IBM FlashSystem A9000/R
Call Home and Remote Support Overview

Applicable Products

Product: IBM FlashSystem A9000/R
Product Version(s): v12.x

Table of Contents

Trademarks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of IBM Corporation in the United States, other countries, or both. These and other IBM trademarked terms are marked on their first occurrence in this information with the appropriate symbol (® or ™), indicating US registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries. A current list of IBM trademarks is available on the Web at http://www.ibm.com/legal/copytrade.shtml.

The following terms are trademarks of the IBM Corporation in the United States, other countries, or both:

IBM FlashSystem®

The following terms are trademarks of other companies:

Microsoft, Windows, and Internet Explorer are trademarks of Microsoft Corporation in the United States, other countries, or both.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.

Other company, product, or service names may be trademarks or service marks of others.

1.0 Overview

IBM® encourages you to take advantage of **IBM Call Home, Proactive Support** and **Remote Support** and all their related features to allow you and IBM to partner for your success[1]. This Call Home and Remote Support Overview is provided for informational purposes and does not modify any of your agreements with IBM.

IBM Call Home is a pport function embedded in all IBM storage products. By enabling Call Home, the health and functionality of your system is constantly monitored. Should a software or hardware error occur, the Call Home function notifies IBM Support of the event. The function then automatically opens a service request and transfers preliminary critical diagnostic data to authorized support personnel. By obtaining information in this way, IBM Support is better able to quickly identify problems and develop an action plan for problem resolution giving a more effective first contact support session and most often, an overall reduction in time to resolution.

In addition, IBM Call Home enables Proactive Support, as it allows proactive notifications from your A9000/R system regarding the storage system health and components to be sent to IBM Support at predefined intervals. Heartbeats and events are sent from the system to the IBM service center. The service center analyzes the information within the heartbeats and the events, correlates it with its vast database and can then trigger a component replacement prior to its potential failure. Proactive Support minimizes the number of interaction cycles with IBM Support and can enhance the stability of your storage system.

The enablement of **Remote Support** can further reduce time to resolution for those incidents, where IBM Support needs to interact with your storage system.
The Remote Support function allows IBM Support to remotely and securely access your storage system when needed during a support call. By using Remote Support, the customer initiates a secure connection from IBM FlashSystem™ A9000/R when a problem arises. An IBM Remote Support specialist can then connect to the system, analyze the problem, repair it remotely if possible, or assist an IBM SSR, who is onsite. Remote Support helps to minimize the time it takes to diagnose and remedy storage system operational issues.

Continue reading for a detailed explanation of **IBM Call Home**, Proactive Support, and **Remote Support**, in order to gain maximum benefit out of these support features for your IBM FlashSystem A9000/R:

- 24/7 system monitoring
- Proactive healing
- Automatic notification to you and IBM Support in the event of a system error

[1] IBM customers are eligible for these support function features if they are currently within the period set forth in their Statement of Limited Warranty; or if post-warranty, they have either an active Software Maintenance Agreement or Hardware Maintenance Agreement.

- Faster diagnosis and time to resolution

2.0 IBM Call Home & Proactive Support

IBM is committed to servicing the FlashSystem™ A9000/R in a secure and professional manner, whether it is warranty work, planned code upgrades, or management of a component failure. Dispatching service personnel for on-site assistance and maintenance is part of that commitment. In order to minimize downtime and maximize efficiency, however, IBM Support encourages you to enable Call Home, including heartbeats. In addition, you can benefit from Proactive Support, meaning professional support may heal your system before it runs into a potential failure.

The storage system's ability to enable the above support features remains dependent on the availability of an outside connection and client-defined settings. Continue reading for a detailed explanation of what each support task entails.

2.1 Call Home and Proactive Support?

IBM Call Home and Proactive Support allows proactive notifications regarding the storage system health and components to be sent to IBM Support at predefined intervals. Heartbeats and events are sent from the system to the IBM service center. The service center analyzes the information within the heartbeats and the events, correlates it with its vast database and can then trigger a component replacement prior to its potential failure.

Upon detection of a hardware or software error code, both IBM Support and your predefined contact person are notified via e-mail, through a specified SMTP gateway. If IBM Support determines that the detected event requires service or further investigation, a new PMR is created and sent to the appropriate IBM Support team. Proactive Support serves to minimize the number of interaction cycles with IBM Support.

If required, the customer email gateway can be configured to send Call Home information to IBM only via a secured channel. For more information, see Redbooks in Appendix A and refer to the 'Encrypting Call Home and heartbeat notifications' section in the FlashSystem™ A9000/R Architecture and Implementation Redbooks publication.

Call Home for FlashSystem™ A9000/R is designed to always use SMTP. It is configured by a qualified IBM service representative only, typically at the time of storage system installation. You must have an SMTP email system available that the FlashSystem™ A9000/R system can use to send outgoing Call Home emails to IBM.

The SMTP address for Call Home is configured separately from the general FlashSystem™ A9000/R SMTP setting. If the customer mail server gateway changes, a service call may be logged so that the internal Call Home SMTP setting can be changed,

or the customer admin can update via XCLI smtp_update command (with updated address options) using the internal=yes option.

Table 1 lists requirements that need to be met in order to successfully configure the Call Home function.

Important: It is the customer's responsibility to configure the SMTP email system to enable the FlashSystem™ A9000/R system to send outgoing emails for the Call Home function. The email configuration rules must not inhibit Call Home emails from being sent in real time. For example, FlashSystem A9000 and A9000R emails must not be placed in a queue for later delivery or filtered for priority. Failure to verify the email system might delay the successful configuration of Call Home and Proactive Support.

Table 1: Requirements for Call Home Configuration

Call Home configuration requirement	**Value**	**Comment**
Customer SMTP port	25	The customer SMTP server must be reachable on port 25 from the customer-provided management IP address.
Customer SMTP address	IP address	This IP address is supplied by the customer.
Email destination address	xiv-callhome-eastern-hemisphere@ vnet.ibm.com or xiv-callhome-western-hemisphere@ vnet.ibm.com	Customer SMTP server must allow relaying to the following IBM email addresses based on geographical location: • East: EMEA, Asia, Australia, Africa, and the rest of the world • West: USA, Canada, Latin America, and the Caribbean Islands
Email source address	customer-defined (XIVName@company.com)	The default email address from which the email is sent. This email address can be customer-defined to conform to the customer email relay rules.

2.2 Heartbeat

When Call Home is enabled on the FlashSystem™ A9000/R, a proactive storage system inventory, called a heartbeat, is sent to IBM Support. This feature is a one-way communication from the storage system to IBM Support that only contains basic product information. By sending this information, IBM can verify that the storage system is operational and capable of initiating a successful Call Home in the event of a detected error. Heartbeats are sent from the system to the IBM service center.

To efficiently maintain the system, the sending of heartbeats is done daily, with a full heartbeat sent once a week. If a scheduled heartbeat does not reach IBM, an alert will be sent to company personnel to notify them of the failure and to encourage further investigation into the health status of the system in question.

2.3 Information sent to IBM via Call Home

The only data provided to IBM is machine specific information essential in the diagnostic and repair process. The information *does not* include any of the data stored on the storage array.
The machine specific information transmitted includes: machine type, model, serial number, customer contact information and specific details related to the health of the storage system. In the case of a Call Home event, this data will also include specific error codes.

Although troubleshooting is the primary reason for sending Call Home data, IBM may also use the information to improve products and services. Additionally, analysis of Call Home data enables customized assistance from IBM Support team, such as proactive account management and applicable code upgrades.

See Appendix B for a detailed list of heartbeat data contents.

3.0 IBM Remote Support

Remote access to your storage system is the most interactive level of assistance from IBM. After a Call Home transmission and review of preliminary diagnostic data, real-time analysis and direct interaction with the FlashSystem™ A9000/R may be necessary to delve deeper into the problem and develop an action plan. To minimize system downtime and provide the most efficient support session, an IBM support engineer may request access to interact with the affected storage system. Depending on the severity of the issue, Remote Access to the system can provide problem resolution or minimize the effects of an impacting event while a service representative is dispatched to the local worksite. To provide remote assistance to the FlashSystem™ A9000/R storage systems, IBM authorized support engineers use the IBM Remote Support Center (RSC) over a secure network interface Remote Access is always subject to customer approval, and even if permission for Remote Access is granted, it can be revoked at any time by the customer.

The following chapters describe the RSC management system in more detail.

3.1 Remote Support Prerequisites

To perform remote support through the Remote Support Center (RSC), your storage system must be able to initiate an outbound SSH connection to IBM (see section 3.2).

If the system does not have direct access to the Internet (for example, due to a firewall), you can use the IBM Remote Support Proxy to facilitate the connection to IBM (see section 3.3).

For more information, see the IBM FlashSystem™ A9000/R Architecture and Implementation Redbooks.

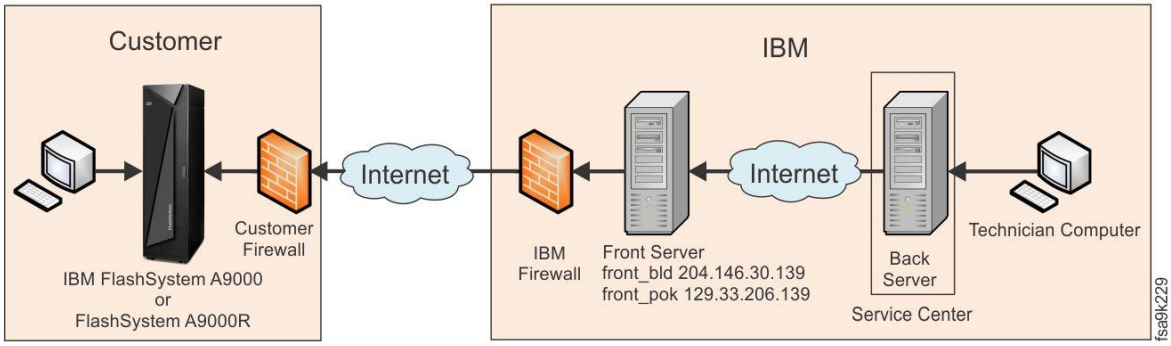
Name	Management IP Internet Access	Port / Type	Required Front Servers
Remote Support Center (RSC)	Internet Access Allowed	22 / SSH outbound	Name Address Port Front_bld 204.146.30.139 22 Front_pok 129.33.206.139 22
Remote Support Proxy	No Direct Internet Access	443 / TCP outbound	Configure Proxy Address

3.2 Remote Support Components

The IBM Remote Support Center consists of three components: IBM Remote Support Client, Front Server, and Back Server.

- The IBM Remote Support Client is a software component that is installed on the storage system and handles Remote Support connectivity. It relies on a single outgoing Transmission Control Protocol (TCP) connection and is not able to

receive inbound connections of any kind. The Remote Support client is controlled by using the command-line interface (CLI) commands or the Hyper-Scale Manager (HSM) GUI to start a connection, terminate a connection (due to timeout



or customer request), view status of a connection, list support centers, define support centers or delete support centers. See Appendix C for CLI commands.

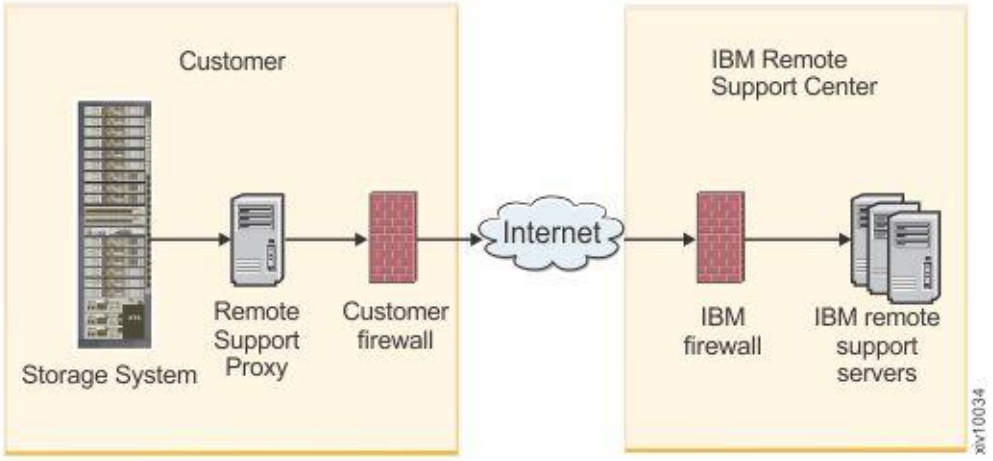
- The front servers serve as a hub at which the storage system and the Remote Support back server connect.
  The front servers are located in an IBM DMZ and receive and maintain connections from the Remote Support client and the back server. The front servers are strictly inbound and do not initiate any outbound communication.
  No sensitive information is stored on the front server, and all data passing through the front server from the client to the back server is encrypted, so the front server or a malicious entity in control of a front server cannot access this data.
- One or more back servers are located within the IBM intranet. Only IBM service representatives that are authorized to perform Remote Support of the storage system can access these servers. The back server authenticates the IBM service representative, provides the IBM service representative with a user interface through which to choose a system to support, and manages the Remote Support session as it progresses. The IBM service representative connects to the back server by using a Secure Shell (SSH) client or an HTTPS connection with any browser.

3.3 Remote Support Proxy

The Remote Support system for IBM® storage systems requires TCP/IP communication between the storage system and the IBM Remote Support Center. When a storage system does not have direct access to the Internet (for example, due to a firewall), you can use the Remote Support Proxy to facilitate that connection.

The IBM® Remote Support Proxy utility creates a network proxy that connects one or more IBM storage systems to IBM Remote Support servers in the IBM Remote Support Center. It establishes a service on a Linux system that has Internet connectivity to the IBM Remote Support Center and local network connectivity to the storage system. The

connection to the IBM Remote Support Center is initiated by the storage system through its management graphical user interface (GUI) or command-line interface (CLI).
The figure below illustrates a typical network configuration that uses the Remote Support Proxy. The communication between the storage system and the Remote Support Proxy uses Secure Shell (SSH). The communication between the Remote Support Proxy and the Remote Support Center is encrypted with an additional layer of Secure Sockets Layer (SSL).



For installation and management of the Remote Support Proxy, please turn to the IBM Knowledge Center for FlashSystem™ A9000/R or make use of the IBM XIV Remote Support Proxy User Guide (GA32-0795). Within the IBM Knowledge Center you will also find the latest release notes for the IBM Remote Support Proxy.

3.4 Remote Support Security Features

Security and privacy are fundamental concerns when granting Remote Access to support personnel. Remote Support Connectivity (RSC) relies on standard, proven security technologies and was designed to meet these security concerns.

The following features facilitate the secure exchange of data between you and the IBM support engineers:

- Encryption of all data flowing from the customer system to the back server
- Front servers are on an IBM DMZ of the internet. They are security-hardened machines and strictly inbound. No sensitive information is stored on them and they cannot access the encrypted data that are passing through them.

For those instances, where FlashSystem™ A9000/R support personnel needs to log into a system remotely for a real time diagnostic session, the following security features are handled by the logic of the back server within the IBM Intranet:

- Access control and authentication logic: Only authorized support personnel is eligible for Remote Support tasks.
- Logging and managing of the support session
- Connection to the back server is only possible through Secure Shell (SSH) client or an HTTPS connection via any browser.

Remote Access is always subject to customer approval, and even if permission for Remote Access is granted, it can be revoked at any time by the customer.

Once you decide to enable remote support on your system, you have the choice between four different options (Refer to Appendix C for CLI command examples):

- Always on
- For a specified, limited amount of time
- On and off according to your needs
- Automatic connection to Remote Support on severe system conditions

Regarding *automatic connection to Remote Support on severe system conditions*, we would like to refer you to the IBM Knowledge Center.

IBM strongly recommends to setup and test both Call Home and Remote Support functionality during installation of the system, while IBM SSR personnel is still onsite to guide you.

Appendix A: Additional publications and resources

How to access IBM Redbooks publications

You can search for, view, or download IBM Redbooks® publications, Redpaper™ publications, Hints and Tips, draft publications, and additional materials, as well as order hardcopy IBM Redbooks publications or CD-ROMs, at this website:
www.ibm.com/redbooks

IBM Redbooks publications

For information about ordering this publication, see “How to Access IBM Redbooks Publications” in the section above. Note that the following documents might be available in softcopy only.

- *IBM FlashSystem™ A9000/R Architecture and Implementation, SG24-8345-02*
- *IBM FlashSystem™ A9000 Product Guide,* REDP-5474-00
- *IBM FlashSystem™ A9000R Product Guide*, REDP-5475-00
- *IBM FlashSystem™ A9000 and A9000R Business Continuity Solutions*, REDP-5401-02
- *IBM Hyper-Scale Manager for IBM Spectrum Accelerate Family: IBM XIV, IBM FlashSystem A9000 and A9000R, and IBM Spectrum Accelerate,* SG24-8376-02
- *IBM HyperSwap for IBM FlashSystem A9000 and A9000R,* REDP-5434-00

Online resources

These websites are also very relevant as further information sources:

- IBM FlashSystem A9000 marketplace: https://www.ibm.com/us-en/marketplace/small-cloud-storage
- IBM FlashSystem A9000R marketplace: https://www.ibm.com/us-en/marketplace/large-cloud-storage
- IBM FlashSystem A9000 Knowledge Center: https://www.ibm.com/support/knowledgecenter/en/STJKMM
- IBM FlashSystem A9000R Knowledge Center: https://www.ibm.com/support/knowledgecenter/en/STJKN5/landing/IBM_FlashSystem_A9000R_welcome_page.html
- IBM FlashSystem A9000 Support Portal and product documentation: https://www.ibm.com/support/home/product/10000562/IBM_FlashSystem_A9000
- IBM FlashSystem A9000R Support Portal and product documentation: https://www.ibm.com/support/home/product/10000563/IBM_FlashSystem_A9000R
- IBM System Storage Interoperation Center (SSIC): http://www.ibm.com/systems/support/storage/ssic/interoperability.wss

Help from IBM

- IBM Support and Downloads: www.ibm.com/support
- Fix Central A9000: https://www-945.ibm.com/support/fixcentral/swg/selectFixes?parent=Flash%20high%20availability%20systems&product=ibm/StorageSoftware/IBM+FlashSystem+A9000&release=All&platform=All&function=all
- Fix Central A9000R: https://www-945.ibm.com/support/fixcentral/swg/selectFixes?parent=Flash%20high%20availability%20systems&product=ibm/StorageSoftware/IBM+FlashSystem+A9000R&release=All&platform=All&function=all
- IBM Global Services: www.ibm.com/services

Appendix B: Heartbeat data contents and Call Home example

The following list outlines all of the information sent by a FlashSystem™ A9000/R along with a **daily regular heartbeat**:

- Customer contact information (name, address, phone number, email address, country…)
- System name and serial number
- Code version
- Time zone of the system
- Flash card size
- System total capacity
- Storage, space allocated
- Storage, space remaining
- Data reduction factor
- State of the system
- Data protection status
- Encryption state
- Installed patch scripts
- Main IBM contact information

The following list outlines all of the information sent by a FlashSystem™ A9000/R along with a **full heartbeat** in addition to the information sent with a regular heartbeat:

Details of:

- Modules
- SSDs – vault devices
- Boot disks
- DIMMs
- CPUs
- Network interface cards
- Compression adapters
- Module fans
- Module power supplies
- Module batteries
- Infiniband (IB) Switches
- IB switch batteries
- IB switch power supplies
- IB switch fans
- Flash enclosures
- Flash canisters
- Flash cards
- Flash fans
- Flash batteries
- Flash power supplies
- Flash power interposer boards
- Installed patch scripts

- Support center configuration
- System statistics
- RACE statistics (compression engine)

The following shows an example of a call home of a single event via e-mail (SMTP):

```
Received:from nextra-1320902-module-1 (unknown [9.155.116.200]) by
 d06av23.portsmouth.uk.ibm.com (Postfix) with SMTP for
 <xiv-callhome-eastern-hemisphere@vnet.ibm.com>; Tue, 12 Sep 2017 17:00:19
 +0100 (BST)
Received:by nextra-1320902-module-1 (sSMTP sendmail emulation); Tue, 12 Sep
 2017 18:04:27 +0200
Subject:9835-415: 1320902: Informational: Host with name 'IBM_Test' was
 deleted.
From:A9000R <A9k_EMEA_PFE@de.ibm.com>
Date:Tue, 12 Sep 2017 18:04:27 +0200
Message-ID:<XIV-9835-415-1320902-3925-1505232267@ibm.com>
Importance:Normal
X-Priority:3
To:xiv-callhome-eastern-hemisphere@vnet.ibm.com
X-TM-AS-GCONF:00
X-Xagent-Gateway:uk1vsc.vnet.ibm.com (XAGSMTP at UK1VSC)

<event id="3925">
   <alerting value="no"/>
   <code value="HOST_DELETE"/>
   <description value="Host with name 'IBM_Test' was deleted."/>
   <description_template value="Host with name '{host.name}' was deleted."/>
   <index value="3925"/>
   <node value="901"/>
   <severity value="Informational"/>
   <timestamp value="2017-09-12 18:04:26"/>
   <timezone value="+0200"/>
   <tshooting value=""/>
   <user_event value="yes"/>
   <user_name value="xiv_maintenance"/>
   <user_uid value="3118446149633"/>
   <serial_number value="1320902"/>
   <machine_type value="9835"/>
   <machine_model value="415"/>
   <version value="12.1.0.a"/>
   <is_in_manufacturing value="no"/>
   <technician_at_work value="no"/>
   <maintenance_urgency value="NONE"/>
   <data>
      <record path="event">
```



```
<record path="data">
  <record path="host">
    <field name="creator" value="xiv_maintenance"/>
    <field name="creator_category" value="xiv_maintenance"/>
    <field name="id" value="22e901f50000d"/>
    <field name="name" value="IBM_Test"/>
    <record path="domain_bitmask">
      <field name="0" value="0"/>
      <field name="1" value="0"/>
      <field name="2" value="1"/>
    </record>
    <field name="cluster" value=""/>
    <field name="cluster_id" value="0"/>
    <field name="map_id" value="22e901f50000d"/>
    <field name="fc_ports" value=""/>
    <field name="iscsi_ports" value=""/>
    <field name="type" value="default"/>
    <field name="user_group" value=""/>
    <field name="iscsi_chap_name" value=""/>
    <field name="perf_class" value="none"/>
  </record>
</record>
        </record>
    </data>
</event>
```

Appendix C: Support Center CLI Commands

CLI Commands:
List a support center (support_center_list):
https://www.ibm.com/support/knowledgecenter/STJKN5_12.2.1/r_command__system__support_center_list.html

Define a support center (support_center_define):
https://www.ibm.com/support/knowledgecenter/STJKN5_12.2.1/r_command__system__support_center_define.html

Delete a support center (support_center_delete):
https://www.ibm.com/support/knowledgecenter/STJKN5_12.2.1/r_command__system__support_center_delete.html

Check Status of Remote Support (support_center_status):
https://www.ibm.com/support/knowledgecenter/STJKN5_12.2.1/r_command__system__support_center_list.html

Connect Remote Support (support_center_connect):
https://www.ibm.com/support/knowledgecenter/en/STJKN5_12.2.1/r_command__system__support_center_connect.html

Disconnect Remote Support (support_center_disconnect):
https://www.ibm.com/support/knowledgecenter/STJKN5_12.2.1/r_command__system__support_center_disconnect.html