

Computing Service

S. Angius (Tec.), C. Bisegni (Tec.), R. Gargana, M. Gospodarczyk (Ass.),
D. Maselli (Tec.), M. Pistoni (Resp.), C. Soprano (Tec.),
D. Spigone (Tec.), T. Tonto (Tec.), M. Tota (Ass.)

1. Summary

The Computing Service of LNF deals with the configuration and administration of data transmission network, of the IT infrastructure and of the computing resources of LNF and AC (Central Administration). Furthermore, it also plays a relevant role for INFN by managing several IT services, relevant at national level, centralized at LNF. In detail, the Computing Service manages:

- *The network infrastructure*: the structured cabling system, both copper and optic fiber, the Local Area Network equipment (Layer 2 and Layer 3 switches), the wireless network equipment, the Wide Area Network connections and access routers, the firewalls and the devices for the management of information security;
- *The following Storage infrastructure and Mass Storage resources*: Storage Area Network, Network Attached Storage, Distributed File System (Andrew File System), Tivoli Storage Manager to provide backup and archiving services through magnetic tape libraries;
- *Several virtualization system infrastructures*: a set of machine clusters based on Intel processor, used to manage several virtualization environments;
- *A set of infrastructure services for ensuring the functionalities of the network*: the Dynamic Host Configuration Protocol and the Domain Name System servers, security servers (Log and Audit recording, monitoring system), virtual servers for providing the national infrastructure of authentication and authorization, etc.;
- *A set of critical IT services*: the eMail system (i.e. email relays, inbox server, webmail, Antivirus and Antispam), Database Servers (Oracle and MySQL), web and streaming servers, printing servers, etc.;
- *The scientific computing resources*: computing farms of some experiments, the Windows domain, Linux virtual systems for general users access;
- *Computing management resources for ERP (Enterprise Resource Planning)*: the Information System for staff management and payroll;
- *The web hosting services for INFN, AC and LNF*: web servers and portals, database and application servers.
- *The Disaster Recovery of services and data relevant or critical for INFN*: the protection of the Institute's applications and business data.

Moreover, the Computing Service provides also support to:

- facilities and experiments which autonomously manage their computing resources and in particular to the IT infrastructure based on the computational grid of the ATLAS experiment and to the virtualization systems for DAΦNE control within the Accelerators Division;
- configuration and administration of workstations and personal computers used by employees, associates, graduate students, undergraduates, guests, LNF services and/or INFN experiments;
- the use of IT resources exported or shared and of distributed devices and peripherals.

2. Activities developed in 2018

During 2018, the Computing Service updated and maintained the network, storage and virtualization infrastructures, as well as basic services and scientific and business IT resources, both with local and national value.

The Computing Service implemented the IPv6 protocol on the local and geographical network and on the LNF security systems, in particular for the connectivity requirements of the computing farm of the ATLAS experiment.

The Service has also started an update process of the Storage Area Network and in particular of the Backup and Archiving system, increasing the storage capacity both on disk and on tape.

The Computing Service has also contributed to the development of the !Chaos project (aimed to the realization of a prototype of Control as a Service open platform, suited for a large number of applications in science, industry and society) and in particular to the core and common framework software development.

Driven by the needs of the !Chaos project, the Computing Service collaborated in the management of an IT infrastructure dedicated to the project, to provide specific IT services, useful for the control of experimental equipment.

Finally, the Computing Service continued the updating and management of the INFN Corporate Cloud, in collaboration with other INFN sites, using the opensource Openstack platform, for the realization of a production environment on a national geographic scale, with the goal to provide IT resources based on IaaS (Infrastructure as a Service) and PaaS (Platform as a Service) models, having high availability and high scalability requirements.