LUMINEX™

MODERN MAINFRAME DATA SOLUTIONS

CGX Alerts

(Version 1.22)

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CGX Alerts
version 1.22

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Table of Contents

1. Introduction

This document will discuss the alerting mechanisms for Luminex solutions based on the Channel Gateway X (CGX) system, including MVT and MDI solution families. There are multiple processes that detect alert conditions, each utilizing the alerting mechanisms to present the alert. This document will describe the various alert mechanisms, messages and their associated LUM codes.

2. Alerting Mechanisms

A user can be notified of an alert condition by one of the following mechanisms:

- Email
- SNMP Traps
- LTMON messages on the mainframe console

Each of these mechanisms requires different configurations. Multiple mechanisms can be in place at the same time.

All mechanisms attempt to prevent a flood of alerts in the event that the condition persists. Identical alert messages will be presented once per day. For example, if an alert condition arises that indicates that the scratch pool is below a defined threshold, only one of these alerts will be sent by the mechanism even though this condition is detected numerous times a day.

3. Alerting Categories

Multiple processes can throw an alert condition. Some have configurable thresholds to determine when an alert is thrown. These thresholds, and their default values, will be discussed in a later section. Also, the message contents will also be documented later.

3.1   Hardware Alerts

A process runs constantly on the Channel Gateway in order to detect hardware issues. Issues detected include:

- Power supply failures
- Fan failures
- File System nearing capacity
- File System alert messages
- Fibre Channel alert messages
- Internal Disk failures
- General failures

The general failures can be of many types. The Channel Gateway alerting software uses alerting tools available within the operating system. There are operating system methods that work directly with the hardware to detect various types of hardware issues. Some examples are memory faults, over temperature, and board failures. The Channel Gateway alerting software will present these detected by the operating system as general hardware failures.

3.2   System Alerts

The Channel Gateway software monitors various system conditions related to the CGX system. Such conditions are as follows:

- Scratch Pool below threshold
- Scratch Updates not occurring
- Licensing about to expire
- Idle Devices (tape mounted, but no activity)
- Compression hardware problems (i.e. transitioned to software failover mode)

If in Synchronous Tape Matrix (STM) mode, there are additional alert conditions:

- STM running in degraded mode
- STM restored from degraded mode

4. Configurable Thresholds

By default, all alert conditions are enabled. Some can be disabled or have their thresholds adjusted. Below are the alerts that can be disabled, or have their thresholds modified. The disabling and threshold changes can only be performed by Luminex support.

The configurable alerts and thresholds deal primarily with the scratch update and capacity checks. Some of the alerts can be configured "system" or "Storage Pool (SP)" specific. If of the SP type, a specific value can be set per Storage Pool.

Alert Type	Description	Default	Type
Check Scratch Update	Runs various checks on the scratch update process	Enabled	System
Check Scratch Update Days Run Test	If Check Scratch Update is enabled, determines if the scratch update was run within (X) days.	7 days	SP
Check Scratch Update Report Size Check	If Check Scratch Update is enabled, determines if the scratch update list was at least (X) VOLSER's	10000	SP
Scratch List Size	Checks to determine if the scratch list is at a minimum size	200	SP
File System Capacity Threshold	All file systems, whether they are used for VOLSER data or not, are checked for its capacity.	85%	System
Maximum number of directory entries	Some NFS storage devices have a limit on the number of files that can reside within them. An alert will occur if the configured threshold has been reached.	Disabled	System
Replication Queue Threshold	Checks the replication queue for excessive entries	250	SP
Idle Time	Checks tape drives that appear to be idle	300 seconds	System

The alert, Check Scratch Update, is typically disabled at the remote or disaster recovery sites. The Scratch List size threshold can be lowered for test systems that do not have a large number of scratch tapes. An alternate way to disable some checks over others is to set the default to 0. For example, SPprod can have a threshold of 500 for its Scratch List Size, while SPtest can have 0.

5. Enabling Email Alerts

Email alerts are setup by Luminex support. Email alerts require that the Channel Gateways servers are can access the site email server. Required information includes:

- customer email server
- email addresses of all recipients

6. Alert Message Format

Each LTMON alert message will have associated with it a LUMxxx code, where xxx is a number from 000 to 999. When using LTMON to display messages to the mainframe console, AUTO-OPS can be setup to perform specific actions for particular messages, if desired.

Below is a sample email alert:

```
Luminex Channel Gateway status message
generated by server cga1


LUM101 - Only 0 scratch tapes in SPprod1
Running your scratch update utility is recommended
```

7. Messages

Below is a table of all current messages and the process that is performing the alert. The Alert Message description may contain variable information. This is indicated by a key word surrounded by <>. Note that there may be multiple uses of the same LUM code. This table shows all possible messages regardless of the hardware options and software configuration.

Code	Type	Message	Action
LUM001	Error	Server has Power Overload	Call support
LUM001	Error	Server has Power Fault	Call support
LUM002	Error	Server has Cooling/Fan Fault	Call support
LUM003	Warning	fmadm indicates a problem: <error message>	Call support
LUM003	Error	Channel Gateway has general hardware failure	Call support
LUM004	Warning	<file system> is at <x%> percent capacity	Once the system is at 99%, the CGX will cease to allow writes; this condition cannot be allowed to occur; call support
LUM005	Error	Mirrored internal disk reports a problem - metastat	The system will continue on the other mirrored disk; call support
LUM005	Error	Hardware RAID controller status <error message>	Call support
LUM005	Error	zfs reported disk error <error message>	Call support
LUM005	Error	Hardware RAID <error detecting program> reported disk status <error message>	Call support
LUM006	Error	Server has Drive Fault	Call support
LUM007	Warning	System resource <resource name> is nearing maximum threshold	Call support
LUM009	Error	Tag=<Tag identifier> has been idle for <count> seconds	A tape is mounted but is not changing position; check to see if the VOLSER is expected to be in an extended idle state; check to see if the device is boxed and attempt to vary back on; the idle threshold time can be increased by Luminex support

Code	Type	Message	Action
LUM010	Warning	Tag=<Tag identifier> is not responding	A device is not responding to a status query; call support
LUM012	Error	Mount is pending on 28C7 (This message only occurs on the mainframe console, no email is sent)	The mainframe program LTMON has determined that a mount is not being satisfied; call Luminex Support
LUM013	Error	Error or fail message detected in compression hardware log	Call support
LUM015	Error	READONLY or fsck message detected in the system log	A possible file system problem may exist; this message can occur normally on reboot; call support to analyze
LUM016	Error	Channel Gateway has hardware issue: <sensor> indicates an error.	Call support
LUM016	Notice	A Channel Gateway hardware issue has been resolved.	No action needed
LUM017	Error	Network <nic name> indicates link of <status>	Check networking infrastructure; a cable has been pulled, switch rebooted, or other network issue
LUM017	Error	Bonded network interface <nic name> indicates link status of <status>	Check networking infrastructure; a cable has been pulled, switch rebooted, or other network issue
LUM017	Notice	Network issue has been resolved	A previous network error was detected and determined to be resolved; no action needed
LUM017	Error	multipath Fail message detected in the system log	One of the Fibre Channel paths has failed; check SAN infrastructure; call support.
LUM018	Error	Fibre Channel <name> has a status of <status>	Check SAN infrastructure; a cable has been removed, a switch rebooted, or other Fibre Channel issue; call support

Code	Type	Message	Action
LUM018	Notice	Fibre Channel issue has been resolved	A previous Fibre Channel error was detected and determined to be resolved; no action needed
LUM019	Warning	hpacu Controller at Slot <slot number> has Status: <error message>	Call support
LUM020	Warning	Found core file <name>	A program abnormally terminated; this may or may not affect operations; call support
LUM021	Error	Key <key name> expired for decryption on <date>	Call support to renew license
LUM022	Error	Key <key name> is expiring for decryption on <date>	Call support to renew license
LUM023	Error	Key <key name> expired for encryption on <date>	Call support to renew license
LUM024	Warning	Key <key name> is expiring on <date>	Contact your Security Officer to create and install new encryption keys
LUM030	Error	Failed to get hostkey	Call support
LUM031	Error	Encryption not licensed	Encryption feature is not enabled; call support
LUM032	Error	Key manger <database> not available	Encryption configuration problem; call support
LUM033	Error	GetKeyInfo: key <name> not available	Encryption configuration problem; call support
LUM036	Warning	i/o failed on storage=<mirror name>, degrading mirror	Confirm storage connectivity infrastructure; call support
LUM037	Warning	mounts continuing due to degrade=auto	Confirm storage connectivity infrastructure; call support
LUM038	Error	mounts pending due to degrade=manual	Confirm storage connectivity infrastructure; call support
LUM039	Warning	Mounting VOLSER with broken mirror	Confirm storage connectivity infrastructure; call support
LUM040	Warning	possibly severed from <node name>	Confirm storage connectivity infrastructure; call support

Code	Type	Message	Action
LUM041	Error	no storage enabled	A configuration problem with STM; call support
LUM042	Warning	mounts pending due to sever	Confirm storage connectivity infrastructure; call support
LUM043	Error	I/O FAILED TO FIND ALTERNATE PRIMARY	Call support
LUM045	Notice	scratch tape list updated for <SP name> using report provided in VOLSER <update VOLSER> <exception directory> on <date/time>	No action needed
LUM046	Warning	STM <STM name>, device <storage name> is configured <non-online status>	Call support if action is not expected
LUM047	Warning	STM <STM name>, device <storage name> is currently <non-online status>	Call support if action is not expected
LUM048	Warning	STM <STM name>, device <storage name> has <non-0 value> journals.	Call support if action is not expected
LUM048	Notice	Journals have been cleared	No action needed
LUM049	Notice	Restore started	Call support if action is not expected
LUM050	Notice	Restore completed	No action needed
LUM051	Warning	A system resource is near its threshold; a configuration change may be required	Call support
LUM052	Notice	Aborted FICON Frame Detected	Contact support if a job fails, or there are SIM or other errors in the system log; there is a likely bad cable or transceiver in the FICON path
LUM101	Warning	Only <count> scratch tapes in <Storage Pool name>	Verify the scratch update is working
LUM104	Error	Luminex licenses have expired - contact support for permanent licenses	Call support for new license. Do not reboot/restart as the system will not run its software
LUM104	Error	Luminex license expires in <count> days for <license key>	Call support for new license
LUM105	Warning	Scratch update has not been run in <count> days for <Storage Pool name>	Run the scratch update job

Code	Type	Message	Action
LUM106	Warning	Scratch update report size of <count> did not exceed <minimal count> for <Storage Pool name>	Verify that the scratch update is sending the list of all scratches and not just the recent scratches
LUM107	Warning	Scratch update has never been run for <Storage Pool name>	The scratch update has not been run, or a configuration problem has occurred; call support
LUM108	Warning	No Scratch Update VOLSER was configured for <Storage Pool name>	Call support
LUM109	Warning	Host was unresponsive for longer than <nnnn> seconds. Host <Hostname>	Troubleshoot connectivity for <Hostname>
LUM110	Error	Stale lock found; This affects processing of scratch and replication lists. Contact Luminex Support. Lock for SP <SP name> - Alert time (<MMddhh>)	Call support
LUM114	Warning	Storage Unit <SU name> has greater than <threshold count> directory entries	Some storage devices have a limited number of supported files/directories; call support to evaluate the condition
LUM115	Warning	The Luminex CGX control units have been stopped	This message will occur if Luminex Support is performing maintenance
LUM116	Warning	The Luminex CGX control units have been started	This message will occur after a server reboot or during Luminex Support maintenance; if this message is not expected, call support
LUM204	Error	Replication Failed. <code> returned for <VOLSER> to <remoteHost:directory>	See Luminex Replication Messages section
LUM205	Error	Replication Failed. Timed out sending data	See Luminex Replication Messages section
LUM206	Warning	Replication failed. Source data may have been moved	See Luminex Replication Messages section
LUM207	Error	Replication Failed. Destination <remoteHost> not responding	See Luminex Replication Messages section

Code	Type	Message	Action
LUM208	Warning	Replication failed. Partial Transfer due to error.	See Luminex Replication Messages section
LUM209	Error	Configuration error with destination cleanup	See Luminex Replication Messages section
LUM210	Warning	Failure to perform cleanup at the destination.	See Luminex Replication Messages section
LUM211	Error	Destination <remoteHost> not in proper state for replication	See Luminex Replication Messages section
LUM212	Error	Process <process name> has stopped running	Call support
LUM213	Warning	<storage Pool> is in DR/COR mode	If no longer in DR test mode, transition out of DR mode on a remote Channel Gateway GUI
LUM214	Error	A remote execution command failed	Call support to validate that the remote server is in the known_hosts table, has ssh keys exchanged, or an incorrect password
LUM215	Warning	Replication queue for <Storage Pool> is over <count>	This is a warning only; if a replication queue of this size is not expected, call Luminex support to investigate
LUM216	Warning	Access to workDir <path> failed	Call support to validate a configuration or file system problem
LUM217	Error	No TraceMgr configuration file found during TM logdir check	Call support to have the Trace Manager Logging Directory configured.
LUM218	Error	No tmmonitor processes found during TM logdir check	Call support
LUM219	Error	tmmonitor process logdir differs from tracemgr config	Call support
LUM220	Warning	traceLevel is NULL in config for <package> <path>/<name>.config	Call support and have the default traceLevel value added to the identified configuration file
LUM221	Warning	cfgtool error on read of traceLevel (<cfgtool error msg>) for <package> <path>/<name>.config	Call support

Code	Type	Message	Action
LUM222	Warning	No traceLevel Entry in config for <package> <path>/<name>.config	Call support and have a traceLevel value put into the identified configuration file
LUM223	Warning	traceLevel set in config is not default <value> traceLevel is <cfgvalue> for <package> <path>/<name>.config	Call support
LUM224	Warning	openFlagsOverride defined in <SPname> should be zero not <value>	Call support to have the openFlagsOverride set to zero
LUM225	Error	Stale lock found at <path> which is <mins> minutes old	Call support
LUM226	Warning	Storage Pool <SPname> is <value>% of capacity limit	If needed, call Luminex Support to have the cap-Limit setting removed or modified
LUM227	Error	RepMon received replication request for <volser> to unknown target <target>	Call support
LUM228	Notice	Destination <remote host> is now reachable for replication	None
LUM229	Notice	A Glacier recall was initiated for VOLSER xxxxxx. This recall could take more than 4 hours.	None
LUM230	Notice	The request to recall VOLSER xxxxxx from Glacier storage has completed.	None
LUM300	Error	lwatcher for <watcher name> is not running	Call support
LUM301	Error	mdi_alive not running	Call support
LUM302	Error	Tag <tagname> in <profile or watcher name> is a int32 and does not contain a numeral	Call support to check tag-name entries
LUM303	Error	Files exists in hold directory <hold file information>	Call support
LUM304	Error	MDI985T MDI Failure - Preprocessing Error <error information>	Call support
LUM305	Error	MDI001I MDI failure - Preprocessing Error - UserID=<userid> JOBID=<jobid>	Call support
LUM306	Error	MDI101 PDQ <watcher name> Failure - <process number> Not Responding - <counter>	None

Code	Type	Message	Action
LUM901	Error	Channel Gateway is NOT RESPONDING (This message only occurs on the mainframe console, no email is sent)	The mainframe program LTMON is attempting to communicate with a device that is BOXED or unresponsive; vary the device offline and online; call Luminex support if unresolved

8. Luminex Replication Messages

This section will provide further details for error messages with Codes or additional information to assist in resolving alert conditions. In all cases, the replication will automatically be retried. The RepMon GUI will continue to show that the replication is in progress. Only when the maximum retry count is exceeded will the GUI show an error. The replication will continue to be retried even after the error message is displayed. If an error is displayed, Luminex support should be notified.

8.1 LUM204

The format of the LUM204 message is below:

```
Replication Failed. <code> returned for <VOLSER> to <remoteHost:directory>
```

The following sections will refer to the value of <code>.

8.1.1 Code 10

This code indicates that the remote CGX server is not configured properly to receive data. Possible causes are below:

- SSH keys were not exchanged. Call support.
- Remote site does not have xinetd configured but in use
- A problem with the Replication configuration. Call support.

8.1.2 Code 12

A common error with this code is the remote directory permissions are not adequate for a replication target. This can be the result of a configuration issue or the remote storage and/or file system has been placed into read-only mode. Another possible cause is the directory names of the primary site do not match those of the remote site. This will require the addition of the "convertDir" entries in the replication configuration files. Call support.

8.1.3 Code 23

This code indicates that there was a partial transfer of data due to an error. The possible causes are as follows:

- The VOLSER was appended, or overwritten, while being replicated. Mainframe applications such as TSM and HSM routinely perform this operation.
- There is a permissions problem on the destination CGX directory.

In newer versions of CGX software, this code is replaced with a specific LUM208 code message.

8.1.4 Code 24

This code indicates that the data being transferred has disappeared during the transfer. When a

system is configured with multiple Storage Units it is common that the CGX software will move overwritten VOLSER data to another SU. If the affected VOLSER was written and queued for replication and then overwritten, this code could occur.

In newer versions of CGX software, this code is replaced with a specific LUM206 code message.

8.1.5 Codes 30/35

This code indicates a time out condition when attempting to replicate. This is determined when the operation does not complete within the expected time period. Potential causes of this message are:

- Loss of network connectivity between sites. This could be the result of a rebooted switch, failure or reboot of any WAN optimization device, or failure or reboot of the remote Channel Gateway.
- Slow network connectivity. If the link between sites is sufficiently slow, large files may not transfer in the time period. The timeout value can be increased by Luminex support.
- Storage issues. These problems would normally be detected in other areas of software. But if the storage is significantly slow in responding, a timeout can occur.

In newer versions of CGX software, this code is replaced with a specific LUM205 code message.

8.1.6 Remaining Codes

For any other code, call support.

8.2 LUM205

See the description for Codes 30/35 above.

8.3 LUM206

See the description for Code 24 above.

8.4 LUM207

Prior to attempting the replication, an attempt to communicate with the remote CGX system is performed. This code is presented when that communication fails. The possible causes for this are:

- SSH keys were not exchanged between the source and remote CGX's. Call support.
- There is a networking issue between the sites. Call support.
- There is a problem with the source CGX replication configuration. Call support

8.5 LUM208

See the description for Code 23 above.

8.6 LUM209

This message indicates that the replication configuration files at the primary host is incorrect. Call support.

8.7 LUM210

This message indicates a probable communication problem with the remote site. The possible cause is:

- Loss of network connectivity between sites. This could be the result of a rebooted switch, failure or reboot of any WAN optimization device, or failure or reboot of the remote Channel Gateway.

8.8 LUM211

This code indicates that the remote site has been configured as a PRIMARY site through the Site Methods operation. This feature is only available when in the SWAP mode. The inconsistency is created when the FORCE option was used to change site when there was a communication issue between sites. A support call will be required to rectify once the desired PRIMARY site is determined.

8.9 LUM212

A program required for replication has terminated unexpectedly. When this occurs, all replication on this CGX system will cease. Luminex support should be called immediately to restart the process and re-queue all missed replications. This condition may require Luminex support to perform a remote site inventory of all replicated VOLSERs to determine the VOLSERs not replicated.

8.10 LUM215

An alert occurs when the replication queue for this Storage Pool exceeds a threshold. By default, this threshold is 250 VOLSERs. If this is an expected condition, the threshold can be modified by Luminex Support. A different threshold can be set for each Storage Pool replication queue. A replication queue can reach a threshold value if a higher than normal number of VOLSERs were written, if the replication link is slower than normal, or other issues exist that prevent the replication queue from being emptied.

8.11 LUM216

The workDir (in an SP type configuration file) does not exist or has permissions that do not allow execution, reading or writing in the directory. When the workDir does not exist, it is possible a mounted partition has not been (or is no longer) mounted.

8.12 LUM217

The CGX server is not fully configured. The Trace Manager configuration file was not present when attempting to read the Logging Directory setting.

8.13 LUM218

Trace Manager tmmonitor processes which collect the data for audit reports were not found among the running processes on the CGX server.

8.14 LUM219

The Trace Manager configuration file is specifying a logging directory setting other than what is being used by the Trace Manager monitor processes running on the CGX server.

8.15 LUM220

The parameter traceLevel is specified as name with no value. Package, path and name information for the CGX server configuration file with the condition is given.

8.16 LUM221

An error message or code was received while reading the parameter traceLevel from the configuration file indicated.

8.17 LUM222

The parameter traceLevel is not present in the indicated configuration file. Package, path and name information for the CGX server config file with the condition is given.

8.18 LUM223

Tthe parameter traceLevel is set to other than the default level.

8.19 LUM224

A debugging setting of openFlagsOverride has been set in the SP configuration. The normal setting (not debugging) is the value 0.

8.20 LUM225

A queue lock is more than 60 minutes old. This lock will need to be cleared for replications to resume.

8.21 LUM226

This is a warning only. This code indicates a setting of capLimit has been set in the SP configuration.

The alert indicates that storage used in this SP has exceeded 95% of the capLimit Gbytes setting. If needed, call Luminex Support to have the capLimit setting removed or modified.

8.22 LUM227

A configuration issue exists in RepMon. A replication target was specified but there is no corresponding target configuration file present.

8.23 LUM228

This code indicates that the connection to the remote CGX system has been restored. This code is in response to error 207.

8.24 LUM229

This code indicates that CloudTAPE has initiated a recall of a VOLSER from a Glacier storage target. This alert is informational only and no action is required.

8.25 LUM230

The recall of a VOLSER from Glacier storage has been successfully completed. This alert is informational only and no action is required.

9. Luminex MDI Messages

9.1 LUM300

The MDI PDQ lwatcher process for <watcher name> on the MDI PDQ server is not running.

9.2 LUM301

The heartbeat process on the MDI CGX server is not running.

9.3 LUM302

The <watcher name> configuration file or the <profile name> configuration file contains a parameter <tagname> that should be an Int32 number. Something other than a number is being set in the configuration file.

9.4 LUM303

The hold directory for one of the PDQ watchers contains files. The PDQ could not process the file when it was received. The mainframe user, the watcher name, and the file are in the <hold file information>.

9.5 LUM304

An MDI job failed early during DISPATCH pre processing. The error got routed through the CGX Alert message mechanism because no Profile configuration or no email error routing was found.

9.6 LUM305

An MDI job failed early during MDITASK pre processing. The error got routed through the CGX Alert message mechanism because no email error routing was found.

9.7 LUM306

The <watcher name> process <process number> for the PDQ server is not responding.

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