An elastic OpenStack grid

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What's in it for ALICE

- Ability to exploit external resources in periods with high demand

- Scale up and down applications on demand
  – Possibility of scaling up when resources are cheap

- Example: Grid site is running low on resources.
  – Deploy more worker nodes

- Example: AliEn's API servers are getting overloaded
  – Deploy more API servers

Goals for the project

- Automatic elasticity

- Scale up and down based on resource demand

    – Heat and Ceilometer

- Detecting situations when resources are running low and correcting

- Monitoring with ELK

    – ElasticSearch, Logstash and Kibana

Heat and Ceilometer

- Plugins for OpenStack

- Ceilometer collects data about resource usage

- Heat performs actions on that data

- Used here to measure resource usage and scale grid.

ELK

- Elasticsearch
  - High performance search and analytics tool
- Logstash
  - Input → filter → codec → output
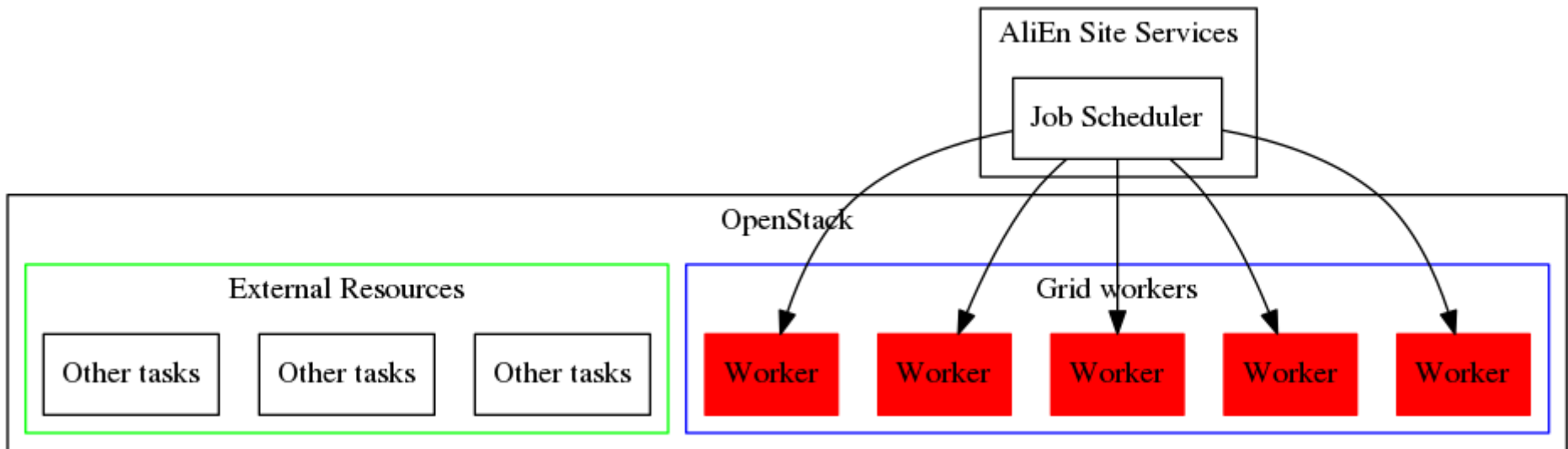- Kibana
  - Visualize the data

Secondary goals

- Recreatable environments via Puppet
  - Puppet is a tool for automatically recreating computer environments
  - Declare how the environment is supposed to look like, not how to do it
- ELK, OpenStack and integrations

Current solution [AliEn Grid site]
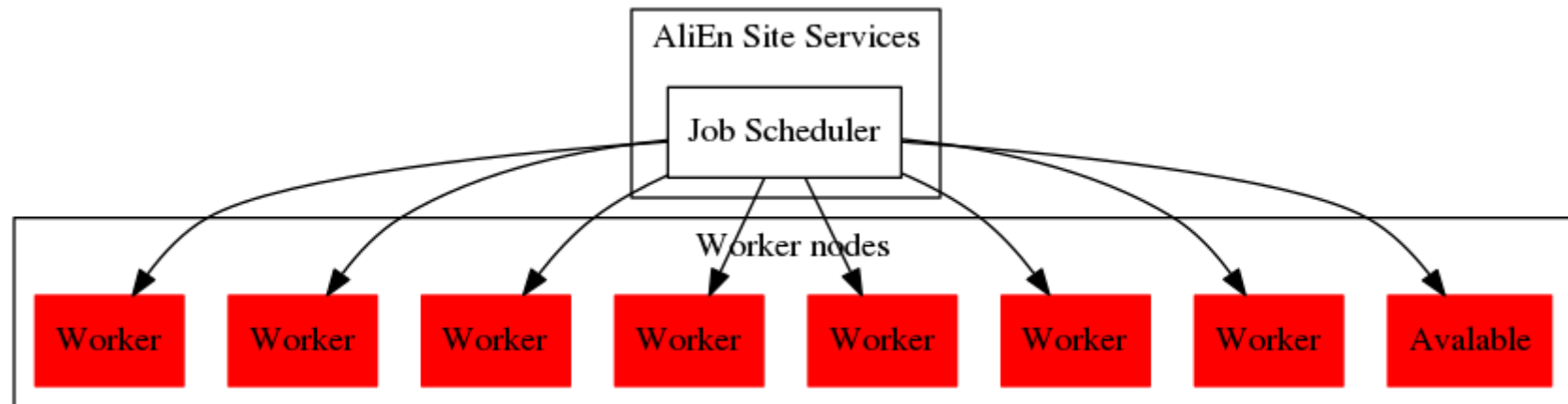
Thesis solution - Scale up on demand[Exploit external resources]

Current progress

- OpenStack environment up and running

- ELK almost up and running

Issues so far

- Puppet
- OS requirements
- Puppet modules
  - OpenStack
  - MySQL

In progress / Remaining work

- Deciding what grid tools to use for the prototype

- OpenStack monitoring metrics

- Getting grid and autoscaling implemented

- Measuring performance penalty of OpenStack

Outlook for next offline week

- Able to set up a new grid site with minimal amount of work

- Grid able to scale with no, or minimal operator intervention

- Grid able to receive computational jobs

- The system able to give good metrics to operator via Kibana

Q&A

- Input and suggestions to niklas.trippler@cern.ch

- Thank you to Dario Berzano for idea to use Heat and Ceilometer