



Site Report

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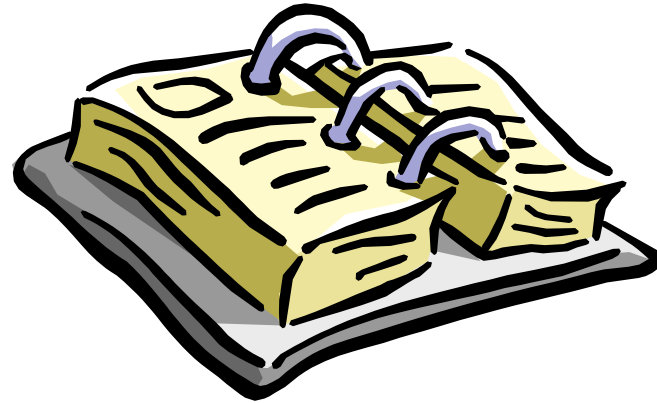
Jefferson Lab
Oct.30-Nov.3,2000



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di Fisica Nucleare
Italy

Outline of Presentation

- **Introduction**
- **Environment today**
- **Services**
- **Network**
- **AFS**
- **Condor project**
- **INFN-GRID project**
- **Conclusions**



INFN

- **Structure:**
 - 4 National Laboratories: Frascati, Legnaro, Gran Sasso and Catania
 - 19 Sections linked to Physics Department of Universities
 - 7 Associated Sites
 - 1 National Networking Center in Bologna



INFN - People

- 2000 people (~ 600 physicists)
- more than 2000 physicists affiliates from the Universities
- 2000 final-year students
- external researchers



Computing Activities

- **On-line computing**
- **Montecarlo production**
- **Data Analysis**
- **Theoretical calculations on dedicated computer**
- **Central computing services for program development, mailing and all major networking services**
- **CAD/CAM**
- **Desktop computing**

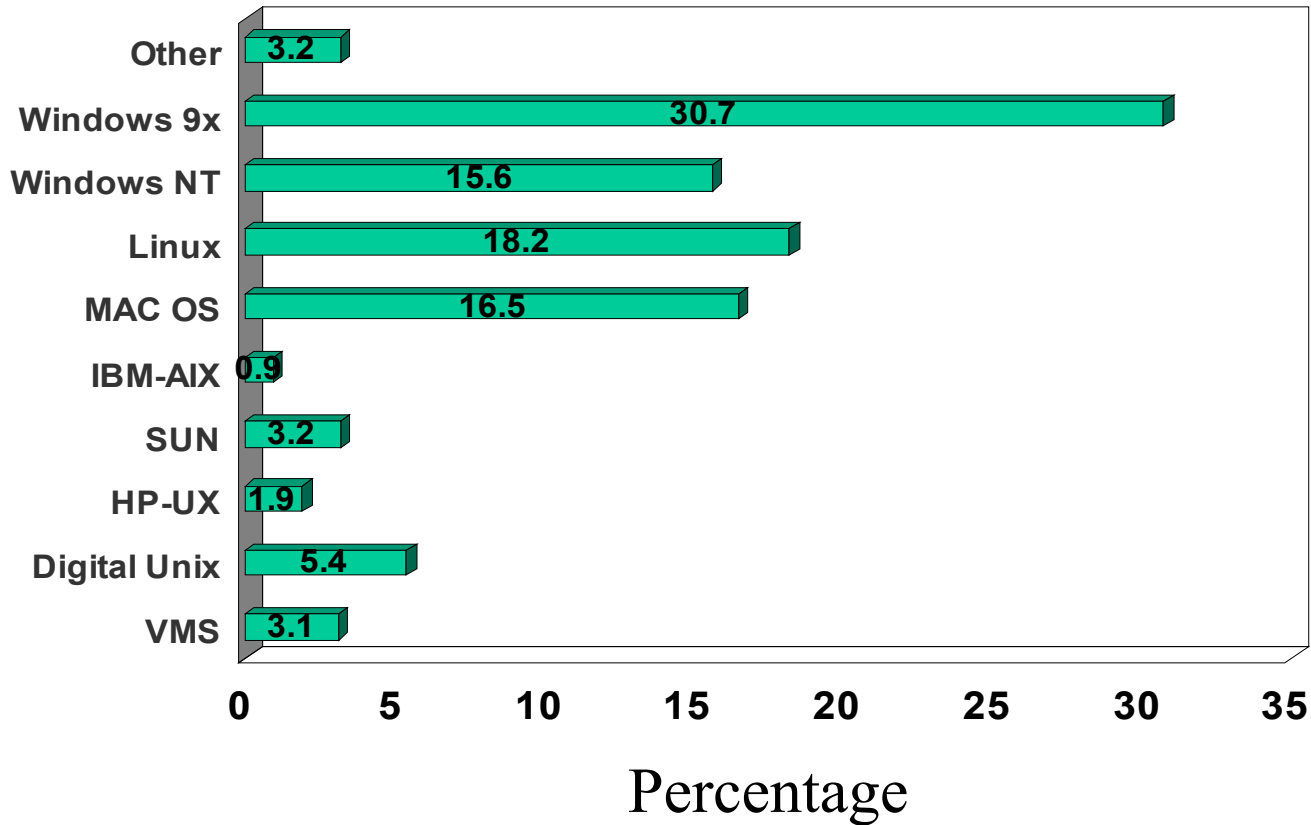


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Computing Environment



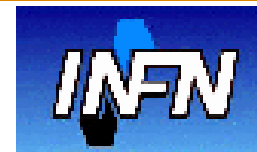


INFN network

- The *INFN* network is completely integrated into a nation-wide infrastructure providing a backbone connectivity at 155 Mbps called GARR-B (Broad band network service for the Italian Academic and Research community)
- GARR-B network is interconnected to the other European Research Networks via the TEN-155 link and to the USA Academic and Research networks via a link to EuroPOP in New York at 45 Mbps
- Besides the connection to the global internet commodity is guaranteed via a link from Naples to New York at 155 Mbps
- A 622 Mbps link from Milan to New York is in a testing phase now and will be running by the next week for both commodity and research traffic to USA and global internet
- In order to improve the connections between domestic sites, GARR-B is now considering the startup of a new project based on WDM (Wavelength Division Multiplexing) technology at 2.5 Gbps



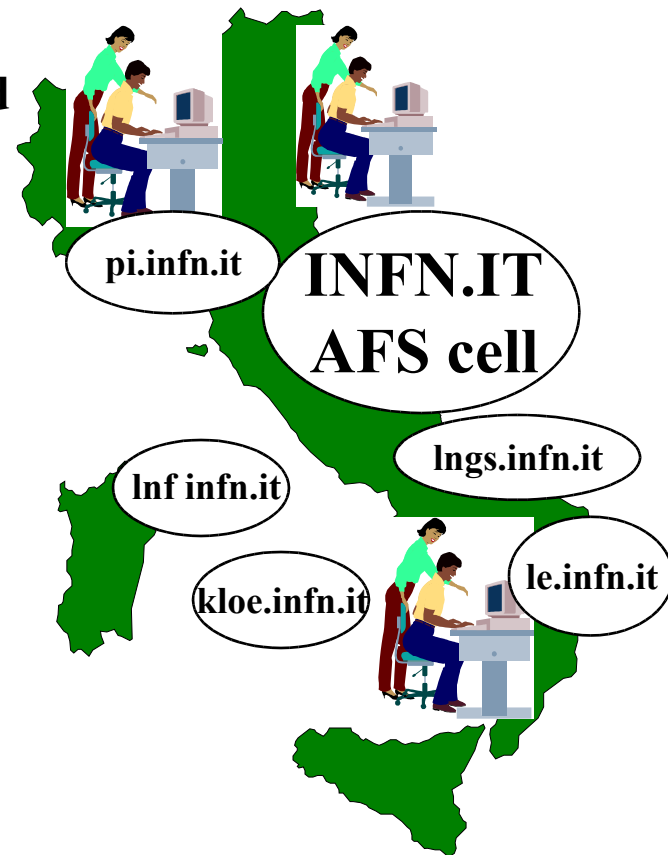
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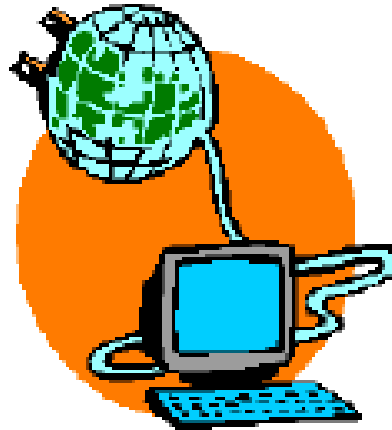
How we share data today

- INFN utilizes heavily AFS services to share data and software throughout the Italian country
- at present we have an AFS structure consisting of 6 cells:
 - **infn.it** : *nation-wide cell*
 - **pi.infn.it** : *local cell at unit of Pisa*
 - **lngs.infn.it**: *local cell at unit of Gran Sasso International Laboratory*
 - **le.infn.it**: *local cell at unit of Lecce*
 - **Inf.infn.it**: *local cell at LNF unit*
 - **kloe.infn.it**: *local cell at LNF used by KLOE experiment*



WEB Server

- **The 70% of Web Servers are hosted on a platform running a commercial unix**
- **The 20% of them are running on a Linux system**
- **Software mainly used:**
 - Apache: 80%
 - IIS: 4.5%
 - Netscape: 4.5%
 - Other: 9.1%



E-mail

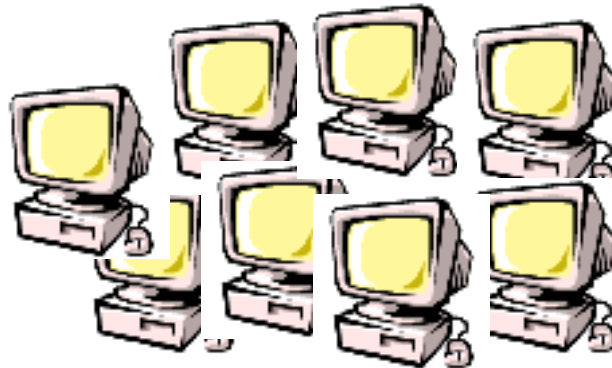
- **Mail relays used (percentage by units):**
 - BSD sendmail : 73%
 - VMS sendmail: 22%
 - Other: 5%

- **Preferred Mail agents used:**
 - Netscape
 - Pine
 - Outlook
 - Eudora
 - VMS mail



Compute Farm

- Farms have mainly been running on linux systems
- Only a few ones have been running on Digital Unix and SUN
- By the end of this year a lot of farms will be implemented configuring clusters of PCs with linux on it
- So far we have not any farm on NT





Condor

pool on WAN

- **A Condor pool on WAN has been configured in order to provide a global computing resource to INFN users**
- **Condor philosophy aims at using only idle CPU cycles, optimizing the usage of existing and unused computing capacity**
- **A global pool of 200 machines has been working for 2 years and it is divided into sub-pools in order to give higher priority to jobs belonging to local users or researcher's groups within a site**
- **Good results and exploitation of computing resources**



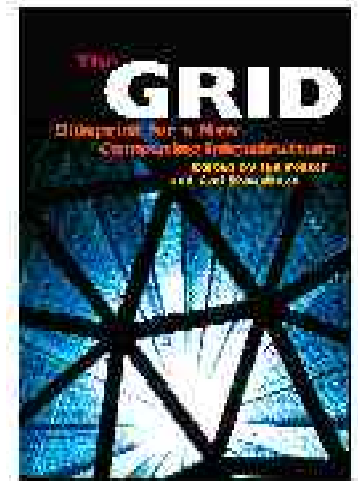
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INFN-GRID project

- Project for the next 3 years and more than 20 FTE involved in it
- Workplan divided in 5 packages complementary and in support of DATAGRID project
- Many LHC experiments involved: ALICE, ATLAS, CMS, LHCb and others
- The project activities will provide a layout of the **necessary size** to test in real life the **middleware, the application development**, the development of the LHC experiment **computing models** during this prototyping phase and the necessary support to LHC experiment computing activities
- The national testbed deployment will be synchronized with DataGrid project activities





Conclusions

- **At present there is no plan to move central computing facilities to Linux yet**
- **An INFN working group is testing a Windows 2000 environment to verify all features we want to use for our goals**
- **Commercial unix is stable but its interest is diminishing while Linux is getting the better of it at a high speed**
- **Ever-growing role of PCs is evident and it takes to manage much more FTE than central computing facilities. So it is necessary to find out tools to make it easy to manage**
- **In a heterogeneous environment like that we have, the need of an efficient distributed file system is ever growing. So it is necessary to guarantee its functionality and efficiency.**
- **Will be GRID the solution? It is difficult to say now.**
- **LAN is crucial and there is a wide deployment of Gigabit ethernet. Anyway increasing bandwidth is a necessary but not sufficient condition for guaranteeing a good performance of the applications**