



IBM XIV Host Attachment Kit for Linux

Version 1.6.0

Release Notes

First Edition (May 2011)





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This document edition applies to Version 1.6.0 of the IBM XIV Host Attachment Kit for Linux software package. Newer document editions may be issued for the same product version in order to add missing information or amend typographical errors. The edition is reset to 'First Edition' for every new product version.

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Overview

The IBM® XIV® Host Attachment Kit (HAK) for Linux is a software pack that simplifies the task of connecting a Linux host to the IBM XIV Storage System. The HAK provides a set of CLI-based tools that automatically detect any physically connected XIV storage system (single system or an array), define the host on the XIV storage system, and apply best-practice native Linux multipath configuration.

After the connection is established, XIV-based storage volumes can be mapped to the host without any additional manual configuration, and can be accessed and used from the host for a range of storage operations.

Compatibility and requirements

The IBM XIV Host Attachment Kit for Linux is compatible with different versions of the Linux operating system and the XIV storage system, as well as with different HBAs and multipath solutions. Certain software packages, patches, or drivers must be installed on the host, as detailed in the following subsections.

Note: This section applies to Version 1.6.0. For information about the compatibility and requirements of a previous Host Attachment Kit version, refer to its relevant release notes.

Supported Linux versions

The IBM XIV Host Attachment Kit for Linux supports different Linux versions or editions, as listed in the following table.

Operating system	Architecture	Compatibility note
Red Hat Enterprise Linux (RHEL) 4.5 – 4.8	x86, x64	Boot from SAN is not available.
Red Hat Enterprise Linux (RHEL) 5.1 – 5.6	x86, x64	
Red Hat Enterprise Linux (RHEL) 6.0	x86, x64	
SUSE Linux Enterprise Server (SLES) 10	x86, x64	<ul style="list-style-type: none"> • Tested with Service Pack 2 and Service Pack 3. • Boot from SAN is not available.
SUSE Linux Enterprise Server (SLES) 11	x86, x64	<ul style="list-style-type: none"> • Tested without and with Service Pack 1. • Boot from SAN is available, but without multipath support (not recommended).

Supported XIV storage systems

The IBM XIV Host Attachment Kit for Linux supports different microcode versions of the IBM XIV Storage System, as listed in the following table.

Storage system	Microcode version	Compatibility note
IBM XIV Storage System	10.1.0	N/A
	10.2.0 and 10.2.2	N/A
	10.2.4 and 10.2.4a	N/A

Supported HBAs

The IBM XIV Host Attachment Kit for Solaris supports different host bus adapter (HBA) brands and types. For the latest support information and compatibility matrix, see the IBM System Storage Interoperability Center at the following web address:

<http://www-03.ibm.com/systems/support/storage/config/ssic>

Note: For best performance, install the latest firmware and drivers for the HBAs that are in use. The HBA vendor should provide the latest firmware and drivers.

Supported multipath and I/O solutions

The IBM XIV Host Attachment Kit for Linux supports the following multipath solutions:

- Native multipath I/O (MPIO)
- Veritas Dynamic Multipathing (DMP) 5.0

Required software on the host

Prior to installing the IBM XIV Host Attachment Kit for Linux and depending on the installed Linux version and storage connectivity type, specific software packages must be installed on the host, as specified in the following table.

Operating system	Connectivity type	Required software package
RHEL	Fibre Channel (FC)	<ul style="list-style-type: none"> • <code>device-mapper-multipath</code> • <code>sg3_utils</code>
SLES 10	Fibre Channel (FC)	<ul style="list-style-type: none"> • <code>multipath-tools</code> • <code>sg3_utils</code>
SLES 11	Fibre Channel (FC)	<ul style="list-style-type: none"> • <code>multipath-tools</code> • <code>scsi</code>
RHEL	iSCSI	<ul style="list-style-type: none"> • <code>iscsi-initiator-utils</code>
SLES 10, SLES 11	iSCSI	<ul style="list-style-type: none"> • <code>open-iscsi</code>

Change log

This section summarizes the changes made in different version releases of the IBM XIV Host Attachment Kit for Linux.

Version 1.6.0 (May 2011)

Version 1.6.0 includes the following enhancements and fixes:

- | | |
|------------------|--|
| HA-6559 | Enhancement: Added support for RHEL 6.0. |
| HA-18616* | Enhancement: <code>xiv_diag</code> now provides the HAK version number when used with the <code>--version</code> argument. |
| HA-22130* | Enhancement: More information is collected with the <code>xiv_diag</code> command. |
| HA-24970* | Enhancement: <code>xiv_devlist</code> can display LUN sizes in different capacity units, by using the <code>-u</code> or <code>--size-unit</code> argument.

Usage:
<code>-u SIZE_UNIT, --size-unit=SIZE_UNIT</code>
Valid <code>SIZE_UNIT</code> values: MB, GB, TB, MiB, GiB, TiB |
| HA-26338* | Enhancement: The <code>xiv_devlist</code> output can be saved to a file in CSV or XML format, by adding the <code>-f</code> or <code>--file</code> argument.

Usage:
<code>-f OUTFILE, --file=OUTFILE</code>
Valid <code>OUTFILE</code> values: CSV, XML |
| HA-26338* | Enhancement: Added an option to create a file output using the <code>-f/--file</code> argument with the <code>xiv_devlist</code> command. |
| HA-19839 | Fixed: On RHEL 4.0, <code>xiv_attach</code> fails and displays the "Function not implemented" error message when the native Linux drivers for QLogic HBAs are installed. |
| HA-18046* | Fixed: Erroneous text message prompted by the <code>xiv_attach</code> command. |
| HA-21456* | Fixed: Redirecting the <code>xiv_devlist</code> output results in a broken pipe error. |
| HA-22470* | Fixed: In some cases, the <code>xiv_devlist</code> output shows "N/A" in the Size field instead of the actual LUN size. |
| HA-22603 | Fixed: On RHEL, An exception failure occurs when running <code>xiv_devlist -m veritas</code> on RHEL while using non-Vritas VM/MP. |

HA-23250*	Fixed: <code>xiv_attach</code> crashes when a user who is not defined as a storage admin (user type) tries to define a host.
HA-26202	Fixed: <code>xiv_attach</code> displays an error when the <code>multipath.conf</code> file is not properly formatted.
HA-26601*	Fixed: <code>xiv_devlist</code> may cause a few non-IBM RAID controllers to lose a disk due to incorrect SCSI Test-Unit-Ready parsing.
HA-62263*	Fixed: Entering an invalid username or password results in a wrong error message.
HA-80659	Fixed: In some cases, <code>xiv_attach</code> fails to determine whether the Linux OS version is supported or not.

* Applies to all supported operating systems.

Version 1.5.2 (April 2010)

Version 1.5.2 included the following changes and fixes:

HA-9356	Change: The <code>xiv_devlist</code> command now sorts the listed devices by name.
HA-12551	<p>Change: The <code>40-multipath.rules</code> file is no longer overwritten.</p> <p>To prevent potential conflicts with the Red Hat updates to the <code>40-multipath.rules</code> file, the Host Attachment Kit now changes only the <code>last_rule</code> entry in the file.</p> <hr/> <p>Attention: If you are upgrading the Host Attachment Kit from an earlier version (prior to 1.5.2), ensure that the <code>40-multipath.rules</code> file (located in <code>/etc/udev/rules.d</code>) is based on the latest available Red Hat package.</p> <hr/>
HA-15750	Fixed: <code>xiv_diag</code> fails to collect the content of files under <code>/proc</code> and <code>/sys</code>

Version 1.5.1 (December 2009)

Version 1.5.1 included the following changes and fixes:

HA-6695	<p>Fixed: Not all commands work when using the "sudo" prefix.</p> <p>Commands that require super-user permissions to run can be prefixed with "sudo" when running them on a regular user shell.</p>
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HA-11858

Fixed: The `multipath.conf` verification and configuration fail whenever the `#` character is not present on the first column.

Comments are now accepted after white spaces and at the end of a configuration line.

HA-12104

Change: `xiv_diag` now uses compressed TAR archives.

Because ZIP files do not support empty directories, symbolic links, and so on, `xiv_diag` now uses compressed TAR archives to support these exceptions.

HA-12125

Fixed: `xiv_attach` crashes when using `/sys` scanning for XIV LUNs.

Occurred when the directory did not contain the expected files.

HA-12132

Fixed: Mpath sym-links are not created in the `dev/xiv` directory.

For example, the following folder is not created:

```
/dev/xiv/by-machine/MN00026/1123/mpath
```

Version 1.5.0 (November 2009)

Version 1.5.0 included the following enhancements, changes, and fixes:

HA-3965*

Enhancement: Automatic host definition on undefined XIV systems.

The `xiv_attach` and `admin` commands automatically detect undefined XIV storage systems and define the host on those systems.

HA-6151*

Enhancement: Added the `--version` command argument.

The `--version` command argument was added to the `xiv_fc_admin` and `xiv_iscsi_admin` commands. In addition, `xiv_attach` displays the HAK version in the Welcome banner.

HA-6281

Enhancement: New device hierarchy with consistent device names.

Each XIV-based volume is assigned with the same device name across all connected systems (for example:

```
/dev/xiv/bymachine/MN00022/351/mpath
```

on all systems).

In addition, the machine ID (MN00022) and volume ID (351) are presented as decimal numbers, and both the XIV GUI and the `xiv_devlist` command use these decimal numbers.

HA-6565*

Enhancement: Support for iSCSI connectivity with CHAP authentication.

The Host Attachment Kit supports attaching hosts for XIV systems using iSCSI with CHAP authentication.

The `xiv_iscsi_admin` and `xiv_attach` commands are CHAP-aware.

HA-6708*

Enhancement: Colored output for host attachment binaries.

Colored output added to the following commands:

- `xiv_attach`
- `xiv_iscsi_admin`
- `xiv_fc_admin`
- `xiv_devlist`
- `xiv_diag`

HA-9877*

Enhancement: Listing attached XIV systems.

The `xiv_attach`, `xiv_iscsi_admin` and `xiv_fc_admin` commands display the attached XIV systems along with basic connectivity information.

HA-9887*

Enhancement: Additions and changes to the `xiv_devlist` command.

- Added command-line arguments:
 - `-t xml` provides a new XML output format
 - `--hex` changes the machine ID from decimal to hexadecimal base
 - `-o all` adds all available fields to the table
 - `--xiv-only` lists only the XIV devices
 - `-d` writes debugging information to a file
- Wide-terminal-aware table output:
 - If the terminal width is long enough, each row in the table is printed on a single line.
 - If the terminal width is shorter than needed, the columns are wrapped where necessary.
- Changed the machine ID format to decimal base.
- Added verification that the user is running with root/administrator permissions.

HA-6956*

Change: Restructured host attachment tree.

The host attachment tree was restructured so that it will be consistent across all operating systems.

HA-5895

Change: Decouple FC-specific and iSCSI-specific functions

There is no longer a requirement for the iSCSI package to be installed on Linux for FC-only configurations.

HA-5436

Fixed: `multipath.conf` does not verify the presence of required functions.

HA-6152

Fixed: `xiv_diag` functionality issues.

HA-6157	Fixed: Multipath devices may disappear after attaching new LUNs and performing rescan.
HA-6723	Fixed: iSCSI rescan code may cause existing devices to disappear for a short while.
HA-9980*	Fixed: An error message stating "XPyV: command not found" appears in a first-time installation.
HA-9099	Fixed: On RHEL 5.3 and above, the multipath service cannot be restarted when a boot device is in multipath mode.
HA-10854	Fixed: The rescan operation may not remove all unmapped devices.
HA-10331	Fixed: The HAK installation fails if another installed package was detected as conflicting with Python.

* Applies to all supported operating systems.

Known limitations

This section details the known limitations in Version 1.6.0, along with possible workarounds (if workarounds are available).

HA-100800	<p>Mapping the LUN0 volume causes errors.</p> <p>Due to the distinctive properties of the XIV-based LUN0 volume (on any storage pool), mapping it to the host causes numerous errors or performance problems.</p> <p>Accordingly, mapping the LUN0 volume is not recommended.</p>
HA-6068	<p>Logical partitions are assigned with long non-friendly names.</p> <p>The non-friendly names are created in the <code>/dev/mapper/</code> directory. For example:</p> <pre>/dev/mapper/200173800012900edp5</pre>
HA-11718	<p>Unmapped LUNs are not always removed after the rescan.</p> <p>In some of the early RHEL 5.x releases, <code>multipathd</code> (responsible for removing stale multipath maps) stops reacting to <code>udev</code> events.</p> <p>Red Hat provides a fix for <code>multipath-tools</code> and <code>kpartx</code> at the following web address:</p> <p>https://rhn.redhat.com/errata/RHEA-2009-1377.html</p>
HA-19873	<p>When using <code>xiv_devlist</code>, a volume that is reserved by another host appears as an unreachable device.</p> <p>Currently there is no workaround for this limitation (HA-19873).</p>

HA-22503	<p>In RHEL 6.0, unmapped (or dead) LUNs are not removed from the <code>xiv_devlist</code> output the after performing rescan.</p> <p>To resolve this issue, wait a few minutes and then run:</p> <pre>multipath -f <problematic device></pre>
HA-37888	<p><code>xiv_devlist</code> does not identify LUN0.</p> <p>Currently there is no workaround for this limitation (HA-37888).</p>
HA-53631	<p><code>xiv_iscsi_admin -L</code> does not work when mapping LUN0.</p> <p>Currently there is no workaround for this limitation (HA-53631).</p>
HA-53672	<p><code>xiv_attach</code> may fail when used over iSCSI and the host is not connected to all the IP addresses reported by the <code>ipinterface_list</code> XCLI command.</p> <p>To avoid this issue, make sure that the host is connected to and can access all the reported IP addresses.</p>
HA-59872	<p>In RHEL 4.7 or in earlier versions, the QLogic HBA drivers may cause <code>xiv_devlist</code> not to show all the mapped volumes after performing rescan.</p> <p>To resolve this issue, install the latest QLogic HBA drivers or upgrade to a later RHEL version (4.8 or later).</p>
HA-62042	<p><code>xiv_iscsi_admin -R</code> hangs when host is detached from the XIV storage system.</p>
HA-63781	<p><code>xiv_attach</code> does not work in the first attempt over an iSCSI connection, and a retry is required.</p>
HA-65405	<p><code>xiv_attach</code> shows 'Unknown type' for the Hitachi HBA driver.</p> <p>Currently there is no workaround for this limitation (HA-65405).</p>
HA-80766	<p>iSCSI connections may not work properly on SUSE.</p> <p>Currently there is no workaround for this limitation (HA-80766).</p>
HA-101053	<p>When using <code>xiv_attach</code> over iSCSI on x86-based RHEL 6, a failure occurs on the last step in which the host is defined on the XIV system.</p> <p>To overcome this issue, after running <code>xiv_attach</code> and receiving the error message:</p> <ol style="list-style-type: none"> 1. Use <code>xiv_iscsi_admin -P</code> to detect all iSCSI addresses. 2. Define a new host on the XIV system by using the XIV GUI or XCLI, and add to this host the iSCSI posts that you found in the previous step.

HA-101685

The `/dev/xiv` directory contains alternative shortcuts to XIV storage system devices.

This directory is not fully available on:

- All SLES versions
- RHEL 4.x

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This section includes notices regarding reference publications, performance of IBM and non-IBM products, documentation format, help information, amendments, and trademarks.

Related publications

You can find additional information and publications related to the IBM XIV Host Attachment Kit for Linux on the following web addresses.

- IBM XIV Host Attachment Kit for Linux – User Guide, available on the IBM XIV Storage System Information Center:
<http://publib.boulder.ibm.com/infocenter/ibmxiv/r2>
- IBM XIV Storage System – Product Overview, Planning Guide, available under Publications on the IBM XIV Storage System Information Center (see the previous web address).
- IBM and Linux website:
<http://www-03.ibm.com/linux>

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