

Planning a Novell ICS Logging Strategy
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1.0 Overview of ICS Logging

Novell ICS is a high performance proxy cache system capable of handling thousands of transactions per second. Although the system can log extensive details of each transaction, and although the disk space reserved for log files is quite generous on most ICS appliances, if transaction volume is high and log entries consume a few hundred bytes each, the system can fill up the available disk space in a matter of minutes.

This Readme explains how ICS logging works and presents management options you can use to ensure optimal use of the available log file disk space and timely migration (downloading) of log files to other storage devices.

1.1 What ICS Can log

The following table shows the transactions ICS can log and the formats available for each service type.

Service	Common	Extended
Transparent/Forward Proxy	Yes	Yes
Web Server Accelerator	Yes	Yes
Cluster Services (all types)	Yes	Yes
Content Filtering	Yes*	No

* ICS filtering common format differs from the industry standard common log format used to log proxy cache transactions.

1.2 The Costs of Logging

1.2.1 Performance

Turning on logging for a given service increases system overhead and causes some degradation of performance. Therefore, logging should be used only when service transactions must be tracked for customer billing purposes or other compelling reasons.

1.2.2 Disk Space

Transaction volume and log entry size can cause available disk space to fill up very quickly.

Section 3.0 presents formulas you can use to estimate how quickly your logging disk will become full and ways to avoid this.

1.3 System Constraints and Options

To plan a logging strategy you must know the capacity of your appliance and understand the ICS log file management options available to you.

1.3.1 Disk Space Is Preset

It is essential that you know how much logging disk space is available on your appliance.

Logging disk space is not user-configurable and is preset by the ICS vendors who produced your appliance. Most vendors allocate different amounts of disk space for log files for each level or tier of appliance they produce.

If your vendor has not provided this information, you must get it from them before you can plan a logging strategy.

1.3.2 Active Log Files Cannot Be Deleted

Log files currently in use by the ICS system cannot be deleted. Thus it is essential to configure the system so that log entries are distributed across at least two log files per service before disk space approaches a full condition.

This will allow you to delete the older, non-active files thus freeing up critical logging disk space.

After determining how much logging disk space is available and how often you can expect the space to fill up, you can configure the ICS system to generate at least two log files per service.

You can download active files. They will contain all transaction data up to the moment of the download.

1.3.3 Roll Over by Time

If you plan to download and delete older log files at a set time, you must configure ICS so that at least two log files exist per service at the time you've scheduled for downloading and deleting. One file will be active, the other closed and ready for download and deletion.

For example, if you determine that your log disk space will fill every 12 hours, then you must configure ICS to roll the log files over in less than 6 hours, so that at least one log file per service is closed and ready

to be downloaded and deleted.

1.3.4 Roll Over by Size

If you aren't certain how long it will take to fill your appliance's logging disk space, you can roll the log files over by size.

For example, you might be logging transactions for 3 services and have a log volume size of 6 GB. Since you must have at least 2 log files per service before the disk space fills, each log file must be smaller than 1 GB when ICS rolls it over.

1.3.5 Logging Ceases When the Logging Disk Is Full

When ICS logging encounters a disk full condition, it stops logging and closes all log files.

1.3.6 Log Filenames Are Limited

ICS automatically generates log filenames as follows:

- 6 numbers representing the year, month, and day the file was created
- A dash separating the date from a letter identifier.
- Letter identifiers running from A through ZZ.

This naming convention accommodates up to 702 log files per day. If the rollover options are set so that all the possible filenames are used in one day, the log file with the ZZ letter identifier is not closed until the start of the next day (unless the logging disk becomes full).

2.0 General Logging Guidelines

As explained above, ICS logging involves system and maintenance overhead. If your situation requires that you use logging, keep the following general guidelines in mind as you configure your appliance.

2.1 Keeping Log Entry Size as Small as Possible

Identify the business or other reasons for tracking service transactions. Determine which services you need to track.

If you use common log format, log entry size is fixed.

If you use extended log format, log entry size depends on the number of log fields selected. You should carefully scrutinize the information you track to ensure that the data collected is essential. A few bytes can add up very quickly when ICS is tracking thousands of hits every second.

For example, if you select URI, also selecting URI-STEM and URI-QUERY would be redundant since $URI = URI-STEM + URI-QUERY$. Also, logging Cookie information can consume a lot of space and might provide very little, if any critical information.

2.2 Planning a Workable Strategy and Following Your Plan

Using the information presented in Section 1.0 and the formulas and guidelines in the next section, develop a solid plan for downloading and deleting the log files before your appliance runs out of logging disk space.

Currently you must manually download log files using the browser-based management tool or FTP. However, Novell is investigating other download options and ways to automate the download processes.

3.0 Planning Your ICS Logging Strategy

Since logging requirements and transaction volume vary widely, it is impossible to make general recommendations regarding appropriate logging strategies.

This section contains empirical formulas you can use to determine your system needs. The variables used in the formulas are explained first.

3.1 Variable Definitions

- LOGVOL_SIZE: The total disk capacity reserved

for log files on your appliance.

You must get this information from your appliance vendor.

- LOGENTRY_SIZE: The average log entry size.

You can determine this by configuring your appliance to track the required information, generating traffic to the appliance, downloading the log files, determining how large each entry is, and calculating the average.

- REQUEST_RATE: The peak rate of requests per second

You can estimate this or place your appliance in service and get more accurate data by accessing the browser-based management tool's Monitoring tabs.

- NUM_SERVICES: The number of services for which logging is enabled.

- LOGS_PER_SERVICE: The number of log files, both active and closed, that you want ICS to generate for each service.

You must plan to have at least two logs per service. This is because, unless the appliance has run out of logging disk space, one file per service being logged will always be active, and you can't delete an active log file. See section 1.3.2.

- DISKFULL_TIME: The average amount of time required to fill your logging disk space.

The formula for calculating this is explained in 3.2.1.

- MAX_ROLL_TIME: The maximum value you should specify in the Rollover Every field in the browser-based management tool.

The formula for calculating this is explained in 3.2.2.

- MAX_LOG_ROLL_SIZE: The maximum log size you should specify in the Rollover When File Size

Reaches field in the browser-based management tool.

The formula for calculating this is explained in 3.2.3.

3.2 Calculation Formulas

3.2.1 DISKFULL_TIME

Using this formula, you can calculate how long it will take ICS to fill your logging disk space.

$$\text{DISKFULL_TIME seconds} = \frac{\text{LOGVOL_SIZE}}{(\text{REQUEST_RATE} * \text{LOGENTRY_SIZE} * \text{NUM_SERVICES})}$$

For example, assume the following:

- LOGVOL_SIZE = 1 GB
- REQUEST_RATE = 1000 requests per second
- LOGENTRY_SIZE = 1KB
- NUM_SERVICES = 1

Then DISKFULL_TIME = (1 GB) / (1000 * 1KB * 1) = 1048 seconds (17.47 minutes).

Your logging disk space will fill up every 17.47 minutes. Since you can't increase the disk space nor limit the requests being logged, you might want to consider reducing the log entry size by configuring ICS to log less information per transaction.

3.2.2 MAX_ROLL_TIME

Using this formula, you can calculate the maximum roll-over time value you should specify in the Rollover Every field of the Log Options dialog box.

$$\text{MAX_ROLL_TIME} = \frac{\text{DISKFULL_TIME}}{\text{LOGS_PER_SERVICE}}$$

For example, assume the following:

- DISKFULL_TIME = 12 hours
- LOGS_PER_SERVICE = 2

Then $\text{MAX_ROLL_TIME} = 12 / 2 = 6$ hours.

If you choose to roll your logs over by time intervals, the maximum time should be less than six hours. Otherwise scheduling the download and deletion of log files is much more complicated and the window in which this can be done is narrower.

3.2.3 MAX_LOG_ROLL_SIZE

Using this formula, you can calculate the maximum log file size you should specify in the Rollover When File Size Reaches field of the Log Options dialog box.

$$\text{MAX_LOG_ROLL_SIZE} = \text{LOGVOL_SIZE} / (\text{NUM_SERVICES} * \text{LOGS_PER_SERVICE})$$

For example, assume the following:

- LOGVOL_SIZE = 600 MB
- NUM_SERVICES = 2
- LOGS_PER_SERVICE = 3

Then $\text{MAX_LOG_ROLL_SIZE} = 600 \text{ MB} / (2 * 3) = 100 \text{ MB}$.

If you choose to roll your logs over when they reach a specific size, the file size should be no more than 100 MB. Otherwise, the system will run out of disk space before you have three complete log files and scheduling the download and deletion of log files will be much more complex.

3.3 Configuring Logging Options

The following table gives the path in the browser-based management tool to the Log Options dialog box for each service.

Service	Path
---------	------

Transparent/Forward	Cache > Client Accelerator > Enable Logging for Client Acceleration > Log Options
Web Server Accelerator	Cache > Web Server Accelerator > Insert > Enable Logging for This Accelerator > Log Options
Cluster Services	Cache > Cluster > Forward or Transparent or Accelerator > Enable Logging > Log Options
Content Filtering	Cache > Filtering > Enable Filter Logging > Log Options

The following sections discuss each of the areas within the Log Options dialog box.

3.3.1 Log Format

You can configure ICS to use either common or extended log file format. However, only the extended format lets you select which fields to log, thus controlling log entry size. See Section 2.1.

Keep in mind that each bit of information you log increases the size of each log entry, thus affecting the rate at which logging disk space is used.

3.3.2 Rollover Options

- Rollover Every: This radio button lets you control how often ICS will start new logs for the service. If you decide to use this option, consider the information in the previous sections, particularly 1.3 and 3.2.2.
- Rollover When File Size Reaches: This radio button lets you control how large each log file becomes. If you decide to use this option, consider the information in the previous sections, particularly 1.3 and 3.2.3.

3.3.3 Old File Options

Ideally you will schedule the downloading and deleting of log files so that the system never becomes full.

ICS provides three options for dealing with old files, two of which can help you automatically dispose of older files and avoid the disk full condition.

The first option, Do Not Delete, is not recommended because it can lead to a disk full condition if files are not manually downloaded and deleted. If, however, the older logging data has more value for some reason, this option will preserve the oldest log files unless you manually delete them.

The other two options automatically delete the oldest files from the system. All logging data contained in these files is lost.

- Delete Files Older Than: This option lets you configure ICS to delete files when they are older than the time you specify.
- Limit Number of Files to: This option lets you limit the total number of log files retained for each service. After the limit each reached, the oldest file for the service is deleted each time a new file is created.

4.0 Planning Your ICS Log File Download/Delete Strategy

We recommend you use the browser-based management tool to download and delete log files. If you want to use FTP, refer to Using Other ICS Services > Using ICS Logging Services in the online documentation.

4.1 Setting a Regular Schedule

Once you have developed an ICS logging strategy, you know how often you must download and delete the log files to avoid running out of log disk space.

We recommend that you establish a regular schedule and ensure that all those who are responsible for downloading and deleting log files know the following things:

- When log files are to be downloaded and deleted
- How to determine the name of each log file to be downloaded and deleted
- Where to save the log files

You will want to develop specific procedures for your situation. The following sections contain general ideas for accomplishing these tasks.

4.2 When to Download and Delete the Files

The primary consideration is that log files must be downloaded and deleted before the logging disk space fills up.

4.3 Getting Log Filenames

Before you can download or delete a log file you must know its exact name.

4.3.1 Using the Browser-Based Tool

You can most easily view log filenames in the browser-based management tool. Click Monitoring > click Cache Logs > select a log format > select a service.

4.3.2 Using FTP

The mini FTP server in ICS 1.2 does not support the CWD command for changing to the target log directories. You can however use the LS command in connection with full paths to list log files.

For example, LS LOGS:ETC/PROXY/DATA/LOGS/FORWARD/COMMON/ lists transparent and forward proxy log files in common format.

For a complete list of log file directory paths, see Using Other ICS Services > Using

ICS Logging Services > Using Telnet to Manage Log Files in the online documentation.

4.3.3 Using the Command Line

You can also see a list of log filenames from the command line. Refer to Using Other ICS Services > Using ICS Logging Services > Using Telnet to Manage Log Files in the online documentation.

You cannot download files from the command line.

4.4 Saving Log Files

4.4.1 Using the Browser-Based Management Tool

You can download the files in the browser-based management tool as you view them. After you click Download, when the browser asks what you want to do with the file, save it to your designated log file storage location.

4.4.2 Using FTP

You can also use FTP from the storage location to retrieve the files using the get command. You must first obtain each filename using one of the options explained in 4.3 above.

You can also use the mget command, but be aware that this command also downloads active log files that are not complete.

ICS doesn't currently support the FTP put command.

4.5 Remember to Delete Downloaded Log Files

After the log files have been downloaded and saved to another location, delete the files using one of the following options:

- The Delete button in the browser-based management tool

- The del command in FTP

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