

Marks & Spencer rings the changes as credit card authorisation traffic swamps its network. Cable & Wireless solves the problem and adds benefits at no extra cost.

Cable & Wireless brings pioneering IP voice and data network to hundreds of stores

Customer demand led Marks & Spencer, a leading UK retailer, to take credit cards at its 304 stores. But the card authorisation traffic swamped its old data network, delaying customers at the checkouts. The company upgraded the network to Cable & Wireless IP-VPN QoS, a highly flexible service that prioritises urgent traffic and can cope with increasing volumes of traffic — all without extra cost. It's now looking at merging its voice and data networks to achieve a cost reduction as well as better performance.

Traffic on the existing network was growing and a decision made in 2000 to start accepting credit cards had further burdened the infrastructure. The company could see checkout times at its tills rising as authorisation traffic swamped the network, and was concerned this would hit the essential Christmas and January sales periods. It had to fix its over-burdened network, and fast.

'The old network wasn't going to get us through the Christmas 2000 trading peak,' said Adrian Pratt, the technical consultant to Marks & Spencer responsible for the network upgrade program. 'One of the most important store activities is card authorisations, which demands a quick response at the till. The network was so congested that the queues were lengthening.'

Long queues run counter to Marks & Spencer's customer-focused approach to retailing. And the network's performance wasn't hitting just customers. Staff were finding it slow to access their email and to get at key documents, such as pricing information, stored on the company's networked public folders, and so could spend less time on the shop floor helping customers.

Marks & Spencer also faced issues with its voice network. Each store had a limited number of phone lines, reducing customers' access at busy times. The company was also being billed for calls between stores, a cost it could do without.

Legacy network lacked prioritisation

At the heart of the issue was Marks & Spencer's old X.25 network of 64 kbit/s links to each of the stores. The network had been designed 16 years ago and, despite having had technology upgrades, had now reached the end of its useful life. 'We couldn't scale it any further,' Pratt said.

One key issue with the X.25 network was its inability to prioritise traffic. According to Pratt, a lot of the network bandwidth was being taken up with traffic between the company's network of 350 Windows

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Adrian Pratt,
technical consultant
for Marks & Spencer



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NT servers, as they kept each other updated about changes made locally. Without prioritisation, this ‘NT chitchat’ was swamping vital user traffic such as credit card authorisations.

Marks & Spencer had taken a long-term strategic decision to move to an internet protocol (IP) virtual private network (VPN) some time ago. It had expected to make the move in two stages, using an interim solution before moving to an IP network. But the forecasts of network congestion that were made in early 2000 prompted the company to make the move early, becoming the first customer of Cable & Wireless IP-VPN QoS.

‘We never thought we would make it in one jump,’ said Pratt. ‘That’s why we were pleased when Cable & Wireless came along and offered us a solution.’

‘What we were looking for on the new network was Quality of Service,’ said Pratt. Prioritisation was a key requirement for the new network so that credit card authorisation traffic, which directly impacts how long customers wait at the tills, could be handled before the NT network communications. QoS also means that Pratt can look forward to getting more out of the network assets he has invested in.

Marks & Spencer wanted the new solution to be ‘cost neutral’ — not to cost them more than the network they already had. The company needed the network to offer long-term scalability to support plans for streaming video and an extended intranet. And they needed the network in place quickly to meet the Christmas rush in the stores and to avoid recurring rental charges for their existing network.

Two to become one in merged voice and data plan

The solution Cable & Wireless developed for Marks & Spencer was a pair of services, one for voice and one for data, chosen with an eye to merging them in future.

For voice it proposed Cable & Wireless National VPN (NVPN), which offers capacity for voice calls on demand from the Cable & Wireless network, rather than the fixed capacity (which has to be paid for whether it’s used or not) offered by private circuits. Calls on the NVPN network are charged at a lower rate than PSTN calls, and NVPN also offers a Dial Plan to allow short-code dialling.

For data Cable & Wireless proposed IP-VPN QoS. Like NVPN, Cable & Wireless IP-VPN QoS connects all the sites it serves (any-to-any). Its great advantage is that it supports the critical prioritisation requirement. It allows users to define priorities for certain classes of traffic, which Cable & Wireless then agrees to send through the network with guaranteed limits on delays and errors. Implementing QoS on the IP-VPN network would also be critical to it later supporting voice traffic. Without prioritisation, voice calls can break up or suffer delays that make conversation difficult.

A further benefit of both voice and data VPNs is that each site needs just one connection to the Cable & Wireless network. Each Marks & Spencer site was linked to the Cable & Wireless backbone network at 2 Mbit/s — a thirty-fold increase in bandwidth over the 64 kbit/s X.25 solution.

In the mid-term Cable & Wireless and Marks & Spencer agreed that the voice and data networks will merge, once suitable network termination equipment supporting voice over IP is available.

Even when voice and data merges on one network, the prioritisation features of IP-VPN QoS ensure essential business traffic, such as credit card authorisations, will always get through despite the extra traffic. This means Marks & Spencer can make the most of its current assets, post-poning the time at which it has to invest in more bandwidth.

‘If in future we fill the new network up we still won’t impact the business traffic,’ he said. ‘Fatter pipes don’t solve the problem — they just put the problem off. You can sweat the asset far more with QoS — it enables us to do that a lot more readily than with the old network.’

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Meeting the Christmas rush

Having agreed the new network architecture, Marks & Spencer set aggressive targets for its rollout. There were two key dates to beat – the Christmas and January sales rush, and the rental renewal dates for the existing X.25 circuits.

48 stores had IP-VPN QoS connections by the target date of 30 November 2000, and 17 core sites were connected to National VPN by the target of 31 January 2001.

Once the first phase had been completed successfully, the roll-out team moved into a 'wholesale' operation. They planned to migrate up to nine sites a day onto the IP-VPN network, working four days a week. On the voice side, they planned to migrate three sites a day, working five days a week.

Marks & Spencer set equally aggressive goals for this second phase. The target was to deliver 261 IP-VPN store connections by the end of April, and the team managed to complete 96% of the sites by this time. On the voice side, Marks & Spencer wanted 289 NVPN connections by the end of May. The rollout team had 97% of these stores migrated by the deadline. Where the team fell short it was usually due to problems beyond its control, such as restrictions over working in buildings containing asbestos, or delays over physical access arrangements crossing railway lines and roads.

'Cable and Wireless exceeded our expectations,' said Pratt. 'This was a major roll-out. We set tough deadlines with tough penalties and Cable & Wireless rose to the challenge.'

The roll-out has continued and all 304 Marks & Spencer stores countrywide are now linked to the two networks.

Easier access

So what impact has the new network had? Customer facing issues such as credit card authorisation times have been minimised by using QoS to give the transactions priority on the network. And customers now find it easier to get in touch with the stores because the NVPN has given each store 30 phone lines, many more than before.

For the staff a faster network has meant that access to systems such as customer ordering, ticketing, sales and stock control is easier. Access to email and shared data folders has become much slicker, according to Pratt, which in turn has allowed the company to reduce the amount of paper documentation it has to ship to each store. And regional managers can now use the 'any-to-any' capabilities of the IP-based network to draw down information about any store in their area, no matter which store they are in. The X.25 network architecture meant they had to ask for explicit links to be set up between the stores before they could access that information.

The business case for the new network

In cost terms the new network looks set to pay for itself. Pratt says that by merging separate budgets for the data and voice networks into one pot he was able to achieve the large increase in function of the new network at no additional cost. And when the two networks merge, the deal will look better still.

'The new network will allow us to integrate voice and data,' Pratt said. 'The NVPN will consolidate onto the IP-VPN, which will be upgraded to carry the voice. When we do that we can get a cost reduction. So we're cost neutral today, going to cost saving when we merge.'

'The other key thing about the architecture is that it is scalable to anything I can envisage at the moment,' he added.

Marks & Spencer has already made further commitments to the NVPN/IP-VPN strategy. The company has just added 14 general merchandise warehouses to the network, a bigger and more critical commitment than any single store. The warehouses run all day, every day, so it is difficult to find time slots when they can be moved onto the new network.

'The general merchandising warehouses are more complex because they are online — none of their data is held locally,' said Pratt. 'So if they don't have communication you've got 200-plus people standing around doing nothing.'

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To deal with this issue the new network was built in parallel with the old one and then the team staged the transition of various functions to the new network. For the most critical elements, Cable & Wireless negotiated a two-hour slot on a Sunday afternoon in which to make the transition.

‘Cable & Wireless has been very professional in their approach to this and put a lot of effort into planning, execution and delivery of all this,’ said Pratt. ‘They made sure they had heightened awareness in their network operations centre, where they were on point to ensure the whole thing hung together.’

‘All our general merchandising warehouses are running the Cable & Wireless network now and they are the most critical part of our operation. If the warehouses stop the stores quickly run out,’ Pratt added. He says the flagship Marble Arch store in London’s West End takes up to four deliveries a day.

Sweating the asset — the business case

Pratt is keen to build on the capabilities of the IP-VPN to cut costs and improve communications at Marks & Spencer. Because the network offers QoS guarantees, streaming video becomes possible. Pratt is keen to use this facility to offer e-learning, so that Marks & Spencer can offer on-site training to its workforce, particularly for the seasonal workers.

‘We have 60 000 workers with the bulk of them in the stores and there’s a large amount of training needed there,’ Pratt said. ‘E-learning with streaming media is paramount to delivering good customer service in the stores.’

QoS facilities are key to enabling the network to be used for delivering multimedia content without disrupting essential business activities. Pratt is also considering using QoS to extend the use of multimedia by sending heavily-used files, such as a video of the chairman’s presentation, to local stores at low priority. Then when people want to view the presentation they can get hold of it locally. By reducing the burden on the core network, Marks & Spencer can get more out of less, further ‘sweating the asset’, as Pratt puts it.

Working with Cable & Wireless

Marks & Spencer had a critical issue to deal with when it first started looking for a new network solution — it was becoming difficult for the shops to take payment from customers. Choosing a partner to overcome this issue was clearly going to be critical. So why did Cable & Wireless get the job?

Pratt was clear he preferred his supplier to have its own network infrastructure in the ground. And he wanted a solution that would suit Marks & Spencer’s needs precisely, without using a fully customised solution which would create support issues later on. What he wanted, in fact, was ‘a blend tailored to an extent where we can gain business benefit we’re looking for – and they were the only people prepared to do that.’

‘Cable & Wireless has shown a willingness to partner with us,’ Pratt added. ‘They were the only level one telecoms player that showed any willingness to listen to what we wanted and tailor their delivery to meet absolutely our requirements.’

He sums up: ‘They were very focused on us because we were the launch customer for the product. They have been very attentive in ensuring it’s delivered and we get what we expected. They had a ‘can do’ attitude.’

Cable & Wireless
Registered office address:
124 Theobalds Road, London WC1X 8RX

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