



CSR Synergy Bluetooth 18.2.0

PAN Personal Area Networking Profile

Demo Description

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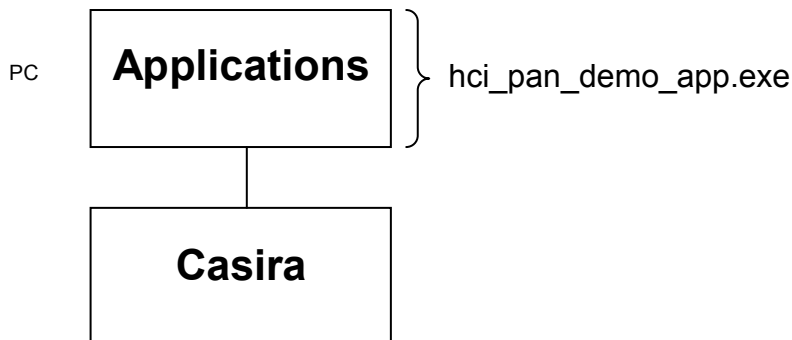
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1 Persona Area Networking (PAN) Profile

1.1 General

The PAN demo application program is an example application of how the PAN API of CSR Synergy Bluetooth can be used. The application is running with a HCI-build firmware only. The application includes a demo implementation of IP, ARP, ICMP, UDP, DHCP client and TFTP server running as Scheduler tasks.



The scenarios covered by this profile are the following:

- Inquire and discover remote devices and remote services
- Send a ping request to a remote device
- Send and receive a file using TFTP. The demo application internet stack contains a TFTP server

The application has been made to run on Windows and Linux and may be connected to the Casira using either a serial connection using BCSP (`hci_pan_demo_app.exe`), a serial connection using H4DS (`hci_pan_demo_app_h4ds.exe`) or an USB connection (`hci_pan_demo_app_usb.exe`), and their HCI equivalent.

The Linux example application runs like the windows application, but has also been extended to run in kernel mode and hook into the Linux Networking sub-system.

1.2 Use of program `hci_pan_demo_app.exe`

NOTE: This description is for CSR Synergy Bluetooth HCI using BCSP over UART as host transport.

Start the program `hci_pan_demo_app` with one or more of the following program options:

1. Choose the COM port on which the Bluetooth module is connected, by specifying the `-c` parameter to the program, e.g. `hci_pan_demo_app -c com1`. At start up COM1 is selected as default.
2. Choose the baudrate for the selected port on which the Bluetooth module is connected, by specifying the `-b` parameter to the program, e.g. `hci_pan_demo_app -b 115200`. 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_pan_demo_app -a 0002:5b:01a494`. If no address is specified it is necessary to perform a search for servers in order to establish a connection.

Commands available in the main menu (Idle state) are listed in the screen dump below:

```

/cygdrive/s/p4work/bchs/main/applications/pan
tt01@tt01lap1 /cygdrive/s/p4work/bchs/main/applications/pan
$ ./hci_pan_demo_app -c com9 -a 0002:5b:01bf36

Pan Demo:
Hit <ESC> to quit program!
Initialising MAC address, please, wait...
Idle state
Options:
A for address configuration
P to activate PANU server
G to activate GN server
N to activate NAP server
S to search for servers
D to establish connection to: [0002:5B:01BF36]
-

```

Press S for a search for servers in the vicinity:

```

/cygdrive/s/p4work/bchs/main/applications/pan

Select server state
Options:
C to cancel server search
Press a number from the list below to select a server
0: ICEBEAR
   000E:9B:DA64B4
   Laptop
1: 900AP_PIN0000
   000D:88:9F3AEA
   LAN/Network Access Point
-

```

When the device(s) are found press the number of the desired device. When pressing 'C' - the server search is cancelled and application returns to idle state.

After selecting a device the application returns to the idle state and replaces the default device address with the selected device address:

```

/cygdrive/s/p4work/bchs/main/applications/pan

Select server state
Options:
C to cancel server search
Press a number from the list below to select a server
0: ICEBEAR
   000E:9B:DA64B4
   Laptop
1: 900AP_PIN0000
   000D:88:9F3AEA
   LAN/Network Access Point
Device 1 selected
Idle state
Options:
A for address configuration
P to activate PANU server
G to activate GN server
N to activate NAP server
S to search for servers
D to establish connection to: [000D:88:9F3AEA]

```

Press 'D' to establish a connection to the selected device using one of the 3 supported services:

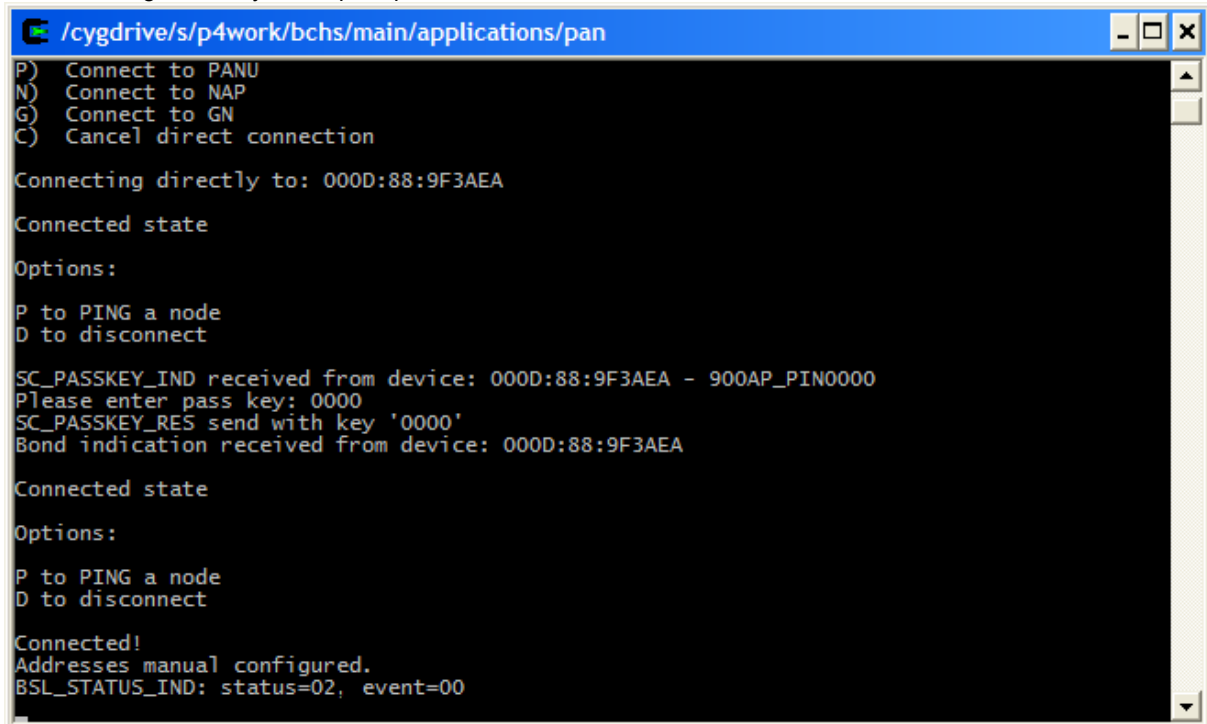
```

/cygdrive/s/p4work/bchs/main/applications/pan

Direct connection state
Target device: [000D:88:9F3AEA]
Options:
P) Connect to PANU
N) Connect to NAP
G) Connect to GN
C) Cancel direct connection

```

After selecting service, you are prompted for the PIN, which must be entered to connect:



```

/cygdrive/s/p4work/bchs/main/applications/pan
P) Connect to PANU
N) Connect to NAP
G) Connect to GN
C) Cancel direct connection

Connecting directly to: 000D:88:9F3AEA
Connected state
Options:
P to PING a node
D to disconnect

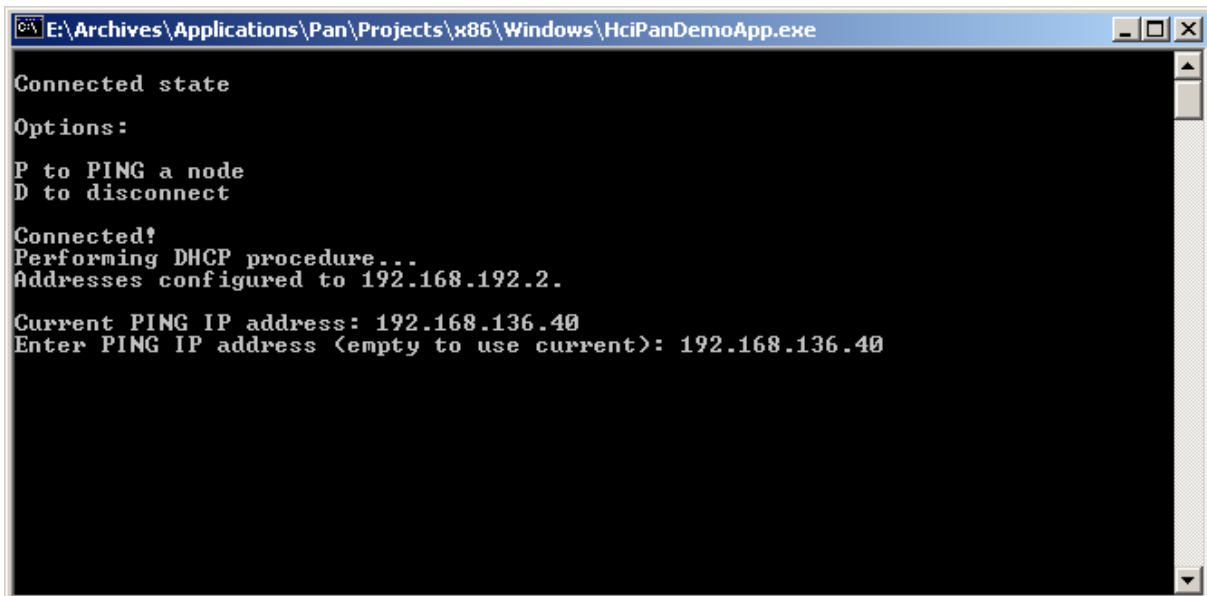
SC_PASSKEY_IND received from device: 000D:88:9F3AEA - 900AP_PIN0000
Please enter pass key: 0000
SC_PASSKEY_RES send with key '0000'
Bond indication received from device: 000D:88:9F3AEA
Connected state
Options:
P to PING a node
D to disconnect

Connected!
Addresses manual configured.
BSL_STATUS_IND: status=02, event=00

```

The CSR_BT_BSL_STATUS_IND informs the application about lower layer mode changes. The example shows that the Bluetooth link has entered sniff mode.

When connected, it is possible to ping nodes on the peer side. Choose P to PING a node, see illustration below:



```

E:\Archives\Applications\Pan\Projects\x86\Windows\HciPanDemoApp.exe
Connected state
Options:
P to PING a node
D to disconnect

Connected!
Performing DHCP procedure...
Addresses configured to 192.168.192.2.

Current PING IP address: 192.168.136.40
Enter PING IP address (empty to use current): 192.168.136.40

```

The default ping data size is set 1472 bytes - this will send a IP packet of 1500 bytes (including the IP and ICMP headers). The default size can only be changed by changing the corresponding define and recompiling the code.

```

E:\Archives\Applications\Pan\Projects\x86\Windows\HciPanDemoApp.exe

Connected state
Options:
P to PING a node
D to disconnect

Connected!
Addresses manual configured.
BSL_STATUS_IND: status=02, event=00
Current PING IP address: 192.168.42.33
Enter PING IP address (empty to use current):

Pinging 192.168.42.33, please, wait...
PING success <1472 bytes in 922000 usecs.>!

Current PING IP address: 192.168.42.33
Enter PING IP address (empty to use current):

Pinging 192.168.42.33, please, wait...
PING success <1472 bytes in 481000 usecs.>!

```

Notice: The response time depends on the sniff interval. In addition, the first ping (or any first time transmission to a node) will be preceded by an ARP request to locate the Ethernet address of the peer.

Press 'G' in the main menu to activate the local device as a GN server.

```

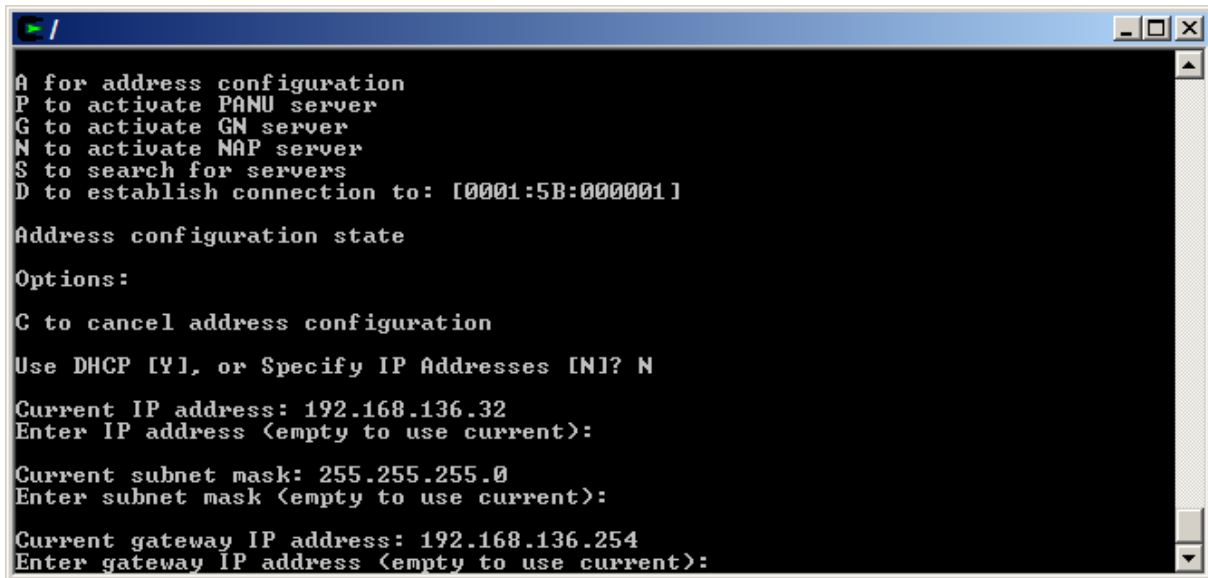
E:\Archives\Applications\Pan\Projects\x86\Windows\HciPanDemoApp.exe

Connectable server state
Options:
C to cancel server mode
GN server activated, awaiting connection...

```

The same procedure is used for activating the local device as a NAP or PANU.

The 'A' option is used for setting the local addresses. This can be done either automatically by enabling DHCP or manually, in which case the IP address, subnet mask and gateway IP address can be entered.



```
A for address configuration
P to activate PANU server
G to activate GN server
N to activate NAP server
S to search for servers
D to establish connection to: [0001:5B:000001]

Address configuration state

Options:
C to cancel address configuration

Use DHCP [Y], or Specify IP Addresses [N]? N

Current IP address: 192.168.136.32
Enter IP address (empty to use current):

Current subnet mask: 255.255.255.0
Enter subnet mask (empty to use current):

Current gateway IP address: 192.168.136.254
Enter gateway IP address (empty to use current):
```

Note: Do not enable DHCP if the peer side does not support DHCP.

2 Linux

This section describes how to build and run the PAN demo application on Linux.

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

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

This will output two files: `hci_pan_demo_app` and `hci_pan_demo_app_usb`, for serial and USB communication respectively.

The demo applications are used like described above for Windows.

Terms and Definitions

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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