

DEPLOYING INDUSTRIAL ETHERNET FOR 24 x 7 MISSION CRITICAL APPLICATIONS

A communication network is only as reliable as its weakest link. When deploying a network for 24 x 7 critical infrastructure, the entire signal transmission path must be robust, reliable, maintainable and scalable. Ethernet technology is now extensively used in industry verticals such as Oil and gas, Metals and mining, Pulp and paper, Power generation, Power transmission and distribution, Process automation, Building automation, Road, rail and transportation, CCTV, security and surveillance to name a few. Categorised under the technology banner of Industrial Ethernet, most users typically only consider the bare basics when implementing these critical networks. For example, common factors typically considered are physical characteristics to handle the harsh environmental conditions such as high temperature, corrosive gases, vibration and shock. In addition, the assumption that Ethernet is 'plug and play' could not be further from the truth when used in critical infrastructure.

As the name 'network' suggests, it is a collection of components put together to ensure a signal is successfully transmitted from A to B. However to ensure signal integrity and performance in accordance with the requirements of the application, one must look beyond physical features of a switch or router. Physical characteristics are indeed important, but let us also consider other critical factors of a network:

- Cabling and connectors, often referred to as Layer 1, be it copper or fibre, must be suitably selected according to the transmission distance and suit environmental conditions such as oil, moisture, sunlight, vibration, etc.
- IP addressing schemas must cater for the application requirements for network segregation and future scalability. Upon which, Layer 2 segregation using Virtual Lans (VLANs) or Layer 3 routing can be implemented. Flat networks are no longer practical in critical applications.
- Network redundancy and the relevant redundancy protocols must be carefully selected, matching the network topology and the recovery times required to suit the application.
- Specific factors around industrial communications such as multicast control, and industry specific traffic (e.g. 61850 protocols)
- Network security should also be deployed and monitored to ensure the network remains in a safe and secure operating state at all times.
- Wireless systems to complement the wired architecture can also be deployed to further leverage flexibility and mobility when accessing the networked applications.
- Other aspects that aid engineering, operations and maintenance such as network management tools and software, intuitive user interfaces, disaster recovery techniques and mechanisms, live maintenance and upgrades, troubleshooting tools, should all be considered for a 24 x7 critical network.

All the above culminate together to ensure the total lifecycle of a network is optimised, from the design, engineering, operations, maintenance and future scalability. This then also reduces the total cost of ownership of the network.

Belden recognize the importance of this comprehensive approach, and via its product families of Hirschmann, Garrettcom and Tofino have been delivering this invaluable knowledge and training through our Mission Critical Network Design Seminar. First conducted in 2003 as an event called "Industrial Ethernet Congress", the seminar ran annually for 5 years in Germany before being launched in the United States. In 2011, the seminar was brought to Asia Pacific. Since then, Belden have successfully conducted four seminars in the region. The seminars are conducted by subject matter experts from Germany, and regional technical experts.

Our next seminar will be in Hanoi, Vietnam from the 28th to 30th August. Do not miss this opportunity to gain this comprehensive knowledge and skill in a single cost effective seminar. For more information, please contact Ms. Michelle Eng, Phone: +65 6854 9860 / Email: Michelle.Eng@belden.com

