

IBM XIV Host Attachment Kit for Linux
Version 2.0.0

Release Notes



First Edition (March 2013)

This document edition applies to version 2.0.0 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 command-line interface (CLI) tools that help host administrators perform different host-side tasks, such as: detect any physically connected XIV storage system (single system or multiple systems), detect XIV volumes, define the host on the XIV storage system, run diagnostics, and apply best practice native multipath connectivity configuration on the host.

You can download the IBM XIV Host Attachment Kit software package at any time from the IBM Fix Central website (www.ibm.com/support/fixcentral).

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 2.0.0. 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
Red Hat Enterprise Linux (RHEL) 5.1 – 5.8	x86, x64
Red Hat Enterprise Linux (RHEL) 6.0 – 6.3	x86, x64
SUSE Linux Enterprise Server (SLES) 11	x86, x64
SUSE Linux Enterprise Server (SLES) 11 SP1	x86, x64
SUSE Linux Enterprise Server (SLES) 11 SP2	x86, x64

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
IBM XIV Storage System	10.2.x
	11.0.x, 11.1.x, 11.2.0

Note: Newer microcode versions may also be compatible. Refer to the latest XIV storage system release notes when a new XIV microcode version becomes available. You can obtain the latest XIV storage system release notes on the IBM XIV Storage System Information Center (publib.boulder.ibm.com/infocenter/ibmxiv/r2).

Supported HBAs

The IBM XIV Host Attachment Kit for Linux supports different host bus adapter (HBA) brands and types.

For the latest support information and compatibility matrix, see the IBM System Storage® Interoperation Center website (www.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 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 or 5.1 (including native support for XIV in Veritas Storage Foundation 5.1)

Important: For proper Active/Active multipathing using Veritas Dynamic Multipathing 5.0, install the Symantec Array Support Library for IBM XIV, which can be downloaded from the Symantec website (www.symantec.com/business/support/index?page=content&id=TECH77828).

Required software on the host

Prior to installing the IBM XIV Host Attachment Kit for Linux, depending on the installed Linux version (RHEL or SLES) and storage connectivity type (FC or iSCSI) – specific software packages must be installed on the host, as detailed in the following table.

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

Change log

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

Version 2.0.0 (March 2013)

Version 2.0.0 includes the following enhancements.

Ticket ID	Description
HA-26055*	Enhancement: A new host diagnostics utility, Host Profiler (xiv_host_profiler), is now available. The utility collects comprehensive host configuration information, creates a profile based on this information, and allows detailed analysis of the collected information. For more information, refer to the Diagnostics chapter in the IBM XIV Host Attachment Guide.
HA-251470	Enhancement: Reduced HAK package size, requiring less disk space.

* Applies to all supported operating systems.

Version 1.10.0 (September 2012)

Version 1.10.0 included the following changes and fixes.

Ticket ID	Description
HA-236975	Change: On RHEL 6.3 or later, the xiv_attach and xiv*_admin commands no longer configure the <code>multipath.conf</code> file. The known devices list in <code>device-mapper-multipath</code> already includes the optimal configuration for the XIV storage system.
HA-101061	Fixed: On RHEL 6, errors are encountered when extracting an xiv_diag generated file that includes linked files.
HA-236858*	Fixed: xiv_devlist does not display the correct size of volumes that are larger than 2.2 TB.
HA-242439	Fixed: xiv_diag reads files from the <code>/sys</code> directory to collect and pack information in the xiv_diag output package, causing errors.

* Applies to all supported operating systems.

Version 1.9.0 (June 2012)

Version 1.9.0 added support for RHEL 6.3, and included the following enhancements and fixes.

Ticket ID	Description
HA-10663	<p>Enhancement: Detailed on-screen help prompt is now available for the different HAK utilities using the man command option in the following format:</p> <pre>man xiv_attach man xiv_fc_admin man xiv_iscsi_admin man xiv_syslist man xiv_devlist man xiv_diag</pre>
HA-73943*	<p>Enhancement: The --path optional argument is now available for the xiv_diag command, allowing one-step definition of the directory into which the report file should be generated. For more information, refer to the user guide.</p>
HA-233433*	<p>Fixed: In some cases, xiv_syslist may fail with a general error prompt (ValueError exception).</p>
* Applies to all supported operating systems.	

Version 1.8.0 (March 2012)

Version 1.8.0 included the following enhancements and fixes.

Ticket ID	Description
HA-179589*	<p>Enhancement: A new utility, xiv_syslist, has been added to the IBM XIV Host Attachment Kit in order to provide broader and more customized information than the output of the xiv_fc_admin -L and xiv_iscsi_admin -L commands.</p> <p>Using the xiv_syslist command and its optional arguments, users can view different details of all XIV storage systems that are connected to the host. For more information, refer to the IBM XIV Host Attachment Guide.</p>
HA-172254	<p>Fixed: In some cases, xiv_devlist -o returns an exception error on SLES 11.</p>
HA-169596	<p>Fixed: On SLES 11 Service Pack 1, xiv_attach reports the multipath service as 'NOT OK' if there are no volumes that are mapped to the host.</p>
* Applies to all supported operating systems.	

Version 1.7.1 (December 2011)

Version 1.7.1 added support for Red Hat Enterprise Linux (RHEL) versions 5.7 and 6.1.

In addition, version 1.7.1 included the following enhancements and fixes:

Ticket ID	Description
HA-12785	<p>Enhancement: Detailed command information can be displayed with a new verbosity argument.</p> <p>You can display detailed information regarding a HAK command by using the --verbose or -i argument. For more information about this new argument, refer to the IBM XIV Host Attachment Guide.</p>
HA-53672	<p>Fixed: xiv_attach may fail when the connectivity with at least one iSCSI target cannot be established.</p>
HA-63781	<p>Fixed: xiv_attach does not work in the first attempt over an iSCSI connection, and a retry is required.</p>
HA-163382*	<p>Fixed: An exception occurs when trying to define the host on the XIV storage system with incorrect XIV credentials.</p>
HA-163587	<p>Fixed: On RHEL 5.7 and 6.1, running xiv_attach over iSCSI results in a failure message.</p>
HA-164862	<p>Fixed: On RHEL 6.1, an invalid syntax error message may appear when the host is being defined by xiv_attach on the XIV storage system.</p>
HA-170861	<p>Fixed: Due to a known issue in SLES 11 (584372), using xiv_diag on SLES 11 may cause the host to crash.</p>
* Applies to all supported operating systems.	

Version 1.7.0 (September 2011)

Version 1.7.0 added support for the XIV Gen3 hardware configuration and for version 11.0 of the IBM XIV microcode.

In addition, version 1.7.0 included the following enhancements, changes, and fixes:

Ticket ID	Description
HA-159503*	<p>Enhancement: Portable HAK.</p> <p>Instead of installing the HAK locally on each host, it can be used from a mounted network drive or from a portable USB flash drive. For more information about this enhancement, refer to the user guide.</p>
HA-23373*	<p>Enhancement: xiv_fc_admin -L now displays all four levels of the XIV microcode version number, in the x.y.z.n format.</p> <p>For example: 10.2.4.1 is displayed for microcode 10.2.4a, 10.2.4.2 is displayed for microcode 10.2.4b.</p>

Ticket ID	Description
HA-102685	<p>Change: The <code>/dev/xiv</code> link creation feature has been disabled.</p> <p>When performing a clean installation or when using the portable HAK on a new host, the <code>/dev/xiv/</code> links are no longer created for XIV devices. When upgrading from a previously installed HAK version, existing <code>/dev/xiv/</code> links are disabled.</p>
HA-121647*	<p>Change: The IBM Storage Solutions External Runtime Components (previously named "XPyV") are now integrated within the HAK code, rather than installed separately.</p>
HA-114392	<p>Fixed: <code>/dev</code> directory error occurs when running <code>xiv_diag</code> on RHEL 5.6.</p>
HA-124644	<p>Fixed: Invalid configuration options, such as <code>polling_interval</code>, <code>prio</code>, and <code>prio_callout</code> are written to the <code>multipath.conf</code> file.</p>
* Applies to all supported operating systems.	

Version 1.6.0 (May 2011)

Version 1.6.0 included the following enhancements and fixes.

Ticket ID	Description
HA-6559	<p>Enhancement: Added support for RHEL 6.0.</p>
HA-18616*	<p>Enhancement: <code>xiv_diag</code> now provides the HAK version number when used with the <code>--version</code> argument.</p>
HA-22130*	<p>Enhancement: More information is collected with the <code>xiv_diag</code> command.</p>
HA-24970*	<p>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.</p>
HA-26338*	<p>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.</p>
HA-26338*	<p>Enhancement: Added an option to create a file output using the <code>-f/--file</code> argument with the <code>xiv_devlist</code> command.</p>
HA-19839	<p>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.</p>
HA-18046*	<p>Fixed: Erroneous text message prompted by the <code>xiv_attach</code> command.</p>
HA-21456*	<p>Fixed: Redirecting the <code>xiv_devlist</code> output results in a broken pipe error.</p>
HA-22470*	<p>Fixed: In some cases, the <code>xiv_devlist</code> output shows "N/A" instead of the actual volume size.</p>

Ticket ID	Description
HA-22603	Fixed: On RHEL, An exception failure occurs when running xiv_devlist -m veritas on RHEL while using non-Vritas VM/MP.
HA-23250*	Fixed: xiv_attach crashes when a user who is not defined as a storage admin (user type) tries to define a host.
HA-26202	Fixed: xiv_attach displays an error when the multipath.conf file is not properly formatted.
HA-26601*	Fixed: xiv_devlist 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, xiv_attach 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.

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

Version 1.5.1 (December 2009)

Version 1.5.1 include the following changes and fixes.

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

Ticket ID	Description
HA-11858	Fixed: The <code>multipath.conf</code> verification and configuration fail whenever the <code>#</code> character is not present on the first column.
HA-12104	Change: <code>xiv_diag</code> now uses compressed TAR archives. Because ZIP files do not support empty directories, symbolic links, and so on, <code>xiv_diag</code> now uses compressed TAR archives to support these exceptions.
HA-12125	Fixed: <code>xiv_attach</code> crashes when using <code>/sys</code> scanning for XIV LUNs. Occurred when the directory did not contain the expected files.
HA-12132	Fixed: Multipath symlinks are not created in the <code>dev/xiv</code> directory. For example, the following folder is not created: <code>/dev/xiv/by-machine/MN00026/1123/mpath</code>

Version 1.5.0 (November 2009)

Version 1.5.0 included the following enhancements, changes and fixes.

Ticket ID	Description
HA-3965*	Enhancement: Automatic host definition on undefined XIV systems. The <code>xiv_attach</code> and <code>admin</code> commands automatically detect undefined XIV storage systems and define the host on those systems.
HA-6151*	Enhancement: Added the <code>--version</code> command argument. The <code>--version</code> command argument was added to the <code>xiv_fc_admin</code> and <code>xiv_iscsi_admin</code> commands. In addition, <code>xiv_attach</code> 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: <code>/dev/xiv/bymachine/MN00022/351/mpath</code> 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 <code>xiv_devlist</code> command use these decimal numbers.

Ticket ID	Description
HA-6565*	<p>Enhancement: Support for iSCSI connectivity with CHAP authentication.</p> <p>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.</p>
HA-6708*	<p>Enhancement: Colored output for host attachment binaries.</p> <p>Colored output added to the following commands:</p> <ul style="list-style-type: none"> • xiv_attach • xiv_iscsi_admin • xiv_fc_admin • xiv_devlist • xiv_diag
HA-9877*	<p>Enhancement: Listing attached XIV systems.</p> <p>The xiv_attach, xiv_iscsi_admin and xiv_fc_admin commands display the attached XIV systems along with basic connectivity information.</p>
HA-9887*	<p>Enhancement: Additions and changes to the xiv_devlist command.</p> <ul style="list-style-type: none"> • Added command-line arguments: <ul style="list-style-type: none"> – -t xml provides a new XML output format – --hex changes the machine ID from decimal to hexadecimal base – -o 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. Alternatively, 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*	<p>Change: Restructured host attachment tree.</p> <p>The host attachment tree was restructured so that it will be consistent across all operating systems.</p>
HA-5895	<p>Change: Decouple FC-specific and iSCSI-specific functions</p> <p>There is no longer a requirement for the iSCSI package to be installed on Linux for FC-only configurations.</p>
HA-5436	<p>Fixed: <code>multipath.conf</code> does not verify the presence of required functions.</p>
HA-6152	<p>Fixed: xiv_diag functionality issues.</p>

Ticket ID	Description
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 issues

This section details the known issues in version 2.0.0, along with possible workarounds (if workarounds are available).

Ticket ID	Description
HA-159609	When no volumes are mapped to the host, the iSCSI daemon does not start. Thus the configuration task <code>iscsi</code> service fails. Use RHEL 6.2 or later to resolve the issue.
HA-100800	Mapping the LUN0 volume causes errors. Due to the distinctive properties of the XIV LUN0 volume (on any storage pool), mapping it to the host causes numerous errors or performance problems. Accordingly, mapping the LUN0 volume is not recommended.
HA-11718	Unmapped LUNs are not always removed after the rescan. In some of the early RHEL 5.x releases, multipathd (responsible for removing stale multipath maps) stops reacting to udev events. Red Hat provides a fix for multipath-tools and kpartx at the Red Hat Customer Portal website (rhn.redhat.com/errata/RHEA-2009-1377.html).
HA-22503	On RHEL 6 and SLES 11, unmapped (or dead) LUNs are not removed from the <code>xiv_devlist</code> output the after performing rescan. To resolve this issue, wait a few minutes and then run: multipath -f <problematic device>

Ticket ID	Description
HA-37888	<p>xiv_devlist does not identify LUN0.</p> <p>Currently there is no workaround for this limitation (HA-37888).</p>
HA-65405	<p>xiv_attach shows 'Unknown type' for the Hitachi HBA driver.</p> <p>Currently there is no workaround for this limitation (HA-65405).</p>
HA-91689	<p>A host cannot be attached over iSCSI if it is already attached over FC.</p> <p>Workaround: The host can be defined manually on the XIV system using the XIV GUI or XIV CLI.</p>
HA-101053	<p>When using xiv_attach over iSCSI on x86-based RHEL 6 or RHEL 5, a failure may occur on the last step in which the host is defined the XIV storage system. This applies to XIV microcode versions 10.2.4.x and 11.0.x.</p> <p>To resolve this issue, manually configure the host on the XIV system as follows:</p> <ol style="list-style-type: none"> 1. Use xiv_iscsi_admin -P to detect all iSCSI addresses of the host. 2. Define a new host on the XIV system by using the XIV GUI or XCLI, and add this host the iSCSI posts that you found in the previous step.
HA-163935	<p>xiv_diag may hang when unreachable block devices are present.</p> <p>Regardless of this issue, the xiv_diag log file (xiv_diag_results*.tar.gz) is properly generated. To avoid this issue, remove all unreachable block devices before running xiv_diag. Also, due to a known issue in RHEL 6 (631009 (https://bugzilla.redhat.com/show_bug.cgi?id=631009)), you may need to use multipath -f <mpath device> to clean up all multipath devices.</p>
HA-165868	<p>The user_friendly_names multipath parameter is automatically assigned with 'yes'.</p> <p>Workaround: If you want to use non-friendly names, manually change the parameter value to 'no'.</p>
HA-165914	<p>udev-related problems may occur on hosts that were upgraded from HAK versions earlier than 1.7.0.</p> <p>To resolve this issue, manually delete the udev rule in /dev/udev/rules.d/44-ibm-xiv.rules. You might need to reload the udev rules or reboot the host.</p> <p>Note: This workaround removes the /dev/xiv device tree, as in a clean HAK installation.</p>

Ticket ID	Description
HA-169363	<p>On RHEL 4, xiv_attach may not detect an XIV LUN0 device over iSCSI, resulting in inability to define the host on the XIV storage system.</p> <p>To resolve this issue, use the XIV GUI or XIV CLI (XCLI) to manually define the host and its ports.</p>
HA-171098	<p>Due to a known issue in RHEL 6 (662433 (bugzilla.redhat.com/show_bug.cgi?id=662433)), hosts that use mapped volumes over iSCSI might freeze during an OS shutdown or reboot.</p> <p>If this occurs, power off and restart the host manually.</p> <p>To avoid this issue, upgrade to RHEL 6.3.</p>
HA-227476	<p>If XIV volumes mapped to a host that regularly boots from SAN, deleting a WWPN associated with these volume mappings causes the server to hang.</p> <p>Currently there is no workaround for this limitation (HA-227476).</p>
HA-251225	<p>The xiv_host_profiler and xiv_syslist utilities might not detect all connectivity parameters if the host uses HBAs manufactured by LSI. In such a case, the utilities would not be able to determine whether the host is connected to two or more XIV modules, and the xiv_host_profiler --analyze command will report that the host is not properly configured.</p> <p>Currently there is no workaround for this limitation (HA-251225), and you need to manually check whether the host is connected to at least two XIV modules (if LSI HBAs are used).</p>
HA-254724	<p>When running the xiv_host_profiler --create-scheduled-task command and no crontab file exists for the root user, a Linux message stating 'No crontab for root' is displayed.</p> <p>This is a one-time occurrence that has no impact on the creation of the scheduled task.</p>
HA-255825	<p>The upload of the host profile to the XIV storage system fails silently (without any indication) in the following host configuration:</p> <ol style="list-style-type: none"> <li>1. The host is connected to the XIV storage system over iSCSI, and – <li>2. The host HBA FC ports are zoned with the FC targets of the XIV storage system, but are not registered with it. <p>To resolve this issue, remove the host HBA FC port zoning with the FC targets of the XIV storage system.</p>

Related information and publications

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

- IBM Storage Host Software Solutions Information Center (publib.boulder.ibm.com/infocenter/strhosts/ic)
- IBM XIV Storage System Information Center (publib.boulder.ibm.com/infocenter/ibmxiv/r2)
- IBM and Linux website (www.ibm.com/linux)

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