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elixir
de.NBI
GERMAN NETWORK FOR BIOINFORMATICS INFRASTRUCTURE

# BiBiGrid Intro

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# Today's Schedule

Introduction to BiBiGrid (Overview, Requirements…)
Background knowledge: HPC & Cloud Computing
BiBiGrid Features
Short Break
BiBiGrid Hands-On
- Configuration
- Starting your first Cluster
- Short Break
- Log In & Try Out
- Cluster Monitoring
- Manual Scaling of Instances
- Short Break
- Ansible Introduction & Usage
- Terminating the Cluster

# BiBiGrid Overview

Tool for an easy Cluster Setup inside a Cloud Environment

OpenSource ( → GitHub)

Configuring and Managing Access to Cluster(s)

# BiBiGrid Requirements

- Java 11+
- Commandline Access
- OpenStack API Access
- SSH Access to Master Instance

# BiBiGrid Features

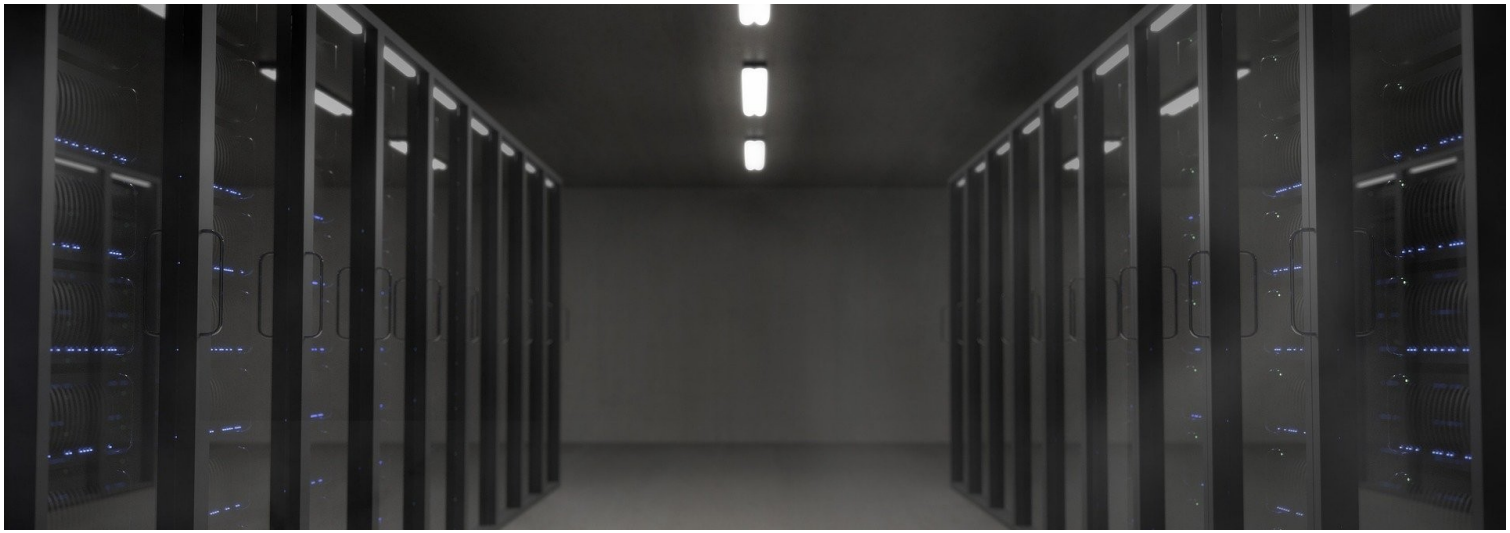
- Full Openstack support
  (AWS, Azure and Google Compute no LTS)
- WebIDE (Theia)
- Batch Grid Scheduling (Slurm)
- Monitoring (Zabbix)
- Manually Scalability
- Extensible by Ansible Roles

# High Performance Computing (HPC)

Computing nodes working together in parallel

Process data and perform complex calculations at high speeds

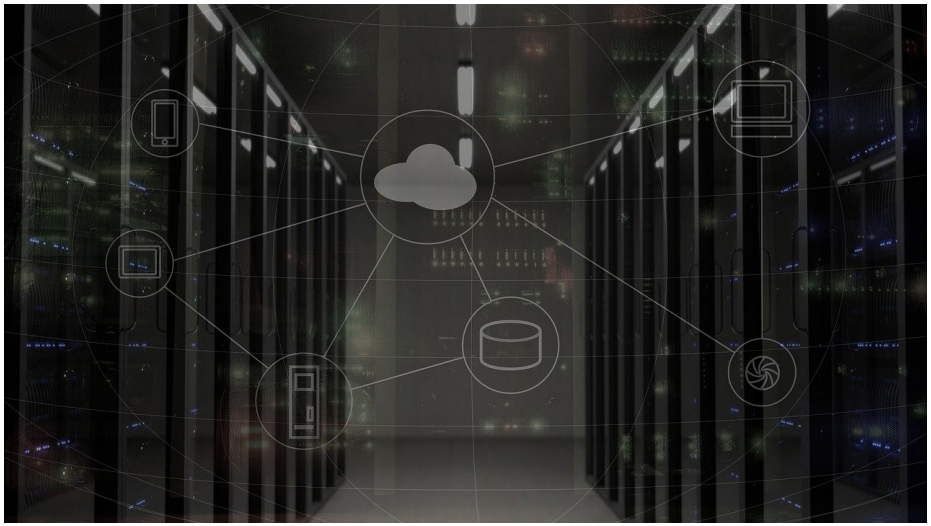
May bring Scientific, Industrial, and Societal Advancements



# Cloud Computing

Computer Network Infrastructure to access

- Data Storage
- Computing Capacity
- Application Software



# Theia WebIDE

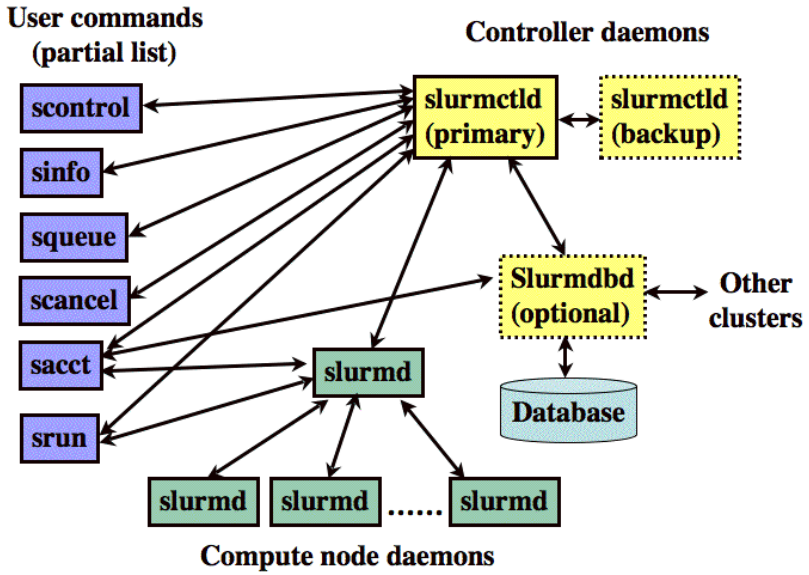
- *Integrated Development Environment*
- Visual Access to file structure and files
- Supports various programming languages
  - JavaScript, Java, Python and many more …
- **Integrated Terminal**

# SLURM Batch Grid Scheduling

**S**imple **L**inux **U**tility for **R**esource **M**anagement

Execute Jobs in Parallel (inside the Cluster)

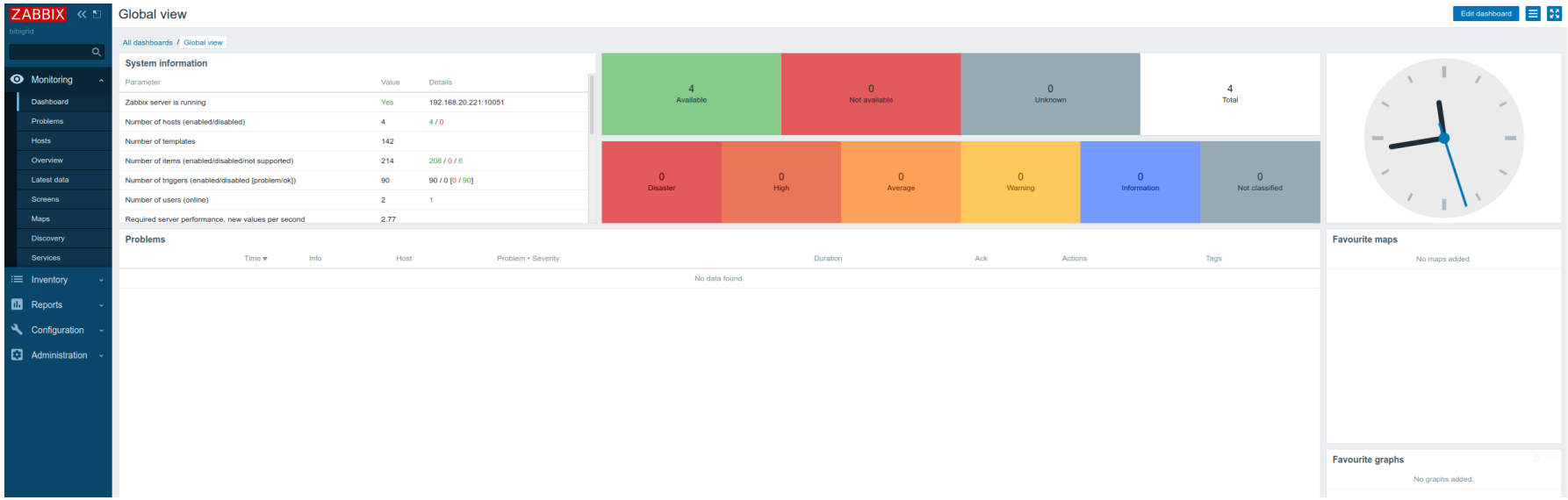
Manage Job Queues




Taken from https://slurm.schedmd.com/quickstart.html

# Monitoring with Zabbix

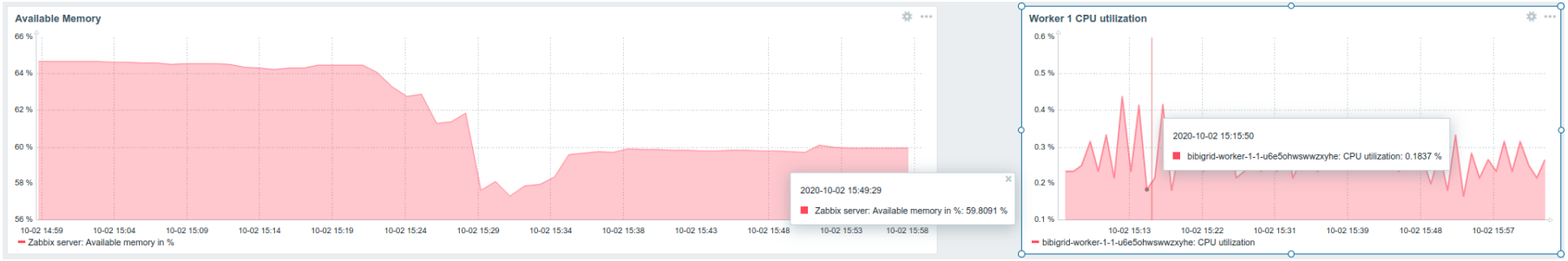
- Monitors numerous parameters of a network
- Provides information about health and integrity of servers
- Data Visualisation features




Zabbix Dashboard

# Monitoring with Zabbix

- Monitors numerous parameters of a network
- Provides information about health, integrity and load of a BiBiGrid cluster
- Data Visualisation features




Using Zabbix widgets to display BiBigrid Cluster Loads

# Cluster Scalability

- Manual Scaling of Clusters to Avoid Overloads
- Scale Up:  Append Instances to a Cluster
- Scale Down: Shutting Down Instances of a Cluster

# BiBiGrid HandsOn

Tutorials:
Original GitHub Documentation

de.NBI Wiki

For Today:
GitHub CLUM 2020