

## Routing between two BACnet/IP networks

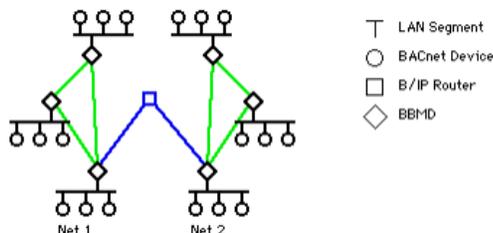
Although the foreign registration process provides the ability for individual remote devices to participate in a particular B/IP network, there may be occasions when it is desirable for two collections of B/IP devices to interoperate more closely. This type of interoperation can only produce results consistent with the assumptions and intent contained in the original BACnet standard if the configuration of the two B/IP networks has been coordinated. For example, it is assumed that Device object identifiers are unique "internetwork wide." If this is not the case, the Who-Is service will produce ambiguous results. Similarly, the Who-Has service may be useless for dynamic configuration applications if multiple instances of objects with identical object identifiers exist.

The BACnet standard also assumes that only a single path exists between devices on different BACnet networks and that this path passes through a BACnet router. The internet's web topology violates this assumption in that, apart from security constraints such as "firewalls", any IP device can communicate directly with any other IP device if it knows the device's IP address.

## B/IP internetwork design considerations...

Many BACnet internetwork configurations are possible.

- Depending on local traffic conditions and security requirements, all B/IP subnetworks can be configured into a single B/IP network. This case has been dealt with above.
- Creating two or more B/IP networks, each with a unique network number, can be useful for limiting the propagation of local broadcast messages and for providing security by confining traffic to a particular geographic or logical area.
- A single device can be configured to provide all the routing for a B/IP internetwork. See the following figure. The advantages include: only a single routing table is required; the possibility of creating multiple paths between B/IP networks is eliminated; and the resulting star topology is easy to conceptualize. The disadvantages are: there is a single point of failure; and a single device could present a traffic bottleneck under heavy load conditions.



A single B/IP Router can perform all routing for two or more B/IP networks by registering as a foreign device on each network. It is then "directly connected" to each such network and uses a UDP port unique to that network for communication with its individual nodes. The unique UDP port is required to determine a message's origin for the purpose of appending an SNET to the routed packet.