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SOLUTIONS

Structured Cabling Serves Multiple Airport Systems

Aer Rianta cuts maintenance time by half at Shannon Airport with the SYSTIMAX® GigaSPEED® Solution

Laying cable at a modern airport is now as essential as laying taxi-ways and aprons. Without networked systems, getting passengers on and off aircraft would be like getting planes off the ground without runways.

This is apparent at Shannon airport on Ireland's west coast. Since 1945, when transatlantic airlines' made it their gateway to Europe, the airport has grown steadily and its systems are amongst the most sophisticated in the world. At the heart of its technology is a structured cabling installation that serves everything from telephones to CCTV.

The same cabling is used both by the airport owners, Aer Rianta, and tenants including airlines, travel companies, car hire and other airport related businesses. Its plug and play convenience makes the network an increasingly attractive part of the

facilities package offered to companies leasing space in the terminal buildings.

"The buildings are now flood wired, and any equipment with standard RJ45 connectors can be plugged into the network via a nearby outlet," said Airport Engineering Manager, Brendan Mullins. "Re-patching and extending the network is also straightforward, so life for users, system builders and maintenance engineers is made easier."

The installation of the structured cabling system was recently completed using the SYSTIMAX GigaSPEED Solution, providing over 4,500 outlets. These are located on the walls and ceilings of the established terminal building and also in the new, £30 million, 10,000m² extension. Each outlet can provide voice, data and video connectivity. Data throughput is up to 100 Mb/s and, if the current 100BASE-T network is upgraded, there is potential for 1 Gb/s or more.

Connecting Everything

Equipment using the network includes client/servers, CCTV cameras, and point-of-sale systems in bars, restaurants and shops. Perhaps the most important application is the CUTE (common user terminal equipment) system for flight check-in and departures. This is central to the operations of more than 20 airlines and charter flight companies using the airport.



Equally vital is FIDS (flight information display system), which has twin servers connected to the network backbone. In effect, the backbone connection directly links the servers via high bandwidth, singlemode fiber, enabling hot standby operations should one of them malfunction.

Another role of the cabling system is to interconnect the airport's building management system. Sensors and controllers plugged into the network automate the management of heating, ventilation, air conditioning and lighting to ensure passenger comfort and save energy.

In all these, and other applications, the network infrastructure now provides reliable, consistent, high performance connectivity.

Total Replacement

The new structured system supersedes ad hoc cabling for telephone and IT equipment that had accumulated over 30 years. This included twisted pair, coaxial and fiber cables, installed and maintained by tenants at the airport as well as by Aer Rianta itself. The end result was as an exceptionally complex installation that had become expensive to maintain.

As early as 1995, Aer Rianta's Technical Services department had been looking at ways to simplify its cabling and cut running costs. By late 1998 it had been decided that the only solution was total replacement.

Brendan Mullins was responsible for specifying the requirements and selecting the best supplier. Early on, it became clear that investing in a high performance, integrated system from a single supplier would pay dividends both in the short and long-term.

"Ad hoc installations had left us with a tangle of different cable, including many live connections hidden or trapped by redundant ones," he said. "So we were determined to impose a systematic approach that ensured we'd never be troubled by confused or incompatible cabling again."

Offerings from all the major cabling suppliers were considered, but the SYSTIMAX GigaSPEED Solution was most suitable for Aer Rianta's requirements. The company was already using SYSTIMAX Structured Connectivity Solutions at its Dublin and Cork airports, and the system had proved its dependability.

Another key feature of the GigaSPEED Solution for Aer Rianta was its conformance with the Category 6/Class E cabling standard. This provides for end-

to-end throughput in the gigabit range, and its high bandwidth also gives significant advantages with current 100 Mb/s applications.

Lower bit error rates associated with Category 6 cabling cut file transfer wait time and improve the quality of streaming video and sound with 100BASE-T applications. This ability to handle multimedia, combined with potential for Gigabit connections to the desk, provided the future proofing that Aer Rianta required.

"We were looking 15 or more years ahead and wanted to be sure the cabling wouldn't restrict development over this period," said Brendan Mullins. "Airport systems are evolving fast and Shannon is expanding, so we had to be sure the new infrastructure would not be rendered obsolete by innovation and growth."

Fire Safe

Cabling for both the original and new buildings runs in ceiling spaces, some of which are above passenger concourses. Aer Rianta was fully aware of the issues surrounding fireproofing and this enabled them to make an informed choice. To ensure maximum safety, Aer Rianta chose cable types with the highest standard of fire resistance. SYSTIMAX GigaSPEED FSFR (fire safe, flame retardant or Plenum) cable was selected because it is specifically designed for areas where risks due to fire spread are paramount.

It was developed with groups such as the US National Fire Protections Association, and is recommended by the UK Loss Prevention Council at sites wherever safety is a priority. Insulated with Teflon* FEP, FSFR provides a good balance between signal transmission and fire safety. It has high melting point, thermal degradation and auto-ignition temperatures. In addition, when combustion does occur, heat generation, smoke release and flame propagation rates are all extremely low.

Installation of the cabling, which began in early 2000, was handled by SYSTIMAX BusinessPartner, NTL. Phase 1 was to cable the new building, installing wall-mounted outlets in groups of four throughout office spaces. These provide phone, fax, data and building management connections at each location. In other areas, many double outlets are installed to serve devices including cameras, displays and sensors.

Around 75 percent of the work was done during Phase 2, covering the original building where existing cable runs made progress more difficult.

* Teflon is a trademark of the Dupont Corporation

“ Demand for network connections is accelerating as new systems are introduced, so our cost savings will follow the same upward curve. ”

Mr Brendan Mullins, Airport Engineering Manager

Across both buildings, a total of 18 communications rooms have been built or refurbished. These house the compact SYSTIMAX 110 patching frames that allow fast re-routing of connections and hook-up of new links.

Backbone IT traffic between communications rooms is carried over Gigabit Ethernet. To ensure resilience, there are multiple cross-links between the rooms via the mixed single and multimode fiber backbone cables. This provides for every zone of the network to be served by two communications rooms, minimizing the impact of any faults.

The system was developed with no single point of failure and, for resilience, there are two additional dedicated telecom rooms on the site. These enable telecom providers to connect into the structured cabling system at designated points. The providers' services are then delivered to 17 different client-owned PABXs, ranging from six to 200 lines, via Aer Rianta's infrastructure.

"When one national supplier served all the businesses here, they laid and maintained cabling runs direct to PABXs," said Brendan Mullins. "With deregulation and arrival of new telecom suppliers, this was not practical, so providing the final link via our cabling was the only solution."

Costs Halved

Once the new installation was operational, Aer Rianta began migrating its own and clients' applications from existing connections to the new ones. As this is done, old cabling is removed and, eventually, one common, consistent installation will serve every telephone and networked device on the site.

Investment in the Avaya SYSTIMAX GigaSPEED Solution was justified on cost saving alone and, in operation, it is cutting time needed for network-related tasks by more than half. With thousands of network changes required annually simply to deal with staff moves, office reorganization and relocation, Aer Rianta can appreciate the scale of savings. Added to this, there are tens of thousands more actions to re-route, disconnect and extend the network for new projects every year, and almost as many changes to existing systems.

"Demand for network connections is accelerating as new systems are introduced," said Brendan Mullins. "So our cost savings will follow the same upward curve."

Among the additional devices that will soon be plugged into the network are sensors monitoring the operation of baggage carousels. Like other new systems, linking these to servers and displays will not be a problem since the cabling system makes data communications as easily available as the electricity supply.

Wally Blennerhassett, Sales Director, SYSTIMAX® Solutions, Ireland, said, "We are delighted with the installation at Shannon Airport and especially the way in which we have enabled voice, data and building management systems to be integrated on to one converged system. In the rapidly expanding and evolving world of airport systems, we had to be sure to install a system that would be both safe and future proof. We are also confident that over time Aer Rianta's new infrastructure will show considerable savings in both costs and time."

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