

NAREGI: The Japanese National Research Grid Project

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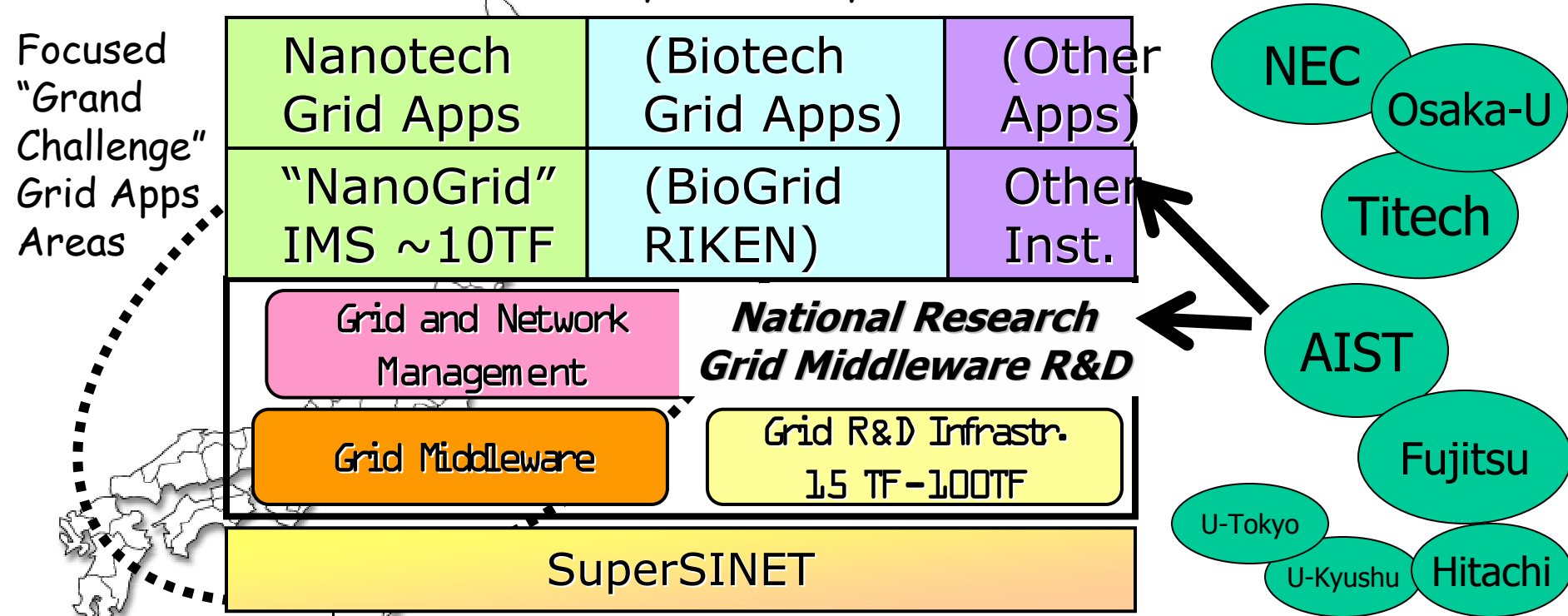


GLOBAL SCIENTIFIC INFORMATION AND
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GSIC

National Research Grid Infrastructure (NAREGI) 2003-2007

- Petascale Grid Infrastructure R&D for Future Deployment
 - \$45 mil (US) + \$16 mil × 5 (2003-2007) = \$125 mil total
 - Hosted by National Institute of Informatics (NII) and Institute of Molecular Science (IMS)
 - PL: Ken Miura (Fujitsu→NII)
 - SLs Sekiguchi(AIST), Matsuoka(Titech), Shimojo(Osaka-U), Hirata(IMS)...
 - Participation by multiple (>= 3) vendors
 - Resource Contributions by University Centers as well Various Partners



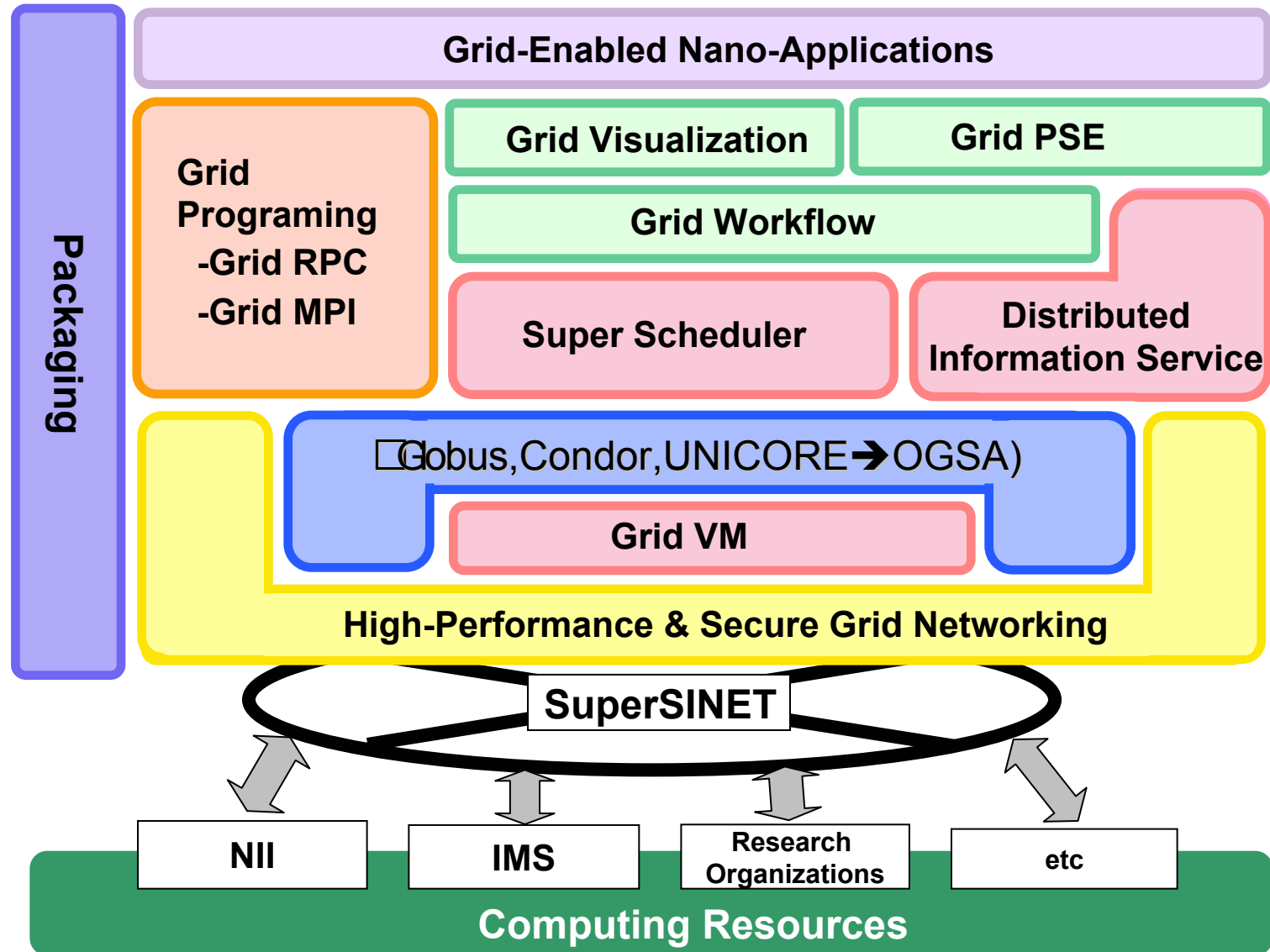
NAREGI R&D Assumptions & Goals

- Future Research Grid Metrics for Petascale
 - 10s of Institutions/Centers, various Project VOs
 - **> 100,000 users, > 100,000~1,000,000 CPUs**
 - Machines very heterogeneous, SCs, clusters, desktops
 - 24/7 usage, production deployment
 - Server Grid, Data Grid, Metacomputing...
- High Emphasis on Standards
 - De facto collaboration **Globus, Unicore, Condor, VOMS(EGEE)**
 - GGF contributions, esp. OGSA related activities
- Win support of users
 - **Application and experimental deployment essential**
 - **R&D for production quality (free) software**
 - **Nano-science (and now Bio) involvement, large testbed**

Participating Organizations

- National Institute of Informatics (NII)
(Center for Grid Research & Development)
- Institute for Molecular Science (IMS)
(Computational Nano□science Center)
- Universities and National Labs (Joint R&D)
(AIST, Titech, Osaka-u, Kyushu-u, Kyushu Inst. Tech., etc.)
(ITBL Project, National Supecomputing Centers etc.)
- Participating Vendors (IT as well as Chemicals/Materials)
 - Consortium for Promotion of Grid Applications in Industry

NAREGI Software Stack



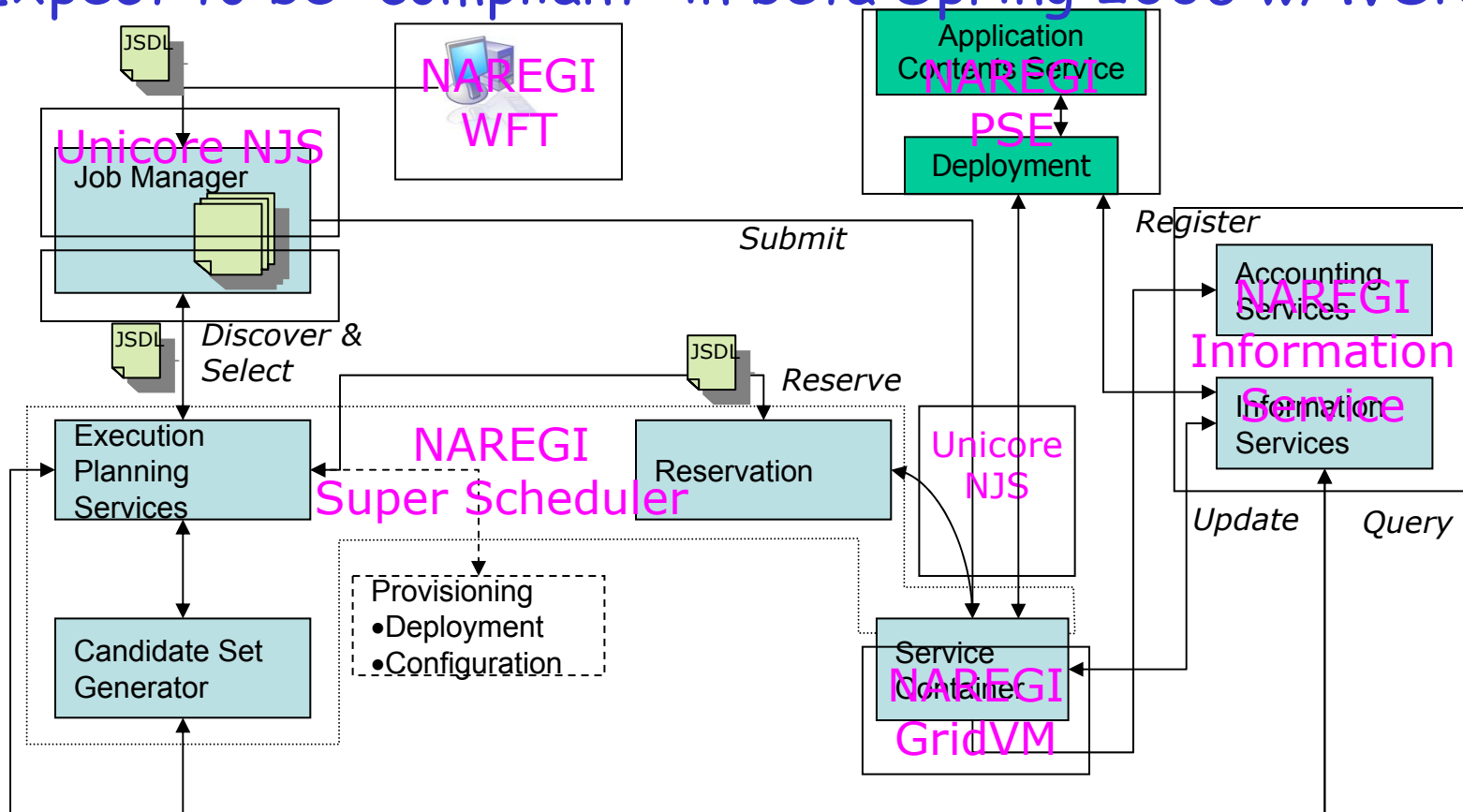
R&D in Grid Software and Networking Area (Work Packages)

- WP-1: Lower and Middle-Tier Middleware for Resource Management:
 - Matsuoka(Titech), Nakada(AIST/Titech)
- WP-2: Grid Programming Middleware:
 - Sekiguchi(AIST), Ishikawa(U-Tokyo), Tanaka(AIST)
- WP-3: User-Level Grid Tools & PSE:
 - Usami (new FY2005, NII), Kawata(Utsunomiya-u)
- WP-4: Data Management (new FY 2005):
 - Matsuda (Osaka-U), Date (Osaka-U)
- WP-5: Networking, Security & User Management
 - Shimojo(Osaka-u), Oie(Kyushu Tech.)
- WP-6: Grid-enabling tools for Nanoscience Applications :
 - Aoyagi(Kyushu-u)

NAREGI Super Scheduler and OGSA-EMS

Open Grid Service Architecture - Execution Management Service
will be standardized by OGSA RSS-WG, BES-WG, etc.

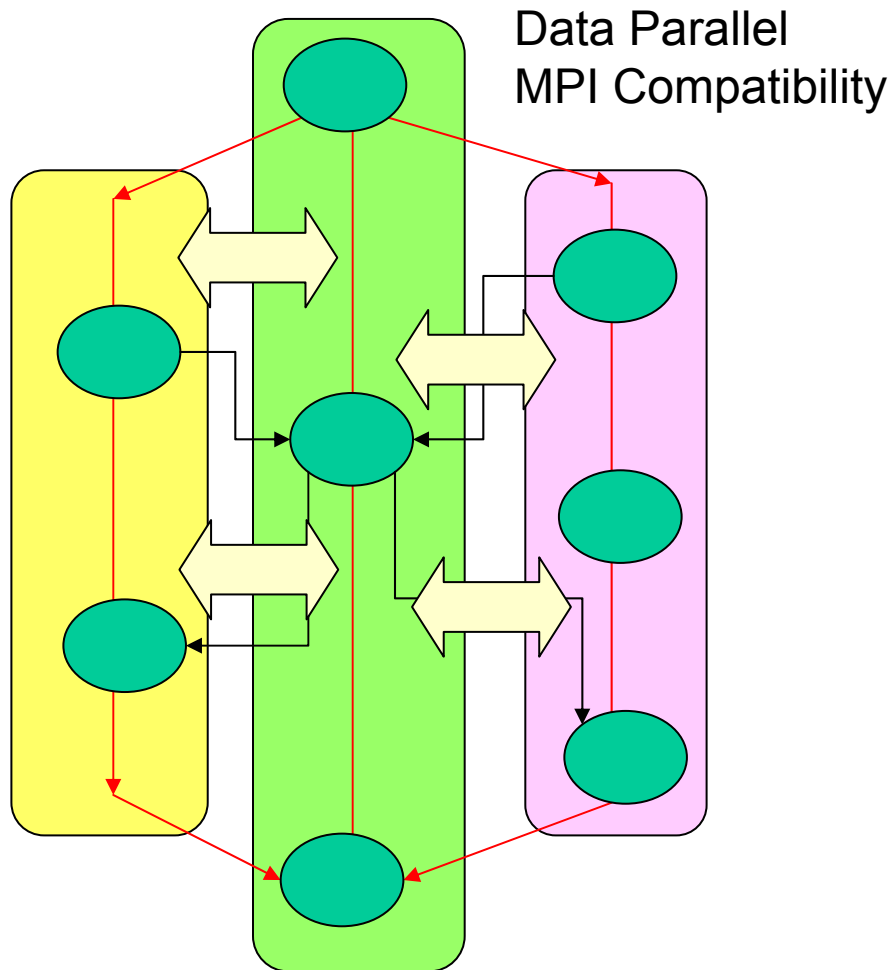
- NAREGI SS alpha is the first implementation that largely follow the OGSA Architecture v. 1.0.
- Expect to be "compliant" in beta Spring 2006 w/WSRF



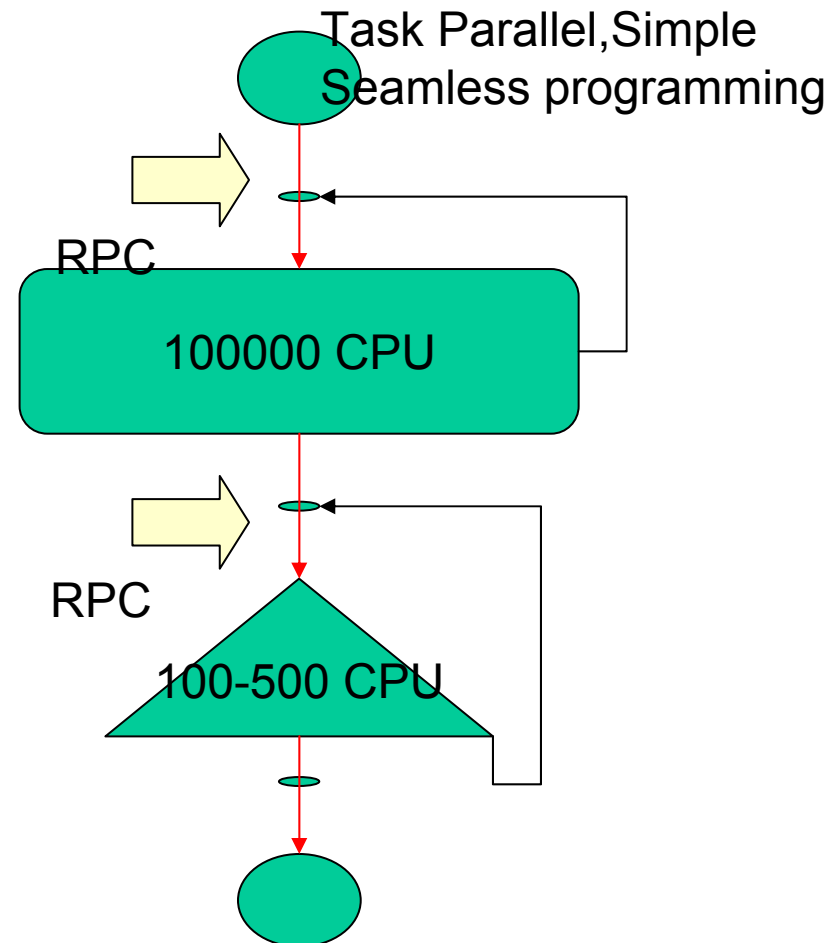
NAREGI Parallel Programming Models

GridRPC now GGF recommendation

GridMPI



GridG2)



Some Questions Posed

- Resources we invest
- Standards or community processes that benefit our work
- Standards we contribute to
- Assessment of the process and future plans.

Resources NAREGI invests

- Every WP is expected to set or comply with the standards whenever possible
- Approx. 10 people attend every GGF
- Also various phone, F2F, and email meetings inbetween
- Considered as critical part of our success metric

Standards or community processes that benefit our work and their Assessment


- Overall standards processes help:
 - Mandates documentation of the charter, standards, process - easier to follow for non-native English speakers
 - Open process - No "back-door" proprietary decisions by a closed group
 - Fostering of international community of people clearly committed to standardization

Standards we contribute to

- Initially, it was hard
 - New kid on the block
 - Language barrier
- Dramatic rise now
 - Confidence built with concrete software
- OGSA-related
 - OGSA-BES
 - OGSA-RSS(BoF)
 - JSDL
 - Implementation of UR
 - etc.
- Programming
 - GridRPC
 - Hopefully GridMPI
- Keep close watch on
 - CDDLM
 - Security
- Administration
 - 1 GFAC
 - 1 GFSG

Future Plans: Importance in unifying Grid middleware, esp. VO & user management for international e-Science

Grid Regional Infrastructural Efforts
Collaborative talks on PMA, etc.

All different software stacks			
Europe: EGEE, UK e-Science, ...			
 US: TeraGrid, OSG,			
Japan: NII CyberScience (w/NAREGI), ... Other Asian Efforts (GFK, China Grid, etc.)...			
HEP Grid VO	NEES -ED Grid VO	Astro IVO	Requires standardization and some commonality in software platforms