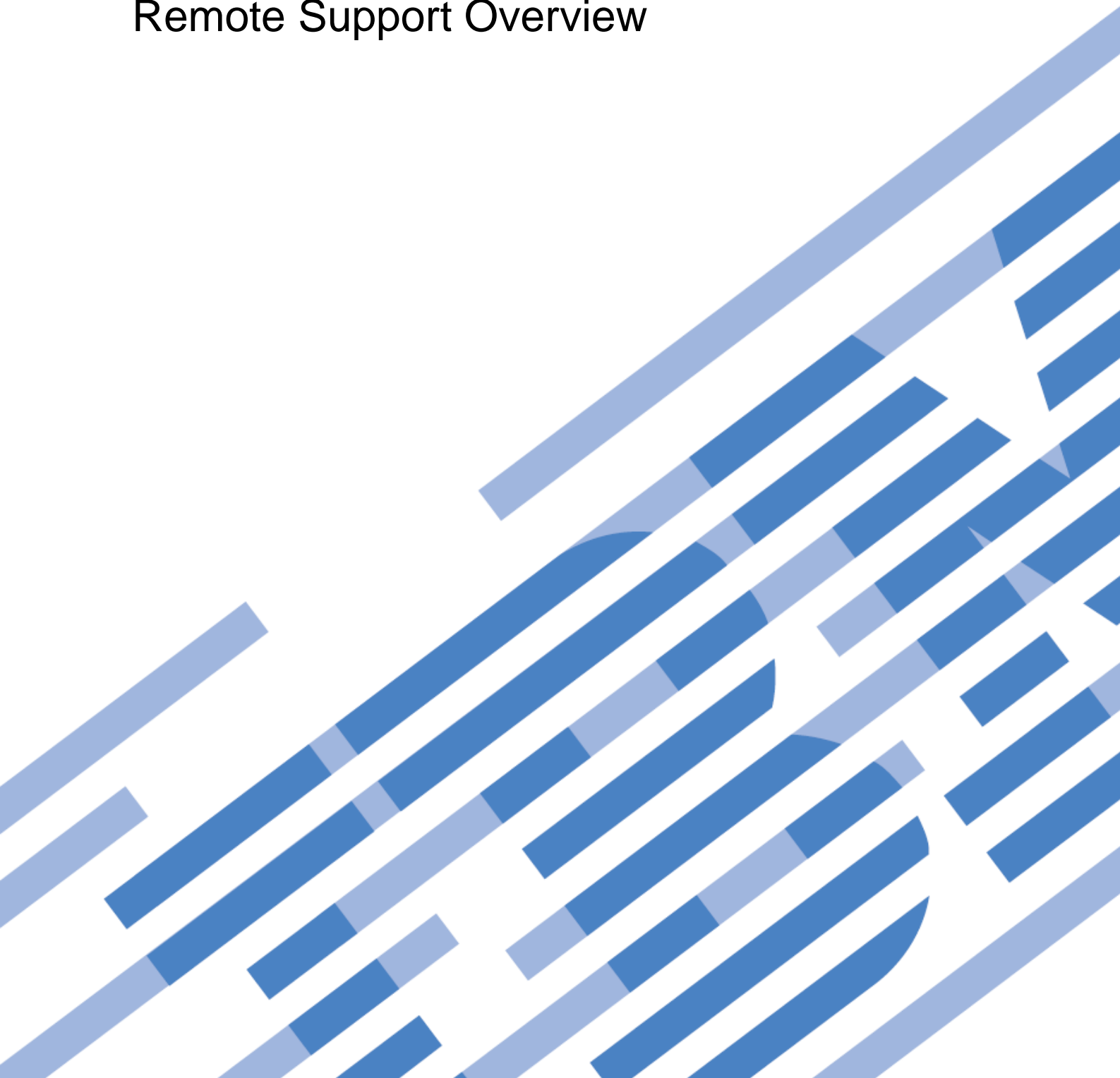# IBM FlashSystem 720 & FlashSystem 820 Remote Support Overview

Applicable Products

Product: IBM FlashSystem 720
Product Version(s): 6.3.1-p10, 6.3.0

Product: IBM FlashSystem 820
Product Version(s): 6.3.1-p10, 6.3.0

ⓘ   IBM Support highly recommends upgrading your FlashSystem firmware to the current level of 6.3.1-p10 to avoid possible vulnerabilities occurring in your environment.

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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 tasks

IBM is committed to servicing the FlashSystem™ 720 and 820, whether it is warranty work or management of a component failure, in a secure and professional manner. Dispatching service personnel for on-site assistance and maintenance is part of that commitment, but to minimize downtime and maximize efficiency, IBM Support can perform support tasks remotely. The remote support tasks able to be performed are stated below:

- Call Home
- Heartbeat
- Diagnostic Data Offload
- Remote Access

The storage system's ability to perform these support tasks remains dependent on the availability of an outside connection and the settings defined during installation. A detailed explanation of what each support task entails can be found below.

2.1 Call Home

IBM Call Home is a predictive and preventative embedded-support function that monitors the health and functionality of your IBM FlashSystem through error logs and event notifications. Upon detection of a hardware or software error code, the IBM Call Home transmission protocol initially notifies both you and IBM Service Center of the detected event through your company's email server using Simple Mail Transfer Protocol (SMTP). If Service Center determines that the detected event requires service or further investigation, a new PMR is created and sent to the appropriate IBM Support personnel. Depending on the type of error reported, an IBM service representative can be dispatched to your site with necessary replacement parts or you can grant IBM Service Engineers remote access to view diagnostic data for the affected system. The information that is sent to IBM during an error-initiated Call Home is viewable from the management GUI's system log.

2.2 Heartbeat

IBM Call Home on the FlashSystem can be enabled to transmit proactive inventory information to IBM Support called a heartbeat. 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. If a scheduled inventory alert does not reach IBM and event notifications for the system are optionally enabled, an alert will be sent to the defined recipients to notify them of the unexpected failure and encourage further investigation into the health status of the system.

2.3 Diagnostic data offload

For certain events causing a severe impact to the FlashSystem, a large amount of problem-related data, known as Support Logs, must be generated for IBM support resources to quickly and accurately troubleshoot the system. The data reviewed by IBM support includes machine configuration information such as machine model, type, and serial number. Logs containing completed commands, network configuration changes,

and detailed error logs are also sent to assist during events causing complicated diagnostic processes.

For severe events, additional data packages from the affected component may be required by IBM support to complete the diagnostic process. If additional data must be sent, company personnel will be told by an IBM support representative of the packages to be collected and uploaded to the IBM support's problem management database, ECuRep. Further instructions regarding manual collection and submittal of support data can be found in Section 4.0 'Instructions.'

2.4   Remote access

Remote access describes the most interactive level of assistance from IBM. After a Call Home transmission and review of preliminary diagnostic data, direct interaction with the FlashSystem 720 or 820 may be necessary to delve 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 could provide problem resolution or be implemented to minimize the effects of an impacting event while a service representative is dispatched to the worksite.

2.4.1   Ethernet connection

The FlashSystem 720 and 820 storage systems include a Gigabit Ethernet port to provide connectivity from the local worksite's pre-installed Ethernet network. By providing an outside connection, the system can access the FlashSystem web interface, which offers many managing, monitoring, and troubleshooting tools including Call Home. A brief selection of the monitoring and troubleshooting tools offered by the FlashSystem web interface can be found in Section 3.0 'FlashSystem Web Interface.' During installation the Ethernet port must be supplied with an IP address, a subnet mask, and a gateway address if used in your company's network. FlashSystem offers three possible IP address settings: Static IP, Dynamic Host Configuration Protocol (DHCP), and No Ethernet. The default factory setting is DHCP. Instructions for properly configuring the Ethernet connection to the storage system can be found in Section 4.1 'Configuring network settings with a static IP address' and Section 4.2 'Configuring network settings with DHCP.'

3.0 FlashSystem web interface

The FlashSystem storage system is equipped with a browser-enabled tool to facilitate system monitoring, management, and configuration known as the FlashSystem web management interface. This interface provides easy access to tools that assist in remote management, troubleshooting, and provide a comprehensive overview of the status and functionality of all the components that create the system. Further information regarding unique features accessible from the web interface and configuration instructions can be found in the sections below or by downloading the *IBM FlashSystem Web Interface Guide*, S7004339.

ⓘ The IBM FlashSystem web management interface requires version 1.5 or later of the Java™ Runtime Environment.

3.1 Event reporting

The FlashSystem 720 and 820 record all command inputs and events in an event log accessible from the web management interface. Once an entry has been made in the event log, the status and functionality of the system's components are analyzed. If any service activity or further investigation into the health of the system is required, a notification is sent that follows the configured reporting method defined during installation.

3.1.1 Event reporting process

The following methods can be enabled to notify your local system administrators and/or IBM support personnel of a new and/or serviceable event:

- Call Home can be enabled so that critical faults generate a problem management record (PMR) that is sent directly to authorized IBM support resources by SMTP e-mail protocol.
- An SNMP trap can be sent to an SNMP manager that is configured and managed by your local personnel.
- Log messages can be forwarded on a UP network by using the syslog protocol.
- Event notifications can be forwarded via e-mail using SMTP.

3.1.2 Event log

The FlashSystem Event Log is accessible through the web management interface and provides useful information related to any changes detected by the system. These logs can be used to view changes in the configuration and recent command inputs, which can be useful when troubleshooting problems in the storage system. When viewing the log, the following event information is given: the event's priority, the time the event occurred, the component the event occurred on, and a brief description of the event. The following outlines the pre-defined priority levels for events occurring on either the FlashSystem 720 or 820:

- Error
  The error priority level indicates a problem that must be corrected as soon as possible. This priority level indicates a serious problem with the system. The typical reason for this priority level is a hardware failure, but certain configuration

errors or fabric errors are included in this priority level. IBM recommends enabling Call Home to send error notifications to IBM Support personnel.

- Notice
  The notice priority level indicates a problem or unexpected condition with the system. Events with this priority level should be immediately investigated to determine the effect that it might have on your operation and make any necessary corrections. A notice priority level does not require any replacement parts and therefore does not require involvement from IBM support. The allocation of the notice priority level does not imply that the event is any less serious than an event with an error priority level.
- Information
  The information priority level indicates that an expected event has occurred. No remedial action is required for events with this priority level.

3.1.3 Event notifications

The FlashSystem 720 and 820 should be configured to send notifications when a new event is reported. By enabling notifications to be sent by one or more of the available mechanisms, monitoring the storage system can be done without viewing an individual storage system's event log on the management interface. The following event notification mechanisms can be enabled on FlashSystem 720 or 820:

- Email
  An event notification can be sent to up to five email addresses. This mechanism notifies individuals of events occurring on the system. Individuals set up to receive email notifications can receive them whenever or wherever email access is permitted, including mobile devices.
- Simple Network Management Protocol (SNMP)
  An SNMP trap report can be sent to a data center management system that consolidates SNMP reports from multiple systems. Using this mechanism, entire data centers can be monitored from a single workstation.
- Syslog
  A syslog report can be sent to a data center management system that consolidates syslog reports from multiple systems. This mechanism for event notifications also allows entire data centers to be managed from a single workstation.

3.2 User access

To prevent unauthorized access to the configuration of the storage system and ultimately to the information stored on its volumes, your FlashSystem product uses password-based user authentication. Password-based user authentication is a form of challenge-response authentication protocol where the authenticity of a user is established by presenting that user with a question (the challenge) and then their response is compared with information stored in a credential repository.

Upon initial configuration, the user's account types are also defined. The type of account designated for a user dictates the level of access and type of functions they are allowed to perform on the storage system.

The following outlines the pre-defined user account types available:

- High-Privileged user
  The high-privileged user is allowed to change configurations and settings on the storage system using the web management interface. A user with this account type is also able to do all tasks assigned to low-privileged users.
- Low-Privileged user
  The low-privileged user can view statistics, logs, and other information regarding the storage system. A user with this account type cannot change any settings or alter the configuration of the storage system in any way.

4.0 Instructions

The following sections provide instructions for initial configuration and modifying client-configurable options for some of the remote support and monitoring features available to the FlashSystem 720 and 820.

4.1 Configuring network settings with a static IP address

The storage system allows system monitoring and configuration through the installed Ethernet ports. Local system administrators are responsible for providing each port with an IP address, a subnet mask, and a gateway address if used in the pre-existing network. There are three possible IP address settings: Static IP, DHCP, or No Ethernet. The default setting is DHCP. For any questions that you may have regarding IP assignment values, please consult your network administrator.

To set up the network by using the front panel, please complete the following steps:
1. Use the arrow buttons to cycle through the top-level menu options until the display window shows **Net Config**.
2. Use the **Select** button to choose this option and continue with the configuration. If your storage system has multiple management controllers installed, select the management controller you would like to configure.

   The following menu options are accessible by using the arrow buttons to scroll:
   - **Show Current** – Displays the current IP configuration, host name, IP Config address, subnet mask, gateway address (if applicable), and hardware MAC address for the management controller.
   - **Eth0 Config** – Configures the Eth0 Ethernet port
   - **Restart Net** – Shuts down and restarts the Ethernet ports by using the current IP assignment configuration.
   - **Exit Menu** – Exits the network menu
3. To continue setting up the Ethernet configuration select **Eth0 Config**, then use the arrow buttons to scroll to the first menu option, **Static** and click the **Select** button.
4. The next display screen prompts the user to enter the IP address. Use the ↑ and ↓ buttons to move the cursor. Click **Select** to cycle through the numbers 0 through 9. The current changes can be cancelled at any time during the configuration process by selecting the **Menu** button and following the dialog.
5. Once the process of entering the IP address is complete, move the cursor off the end of the address. This action brings up the **Subnet Mask** screen.

6. Using the same procedure as entering the IP address, enter the subnet mask.
7. The final value that must be entered is the Ethernet gateway. If the system is on a private network and this value is not needed, enter 0.0.0.0 on the next screen and then press any key to dismiss this message. Otherwise, enter the gateway IP address using the same procedure as before.
8. After all required fields have been entered, the changes made can be reviewed, applied, edited or canceled using the **Review Configuration** pane.
9. To apply the changes, select the **Apply New Settings** option. The changes are then applied and the network is automatically restarted. The final pane displays the assigned IP address.

ⓘ Because a static IP address was established rather than using DHCP, there is no automatic discovery of the network DNS server. To enter the DNS server information, use the web management interface. The DNS settings are configured using the Network node in the system tree.

4.2 Configuring network settings with DHCP

The storage system is pre-configured to use DHCP as its IP address method. To configure the DHCP server, the hardware MAC address of the storage system must be known.

To obtain the MAC address and to configure your system to use DHCP by using the front panel, please complete the following steps:
1. Use the arrow buttons to cycle through the top-level menu options until the display window shows **Net Config**.
2. Use the **Select** button to choose this option and continue with the configuration. If your storage system has multiple management controllers installed, select the management controller you would like to configure.

    The following menu options are accessible by using the arrow buttons to scroll:
    - **Show Current** – Displays the current IP configuration, host name, IP Config address, subnet mask, gateway address (if applicable), and hardware MAC address for the management controller.
    - **Eth0 Config** – Configures the Eth0 Ethernet port
    - **Restart Net** – Shuts down and restarts the Ethernet ports by using the current IP assignment configuration.
    - **Exit Menu** – Exits the network menu
3. Select the **Show Current** option by pressing the **Select** button.
4. Use the ↓ button to scroll to the section that displays the information for the desired Ethernet device. The MAC address is shown at the bottom and is displayed as six octets, such as `a2:78:90:f7:01:88`. This is the value that will be used to configure the DHCP server.
5. On the front panel display choose **Eth0 Config**, then select **DHCP**.
6. On the next pane use the ↓ to confirm the setting. The system restarts automatically. The final screen will then display the IP address that is assigned by the DHCP server.

(i) If the network fails to start, check the Ethernet connection and contact your system administrator. If the IP configuration was saved successfully, select the **Restart Net** option from the management controller menu instead of reselecting the same IP configuration.

4.3 Accessing the web management interface

To use the FlashSystem management interface, the system IP address must be known and the browser used must support Sun Java v1.5 or later.

To acquire the IP address of the storage system by using the front panel display, please complete the following steps:

1. Press the **Menu** button to display the **Main Menu** pane. Use the arrow buttons to find the **System Info** option, and then press the **Select** button.
2. Use the ↓ button to scroll until the `Eth0 P` line and the lines below it are able to be seen.
3. Take note of the IP address.

To open the web management interface, complete the following steps:

4. Download the Sun Java plug-in for Microsoft Internet Explorer for Windows and for both Linux and Windows versions of Firefox. To obtain the latest Sun Java plug-in, go to http://www.java.com.
5. Using a standard web browser with the Sun Java plug-in, set the address to the IP address acquired in Step 3.
6. The System Login pane will then be visible. The storage system is initially configured with a default admin user defined as User: admin and Password: password
7. Log in to the web interface. The opening pane is then visible.
8. Expand or select the desired storage system icon in the system tree.

4.4 Call Home configuration

The following instructions outline the procedure to properly configure Call Home on the FlashSystem 720 and 820.

(i) You must configure the SMTP email system by using the mail service function to enable the system to send outgoing emails for the Call Home function. The email configuration rules must not inhibit Call Home e-mails from being sent in real time. Emails with Importance or X-Priority in the email header must not be delayed. For example, system emails must not be placed in a queue for later delivery or filtered for priority.

4.4.1 Call Home configuration requirements

The following table outlines the requirements for proper configuration of IBM Call Home:

Table 1: Call Home Configuration Information

Call Home Config Requirement	Value	Details
SMTP Port	25	Your SMTP server must be reachable on port 25 from the management IP address.
SMTP Address	IP address	Your SMTP server IP address
Email Destination Address	flash-sc1@vnet.ibm.com	The SMTP server must allow relaying to this email address.
Email Source Address	flashsystems@us.ibm.com or customer-defined	The default email address from when the email is sent. You can set this email address to conform to your email relay rules.

4.4.2 Configuring the mail service

The mail service function provides system event email notifications and the ability to email the system report directly for support purposes.

To configure the mail service settings, complete the following steps:
1. In the web interface, select the **Services** node in the tree, then click the **Mail** node. An overview pane is displayed.
2. Click the **Configure** button to open the configuration wizard. Use this wizard to enable available functions, set the SMTP server, and to enter the target email addresses. Any available mail service functions can be enabled by clicking the check box that corresponds to the function. The SMTP server might be set manually or found automatically from DHCP by setting the server value to **Default**.
3. Specify up to five email targets to receive emails that are sent by the service.

ⓘ The flash-sc1@vnet.ibm.com email address is stored internally and does not need to be added manually.

4. The e-mail source address can be customized by using the command-line interface (CLI):
   a. From a Telnet or Secure Shell (SSH) protocol client, access the system by using the system IP address.
   b. Log in by using the default user name and password, or your system's unique user name and password.
   c. Enter system call_home_config *<SMTP IP address><custom email address>* at the command prompt.

ⓘ *<SMTP IP address>* can be the IP address of the default mail system SMTP server or the IP address of a different SMTP of your choice.

4.4.3 Configuring the support contact information

The support contact information is used to route notifications from IBM Service Center to the IBM support team closest to your geographical region. The contact information is also used by IBM support representatives to notify you when a system requires service.

To update the support contact information, please complete the following steps:
1. In the web interface, select the **Services** node in the system tree, then click **Support.** An overview pane is displayed.
2. Click the **Configure** button. A configuration wizard is displayed.
3. Verify that the ISO Country Code is accurate.
4. Add a contact name, email address, and phone number.

ⓘ Please provide the contact information of the individual to be contacted by IBM support in the case of a system defect. To ensure that IBM support is able to notify you of a serviceable event, be sure to update the provided contact information as personnel changes.

4.5 Manual collection of support logs

During certain serviceable events, IBM support personnel may request a system report to be sent to assist in the diagnostic process. The system report is an extremely valuable tool for troubleshooting system issues. The report includes a snapshot of all current configuration settings for the storage system along with the event log, hardware error log, and other problem-related information.

To download the **System Log**, please complete the following steps:
1. From the web interface, navigate to the **System List** and choose the affected system in which you would like to obtain the logs from.
2. Once the system has been chosen, select **Logs → Full System Reports**.
3. To save the system report, click **Save System Report** and specify a text file.

To download the **Storage Log**, please complete the following steps:
1. From the web interface, navigate to the **System List** and choose the affected system in which you would like to obtain the logs from.
2. Once the system has been chosen, select **Storage → Storage Reports**.
3. To save the storage log, click **Save Storage Reports** and specify a text file.

To email a system or storage log for troubleshooting purposes, complete the following steps:
1. From the web interface, select the **Logs** node in the system tree.
2. Click **Email System Report** located in the toolbar.
3. Complete the **From** and **Comments** fields in the pane.
4. To send the report, click **OK**. This process may take a few moments to complete while the system report is being created.

If you would prefer to upload the system logs directly to IBM support staff, this can be done using ECuRep which was established as a data repository to manage customer

cases of system problems. From the ECuRep portal, IBM support personnel working on a reported problem can access the information and logs that you have provided.

To upload data to EcuRep:
1. Open a web browser and navigate to http://www.ecurep.ibm.com/app/upload
2. Select either **Standard Upload** or **Secure Upload** from the menu on the left side of the ECuRep home page. See Figure 10 below.
3. Provide the following information in the open text fields on the ECuRep page:
   a. PMR Number: The problem management record (PMR) number provided by IBM authorized service.
   b. Upload is for: Other
   c. Email Address: The email address of the person performing the upload
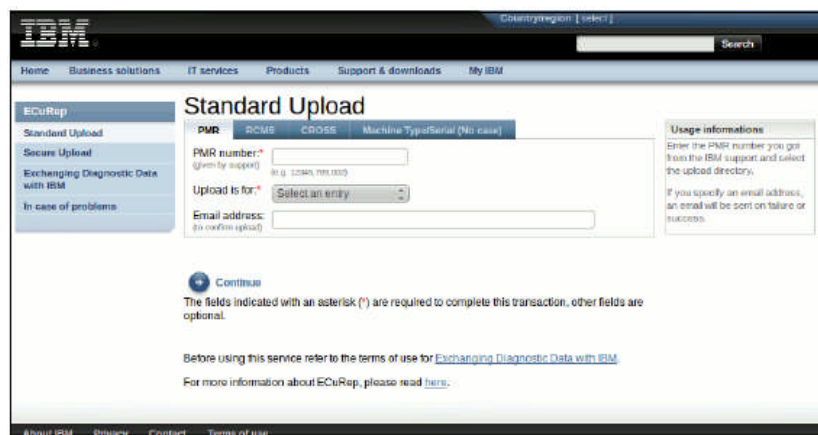

Fig. 10: ECuRep page to upload logs to IBM

4. Once the required information has been entered, click Continue to select the Support Package for upload, then press **OK**. The selected Support Package is uploaded to IBM support staff for diagnostic purposes.

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 710 and IBM FlashSystem 810 Product Guide*, TIPS1002
- *Installing the IBM FlashSystem 710*, GI11-9893-00
- *IBM FlashSystem 710 User's Guide,* S7004329
- *Installing the IBM FlashSystem 810*, GI11-9894-00
- *IBM FlashSystem 810 User's Guide*, S7004333

Other publications

These publications are also relevant as further information sources:

- *IBM FlashSystem SCSI Interface Guide*, S7004337
- *IBM FlashSystem SNMP Guide*, S7004338
- *IBM FlashSystem Web Interface Guide*, S7004339
- *IBM FlashSystem Integration Guide, S7004373*
- *IBM FlashSystem Troubleshooting and CRU Service,* S7004508

Online resources

These websites are also relevant as further information sources:

- IBM FlashSystem product web page:
  http://www.ibm.com/systems/storage/flash/
- IBM Support Portal for FlashSystem 710:
  http://www.ibm.com/support/entry/portal/product/system_storage/flash_storage/flash_systems/ibm_flashsystem_710?productContext=1790244376
- IBM Support Portal for FlashSystem 810:
  http://www.ibm.com/support/entry/portal/product/system_storage/flash_storage/flash_systems/ibm_flashsystem_810?productContext=-297496846
- IBM System Storage Interoperability Center (SSIC):
  http://www.ibm.com/systems/support/storage/ssic/interoperability.wss

Help from IBM

- IBM Support and Downloads:
  http://www.ibm.com/support
- IBM Global Services:
  http://www.ibm.com/services

Appendix B: Heartbeat data contents

The following information is provided to IBM support during a heartbeat transmission from a FlashSystem 720 or 820 product.

- Customer contact information (name, address, phone number, email address, country…)
- Services enabled on the system (email notification, SNMP, SSH ….)
- When battery test is scheduled to run
- Time Heartbeat is sent every day
- Time zone of the system
- Vendor information (Texas Memory Systems vs IBM)
- Storage configuration
- System total capacity
- RAID level used
- State of the RAID array
- RAID rebuild in progress
- Fault present
- Flashcard acting as spare (if any)
- Number of volume configured
- Storage allocated
- Storage remaining
- Volume maximum size
- SCSI reservation counters
- Number of access policies vs open access
- Vital Product Data (serial numbers of components in the system, type…)
- States of sensors in the system (temperature, cards voltage…)
- Flash card health (location in the machine, number writes, erase, run time…)
- Flash layout
- Unresolved hardware error
- SCSI statistics
- Interface card state (link speed, connection …)
- Fan speed
- Battery health (health, charge…)
- Volume metadata
- Messages currently displayed on LCD
- Licenses enabled