Omni Data
Open-E Certification of
Virtual Iron

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Omni Data runs a 5 node cluster OF IBM X series 3550 servers using Virtual Iron Software 3.7. The cluster utilizes an iSCSI based SAN/NAS solution for storage. During July of 2007 Omni Data tested the cluster using Open-E iSCSI-R3 on a server class system using SATA hard drives as an iSCSI target device. The iSCSI initiator and targets where set up on a VLAN dedicated to the iSCSI initiator and Target devices. A HP 1824 Revision A switch was used for connectivity. The VLAN isolation increased throughput by approximately 20 percent over being connected on the same LAN as the servers. The unit worked flawlessly with excellent throughput. Virtual Iron had no trouble seeing the target and attaching to the Storage device.

We found the Open-E solution to be feature rich and included all of the functionality necessary for the tasks at hand.

Our testing indicates that virtualization of common task servers such as file, print, and web based application servers; can be virtualized at a price point far less than what most IT directors would believe. Using off the shelf hardware to install the Open-E device as the storage solution, then adding low cost virtualization software like Virtual Iron, functionality such as redundancy, replication, and load balancing can be achieved at price points well below $10,000.

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1. Hardware Used
    - Open-E iSCSI-R3 chip
    - Dell PowerEdge 2250 / Dell Dimension 3100
    - Snap 210 1TB Snap Server
2. Software Used
    - Open-E software
    - Microsoft iSCSI initiator
    - Virtual Iron v3.7

Installation

1. Open-E R3 chip installed in Dell Dimension 3100
    - The installation process is very straight forward. Simply locate the USB hub that is standard on most motherboards and plug the Open-E module into it. For testing purposes the chip was plugged directly into the board for the first test, and for the second test, the adapter supplied with the chip was used.
2. Booting from the Open-E chip
    - Once the chip is installed the next step is to get your system to boot from the device.
    - By entering the BIOS upon system startup, the option to boot from “USB DEVICE” was selected.
    - The device was recognized as bootable, system booted from the Open-E chip.
3. Network Settings
    - Once the system has finished loaded, CTRL+ALT+N allows you to configure a static address for the machine.
    - Entering the setup screen for the iSCSI chip in the bios allows you to backup the configuration for future use.
4. Web Based Access
    - Once the network settings have been configured, the machine can be accessed from any PC in the same subnet as the Open-E box by launching a web browser and typing in the IP address of the machine.
    - Web based access is tab delimited and very easy to navigate.

Testing

1. Network Infrastructure
    - HP Procurve 2650
    - 50 vlan (Test Environment)
    - Open-E box (Dell PowerEdge 2650) (2 150gb SATA drives, Adaptec 3200s RAID Controller, Open-E R3 chip)
    - IBM 3550 (Windows Server 2003, Microsoft iSCSI initiator)
    - IBM 3550 (Virtual Iron Virtual Manager)
    - IBM 3550 (Virtual Iron Virtual Node)
    - Adaptec Snap Server 210 (1 TB)
    - See Visio Diagram for Network layout
2. Creating Volumes and iSCSI targets
    - SATA drives converted to a single RAID using H/W RAID
    - Three volumes created (100gb each)
    - iSCSI targets created for each of the volumes and each target activated.
    - iSCSI targets connected to Windows 2003 Server using Microsoft iSCSI initiator.
    - Targets are converted into logical drives via disk management and viewed by the machine as local hard drives.
    - Shares created on these targets and mapped out to other test machines.
    - File transfer speed was sufficient
        - After successfully testing the above method, the same process was followed with the exception of the H/W RAID. The second test utilized S/W RAID. This was found to work exceptionally well. The feature makes it very easy to convert a standard PC without a RAID card into a device with a large storage capacity.
        - For the second test, a Dell dimension 3100 PC was used. 2 SATA drives were plugged directly into the board.
        - Software RAID was used to configure these drives. After RAID and Volumes were created, the machine gave the impression that a RAID controller was installed.
3. Open-E and Virtual Iron
    - The Virtual Iron test environment used for testing consists of two IBM 3550 servers. The first server (The VI manager server) runs Cent OS 4 along with the virtual manger software.
    - The second server (also an IBM 3550) called vnode1 is PXE booted off of the VI manger box. This server contains 4 NIC's. Each NIC is connecting to a different network.
        - NIC 1 – Server Network
        - NIC 2 - Data Network
        - NIC 3 - Virtual Management Network
        - NIC 4 - iSCSI Network
    - The IP of the Open-E box is assigned to the iSCSI port on vnode1.
    - A discovery on this port yielded the following targets:
        - iqn.2007-06:dss.target0
        - iqn.2007-06:dss.target1
        - iqn.2007-06:dss.target2
    - Virtual servers were created on vnode1 using the iSCSI network to connect to the Open-E iSCSI-R3 targets.
    - Using block level recovery software machines were restored to the virtual server (using the Open-E iSCSI-R3 target as its boot drive)
    - After complete restoration of the machine the iSCSI target is seen as the primary hard drive for the virtual machine.

Figures

- Figure 1
  - Show here is the main Virtual Iron Screen. On this screen you can see the Virtual Machines that were created for Open-E testing purposes.
  - Take notice of the lower half of the picture under the storage section.
  - This shows the actual device target that was created with Open-E.

- Figure 2
  - This figure show the iSCSI page on the Virtual Iron Server.
  - Show in the right column is the iSCSI initiator name that was created in the Open-E software, the port that is being used for the iSCSI network, and the IP address of the physical Open-E server.

- Figure 3
  - Volume Group 1
    - Logical Volume 0
    - Logical Volume 1
    - Logical Volume 2
  - A volume group is created using the volume manager.
  - Logical Volumes are then created under the Volume Group.
  - The logical volumes will be used to create the iSCSI targets

- Figure 4
  - iSCSI Targets
  - iSCSI target 0 was created from logical volume 0
  - After created Logical Volume 0, you are able to tie an iSCSI target to the volume created.

Figure 1

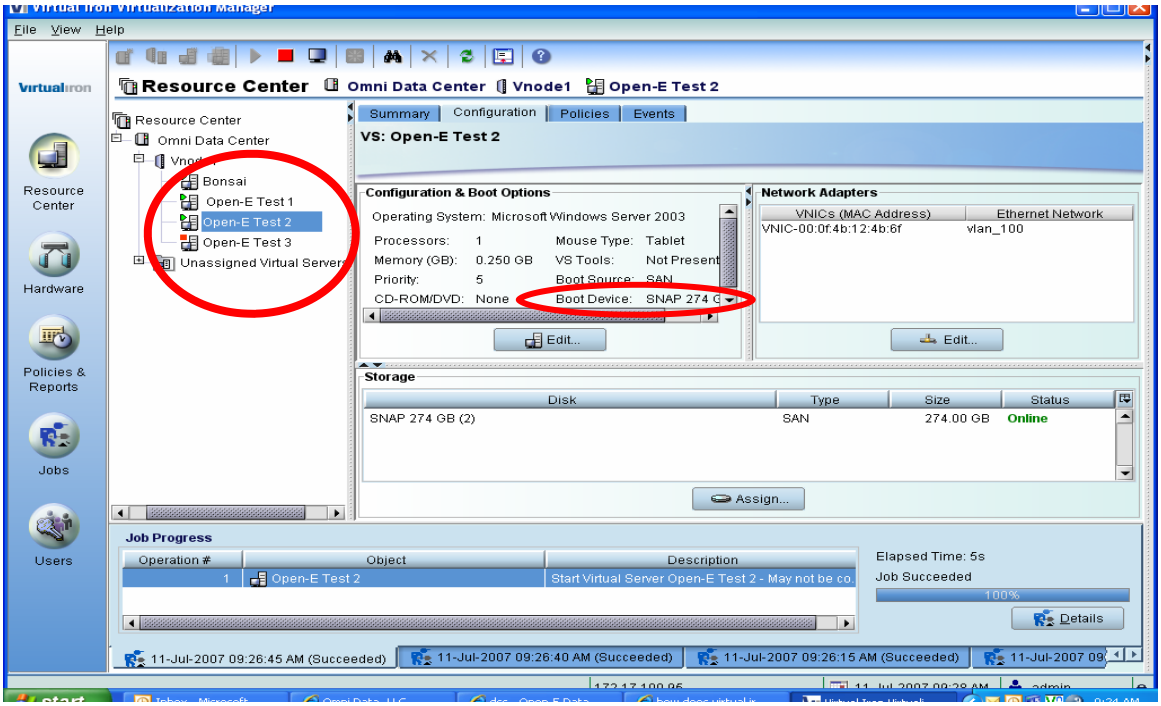


Figure 2

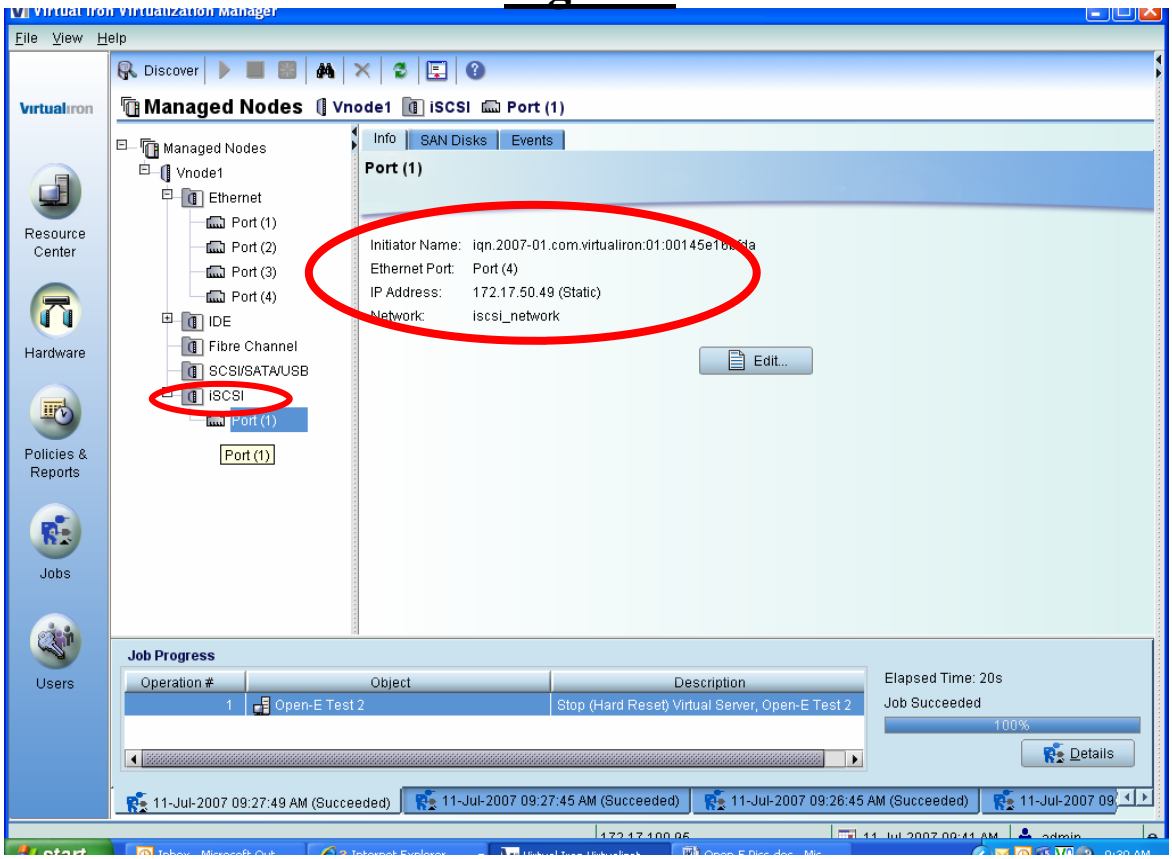


Figure 3

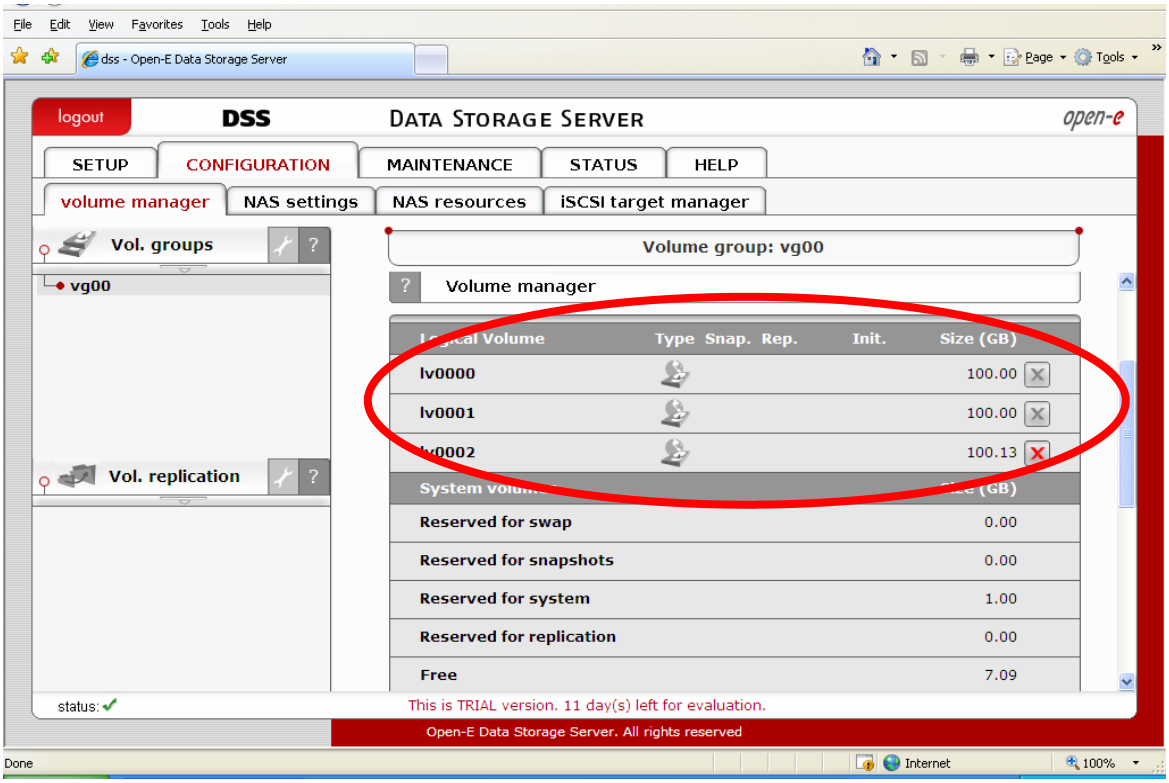
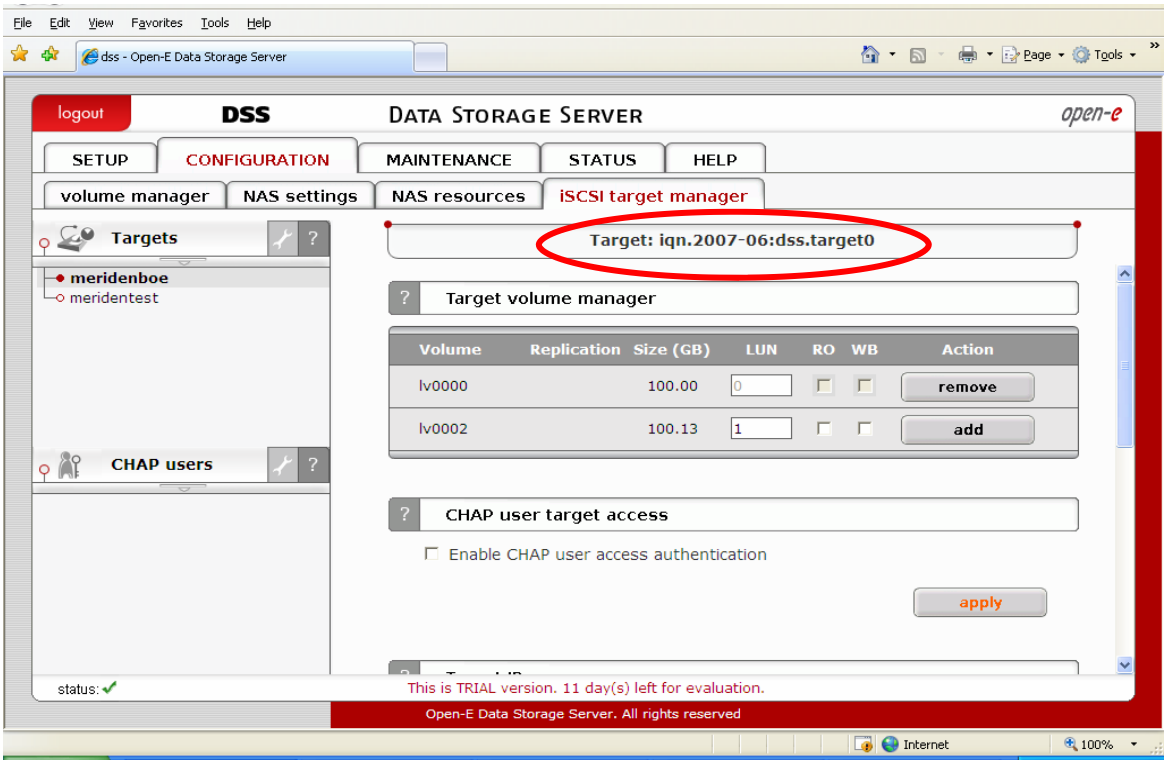


Figure 4



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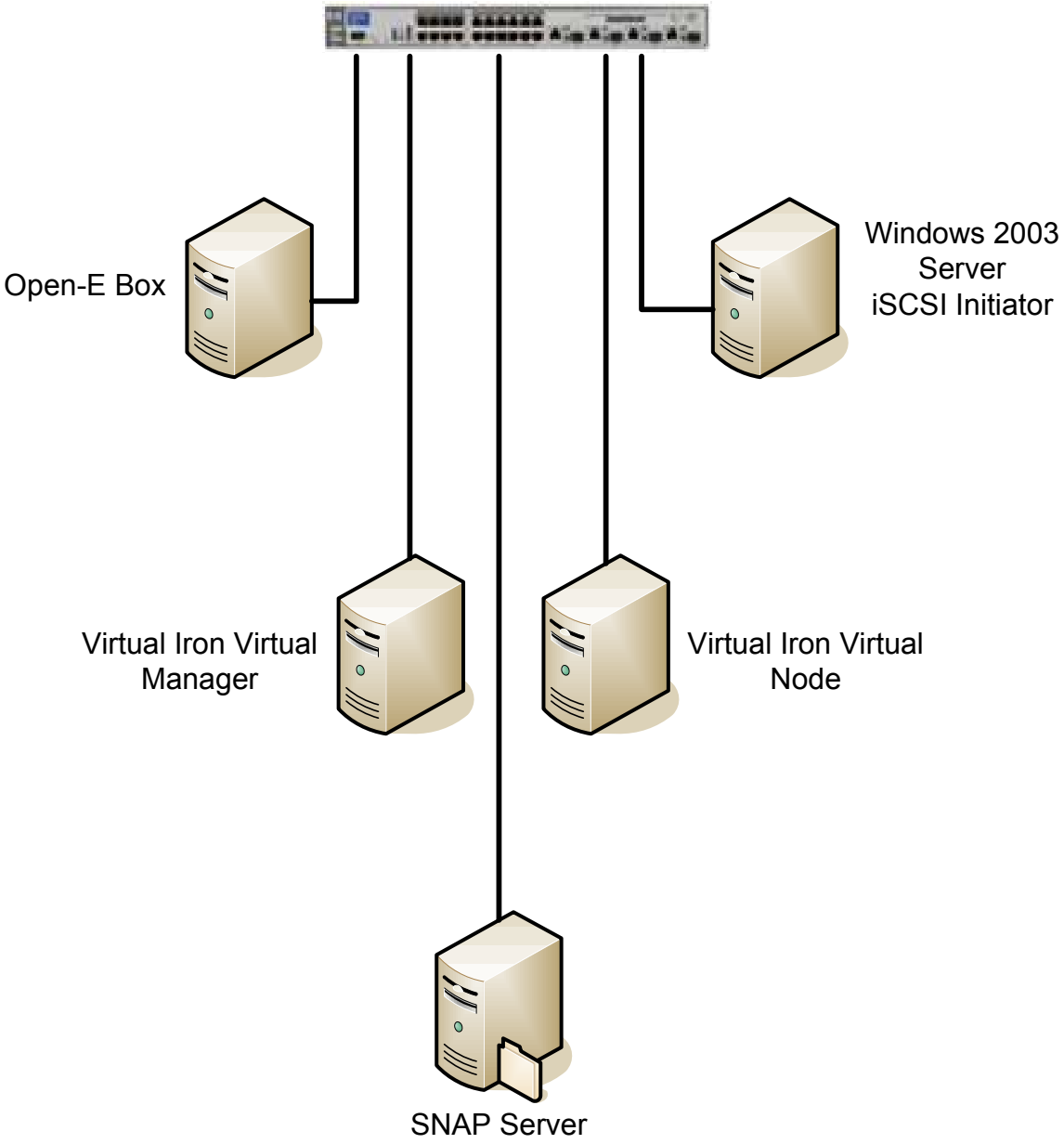

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