Automating Thin Storage Reclamation with Veritas Storage Foundation

Storage Foundation Thin Reclamation

By allowing physical storage to essentially be allocated on demand as application writes are performed on thin LUNs, Thin Provisioning effectively automates storage provisioning. The problem is that when data is deleted from a host file system, the physical storage stays allocated to a thin LUN. As a result, all thin LUNs have a tendency to become 'chubby' over time, resulting in increasing amounts of wasted storage (storage that is allocated but does not support application data).

Veritas Storage Foundation Thin Reclamation offers a simple solution to this problem, automating the task of "right-sizing" your thin storage, without affecting application uptime. Symantec is the first software vendor to offer such capability.

Fully Automate In Place Reclamation of All Unused Space in Host File Systems

`vxdisk reclaim`
On a disk, disk group or full enclosure

Reclamation
WRITE_SAME

- Non disruptive to applications, host and SAN
- Works regardless of content of unused space
- Granular reclamation down to LUN page size
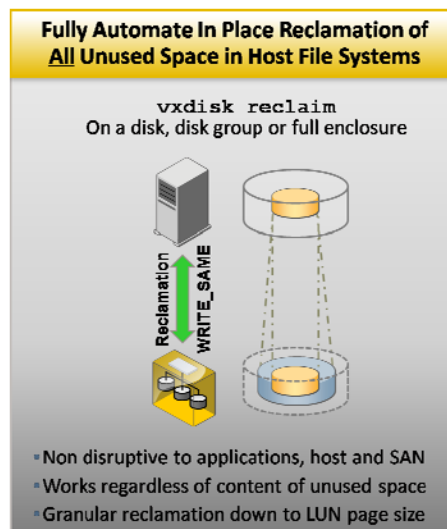
Non-Disruptive to Applications, Hosts and SAN

Thin Reclamation makes storage reclamation **easy**, **online** and **transparent** to applications, hosts and SAN. The standards based Thin Reclamation API enabling this functionality leverages the SCSI WRITE_SAME command with the standard UNMAP bit turned on to inform the storage array that all physical storage for a certain block range can be reclaimed. This whole process is done in-band with little to no performance impact on the host and storage array. No changes to the host file system, volume size, or SAN configuration are needed.

This maximizes storage availability and thus improves business continuity and agility.

Works Regardless of Content of Unused Space

Storage array vendors recognize the need for thin storage reclamation and implement functionality that automatically reclaims space that contains large enough contiguous series of zeroes. This is often referred to as *zero page reclamation*. The obvious limitation of this is that 'unused space' almost never contains zeroes: it contains whatever was there when it was used last. To reclaim unused space using array functionality requires all the free space in a file system to be actively zeroed out, consuming considerable amounts of host and SAN resources and very likely affecting application performance.

Instead of looking at the content of blocks to decide whether they should be reclaimed or not, Veritas Storage Foundation leverages its detailed knowledge of the location of all unused space in the host file systems. Hosts running Storage Foundation can efficiently communicate the location of all this unused space to the storage array using the standards based Storage Foundation Thin Reclamation API. This enables the storage array to internally reclaim all unused physical storage, automatically making it available for other thin LUNs.

Granular Reclamation Leading to Better Storage Utilization

You can trigger Thin Reclamation on the level of *disks, disk groups and enclosures* with one command. Internally, the reclamation is carried out down to the granularity of the LUN page size, making it possible to reclaim even a very small piece of unused storage (as small as 8KB for some arrays).

Enabling and Using Thin Reclamation API

Veritas Storage Foundation Thin Reclamation API helps Datacenter Administrators to achieve optimal storage utilization in thin storage arrays. Storage Foundation discovers and reports thin storage devices automatically. The report generated by the command vxdisk –o thin list reports the type of thin devices – thin provisioning capable (**thin**) vs. thin reclamation capable (**thinrclm**). In particular, it shows the thin LUN size and its actual physical allocation. Datacenter Administrators can find out how much space has been reclaimed by examining the physical allocation before and after they issue the Thin Reclamation command:

vxdisk reclaim [<disk>|<dg>|<encl>]

Experience Thin Reclamation

Thin Reclamation is currently supported with Storage Foundation for Windows, Unix and Linux to storage hardware from the following vendors.

You can find more detailed support information in the Hardware Compatibility Lists:

Unix/Linux:
Storage Foundation 5.0 MP3:
http://seer.entsupport.symantec.com/docs/283161.htm
Storage Foundation 5.1:
http://seer.entsupport.symantec.com/docs/330441.htm

Windows:
Storage Foundation 5.1 SP1:
http://seer.entsupport.symantec.com/docs/337683.htm

To experience the power of Thin Reclamation

Step 1: Find out how much physical storage has been allocated in thin storage via:
vxdisk –o thin list

Step 2: Perform Thin Reclamation via:
vxdisk reclaim [<disk>|<dg>|<encl>]

Step 3: Observe the difference in physical allocation after Thin Reclamation via:
vxdisk –o thin list

More Information

Visit our website
http://enterprise.symantec.com

To speak with a Product Specialist in the U.S.
Call toll-free 1 (800) 745 6054

To speak with a Product Specialist outside the U.S.
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