

# **Bus Number Assignment and Maintenance Using Broadcasts**

Drawn from BR046R02

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## *Assumptions (1)*

A single 'Prime Portal' is responsible for maintaining bus numbers across the network.

A single 'Alpha Portal' on each bus is responsible for communicating with the Prime Portal on behalf of the bus. Not necessarily the closest portal to the Prime Portal.

The Alpha Portal of a bus new to the network is responsible for identifying itself to the Prime Portal and obtaining a bus number.

## *Assumptions (2)*

The Alpha Portal of a bus new to the network does not need to know the identity or location of the Prime Portal to communicate with it.

Portals between the Prime Portal and an Alpha Portal requesting a bus number are minimally involved in the bus number assignment process. I.e., their only function is to act as a conduit for communication.

Portal's do not maintain a network topology map. They only 'know' whether or not a particular bus number is closer to their 'companion portal' than to themselves.

## *Communication Without a Bus Number*

Network Management Packets to/from Alpha Portal with no bus number are broadcast - knowing location of Alpha or Prime Portal not necessary.

Broadcast Network Management Packets contain GUID of Alpha Portal for identification.

Active portals forward broadcast Network Management Packets to companion portal, even if they do not yet have a bus number.

Packets retransmitted if no response within specified time.

## *Requesting/Assigning a Bus Number (1)*

When an Alpha Portal does not have a bus number, it broadcasts a Bus Assignment Request Packet (NMP).

Contains preferred bus number.

Prime Portal checks availability of bus numbers. Three possibilities:

Preferred bus number is available.

Different bus number is available.

No bus number is available.

Prime Portal broadcasts a Bus Assignment Response Packet (NMP) back to requesting Alpha Portal if any bus number is available.

Contains assigned bus number.

## *Requesting/Assigning a Bus Number (2)*

Prime Portal queues request if no bus number is available.

Can detect duplicate request based on Alpha Portal GUID.

Broadcasts a Bus Assignment Response Packet (NMP) back to requesting Alpha Portal when a bus number becomes available.

## *Maintaining Bus Numbers (1)*

Prime Portal periodically initiates Bus Information Request Packets (NMP).

Destination ID is Alpha Portal of bus from which information is being requested.

Round robin through all valid bus numbers.

Alpha Portal of target bus responds with Bus Information Response Packet (NMP).

Contains GUID of Alpha Portal – used to detect duplicate bus numbers.

Prime Portal stores GUID of Alpha Portal of first Bus Information Response Packet (NMP) received.

## *Maintaining Bus Numbers (2)*

Prime Portal sends a Bus De-Assignment Request Packet (NMP) to Alpha Portal of duplicate bus number.

Contains GUID of Alpha Portal – differentiates it from valid Alpha Portal.

Duplicate Alpha Portal responds to de-assignment request with a Bus De-Assignment Response Packet (NMP)

Contains GUID of Alpha Portal – differentiates it from valid Alpha Portal.

When 7 Bus Information Request Packets (NMP) have been sent to a particular bus number without a valid Bus Information Response Packet (NMP), bus number is reclaimed for future use.