

Free Unused Storage with Hitachi Dynamic Provisioning Zero Page Reclaim Feature

WebTech Q&A Session - February 4, 2009

- 1. Can this feature be applied to Hitachi Adaptable Modular Storage systems?**
No, currently Dynamic Provisioning is only available on the Hitachi Universal Storage Platform™ V and Universal Storage Platform VM.
- 2. I just wanted to verify, should there only be one RAID group per Dynamic Provisioning Pool?**
No. You can have quite a number of RAID groups in a single Dynamic Provisioning Pool. You just should not mix RAID types in a single pool, since that would lead to having different RAID types in a single virtual volume which would not make sense.
- 3. Do we need to use Tiered Storage Manager to migrate the volumes in order to use Zero Page Reclaim?**
No, you could alternately move the volumes with Hitachi Data Systems Replication products or server based tools.
- 4. Is Zero Page Reclaim available under the Command line interface since it is ongoing process - meaning we have to start and stop the process?**
No, it can only be started through the GUI.
- 5. Can you comment on the Dynamic Provisioning friendliness of VFMS?**
VMware VFMS is thin friendly.
- 6. With file system zero data file systems we understand well, such as VxFS, can we say Zero Page Reclaim is effective? Why advertise only after migrations? Why not any time?**
Currently it is difficult to determine the amount of storage that would be reclaimed – often this could be very little. Since we cannot show how to predict the results, we are not marketing it for that purpose.
- 7. Are Oracle ASM and Oracle Cluster File Systems supported with thin provisioning?**
Yes. See our best practice whitepapers here: <http://www.hds.com/assets/pdf/hitachi-dynamic-provisioning-software-best-practices-guide-oracle.pdf>
- 8. When you start the Zero Pages Discard, does it complete automatically or do we have to stop it?**
Once started it continues as a low priority task (via external i/o) until completion.
- 9. Is the view shown in Hitachi Device Manager as well? This would give a nice summary slightly before or after the steps are taken.**
It can be seen from Device Manager's Physical View

10. What is the performance impact to the server and application when running zero page reclaim?

Very minimal, it runs as a low priority task.

11. Where can I find the procedure to do this?

The management interface is included in an updated release of Hitachi Storage Navigator software associated with this microcode release – see MK-96RD621, and it's use is described in the updated Dynamic Provisioning Users Guide - MK-96RD641-10.

12. Can the process be automated or started via a command line interface?

Not at this time

13. Is the zero page discard functionality integrated on the device manager GUI at some point?

It is through the Device Manager Physical View

14. Is it available on Universal Storage Platform or only on Universal Storage Platform -V?

It is available only on both the Hitachi Universal Storage Platform V and Hitachi Universal Storage Platform VM

15. Is there anyway of reclaiming space in a file system (VxFS) when files are deleted from the file system?

It is far more likely that benefits will be seen from space that has never been used than reclaimed from a cleanup on an ongoing basis.

16. If you add disks to an existing pool does it restripe the pool?

Not at this time. However active rebalancing is on the short term roadmap.

17. Can we stop the reclaim pages once it starts? And if we can, what does it do to pages already reclaimed.

Yes, there is a **stop** button. Once a page is reclaimed, it is reclaimed.

18. Does a windows disk fragmented help to get more "zero" pages that can be "thinned"

No. Quite the contrary, a windows defragment operation will tend to touch all of the volume and thus cause all the pages to be allocated.

19. Can it reclaim space in an Oracle database file that has not been used?

Yes.

20. Have you had relative success with Zero Page Reclaim with VMware? Any special considerations or limitations?

Zero Page Reclaim is a recent feature and we are still gathering input on it's use with VMware. We expect its degree of usefulness will parallel the usefulness of Dynamic Provisioning itself and we do have experience that Dynamic Provisioning can be effective with VMFS volumes and with LDEVs mapped directly to Virtual Machines as well. It primarily depends on the behavior of the file system and applications run in the Virtual Machines.

21. Do we need to use any special Vertias APIs for Zero Page Reclaim to work? Any host level interaction required?

No to both questions.

22. If I am using VxFS and I am using Dynamic Provisioning and I have at a later time deleted a lot of data will zero page reclaim actually reclaim the space back to the pool?

Probably not, because the deleted 'space' is probably not all zeroed and it would have to be a contiguous series of zeros in an entire Dynamic Provisioning page to be freed.

23. You can probably do this for all external storage behind the Universal Storage Platform, be it that is, Symmetrix, Adaptable Modular Storage or Clariion?

Yes, both Dynamic Provisioning and the Zero Page Reclaim process can be used for storage externally connected to a Universal Storage Platform.

24. Will the zero page reclaim feature reclaim space from NTFS file systems that were formatted without using the quick format feature?

During a full format more the volume is written to so less can be reclaimed. Best practice is to use the quick format feature with NTFS and Dynamic Provisioning.

25. How long to implement zero out file system utilities versus the actual new SCCI standards which are being developed?

We are involved in this work and will quickly adopt it.

26. Some applications are better suited for thin pools than others. If I have a misbehaving application or an admin who is running a disk defrag while running Zero Page Reclaim, what will be the net effect?

There will not be a lot of benefit seen from running the Zero Page Reclaim.

27. What kind of license required for this feature?

The Zero Page Reclaim feature is a standard part of Hitachi Dynamic Provisioning software.

28. Is it advisable for after running Zero Page Reclaim to optimize again?

No. The optimize step is used after adding new LDEVs to a pool and has nothing to do with Zero Page Reclaim.

29. When a V-vol reaches its volume limit is it possible to extend or expand the V-Volumes in the pool to enable additional capacity beyond the initial size?

Yes. Dynamic Provisioning supports online volume expansion for V-Volumes with Microsoft Operating Systems. Similar support for other operating systems is expected to be added this year.

30. Is RAID-6 supported with Dynamic Provisioning?

Yes, all RAID configurations supported by the Universal Storage Platform are supported by Dynamic Provisioning

31. Can this be used with Microsoft Exchange storage group to reclaim unused space?

After migrating from a standard fat volume to a virtual volume and depending of how much of Exchanges storage groups volume has not been used yet, yes you should be able to reclaim unused space. See the whitepaper here for use of Dynamic Provisioning with Exchange:

<http://www.hds.com/assets/pdf/hitachi-dynamic-provisioning-software-best-practices-guide-microsoft.pdf>

32. Is it supported to migrate V-Volumes using volume migratory or Tiered Storage Manager across different pools? Example from a RAID-6 pool to RAID-1+0 pool?

Yes, you can migrate V-Volumes between pools with different raid types and retain the 'thinness', or to actual physical volumes which would be 'fat'.

33. Can you run this on a vol that is used for VMware ESX host? Are there any version restrictions?

Yes, you can use a Dynamic Provisioning virtual volume for a VMware ESX host. All versions of Dynamic Provisioning support this.



34. Is there a host supported Matrix or is it supported by all operating systems like Windows and UNIX?

Dynamic Provisioning's virtual volumes are totally transparent to all types of open servers – Windows, UNIX and Linux. Dynamic Provisioning does not support Mainframe operating systems volumes at this time.