



Network Address Translation (NAT) Deployment and Features

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Introduction

- ◆ **With network address translation (NAT) in Microsoft® Windows® 2000, you can configure your network to share a single connection to the Internet.**
- ◆ **Fewer Internet valid IP addresses are needed.**
- ◆ **Improved security because clients are not directly on the Internet.**

Introduction (2)

- ◆ **Internet Connection Sharing (ICS) is included with Windows 2000 Professional and higher.**
- ◆ **Network address translation (NAT) is included with Windows 2000 Server and higher.**
- ◆ **This presentation focuses on network address translation.**

Components

- ◆ **NAT consists of the following three components:**
 - **Translation**
 - **Addressing**
 - **Name Resolution**

Components: Translation

- ◆ NAT translates the IP addresses and TCP/UDP port numbers of packets that are forwarded between the private network and the Internet.
- ◆ The packets sent out of NAT have a source IP address of the NAT machine. Therefore, external machines are never aware that NAT is being used.

Components: Addressing

- ◆ The addressing component is a simplified DHCP server called the DHCP allocator.
- ◆ Either the DHCP allocator or an existing DHCP server can be used.

Components: Name Resolution

- ◆ The name resolution component of NAT is the DNS Proxy.
- ◆ Either the DNS proxy or an existing DNS server can be used.

NAT Configuration

- ◆ NAT is configured in the Routing and Remote Access service snap-in
 - The snap-in
 - IP routing
 - Right-click General and click “New Routing Protocol”
 - Select “Network Address Translation (NAT)” and then click OK

NAT Configuration (2)

- ◆ **After NAT is installed, it is necessary to specify a public and a private interface.**
 - **Right-click “Network Address Translation (NAT)”**
 - **Choose “New Interface”**
 - **Select the external interface and then click OK**
 - **Specify this interface as the public interface and enable “Translate TCP/UDP Headers (recommended)”**
 - **Repeat the process for the internal interface and specify this as the private interface**

Client Configuration

- ◆ **Clients behind NAT:**
 - Configured as DHCP client (discussion with DHCP allocator)
 - Configured as DHCP client (discussion with DHCP server)
 - Statically configured clients

Static Mapping: Special Ports

◆ Special Ports:

- This allows the administrator to specify certain types of traffic to be sent to a specific internal machine
- Example: Web server behind NAT
- Create a special port for incoming TCP port 80 traffic destined to the internal Web server

Static Mapping: Address Pool

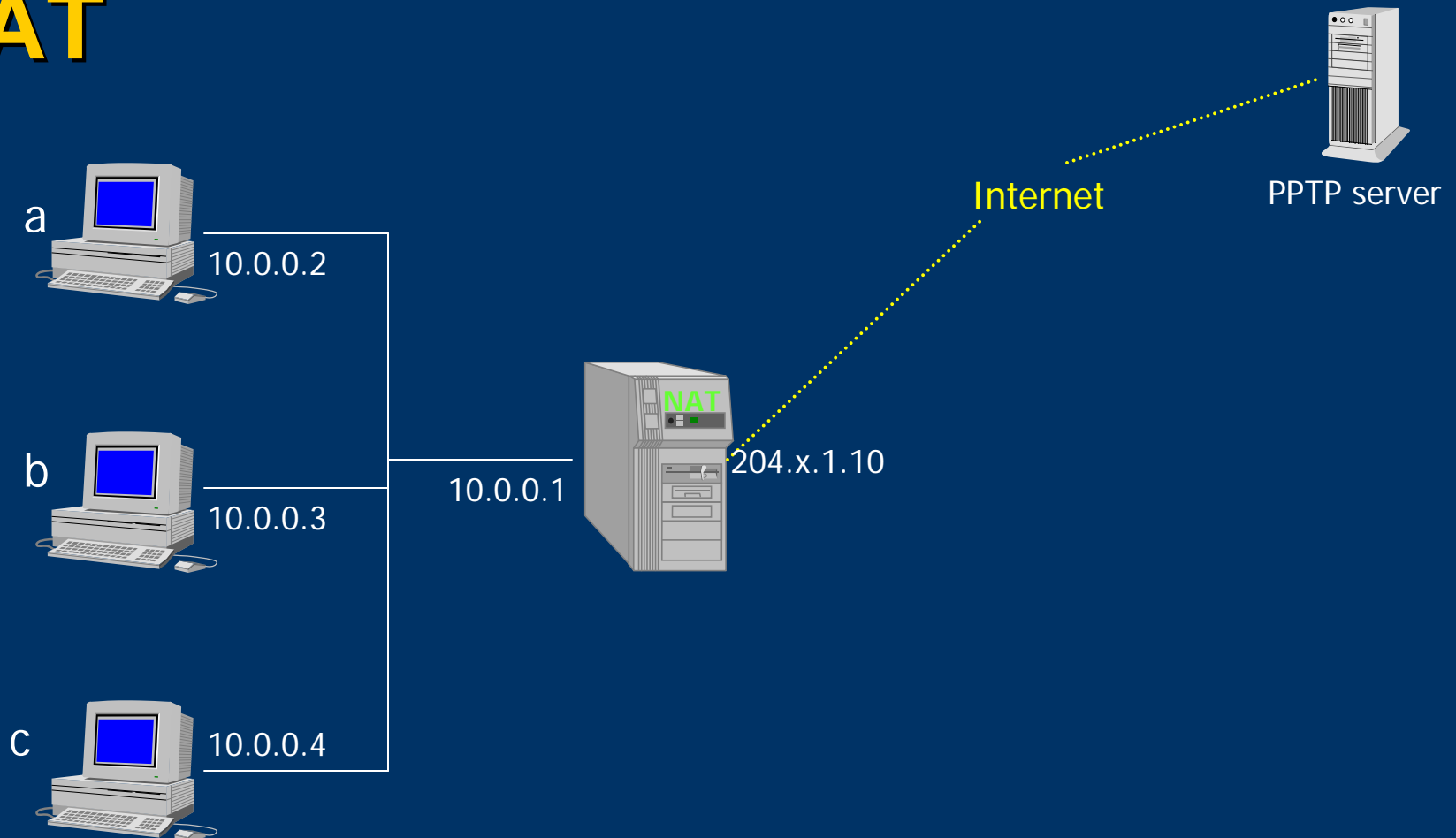
◆ Address Pool:

- NAT also gives us the functionality to create a one-to-one mapping between external IP address and internal IP address
- Add external IP address to Address Pool list
- Click “Reservations” and specify the external and internal IP addresses
- Also enable “Allow incoming sessions to this address”

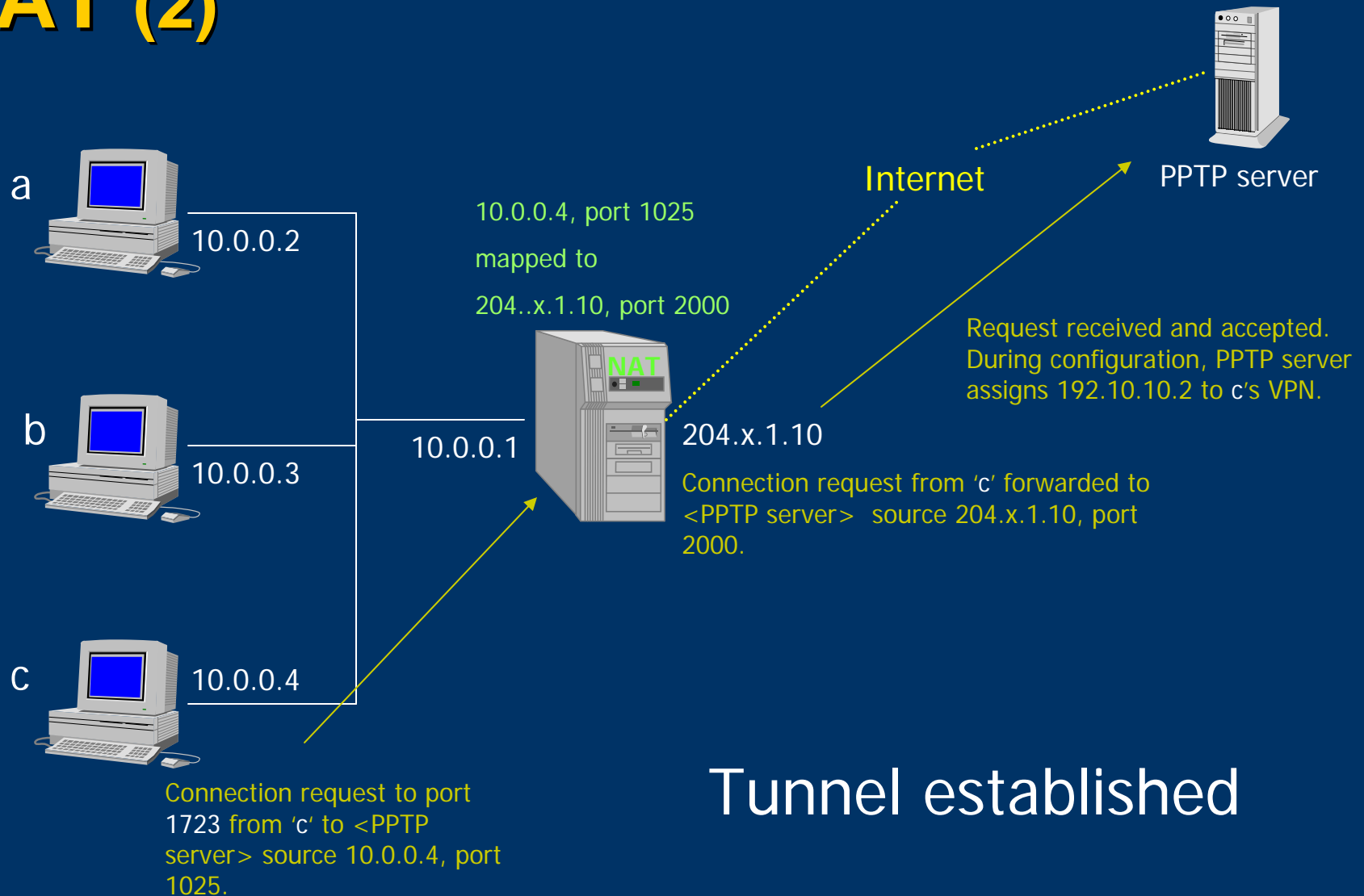
NAT Editors

- ◆ NAT performs TCP port and UDP port translation, in addition to IP address translation
- ◆ If an application stores IP address or port information within its own header (like FTP PORT command), a NAT editor is needed
- ◆ Two editors that Windows 2000 includes are FTP and PPTP
- ◆ Any service that encrypts these headers won't work (like IPSec)

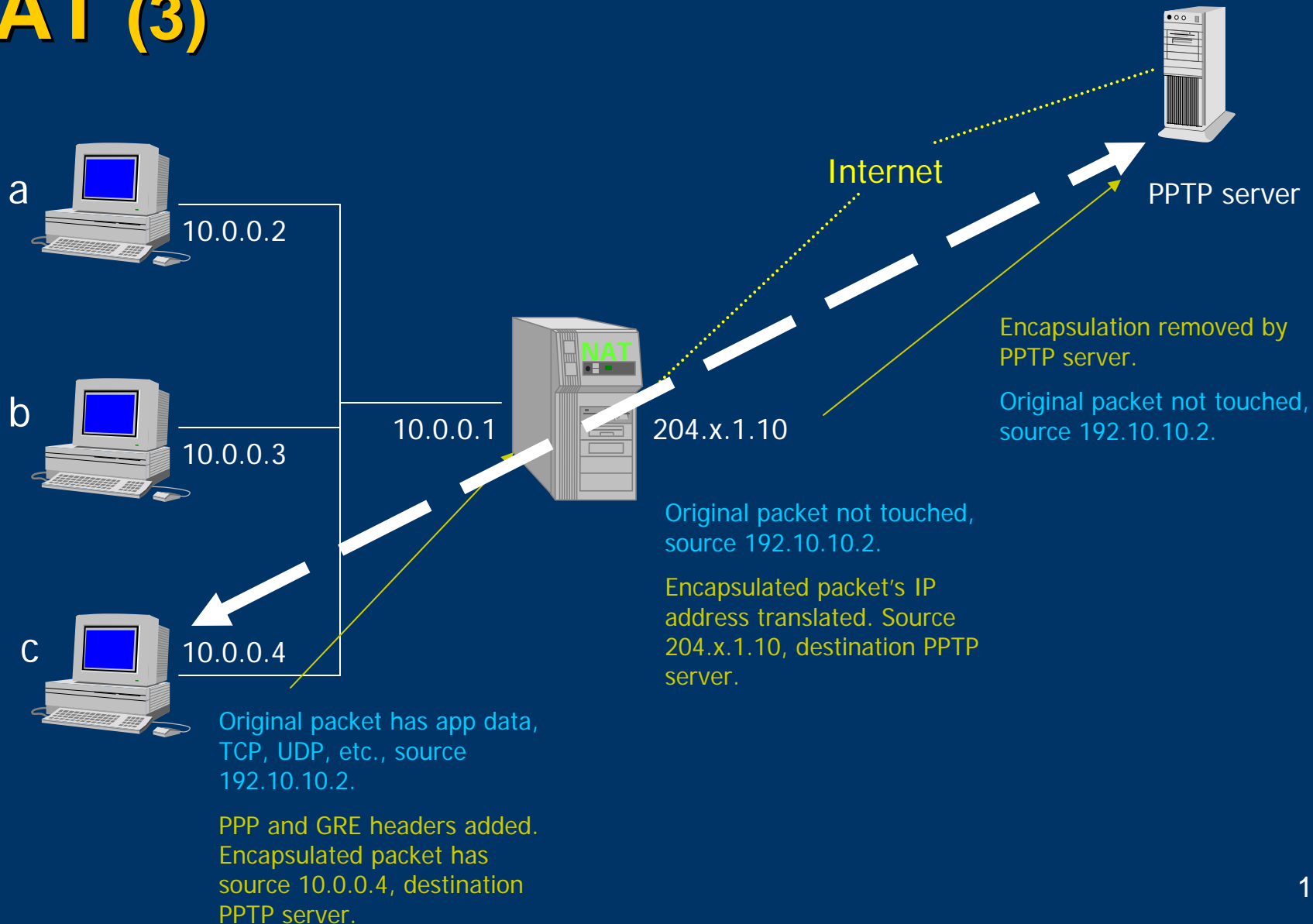
Outgoing PPTP Client Through NAT



Outgoing PPTP Client Through NAT (2)



Outgoing PPTP Client Through NAT (3)



Resources

- ◆ **Windows 2000 Help**
- ◆ **Technical information**
 - **<http://www.microsoft.com/windows2000/library/>**



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