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IPv6 in the EGEE Related Projects: the EUChinaGRID experience

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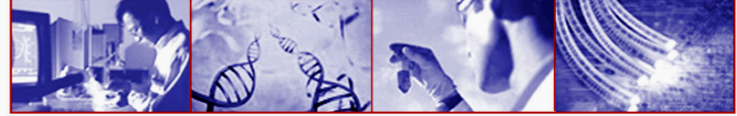
*Budapest, 01/10/2007
EGEE 2007*



FP6-2004-Infrastructures-6-SSA-026634

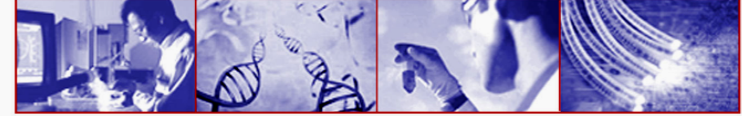


<http://www.euchinagrid.eu>



Project Information

- ▶ EUChinaGRID is a Specific Support Action (SSA) funded under the EU VI Framework Program.
- ▶ The project started on the 1 January 2006.
- ▶ 24 months duration. (3 months extension)
- ▶ 10 partners (6 from Europe and 4 from China).
- ▶ A total of 495 person months (325 funded).
- ▶ More information is available on the project web site: www.euchinagrid.eu.

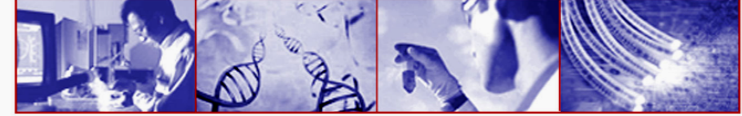


IPv6: A specific activity in EUChinaGRID

IPv6 compliance of the middleware on operational networks

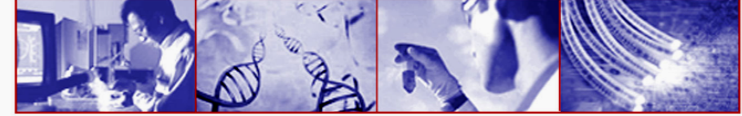
in China (CNGrid GOS) and in Europe
(EGEE gLite)

- ▶ address possible issues;
- ▶ provide feedback to MW developers.



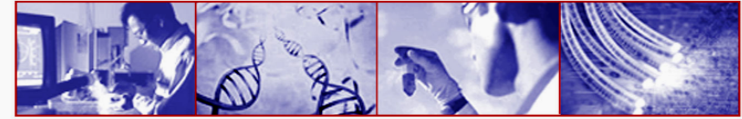
gLite IPv6 compliance performed tasks

- ▶ gLite code survey performed by GARR and INFN with an ad-hoc developed tool: **the IPv6 code checker**
 - ▶ Specific tests on an IPv6 test-bed highlighted a number of IP version dependencies in the gLite code
- **gLite is not yet IPv6-ready**
- ▶ A migration guideline document delivered to the EGEE middleware developers.
 - ▶ **Fruitful collaboration with EGEE and ETICS**



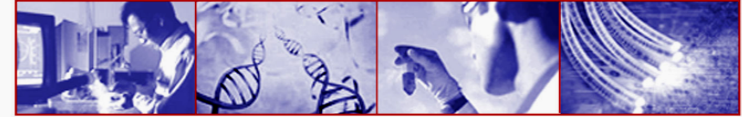
IPv6 code checker

- ▶ It is a simple bash script
- ▶ It looks for:
 - non RFC-3493 compliant calls in specific patterns
 - suspicious IPv4 code patterns and function calls inside the source code (**C/C++**, **Java**, **Python**, **Perl**).
- ▶ **Available for downloading:**
http://www.euchinagrid.org/IPv6/cod_checker.html
- ▶ It has been run on 52 gLite WMS CVS modules : 16 failed



Example of IPv6 code checker output

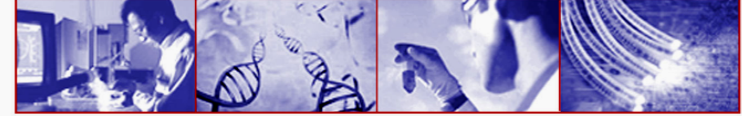
```
org.glite.security.voms  
INADDR_ [FAILED]  
addr_in [FAILED]  
F_INET$ [PASSED]  
gethostbyname [FAILED]  
inet_addr [PASSED]  
inet_ntoa [PASSED]  
Inet4Address [PASSED]  
inet_aton [PASSED]  
gethostbyname_ex [PASSED]  
INADDR_BROADCAST [PASSED]  
0.0.0.0 [FAILED]  
127.0.0.1 [PASSED]  
255.255.255.255 [PASSED]
```

IPv6 code-checker and ETICS

- ▶ IPv6 code-checker is a plug-in in the ETICS building-system

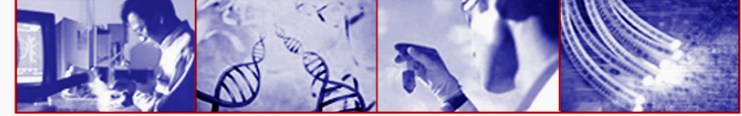
The screenshot shows the ETICS interface with a tree view of reports. The tree view includes folders for 'Reports', 'gLite-ipv6', and 'Latest Reports'. The 'Latest Reports' folder contains several test results, including 'org.gLite.testsuites.ipv6.HEAD_slc4_ja32_gcc346_test (29/09/07 19.07.09)', 'gLite-ipv6.HEAD_slc4_ja32_gcc346_test (01/10/07 10.33.06)', and 'org.gLite.testsuites.ipv6.BD-II-tests_slc4_ja32_gcc346_test (29/09/07 19.00.09)'. The graphic on the right features the text 'gLite IPv6 compliance' and logos for 'gLite', 'ETICS The Grid Quality Process', 'euchinagrid', and 'EGEE Enabling Grids'.



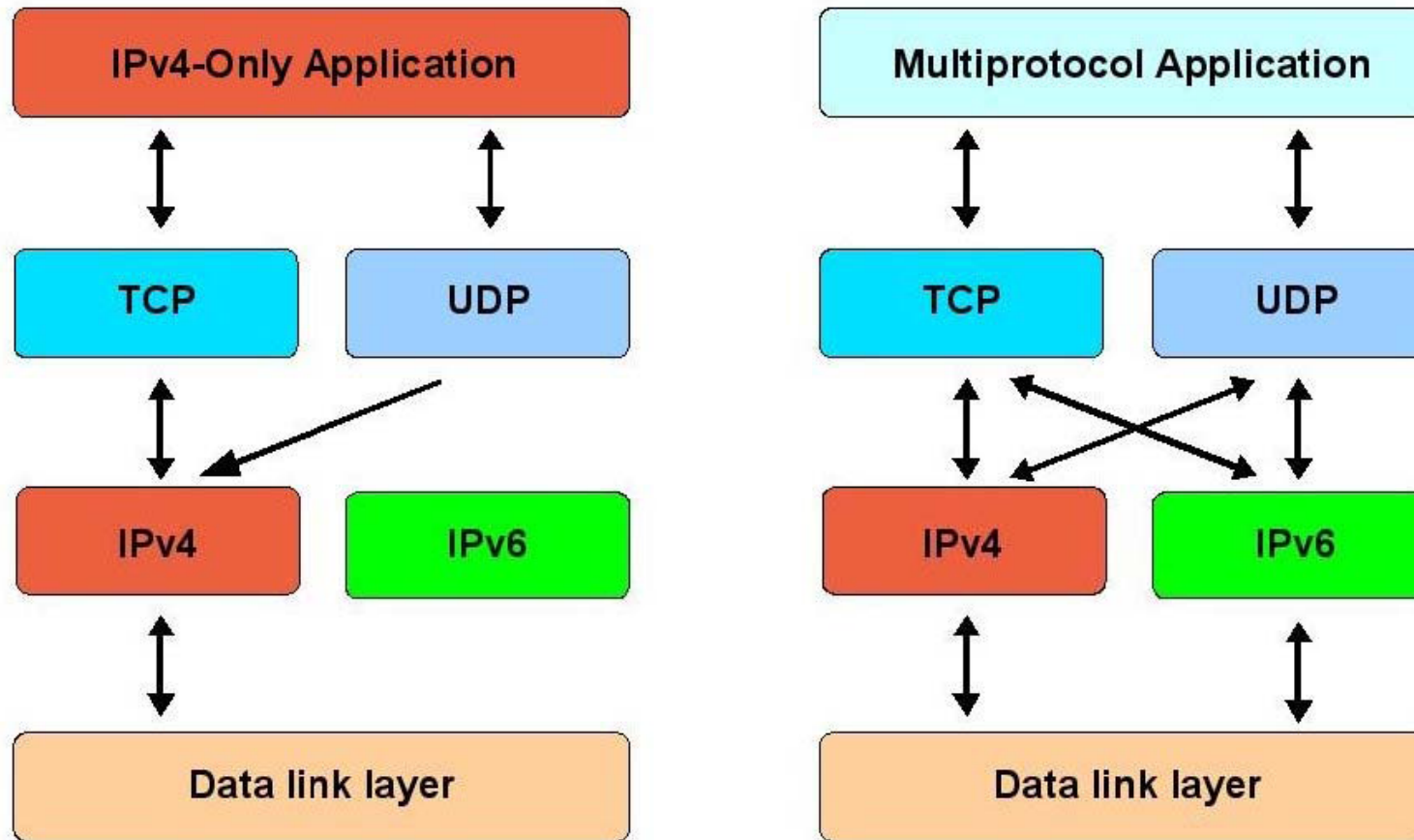
IPv6 guidelines for GRID developers

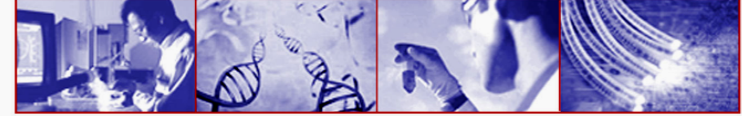
The document consists of two parts.

- ▶ the IPv6 Programming guide
 - It describes basics of IPv6 programming and explains how to port IPv4 applications on IPV6.
 - It focuses on the most used programming languages: C/C++, Perl, Python, Java
- ▶ the gLite code survey
 - It reports results of the code survey on the middleware source code and draws up the list of the incompatible modules.
- ▶ Included in EUChinaGrid deliverable D2.2
 - <http://www.euchinagrid.org/docs/EUChinaGRID-Del2.2v3-1.pdf>



Protocol-agnostic programming





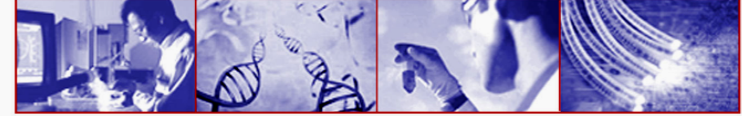
IPv6 testbed @GARR

▶ Hardware:

- VMWARE ESX server based virtual nodes

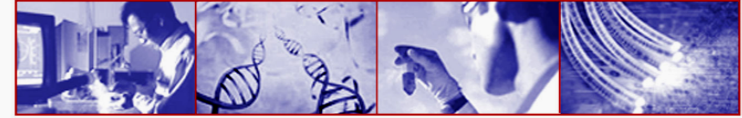
▶ Software:

- Operating System: Scientific Linux CERN 3.0.8
- gLite middleware : gLite 3.0.6 + recommended patches



Test operational procedure

- ▶ Install and configure gLite
- ▶ Start up all services
- ▶ Let the system work on dual stack
 - Register nodes with double hostnames on a dual stack DNS server (verify DNS resolving)
- ▶ Switch off IPv4 and restart with IPv6 only
- ▶ Re-configure and restart services when required (and possible!)
- ▶ Perform basic functional tests from the UI node



IPv6 compatibility of GRID middleware

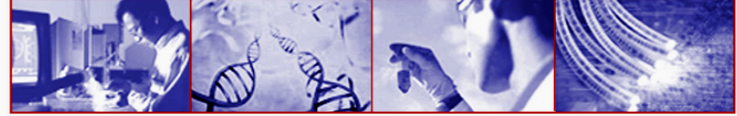
- ▶ A specific task was started in order to investigate if libraries, software and other third-party elements used in gLite and GOS are IPv6 compliant.
- ▶ Results reported in a list of modules and third-party components.

http://www.euchinagrid.org/IPv6/ipv_grid_middle.html

IPv6 compatibility of Grid middleware and related software

IPv6 compatibility of Grid middleware and related software

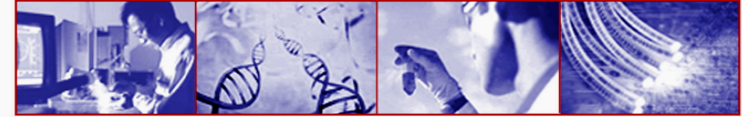
Component	Middleware	Internal related documents	Official compatibility	Compatibility tests
Globus-toolkit		IPv6 compatibility of GLOBUS	Yes (note1)	TBD
Condor		IPv6 compatibility of Condor	No (note 2)	TBD
LSF			Yes (note 3)	TBD
PBS			No	TBD
Tomcat		IPv6 compatibility of Tomcat	Yes	Not needed
Java		IPv6 compatibility of Java	Yes	Not needed



GOS IPv6 migration

- ▶ CNGrid GOS (Grid Operating System) middleware is written in Java, which natively supports IPv6.
- ▶ A full dual-stack version of GOS has been deployed by Beihang University (BUAA).
- ▶ The new release of GOS was thoroughly tested on a test-bed set up on servers at BUAA, Tsinghua University and Institute of Computing Technology (ICT) in Chinese Academy of Sciences (CAS).
- ▶ GOS was deployed on 11 main nodes of CNGrid.

euchinagrid GOS on IPv6



★ Interconnection & Interoperability of Grids between Europe & China ★

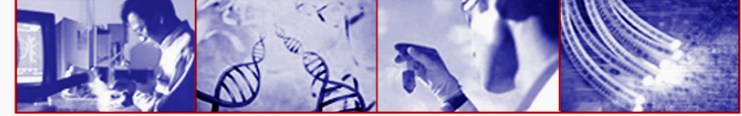
Welcome: Grid Admin [Refresh](#) [Logout](#)

CNGrid PORTAL

- AgoraList
 - Mine
 - batchAgora
 - DefaultAgora
 - Entered
 - Others
- PersonalData
- AdminSet
 - Configure
 - UserApplyList
 - AgoraApplyList
 - GripInfo
 - UserList
 - AgoraList
- CreateAgora

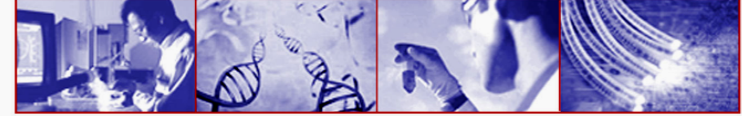
Detailed Job Information :

AppName	2007-1-30-blasttest-001
Executable	export PATH=\$PATH:/opt/wwwblast/; mkdir 1170237392953; ...
JobState	done
AddTime	Wed Jan 31 18:04:58 CST 2007
BatchID	urn:gridsam:ff808081107747880110779d3e600093
submitTime	2007-01-31 18:04:57
UpdateTime	Wed Jan 31 18:04:58 CST 2007
CpuApplyNumber	0
ClientIP	null
Description	
JobID	null
LoginIP	219.224.191.248
ServiceURL	http://219.224.191.248:38080/batch/services/batch
UserDN	CN=NetworkCenterAdmin, OU=CCC, ...
StageOut	ftp://gos:gos@[2001:da8:ae:200:4e00:10ff:feac:83ad]:21/home/gos/testresult/totalresult_1170237392953.jsp ftp://gos:gos@[2001:da8:ae:200:4e00:10ff:feac:83ad]:21/home/gos/testresult/totalresult_1170237392953.zip ftp://gos:gos@[2001:da8:ae:200:4e00:10ff:feac:83ad]:21/home/gos/testresult/stdout.txt ftp://gos:gos@[2001:da8:ae:200:4e00:10ff:feac:83ad]:21/home/gos/testresult/stderr.txt
JSDL File	Click Here to Download
Delete Record:	Click Here to Delete This Job Record



DAS IPv6 version

- ▶ DAS (Data Access Service) is a middleware used in Scientific Data Grid (a sub-project of CNGrid) aiming at uniform data access service on heterogeneous relational databases covering many disciplines.
- ▶ ***It's IPv6 compliant.***
- ▶ Fully tested in an IPv6 environment.
 - DASv6: <http://das.sdq.ac.cn:8080/dataview>



数据访问服务

Data Access Service

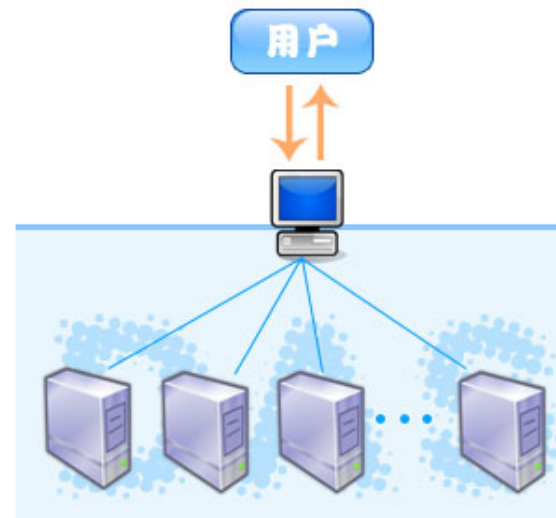
- 数据访问服务列表
- pubmed文献数据库
 - [构造查询](#)
 - [高级查询](#)
- 序列特性描述库
 - [构造查询](#)
 - [高级查询](#)
- 禽流感国际核酸序列数据库
 - [构造查询](#)
 - [高级查询](#)
- 禽流感国际研究进展数据库
 - [构造查询](#)
 - [高级查询](#)
- 禽流感文献数据库
 - [构造查询](#)
 - [高级查询](#)
- 青海采集宿主
 - [构造查询](#)
 - [高级查询](#)
- 禽流感野鸟宿主

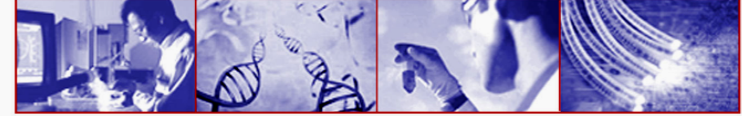
项目背景

您正使用如下地址访问此网站：2001:760:0:0:0:0:cafe

[使用帮助](#)

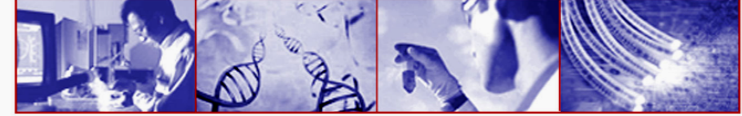
数据访问服务系统（DAS）属于科学数据网格项目中“数据统一访问”模块。该系统应用在科学数据库中，旨在解决大规模的分布、异构、自治数据库群的统一访问问题。科学数据库建库单位的数据库管理员或服务提供者安装本软件，在所属专业子库上成功部署数据访问服务之后，即实现了在网格环境下该专业子库的数据发布，对外提供访问数据资源的网格服务。DAS介于数据用户和物理数据库系统之间，对物理数据库进行封装后，对外提供数据访问的网格服务接口。通用Web检索前端（DataView）通过调用网格服务访问数据库资源。





IPv6 Tutorials

- ▶ In Rome(06), Catania(07), Thessaloniki (07)
- ▶ The Agenda:
 - IPv6 basic concepts (Header, addressing, DNS)
 - How to setup IPv6 (linux / windows OS)
 - IPv4 - IPv6 transition
 - How to setup an IPv6 over IPv4 tunnel (linux box)
 - Programming with IPv6
 - Network transparent programming
- ▶ Slides are available in IPv6 EUChinagrid website:
 - <http://www.euchinagrid.eu/IPv6/>



http://www.euchinagrid.eu/IPv6/

The screenshot shows a Mozilla Firefox browser window with the address bar displaying `http://www.euchinagrid.org/IPv6/index.html`. The page content includes the **euchinagrid IPv6** logo, a navigation menu on the left, and a main content area with a welcome message and a list of links.

- home
- documentation
 - documents
 - deliverables
 - presentations
- code checker
- IPv6 - grid middleware
- testbed
- IPv6 tutorial
 - participants
 - agenda
 - presentations
- contacts
- snooping data

EUChinaGRID Project

Welcome to the **EUChinaGRID IPv6** web site.

Here you can find all the information and the documentation about our IPv6 study on the available and foreseen network connectivity to promote new high bandwidth links between Europe and China or Asia in general and to study the available Grid Middleware for an IPv6 network and the interaction between Grid Services and IPv4-IPv6 communication.

[home](#) | [documentation](#) | [code checker](#) | [IPv6 - grid middleware](#) | [testbed](#) | [IPv6 tutorial](#) | [contacts](#)

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