BUILDING A LOCAL AREA NETWORK

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Computers are now a vital part of truss plants and in most, if not all, plants they are connected to a network.

As a result, the performance of the network can have a bearing on the work throughput of the plant. It is therefore important to have the network operating as efficiently as possible.

To design a Local Area Network (LAN), or redesign an existing one, several important aspects should be considered.

What do you require from the network; what speed or throughput do you require as a satisfactory minimum? Generally the simple answer is the faster the better - however this must be balanced against physical practicalities and budgetary considerations.

Although it would be nice if we all had the fastest network available this is seldom financially feasible. So what can be done to maximise the throughput of the network you do have or intend to get.

There are two key points to consider when selecting the network components - speed and duplex.

Speed

Understanding network speed is quite simple and it is obvious that a 100Mbps network will be faster than one running at 10Mbps and a 1Gbps (1000Mbps) network is faster still.

What is often overlooked is that any two devices connected to a network will communicate at the slowest common speed.

Duplex

Duplex is less obvious and is generally not so well understood. There are two choices - half or full.

Half duplex means that only one end at a time can transmit. Full duplex allows traffic in both directions simultaneously and, depending on the network usage, can effectively double the available bandwidth.

Once again though, any two devices will communicate at the lowest common duplex capability.

Hub or Switch

There are two types of hub available to us. A plain hub, normally just called a hub, or a switched hub, commonly referred to simply as a switch.

Recently the cost of switches has in many instances dropped to that of hubs and in some cases even lower. So why choose one over the other?

When data arrives at a hub it is passed on to all other ports (sockets). For this reason heavy traffic on one port can have a negative effect on traffic for all the other ports because it uses a significant part of the available bandwidth.

A switch is different in that it is an "intelligent" device. The switch maintains a list of the devices connected to each port. Traffic destined for any connected device is sent only to the relevant port and therefore does not interfere with the available bandwidth of the other ports. This can be very beneficial.

Of course if all the traffic originates from only one port, and all the ports operate at the same speed, there may be no noticeable difference.

The solution in this case is to use a hybrid switch, which has one or two 1G ports, while the remainder are 100Mbps. It is important in this case that the machine handling all the traffic, normally a server, needs to be fitted with a 1G network adapter as well.

Selecting Components

Having determined your speed requirements the first decision should be in the selection of the heart of the network, the hub(s) and/or switch(es).

Based on the information above it should be clear that you would be best off with a full duplex switch supporting the speed(s) you intend to use.

Ideally you should only select units which provide auto sensing of both speed and duplex. This will allow the best possible throughput regardless of what devices are plugged into any given port.

Network cards should also be full duplex at whatever speed is chosen.

Cabling, which includes the plugs and sockets, as well as the cable itself, absolutely must be up to specification for the required speed.

Cabling that is under specification can drag the network performance down as easily as fitting lower speed network adapters. If you are unsure of the cabling you require seek expert advise.

Wireless Networking

Although wireless networking can be a great boon to users of laptops it must be remembered that wireless network adapters currently operate at much lower speeds than "normal" network cards.

Finally

Networks and their components are highly technical and need to be set up correctly. If you rely on your network and it does not perform satisfactorily and reliably it could seriously impact your business.

If in doubt get advice from, or have the work done by, a suitably qualified person.