

# Hitachi Virtual Infrastructure Integrator

## Frequently Asked Questions

### Introduction to Virtual Infrastructure Integrator

#### 1. What is Hitachi Virtual Infrastructure Integrator v3?

Hitachi Virtual Infrastructure Integrator is a comprehensive data protection solution for VMware vSphere environments, accessed through the vSphere Web Client, that lets virtual machine (VM) administrators manage their VMs' data management services effectively. Virtual Infrastructure Integrator leverages the high performance and scalability of Hitachi snapshot services. It simplifies data management with scheduled and instantaneous backup, recovery and cloning services, reducing risks, costs and administrative overhead. It helps you meet backup and recovery service level agreements (SLAs) at VM-level granularity while improving resource utilization (see Figure 1).

Virtual Infrastructure Integrator provides application-consistent backups for VMware vSphere environments, with the following key features for VM administrators:

- Create space-efficient granular backups of a VM using file clone and Hitachi Thin Image snapshots.
- “Fast clone” a VM snapshot to create a secondary VM, based on a previous snapshot of a production VM. This capability enables use cases, including restoration of individual items from a VM to the running production VM, testing, validation and analysis of a production issue.
- Mount snapshots of VMDKs to allow snapshot disks to be mounted back to a production VM. An example is a Microsoft® Windows® system with c:\ and d:\ drives. We can mount a snapshot of those drives as the x:\ and y:\ drives via a single click.
- Provide additional visibility on storage-related configuration information per datastore.
- Create static or dynamic VM groups to create groups of related VMs and to manage a group as single entity. Example use cases include applying a single backup schedule to a group of VMs and fast cloning a group of related VMs.
- View the compliance dashboard to check for best-practice HDS storage configuration.
- View running tasks and search for a specific schedule on the activity screen, which lists all scheduled tasks.
- Use instantaneous, efficient clones to create and provision hundreds of readable and writeable clones of a source VM in a single operation.

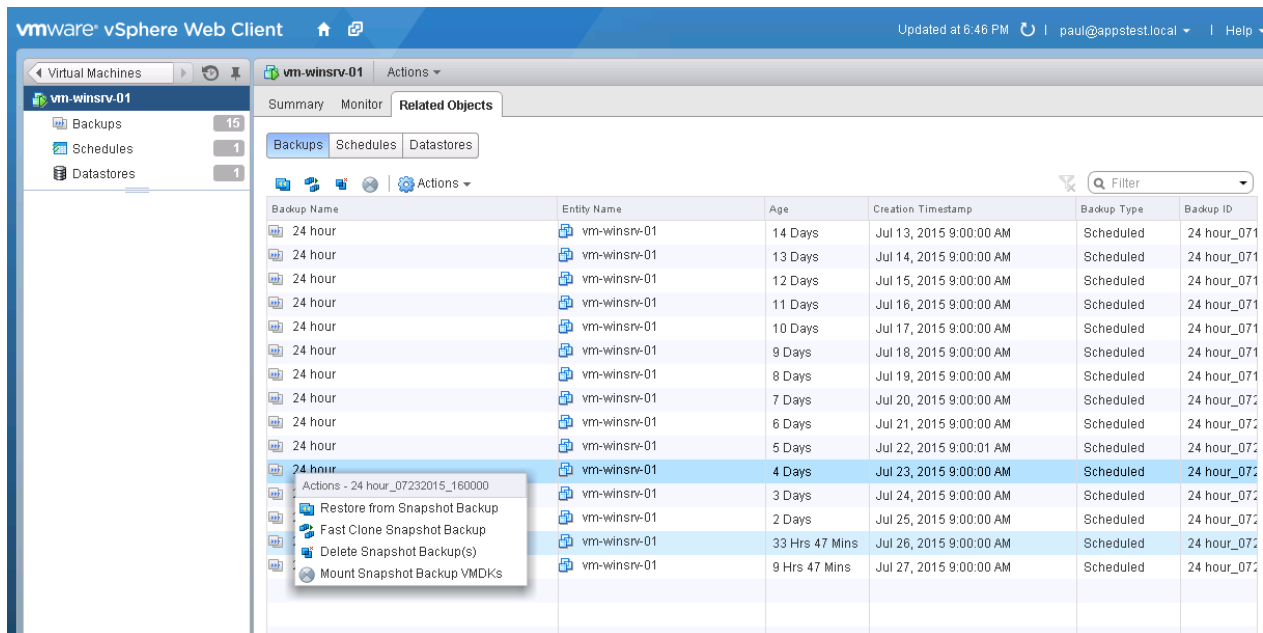


Figure 1. Hitachi Virtual Infrastructure Integrator v3 User Interface

## 2. What is new to customers about Hitachi Virtual Infrastructure Integrator v3?

Virtual Infrastructure Integrator v3 adds support for HDS block storage, including the entire Hitachi Virtual Storage Platform (VSP) family and Hitachi Unified Storage VM (HUS VM). We offer managed data protection solutions for customers deploying NFS and Fibre Channel protocols in VMware environments. Virtual Infrastructure Integrator v3 continues to provide support for Hitachi NAS Platform (HNAS) file storage systems.

There are also additional enhancements to existing capabilities, plus broadened management of VM and datastore backup and recovery capabilities on existing HNAS and VMware environments. These enhancements also benefit VMware environments with VSP G1000, VSP G800, VSP G600, VSP G400, VSP G200, VSP and HUS VM. Enhancements include:

- Enhanced backup, recovery and data protection.
- Best practices and compliance dashboard.
- Virtual Infrastructure Integrator user interface and usability improvements.
- Integration and interoperability enhancements.
- Security and logging enhancements.
- Cloning VM and vApp services.
- Environment version support.
- Documented tested recoverability of Virtual Infrastructure Integrator service.

Notable areas in the above include:

- Application backup consistency improvements plus Linux.
- Higher concurrency and scale.
- Security and role-based access control (RBAC).
- VM alignment notifications.
- Enhanced CLIs and application programming interfaces (APIs).
- Enhanced provisioning.
- Hi-Track Remote Monitoring system integration.

3. [Why do customers view Virtual Infrastructure Integrator as an important piece in their data protection strategy?](#)

Virtual infrastructure Integrator enables VMware infrastructure admins to self-manage tasks across domains that drive efficiencies. The result is lower capital and operating expenditures (capex and opex) for such tasks as provisioning datastores or providing scalable backups through storage snapshots. In addition, plug-ins guide the administrator to apply data management and configuration best practices within the infrastructure as it relates to VMs running on HDS storage systems.

4. [How does Virtual Infrastructure Integrator help customers manage and protect virtual infrastructure?](#)

VMware vSphere is a leading platform that aggregates CPU, networking and storage resources into a seamless, flexible and dynamic infrastructure that delivers maximum efficiency, utilization, control and choice to customers. Hitachi Data Systems provides the storage and data management foundation for VMware customers to transform their storage into a highly efficient pool of resources that can scale and adapt to any need. VMware customers can now take advantage of the following benefits:

**Simplified management.** With Virtual Infrastructure Integrator, customers can simplify data management with scheduled and instantaneous backup, recovery and cloning for virtualized servers and storage. These capabilities dramatically improve management of the data center environment through better availability and manageability.

**Risk reduction.** Virtual Infrastructure Integrator helps customers reduce risk of business disruption by allowing more frequent protection and rapid recovery of VMs, thus improving recovery point and time objectives (RPO/RTO). It provides application-consistent data protection, preventing any data loss in the backup and recovery of VMs.

**Improved efficiency.** Data protection solution enables a zero-backup window by leveraging highly integrated, storage-based snapshots. It allows efficient capacity management resulting in lower opex in cloning and snapshot operations.

5. [Who should consider deploying Hitachi Virtual Infrastructure Integrator in their data center?](#)

For customers who are trying to drive data-management efficiencies within their VMware environments and are trying to break down silos across IT domains, using Virtual Infrastructure Integrator as part of an overall HDS solution provides necessary data protection and management value-add capabilities to VM administrators.

6. What are the top five problems addressed by Virtual Infrastructure Integrator?

Virtual Infrastructure Integrator allows VM admins to apply efficient data management services to lower capex and opex and improve efficiencies across domains. It gives admins the ability to:

- Provide visibility and association between HDS-based datastores and associated VMs.
- Manage and schedule backups to leverage storage snapshots.
- Back up more frequently to reduce the amount of new data at risk (RPO).
- Address need for almost instantaneous recovery (RTO) of virtual machines.
- Enable granular recovery of individual items inside the virtual machine.
- Quickly create space-efficient clones of VMs.

7. Which HDS storage systems are supported?

- Hitachi NAS Platform: HNAS 4100, HNAS 4080, HNAS 4060, HNAS 4040, HNAS 3090 or HNAS 3080.
- Hitachi Virtual Storage Platform: VSP G1000, VSP G800, VSP G600, VSP G400, VSP G200, VSP.
- Hitachi Unified Storage VM.

## Using Virtual Infrastructure Integrator

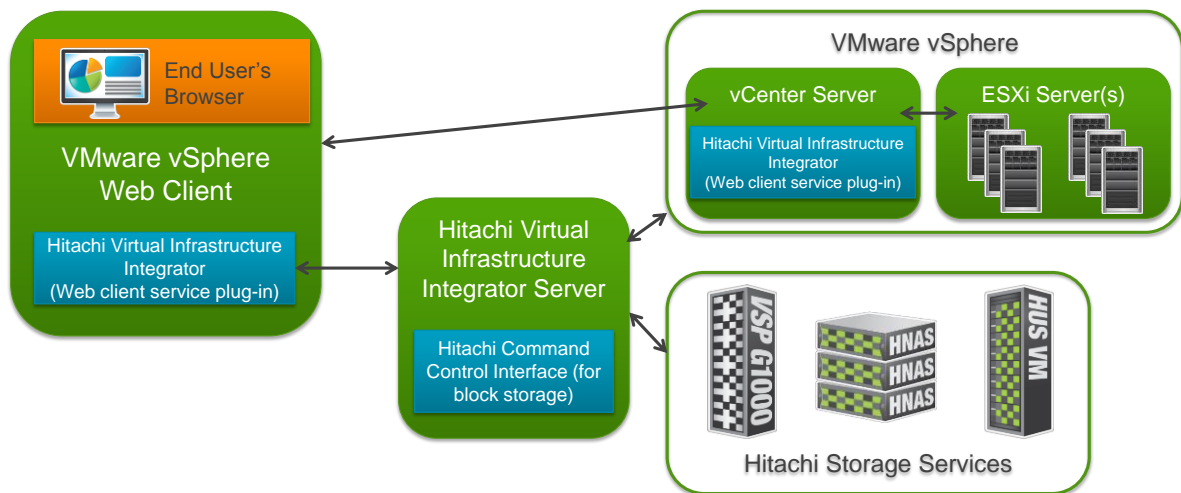
8. Does Hitachi Virtual Infrastructure Integrator keep track of a history of snapshot backups that may be previously stored on a different datastore?

Yes, each Virtual Infrastructure Integrator snapshot backup is associated with the datastore where the VM resided when the backup was taken. If a VM is “moved” to a different datastore, we retain the existing snapshot backups on the “old” datastore until the Virtual Infrastructure Integrator policy rotates out the oldest Virtual Infrastructure Integrator snapshot backups, as per the retention setting in the policy. Typically, the restore of these older snapshots would occur onto the older datastore. However, you could effectively restore to the “new” datastore by using Storage vMotion when desired.

9. What are the architectural benefits of Virtual Infrastructure Integrator?

By integrating into the VMware vSphere virtual environment (see Figure 2), Virtual Infrastructure Integrator software provides seamless data management services. Such services include managed snapshot backups, snapshot restores and snapshot backup scheduling operations on VMs and virtual applications (vApps) hosted exclusively on Hitachi storage devices.

You can apply snapshot backup schedules to specific VMs and vApps by grouping them according to your needs. Virtual Infrastructure Integrator also enables the creation of VM and vApp clones instantly, even while the VMs and vApps are powered on.



VSP G1000 = Hitachi Virtual Storage Platform G1000, HNAS = Hitachi NAS Platform, HUS VM = Hitachi Unified Storage VM

Figure 2. Architecture of a Virtual Infrastructure Integrator and VMware vSphere Virtual Environment

10. Will HNAS' support of VMware vSphere virtual volumes change the behavior of how it handles VM snapshot, backup and restore history when considering a vMotion event?

Virtual Infrastructure Integrator will retain, at minimum, the same mechanism to preserve older snapshots, even with Storage vMotion events. And it is highly likely that we will be able to optionally move the snapshots with a Storage vMotion event.

11. Is there any automation of snapshot or backup policy applied to a given VM when a vMotion event occurs from one HNAS hosted datastore to another HNAS hosted datastore? Or, would it require a manual process to re-assign a Virtual Infrastructure Integrator snapshot backup and retention policy for the VM on the new datastore after vMotion?

We allow the creation of backup protection policies at the VM, vAPP, datastore and custom group levels. For environments where Storage vMotion is a common activity (move between datastores), we recommend using Virtual Infrastructure Integrator groups or continue to use datastore policies. The policy at group level will protect the VM, no matter where in the environment it gets moved. When using datastore policies, every backup operation will check for new VMs on that datastore and the same data protection policy will be applied to any that are detected. Alternatively, you can set up the policy at a VM level.

It is likely that Virtual Infrastructure Integrator groups will become the dominant or preferred mechanism, especially with API services in Virtual Infrastructure Integrator v3, which provide the foundation to enable automatically provisioned backup policy services as part of the initial VM provisioning in VVol-based environments.

## 12. Can Hitachi Virtual Infrastructure Integrator provide high availability for critical applications?

Hitachi Virtual Infrastructure Integrator software provides high availability and enhanced data protection with support for snapshot vaulting. Vaulting is also referred to as replication in some systems. Vaulting can protect snapshots and the VMs by space-efficiently replicating a copy of the snapshots to another Hitachi storage device residing in the same data center or a remote data center. Current support is for file-based VMs on HNAS only.

For the vaulting feature, HNAS operating system (OS) v11.3.3450.14 or later is required.

## 13. Can I create customized groups for Virtual Infrastructure Integrator data protection purposes?

Use the Hitachi Virtual Infrastructure Integrator to create, edit and delete custom groups of VMs and vApps from the “All VMs on Hitachi Storage” group. You can perform functions within the Virtual Infrastructure Integrator on a defined group, including:

- Make snapshot backups of all members of a group (see Figure 3).
- Schedule group snapshot backups.
- View all events associated with the VMs and vApps in a group.

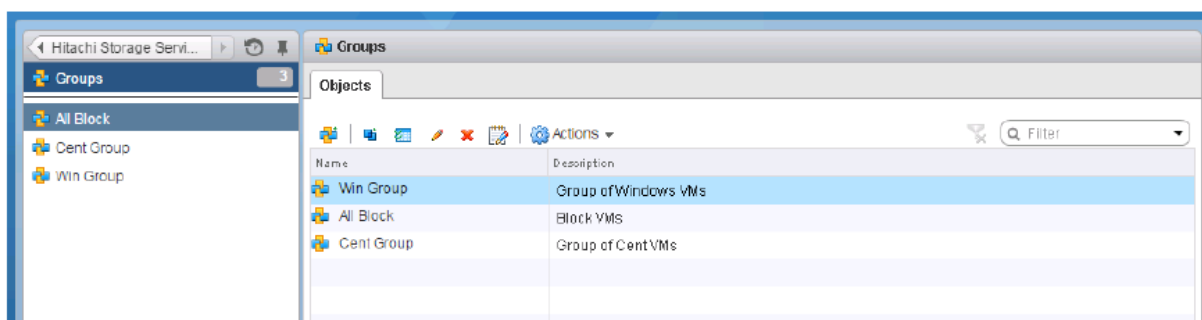


Figure 3. Virtual Infrastructure Integrator: Perform Group Functions

## 14. How do we achieve application-consistent snapshots?

We inherit application-consistent snapshots by virtue of how Virtual Infrastructure Integrator calls VMware snapshots on virtual disks [with Microsoft apps Volume Shadow Copy Service (VSS) writers and Linux apps have pre- and post-scripts prior to calling HNAS file clone snapshot and block Thin Image snapshots.

Detail: The VSS driver in VMware Tools includes a VSS Requestor and a VSS Snapshot Provider. The VSS Requestor is available inside the supported guest and operates at the VM level. When a snapshot includes the quiesce option, the host requests the guest Windows OS to quiesce the disks via the VSS Requestor in VMware Tools. When the application is quiesced, the VSS Requestor notifies the host and the snapshot is created. It is possible to achieve application-level quiescing with VMware Tools. As Virtual Infrastructure Integrator calls a VM snapshot during its backup and cloning process, it automatically inherits an application consistent backup. That is, the snapshots and clones are application consistent.

15. How can I ensure a Virtual Infrastructure Integrator deployment is compliant with best practices for optimal performance? Can the compliance dashboard be customized?

Hitachi Virtual Infrastructure Integrator software's compliance validation feature (see Figure 4) helps to ensure compliance with Hitachi NAS Platform best practices for using the Virtual Infrastructure Integrator with VMware vSphere environments.

The checks validate that the environment is optimally configured as a NFS shared-storage resource. After the checks run, the software reports any noncompliance with Hitachi NAS Platform NFS best practices in the summary information of the Hitachi Virtual Infrastructure Integrator GUI and displays the recommended configuration. You can then use that information to fine tune Hitachi NAS Platform storage and VM provisioning for best possible performance and optimized storage space usage. Best practice variables are coded into the compliance dashboard, and they cannot be changed after leaving the factory. In the current release, the compliance dashboard is available only for file and not block.

The screenshot shows the 'Compliance Dashboard' with the 'Hosts' tab selected. The dashboard is titled 'Hitachi NAS NFS Best Practices Compliance Dashboard' and has sub-tabs for 'Hosts', 'HNAS Storage Servers', and 'Datastores'. The 'List of Hosts' section contains a table with the following data:

Name	Status
172.20.162.9	Non-Compliance
172.20.162.135	Non-Compliance
172.20.162.151	Non-Compliance

The 'Best Practices Parameters' section contains a table with the following data:

HNAS NFS Best Practices for VMWare ESXi Host	Status	Value	Description
Max NFS mounts per Host set to 128 or greater	Normal	8	The maximum number of NFS mounts per Host should be set to 128 or greater.
TCP/IP Heap Size per Host	Non-Compliance	0	The TCP/IP Heap size per Host should be set to 32.
TCP/IP maximum Heap Size per Host	Non-Compliance	256	The maximum TCP/IP Heap size per Host should be set to 256.
NFS Heartbeat frequency per Host	Normal	12	The NFS Heartbeat frequency per Host should not be greater than 12.

The 'Details' section is divided into two parts: 'Corrective Action' and 'Non Compliance Details'. The 'Corrective Action' section contains the text: 'See the VMware documentation to change the Net.TcplpHeapSize and Net.TcplpHeapMax settings.' The 'Non Compliance Details' section contains the text: 'VMware vSphere setting for Net.TcplpHeapSize is currently '0' and the setting for the Net.TcplpHeapMax is currently '256'. Net.TcplpHeapSize should be set to 32 and Net.TcplpHeapMax should be set to 256.'

Figure 4. Compliance Dashboard Showing Hosts Tab

16. Which vSphere and vCenter versions does Virtual Infrastructure Integrator support?

In the current release, Virtual Infrastructure Integrator supports only vSphere 5.5 and vSphere 6.0.

17. Is there integration with other virtualization platforms?

The current version is VMware only.

## Licensing

18. How is Hitachi Virtual Infrastructure Integrator v3 licensed and priced?

Customers purchase a Virtual Infrastructure Integrator license based on VMware datastore capacity being protected per storage system, or choose the unlimited license per system. This is a very cost-effective solution. Customers have the option to upgrade to an unlimited license upon reaching a certain capacity ceiling per storage system.

19. Is pricing Virtual Infrastructure Integrator for Hitachi NAS Platform storage per node?

Yes, essentially storage node-based pricing is used with capacity and an unlimited option. For example, consider capacity of cluster x quantity of nodes. (Pricing is capped at two nodes; we don't charge additional for other nodes in the cluster.) Pricing is on par with pricing for VSP G600. Our expectation is that most companies will choose the unlimited license (equivalent to a node-based license), which is also price-capped at two nodes.

20. How will Virtual Infrastructure Integrator help organizations save money?

- Lower the cost of backup by moving toward a space-efficient snapshot and replicate model for data protection in comparison to legacy backup methodologies.
- Simplify data management and increase administrative productivity (opex).



## Virtual Infrastructure Integrator for Block

21. Is the block support granular down to the individual VM in terms of Thin Image overhead or is it "LUN-wide" snapshot protection or overhead?

When we protect a single VM, we create a Thin Image for the entire LUN. It isn't feasible for Virtual Infrastructure Integrator to protect only one VM using Thin Image, as Thin Image protects the entire LUN. However, Virtual Infrastructure Integrator will allow you to restore only a single VM.

22. After a VM is unregistered and deleted and then the file clone is restored, the customer finds they made a mistake and want to replace the original VM that was restored over, is there a way to get it back since file clone is just a pointer?

Yes. When we do a restore, we do not change the backup. If the user makes a mistake and restores the wrong version of the VM, they can do another restore (assuming the backup has not been dropped as part of the retention schedule) of a different backup. Without a backup, there is no way to go back to the VM that was overwritten by the restore.

23. During restore workflow for block, do I have to delete the old virtual machine disk (VMDK) files?

No. Virtual Infrastructure Integrator will automatically unregister the old VM, delete the VMDKs and re-register the VM from the snapshot backup. At this point, the VM is available and the software will initiate a Storage vMotion to bring that particular VM back from the snapshot backup to the production datastore.

24. Does Virtual Infrastructure Integrator for block still offer per VM or group scheduling or only per datastore scheduling?

Yes, Virtual Infrastructure Integrator offers per VM, per vApp, per group, and per block datastore scheduling.

25. Are we specifying and/or restricting a maximum number of block Thin Image backups per VM or datastore via Virtual Infrastructure Integrator?

No. We are only limited by the available capacity on the Thin Image pool and any inherent limitations by the storage system microcode.

26. Is the backup performance on block as quick as it is on HNAS? Is it the same for a 1GB LUN and 1TB LUN?

Yes, the performance is different but much faster than legacy backup, with some variability depending on the block platform being used. For example, a 2TB backup should be under 30 seconds on block and roughly 8 seconds on file. Block snapshot processing includes additional tasks, such as adding the snapshot volume to host groups.

27. Can snapshot backups be replicated to another storage system via Virtual Infrastructure Integrator for block, or will this need separate management?

Virtual Infrastructure Integrator v3 does not support replicating block Thin Images (Virtual Infrastructure Integrator block datastore backups). HDS recommends Hitachi Replication Manager (HRpM) or Hitachi Data Instance Director (HDID) for this capability.

28. Does Virtual Infrastructure Integrator for block support backup and restoring individual VMs or the whole datastore?

Virtual Infrastructure Integrator supports restoring individual VMs or restoring individual files within the VM. We do not support and do not plan to support restoring an entire datastore as this would be the same as a revert operation performed by the storage administrator.

## Virtual Infrastructure Integrator and Interplay With Other Products

29. Can Virtual Infrastructure Integrator server and Hitachi Data Instance Director server coexist on one Microsoft Windows Server® VM?

We are working with the HDID development team on a future release of HDID. We do not anticipate any inherent conflicts that would prevent both existing on the same Windows Server VM, but we aren't far enough along in the integration to commit to a specific answer at this time.

30. Will Virtual Infrastructure Integrator support RDMs (raw device mapping)?

No, it will not work with VMs that have a raw device map. It supports VMFS and NFS datastores.

31. Is there any integration with Hitachi Data Protection Suite, powered by CommVault with IntelliSnap technology?

No, IntelliSnap is an alternative or competitive solution; it provides broader application-consistent snapshot support on HDS block storage, but does not support snapshots or clones on HNAS.

32. When will virtual volumes (VVol) be supported and what changes will this cause?

VVols will be supported in a future release. This shouldn't cause any changes to the block or file use cases. Of course, there will be additional Virtual Infrastructure Integrator nodes and an additional configuration screen.

## Additional Information

33. Where can I get additional information regarding Virtual Infrastructure Integrator?

- HDS.com: <http://www.hds.com/solutions/virtualization/vmware-vmware/data-protection/virtual-infrastructure-integrator.html>
- VMware Solution Exchange: <https://solutionexchange.vmware.com/store/products/hitachi-virtual-infrastructure-integrator>

34. Who do I contact for further questions on Virtual Infrastructure Integrator?

For more information or help with an opportunity, please contact [DP-PM@hds.com](mailto:DP-PM@hds.com) or [vmware@hds.com](mailto:vmware@hds.com)