

Network practice

There's much more to securing and provisioning your business and plant networks than meets the eye – and, with the pressure on for better performance, getting this right is key. Antony Adshead reports on the latest solutions

it looks like the network is achieving a new prominence in the minds of the UK's IT managers and heads of business. Long viewed as 'plumbing', its strategic importance is being realised, with 78% of 600 business leaders and IT heads polled in a Cisco survey now believing their networks are "very important or vital" to their businesses – and just 10% viewing them as static data pipes.

Interestingly, in those companies performing particularly well – where turnover has increased by more than 15% in the past year – the network is viewed as a strate-

gic asset by 59% of respondents, compared with just 40% in companies with static growth. Such views are increasingly prevalent in manufacturing, where growing IT-enabled automation and monitoring of production lines and supply chains means the network is assuming a mission status every bit as critical as that in sectors such as banking.

So, what are the key drivers for network upgrades in manufacturing, the technologies coming to the fore and the main challenges to implementing cross-enterprise networks?

Naturally, there are negative drivers that pull businesses to upgrade their networks – the most obvious being when a network has been exhibiting signs of poor performance. But inefficiencies may be manifested in ways other than network slow-down. Your infrastructure may well be comprised of multiple technologies from different providers, meaning that fault-finding and maintenance are difficult. So that's one positive reason to upgrade – in this case, by consolidating your network provision, using fewer providers and newer technology.

Then there are reasons of business expansion and the resulting demands on your networks. Where business units once ran their own local area networks, plants and regional offices are now being connected globally. As Neil Rickard, research vice president for networks with analyst Gartner, says: "IT consolidation activity is a huge

Security, performance and practice

A key issue on any network is security – and where manufacturing is being connected to enterprise networks, dangerous vulnerabilities are possible. With integration between ERP and MES (manufacturing execution systems), and the growing number of connections between the wider business network and SCADA, HMI and PLC terminals, the latter devices are becoming more open to threats that were previously sealed off by proprietary networking technologies.

Torsten Rössel, director of business development at industrial security specialist Innominate, warns: "Contrary to popular belief, many industrial automation components with Ethernet interfaces, such as PLCs or PC-based controllers, are intrinsically insecure and vulnerable to even rather elementary network and malware attacks."

But protecting these systems is not as simple as using standard office LAN security techniques, not least because weekly software patch days are just not an option for production. So, while the business network is adequately protected by firewalls, intrusion prevention and detection devices, anti-virus software and the like, production environments increasingly require devices that sit at the manufacturing network edges – and hence Innominate's growing sales.

But while security is critical, so is network performance – so IT departments are likely to need monitoring tools and possibly also network accelerators. Exinda's Con Nikolouzakakis suggests: "Network optimisation and application acceleration technologies ensure that your network is used to its full potential. But customers should use network monitoring tools to understand how their network is being used. Most are surprised by how non-critical business traffic is using up network bandwidth."

The final, but certainly not least important, issue to consider, as enterprise and manufacturing networks converge, is that of the policies and practices of the IT department. Where IT in manufacturing and enterprise IT have evolved as separate functions, there is a need now to ensure that they're talking the same language, understanding one another and harmonising good practice. It's a tall order, given the classic culture clash, but it has to be done.

As analyst Gartner's Neil Rickard warns: "If you are merging IT and manufacturing functions, you will need to change organisational practices. It's not without some foundation that manufacturing sees IT as sometimes doing things that would be disastrous on a mission-critical production network. Things that might be acceptable in the IT space are not in manufacturing. You need policy on re-boots, so that they can't just be done any time; a software policy that ensures only proven and tested applications go live; and a change management policy, so that who can do what with which applications is subject to strict rules."



driver for network upgrades. Where IT may have once operated at a business unit level, there is now a drive to create shared services across countries and regions.”

At the same time, there is a growing trend towards the adoption of mainline IT networking technologies in manufacturing environments. Where industrial Ethernet technologies were once standard for shopfloor systems, such as SCADA (supervisory control and data acquisition) and HMI (human machine interface) provision, networking protocols such as IP are now being used – leading to combined manufacturing and enterprise networks.

Con Nikolouzakis, director with network performance management tools Exinda Networks, says: “Manufacturing companies cannot afford supply chain applications or CRM [customer relationship management] applications to be down or sluggish. The expense is too great in terms of not having the proper materials, employees being unproductive and possibly damaging customer relations.”

Priority traffic

A key technology coming to the fore in network provision is MPLS (multi protocol label switching), which is superseding existing WAN methods such as frame relay and ATM (asynchronous transfer mode). Essentially, MPLS is an IP-based replacement for these, with the crucial attribute of routing data traffic according to configurable priorities. So, where it was once touted as the enabler of VoIP (voice over IP, see page 14) and video conferencing – because of its ability to ensure smooth packet flow for these applications – it is now recognised as equally important for real-time production management and automation.

Carl Lloyd, director of solution strategy at Computer Associates, agrees. “MPLS is definitely on the rise. Customers are choosing it, or are being obliged to use it by suppliers that offer MPLS networks with two or three

times the bandwidth and better QoS [quality of service] than end-of-life technologies such as ATM or frame relay. Providers know it is the future. You get reliability, with higher performance, and can define the QoS for specific types of traffic.”

While MPLS is on the march in fixed WANs, wireless LAN technology is also becoming established. Not having to install cables, or re-route them for moves and changes, makes it a very attractive proposition. It is also particularly well suited to domains such as warehousing, where operators can work more efficiently as a result of not needing to return to workstations to input and receive data and instructions.

Having said that, wireless is not suitable for all operations. Although developments are underway, particularly with self-organising, time-synchronised mesh networks, wireless does not yet have a great reputation for standing up so well to the often electrically noisy environments found in manufacturing plants. As Phil Coackley, head of industry marketing with BT Global Services, says: “Wireless has its place, but is not the answer to everything. It’s very useful for some difficult areas, but there are locations with high noise levels, due to metal vehicles passing access points and so on. For these reasons, it has to be planned, measured and implemented carefully.”

Gartner’s Rickard also points to the reliability issues with wireless, compared to fixed networks. “Wireless is not a no-brainer in all of manufacturing,” he says. “There’s a good case for using it to support some of the workforce, but it’s not a complete replacement for the wired network. Manufacturing is electrically noisy and, even in a clean environment, wireless is substantially less reliable than wired. Wired is three or four nines reliable; wireless is 90% in a good environment. But it is good for visiting engineers and mobile staff.” ■

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