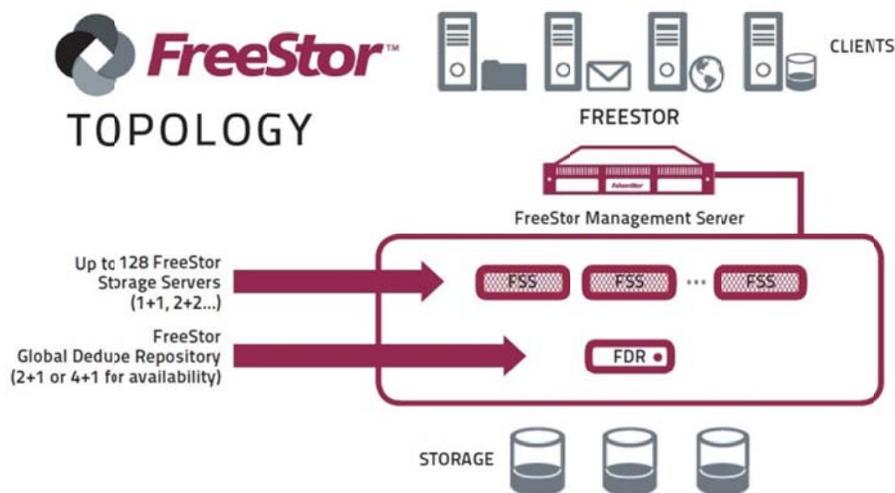




## Testing FreeStor by FalconStor

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SDS Platform With comprehensive analysis tools



With FreeStor, FalconStor offers an SDS platform, which is particularly relevant for its powerful management and analysis tools. Apart from this, the product also includes replication and high availability functions. We looked at how the installation of a FreeStor environment is taking place and how the solution works.

FalconStor FreeStor essentially consists of two different components:

First of all, the FreeStor Storage Server (FSS), which is used to abstract the storage components in the enterprise, into a shared storage pool and then make them available to the clients. The storage servers were available to us at the test time in version 9.0.

The second component is the FreeStor Management Server (FMS). This was at the test time in version 10.0. It also manages the storage environment, and gives administrators the ability to gain an accurate view of the performance, utilization, and other operating data of the storage installation using comprehensive analytics. FreeStor also provides administrators with capacity forecasts to analyze usage trends and predict how long the available memory will probably be enough.

The test

FreeStor is either available in appliance form or as a virtual appliance or software. For our test, FalconStor provided us with two images of virtual appliances, one from a storage server (FSS) and one from a management server (FMS). We imported these images, which were delivered as OVF files, into our virtualization environment based on VMware ESXi 6.5. We set up the storage server twice in our test environment, first to connect the second instance to clients other than the first, second to try to replicate to other servers, and thirdly to create a high-availability cluster with the two Storage servers.

As soon as our three virtual machines were available in our virtualization environment, we were familiar with the product's management and analysis tools and combined the storage solution with local storage components. These were then made available to various clients as virtual drives. Then we used the virtual drives in daily operation, analyzed the usage with the web interface, set up a replication, worked with snapshots and mirrors, and ultimately implemented a failover environment.

Providing the first virtual disk

After the VMs were commissioned, we logged into the Web-based management tool and added our storage servers to the FreeStor environment. Then, under "Manage / Settings", we activated the iSCSI target mode for both storage servers so that we could use them as iSCSI systems. Then we set the authentication method. In addition to Microsoft Active Directory, FreeStor also supports an LDAP server and local authentication. At this point, we decided to set up Active Directory (AD) and connect to our AD server under Windows Server 2016.

Now we turned to the task of incorporating our physical storage devices into the environment and creating storage pools. When creating the pool, it is sufficient to assign a name and insert the desired device, after which the respective pool is available for the work.

After completing these tasks, we set up a configuration repository in "Manage / Settings", where a constantly updated version of our server configuration was stored. Then we put our first virtual memory device under "Manage / Virtual Devices".

Once virtual devices are available, administrators have the option to set them into groups, set up a mirror, a replication, or activate TimeMarks, which are snapshots of a virtual device.

Now it was only necessary to assign the virtual device to a client. In the test, we used the iSCSI initiator on a Windows Server 2008 R2 for this purpose. There, in Quick Connect, we specified the IP address of the iSCSI interface of the previously configured storage server, which we had connected to a network interface on the Windows server that worked in the same subnet. Afterwards, we were able to create the client in the FreeStor web interface under "Manage / Clients". We also added the initiator to the client at this time. To do this, we simply had to scan the existing initiators (since we had previously communicated to the storage server via "Quick Connect", the server knew the initiator of the Windows system already at this time) and add via "Add" Of the client.

Once the client existed, we were able to complete the provision of the virtual memory device. To this end, we added our virtual device to the client in the web interface, rebooted Windows and then performed a device auto-configuration in the Windows iSCSI initiator. The system then linked to the virtual disk and found it in the Windows disk management as "FALCON IPSTOR DISK SCSI Disk Device". After we had set up, initialized, formatted, and put a drive letter on the disk, we were able to use it on the Windows system as normal as a local disk.

By the way, there is an even simpler way to provide clients with virtual memory. We tested this on a Windows Server 2012 R2. Here, it was necessary to create a user account for the affected client in the management interface and make it available to a storage pool. Then we installed the FalconStor Intelligent Management Agent (IMA) on our client and started the iSCSI initiator service. We then added the appropriate server-side server to our Windows Server 2012 R2 system. For this, we ran the server discovery in the IMA management interface, which promptly found the two storage servers on our network. After selecting the right server system, we only had to specify credentials for server access, enable iSCSI as a protocol, and click "OK".

Now that we had access to the storage system, we could add a new disc via the IMA Management Console. After we initialized and formatted them with the help of the Windows on-board devices, they were also used as a local drive.

The Analysis Functions

In operation, the aforementioned analysis functions are of particular importance. They offer managers the opportunity to access various inventory views to the existing servers, virtual devices, physical devices, clients, and customers (for multi-tenancy environments, that is, multi-tenant installations). Capacity Management, on the other hand, provides information about physical and virtual memory, storage pools, snapshot resources, and more.

More interesting is the point "Performance Monitoring", which provides information about the performance (throughput, IOPS and latency) of the virtual and physical devices, the clients, the Fiber Channel targets as well as the iSCSI targets and the like. The same is true for server throughput.

"Server Load" provides IT staff with detailed data on CPU load, storage usage, system disk usage, and the network throughput of each server. The "Trends" area is also interesting, as it shows how the capacity, utilization and performance of individual servers, as well as virtual or physical devices, have developed for the last week, the last day, the last hours and in real time.

The prediction of future usage of storage enables the responsible employees to extrapolate the future storage consumption based on historical data collected. The solution specifies how much memory usage will grow each day, and how many days it will take until the existing memory is 90, 95, or 100 percent full. In addition, the tool also shows how full the memory is likely to be in a week, month, three months, six months, and a year.

The next test

After we had worked through the functionality of the management tool, we adjusted our configuration in the test more precisely to our needs. We added a number of new clients on Linux and Windows to the storage environment, set up a replication for one of our virtual drives (which immediately started working), worked successfully with snapshots, mirrors and analysis functions, and finally configured a fail- Environment with our two storage servers, which can easily be put into operation.

Conclusion

In the test, we realized that the FalconStor FreeStor environment is unusually easy to install and use. The use of the SDS platform requires very little training and special skills are also hardly needed. The time required for the implementation and configuration of the system during operation was also short.

Despite the relatively simple operation, the system provides practically all the functions required in the company environment. These include snapshots, replications, mirrors, caches, and high-availability features. The solution enables administrators to use their storage environments as efficiently as possible.