ProfiT-HPC

A Profiling Toolkit for HPC in Tiers 2 and 3

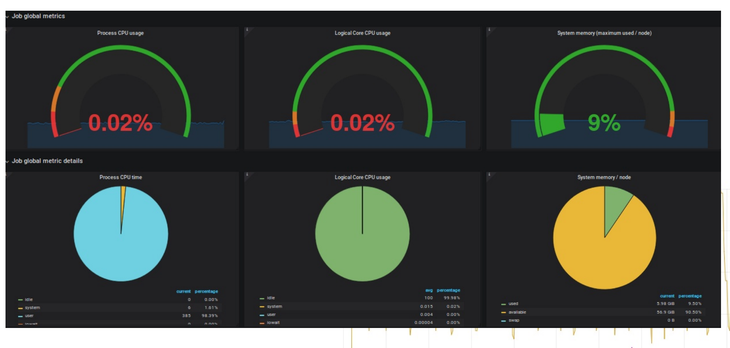
Job-Specific Monitoring

collecting and storing job's metric data

- **Telegraf**:
  agent to collect metrics and events. Using own and Telegraf community plugins
- **PfiTCollect**:
  a lightweight metric collection tool implemented within the project
- **InfluxDB**:
  time series database to store metrics

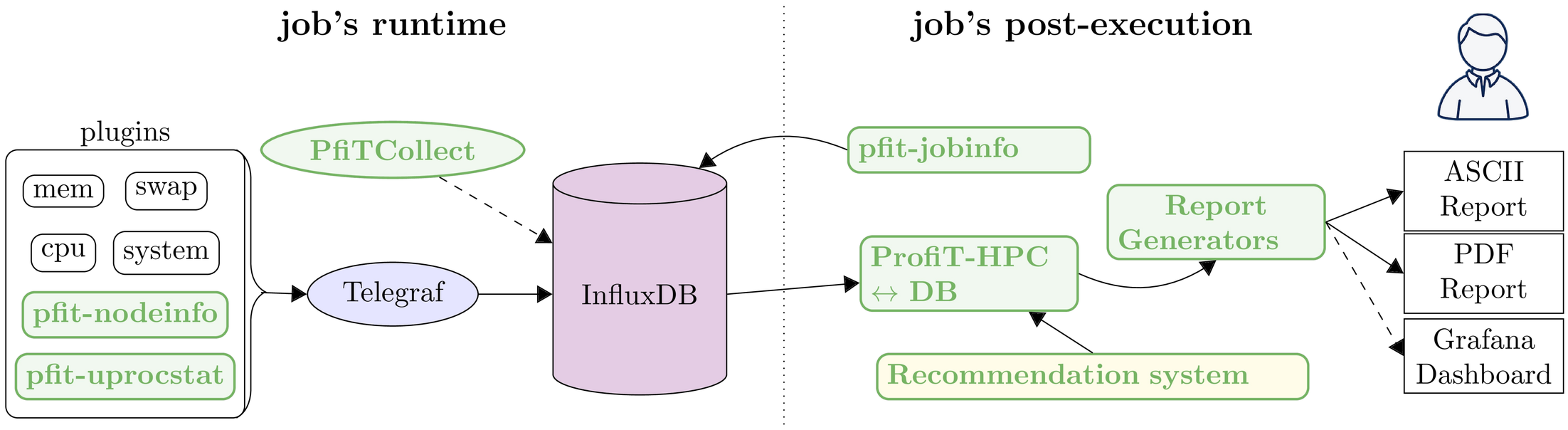
Job Reports

- **ASCII report:**
  textual summary of the job, which can be output in console or sent as a plain text message
- **PDF report:**
  more visual job summary, including graphs. Shows more details and is attachable to email
- **Interactive dashboards:**
  higher level of details. Includes real-time measurements



Recommendation system

- After job analysis optimization hints in every kind of report
- Comprehensive instructions to improve efficiency of jobs
- Graphical indication of problems during runtime
- Using machine learning to detect anomalous behavior



Goals

- **increase awareness**
  of the importance of performance of HPC applications
- **automatic feedback**
  on the performance and resource consumption of a job
- **recommendations**
  for optimization of the job

Achievements

- **working prototypes**
  complete toolchain works in a prototype version
- **modular architecture**
  parts of the toolkit can be interchanged
- **artificial environment**
  the toolkit is being elaborated and tested within artificial environment without HPC interaction

Next Steps

- **recommendation system**
  include machine learning approaches
- **gathering more metrics**
  enlarging the measurement data through profiling and hardware/system specific metrics
- **recommendations by experts**
  create a database of hints formed by HPC experts

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