



APROC in EGI-InSPIRE

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Academia Sinica Grid Computing



Outline

- APROC is the bridge to EGI
- Grid operation support
- Regional collaborations and e-Science applications support
- Summary



APROC in EGI

- APROC is a stable supporting mechanism on both gLite-based e-Infrastructure and e-Science applications.
- APROC is the bridge of Asia Grid centres to EGI
 - The 9 Asia partners are working as a federation in EGI
 - Simon Lin of ASGC is serving as the federation coordinator
 - APROC is running by ASGC from 2005



Asia Pacific Regional Operations Center

- Mission
 - Provide deployment support facilitating Grid **expansion**
 - Maximize the **availability** of Grid services
- Supports **EGEE** sites in **Asia Pacific** since April 2005
 - 27 production sites in 13 countries currently
 - Over 11,000 CPU Cores and >4 PB Storage resources
- Runs ASGCCA Certification Authority since 2003
 - chairs APGridPMA, part of IGTF (Int. Grid Trust Federation)
- Middleware installation support
- Production resource center certification
- Grid Operations support
 - Monitoring, troubleshooting, problem tracking
 - Software updates and security coordination





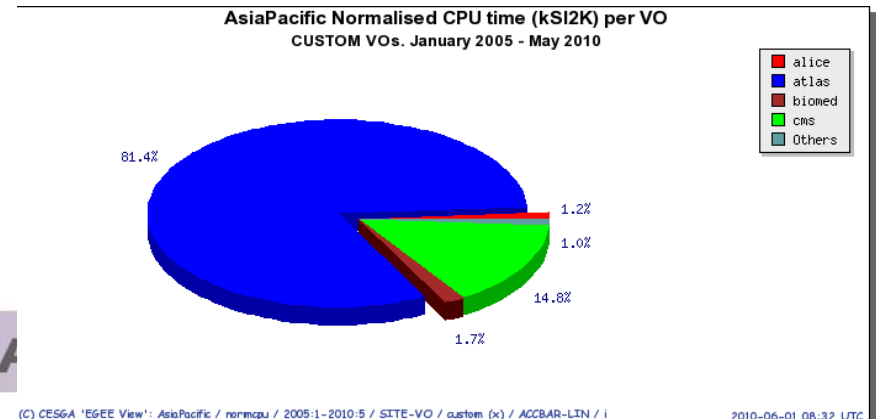
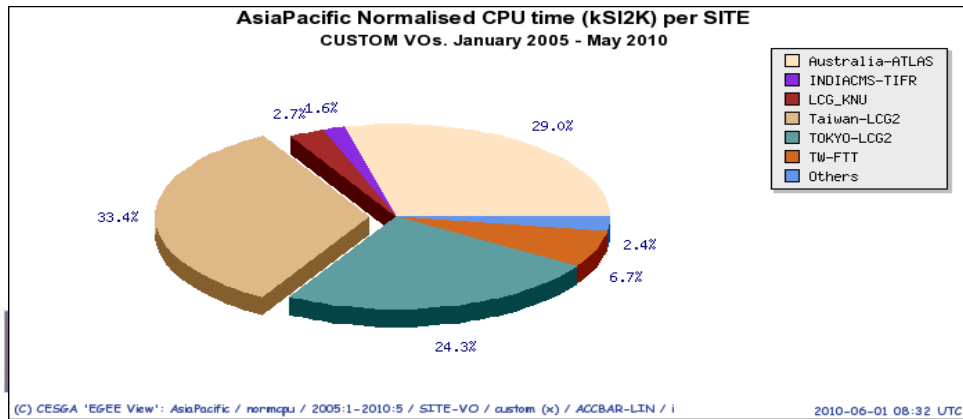
Grid Resources in Asia

	CPU Cores	Disk (TB)	Tape (TB)
ASGC, Taiwan	7,981	2,500	2,500
KISTI, Korea	608	-	0
Tokyo U. Japan	476	423	0
KEK, Japan	354	208	0
KNU, Korea	336	381	0
TIFR, India	320	0.3	0
VECC, India	208	0.1	0
UPM, Malaysia	248	0.1	0
Melbourne U. AU	74	258	0
Other 15 sites	397	401.5	0
Total	11,002	4,172	2,500



APROC Usage

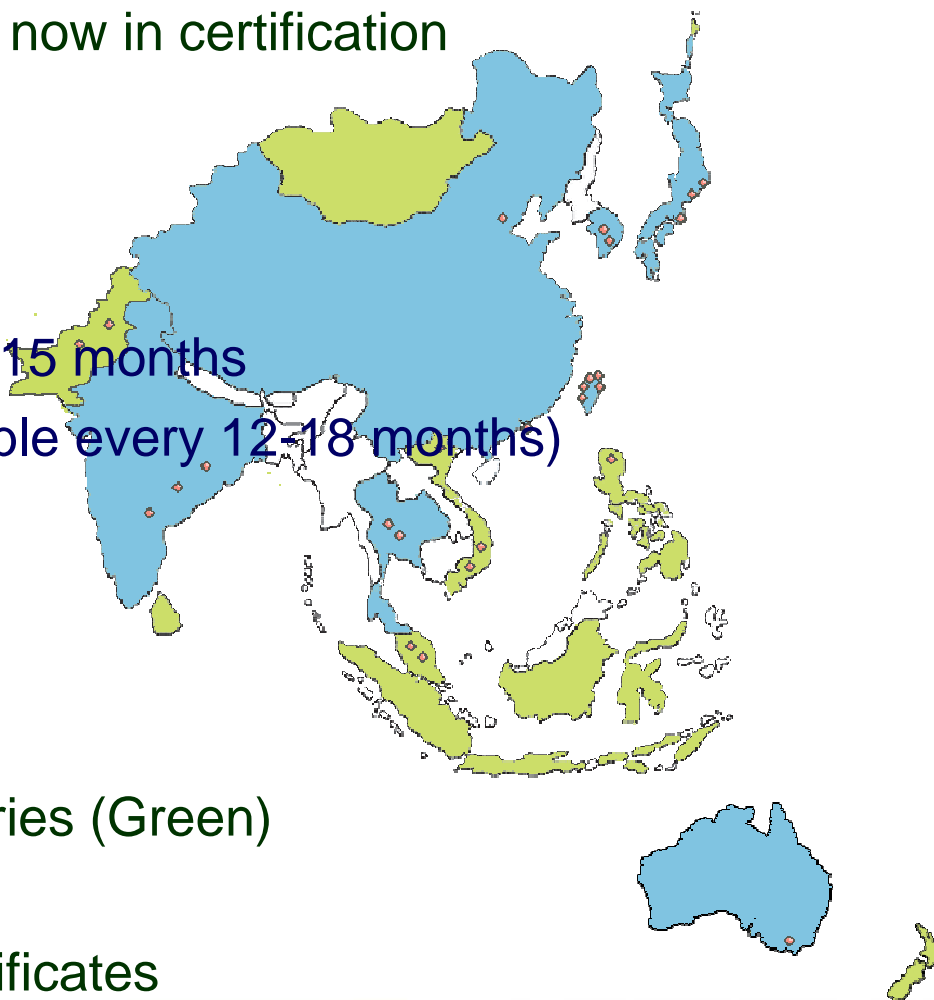
Normalised CPU time [units 1K.SI2K.Hours] by SITE and VO																				
SITE	alice	apesci	atlas	belle	biomed	calice	cdf	cms	dteam	esr	eusia	euchina	ilc	lhcb	ops	ppj.vo.kek.jp	twgrid	unknown	Total	%
Australia-ATLAS	0	0	15,008,017	213,145	712,266	0	0	0	478	0	0	0	0	0	14,453	0	0	0	15,948,359	27.88%
CN-BEIJING-PKU	7	0	37	0	106	0	0	556	6	37	0	13	0	26	186	0	0	0	974	0.00%
HK-HKU-CC-01	0	0	0	0	0	0	0	0	92	0	0	0	0	0	360	0	1	0	453	0.00%
INDIACMS-TIFR	0	0	0	0	0	0	0	878,884	119	0	0	0	0	0	432	0	0	0	879,435	1.54%
JP-HIROSHIMA-WLCCG	323,190	0	0	0	0	0	0	0	12	0	0	0	0	0	690	0	0	0	323,892	0.57%
JP-KEK-CRC-02	0	0	737	877,863	0	43,321	0	0	84	0	0	0	441,846	0	2,743	3	0	0	1,366,397	2.39%
KR-KISTI-GCRT-01	305,191	0	0	31,353	0	0	705	0	16	0	0	0	0	0	430	0	0	3	337,698	0.59%
LCG_KNU	0	0	1,259	0	0	0	0	1,451,978	47	0	0	0	0	586	556	0	0	0	1,454,426	2.54%
MY-MIMOS-GC-01	0	26	0	0	0	0	0	0	0	0	8,840	0	0	0	283	0	0	0	9,149	0.02%
MY-UM-CRYSTAL	0	0	0	0	0	0	0	0	0	0	137	0	0	0	36	0	0	0	173	0.00%
MY-UPM-BIRUNI-01	0	0	0	0	0	0	0	0	0	0	6,922	0	0	0	50	0	0	0	6,972	0.01%
MY-UTM-GRID	0	0	0	0	0	0	0	0	0	0	447	0	0	0	35	0	0	0	482	0.00%
PAKGRID-LCG2	170	0	5,493	0	50,120	0	0	6,423	175	0	0	0	0	19,558	711	0	0	0	82,650	0.14%
PH-ASTI-LIKNAYAN	0	0	0	0	0	0	0	0	1	0	0	0	0	0	26	0	0	0	27	0.00%
PH-ATENEO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	0	0	0	23	0.00%
Taiwan-LCG2	48	0	14,328,242	77,766	144,498	0	0	3,688,857	174	0	215,268	0	0	0	4,615	0	1,166,343	0	19,625,811	34.31%
TH-HAI	0	0	0	0	0	0	0	0	2	0	340	0	0	0	258	0	0	0	600	0.00%
TH-NECTEC-LSR	0	0	0	0	0	0	0	0	0	0	702	0	0	0	469	0	2	0	1,173	0.00%
TOKYO-LCG2	0	0	13,184,620	0	0	0	0	0	1,763	0	0	0	0	0	957	0	0	0	13,187,340	23.05%
TW-FTT	0	0	1,703,947	259,676	2,578	0	0	1,909,124	68	0	4,406	0	0	0	1,123	0	547	0	3,881,469	6.79%
TW-NCUHEP	0	0	0	0	0	0	0	89,919	58	0	0	0	0	0	335	0	0	0	90,312	0.16%
TW-NIU-EECS-01	0	0	0	0	0	0	0	0	63	0	0	0	0	0	427	0	3,830	0	4,320	0.01%
TW-NTCU-HPC-01	0	0	0	0	0	0	0	0	31	0	0	0	0	0	326	0	1	0	358	0.00%
VN-HPCC-HUT-HN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28	0	0	0	28	0.00%
VN-IFI-PPS	0	0	0	0	2,080	0	0	0	2	0	0	0	0	0	79	0	0	0	2,161	0.00%
VN-IOIT-HN	0	0	0	0	375	0	0	0	4	0	0	0	0	0	212	0	0	0	591	0.00%
VN-IOIT-KEYLAB	0	0	0	0	0	0	0	0	0	0	390	0	0	0	25	0	0	0	415	0.00%
Total	628,606	26	44,232,352	1,459,603	912,023	43,321	705	8,025,741	3,195	37	237,452	13	441,846	20,170	29,868	3	1,170,724	3	57,205,688	
Percentage	1.10%	0.00%	77.32%	2.55%	1.59%	0.08%	0.00%	14.03%	0.01%	0.00%	0.42%	0.00%	0.77%	0.04%	0.05%	0.00%	2.05%	0.00%		





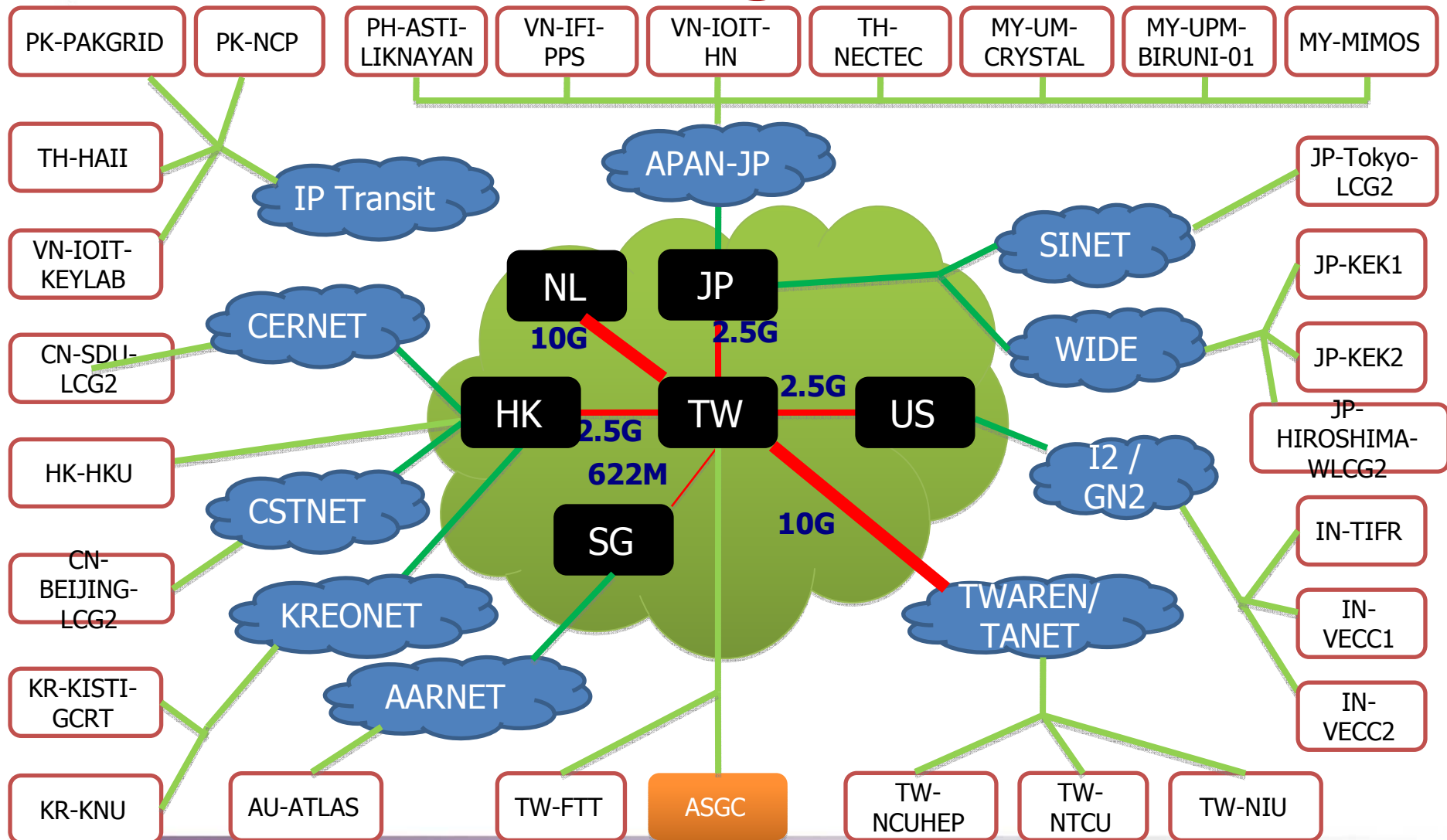
E-Science Infrastructure in Asia

- Site: 20 (Apr'08) -> 25 (Apr'09) -> 31 (Dec'09) -> 27 (May'10)
 - New Zealand and Singapore are now in certification
 - NYMU-TW is establishing
- VO: support 16 VOs
- Resources Utilization:
 - CPU Utilization doubled every 6-15 months
 - Faster than EGEE average (double every 12-18 months)
- Site Reliability
 - 24 sites signed SLA
- Trust Infrastructure (APGridPMA)
 - 15 CA in 9 Countries (Blue)
 - RA extended in another 7 Countries (Green)
 - Mongolia is under accreditation
 - ~ 1,276 Users, ~2,356 Host Certificates





E-Science Collab Networking in Asia Pacific Region





Primary Grid Activities in Asia

	EGEE	HEP & WLCG	EUAsiaGrid	EGI-Inspire	CHAIN	PRAGMA	Bilateral, National
TW	APF, APROC	ATLAS, CMS, Belle	NDM, LS, CC, eSS, HEP, DC	V	V	V	TWGrid
JP	APF	ATLAS, Belle		V		V	NAREGI
KR	APF	CMS	LS	V		V	
CN		ATLAS, CMS, Alice			V	V	EU-ChinaGrid
PH			NDM, LS	V	V	V	
VN			NDM, LS	V	V	V	
TH			NDM, CC	V	V	V	ThaiGrid
MY			NDM, LS, CC, DC	V	V	V	
SG			LS	V		V	APBioGrid
AU	APF	ATLAS, Belle		V	V	V	ARCS
NZ					V	V	BeSTGrid
IN		CMS					Garuda, EU-IndiaGrid
PK		CMS					



AP Site Availability/Reliability

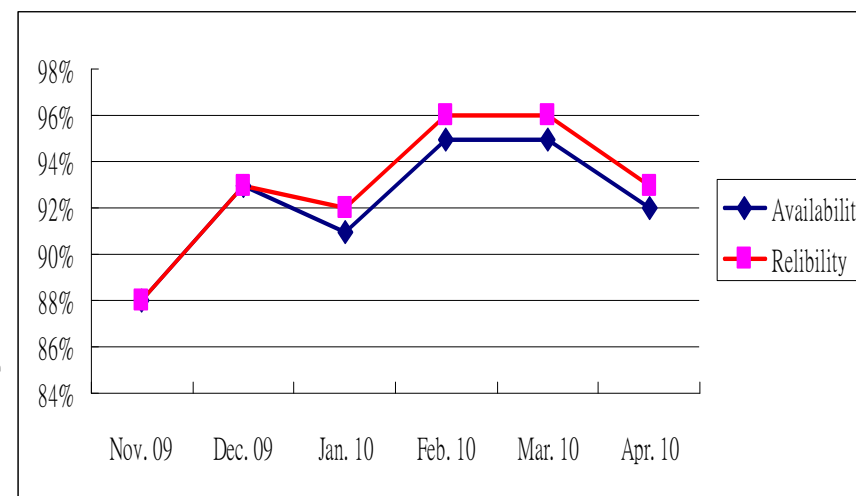
	Nov. 09	Dec. 09	Jan. 10	Feb. 10	Mar. 10	Apr. 10
Availability	88%	93%	91%	95%	95%	92%
Reliability	88%	93%	92%	96%	96%	93%
GGUS Ticket	44	47	67	45	37	37

•Main reason:

- Site UnScheduled downtime

•Improvement:

- SLA monitoring and enforcement
- Encouraging sites to improve availability and report the schedule downtimes





GGUS Tickets in Asia Pacific

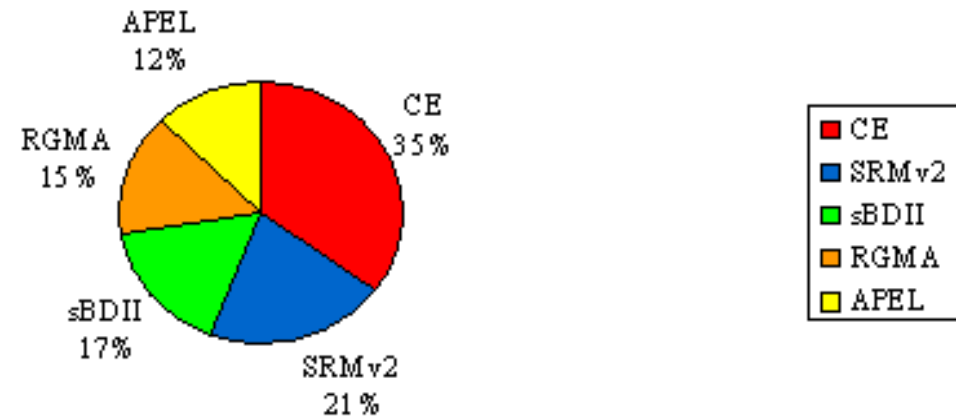
• Issues:

- Configuration changes
- Service instabilities
- Network performance

• Possible solutions

- Expand coverage of monitoring tools
- Improve detail and coverage to current trouble shooting guides
- Use High Availability solutions
- Provide training to new site admin

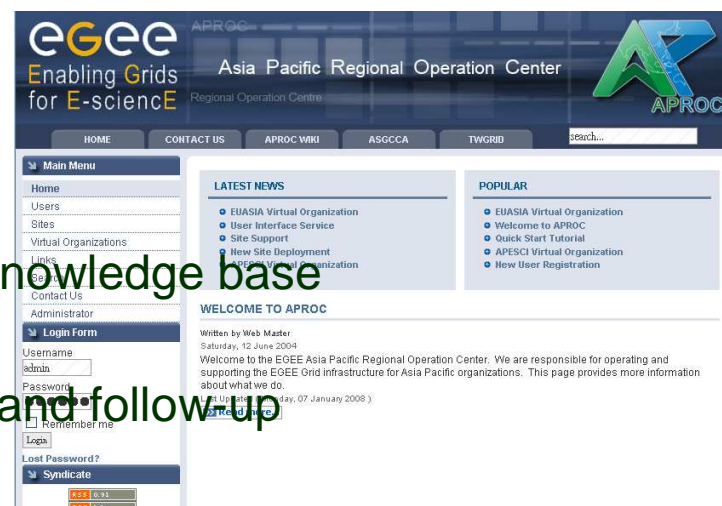
Ticket Categories (May, 2009 ~ May, 2010)





Grid Operation and Support

- **ROD and 1st line support services**
 - CIC Dashboard, Gstat, SAM, Nagios, Smokeping
 - APROC support mailing list, GGUS, Regional ticketing system, Voice and message services
- **Operation tools deployment**
 - Regional-level Nagios system and GStat2.0
- **VO Infrastructure support**
 - VOMS, LFC, top BDII, WMS, MON box
- **Release support and coordination**
 - M/W updates, upgrades and installation
- **Support services**
 - User support
 - APROC portal, documentation and regional knowledge base
- **Security coordination**
 - Security release announcement, instructions and follow-up





SLA in APROC

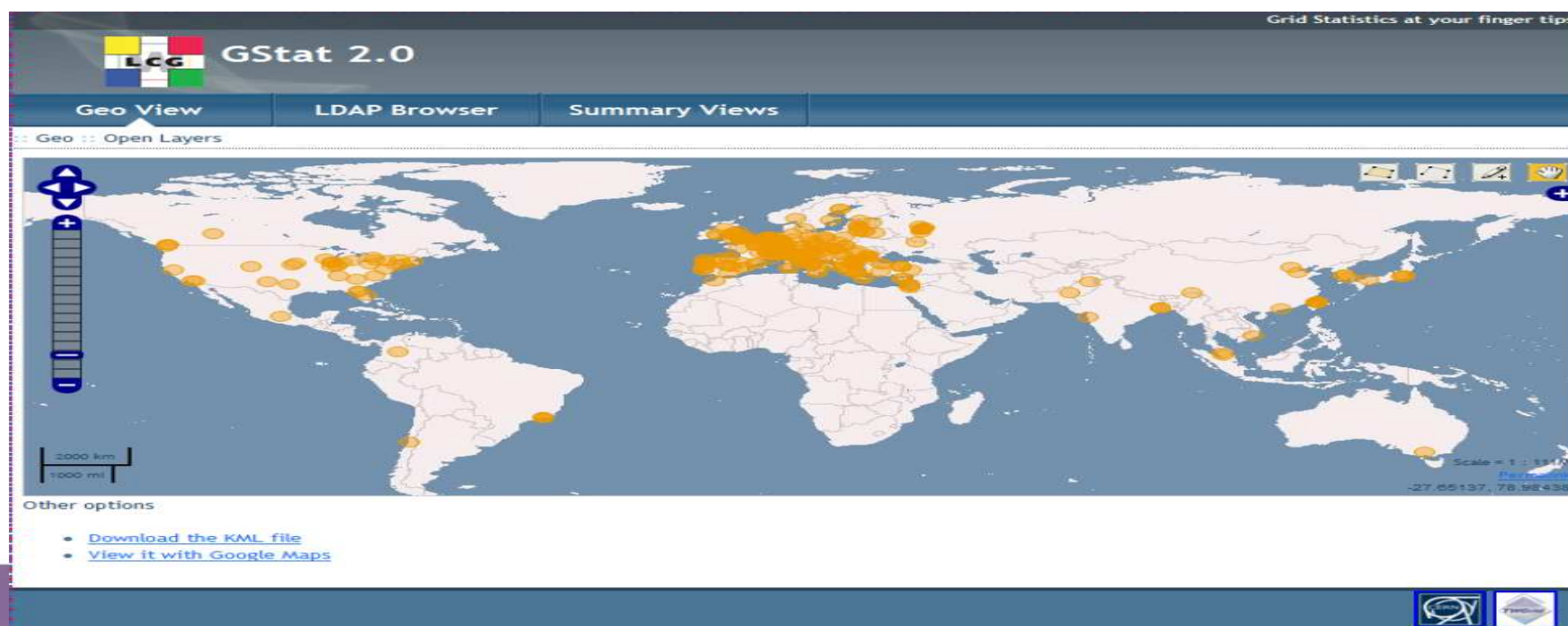
- **24 sites signed SLA**
- **Ensure the availability and reliability of grid infrastructure**
- **New Site should refer to SLA to set up site**
- **Monitoring the SLA status by wiki page**

http://wiki.twgrid.org/apwiki/Reports/APROC_SLA_status



GStat 2.0 Deployment

- APROC is responsible for the maintenance of GStat
- New GStat 2.0 is developed by ASGC in collaboration with CERN
- Production GStat 2.0 instances are available at
 - WLCG: <http://gstat-prod.cern.ch/gstat>
 - APROC: <http://gstat2.grid.sinica.edu.tw/gstat>





Regional Nagios Deployment

- Deploy a regional Nagios for Grid services monitoring
 - <https://rocnagios.grid.sinica.edu.tw/nagios/>
- Under validation process

Current Network Status
Last Updated: Wed Jun 2 20:18:10 UTC 2010
Updated every 601 seconds
Nagios® Core™ 3.2.1 - www.nagios.org
Logged in as /C=TW/D=AS/OU=GRID/CN=Shu Ting Liao 193241

Host Status Totals

Up	Down	Unreachable	Pending
127	0	0	0

Service Status Totals

Ok	Warning	Unknown	Critical	Pending
712	21	99	36	78

Service Overview For All Host Groups

Australia (Australia)

Host	Status	Services	Actions
agh1.atlas.unimelb.edu.au	UP	1 OK	
agh2.atlas.unimelb.edu.au	UP	1 OK 2 UNKNOWN 11 PENDING	
agh3.atlas.unimelb.edu.au	UP	9 OK	
agh4.atlas.unimelb.edu.au	UP	1 OK	
agh5.atlas.unimelb.edu.au	UP	1 OK 2 UNKNOWN 11 PENDING	
agh6.atlas.unimelb.edu.au	UP	2 OK	

China (China)

Host	Status	Services	Actions
egee01.grid.hku.hk	UP	9 OK	
egee02.grid.hku.hk	UP	14 OK 2 UNKNOWN	
egee03.grid.hku.hk	UP	1 OK	

Host

Host
ce.indiacms.res.in
dcache_server.tier2-kol.res.in
gridce02.tier2-kol.res.in
mon.indiacms.res.in
se01.indiacms.res.in



Security Operation

- **Security coordination**
 - With Operational Security Coordination Team (OSCT) since 2007
 - Security Service Challenge
 - 2005 SSC1
 - 2007 SSC2
 - 2009 SSC3
 - 2010 SSC4 (in progress)
 - OSCT Duty-Contact
 - Day-to-day issue (challenges, local events, etc)
 - Training and dissemination
 - Website maintenance
 - Security workshops in Asia

The screenshot displays the website for the EGEE Operational Security Coordination Team. The header includes the EGEE logo and the text 'Enabling Grids for E-science'. The main navigation bar lists: Mission, Incident reporting, Dissemination, Alerts, Operational notices, Monitoring, Security challenges, Policies, Meetings, and Contacts. The page title is 'Security Challenges'. Under 'Terms of reference', there are sections for 'Mandate' and 'Objective'. The 'Objective' section states: 'The goal of the LOG/EGEE Security Service Challenge, is to investigate whether sufficient information is available to be able conduct an audit trace as part of an incident response, and to ensure that appropriate communications channels are available. More specifically, the SSC will address the following security aspects of the Grid: 1. Compliance with, and understanding of, the Audit Requirements for LOG; 2. Compliance with, and understanding of, the LOG/EGEE Incident Handling and Response Guide; 3. The overall execution of the incident handling procedures.' Below this is an 'Outline' section with a 'Schedule' subsection. The 'Schedule' section states: 'OSCT conducts the SSC semi-regularly across all the LOG/EGEE Grid Sites. The particulars of the challenge will evolve over time. Additional information, including historical information, about the SSC is available from the SSC Wiki.' The 'Outline of the Challenge' section begins with: 'The test job is a program which is launched by means of the published methods applicable to the Grid. It will be submitted under unobtrusive credentials that will be retained for the duration of the test. After 72 wall-clock-hours, the job will terminate itself. During this time, the job will mostly lie dormant, but it will wake up occasionally to report its presence through an out-of-band logging channel. While the job is active, it...



Applications in Asia

- Application is the best drivers for evolution of e-Infrastructure, technology, and collaboration framework
- WLCG and Collaborations conducted by EUAsiaGrid project are the primary applications in Asia
 - Biomedical and Bioinformatics
 - Earth Science
 - Computational Chemistry
 - Climate change and Weather simulation
 - Social Simulation
 - High Energy Physics
- Collaborations are carrying on and extended within Asia Federation and with EGI





Dissemination & Outreach

- Training
 - Target Audience: Site Administrator, User, Application Developer, Trainer, and General Public (19 Events, 836 participants since 2006)
- Incubation Program
 - Grid Camp and Station Program
 - e-Science application and industrial program
- Symposium/Conference/Workshop
 - Promoting e-Infrastructure values, ASGC services etc., and to engage in more collaboration
 - Project coordination, learning, sharing and interactions by hosting events in Taiwan.
 - International Symposium on Grid Computing (starting from 2002)
 - 24 sites of 13 countries in Asia made site report at ISGC 2010
 - Computing on High Energy Physics (CHEP) 2010
 - Open Grid Forum 2011



Summary of e-Science in Asia

- Diversity
 - Geographically large and culturally diverse in nature
 - Level of scientific collaboration often reflected by the networking connectivity
 - The region as a whole traditionally inexperienced in regional cooperation
- Grids in Asia
 - Inhomogeneous Grids with limited operations experience, making collaboration difficult.
- Why e-Science in Asia?
 - The global infrastructure is establishing quickly
 - Take advantage of sharing and collaboration to bridge the gap between Asia and the world
 - To address the challenge of regional cooperation
- **APROC** is the best approach in this region to support and extend the infrastructure, application and collaboration within Asia and with EGI.