



DYNAMIC NAT

Teldat-Dm 755-I

Copyright© Version 10.71 Teldat SA

Legal Notice

Warranty

This publication is subject to change.

Teldat offers no warranty whatsoever for information contained in this manual.

Teldat is not liable for any direct, indirect, collateral, consequential or any other damage connected to the delivery, supply or use of this manual.

Table of Contents

| | | |
|-----------|---|----|
| Chapter 1 | Introduction | 1 |
| 1.1 | Introduction to NAT | 1 |
| 1.2 | Types of NAT | 1 |
| 1.2.1 | Static NAT | 2 |
| 1.2.2 | Dynamic NAT | 2 |
| 1.2.3 | NAPT/PAT (Masquerading) | 2 |
| 1.3 | Problems common to all NAT techniques | 3 |
| 1.3.1 | State Information | 3 |
| 1.3.2 | Fragmentation | 3 |
| 1.3.3 | Behavior depending on protocol | 3 |
| Chapter 2 | Configuration | 4 |
| 2.1 | Configuring DYNAMIC NAT | 4 |
| 2.2 | DYNAMIC NAT Configuration Commands | 5 |
| 2.2.1 | ? (HELP) | 5 |
| 2.2.2 | INTERFACE | 5 |
| 2.2.3 | POOL | 6 |
| 2.2.4 | RULE | 6 |
| 2.2.5 | TIMEOUT | 6 |
| 2.2.6 | LIST | 7 |
| 2.2.7 | NO | 7 |
| 2.2.8 | EXIT | 7 |
| 2.3 | Commands Summary | 8 |
| Chapter 3 | Monitoring | 9 |
| 3.1 | Monitoring DYNAMIC NAT | 9 |
| 3.1.1 | ? (HELP) | 9 |
| 3.1.2 | CLEAR | 9 |
| 3.1.3 | LIST | 11 |
| 3.1.4 | EXIT | 11 |
| Chapter 4 | Configuration Example | 12 |
| 4.1 | Dynamic NAT | 12 |
| Chapter 5 | DNAT Facility Events | 14 |
| 5.1 | Viewing the DNAT facility events | 14 |
| 5.2 | Events Example | 14 |

Chapter 1 Introduction

1.1 Introduction to NAT

Two of the key problems facing the Internet are depletion of IP address space and scaling in routing. Network Address Translation (NAT) is a feature that allows an organization's IP network to appear from the outside to use different IP address space than what it is actually using. Thus, NAT allows an organization which uses private addresses (local addresses), and therefore not accessible through the Internet routing tables, to connect to the Internet by translating those addresses into globally routable address space (public addresses) which are accessible from Internet. NAT also allows organizations to launch readdressing strategies where the changes in the local IP networks are minimum.

NAT has several applications. The following scenarios are some of the possibilities:

- If you want to connect to the Internet, but not all your hosts have globally unique IP addresses (allowed). NAT is configured on the router at the border of a stub domain (local network) and a public domain such as the Internet (outside network). The NAT translates the inside local addresses to globally unique IP addresses before sending packets to the outside network.
- If an organization requires IP connectivity between remote offices. The remote offices have inside IP networks which do not comply with the addressing plan as the routing tables through which connectivity is carried out between them are large or unmanageable. In this case it is sufficient to configure NAT in the border router of each office thus carrying out the translation between office inside networks and global networks as these now comply with the addressing plan.
- You must change your inside addresses. Instead of changing them, which can be a considerable amount of work, you can translate them by using NAT.

A significant advantage of NAT is that it can be configured without requiring changes to hosts or routers other than those few routers on which NAT will be configured. The disadvantages of NAT appear when large numbers of hosts require NAT simultaneously or when the network applications exchange source or destination IP address references: these applications do not work if the information is sent through a NAT router in transparent mode. In these cases the only solution is that the NAT router analyses the data packet of the application, ascertain and change the references to local IP addresses.

A router configured with NAT will have at least one local interface (an interface in contact with the local network) and one global (an interface in contact with the global network). In a typical environment, NAT is configured at the exit router between a stub domain and backbone. When a packet is leaving the domain, NAT translates the locally significant source address for a globally unique address. When the packet is entering the domain, NAT translates the globally unique address into a local address.

A router configured with NAT must not advertise the local networks to the outside. However, global routing can be advertised through the local interfaces.

As previously mentioned, the term 'local' refers to those networks that are owned by an organization and that must be translated. Inside the domain, hosts will have address in the one address space, while on the outside, they will appear to have addresses in another address space. The first address space is referred to as the "local" address space while the second is referred to as the "global" address space.

1.2 Types of NAT

Address translation can be:

- Static NAT: where the mapping of local and global addresses is unanimous.
- Dynamic NAT: establishes a mapping of local addresses in a pool of global addresses. This means that the mapping between global addresses and local addresses is not unanimous and depends of the execution conditions.
- NAT (Address Port Translation): establishes a mapping between local addresses and a unique global address. In this case a translation of the transport protocols ports (UDP, TCP) is carried out.

In the following sections m and n mean:

m: number of local IP addresses.

n: number of global IP addresses.

1.2.1 Static NAT

m : n-Translation, m, n ≥ 1 and m = n (m, n ∈ N)

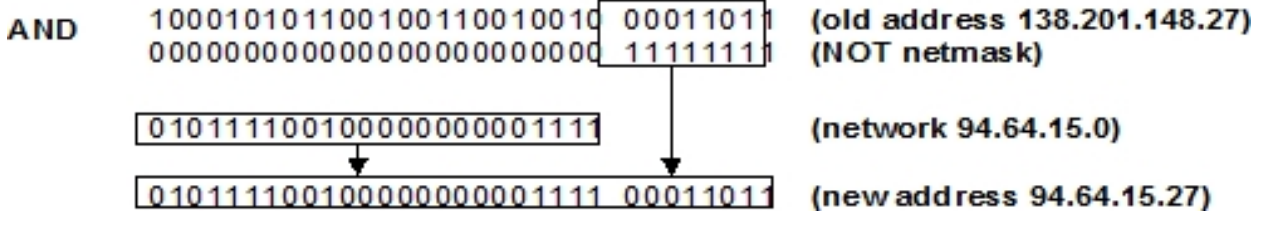
With static NAT we can translate between local networks and global networks of the same size (contain the same number of IP addresses). A special case is when both networks contain just one IP address, i.e. the netmask is 255.255.255.255). The NAT process can be described with the following translation:

global-address = global-network OR (local-address AND (NOT netmask))

local-address = local-network OR (global-address AND (NOT netmask))

Example:

- NAT rule: translate all the local network addresses 138.201.148.0 in the global network 94.64.15.0, netmask is 255.255.255.0 for both.



1.2.2 Dynamic NAT

m : n-Translation, m ≥ 1 and m ≤ n (m, n ∈ N)

This type of NAT is necessary when the number of global addresses to translate does not equal the number of local ones, or they are equal but for some reason it is not desirable to have a static mapping. The number of hosts simultaneously communicating with the outside network is generally limited by the number of global addresses available. When all the global addresses are being used, then subsequent connections must be rejected returning a “host unreachable”.

Example:

- NAT rule: dynamically translates all the local network addresses 138.201.0.0 mask 255.255.0.0 into global network addresses 278.201.112.0 with mask 255.255.255.0.
- Each new connection from the local network towards the outside obtains a global address from the pool of global address available.
- If the local address already has a global address it uses this mapping.
- If a mapping is not used within a determined time period (configurable), this is released leaving the pool global address free to be assigned in another mapping.
- Possibility of releasing a determined mapping.

1.2.3 NAPT/PAT (Masquerading)

m : n-Translation, m ≥ 1 and n = 1 (m, n ∈ N)

This is a very special case of dynamic NAT and currently is the type of NAT most used. Here there exist many local addresses which are translated to the same global address. In contrast to the previous NAT more than 'n' connections are permitted. Now an arbitrary number of connections are multiplexed using port information (TCP, UDP). The number of simultaneous connections is limited only by the number of NAT ports available.

The main problem with this type of NAT is that many services only accept connections coming from privileged ports in order to ensure that it does not come from an ordinary user. To support NAT, you need to maintain handlers for each TCP, UDP connection.

Another limitation, by default, is that incoming connections are not permitted.

Example:

- NAT rule: masquerade the global network addresses 138.201.0.0 after the router's outside global interface address.
- For each outgoing packet the source address is replaced by the NAT router's outside interface address and the source port is exchanged for an unused NAT port.
- If the destination of the incoming packets is the NAT router's outside interface address and the destination port corresponds to an already assigned NAT port, the address and port is exchanged for the corresponding local address

and local port.

1.3 Problems common to all NAT techniques

All connections through a router are identified by a five-tuple: protocol, source address and port, destination address and port. If the router has NAT enabled, three five-tuples appear representing the same connection, one for each section:

- The first or local section: from the source to the NAT router.
- The second or global section: from the NAT router to the destination.
- Third or inside section: the inside NAT router interface or local to the outside interface or global.

Only the NAT router has the information on what is going on in each section, but this also means that the NAT router has to store a lot of information on the established connection, something which routers without NAT do not have to do.

This is something that they have in common with firewalls: both types of devices not only relay packets but also analyze and control the type of information which is exchanged between them and maintain the state information on each connection: a significant overhead compared to a router without NAT.

If NAT is enabled, all packets traveling from the local domain to the global domain must go through the NAT router/routers.

1.3.1 State Information

Except for static NAT, the NAT router needs to store dynamic information on the current mapping between the local and global addresses. In addition, this type of state information must have a timeout limit so that if a specific device stops transmitting information, it can be cleared from the list.

1.3.2 Fragmentation

In NAT strategies where not only the addresses are translated but also the ports, another problem appears in the fragmentation. When a packet is fragmented the NAT router can only use the port information from the first fragment as the rest of the fragments have a port 0xFFFF. This is why you must keep state information about fragments.

1.3.3 Behavior depending on protocol

1.3.3.1 “Poisonous” applications

The so-called “Poisonous” applications are those applications which include IP addressing information and/or TCP/UDP ports outside the corresponding header fields. Each application of this type requires specific treatment. Examples of these applications are FTP, ICMP, etc.

1.3.3.2 Dynamic Routing Protocols (RIP, EGP, ...)

A NAT configured router should not announce the local networks through the global interfaces. However the global routes can be announced through the local interfaces. Static routing is recommended.

Chapter 2 Configuration

2.1 Configuring DYNAMIC NAT

This section describes the steps to configure DYNAMIC NAT facility. Once the required options have been configured, save the configuration and restart the router so the new configuration activates. The following sections describe the configuration process in more detail.

- Accessing the configuration environment.
- Configuring the implied interfaces in DYNAMIC NAT.
- Configuring the address pool.
- Configuring the rules.
- Configuring timeout.
- Exiting the DYNAMIC NAT configuration process.
- Restarting the router so the new configuration activates.

Accessing the DYNAMIC NAT Configuration environment

To access the DYNAMIC NAT configuration environment, first access the IP environment.

```
*P 4
Config>PROTOCOL IP

-- Internet protocol user configuration --
IP config>
```

From here, introduce the following command:

```
IP config>NAT DYNAMIC

-- Dynamic NAT user configuration --
DNAT config>
```

Configuring the Address Pool

You can define up to 4 address pools; each one can be associated to a DNAT rule. Each pool is identified by a whole number and both the first pool address and the last pool address are configured. The useful addresses are all those included between the first and the last address inclusive.

The pool is a circular, i.e. once a pool address has been assigned in a mapping, the following available address will be the consecutive one (i.e. Round Robin).

Configuring rules

The following can be defined through the rules:

- The interfaces over which they act.
- The address pool used to carry out the translations.
- The extended access list which determines what type of traffic DNAT is applied over.

Configuring timeout

To avoid the situation where a mapping not being used remains blocked and is not released (with the subsequent loss of the pool address), there is a configurable time period which once timed out and where a mapping has not been used, this is released.

Default time period is 24 hours.

2.2 DYNAMIC NAT Configuration Commands

This chapter summarizes and explains all the DYNAMIC NAT facility configuration commands for the router.

To access the prompt, enter the following:

```
*P 4
User configuration
Config>PROTOCOL IP

-- Internet protocol user configuration --
IP config>NAT DYNAMIC

-- Dynamic NAT user configuration --
DNAT config>
```

All the configuration commands must be entered at the DNAT prompt (DNAT config>).

| Command | Function |
|-----------|--|
| ? (HELP) | Lists the available commands or their options. |
| INTERFACE | Permits identifying the interfaces as inside or outside. |
| POOL | Configures the address pools. |
| RULE | Configures the DNAT rules. |
| TIMEOUT | Configures the maximum time a mapping remains unused before it is released. |
| LIST | Lists the configuration saved in SRAM. |
| NO | Permits you to delete or configure some of the previous commands by default. |
| EXIT | Returns to the <i>IP Config</i> > prompt. |



Note

You must save the configuration and restart the router so the new configuration activates.

2.2.1 ? (HELP)

Displays a list of the available commands or their options.

Syntax:

```
DNAT Config>?
```

Example:

```
DNAT Config>?
  interface    Dynamic nat interface configuration
  pool        Configure a pool of ip addresses
  rule        Configure a rule in order to do dynamic nat
  timeout     Timeout (seconds) for dynamic address translations. 0 -> no
              timeout
  list        Display dynamic nat configuration
  no
  exit
DNAT Config>
```

2.2.2 INTERFACE

While configuring DNAT, we must define which two interfaces are going to carry out DNAT and which is configured as inside and which as outside. The local interface is considered as inside and the global outside.

Example:

```
DNAT config>interface Ethernet0/0 ?
```

```

inside    defines interface as inside
outside   defines interface as outside
DNAT config>interface ethernet0/0 inside
DNAT config>

```

2.2.3 POOL

Through this command we can configure the pools where the global addresses are acquired to execute the mappings. A maximum of 4 pools can be configured.

A first address and a last address are defined for each pool. The available addresses are all those contained in this interval, including the first and last addresses.

Example:

```

DNAT config>pool 2 ?
 <a.b.c.d>    First address
DNAT config>pool 2 1.3.1.0 ?
 <a.b.c.d>    Last address
DNAT config>pool 2 1.3.1.0 1.3.1.5
DNAT config>

```

2.2.4 RULE

Through this command the rules to be followed to determine DNAT mappings are configured. Each rule is identified by a whole number.

The following is configured in each rule:

- **Inside/outside:** Determines if this rule is applied over the interface defined as inside or that defined as outside through the INTERFACE command.
- **The extended access list associated to the rule.** This access list determines which traffic the rule acts over and which it does not.
- **Finally, the pool associated to the rule is configured.** This is the pool the global addresses are taken from to execute the mappings.

Example:

```

DNAT config>rule 1 ?
inside    enables rule over inside interfaces
outside   enables rule over outside interfaces
list      list to match in rule
pool      pool used by rule
DNAT config>rule 1 inside
DNAT config>rule 1 list 100
DNAT config>rule 1 pool 1
DNAT config>

```

2.2.5 TIMEOUT

This command configures the maximum time a mapping can remain without being used before it is released. If a mapping is not used for a period of time greater than configured in the timeout, this is released also releasing the associated the pool address.

Default is 24 hours.

If a zero value is configured for the timeout, this will not be operative. This also means that once a mapping has been established, the only way to release it is with the CLEAR command from P3 in cases where it is no longer being used.

The maximum configurable value is 400 weeks.

Example:

```

DNAT config>timeout ?
<0s..400w>    Time value

```

```
DNAT config>timeout 120
DNAT config>
```

2.2.6 LIST

Lists the configuration currently saved in SRAM.

Example:

```
DNAT config>list ?
  interface
  pool
  rule
  timeout
  all
DNAT config>list all
DNAT Configuration.

Configured interfaces:
  atm1/0.1  outside
  ethernet0/0  inside

Configured pools:
  pool 1: 1.3.1.0 - 1.3.1.1

Configured rules:
  rule 1 inside list 100 pool 1

Configured timeout:
  180 seconds
DNAT config>
```

2.2.7 NO

Permits you to delete or configure by default the following configuration aspects:

- **Interface:** eliminates a determined interface from the DNAT configuration.
- **Pool:** eliminates a determined pool from the DNAT configuration.
- **Rule:** eliminates a determined rule from the DNAT configuration.
- **Timeout:** configures by default the timeout parameter (86400s – 24h).

Example:

```
DNAT config>no ?
  interface  Delete dynamic nat interface
  pool       Delete a pool of ip addresses
  rule       Delete a rule of dynamic nat
  timeout    Set default value for timeout translations: 86400s
DNAT config>no interface ethernet0/0
DNAT config>
```

2.2.8 EXIT

Permits you to return to the higher level prompt (IP).

Example:

```
DNAT config>exit
IP config>
```

2.3 Commands Summary

INTERFACE <interface> INSIDE

OUTSIDE

[NO] INTERFACE <interface>

POOL <pool ID> <first IP addr> <last IP addr>

[NO] POOL <pool ID>

RULE <rule ID> INSIDE

OUTSIDE

LIST <list number>

POOL <pool ID>

[NO] RULE <rule ID>

TIMEOUT <value>

[NO] TIMEOUT

Chapter 3 Monitoring

3.1 Monitoring DYNAMIC NAT

This section summarizes and explains the DYNAMIC NAT facility monitoring commands for the router. These commands allow you to monitor the behavior of the said facility as well as release the required mappings.

To access the monitoring prompt, enter the following:

```
*p 3
Console Operator
+protocol ip
IP+nat dynamic
-- Dynamic NAT user console --
DNAT+
```

| Command | Function |
|--------------------------|---|
| <i>?</i> (<i>HELP</i>) | Lists the commands or their options. |
| <i>CLEAR</i> | Releases all active mappings or some specific ones. |
| <i>LIST</i> | Lists the active mappings and pools. |
| <i>EXIT</i> | Exits the monitoring menu. |

3.1.1 ? (HELP)

Use the *?* command (HELP) to list the commands which are valid at the level the router is programmed in. You can also use this command after a specific command to list its options.

Syntax:

```
SNAT monit+?
```

Example:

```
DNAT+?
  clear   Releases active DNAT mappings
  list    Lists the active mappings and pools
  exit    Exit to parent menu
DNAT+
```

3.1.2 CLEAR

Use this command to release mappings and thus release the pool addresses associated to the said mappings.

Syntax:

```
DNAT+clear ?
  all     Eliminates all the active mappings
  entry   Eliminates one specific mapping associated to an address
```

3.1.2.1 CLEAR ALL

Eliminates all the active mappings, independently of the pool or rules they are related to, releasing all the addresses associated to them.

Syntax:

```
DNAT+clear all
```

Example:

```
DNAT+list
```

```
Dynamic NAT entries:
```

| SRC | DST | HITS | seconds | Pool |
|-----------------|---------------|--------|---------|------|
| 172.24.51.88 : | 1.3.1.1 | 286722 | 0 | 1 |
| 1.3.1.1 : | 172.24.51.88 | 552593 | 0 | 1 |
| 172.24.51.117 : | 1.3.1.0 | 20389 | 5 | 1 |
| 1.3.1.0 : | 172.24.51.117 | 20390 | 5 | 1 |

```
Active pools:
```

```
pool 1: 1.3.1.0 - 1.3.1.1
```

```
DNAT+clear all
```

```
DNAT+list
```

```
Dynamic NAT entries:
```

| SRC | DST | HITS | seconds | Pool |
|-----|-----|------|---------|------|
|-----|-----|------|---------|------|

```
Active pools:
```

```
pool 1: 1.3.1.0 - 1.3.1.1
```

```
DNAT+
```

3.1.2.2 CLEAR ENTRY

Eliminates only one specific mapping. You need to enter the pool IP address associated to the mapping you wish to delete. This IP address is consequently released.

Syntax:

```
DNAT+clear entry <IP_address>
```

Example:

```
DNAT+list
```

```
Dynamic NAT entries:
```

| SRC | DST | HITS | seconds | Pool |
|-----------------|---------------|--------|---------|------|
| 172.24.51.88 : | 1.3.1.1 | 286722 | 0 | 1 |
| 1.3.1.1 : | 172.24.51.88 | 552593 | 0 | 1 |
| 172.24.51.117 : | 1.3.1.0 | 20389 | 5 | 1 |
| 1.3.1.0 : | 172.24.51.117 | 20390 | 5 | 1 |

```
Active pools:
```

```
pool 1: 1.3.1.0 - 1.3.1.1
```

```
DNAT+clear entry 1.3.1.0
```

```
DNAT+list
```

```
Dynamic NAT entries:
```

| SRC | DST | HITS | seconds | Pool |
|----------------|--------------|--------|---------|------|
| 172.24.51.88 : | 1.3.1.1 | 287010 | 0 | 1 |
| 1.3.1.1 : | 172.24.51.88 | 552881 | 0 | 1 |

```
Active pools:
```

```
pool 1: 1.3.1.0 - 1.3.1.1
```

```
DNAT+
```

3.1.3 LIST

Use this command to view the various DNAT facility parameters that can be monitored.

On executing the LIST command, you can view all the active dynamic entries. The following parameters are monitored for each entry:

- **SRC – DST:** IP address before translation, IP address after translation. You can check for each mapping which address from its associated pool corresponds to the said mapping.
- **HITS:** This is the number of executed translations from the point when this mapping becomes active.
- **Seconds:** Time lapsed since the last time this mapping was used. When this time exceeds the configured timeout, this mapping is released.
- **Pool:** Active pool where the global address used in a determined mapping was taken.

Through this command you can also check which pools are currently active in the device. A pool is considered active when it is associated to a rule.

Syntax:

```
DNAT+list
```

Example:

```
DNAT+list
```

```
Dynamic NAT entries:
```

| SRC | DST | HITS | seconds | Pool |
|-----------------|---------------|------|---------|------|
| 172.24.51.88 : | 1.3.1.1 | 3329 | 0 | 1 |
| 1.3.1.1 : | 172.24.51.88 | 3436 | 0 | 1 |
| 172.24.51.117 : | 1.3.1.0 | 3133 | 0 | 1 |
| 1.3.1.0 : | 172.24.51.117 | 3134 | 0 | 1 |

```
Active pools:
```

```
pool 1: 1.3.1.0 - 1.3.1.1
```

```
DNAT+
```

3.1.4 EXIT

Use the **EXIT** command to return to the previous prompt level.

Syntax:

```
DNAT+exit
```

Example:

```
DNAT+exit
```

```
IP+
```

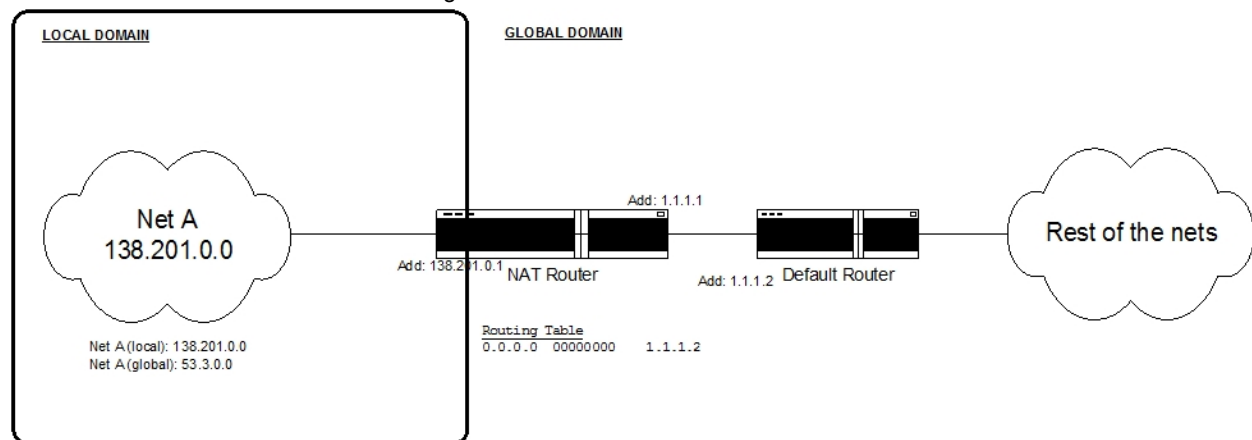
Chapter 4 Configuration Example

4.1 Dynamic NAT

In this example we have a large company using a class A IP network (1.0.0.0). A small department in the company needs IP addresses for various reasons and believing that they will never need to connect to the rest of the company, arbitrarily choose a network (138.201.0.0). Several years go by when they find they need complete connectivity due to the growing development of the new communication technologies. The first solution to emerge is to change the local domain addresses for addresses pertaining to the network assigned to the company. However they realize that this cannot be done as the department has many clients who have contracted continuous connectivity services (24 hours a day, 7 days a week) with the addresses of the said local domain and of course will not accept any kind of solution which results in non-completion of their contract.

The solution for this department in the company is to configure dynamic NAT in the router which carries out the connection between the said department and the rest of the corporate Intranet. Given that the number of simultaneous connections between the department and the Intranet is not very large, a pool with 4 IPs, from 1.3.1.0 to 1.3.1.3 inclusive, is defined. This means that the rest of the subnet 1.3.1.0 addresses remain available and we can have up to four simultaneous connections between the department and the Intranet.

Let's take a look at the DNAT router configuration:



- Extended access list configuration.

```
*P 4
Config>feature access-lists

-- Access Lists user configuration --
Access Lists config>access-list 100
Extended Access List 100>entry 1 default
Extended Access List 100>entry 1 permit
Extended Access List 100>entry 1 source address 138.201.0.0 255.255.0.0
Extended Access List 100>
```

- Configuring IP addresses.

```
Config>net ethernet0/0

-- Ethernet Interface User Configuration --
ethernet0/0 config>ip address 138.201.0.1 255.255.0.0
ethernet0/0 config>exit
Config>net serial0/0

-- Frame Relay user configuration --
serial0/0 FR config>ip address 1.1.1.1 255.0.0.0
serial0/0 FR config>exit
Config>
```

- IP Routes Configuration.

```
*P 4
```



```
Config>protocol ip

-- Internet protocol user configuration --
IP config>route 0.0.0.0 0.0.0.0 1.1.1.1
IP config>route 1.3.1.0 255.255.255.0 ethernet0/0
IP config>
```

- **DNAT Configuration.**

```
*p 4
Config>protocol ip

-- Internet protocol user configuration --
IP config>nat dynamic

-- Dynamic NAT user configuration --
DNAT config>interface serial0/0 outside
DNAT config>interface ethernet0/0 inside
DNAT config>pool 1 1.3.1.0 1.3.1.3
DNAT config>rule 1 inside
DNAT config>rule 1 list 100
DNAT config>rule 1 pool 1
DNAT config>timeout 1h
DNAT config>
```

Chapter 5 DNAT Facility Events

5.1 Viewing the DNAT facility events

Similar to other subsystems, events that are produced associated to the DNAT facility can be viewed in real time.

To enable them from the events configuration general menu is as follows:

```
*PROCESS 4
User Configuration
Config>EVENT

-- ELS Config --
ELS Config>ENABLE TRACE SUBSYSTEM DNAT ALL
ELS Config>EXIT
Config>SAVE
Save configuration [n]? Y

Saving configuration...OK
Config>
```

The events can also be enabled from the monitoring menu, in which case you do not have to restart the device in order to see them. The process is as follows:

```
*PROCESS 3
Console Operator
+EVENT

-- ELS Monitor --
ELS+ENABLE TRACE SUBSYSTEM DNAT ALL
ELS+EXIT
+
```

The list of events available for DNAT depends on the software release. Each software release distribution comes with its own group of available events.

5.2 Events Example

Below you can see a typical events trace in a series of translations in a router with DNAT facility configured.

```
*PROCESS 2
07/20/04 11:43:29 DNAT.009 Out pkt 172.24.51.88->192.192.192.192 p
rot 1
07/20/04 11:43:29 DNAT.002 New clnt 172.24.51.88->192.192.192.192 => 1.3.1.0->1
92.192.192.192
07/20/04 11:43:29 DNAT.010 Translation 172.24.51.88->192.192.192.192 => 1.3.1.0
->192.192.192.192
07/20/04 11:43:29 DNAT.008 In pkt 192.192.192.192->1.3.1.0 prot 1
07/20/04 11:43:29 DNAT.010 Translation 192.192.192.192->1.3.1.0 => 192.192.192.
192->172.24.51.88
07/20/04 11:43:30 DNAT.009 Out pkt 172.24.51.88->192.192.192.192 prot 1
07/20/04 11:43:30 DNAT.010 Translation 172.24.51.88->192.192.192.192 => 1.3.1.0
->192.192.192.192
07/20/04 11:43:30 DNAT.008 In pkt 192.192.192.192->1.3.1.0 prot 1
07/20/04 11:43:30 DNAT.010 Translation 192.192.192.192->1.3.1.0 => 192.192.192.
192->172.24.51.88
07/20/04 11:43:30 DNAT.009 Out pkt 172.24.51.88->192.192.192.192 prot 1
07/20/04 11:43:30 DNAT.010 Translation 172.24.51.88->192.192.192.192 => 1.3.1.0
->192.192.192.192
```

```
07/20/04 11:43:31 DNAT.008 In pkt 192.192.192.192->1.3.1.0 prot 1
07/20/04 11:43:31 DNAT.010 Translation 192.192.192.192->1.3.1.0 => 192.192.192.
192->172.24.51.88
07/20/04 11:43:31 DNAT.009 Out pkt 172.24.51.88->192.192.192.192 prot 1
07/20/04 11:43:31 DNAT.010 Translation 172.24.51.88->192.192.192.192 => 1.3.1.0
->192.192.192.192
07/20/04 11:43:32 DNAT.008 In pkt 192.192.192.192->1.3.1.0 prot 1
07/20/04 11:43:32 DNAT.010 Translation 192.192.192.192->1.3.1.0 => 192.192.192.
192->172.24.51.88
07/20/04 11:43:32 DNAT.009 Out pkt 172.24.51.88->192.192.192.192 prot 1
07/20/04 11:43:32 DNAT.010 Translation 172.24.51.88->192.192.192.192 => 1.3.1.0
->192.192.192.192
07/20/04 11:43:33 DNAT.008 In pkt 192.192.192.192->1.3.1.0 prot 1
07/20/04 11:43:33 DNAT.010 Translation 192.192.192.192->1.3.1.0 => 192.192.192.
192->172.24.51.88
07/20/04 11:43:33 DNAT.009 Out pkt 172.24.51.88->192.192.192.192 prot 1
07/20/04 11:43:33 DNAT.010 Translation 172.24.51.88->192.192.192.192 => 1.3.1.0
->192.192.192.192
07/20/04 11:43:34 DNAT.008 In pkt 192.192.192.192->1.3.1.0 prot 1
07/20/04 11:43:34 DNAT.010 Translation 192.192.192.192->1.3.1.0 => 192.192.192.
192->172.24.51.88
07/20/04 11:43:34 DNAT.009 Out pkt 172.24.51.88->192.192.192.192 prot 1
07/20/04 11:43:34 DNAT.010 Translation 172.24.51.88->192.192.192.192 => 1.3.1.0
->192.192.192.192
07/20/04 11:43:35 DNAT.008 In pkt 192.192.192.192->1.3.1.0 prot 1
07/20/04 11:43:35 DNAT.010 Translation 192.192.192.192->1.3.1.0 => 192.192.192.
192->172.24.51.88
07/20/04 11:43:35 DNAT.009 Out pkt 172.24.51.88->192.192.192.192 prot 1
07/20/04 11:43:35 DNAT.010 Translation 172.24.51.88->192.192.192.192 => 1.3.1.0
->192.192.192.192
07/20/04 11:43:35 DNAT.008 In pkt 192.192.192.192->1.3.1.0 prot 1
07/20/04 11:43:35 DNAT.010 Translation 192.192.192.192->1.3.1.0 => 192.192.192.
192->172.24.51.88
07/20/04 11:43:37 DNAT.009 Out pkt 172.24.51.88->192.192.192.192 prot 1
07/20/04 11:43:37 DNAT.010 Translation 172.24.51.88->192.192.192.192 => 1.3.1.0
->192.192.192.192
07/20/04 11:43:37 DNAT.008 In pkt 192.192.192.192->1.3.1.0 prot 1
07/20/04 11:43:37 DNAT.010 Translation 192.192.192.192->1.3.1.0 => 192.192.192.
<CTRL-P>
*
```