



## Dial Routing

bintec Dm744-I

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## I Related Documents

bintec Dm702-I TCP/IP

bintec Dm705-I Generic Serial Interfaces

bintec Dm710-I PPP Interface

bintec Dm729-I BRI ISDN Interface

bintec Dm772-I Common Configurations for Interfaces

# Chapter 1 Introduction

## 1.1 Dial Routing Interface

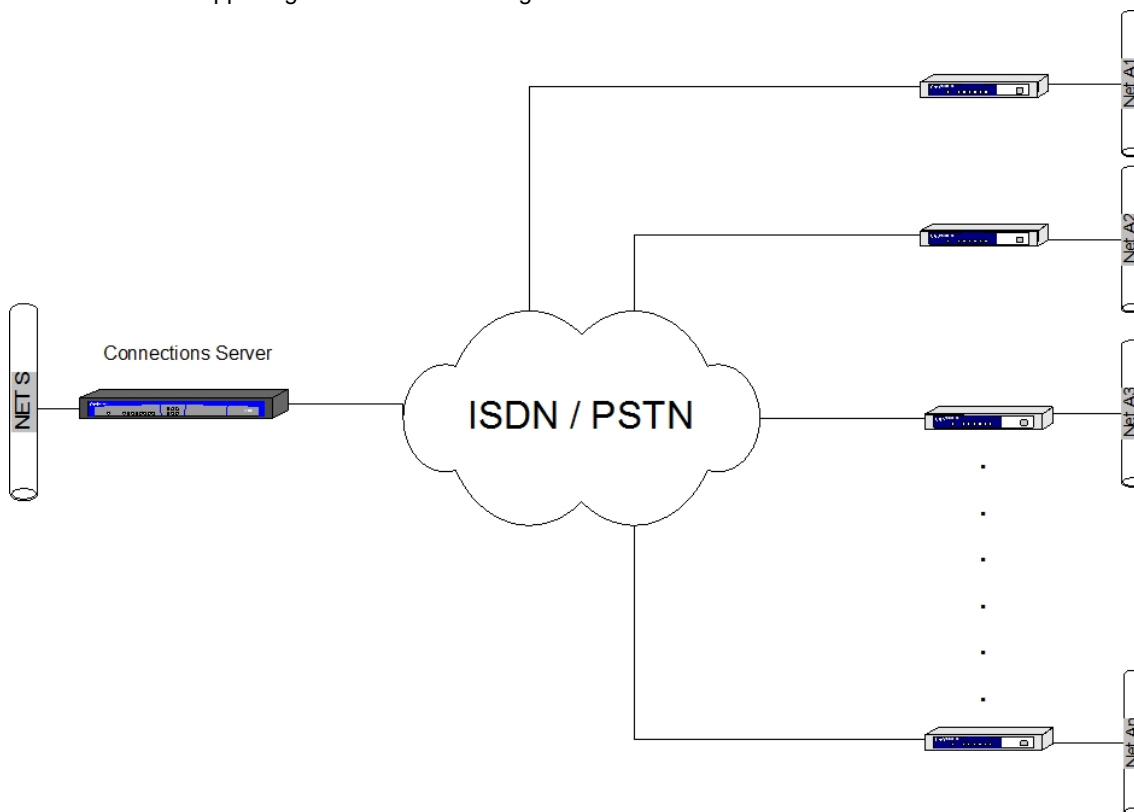
The *Dial Routing* interface is a virtual interface that distributes IP traffic via a pool of Dial PPP interfaces. A series of connections is defined in the configuration of said interface such as the Dial PPP interfaces pool name. Each profile has an identifier (ID), which uniquely identifies this and a set of associated parameters (called number, user and password). Each Dial PPP interface can be registered in the pool through configuration. On enabling the *Dial Routing* feature, enter the pool name configured within the *Dial Routing* interface.

## 1.2 Static Routes ID

The static routes ID are static routes whose next hop is a *Dial Routing* interface with an extra parameter: the ID (profile identifier). Default is cost 3 assigned.

## 1.3 Function

Through the combination of the static routes ID and the *Dial Routing* interface, the router can act as a Dial PPP connections server. Supposing we have the following network:



In the connections server, you add as many routes ID as existing BRANCH networks. In the example case, supposing we add a route to the LAN network of each branch (A1, A2 .....An). If a device located in network S needs to address branch X LAN (AX), the IP packets exit with source S and destination AX and reach the connections server in the first hop. In the initial state, assuming that an alternative lower cost route to said destination network does not exist, the first IP packet uses the route ID. This packet passes to the specified *Dial Routing* interface in the next route hop together with the ID. The *Dial Routing* interface then checks if said ID is in use and if not, searches for a free PPP Dial interface (from those registered). If one is found, it reserves it, dynamically configures it with the ID profile parameters and runs it over all the routes IDs whose next hop is the *Dial Routing* interface whose ID is the previous ID. This then adds a static route (dynamically created) to each with the same destination and mask, the next hop being the reserved Dial PPP interface (with cost 1). The rest of the IP packets use the new static route. When the call is released (due to idle timeout or something similar), this new static route disappears.

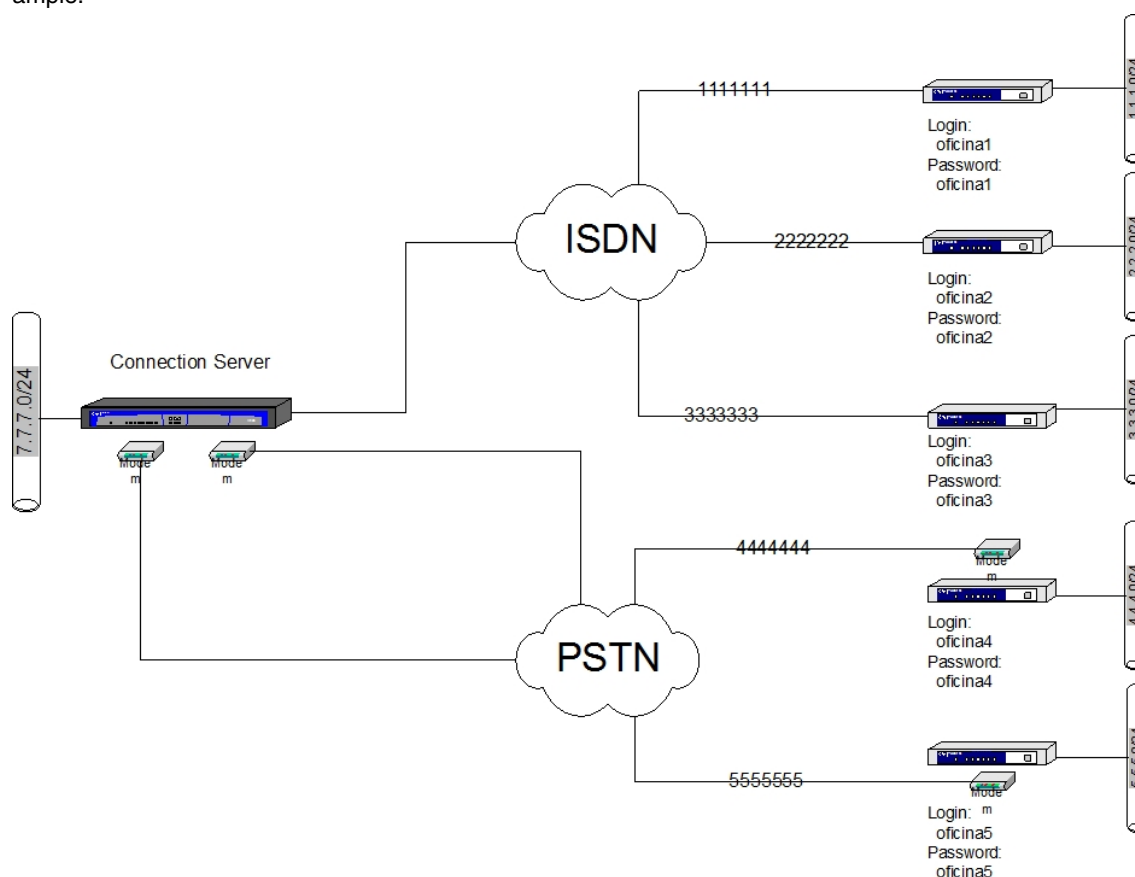
## 1.4 Configuring correctly

- Create as many PPP interfaces as B channels or modem connections you wish to reserve for the connections (create as many simultaneous connections as you wish).
- Create the *Dial Routing* interface.
- From the *Dial Routing* interface configuration, add as many connections as existing destinations. Each profile is composed of a unique identifier, an ISDN telephone number, a login and a password; these parameters must be the parameters of the branch they represent.
- From the *Dial Routing* interface configuration, configure the connections pool name.
- From the configuration for each Dial PPP you wish to participate in the pool, enable the *Dial Routing* facility and configure the same pool name as assigned in the previous step.
- Add unnumbered addresses to the PPP and *Dial Routing* interfaces. Configure the internal IP address. Enable IP Classless.
- Add static routes ID: destination and mask corresponding to the each branch's network, next hop the *Dial Routing* interface and ID corresponding to the profile associated to said branch.
- If a determined branch has more than one network, configure as many routes (with the same ID) as the different networks pertaining to the branch.

Configuration of the connections and the routes ID is dynamic: you do not need to restart the device.

## 1.5 Configuration Procedure

The following example shows the sequence to follow to establish a suitable configuration for typical scenario, e.g. to access networks located through PSTN and ISDN connections. The next figure shows the user scenario for the example.



The steps to configure the previous graphic connections server are as follows:

In this example, we start from the router default configuration, which acts as the connections server (although you can use any router that possesses this function).

### 1.5.1 Creating interfaces

The first step is to decide which interfaces are required for said scenario:

- Configure as AT interfaces, the same number of serial lines as simultaneous connections to required PSTN destinations (without exceeding the number of modems available). Then create a PPP interface for each AT interface. The example shows two modems and we assume we are going to use both. So, configure lines 1 and 2 as AT interfaces and add two PPP interfaces to operate over the AT interfaces.
- Create the same number of PPP interfaces as simultaneous connections to required ISDN destinations (without exceeding the number of ISDN B channels available). This example shows a BRI interface with two B channels and we assume we are going to use both. Therefore, create two further PPP interfaces to operate over the two BRI interface B channels. (Note: more connections can be configured - objective of dial-routing - however we have limited them to two simultaneous ones for this example).
- Additionally, configure a *Dial Routing* interface to manage the PSTN connections and uses the PPP interfaces that operate over AT, and another one, to manage connections with ISDN destinations using the PPPs configured to operate over the BRI interface.

In short, configure lines 1 and 2 as AT interfaces and add four PPP interfaces and two *Dial Routing*.

Run **show config** to view the device configuration in text mode. At the end of the configuration text, you can see which interfaces are already available and which ones need changes made to them.

```
*config
Config>show config
; Showing System Configuration for access-level 15 ...
; ATLAS Router 2 156 Version 10.7.0

log-command-errors
no configuration
set data-link x25 serial0/0
set data-link x25 serial0/1
set data-link x25 serial0/2
;
;
network ethernet0/0
; -- Ethernet Interface User Configuration --
  no ip address
;
exit
;
;
;
network x25-node
; -- X25-node interface configuration --
  no ip address
;
exit
;
;
;
dump-command-errors
end
; --- end ---
Config>list devices

Interface          Connector      Type of interface
ethernet0/0        LAN1           Fast Ethernet interface
serial0/0           SERIAL0/WAN1   X25
serial0/1           SERIAL1/WAN2   X25
serial0/2           SERIAL2/WAN3   X25
bri0/0             BRI/ISDN1      ISDN Basic Rate Int
x25-node           ---           Router->Node
Config>
```

As you can see, the serial lines are in X.25 mode so need changing. As there are no PPP interfaces or *Dial Routing*, these also require adding.

The following sequence of commands shows how to execute this operation. Firstly add the PPP interfaces.

```
Config>add device ppp 1
Config>add device ppp 2
Config>add device ppp 3
```



```

Config>add device ppp 4
Config>list devices

Interface      Connector      Type of interface
ethernet0/0    LAN1           Fast Ethernet interface
serial0/0      SERIAL0/WAN1  X25
serial0/1      SERIAL1/WAN2  X25
serial0/2      SERIAL2/WAN3  X25
bri0/0         BRI/ISDN1     ISDN Basic Rate Int
x25-node       ---           Router->Node
ppp1           ---           Generic PPP
ppp2           ---           Generic PPP
ppp3           ---           Generic PPP
ppp4           ---           Generic PPP
Config>

```

Subsequently, create the *Dial Routing* interfaces.

```

Config>add device dial-routing 1
Config>add device dial-routing 2
Config>list devices

Interface      Connector      Type of interface
ethernet0/0    LAN1           Fast Ethernet interface
serial0/0      SERIAL0/WAN1  X25
serial0/1      SERIAL1/WAN2  X25
serial0/2      SERIAL2/WAN3  X25
bri0/0         BRI/ISDN1     ISDN Basic Rate Int
x25-node       ---           Router->Node
ppp1           ---           Generic PPP
ppp2           ---           Generic PPP
ppp3           ---           Generic PPP
ppp4           ---           Generic PPP
dialroute1     ---           Dial Routing
dialroute2     ---           Dial Routing
Config>

```

And finally, change the serial lines configuration.

```

Config>set data-link at serial0/0
Config>set data-link at serial0/1
Config>list devices

Interface      Connector      Type of interface
ethernet0/0    LAN1           Fast Ethernet interface
serial0/0      SERIAL0/WAN1  AT COM
serial0/1      SERIAL1/WAN2  AT COM
serial0/2      SERIAL2/WAN3  X25
bri0/0         BRI/ISDN1     ISDN Basic Rate Int
x25-node       ---           Router->Node
ppp1           ---           Generic PPP
ppp2           ---           Generic PPP
ppp3           ---           Generic PPP
ppp4           ---           Generic PPP
dialroute1     ---           Dial Routing
dialroute2     ---           Dial Routing
Config>

```

The following shows the results of the configuration (with the created interfaces) in text mode.

```

Config>show config
; Showing System Configuration for access-level 15 ...
; ATLAS Router 2 156 Version 10.7.0

log-command-errors
no configuration
add device ppp 1
add device ppp 2
add device ppp 3

```

```
add device ppp 4
add device dial-routing 1
add device dial-routing 2
set data-link at serial0/0
set data-link at serial0/1
set data-link x25 serial0/2
;
;
network ethernet0/0
; -- Ethernet Interface User Configuration --
  no ip address
;
exit
;
;
;
network x25-node
; -- X25-node interface configuration --
  no ip address
;
exit
;
;
;
network ppp1
; -- Generic PPP User Configuration --
  no ip address
;
exit
;
;
;
network ppp2
; -- Generic PPP User Configuration --
  no ip address
;
exit
;
;
;
network ppp3
; -- Generic PPP User Configuration --
  no ip address
;
exit
;
;
;
network ppp4
; -- Generic PPP User Configuration --
  no ip address
;
exit
;
;
;
network dialroute1
; -- DR interface configuration --
  no ip address
;
exit
;
;
;
network dialroute2
; -- DR interface configuration --
  no ip address
```

```

;
exit
;
;
;
dump-command-errors
end
; --- end ---
Config>

```

## 1.5.2 Configuring the Dial Routing Interfaces

*Dial Routing* interface configuration consists of two main steps.

The first is to configure the name of the Pool corresponding to the interface. This pool name joins the interface with the PPP interfaces used to carry out the connections. This must be the same as the one configured when enabling *Dial Routing* in the PPP interfaces.

The second is to configure the connection destinations to be carried out through this interface.

You can also configure a time period where a PPP interface remains in quarantine (i.e. without being used by the *Dial Routing*) when a local error occurs (failure to establish the physical level in the ISDN interface, for example).

The following shows how to configure the first two vital parameters. To view all configuration possibilities, please see the section on configuration commands further on in this manual.

### 1.5.2.1 Configuring the Pool name

As already indicated, you need to configure a pool name that refers to the PPP interfaces to “register” these in a *Dial Routing* interface on start up. The command used to configure this is displayed below where we configure “ISDN” as the pool name (so the *Dial Routing* manages the ISDN connections) and “PSTN” (for managing connections via the modem).

```

Config>network dialroute1

-- DR interface configuration --
dialroute1 config>pool-name RDSI
dialroute1 config>list interface
Interface Configuration
-----
Pool Name:          RDSI
Quarantine time:   4 min.
dialroute1 config>exit
Config>network dialroute2

-- DR interface configuration --
dialroute2 config> pool-name RTC
dialroute2 config>list interface
Interface Configuration
-----
Pool Name:          RTC
Quarantine time:   4 min.
dialroute2 config>

```

The following list shows the router global configuration once this operation is complete.

```

dialroute2 config>exit
Config>show config
; Showing System Configuration for access-level 15 ...
; ATLAS Router 2 156 Version 10.7.0

log-command-errors
no configuration
add device ppp 1
add device ppp 2
add device ppp 3
add device ppp 4
add device dial-routing 1
add device dial-routing 2
set data-link at serial0/0

```

```
set data-link at serial0/1
set data-link x25 serial0/2
;
;
network ethernet0/0
; -- Ethernet Interface User Configuration --
  no ip address
;
exit
;
;
;
network x25-node
; -- X25-node interface configuration --
  no ip address
;
exit
;
;
;
network ppp1
; -- Generic PPP User Configuration --
  no ip address
;
exit
;
;
;
network ppp2
; -- Generic PPP User Configuration --
  no ip address
;
exit
;
;
;
network ppp3
; -- Generic PPP User Configuration --
  no ip address
;
exit
;
;
;
network ppp4
; -- Generic PPP User Configuration --
  no ip address
;
exit
;
;
;
network dialroutel
; -- DR interface configuration --
  no ip address
;
  pool-name RDSI
;
exit
;
;
;
network dialroute2
; -- DR interface configuration --
  no ip address
;
  pool-name RTC
```

```

;
exit
;
;
;
dump-command-errors
end
; --- end ---
Config>

```

### 1.5.2.2 Configuring the destination connections

The second step is to configure the parameters to connect to each possible destinations. For each destination, configure a telephone number, a user and a password, which shape the profile for this destination.

In the following example, we have five connection destinations (as many connections as remote branches) with the following parameters:

- ISDN Destinations:

Profile 1: telephone number 1111111, user oficina1 and password oficina1.

Profile 2: telephone number 2222222, user oficina2 and password oficina2.

Profile 3: telephone number 3333333, user oficina3 and password oficina3.

- PSTN Destinations:

Profile 1: telephone number 4444444, user oficina4 and password oficina4.

Profile 2: telephone number 5555555, user oficina5 and password oficina5.

The ISDN destination connections are configured in the **dialroute1** interface, which manages the ISDN connections, and the PSTN destinations are configured in the **dialroute2** interface.

The following shows all the commands needed to execute said configuration and the list of connections once created.

```

Config>network dialroute1

-- DR interface configuration --
dialroute1 config>connection 1 default
dialroute1 config>connection 1 destination-address 1111111
dialroute1 config>connection 1 username oficina1
dialroute1 config>connection 1 password oficina1
dialroute1 config>connection 2 default
dialroute1 config>connection 2 destination-address 2222222
dialroute1 config>connection 2 username oficina2
dialroute1 config>connection 2 password oficina2
dialroute1 config>connection 3 default
dialroute1 config>connection 3 destination-address 3333333
dialroute1 config>connection 3 username oficina3
dialroute1 config>connection 3 password oficina3
dialroute1 config>list connection
Connections
-----

ID          Destination Address  Username
-----
1          1111111              oficina1
2          2222222              oficina2
3          3333333              oficina3
dialroute1 config>exit
Config>network dialroute2

-- DR interface configuration --
dialroute2 config>connection 1 default
dialroute2 config>connection 1 destination-address 4444444
dialroute2 config>connection 1 username oficina4
dialroute2 config>connection 1 password oficina4
dialroute2 config>connection 2 default

```

```
dialroute2 config>connection 2 destination-address 5555555
dialroute2 config>connection 2 username oficina5
dialroute2 config>connection 2 password oficina5
dialroute2 config>list connection
Connections
-----

ID          Destination Address  Username
-----
          1  4444444             oficina4
          2  5555555             oficina5
dialroute2 config>
```

The following list shows the device global configuration once this operation has been executed.

```
dialroute2 config>exit
Config>show config
; Showing System Configuration for access-level 15 ...
; ATLAS Router 2 156 Version 10.7.0

log-command-errors
no configuration
add device ppp 1
add device ppp 2
add device ppp 3
add device ppp 4
add device dial-routing 1
add device dial-routing 2
set data-link at serial0/0
set data-link at serial0/1
set data-link x25 serial0/2
;
;
network ethernet0/0
; -- Ethernet Interface User Configuration --
    no ip address
;
exit
;
;
network x25-node
; -- X25-node interface configuration --
    no ip address
;
exit
;
;
network ppp1
; -- Generic PPP User Configuration --
    no ip address
;
exit
;
;
network ppp2
; -- Generic PPP User Configuration --
    no ip address
;
exit
;
;
network ppp3
; -- Generic PPP User Configuration --
    no ip address
```

```
;
exit
;
;
;
network ppp4
; -- Generic PPP User Configuration --
  no ip address
;
exit
;
;
;
network dialroute1
; -- DR interface configuration --
  no ip address
;
  connection 1 default
  connection 1 destination-address 1111111
  connection 1 username oficina1
  connection 1 password oficina1
;
  connection 2 default
  connection 2 destination-address 2222222
  connection 2 username oficina2
  connection 2 password oficina2
;
  connection 3 default
  connection 3 destination-address 3333333
  connection 3 username oficina3
  connection 3 password oficina3
;
  pool-name RDSI
;
exit
;
;
;
network dialroute2
; -- DR interface configuration --
  no ip address
;
  connection 1 default
  connection 1 destination-address 4444444
  connection 1 username oficina4
  connection 1 password oficina4
;
  connection 2 default
  connection 2 destination-address 5555555
  connection 2 username oficina5
  connection 2 password oficina5
;
  pool-name RTC
;
exit
;
;
;
dump-command-errors
end
; --- end ---
Config>
```

### 1.5.3 Configuring the AT Interfaces

A possible next step would be to configure the AT interfaces so the installed modems operate correctly. The necessary parameters are as follows:

- **Speed:** Possible speeds are: 2400, 4800, 9600, 19200, 38400, 57600 and 115200. We recommend configuring the speed immediately above the speed of your modem. I.e. if you have a 33.6K modem (33600), configure 38400; if you have a 56K modem then configure 57600 etc.
- **AT Commands:** AT commands configuration depends on your modem. The majority of the modems operate with the default configuration in the device. Please consult the manufacturers manual for yours to find out what commands are valid.
- It is also very important to stress that the data bits must be 8, therefore the **Data bits** parameters should not be modified. It's also quite common for the **Parity** parameter to be set to **NONE** and the **Stop bits** to 1.

The following shows the the commands sequence to configure the speed and the AT commands. As you can see, the default configuration has been respected (it is perfectly valid for the modem in the example) however, this serves as an example for the commands syntax.

```
Config>network 1

-- Interface AT. Configuration --
serial0/0 AT config>?
  additional-control-command    Set additional AT commands
  connection-mode              Set connection mode (Dial command or DTR)
  cts-control-command          Set AT command for CTS signal control
  data-bits                    Set number of bits per character
  dcd-control-command          Set AT command for DCD signal control
  description                  Enter interface description
  dial-mode                   Set dial mode (tone or pulse)
  disable                     Disable some features
  dsr-control-command          Set AT command for DSR signal control
  dtr-control-command          Set AT command for DTR signal control
  enable                      Enable some features
  flow-control-command         Set AT command for flow control
  frame-size                  Set frame size
  list                        List configuration
  no                          Set default config
  number-rings                Set number of rings for auto answer
  parity                      Set character parity
  ring-tone-length            Set ring tone and silence lengths
  shutdown                   Change state to administratively down
  speed                       Set speed
  stop-bits                   Set number of stop bits per character
  update                     Update a level indicator
  v42-control-command          Set AT command for V.42 comp/error correction
  wait-time                   Set maximum connection time
  exit                        Return to previous menu
serial0/0 AT config>speed 57600
serial0/0 AT config>additional-control-command no-command
serial0/0 AT config>cts-control-command &R0
serial0/0 AT config>dcd-control-command &C1
serial0/0 AT config>dsr-control-command &S0
serial0/0 AT config>dtr-control-command &D2
serial0/0 AT config>v42-control-command &Q5
serial0/0 AT config>
```



#### Note

For further information on AT configuration, please see manual bintec Dm705-I Generic Serial Interfaces.

### 1.5.4 Configuring the ISDN Interfaces (BRI)

Here we configure the ISDN base interface. Normally the device default configuration is adequate (provided its base interface corresponds to the European standards). In this case, we recommend you do not modify any of the parameters.



For American standards, you need to configure the standard and the SPIDs of the two circuits (and possible more). If you do not know these values, please consult your telecommunications operator.

The following example shows how to configure these two parameters where the standard is configured to NI-1 (the most common for American standards).

```
Config>network bri0/0

-- BRI ISDN Configuration --
bri0/0 BRI config>set circuit spid 1 9876543210100
bri0/0 BRI config>set circuit spid 2 9876543210101
bri0/0 BRI config>set global standard ni-1
bri0/0 BRI config>
```



#### Note

For further information on configuring the BRI interface, please see manual bintec Dm729-I BRI ISDN Interface.

## 1.5.5 Configuring the PPP Interfaces

PPP interfaces. First create a dial profile, or calls profile, for the interfaces. This must be configured to PERMIT for outbound calls (the aim of *Dial Routing* to to make calls to destinations using a limited number of PPP interfaces). If you want the interfaces to receive calls, create a single dial profile used by all the interfaces. If you want only a few PPP links to receive calls (so the rest of the PPP interfaces only make calls ) then create a profile with inbound and outbound calls enabled and another profile with outbound calls only.

The following commands sequence shows how to create a dial profile. The example assumes all the profiles can make and receive calls. Create a profile (DIALROUTING) to be used by all PPP links.

```
Config>global-profiles dial

-- Dial Profiles Configuration --
Dial Profiles config>profile DIALROUTING default
Dial Profiles config>profile DIALROUTING inout
Dial Profiles config>profile DIALROUTING idle-time 70
Dial Profiles config>list

DIAL PROFILE...: DIALROUTING
Local Address.:
Remote Address:                Alternative Remote:
Permissions...: Inbound & Outbound
Idle Time.....: 70
Shutdown Calls: Yes
Priority.....: Normal
Callback.....: None
ISDN Call type: Digital unrestricted data
ISDN Class....: 64 Kbps
Hold queue....: 0
3GPP Acc Ctrl.: None
3GPP APN.....: None
3GPP PDPTType .: IP
3GPP CBST.....: 0,0,1
Call Retry....: Disabled
Call List.....: None

Dial Profiles config>
```

Subsequently, link the PPP interfaces with the base interface they operate (BRI or AT). In the example, the ppp1 and ppp2 interfaces are configured to operate over ISDN and interfaces ppp3 and ppp4 to operate over serial lines 0 and 1 respectively.

```
Config>network pppl

-- Generic PPP User Configuration --
pppl config>base-interface

-- Base Interface Configuration --
```

```

ppp1 Base IFC config>base-interface bri0/0 255 link
ppp1 Base IFC config>base-interface bri0/0 255 profile DIALROUTING
ppp1 Base IFC config>list

  Base Interface      Profile Name      Base Circuit Id  Number of circuits
  -----
  bri0/0      bri/0      DIALROUTING      255      1

ppp1 Base IFC config>exit
ppp1 GenPPP config>exit
Config>network ppp2

-- Generic PPP User Configuration --
ppp2 GenPPP config>base-interface

-- Base Interface Configuration --
ppp2 Base IFC config>base-interface bri0/0 255 link
ppp2 Base IFC config>base-interface bri0/0 255 profile DIALROUTING
ppp2 Base IFC config>list

  Base Interface      Profile Name      Base Circuit Id  Number of circuits
  -----
  bri0/0      bri/0      DIALROUTING      255      1

ppp2 Base IFC config>exit
ppp2 GenPPP config>exit
Config>network ppp3

-- Generic PPP User Configuration --
ppp3 GenPPP config>base-interface

-- Base Interface Configuration --
ppp3 Base IFC config>base-interface serial0/0 link
ppp3 Base IFC config>base-interface serial0/0 profile DIALROUTING
ppp3 Base IFC config>list

  Base Interface      Profile Name      Base Circuit Id  Number of circuits
  -----
  serial0/0      at/0      DIALROUTING      1      1

ppp3 Base IFC config>exit
ppp3 GenPPP config>exit
Config>network ppp4

-- Generic PPP User Configuration --
ppp4 GenPPP config>base-interface

-- Base Interface Configuration --
ppp4 Base IFC config>base-interface serial0/1 link
ppp4 Base IFC config>base-interface serial0/1 profile DIALROUTING
ppp4 Base IFC config>list

  Base Interface      Profile Name      Base Circuit Id  Number of circuits
  -----
  serial0/1      at/1      DIALROUTING      1      1

ppp4 Base IFC config>exit
ppp4 GenPPP config>exit
Config>

```

Consequently, create the PPP configurations. First create the users. Create one user for the remote branch and another for the central.

```
Config>network ppp1
```

```

-- Generic PPP User Configuration --
ppp1 config>ppp

-- PPP Configuration --
ppp1 PPP config>authentication allowed-user oficinal password oficinal
ppp1 PPP config>authentication allowed-user oficina2 password oficina2
ppp1 PPP config>authentication allowed-user oficina3 password oficina3
ppp1 PPP config>authentication sent-user central password central
ppp1 PPP config>exit
ppp1 config>exit
Config>network ppp2

-- Generic PPP User Configuration --
ppp2 config>ppp

-- PPP Configuration --
ppp2 PPP config>authentication allowed-user oficinal password oficinal
ppp2 PPP config>authentication allowed-user oficina2 password oficina2
ppp2 PPP config>authentication allowed-user oficina3 password oficina3
ppp2 PPP config>authentication sent-user central password central
ppp2 PPP config>exit
ppp2 config>exit
Config>network ppp3

-- Generic PPP User Configuration --
ppp3 config>ppp

-- PPP Configuration --
ppp3 PPP config>authentication allowed-user oficina4 password oficina4
ppp3 PPP config>authentication allowed-user oficina5 password oficina5
ppp3 PPP config>authentication sent-user central password central
ppp3 PPP config>exit
ppp3 config>exit
Config>network ppp4

-- Generic PPP User Configuration --
ppp4 config>ppp

-- PPP Configuration --
ppp4 PPP config>authentication allowed-user oficina4 password oficina4
ppp4 PPP config>authentication allowed-user oficina5 password oficina5
ppp4 PPP config>authentication sent-user central password central
ppp4 PPP config>exit
ppp4 config>exit
Config>

```

Next, enable CHAP authentication (i.e. so a PPP remote end authenticates through CHAP) and configure the *Dial Routing* pool name each PPP interface pertains to. Please note: it is essential that the pool name coincides with the one configured in the corresponding *Dial Routing* interface.

```

Config>network ppp1

-- Generic PPP User Configuration --
ppp1 config>ppp

-- PPP Configuration --
ppp1 PPP config>authentication chap
ppp1 PPP config>dial-routing-pool RDSI
ppp1 PPP config>exit
ppp1 config>exit
Config>network ppp2

-- Generic PPP User Configuration --
ppp2 config>ppp

-- PPP Configuration --
ppp2 PPP config>authentication chap

```

```

ppp2 PPP config>dial-routing-pool RDSI
ppp2 PPP config>exit
ppp2 config>exit
Config>network ppp3

-- Generic PPP User Configuration --
ppp3 config>ppp

-- PPP Configuration --
ppp3 PPP config>authentication chap
ppp3 PPP config>dial-routing-pool RTC
ppp3 PPP config>exit
ppp3 config>exit
Config>network ppp4

-- Generic PPP User Configuration --
ppp4 config>ppp

-- PPP Configuration --

ppp4 PPP config>authentication chap
ppp4 PPP config>dial-routing-pool RTC
ppp4 PPP config>exit
ppp4 config>exit

```

With this last step, two types of PPP connections have been configured, one for ISDN connections, which request CHAP authentication, accept users corresponding to branches 1, 2 and 3, is a member of the ISDN *Dial Routing* pool and authenticates with the central user. The second one is for PSTN connections, which request CHAP authentication, accepts users corresponding to branches 4 and 5, is a member of the PSTN *Dial Routing* pool and authenticates with the central user.

The following list displays the device global configuration in text mode after these configuration adjustments have been made.

```

Config>show config
; Showing System Configuration for access-level 15 ...
; ATLAS Router 2 156 Version 10.7.0

log-command-errors
no configuration
add device ppp 1
add device ppp 2
add device ppp 3
add device ppp 4
add device dial-routing 1
add device dial-routing 2
set data-link at serial0/0
set data-link at serial0/1
set data-link x25 serial0/2
global-profiles dial
; -- Dial Profiles Configuration --
  profile DIALROUTING default
  profile DIALROUTING inout
  profile DIALROUTING idle-time 70
;
exit
;
;
;
network ethernet0/0
; -- Ethernet Interface User Configuration --
  no ip address
;
exit
;
network bri0/0
; -- BRI ISDN Configuration --
  set circuit spid 1 9876543210100

```

```
set circuit spid 2 9876543210101
set global standard ni-1
exit
;
;
;
network x25-node
; -- X25-node interface configuration --
no ip address
;
exit
;
;
;
network ppp1
; -- Generic PPP User Configuration --
no ip address
;
ppp
; -- PPP Configuration --
authentication chap
authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
authentication allowed-user oficinal ciphered-pwd 0xA3CBFC7A4DF0079F9E8519
D7C927D959
authentication allowed-user oficina2 ciphered-pwd 0xA3CBFC7A4DF0079F325527
6956674D84
authentication allowed-user oficina3 ciphered-pwd 0xA3CBFC7A4DF0079F8C3F64
C7DCE0E903
dial-routing-pool RDSI
exit
;
base-interface
; -- Base Interface Configuration --
base-interface bri0/0 255 link
base-interface bri0/0 255 profile DIALROUTING
;
exit
;
exit
;
;
;
network ppp2
; -- Generic PPP User Configuration --
no ip address
;
ppp
; -- PPP Configuration --
authentication chap
authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
authentication allowed-user oficinal ciphered-pwd 0xA3CBFC7A4DF0079F9E8519
D7C927D959
authentication allowed-user oficina2 ciphered-pwd 0xA3CBFC7A4DF0079F325527
6956674D84
authentication allowed-user oficina3 ciphered-pwd 0xA3CBFC7A4DF0079F8C3F64
C7DCE0E903
dial-routing-pool RDSI
exit
;
base-interface
; -- Base Interface Configuration --
base-interface bri0/0 255 link
base-interface bri0/0 255 profile DIALROUTING
;
exit
;
exit
```

```
;
;
;
network ppp3
; -- Generic PPP User Configuration --
  no ip address
;
  ppp
; -- PPP Configuration --
  authentication chap
  authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
  authentication allowed-user oficina4 ciphered-pwd 0xA3CBFC7A4DF0079FD654B4
0C2E5C57DC
  authentication allowed-user oficina5 ciphered-pwd 0xA3CBFC7A4DF0079FA12F34
101943C3D1
  dial-routing-pool RTC
  exit
;
  base-interface
; -- Base Interface Configuration --
  base-interface serial0/0 link
  base-interface serial0/0 profile DIALROUTING
;
  exit
;
Exit
;
;
;
network ppp4
; -- Generic PPP User Configuration --
  no ip address
;
  ppp
; -- PPP Configuration --
  authentication chap
  authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
  authentication allowed-user oficina4 ciphered-pwd 0xA3CBFC7A4DF0079FD654B4
0C2E5C57DC
  authentication allowed-user oficina5 ciphered-pwd 0xA3CBFC7A4DF0079FA12F34
101943C3D1
  dial-routing-pool RTC
  exit
;
  base-interface
; -- Base Interface Configuration --
  base-interface serial0/1 link
  base-interface serial0/1 profile DIALROUTING
;
  exit
;
exit
;
;
;
network dialroutel
; -- DR interface configuration --
  no ip address
;
  connection 1 default
  connection 1 destination-address 1111111
  connection 1 username oficina1
  connection 1 password oficina1
;
  connection 2 default
  connection 2 destination-address 2222222
  connection 2 username oficina2
```

```

connection 2 password oficina2
;
connection 3 default
connection 3 destination-address 3333333
connection 3 username oficina3
connection 3 password oficina3
;
pool-name RDSI
;
exit
;
;
;
network dialroute2
; -- DR interface configuration --
no ip address
;
connection 1 default
connection 1 destination-address 4444444
connection 1 username oficina4
connection 1 password oficina4
;
connection 2 default
connection 2 destination-address 5555555
connection 2 username oficina5
connection 2 password oficina5
;
pool-name RTC
;
exit
;
;
;
dump-command-errors
end
; --- end ---
Config>

```

### 1.5.5.1 Configuring with multilink PPP

Sometimes you need to connect to a remote device at a higher speed, using the two B channels from the ISDN base interface for example. In these cases, PPP allows various PPP links to be aggregated through a mechanism known as multilink PPP (MP). This facility can be used over any two PPP links. The most common use is described above (join two B channels and achieve a bandwidth of 128 Kbps). However, it is also possible to carry out MP over two modem connections provided both ends have two modem connections.

It is possible, in the given scenario, to make use of this mechanism to obtain wider bandwidth connections, however it is necessary to emphasize various aspects:

- A PPP is going to simultaneously use various channels; therefore the number of simultaneous connections is reduced. I.e. if we have two ISDN channels available and multilink can be carried out over them, when this facility is in use, you cannot access other remote devices.
- The destination telephone numbers must be the same for all connections going to participate in the same MP link as, in the *Dial Routing* connections, only one telephone number can be configured.

Various variations can be proposed over the above scenario where multilink use can intervene. The simplest would be to allow all ISDN destinations for example, to execute multilink. This means you only need to configure the involved PPP interfaces so they can operate with multilink.

Another possible variation is where you only need to access some destinations with multilink. This latter configuration means you need to create another *Dial Routing* interface, which handles the PPP that carry out multilink, configure these PPP interfaces to operate with multilink and register the connections with destinations you wish to access with multilink in said *Dial Routing* interface.

The following is the configuration process for the first of these scenarios.

The first step is to modify the base interfaces configuration, which use the PPP over ISDN, to allow the use of the two BRI channels. For this, execute the following sequence of commands.

```
Config>network pppl
```

```

-- Generic PPP User Configuration --
ppp1 config>base-interface

-- Base Interface Configuration --
ppp1 Base IFC config>base-interface bri0/0 255 number-of-circuits 2

ppp1 Base IFC config>list

      Base Interface      Profile Name      Base Circuit Id  Number of circuits
-----
      bri0/0      bri/0      DIALROUTING      255      2

ppp1 Base IFC config>exit
ppp1 config>exit
Config>network ppp2

-- Generic PPP User Configuration --
ppp2 config>base-interface

-- Base Interface Configuration --
ppp2 Base IFC config>base-interface bri0/0 255 number-of-circuits 2
ppp2 Base IFC config>list

      Base Interface      Profile Name      Base Circuit Id  Number of circuits
-----
      bri0/0      bri/0      DIALROUTING      255      2

ppp2 Base IFC config>

```

Subsequently, configure the multilink parameters in the PPP interfaces going to operate with multilink. **We strongly recommend enabling the option that only can add new links to the multilink if the PPP has been initiated from our side.** In addition to the basic parameters (enable multilink and the option to add links in outgoing calls only), you can configure the following:

- *Activation Interval*: Period of time that the traffic load on the line must remain above the activation threshold so a new link is added.
- *Deactivation Interval*: Period of time that the traffic load on the line must remain below the activation threshold so a link is released.
- *Activation Threshold*: This is the previously mentioned activation threshold.
- *Deactivation Threshold*: This is the previously mentioned deactivation threshold.
- *Traffic Load*: Direction of the traffic taken into account to calculate the amount of traffic on the line (inbound, outbound or both).
- *Max Links per Bundle*: Maximum number of links that can be added to the same multilink.

We recommend that the remaining parameters take their default values.

```

Config>network ppp1

-- Generic PPP User Configuration --
ppp1 config>ppp

-- PPP Configuration --
ppp1 PPP config>multilink enable
ppp1 PPP config>multilink call-out
ppp1 PPP config>multilink activation interval 60
ppp1 PPP config>multilink activation threshold 80
ppp1 PPP config>multilink deactivation interval 90
ppp1 PPP config>multilink deactivation threshold 25
ppp1 PPP config>exit
ppp1 config>exit
Config>network ppp2

-- Generic PPP User Configuration --
ppp2 config>ppp

```



```
-- PPP Configuration --
ppp2 PPP config>multilink enable
ppp2 PPP config>multilink call-out
ppp2 PPP config>multilink activation interval 60
ppp2 PPP config>multilink activation threshold 80
ppp2 PPP config>multilink deactivation interval 90
ppp2 PPP config>multilink deactivation threshold 25
ppp2 PPP config>exit
ppp2 config>exit
Config>
```

In this example, a multilink has been configured. This will attempt to add a new link if the line traffic load remains above 80% of the accumulated bandwidth during 60 consecutive seconds and will attempt to eliminate the link if the traffic load remains below 25% of said bandwidth during 90 seconds, taking into account both inbound and outbound traffic. Please note that the percentage of traffic is taken over the whole of the bandwidth the multilink currently has enabled. I.e. if there is a single PPP over ISDN, the activation level will be 51.2 Kbps (80% of 64 Kbps) and when there are two links, the deactivation threshold is 32 Kbps (25% of 128 Kbps). We recommend these calculations be made when configuring. Make sure that you do not configure an activation time threshold below the deactivation time, contrariwise the result will be the constant adding and eliminating of links.

Use the **show config** command to display the configuration in text mode, which will achieve the following result:

```
Config>show config
; Showing System Configuration for access-level 15 ...
; ATLAS Router 2 156 Version 10.7.0

log-command-errors
no configuration
add device ppp 1
add device ppp 2
add device ppp 3
add device ppp 4
add device dial-routing 1
add device dial-routing 2
set data-link at serial0/0
set data-link at serial0/1
set data-link x25 serial0/2
global-profiles dial
; -- Dial Profiles Configuration --
  profile DIALROUTING default
  profile DIALROUTING inout
  profile DIALROUTING idle-time 70
;
exit
;
;
;
network ethernet0/0
; -- Ethernet Interface User Configuration --
  no ip address
;
exit
;
network bri0/0
; -- BRI ISDN Configuration --
  set circuit spid 1 9876543210100
  set circuit spid 2 9876543210101
  set global standard ni-1
exit
;
;
;
network x25-node
; -- X25-node interface configuration --
  no ip address
;
exit
```

```

;
;
;
network ppp1
; -- Generic PPP User Configuration --
  no ip address
;
  ppp
; -- PPP Configuration --
  authentication chap
  authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
  authentication allowed-user oficinal ciphered-pwd 0xA3CBFC7A4DF0079F9E8519
D7C927D959
  authentication allowed-user oficina2 ciphered-pwd 0xA3CBFC7A4DF0079F325527
6956674D84
  authentication allowed-user oficina3 ciphered-pwd 0xA3CBFC7A4DF0079F8C3F64
C7DCE0E903
  dial-routing-pool RDSI
  multilink enable
  multilink activation interval 1m
  multilink activation threshold 80
  multilink deactivation interval 1m30s
  multilink deactivation threshold 25
  multilink call-out
  exit
;
  base-interface
; -- Base Interface Configuration --
  base-interface bri0/0 255 link
  base-interface bri0/0 255 profile DIALROUTING
  base-interface bri0/0 255 number-of-circuits 2
;
  exit
;
exit
;
;
;
network ppp2
; -- Generic PPP User Configuration --
  no ip address
;
  ppp
; -- PPP Configuration --
  authentication chap
  authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
  authentication allowed-user oficinal ciphered-pwd 0xA3CBFC7A4DF0079F9E8519
D7C927D959
  authentication allowed-user oficina2 ciphered-pwd 0xA3CBFC7A4DF0079F325527
6956674D84
  authentication allowed-user oficina3 ciphered-pwd 0xA3CBFC7A4DF0079F8C3F64
C7DCE0E903
  dial-routing-pool RDSI
  multilink enable
  multilink activation interval 1m
  multilink activation threshold 80
  multilink deactivation interval 1m30s
  multilink deactivation threshold 25
  multilink call-out
  exit
;
  base-interface
; -- Base Interface Configuration --
  base-interface bri0/0 255 link
  base-interface bri0/0 255 profile DIALROUTING
  base-interface bri0/0 255 number-of-circuits 2
;

```

```

    exit
;
exit
;
;
;
network ppp3
; -- Generic PPP User Configuration --
    no ip address
;
    ppp
; -- PPP Configuration --
    authentication chap
    authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
    authentication allowed-user oficina4 ciphered-pwd 0xA3CBFC7A4DF0079FD654B4
0C2E5C57DC
    authentication allowed-user oficina5 ciphered-pwd 0xA3CBFC7A4DF0079FA12F34
101943C3D1
    dial-routing-pool RTC
    exit
;
    base-interface
; -- Base Interface Configuration --
    base-interface serial0/0 link
    base-interface serial0/0 profile DIALROUTING
;
    exit
;
exit
;
;
;
network ppp4
; -- Generic PPP User Configuration --
    no ip address
;
    ppp
; -- PPP Configuration --
    authentication chap
    authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
    authentication allowed-user oficina4 ciphered-pwd 0xA3CBFC7A4DF0079FD654B4
0C2E5C57DC
    authentication allowed-user oficina5 ciphered-pwd 0xA3CBFC7A4DF0079FA12F34
101943C3D1
    dial-routing-pool RTC
    exit
;
    base-interface
; -- Base Interface Configuration --
    base-interface serial0/1 link
    base-interface serial0/1 profile DIALROUTING
;
    exit
;
exit
;
;
;
network dialroutel
; -- DR interface configuration --
    no ip address
;
    connection 1 default
    connection 1 destination-address 1111111
    connection 1 username oficial
    connection 1 password oficial
;

```

```

connection 2 default
connection 2 destination-address 2222222
connection 2 username oficina2
connection 2 password oficina2
;
connection 3 default
connection 3 destination-address 3333333
connection 3 username oficina3
connection 3 password oficina3
;
pool-name RDSI
;
exit
;
;
;
network dialroute2
; -- DR interface configuration --
no ip address
;
connection 1 default
connection 1 destination-address 4444444
connection 1 username oficina4
connection 1 password oficina4
;
connection 2 default
connection 2 destination-address 5555555
connection 2 username oficina5
connection 2 password oficina5
;
pool-name RTC
;
exit
;
;
;
dump-command-errors
end
; --- end ---
Config>

```



### Note

For further information on configuring PPP, please see manual bintec Dm710-I PPP Interface.

## 1.5.6 Configuring IP

Once you have configured everything relative to the interfaces, configure the IP protocol.

### 1.5.6.1 Configuring IP addresses

Configure the Ethernet IP address and the internal IP address is set to coincide with said address.

```

Config>network ethernet0/0

-- Ethernet Interface User Configuration --
ethernet0/0 config>ip address 7.7.7.7 255.255.255.0
ethernet0/0 config>exit
Config>protocol ip

-- Internet protocol user configuration --
IP config>internal-ip-address 7.7.7.7
IP config>list addresses
IP addresses for each interface:
ethernet0/0      7.7.7.7      255.255.255.0   NETWORK broadcast, fill 0
serial0/0        IP disabled on this ifc

```

```

serial0/1                IP disabled on this ifc
serial0/2                IP disabled on this ifc
bri0/0                   IP disabled on this ifc
x25-node                 IP disabled on this ifc
ppp1                     IP disabled on this ifc
ppp2                     IP disabled on this ifc
ppp3                     IP disabled on this ifc
ppp4                     IP disabled on this ifc
dialroute1              IP disabled on this ifc
dialroute2              IP disabled on this ifc
Internal IP address: 7.7.7.7
IP config>exit
Config>

```

The PPP and *Dial Routing* interfaces are configured as unnumbered.

```

Config>network ppp1

-- Generic PPP User Configuration --
ppp1 config>ip address unnumbered
ppp1 config>exit
Config>network ppp2

-- Generic PPP User Configuration --
ppp2 config>ip address unnumbered
ppp2 config>exit
Config>network ppp3

-- Generic PPP User Configuration --
ppp3 config>ip address unnumbered
ppp3 config>exit
Config>network ppp4

-- Generic PPP User Configuration --
ppp4 config>ip address unnumbered
ppp4 config>exit
Config>network dialroute1

-- DR interface configuration --
dialroute1 config>ip address unnumbered
dialroute1 config>exit
Config>network dialroute2

-- DR interface configuration --
Dialroute2 config>ip address unnumbered
Dialroute2 config>exit
Config>protocol ip

-- Internet protocol user configuration --
IP config>list addresses
IP addresses for each interface:
 ethernet0/0      7.7.7.7      255.255.255.0  NETWORK broadcast, fill 0
 serial0/0        IP disabled on this ifc
 serial0/1        IP disabled on this ifc
 serial0/2        IP disabled on this ifc
 bri0/0           IP disabled on this ifc
 x25-node         IP disabled on this ifc
 ppp1             unnumbered      0.0.0.0        NETWORK broadcast, fill 0
 ppp2             unnumbered      0.0.0.0        NETWORK broadcast, fill 0
 ppp3             unnumbered      0.0.0.0        NETWORK broadcast, fill 0
 ppp4             unnumbered      0.0.0.0        NETWORK broadcast, fill 0
 dialroute1       unnumbered      0.0.0.0        NETWORK broadcast, fill 0
 dialroute2       unnumbered      0.0.0.0        NETWORK broadcast, fill 0
Internal IP address: 7.7.7.7
IP config>

```

### 1.5.6.2 Enabling Ip Classless

```
IP config>classless
IP config>list ip-protocol
Directed broadcasts: enabled
RIP: disabled
OSPF: disabled
Multipath: disabled
Ip classless: enabled
Icmp redirects: enabled
Icmp unreachable: enabled
IP config>
```

### 1.5.7 Adding ID static routes

This last step configures the routes with an identifier, which link the IP destinations with the *Dial Routing* interfaces connections. To do this, a route to the destination address/subnet is created with the gateway being the *Dial Routing* interface used for access, together with the identifier corresponding to the *Dial Routing* connection. This connection should be used to connect to the device providing access to said network.

In this example, a route with identifier has been created for branch 1 to network 1.1.1.0, with mask 255.255.255.0, whose gateway is the dialroute1 interface with identifier 1, as this is the connection created with the parameters to access branch 1. A similar process is carried out with the rest of the branches and the result is shown below:

```
IP config>id-route 1.1.1.0 255.255.255.0 dialroute1 1
IP config>id-route 2.2.2.0 255.255.255.0 dialroute1 2
IP config>id-route 3.3.3.0 255.255.255.0 dialroute1 3
IP config>id-route 4.4.4.0 255.255.255.0 dialroute2 4
IP config>id-route 5.5.5.0 255.255.255.0 dialroute2 5
IP config>
```



#### Note

For further information on configuring IP, please see manual bintec Dm702-I TCP/IP.

### 1.5.8 Configuration Summary

Lastly, we are going to display the definitive device global configuration in text mode for our scenario. This configuration can be used as a base to carry out any required modifications and to send the resulting commands sequence to the device to obtain the required configuration. **This configuration does not include the multilink configuration.**

```
Config>show config
; Showing System Configuration for access-level 15 ...
; ATLAS Router 2 156 Version 10.7.0

log-command-errors
no configuration
add device ppp 1
add device ppp 2
add device ppp 3
add device ppp 4
add device dial-routing 1
add device dial-routing 2
set data-link at serial0/0
set data-link at serial0/1
set data-link x25 serial0/2
global-profiles dial
; -- Dial Profiles Configuration --
  profile DIALROUTING default
  profile DIALROUTING inout
  profile DIALROUTING idle-time 70
;
exit
;
;
network ethernet0/0
```

```

; -- Ethernet Interface User Configuration --
  ip address 7.7.7.7 255.255.255.0
;
;
;
;
exit
;
network bri0/0
; -- BRI ISDN Configuration --
  set circuit spid 1 9876543210100
  set circuit spid 2 9876543210101
  set global standard ni-1
exit
;
;
;
network x25-node
; -- X25-node interface configuration --
  no ip address
;
exit
;
;
network ppp1
; -- Generic PPP User Configuration --
  ip address unnumbered
;
;
;
;
  ppp
; -- PPP Configuration --
  authentication chap
  authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
  authentication allowed-user oficinal ciphered-pwd 0xA3CBFC7A4DF0079F9E8519
D7C927D959
  authentication allowed-user oficina2 ciphered-pwd 0xA3CBFC7A4DF0079F325527
6956674D84
  authentication allowed-user oficina3 ciphered-pwd 0xA3CBFC7A4DF0079F8C3F64
C7DCE0E903
  dial-routing-pool RDSI
  exit
;
  base-interface
; -- Base Interface Configuration --
  base-interface bri0/0 255 link
  base-interface bri0/0 255 profile DIALROUTING
;
  exit
;
exit
;
;
network ppp2
; -- Generic PPP User Configuration --
  ip address unnumbered
;
;
;
;
  ppp
; -- PPP Configuration --
  authentication chap
  authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
  authentication allowed-user oficinal ciphered-pwd 0xA3CBFC7A4DF0079F9E8519
D7C927D959

```

```

        authentication allowed-user oficina2 ciphered-pwd 0xA3CBFC7A4DF0079F325527
6956674D84
        authentication allowed-user oficina3 ciphered-pwd 0xA3CBFC7A4DF0079F8C3F64
C7DCE0E903
        dial-routing-pool RDSI
        exit
;
base-interface
; -- Base Interface Configuration --
        base-interface bri0/0 255 link
        base-interface bri0/0 255 profile DIALROUTING
;
        exit
;
exit
;
;
network ppp3
; -- Generic PPP User Configuration --
        ip address unnumbered
;
;
;
        ppp
; -- PPP Configuration --
        authentication chap
        authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
        authentication allowed-user oficina4 ciphered-pwd 0xA3CBFC7A4DF0079FD654B4
0C2E5C57DC
        authentication allowed-user oficina5 ciphered-pwd 0xA3CBFC7A4DF0079FA12F34
101943C3D1
        dial-routing-pool RTC
        exit
;
base-interface
; -- Base Interface Configuration --
        base-interface serial0/0 link
        base-interface serial0/0 profile DIALROUTING
;
        exit
;
exit
;
;
network ppp4
; -- Generic PPP User Configuration --
        ip address unnumbered
;
;
;
        ppp
; -- PPP Configuration --
        authentication chap
        authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
        authentication allowed-user oficina4 ciphered-pwd 0xA3CBFC7A4DF0079FD654B4
0C2E5C57DC
        authentication allowed-user oficina5 ciphered-pwd 0xA3CBFC7A4DF0079FA12F34
101943C3D1
        dial-routing-pool RTC
        exit
;
base-interface
; -- Base Interface Configuration --
        base-interface serial0/1 link
        base-interface serial0/1 profile DIALROUTING

```



```
;
    exit
;
exit
;
;
network dialroute1
; -- DR interface configuration --
    ip address unnumbered
;
;
;
    connection 1 default
    connection 1 destination-address 1111111
    connection 1 username oficinal
    connection 1 password oficinal
;
    connection 2 default
    connection 2 destination-address 2222222
    connection 2 username oficina2
    connection 2 password oficina2
;
    connection 3 default
    connection 3 destination-address 3333333
    connection 3 username oficina3
    connection 3 password oficina3
;
    pool-name RDSI
;
exit
;
;
network dialroute2
; -- DR interface configuration --
    ip address unnumbered
;
;
;
    connection 1 default
    connection 1 destination-address 4444444
    connection 1 username oficina4
    connection 1 password oficina4
;
    connection 2 default
    connection 2 destination-address 5555555
    connection 2 username oficina5
    connection 2 password oficina5
;
    pool-name RTC
;
exit
;
protocol ip
; -- Internet protocol user configuration --
    internal-ip-address 7.7.7.7
    classless
    id-route 1.1.1.0 255.255.255.0 dialroute1 1
    id-route 2.2.2.0 255.255.255.0 dialroute1 2
    id-route 3.3.3.0 255.255.255.0 dialroute1 3
    id-route 4.4.4.0 255.255.255.0 dialroute2 4
    id-route 5.5.5.0 255.255.255.0 dialroute2 5
;
exit
;
;
```

```
dump-command-errors
end
; --- end ---
Config>
```

## Chapter 2 Configuration

### 2.1 Dial Routing Interface Configuration Commands

This section describes all the commands to configure the *Dial Routing* interface. To access the configuration environment for said interface, proceed as for the rest of the device interfaces, through the **network** command in the device configuration followed by the interface identifier:

```
*config
Config> network dialroute1
-- DR interface configuration --
dialroute1 config>
```

There are certain commands that are common for all the device's interfaces. These commands are described in the manual on configuring common interfaces (bintec Dm772-I Common Configurations for Interfaces).

The following table shows the specific commands for this *Dial Routing* interface:

Command	Function
? (HELP)	Lists the commands or their options.
CONNECTION	Configures a connection.
LIST	Lists the current configuration.
NO	Negates a command or establishes its default value.
POOL-NAME	Configures the pool name.
QUARANTINE-TIME	Configures the quarantine time.
EXIT	Returns to the previous prompt.

#### 2.1.1 Configuring connections

##### 2.1.1.1 Adding a new connection

Run **connection** to add a new connection.

```
dialroute1 config>connection <id> default
```

This command creates a connection with the default values for the distinct parameters. The way to modify the parameter values is explained further on in this manual.

The <id> parameter is a number that uniquely identifies the connection. This connection identifier must be distinct to already existing connections. Contrariwise, the command will modify the previously configured connection parameters that have said identifier.

Additionally, this identifier serves to link the connection with the IP destination accessed through the connection. For this, the ID static route identifier must coincide with the *Dial Routing* connection identifier (that provides access to the subnet specifying this route).

##### 2.1.1.2 Modifying connection parameters

Once the connection has been created, assign parameter values or change the previously assigned value by running **connection** with the different permitted options.

###### 2.1.1.2.1 Modifying the destination telephone number

```
dialroute1 config>connection <id> destination-address <telephone number>
```

###### 2.1.1.2.2 Modifying the user

```
dialroute1 config>connection <id> username <name>
```

###### 2.1.1.2.3 Modifying the password

```
dialroute1 config>connection <id> password <password>
```

### 2.1.1.3 Deleting a connection

Deletes a connection, as shown below:

```
dialroute1 config>no connection <id>
```

### 2.1.1.4 Example of a connection configuration

First, create the connection:

```
dialroute1 config>connection 5 default
```

Secondly, assign the values to the different parameters:

```
dialroute1 config>connection 5 destination-address 918076565
dialroute1 config>connection 5 username usuariol
dialroute1 config>connection 5 password passwordl
dialroute1 config>list connection
Connections
-----
ID          Destination Address  Username
-----
          5  918076565          usuariol
dialroute1 config>
```

It may be necessary to change the value of an incorrectly entered parameter. E.g. if it's necessary to enter a 0 before the telephone number to access the external line, the command is as follows:

```
dialroute1 config>connection 5 destination-address 0918076565
dialroute1 config>list connection
Connections
-----
ID          Destination Address  Username
-----
          5  0918076565          usuariol
dialroute1 config>
```

Lastly, when you wish to delete a connection, enter:

```
dialroute1 config>no connection 5
dialroute1 config>list connection
No connections found.
dialroute1 config>
```

## 2.1.2 Configuring the pool name

The connections pool name is used to link the *Dial Routing* interface with the PPP interfaces used to establish the connections. For this, on enabling *Dial Routing* in the corresponding PPP interfaces, configure the same profile name as configured here.

To configure the PPP links pool name that use this interface, run the following command:

```
dialroute1 config>pool-name <pool-name>
```

*Example:*

```
dialroute1 config>pool-name POOL1
dialroute1 config>
```

## 2.1.3 Configuring the quarantine time

When a PPP interface suffers a local source error detectable only when you try and carry out a connection (ISDN cable disconnection for example), a mechanism is used to avoid the situation where successive connections unsuccessfully try to use this interface. This mechanism places the interface in *quarantine* during a determined period of time during which the *Dial Routing* will not use said PPP link. The duration time of this quarantine period is configurable through the following command:

```
dialroute1 config>quarantine-time <number of minutes>
```

**Example:**

```
dialroute1 config>quarantine-time ?
<2..60>    Quarantine time (minutes)
dialroute1 config>quarantine-time 4
dialroute1 config>
```

## 2.1.4 Configuring the IP address

Use the following command to add an IP address to the interface (common to all IP interfaces):

```
dialroute1 config>ip address { <dirección_IP> | unnumbered }
```

**Example:**

To configure an IP address for the *Dial Routing* interface as unnumbered, enter the following:

```
dialroute1 config>ip address unnumbered
dialroute1 config>
```

**Note**

For further information on configuring IP, please see manual bintec Dm702-I TCP/IP Configuration.

## 2.1.5 Displaying the configuration

### 2.1.5.1 Listing the configuration common to all connections

Run the following command to list the configuration affecting all connections:

```
dialroute1 config>list interface
```

**Example:**

```
dialroute1 config>list interface
Interface Configuration
-----
Pool Name:          POOL1
Quarantine time:    4 min.
dialroute1 config>
```

### 2.1.5.2 Listing specific connection parameters

Run the following command to list the configured connections:

```
dialroute1 config>list connection
```

**Example:**

```
dialroute1 config>list connection
Connections
-----
ID          Destination Address  Username
-----
1          918076565            USUARIO1@bintec
dialroute1 config>
```

### 2.1.5.3 Listing all the configuration

Run the following command to list the whole of the configuration for this interface:

```
dialroute1 config>list all
```

**Example:**

```
dialroute1 config>list all
Interface Configuration
-----
```

```

Pool Name:          POOL1
Quarantine time:    4 min.

Connections
-----

ID          Destination Address  Username
-----
          1  918076565          USUARIO1@bintec
dialroute1 config>

```

## 2.1.6 Return to the previous menu

To exit the interface configuration menu and return to the device main configuration menu, run the following command (the same for all the device configuration):

```
dialroute1 config>exit
```

*Example:*

```
dialroute1 config>exit
Config>
```

## 2.2 ID Static Routes Configuration Commands

In this section, all commands used to configure the ID static routes are described. Run the following commands to access the IP configuration menu and the configuration environment for the routes:

```
*config
Config>protocol ip
-- Internet protocol user configuration --
IP config>
```

### 2.2.1 Adding a static route with identifier

Run the following command to add an ID static route:

```
IP config>id-route <dest> <mask> <next-gw> <id>
```

The parameters are, in this order, destination network, destination mask, next hop and identifier.

In the next hop parameter, enter the *Dial Routing* interface name, which contains the connection to reach said destination network.

*Example:*

```
IP config>id-route 2.2.2.2 255.255.255.255 dialroute1 25
IP config>
```

### 2.2.2 Deleting a static route with identifier

To delete an ID static route, run the following command:

```
IP config>no id-route <dest> <mask> <next-gw>
```

These parameters, in this order, are: destination network, destination mask and next hop.

*Example:*

```
IP config>no id-route 2.2.2.2 255.255.255.255 dialroute1
IP config>
```

### 2.2.3 Listing configured ID routes

Run the following command to list the configured static routes:

**Syntax:**

```
IP config>list routes
```

**Note**

The ID routes are those in the list that begin with “ID Route...”. The rest are normal static routes.

**Example:**

```
IP config>list routes

route to 0.0.0.0,0.0.0.0 via 192.168.1.1, cost 1
ID route to 5.5.5.5,255.255.255.255 via dialroute1, Id 5
ID route to 3.3.3.3,255.255.255.255 via dialroute1, Id 3
ID route to 1.1.1.1,255.255.255.255 via dialroute1, Id 1
ID route to 192.80.0.120,255.255.255.255 via dialroute2, Id 2
IP config>
```

**Note**

For further information on IP configuration, please see manual bintec Dm702-I TCP/IP Configuration.

## Chapter 3 Monitoring

### 3.1 Monitoring the Dial Routing Interface

This section describes the commands used to monitor the state of the *Dial Routing* interface links and connections. To access this monitoring, run the following commands:

```
*monitor
Console Operator
+network <interface_name>
-- Interface <interface_name> Console --
DR monitor+
```

*Example:*

```
*monitor
Console Operator
+network dialroutel
-- Interface dialroutel Console --
DR monitor+
```

The following commands are available in the interface console:

Command	Function
? (AYUDA)	Lists the commands or their options.
LIST	Displays the <i>Dial Routing</i> interface monitoring information.
EXIT	Exits the interface monitoring console.

#### 3.1.1 ? (HELP)

Use the ? (**HELP**) command to list the commands available at the layer where the router is monitoring. You can also use this command after a specific command to list its options.

*Syntax:*

```
DR monitor+?
```

*Example:*

```
DR monitor+?
list    Show monitoring information
exit
DR monitor+
```

#### 3.1.2 Displaying the monitoring information

On selecting **list**, view the available options by running **help**:

```
DR monitor+list ?
all          Information about links and connections
connections  Status of the Dial Routing connections
links       State of the participating PPP interfaces
DR monitor+
```

##### 3.1.2.1 Monitoring information completed

To list the state of the PPP interfaces, participating in the *Dial Routing* process, and the status of the *Dial Routing* connections in an interface, run the following command:

*Syntax:*

```
DR monitor+list all
```

*Example:*

```
DR monitor+list all
```



```

Links status
-----
PPP Interface      Status                Connection ID
-----
ppp1               IDLE
ppp2               IDLE

Connections status
-----
Connection Id      Destination address    Username                Status
-----
1                  918076565             USUARIO1@bintec        INACTIVE
DR monitor+

```

### 3.1.2.2 Connection Status

To list the status of the *Dial Routing* connections in an interface, run the following command:

**Syntax:**

```
DR monitor+list connections
```

**Example:**

```

DR monitor+list connections
Connections status
-----
Connection Id      Destination address    Username                Status
-----
1                  918076565             USUARIO1@bintec        INACTIVE
DR monitor+

```

A list is displayed with an entry for each connection profile where you can see the identifier, the destination telephone number, the user name and if this is being used by a link or not.

### 3.1.2.3 Link information

To list the state of the PPP interfaces (participating in the *Dial Routing* process directed by this interface), run the following command:

**Syntax:**

```
DR monitor+list links
```

**Example:**

```

DR monitor+list links
Links status
-----
PPP Interface      Status                Connection ID
-----
ppp1               IDLE
ppp2               IDLE
DR monitor+

```

This list contains an entry for each PPP interface that can be used by this Dial Route interface to carry out a connection. The *Status* field indicates if the interface is active or available. When active, the *Connection ID* field indicates the identifier of the connection you are using.

If the link list contains less interfaces than expected, check the pool name configuration in the *Dial Routing* interface and the PPP interfaces.

## 3.1.3 Return to the previous menu

Run **exit** to leave the interface monitoring menu.

**Syntax:**

```
DR monitor+exit
```

**Example:**

```
DR monitor+exit
+
```

## 3.2 Monitoring the ID Static Routes

This section describes commands used to monitor ID static routes. Run the following commands to access the monitoring menu for these routes:

```
*monitor
Console Operator
+protocol ip
IP+
```

The following table summarizes the ID static routes monitoring commands.

Command	Function
<i>DUMP-ROUTING-TABLE</i>	Lists the active routes table.
<i>ROUTE-GIVEN-ADDRESS</i>	Lists the next hop to a determined destination.
<i>STATIC-ROUTES</i>	Lists the static routes table.
<i>EXIT</i>	Returns to the previous prompt.

### 3.2.1 Active routes Table

Run **dump-routing-table** to display the active routes table:

*Syntax:*

```
IP+dump-routing-table
```

*Example:*

```
IP+dump-routing-table
Type                Dest net/Mask  Cost Age  Next hop(s)

Stat(1) [0]         0.0.0.0/0    [ 60/1 ] 0  192.168.1.1 (ethernet0/0)
Sbnt(0) [0]         1.0.0.0/8    [240/1 ] 0  None

                    Stat(1) [0] 1.1.1.0/24 [ 60/3 ] 0 dialroute1
Sbnt(0) [0]         2.0.0.0/8    [240/1 ] 0  None

                    Stat(1) [0] 2.2.2.0/24 [ 60/3 ] 0 dialroute1
Sbnt(0) [0]         3.0.0.0/8    [240/1 ] 0  None

                    Stat(1) [0] 3.3.3.0/24 [ 60/3 ] 0 dialroute1
Sbnt(0) [0]         4.0.0.0/8    [240/1 ] 0  None

                    Stat(1) [0] 4.4.4.0/24 [ 60/3 ] 0 dialroute2
Sbnt(0) [0]         5.0.0.0/8    [240/1 ] 0  None

                    Stat(1) [0] 5.5.5.0/24 [ 60/3 ] 0 dialroute2
Sbnt(0) [0]         7.0.0.0/8    [240/1 ] 0  None
Dir(0) [1]          7.7.7.0/24   [ 0/1 ] 0  ethernet0/0
Dir(0) [1]          7.7.7.7/32   [ 0/1 ] 0  snk
Dir(0) [1]          192.168.1.0/24 [ 0/1 ] 0  ethernet0/0

Default gateway in use.
Type Cost Age  Next hop
Stat 1  0  192.168.1.1 (ethernet0/0)

Routing table size: 768 nets (64512 bytes), 15 nets known, 15 shown
IP+
```

The ID static routes are those shown in bold. These differ from the rest of the static routes in the next hop (dialrouteX), apart from that they are identical.

### 3.2.2 Calculating the next hop

Run **route-given-address** to display the next hop to a determined destination.

*Syntax:*

```
IP+route-given-address <dest>
```

*Example:*

```
IP+route-given-address 1.1.1.1
Destination: 1.1.1.0
Mask: 255.255.255.0
Route type: Stat
Distance: 3
Tag: 0
Next hop(s): 1.1.1.1 (dialroute1 ) Age: 0
IP+
```

If the next hop to access a determined destination is a *Dial Routing* interface, “dialrouteX” will appear in “Next hop”

### 3.2.3 Static routes Table

Run **static-routes** to view the configured static routes table:

*Syntax:*

```
IP+static-routes
```

*Example:*

```
IP+static-routes
Flags: A added to routing table, R refresh, T track up
Type Net Cost Next_hop Int Circuit State
---- ---
CNFG 0.0.0.0/0 1 192.168.1.1 ethernet0/0 N/A Ar
CNFG 1.1.1.0/24 3 dialroute1 dialroute1 1 Ar
CNFG 2.2.2.0/24 3 dialroute1 dialroute1 2 Ar
CNFG 3.3.3.0/24 3 dialroute1 dialroute1 3 Ar
CNFG 4.4.4.0/24 3 dialroute2 dialroute2 4 Ar
CNFG 5.5.5.0/24 3 dialroute2 dialroute2 5 Ar
IP+
```

The ID static routes are highlighted in bold. These differ from the rest in the next hop (dialroute X) and in the circuit: the configured ID.