The VISPA Internet Platform for Outreach, Education and Scientific Research in Various Experiments

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Motivation

- Web based platform providing a graphical front-end to infrastructures
- Deployment (once for all)
- Scalability (workspaces exchangeable)
- Access from everywhere and with many devices

More physics and less computing
Concept

Client → HTTPS → Webserver → SSH → Workspace

- Static content, scripts, and GUI
- Controller functions dispatch requests
- Workspace code, process requests

- Server Code
- Workspace Code
- Browser Code

+ Local resources
Code Editor: Edit – Run – Verify

➔ Editing, output and preview of results in one view
➔ C/C++ and Python Scripts can directly be executed
➔ Verify output figures
Extensions

- Custom applications to serve individual requirements
  → Installed on top of the platform
- Basic extensions provided in standard setup
  → Codeeditor, Filebrowser, Terminal
- Working conditions comparable to personal computer
Special Extensions

Jobmanagement:
- designer: integrate parameter scans
- submission: submission to a batch system e.g. HTC Condor, WLCG
- dashboard: overview of jobs e.g. status, runtime

Parameter Scan
- overview over all plots produced in a parameter scan → helps comparing
Server Setup at RWTH Aachen

- Load balancing allows simultaneous access of many users
  → Without balancer limited by CherryPy threads (sticky sessions)
- Apache cache for static content
  → speed up loading
- Next step: starting server instances on demand
Workspace setup at RWTH Aachen

- User authentication via common MySQL database of server instances
  - Only one database and no synchronization
  - No additional registration for workspace needed

- Home directories on external NFS
  - Highest stability, speed not depending on load of workers
  - Easy to extend

- Distributed file system (gluster) for scratch

- Server Inst. 01
- Server Inst. 16
- Worker 01
- Worker 16
- NFS server for home

- 128 cores with 2 GB RAM each
- Debian 7
VISPA in Education

- Blended Learning
- VISPA successfully used in lectures:
  - Bachelor and Master
    » Homework assignments +
    analyzing experiments demonstrated in lecture hall
  - Feedback helped to improve the platform
VISPA in Outreach

Pierre Auger Public Data

- Perform physics analyses with public data of the Pierre Auger Observatory

CERN Open Data Portal:

- One click access to CMS public data
- “Discover” e.g. the Z-Boson without installing any software
- Use examples as start for analysis
- ~ 300 Users since start

Poster Session B
Contrib. ID: 249
VISPA in Scientific Research


Currently transferring analysis designer from desktop to web version

Used modules:
- electron selection
- jet energy resolution
- b-tagging
- top reconstruction
- ...

Graph showing $\sigma$ (pb) vs $s$ (TeV) with data points and theoretical predictions.
Summary

- VISPA delivers a web GUI to infrastructures

- Used for scientific research, teaching and outreach

- Continuously improved system

- Try it (guest login available):
  www.vispa.physik.rwth-aachen.de

- Repository:
  https://forge.physik.rwth-aachen.de/projects/vispa-web