

AFS @ INFN



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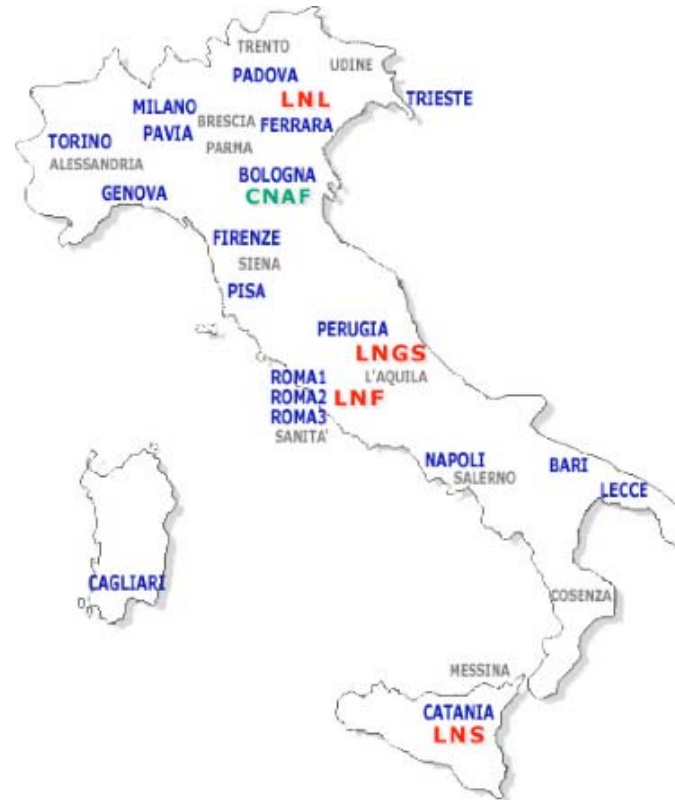


- The INFN is an organization dedicated to the **study of the fundamental constituents of matter**, and conducts theoretical and experimental research in the fields of subnuclear, nuclear, and astroparticle physics.
- The INFN **workforce** includes about 2000 of its own employees, almost 2000 university employees involved in research conducted by the Institute, and 1300 young researchers, including undergraduate and graduate students and research fellows.
- INFN sites are distributed all over the country.

INFN Structure



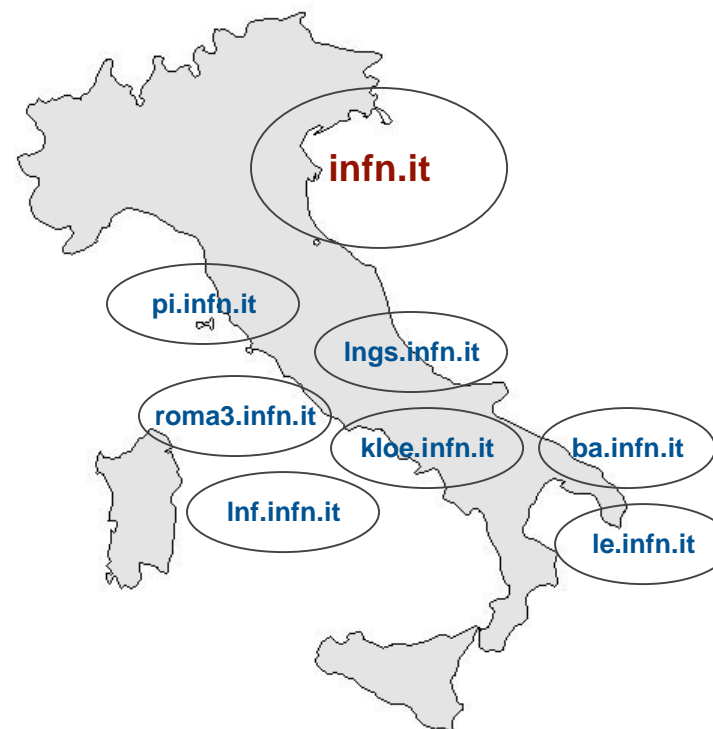
- 19 **Sections** (and their **Associated Sites**), linked to Universities Physics Departments
- 4 **National Laboratories**:
 - Frascati,
 - Legnaro
 - Gran Sasso
 - Catania
- 1 **National Networking Center**: CNAF (Bologna)
- Sections work on experiments in national and international laboratories.



AFS at INFN



- In use since 1994 (first cell in Pisa), nation-wide cell **infn.it** since 1995
- At present we have an AFS structure consisting of 8 cells:
 - **infn.it**: *nation-wide cell*
 - **ba.infn.it**: *local cell at unit of Bari*
 - **le.infn.it**: *local cell at Lecce unit*
 - **Inf.infn.it**: *local cell at LNF unit*
 - **Ings.infn.it**: *local cell at unit of Gran Sasso International Laboratory*
 - **pi.infn.it**: *local cell at unit of Pisa*
 - **roma3.infn.it**: *local cell at Roma3 unit*
 - **kloe.infn.it**: *local cell at LNF, used by KLOE experiment*
- Many users belong to two or more cells



INFN AFS Usage



- user home directories
- web sites
- software repository (public and licensed software)
- experiment data
- experiment software releases
- collaborative data space (project management)

AFS local cells



| Cell name | Auth | FS | Volumes | Users | Online TB | Backup |
|---------------|------|----|---------|-------|-----------|-----------------|
| ba.infn.it | K5 | 2 | 306 | 320 | 0.4 | vos dump + copy |
| le.infn.it | K5 | 3 | 1498 | 796 | 10.0 | AFS backup |
| Inf.infn.it | K5 | 7 | 2212 | 1352 | 16.0 | Tivoli TSM |
| Ings.infn.it | K5 | 2 | 850 | 764 | 0.4 | AFS backup |
| pi.infn.it | K4 | 6 | 2500 | 999 | 1.7 | vos dump + copy |
| roma3.infn.it | K5 | 1 | 126 | 67 | 5.0 | vos dump + copy |
| kloe.infn.it | K4 | 2 | 332 | 154 | 15.0 | Tivoli TSM |

- cell **pi.infn.it** will move to K5 authentication soon
- the experiment **KLOE** will leave AFS in the future: they'll probably share data using NFS v4
- Most of these cells are based on AFS servers running on Linux boxes
- AFS cross-authentication is available between K5 cells

AFS nation-wide cell **infn.it** (1/2)



Authentication is based on Kerberos 5

- In 2004 we moved the **Realm INFN.IT** from KAserver/K4 to K5
- **Kerberos 5 Servers:**
 - 1 Master Server at CNAF (Bologna), connected over a 10 Gb link to the italian national research network (GARR) backbone
 - 1 Slave at the same Bologna site
 - 1 Slave at Roma unit, connected over a 1 Gb link to GARR backbone
 - 1 Slave at unit of Napoli, connected over a 1 Gb link to GARR backbone too.
- **real-time propagation** from Master KDC to KDC Slaves, is granted through a “home-made” service (a C program that uses FAM library --now known as Gamin--, written by Sandro Angius INFN LNF), which controls the DB and propagate any modification immediately.
- Kerberos 5 Realm INFN.IT is cross-authenticated to each local K5 Realm.

AFS nation-wide cell **infn.it** (2/2)



- AFS cell **infn.it** has **10 FileServers** distributed all over the country (in 9 INFN sites): we have file servers in the cities of Bologna, Ferrara, Napoli, Perugia, Pavia, Roma and Trieste.
- They offer a total of 7.5 TBytes of disk space, distributed in 3017 volumes, to 1676 cell users.
- **Backup** differs from site to site: it goes from the former AFS backup (AFS *buserver*) to the copy of the 'vos dump' command output into another device.
- It is difficult to calculate the amount of **AFS Clients**, since most of the users have an AFS client installed on their Desktop and Laptop. We are used to see AFS clients running on the most common used platform: Windows, Linux (in all its flavours) and Mac OS X.

INFN AFS System Administration



- Daily management is in charge of the INFN site that hosts the AFS Servers.
- INFN Computing Committee created a national working-group on AFS, whose members are the colleagues coming from all INFN sites.
- A **great** help to AFS management and organization is offered by CASPUR since the beginning. INFN stipulated with this Inter-Universities Consortium a contract for AFS support.

Conclusions



- INFN sites heavily utilize AFS service to share data and software both throughout different sites and within local site;
- INFN users are now quite familiar with AFS technology because of the long time usage;
- AFS cross cell authentication (based on K5) solved the problem of the limitation of file sharing (ACL) to users belonging to the same AFS cell (see “*Cross-realm authentication*”, S.Angius);
- AFS is now a transparent mean of resource sharing among sections and labs at INFN.

- Having deployed and successfully used AFS since 15 years, INFN is now also interested in contributing to develop further functionalities and applications on top of the OpenAFS layer (see “*AFS preference pane for Mac OS X*”, C.Bisegni and “*AFS FileServer in High Availability*”, C.Bulfon).



Many thanks to

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and most of all

Thank You