required iSCSI software packages is installed on the host.
2. •Configure service IP addresses on the host and the storage system.
3. •Establish iSCSI connections
4. •Scan for LUNs on the host.

3.1 Check iSCSI on the Host

 # rpm -qa |grep iscsi // check the iSCSI software installation
 # chkconfig --list | grep iscsi

```
ptadm@fw0008859:~> rpm -qa | grep iscsi
open-iscsi-2.0.872-0.35.1
yast2-iscsi-server-2.17.10-0.7.3
yast2-iscsi-client-2.17.34-0.5.1
ptadm@fw0008859:~>
```

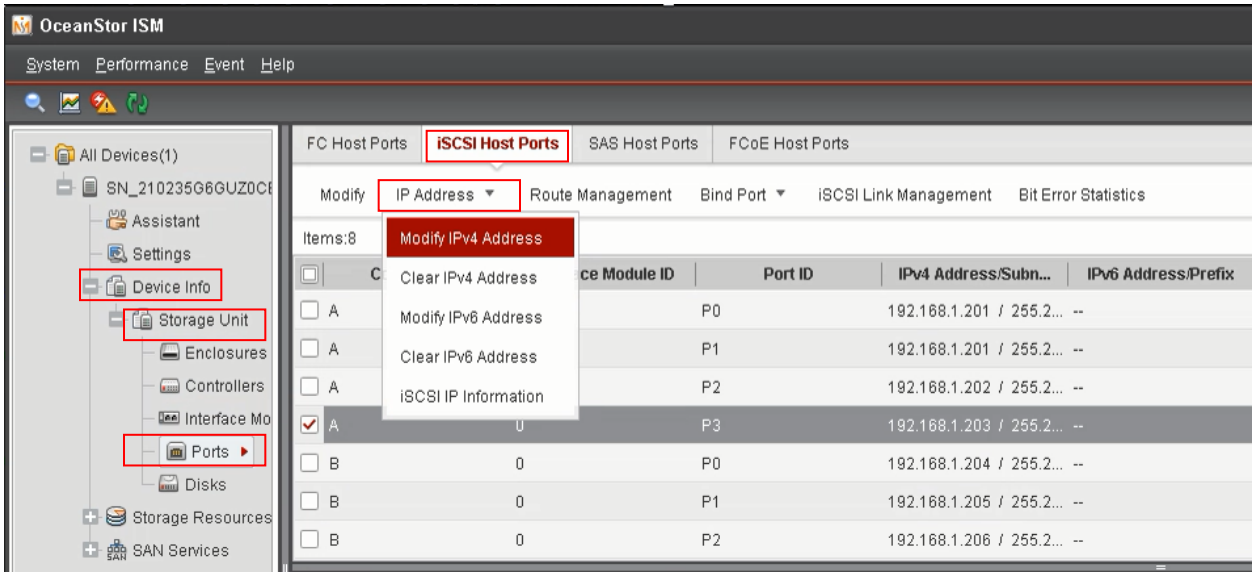
The output shows that iSCSI software is installed.

```
root@pterodb22883:/home/ptadm> chkconfig --list |grep iscsi
open-iscsi                0:off  1:off  2:off  3:on   4:off  5:on   6:off
root@pterodb22883:/home/ptadm>
```

If 3 and 5 are off, use **# insserv open-iscsi** command to update.

3.2 Configure service IP addresses for storage systems and hosts

(1) On storage systems (Already done):



3.3 Configure initiators

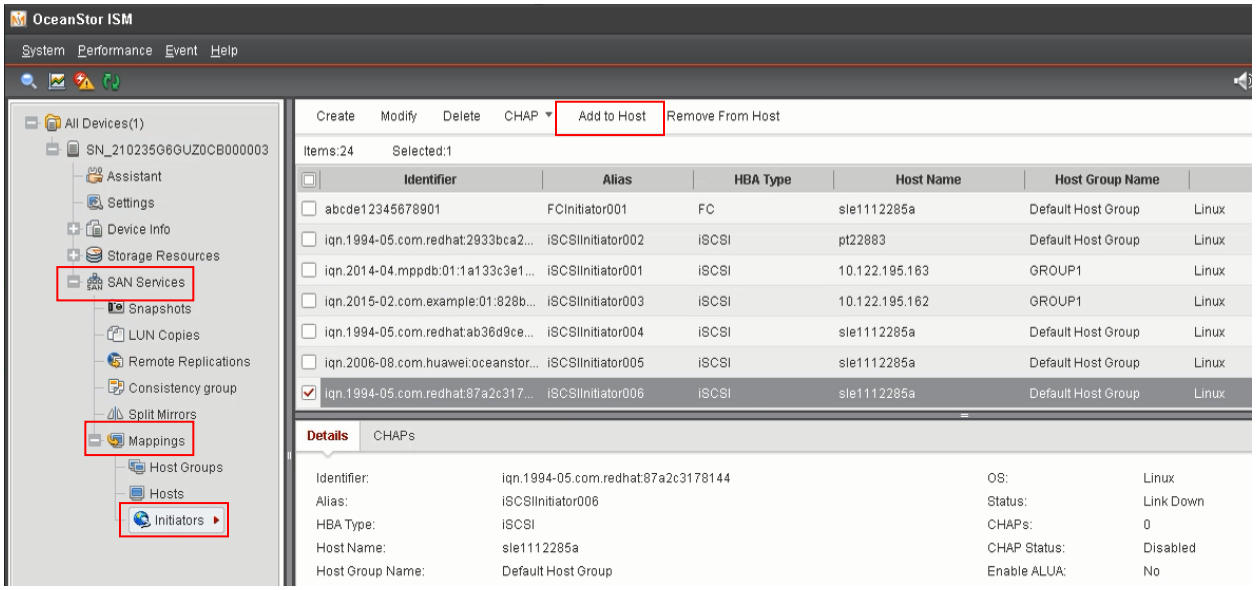
Initiators configured on a host are identified by the ISM

(1) On a host:

sudo /etc/init.d/open-iscsi start // start the iSCSI service on a host # **sudo cat /etc/iscsi/initiatorname.iscsi** // check the initiatorname on a host

```
fw0013550:/home/ptadm # service open-iscsi start
Loading iscsi modules:                                          done
Setting up iSCSI targets:                                       done
fw0013550:/home/ptadm #
ptadm@fw0008859:~> sudo cat /etc/iscsi/initiatorname.iscsi
root's password:
##
## /etc/iscsi/iscsi.initiatorname
##
## Default iSCSI Initiatorname.
##
## DO NOT EDIT OR REMOVE THIS FILE!
## If you remove this file, the iSCSI daemon will not start.
## If you change the InitiatorName, existing access control lists
## may reject this initiator.  The InitiatorName must be unique
## for each iSCSI initiator.  Do NOT duplicate iSCSI InitiatorNames.
InitiatorName=iqn.1996-04.de.suse:01:671de66e4347
#InitiatorName=iqn.1996-04.de.suse:01:initiator118
ptadm@fw0008859:~>
```

(2) On a Storage System



3.4 Query the IP address of the target (iSCSI host port) and log in to the target

 # iscsiadm –m discovery –t st –p 192.168.1.206 // Query the IP address of the target

 # sudo cat /etc/iscsi/initiatorname.iscsi // Log in to the target

```
root@pterodb22883:/home/ptadm> iscsiadm -m discovery -t st -p 192.168.1.206
192.168.1.206:3260,13 iqn.2006-08.com.huawei:oceanstor:21000022a10e349b::1020002:192.168.1.206
root@pterodb22883:/home/ptadm>
```

```
root@pterodb22883:/home/ptadm> iscsiadm -m node -p 192.168.1.206:3260 -l
Logging in to [iface: default, target: iqn.2006-08.com.huawei:oceanstor:21000022a10e349b::1020002
:192.168.1.206, portal: 192.168.1.206,3260]
```

3.5 Check for LUNs

(1) Scan for the LUNS on the host

 # sudo rescan-scsi-bus.sh

```
fw0013550:/home/ptadm # rescan-scsi-bus.sh
Scanning SCSI subsystem for new devices
Scanning host 0 for  SCSI target IDs  0 1 2 3 4 5 6 7, all LUNs
sg0 changed:  device 0 0 0 0 ...
from:Enclosure                        : 00
to: Enclosure  2G SAS  Model: Expander         Rev: RevB
      Type:   Enclosure                        ANSI SCSI revision: 06


sg1 changed:  device 0 2 0 0 ...
from:Direct-Access                    : 00
to: Direct-Access      Model: LSI              Rev: 4.27
      Type:   Direct-Access                    ANSI SCSI revision: 05


sg2 changed:  device 0 2 1 0 ...
from:Direct-Access                    : 00
to: Direct-Access      Model: LSI              Rev: 4.27
      Type:   Direct-Access                    ANSI SCSI revision: 05


sg3 changed:  device 0 2 2 0 ...
from:Direct-Access                    : 00
to: Direct-Access      Model: LSI              Rev: 4.27
      Type:   Direct-Access                    ANSI SCSI revision: 05


sg4 changed:  device 0 2 3 0 ...
from:Direct-Access                    : 00
to: Direct-Access      Model: LSI              Rev: 4.27
      Type:   Direct-Access                    ANSI SCSI revision: 05


Scanning host 1 for  SCSI target IDs  0 1 2 3 4 5 6 7, all LUNs
Scanning host 2 for  SCSI target IDs  0 1 2 3 4 5 6 7, all LUNs
Scanning host 3 for  SCSI target IDs  0 1 2 3 4 5 6 7, all LUNs
Scanning host 4 for  SCSI target IDs  0 1 2 3 4 5 6 7, all LUNs
Scanning host 5 for  SCSI target IDs  0 1 2 3 4 5 6 7, all LUNs
Scanning host 6 for  SCSI target IDs  0 1 2 3 4 5 6 7, all LUNs
Scanning host 7 for  SCSI target IDs  0 1 2 3 4 5 6 7, all LUNs
Scanning host 8 for  SCSI target IDs  0 1 2 3 4 5 6 7, all LUNs
Scanning host 9 for  SCSI target IDs  0 1 2 3 4 5 6 7, all LUNs
Scanning host 10 for  SCSI target IDs  0 1 2 3 4 5 6 7, all LUNs
Scanning host 14 for  SCSI target IDs  0 1 2 3 4 5 6 7, all LUNs
sg5 changed:  device 14 0 0 0 ...
from:Direct-Access                    n: 00
to: Direct-Access  I   Model: S5500T           Rev: 2105
      Type:   Direct-Access                    ANSI SCSI revision: 04


sg6 changed:  device 14 0 0 1 ...
```

(2) Query LUN information on the host

 # lsscsi

 # fdisk -l

```
fw0013550:/home/ptadm # lsscsi
[0:0:0:0]    enclosu 12G SAS  Expander         RevB  -
[0:2:0:0]    disk    LSI      LSI              4.27  /dev/sda
[0:2:1:0]    disk    LSI      LSI              4.27  /dev/sdb
[0:2:2:0]    disk    LSI      LSI              4.27  /dev/sdc
[0:2:3:0]    disk    LSI      LSI              4.27  /dev/sdd
[14:0:0:0]   disk    HUAWEI   S5500T           2105  /dev/sde
[14:0:0:1]   disk    HUAWEI   S5500T           2105  /dev/sdf
[14:0:0:2]   disk    HUAWEI   S5500T           2105  /dev/sdg
[14:0:0:3]   disk    HUAWEI   S5500T           2105  /dev/sdh
[14:0:0:4]   disk    HUAWEI   S5500T           2105  /dev/sdi
fw0013550:/home/ptadm #
```

```
fw0013550:/home/ptadm # fdisk -l

WARNING: GPT (GUID Partition Table) detected on '/dev/sdc'! The util fdisk doesn't
 Parted.


Disk /dev/sdc: 4193.0 GB, 4192993280000 bytes
255 heads, 63 sectors/track, 509769 cylinders, total 8189440000 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

   Device Boot      Start         End      Blocks   Id  System
/dev/sdc4               1           1           0+  ee  GPT

Disk /dev/sda: 479.0 GB, 478998953984 bytes
255 heads, 63 sectors/track, 58234 cylinders, total 935544832 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x0009f54c

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1            2048    10489855     5243904   82  Linux swap / Solaris
/dev/sda2   *    10489856   935544831   462527488   83  Linux

WARNING: GPT (GUID Partition Table) detected on '/dev/sdd'! The util fdisk doesn't
 Parted.


Disk /dev/sdd: 4193.0 GB, 4192993280000 bytes
255 heads, 63 sectors/track, 509769 cylinders, total 8189440000 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

   Device Boot      Start         End      Blocks   Id  System
/dev/sdd4               1           1           0+  ee  GPT

WARNING: GPT (GUID Partition Table) detected on '/dev/sdb'! The util fdisk doesn't
 Parted.


Disk /dev/sdb: 4193.0 GB, 4192993280000 bytes
255 heads, 63 sectors/track, 509769 cylinders, total 8189440000 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

   Device Boot      Start         End      Blocks   Id  System
/dev/sdb4               1           1           0+  ee  GPT
```

```
Disk /dev/sdb: 4193.0 GB, 4192993280000 bytes
255 heads, 63 sectors/track, 509769 cylinders, total 8189440000 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

   Device Boot      Start         End      Blocks   Id  System
/dev/sdb4               1           1           0+  ee  GPT

Disk /dev/sde: 5494.3 GB, 5494336913408 bytes
255 heads, 63 sectors/track, 667981 cylinders, total 10731126784 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

Disk /dev/sde doesn't contain a valid partition table

Disk /dev/sdf: 17998.1 GB, 17998060453888 bytes
255 heads, 63 sectors/track, 2188139 cylinders, total 35152461824 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

Disk /dev/sdf doesn't contain a valid partition table

Disk /dev/sdg: 3293.2 GB, 3293166174208 bytes
255 heads, 63 sectors/track, 400371 cylinders, total 6431965184 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

Disk /dev/sdg doesn't contain a valid partition table

Disk /dev/sdh: 19998.4 GB, 19998441472000 bytes
255 heads, 63 sectors/track, 2431338 cylinders, total 39059456000 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

Disk /dev/sdh doesn't contain a valid partition table

Disk /dev/sdi: 19998.4 GB, 19998441472000 bytes
255 heads, 63 sectors/track, 2431338 cylinders, total 39059456000 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000
```

4. Troubleshooting:

4.1 The newly added LUNs cannot be identified on the host

(1) Restart the open-iscsi service:

```
# /etc/init.d/open-iscsi restart
```

(2) Re-log in to the iSCSI initiator:

```
# iscsiadm -m node –u
# iscsiadm -m node –l
```

5. Acronyms and Abbreviations:

ISM	Integrated Storage Manager
SAN	Storage area network is a network which provides access to block level data storage
HBA	Host Bus Adaptor
LUN	Logical Unit Number
LV	Logical Volume
LVM	Logical Volume Manager
VG	Volume Group
iSCSI	Internet Small Computer Systems Interface
VLAN	hosts on an Ethernet network are divided into multiple logical groups. Each logical group is a VLAN