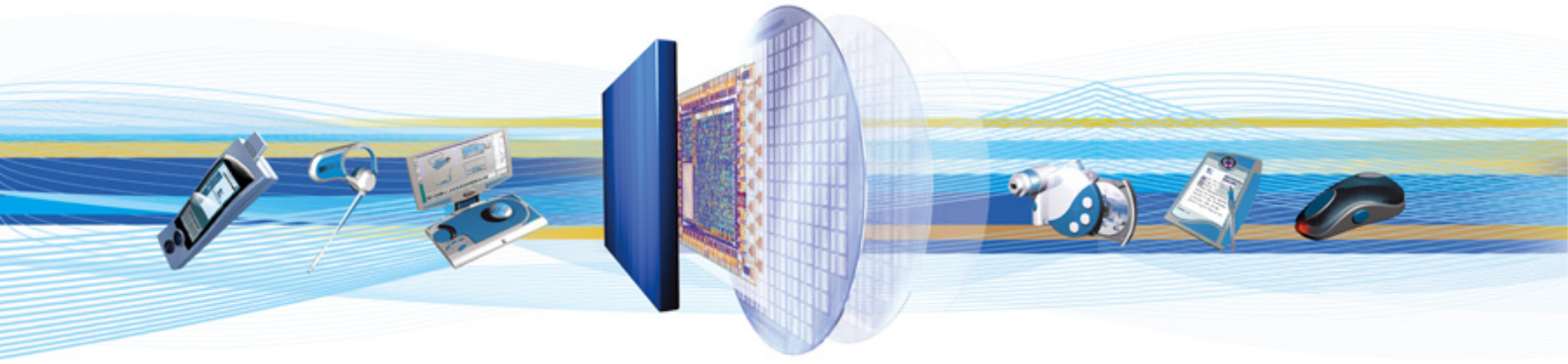
CSR Synergy Bluetooth 18.2.0

DUN Dial-Up Networking Data Terminal Profile

Demo Description

November 2011



Cambridge Silicon Radio Limited

Churchill House
Cambridge Business Park
Cowley Road
Cambridge CB4 0WZ
United Kingdom

Registered in England and Wales 3665875

Tel: +44 (0)1223 692000
Fax: +44 (0)1223 692001
www.csr.com

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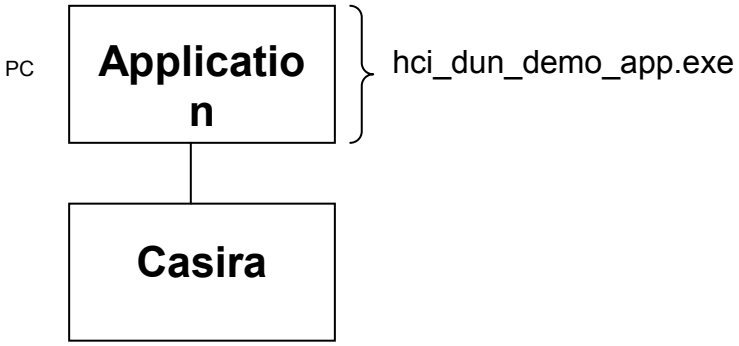
1 Dial-Up Networking Data Terminal (DUN-DT) Profile

1.1 Generally

The DUN-DT profile provides the Data Terminal functionality of the DUN profile. This demo is running with a CASIRA with HCI-build firmware.



The Dial-Up Networking (DUN) profile defines the protocols and procedures being used by devices implementing the usage model called 'internet bridge'.

The scenarios covered are the following:

- Usage of a cellular phone or modem by a computer as a wireless modem for connecting to a Dial-Up Internet access server, or using other Dial-Up services
- Usage of a cellular phone or modem by a computer to receive data calls

The following roles are defined:
Gateway (GW): This is the device that provides access to the public network. Typical devices acting as gateways are cellular phones and modems.
Data Terminal (DT): Device that uses the Dial-Up services of the gateway. Typical devices acting as data terminals are laptops and desktop PCs.

This demo covers the Data Terminal part, and has been made to run on Windows and Linux and may be connected to the Casira using either a serial connection using BCSP (`rfc_dunc_demo_app.exe`), a serial connection using H4DS (`rfc_dunc_demo_app_h4ds.exe`) or an USB connection (`rfc_dunc_demo_app_usb.exe`).

On Windows the DUNC demo application and the underlying layers all run in the same process while on Linux it is possible to:

1) have the DUNC demo application running together with the underlying layers in one process.
2) have the DUNC demo application running in one process and the rest of the protocol stack in another process, communicating between the two processes by means of TCP/IP.
3) have the DUNC demo application running in user space and the rest in kernel space.
4) have the DUNC demo application running in user space and the rest in kernel space as a standard Linux serial port (TTY) device.

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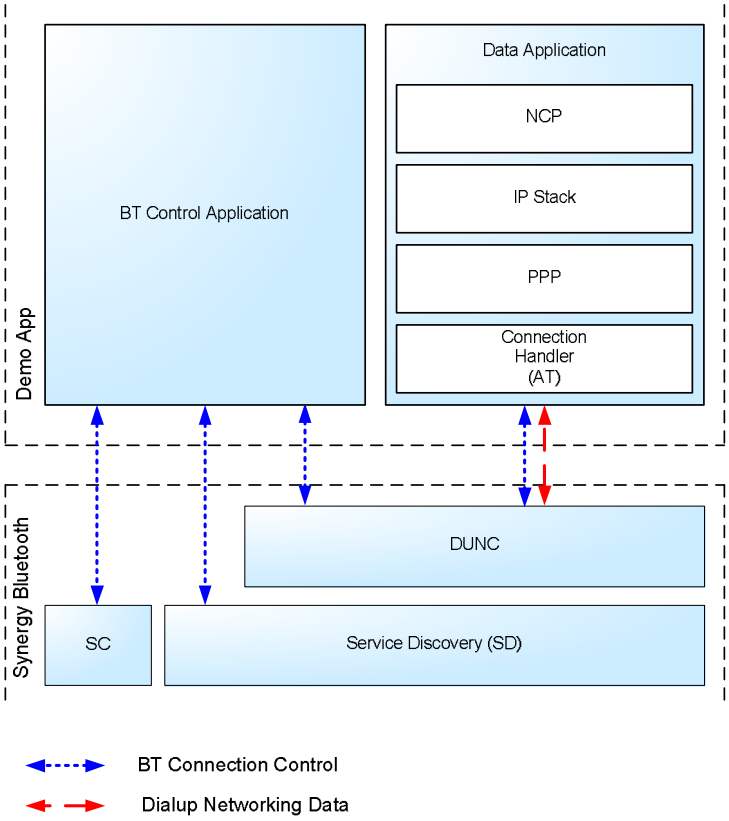
1.2 Architecture of Demo

This demo application utilizes the functionality of having a *Bluetooth Connection Control* message flow and a *DUN Data* message flow. The figure below shows the architecture of the demo application and how the two message flows are utilised.



As depicted in the figure, the demo application is divided into to separate scheduler tasks; a *BT Control Application* and a *Data Application*. Each of the tasks has its own message queue and must be concerned as two separate applications. The applications have the following responsibilities:

- ***BT Control App:*** Is responsible for establishing and controlling the Bluetooth connection.
- ***Data App:*** Is responsible for establishing a connection to the dialup server, and establishing an IP connection. Furthermore, it controls the emulated serial port that is provided by the RFCOMM connection.

For further description of the primitives sent on the *BT Control* and *DUN Data* message flows, please see the "Dial-up Networking Data Terminal API" document, api-0106-dt ….

1.3 Use of Application hci_dunc_demo_app.exe

Note: This description is for CSR Synergy Bluetooth HCI. The functionality of the application for the RFCOMM build is identical. The only difference is the naming: `hci_dunc_demo_app.exe` versus `rfc_dunc_demo_app.exe`.

The DUN scenario has two sides: one Data Terminal side (the `hci_dunc_demo_app.exe` program) and one Gateway side (e.g. a mobile phone running the DUN-GW profile).

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Starting the program hci_dunc_demo_app.exe:

1. Choose the COM port on which the Bluetooth module is connected, by specifying the –C parameter to the program, e.g. `hci_dunc_demo_app.exe -C COM2`. If no –C parameter is given, COM1 is selected as default.

2. Choose baudrate for the COM port on which the Bluetooth module is connected, by specifying the –B parameter to the program, e.g. `hci_dunc_demo_app.exe -B 230400`. If no parameter is specified the default is 115200.

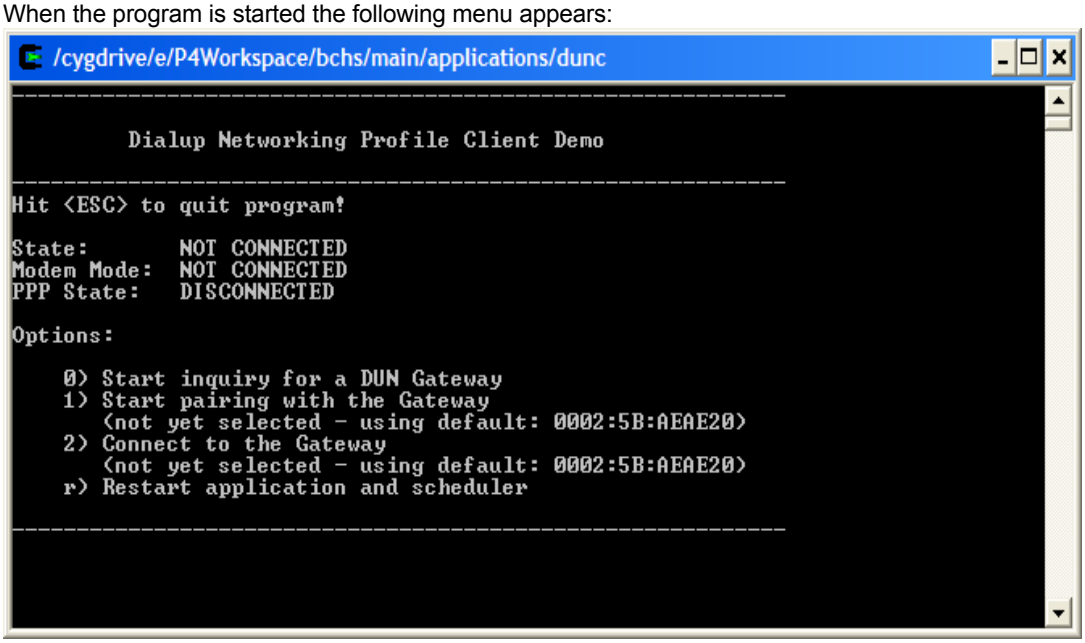
3. Choose a specific device for default connection by specifying the –A parameter to the program, e.g. `hci_dunc_demo_app.exe -a 0002:5b:AEAE20`. If no address is specified it is necessary to perform a search for servers in order to establish a connection.

A command to start the application on COM3 running 460800 baud and default connection to a device with the address "0002:5b:AEAE20", is shown below:

```
hci_dunc_demo_app.exe -C COM3 -B 460800 -A 0002:5b:AEAE20
```

Using the program hci_dunc_demo_app.exe:

1. When the program is started the following menu appears:



   The three parameters above the options show the state of the demo. The *State* shows the state of the Bluetooth connection, *Modem Mode* shows if a connection is established to the dialup server and finally the *PPP state* shows the state of the IP connection. The state parameters will be viewable in all menus of the demo. If the –A parameter is specified it is possible to connect to the gateway without device inquiry.

2. Select '0' for starting inquiry for the DUN gateway. This starts the inquiry, and if any devices are within range and discoverable they will appear, as shown below:

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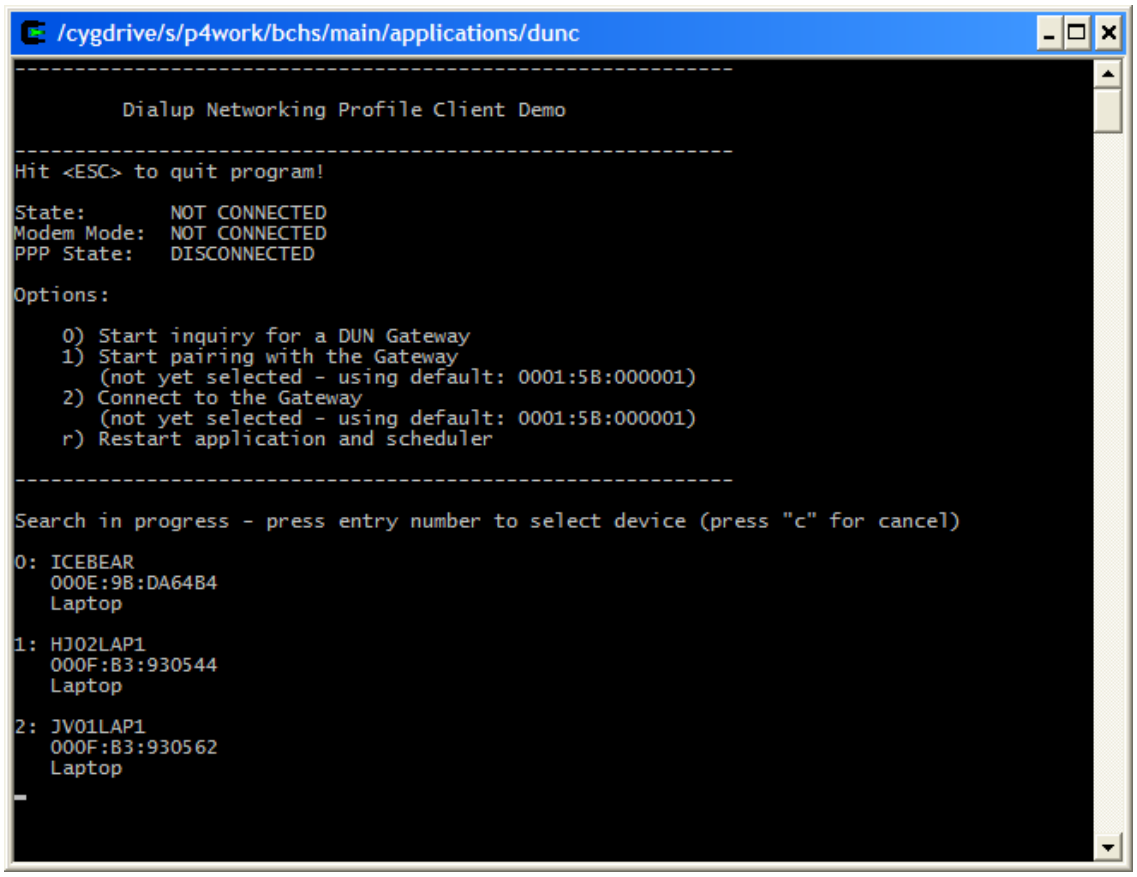
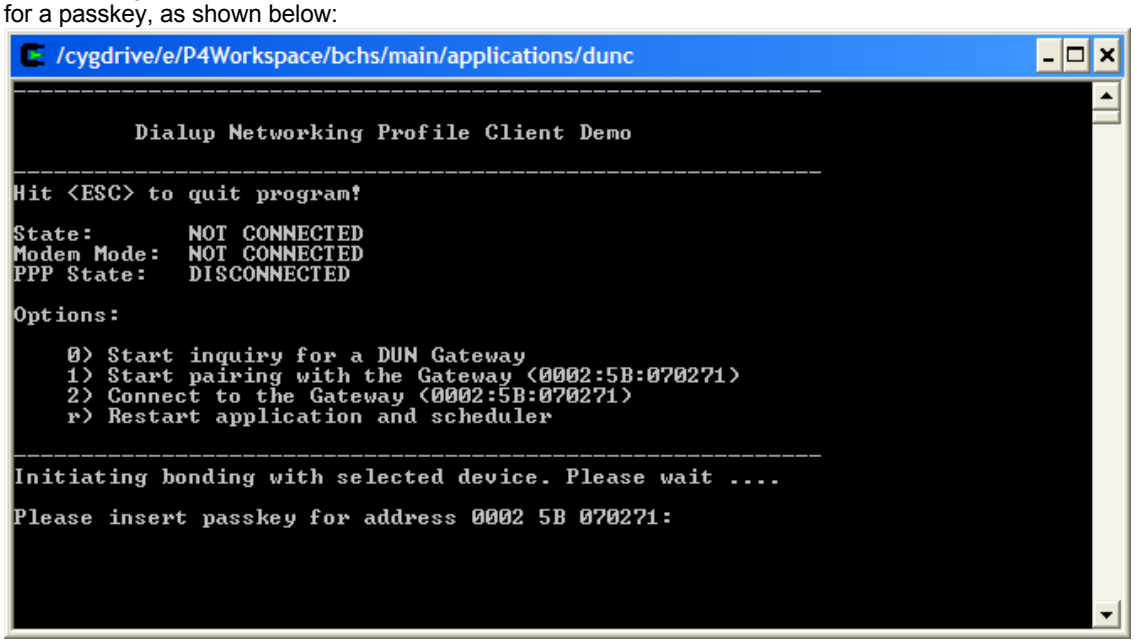


Select the device to connect to by entering the number appearing before the entry. The discovery can be cancelled at any time by pressing ‘c’.

3. When having selected the device to connect to, press ‘1’ to pair with the device. The demo will now ask for a passkey, as shown below:



Enter the passkey, and press enter. Remember to enter the same passkey at the gateway side when being prompted.

4. Now press ‘2’ in order to establish a Bluetooth connection to the gateway. While connecting the following menu appears:

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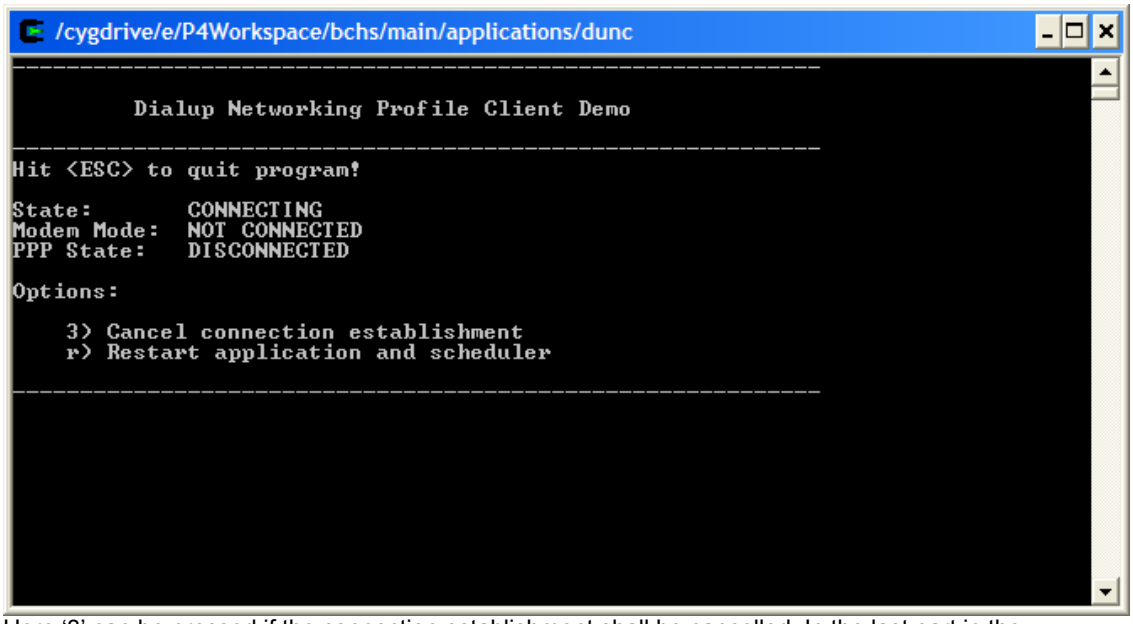
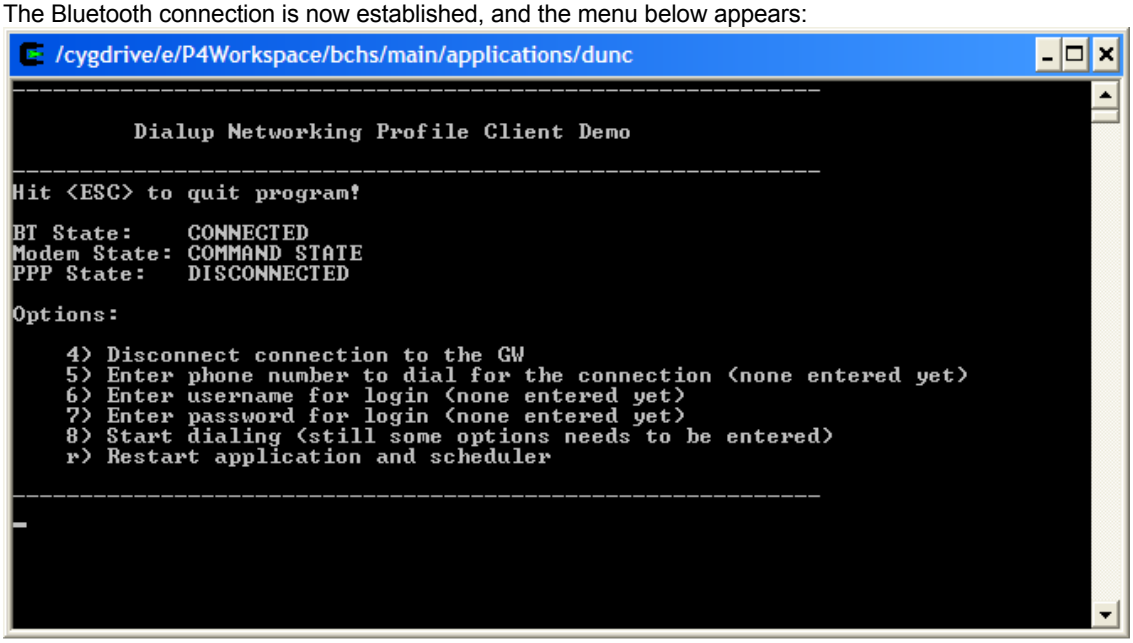


Here '3' can be pressed if the connection establishment shall be cancelled. In the last part in the description of how to use the demo it is assumed that this option is not chosen.

5. The Bluetooth connection is now established, and the menu below appears:



6. Press '5' to enter the phone number to dial. When entering the number is completed press Enter.

7. Press '6' to enter the user name required for logging on to the dialup server. When entering the user name is completed press Enter.

8. Press '7' to enter the password necessary for logging in. When entering the password is completed press Enter.

9. Now the '8' option should be enabled – hence press '8' to start dialling and logging on to the dialup server and starting an IP session. The login is done automatically.

10. The IP session is started, and an IP address has been assigned, as shown in the screen dump below.

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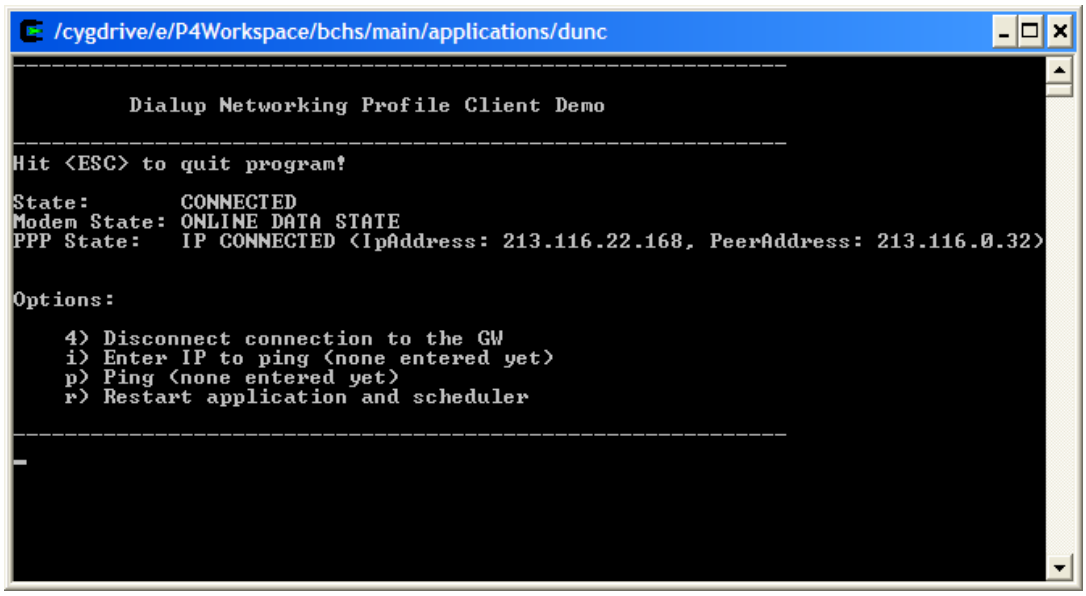
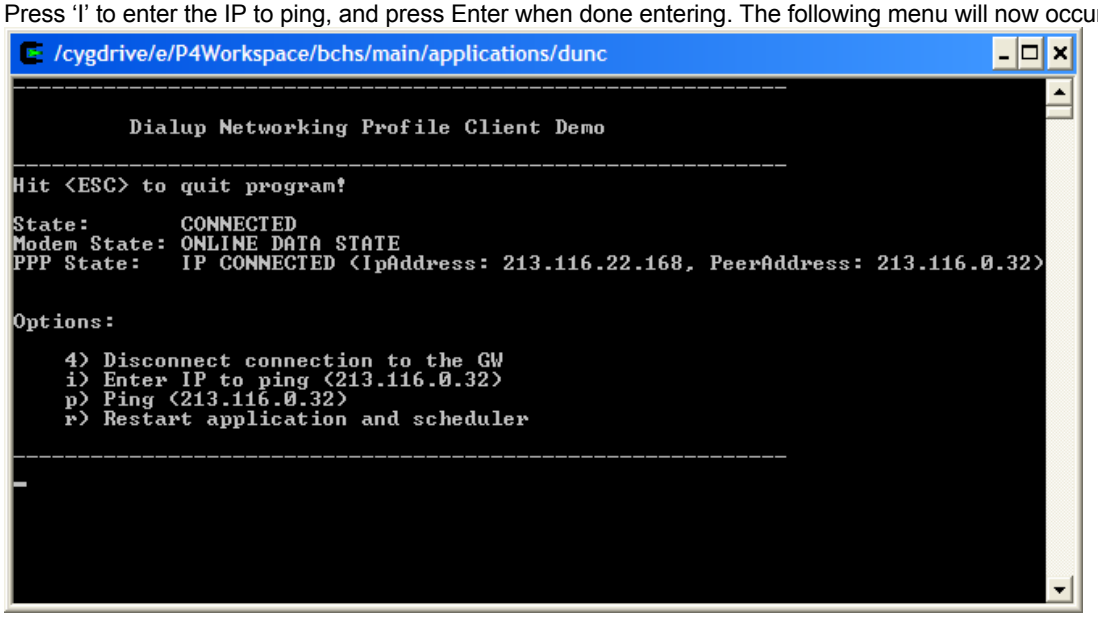


11. Press 'I' to enter the IP to ping, and press Enter when done entering. The following menu will now occur.



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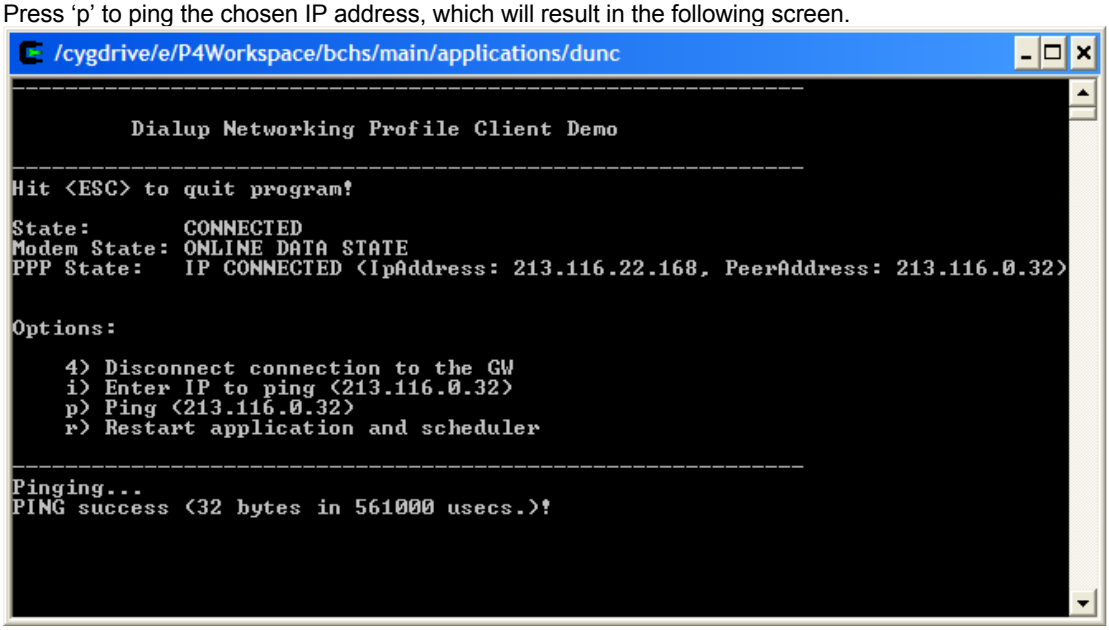
12. Press ‘p’ to ping the chosen IP address, which will result in the following screen.



This indicates that the connection to the Internet was established successfully!

13. To disconnect the Bluetooth connection to the gateway, press ‘4’.

2 Linux

This section describes how to build and run the DUNC demo application on Linux. Prior to compiling any of the Linux demos the CSR Synergy Bluetooth libraries must be compiled from the root of the CSR Synergy Bluetooth directory tree. The User Guide describes how this is done.

The basic DUNC demo application (pure user space), located in `./applications/dunc` may be compiled on Linux by means of:

```
> make clean all TARGET_ARCH=Linux-2.6-x86
```

This will output six files: `hci_dunc_demo_app`, `hci_dunc_demo_app_h4ds` and `hci_dunc_demo_app_usb`, for serial BCSP communication, serial H4DS communication and USB communication using a HCI split and `rfc_dunc_demo_app`, `rfc_dunc_demo_app_h4ds` and `rfc_dunc_demo_app_usb`, for serial BCSP communication, serial H4DS communication and USB communication respectively using a RFC split.

The demo applications are used like described above for Windows.

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BlueCore®	Group term for CSR's range of Bluetooth wireless technology chips
Bluetooth®	Set of technologies providing audio and data transfer over short-range radio connections
CSR	Cambridge Silicon Radio
UniFi™	Group term for CSR's range of chips designed to meet IEEE 802.11 standards

Document History

Revision	Date	History
1	26 SEP 11	Ready for release 18.2.0

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