

: RRAS server separating two subnets – one subnet cannot reach the Internet and computers can't ping each other between

Re: RRAS server separating two subnets – one subnet cannot reach the Internet and computers can't ping each other between subnets

Source:

<http://www.tech-archive.net/Archive/Windows/microsoft.public.windows.server.networking/2008-09/msg00196.html>

- *From:* "Bill Grant" <not.available@online>
 - *Date:* Fri, 19 Sep 2008 14:54:35 +1000
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"Spin" <Spin@xxxxxxxxxxxx> wrote in message news:6jge46F37fekU1@xxxxxxxxxxxxxxxxxxxxxxxxxxxx

Gurus,

I have a small lab with a bunch of servers setup on two different subnets, 192.168.1.1 is the gateway for one and 172.16.1.1 is the gateway for the other. Installed on my Windows 2003 SP2 RRAS server are three NICs, the third NIC is the gateway to the Internet.

What works: The RRAS server can reach the Internet as well as the computers in the 192.168.1.0/24 subnet (the first subnet built).

What's broken: The computers on the 172.16.1.0/16 subnet cannot get to the Internet AND no computer in either subnet can ping any computer in the other subnet. What am I doing wrong?

Additional details:

192.168.1.0/24 subnet computer XP1:

Host Name : XP1
Primary Dns Suffix : alpha.local
Node Type : Unknown
IP Routing Enabled. : No
WINS Proxy Enabled. : No
DNS Suffix Search List. : alpha.local
alpha.local

Ethernet adapter Local Area Connection:

Connection-specific DNS Suffix . : alpha.local
Description : VMware Accelerated AMD PCNet Adapter #2
Physical Address. : 00-0C-29-4C-D8-52
Dhcp Enabled. : Yes

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```
Autoconfiguration Enabled . . . . : Yes
IP Address. . . . . : 192.168.1.200
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.1.1
DHCP Server . . . . . : 192.168.1.10
DNS Servers . . . . . : 192.168.1.10
Lease Obtained. . . . . : Thursday, September 18, 2008 9:31:05 PM
Lease Expires . . . . . : Friday, September 26, 2008 9:31:05 PM
```

172.16.1.0/16 subnet computer XP2:

```
Host Name . . . . . : XP2
Primary Dns Suffix . . . . . : alpha.local
Node Type . . . . . : Unknown
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : alpha.local
```

Ethernet adapter Local Area Connection:

```
Connection-specific DNS Suffix . :
Description . . . . . : VMware Accelerated AMD PCNet Adapter
```

```
Physical Address. . . . . : 00-0C-29-E1-E7-07
Dhcp Enabled. . . . . : No
IP Address. . . . . : 172.16.1.2
Subnet Mask . . . . . : 255.255.0.0
Default Gateway . . . . . : 171.16.1.1
DNS Servers . . . . . : 192.168.1.10
```

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Spin

That is how IP routing works.

As soon as you have multiple routers and multiple default gateways, default routing fails. Traffic from your internal network can get to the gateway router by default, but there is no return path. You will need to add some extra routing to your gateway router to get it running (or run the router as a NAT router).

Running with NAT solves the routing issue (because all traffic from the internal subnet will be using the router's "public" IP) but also isolates the inner network from the other. (ie the machines behind NAT can see the machines in the other subnet and the Internet, but not vice versa because NAT is a one-way translation). This is how I run my private virtual network.

If you really want normal routing between the subnets you need a route on the gateway router to bounce traffic for the internal network back to the internal router. The default route of the gateway router points out to the Internet!

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```
Internet
|
gateway router
192.168.1.1
|
workstations
192.168.1.x dg 192.168.1.1
|
192.168.1.254 dg 192.168.1.1
RRAS
172.16.1.1/16 dg blank
|
workstations
172.16.x.y/16 dg 172.16.1.1
```

If RRAS is configured as a NAT router, this works. All traffic from the 172.16 network reaching the gateway is using the RRAS server's 192.168.1.254 address. The replies come back to the NAT router and it delivers to the client.

Without NAT, this fails. If you try to access a machine in the 192.168 subnet, the reply goes to the default gateway at 192.168.1.1 which has no idea where the 172.16 subnet is, so it tries to send it using default route (out to the Internet). This fails because it is a private IP and the packet is discarded. If you try to access the Internet, much the same thing happens. The router has nowhere to send the reply.

To make it work you need to add a static route to the gateway router so that it knows where the 172.16 subnet is and how to reach it. The simplest way is to add a static subnet router to the gateway router. eg

```
172.16.0.0 255.255..0.0 192.168.1.254
```

Now everything works. Packets arriving at the gateway router for 172.16 addresses are forwarded to the RRAS router which delivers them directly from its private NIC.

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