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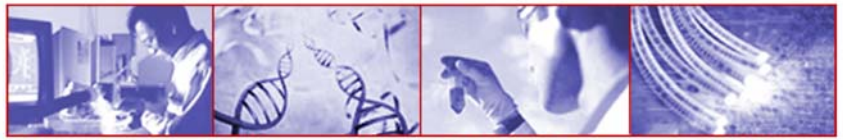

Interconnection & Interoperability of Grids between Europe & China

Interconnection & Interoperability of Grids between Europe and China the EUChinaGRID Project

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Project Manager

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Information Society and Media

Outline

- Grid Infrastructures across the continents
- Europe and China
- EUChinaGRID Objectives, Participants and status
- Issues and Perspectives
- EUChinaGRID and EGEE future
- Conclusions

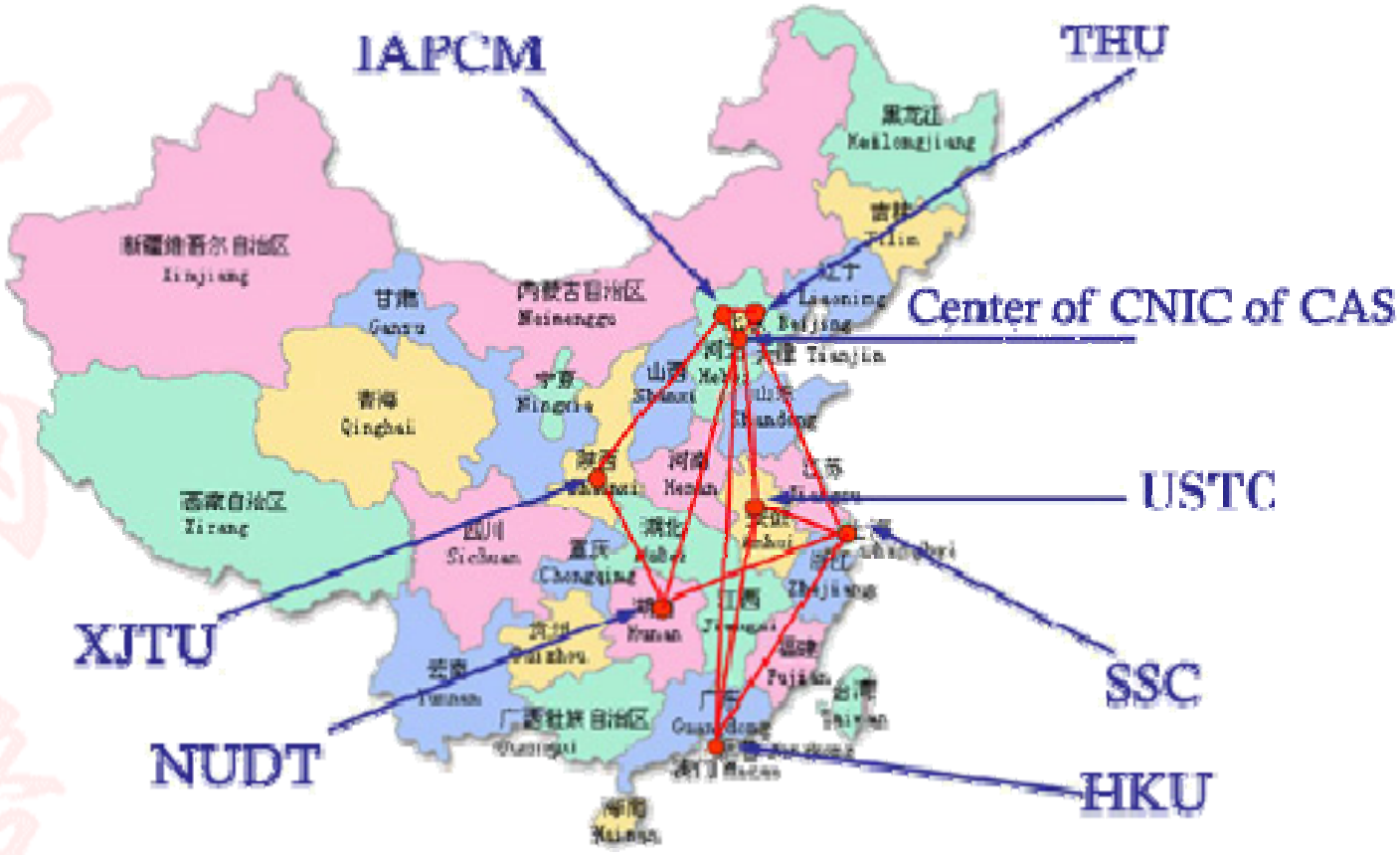
Building new infrastructures

- Building Grid Infrastructures with other Countries than Europe has normally two possible approaches:
- In Greenfield regions you have to start almost from scratch: disseminate the knowledge, find the Users, select communities, promote National Grid Initiatives, etc.
- Other countries like China have already their Grid projects and infrastructures and therefore interoperability and interoperation are the key issues.

Europe and China

- China is one of the fastest growing economies in the world with a specific infrastructure for Science GRID (CNGrid).
- Many groups of scientists in Europe have already established good relationships with Chinese Research Groups.
- Grids can provide an infrastructure to enhance the level of collaboration, deploying new applications and shared access to scientific data.
- GRID is a reality which allows new ways of sharing resources (not all of them completely exploited) in scientific collaboration (eScience) and in other fields (eGovernment, eHealth, eBusiness, etc.)
- EU has largely invested in GRID technology in the past years and is planning to invest more in FP7.

Infrastructures: CNGRID



How to proceed

- One approach is to contact a certain number of possible partners in the country and ask them for possible applications.
- Transversal approach is to contact scientific communities and search for cross-border collaborations and applications.
- Both approaches are useful and were used during the set-up of the EUChinaGRID collaboration.
- A correct mix of technical and applicative partners is fundamental to streamline the consortium on reasonable objectives and time scales.
- Network connectivity is mandatory.

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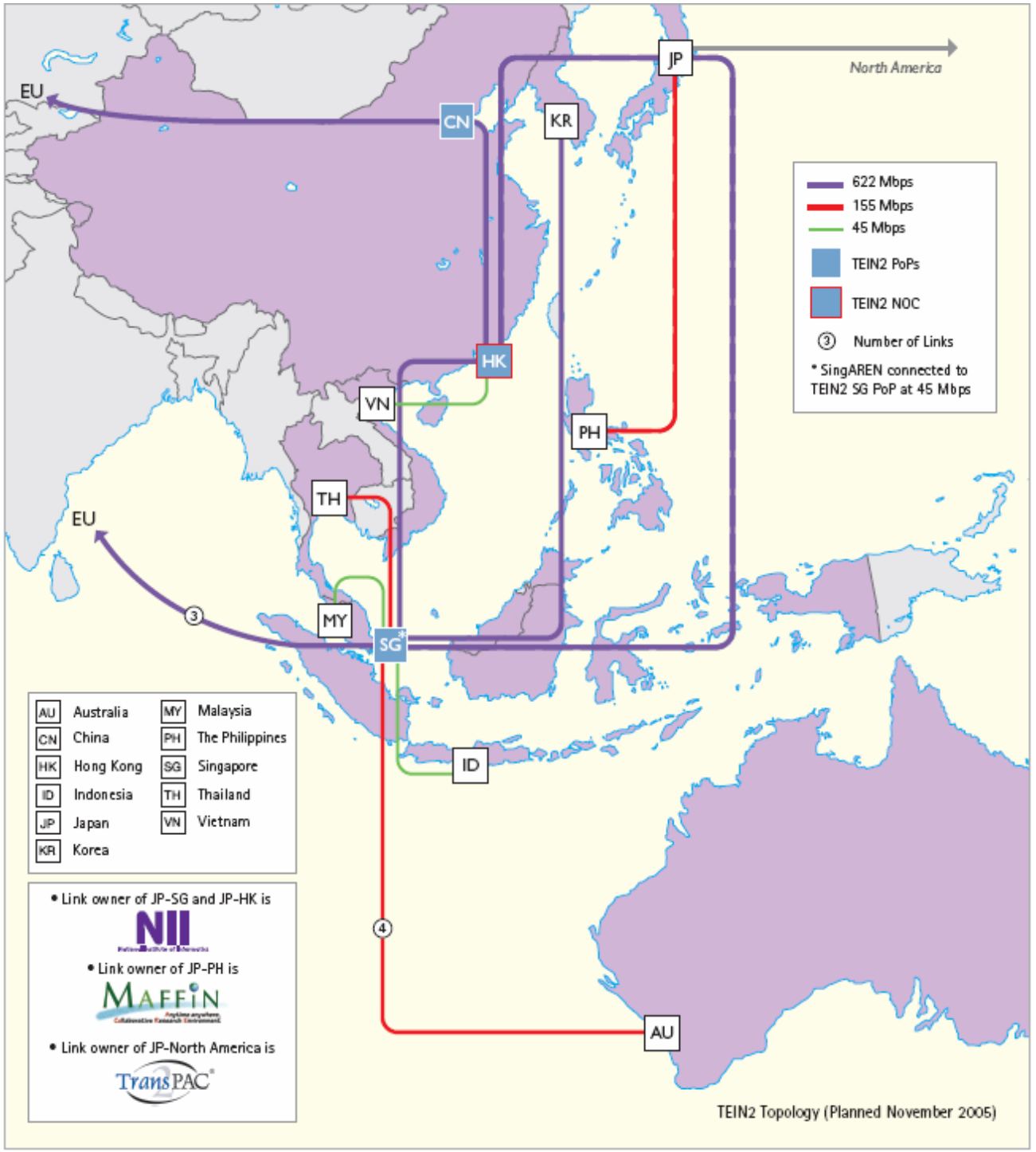
Network: TEIN2

ORIENT will upgrade to 2.5 Gbps



EUChinaGRID Main Objectives

- Main objective is to support the Interconnection and Interoperability of Grids between Europe and China.
- Main focus is on two specific infrastructures:
  - CNGRID in China
  - EGEE in Europe
- Dissemination of advanced knowledge in Grid technology is also a relevant part of the activity.
- Strengthening the collaboration between scientific groups in both Countries, supporting existing and new Grid applications.

Participants

1	Istituto Nazionale di Fisica Nucleare (IT) (coordinator)
2	European Organisation for Nuclear Research CERN (CH)
3	Dipartimento di Biologia - Università di Roma Tre (IT)
4	Consortium GARR (IT)
5	Greek Research & Technology Network (GR)
6	Jagiellonian University – Medical College, Cracow (PL)
7	School of Computer Science and Engineering – Beihang University Beijing (CN)
8	Computer Network Information Center, Chinese Academy of Sciences - Beijing (CN)
9	Institute of High Energy Physics, Chinese Academy of Sciences - Beijing (CN)
10	Peking University – Beijing (CN)

Third Parties

- ACADEMIA SINICA GRID COMPUTING CENTRE (ASGC), TAIPEI (CERN)
- Physics Department – UNIVERSITÀ DI ROMATRE – ROMA (INFN)

Project Information

- The project started on the 1 January 2006.
- 24 Months duration.
- EU Contribution of 1,299,998 €.
- A total of 495 Person Months (325 Funded).

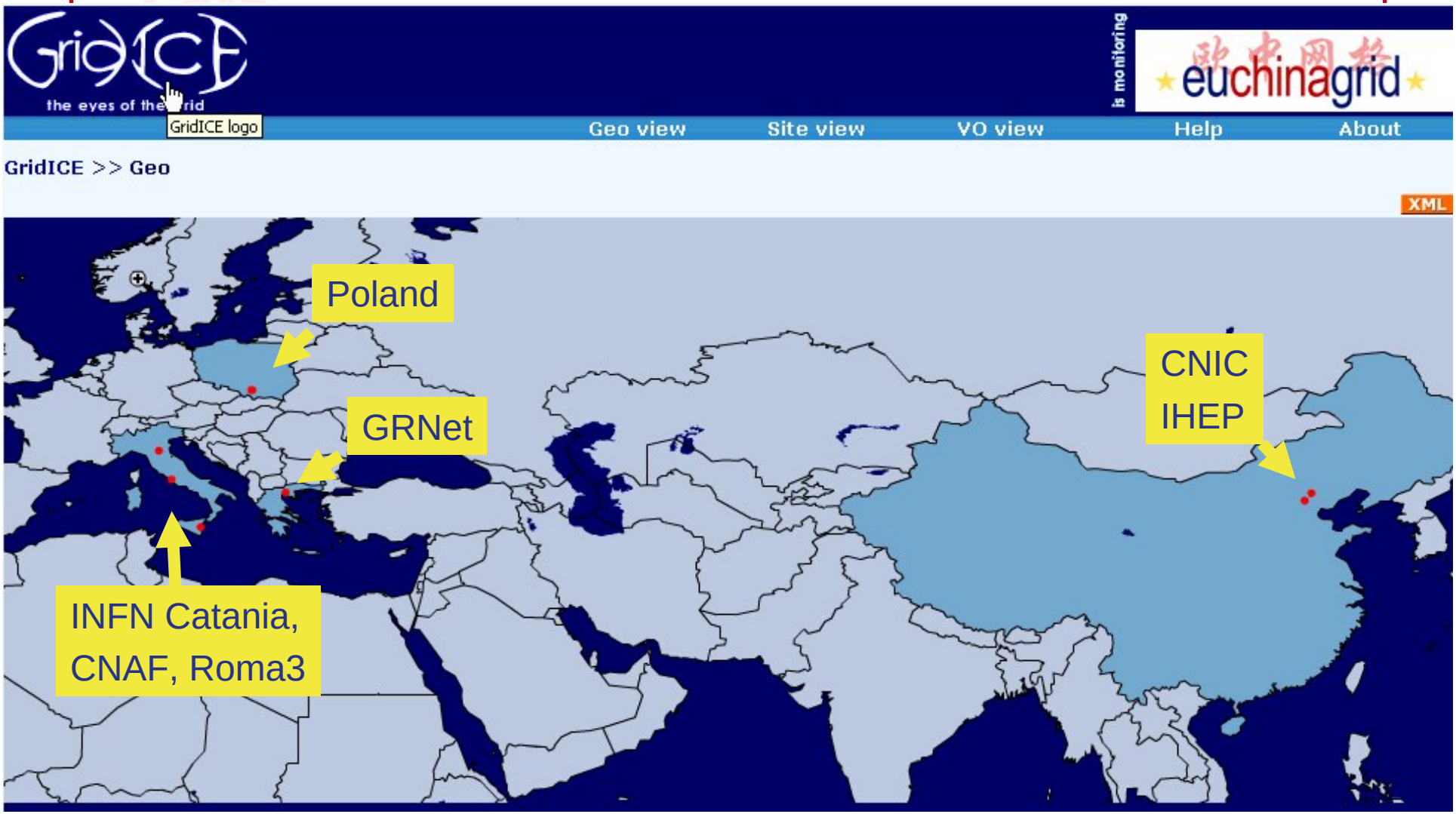
EUChinaGRID WP's

- WP1 – Project Administrative and Technical Management
- WP2 – Network planning and interoperability study
  - Specific activity to study IPv4/IPv6 GRID interoperability.
- WP3 – Pilot infrastructure operational support
  - Specific activity to study interoperability between EGEE & CNGrid.
- WP4 – Applications
  - EGEE applications (LHC, Bio, etc.)
  - ARGO-YBJ and Gamma Ray Bursts
  - Never Born Proteins
- WP5 – Dissemination
  - Dissemination of advanced knowledge on Grid technologies.

Infrastructural approach

- Interoperability of EGEE-CNGRID is the starting point for the EUChinaGRID Infrastructure.
- Interoperation is the following step.
- EGEE MW can't be modified by us.
- Installation of gLite sites willing to take part in LCG or EU based applications.
- Build a Gateway between gLite and GOS to make interoperable some basic services: job submission and Security/Authentication.
- Operations: ROC, VO, Support, Ticketing, etc.

GridIce Monitor (1/2)



Issues and Perspectives (1/2)

- EGEE and CNGrid MW are presently not IPv6 compliant.
- China is going to deploy the largest production IPv6 network in the world.
- IPv6 is the natural choice for new generation IP telephony in convergence with Wireless Networking.
- Grid services should be able to run on the future IPv6 enabled PDA's, portable phones, etc.
- A specific workshop is organized at the EGEE'06 Conference also on this subject.

Issues and Perspectives (2/2)

- Connectivity between China and Europe was not satisfactory:
  - Long hops from EU to US and then back to Russia.
  - More than 400 ms round trip times.
- New TEIN2 links at 622 Mbps and, later on, ORIENT link at 2.5 Gbps are creating direct connectivity between European Research and Academic Network (GEANT) and Chinese Research and Academic Networks (CSTNET and CERNET).

EUChinaGRID and EGEE future

- EUChinaGRID is an SSA instrument and in 2 years can support the pilot of a new EU-CN infrastructure.
- A new phase will be needed to consolidate the results in a production eInfrastructure connected to EGEE.
- EUChinaGRID has European Sites which are also part of EGEE, but Chinese sites can't be considered only as an "extension" of EGEE.
- Many interoperability and interoperation issues are common with other Grid Infrastructures.

Conclusions

- EUChinaGRID project has started to create a joint Grid community between China and Europe.
- Applications of interest for both Countries are being deployed on the Grid.
- Technical Issues on Interoperability, IPv6 Compatibility and Network connectivity are already under discussion and some possible solutions will be available, hopefully, in short time.
- Still a long path is in front of us, but we're sure to be on the right track.

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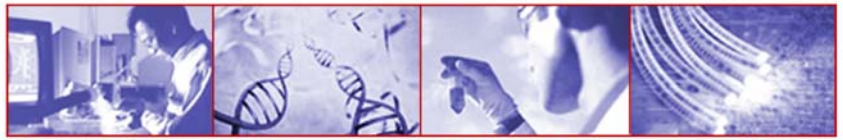

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Thank you for your kind attention !

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