在 VPN 3000 集中器上配置冗余路由

目录

简介

如果远程站点丢失其VPN 3000集中器或Internet连接，本文描述如何配置一冗余的VPN故障切换。在本例中，假设，在VPN查找的公司网络3030B后使用开放最短路径优先(OSPF)作为其默认路由协议。

注意： 当您重新分配在路由协议之间时，您能形成能导致在网络的麻烦的路由环路。OSPF用于此示例，但是它不是能使用的唯一的路由协议。

此示例目标是有192.168.1.0网络使用红色通道(在操作情况)的正常下，表示在Network Diagram部分，到达192.168.3.x。如果通道、VPN集中器或者ISP丢包， the192.168.3.0网络在绿色通道的一个动态路由协议然后了解。并且，连接没有丢失到192.168.3.0站点。一旦问题是解决的，流量自动地恢复回到红色通道。

注意： 在允许在无效的路由前，将接受的一个新的路由RIP有三分钟老化计时器。并且，假设，通道创建，并且流量能在对等体中通过。

先决条件

要求

本文档没有任何特定的要求。

使用的组件

本文档中的信息基于以下软件和硬件版本：

- Cisco路由器3620和3640
- Cisco VPN 3080集中器-版本：Cisco系统， Inc./VPN 3000集中器版本4.7
- Cisco VPN 3060集中器-版本：Cisco系统， Inc./VPN 3000集中器系列版本4.7
- Cisco VPN 3030集中器-版本：Cisco系统， Inc./VPN 3000集中器系列版本4.7

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

规则

有关文档规则的详细信息，请参阅 Cisco 技术提示规则。

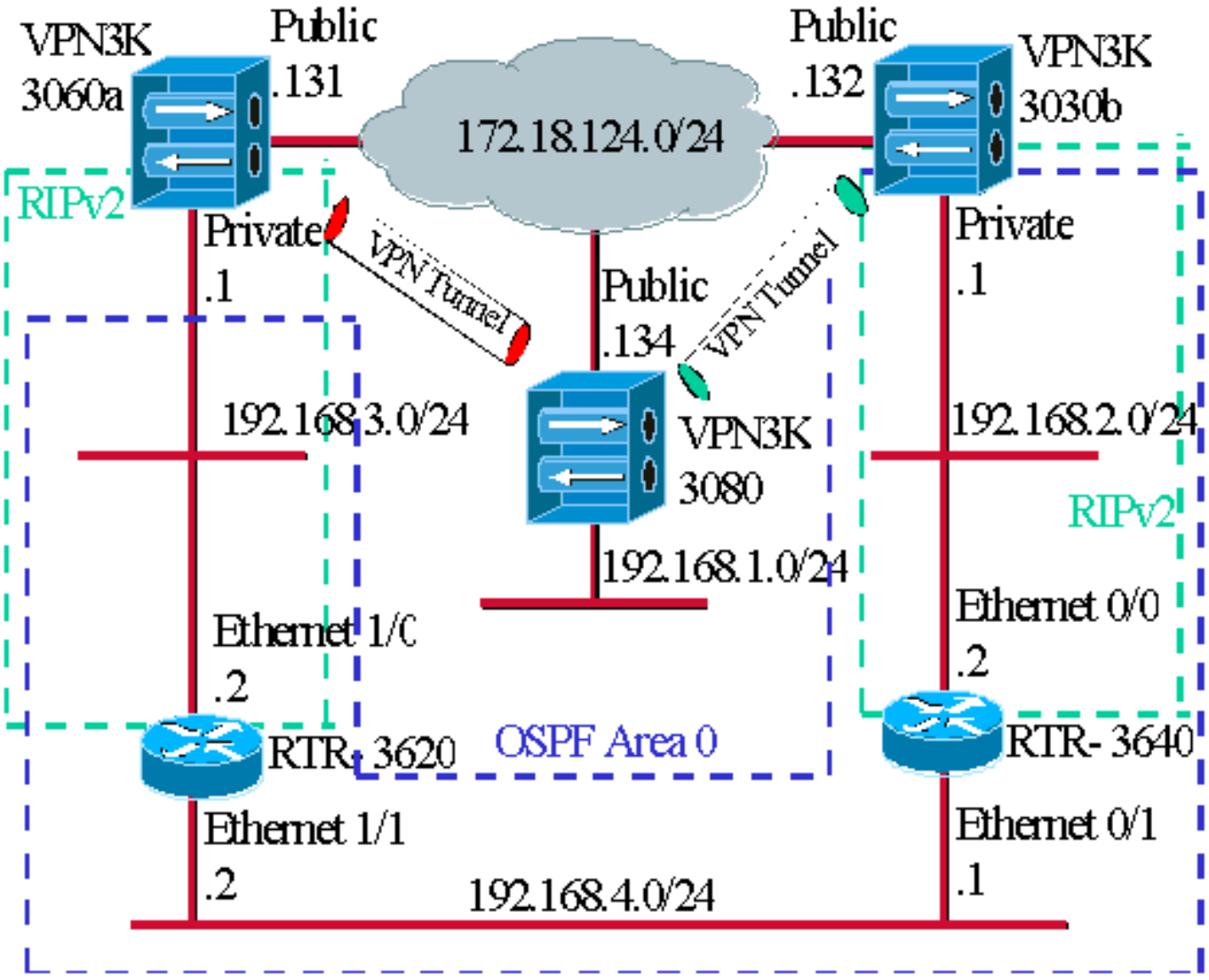
配置

本部分提供有关如何配置本文档所述功能的信息。

注意： 要查找本文档所用命令的其他信息，请使用命令查找工具（仅限注册用户）。

网络图

本文档使用以下网络设置：



蓝色破折号表明OSPF从对RTR-3640和RTR-3620的VPN 3030b启用。

绿色破折号表明RIPv2从对RTR-3620、RTR-3640和私有VPN 3030b的私有VPN 3060a启用。

因为网络发现启用，RIPv2在红色和绿色VPN通道也启用。启用在VPN 3080专用接口的RIP是不必要的。因为所有路由由在此链路的OSPF了解也没有在192.168.4.x网络的RIP。

注意： 在192.168.2.x和192.168.3.x网络的PCs需要有他们的指向路由器和不VPN集中器的默认网关。在哪里允许路由器决定路由数据包。

路由器配置

本文使用这些路由器配置：

- 路由器3620
- 路由器3640

路由器3620

```
rtr-3620#write  terminal
Building configuration...
```

```
Current configuration : 873 bytes
!
version 12.2
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname rtr-3620
!
ip subnet-zero
!
interface Ethernet1/0
 ip address 192.168.3.2 255.255.255.0
 half-duplex
!
interface Ethernet1/1
 ip address 192.168.4.2 255.255.255.0
 half-duplex
!
router ospf 1
 log-adjacency-changes
!--- To pass the routes learned through RIP into the
OSPF process, !--- use the redistribute command. !--- To
prevent a routing loop, block the 192.168.1.0 network !-
-- from entering the OSPF process. It should only be
learned !--- through the RIP process. No two different
routing processes !--- exchange information unless you
implicitly use the !--- redistribute command. !--- The
192.168.1.x network is learned through OSPF from the !--
- 192.168.2.x side. However, since the admin distance is
changed, !--- it is not installed into the table !---
because RIP has an administrative distance of 120, !---
and all of the OSPF distances are 130.

 redistribute rip subnets route-map block192.168.1.0
!--- To enable the OSPF process for the interfaces that
are included !--- in the 192.168.x.x networks: network
192.168.0.0 0.0.255.255 area 0 !--- Since RIP's default
admin distance is 120 and OSPF's is 110, !--- make RIP a
preferable metric for communications !--- over the
"backup" network. !--- Change any learned OSPF routes
from neighbor 192.168.4.1 !--- to an admin distance of
130. distance 130 192.168.4.1 0.0.0.0 ! !--- To enable
RIP on the Ethernet 1/0 interface and set it to !--- use
version 2: router rip version 2 network 192.168.3.0 ! ip
classless ! ! access-list 1 deny 192.168.1.0 0.0.0.255
access-list 1 permit any route-map block192.168.1.0
permit 10 match ip address 1 ! line con 0 exec-timeout 0
0 line aux 0 line vty 0 4 ! end
```

路由器3640

```
rtr-3640#write terminal
Building configuration...

Current configuration : 1129 bytes
!
version 12.2
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname rtr-3640
```

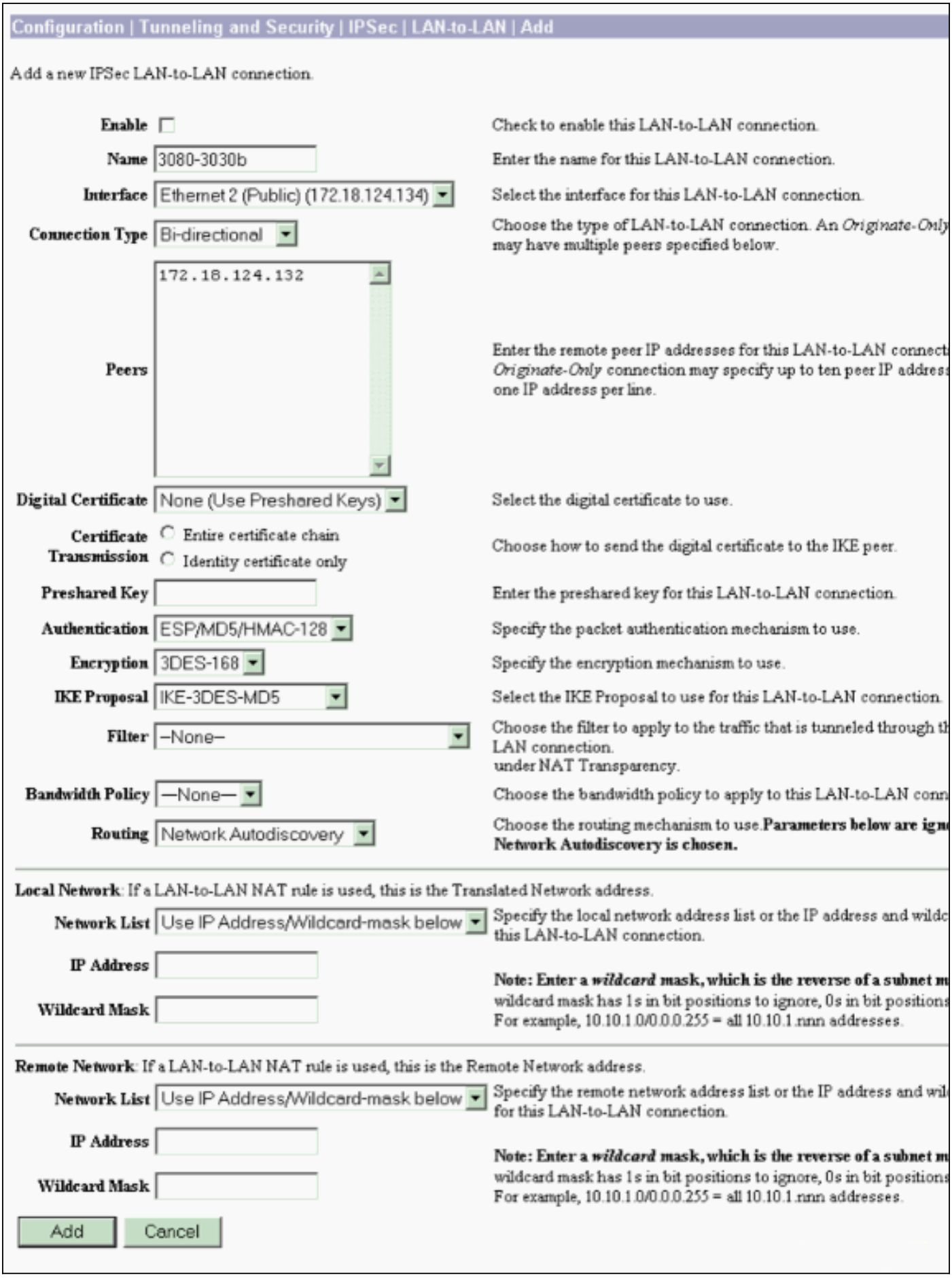
```
!
ip subnet-zero
!
interface Ethernet0/0
 ip address 192.168.2.2 255.255.255.0
 half-duplex
!
interface Ethernet0/1
 ip address 192.168.4.1 255.255.255.0
 half-duplex
!
router ospf 1
 log-adjacency-changes
!--- Use this command to push RIP learned routes into
OSPF. !--- You need this when the VPN 3060a or the
connection drops and !--- the 192.168.3.0 route needs to
be injected into the OSPF backbone. redistribute rip
subnets !--- Place all 192.168.x.x networks into area 0.
network 192.168.0.0 0.0.255.255 area 0 !--- Since RIP's
default admin distance is 120 and OSPF's is 110, !---
make RIP a preferable metric for communications !---
over the "backup" network. !--- Change any learned OSPF
routes from neighbor 192.168.4.2 !--- to an admin
distance of 130. distance 130 192.168.4.2 0.0.0.0 ! !---
To enable RIP on the Ethernet 0/0 interface and set it
to !--- use version 2: router rip version 2 network
192.168.2.0 ! ip classless ! line con 0 exec-timeout 0 0
line aux 0 line vty 0 4 ! end
```

VPN 3080集中器配置

对VPN 3030b的LAN对LAN VPN 3080

选择**LAN对LAN Configuration>建立隧道和安全> IPSec >的IPSec**。因为使用网络自动发现，没有需要填好本地和远程网络列表。

注意： 运行软件版本3.1和更加早期的VPN集中器有自动发现的一个复选框。软件版本3.5 (使用在VPN 3080)使用一个下拉菜单，例如那个生动描述此处。

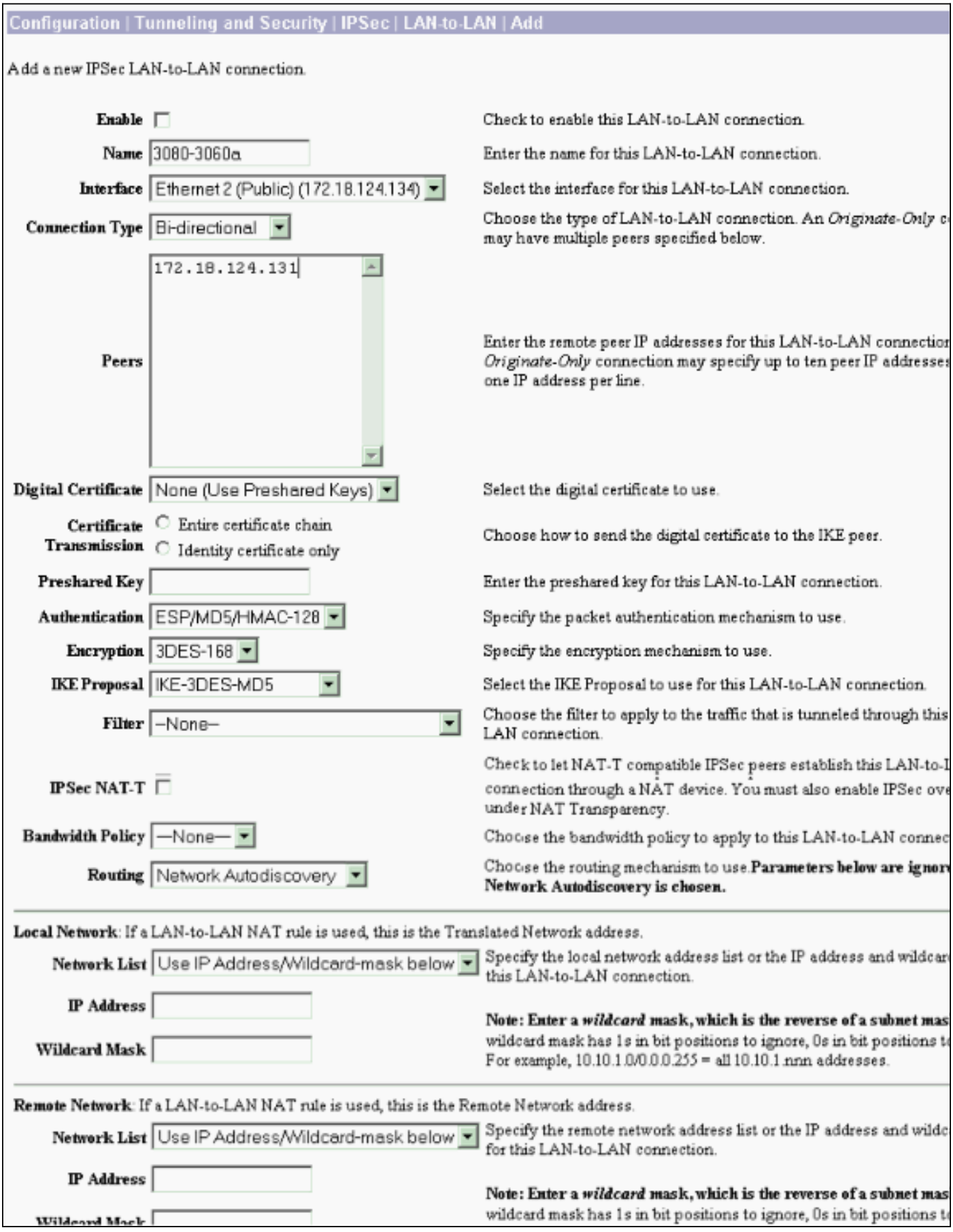


[对VPN 3060a的LAN对LAN VPN 3080]

选择**LAN对LAN Configuration>建立隧道和安全> IPSec >的IPSec**。因为使用网络自动发现，没有

需要填好本地和远程网络列表。

注意： 运行软件版本3.1和更加早期的VPN集中器有自动发现的一个复选框。软件版本3.5 (使用在VPN 3080)使用一个下拉菜单，例如那个生动描述此处。

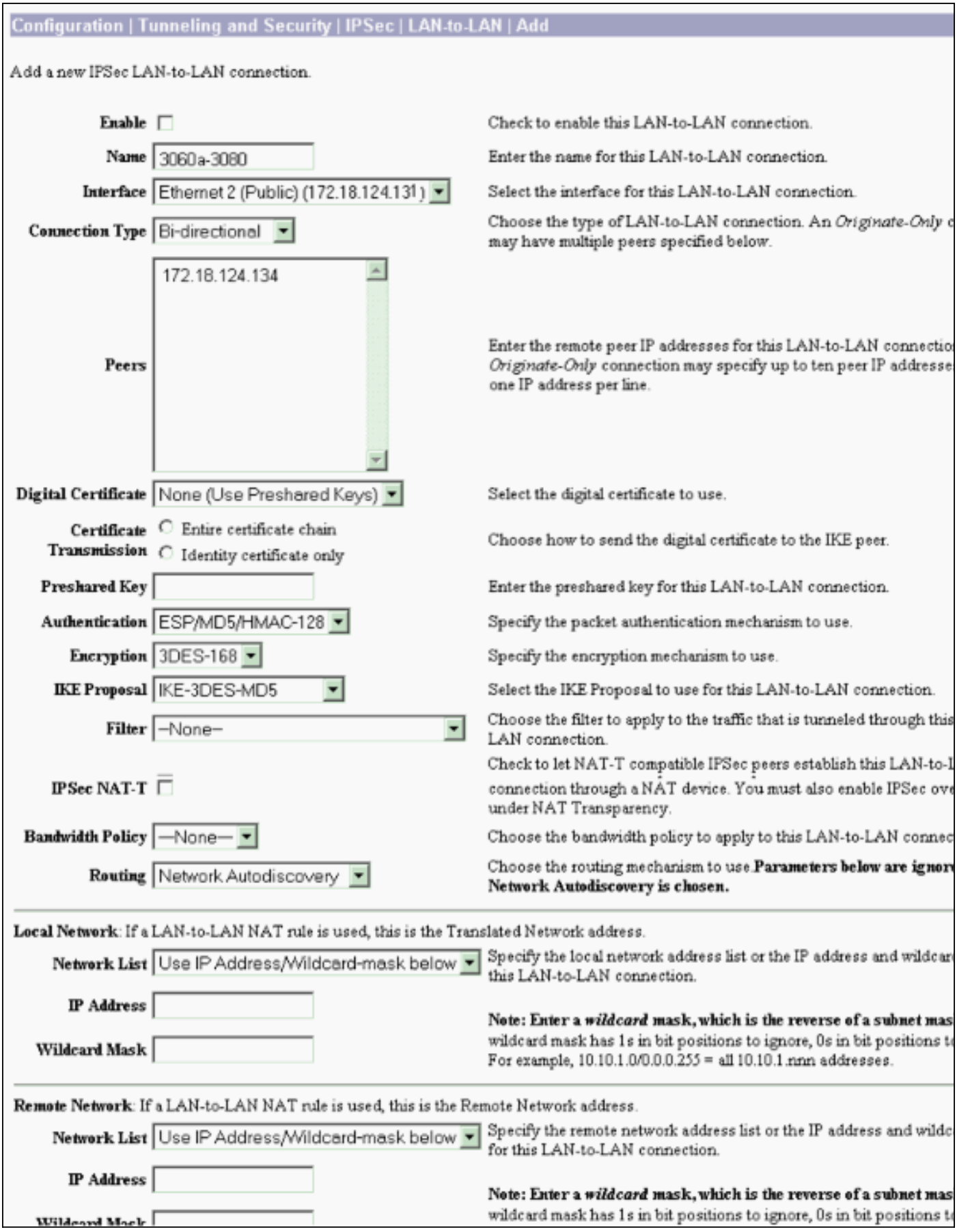


VPN 3060a集中器配置

对VPN 3080的LAN对LAN VPN 3060a

选择**LAN对LAN Configuration>建立隧道和安全> IPSec >的IPSec**。

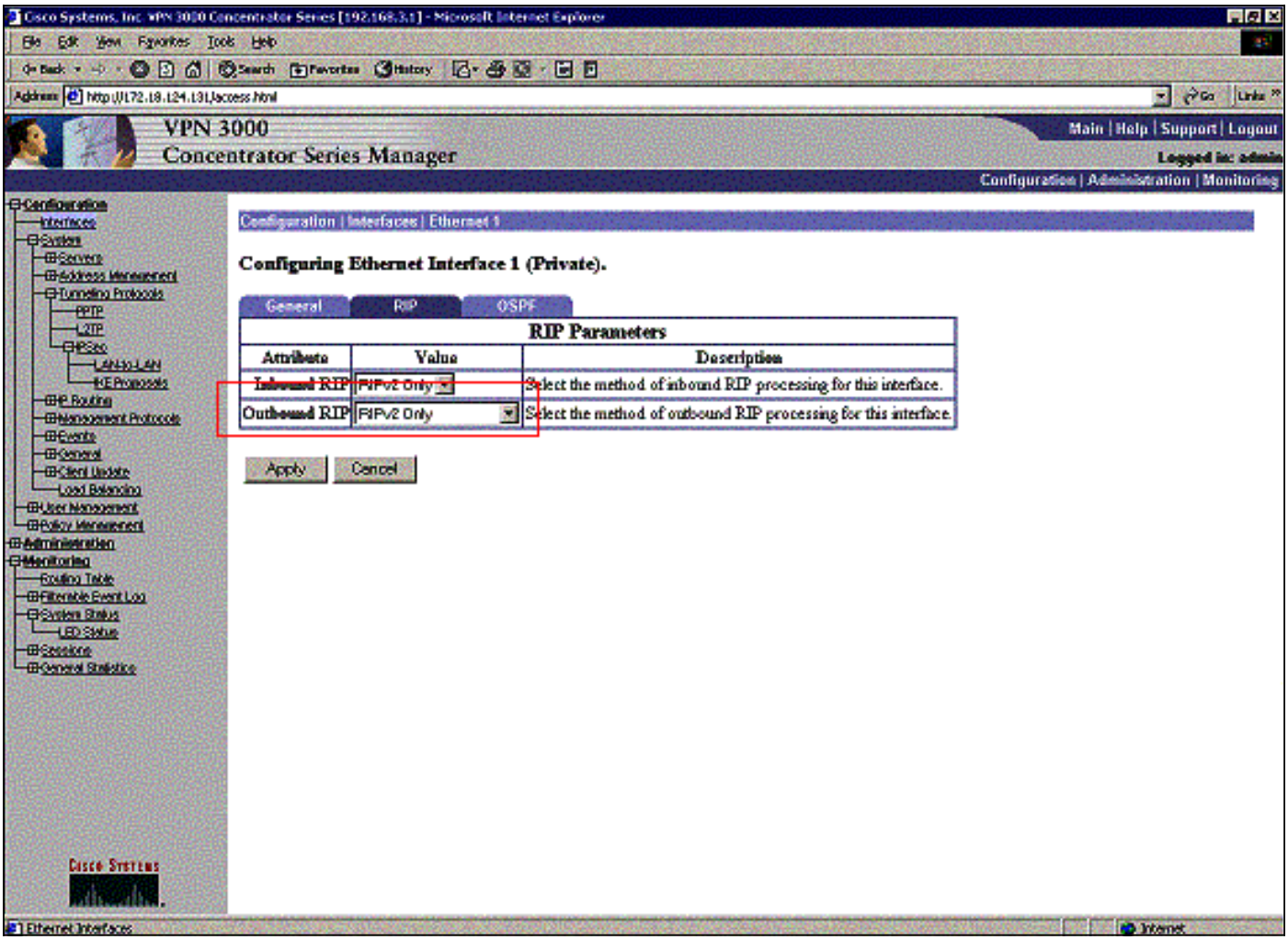
注意： 有在VPN 3060的一个复选框网络自动发现的而不是下拉菜单正如在软件版本3.5及以后。



[传递了解隧道的路由的Enable (event) RIP对VPN 3620路由器](#)

选择Configuration > Interfaces >私有> RIP。更改下拉菜单对仅RIPv2并且单击应用。然后请选择Configuration > System > Tunneling Protocols > IPSec > LAN对LAN。

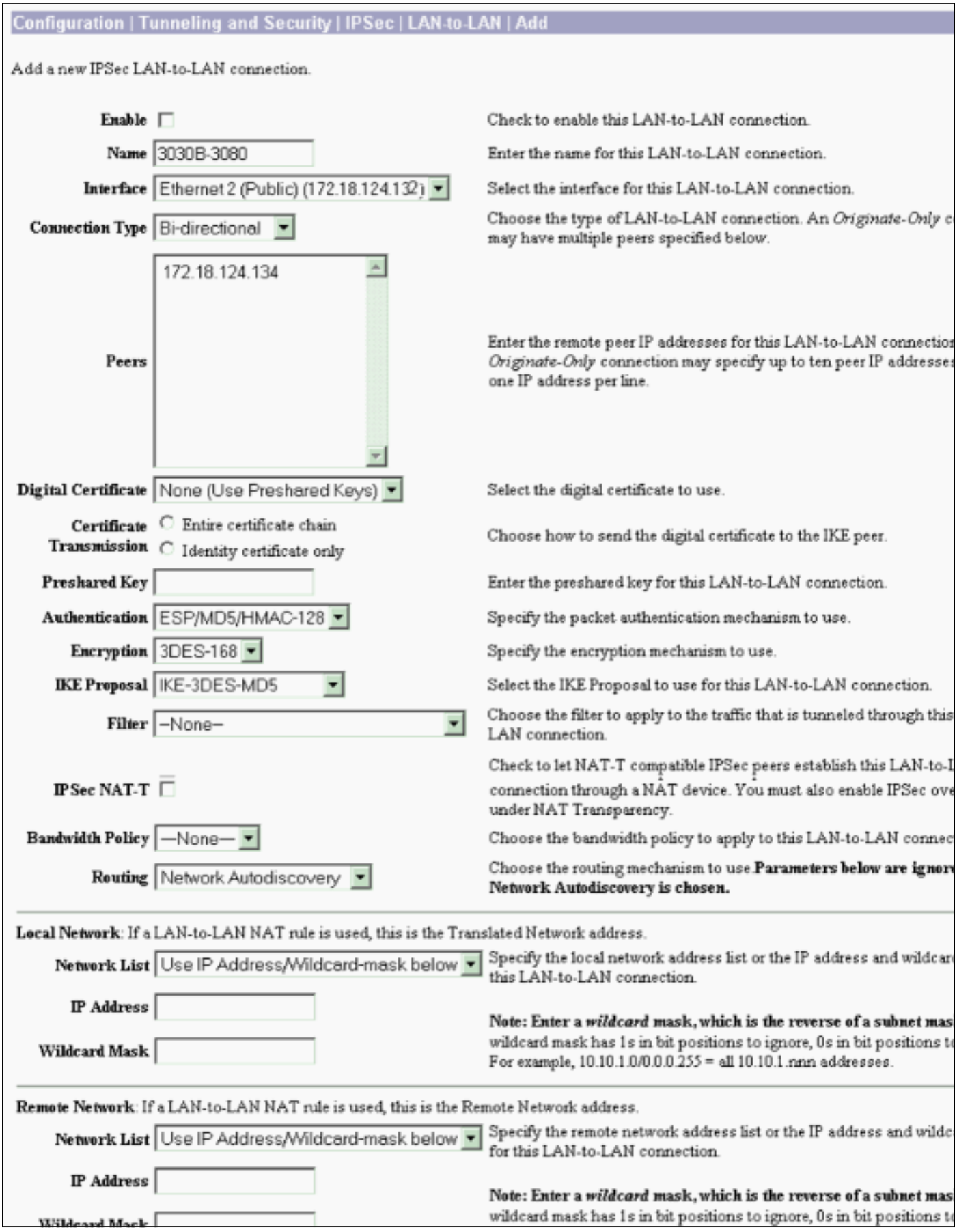
注意： 默认是出站RIP，并且为专用接口禁用。



VPN 3030b集中器配置

对VPN 3080的LAN对LAN VPN 3030b

选择Configuration>建立隧道和安全> IPSec > LAN对LAN。

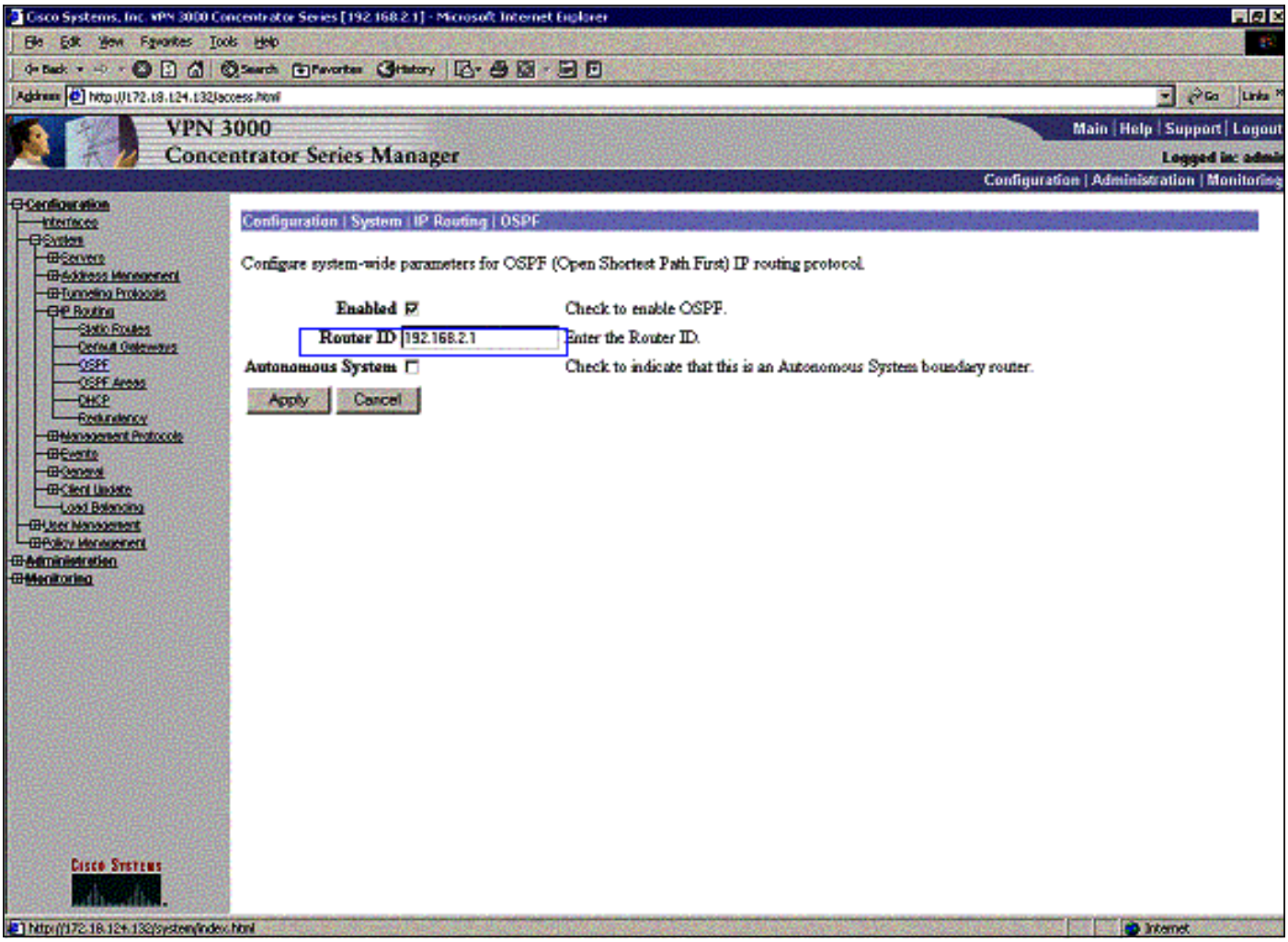


使RIP传递了解隧道的路由到VPN 3640路由器

遵从在VPN 3060a集中器的本文列出的前步骤。

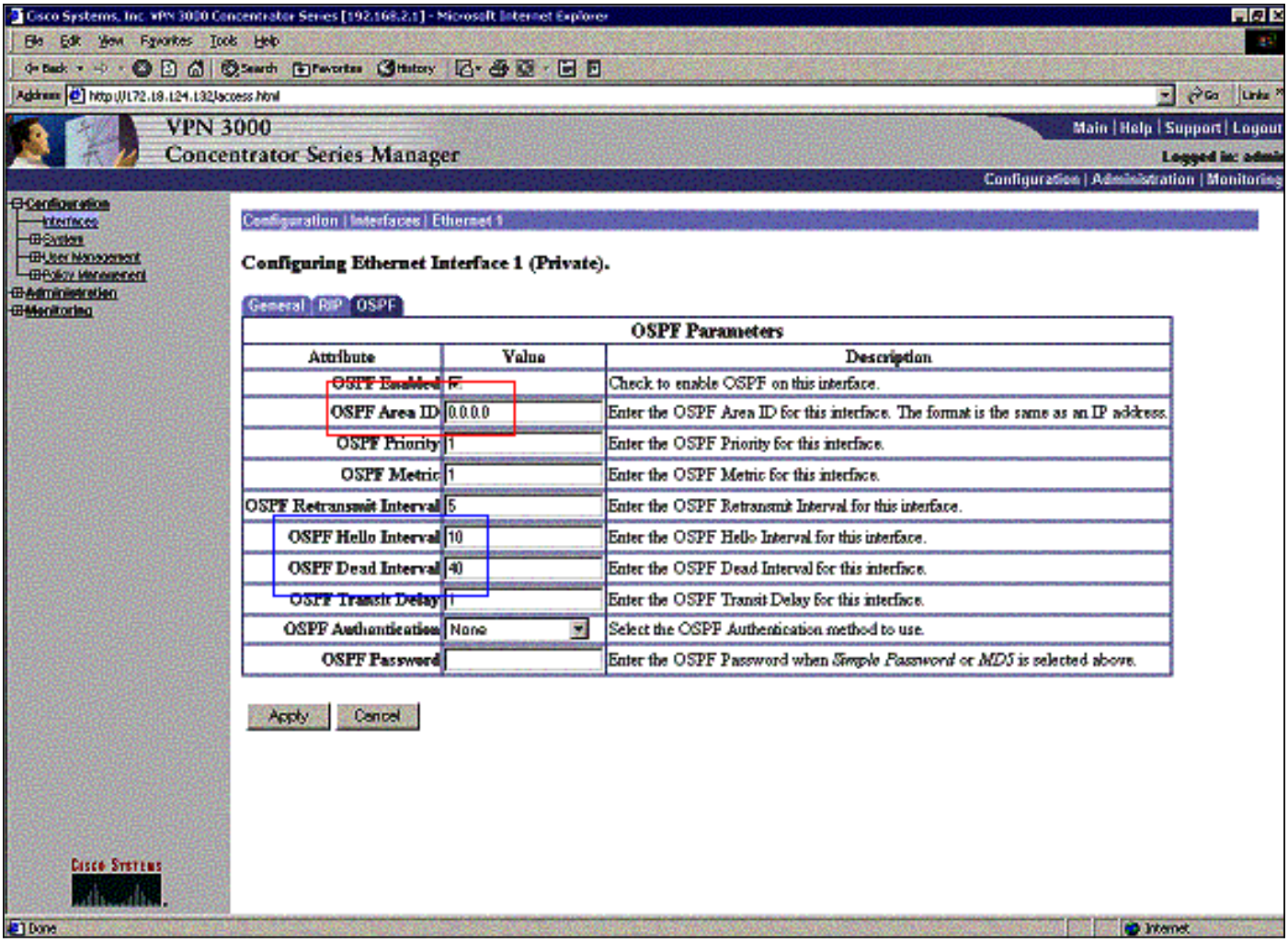
使OSPF传递了解的骨干网的路由到VPN 3030b集中器

选择Configuration > System > IP Routing > OSPF并且输入路由器ID。




```
rtr-3640#show ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address         Interface

192.168.4.2       1   FULL/DR         00:00:39    192.168.4.2     Ethernet0/1
!--- For troubleshooting purposes, it helps to make the router ID the !--- IP address of the
private interface. 192.168.2.1       1   FULL/BDR        00:00:36    192.168.2.1     Ethernet0/0
```

区域ID需要匹配在电线的ID。因为在本例中的区域是0，由0.0.0.0代表。并且，请检查Enable (event) OSPF方框并且单击应用。



确保您的OSPF计时器匹配那路由器。要验证路由器计时器，请使用**show ip ospf interface <interface name>命令**。

```
rtr-3640#show ip ospf interface ethernet 0/0
Ethernet0/0 is up, line protocol is up
  Internet Address 192.168.2.2/24, Area 0
  Process ID 1, Router ID 192.168.4.1, Network Type BROADCAST, Cost: 10
  Transmit Delay is 1 sec, State DR, Priority 1
  Designated Router (ID) 192.168.4.1, Interface address 192.168.2.2
  Backup Designated router (ID) 192.168.2.1, Interface address 192.168.2.1
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:05
  Index 1/1, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 2
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 192.168.2.1  (Backup Designated Router)
Suppress hello for 0 neighbor(s)
```

关于OSPF的更多信息，参考RFC 1247 。

验证

本部分所提供的信息可用于确认您的配置是否正常工作。

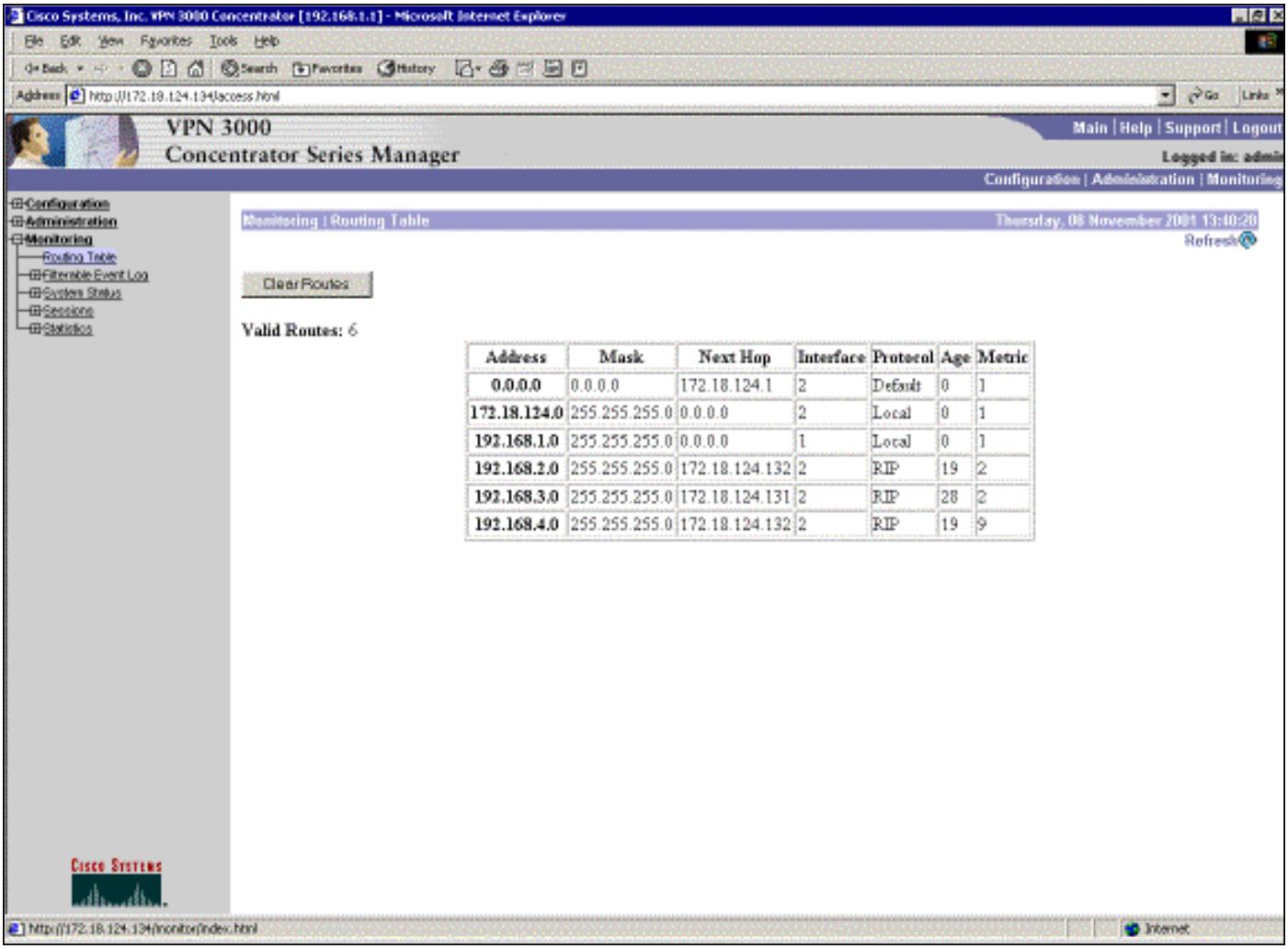
命令输出解释程序工具（仅限注册用户）支持某些 **show** 命令，使用此工具可以查看对 show 命令

输出的分析。

此命令输出显示准确路由表。

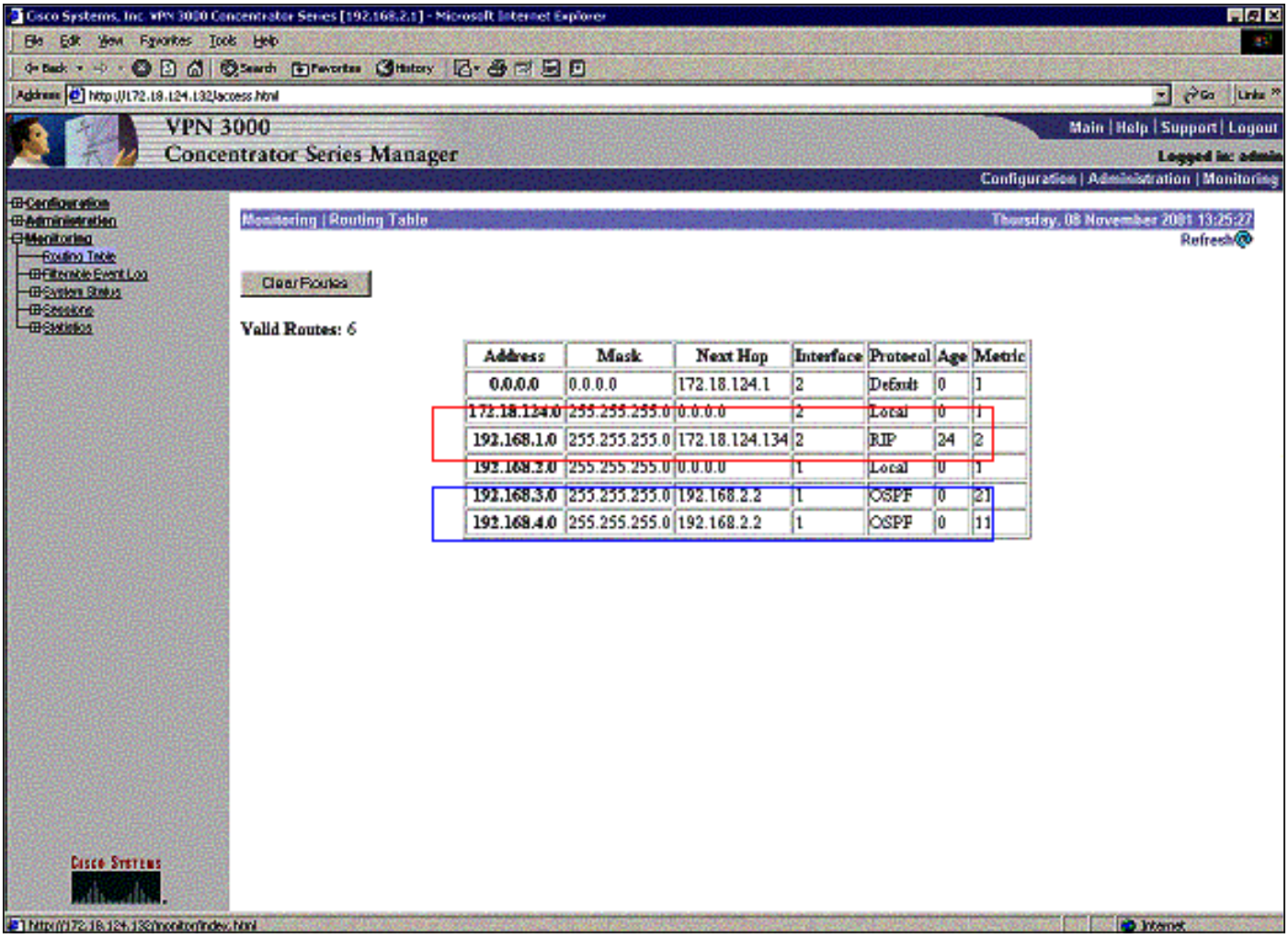
```
rtr-3620#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

Gateway of last resort is not set

     172.18.0.0/24 is subnetted, 1 subnets
R       172.18.124.0 [120/1] via 192.168.3.1, 00:00:11, Ethernet1/0
C    192.168.4.0/24 is directly connected, Ethernet1/1
!--- The 192.168.1.x network is learned from the !--- VPN 3060a Concentrator. R
192.168.1.0/24 [120/2] via 192.168.3.1, 00:00:11, Ethernet1/0
!--- The 192.168.3.x network traverses the 192.168.4.x network !--- to get to the 192.168.2.x
network. O    192.168.2.0/24 [130/20] via 192.168.4.1, 00:01:07, Ethernet1/1
C    192.168.3.0/24 is directly connected, Ethernet1/0

rtr-3640#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

Gateway of last resort is not set

     172.18.0.0/24 is subnetted, 1 subnets
R       172.18.124.0 [120/1] via 192.168.2.1, 00:00:23, Ethernet0/0
C    192.168.4.0/24 is directly connected, Ethernet0/1
!--- The 192.168.1.x network is learned from the !--- VPN 3030b Concentrator. R
192.168.1.0/24 [120/2] via 192.168.2.1, 00:00:23, Ethernet0/0
C    192.168.2.0/24 is directly connected, Ethernet0/0
!--- The 192.168.2.x network traverses the 192.168.4.x network !--- to get to the 192.168.3.x
network. !--- This is an example of perfect symmetrical routing. O    192.168.3.0/24 [130/20]
via 192.168.4.2, 00:00:58, Ethernet0/1
```

Thisis VPN 3080集中器路由表在正常情况下。



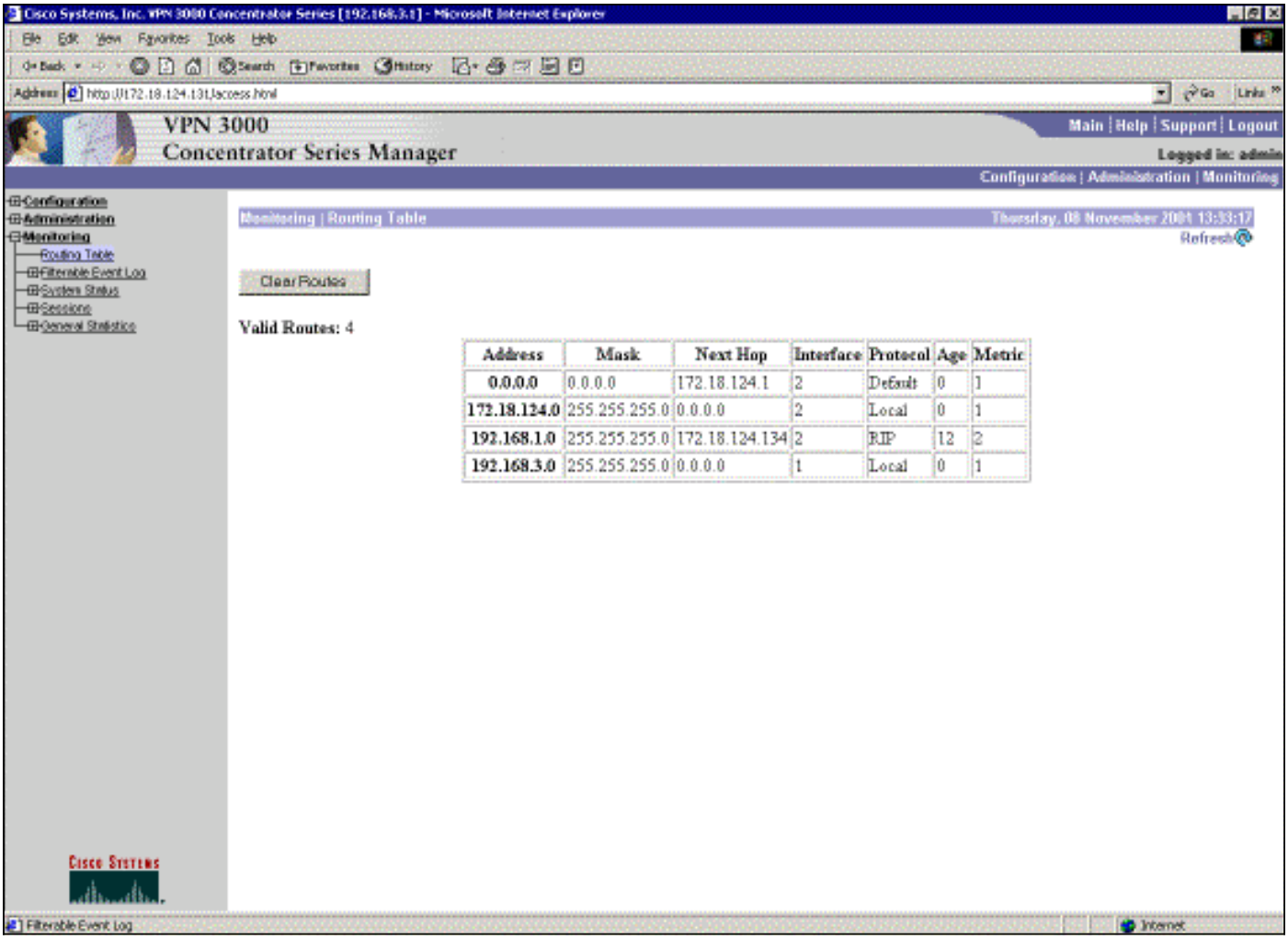
网络192.168.2.x和192.168.3.x分别为两获知通过VPN通道172.18.124.132和172.18.124.131。因为路由器的OSPF广告被放置到VPN 3030b集中器的路由表， 192.168.4.x网络通过172.18.124.132通道了解。然后路由表通告网络给远程VPN对等体。

在正常情况下这是VPN 3030b集中器路由表。



红色方框突出显示192.168.1.x网络从VPN通道了解。蓝色框突出显示网络192.168.3.x和192.168.4.x通过核心OSPF程序了解。

在正常情况下这是VPN 3060a集中器路由表。

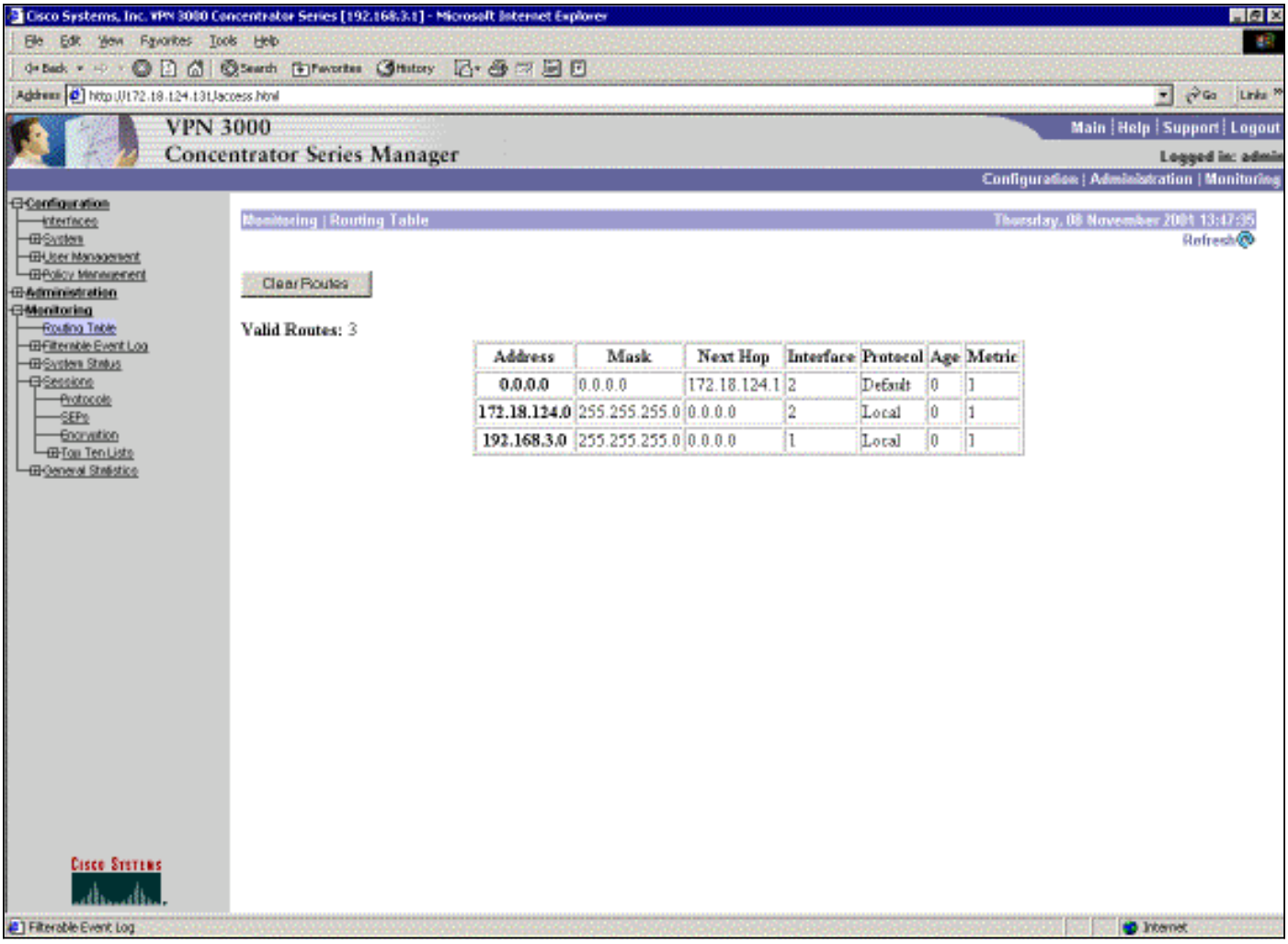


网络192.168.1.x唯一的网络在这里，并且可以通过VPN通道被到达。没有192.168.2.0网络，因为进程(例如RIP)不传递该路由。只要在192.168.3.x网络的PCs不指向他们的默认网关VPN集中器，丢失的没什么。如果选择，您能总是添加静态路由。然而，对于此示例， VPN集中器不需要到达192.168.2.0网络。

故障排除

模拟故障

这是一个模拟的故障在配置里。如果去除过滤器对公共接口，则VPN通道下降。这导致了解的192.168.1.0的路由通过通道丢弃。需要大约RIP进程的三分钟能清除路由。所以，您能潜在有直到路由的一三分钟中断计时自己。



一旦RIP路由超时，在路由器的新的路由表看起来与此相似：

```
rtr-3620#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     172.18.0.0/24 is subnetted, 1 subnets
R       172.18.124.0 [120/1] via 192.168.3.1, 00:00:05, Ethernet1/0
C    192.168.4.0/24 is directly connected, Ethernet1/1
!--- Now the 192.168.1.0 route is learned properly !--- through the OSPF backbone. O E2
192.168.1.0/24 [130/20] via 192.168.4.1, 00:00:05, Ethernet1/1
O    192.168.2.0/24 [130/20] via 192.168.4.1, 19:55:48, Ethernet1/1
C    192.168.3.0/24 is directly connected, Ethernet1/0
```

什么能出错？

如果忘记在管理距离更改的添加到130，则您能可能看到此输出。注意两个VPN通道是UP。

VPN 3080 集中器

注意： 这是路由表的无图的用户界面(GUI)版本。

```
rtr-3620#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     172.18.0.0/24 is subnetted, 1 subnets
R       172.18.124.0 [120/1] via 192.168.3.1, 00:00:05, Ethernet1/0
C    192.168.4.0/24 is directly connected, Ethernet1/1
!--- Now the 192.168.1.0 route is learned properly !--- through the OSPF backbone. O E2
192.168.1.0/24 [130/20] via 192.168.4.1, 00:00:05, Ethernet1/1
O    192.168.2.0/24 [130/20] via 192.168.4.1, 19:55:48, Ethernet1/1
C    192.168.3.0/24 is directly connected, Ethernet1/0
```

达到192.168.3.0网络，路由需要通过172.18.124.131。然而，在RTR-3620的路由表显示：

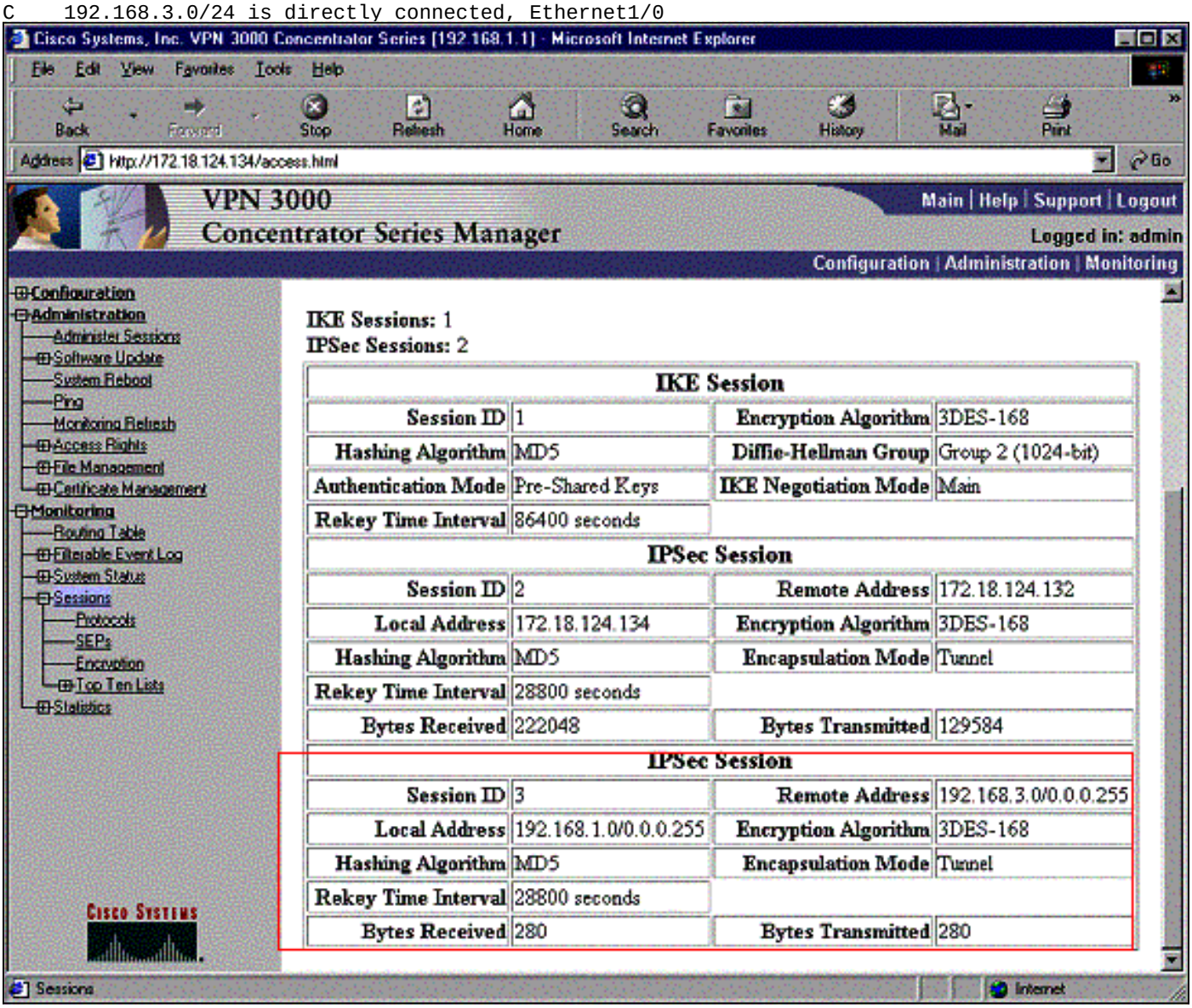
```
rtr-3620#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     172.18.0.0/24 is subnetted, 1 subnets
O E2    172.18.124.0 [110/20] via 192.168.4.1, 00:03:16, Ethernet1/1
C    192.168.4.0/24 is directly connected, Ethernet1/1
!--- This is an example of asymmetric routing. O E2 192.168.1.0/24 [110/20] via 192.168.4.1,
00:03:16, Ethernet1/1
O    192.168.2.0/24 [110/20] via 192.168.4.1, 00:03:16, Ethernet1/1
C    192.168.3.0/24 is directly connected, Ethernet1/0
```

有上一步192.168.1.0网络，路由需要通过骨干网192.168.4.x网络。

流量仍然运作，因为自动发现生成关于VPN 3030b集中器的适当的安全关联(SA)信息。例如：

```
rtr-3620#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set
```

```
     172.18.0.0/24 is subnetted, 1 subnets
O E2    172.18.124.0 [110/20] via 192.168.4.1, 00:03:16, Ethernet1/1
C    192.168.4.0/24 is directly connected, Ethernet1/1
!--- This is an example of asymmetric routing. O E2 192.168.1.0/24 [110/20] via 192.168.4.1,
00:03:16, Ethernet1/1
O    192.168.2.0/24 [110/20] via 192.168.4.1, 00:03:16, Ethernet1/1
C    192.168.3.0/24 is directly connected, Ethernet1/0
```



即使路由表说对等体应该是172.18.124.131，实际SA (通信流)是到VPN 3030b集中器在172.18.124.132。SA表优先于路由表。路由表和SA表的仅周密的调查在VPN 3060a集中器显示流量在正确的方向不流。

相关信息

- Cisco VPN 3000 系列集中器支持页
- IPSec 支持页面
- 技术支持 - Cisco Systems