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New network architecture at IN2P3-CC

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The Computer Centre of the French National Institute for nuclear and particle physics (IN2P3-CC), located in Lyon, has recently rolled out a major network upgrade. The previous network architecture, nearly 4 years old, reached limits and an upgrade was necessary to face new challenges, particularly massive data transfers, virtualisation, heavy Grid computation and an upcoming additional computing room.

After a thorough analysis of current network devices (feature, topology, configuration, usage) and network behaviour (identifying traffic patterns, main areas of exchange, bottlenecks, major consumers and producers) a new architecture was designed. A key objective, besides removing bottlenecks, was to improve scalability of the network, especially by enabling seamless and non disruptive bandwidth upgrades in the future. Strong attention was paid to use configurations able to deliver wire speed.

Even with strong preliminary testing and anticipating all possible tasks (pre-wiring, creating new configurations, making checklists...) the deployment was done in September 2010 within a nightly scheduled maintenance during a 5 hours network intervention (not continuously service impacting). We also used the maintenance window to upgrade software on 170 network devices, harmonising management and supported features.

Layout was completely re-organised to reduce as much as possible paths length for heavy exchanges. The new network architecture is built around a central redundant Cisco Nexus 7018 aggregating flows up to 60G from several key functional areas (storage, computing, WAN...). Hosts doing intensive exchanges are connected up to 10G directly through a distribution layer, mainly featuring 4900M and Catalyst 6500, while other consumers are offloaded onto an access layer. 80G are foreseen to connect the new computing room.

Summary

The process leading to the new network infrastructure at IN2P3-CC, how it was deployed, benefits, lessons learnt and early feedback will be presented.

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