EXECUTIVE SUMMARY

Client
Doctor Negrin University Hospital of Gran Canaria

Industry
Health

Location
Spain

Business Challenge
- Setting a new local area network
- Providing high capacity, availability and performance communications
- Security in hospital communication and efficiency to meet the Centre's needs

Business solution
- Catalyst 6500 VSS Virtual Switching
- Local high availability and capacity network
- Catalyst 3750 series switches

Business results
- Providing better patient care and quality service
- Better experience for the patient by means of uninterrupted safe communications.
- Communication network prepared for future applications

The Doctor Negrin University Hospital of Gran Canaria introduces a new high capacity and performance local area network with the Virtual Switching System developed by Cisco.

The Doctor Negrin University Hospital of Gran Canaria integrated a new high capacity and performance local area network to the facilities in order to provide better care and quality services to the patients. This hospital is the first to implement the Virtual Switching solution developed by Cisco. In this way, it becomes a pioneer centre in the use of virtualisation technology in Spain.

Business challenge

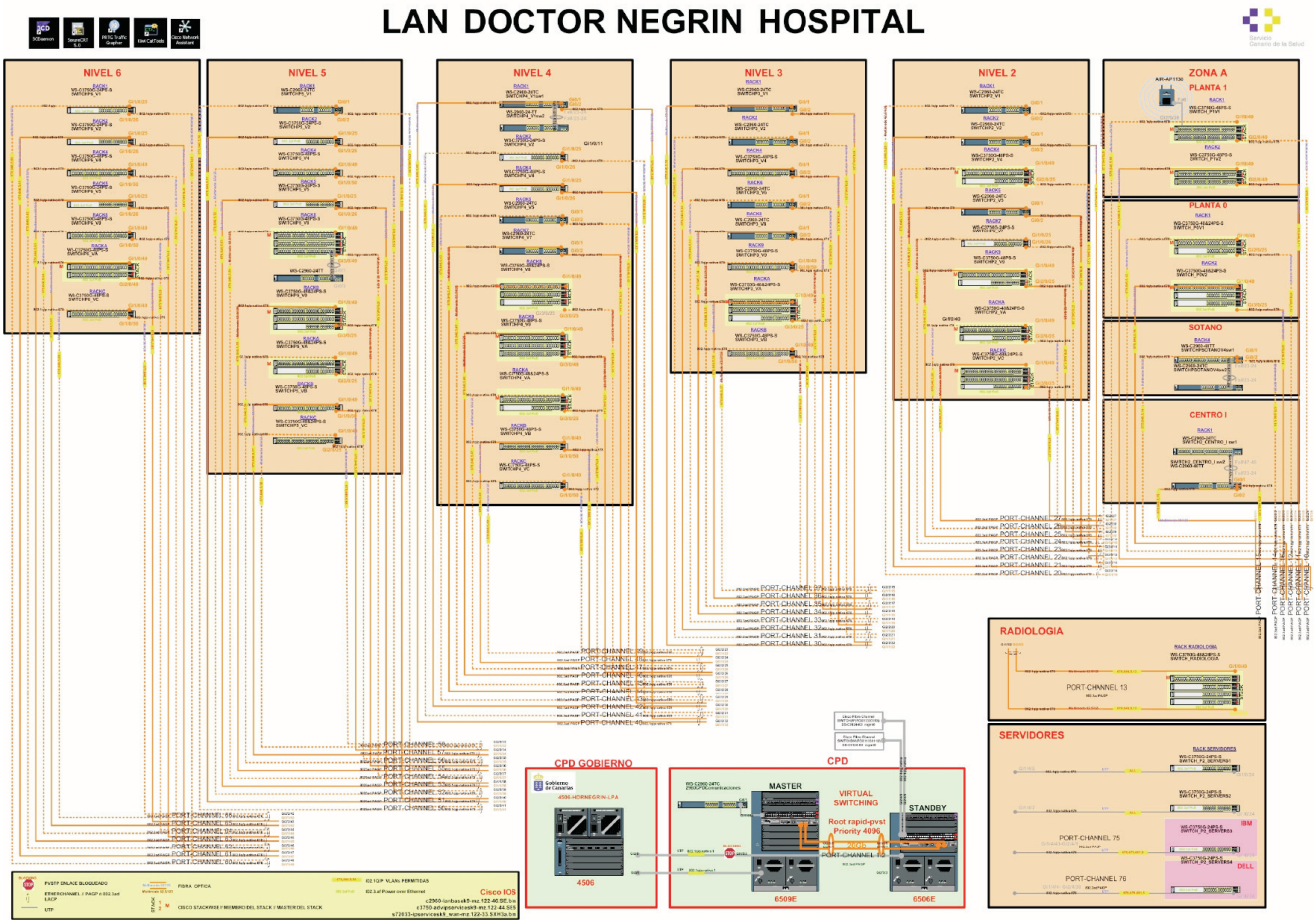
The Doctor Negrin University Hospital of Gran Canaria, located in Las Palmas de Gran Canaria (Canary Islands, Spain), is part of the Canary Health Service's hospital network. It was opened on June, 1999. This centre was created as a response to the demands coming from various public and private institutions and from citizens themselves. The hospital provides health cover to inhabitants from various cities of Las Palmas. The registered population amounts to 450.000 inhabitants and has a staff of 2000 workers. The centre has 704 beds for hospitalisation, 43 day beds, a surgical area of 24 installed operation rooms and 86 establishments to attend external consultations. It has the latest technical diagnostic and treatment means including, among others, magnetic resonance and linear accelerators. It is a regional reference centre for cardiac surgery and radio-therapeutic oncology and an autonomous reference centre for allogeneic bone marrow transplant.

One of the hospital's operative strategy keys is the use of technology as a way of improving excellence in patient care. Within the technological advances included in this strategy, the most important are digital image, pneumatic transport systems, robotic transport system, voice and information technology, through sophisticated networks with almost 2.000 phone extensions, air-conditioner systems, security systems for occupants and the centre's patrimony as well as the medical gas distribution network network formed by a main power station and two sub-stations to cover the needs of the entire hospital.

All these facilities are controlled from the centralised Technical Management Centre where all the automation signals from various equipment converge.

Another key element has been the integration to the facilities of a new local network developed by Cisco and based on 10 Gigabits Ethernet links which make the network more efficient. This will permit to better attend the patients since the high availability of the network and bandwidth enlargement ensure real-time hospital communications and enable allow quick and and efficient responses to the hospital needs. Cisco's installation of the Virtual Switching System has turned Doctor Negrin University Hospital of Gran Canaria into a pioneer centre in the use of this avant-garde technology, thus becoming a reference for the Spanish health sector.

> **"This new information highway enables to increase the hospital network's availability and security, and further makes it suitable for providing new quality services, not only to patients but also to the staff, who can access a video library on line or live Internet Protocol Television transmissions from the operating rooms or galleries to the entire intranet. In the future, the centre's integrated network may lead to IP telephone network through which voice communications will be assured as well as better dynamism in attending the calls".**
>
> Eduardo Estaún- Managing director, Doctor Negrin University Hospital of Gran Canaria (Las Palmas de Gran Canaria, Spain).



System installed at Doctor Negrin University Hospital of Gran Canaria

Technical description of the solution

In order to resolve the technical and business requirements established by the Doctor Negrin University Hospital of Gran Canaria, Cisco suggested a solution based on Cisco Catalyst 6509-E switches, virtualised as a single switch thanks to the Cisco Virtual Switching System technology. Using Catalyst 6500 and its virtualisation system, the hospital improves its scalability, and network management efficiency.

Moreover, the staff can access a user-level network consisting of 68 systems Cisco Catalyst 3750 equipped with Stackwise technology. This solution enables access at 1 Gigabit Ethernet to 24, 48, 72... ports.

Cisco recommended Catalyst 6509-E because of its capacity to provide necessary interface density and switch level. Cisco Catalyst 6500 Virtual Switching System offers the maximum operating time without interruptions. If one of the chassis fails, the interruption time will be less than 200 mseconds, thanks to the NSF/SSO inter-chassis technology. At the same time, it simplifies the network's logical architecture by a 50% and dramatically reduces operational costs.

Being the first centre that implements this new network technology, the Doctor Negrin University Hospital of Gran Canaria is pioneer in the installation of Cisco's Virtual Switching System VSS solution.

The benefits provided of by this new virtual technology can be grouped into 3 main categories:

1.- VSS improves operational efficiency

- A single administration point for the logical switch that can be managed through only one configuration log and a single IP.VSS, which reduces the number of devices to manage by half.
- Multi-chassis Etherchannel (MEC) which enables level two loop-free redundant topologies without the need of Spanning-tree protocols (STP). Moreover, MEC enables to use double bandwidth since it allows to balance the traffic between all topology links.
- Flexible installation options regarding the localisation of inferior layer switches connected to standard 10 Gigabits interfaces.

2.- VSS improves non-stop communications

- Anti-failure checking systems between devices which prevent applications based on the network's information from suffering any interruptions while working. VSS eliminates the 2-3 layer protocols reconvergence if a network's virtual member fails.
- Etherchannel is used for recovering 2-3 sub-layers links, allowing reconvergence times of at least 200 mseconds.
- Capacity to update the switch's operative system version (IOS) without any impact on settings and network services (In Service Software Upgrade).

3.- VSS increases the system's bandwidth up to 1.4 Tbps

- Activates all available bandwidth between every layer redundant device of the two Catalyst 6500 with a balancing system of feed based on Etherchannel.
- Enables the use of standard links for network interfaces with the server working with various switches and being able to maximise the bandwidth available to the server.
- Maintains the bandwidth eliminating unicast traffic flooding causing asymmetric routing and optimising the number of leaps for the hospital's internal traffic.

Cisco local network system provides security, connectivity between all the hospital's services quality and real-time applications such as voice and video applicationss. Furthermore, it guarantees access to information and resources from anywhere in the hospital, reducing operational costs.

Business results

Thanks to the implantation of the new network, the Doctor Negrin University Hospital of Gran Canaria will obtain the following advantages:

- Improvement in service quality and patient care.
- A safe local area communications network that allows a fluent and uninterrupted communication.
- High network availability which ensures real-time communications within the hospital and enables to quickly and efficiently meet its needs.
- Supporting the network infrastructure in order for it to be ready for future applications.

The new network installation was finished in March of 2009.

> **"In a centre like the Doctor Negrin University Hospital of Gran Canaria, Cisco technology is particularly useful for provide providing quick and efficient care to patients, either for hospital admittance or for a check-up in the centre. At Cisco, we think that technology is fundamental to change the way we communicate and truly beneficial in order for inhabitants to improve their life quality".**
>
> Jesús Galindo - Director de Sector Público, Cisco España

Next steps

This technology serves as a basis for future implementation of additional services like the ones foreseen in the Unified Communications solutions, wireless network solutions, network security solutions or applications of specific services. In the Switches Catalyst 6509, some of these solutions simply require the installation of an additional service module in the switch chassis (like Wireless or Firewall Services Module).

Products list:

Routing and switching

- Cisco Catalyst Switching 6509-E with Virtual Switching System 1440
- Cisco Catalyst series switches 3750

For further information:
To know Cisco's solutions in the health sector please see the page:
www.cisco.com/web/strategy/healthcare

To learn more about Doctor NegrínUniversity Hospital of Gran Canaria, please go to:
http://www.gobcan.es/sanidad/scs/hospitaldoctornegrin.htm

For further information on Cisco's products
www.cisco.es

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV
Amsterdam, The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.