# ring a Cisco SOHO77 Router With a Single IP Address, DHCP, P

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# Configuring a Cisco SOHO77 Router With a Single IP Address, DHCP, PPPoA, and PPP−PAP



## Introduction

This sample configuration shows a Cisco SOHO77 Digital Subscriber Lline (DSL) Router connecting to a Cisco 6130 Digital Subscriber Line Access Multiplexer (DSLAM) and terminating on a Cisco 6400 Universal Access Concentrator (UAC). The Cisco SOHO77 has been configured as a Dynamic Host Configuration Protocol (DHCP) server with PPP over ATM (PPPoA).

The Internet Service Provider (ISP) has given the subscriber a single IP address, 172.18.0.1, for Internet connectivity, but the subscriber has a small network of PCs and wants to have Internet access for all devices.

The solution is to configure Network Address Translation (NAT) on the Cisco SOHO77. NAT is designed for IP address simplification and conservation, as it enables private IP internetworks that use nonregistered IP addresses to connect to the Internet. NAT operates on a router, usually connecting two networks, and translates the private (in this case the 10.0.0.0 network) addresses in the internal network to legal (in this case 172.18.0.1) addresses before packets are forwarded to another network. As part of this functionality, NAT can be configured to advertise only one address (172.18.0.1) for the entire network. This provides additional security, effectively hiding the entire internal network behind that address.

NAT has the dual functionality of security and address conservation and is typically implemented in remote access environments. An IP address of 10.0.0.1 will be manually configured on the Ethernet interface of the Cisco SOHO77. The Cisco SOHO77 will be configured to act as a DHCP server and will lease IP addresses to local LAN devices attached to its Ethernet network.

The following configuration shows NAT configured for the Ethernet and ATM interfaces. The Ethernet0 interface has an IP address of 10.0.0.1 with a subnet mask of 255.0.0.0. NAT is configured for inside, which means that the interface is connected to the inside network that is subject to NAT translation. The ATM interface "Dialer0" has an IP address of 172.18.0.1 and a subnet mask of 255.255.0.0. NAT is configured for outside, which means that the interface is connected to an outside network, such as the Internet.

## Before You Begin

## Conventions

For more information on document conventions, see the Cisco Technical Tips Conventions.

## Prerequisites

There are no specific prerequisites for this document.

## Components Used

The information in this document is based on the software and hardware versions below.

- Cisco SOHO77 Customer Premises Equipment (CPE) IOS® Software Release 12.1(3)XP2
- Cisco 6400 UAC−Node Route Processor (NRP) IOS Software Release 12.1(3)DC1
- Cisco 6400 UAC−Node Switch Processor (NSP) IOS Software Release 12.1(3)DB
- Cisco 6130 DSLAM−NI2 IOS Software Release 12.1(5)DA

The information presented in this document was created from devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If you are working in a live network, ensure that you understand the potential impact of any command before using it.

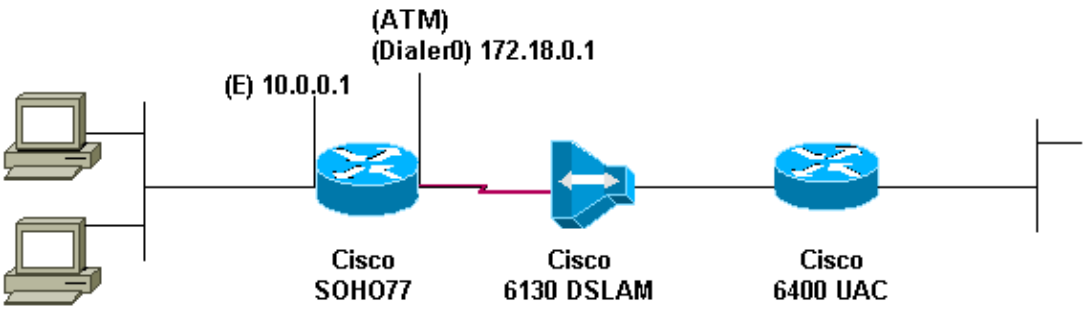
# Configure

In this section, you are presented with the information to configure the features described in this document.

**Note:** To find additional information on the commands used in this document, use the Command Lookup Tool ( registered customers only) .

## Network Diagram

This document uses the network setup shown in the diagram below.




## Configurations

This document uses the configuration shown below.

Cisco SOHO77

```
!
version 12.1
service timestamps debug datetime msec
service timestamps datetime msec
```

```
!
hostname R1
!
ip subnet-zero
!
ip dhcp excluded-address 10.0.0.1

!--- The DHCP pool will not lease this address; its used by interface E0.

!
ip dhcp pool
<pool name>

 network 10.0.0.0 255.0.0.0
 default-router 10.0.0.1

!--- Default gateway will be assigned to local devices.

!
interface Ethernet0
 ip address 10.0.0.1 255.0.0.0
 no ip directed-broadcast
 ip nat inside
 no ip mroute-cache
!
interface ATM0
 no ip address
 no ip directed-broadcast
 no ip mroute-cache
 no atm ilmi-keepalive
 pvc 1/150
  encapsulation aal5mux ppp dialer
  dialer pool-member 1
 !
 hold-queue 224 in
!
interface Dialer0
  ip address 172.18.0.1 255.255.0.0
  ip nat outside
  no ip directed-broadcast
  encapsulation ppp
  dialer pool 1
  dialer-group 2
  ppp pap sent-username <username> password <password>
!
ip nat inside source list 1  interface Dialer0 overload
ip classless
ip route 0.0.0.0 0.0.0.0 Dialer0
no ip http server
!
access-list 1 permit 10.0.0.0 0.255.255.255
dialer-list 2 protocol ip permit
!

end
```

# Verify

There is currently no verification procedure available for this configuration.

# Troubleshoot

There is currently no specific troubleshooting information available for this configuration.

# Related Information

- **Cisco DSL Technology Support Information**
- **Cisco DSL Product Support Information**
- **Technical Support − Cisco Systems**