the EXTENSION

A Technical Supplement to Control Network

The Best of Ethernet Technology

It's August and the "dog days of summer" are upon us. Some would say it's the hot sultry days "not fit for a dog." Everyone tries to relax in this heat at their favorite getaway. With this in mind, we decided to recap some of our best Industrial Ethernet articles for your reading pleasure which will make you work smarter in industrial networking once you return from your trip.

Choosing the Right Industrial Ethernet Switch

Selecting the proper Industrial Ethernet switch can be a confusing task. There are many options to consider such as auto-negotiation, redundancy, determinism and many more. As there is no standard that dictates all the mandatory features provided on a unmanaged or managed switch, you'll need to ask your switch vendor which features they include in their products. Visit www.ccontrols.com/pdf/Extv6n1.pdf for more information.

Introduction to Switch Technology

In this article, the concept of switching was introduced as an alternative to the deployment of repeaters. Switches cannot only increase the overall network diameter, but will improve the performance of Ethernet networks as well. Visit www.ccontrols.com/pdf/ExtV1N9.pdf to learn how switches could provide a better solution over repeating hubs depending upon the application.

ABCs of Ethernet Redundancy

This is a fact sheet complete with diagrams and tables that covers the things you need to know about Ethernet redundancy. You'll learn:

- What is a ring network?
- What types of redundancy are available?
- What is network recovery time?

Visit www.ccontrols.com/pdf/abc1.pdf to understand why you should care about Ethernet redundancy.

ABCs of Ethernet Troubleshooting (Part I)

Ethernet networks can present many symptoms, but troubleshooting can be helped by asking some common questions. One such question is: Do the link LEDs indicate proper cable connections? By applying the principles discussed in this article, your efforts can be more effective. Visit www.ccontrols.com/pdf/abc2.pdf.

ABCs of Ethernet Troubleshooting (Part 2)

The ABCs of Ethernet Troubleshooting (Part 1) discussed mostly physical and data link layer network issues. If problems persist after applying the suggestions in that document, other diagnostic efforts can be taken.

Tools such as protocol analyzers can be used to help diagnose network problems. Protocol analysis is the process of capturing Ethernet frames and analyzing the data in these frames. There are many tools and applications that can help you do this.

This article "digs deeper" into troubleshooting. We actually mean going higher into the OSI or TCP/IP model. It talks about receiving data, ARP, UDP protocols, High Frequency or Messaging and much more. Keep in mind that in the future you may see newer protocols than are mentioned within this article. Just remember, you only have to search the Internet for information on it and perhaps find others experiencing the same problems. Visit www.ccontrols.com/pdf/abc5.pdf.

Using Ethereal for Network Troubleshooting

What would you do if the network is not nearby and you're receiving complaints that production is down? That's why sophisticated industrial networks that use technologies such as Ethernet require a troubleshooting tool that rises to that same level of sophistication. One of the best tools for troubleshooting networks is a network sniffer or protocol analyzer which can translate the traffic on the network into meaningful data to the operator. One such tool is Ethereal which is available for free on the Internet. Visit www.ccontrols.com/pdf/Extv7n1.pdf to learn about analyzing a packet captured by Ethereal and other topics.

ABCs of Managed Switches

Many applications will operate properly when using plug-and-play switches. But there comes a time when you need to take control of your communication system. This is where the managed switch becomes a significant part of your communication strategy. This fact sheet focuses on the concepts and terminology you need to know. Visit www.ccontrols.com/pdf/abc.pdf. If you need technical information and application assistance, Contemporary Controls is here to help you. Just call us at (630) 963-7070.

ABCs of EtherNet/IP Switches

This article examines EtherNet/IP™ switches. EtherNet/IP networks require specific switch features in order to function without failure. Contemporary Controls' managed switches (the EISX_M, the EICP_M, and the EISB_M) provide all the required and recommended features which can be employed to achieve optimum network performance. Learn the importance of these features by visiting www.ccontrols.com/pdf/abc9.pdf.

ABCs of Ethernet Fiber Optics

The use of fiber optics in Local Area Networks (LANs), such as Ethernet, has increased due to the inherent advantages of using fiber. High data rates can be maintained without electromagnetic or radio frequency interference (EMI/RFI). Longer distances can be achieved over that of copper wiring. Visit www.ccontrols.com/pdf/abc3.pdf to understand how Ethernet will function with no difficulty over fiber optics as long as some simple rules are followed.

Introduction to Virtual LANs

This article discusses VLANs as an effective means of portioning a larger LAN into manageable subsets. VLANs restrict the broadcast domain, improve performance and security, and they are ideal for isolating industrial automation systems from IT systems while retaining the plant's structural wiring. Visit www.ccontrols.com/pdf/Extv5n1.pdf to learn about VLAN structure, Port VLAN, VLAN tagging and VLAN core switches.
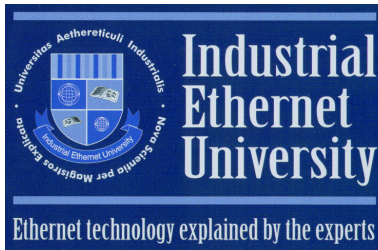
As part of the company's effort to educate the industry on the merits of Industrial Ethernet, Contemporary Controls launched the virtual Industrial Ethernet University (IEU) a few years ago. Professionals from around the world (more than 2,600) have enrolled and the number is growing daily. These individuals have used the Ethernet knowledge gained to increase their effectiveness on the job...and to further their careers.

At the IEU, you'll learn Ethernet from the physical and data link layers up through the network, transport, and application layers. All material comes from the IEEE Std. 802.3 and relevant Request for Comments (RFCs). And it's all vendor-neutral since the purpose of the university is to educate the public for the benefit of the industry.

There are 20 FREE on-line courses vital to running highly-effective, trouble-free Industrial Ethernet and 11 guest lectures from the top ranks of this technology.

In order to see that each professional comprehends the material, he must complete a test. Some gain a certificate of completion upon successful graduation. One recent graduate said, "I recommend all those who are in the field to enroll and make it your solid base of information on Ethernet.

IEU sets a good example of online learning. Thanks!"

Don't wait to enroll any longer. Visit www.ieu.cc today!

But the IEU isn't the only educational resource on Ethernet offered by the company. Our Senior Product Specialist Bill Greer writes a blog on the subject. The blog, titled "Bill's Blog on Industrial Ethernet," can be found by visiting www.ccontrols.com/blog.htm.

Greer created this blog to share his thoughts, experiences, and insights on this ever-popular technology. Subjects discussed may range from simple to complex to those that challenge at the outset but appear fascinating to our team of engineers once a conclusion has been drawn. For example, some topics have included the following:

• Data Latency Can Be Variable

• Does Your Fiber Data Freeze?

• How important is SNMP?

• To Shield or Not to Shield?

Greer hopes that if you encounter an interesting issue, you'll feel free to post a comment and share your knowledge with our readers.

He will also post news and developments from the world of Ethernet in order to better educate our readers.

Greer encourages our readers to come back often to the site in order to find just the right solution to a problem and some good reading.

Contemporary Controls strives to lead the way in Industrial Ethernet educational resources. We sincerely hope these articles assist you in working smarter.

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