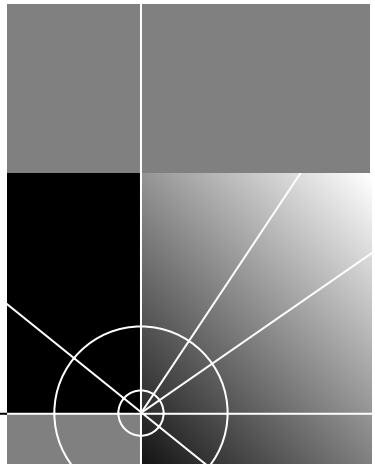
NETBUILDER II® HSS 4-PORT WAN MODULE SOFTWARE RELEASE NOTES

Software Version 10.3



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3Com Corporation
5400 Bayfront Plaza
Santa Clara, California
95052-8145

NETBUILDER II HSS 4-PORT WAN MODULE RELEASE NOTES

Introduction

These release notes provide important hardware and software information for customers installing HSS 4-Port WAN modules in NETBuilder® Bridge/Router systems. The following topics are covered:

- Feature information
- Important hardware information
- Known problems and limitations
- Software configuration information
- Upgrade instructions for software version 10.3

Feature Information

This section provides information on HSS 4-Port WAN module features.

Clock Source

The HSS 4-Port WAN module can be used as a clock source, provided you are using the appropriate cables. See *Installing the NETBuilder HSS 4-Port WAN Module* for cable information.

Supported Clock Rates

The maximum supported rate on any one port is 4 megabits per second. The maximum number or ports at 4 Mbps is 2. Four ports will run at T1/E1.

Important Hardware Information

This section provides important hardware installation information

Installation Caution

When installing, removing or replacing an HSS 4-Port WAN module, always disconnect the hydra cable first. Reconnect the cable only after the module is properly installed in the chassis. The weight of the cable connector may cause the module to flex and damage the connectors if the module is not properly installed.

Special Hardware Requirements for NETBuilder Extended Chassis

For some older NETBuilder II Extended chassis models, the card carrier may need to be replaced before you install your HSS 4-Port WAN module. You can determine whether you have an older card carrier by looking at the part number on the card carriers in your chassis. If the part number is 70-0399-**000**, you will need to replace the card carrier. Contact your network supplier for ordering instructions. The order number for the replacement card carrier is 3C6048, UPC# 662705161525**.**

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Software Configuration Information

This section describes software configuration information specific to the HSS 4-Port WAN module.

Port and Path Numbering

The four possible ports and paths for the HSS 4-Port WAN module have specific names that must be used when entering commands. Commands that display this additional physical interface will show information for each possible port or path. The path and port designations for this module are as follows:

- Port 1 (A) = !<port>
- Port 2 (B) = !<port>B
- Port 3 (C) = !<port>B
- Port 4 (D) = !<port>D
- Path 1 (A) = !<path>
- Path 2 (B) = !<path>B
- Path 3 (C) = !<path>C
- Path 4 (D) = !<path>D

For example, for a chassis with an HSS 4-Port WAN module installed in slot 3, when the SHow Path Baud command is entered, a display similar to the following appears:

```
sh -pa baud
======================== SHow -PATH BAud ========================
Path !3    BAud = 64
Path !3B   BAud = 38.4
Path !3C   BAud = 38.4
Path !3D   BAud = 64
```

Known Problems and Limitations

The section describes known problems and limitations for the HSS 4-Port WAN module.

Clock Configurations for Serial WAN Interfaces operating at T1 and faster Data Rates

This section is intended to alert installers and customers to a problems that occur when two devices are interconnected using synchronous serial interfaces and are operating at high serial data rates. Whenever a DTE (such as a NETBuilder system) is connected to a DCE device (such as a CSU/DSU) the DCE serial interface should always be configured to sample serial data sent from the DTE by using the serial clock returned from the DTE. Failure to use this configuration can result in high frame error rates.

When using WAN data rates near T1 (1.544Mbs) or greater, correctly configuring the serial interface on the attached DCE (Data Communications Equipment) is crucial for reliable data transfer. Virtually all interoperability problems (such as high frame error rates) can be eliminated by correctly configuring the DCE clock.

Synchronous Data Transmission

Figure 1 shows the serial data and clock signals used to connect a DCE device to a DTE (such as when a CSU/DSU is connected to a NETBuilder WAN serial port).

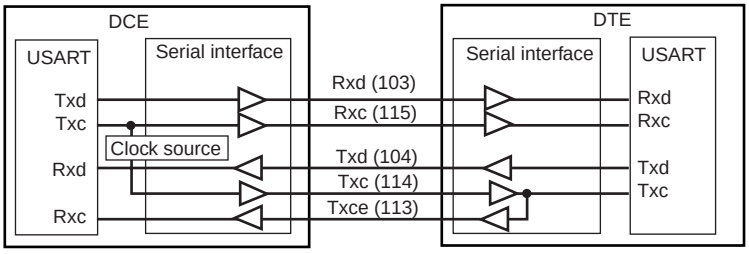

Figure 1 Serial data and clock signals to connect a DCE to a DTE device

Synchronous data transmission is nearly always used with serial data rates of 64 kilobits per second or higher. Figure 2 shows a series of data bits and the accompanying clock signal. The position of the data bits indicates that the data bit may have a value of either 1 or 0 and may change value only when the high to low transition of the clock signal occurs.

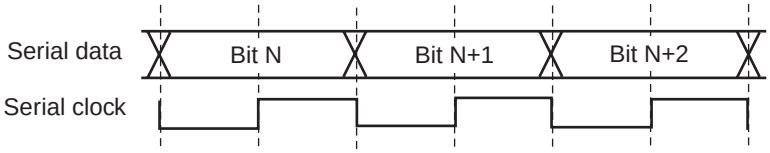

Figure 2 Data bits and accompanying clock signal

The serial data changes with one edge of the clock, while the other clock edge occurs in the middle of the data bit. The device receiving the data uses the edge of the clock signal that occurs in the middle of the data bit to sample the state of the data bit (in Figure 1 this is shown as the low to high transition, also known as the "rising" edge). Data must be stable (unchanging) before and after the sampling clock edge for reliable data reception.

Problem Description

In Figure 1, the serial data signal (RXD) and accompanying clock signal (RXC) sent from the DCE to the DTE arrive at the DTE without difficulty, since both signals travel the same distance at the same speed and maintain the timing relationship shown in Figure 2. The problem discussed in this section occurs when data is sent from the DTE to the DCE at higher data rates. Figure 3 shows the signals involved.

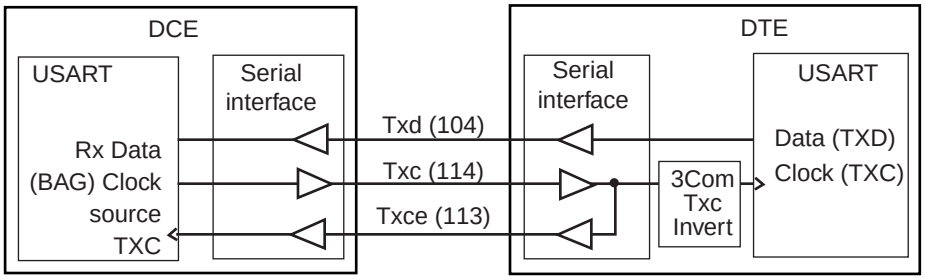

Figure 3 Signals involved when data is sent at higher data rates.

In this case the DCE sends a clock signal to the DTE and the DTE sends the data back to the DCE in synchronization with clock. When using higher data rates or long cable lengths, the timing relationship between the clock signal sent from the DCE and the data from the DTE is significantly altered by the amount of time it takes the signals to travel from one device to another, as shown in Figure 4.

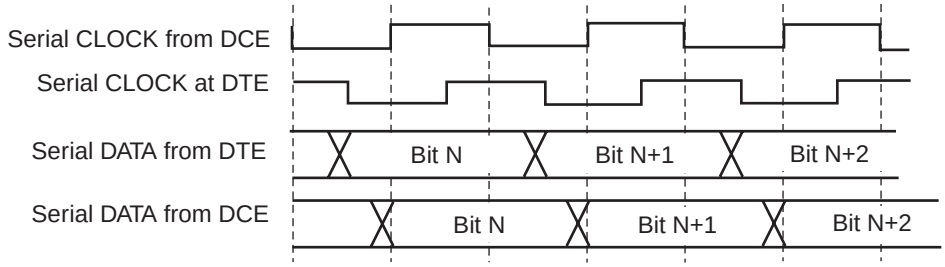

Figure 4 Altered timing relationship at higher data rates

The shift between the clock signal from the DCE and the data sent back from the DTE can become large enough that the middle of the data bit actually lines up with the opposite clock edge. Frequently CSU/DSUs and other DCEs are preconfigured to sample data using the clock sent by the DCE. Unreliable data transmission occurs because the data is changing at the clock edge used to sample the data. The timing relationship of the clock and data signals also depends on the delay through the on-board serial interface circuitry. Replacing a NETBuilder II WAN module with different type of module or changing data rates can cause a previously reliable connection to behave erratically. The customer may incorrectly conclude the fault is with the replacement module.

Solutions

The preferred solution to this problem is to configure the DCE to use the clock sent from the DTE to sample the data sent by the DTE. Figure 5 shows the timing relation of this clock to the data from the DTE (from the perspective of the DCE.)

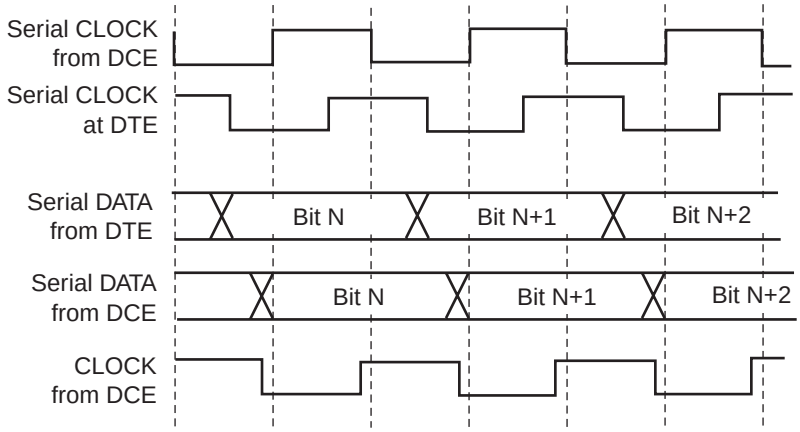

Figure 5 DCE clock used to sample data sent from DTE

The rising edge of DTE clock occurs in the middle of the data bit as desired. The correct timing relationship is maintained because the data and clock signals experience the same delay through the serial interface circuitry and the cable (see Figure 3). Configuring the DCE to sample sent data from the DTE using the DTE clock maintains the correct timing relationship regardless of the data rate or cable length.

A commonly used alternative solution is to configure the DCE to invert the clock, so that data is sampled by the DCE on the opposite clock edge. This will usually correct the problem unless there is a change in either cable length or data rate, when the symptoms can reappear.

Configuring the DCE (CSU/DSU)

Since the clock sent from the DTE to the DCE does not have a consistent common name, determining how to configure a particular DCE may not be obvious. CCITT/ISO designates the signal as "*Circuit #113, Transmitter Signal Element Timing, DTE Source*". The table below shows the pin designations for the most common synchronous serial interfaces.

Interface Type	Pin Designators
V.35‘	U, W
RS-449	17, 35
RS-530	24, 11
X.21	Not supported

Standalone CSU/DSUs often have an option to use the clock from the DTE. Refer to the manual provided with your DCE for instructions on how to configure the DTE clock option. The previous table may also prove helpful. X.21 devices and DCEs that do not have the DTE clock option should configure the serial interface to invert the clock.

Asynchronous Tunneling Functionality

The parameters to configure databits, parity, and stopbits for asynchronous tunneling (ATUN) ports are not available. ATUN will only work with the following default settings:

- 8 databits
- 1 stop bit
- No parity

Contact your network supplier if you require a configuration that will not work with these settings.

PATHCONTrol Toggle

If you have16 or more virtual ports per path and the path goes down, the PATHCONTrol = Enabled command will not work as a toggle to bring the path back up. You must first disable the path and then re-enable it.

Upgrade Instructions for NETBuilder Software, Version 10.3

The following sections describe the steps necessary to upgrade from older software versions to NETBuilder Software version 10.3. The HSS 4-Port WAN module requires version 10.3 software to operate.

The three CDs provided with your HSS 4-Port WAN module contain the following items:

- NETBuilder Software version 10.1 and 10.3
- NETBuilder Upgrade Management Utilities, version 10.1
- NETBuilder Documentation

There are no upgrade management utilities for version 10.3. Customers who wish to retain their existing pre-10.3 configuration settings (9.3.x through 10.1) must first upgrade to version 10.1 using the Upgrade Management Utilities version 10.1, and then copy the 10.3 image as described in the procedure below.

The upgrade process in this release note is an interim upgrade solution. Customers are urged to check the world wide web site for versions of the NETBuilder Upgrade Management Utilities greater than 10.1. Later versions support a smoother process allowing customers to upgrade easily to the most current NETBuilder Family Software.

Upgrade Scenarios

This section describes common upgrade scenarios for customers installing HSS 4-Port WAN modules.

Customers with DPE modules and software version 9.3.x.

If you have a bridge/router with a DPE module and you are using software version 9.3.x, you must use the Upgrade Management Utilities version 10.1 to upgrade from 9.3.x to 10.1, then copy the 10.3 image onto your NETBuilder bridge/router. Use the following procedure:

For detailed instructions about NETBuilder Upgrade Management Utilities, see Upgrading NETBuilder Family Software for version 10.1.

1. Copy the Upgrade Utilities to your network management station (NMS) using:

   `bcmsetup <drive>: all` (for Windows)
   `bcmsetup all` (for Unix)

2. Install the NETBuilder Family Software, version 10.1 and 10.3 onto the NMS:

   `bcminstall -cdrom <CD-ROM drive>:\image` (for Windows)
   `bcminstall` (for Unix)

3. Verify that the utilities are installed correctly:

   `bcmdiagnose`

4. Verify connectivity to the NETBuilder bridge/router:

   `bcmdiagnose <device>` (device = NB Ipaddr or NB hostname)

5. Archive configuration files from the NETBuilder bridge/router:

   `bcmsysupgrade -s:from_nb <device>` (device = NB Ipaddr or NB hostname)

6. Upgrade the current configuration files to 10.1:

   `bcmsysupgrade -s:update <device>` (device = NB Ipaddr or NB hostname)

7. Copy the configuration and image files to the /101/ directory on the NETBuilder bridge/router:

   `bcmsysupgrade -s:to_nb <device>` (device = NB Ipaddr or NB hostname)

8. Test boot the 10.1 and configuration files:

   `bcmsysupgrade -s:test_boot <device>` (device = NB Ipaddr or NB hostname)

   The bridge/router is rebooted, and the utilities confirm the IP connection and that 10.1 software is running.

9. Accept the upgrade:

   `bcmsysupgrade -s:accept <device>` (device = NB_Ipaddr or hostname)

10. Rename the boot.29k file in the /101/ directory to boot.101:

    `bcmmv <NB_ipaddr>:a:/101/boot.29k <NB_ipaddr>:a:/101/boot.101`

11. Copy the 10.3 image to the NB:

    ```
    bcmcp /tftpboot/image/NBDPE/SW/103/<pkg>/boot.29k
     <NB_Ipaddr>:a:/101/boot.29k
    ```

12. Copy the HSS 4-Port WAN software to the NETBuilder bridge/router:

    ```
    bcmcp /tftpboot/image/NBDPE/SW/103/<pkg>/4portwan.860
     <NB_Ipaddr>:a:/101/4portwan.860
    ```

13. Reboot the router:

    `bcmctrl <NB_Ipaddr> -reboot`

Customers with a DPE module and software version 10.1.

If you are already running software version 10.1 on a bridge/router with a DPE module installed, use the following procedure:

For detailed instructions about NETBuilder Upgrade Management Utilities, see Upgrading NETBuilder Family Software for version 10.1.

1. Copy the Upgrade Utilities to your network management station (NMS) using the bcmsetup command:

   `bcmsetup <drive>: all` (for Windows)
   `bcmsetup all` (for UNIX)

2. Install the NETBuilder Family Software, version 10.1 and 10.3 onto the NMS:

   `bcminstall -cdrom <CD-ROM drive>:\image` (for Windows)
   `bcminstall` (for UNIX)

3. Verify connectivity to the NETBuilder bridge/router:

   `bcmdiagnose <device>` (device = NB_Ipaddr or hostname)

4. Rename the boot.29k file in the /101/ directory to boot.101:

   ```
   bcmmv <NB_ipaddr>:a:/101/boot.29k <NB_ipaddr>:a:/101/boot.101
   ```

5. Copy the 10.3 image to the NB:

   ```
   bcmcp /tftpboot/image/NBDPE/SW/103/DW/boot.29k
     <NB_Ipaddr>:a:/101/boot.29k
   ```

6. Copy the HSS 4-Port WAN software to the NETBuilder bridge/router:

   ```
   bcmcp /tftpboot/image/NBDPE/SW/103/DW/4portwan.860
     <NB_Ipaddr>:a:/101/4portwan.860
   ```

7. Reboot the router:

   ```
   bcmctrl <NB_Ipaddr> -reboot
   ```

Customers with CEC modules and software versions prior to 10.1.

If you have a bridge/router with a CEC module installed, you must install a DPE module and use Upgrade Management Utilities version 10.1 to upgrade from 9.3.x to 10.1 then copy the 10.3 image onto the bridge/router.

For detailed instructions about NETBuilder Upgrade Management Utilities, see Upgrading NETBuilder Family Software for version 10.1.

1. Copy the Upgrade Utilities to your network management station (NMS) using:

   `bcmsetup <drive>: all` (for Windows)
   `bcmsetup all` (for UNIX)

2. Install the NETBuilder Family Software, version 10.1 and 10.3 onto the NMS:

   `bcminstall -cdrom <CD-ROM drive>:\image` (for Windows)
   `bcminstall` (for UNIX)

3. Verify that the utilities are installed correctly:

   `bcmdiagnose`

4. Verify connectivity to the NETBuilder bridge/router:

   `bcmdiagnose <device> (device = NB_Ipaddr or hostname)`

5. Archive configuration files from the NETBuilder bridge/router:

   `bcmsysupgrade -new_hw -s:from_nb <device>` (device = NB_Ipaddr or hostname)

6. Upgrade the current configuration files to 10.1:

   `bcmsysupgrade -new_hw -s:update <device>` (device = NB_Ipaddr or hostname)

7. Replace the CEC module with a DPE module.

   For installation instructions see the hardware installation guide that shipped with the DPE module.

8. Attach a console to the Console port on the bridge/router.

9. Set up IP routing by following these steps:

   a. Log on to the bridge/router as root and press the Return key.

      The password prompt is displayed.

   b. At the password prompt, press the Return key.

      The network manager prompt (NETBuilder #) is displayed.

   c. Set up an IP address and subnet mask using:

      `SETDefault !<port> -IP NETaddr = <IP address> [<subnet mask>]`

      Where <port> is the port through which the bridge/router can be accessed by the NMS.

   d. Enable IP routing by entering:

      `SETDefault -IP CONTrol = ROute`

   e. Enable a route discovery protocol. For example, enable OSPF by using:

      `SETDefault !<port> -OSPF CONTrol = Enable`

   f. Check your configuration by pinging the bridge/router from the NMS:

      `ping <IP address>`

      Where <IP address> is the IP address of the bridge/router.

10. Set up SNMP.

    See *Using NETBuilder Family Software* and *Reference for NETBuilder Family Software* for more information on how to set up SNMP.

    To enable SNMP read/write access, you need to modify two parameters in the SNMP Service: COMmunity and MANager.

    a. The COMmunity parameter modifies the list of communities. For information on how to use the COMmunity parameter, see *Using NETBuilder Family Software* and to *Reference for NETBuilder Family Software.*

       By default all NETBuilder configuration files are accessible to an SNMP-based manager with read privileges. To change SNMP access privileges to read/write for a network management station for a community named public, enter:

       `ADD -SNMP COMmunity “public” RW`

    b. With the MANager parameter, create a new manager with read/write access to the bridge/router. For security reasons, limit the number of network management stations by entering the IP address of the network management station that will have access. For example, enter:

       `ADD -SNMP MANager “private” 129.213.224.1`

11 Copy the configuration and image files to the /101/ directory on the NETBuilder bridge/router:

`bcmsysupgrade -new_hw -s:to_nb <device>` (device = NB Ipaddr or NB hostname)

12 Test boot the 10.1 and configuration files:

`bcmsysupgrade -new_hw -s:test_boot <device>` (device = NB Ipaddr or NB hostname)

The bridge/router is rebooted, and the utilities confirm the IP connection and that 10.1 software is running. Verify that your upgrade completed successfully.

13 Accept the upgrade:

`bcmsysupgrade -new_hw -s:accept <device>` (device = NB Ipaddr or NB hostname)

14 Rename the boot.29k file in the /101/ directory to boot.101:

```
bcmmv <NB_ipaddr>:a:/101/boot.29k <NB_ipaddr>:a:/101/boot.101
```

15 Copy the 10.3 image to the NB:

```
bcmcp /tftpboot/image/NBDPE/SW/103/DW/boot.29k
 <NB_Ipaddr>:a:/101/boot.29k
```

16 Copy the HSS 4-Port WAN software to the NETBuilder bridge/router:

```
bcmcp /tftpboot/image/NBDPE/SW/103/DW/4portwan.860
 <NB_Ipaddr>:a:/101/4portwan.860
```

17 Reboot the router:

```
bcmctrl <NB_Ipaddr> -reboot
```