Application Note 40

Configure Ethernet Bridging
(Between Local and Remote TransPort Networks)

Digi Technical Support

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1 INTRODUCTION

1.1 Outline

This Application Note (AN) aims to enable the reader to easily configure an Ethernet bridge between two TransPorts over a Wide Area Network (WAN) link.

The diagram below details the IP number scheme and architecture of this example configuration.

![Network diagram](image)

Figure 1-1: Network diagram

1.2 Assumptions

This guide has been written for use by technically competent personnel with a good understanding of the communications technologies used in the product, and of the requirements for their specific application.
Configure Bridging Local Ethernet Devices Between Local and Remote TransPort Networks

**Configuration:** This AN assumes that the two TransPort devices are connected via routable public or private addresses. It is possible to allow bridging over W-WAN, ISDN and PSTN connections but note that the only restriction on the traffic sent across the link is done via MAC address filtering and that all Ethernet traffic will be bridged.

Users may wish to block the UDP ports configured for transmission of the bridged traffic from accessing any secondary connection via W-WAN, ISDN or PSTN, if only the main connection is to be used and to prevent bridging on secondary or tertiary network connections.

A WR41 with a cellular interface is being used as the “Remote” device in this AN, and this device is able to get a public address.

To use the Bridging functionality if the address assigned to the wireless interface is “NAT’ed” (not public) by the provider, adjust the configuration of the “Local” DR6410 at Site A to ensure that it is configured to initiate the bridge (refer to section 2.3 for further details), and that the “Remote” WR41 at site B is configured to listen for the incoming connection.

Please note that without encryption, the Ethernet traffic in this AN is passing over the network unencrypted and is potentially open to intercept. Therefore, there are security concerns that must be addressed in implementing this setup.

### 1.3 Caution

Please note that broadcast Ethernet traffic will be bridged over the WAN connection.

The only restriction on what traffic is bridged is done in the Ethernet > MAC Bridge options and no firewall restrictions are applied to this traffic.

On networks where there is a low capped limit or where charges are per megabyte (MB/GB) or per minute (as is the case on ISDN and PSTN) high network charges could be incurred after implementing the Bridging features described in this AN.

It is therefore highly recommend that interfaces which have flat rate charges such as unlimited dialup interfaces or ADSL or mobile broadband where there are no data or time limits for the transferred traffic are used.

A full security audit of the traffic is recommended as the transmitted traffic will be sent over the network unencrypted unless IPsec is used to encrypt the data.

### 1.4 Corrections

Requests for corrections or amendments to this AN are welcome and should be addressed to: tech.support@digi.com

Requests for new ANs can be sent to the same address.
## 1.5 Version

<table>
<thead>
<tr>
<th>Version Number</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Published</td>
</tr>
<tr>
<td>1.1</td>
<td>Updated diagram and introduction</td>
</tr>
<tr>
<td>1.2</td>
<td>Updated to new web GUI</td>
</tr>
<tr>
<td>1.3</td>
<td>Updated screenshots and instructions for new web interface, rebranding (Jun 2016)</td>
</tr>
</tbody>
</table>
2 CONFIGURATION

Only the parts of the configuration files that specifically relate to the configuration of this example will be explained in detail. The configuration files can be found in their entirety at the end of this document.

Please note that on all the sections below, click the ‘Apply’ button at the bottom of the page to commit the changes.

2.1 Configuration of “Local” Site A DR6410

2.1.1 Configure Local Ethernet Interface 0

First, configure the Ethernet interface with an IP Address:

Second, setup the bridging destination and the port to bridge on. If requiring two-way bridging then a listening port will also be needed:
Configure Bridging Local Ethernet Devices Between Local and Remote TransPort Networks

Last, enable Ethernet and IP analysis for ETH 0:

### Management - Analyser > Settings

#### Ethernet Interfaces

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP address</td>
<td>10.2.63.100</td>
<td>Enter the IP address of the LAN interface</td>
</tr>
<tr>
<td>Forward to IP address</td>
<td>123.45.6.7</td>
<td>Enter the remote host WAN IP address</td>
</tr>
</tbody>
</table>

**Figure 2-2: Site A Eth 0 Setup**
Configure Bridging Local Ethernet Devices Between Local and Remote TransPort Networks

<table>
<thead>
<tr>
<th>Port</th>
<th>6000</th>
<th>Port on Remote Host. Enter the port number to configure on the remote TransPort’s ‘MAC Bridge Listen Port (Host Mode)’ setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listen on Port</td>
<td>7000</td>
<td>Local Listening Port. This is required only if hosts on the remote site to locate hosts on the local network. This example demonstrates bidirectional bridging so both sites are also in listening mode</td>
</tr>
<tr>
<td>Ethernet Interfaces</td>
<td>ETH 0</td>
<td>Turn on Ethernet analysis so that the bridged packets being sent to and from the remote networks can be seen, and verify that the bridge is working</td>
</tr>
<tr>
<td>IP Sources</td>
<td>ETH 0</td>
<td>Turn on analysis for this interface so as to permit troubleshooting if there are problems with the setup</td>
</tr>
</tbody>
</table>
2.1.2 Configure DSL Interface

Turn on IP analysis for monitoring and setup the username and password for the ADSL link:

![Figure 2-3: Site A DSL Setup](image)

Management - Analyser > Settings

IP Sources

- ETH 0
- ETH 1
- ETH 2
- ETH 3
- ETH 4
- ETH 5
- ETH 6
- ETH 7
- ETH 8
- ETH 9
- ETH 10
- ETH 11
- ETH 12
- ETH 13
- ETH 14
- ETH 15
- ETH 16
- ETH 17
- ETH 18
- ETH 19
- ETH 20
- ETH 21
- ETH 22
- ETH 23
- ETH 24
- ETH 25
- ETH 26
- ETH 27
- OVPN 0
- OVPN 1
- OVPN 2
- PPP 0
- **PPP 1**
- PPP 2
- PPP 3
- PPP 4
- PPP 5
- PPP 6
- PPP 7
- PPP 8
- PPP 9
- PPP 10
- PPP 11
- PPP 12
- PPP 13
- PPP 14
- PPP 15
- **PPP 16**
- PPP 17
- PPP 18
- PPP 19

Clear all IP Sources
Configure Bridging Local Ethernet Devices Between Local and Remote TransPort Networks

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Username</td>
<td>Username</td>
<td>ADSL access username</td>
</tr>
<tr>
<td>Password</td>
<td>Password</td>
<td>ADSL access password</td>
</tr>
<tr>
<td>Confirm Password</td>
<td>Password</td>
<td>Confirm ADSL access password</td>
</tr>
<tr>
<td>IP Sources</td>
<td>PPP 1</td>
<td>Turn on analysis for this interface so as to permit troubleshooting if there are problems with the setup</td>
</tr>
</tbody>
</table>

2.1.3 Configure MAC Addresses to be Bridged

Up to 64 MAC address configurable values can be used to filter the traffic to be bridged. These addresses can be full addresses or partial addresses. Please note the minimum values are HEX pairs, so ‘00’ or ‘0004’ will work but ‘0’ or “000” will not work. One HP laptop and one Micro Client Jr device are used at the Local Site A end of the connection to test:

<table>
<thead>
<tr>
<th>MAC Address</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>444D50</td>
<td>Micro Client Jr</td>
</tr>
<tr>
<td>002264</td>
<td>HP laptop</td>
</tr>
</tbody>
</table>

To check what the MAC (physical) address is, CLI into the TransPort via telnet or SSH, or log into the web interface, navigate to Administration - Execute a command, and then issue the following command to ping the HP laptop’s IP address (which must be known first):

```plaintext
ping 10.2.63.1 -e0
```

Once this is completed, issue the following command:

```plaintext
arp -a
```

An ARP table similar to the one below should be seen containing the machine’s MAC address. The ARP table holds a list of ‘Physical Address’ and ‘IP Address’ values held in the ARP cache:

```
arp -a
Command result
ARP Cache Size:300 entries, old entries reused:0 no arp matches:1194070
nb of entries:0
ETH 1:
  IP Address   Physical Address     Expiry  Retries State
  10.2.63.10   44-4d-50-e1-74-90   187      3   found
  10.2.63.1     00-22-64-67-41-3d 219      3   found
```

Page | 11
Configure Bridging Local Ethernet Devices Between Local and Remote TransPort Networks

Part of a MAC address or the full address can be used to filter for bridging, so ‘00’ can be used and this will bridge most Ethernet cards, or 00226467413D can be used to only bridge a certain device.

Please see the caution section [here](#) before setting up bridging and deciding on what addresses to bridge.

Bridge for a specific address 00226467413D (the HP laptop) and omit the other device on the network so that only traffic from the HP laptop is bridged:

![Configuration - Network > Interfaces > Ethernet > MAC Bridging](image)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac Address</td>
<td>00:22:64:67:41:3D</td>
<td>MAC address to be bridged</td>
</tr>
</tbody>
</table>

**NOTE:** From firmware version 5.151 and later an * can be used to denote that traffic from all source MAC addresses should be bridged.

### 2.1.4 Configure Logging

Double check that the Analyser is setup correctly. Remove any settings that do not match here. On the IP traces, only packets that are going to or from the ports 6000 or 7000 need to be seen.

Using a ‘~’ (tilde) sign on any filter within the Analyser settings will cause the unit to only record traffic that matches the filter, and exclude all other traffic. Please be wary of combining tilde filters on port, protocol, and IP, as this can often result in NO results. For example, filtering for only port 80 and protocol 1 will usually result in no matches as there is no web traffic over ICMP.
## Management - Analyser > Settings

### IP Sources

<table>
<thead>
<tr>
<th>ETH 0</th>
<th>ETH 1</th>
<th>ETH 2</th>
<th>ETH 3</th>
<th>ETH 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETH 5</td>
<td>ETH 6</td>
<td>ETH 7</td>
<td>ETH 8</td>
<td>ETH 9</td>
</tr>
<tr>
<td>ETH 10</td>
<td>ETH 11</td>
<td>ETH 12</td>
<td>ETH 13</td>
<td>ETH 14</td>
</tr>
<tr>
<td>ETH 15</td>
<td>ETH 16</td>
<td>ETH 17</td>
<td>ETH 18</td>
<td>ETH 19</td>
</tr>
<tr>
<td>ETH 20</td>
<td>ETH 21</td>
<td>ETH 22</td>
<td>ETH 23</td>
<td>ETH 24</td>
</tr>
<tr>
<td>ETH 25</td>
<td>ETH 26</td>
<td>ETH 27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OVPN 0</td>
<td>OVPN 1</td>
<td>OVPN 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPP 0</td>
<td></td>
<td></td>
<td>PPP 1</td>
<td>PPP 2</td>
</tr>
<tr>
<td>PPP 5</td>
<td>PPP 6</td>
<td>PPP 7</td>
<td>PPP 8</td>
<td>PPP 9</td>
</tr>
<tr>
<td>PPP 10</td>
<td>PPP 11</td>
<td>PPP 12</td>
<td>PPP 13</td>
<td>PPP 14</td>
</tr>
<tr>
<td>PPP 15</td>
<td>PPP 16</td>
<td>PPP 17</td>
<td>PPP 18</td>
<td>PPP 19</td>
</tr>
</tbody>
</table>

[Clear all IP Sources]

### IP Options

- [ ] Trace discarded packets
- [ ] Trace loopback packets

### Ethernet Packet Filters

**MAC Addresses:**

### IP Packet Filters

<table>
<thead>
<tr>
<th>TCP/UDP Ports:</th>
<th>~6000,7000</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>IP Protocols:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>IP Addresses:</td>
<td></td>
</tr>
</tbody>
</table>

### Discarded IP Packet Filters

<table>
<thead>
<tr>
<th>TCP/UDP Ports:</th>
<th>~6000,7000</th>
</tr>
</thead>
</table>

**Figure 2-5: Site A Analyser Setup**
Configure Bridging Local Ethernet Devices Between Local and Remote TransPort Networks

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable Analyser</td>
<td>Checked</td>
<td>Enable logging to the analyser trace</td>
</tr>
<tr>
<td>Maximum packet capture size</td>
<td>1500</td>
<td>Collect most full sized packets</td>
</tr>
<tr>
<td>Log Size</td>
<td>180</td>
<td>Set the Analyser to the maximum size</td>
</tr>
<tr>
<td>Ethernet Interfaces</td>
<td>ETH 0</td>
<td>Enable Ethernet logging for this interface</td>
</tr>
<tr>
<td>IP Sources</td>
<td>ETH 0</td>
<td>Enable IP logging for this interface</td>
</tr>
<tr>
<td>IP Sources</td>
<td>PPP 1</td>
<td>Enable IP logging for this interface</td>
</tr>
<tr>
<td>IP Options</td>
<td>Trace Discarded Packets</td>
<td></td>
</tr>
<tr>
<td>IP Packet filters</td>
<td>~6000,7000</td>
<td>Traffic between the sites on the bridging ports only selected</td>
</tr>
<tr>
<td>Discarded IP Packet Filters</td>
<td>~6000,7000</td>
<td>Traffic between the sites on the bridging ports only selected</td>
</tr>
</tbody>
</table>

Save the config of “Local” Site A TransPort and move on to the next section.

2.2 Configuration of “Remote” Site B WR41

Please note that a cellular WAN interface is used here; please be aware of the caution regarding bandwidth charges above (in this case, excess bandwidth charges) that could be incurred as a result of bridging Ethernet networks.

2.2.1 Configure Local Ethernet Interface 0

First, configure the Ethernet interface with an IP address:

![Configuration - Network > Interfaces > Ethernet > ETH 0](image)

Description: 

- Get an IP address automatically using DHCP
- Use the following settings
  - IP Address: 10.2.63.200
  - Mask: 255.255.255.0
  - Gateway:
  - DNS Server:
  - Secondary DNS Server:

Changes to these parameters may affect your browser connection.
Configure Bridging Local Ethernet Devices Between Local and Remote TransPort Networks

Second, setup the bridging destination and the port to bridge on. If requiring two-way bridging then a listening port will also be needed:

![MAC Bridging Configuration](image)

**Enable MAC Bridging on Ethernet interfaces**

- **Interface Enable**
- **Forward to IP Address**
- **Port**
- **Listen on Port**

<table>
<thead>
<tr>
<th>Interface</th>
<th>Enable</th>
<th>Forward to IP Address</th>
<th>Port</th>
<th>Listen on Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETH 0</td>
<td>✔</td>
<td>123.45.67.8</td>
<td>7000</td>
<td>6000</td>
</tr>
</tbody>
</table>
Last, enable Ethernet and IP analysis for ETH 0:

### Management - Analyser > Settings

#### Ethernet Interfaces
- **ETH 0**
- **ETH 5**
- **ETH 6**
- **ETH 7**
- **ETH 8**
- **ETH 9**
- **ETH 10**
- **ETH 11**
- **ETH 12**
- **ETH 13**
- **ETH 14**
- **ETH 15**
- **ETH 16**
- **ETH 17**
- **ETH 18**
- **ETH 19**
- **ETH 20**
- **ETH 21**
- **ETH 22**
- **ETH 23**
- **ETH 24**
- **ETH 25**
- **ETH 26**
- **ETH 27**

**Clear all Ethernet Interfaces**

#### PPP Interfaces
- **PPP 0**
- **PPP 1**
- **PPP 2**
- **PPP 3**
- **PPP 4**
- **PPP 5**
- **PPP 6**
- **PPP 7**
- **PPP 8**
- **PPP 9**
- **PPP 10**
- **PPP 11**
- **PPP 12**
- **PPP 13**
- **PPP 14**
- **PPP 15**
- **PPP 16**
- **PPP 17**
- **PPP 18**
- **PPP 19**

**Clear all PPP Interfaces**

#### IP Sources
- **ETH 0**
- **ETH 5**
- **ETH 6**
- **ETH 7**
- **ETH 8**
- **ETH 9**
- **ETH 10**
- **ETH 11**
- **ETH 12**
- **ETH 13**
- **ETH 14**
- **ETH 15**
- **ETH 16**
- **ETH 17**
- **ETH 18**
- **ETH 19**
- **ETH 20**
- **ETH 21**
- **ETH 22**
- **ETH 23**
- **ETH 24**
- **ETH 25**
- **ETH 26**
- **ETH 27**
- **OVPN 0**
- **OVPN 1**
- **OVPN 2**
- **PPP 0**
- **PPP 1**
- **PPP 2**
- **PPP 3**
- **PPP 4**
- **PPP 5**
- **PPP 6**
- **PPP 7**
- **PPP 8**
- **PPP 9**
- **PPP 10**
- **PPP 11**
- **PPP 12**
- **PPP 13**
- **PPP 14**
- **PPP 15**
- **PPP 16**
- **PPP 17**
- **PPP 18**
- **PPP 19**

**Clear all IP Sources**

**Figure 2-6: Site B Eth 0 Setup**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP address</td>
<td>10.2.63.200</td>
<td>Enter the IP address of the LAN interface</td>
</tr>
<tr>
<td>Forward to IP address</td>
<td>123.45.67.8</td>
<td>Enter the remote host WAN IP address</td>
</tr>
</tbody>
</table>
Configure Bridging Local Ethernet Devices Between Local and Remote TransPort Networks

<table>
<thead>
<tr>
<th>Port</th>
<th>7000</th>
<th>Port on Remote Host. Enter the port number that will be configured on the remote TransPort’s ‘MAC Bridge Listen Port (Host Mode)’ setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listen on Port</td>
<td>6000</td>
<td>Local Listening Port. This is required only if hosts on the remote site need to locate hosts on the local network. In this example, bi-directional bridging is utilized so both sites are also in listening mode</td>
</tr>
<tr>
<td>Ethernet Interfaces</td>
<td>ETH 0</td>
<td>Turn on Ethernet analysis so that bridged packets being sent to and from the remote networks can be seen, and verify that the bridge is working</td>
</tr>
<tr>
<td>IP Sources</td>
<td>ETH 0</td>
<td>Turn on analysis for this interface to enable troubleshooting if there are problems with the setup</td>
</tr>
</tbody>
</table>

### 2.2.2 Configure Analysis

In this example, a cellular WAN link is used, which provides a static IP address for the WR to connect to. **Please be aware of the caution note above regarding potential network charges.** We only need to set up monitoring here. Please note that if the wireless WAN connection requires a username and password, or if a SIM PIN is required, then this is done within the Mobile Configuration on the next item. The SIM we are using requires no username, password or PIN, so there is very little to configure in this page except the setting up of the monitoring:

*Management - Analyser > Settings*

**IP Sources**

- ETH 0
- ETH 5
- ETH 10
- ETH 15
- ETH 20
- ETH 25
- OVPN 0
- PPP 0
- PPP 1

**Figure 2-7: Site B PPP 1 Setup**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP Sources</td>
<td>PPP 1</td>
<td>Turn on analysis for this interface to enable troubleshooting if there are issues</td>
</tr>
</tbody>
</table>
2.2.3 Configure Mobile Interface

Here, the APN for the cellular WAN connection is entered. Please note that some wireless connections may require more settings such as a PIN, username, and password, to be setup on the PPP interface:

![Configuration - Network > Interfaces > Mobile]

Select the service plan and connection settings used in connecting to the mobile network.

**Mobile Service Provider Settings**

<table>
<thead>
<tr>
<th>Service Plan / APN</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Your.APN.goes.here</td>
<td>Replace this with the proper APN (if required)</td>
</tr>
</tbody>
</table>

![Figure 2-8: Site B APN Setup]

2.2.4 Configure MAC Addresses to be Bridged

Please see section above for more detail about how to determine what the MAC address is. The IP address of the device that is to be bridged in this example is 10.2.63.2; first test that this is responding OK:

```
ping 10.2.63.2 -e0
```

arp –a will again give us the IP addresses of devices on this network segment that the device has seen recently.
Configure Bridging Local Ethernet Devices Between Local and Remote TransPort Networks

Both of these devices are TransPorts (OID ‘00042D’). They could equally be PCs or any other Ethernet connected devices. As can be seen above, the MAC address needing to be bridged is **00042D012F2D**. Enter this into the bridge filter form:

![Configuration - Network > Interfaces > Ethernet > MAC Bridging](image)

**Figure 2-9: Site B Mac Filter Setup**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac Address</td>
<td>00:04:2D:01:2F:2D</td>
<td>MAC address to be bridged</td>
</tr>
</tbody>
</table>

### 2.2.5 Configure Logging

This is just to double check that the analyser is setup correctly. Remove any settings that do not match here. IP traces are only required for packets that are going to or from the ports 6000 or 7000.

Using a ‘~’ tilde sign on any filter within the analyser settings will cause the unit to only record traffic that matches the filter and exclude all other traffic – please be wary of combing tilde filters on port, protocol and IP as this can often result in no results as for example filter for only port 80 and protocol 1 will usually result in no matches as there is no web traffic over ICMP.

![Management - Analyser > Settings](image)
### Management - Analyser > Settings

#### Ethernet Interfaces

- ETH 0
- ETH 1
- ETH 2
- ETH 3
- ETH 4
- ETH 5
- ETH 6
- ETH 7
- ETH 8
- ETH 9
- ETH 10
- ETH 11
- ETH 12
- ETH 13
- ETH 14
- ETH 15
- ETH 16
- ETH 17
- ETH 18
- ETH 19
- ETH 20
- ETH 21
- ETH 22
- ETH 23
- ETH 24
- ETH 25
- ETH 26
- ETH 27

[Clear all Ethernet Interfaces]
Configure Bridging Local Ethernet Devices Between Local and Remote TransPort Networks

Management - Analyser > Settings

IP Sources
- ETH 0
- ETH 1
- ETH 2
- ETH 3
- ETH 4
- ETH 5
- ETH 6
- ETH 7
- ETH 8
- ETH 9
- ETH 10
- ETH 11
- ETH 12
- ETH 13
- ETH 14
- ETH 15
- ETH 16
- ETH 17
- ETH 18
- ETH 19
- ETH 20
- ETH 21
- ETH 22
- ETH 23
- ETH 24
- ETH 25
- ETH 26
- ETH 27
- OVPN 0
- OVPN 1
- OVPN 2
- PPP 0
- PPP 1
- PPP 2
- PPP 3
- PPP 4
- PPP 5
- PPP 6
- PPP 7
- PPP 8
- PPP 9
- PPP 10
- PPP 11
- PPP 12
- PPP 13
- PPP 14
- PPP 15
- PPP 16
- PPP 17
- PPP 18
- PPP 19

Clear all IP Sources

IP Options
- Trace discarded packets
- Trace loopback packets

Ethernet Packet Filters
MAC Addresses:

IP Packet Filters
TCP/UDP Ports: ~6000,7000
IP Protocols:
IP Addresses:

Discarded IP Packet Filters
TCP/UDP Ports: ~6000,7000

Figure 2-10: Site B Analyser Setup
Configure Bridging Local Ethernet Devices Between Local and Remote TransPort Networks

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable Analyser</td>
<td>Checked</td>
<td>Enable logging to the Analyser trace</td>
</tr>
<tr>
<td>Maximum packet capture size</td>
<td>1500</td>
<td>Collect most full sized packets</td>
</tr>
<tr>
<td>Log Size</td>
<td>180</td>
<td>Set the Analyser to the maximum size</td>
</tr>
<tr>
<td>Ethernet Interfaces</td>
<td>ETH 0</td>
<td>Enable Ethernet logging for this interface</td>
</tr>
<tr>
<td>IP Sources</td>
<td>ETH 0</td>
<td>Enable IP logging for this interface</td>
</tr>
<tr>
<td>IP Sources</td>
<td>PPP 1</td>
<td>Enable IP logging for this interface</td>
</tr>
<tr>
<td>IP Options</td>
<td>Trace Discarded Packets</td>
<td></td>
</tr>
<tr>
<td>IP Packet filters</td>
<td>~6000,7000</td>
<td>Traffic between the sites over the bridge only</td>
</tr>
<tr>
<td>Discarded IP Packet Filters</td>
<td>~6000,7000</td>
<td>Discarded traffic between the sites over the bridge only.</td>
</tr>
</tbody>
</table>

2.2.6 Save the config

Once configured, save the configuration.

If the config is not saved, the above configuration steps will have to be repeated following a reboot of the TransPort!

![Administration - Save configuration](image)
2.3 Alternate configuration for NAT

If the “Local” TransPort has a private IP address instead of a public IP address, only the Remote TransPort needs to be configured to listen. The Local TransPort needs to be configured to initiate the bridge via the public IP address of the Remote TransPort, connecting to the port that the Remote TransPort is configured to listen on.

Be sure to also follow the “Configure MAC Addresses to be Bridged” instructions earlier in this section.

Local TransPort:

```
Configuration - Network > Interfaces > Ethernet > MAC Bridging

MAC Bridging

Enable MAC bridging on Ethernet interfaces

<table>
<thead>
<tr>
<th>Interface</th>
<th>Enable</th>
<th>Forward to IP Address</th>
<th>Port</th>
<th>Listen on Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETH 0</td>
<td>✓</td>
<td>123.45.6.7</td>
<td>6000</td>
<td></td>
</tr>
</tbody>
</table>
```

123.45.6.7 is the public IP address of the other Remote TransPort.

Remote TransPort:

```
Configuration - Network > Interfaces > Ethernet > MAC Bridging

MAC Bridging

Enable MAC bridging on Ethernet interfaces

<table>
<thead>
<tr>
<th>Interface</th>
<th>Enable</th>
<th>Forward to IP Address</th>
<th>Port</th>
<th>Listen on Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETH 0</td>
<td>✓</td>
<td></td>
<td>0</td>
<td>6000</td>
</tr>
</tbody>
</table>
```
3 TESTING

To test this setup, send a ping from 10.2.63.2 to 10.2.63.10:

```
ping 10.2.63.10
PingAddr [10.2.63.10]
Sent PING # 1
PING reception # 1 : response time 0.43 seconds
Interface: ETH 0
Ping Statistics
Sent : 1
Received : 1
Success : 100%
Average RTT : 0.43 seconds
OK
```

This test was successful (100%).

A ping from 10.2.63.1 to either node attached to the WR41 was also successful, but a ping from 10.2.63.10 to either of the devices attached to the WR failed. A ping from 10.2.63.20 to either of the devices attached to the DR also failed.

Below is the successful trace showing the ping between 10.2.63.2 and 10.2.63.10. Please note that the trace below has been tidied up. Subsequent ARP requests sent and some NETBIOS traffic have been omitted.
Configure Bridging Local Ethernet Devices Between Local and Remote TransPort Networks

<table>
<thead>
<tr>
<th>STAGE</th>
<th>10.2.63.2</th>
<th>WR41</th>
<th>DR6410</th>
<th>10.2.63.10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ARP request &gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Packet encap 7000 &gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Packet Rcvd port 7000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>ARP Request &gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>&lt; ARP Reply</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>&lt; Packet encap from port 7000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>&lt; Packet recd from port 7000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>&lt; ARP Reply</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>ICMP ECHO Request &gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Packet encap 7000 &gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Packet Rcvd port 7000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>ICMP ECHO Request &gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>&lt; ICMP ECHO Reply</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>&lt; Packet encap from port 7000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>&lt; Packet recd from port 7000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>&lt; ICMP ECHO Reply</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Traces:
The trace below is sectioned off and some traffic is excluded to make the conversation above easier to see.
At this point, the MAC address of the target machine is not known, so the device on the WR41 network sends an ARP request for the MAC address of the device that has 10.2.63.10. Please note the source IP address. The TransPort sees this MAC address and checks the bridging table to see if this traffic should be bridged.
Configure Bridging Local Ethernet Devices Between Local and Remote TransPort Networks

The WR then adds a bridging header to the packet and sends this to the DR. The packet sent from the WR matches the packet received at the DR. Also apart from the header information:

45 00 00 60 00 15 00 00 F9 11 29 8A 7B 2D 06 07 ETH From LOC TO REM IFACE: ETH 0

The packet is identical to the one received on the Ethernet port of the WR in stage 1.
Configure Bridging Local Ethernet Devices Between Local and Remote TransPort Networks

**ARP request sent on the WR41 network is now sent out of Eth 0 on the DR network.**

**ARP reply to ARP request is received on the Ethernet port of the DR; now a MAC address for the destination device is seen. Please note that although this device can be pinged from the WR network, this MAC address is not in the MAC bridge table on the DR, so it is not possible to initiate a ping in the opposite direction from the 10.2.63.10 device.
The ARP reply is encapsulated and sent back to the WR41 router again. Notice that the packet without the bridging header is the same packet seen on the DR local network and is not encrypted.
Configure Bridging Local Ethernet Devices Between Local and Remote TransPort Networks

ARP reply is seen back on the WR41 local network. Now that a destination MAC address is found, a ping to the remote device can be sent.

ICMP ping request Ethernet packet is seen on the WR41 network coming from the node set up for bridging and is sent to the remote network. Please note that any Ethernet packet from this node except a packet for the WR41 itself will be bridged.
Configure Bridging Local Ethernet Devices Between Local and Remote TransPort Networks

ICMP ping request is encapsulated and sent to the DR device.
Configure Bridging Local Ethernet Devices Between Local and Remote TransPort Networks

ICMP ping request is sent on the DR network.

ICMP reply is received from the DR network device.
ICMP reply is encapsulated and sent to the WR by the DR.
ICMP reply is sent to 10.2.63.2 and devices have been successfully bridged across the Internet
4 CONFIGURATION FILES

4.1 DR6410 “Local” Site A configuration

This is the configuration file from DR6410 Site A TransPort:

```
eth 0 IPaddr "10.2.63.100"
eth 0 ipanon ON
eth 0 ethanon ON
eth 0 srcbHost "[WR41 SITE B IP ADDRESS]"
eth 0 srcbPort 6000
eth 0 srcblistenport 7000
bridgemac 0 mac "[ENTER MAC ADDRESS TO BE BRIDGED]"
lapb 0 ans OFF
lapb 0 tinact 120
lapb 1 tinact 120
lapb 3 dtemode 0
lapb 4 dtemode 0
lapb 5 dtemode 0
lapb 6 dtemode 0
def_route 0 ll_ent "ppp"
def_route 0 ll_add 1
def_route 1 ll_ent "PPP"
def_route 1 ll_add 3
ppp 1 IPaddr "0.0.0.0"
ppp 1 username "[ENTER ADSL USERNAME]"
ppp 1 epassword "[ADSL ENCRYPTED PASSWORD]"
ppp 1 timeout 0
ppp 1 aodion 1
ppp 1 immoos ON
ppp 1 autoassert 1
ppp 1 echo 10
ppp 1 echodropcnt 5
ppp 1 l1ifac"AAL"
ppp 1 ipanon ON
ppp 3 l_pap OFF
ppp 3 l_chap OFF
ppp 3 l_addr ON
ppp 3 r_chap OFF
ppp 3 r_addr OFF
ppp 3 IPaddr "0.0.0.0"
ppp 3 username "ENTER WWAN Username"
ppp 3 epassword "KD5lSVJDVg="
ppp 3 phonenum "*98*1#"
ppp 3 timeout 0
ppp 3 use_modem 1
ppp 3 aodion 1
ppp 3 immoos ON
ppp 3 autoassert 1
ppp 3 defpak 16
ppp 4 defpak 16
modemcc 0 info_asy_add 9
modemcc 0 init_str "+CGQREQ=1"
```
modemcc 0 init_str1 "+CGQMIN=1"
modemcc 0 apn "Your.APN.Goes.Here"
modemcc 0 link_retries 10
modemcc 0 stat_retries 30
modemcc 0 sms_interval 1
modemcc 0 init_str_2_0 "+CGREQ=1"
modemcc 0 init_str_1_0 "+CGQMIN=1"
modemcc 0 apn_0 "Your.APN.Goes.Here"
modemcc 0 link_retries_0 10
modemcc 0 stat_retries_0 30
modemcc 0 sms_interval_0 1
ana 0 anon ON
ana 0 l1on ON
ana 0 xoton OFF
ana 0 lapdon 0
ana 0 lapbon 0
ana 0 ipfilt "~7000,6000"
ana 0 discardson ON
ana 0 discportfilt "~7000,6000"
ana 0 maxdata 1500
ana 0 logsize 180
cmd 0 unitid "ss%s>"
cmd 0 cmdnua "99"
cmd 0 hostname "Sarian.router"
cmd 0 tremto 1200
cmd 0 web_suffix ".wb2"
user 0 name "username"
user 0 epassword "KD5lSVJDVVg=
user 0 access 0
user 1 access 0
user 2 access 0
user 3 access 0
user 4 access 0
user 5 access 0
user 6 access 0
user 7 access 0
user 8 access 0
local 0 transaccess 2
sslsvr 0 certfile "cert01.pem"
sslsvr 0 keyfile "privrsa.pem"
ssh 0 hostkey1 "privSSH.pem"
ssh 0 nb_listen 5
ssh 0 v1 OFF
4.2 WR41 “Remote” Site B configuration

This is the configuration file from WR41 Site B TransPort:

```
eth 0 IPaddr "10.2.63.200"
eth 0 ipanon ON
eth 0 ethanon ON
eth 0 srcbHost ":[DR6410 SITE A IP ADDRESS]"
eth 0 srcbPort 7000
eth 0 srcblistenport 6000
bridgemac 0 mac ":[ENTER MAC ADDRESS TO BE BRIDGED]"
lapb 0 ans OFF
lapb 0 tinact 120
lapb 1 tinact 120
lapb 3 dtemode 0
lapb 4 dtemode 0
lapb 5 dtemode 0
lapb 6 dtemode 0
gps 0 asy_add 1
gps 0 gpson ON
def_route 0 ll_ent "ppp"
def_route 0 ll_add 1
ppp 0 timeout 300
ppp 1 r_chap OFF
ppp 1 IPaddr ":0.0.0.0"
ppp 1 phonenum ":*98*1#"
ppp 1 timeout 0
ppp 1 use_modem 1
ppp 1 aodion 1
ppp 1 autoassert 1
ppp 1 ipanon ON
ppp 3 defpak 16
ppp 4 defpak 16
modemcc 0 info_asy_add 7
modemcc 0 init_str "+CGREQ=1"
modemcc 0 init_str1 "+CGQMIN=1"
modemcc 0 apn "3internet"
modemcc 0 link_retries 10
modemcc 0 stat_retries 30
modemcc 0 sms_interval 1
modemcc 0 sms_access 1
modemcc 0 sms_concat 0
modemcc 0 init_str_2 "+CGREQ=1"
modemcc 0 init_str1_2 "+CGQMIN=1"
modemcc 0 apn_2 "Your.APN.goes.here"
modemcc 0 link_retries_2 10
modemcc 0 stat_retries_2 30
ana 0 anon ON
ana 0 l1on ON
ana 0 lapdon 0
ana 0 lapbon 0
ana 0 asyon 0
ana 0 ipfilt ":~7000,6000"
ana 0 discardson ON
```
Configure Bridging Local Ethernet Devices Between Local and Remote TransPort Networks

```
ana 0 discportfilt "~7000,6000"
ana 0 maxdata 1500
ana 0 logsize 180

cmd 0 unitid "ss%s>"
cmd 0 cmdnua "99"
cmd 0 hostname "Sarian.router"
cmd 0 asyled_mode 2

cmd 0 tremto 1200

cmd 0 web_suffix ".wb2"
cmd 1 autocmd "ats31=7"
cmd 1 gpson 1

user 0 name "Sarian"
user 0 epassword "Dw0iCw=="
user 0 access 0
user 1 name "username"
user 1 epassword "KD5lSVJDVVg="
user 1 access 0
user 2 access 0
user 3 access 0
user 4 access 0
user 5 access 0
user 6 access 0
user 7 access 0
user 8 access 0
user 9 access 0

local 0 transaccess 2

sslsvr 0 certfile "cert01.pem"
sslsvr 0 keyfile "privrsa.pem"

ssh 0 hostkey1 "privSSH.pem"

ssh 0 nb_listen 5

ssh 0 v1 OFF
```
## 5 FIRMWARE VERSIONS

**NOTE:** As part of updating this document version to version 1.3, these steps have been tested and verified with TransPort WR21 and WR44v2 units running the current release firmware to-date, v5.2.14.5.

### 5.1 “Local” Site A DR6410

<table>
<thead>
<tr>
<th>Component</th>
<th>Revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digi TransPort DR64-HXA1-DE2-XX(MkII) Ser#:17000 HW Revision: 7503a</td>
<td></td>
</tr>
<tr>
<td>ARM Bios Ver 6.29 v35 197MHz B128-M128-F300-0100000,0 MAC:00042d000000</td>
<td></td>
</tr>
<tr>
<td>Power Up Profile: 0</td>
<td></td>
</tr>
<tr>
<td>Async Driver</td>
<td>Revision: 1.19 Int clk</td>
</tr>
<tr>
<td>Wi-Fi</td>
<td>Revision: 2.0</td>
</tr>
<tr>
<td>Ethernet Port Isolate Driver</td>
<td>Revision: 1.11</td>
</tr>
<tr>
<td>Firewall</td>
<td>Revision: 1.0</td>
</tr>
<tr>
<td>EventEdit</td>
<td>Revision: 1.0</td>
</tr>
<tr>
<td>Timer Module</td>
<td>Revision: 1.1</td>
</tr>
<tr>
<td>AAL</td>
<td>Revision: 1.0</td>
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<tr>
<td>ADSL</td>
<td>Revision: 1.0</td>
</tr>
<tr>
<td>(B)USBHOST</td>
<td>Revision: 1.0</td>
</tr>
<tr>
<td>L2TP</td>
<td>Revision: 1.10</td>
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<tr>
<td>PPTP</td>
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<td>TACPLUS</td>
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<td>MySQL</td>
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<tr>
<td>LAPB</td>
<td>Revision: 1.12</td>
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<tr>
<td>X25 Layer</td>
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<tr>
<td>MACRO</td>
<td>Revision: 1.0</td>
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<tr>
<td>PAD</td>
<td>Revision: 1.4</td>
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<tr>
<td>X25 Switch</td>
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</tr>
<tr>
<td>V120</td>
<td>Revision: 1.16</td>
</tr>
<tr>
<td>TPAD Interface</td>
<td>Revision: 1.12</td>
</tr>
<tr>
<td>SCRIBATSK</td>
<td>Revision: 1.0</td>
</tr>
<tr>
<td>BASTSK</td>
<td>Revision: 1.0</td>
</tr>
<tr>
<td>ARM Sync Driver</td>
<td>Revision: 1.18</td>
</tr>
<tr>
<td>TCP (HASH mode)</td>
<td>Revision: 1.14</td>
</tr>
<tr>
<td>TCP Utils</td>
<td>Revision: 1.13</td>
</tr>
<tr>
<td>PPP</td>
<td>Revision: 1.19</td>
</tr>
<tr>
<td>WEB</td>
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<td>PollANS</td>
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<td>PPPPOE</td>
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<td>MODEM CC (Option 3G)</td>
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<tr>
<td>FLASH Write</td>
<td>Revision: 1.2</td>
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<tr>
<td>Command Interpreter</td>
<td>Revision: 1.38</td>
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<tr>
<td>SSLCLI</td>
<td>Revision: 1.0</td>
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<tr>
<td>OSPF</td>
<td>Revision: 1.0</td>
</tr>
<tr>
<td>BGP</td>
<td>Revision: 1.0</td>
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<tr>
<td>Service</td>
<td>Revision</td>
</tr>
<tr>
<td>--------------------</td>
<td>----------</td>
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<td>QOS</td>
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<td>RADIUS Client</td>
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<td>SSH Server</td>
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<td>SCP</td>
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<tr>
<td>CERT</td>
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<td>LowPrio</td>
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</tr>
<tr>
<td>Tunnel</td>
<td>1.2</td>
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<td>OVPN</td>
<td>1.2</td>
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<tr>
<td>TEMPLOG</td>
<td>1.0</td>
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<td>iDigi</td>
<td>2.0</td>
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<tr>
<td>OK</td>
<td></td>
</tr>
</tbody>
</table>
5.2 “Remote” Site B WR41

Digi TransPort WR41-HXA1-DV1-XX(WR41v1) Ser#:140000 HW Revision: 7103a
Software Build Ver5146.  Feb 08 2012 12:24:12  ZW
ARM Bios Ver 6.55 v36 399MHz B128-M128-F80-0100,0 MAC:00042d00000
Power Up Profile: 0
Async Driver Revision: 1.19 Int clk
Ethernet Driver Revision: 1.11
Firewall Revision: 1.0
EventEdit Revision: 1.0
Timer Module Revision: 1.1
(b)USBHOST Revision: 1.0
SDMMC Revision: 1.0
L2TP Revision: 1.10
PPTP Revision: 1.00
TACPLUS Revision: 1.00
MODBUS Revision: 0.00
MultiTX Revision: 1.00
LAPB Revision: 1.12
X25 Layer Revision: 1.19
MACRO Revision: 1.0
PAD Revision: 1.4
V120 Revision: 1.16
TPAD Interface Revision: 1.12
GPS Revision: 1.0
SCRIBATS1K Revision: 1.0
BASTSK Revision: 1.0
PYTHON Revision: 1.0
ARM Sync Driver Revision: 1.18
TCP (HASH mode) Revision: 1.14
TCP Utils Revision: 1.13
PPP Revision: 1.19
WEB Revision: 1.5
SMTP Revision: 1.1
FTP Client Revision: 1.5
FTP Revision: 1.4
IKE Revision: 1.0
PollANS Revision: 1.2
PPPOE Revision: 1.0
MODEM CC (Option 3G) Revision: 1.4
FLASH Write Revision: 1.2
Command Interpreter Revision: 1.38
SSLCLI Revision: 1.0
OSPF Revision: 1.0
BGP Revision: 1.0
QOS Revision: 1.0
PWRCTRL Revision: 1.0
RADIUS Client Revision: 1.0
SSH Server Revision: 1.0
SCP Revision: 1.0
CERT Revision: 1.0
LowPrio Revision: 1.0
Tunnel Revision: 1.2
OVPN Revision: 1.2