

Introducing a common interface to access AFS statistics

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2019 OpenAFS Workshop



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AGENDA

- Motivation
- Problem
- Solution
- StatsStore
- StatsStore and OpenAFS
- Other platforms
- Collectd
- Collectd and OpenAFS
- Links



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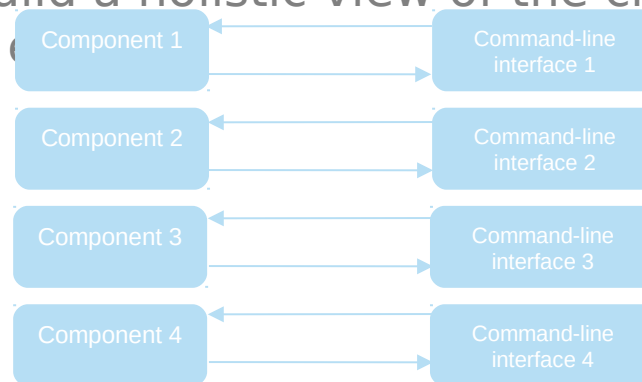
MOTIVATION

- Plenty of reasons why collecting stats about your system is a good idea;
 - Troubleshooting;
 - Tracking down bottlenecks;
 - Analyzing long-term trends;
 - Measure and monitor application performance;
 - Identify ways to optimize performance;
 - Others;



PROBLEM

- Different interfaces to get stats from different components of the system;
- Getting stats from one component of your system might not be enough;
 - Unable to correlate data from various applications;
 - Unable to connect events to certain system states;
- Difficulties to build a holistic view of the circumstances surrounding an event

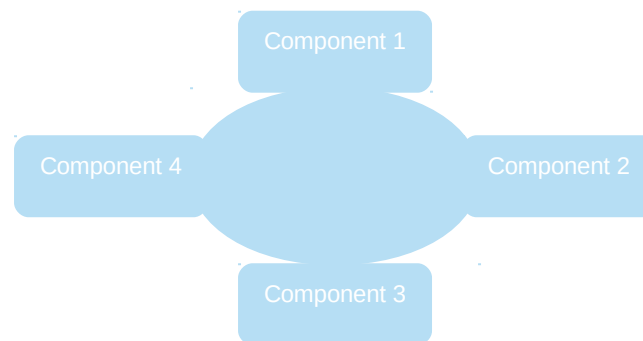




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PROBLEM

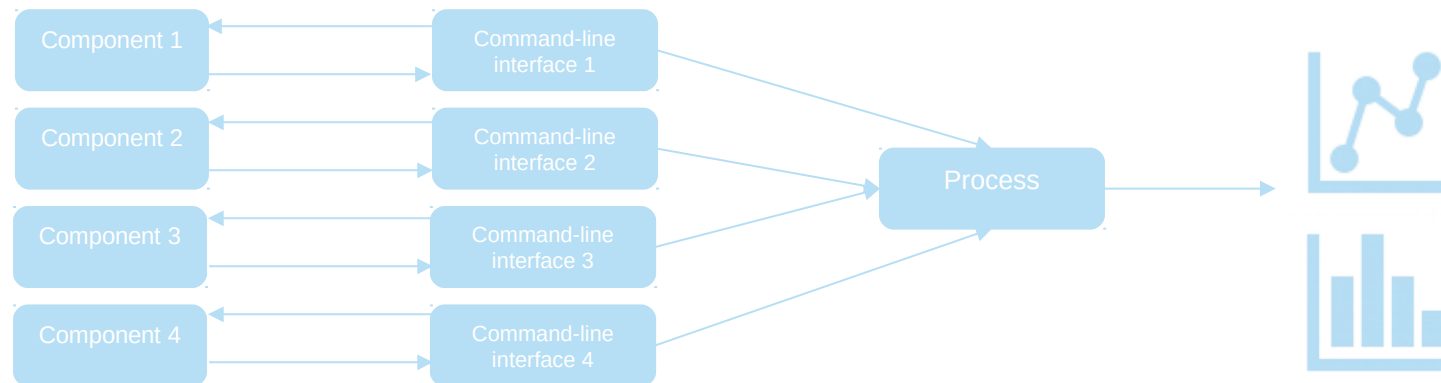
- Tracking data about the system as a whole could:
 - Bring together apparently disparate pieces of system data;
 - Help us understand what the environment looked like exactly at the time of the problem;
- See our system as a system, instead of as a loose set of unrelated components;
- Unfortunately, each component provides statistics in a different way;





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PROBLEM





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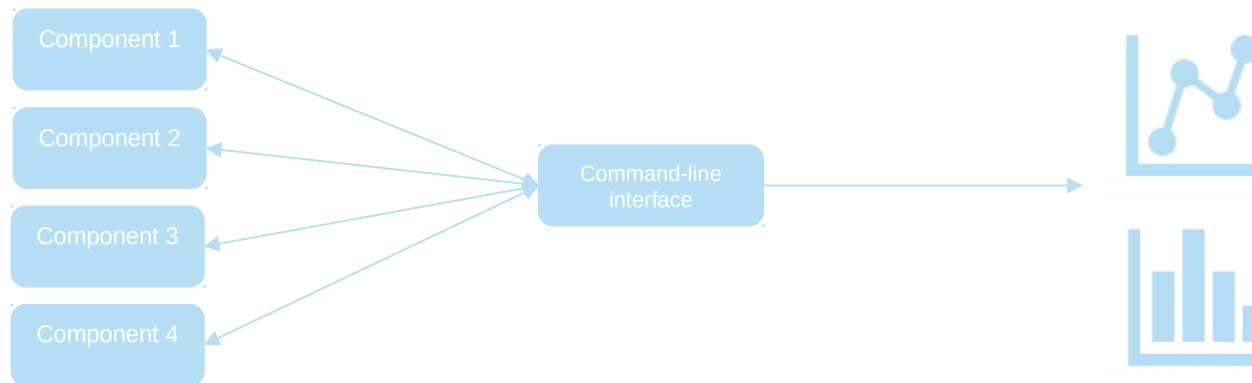
SOLUTION

- A common namespace to access performance data from a variety of system sources;
- Ideally, same command-line interface and API;
- A shared namespace across statistics enables you to easily explore all available information for a given system;



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SOLUTION





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STATSSTORE

- Introduced in Oracle Solaris 11.4;
- StatsStore unifies the broad set of Oracle Solaris observability technologies under one set of naming rules;
- This consolidated view of data is available through the interactive System Web Interface and through CLIs and APIs;



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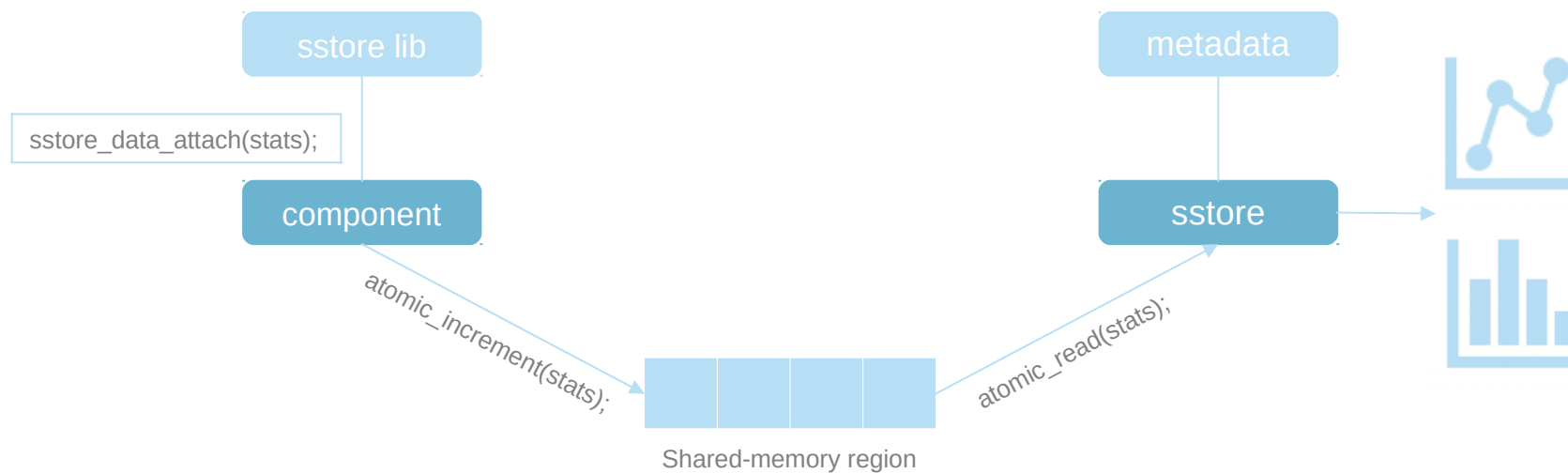
STATSTORE

- Create metadata files that define your statistics;
- Modify your application to update values for the statistics that you created in metadata;
- Interfaces are available for both C and Python;
- Interface creates a shared memory region between sstored and the client process;
 - Supports only integer statistic values;
 - Values in this shared memory region are initialized to 0;
 - To update the statistics store, update the shared memory region array element for that statistic;



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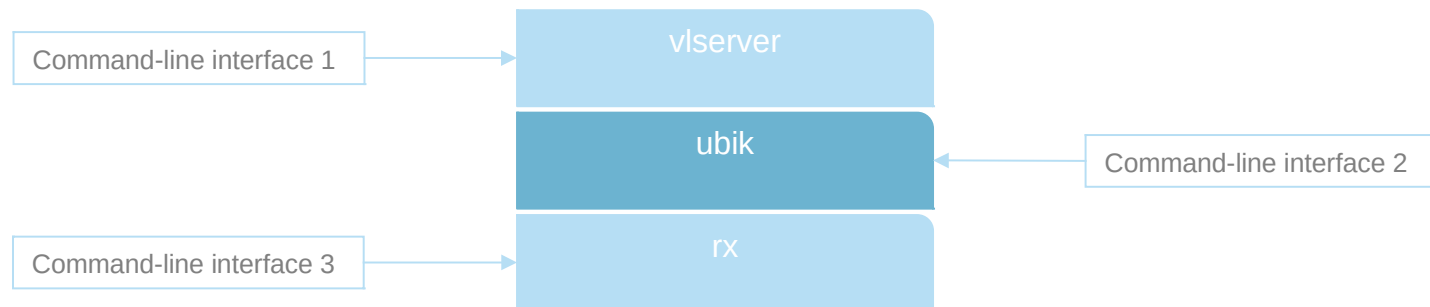
STATSSTORE





STATSSTORE AND OPENAFS

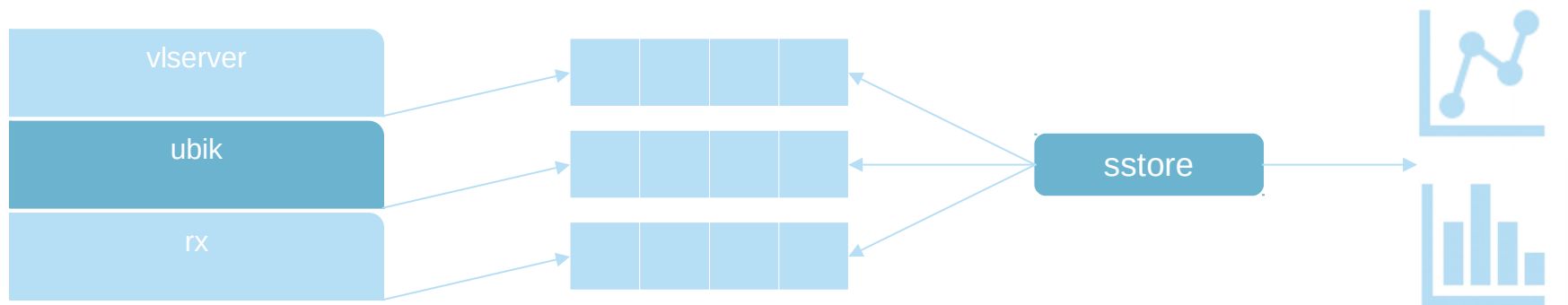
- Different ways to get statistics from different processes;
 - Different command-line interfaces;
 - Signals;
 - Fileserver, VL server, PT server, Volume server, etc.;
- Different ways to get statistics from the same process;





STATSSTORE AND OPENAFS

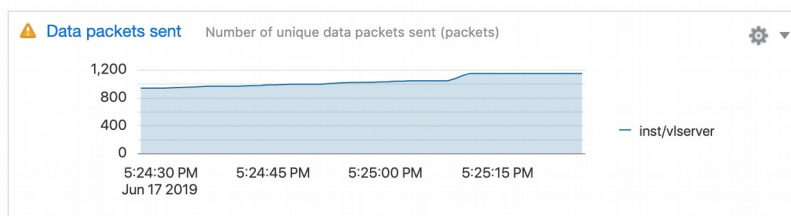
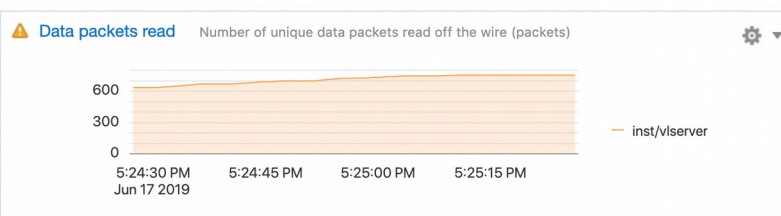
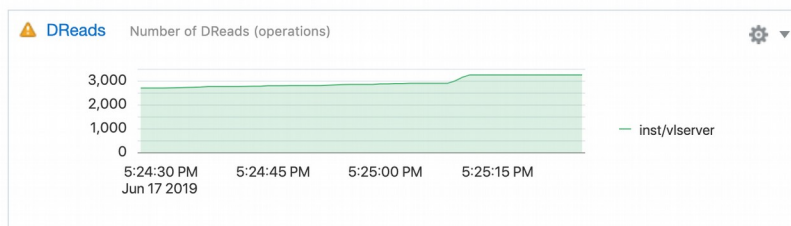
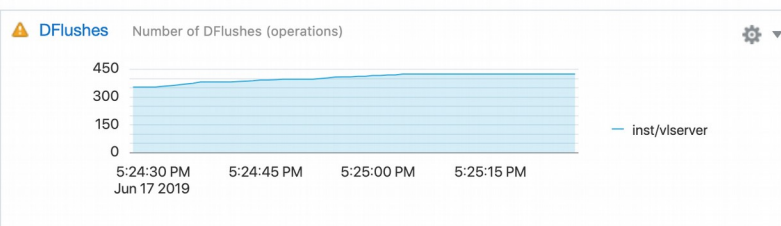
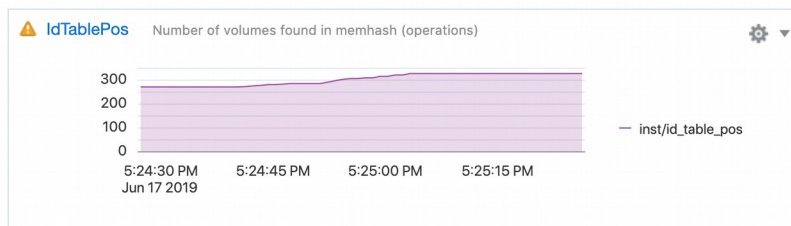
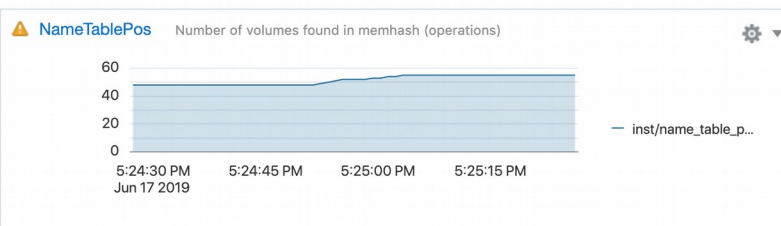
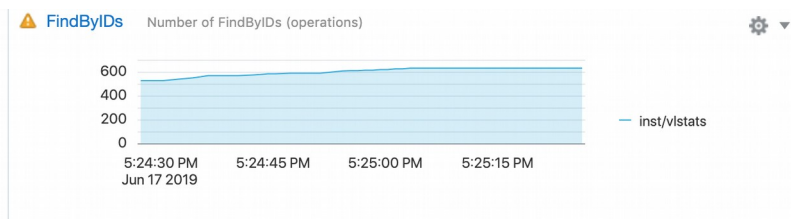
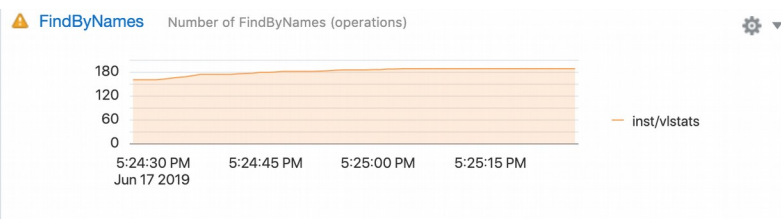
- Code refactoring:
 - Move related stats to the same struct;
 - Use stats store library to create shared memory region for each struct;
 - Update counters normally;





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STATSSTORE AND OPENAFS





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OTHER PLATFORMS

- StatsStore is Solaris specific;
- Alternative for Linux;
 - Collectd;
- Collectd is an open source daemon that collects system and application performance metrics;
- Collects, transfers and stores system performance statistics;
 - Data acquisition and storage handled by plugins;



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COLLECTD



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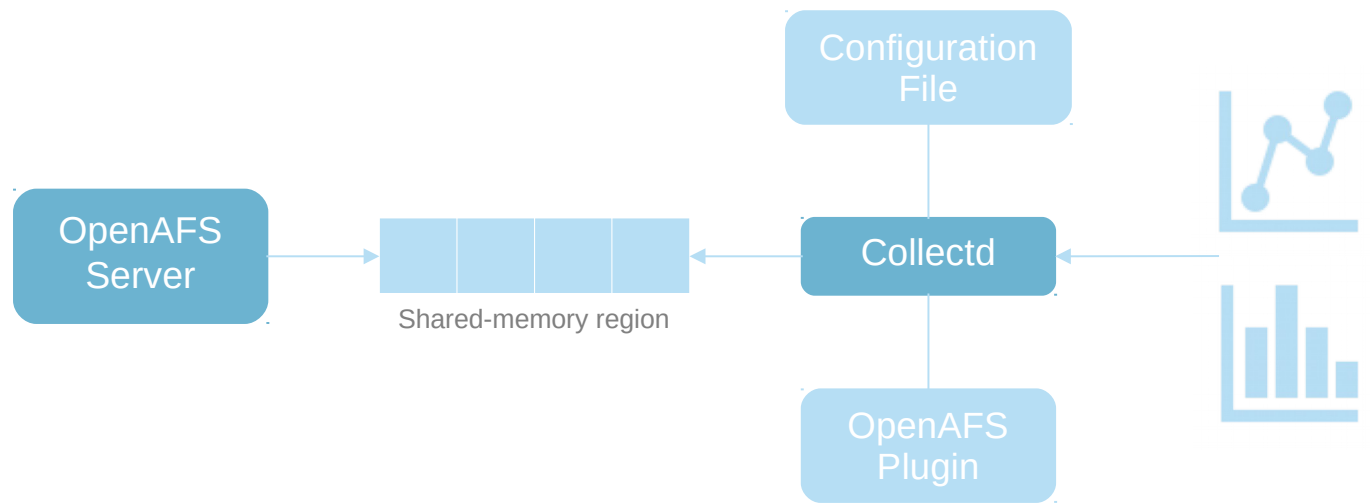
COLLECTD

- Benefits:
 - Open source;
 - Extensible;
 - Free;
 - Lightweight;
 - Lots of plugins (over 130 plugins);
 - Widely supported (Linux, Mac OS X, AIX, FreeBSD, NetBSD, OpenBSD, etc.);
 - More;



COLLECTD

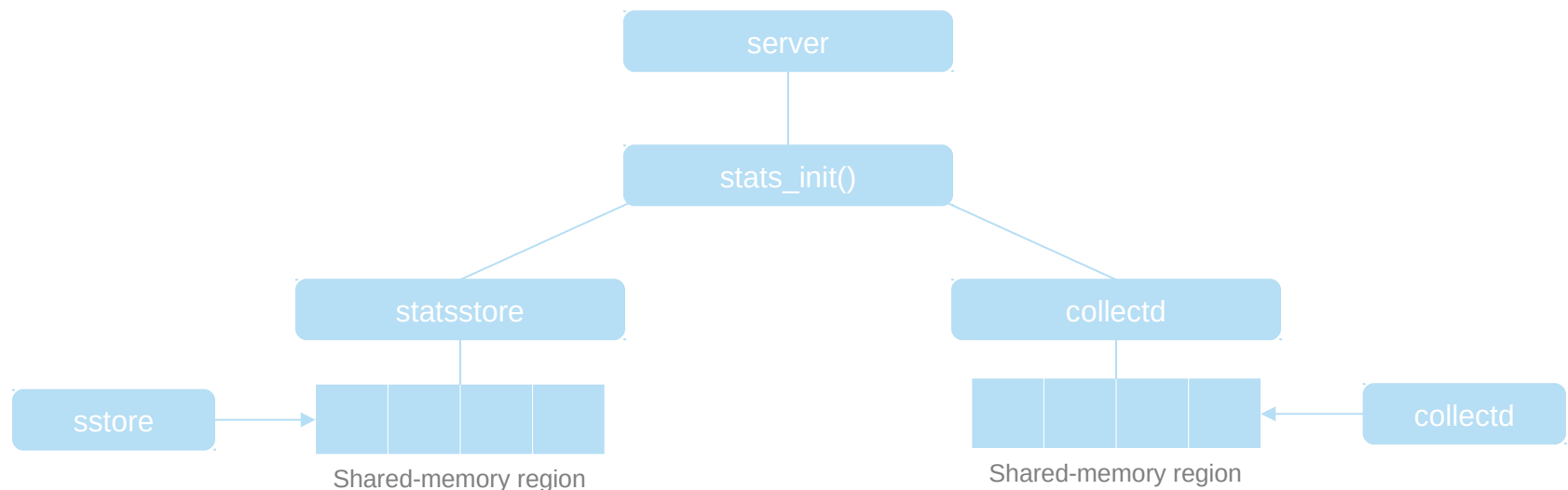
- Everything in collectd is done in plugins;
- Each plugin has their own unique settings;
- Plugin for OpenAFS developed;
 - Creates shared-memory region for each group of stats;
 - Group of stats specified in the configuration file;





COLLECTD AND OPENAFS

- OpenAFS uses the same interface used by StatsStore;
 - But with different implementation;
 - Collectd plugin: github.com/marciobarbosa/collectd/tree/mbarbosa/afs-stats-3





COLLECTD AND OPENAFS





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Thank you!