

WINDOW OF OPPORTUNITY

G. JAMES INTEGRATES ADMINISTRATION WITH FACTORY SYSTEMS IN ONE STREAMLINED CISCO SYSTEMS NETWORK

HEADQUARTERED IN BRISBANE, QUEENSLAND, G. JAMES AUSTRALIA IS AN INTEGRATED GLASS AND ALUMINIUM MANUFACTURER AND CONTRACTOR.

Their primary business is glass processing, aluminium window and door fabrication and the production of extruded aluminium profiles.

Established as a glass merchandising business in the 1918 with a staff of five, today G. James employs over 2100 staff and has more than 20 locations in Australia and operations in New Zealand, Singapore and Malaysia.

THE CHALLENGE

G. JAMES WANTED TO INTEGRATE ADMINISTRATION AND MANUFACTURING SYSTEMS AND REDUCE OPERATIONAL COSTS.

As early as 1992 G. James understood the value of integrated networks, installing a converged voice and data network using TDM over ISDN. In 2002 this system was upgraded to a Cisco converged network linking their head office with their 20 branch and regional locations. They also installed a Cisco IP Telephony solution in their overseas operations, which resulted in immediate cost savings from international toll-bypass and a newly developed centralised management infrastructure.

In contrast to this, the manufacturing areas were using 10 BaseFL hubs and fibre hubs as well as a duplicate hub infrastructure to further separate admin and machine control networks on their plant floors. In fact, all systems were completely autonomous with no visibility across the organisation. Orders on the manufacturing floor were completed using paper and pen, which saw long delays in collating information.

David Moy, Technical Services Manager at G. James Australia, comments: "Orders were commonly fulfilled before all the paperwork was collated. The process was complex and time-consuming, and customers could not be kept up to date.

"So we began looking into extending our network to the manufacturing floor. We knew that by connecting manufacturing processes to order

management systems and automating them, we could streamline our operations, improve visibility, increase efficiencies and our customers would be able to remotely enquire as to the status of their orders in real-time."

The most significant challenges were the integration of administration and manufacturing systems so that staff could gain access to real-time information, and enabling the automated equipment to be managed via the network. This involved crossing boundaries between administration and operational control on the factory floor and necessitated redesigning process control systems so they could be interrogated remotely.

David Moy explains: "The vision has been from top down, with systems being built from the ground up. This has been done to ensure capabilities of end devices match with upper applications because it's easier to build the upper applications knowing the boundaries of system end points. Bear in mind that we are linking factories across five major sites, two manufacturing countries (Australia and Malaysia), and outlets in four countries, so this is no small task!"



THIS IS THE POWER OF THE NETWORK. NOW.



THE SOLUTION

TO CONNECT THE DISPARATE SYSTEMS IN THE MANUFACTURING PLANTS AND AUTOMATE THEM, G. JAMES INSTALLED CISCO SWITCHED ETHERNET THAT SUPPORTS VIRTUAL LOCAL AREA NETWORKS (VLANS) FOR MAXIMUM SECURITY.

The Cisco 2955 Industrial Ethernet Switch is an industrial-grade switch that provide fast ethernet and gigabit ethernet connectivity for deployment in harsh environments, including temperature changes and vibration.

David Moy comments: "Far from the rarefied, stable and comfortable environment of the average air-conditioned server room, the factory floor is an inhospitable place.

A network device must supply intelligent services such as QoS (Quality of Service), high availability and security and have the physical strength of traditional manufacturing hardware. The Cisco 2955 series switches were our preferred option because of their robust, industrial-strength build and their small footprint, which allowed them to easily fit the on to industry-standard DIN rail mountable units next to the Programmable Logic Controllers (PLC) which control the automatic plant."

Another key advantage has been the Cisco IOS software functionality for traditional data, video and voice services with enhanced intelligent features for additional security, advanced Quality of Service (QoS), high availability and manageability. This software gives David Moy the flexibility to manage the system and fix any problem quickly to ensure that downtime is kept to a minimum.

ALL THE PLC PLANT SYSTEMS ARE SITUATED IN THE SAME AREA AS THE SWITCHES, MAKING IT EASY TO CREATE VIRTUAL LOCAL AREA NETWORKS ON THE LAN.

He explains: "Our network must provide secure, predictable, measurable and in some instances, guaranteed, services to support our business processes. Different applications and PLC devices have different requirements with respect to bandwidth, latency and jitter. We have time sensitive applications, such as voice transmission, that though may not require high bandwidth, is sensitive to delay and jitter. Alternatively, an FTP file transfer may require considerable bandwidth, while easily tolerating delay. We also have mission-critical applications that require high bandwidth with little delay. The Cisco IOS software allows us to achieve the required QoS for all of these services by managing the delay, jitter, bandwidth and packet-loss parameters for every type of traffic on our network."

THE RESULTS

BY USING CISCO IOS SOFTWARE TO CONTROL MANUFACTURING AND ADMINISTRATION DATA, G. JAMES IS ABLE TO REDUCE MANAGEMENT TIMES AND SIGNIFICANTLY IMPROVE THE TOTAL COST OF OWNERSHIP OF THE NETWORK.

David Moy comments: "Everything is centralised, which makes the manufacturing and administrative processes far easier to manage. Not only can I separate administrative and control traffic for security reasons, I also have the capability to add and isolate Cisco wireless devices in the future.

"The solution has worked smoothly and when there are issues, they're easy to fix. For example, when I was in Washington, USA, I was notified of a problem in one of our Sydney plants. Instead of explaining the nature of the problem over the phone, I was able to VPN connect back to Brisbane and then use the internal network to access the relevant PLC in Sydney and fix it.

David Moy notes that they are already seeing a trend towards newer factory devices being Ethernet ready, making it easier to connect them to the network. "Standardisation reduces management time," he says.

The Cisco 2955 switches also come with common standard IOS commands, QoS capabilities and an alarm from switch into PLC for communication failure alerting. We're not having to deal with dozens of different systems any more. There's also no more worrying about different voltages in different countries, the Cisco 2955 switch offers a 24-volt DC power, which is common in nearly every country in every control cabinet."

IMPROVEMENTS TO THE FACTORY OPERATION ARE ALREADY EVIDENT AT G. JAMES PROVIDING A JUSTIFIABLE RETURN ON INVESTMENT.

"Now that we have the Cisco converged network in place, we have a secure, reliable platform for manageable growth," said David Moy. "We are also in a strong position to leverage the technology for future innovations. For example, we are looking at the possibility of using IP video surveillance to monitor remote sites. Down the track, we can incorporate further IP technologies to enhance our manufacturing or administration processes."



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