

IBM Storage Host Attachment Kit for Linux
Version 2.9.0

Release Notes



First Edition (March 2018)

This document edition applies to version 2.9.0 of the IBM Storage Host Attachment Kit for Linux software package. Newer document editions may be issued for the same version in order to add missing information, update information, or amend typographical errors. The edition is reset to "First Edition" for every newly released version.

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Overview

The IBM® Storage Host Attachment Kit (HAK) for Linux is a software pack that simplifies the task of connecting a Linux host to the IBM storage systems.

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 storage system (single system or multiple systems), detect storage volumes, define the host on the storage system, run diagnostics, and apply best practice native multipath connectivity configuration on the host.

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

What's new in version 2.9.0

Version 2.9.0 adds support for Red Hat Enterprise Linux (RHEL) versions 6.9 and 7.4, and SUSE Linux Enterprise Server (SLES) 12 SP3. In addition, it resolves miscellaneous issues.

General availability date: 14 March 2018

For more information about the fixes in version 2.9.0, see “Change log” on page 3.

Compatibility and requirements

The IBM Storage Host Attachment Kit for Linux is compatible with different versions of the Linux operating system and the 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 2.9.0. For information about the compatibility and requirements of a previous Host Attachment Kit version, refer to its relevant release notes. In addition, the HAK lifecycle and support matrix (www.ibm.com/support/knowledgecenter/SSEPRF/landing/css_lifecycle_support_matrix_hak.html) details the HAK lifecycle with compatible storage system microcode versions and supported operating system releases.

Supported Linux versions

Version 2.9.0 of the IBM Storage Host Attachment Kit for Linux supports different Linux versions and editions, as listed in the following table. All listed Linux releases support IBM HyperSwap solution.

| Operating system | Architecture |
|---|-------------------------------------|
| Red Hat Enterprise Linux (RHEL) 6.4–6.9 | x86, x64, POWER7®/8 (if applicable) |
| Red Hat Enterprise Linux (RHEL) 7.0–7.4 | x64, POWER7/8 (if applicable) |
| CentOS Linux 7.x | x64 |

| Operating system | Architecture |
|--|------------------------------------|
| SUSE Linux Enterprise Server (SLES) 11 SP3, SP4 | x86, x64, POWER7/8 (if applicable) |
| SUSE Linux Enterprise Server (SLES) 12 | x64, POWER7/8 (if applicable) |
| SUSE Linux Enterprise Server (SLES) 12 SP1, SP2, SP3 | x64, POWER7/8 (if applicable) |

Note: For details on Linux support on IBM Power Systems™ servers, refer to IBM Knowledge Center.

Supported storage systems

Version 2.9.0 of the IBM Storage Host Attachment Kit for Linux supports different microcode versions of the IBM storage systems, as listed in the following table.

| Storage system | Microcode version |
|--------------------------|--|
| IBM XIV® Storage System | 11.1.x, 11.2.x, 11.3.x, 11.4.x, 11.5.x, 11.6.x |
| IBM Spectrum Accelerate™ | 11.5.x |
| IBM FlashSystem® A9000 | 12.0.x, 12.1.x, 12.2.x |
| IBM FlashSystem A9000R | 12.0.x, 12.1.x, 12.2.x |

Note: Newer microcode versions may also be compatible. When a newer microcode version becomes available, refer to the latest storage system release notes to check whether the new microcode version is also supported. In addition, the HAK lifecycle and support matrix (ibm.com/support/knowledgecenter/SSEPRF/landing/css_lifecycle_support_matrix_hak.html) details the HAK lifecycle with compatible storage system microcode versions and supported operating system releases.

Supported HBAs

The IBM Storage 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).

Important: For iSCSI connectivity, only iSCSI software initiators are supported. Hardware iSCSI HBAs are not supported.

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 Storage Host Attachment Kit for Linux supports the following multipath solutions:

- Native Device Mapper-Multipath (DM-MP), including the device-mapper multipath switch (*dm-switch*) module.

- Veritas Dynamic Multipathing (DMP). For the details of the supported DMP versions and of the HyperSwap support with DMP, refer to the IBM System Storage Interoperation Center.

Important: Using more than one multipath I/O framework on the same host is not supported.

Required software on the host

Prior to running the IBM Storage 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 |
|---|--------------------|--|
| Red Hat Enterprise Linux (RHEL), CentOS Linux | 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 |
| SUSE Linux Enterprise Server (SLES) | 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 Storage Host Attachment Kit for Linux.

Version 2.9.0 (March 2018)

Version 2.9.0 adds support for Red Hat Enterprise Linux (RHEL) versions 6.9 and 7.4, and SUSE Linux Enterprise Server (SLES) 12 SP3. Additional changes in version 2.9.0:

| Ticket ID | Description |
|------------|--|
| HA-262045* | Fixed: When a volume is moved to another storage system, using IBM Hyper-Scale Mobility technology, the dev_list command output fails to display the correct serial number of the target storage system. |
| HA-262054* | Fixed: When a highly-available volume, residing on a primary storage system in HyperSwap, is unmapped from the host, the xiv_devlist command output displays secondary storage, as the current storage system. |

* Applies to all supported operating systems.

Version 2.8.0 (June 2017)

Version 2.8.0 added integration with IBM HyperSwap solution, as introduced by the FlashSystem A9000 and A9000R storage systems (version 12.1). Additional changes in version 2.8.0:

| Ticket ID | Description |
|------------|--|
| HA-261963* | Enhancement: Added support for Veritas Dynamic Multipathing version 7.x. |
| HA-261976* | Enhancement: The HAK multipath configuration has been updated to support the IBM HyperSwap solution. |
| HA-261979* | Enhancement: The <code>xiv_devlist</code> command output indicates the HyperSwap mode of the volume (stretched or regular). |
| HA-261987* | Enhancement: The <code>xiv_devlist</code> command output displays the name of the remote storage system in the IBM HyperSwap solution. |
| HA-261965* | Fixed: The <code>xiv_host_profiler</code> command with the <code>--set-password</code> and <code>--storage</code> arguments fails due to discrepancy between the <code>--storage</code> value and the system serial number of the storage system itself. This update requires resetting the current password. |
| HA-261968* | Fixed: HAK fails to add the WWPN wildcard of the FlashSystem A9000/A9000R storage systems to the <code>multipath.conf</code> blacklist exception section. This occurs, when a BFS (Boot from SAN) host is attached, using the <code>xiv_attach</code> , <code>xiv_iscsi_admin</code> or <code>xiv_fc_admin</code> commands. |

* Applies to all supported operating systems.

Version 2.7.0 (December 2016)

Version 2.7.0 improved security by adding ability to set passwords for hosts, accessing storage systems. Additional changes in version 2.7.0:

| Ticket ID | Description |
|------------|--|
| HA-261894* | Change: Added support for RHEL 6.8 |
| HA-62994* | Fixed: The <code>xiv_devlist</code> command output displays the current HAK version with uppercase <code>-V</code> . |
| HA-261877* | Fixed: Error messages generated, when invalid LDAP credentials are supplied, may be overly general without specifying the exact reason for host attachment failure. |

* Applies to all supported operating systems.

Version 2.6.0 (April 2016)

Version 2.6.0 added support for IBM FlashSystem A9000 and IBM FlashSystem A9000R storage systems with microcode 12.0. In addition, this version introduced support for RHEL 7.2, SLES 12 and SLES 12 SP1, including Linux support on IBM Power Systems servers.

Additional changes and fixes in version 2.6.0:

| Ticket ID | Description |
|------------|---|
| HA-261809* | Change: The xiv_syslist command output displays all supported storage system types. |
| HA-261811* | Change: The xiv_devlist command output displays all supported storage system types. |
| HA-261816* | Fixed: When running the xiv_attach command, scanning for FC-connected storage systems is performed, even if the user chooses not to complete it. |
| HA-261859* | Fixed: A general exception may occur during the xiv_iscsi_admin , xiv_fc_admin or xiv_attach command execution. |
| HA-261869* | Fixed: If during new iSCSI target discovery an IP address is unreachable on a single storage systems, the error message appears for all connected devices. |

* Applies to all supported operating systems.

Version 2.5.0 (September 2015)

Version 2.5.0 added support for XIV microcode version 11.6.x, IBM Spectrum Accelerate 11.5.1.x, and RHEL 7.1. In addition, this version introduced the host-side acceleration (HSA) for improved iSCSI communication between Spectrum Accelerate and a host.

Additional enhancements, changes and fixes in version 2.5.0:

| Ticket ID | Description |
|------------|--|
| HA-261623 | Enhancement: Provisions for enabling and configuring the HSA are added to the xiv_attach and xiv_iscsi_admin commands. For more information, refer to the user guide. |
| HA-261629* | Change: The -L option of the xiv_iscsi_admin and xiv_fc_admin commands is deprecated. Only the xiv_syslist -L command can be used for listing the attached storage systems, as detailed in HA-204578. For more information, refer to the user guide. |
| HA-261657 | Fixed: After upgrading from RHEL 5.x to 6.x, the xiv_devlist command may fail, when it is run by a host installed on an HP server. |

* Applies to all supported operating systems.

Version 2.4.0 (March 2015)

Version 2.4.0 added support for XIV microcode version 11.5.1 and IBM Spectrum Accelerate 11.5.0.b, and included the following enhancement and fix.

| Ticket ID | Description |
|-----------|--|
| HA-261509 | Enhancement: This new feature allows the host administrator to automatically discover and connect to new, already-attached iSCSI ports. For more information, refer to the user guide. |
| HA-261551 | Fixed: Syntax <code>-m --no-native-mp</code> has changed to <code>-m IGNORE</code> . |

Version 2.3.0 (August 2014)

Version 2.3.0 added support for XIV microcode version 11.5 and includes the following enhancements and fixes.

| Ticket ID | Description |
|------------|---|
| HA-250756* | Enhancement: The <code>--list (-L)</code> command option can be used with <code>xiv_diag</code> to display information that is to be gathered by the utility. For more information, refer to the user guide. |
| HA-261277 | Enhancement: The <code>--clean</code> command option can be used with <code>xiv_fc_admin --rescan</code> or <code>xiv_iscsi_admin --rescan</code> to remove unreachable devices from the host. For more information, refer to the user guide. |
| HA-261361* | Enhancement: Added support for the XIV multi-tenancy feature, allowing work with different and separate storage domains that are defined on the same XIV storage system. This enhancement applies only to XIV microcode version 11.5 or later. For more information, refer to the user guide. |
| HA-261367 | Enhancement: The <code>--no-native-mp (-M)</code> command option can be used with <code>xiv_fc_admin</code> and <code>xiv_iscsi_admin</code> to ignore the native multipath framework of the operating system when either the <code>-V</code> , <code>-C</code> , or <code>-R</code> option is used. For more information, refer to the user guide. |
| HA-22503 | Fixed: On RHEL 6 and SLES 11, unmapped (or dead) LUNs are not removed from the <code>xiv_devlist</code> output after performing rescan. |
| HA-91689 | Fixed: A host cannot be attached over iSCSI if it is already attached over FC. |
| HA-261223* | Fixed: A general error message appears when running <code>xiv_attach</code> , <code>xiv_fc_admin</code> , or <code>xiv_iscsi_admin</code> if non-English characters are used in the XIV credentials. |

* Applies to all supported operating systems.

Known issues

This section details the known issues in version 2.9.0 of the IBM Storage Host Attachment Kit for Linux, along with possible solutions or workarounds (if available).

| Ticket ID | Description |
|-----------|---|
| HA-37888 | <p>xiv_devlist does not identify LUN0.</p> <p>Currently there is no workaround or solution for this limitation.</p> |
| HA-65405 | <p>xiv_attach shows 'Unknown type' for the Hitachi HBA driver.</p> <p>Currently there is no workaround or solution for this limitation .</p> |
| HA-100800 | <p>Mapping the LUN0 volume causes errors.</p> <p>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.</p> <p>Accordingly, mapping the LUN0 volume is not supported.</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 (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> |

| Ticket ID | Description |
|-----------|--|
| 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 <code>/dev/udev/rules.d/44-ibm-xiv.rules</code>. You might need to reload the udev rules or reboot the host.</p> <p>Note: This workaround removes the <code>/dev/xiv</code> device tree, as in a clean HAK installation.</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-173095 | <p>If the host is predefined on the XIV storage system without CHAP authentication, using CHAP credentials during the attachment procedure (xiv_attach) silently succeeds, but does not apply any CHAP authentication.</p> <p>Workaround: Ensure that the host is already defined on the XIV storage system with a CHAP name and secret.</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 or solution for this limitation.</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, 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-261163 | <p>On RHEL 6 or SLES 11 SP3, xiv_devlist might hang after a volume is unmapped.</p> <p>To resolve this issue, restart the host.</p> |

| Ticket ID | Description |
|-----------|---|
| HA-261166 | <p>"No Adapter Found" message might appear in some cases when using xiv_host_profiler --create or xiv_host_profiler --analyze, even though a host bus adapter is actually found.</p> <p>This has no impact on the created host profile or host analysis, and you can ignore this message.</p> |
| HA-261345 | <p>On SLES 11 SP2, xiv_attach, xiv_iscsi_admin, and xiv_fc_admin and may hang when using the rescan (-R) option.</p> <p>To avoid this issue, upgrade to SLES 11 SP3.</p> |
| HA-261359 | <p>On SLES 12.0, if one of the iSCSI ports on the storage system is unreachable, then iSCSI service fails to start and an error message is displayed.</p> <p>To avoid this issue, connect the iSCSI port, if it is disconnected, or disable the unreachable port. Then, log out of all the existing nodes. Alternatively, upgrade to SLES 12 SP1.</p> |
| HA-261402 | <p>Running rescan with the --clean flag in RHEL 7.x environment (xiv_iscsi_admin -R --clean or xiv_fc_admin -R --clean) may take several minutes, depending on amount of multipath devices without existing paths.</p> <p>Currently there is no workaround or solution for this limitation.</p> |
| HA-261434 | <p>On RHEL 7.0, the iSCSI service fails to start and an error message is displayed if one of the XIV iSCSI ports is unreachable.</p> <p>To resolve this issue, use RHEL 7.1 or later.</p> |
| HA-261572 | <p>On CentOS Linux 7.x and RHEL 7.x, running the xiv_syslist may fail with exception.</p> <p>To avoid this issue, install the PCI Utilities (<i>pciutils</i>) package .</p> |
| HA-261626 | <p>LUNs with IDs higher than 255 mapped to a host over iSCSI may result in incorrect listing of the storage volumes, using the xiv_devlist command.</p> <p>To avoid this issue, do not use LUN IDs higher than 255.</p> |
| HA-261648 | <p>Updating routing table on the device-mapper multipath switch (xiv_iscsi_admin -U) immediately after restoration of an iSCSI session may cause an execution error.</p> <p>To resolve this issue, rerun the routing table update.</p> |
| HA-261687 | <p>On RHEL 7.x, the xiv_iscsi_admin -C command does not display the correct status of the iSCSI service.</p> <p>Currently there is no workaround or solution for this limitation.</p> |

| Ticket ID | Description |
|-----------|---|
| HA-261731 | <p>On RHEL 7.x, unmapped LUNs remain associated with the host and continue to appear in the xiv_devlist output if the xiv_devlist command is run immediately after rescanning storage systems with the --clean argument (xiv_iscsi_admin -R --clean).</p> <p>To resolve this issue, run the xiv_iscsi_admin -R --clean command again.</p> |
| HA-261758 | <p>When run under CentOS Linux, the xiv_host_profiler --analyze command declares the operating system as unsupported, producing an incorrect host configuration analysis.</p> <p>Currently there is no workaround or solution for this limitation.</p> |
| HA-261835 | <p>When run on a VM under SLES11 SP4 in VMware environment, the xiv_fc_admin -R or xiv_iscsi_admin -R commands may fail with exception.</p> <p>To resolve this issue, configure the virtual machine to display local disk UUID. Then, remove the VMware disk device from black list in <code>multipath.conf</code> file.</p> |
| HA-261881 | <p>Operating systems added in the HAK version 2.6.0 (SLES 12.x, RHEL 7.2 for x86/x64 and all Linux flavors for POWER7/8) appear as unsupported, when running the xiv_host_profiler command on host connected to a storage system with the 11.x microcode.</p> <p>Currently there is no workaround or solution for this limitation.</p> |
| HA-261885 | <p>LUNs with IDs higher than 255 mapped to a host over iSCSI may result in faulty update of the routing table on the device-mapper multipath switch, using the xiv_iscsi_admin -U command.</p> <p>To avoid this issue, do not use LUN IDs higher than 255.</p> |
| HA-261930 | <p>When running the xiv_devlist command on volumes during the Hyper-Scale Mobility process, the storage system serial number indicates either a source or a destination system. This may be confusing, when this command is used several times in a row, and each time a different storage system serial number is displayed.</p> <p>To resolve this issue, use XIV GUI or Hyper-Scale Manger to determine the Hyper-Scale Mobility state and correct serial numbers of the storage systems.</p> |

| Ticket ID | Description |
|-----------|--|
| HA-261995 | <p>Abnormal behavior of the multipath service under SLES 12 SP1 has been identified. One of its possible effects is that the xiv_devlist command output can display individual device paths of a storage volume instead of a single multipath device.</p> <p>To avoid this issue, use SLES 12 SP2 or later.</p> |
| HA-262031 | <p>If a host reboots after HyperSwap failover, the multipath routes to the storage system, originally configured as primary, remain available, but become inactive.</p> <p>Use one of the following procedures to resolve this issue:</p> <ul style="list-style-type: none"> • Procedure 1 <ol style="list-style-type: none"> 1. Identify the FlashSystem A9000 or A9000R block devices excluded by multipath service and manually delete them. 2. Run the xiv_fc_admin -R or xiv_iscsi_admin -R command to detect the connected storage systems. • Procedure 2 <ol style="list-style-type: none"> 1. Identify the FlashSystem A9000 or A9000R block devices excluded by multipath service (primary or secondary volume). 2. Unmap the volume from the storage system. 3. Run the xiv_fc_admin -R --clean or xiv_iscsi_admin -R --clean command to disassociate the unreachable storage systems from the host. This procedure runs a risk of removing other inactive multipath routes, which are not related to the FlashSystem A9000 or A9000R storage systems. 4. Remap the volume to the storage system. 5. Run the xiv_fc_admin -R or xiv_iscsi_admin -R command to detect the connected storage systems. |
| HA-262147 | <p>HyperSwap mode of the volumes, which are in the Proxy state during Hyper-Scale Mobility migration, appears as Yes in the xiv_devlist output.</p> <p>Currently there is no workaround or solution for this limitation.</p> |

Related information and publications

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

- IBM Knowledge Center (ibm.com/support/knowledgecenter)
- IBM XIV Storage System on IBM Knowledge Center (ibm.com/support/knowledgecenter/STJTAG)
- IBM Spectrum Accelerate on IBM Knowledge Center (ibm.com/support/knowledgecenter/STZSWD)

- IBM FlashSystem A9000 on IBM Knowledge Center (ibm.com/support/knowledgecenter/STJKMM)
- IBM FlashSystem A9000R on IBM Knowledge Center (ibm.com/support/knowledgecenter/STJKN5)
- IBM Power Systems software website for AIX®(www.ibm.com/systems/power/software/aix)
- IBM System p website (www.ibm.com/systems/p)
- IBM Flash Storage and Solutions marketing website (ibm.com/systems/storage/flash)

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Use the Directory of Worldwide Contacts to find the appropriate phone number for initiating voice call support. Select the Software option, when using voice response system.

When asked, provide your Internal Customer Number (ICN) and/or the serial number of the storage system that requires support. Your call will then be routed to the relevant support team, to whom you can provide the specifics of your problem.

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