# D-Link®
## FOR BUSINESS

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2021 / CASE STUDY

# Enterprise 10-Gigabit Switches in the Computational Chemistry Cluster at the University of Barcelona

UNIVERSITAT DE BARCELONA



## SUMMARY

**Customer:** Institute of Theoretical and Computational Chemistry of the University of Barcelona

**Installing Partner**: SIE, VIP+ Silver Partner

**Sector:** Education/Research/Campus

**Environment:** 10-Gigabit network for fibre-based connection to the Computational Cluster developed by SIE. Gigabit network for IPMI and GSM communications.

**Installed solutions**

2x DXS-3400-24TC 10G Managed Switches
2x DXS-3610-54T/SI ToR 10G Managed Switches
2x DGS-1210-52 Smart Switch
2x DEM-CB100S SFP+ Stacking Cable
2x DXS-PWR300AC Power Supply

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*"More than 100 researchers from many different countries work at the centre and because of the power of the new cluster we have opened up research into new fields, from molecular dynamics, artificial intelligence, and machine learning to 3D molecular structure design."*

Jordi Inglés - Director of the Institute of Computational Chemistry

## The Project

D-Link has provided 10-Gigabit Managed Switches for network infrastructure, providing fibre-based access to the Institute of Chemistry's (IQTCUB) new calculation cluster. IQTCUB is one of the most acclaimed centres for research in various fields of computational and theoretical chemistry. IQTCUB work includes the development of computational methods and tools, the application of various techniques for electronic structures and the science of materials.

## The Challenge

A decision was made to increase the data centre and computing capacity, in this case adding a new cluster known as IQTC09, which increased the number of calculation cores by 40% and the RAM by 70%. The cluster consists of 1,664 2.9 GHz cores and 26 TB RAM, deployed on 26 nodes developed by SIE Ladón, Partner of D-Link's VIP+ Channel Programme. This is a company with more than 30 years of experience specialising in High-Performance Computing (HPC) solutions.

## The Solution

Cluster nodes are integrated in a 10-Gigabit network connected by fibre to the outside for distribution to connected devices such as computers and desk-top stations. For this, 10-Gigabit Managed Enterprise Switches have been used from the DXS-3400 and DXS-3610 series. These Managed Layer 3 ranges are designed for Top-of-Rack, Campus and Data Centre environments, as well as for distribution, because of their physical stacking and ample 10-Gigabit port density.

In September 2021, a new extension based on the D-Link DXS-3610-54T/SI Switch was completed (a series that developed the DXS-3400 series with Open Flow and SDN, with copper and fibre 10-Gigabit ports, as well as 40G/100G QSFP+/QSFP28 ports) and new GPUs. Following this upgrade, the computational cluster has 17 GPUs with over 330 TFlops in single precision, and more than 178,000 CUDA cores. Thanks to D-Link's SNMP management software, D-View 7, joint monitoring of the two clusters can be achieved.

It was also necessary to create a Gigabit network for IPMI and GSM communications by installing a DGS-1210-52 D-Link Gigabit Smart Switch with full Level 2 management and Level 3 Lite with static routing.



SIE