Using IP addresses on cross connected nodes.

Consider four X-1J nodes connected via a crosslink . The more obvious way of configuring IP connectivity between them is to allocate each an IP address, and then use relevant ARP and IPROUTE commands to set up IP routing between them. A simplified example is shown below.

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If there are several nodes in an IP subnet, they will use up a lot of addresses. It is possible to use "dummy" IP addresses to route between adjacent nodes on a crosslink. This means that you do not allocate an IP address for each node, but only one for the whole node "stack".

The downside of this is that IP users can only ping their local node, they cannot ping another node in the stack.

Note that these "dummy" addresses are NEVER actually used. We need to allocate addresses in order to make the correct entries in the various tables inside the nodes; but because of the way in which the protocol is implemented, the IP addresses are never used, instead the nodes are addressed by their callsign over the crosslink. Depending on how desperate for IP addresses you are, this technique could feasibly be used on point to point backbone links too. In the example I have chosen to use the ampr.org test addresses in the 44.128 series. In fact you can use any address in your node that you know won't appear in your ARP or IPROUTE tables for real.

The way to do this may not be immediately obvious, and a worked example is given below.

The reason it works is because of the way the address translation occurs.

Suppose a packet arrives at GB7OX-4 addressed to 44.131.16.179. First the routing table on GB7OX-4 is scanned, and a match is found. This packet must go to 44.128.0.2. A scan of the ARP table shows that 44.128.0.2 is known, and we must use the MAC address (or in the amateur radio world, the "callsign") rather than an IP number to address the station directly; so the packet is addressed, and sent down the crosslink to GB7OX-2. GB7OX-2 receives the packet, and finds a match in it's routing table, and so sends the packet out of it's radio port according to the entries in its IPROUTE and ARP tables.

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At no time in the above example does the address 44.128.0.2 appear in any protocol headers. Its use is solely to fool the node into passing the frame on to GB7OX-2. The only time it might get used if the route tracing header option of IP were used (it is implemented in TheNet X-1J but seldom used) when it would appear that the frame had been routed through two routers with the same IP address.

If TCP layer services are ever implemented, we may need to think again about this.

Fiona Pattinson
G7ANH @ GB7MXM.#36.GBR.EU