



## ETERNUS CUSTOMER INFORMATION BULLETIN

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**Number/Revision:**

ET-CIB107 Revision 00

**Issue Date:**

4 October 2013

**Title:**

Space Reclamation in Windows Servers without UNMAP Support

**Applies to:**

All DX S2 models (except DX60S2) attached to Windows Server 2008R2 and earlier Windows operating systems.

**Related Documents:**

None

**Effective Duration:**

Until further notice is given

**Details:**

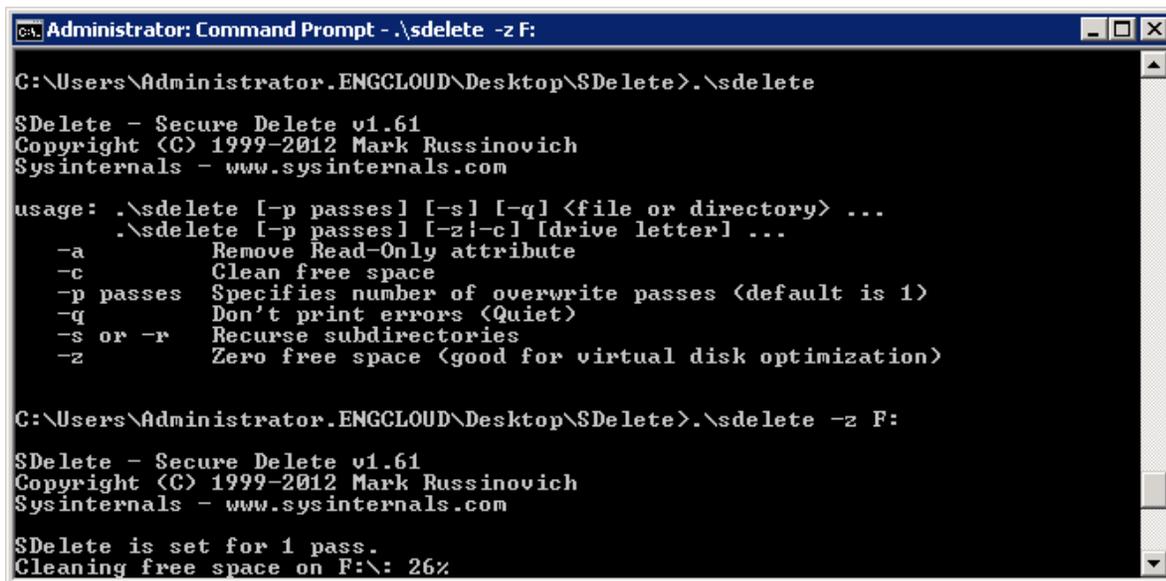
Following are two options that exist in the Windows operating systems without UNMAP support.

**1. Use “sdelete” utility to zero clear for the Zero Reclamation operation.**

Microsoft publishes a free utility called “sdelete” that can be downloaded from the following URL: <http://technet.microsoft.com/en-us/sysinternals/bb897443.aspx> . One of the options, -z, will write zeros to all of the free space in the file system. This will allow the DX S2 Zero Reclamation operation to reclaim the zeroed storage elements. This process returns the elements to an unmapped state, making them available for use.

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The following screenshot illustrates the usage of the sdelete command:



```
Administrator: Command Prompt - \sdelete -z F:
C:\Users\Administrator.ENG CLOUD\Desktop\SDelete>.\sdelete
SDelete - Secure Delete v1.61
Copyright (C) 1999-2012 Mark Russinovich
Sysinternals - www.sysinternals.com

usage: .\sdelete [-p passes] [-s] [-q] <file or directory> ...
       .\sdelete [-p passes] [-z!-c] [drive letter] ...
  -a      Remove Read-Only attribute
  -c      Clean free space
  -p passes Specifies number of overwrite passes (default is 1)
  -q      Don't print errors (Quiet)
  -s or -r Recurse subdirectories
  -z      Zero free space (good for virtual disk optimization)

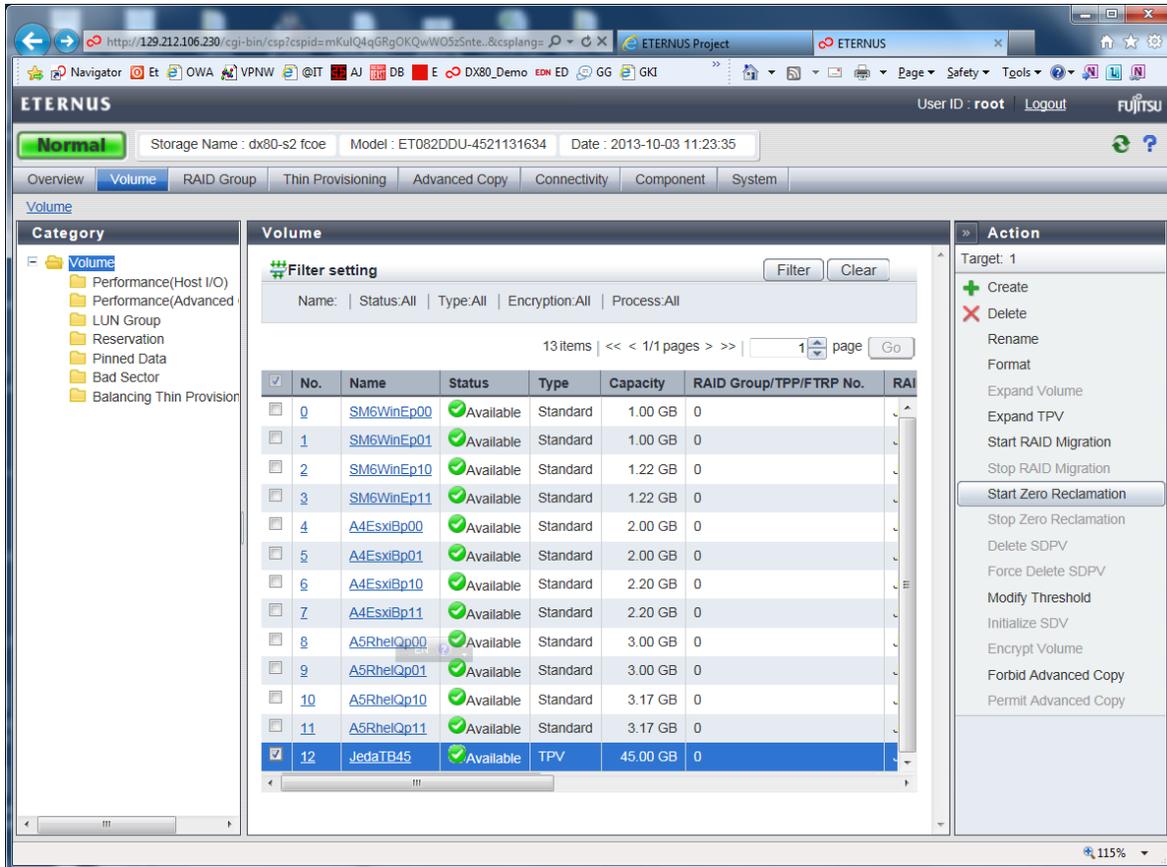
C:\Users\Administrator.ENG CLOUD\Desktop\SDelete>.\sdelete -z F:
SDelete - Secure Delete v1.61
Copyright (C) 1999-2012 Mark Russinovich
Sysinternals - www.sysinternals.com

SDelete is set for 1 pass.
Cleaning free space on F:\: 26%
```

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After the sdelete command is executed, the DX S2 Zero Reclamation operation should be started.

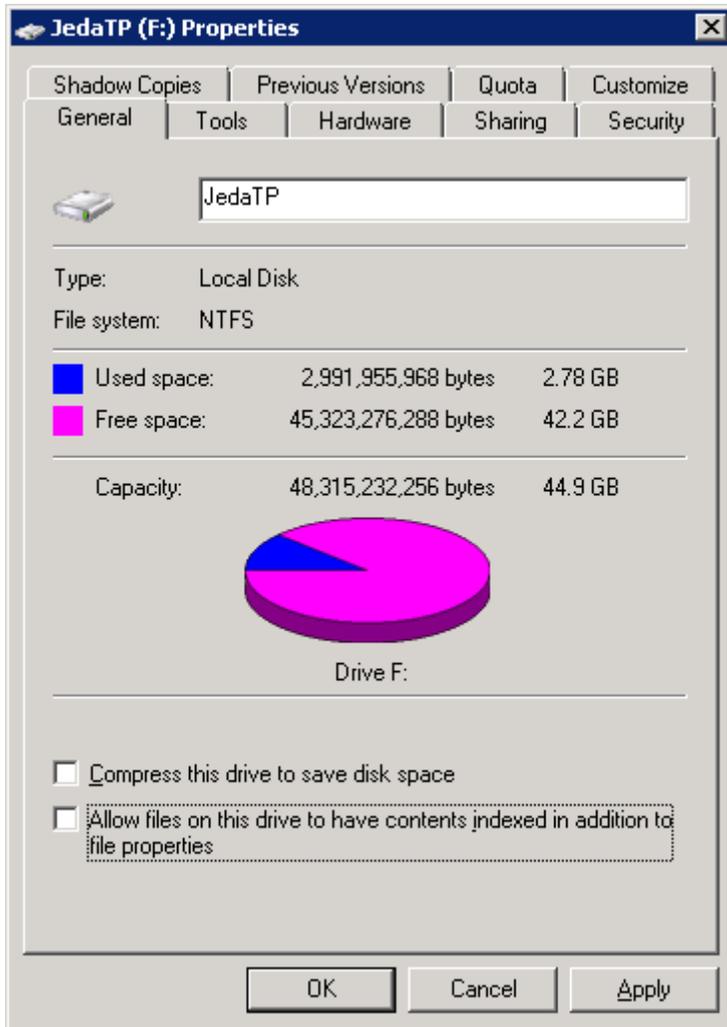
Please select the “Volume” menu in the DX S2 GUI, select the TPV with a check mark, and then click “Start Zero Reclamation” under the Action menu as shown below:



**Warning:** Before executing the sdelete command, please make sure that there is enough free space remaining in the Thin Provisioning Pool to accommodate the extra space required for the LUN’s free space. When sdelete writes zeros to a previously unmapped storage segment the ETERNUS will allocate physical storage from the Thin Provisioned Pool. Pool usage will actually increase when the sdelete command is run.

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For example, the following screenshot represents the property of a Windows Volume backed by a Thin Provisioned Volume. It shows 42.2GB of free space. The unmapped area contained within this free space represents the capacity by which the execution of sdelete may end up using. This is difficult to estimate, but it is bounded by the number of storage elements used by the total free space available.



Depending on how the storage elements are mapped it is possible that up to 44.9GB of storage may be allocated from the pool when the sdelete operation is performed.

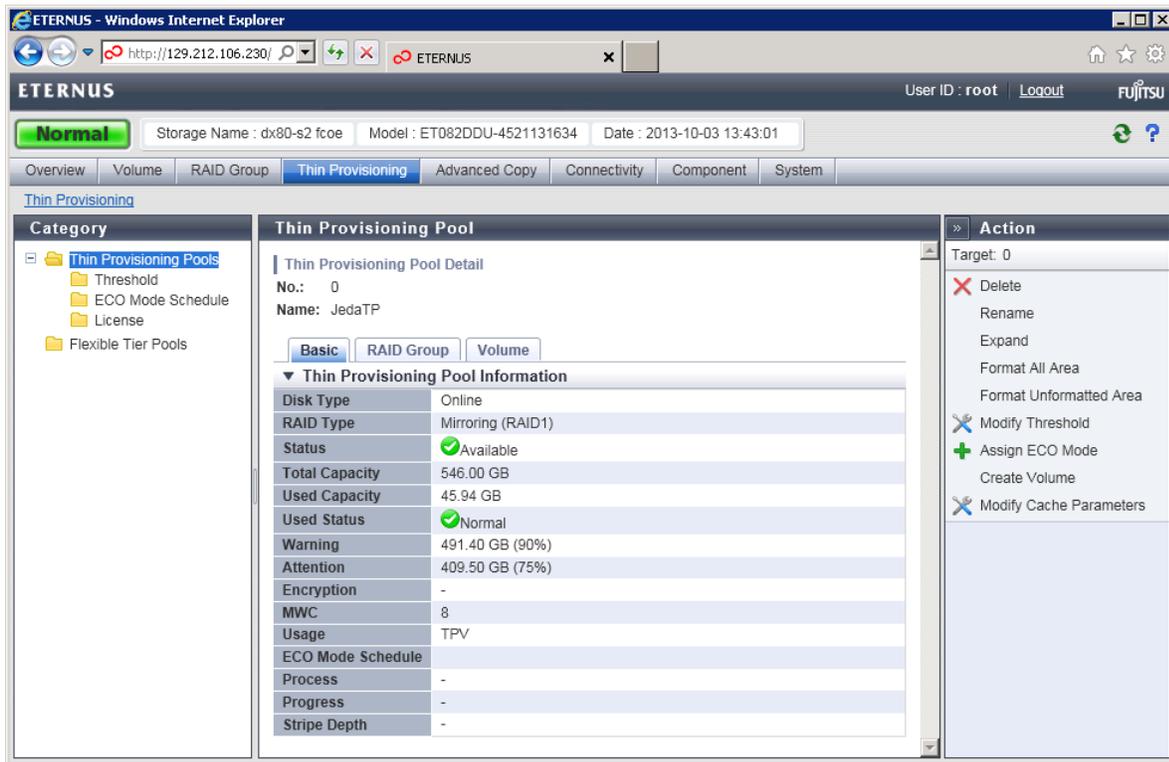
The status of the Thin Provisioning Pool is displayed in the ETERNUS GUI below. Please select the pool being reclaimed and calculate the remaining space which is equal to “Total Capacity” – “Used Capacity”.

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In this example the remaining space capacity:

$$546.00\text{GB} - 45.94\text{GB} = 500.06\text{GB}$$

is larger than the maximum possible capacity growth of 42.2GB due to the sdelete operation. It is safe to proceed with the sdelete operation.



### 2. Use of third party utilities that will perform Zero or UNMAP Reclamation.

There are commercial third party utilities which offer a more optimized solution to space reclamation which avoids the pitfalls associated with the “sdelete” utility.

One example is “PerfectStorage” by Raxco Software (<http://www.raxco.com/business/solutions/storage-management/space-reclamation>)

This is commercial software, but a free 30 day evaluation is available.

There are two options for Space Reclamation offered in this software:

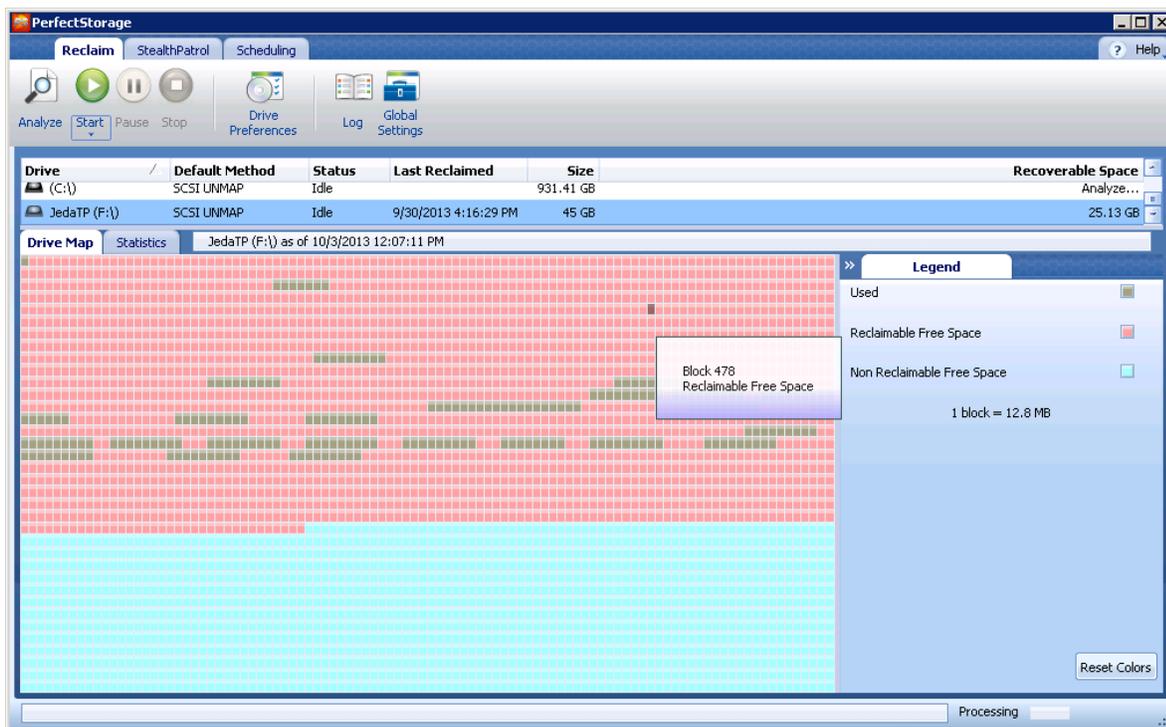
“SCSI UNMAP” option: This is the default method. The SCSI UNMAP command is issued to storage elements which contain non-zero data. The storage elements which contain all zeros

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allocated to physical storage are not targeted by this software. Therefore it is necessary to perform the Zero Reclamation operation in the ETERNUS GUI afterwards to completely reclaim all the available storage.

The following screenshot from the utility illustrates this point. The elements marked by a red box were previously occupied by files which contain non-zero data. The elements marked in blue have zero data (it may be mapped or unmapped).

The execution of the reclaim operation will cover the area marked in red by issuing the UNMAP command. However, it is necessary to perform the ETERNUS Zero Reclaim operation in the GUI to cover the rest of the possible mapped area.



The PerfectStorage Utility also offers the “Smart Zero Fill” option which will write zeros to free areas just as the sdelete option. However, it is careful to only write zeros to the storage areas which do not contain all zeros so the unwanted side effect with sdelete utility is avoided.

Either the SCSI UNMAP or “Smart Zero Fill” option can be used for space reclamation with this software. However, it is necessary to follow up with the Zero Reclamation operation with ETERNUS GUI to complete the operation.



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### Revision History

REVISION	DATE	CHANGE SUMMARY
00	4 Oct 2013	Initial Release