JÜLICH
FORSCHUNGSZENTRUM

Scientific days in Juelich

(based on FZJ – TSU Agreement with IKP)

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3 weeks spent in Forschungzentrum Juelich IKP
3-23 November

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How it all began… (Summer 2012)

Presentation at State University on "Georgian -German workshop" mainly for physicists !

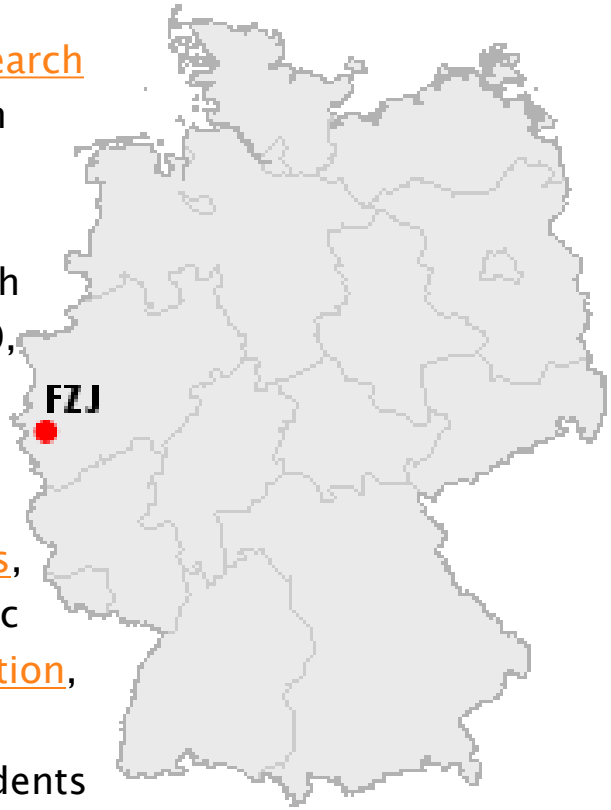
My talk "Very large Object Oriented data Storage and management system" (I thought I have no chance)

After talk – **Prof. Dr. Hans Stroeher** : "We can't completely evaluate your presentation and knowledge, if you found out a supervisor in Juelich, then I can invite you for couple weeks to meet supervisor candidate and define master's thesis"

Dr. Andro Kacharava – inspirational speech – "I think you have good chances, don't give up, this workshop is not only for physicist, so try to be max attentive and active"

Forschungszentrum Jülich GmbH (*Jülich Research Center*)

- is a member of the Helmholtz Association of German Research
- Centres and is one of the largest interdisciplinary research
- centres in Europe. It was founded on 11 December 1956
- by the state of North Rhine-Westphalia as a registered
- association, before it became "Kernforschungsanlage Jülich
- GmbH" or Nuclear Research Centre Jülich in 1967. In 1990,
- the name of the association was changed to
- "Forschungszentrum Jülich GmbH". Forschungszentrum
- Jülich employs more than 4,600 members of staff (2009)
- and works within the framework of the disciplines physics,
- chemistry, biology, medicine and engineering on the basic
- principles and applications in the areas of health, information,
- environment and energy. Amongst the members of staff,
- there are approx. 1,500 scientists including 400 PhD students
- and 130 diploma students



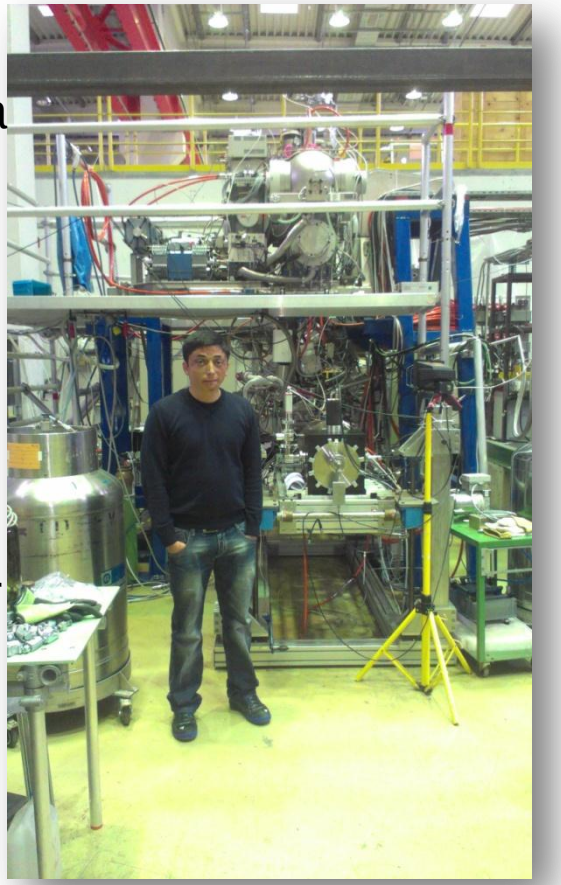
IKP (Institute fuer Kern Physiks) & COSY

Dr. Andro Kacharava was very helpful, he gave me a great introduction excursion on COSY and guided me during my whole stay in IKP.

There is too friendly people in IKP, I met with many people and with some of them we became friends.

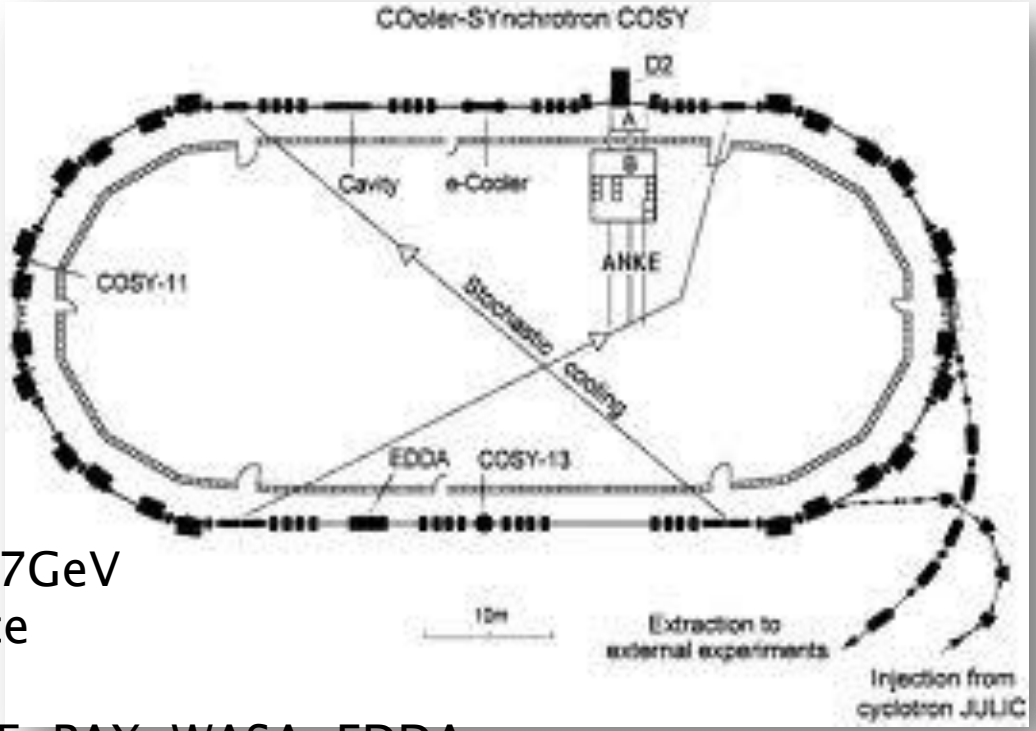
It also was very interesting to watch Mr. Sergey Mikirtychayanys's works with electronic devices, for tracing experiment results.

Forschungszentrum jülich IKP



What I saw and found out

COSY – Cooler SYnchotron



Unpolarized and transversely polarized proton and deuteron Beams

Momentum range: 300MeV – 3.7GeV
About 200 meters circumference

International experiments: ANKE, PAX, WASA, EDDA …

Electron and stochastic cooling.

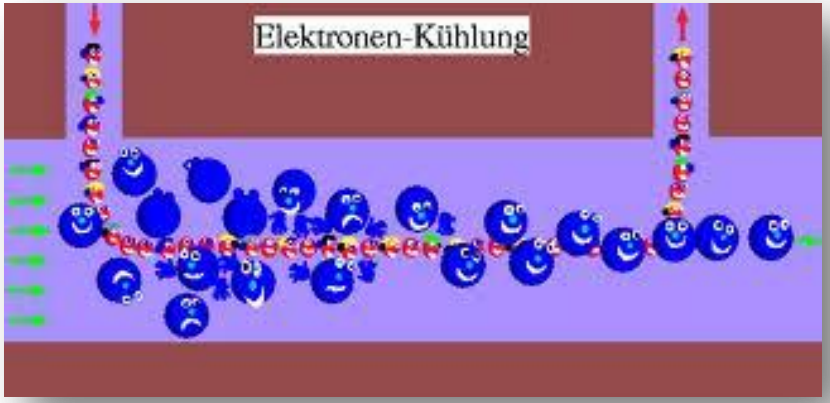
COSY has a cool cooling approach

"As Dr. Andro Kacharava explaned
And as I understood :"

High quality electro beam injected into the straight section

Electrons velocities spread 1/100 000 of the average velocity

Mission : give to chaotic particles strong order



What I saw and found out

Institue for Advanced Simulations

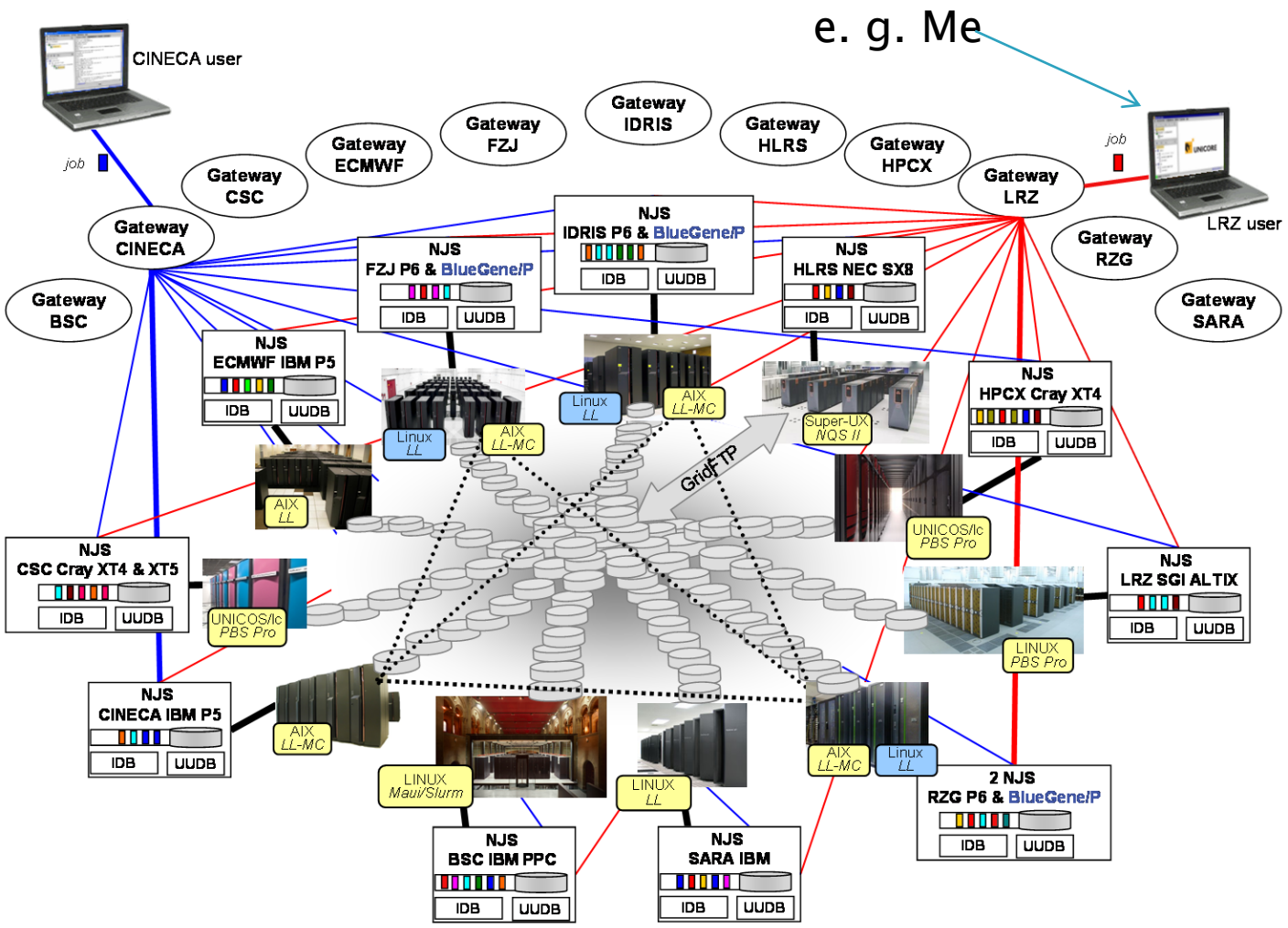
European most powerful clustered grid supercomputer – 8th in the world.

Service Free – what means that any interested person can make her/his calculations on this syster free.

More than 30 scientific centers and universities around the globe using this supercomputer for their calculations.

Also anyone who whishes can connect his computer or laptop to this system reomotly and it means that it will become part of this supercomputer and supercomputer will use it for all coming calculations !!!

What I saw and found out



What I saw and found out

UNICORE system

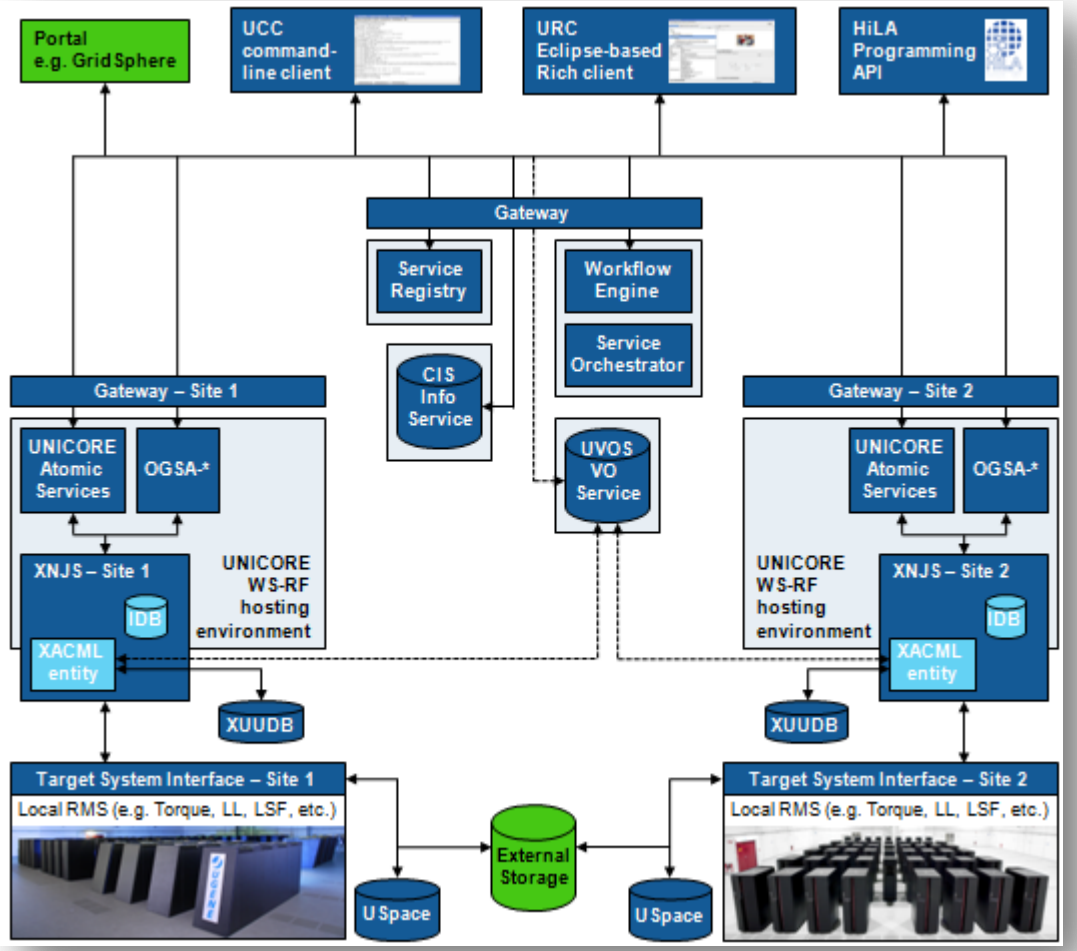
UNICORE (Uniform Interface to Computing Resources) offers a ready-to-run Grid system including client and server software. UNICORE makes distributed computing and data resources available in a seamless and secure way in intranets and the internet.

Juelich SuperComputer “Jugene” use this software.
This softwre can be use not only for SuperComputer, it also could be Used for regular computers and laptops to make micro grid systems. Also one more adventage of this software is that its free and “Open Source” what means that anyone can download its source code and make changes he wishs in code.

What I saw and found out

- UNICORE architecture

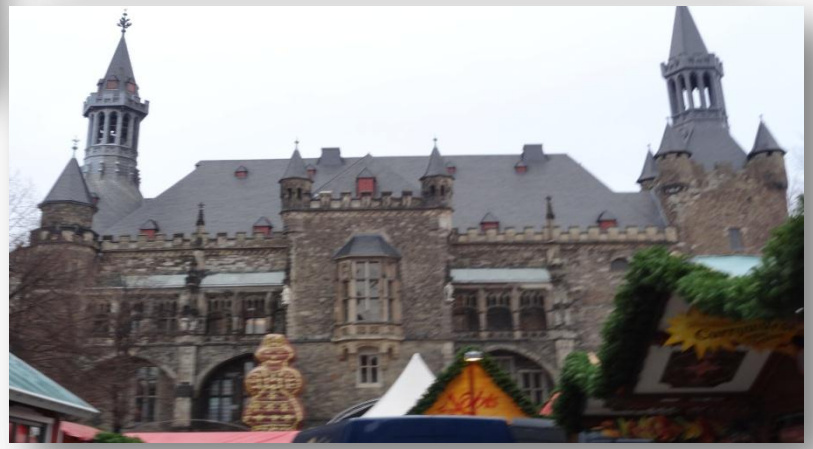
I had to learn UNICORE's architecture and me and Dr. Bernd Schuller decided that the best subject for my masters thesis (based on the SRNF – FZJ program) will be "Metadata Indexing" because it is a pretty challenge and interesting, and It'll have scientific value (start in March 2013).
"Indexing MetaData" – in few words means to organise fast Search for huge amount of data.



During this master thesis this topic will be addressed and the following tasks will be performed

- Specification of use cases and functional requirements
- Design of the federated search service
- ◦ Web service interface
- ◦ Query specification (search options, limiting to certain sites, etc)
- ◦ Result collection and result set management
- Implementation of the federated search service as a UNICORE WSRF web service
- ◦ Setup of working environment (Java, SVN, Maven, Eclipse, JUnit)
- ◦ Implementation including unit tests
- Validating and functional testing
- ◦ (required) Simple usage (client query, show result set)
- ◦ (optional) Workflow system usage (integrate query in workflow, use results in for-each
- loop)
- Writing of the master thesis

Trip to Aachen



Great place, especially old center of the city

Thank you for you attention

- Thank to everyone who helped or collaborated
- Special thanks to Prof. Dr. H. Stroeher and Dr. A. Kacharava

Thank for that great evening →

P.S. Thank to Frau Gisela everything was too tasty especially chicken☺