RedIRIS

Connecting Spanish R&D&i since 1988

What is RedIRIS?

RedIRIS is the Spanish academic and research network that provides advanced communication services to the scientific community and national universities. It deploys various links of up to 10,000 MB which are used for science projects, making the work of researchers easier.

It is a data network to assist in scientific development

It is a test bank for new technology and services
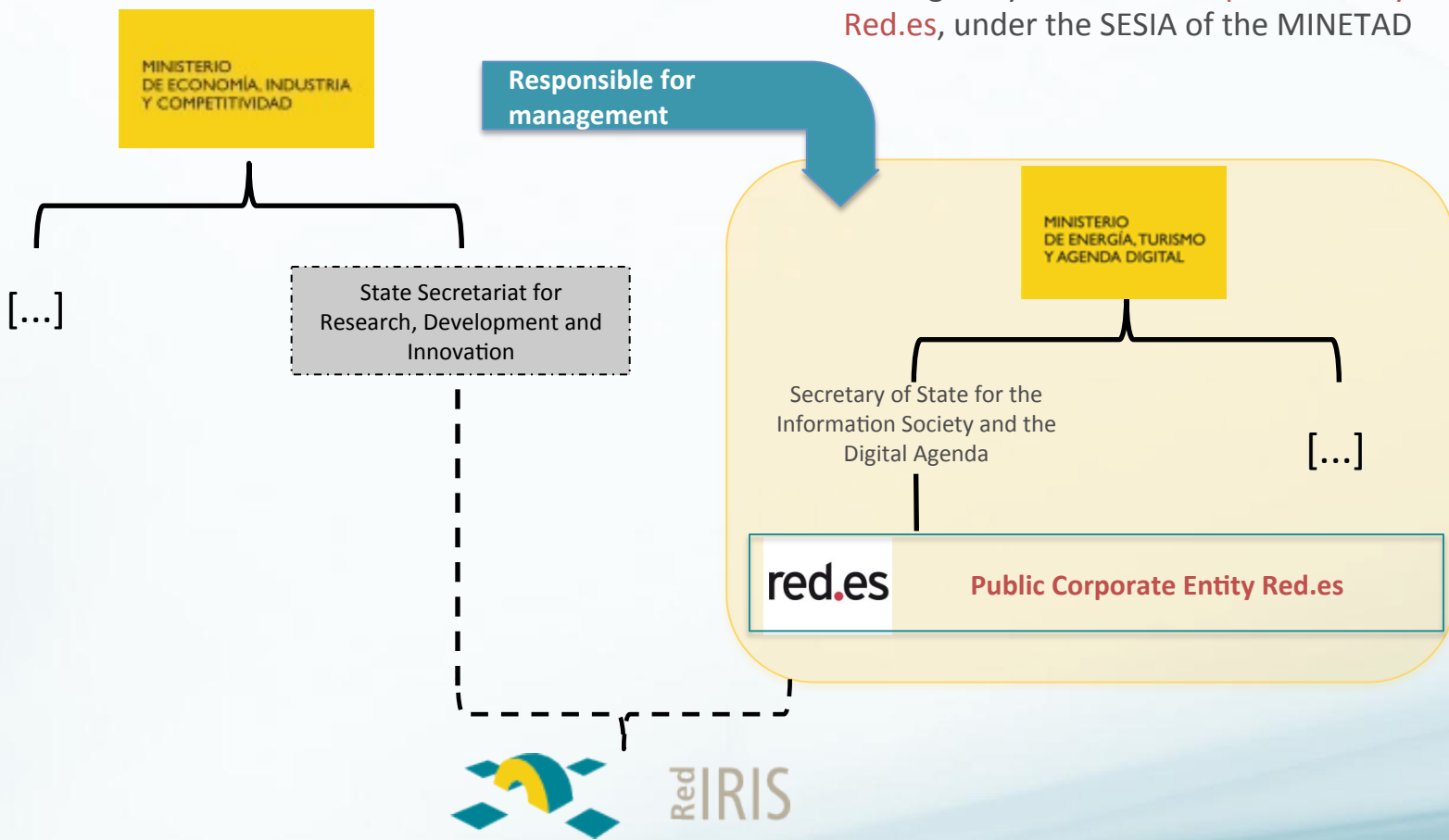
It is a collaborative tool for scientists

It helps to foster an Information Society

Institutional information
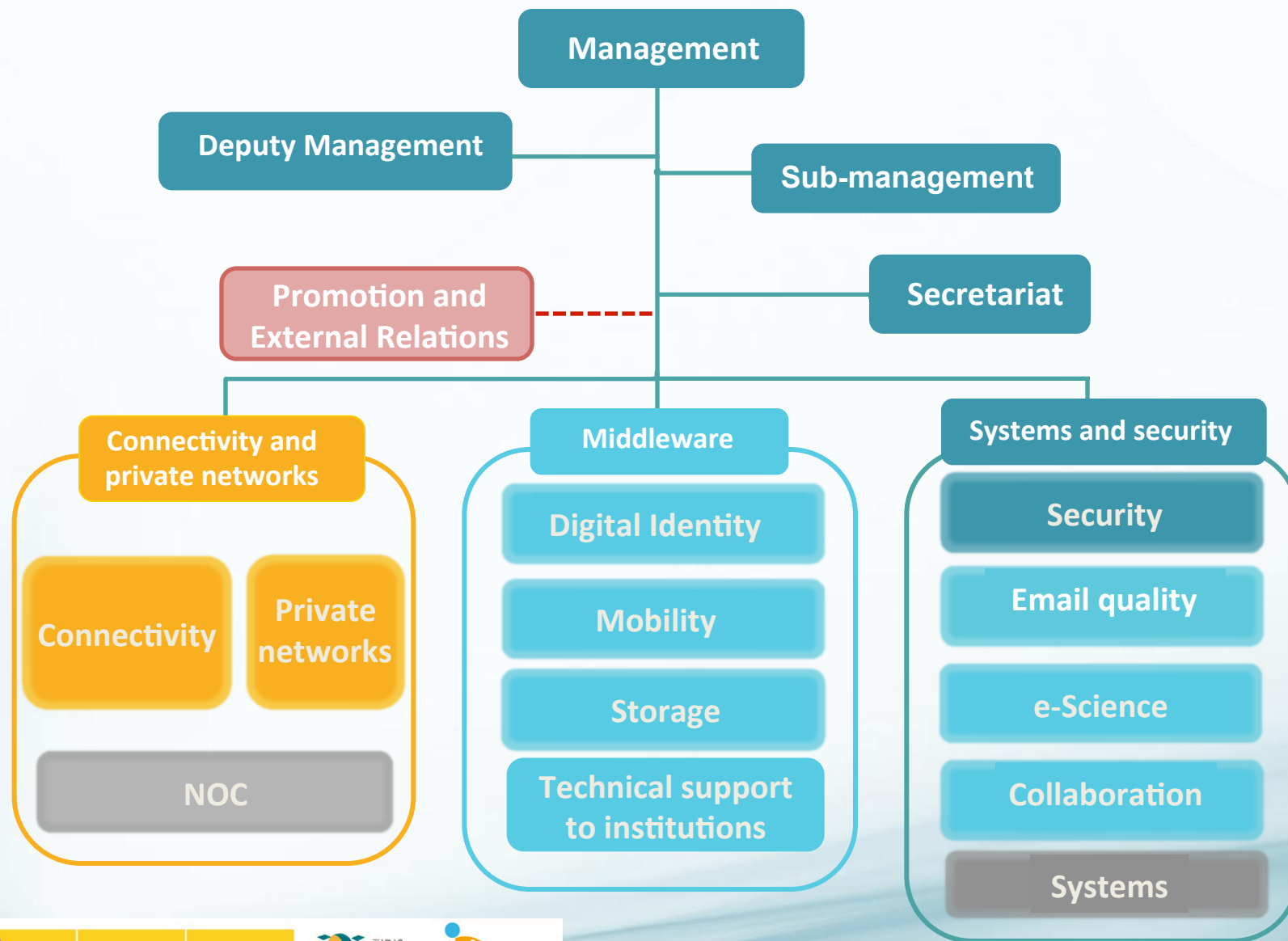
RedIRIS is an *ICTS financed by **MEIC**, which defines the strategy

Managed by the Public Corporate Entity Red.es, under the SESIA of the MINETAD

MINISTERIO DE ECONOMÍA, INDUSTRIA Y COMPETITIVIDAD

Responsible for management

MINISTERIO DE ENERGÍA, TURISMO Y AGENDA DIGITAL

[…]

State Secretariat for Research, Development and Innovation

Secretary of State for the Information Society and the Digital Agenda
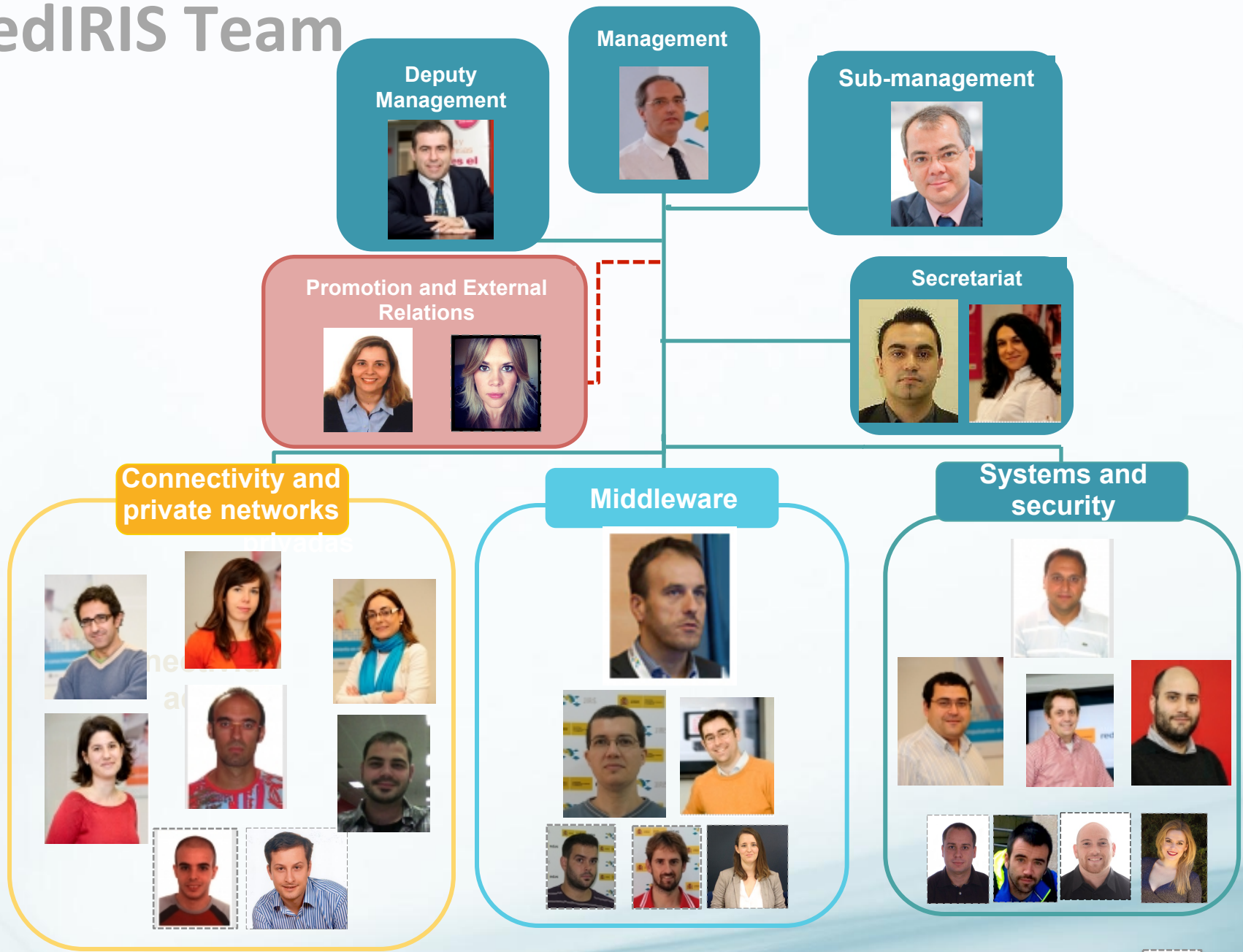
[…]

red.es **Public Corporate Entity Red.es**

Red IRIS

* Singular Scientific Technical infrastructure approved by the MEIC. These are key infrastructure in terms of cost and relevance

RedIRIS Team

RedIRIS Team

Deputy Management

Management

Sub-management

Promotion and External Relations

Secretariat

Connectivity and private networks

Middleware

Systems and security

freelance

RedIRIS and e-Science

e-Science is the scientific activity that intensively uses new technologies. In this environment common horizontal e-infrastructures play a prominent role, among which are advanced communications networks for universities and research centres, such as RedIRIS
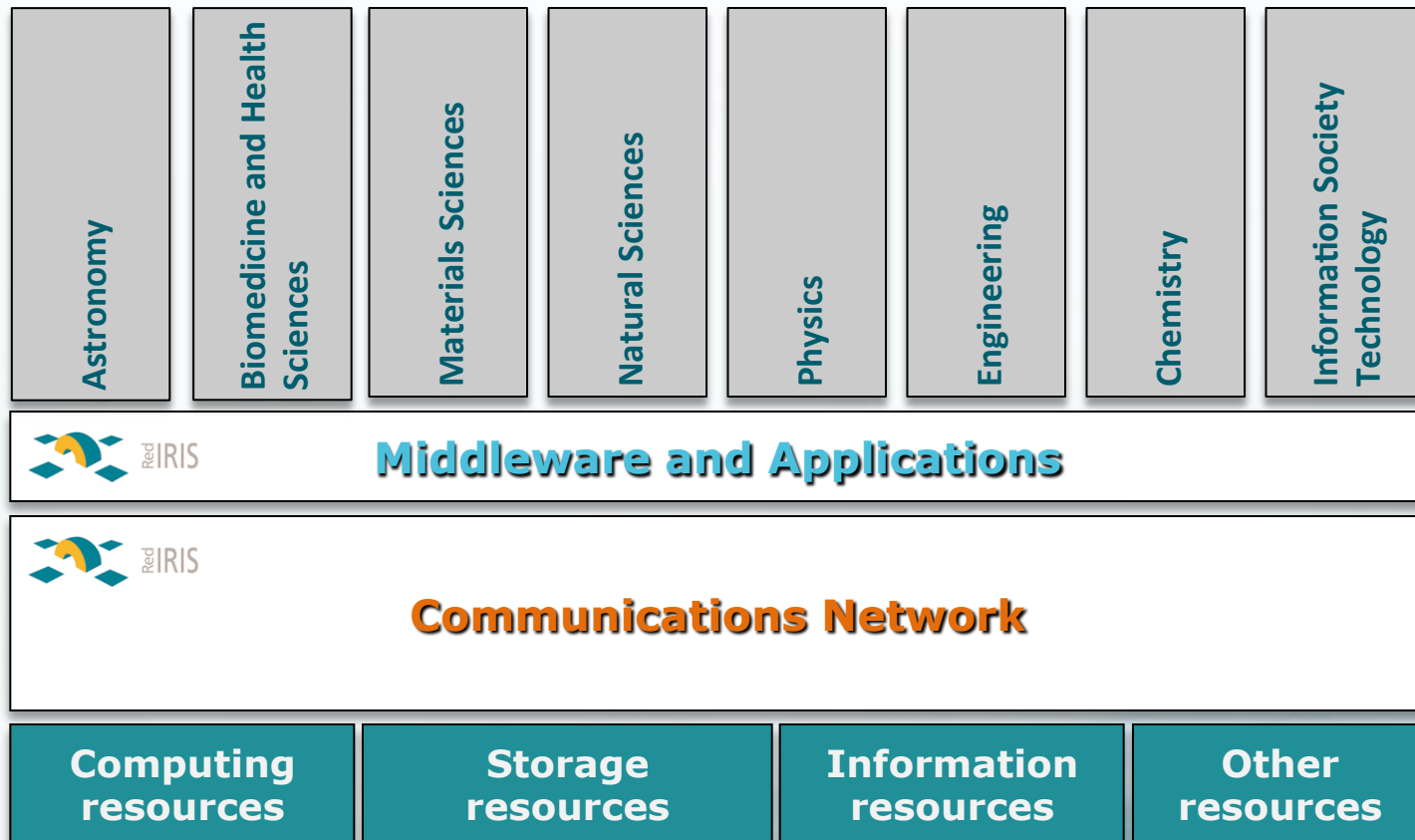
Academic and research Intranet

RedIRIS works in a multidomain environment with various networks, requiring high levels of quality and coordination among all the networks making up the Research Intranet

It co-directs and co-finances GÉANT, which **works with** Internet2, CANARIE, SINET, RedCLARA,

It runs the Spanish NRENs and **works with** other NRENs (JANET, SURFnet, FCT-FCCN, etc.)

It collaborates with regional networks (RECETGA, Anella, CICA, I2BASK, etc.)

It offers services and support

Pan-European and North American networks, and more

National Research and Education Networks (NRENs)

Regional Research Networks

Campus LAN

RedIRIS

RedIRIS directly contributes to improving global connectivity among researchers

RedIRIS collaborates with regional and campus networks to provide high quality services to the national Scientific Community

The Evolution of RedIRIS:

RedIRIS manages a high-capacity core network that has been evolving since it was created in 1988 to provide communications services of the highest capacity, with top-level security and quality at a low cost
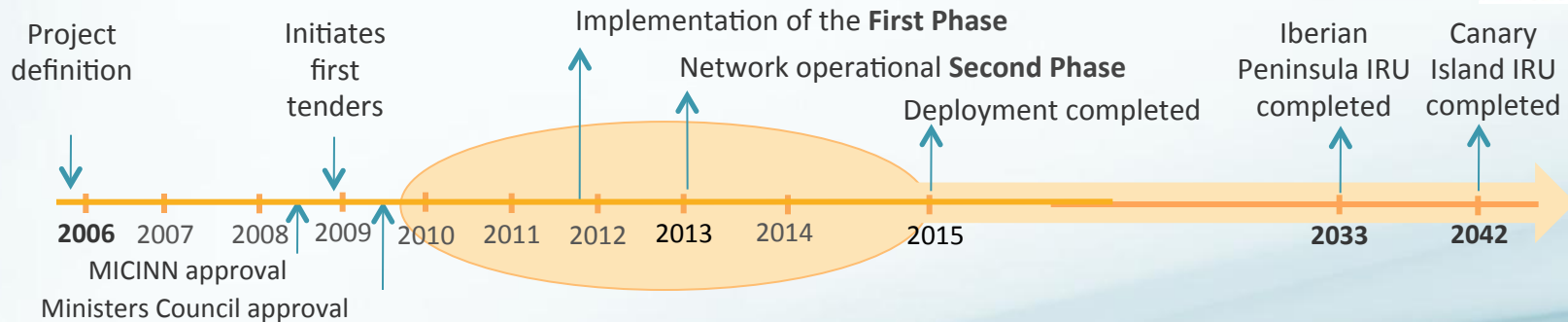

ARPAnet project

RedIRIS is created

RedIRIS manages .es domain names

(2002) RedIRIS IPv6 LAN Speed Record

(2011) Experimental link 100G

1968 | 1983 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014

01 January 1983 The Flag Day

TCP/IP

first European research networks

first Web servers in Spain

(1993) incorporates DANTE

(1998) TEN-155 project begins

(2001) GEANT project begins

(2004) GEANT2 project begins

(2009) GN3 project begins

(2013) GN3+ project begins

The Evolution of RedIRIS

Before 2006, most European research networks used fibre networks. Spain was behind the rest of Europe.

The solution to this problem:

The RedIRIS-NOVA Project
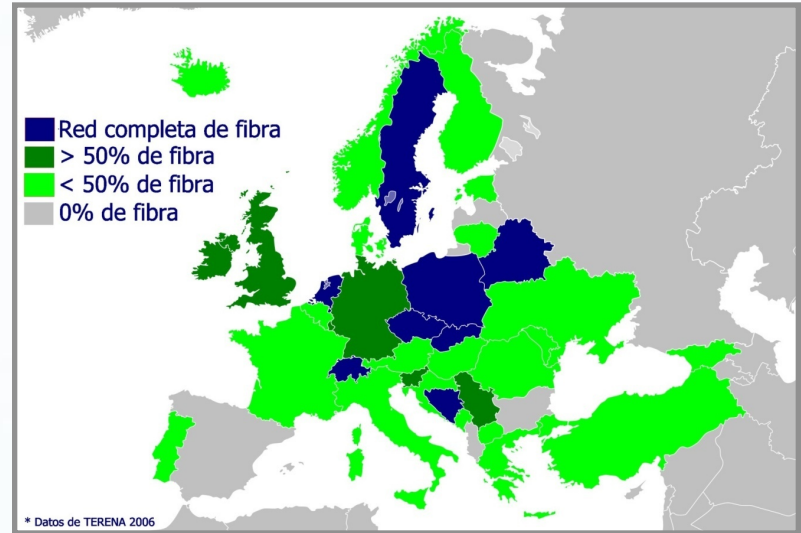
- Obtained the right to use 12,000 km. of fibre optics for over 20 years
- Total project cost: €100M (with €45M of ERDF funds)

Red completa de fibra
> 50% de fibra
< 50% de fibra
0% de fibra

* Datos de TERENA 2006

NOVA
Red IRIS

Project definition

Initiates first tenders

Implementation of the **First Phase**

Network operational **Second Phase**

Deployment completed

Iberian Peninsula IRU completed

Canary Island IRU completed

| 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | | 2033 | 2042 |

MICINN approval

Ministers Council approval

GOBIERNO DE ESPAÑA MINISTERIO ECONOMÍA, INDUSTRIA Y COMPETITIVIDAD MINISTERIO DE ENERGÍA, TURISMO Y AGENDA DIGITAL red.es Red IRIS Infraestructuras Científicas y Técnicas Singulares

The Network

A top-level technological infrastructure in its field, which is set to provide advanced services for decades. A key tool for enabling remote collaboration among researchers and teachers, regardless of their geographic location.

Very high-capacity circuits (up to 100G)

Connects ICTSs

Supports development of regional networks

Latest-generation dark fibre

A much more powerful network for a sensibly lower cost

Internet of the Future Services

Optical channels for research projects

More efficient, robust and flexible
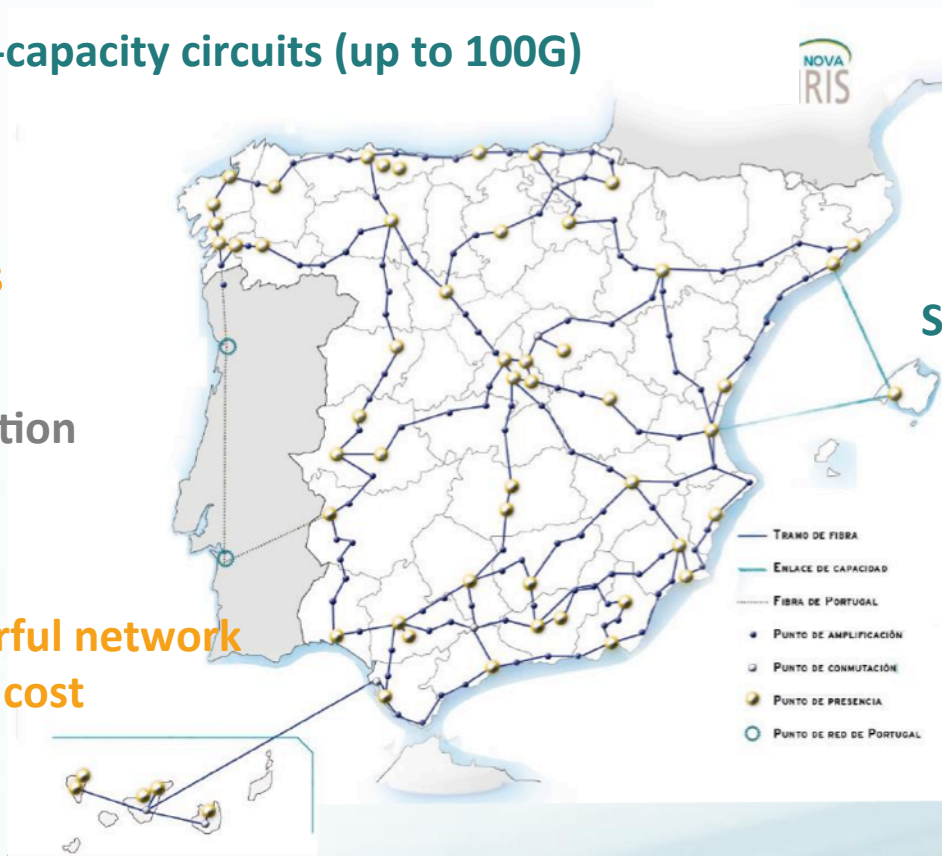
The Network

It connects universities and research institutions to each other using regional networks.

The Network

It gives access to both the academic and research Intranet as well as the Global Internet through connections with global providers and its presence in neutral points of exchange of commercial Internet traffic in Spain: ESPANIX and CATNIX
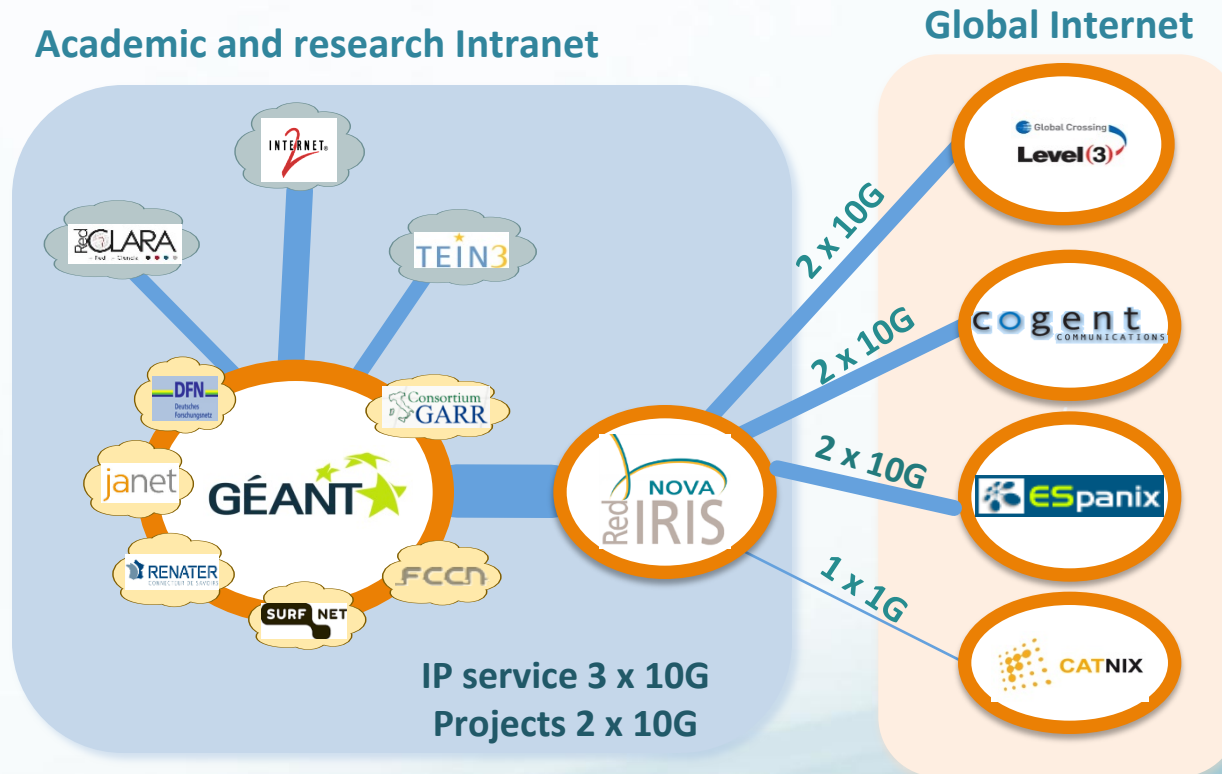
The Network

The global research Intranet

RedIRIS collaborates with other European national academic networks (NRENs) to together deploy and manage a pan-European academic and research network (GÉANT) which connects national academic networks to each other and to other parts of the world.
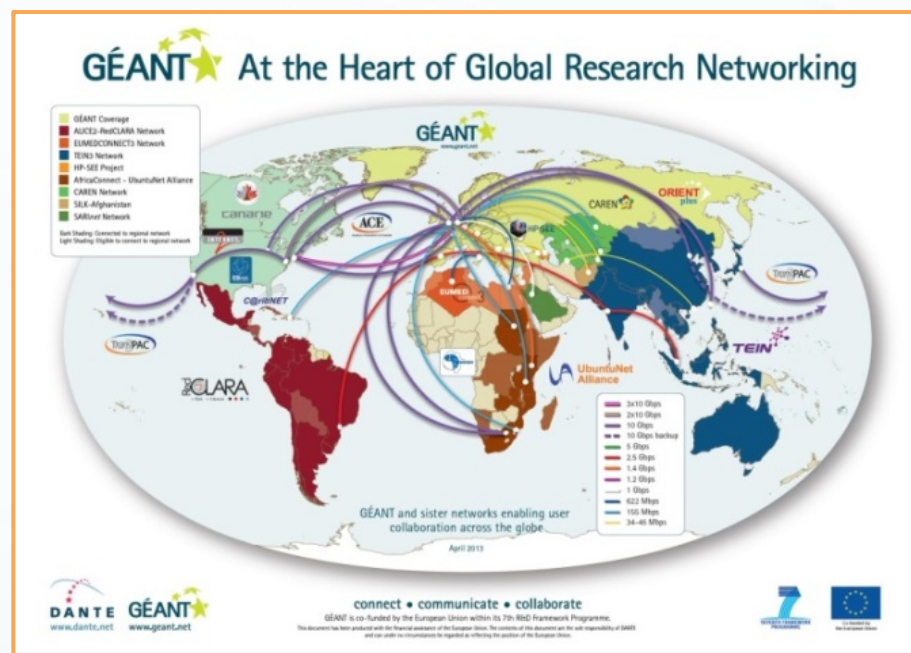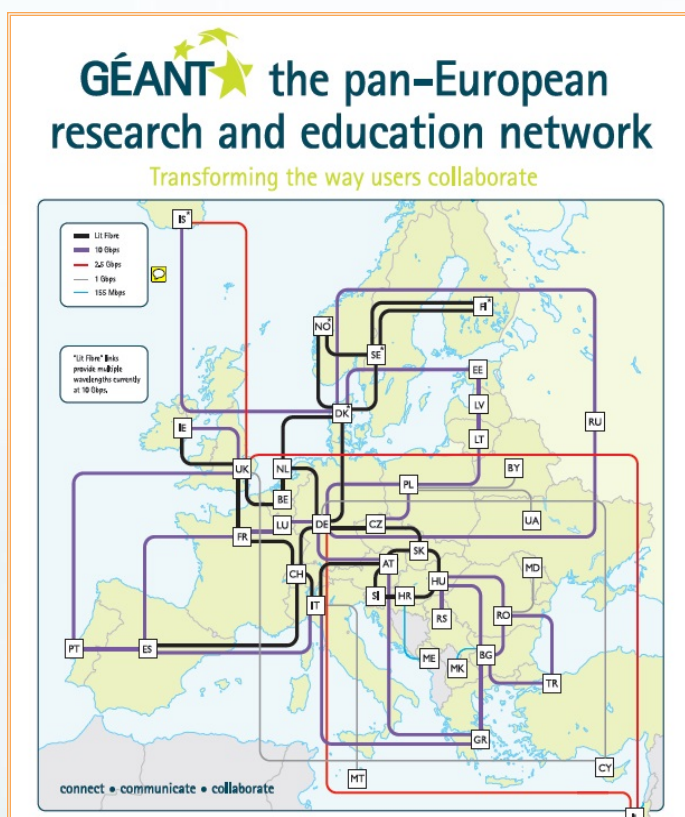
Thanks to RedIRIS and GÉANT, Spanish researchers can access academic networks in other geographical areas, such as Internet2 (USA), Canarie (Canada), RedCLARA (Latin America) and TEIN (Asia Pacific), among others.

Users

RedIRIS offers its services to around **500 institutions** (including Spanish universities, public research centres and ICTSs)

- **150,000 researchers**
- **Around 2,000,000 potential users**

Pie chart:
- R&D Centres 39.79%
- Others 17.34%
- R&D Managers 14.89%
- Universities 16.32%
- Dept. Hospital Research 11.63%
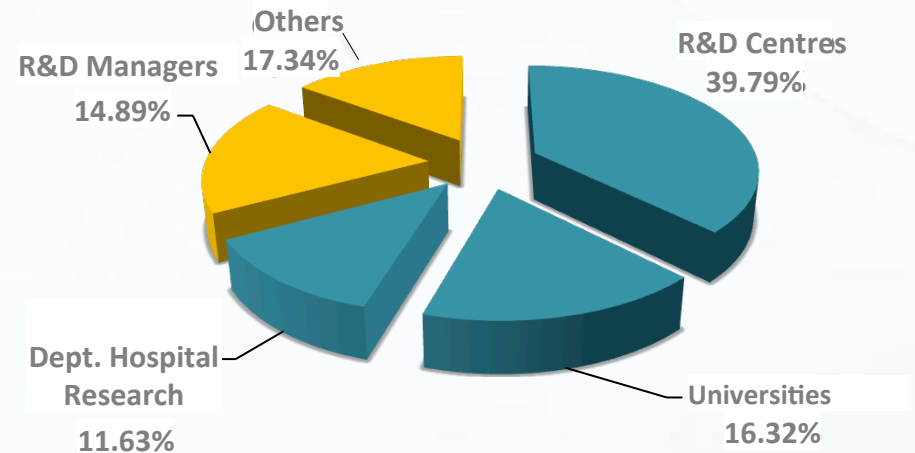
Main users:

Calar Alto Observatory (Almeria)

Telescope of the Yebes Astronomical Centre (Guadalajara)

CSIC National Microelectronics Centre
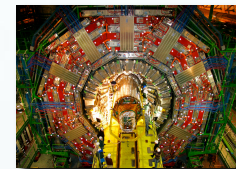
CERN (Switzerland)

Marenostrum, Barcelona Supercomputing Centre (Barcelona)

Laboratory of the Polytechnic University of Madrid

Doñana Biological Station

IAC Great Telescope of the Canary Islands

Users

Personalised services by type:

RedIRIS continually adapts its services to the needs of users at any given moment
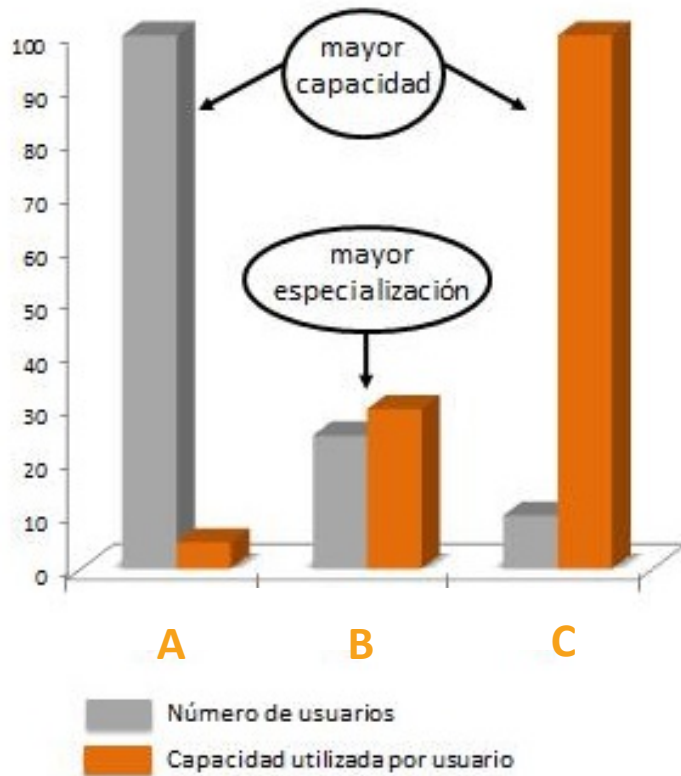
A. Basic service
- Web browsing, email
- Few users, many potential users
  Example: university students

B. Research projects
- Multicast, streaming, VLANs, VPN, QoS
- User communities, virtual organisers
  Example: Flamenco en Red (UCA)

C. Large-scale e-Science projects
- High energy physics, astronomy, biomedicine, natural sciences, IT research, etc.
- Supercomputing and Grid users
- Requires high-speed links (10 Gb)
  Example: Large Hadron Collider (LHC)

Case studies

LHC

The Large Hadron Collider (LHC) is the largest instrument in the world to study the origin of the universe. This innovative engineering project uses a 100-metre-deep circular tunnel with a circumference of 27 km. (located at CERN) generating billions of pieces of data which are analysed by 10,000 physicists around the world.

RedIRIS transports massive amounts of the LHC's data:

RedIRIS connects the Tier1 Spanish centre (PIC) to the LHCOPN network using a 10 Gbps circuit and offers connectivity from the seven TIER2 centres to PIC. Furthermore, it connects the Portuguese centres to the PIC and makes the perfSONAR tool available to the project

Case studies

Supercomputing

Spain has a network of interconnected supercomputers (RES), which in turn connect to the European supercomputing infrastructure through the PRACE project. Thanks to RedIRIS, which establishes the connections, enormous amounts of data are transmitted.

RedIRIS Services

RedIRIS Services

RedIRIS offers a high-capacity communications backbone network known as REDIRIS-NOVA to its affiliated institutions, providing them with access to both the worldwide research Intranet and to the global Internet.

RedIRIS also offers other connectivity-related services such as IPv4 and IPv6 routing and multicast content distribution, among others.

www.rediris.es/servicios/conectividad/
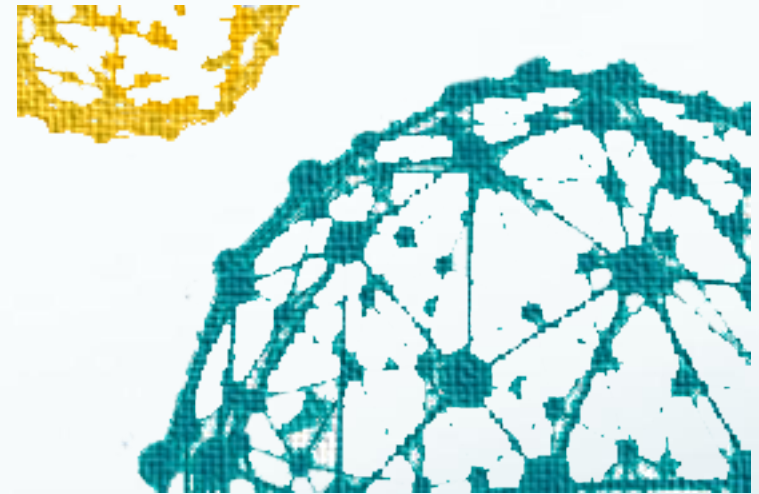
RedIRIS Services

RedIRIS offers member institutions high-capacity end-to-end optical circuits (10 Gbps lightpaths) and virtual circuits for connecting groups located in different geographical locations as if they were on the same network.

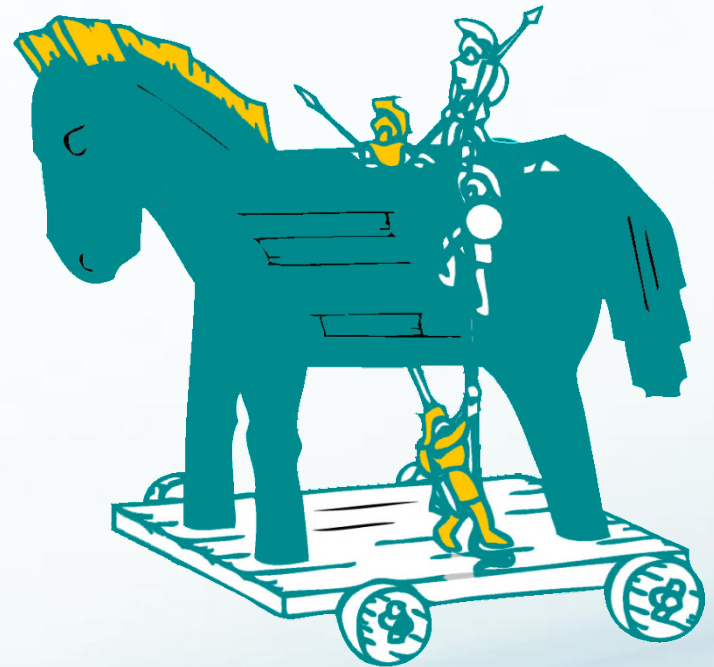www.rediris.es/servicios/redes_privadas/

RedIRIS Services

Security

RedIRIS has a team of experts that oversees the security of your network and the communications that take place through it. It also offers security certificates and advises institutions on security issues.
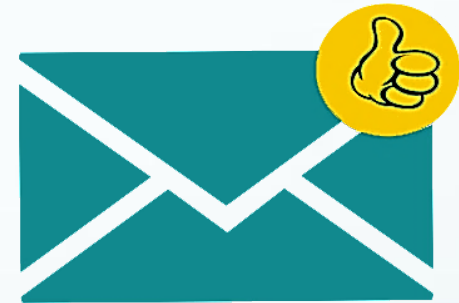
www.rediris.es/servicios/seguridad/

RedIRIS Services

RedIRIS places tools at the disposal of its affiliated institutions in order to help improve their email quality.

Highlights include reputation list management of IP addresses to help reduce spam, and a centralised spam filtering platform (" Washing machine").

www.rediris.es/servicios/calidad_correo/

RedIRIS Services

RedIRIS digital identity services simplify access of affiliated institutions' users to different online services by means of mechanisms that allow for flexible data exchange in accordance with the strictest privacy and security standards.Highlights include SIR and IRIS-SARA services.

www.rediris.es/servicios/identidad/

RedIRIS Services

RedIRIS, through its **eduroam.es** service, allows members of scientific and academic centres to directly access WiFi networks of similar centres in Spain and in many countries abroad by using their credentials of their centre of origin.

www.rediris.es/servicios/movilidad/

RedIRIS Services

Collaboration

One of the fundamental aims of RedIRIS is to promote collaboration between researchers. To this end, RedIRIS offers affiliated institutions a collaborative repository and email distribution lists so that users with common interests can exchange information quickly and efficiently.

www.rediris.es/servicios/colaboracion/

RedIRIS Services

RedIRIS provides technical support to affiliated institutions for issues related to management of communications networks, monitoring of services, network monitoring tools (such as the perfSONAR service), equipment and network security, installation and use of systems, or any other issue related to RedIRIS's activity.

www.rediris.es/servicios/soporte_instituciones/

RedIRIS Services

RedIRIS undertakes various measures aimed at disseminating information about its activity and services among members of its community.

To this end, it organises courses and specialised events such as Working Groups or Technical Conferences which bring together over 400 representatives of its member institutions annually.

Furthermore, RedIRIS edits publications and disseminates information regarding its services through its website (www.rediris.es), is present on social networks (Facebook and Twitter) and sends a periodic online newsletter (RedIRIS e-newsletter).
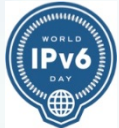
www.rediris.es/difusion/

Participation in forums and projects

RedIRIS participates in national and international research forums and projects to share experiences, develop synergies with other organisations in the sector and improve existing and future services.

THANK YOU VERY MUCH!