GSI Site Report
- HEPIX Fall 2010

Walter Schön, GSI

Topics

- FAIR (Facility for Antiproton and Ion Research) – status update
- GSI IT Organisation
- Data Center
- Lustre upgrade

FAIR - International Facility, update

4. October 2010 : International Contract signed - FAIR GmbH founded

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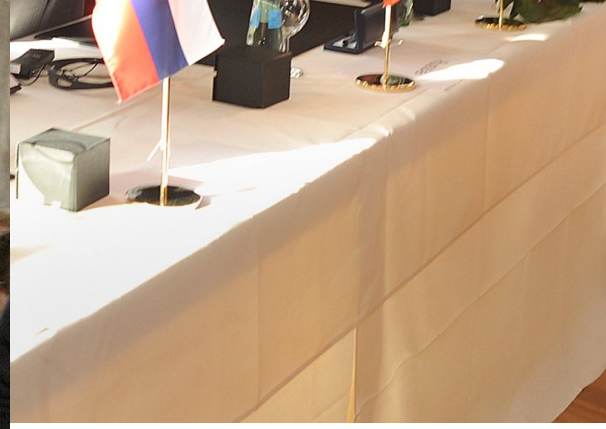


Members of FAIR founding

4.October 2010: 9 founding members signed international contract

Germany: .8 GEuro
Russia : .2 GEuro
Finnland, France, India, Poland, Romania, Sweden, Slowenia

“candidates” : China, Great Britain , ...

FAIR: operated by GSI, GSI 75% Shareholder

Magnet testing hall:

- primary use: testing the supraconducting magnets for the FAIR project

- Quarter II 2011: a 2 floor "mini cube" in one corner with 100 Racks capacity to bridge the time until "the cube" will be ready .....


New office building,
should be ready Feb2011

New departments located in the organisation unit "research"

HPC

- Cluster File Systems,
- HPC Farm,
- Lattice QCD computer

Scientific Computing

- Scientific software (e.g. FAIRROOT)
- GRID Methods

Computing – Infrastructure

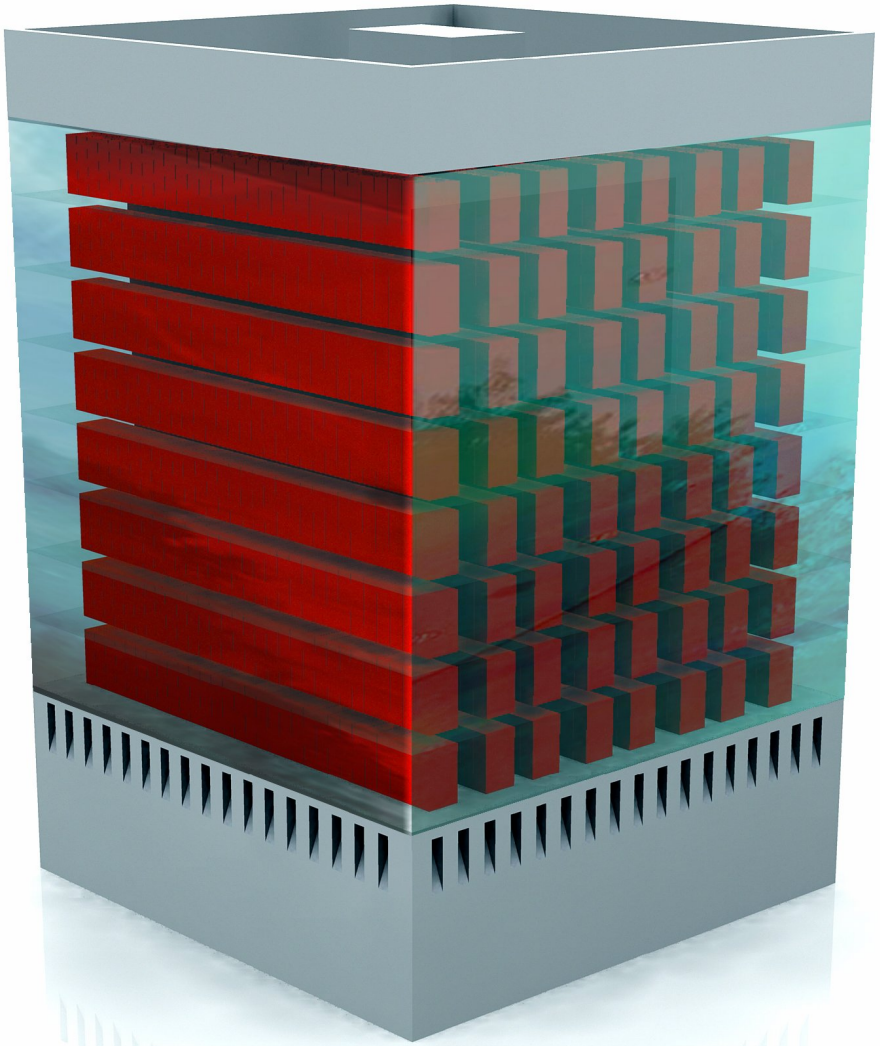
Requirements for FAIR computing:
Comparable to LHC computing

=> simulations for FAIR experiments already started, urgent need for new Computing Infrastructure

=> **„The Cube“ : 3D array of watercooled racks**

Overal Building Planning

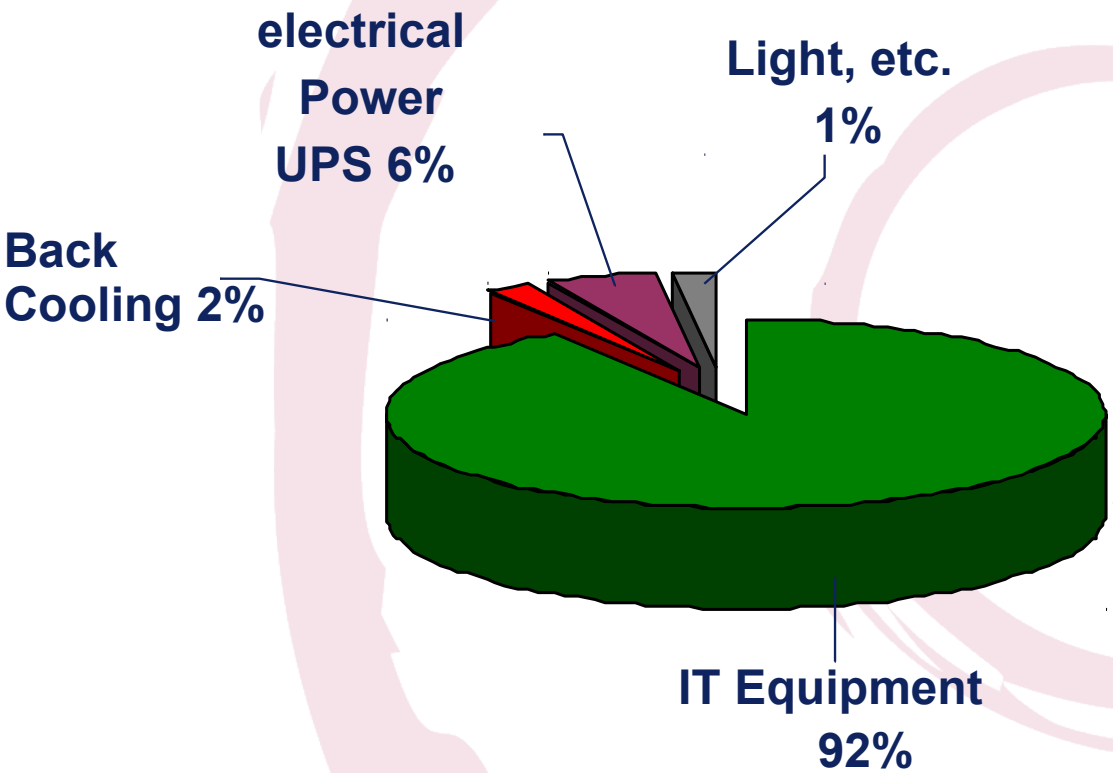
- minimal floor footprint
- space for 1000 19“ racks
- planned cooling power 6MW (building supports more)
- Internal temperature 30°
- minimal construction cost
- fast to build
- Autonomous rack power mgnt.
- back door rack cooling
- smoke detection in every rack
- use of heat for building heating
- shortest cable lenghts
- water pressure below 1bar avoiding risk of spills
- Use of any commercial 19“ architecture
- Unmatched packing density and power density



Concept: V.Lindenstruth/H.Stoecker

DGI Bauwerk mbH
Gesellschaft von Architekten

FAIR future Data Center



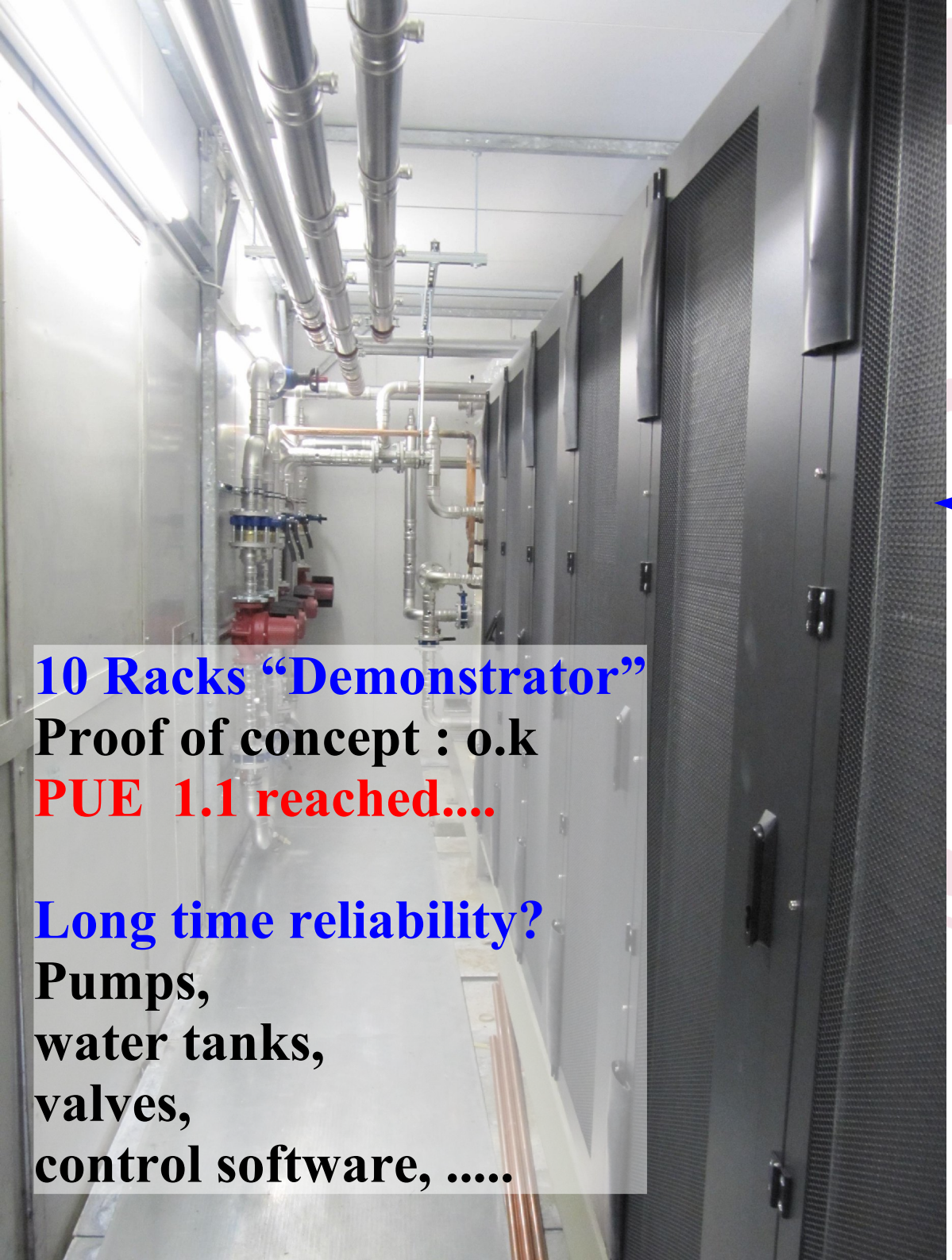
the green grid

$$\text{PUE} = \frac{\text{Total Facility Power}}{\text{IT Equipment Power}}$$

Power **U**sage **E**ffectiveness

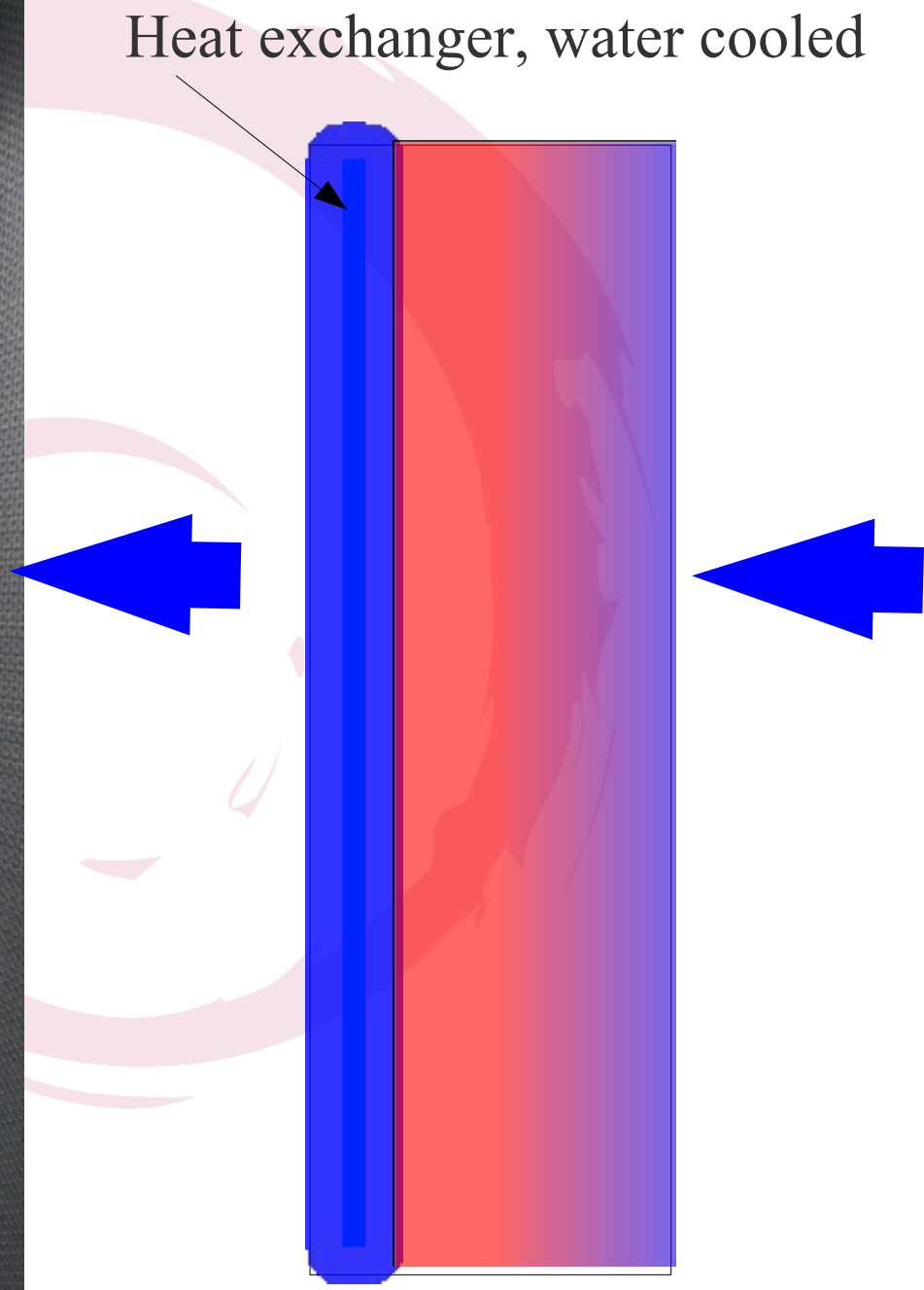
PUE = 1,1

Source: EYP Mission Critical Facilities Inc., New York



10 Racks "Demonstrator"
Proof of concept : o.k
PUE 1.1 reached....

Long time reliability?
Pumps,
water tanks,
valves,
control software, ...




Demonstrator: 100kW thermal capacity
Max. facility Power consumption:
10 kW
-
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lustre status:
100% comodity hardware
3000 disks,
1.6 Pbyte “gross capacity”
User demand for more more more ....
recent ugraded to 1.8.4,
uptime “now” 1100h under permanent heavy load...

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lustre upgrade:
ca. 2 PB (gross capacity) will be added next weeks
=> ca. 3.5 PB System (gross capacity),
Powered by a 48 core MDS with 128 GB RAM ....