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## Bunyan vs winston performance

As is traditional with the JavaScript world, there are a dizzying amount of options for node logging. In this article, I will dig into some of the better and lesser known options to see what's on offer and help you log better in your Node applications. Best practices Before deciding what tool works best for you, following broad logging best practices will help make anything you do log more useful when trying to track down a problem. Read "The Most Important Things to Log in Your Application Software" and the introduction of "JAVA logging – how to do it right" for more details, but in summary, these rules are: Enable logging: This sounds like an obvious rule in an article about logging, but double check you have enabled logging (in whatever tool you use) before deploying your application and don't solely rely on your infrastructure logging. Categorize your logs: As an application grows in usage, the amount of logs it generates will grow and the ability to filter logs to particular categories or error levels such as authorization, access, or critical can help you drill down into a barrage of information. Logs are not only for you: Your logs are useful sources of information for a variety of stakeholders including support and QA engineers, and new programmers on your team. Keep them readable, understandable and clear as to their purpose. And now to everyone's favorite topic, tools: Start with console For many developers, debugging a Node application begins with the console and could still be enough if your application is simple. It offers two main logging outputs: `console.log('Keeping you informed');` // outputs to stdout `console.error('An error!');` // outputs to stderr

That's about it. For more useful logs, you need a bit more information including a level, a timestamp, and formats suitable for humans and machines. You could implement some of this yourself based around console by passing in string replacements and some less common methods (read more on MDN), but there are simpler ways. Using `console.log` can cause performance issues and cause problems when trying to read these logs from a file into log collection tools as it prints the data with line breaks and causes the log collectors to split multi-line logs into separate entries. Format JSON output with bunyan Bunyan is a mature and popular option for node logging, currently at version 1.8.x that has a single purpose. It creates well-formatted JSON versions of your logs, which is particularly useful for those of you using external services to read your logs (see more below). To get started, create a Logger, assigning it a name. From there bunyan has a logging API to tailor messages to your preferred format. For example:

```
var bunyan = require('bunyan');
var log = bunyan.createLogger({name: 'express-skeleton'});
log.info('Welcome to the app');
// Just text log.warn('port bind');
// Text plus metadata
Will produce the following output:
{
  'level': 'info',
  'msg': 'Welcome to the app',
  'time': '2014-05-14T12:43:13.433Z',
  'v': 3,
  'ns': 'express-skeleton'
}
```

And this example shows how to define different message types on the fly and also how to set a log level until you change it again.

```
function onListening() {
  var addr = server.address();
  var bind = typeof addr === 'string' ? pipe : port;
  debug('Listening on ' + bind);
}
```

Enable it by prefixing your application script command (read the documentation on how to customize this to suit your application), e.g. `DEBUG=1 npm start`. Log with Winston For more complex applications with greater or custom logging needs, Winston enters the fray, and possibly (based on git commits) the oldest option in this article. It allows you to define your own logging levels, custom loggers (and destinations), add metadata, maintain multiple asynchronous logs and more. For example, to create a custom logger that adds a timestamp, uppercases the logging level and adds any metadata you define in a log message:

```
// Create custom logger
var logger = new (winston.Logger)({
  transports: [new (winston.transports.Console)({timestamp: function() { return Date.now(); }})],
  formatter: function(options) {
    return options.timestamp() + ' ' + options.level.toUpperCase() + ' (' + options.meta && Object.keys(options.meta).length ? ' ' + JSON.stringify(options.meta) : '') + ')';
  }
});
```

And this example shows how to define different message types on the fly and also how to set a log level until you change it again.

```
function onListening() {
  var addr = server.address();
  var bind = typeof addr === 'string' ? pipe : port;
  debug('Listening on ' + bind);
}
```

For those of you using Express, there's middleware for Winston. Gathering intel A lesser-known option is the Intel package, it offers similar features to the other options above, but provides a lot of default logger types, filters, and formatters. One interesting feature is that if an exception is triggered it will include a stack trace as a JSON object, giving you useful information for fixing problems. Also, Intel has hierarchical loggers meaning you can pass messages up the logger chain if it meets certain criteria, kind of like levels in a support department. Logging to external services With all of these options you will still need to parse, process and understand your logs somehow, and numerous open source and commercial services can help you do this (search NPM and you'll find lots). I'll highlight those that support Node well. The YAL package lets you define remote TCP loggers and send your logs there. It supports log levels, sets timestamps, hostnames, and multiple destinations. `log4js-node` is a node version of the venerable `log4js` framework and offers a comprehensive feature list much like the two options above, and adds an API to provide plugins that can connect to external logging providers. If you're a fluent user, then naturally there's a Node package that also integrates with `log4js` and Winston. If Kibana is your platform of choice, then this package for Winston will format your logs to better suit it. Loggly's package supports tags, JSON objects, arrays, search, and a variety of options for what to log in the first place. Airbrake's package is more suited to error and exception handling and also supports Express and the hapi framework. And of course, Coralogix' own package allows you to create different loggers, assign a log level to them and other useful metadata. In addition to all standard logging features, such as flexible log querying, email alerts, centralized live tail, and a fully hosted Kibana, Coralogix provides machine learning powered anomaly detection in the context of Heroku builds. Another benefit is that Coralogix is the only solution which offers straightforward pricing, all packages include all features. The example below defines a new logger for information, sets an appropriate level and metadata for a class and method name: `var Coralogix = require('coralogix-logger');` `const config = new Coralogix.LoggerConfig({applicationName: 'express-skeleton', privateKey: '', subsystemName: 'node-tester-sub'}); Coralogix.CoralogixLogger.configure(config); const logger = new Coralogix.CoralogixLogger('Information');` `const log = new Coralogix.Log({severity: Coralogix.info, className: 'expressInit', methodName: 'onListening', text: 'Listening' }); logger.addLog(log);` Coralogix also has integration options for Winston and Bunyan keeping you covered no matter what NodeJS option you choose. With Winston, create configuration the same as above and add Coralogix as a transport. `var winston = require('winston');` `var CoralogixWinston = require('coralogix-logger-winston');` `var config = {...}; CoralogixWinston.CoralogixTransport.configure(config); winston.configure({ transports: [new CoralogixWinston.CoralogixTransport({category: 'CATEGORY'})] });` `winston.info('use winston to send your logs to coralogix');` And for Bunyan, again create your configuration and create a logger that streams to Coralogix as raw data, you can also use Coralogix as a child logger of other loggers. `var bunyan = require('bunyan');` `var CoralogixBunyan = require('coralogix-logger-bunyan');` `var config = {...};`

CoralogixBunyan.CoralogixStream.configure(config); `var logger = bunyan.createLogger({name: 'BUNYAN_ROOT', streams: [{level: 'info', stream: new CoralogixBunyan.CoralogixStream({category: 'YOUR CATEGORY'}, type: 'raw')}]});` `logger.info('hello bunyan');` You can send your Node.js logs using our winston-loggly-bulk package. It sends logs directly from your application to Loggly using the HTTP/S Event API. The minimum supported version of node.js is V6.0.0. If you need to use an older version of node.js, please refer to the section Winston 2.x Support below. For alternatives, please see the Advanced Options section. Node.js Logging Setup 1. Install the `winston-loggly-bulk` package Install the `winston-loggly-bulk` package using NPM or from Github If you are running npm version 3 or higher then run the below command to setup the `logging-npm install winston-loggly-bulk` If you are running npm version 2 or lower then run the below command to setup the `logging-npm install winston-loggly-bulk@2.0.3` Configure `loggly-winston-bulk` Paste the following code to create a Loggly client. `var winston = require('winston');` `var Loggly = require('winston-loggly-bulk');` `winston.add(new Loggly({token: 'TOKEN', subdomain: 'SUBDOMAIN', tags: ['Winston-NodeJS'], json: true}));` `winston.log('info', 'Hello World From Node.js');` Replace: `TOKEN: your customer token from the source setup page SUBDOMAIN: the subdomain of your Loggly account` You can find more parameters on Github[ . 3. Send Test Events Run your Node.js application to send test events to Loggly. 4. Verify Events Search Loggly for events with the Winston-NodeJS tag over the past 20 minutes. It may take a few minutes to index the event. If it doesn't work, see the troubleshooting section below.tag:Winston-NodeJS Click on one of the logs to show a list of JSON fields (see screenshot below). If you don't see them, please check that you are using one of automatically parsed formats. Winston 2.x Support If you are using a node.js version V6.0.0 or older, you should use Winston 2.x. Winston 2.x is supported by winston-loggly-bulk version 2.0.3. You can install it by running the following command. `npm install winston-loggly-bulk@2.0.3` There are some syntax changes to create your Loggly logger in your main `app.js` file so please go through the README.md file and see the sample code snippet here. Advanced Node.js Logging Options Package Docs – Describes how to send JSON objects, arrays, use tags, and more node-Loggly-bulk – Use the node-loggly-bulk library to send node.js logs bunyan-loggly – Use the bunyan library which has a wrapper for node-loggly-4js – Use the log4js library which has a wrapper for node-loggly HTTP/S Bulk Endpoint – Send up to 5MB batches of logs over HTTP/S for higher performance Buffer Options – This library includes a buffer to save logs during a temporary network outage. By default it saves 500 events and retries after 30 seconds. If you wish to override the default settings, you can add a `bufferOptions` object as shown below. `bufferOptions: {size: 1000, retriesInMilliseconds: 60 * 1000}` Flush logs and exit – Our library uses ajax requests to send logs to Loggly, and as ajax requests take time to complete, logs can be lost when `process.exit()` is called because it forces an immediate exit. To exit gracefully and ensure that the last logs get to Loggly, we created a function called `flushLogsAndExit()`. It waits for 10 seconds and then calls `process.exit()` itself. This allows enough time for the logs to be sent to Loggly. Here is an example of how to use the method in your `app.js` file: `var winston = require('winston'), winlog = require('winston-loggly-bulk'); winston.log('info', 'Hello World'); winlog.flushLogsAndExit();` If you are instantiating the Loggly transporter using the new keyword and assigning it into any variable, then you have to add that Loggly transporter into `winston` by passing 3 parameters like below. `winston.add(transportObject, null, true);` `winston.remove(transportObject);` As you can see in the above code snippet, we have passed true as a third parameter which tells `winston` that we have already created an instance of Loggly transporter. Also, if you want to remove that transporter later then you should call the `winston.remove()` method. Loggly Libraries Catalog – New libraries are added to our catalog Search or post your own Node.js logging or custom logging questions in the community forum. Troubleshooting Node.js Logs If you don't see any data show up in the verification step, then check for these common problems. Check `winston-loggly-bulk`: Wait a few minutes in case indexing needs to catch up See our HTTP Troubleshooting Guide to verify HTTP events are being sent to Loggly. If you see the error `TypeError: transport is not a function` and you are instantiating the Loggly transporter using the new keyword as shown in the Advanced Logging Options of this document, then make sure you are passing true as a third parameter in the `winston.add()` method. Still Not Working? When the APM Integrated Experience is enabled, Loggly shares a common navigation and enhanced feature set with the other integrated experiences' products. How you navigate the product and access its features may vary from these instructions. For more information, go to the APM Integrated Experience documentation. The scripts are not supported under any SolarWinds support program or service. The scripts are provided AS IS without warranty of any kind. SolarWinds further disclaims all warranties including, without limitation, any implied warranties of merchantability or of fitness for a particular purpose. The risk arising out of the use or performance of the scripts and documentation stays with you. In no event shall SolarWinds or anyone else involved in the creation, production, or delivery of the scripts be liable for any damages whatsoever (including, without limitation, damages for loss of business profits, business interruption, loss of business information, or other pecuniary loss) arising out of the use of or inability to use the scripts or documentation.

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