Lemon – LHC Era Monitoring overview

Lemon is a server-based based monitoring system. On every monitored entity, a monitoring agent with access is responsible for collecting the monitoring information. The monitored samples are stored in a local cache and are forwarded to the application server. The application server stores the received samples in a central monitoring repository, which can interface to either a relational database or a file-based backend. A tool based on RRDtool called Lemon-web is provided for the visualization of the data.

Lemon front-end concept

The Lemon web application is used to retrieve metric information from the monitoring repository to store it into two time-sliced data structures and to provide data visualizations. Round Robin Database (RRD) files are used for time series data storage. Every file holds information from all metrics measured for a given entity. Files from the RRD files are then passed to the web interface for visualization.

Lemon web workflow

The new Lemon web design:
- back-end oriented using Model-View-Controller pattern
- integrated with CERN Single-Sign-On authentication with high granularity authorizations
- using MongoDB for caching graphs and entity configurations
- simple sample engine used for the separation of the workflow logic from the user interface
- support for multiple monitoring repositories
- user views: a user customization of the displayed entity page and graphs

Lemon Monitoring Repository Daemon

The Monitoring Repository Daemon:
- collects, aggregates and caches monitoring data from the central Monitoring Repository
- stores collected and aggregated data as RRD (Round Robin Database) files per monitored entity
- provides any multi-level aggregation with detailed monitoring of expected and reporting entities (visualized in reliability graphs)
- supports aggregation operations: sum, subtraction, multiplication, division

Used technologies

Lemon Visualization

The new functionality provided by the new Lemon web-visualization:
- improved time precision to visualize aggregated data stored in RRD files
- advanced graphs visualization based on the HTML 5 (mouse zoom in/out)
- reliability graphs to monitor data aggregation
- export and visualization of the historical data (e.g. one year) from the central Monitoring Repository with high time granularity (up to collection rate, e.g. 5 min) and on fly aggregation (e.g. power efficiency calculation)
- widget to embed any graph (available as “R52-embedible” below any graph)