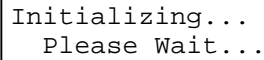


Chapter 5 Troubleshooting

5.1 Controller

Problems with the controller fall into two categories, serious and disastrous. The controller is the only major component in the IFT-6300 that can cause a fatal failure on its own.

After the system POST is complete, the controller will begin initializing the RAID. The following message will be displayed by the LCD panel:



Initializing...
Please Wait...

If everything is working normally, shortly after this message, the system should be up and running. The LCD panel will display the Ready screen and the status in RAIDGuide will indicate Ready.

Problems at Startup

Controller failure at startup will most likely result in a failure to initialize the RAID. If your system hangs at this point of the power-up (wait at least 5 minutes before deciding that the system is stuck), power off, wait 10 seconds, and try again.

Attempt this remedy three times, if the system still does not initialize, check all other components for good connections and status as indicated by LEDs.

Other Problems

The controller is the heart and brain of a RAID array. If, during normal operations, the controller fails the most obvious symptoms will be that the LCD does not light and the array is inaccessible.

NOTE:

Once the POST and RAID initialization are completed (meaning that the controller is functioning properly), any subsequent failures or problems will most likely generate an event message in the array event log.

5.2 Enclosure

The enclosure elements (power supplies, fans, drive trays, LED indicators, ports) are, in most cases, monitored by the RAIDGuide GUI software through the controller (which also monitors and records problems), so problems with them will be displayed in the status window of RAIDGuide.

NOTE:

Detailed information about how to remove and replace power supplies and fans is included in *Section 3.4 Redundancy and Hot Swap*.

Power Supplies

The system comes with two, hot-swappable, redundant power supplies, each of which can supply sufficient power for the entire array indefinitely.

If a power supply fails, a variety of things will happen. The event will be recorded in the array event log by the controller. At the same time, the system alarm will sound and the Attention LED will light. If you are using RAIDGuide to monitor the array, you will see the Status change from Ready to Error, and the array symbol will display the back of the unit with the power supplies highlighted red. On the power supply itself, the status LED will change from Green to Amber, indicating which power supply has failed.



Because the unit comes with redundant power supplies, it is possible to replace a failed power supply without powering down or otherwise interrupting data flow.

To determine which power supply has failed, carefully examine the LED and fans of both supplies. The LED of a failed power supply should be amber and the fans of that supply should not be turning. If you are uncertain which power supply has failed, power down the host and make certain that the array cache is empty **BEFORE** removing a power supply.

To check the cache, press the down arrow button once from the LED Ready display. If it reads “Empty,” there is no data in the cache and you may safely power down or remove a suspect power supply.

NOTE:

The RAIDGuide error readout for the power supplies is unable to display *which* power supply has failed. The display highlights both power supplies, but that does not mean both have failed.

Once you have determined which power supply has failed, to replace it, turn the hand-screw counter-clockwise until the power supply is free, raise the handle on the failed unit, and gently pull the power supply out of the enclosure.

Before sliding a new power supply into the unoccupied bay, you must suspend data transmissions from the array host. In general, to do this requires pausing all services and software that may access the data on the array.

WARNING!

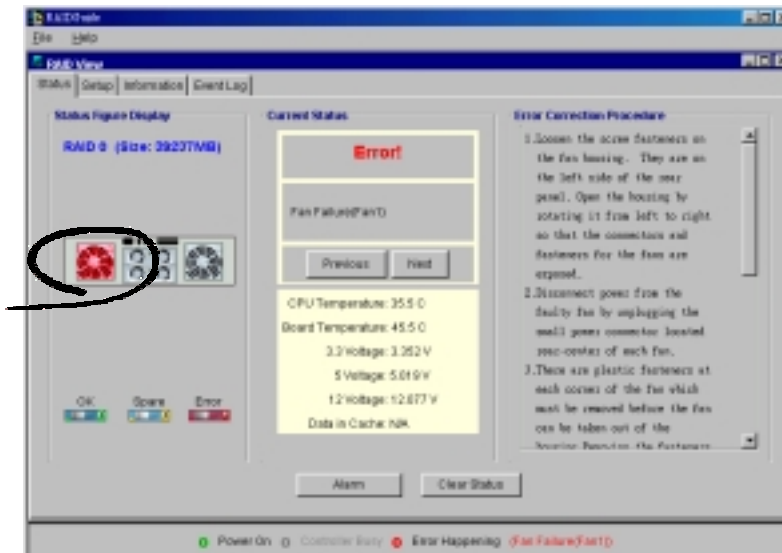
If data is still being sent and received when a new power supply is installed in the unit, it is possible you will encounter data errors.

Once data I/O has been suspended by the host, a new power supply can then be gently slid into the unoccupied space.

Fans

The system also comes with two hot-swappable cooling fans. Both fans are necessary to maintain adequate airflow throughout the enclosure, particularly over extended periods of time.

If a fan fails, it will register as an error event and be logged and available both via the LCD panel and in RAIDGuide.



Removing a failed fan and installing a replacement is a fairly complex process:

- Step 1 :** Each fan housing is mounted on a swivel. To open the housing, loosen the hand screw to the left of the fan. It is not necessary to use a screwdriver.
- Step 2 :** Once the fan housing is free to turn, rotate it towards you so that the back of the fan is exposed.
- Step 3 :** Disconnect the power cable for the failed fan. It is located in the middle of the fan and can be disconnected by squeezing the connector to release it and then pulling gently.
- Step 4 :** After the power cable has been disconnected, it is necessary to remove the plastic rivets at each corner of the fan. To remove the rivets, use your finger nail to remove the central post. This will release the main piece which can then also be removed. Repeat for all four rivets (one in each corner). Save these fasteners!

Step 5 : The fan is now free to remove. Gently slide it out of the housing.

Step 6 : To install the replacement, slide it into the housing, noting the top-bottom and front-back orientation of the fan. The back of the fan should be towards the power connector and the cable at the bottom left of the fan should be down to match the notch on the housing.

Step 7 : Replace all four plastic fasteners, reconnect power (carefully, assuming that the system is still running, the fan will start up immediately), swivel the housing back in place, and tighten down both hand screws.

More information on this process is available in Chapter 3.

All displays and readouts should reflect that the fan error has been repaired.

Drive Trays

Drive trays as a component separate from drives are unlikely to encounter problems unrelated to a drive failure. In the event that you suspect a drive failure may in fact be a problem with a drive tray, shut down the host, remove the questionable drive and tray, and examine the power and data cables to see if they have come loose or are damaged.

If, after checking the cables and returning the drive to its bay in the enclosure, the drive is still showing a failure, the drive itself has probably failed.

LEDs

LEDs, both on the enclosure and on each drive tray, are primarily used to indicate the status of the drives, power supplies, and array. Each of the LEDs listed below has a warning function:

- **Attention LED** – front panel, upper left side – when lit, indicates that some error has occurred.
- **Drive Fault LEDs** – at the top of the front panel, one for each drive bay – when lit, indicates that the drive in the corresponding bay has failed.
- **Power Supply LEDs** – upper center of each power supply – when lit green, the power supply is working; when lit amber, the power supply has failed. (Note that these are distinct from the power LEDs on each drive tray and on the main front panel.)

Ports

The ports on the IFT-6300 are not likely to fail even under the most strenuous circumstances. It is much more likely that a cable has failed, so the first thing to do if you suspect a port or cable failure is to replace the cable with one that

is known to be good. If replacing the cable repairs the problem, the failure is with the old cable not the port. Note that a SCSI bus must be terminated at both ends.

Termination (SCSI)

When using SCSI devices, it is always necessary to pay careful attention to termination. A SCSI bus must be properly terminated at both ends. The IFT-6300 SCSI models come with a physical terminator attached to the right-hand SCSI port. If the RAID array is the last SCSI device on the bus, simply attach it to the host using the unterminated SCSI port and an external SCSI cable. (For information about Fibre connections, see Chapter 6.)

If you want to daisychain other SCSI IFT-6300 arrays or other SCSI devices to your current SCSI IFT-6300, shut down all SCSI devices on the bus first. Once no devices on the bus are transmitting data, disconnect the terminator, connect the new SCSI device, terminate the bus (if it isn't already), and restart all devices. Note that termination must be on both ends of the SCSI bus, and only on both ends.

Replacement Parts

New fans, power supplies, trays, and other similar enclosure parts may be available from your supplier. Please note that replacement parts are *not* available directly from the manufacturer. We suggest that you contact your supplier in the event of a failure or damage to inquire about replacement part availability.

SODIMM

Instructions on SODIMM removal and replacement are available through your supplier should you wish to upgrade the memory yourself. Contact your supplier for information.

5.3 Drives

Drives sometimes fail. One purpose for a RAID array is to protect data integrity in the event of a drive failure. In a RAID1, RAID3, or RAID5 configuration, a single drive failure is not catastrophic. Data is not only protected, it remains available despite the drive failure.

If a drive fails, the Attention LED will light, the red Fault LED to the left of the bay will also light, the alarm will sound, the LCD will display an error icon, and the event log will record the drive failure.

Spare Installed

If the array has a spare drive already installed, the spare will automatically replace the failed drive.

NOTE:

It is highly recommended that you replace a failed drive even if you already have a spare. An installed spare provides an additional safeguard against future drive failures.

No Spare Installed

If there is no hot-ready spare drive installed, a single drive failure in a RAID1, RAID3, or RAID5 array will still not result in data loss or downtime. If a drive fails without a spare, remove the failed drive and replace it with a new one of equal or greater capacity.

The RAID controller will automatically rebuild the array once a new drive has been installed to replace the failed drive. The new drive can be installed in any unoccupied drive bay.

5.4 Notes and Warnings

These notes and warnings are also included within the text of relevant sections of the User's Manual and are added here for reference and in the order in which they appear in the text.

NAME and TYPE	NOTE or WARNING
Fault Tolerance (Note)	The IFT-6300 has been designed to tolerate a single fault in any major component except the controller itself. Drives, fans, power supplies, one of any (or even "each" under worst case) can fail and data will still be maintained and available.
RAID Level Support (Important)	The IFT-6300 only supports RAID 0, RAID 1, RAID 3, RAID 5, RAID 1+Spare, RAID 3+Spare, and RAID 5+Spare. Auto Setup default RAID settings are described in Chapter 2.

RAID1 Expansion (Note)	One drawback to RAID 1 is that it does not allow running expansion. Once a RAID 1 array has been created, to expand it, the data must be backed up elsewhere before a new drive can be added. Other RAID levels permit running expansion.
RAID 0+1 (Important)	RAID (0+1) will not appear in the list of RAID levels supported by the controller. If you wish to perform RAID 1, the controller will determine whether to perform RAID 1 or RAID (0+1). This will depend on the number of drives selected for the logical drive.
SCSI Default Settings (Important) <i>[SCSI Models Only]</i>	If you don't want to use the default SCSI ID setting, it is highly recommended that you change the setting before creating a new RAID using Auto RAID Setup. The RAID initialization process can take a long time depending on the size of the hard drives used. Changing the SCSI ID setting requires reinitializing the array, potentially doubling setup time if not done first.
Single Host Limitation (Important)	The IFT-6300 can only have one host connected at a time. Sharing the array storage capacity is accomplished through the host OS and hardware, <i>not</i> through the IFT-6300.
Auto RAID Setup via LCD (Note)	We highly recommend using Auto RAID Setup via the LCD panel to create the array (see Section 2.3) and RAIDGuide GUI Manager to monitor and maintain it.

Auto RAID Data Wipe (Warning)	Using Auto RAID Setup will wipe out all information currently stored on the hard drives installed in the array.
Setup Informational Graphic (Note)	The graphic on the right side of the Setup screen is a simple descriptive representation of the currently selected RAID level (not necessarily the current running RAID level). The representation is for information purposes only.
Contact Service (Warning)	It is highly recommended that you contact your service representative before attempting any of the Setup / Main / Download functions, since failure to do them properly can result in serious damage to your RAID controller.
Failed Drive Removal (Warning)	A failed drive will be indicated by a "X" mark on the LCD and by a lit red LED just to the left of the drive bay. DO NOT remove the wrong drive! Removing the wrong drive may result in complete data loss!
New Power Supply Install (Warning)	If data is still being sent and received when a new power supply is installed in the unit, it is possible you will encounter data errors.
New RAID Data Wipe (Warning)	Creating a new RAID will destroy all currently stored data.
Using Two Fibre Channels (Warning)	Using two fibre channels requires a third-party "volume management" software to prevent data loss. DO NOT USE two redundant channels to

	connect to a single host unless you have installed software to manage data flow to the RAID array. Failure to do heed this warning will result in data corruption.