

IBM PowerHA SystemMirror for AIX

Standard Edition

Version 7.2.8

Release Notes



Note

Before using this information and the product it supports, read the information in [“Notices” on page 17.](#)

First edition (December 2023)

This edition applies to PowerHA® SystemMirror® Version 7.2.8 for AIX and to all subsequent release and modifications until otherwise indicated in new editions.

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About this document

The Release Notes topics include late technical information that is not included in other topics, and they highlights new functions for the PowerHA SystemMirror Version 7.2.8 for AIX® licensed program.

Highlighting

The following highlighting conventions are used in this document:

Bold	Identifies commands, subroutines, keywords, files, structures, directories, and other items whose names are predefined by the system. Bold highlighting also identifies graphical objects, such as buttons, labels, and icons that the you select.
<i>Italics</i>	Identifies parameters for actual names or values that you supply.
Monospace	Identifies examples of specific data values, examples of text similar to what you might see displayed, examples of portions of program code similar to what you might write as a programmer, messages from the system, or text that you must type.

Case sensitivity in AIX

Everything in the AIX operating system is case sensitive, which means that it distinguishes between uppercase and lowercase letters. For example, you can use the **ls** command to list files. If you type LS, the system responds that the command is not found. Likewise, **FILEA**, **FiLea**, and **filea** are three distinct file names, even if they reside in the same directory. To avoid causing undesirable actions to be performed, always ensure that you use the correct case.

ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

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New functions and features

PowerHA SystemMirror Version 7.2.8 has the following new functions and updates:

Cyber Vault Security in SVC Storwize®

Starting with PowerHA SystemMirror 7.2.8 or later, a safeguarded snapshot backup feature is available with IBM® SAN Volume Controller (SVC) Storwize firmware version 8.5.0.6 or later, to provide data protection in volumes. Safeguarded snapshots secure data to prevent it from being compromised, either accidentally or deliberately. The C-SPOC function in PowerHA SystemMirror supports configuration of SVC storage, Safeguard policy creation, and enabling safeguard snapshots for a Volume Group through SMIT and cl mgr utility. This feature is available in PowerHA SystemMirror Version 7.2.8. For more information, see [Enabling Safeguard function for a volume group using C-SPOC - IBM Documentation](#)

Physical volume level encryption for support in PowerHA

Starting with PowerHA SystemMirror Version 7.2.8 and IBM AIX® Version 7.3TL1, the encryption is supported at the physical volume level, which is part of a volume group. This encryption is configured in the PowerHA SystemMirror environment. Currently, only platform keystore (PKS) authentication method is supported to enable the physical volume encryption. For more information, see [Physical volumes - IBM Documentation](#).

ROHA in IBM PowerVS - enhancements

PowerHA SystemMirror supports Resource Optimized High Availability (ROHA) feature in PowerVS Cloud. Starting with PowerHA® SystemMirror® Version 7.2.8, ROHA in IBM PowerVS is enhanced to manage cloud resources, which are part of Cloud Shared processor pool. For more information, see [Resource Optimized High Availability in Cloud - IBM Documentation](#). ROHA for IBM cloud feature is enhanced to support any new data center in any region or zone. Also, the ROHA feature has better compatibility with different Python versions. For more information, see [Resource Optimized High Availability in Cloud - IBM Documentation](#).

GLVM DR Sizing tool

The existing Geographic Logical Volume Manager (GLVM) Disaster recovery (DR) Sizing tool provides the network bandwidth and cache recommendations for the asynchronous volume group. Starting PowerHA SystemMirror Version 7.2.8, additional recommendations for network performance and latency are also provided in the GLVM DR Sizing tool through iperf tool. For more information, see [GLVM DR Sizing tool - IBM Documentation](#).

Enhancements for the Disk Tiebreaker solution in PowerHA

By imposing a time delay on the low-priority sites, Reliable Scalable Cluster Technology (RSCT) version 3.3.2.0 or later, provides the concept of prioritizing a cluster site. This feature helps to get a tie breaker during cluster split circumstances. Starting PowerHA SystemMirror Version 7.2.8, configuration and operation of site priority, and time delay are enabled during SCSI PR disk tiebreaker and split-merge scenarios. For more information, see [Tie breaker option for split and merge policies - IBM Documentation](#).

HMC Port 443 Support in PowerHA

Starting PowerHA SystemMirror Version 7.2.8, or later, support for both the acceptable Hardware Management Console (HMC) ports (443 & 12443) is enabled giving the user the flexibility to choose the port used for the HMC connectivity.

Email notification enhancement for System events like shutdown

The existing email notification function that supports the PowerHA cluster events, is enhanced to support system events like *aix_shutdown*. For more information, see [Defining a remote notification method - IBM Documentation](#).

PowerHA Integration with Ansible®

Starting PowerHA SystemMirror Version 7.2.8, a new Ansible solution is introduced. This feature provides multiple automation playbooks. These play books help in regular and repetitive PowerHA configurations. The ansible playbooks are shipped as a tarball so that they can be deployed on a

centralized server. For more information, see [Ansible integration with PowerHA System Mirror- IBM Documentation](#).

Utility for reserving IP in PowerVS

PowerHA SystemMirror version 7.2.8 is providing a new utility *clreserveip* to avoid duplicate IP addresses in PowerVS environment. The *clreserveip* utility reserves the IP addresses to be used as Service IP addresses in the PowerVS cluster configuration. For more information, see [clreserveip command- IBM Documentation](#).

PowerHA SystemMirror GUI

The following updates are new in the PowerHA SystemMirror GUI:

ROHA on prem

Resource Optimized High Availability (ROHA) is added as a new feature in the PowerHA SystemMirror GUI. The ROHA feature automatically and dynamically manages Dynamic Logical Partitions (DLPARs), Enterprise Pool CoD (EPCoD), and on or off CoD resources. Resources can be acquired and released on demand to manage those efficiently. HMC is used to manage resources. HMC communication can be established by using the following two methods.

- SSH
- REST

Prerequisites

The Lab administrator must perform the following actions.

- The HMC and cluster nodes do not require a password to communicate.
- The HMC details must be updated in the `/etc/hosts` file of all the cluster nodes.

Email notifications Enhancement for System Based Events and Multiple email Configuration

The PowerHA SystemMirror GUI version 7.2.7, has the email notification feature, which configures a single email notification setting for multiple events for example, events like Admin Op, Site Up, RG Move. All email IDs configured in the PowerHA SystemMirror GUI are notified whenever one of the specified events occurs.

Starting PowerHA SystemMirror GUI 7.2.8, the user can create multiple email groups by using the `Set_email_ID` option. A user can also set up multiple email profiles for a single cluster.

A new system-specific AIX Shutdown event is added to the list of events. Prior to configuring the email notification, the user can also test the Simple Mail Transfer Protocol (SMTP) configuration by sending a test email.

Prerequisite

The lab administrator must perform the following actions.

- SMTP configuration on the cluster nodes.

MFA with Voice call, TOTP, and Signature authentication methods

The IBM Security Verify feature supports two-factor authentication. The first authentication factor is the username and password. The second authentication factor is a system-generated numeric or alphanumeric code that the user must provide to prove their identity.

In the PowerHA SystemMirror GUI 7.2.6 version, Multi Factor Authentication (MFA) was introduced with the provision of sending One Time Password (OTP) to the user's phone number or to email address. An OTP is valid for a specific time. It becomes invalid after a successful user login or when it expires.

Starting PowerHA SystemMirror GUI 7.2.8 version, the GUI supports MFA with the following features.

- Voice Call: The user receives OTP through a phone call.
- Time-Based One-Time Password (TOTP): TOTP authentication is supported by any authenticator application, for example: Microsoft Authenticator or Google Authenticator.
- Signature Authentication: Signature authentication uses IBM Verify application.

File Collection

Starting PowerHA SystemMirror GUI 7.2.8 version, the user has provision to create, view, modify, and delete a file collection by using the PowerHA SystemMirror File Collection GUI feature. Two default file collections are available.

- Configuration_files
- HACMP_files

Fix Central Installation support for the Service Pack (SP)

In the PowerHA SystemMirror GUI version 7.2.7, users might download Service pack (SP) packages directly from the GUI to discovered clusters with one click, instead of downloading from Fix Central. However, after installation the user had to manually install the SP filesets.

With the introduction of PowerHA SystemMirror GUI version 7.2.8, the GUI allows users to install downloaded files directly from the user interface. Users select the cluster from the drop-down menu and select their preferred installation for the available downloads. With these enhancements, the PowerHA simplifies the update process by using the following upgrade options.

- NDU (Non-Disruptive Update)
- Offline Update

Orphan Resources (Service IP and Application controller)

In PowerHA GUI version 7.2.7 and prior releases, users could create the resources only from the Resource Group page, which was associated with that Resource Group. But starting PowerHA SystemMirror GUI version 7.2.8, the GUI allows users to create independent resources, such as Service IP and Application controller that are not associated with any Resource Groups (RGs). This feature is now available in the Service IP and Application controller GUI. Users can create, edit, delete, and view these resources. Also, users have the flexibility to add these newly created or existing Orphan Resources to a specific RG. Users can either use the Cluster (Resource Page) or the Resource Group (Resource Page).

GLVM Sizing Tool Enhancement for Network Latency

In the previous releases, the Geographic Logical Volume Manager (GLVM) Sizing tool provided the network bandwidth and cache recommendations for the Asynchronous Volume Group (VG).

The GLVM sizing tool in PowerHA version 7.2.8 enhancement provides network latency information and recommendation in the GUI.

Following are some of the additional minor enhancements that are added to the PowerHA SystemMirror GUI 7.2.8 version:

- User can select multiple hostname for Cloud Backup Restoration (CBR). The multiple selection allows the user to initiate the restoration process for the cloud images on multiple nodes (hostname) by selecting the check boxes.
- Delete function for storage devices (part of CBM) is now supported which helps the user to remove the storage devices from the GUI itself.
- Node version is upgraded from Node 16 to Node 18.3.

Software requirements

Before you install PowerHA SystemMirror Version 7.2.8, you must install all available service packs for AIX and PowerHA SystemMirror from the [IBM Fix Central](#) website.

PowerHA SystemMirror Version 7.2.8 is supported on the following versions of the AIX operating system:

- IBM AIX 7.3 with Technology Level 2 with Service Pack 1, or later
- IBM AIX 7.3 with Technology Level 1 with Service Pack 2, or later
- IBM AIX 7.3 with Technology Level 0 with Service Pack 4, or later
- IBM AIX 7.2 with Technology Level 5 with Service Pack 6, or later
- IBM AIX 7.2 with Technology Level 4 with Service Pack 6, or later
- IBM AIX 7.1 with Technology Level 5 with Service Pack 12, or later

PowerHA SystemMirror GUI

PowerHA SystemMirror GUI is supported only on the following web browsers:

- Google Chrome Version 57, or later
- Firefox Version 54, or later

The PowerHA SystemMirror GUI requires that OpenSSL is installed on the PowerHA SystemMirror GUI server to generate a unique set of security files (keys and certificates). Secure Shell (SSH) is required for certain features, like backup communication, cluster creation (via wizard and snapshot), and terminal usage in the PowerHA SystemMirror GUI. To run these tasks from the PowerHA SystemMirror GUI as a non-root user, you must configure the **sudo** command on cluster nodes. For more information, see [Logging in as a non-root user](#). After a cluster is successfully added to the PowerHA SystemMirror GUI, the root access or **sudo** access is no longer required to manage the cluster through the PowerHA SystemMirror GUI.

PowerHA SystemMirror GUI can also manage clusters that are running earlier versions of PowerHA SystemMirror. When you manage older clusters in the PowerHA SystemMirror GUI, you can use only the capabilities that are associated with the PowerHA SystemMirror version of the cluster. For example, with PowerHA SystemMirror GUI version 7.2.5 GUI server, if you select a cluster in the PowerHA SystemMirror GUI and that cluster is running PowerHA SystemMirror Version 7.2.3, some of the PowerHA SystemMirror GUI version 7.2.5 capabilities might not be available for the selected cluster.

Hardware requirements

PowerHA SystemMirror graphical user interface (GUI) requires IBM POWER7® or later technology-based servers.

Installation and migration

Support matrix for PowerHA SystemMirror Smart Assists

The following table describes the versions of middleware that can be configured and managed with PowerHA SystemMirror Smart Assists. For information about supported PowerHA SystemMirror version, see [PowerHA SystemMirror for AIX Reference Information](#).

Table 1. Support matrix for PowerHA SystemMirror Smart Assists. The table describes the middleware application versions that are supported on PowerHA SystemMirror with different versions of the AIX operating system.

Middleware application	AIX 7.2	AIX Version 7.3
AIX print subsystem, DHCP, and DNS	7.2	7.3
Oracle Database Server	19C	19C
SAP Netweaver	7.52	7.52
Db2®	11.5	11.5
WebSphere® MQSeries®	9.3	9.3
IBM Tivoli® Directory Server	6.4	6.4
IBM Lotus® Domino® Server Note: Support is withdrawn for this product from PowerHA SystemMirror 7.2.8 or later.	NA	NA
SAP liveCache Hot Standby Note: Support is withdrawn for this product from PowerHA SystemMirror 7.2.8 or later.	NA	NA
MaxDB	7.9.08	7.9.08
IBM Tivoli Storage Manager Note: The product is now known as IBM Spectrum® Protect™.	8.1.8	8.1.8

PowerHA SystemMirror GUI

You do not need to install the PowerHA SystemMirror GUI server in a PowerHA SystemMirror cluster in an integrated configuration, but the PowerHA SystemMirror GUI agent must be installed in a cluster. When you migrate a PowerHA SystemMirror GUI agent, an attempt is made to restart the agent service when the migration completes. When you migrate a PowerHA SystemMirror GUI server, an attempt is made to maintain the original state of the agent service. If the PowerHA SystemMirror GUI server is active when the server migration begins, an attempt is made to restart the PowerHA SystemMirror GUI server when the migration completes.

After you install filesets that are available on the PowerHA SystemMirror Version 7.2.8 for AIX media, or migrate to 7.2.8 from 7.2.7 or older, you must run the `/usr/es/sbin/cluster/ui/server/bin/smuiinst.ksh` command to complete the server installation process. The `smuiinst.ksh` command automatically downloads and installs the remaining files that are required to complete the PowerHA

SystemMirror GUI Server installation process. These downloaded files are not included in the PowerHA SystemMirror filesets because the files are licensed under the General Public License (GPL).

You must migrate the PowerHA SystemMirror GUI server before you migrate any cluster that is managed by the PowerHA SystemMirror GUI server. Clusters (on higher PHA versions) cannot be managed by an older version of the PowerHA SystemMirror GUI server. If the PowerHA SystemMirror GUI server is configured for high availability, you must disable high availability of the PowerHA SystemMirror GUI server before you migrate the PowerHA SystemMirror GUI server. You can enable the PowerHA SystemMirror GUI server for high availability after the migration process is complete.

For more information, see [Configuring the PowerHA SystemMirror GUI server to be highly available](#).

For more information about migration, see the [Upgrading a PowerHA SystemMirror cluster](#) and [Installing PowerHA SystemMirror GUI](#)

Additional information

PowerHA SystemMirror GUI

- If you cannot add a cluster to the PowerHA SystemMirror GUI, or create a new cluster from the PowerHA SystemMirror GUI, consider the following points:
 - Verify that the nodes in the cluster have a boot IP or persistent IP that can be routed to the PowerHA SystemMirror GUI server. You cannot use a service IP to manage a cluster.
 - Verify that SSH connection from the PowerHA SystemMirror GUI server to the remote system that you are trying to connect is working. For example:

```
# ssh 172.19.67.49 /bin/hostname
The authenticity of host '172.19.67.49 (172.19.67.49)' can't be established.
ECDSA key fingerprint is 41:19:ea:f6:4f:46:91:29:f5:a0:fd:89:91:f7:28:97.
Are you sure you want to continue connecting (yes/no)?
```

In the current version of PowerHA SystemMirror GUI, you must also respond to the prompt to establish the SSH connection. You must respond by entering yes to add the host to the `~/.ssh/known_hosts` file of the PowerHA SystemMirror GUI server. After adding the host name to the hosts files the prompt is not displayed again.

- Only a **root** user can create or add a cluster. After the cluster is added in the PowerHA SystemMirror GUI, a non-root user can also manage clusters through the PowerHA SystemMirror GUI. If you do not have root credentials, a **root** user must configure the **sudo** command such that it can be run on one of the nodes in the cluster. For more information, see [Logging in as a non-root user](#). If you have root credentials, Secure Shell (SSH) service must be configured on the cluster to allow root access. The value of the **PermitRootLogin** parameter must be set to yes in the `/etc/ssh/sshd_config` file. You must restart the SSH service after you modify the `sshd_config` file.
 - The SSH service can be used with a key or with a password. For a key, the key must not have a passphrase. The **configPasswordAuthentication** parameter must be set to yes in the `/etc/ssh/sshd_config` file. You must restart the SSH service after you modify the `sshd_config` file.
- If the status of a cluster is incorrect in the PowerHA SystemMirror GUI, consider the following points:
 - The PowerHA SystemMirror GUI server does not interact with the cluster nodes for status. The PowerHA SystemMirror GUI responds based on status change notifications from each node as indicated in the following actions:
 - Core PowerHA SystemMirror GUI events are notified to the PowerHA SystemMirror GUI server immediately after they occur.
 - When the **clmgr** command is used to modify the configuration of a cluster, a notification is sent to the PowerHA SystemMirror GUI server.
 - Verify that the network and firewall settings are allowing traffic between the PowerHA SystemMirror GUI server and PowerHA SystemMirror GUI agents by checking the following:
 - The default port for the PowerHA SystemMirror GUI server is 8080. You can specify a different value for the port in the `/usr/es/sbin/cluster/ui/server/configuration-server.json` file.
 - The default port for the PowerHA SystemMirror GUI agent is 8081. You can specify a different value for the port in the `/usr/es/sbin/cluster/ui/agent/configuration-agent.json` file.
- For more information about changing the values for the ports, see the [Changing ports](#).
- Synchronize the cluster by running the following command:

```
clmgr synchronize cluster
```

After you synchronize the cluster, if the **sync PASSED** event does not appear in the event viewer for that cluster or if the cluster status in the PowerHA SystemMirror GUI is not correct, the problem might require IBM Support assistance.

See [Troubleshooting the PowerHA SystemMirror GUI](#) for more assistance.

- In the PowerHA SystemMirror GUI, you must avoid changing the host name of the PowerHA SystemMirror GUI server. If you must modify the host name of the PowerHA SystemMirror GUI server, clusters that are managed by the PowerHA SystemMirror GUI might not be able to communicate status updates to the PowerHA SystemMirror GUI server. You can avoid this issue in one of the following ways:
 - Remove the cluster from the PowerHA SystemMirror GUI server before you modify the host name, and add the cluster after you modify the host name.
 - Modify the host name of the PowerHA SystemMirror GUI server, and manually update the `/usr/es/sbin/cluster/ui/agent/configuration-agent.json` file on each cluster node. Replace the old server IP address with the new IP address in the **serverURI** property. Restart the PowerHA SystemMirror GUI agent after you modify the file.
- The option to authenticate by specifying an SSH key is not available from the open terminal feature. SSH authentication is supported only through a password.
- You do not need to install the PowerHA SystemMirror GUI server in a PowerHA SystemMirror cluster, but the PowerHA SystemMirror GUI agent must be installed in a cluster. If the PowerHA SystemMirror GUI server is installed within a PowerHA SystemMirror cluster, the PowerHA SystemMirror GUI can be used to keep the PowerHA SystemMirror GUI server highly available.
- The PowerHA SystemMirror GUI can manage AIX clusters concurrently, and with full multi-tenancy support. For more information, see [Cluster zones](#).
- If you install the PowerHA SystemMirror GUI server within a cluster, you must install it on only one of the nodes in the cluster unless you are configuring the PowerHA SystemMirror GUI for high availability. For more information, see [Configuring the GUI to be highly available](#).
- By default, the PowerHA SystemMirror GUI server uses the IP address that is associated with the default host name of the system on which it is running. The PowerHA SystemMirror GUI agents use the IP address of the server's host name to communicate the cluster status to the PowerHA SystemMirror GUI server. If you want to use an alternative IP address for the PowerHA SystemMirror GUI communication, specify the IP address in the **serverAddress** property in the `/usr/es/sbin/cluster/ui/server/configuration-server.json` file. For more information, see [Configuring the PowerHA SystemMirror GUI](#).

Due to expiration of the Bulls freeware, you must use the IBM AIX Toolbox to download dependencies of the PowerHA SystemMirror GUI server. If the PowerHA SystemMirror cluster and the PowerHA SystemMirror GUI server are on PowerHA SystemMirror Version 7.2.3, dependencies remain same.

For 7.2.8 and later versions of PHA, following dependencies have changed:

- `libgcc-8.1.0-2.aix7.2.ppc.rpm` to `libgcc-8.3.0-3.aix7.2.ppc.rpm`
- `libstdcplusplus-8.1.0-2.aix7.2.ppc.rpm` to `libstdcplusplus-8.3.0-3.aix7.2.ppc.rpm`
- For More information , refer [Installing PowerHA SystemMirror GUI](#)

Documentation

To view the latest updates to the documentation, see the [What's new in PowerHA SystemMirror Version 7.2.8 for AIX](#) topic.

To view the documentation in PDF files, see the [PowerHA SystemMirror for AIX PDFs](#) topic.

Man pages

The man pages for the PowerHA SystemMirror commands are provided in the `cluster.man.en_US.es.data` fileset. To view the man pages, from the command line, enter `man`

command_name (where *command_name* is the name of the command). You can also view the man pages in the IBM Documentation, [PowerHA SystemMirror commands](#).

You can use the **clmgr** command to perform most of the PowerHA SystemMirror operations. For more information about the operations that you can perform by using the **clmgr** command, see the [clmgr command: Quick reference](#) topic.

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