Dundee City Council

One of Europe's most advanced Smart City networks

CASE STUDY-SMART CITY

Dundee City Council background

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Dundee is a coastal city on the Firth of Tay estuary in Eastern Scotland and is Scotland fourth largest City with a population of 148,270. Historically famous for the production and export of Jute, Jam and Journalism (D C Thompson publications) Dundee has a regenerated waterfront with 2 nautical museums: RRS Discovery, Captain Scott's Antarctic expedition ship, and 19th-century warship, HM Frigate Unicorn. North of the water, Verdant Works is a museum celebrating the city's jute-manufacturing heritage. It is fast becoming a tourist hot-spot and in 2019 the Victoria and Albert museum was opened making the city even more attractive for tourists.

The Requirement to manage the cities traffic

In line with other major cities there was a requirement to control the cities traffic system and Dundee City Council Traffic Department needed to go to tender to procure a robust communications network. Lead Officer UTC Mr. Peter Coulson issued a tender under the Crown Commercial Services Framework and Case Communications were invited to submit a bid.

Case Communications 6401 routers

Case Communications proposed their 6401 UTMC Rugged Routers which are specifically designed to handle Urban Management Traffic Control (UTMC) systems. Their lightning protection protects the O.T.Us (Outstation Transmission Unit) in the event that the copper circuits get struck by lightning. The 6401 routers are able to operate up to 70^0C and are designed for reliable use in harsh conditions.

High Levels of Security

The Case Communications 6401 routers run secure encrypted tunnels over the Internet back to the In-Station making the solution completely secure.

6401 Routers carrying out automatic health checks

One of the problems with ADSL are lines the 'hanging' which happens on some BT Exchange equipment and has never been rectified by BT. This results in engineers having to go out and reset the routers if they hang. The Case Communications 6401 routers have a 'Health Check' monitor which automatically detects the health of the line and resets the DSLAM in the event it detects a problem.

Making Life Easier using Advanced Network Management

One of the important factors in running a network is control of that network and for this Case Communications offered their CaseView SNMP Network Management system. CaseView depicts a map of the network showing every product in that network. In the event of a problem an icon turns yellow first, and if the problem persists the icon turns red. CaseView then logs the time and date of the problem in its database, allowing a record of the systems performance to be maintained. In addition, it's possible to send a message to the O.T.U allowing a visual view of the entire end to end system and making life easier in diagnosing problems.
By clicking on an Icon it's possible to logon to any product and check its status and also configure the unit.

The Lead Officer of UTC, Mr Peter Coulson states that CaseView has proven invaluable, at a glance it is possible to see communications issues and the immediately differentiate between OTU faults and line faults, which greatly increases efficiency and in doing so saves aggravation, lost time, and money in needlessly sending signal engineers to telecommunications faults or vice versa.

Phase Two upgrading to Fibre

As Dundee's requirements for connectivity and bandwidth increased it became cost effective to start replacing some of the routers in the city centre and to install a Gigabit Fibre optic network.

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Saving Operational costs.

While installing fibre had a capital cost it also reduced the operating costs by getting rid of the copper circuits. By installing a high speed fibre network Mr Coulson had created a City 'super highway' which could accommodate all of the cities IT needs. The high performance network, allowed applications such as CCTV, and ANPR, to operate on the same network as the Traffic Controllers.

Using Case Communications PIGE-8T-4S-MX switches with 8 Gigabit PoE / PoE+ ports and 4 x Gigabit Fibre trunks a resilient ring was built, with the ability to self-heal in the event of a failure in 10ms. As the PIGE-8T-4S -MX switches provide power to connected devices, CCTV and ANPR cameras can be powered from the network. By using VLANS (Virtual Local Area Networks) the network traffic can be kept separate even though they share the same physical structure.

Phase three expanding the network to comply with the Scottish Government for clean air

The Scottish Government has stipulated that the four major Scottish Cities, Edinburgh, Glasgow, Aberdeen and Dundee must implement a 'Clean Air' Policy. This states no vehicle must enter the city unless it has a Euro 6 Compliant engine. In order to police this Dundee need to expand the fibre network and add more ANPR cameras. The diagram below shows the first and second phase fibre networks.

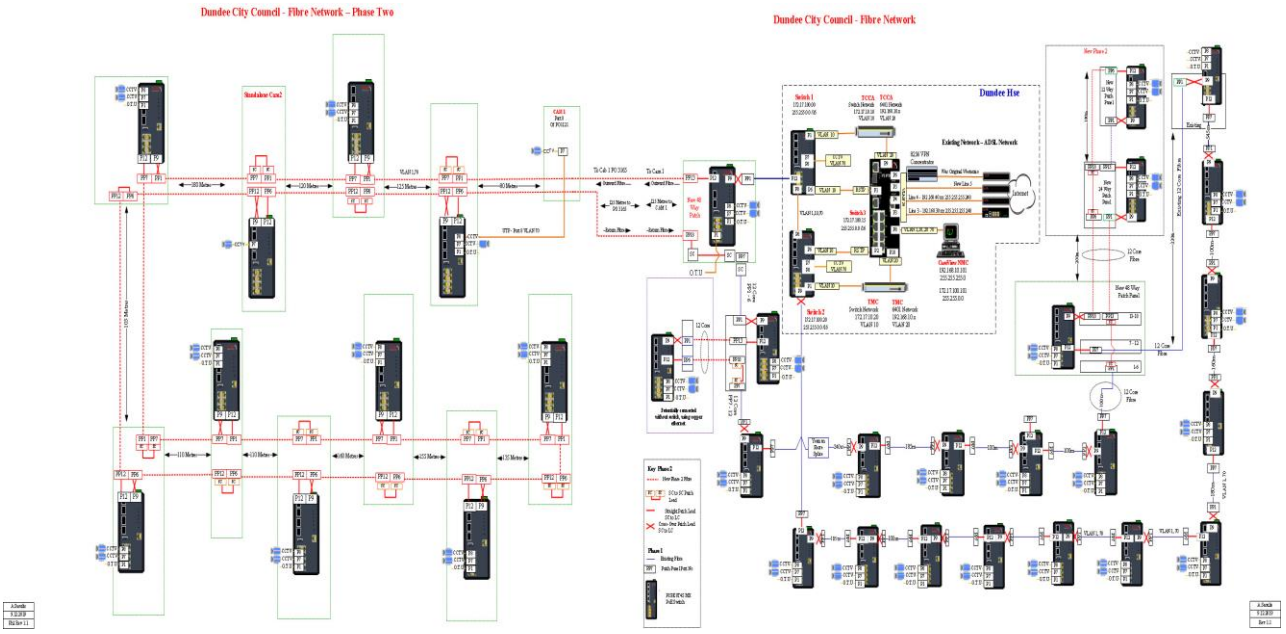
Short Form Pluggables with the ability to monitor the fibre.

To further improve reliability, the Case Communications switches are fitted with the latest SFP (Short Form Pluggables) (Modular Fibre Optic drivers) which use the advanced DMI (Dynamic Managed Interfaces). These Fibre drivers detect the transmit and receive levels, and the temperature at the fibre interface. In the event of any conditions being detected which are outside of 'normal parameters', alarms are sent to warn management of impending problems.

The 2020 Covid outbreak and Lockdown

With the Covid outbreak in 2020 Dundee Lead Officer UTC Mr Pete Coulson was required to work from home along with many other local authority employees. However with remote access to CaseView Mr Coulson could operate his UTMC system and network equally as well as being based in the office.

The diagram below depicts the first two phases of the fibre networks.



As with other SMART cities Dundee City Council could see the benefits of 'Spend to Save' and strive to make Dundee one of the most advanced SMART cities in the UK.

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