NetApp

Log files reference

StorageGRID

NetApp
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Log files reference

StorageGRID provides logs that are used to capture events, diagnostic messages, and error conditions. You might be asked to collect log files and forward them to technical support to assist with troubleshooting.

The logs are categorized as follows:

- StorageGRID software logs
- Deployment and maintenance logs
- Logs for third-party software
- About the bycast.log

> (i) The details provided for each log type are for reference only. The logs are intended for advanced troubleshooting by technical support. Advanced techniques that involve reconstructing the problem history using the audit logs and the application log files are beyond the scope of these instructions.

To access the logs, you can collect log files and system data from one or more nodes as a single log file archive (**SUPPORT** > **Tools** > **Logs**). Or, if the primary Admin Node is unavailable or unable to reach a specific node, you can access individual log files for each grid node as follows:

1. Enter the following command: `ssh admin@grid_node_IP`
2. Enter the password listed in the `Passwords.txt` file.
3. Enter the following command to switch to root: `su -`
4. Enter the password listed in the `Passwords.txt` file.

The StorageGRID log file archive contains the logs described for each category and additional files that contain metrics and debug command output.

Archive location	Description
`audit`	Audit messages generated during normal system operation.
`base-os-logs`	Base operating system information, including StorageGRID image versions.
`bundles`	Global configuration information (bundles).
`cassandra`	Cassandra database information and Reaper repair logs.
`ec`	VCSs information on the current node and EC group information by profile ID.
`grid`	General grid logs including debug (`bycast.log`) and `servermanager` logs.
`grid.xml`	Grid configuration file shared across all nodes.

Archive location	Description
`hagroups`	High availability groups metrics and logs.
`install`	`Gdu-server` and install logs.
`lumberjack.log`	Debug messages related to log collection.
`Lambda-arbitrator`	Logs related to the S3 Select proxy request.
`Metrics`	Service logs for Grafana, Jaeger, node exporter, and Prometheus.
`miscd`	Miscd access and error logs.
`mysql`	The mariaDB database configuration and related logs.
`net`	Logs generated by networking-related scripts and the Dynip service.
`nginx`	Load balancer configuration files and logs. Also includes Grid Manager and Tenant Manager traffic logs.
`nginx-gw`	Load balancer configuration files and logs.
`ntp`	NTP configuration file and logs.
`os`	Node and grid state file, including services `pid`.
`other`	Log files under `/var/local/log` that are not collected in other folders.
`perf`	Peformance information for CPU, networking, and disk I/O.
`prometheus-data`	Current Prometheus metrics, if the log collection includes Prometheus data.
`provisioning`	Logs related to grid provisioning process.
`raft`	Logs from Raft cluster used in platform services.
`snmp`	SNMP agent configuration and alarm allow/deny lists used for sending SNMP notifications.
`sockets-data`	Sockets data for network debug.
`system-commands.txt`	Output of StorageGRID container commands. Contains system information, such as networking and disk usage.

Related information

StorageGRID software logs

You can use StorageGRID logs to troubleshoot issues.

> (i) If you want to send your logs to an external syslog server or change the destination of audit information such as the `bycast.log` and `nms.log`, see Configure audit messages and log destinations.

General StorageGRID logs

File name	Notes	Found on
`/var/local/log/bycast.log`	The primary StorageGRID troubleshooting file. Select **SUPPORT** > **Tools** > **Grid topology**. Then select *Site* > *Node* > **SSM** > **Events**.	All nodes
`/var/local/log/bycast-err.log`	Contains a subset of `bycast.log` (messages with severity ERROR and CRITICAL). CRITICAL messages are also displayed in the system. Select **SUPPORT** > **Tools** > **Grid topology**. Then select *Site* > *Node* > **SSM** > **Events**.	All nodes
`/var/local/core/`	Contains any core dump files created if the program terminates abnormally. Possible causes include assertion failures, violations, or thread timeouts. > (i) The file `` `/var/local/core/kexec_cmd `` usually exists on appliance nodes and does not indicate an error.	All nodes

Server Manager logs

File name	Notes	Found on
`/var/local/log/servermanager.log`	Log file for the Server Manager application running on the server.	All nodes
`/var/local/log/GridstatBackend.err log`	Log file for the Server Manager GUI backend application.	All nodes
`/var/local/log/gridstat.errlog`	Log file for the Server Manager GUI.	All nodes

Logs for StorageGRID services

File name	Notes	Found on
`/var/local/log/acct.errlog`		Storage Nodes running the ADC service
`/var/local/log/adc.errlog`	Contains the Standard Error (stderr) stream of the corresponding services. There is one log file per service. These files are generally empty unless there are problems with the service.	Storage Nodes running the ADC service
`/var/local/log/ams.errlog`		Admin Nodes
`/var/local/log/arc.errlog`		Archive Nodes
`/var/local/log/cassandra/system.log`	Information for the metadata store (Cassandra database) that can be used if problems occur when adding new Storage Nodes, or if the nodetool repair task stalls.	Storage Nodes
`/var/local/log/cassandra-reaper.log`	Information for the Cassandra Reaper service, which performs repairs of the data in the Cassandra database.	Storage Nodes
`/var/local/log/cassandra-reaper.errlog`	Error information for the Cassandra Reaper service.	Storage Nodes
`/var/local/log/chunk.errlog`		Storage Nodes
`/var/local/log/clb.errlog`	Error information for the CLB service. **Note:** The CLB service is deprecated.	Gateway Nodes
`/var/local/log/cmn.errlog`		Admin Nodes
`/var/local/log/cms.errlog`	This log file might be present on systems that have been upgraded from an older version of StorageGRID. It contains legacy information.	Storage Nodes
`/var/local/log/cts.errlog`	This log file is only created if the Target Type is **Cloud Tiering - Simple Storage Service (S3).**	Archive Nodes
`/var/local/log/dds.errlog`		Storage Nodes

File name	Notes	Found on
`/var/local/log/dmv.errlog`		Storage Nodes
`/var/local/log/dynip*`	Contains logs related to the dynip service, which monitors the grid for dynamic IP changes and updates local configuration.	All nodes
`/var/local/log/grafana.log`	The log associated with the Grafana service, which is used for metrics visualization in the Grid Manager.	Admin Nodes
`/var/local/log/hagroups.log`	The log associated with high availability groups.	Admin Nodes and Gateway Nodes
`/var/local/log/hagroups_events.log`	Tracks state changes, such as transition from BACKUP to MASTER or FAULT.	Admin Nodes and Gateway Nodes
`/var/local/log/idnt.errlog`		Storage Nodes running the ADC service
`/var/local/log/jaeger.log`	The log associated with the jaeger service, which is used for trace collection.	All nodes
`/var/local/log/kstn.errlog`		Storage Nodes running the ADC service
`/var/local/log/lambda*`	Contains logs for the S3 Select service.	Admin and Gateway Nodes Only certain Admin and Gateway Nodes contain this log. See the S3 Select requirements and limitations for Admin and Gateway Nodes.
`/var/local/log/ldr.errlog`		Storage Nodes
`/var/local/log/miscd/*.log`	Contains logs for the MISCd service (Information Service Control Daemon), which provides an interface for querying and managing services on other nodes and for managing environmental configurations on the node such as querying the state of services running on other nodes.	All nodes

File name	Notes	Found on
`/var/local/log/nginx/*.log`	Contains logs for the nginx service, which acts as an authentication and secure communication mechanism for various grid services (such as Prometheus and Dynip) to be able to talk to services on other nodes over HTTPS APIs.	All nodes
`/var/local/log/nginx-gw/*.log`	Contains logs for the restricted admin ports on Admin Nodes and for the Load Balancer service, which provides load balancing of S3 and Swift traffic from clients to Storage Nodes.	Admin Nodes and Gateway Nodes
`/var/local/log/persistence*`	Contains logs for the Persistence service, which manages files on the root disk that need to persist across a reboot.	All nodes
`/var/local/log/prometheus.log`	For all nodes, contains the node exporter service log and the ade-exporter metrics service log. For Admin Nodes, also contains logs for the Prometheus and Alert Manager services.	All nodes
`/var/local/log/raft.log`	Contains the output of the library used by the RSM service for the Raft protocol.	Storage Nodes with RSM service
`/var/local/log/rms.errlog`	Contains logs for the Replicated State Machine Service (RSM) service, which is used for S3 platform services.	Storage Nodes with RSM service
`/var/local/log/ssm.errlog`		All nodes
`/var/local/log/update-s3vs-domains.log`	Contains logs related to processing updates for the S3 virtual hosted domain names configuration.See the instructions for implementing S3 client applications.	Admin and Gateway Nodes
`/var/local/log/update-snmp-firewall.*`	Contain logs related to the firewall ports being managed for SNMP.	All nodes

File name	Notes	Found on
`/var/local/log/update-sysl.log`	Contains logs related to changes made to the system syslog configuration.	All nodes
`/var/local/log/update-traffic-classes.log`	Contains logs related to changes to the traffic classifiers configuration.	Admin and Gateway Nodes
`/var/local/log/update-utcn.log`	Contains logs related to Untrusted Client Network mode on this node.	All nodes

NMS logs

File name	Notes	Found on
`/var/local/log/nms.log`	- Captures notifications from the Grid Manager and the Tenant Manager. - Captures events related to the operation of the NMS service, for example, alarm processing, email notifications, and configuration changes. - Contains XML bundle updates resulting from configuration changes made in the system. - Contains error messages related to the attribute downsampling done once a day. - Contains Java web server error messages, for example, page generation errors and HTTP Status 500 errors.	Admin Nodes
`/var/local/log/nms.errlog`	Contains error messages related to MySQL database upgrades. Contains the Standard Error (stderr) stream of the corresponding services. There is one log file per service. These files are generally empty unless there are problems with the service.	Admin Nodes
`/var/local/log/nms.requestlog`	Contains information about outgoing connections from the Management API to internal StorageGRID services.	Admin Nodes

Related information

About the bycast.log

Use S3

Deployment and maintenance logs

You can use the deployment and maintenance logs to troubleshoot issues.

File name	Notes	Found on
`/var/local/log/install.log`	Created during software installation. Contains a record of the installation events.	All nodes
`/var/local/log/expansion-progress.log`	Created during expansion operations. Contains a record of the expansion events.	Storage Nodes
`/var/local/log/gdu-server.log`	Created by the GDU service. Contains events related to provisioning and maintenance procedures managed by the primary Admin Node.	Primary Admin Node
`/var/local/log/send_admin_hw.log`	Created during installation. Contains debugging information related to a node's communications with the primary Admin Node.	All nodes
`/var/local/log/upgrade.log`	Created during software upgrade. Contains a record of the software update events.	All nodes

Logs for third-party software

You can use the third-party software logs to troubleshoot issues.

Category	File name	Notes	Found on
Archiving	`/var/local/log/dsierror.log`	Error information for TSM Client APIs.	Archive Nodes
MySQL	`/var/local/log/mysql.err` `/var/local/log/mysql-slow.log`	Log files generated by MySQL. The file `mysql.err` captures database errors and events such as startups and shutdowns. The file `mysql-slow.log` (the slow query log) captures the SQL statements that took more than 10 seconds to execute.	Admin Nodes

Category	File name	Notes	Found on
Operating system	`/var/local/log/messages`	This directory contains log files for the operating system. The errors contained in these logs are also displayed in the Grid Manager. Select **SUPPORT** > **Tools** > **Grid topology**. Then select **Topology** > *Site* > *Node* > **SSM** > **Events**.	All nodes
NTP	`/var/local/log/ntp.log` `/var/lib/ntp/var/log/ntpstats/`	`/var/local/log/ntp.log` contains the log file for NTP error messages. The `/var/lib/ntp/var/log/ntpstats/` directory contains NTP timing statistics. `loopstats` records loop filter statistics information. `peerstats` records peer statistics information.	All nodes
Samba	`/var/local/log/samba/`	The Samba log directory includes a log file for each Samba process (smb, nmb, and winbind) and every client hostname/IP.	Admin Node configured to export the audit share over CIFS

About the bycast.log

The file `/var/local/log/bycast.log` is the primary troubleshooting file for the StorageGRID software. There is a `bycast.log` file for every grid node. The file contains messages specific to that grid node.

The file `/var/local/log/bycast-err.log` is a subset of `bycast.log`. It contains messages of severity ERROR and CRITICAL.

Optionally, you can change the destination of audit logs and send audit information to an external syslog server. Local logs of audit records continue to be generated and stored when an external syslog server is configured. See Configure audit messages and log destinations.

File rotation for bycast.log

When the `bycast.log` file reaches 1 GB, the existing file is saved, and a new log file is started.

The saved file is renamed `bycast.log.1`, and the new file is named `bycast.log`. When the new `bycast.log` reaches 1 GB, `bycast.log.1` is renamed and compressed to become `bycast.log.2.gz`, and `bycast.log` is renamed `bycast.log.1`.

The rotation limit for `bycast.log` is 21 files. When the 22nd version of the `bycast.log` file is created, the oldest file is deleted.

The rotation limit for `bycast-err.log` is seven files.

> ⓘ If a log file has been compressed, you must not uncompress it to the same location in which it was written. Uncompressing the file to the same location can interfere with the log rotation scripts.

Optionally, you can change the destination of audit logs and send audit information to an external syslog server. Local logs of audit records continue to be generated and stored when an external syslog server is configured. See Configure audit messages and log destinations.

Related information

Collect log files and system data

Messages in bycast.log

Messages in `bycast.log` are written by the ADE (Asynchronous Distributed Environment). ADE is the runtime environment used by each grid node's services.

Example ADE message:

```
May 15 14:07:11 um-sec-rg1-agn3 ADE: |12455685    0357819531
SVMR EVHR 2019-05-05T27T17:10:29.784677| ERROR 0906 SVMR: Health
check on volume 3 has failed with reason 'TOUT'
```

ADE messages contain the following information:

Message segment	Value in example
Node ID	12455685
ADE process ID	0357819531
Module name	SVMR
Message identifier	EVHR
UTC system time	2019-05-05T27T17:10:29.784677 (YYYY-MM-DDTHH:MM:SS.uuuuuu)
Severity level	ERROR
Internal tracking number	0906
Message	SVMR: Health check on volume 3 has failed with reason 'TOUT'

Message severities in bycast.log

The messages in `bycast.log` are assigned severity levels.

For example:

- **NOTICE** — An event that should be recorded has occurred. Most log messages are at this level.
- **WARNING** — An unexpected condition has occurred.
- **ERROR** — A major error has occurred that will impact operations.
- **CRITICAL** — An abnormal condition has occurred that has stopped normal operations. You should address the underlying condition immediately. Critical messages are also displayed in the Grid Manager. Select **SUPPORT** > **Tools** > **Grid topology**. Then select **Site** > **Node** > **SSM** > **Events**.

Error codes in `bycast.log`

Most of the error messages in `bycast.log` contain error codes.

The following table lists common non-numerical codes in `bycast.log`. The exact meaning of a non-numerical code depends on the context in which it is reported.

Error code	Meaning
SUCS	No error
GERR	Unknown
CANC	Canceled
ABRT	Aborted
TOUT	Timeout
INVL	Invalid
NFND	Not found
VERS	Version
CONF	Configuration
FAIL	Failed
ICPL	Incomplete
DONE	Done
SUNV	Service unavailable

The following table lists the numerical error codes in `bycast.log`.

Error number	Error code	Meaning
001	EPERM	Operation not permitted
002	ENOENT	No such file or directory
003	ESRCH	No such process
004	EINTR	Interrupted system call
005	EIO	I/O error
006	ENXIO	No such device or address
007	E2BIG	Argument list too long
008	ENOEXEC	Exec format error
009	EBADF	Bad file number
010	ECHILD	No child processes
011	EAGAIN	Try again
012	ENOMEM	Out of memory
013	EACCES	Permission denied
014	EFAULT	Bad address
015	ENOTBLK	Block device required
016	EBUSY	Device or resource busy
017	EEXIST	File exists
018	EXDEV	Cross-device link
019	ENODEV	No such device
020	ENOTDIR	Not a directory
021	EISDIR	Is a directory
022	EINVAL	Invalid argument

Error number	Error code	Meaning
023	ENFILE	File table overflow
024	EMFILE	Too many open files
025	ENOTTY	Not a typewriter
026	ETXTBSY	Text file busy
027	EFBIG	File too large
028	ENOSPC	No space left on device
029	ESPIPE	Illegal seek
030	EROFS	Read-only file system
031	EMLINK	Too many links
032	EPIPE	Broken pipe
033	EDOM	Math argument out of domain of func
034	ERANGE	Math result not representable
035	EDEADLK	Resource deadlock would occur
036	ENAMETOOLONG	File name too long
037	ENOLCK	No record locks available
038	ENOSYS	Function not implemented
039	ENOTEMPTY	Directory not empty
040	ELOOP	Too many symbolic links encountered
041		
042	ENOMSG	No message of desired type
043	EIDRM	Identifier removed
044	ECHRNG	Channel number out of range

Error number	Error code	Meaning
045	EL2NSYNC	Level 2 not synchronized
046	EL3HLT	Level 3 halted
047	EL3RST	Level 3 reset
048	ELNRNG	Link number out of range
049	EUNATCH	Protocol driver not attached
050	ENOCSI	No CSI structure available
051	EL2HLT	Level 2 halted
052	EBADE	Invalid exchange
053	EBADR	Invalid request descriptor
054	EXFULL	Exchange full
055	ENOANO	No anode
056	EBADRQC	Invalid request code
057	EBADSLT	Invalid slot
058		
059	EBFONT	Bad font file format
060	ENOSTR	Device not a stream
061	ENODATA	No data available
062	ETIME	Timer expired
063	ENOSR	Out of streams resources
064	ENONET	Machine is not on the network
065	ENOPKG	Package not installed
066	EREMOTE	Object is remote

Error number	Error code	Meaning
067	ENOLINK	Link has been severed
068	EADV	Advertise error
069	ESRMNT	Srmount error
070	ECOMM	Communication error on send
071	EPROTO	Protocol error
072	EMULTIHOP	Multihop attempted
073	EDOTDOT	RFS specific error
074	EBADMSG	Not a data message
075	EOVERFLOW	Value too large for defined data type
076	ENOTUNIQ	Name not unique on network
077	EBADFD	File descriptor in bad state
078	EREMCHG	Remote address changed
079	ELIBACC	Cannot access a needed shared library
080	ELIBBAD	Accessing a corrupted shared library
081	ELIBSCN	
082	ELIBMAX	Attempting to link in too many shared libraries
083	ELIBEXEC	Cannot exec a shared library directly
084	EILSEQ	Illegal byte sequence
085	ERESTART	Interrupted system call should be restarted
086	ESTRPIPE	Streams pipe error
087	EUSERS	Too many users
088	ENOTSOCK	Socket operation on non-socket

Error number	Error code	Meaning
089	EDESTADDRREQ	Destination address required
090	EMSGSIZE	Message too long
091	EPROTOTYPE	Protocol wrong type for socket
092	ENOPROTOOPT	Protocol not available
093	EPROTONOSUPPORT	Protocol not supported
094	ESOCKTNOSUPPORT	Socket type not supported
095	EOPNOTSUPP	Operation not supported on transport endpoint
096	EPFNOSUPPORT	Protocol family not supported
097	EAFNOSUPPORT	Address family not supported by protocol
098	EADDRINUSE	Address already in use
099	EADDRNOTAVAIL	Cannot assign requested address
100	ENETDOWN	Network is down
101	ENETUNREACH	Network is unreachable
102	ENETRESET	Network dropped connection because of reset
103	ECONNABORTED	Software caused connection abort
104	ECONNRESET	Connection reset by peer
105	ENOBUFS	No buffer space available
106	EISCONN	Transport endpoint is already connected
107	ENOTCONN	Transport endpoint is not connected
108	ESHUTDOWN	Cannot send after transport endpoint shutdown
109	ETOOMANYREFS	Too many references: cannot splice
110	ETIMEDOUT	Connection timed out

Error number	Error code	Meaning
111	ECONNREFUSED	Connection refused
112	EHOSTDOWN	Host is down
113	EHOSTUNREACH	No route to host
114	EALREADY	Operation already in progress
115	EINPROGRESS	Operation now in progress
116		
117	EUCLEAN	Structure needs cleaning
118	ENOTNAM	Not a XENIX named type file
119	ENAVAIL	No XENIX semaphores available
120	EISNAM	Is a named type file
121	EREMOTEIO	Remote I/O error
122	EDQUOT	Quota exceeded
123	ENOMEDIUM	No medium found
124	EMEDIUMTYPE	Wrong medium type
125	ECANCELED	Operation Canceled
126	ENOKEY	Required key not available
127	EKEYEXPIRED	Key has expired
128	EKEYREVOKED	Key has been revoked
129	EKEYREJECTED	Key was rejected by service
130	EOWNERDEAD	For robust mutexes: Owner died
131	ENOTRECOVERABLE	For robust mutexes: State not recoverable