Applicable Products

Product: IBM DS8870
Product Version(s): 87.x.x.x

Product: DS8800
Product Version(s): 86.x.x.x

Product: DS8700
Product Version(s): 75.x.x.x, 76.x.x.x

Product: IBM DS8100 / DS8300
Product Version(s): 6.1.x.x, 6.2.x.x, 62.x.x.x, 63.x.x.x, 64.x.x.x
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1.0 Overview

IBM® highly encourages you to take advantage of IBM Call Home and all its related features to allow you and IBM to partner for your success. Call Home is a support function embedded in all storage products. By enabling Call home, the health and stability of your system is monitored every hour of every day throughout the year by the industry’s top troubleshooting specialists at IBM support. As an IBM client, the Call Home service will effectively provide you with reduced risk over an un-monitored system by alerting you of a system defect through My Notifications, automatically opening a Problem Management Record (PMR), and ultimately, decreasing system downtime through faster problem determination and resolution. Continuing reading for a detailed explanation of IBM Call Home and other remote support tasks, available connection options, unique features, and instructions for configuring and maximizing the potential of this preventative maintenance feature.
2.0 Remote support planning considerations

IBM is committed to delivering all service in a professional and secure manner. Planned service activities such as machine installation, hardware upgrades, and microcode upgrades typically do not require assistance from the next level of support. Failures are reported to the Remote Support Center when Call Home is enabled. PMRs are automatically updated by a knowledge-based system, which searches for known problems or service exceptions for the reported problem. In addition to the on-site System Service Representative, Remote Support is a key element in the product support strategy. There are four features of Remote Support that need consideration.

- Call Home
- Heartbeat
- Data Offload
- Remote Access

These functions collectively automate problem reporting, make problem determination significantly more efficient, and help IBM to proactively search for problems. Secure high speed internet connections are recommended to optimize all these Remote Support features.

2.1 IBM Policies for Remote Support

The following guidelines are at the core of IBM remote support strategies for the DS8000®:

- When the DS8000 needs to transmit service data to IBM, only logs and process dumps are gathered for troubleshooting. The host input/ouput (I/O) adapters and the contents of Nonvolatile Storage (NVS) cache memory are never transmitted.
- When an Assist On-Site (AOS) or Virtual Private Network (VPN) session with the DS8000 is needed, the Hardware Management Console (HMC) will always initiate such connections and only to predefined IBM servers/ports. There is never any active process that is “listening” for incoming sessions on the HMC.
- IBM maintains multiple-level internal authorizations for any privileged access to the DS8000 components. Only approved IBM service personnel can gain access to the tools that provide the security codes for HMC command-line access.
- Although the HMC is based on a Linux operating system, IBM has disabled or removed all unnecessary services, processes, and IDs.

2.2 IBM Remote support benefits

Security is a critical issue for companies worldwide. Having a secure infrastructure requires systems to work together to mitigate the risk of malicious activity from both external and internal sources. Any connection from your network to the public Internet raises the following security concerns:

- Infection by viruses
- Intrusion by hackers
- Security challenge for authentication of the remote users to access your machine when a remote connection is opened
Remote access support can help to greatly reduce service costs and shorten repair times, which in turn lessens the impact of any failures on your business. Using IBM security access provides a number of advantages designed to help you save time and money and efficiently solve problems.

Here are just a few of the benefits you can realize:

- **Faster problem solving**
  You can contact technical experts in your support region to help resolve problems on your DS8000 without having to wait for data such as logs, dumps, and traces. As a result, problems can be solved faster.

- **Connection with a worldwide network of experts**
  IBM technical support engineers can call on other worldwide subject experts to assist with problem determination. These engineers can then simultaneously view the DS8000 HMC.

- **Closer monitoring and enhanced collaboration**
  You can monitor the actions taken on your HMC and join conference calls with the IBM support engineers to discuss the next steps as the problem determination and resolution process proceeds.

- **Save time and money**
  Many of your problems can be solved without IBM ever having to send an engineer to your site.

### 2.3 Call Home

The IBM Call Home function automatically notifies IBM of any problem detected on the storage system. Upon detection of a hardware or software error code, IBM Call Home transmission protocol notifies IBM support of the detected defect. The function then opens a one-way communication from the Hardware Management Console (HMC) to IBM support in order to automatically open a Problem Management Record (PMR) and transmit non-sensitive, defect-related information for diagnostic purposes. This data contains preliminary diagnostic information such as descriptive error codes, machine type, model and serial number of the impacted system, and current microcode. IBM support has a knowledge system that checks each Call Home record for known problem resolutions or know service exceptions and automatically updates the PMR with required actions. Acquisition of this data often alleviates the prerequisite data collection necessary in traditional troubleshooting methods, allowing IBM support to provide you with more effective troubleshooting.

### 2.4 Hardware service information (Heartbeat and VPD)

IBM Call Home on the DS8000 for heartbeat and Vital Product Data (VPD) are separate from Call Home for problem reporting. Heartbeat and VPD can be enabled to transmit proactive inventory, configuration and code level information to IBM. The Heartbeat is a one-way connection from the HMC to IBM support and verifies the Call Home connections. VPD contains basic product information so that IBM can proactively identify machines exposed to known issues. IBM highly recommends enabling Heartbeats for every 7 days and VPDs for every 14 days.
2.5 Optional client event notifications

A client can receive notifications from the HMC through Simple Network Management Protocol (SNMP) traps and email messages. These alerts are related to Call Home transmissions, client only notifications for things like PPRC link failures, Key Server communication errors, and other general events that do not generate a Call Home. Clients will be notified of Call Home events if SNMP or email notification is enabled by the IBM service representative. Clients will additionally need to use DS8000 Command-line Interface (DSCLI) to enable notification of events such as PPRC path failures or Key Server communication failures.

2.6 Data offload

For some problems affecting the DS8000, a large amount of diagnostic data is required. PE Packages, StateSaves, On Demand Data Dump (ODD) or other types of data must be off-loaded for IBM support to analyze. This data can include text and binary log files, firmware dumps, memory dumps, inventory lists and timelines which are grouped into collections based on the component that generated them or the software service that owns them. The HMC is a focal point in gathering and storing data packages and must be offloaded from the HMC for transmission to IBM support. The data offload can be completed in the following ways:

- Secure Sockets Layer (SSL) Offload
- VPN (IPSec) Offload
- Standard FTP Offload
- Modem Offload

By sending this diagnostic information to IBM with a high speed connection, authorized support personnel are able to quickly identify problems and develop an action plan for problem resolution giving you more effective support sessions and ultimately, an overall reduction in time to resolution. For more information regarding the data offload procedure for each connection type, please reference Section 17.5.2 in the IBM System Storage DS8000: Architecture and Implementation Redbook, which can be accessed from the link below.

IBM System Storage DS8000: Architecture and Implementation Redbook

2.7 Remote access

Remote Support representatives can access the DS8000 remotely to assess the machine state and perform problem determination when Call Home reports a problem. Remote access also allows the Remote Support representative to collect any problem data that is required for complete analysis. Certain action plans can be completed by the Remote Support representative without waiting for a System Service Representative.

There are three remote access methods: modem, VPN and AOS. Each of these access methods can be controlled (enabled) by the client. AOS is embedded on the HMC of DS8870 beginning with release 7.1. This is IBM’s recommended access method.
3.0 Connection options & security features

The DS8000 offers multiple connection options to provide compatibility with each client’s unique IT environment. The following options permit an available outside connection from the HMC to IBM support to allow notification of a detected error, allow remote access for problem determination, and allow the transmission of important diagnostic data.

- AOS
- VPN only
- Modem and IP Network with Traditional VPN
- Modem only
- No Connection

3.1 Remote Connectivity Options

There are options used for inbound connections and for outbound connections. The benefits and drawbacks of the various connection types can be found below. Service activities referenced include problem reporting, debug data offload, and remote access. Note that enabling multiple connection options is allowed and provide redundancy.

<table>
<thead>
<tr>
<th>Connectivity Options</th>
<th>Pros</th>
<th>Cons</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOS (IBM Recommended)</td>
<td>- SSL Security</td>
<td>- Installation and configuration with IBM Support is required</td>
<td>AOS is the IBM recommended connection method for remote access due to its capability to provide more secure connectivity sessions.</td>
</tr>
<tr>
<td></td>
<td>- Secure attended and unattended sessions</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Economical connectivity solution</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Easy installation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VPN Internet</td>
<td>- Fast debug data transfer to IBM</td>
<td>- Can be difficult to implement in some environments</td>
<td>Generally the best option &amp; could be the only option enabled; However; use modem as backup and for initiating remote access sessions.</td>
</tr>
<tr>
<td></td>
<td>- Supports all service activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modem</td>
<td>- Supports all service activities</td>
<td>- Extremely slow debug data transfer to IBM</td>
<td>Might be the only option enabled.</td>
</tr>
<tr>
<td></td>
<td>- Allows IBM to remotely initiate an outbound VPN</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2: Remote support outbound connectivity comparison

<table>
<thead>
<tr>
<th>Connectivity Options</th>
<th>Pros</th>
<th>Cons</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet (SSL)</td>
<td>-Fast debug data transfer to IBM -Supports problem reporting -For various reasons (i.e. proxying), SSL is easier to implement than VPN</td>
<td>Does not support remote access.</td>
<td>To support remote access, at least one of the following must be enabled as an adjunct: VPN, Internet or Modem.</td>
</tr>
<tr>
<td>VPN Internet</td>
<td>-Fast debug data transfer to IBM -Supports all service activities</td>
<td>-Can be difficult to implement in some environments -Does not allow you to inspect packets</td>
<td>Generally the best option &amp; could be the only option enabled; However; use modem as backup and for initiating remote access sessions.</td>
</tr>
<tr>
<td>FTP</td>
<td>-Fast debug data transfer to IBM -Allows proxying</td>
<td>Does not support problem reporting or remote access.</td>
<td>To support all service activities, at least one of the following must be enabled as an adjunct: AOS, VPN, or modem.</td>
</tr>
<tr>
<td>Modem</td>
<td>-Supports all service activities -Allows IBM to remotely initiate an outbound VPN</td>
<td>-Extremely slow debug data transfer to IBM</td>
<td>Might be the only option enabled.</td>
</tr>
</tbody>
</table>

3.2 IBM Assist On-Site (Inbound remote access only connection)

This is the IBM recommended network connection for remote access.

IBM Assist On-Site (AOS) is an IBM Tivoli® software that allows an SSL secure session for IBM support to remotely connect to a client’s IBM storage device for diagnostic purposes. IBM support representatives use the powerful suite of tools accessible by AOS for problem determination. Support engineers can quickly complete problem analysis and take appropriate corrective action. It should be noted that AOS cannot be used to transmit a Call Home signal or data offload, and is strictly a tool to allow remote access in a secure environment.

It should be noted that the IBM DS8870 has AOS installed on the HMC upon purchase. AOS will be configured upon installation, or at a later date upon request, by the SSR assisting on location. The IBM DS8300, IBM DS8700 and IBM DS8800 require the external AOS gateway to be configured by the client upon installation. The client is also responsible for administration tasks on the AOS such as opening the port for connection availability when a problem occurs.

3.3 VPN (IPSec) only

A VPN connection can be established between a client network and IBM support through the HMC. VPN only connections are used for Call Home, Heartbeat, data offload, and remote access. Data is verified for authenticity and integrity. The transmission is encrypted so that even if it is captured en-route, it cannot be “replayed” or deciphered. For security purposes, there is no VPN service that “listens”, waiting for a connection to be made by IBM. Only the HMC is allowed to initiate the VPN tunnel, and it can be made only to predefined IBM addresses.
While it is possible to use a VPN over modem connection for remote access, the bandwidth of this connection is insufficient for data offload purposes.

3.4 Modem and VPN

A modem creates a low-speed asynchronous connection using a telephone line plugged into the HMC modem port. This connection type is relatively secure because the data is not traveling across the Internet. Due to bandwidth limitations, transferring large amounts of data can take a significant amount of time and depend on the average connection speed. IBM support remote access to the HMC through a modem connection enables Service engineers to provide problem determination assistance.

Using modem and VPN does provide redundant Call Home paths, modem and VPN internet with SSL. This redundancy requires a phone line and a network connection to the HMC.

3.5 Modem only

A modem creates a low-speed asynchronous connection that is relatively secure because the data is not traveling across the internet. Due to bandwidth limitations, this connection may not be suitable for data offload. Inbound connectivity to the modem can be set to unattended mode, where the modem will answer a request without intervention. Inbound connectivity can also be set to attended mode, where you or the SSR must enable the modem before a connection can be made. There are also temporary connection enable settings you can control including the scheduled date, time and duration.

3.6 No connections

In environments when outbound connections are forbidden, it is important to understand the implications to DS8000 support. The following list highlights these implications.

- Call Home and Heartbeat
  The HMC will not transmit a Call Home or heartbeat signal under any circumstances. IBM support will need to be notified at the time of installation to add an exception for this DS8000 in the heartbeat database, indicating that it is not expected to contact IBM. Since there is no Call Home customer notification of problems must be enabled.

- Data offload
  If absolutely required and allowed by the client, diagnostic data can be burned onto a removable media, transported to an IBM facility and uploaded to IBM support resources for diagnostic purposes.

- Remote access
  IBM cannot provide any remote support for this DS8000. All diagnostic and repair tasks must take place with an operator physically located at the console.
Appendix: 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 these publications, see “How to Access IBM Redbooks Publications” above. Note that some of the documents referenced here might be available in softcopy only.

<table>
<thead>
<tr>
<th>Title</th>
<th>Description</th>
<th>Order Number</th>
</tr>
</thead>
</table>
| DS8800 and DS8700 Introduction and Planning Guide | This publication provides an overview of the product and technical concepts for DS8800 and DS8700. It also describes ordering features and how to plan for installation and initial configuration of the storage system. | V6.3 GC27-2297-09  
V6.2 GC27-2297-07  
V6.1 GC27-2297-05  
V6.0 GC27-2297-03 |
| DS8870 Introduction and Planning Guide | This publication provides an overview of the product and technical concepts for the DS8870. It also describes the ordering features and how to plan for an installation and initial configuration of the storage system. | V7.3 GC27-4209-09  
V7.2 GC27-4209-08  
V7.1 GC27-4209-05  
V7.0 GC27-4209-02 |
| DS8870 Architecture and Implementation | This publication describes the concepts, architecture, and implementation of the DS8870. This book provides reference information to assist readers to need to plan for, install, and configure the DS8870. | V7.3 SG24-8085-03  
V7.2 SG24-8085-02 |
| DS8000 Command-Line Interface User's Guide | This publication describes how to use the DS8000 command-line interface (DS CLI) to manage DS8000 configuration and Copy Services relationships, and write customized scripts for a host system. It also includes a complete list of CLI commands with descriptions and example usages. | V7.3 GC27-4212-03  
V7.2 GC27-4212-02  
V7.1 GC27-4212-01  
V7.0 GC27-4212-00  
V6.3 GC53-1127-07 |
| Host Systems Attachment Guide | This publication provides information about attaching hosts to the storage system. You can use various host attachments to consolidate storage system capacity and workloads for open systems, System z®, S/390® hosts. | V7.2 GC27-4210-02  
V7.1 GC27-4210-01  
V7.0 GC27-4210-00  
V6.3 GC27-2298-02 |

Other Publications
These publications are also relevant as further information sources. Note that some of the documents referenced here might be available in softcopy only.

- System Storage Productivity Center Software Installation and User’s Guide, SC23-8823
Remote Support Overview


**Online Resources**

These websites and URLs are also relevant as further information sources:


**Help from IBM**

- IBM Support and downloads: [www.ibm.com/support](http://www.ibm.com/support)
- IBM Global Services: [www.ibm.com/services](http://www.ibm.com/services)