



Bridging

Global Bridging Configuration Dialog Box

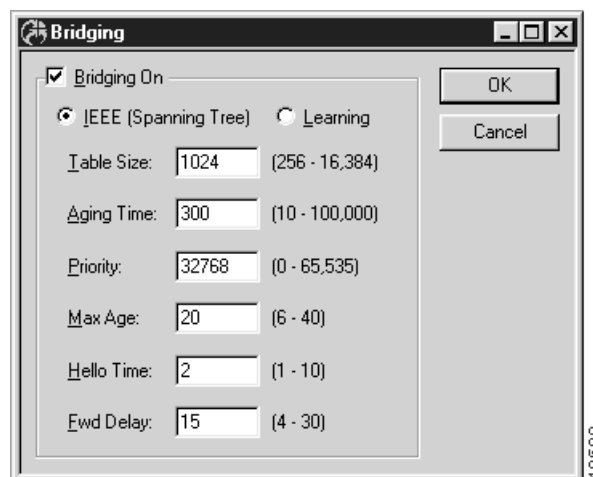
Bridging operates on physical network addresses (such as Ethernet addresses), rather than logical addresses (such as IP or IPX addresses). From the standpoint of routing, router interfaces which are set to bridge between themselves appear as a single logical entity.

Thus, a “Bridge Group” is made up of all of the physical network interfaces in a router which have been set to bridge the same protocol. Whether an interface bridges a protocol is set in the protocol configuration dialog box for each individual physical interface. See, for instance, the IP Routing/Bridging/Off radio buttons in the TCP/IP Routing: Ethernet Configuration dialog box.

Each Bridge Group can have routing parameters set for it. All of the interfaces in the group share these parameters.

To access the Main Bridging Configuration dialog box (Figure 9-1), select Global/Bridging from the Device View.

Figure 9-1 Global Bridging Configuration Dialog Box



Bridge On

This checkbox sets a global parameter which determines whether this router will perform bridging or not. Whether an individual interface actually participates in bridging is determined by settings for that interface.

- If **checked**, the router will bridge packets between interfaces which have the Bridging On checkbox set in their Interface Bridging Configuration dialog boxes. To access that dialog box select Interface/Bridging from the Device View. This can be done for any type of interface except IP subinterfaces.
- If **unchecked**, no packets will be bridged by the router.

Learning/IEEE (Spanning Tree)

This set of radio buttons determines which type of bridging will be performed.

- If **IEEE (Spanning Tree)** is selected, the bridge will act as an IEEE spanning tree bridge. It will send spanning tree BPDU (Bridge Protocol Data Unit) packets, and it will not forward any BPDU packets it receives. This is the default setting.
- If **Learning** is selected, the bridge will act as a simple learning bridge. This means care must be taken not to introduce loops in your network architecture. The bridge will not send spanning tree BPDU packets, and it will forward any BPDU packets it receives.

Table Size

This field sets the maximum number of entries allowed in the bridge table. The bridge table tracks the correspondence between physical interfaces and known addresses. The bridge will only allocate the amount of memory actually needed for the table. If the maximum size is too small, network traffic on all bridged segments will increase since the bridge will not know the specific segment for an address.

For the bridge to operate most efficiently, the table must be as large as the number of network nodes on all network segments which are physically connected to the router plus all network segments connected to the router through other bridges. Values may range from 256 to 16,384. The default value is 1024.

Nodes on segments connected through routers which are not doing bridging do not need to be counted. This is because a router hides the physical addresses of the nodes behind it.

Aging Time

This is the number of seconds since a node's last transmission before its address will be removed from the bridge table. Values may range from 10 to 100,000. The default is 300.

Priority (Spanning Tree)

The spanning tree algorithm uses this value to help determine the Root Bridge for a network. The priority is combined with the bridge's node address to create an eight byte bridge ID. The bridge which has the numerically lowest bridge ID on a network will become the Root Bridge for that network. There will only be one Root Bridge per network.

Values may range from 0 to 65,535. The default value is 32,768.

Setting a bridge's priority to 0 should make it the Root Bridge on the network.

Max Age (Spanning Tree)

This parameter determines the maximum amount of time before the information from the last BPDU packet received is considered stale and the spanning tree is recalculated. Values may range from 6 to 40. The default value is 20 seconds.

All bridges on a network use the **Max Age** value configured into the Root Bridge.

Hello Time (Spanning Tree)

This parameter determines the amount of time between spanning tree BPDU packets sent by the bridge. Values may range from 1 to 10. The default is 2 seconds.

All bridges on a network use the **Hello Time** value configured into the Root Bridge.

Fwd Delay (Spanning Tree)

This parameter determines the amount of time between interface state transitions in the bridge. After startup the bridge spends this amount of time determining whether an interface should participate in the network's spanning tree or be blocked. Once that decision has been made, the same amount of time is also spent learning addresses on the interface before forwarding is enabled.

Values may range from 4 to 30. The default value is 15 seconds.

All bridges on a network use the **Fwd Delay** value configured into the Root Bridge.

Bridging: Interface Configuration Dialog Box

To access this dialog box (Figure 9-2), select Interface/Bridging from the Device View.

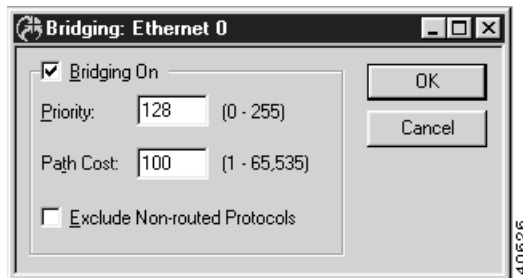
This can be done for any type of interface except IP subinterfaces. Bridging operates on physical network addresses (such as Ethernet addresses), rather than logical addresses (such as IP or IPX addresses). From the standpoint of routing, router interfaces which are set to bridge between themselves appear as a single logical entity.

Thus, a "Bridge Group" is made up of all of the physical network interfaces in a router which have been set to bridge the same protocol. Whether an interface bridges a protocol is set in the protocol configuration dialog box for each individual physical interface. See, for instance, the IP Routing/Bridging/Off radio buttons in the TCP/IP Routing: Ethernet Configuration dialog box.

Each Bridge Group can have routing parameters set for it. All of the interfaces in the group share these parameters. To access the dialog boxes which set these parameters, select Protocol/Bridging for the desired protocol (e.g. IP, IPX, etc.).

WAN bridging is not recommended for ports set to On Demand PPP Link operation. Bridging requires that any broadcast traffic received on one Bridge Group port be resent on all other Bridge Group ports. The net effect is to keep on-demand links up all the time.

Figure 9-2 Interface Configuration Dialog Box



This dialog box is only used to set the per interface values for bridging parameters. The majority of bridging parameters are set in the Main Bridging Configuration dialog box. To access this dialog box, select Global/Bridging from the Device View.

Bridging On

This checkbox determines whether this interface will perform bridging or not. In order for bridging to occur, the global Bridge On checkbox must also be set in the Main Bridging Configuration dialog box.

- If **checked**, the interface will participate in bridging. All non-routable protocols will be bridged. Routable protocols may or may not be bridged, depending on the setting in the individual protocol dialog box for this interface.
- If **unchecked**, no packets will be bridged by this interface.

Priority

This parameter determines the precedence given to this interface by the bridge. By default the lowest numbered interface (i.e. interface 0) will have precedence. Values may range from 0 to 255. The default is 128.

Path Cost (Spanning Tree)

This parameter sets the “cost” of using the interface, which in turn sets the calculated “distance” from the spanning tree’s Root Bridge. Distances are used when calculating spanning tree topology. This value may be used to artificially change the topology of a spanning tree network. Values may range from 1 to 65,535.

The default value for Ethernet ports is 100, as recommended by the IEEE. The default value for WAN ports is 5000.

Exclude Non-Routed Protocols

This checkbox determines whether this interface will bridge protocols which the router does not route. Examples are NetBEUI and DEC LAT.

- If **checked**, the interface will not bridge protocols that the router does not route.
- If **unchecked**, protocols which the router does not route will be bridged to all other interfaces which also have bridging turned on (and do not have this checkbox checked).

