

Cisco IOS/CCP — 使用Cisco CP配置DMVPN

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简介

本文档提供使用思科配置专家（思科CP）在中心路由器和分支路由器之间建立动态多点VPN(DMVPN)隧道的示例配置。动态多点VPN技术集成了GRE、IPSec加密、NHRP和路由等不同概念，可提供高级解决方案，使最终用户能够通过动态创建的分支到分支IPSec隧道进行有效通信。

先决条件

要求

为获得最佳DMVPN功能，建议您运行Cisco IOS®软件版本12.4 mainline、12.4T及更高版本。

使用的组件

本文档中的信息基于以下软件和硬件版本：

- 软件版本为12.4(22)的思科IOS路由器3800系列
- 软件版本12.3(8)的Cisco IOS路由器1800系列
- 思科配置专业版2.5

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

有关文档约定的更多信息，请参考 [Cisco 技术提示约定](#)。

背景信息

本文档提供了如何使用Cisco CP将路由器配置为辐条，将另一台路由器配置为集线器的信息。初始辐条配置如图所示，但稍后在文档中还会详细显示集线器相关配置，以便更好地了解。也可使用类似方法配置其他辐条以连接到集线器。当前场景使用以下参数：

- 集线器路由器公共网络 — 209.165.201.0
- 隧道网络 — 192.168.10.0
- 使用的路由协议 — OSPF

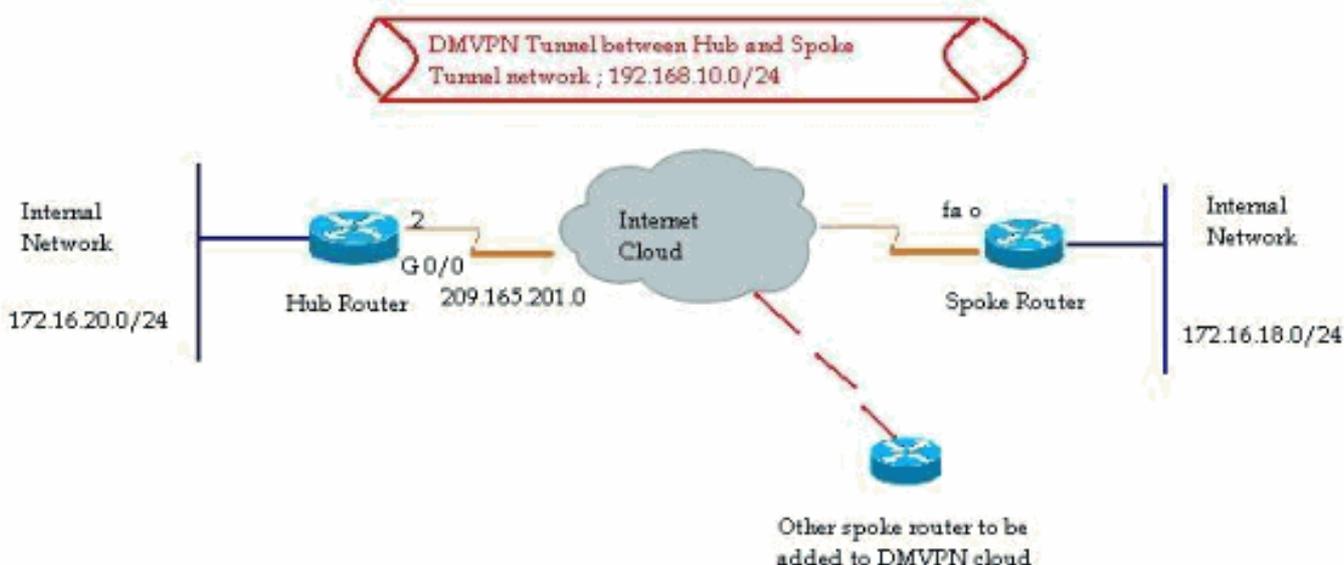
配置

本部分提供有关如何配置本文档所述功能的信息。

注意：使用[命令查找工具](#)(仅限注册客户)可获取有关本节中使用的命令的详细信息。

网络图

本文档使用以下网络设置：



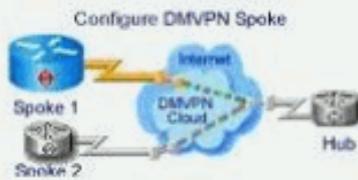
使用思科CP的分支配置

本节介绍如何使用Cisco Configuration Professional中的分步DMVPN向导将路由器配置为辐条。

1. 要启动Cisco CP应用并启动DMVPN向导，请转至 *Configure > Security > VPN > Dynamic Multipoint VPN*。然后，选择“在DMVPN中创建辐条”选项，然后单击“启动选定任务”。

Create Dynamic Multipoint VPN (DMVPN)

Edit Dynamic Multipoint VPN (DMVPN)

 **Create a spoke (client) in a DMVPN**

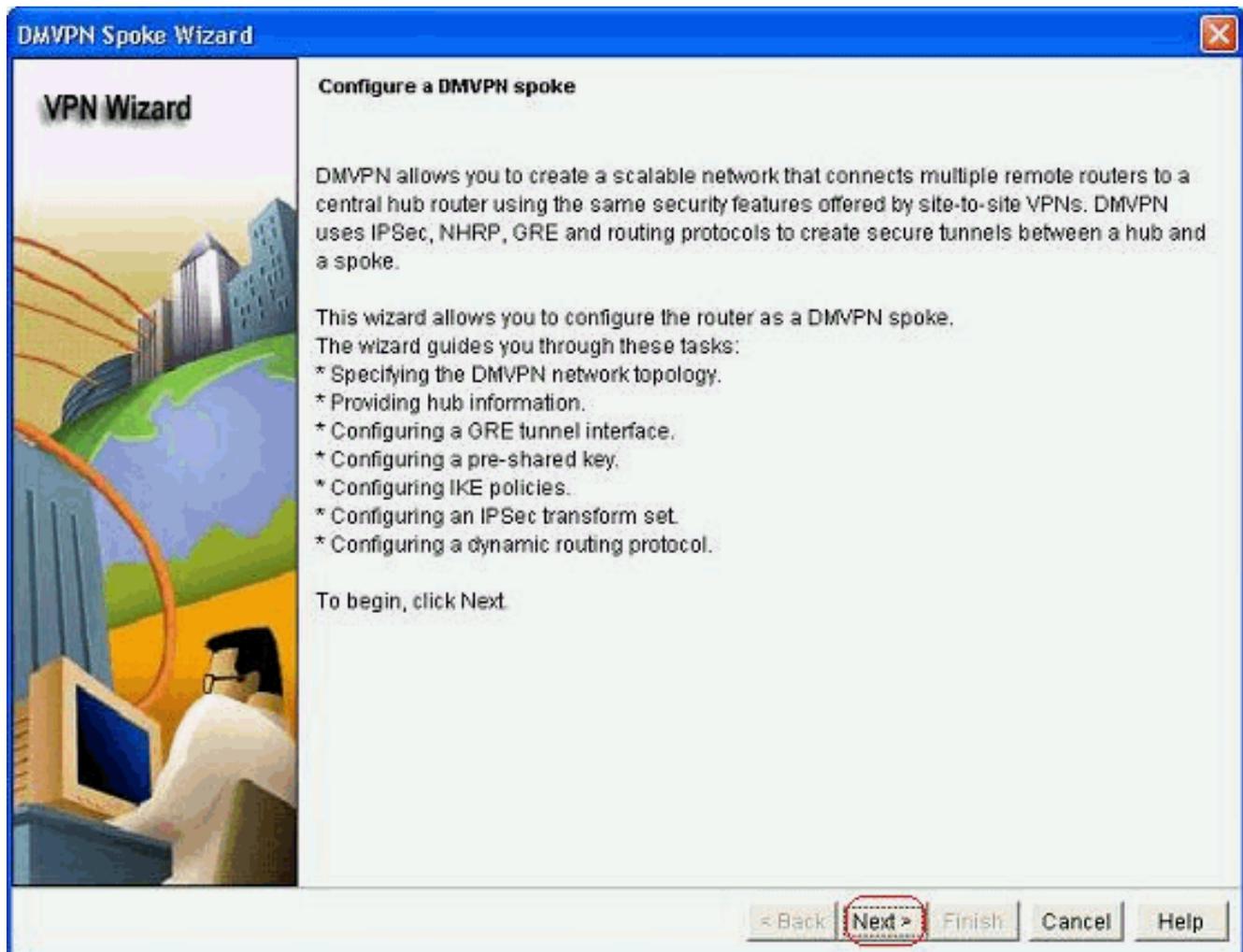
Use this option to configure the router as a spoke in a full mesh or hub and spoke network topology. To complete this configuration, you must know the hub's IP address, NHRP information, pre-shared key, IKE policy, IPSec Transform set and dynamic routing protocol information.

 Create a hub (server or head-end) in a DMVPN

Use this option to configure the router as a primary or backup hub. If you are configuring a backup hub, you must know the primary hub's NHRP information, pre-shared key, IKE policy, IPSec Transform set and dynamic routing protocol information.

[Launch the selected task](#)

2. 单击“下一步”开始



3. 选择中心辐射型网络选项，然后单击下一步。

VPN Wizard

DMVPN Network Topology

Select the DMVPN network topology.

Hub and Spoke network

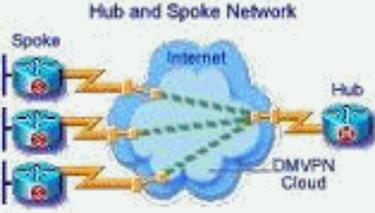
In this topology, all DMVPN traffic is routed through the hub. A point-to-point GRE interface will be configured on the spoke, and the spoke will use it to create a tunnel to the hub which will remain up. Spokes do not create GRE tunnels to other spokes in this topology.

Fully meshed network

In this topology, the spoke dynamically establishes a direct tunnel to another spoke device, and sends DMVPN traffic directly to it. A multipoint GRE tunnel interface is configured on the spoke to support this functionality.

Note: Cisco supports fully meshed DMVPN networks only in the following Cisco IOS images: 12.3(8)T1 and 12.3(9) or later.

Hub and Spoke Network



< Back **Next >** Finish Cancel Help

4. 指定集线器相关信息，例如集线器路由器的公共接口和集线器路由器的隧道接口。

VPN Wizard

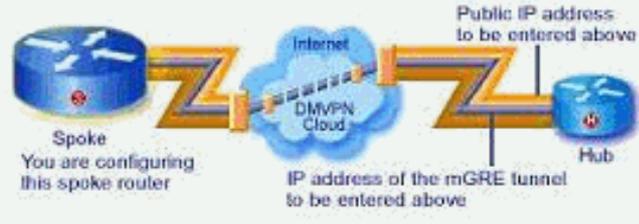
Specify Hub Information

Enter the IP address of the hub and the IP address of the hub's mGRE tunnel interface. Contact your network administrator to get this information.

Hub Information

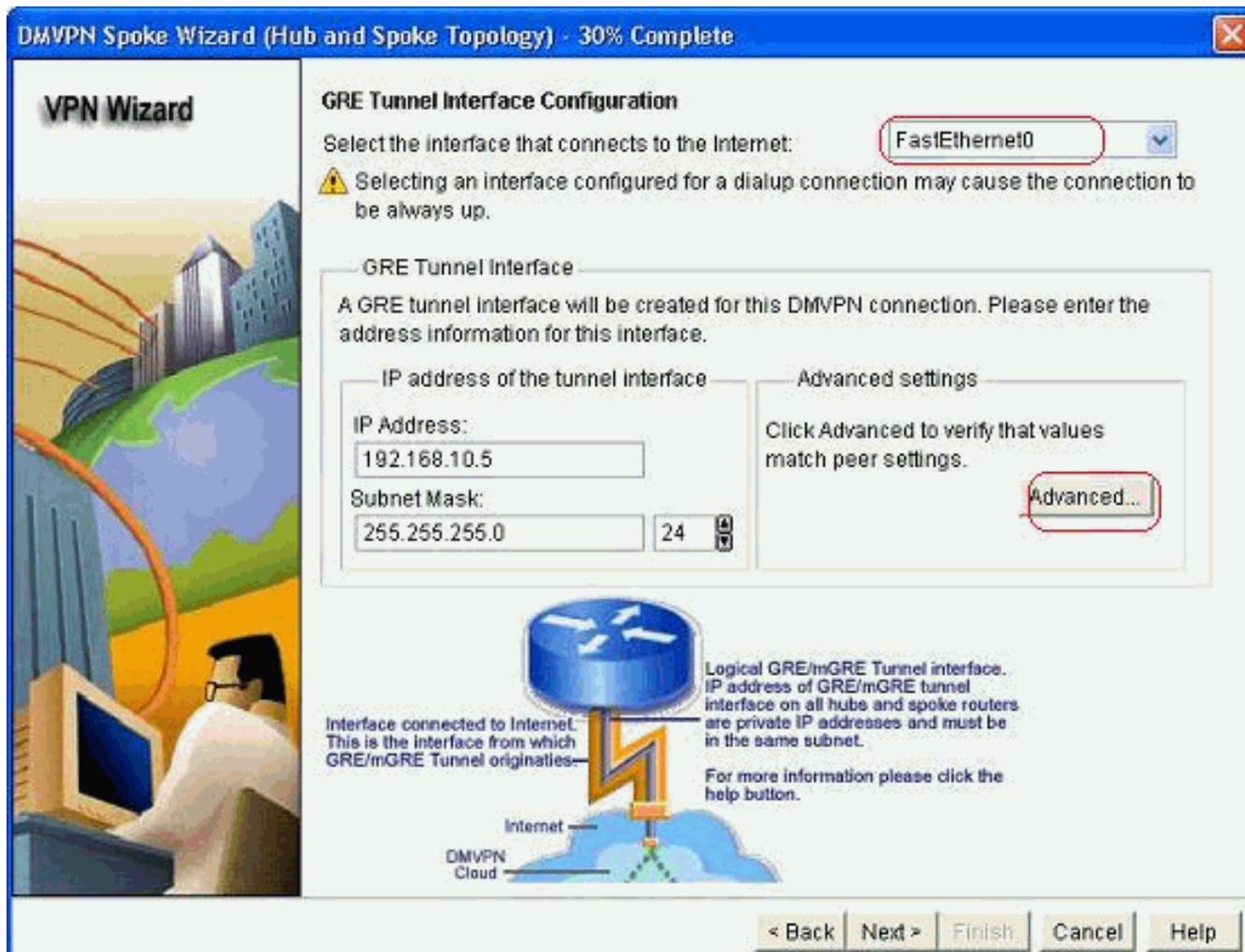
IP address of hub's physical interface: 209.165.201.2

IP address of hub's mGRE tunnel interface: 192.168.10.2

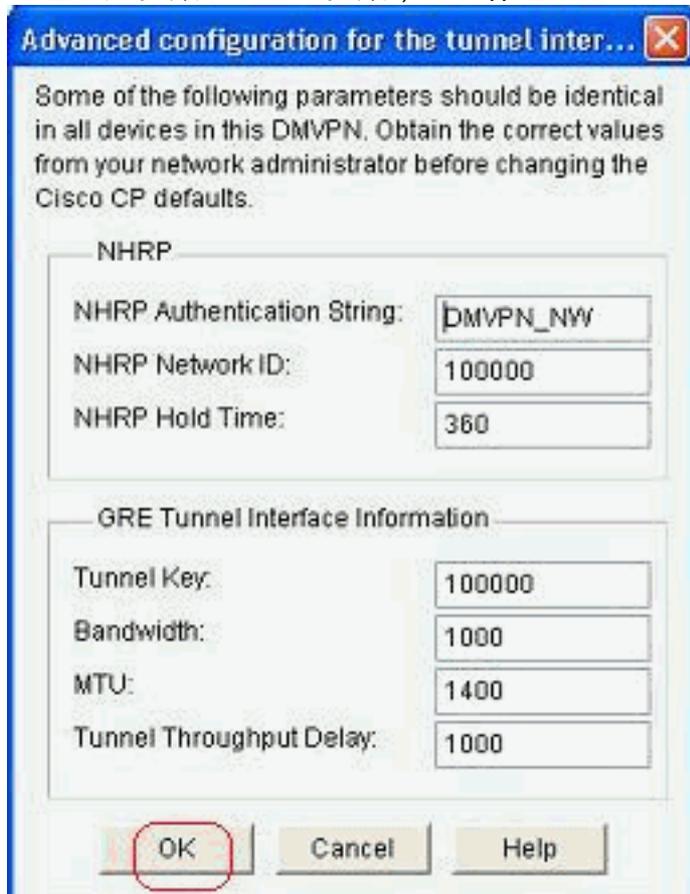


< Back | **Next >** | Finish | Cancel | Help

5. 指定分支的隧道接口详细信息和分支的公共接口。然后，单击*Advanced*。



6. 验证隧道参数和NHRP参数，并确保它们与集线器参数完全匹配。



7. 指定预共享密钥，然后单击Next。



VPN Wizard

Authentication

Select the method you want to use to authenticate this router to the peer device(s) in the DMVPN network. You can use digital certificate or a pre-shared key. If digital certificate is used, the router must have a valid certificate configured. If pre-shared key is used, the key configured on this router must match the keys configured on all other routers in the DMVPN network.

Digital Certificates

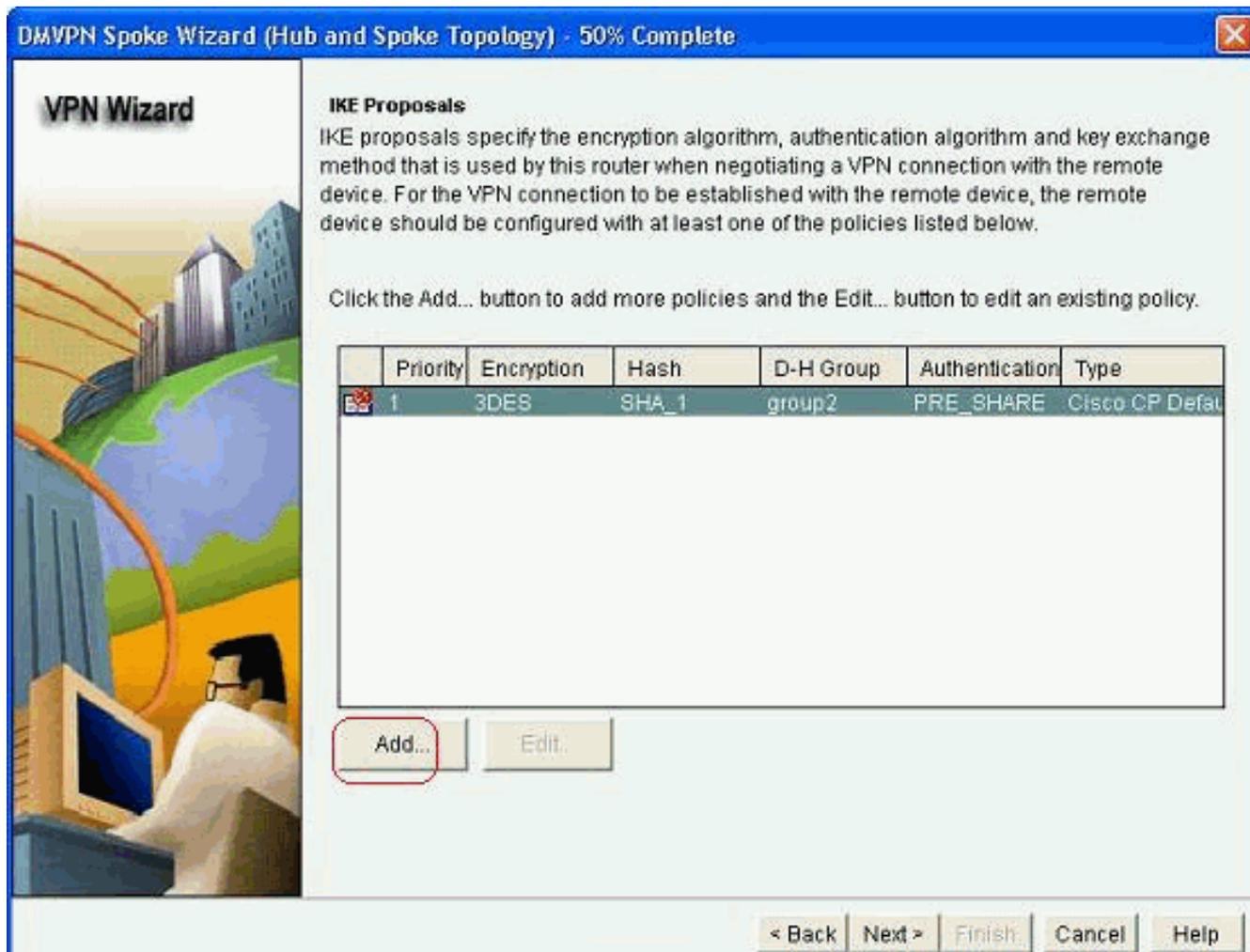
Pre-shared Keys

pre-shared key:

Reenter key:

< Back **Next** > Finish Cancel Help

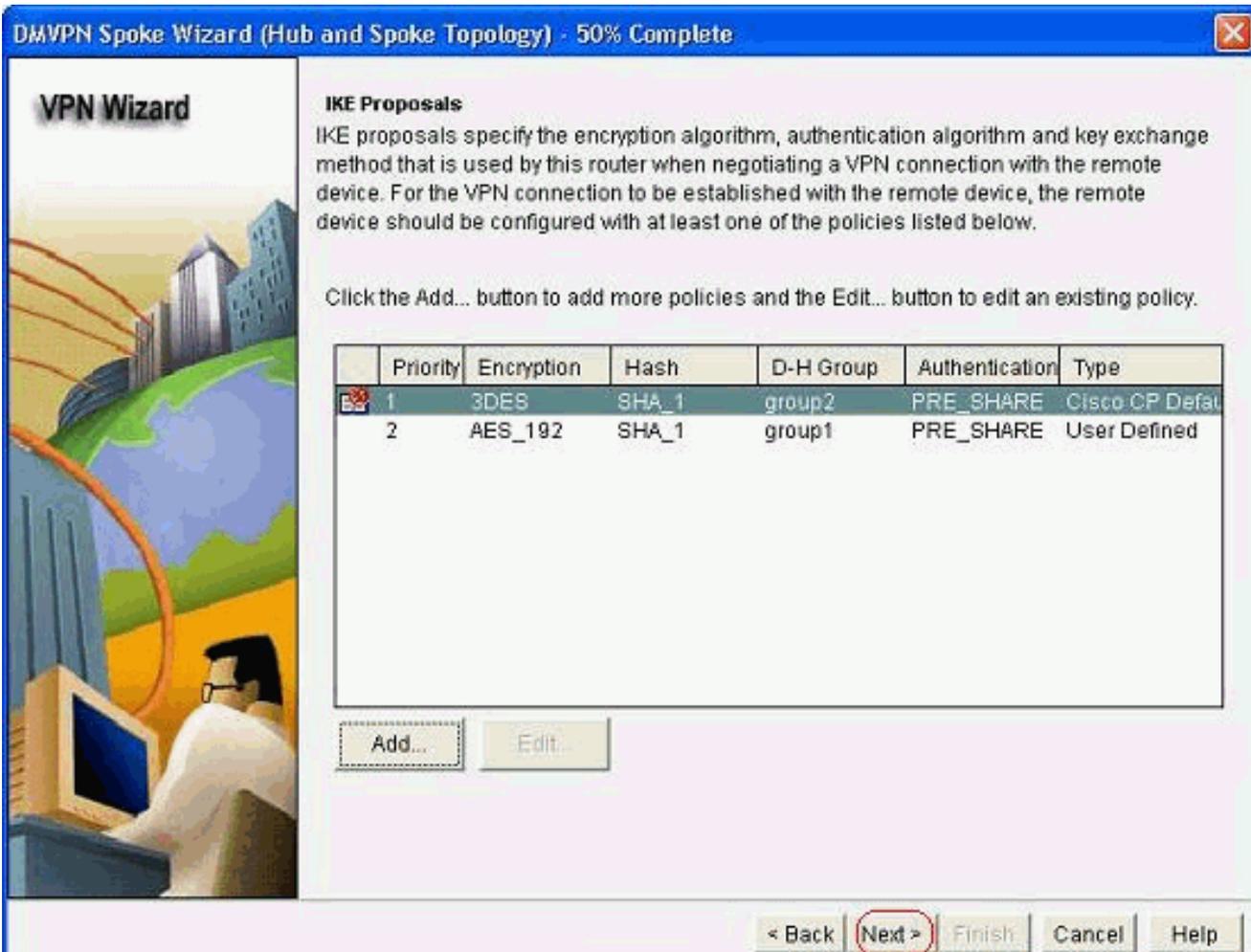
8. 单击Add以添加单独的IKE建议。



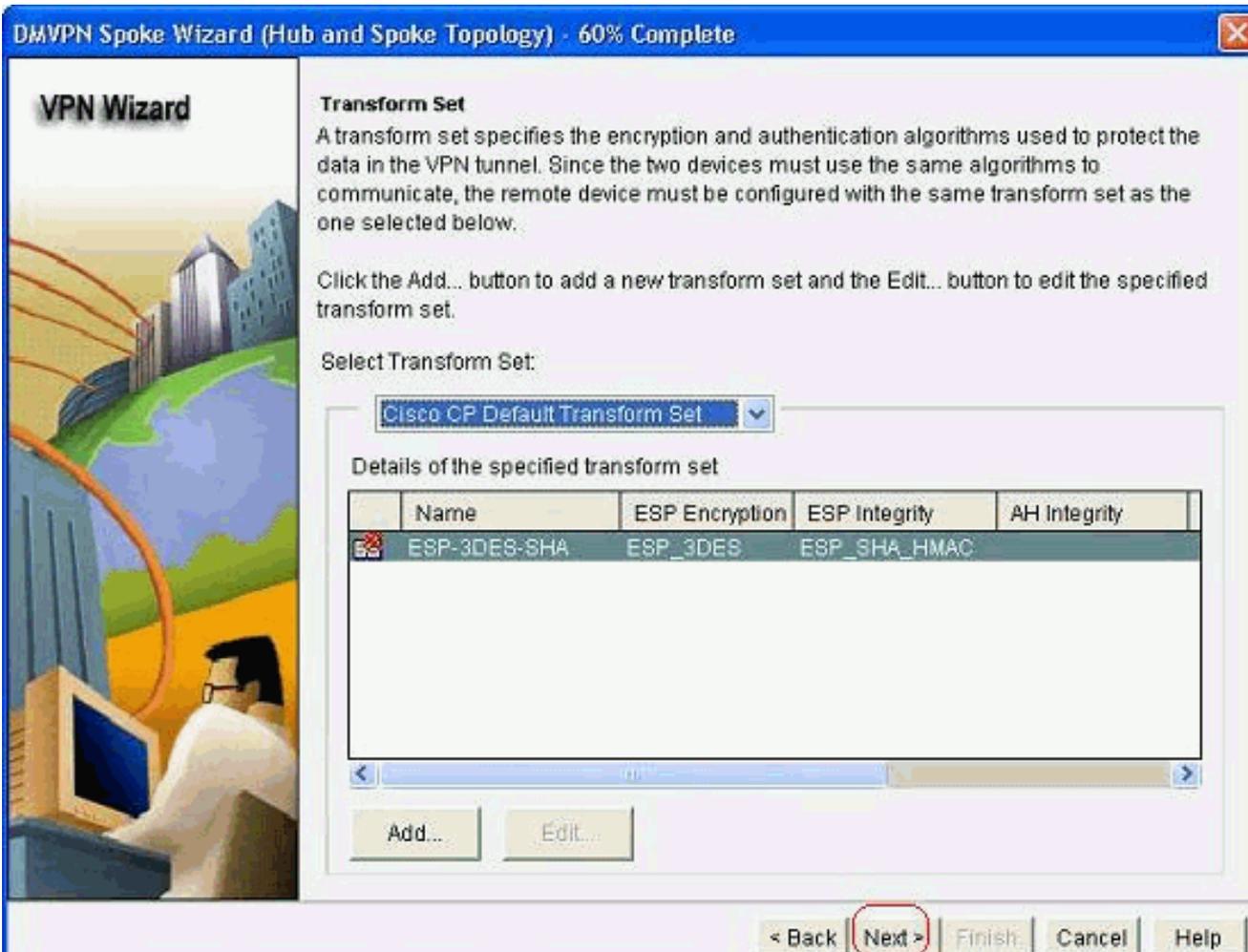
9. 指定加密、身份验证和哈希参数。然后，单击OK。



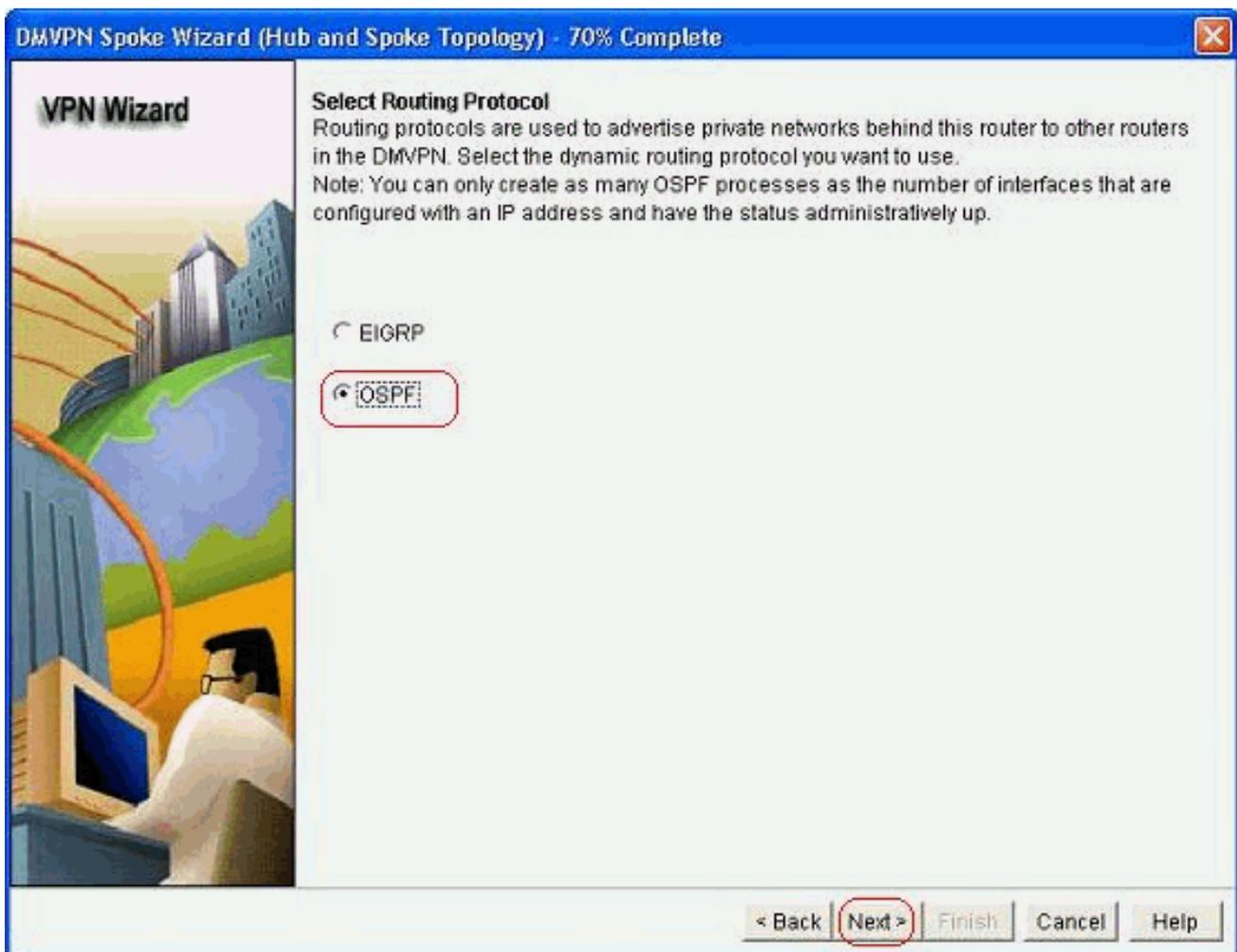
10. 可在此处查看新创建的IKE策略。单击 Next。



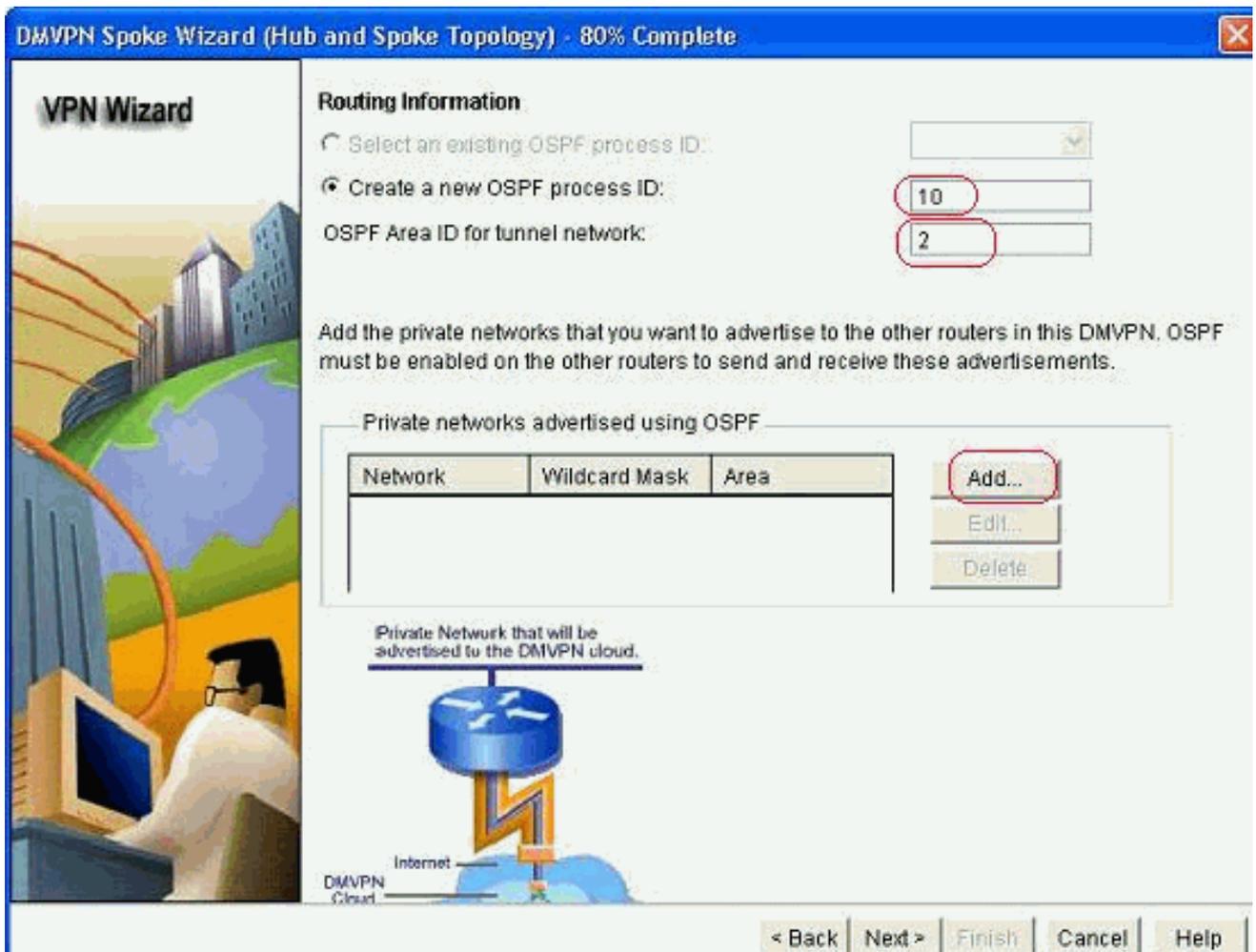
11. 单击Next继续使用默认转换集。



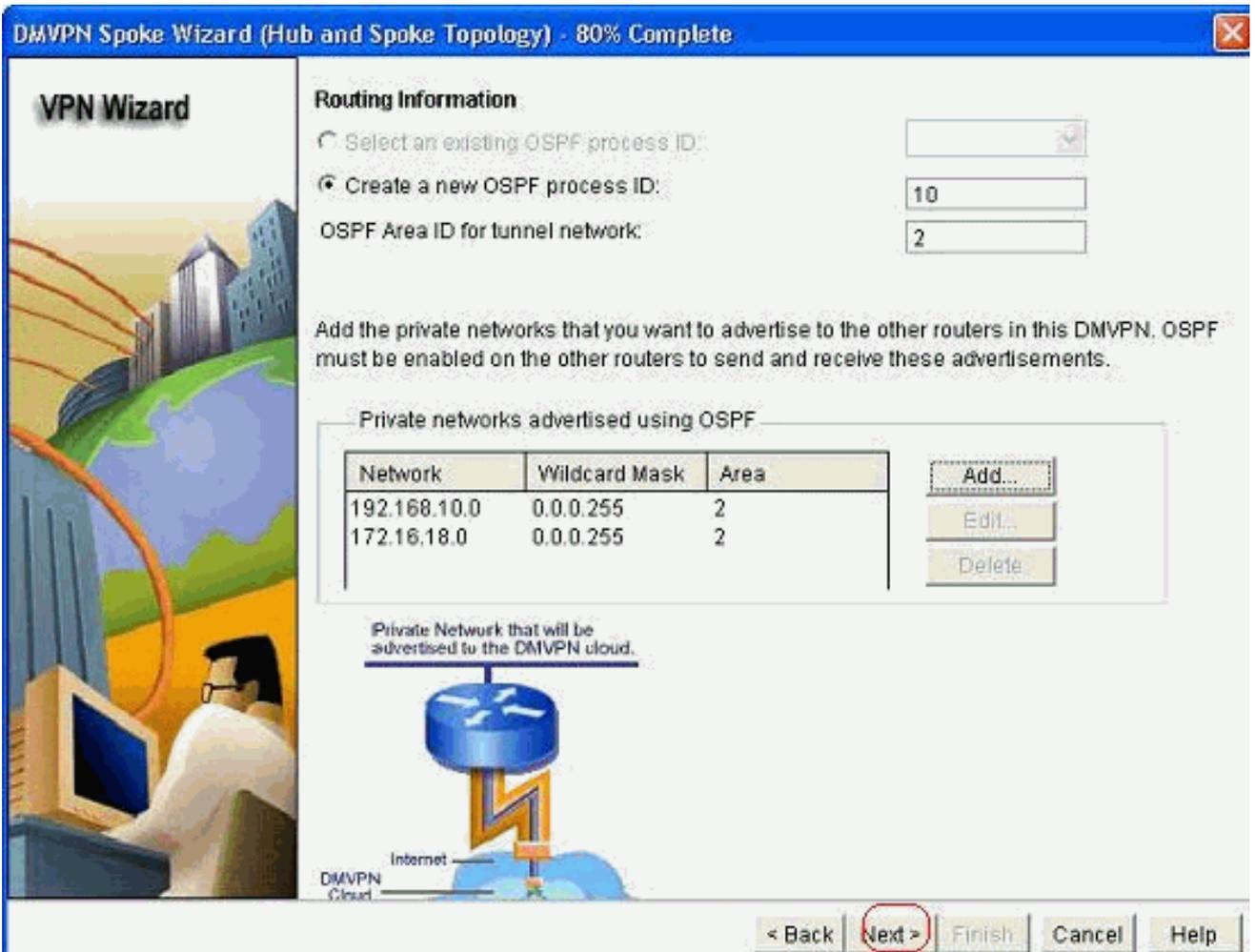
12. 选择所需的路由协议。此处选择了OSPF。



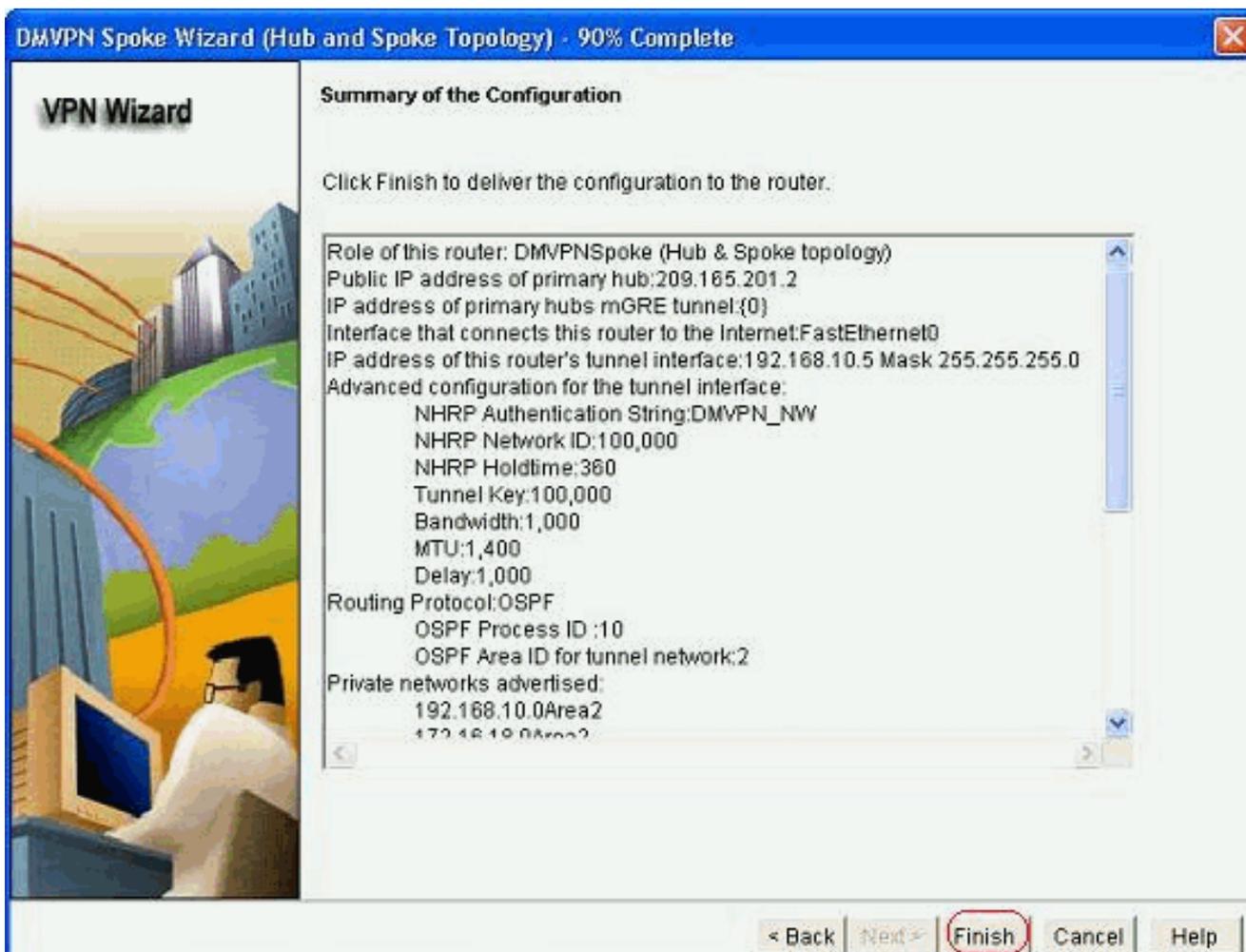
13. 指定OSPF进程ID和区域ID。单击Add以添加要由OSPF通告的网络。



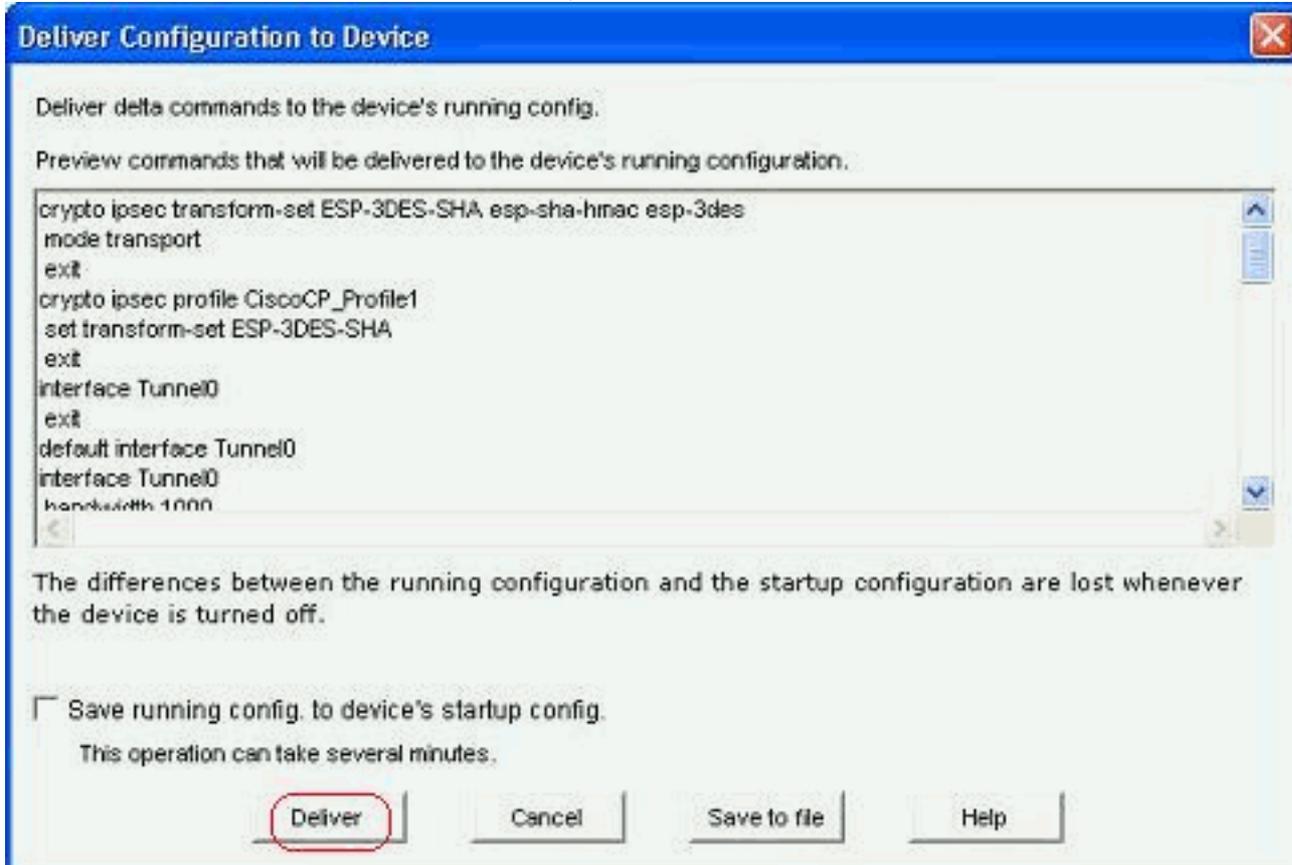
14. 添加隧道网络并单击OK。
15. 在分支路由器后面添加专用网络。然后单击 Next。



16. 单击 *Finish* 完成向导配置。



17. 单击 *Deliver* 执行命令。如果要保存配置，请选中将运行配置保存到设备的启动配置复选框。



[分支的CLI配置](#)

相关CLI配置如下所示：

分支路由器

```
crypto ipsec transform-set ESP-3DES-SHA esp-sha-hmac
esp-3des
mode transport
exit
crypto ipsec profile CiscoCP_Profile1
set transform-set ESP-3DES-SHA
exit
interface Tunnel0
exit
default interface Tunnel0
interface Tunnel0
bandwidth 1000
delay 1000
ip nhrp holdtime 360
ip nhrp network-id 100000
ip nhrp authentication DMVPN_NW
ip ospf network point-to-multipoint
ip mtu 1400
no shutdown
ip address 192.168.10.5 255.255.255.0
ip tcp adjust-mss 1360
ip nhrp nhs 192.168.10.2
ip nhrp map 192.168.10.2 209.165.201.2
tunnel source FastEthernet0
tunnel destination 209.165.201.2
tunnel protection ipsec profile CiscoCP_Profile1
tunnel key 100000
exit
router ospf 10
network 192.168.10.0 0.0.0.255 area 2
network 172.16.18.0 0.0.0.255 area 2
exit
crypto isakmp key ***** address 209.165.201.2
crypto isakmp policy 2
authentication pre-share
encr aes 192
hash sha
group 1
lifetime 86400
exit
crypto isakmp policy 1
authentication pre-share
encr 3des
hash sha
group 2
lifetime 86400
exit
```

使用Cisco CP的集线器配置

本部分显示了如何为DMVPN配置中心路由器的分步方法。

1. 转到 *Configure > Security > VPN > Dynamic Multipoint VPN*，并选择 *Create a hub in a DMVPN* 选项。单击“Launch the selected task(启动所选任务)”。



Create Dynamic Multipoint VPN (DMVPN)

Edit Dynamic Multipoint VPN (DMVPN)

 Create a spoke (client) in a DMVPN

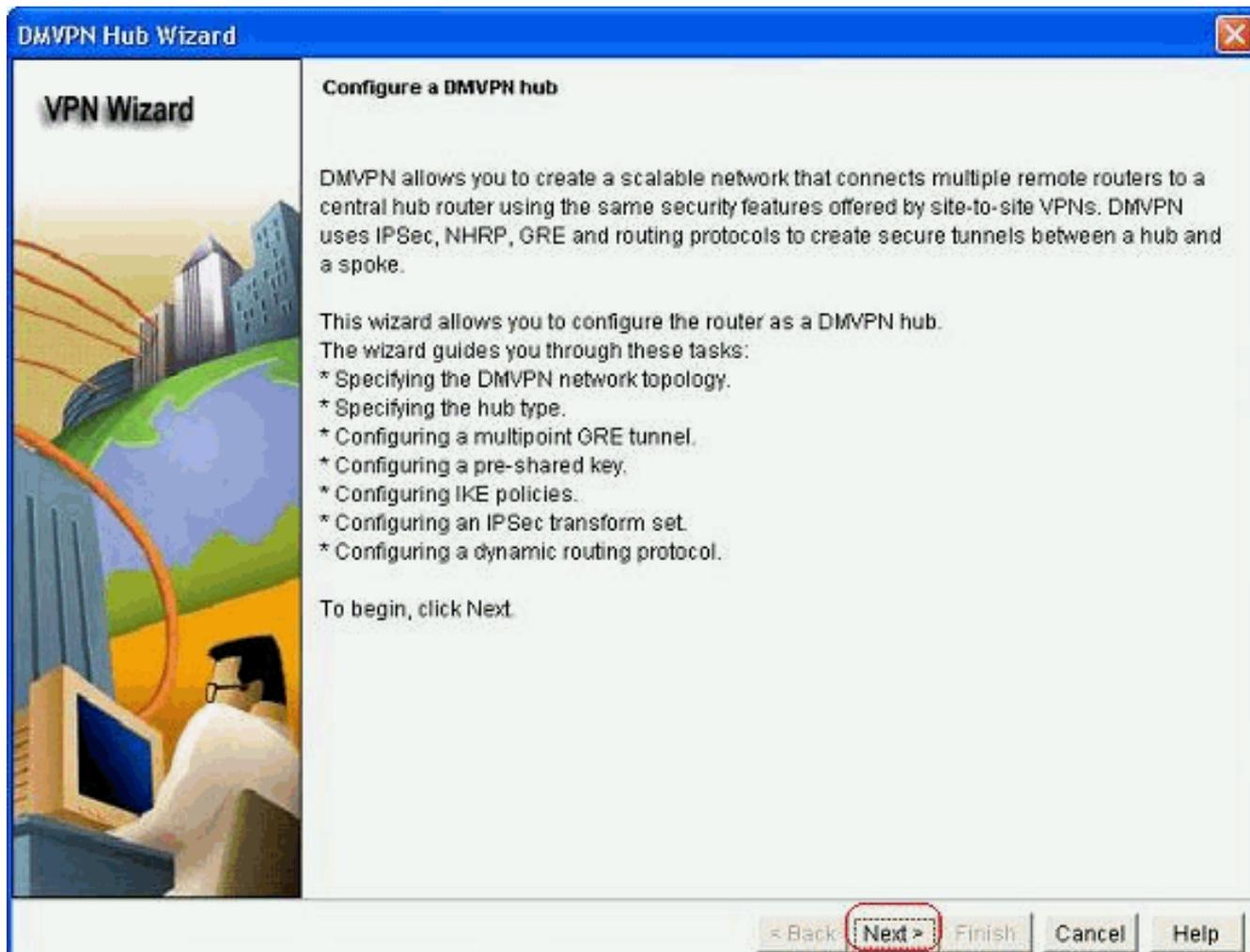
Use this option to configure the router as a spoke in a full mesh or hub and spoke network topology. To complete this configuration, you must know the hub's IP address, NHRP information, pre-shared key, IKE policy, IPsec Transform set and dynamic routing protocol information.

 Create a hub (server or head-end) in a DMVPN

Use this option to configure the router as a primary or backup hub. If you are configuring a backup hub, you must know the primary hub's NHRP information, pre-shared key, IKE policy, IPsec Transform set and dynamic routing protocol information.

Launch the selected task

2. 单击 *Next*。



3. 选择中心辐射型网络选项，然后单击下一步。

VPN Wizard



DMVPN Network Topology

Select the DMVPN network topology.

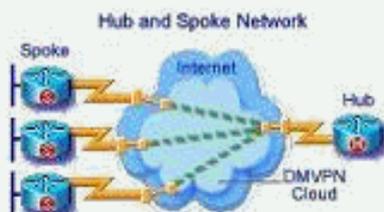
Hub and Spoke network

In this topology, all DMVPN traffic is routed through the hub. A point-to-point GRE interface will be configured on the spoke, and the spoke will use it to create a tunnel to the hub which will remain up. Spokes do not create GRE tunnels to other spokes in this topology.

Fully meshed network

In this topology, the spoke dynamically establishes a direct tunnel to another spoke device, and sends DMVPN traffic directly to it. A multipoint GRE tunnel interface is configured on the spoke to support this functionality.

Note: Cisco supports fully meshed DMVPN networks only in the following Cisco IOS images: 12.3(8)T1 and 12.3(9) or later.



< Back

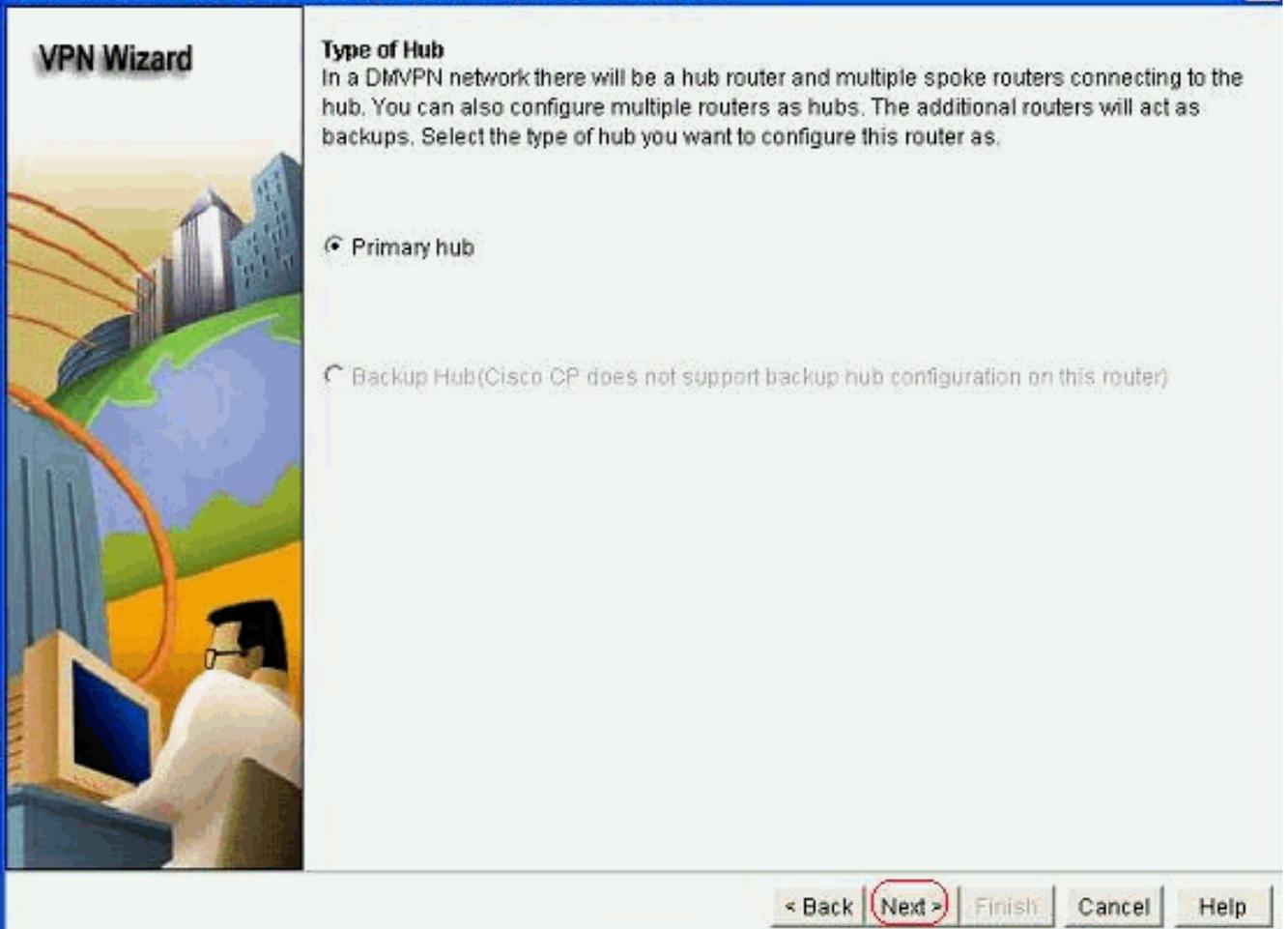
Next >

Finish

Cancel

Help

4. 选择主集线器。然后单击 Next。



VPN Wizard

Type of Hub
In a DMVPN network there will be a hub router and multiple spoke routers connecting to the hub. You can also configure multiple routers as hubs. The additional routers will act as backups. Select the type of hub you want to configure this router as.

- Primary hub
- Backup Hub (Cisco CP does not support backup hub configuration on this router)

< Back **Next >** Finish Cancel Help

5. 指定Tunnel接口参数，然后单击Advanced。

VPN Wizard



Multipoint GRE Tunnel Interface Configuration

Select the interface that connects to the Internet: GigabitEthernet0/0

⚠ Selecting an interface configured for a dialup connection may cause the connection to be always up.

Multi point GRE (mGRE) Tunnel Interface

A GRE tunnel interface will be created for this DMVPN connection. Please enter the address information for this interface.

IP address of the tunnel interface

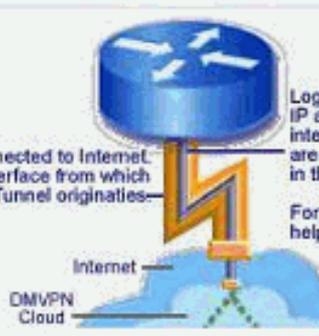
IP Address:

Subnet Mask:

Advanced settings

Click Advanced to verify that values match peer settings.

Advanced...



Interface connected to Internet. This is the interface from which GRE/mGRE Tunnel originates.

Logical GRE/mGRE Tunnel interface. IP address of GRE/mGRE tunnel interface on all hubs and spoke routers are private IP addresses and must be in the same subnet.

For more information please click the help button.

6. 指定隧道参数和NHRP参数。然后，单击OK。

Advanced configuration for the tunnel inter... ✕

Some of the following parameters should be identical in all devices in this DMVPN. Obtain the correct values from your network administrator before changing the Cisco CP defaults.

NHRP

NHRP Authentication String:

NHRP Network ID:

NHRP Hold Time:

GRE Tunnel Interface Information

Tunnel Key:

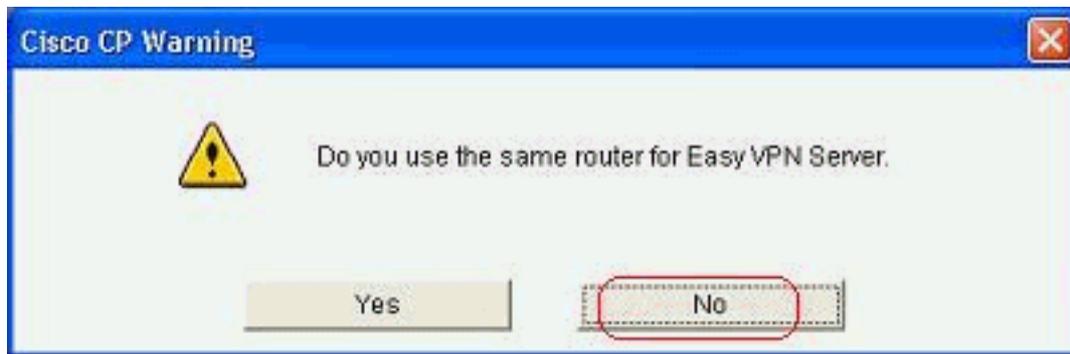
Bandwidth:

MTU:

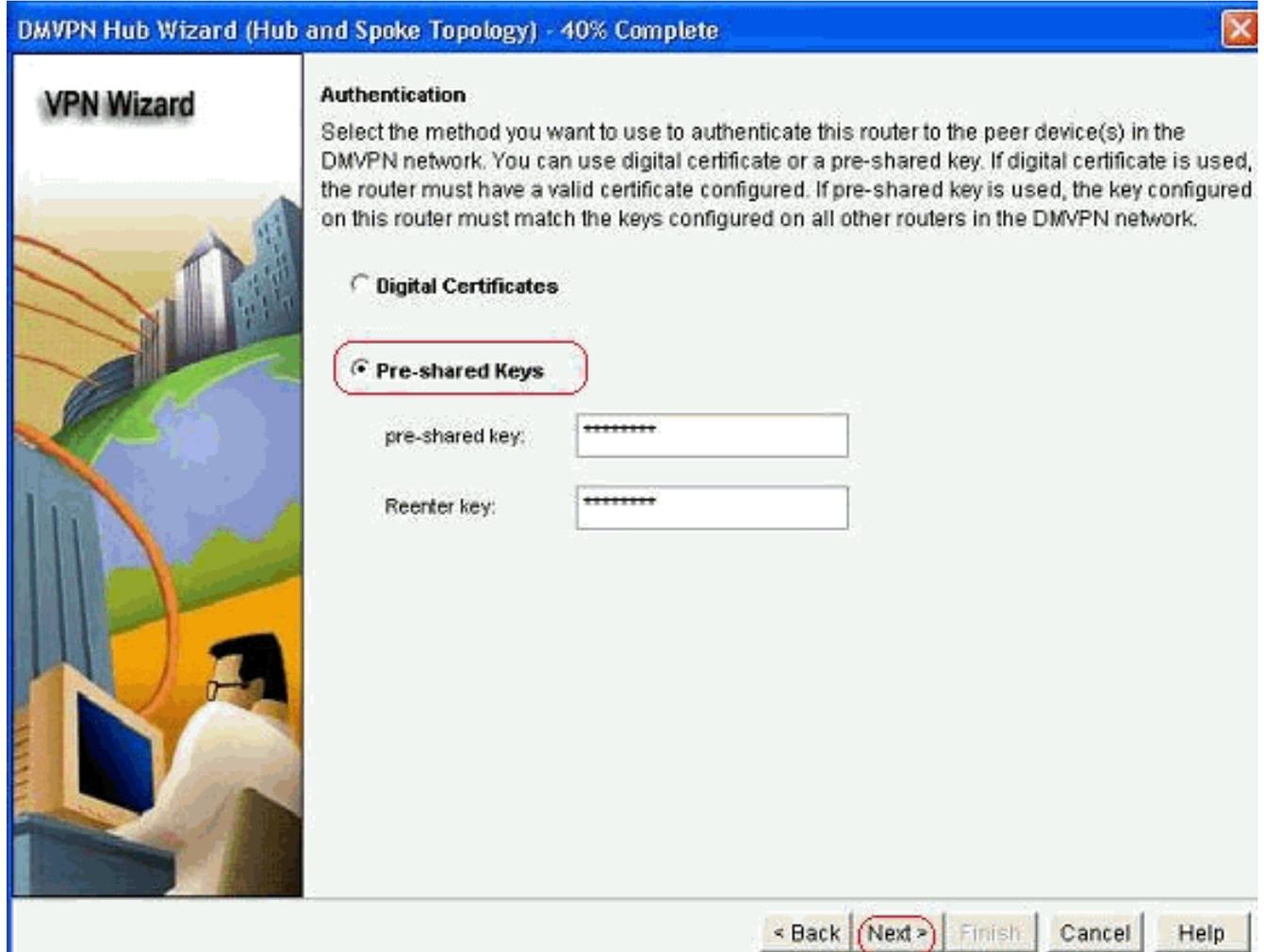
Tunnel Throughput Delay:

OK
Cancel
Help

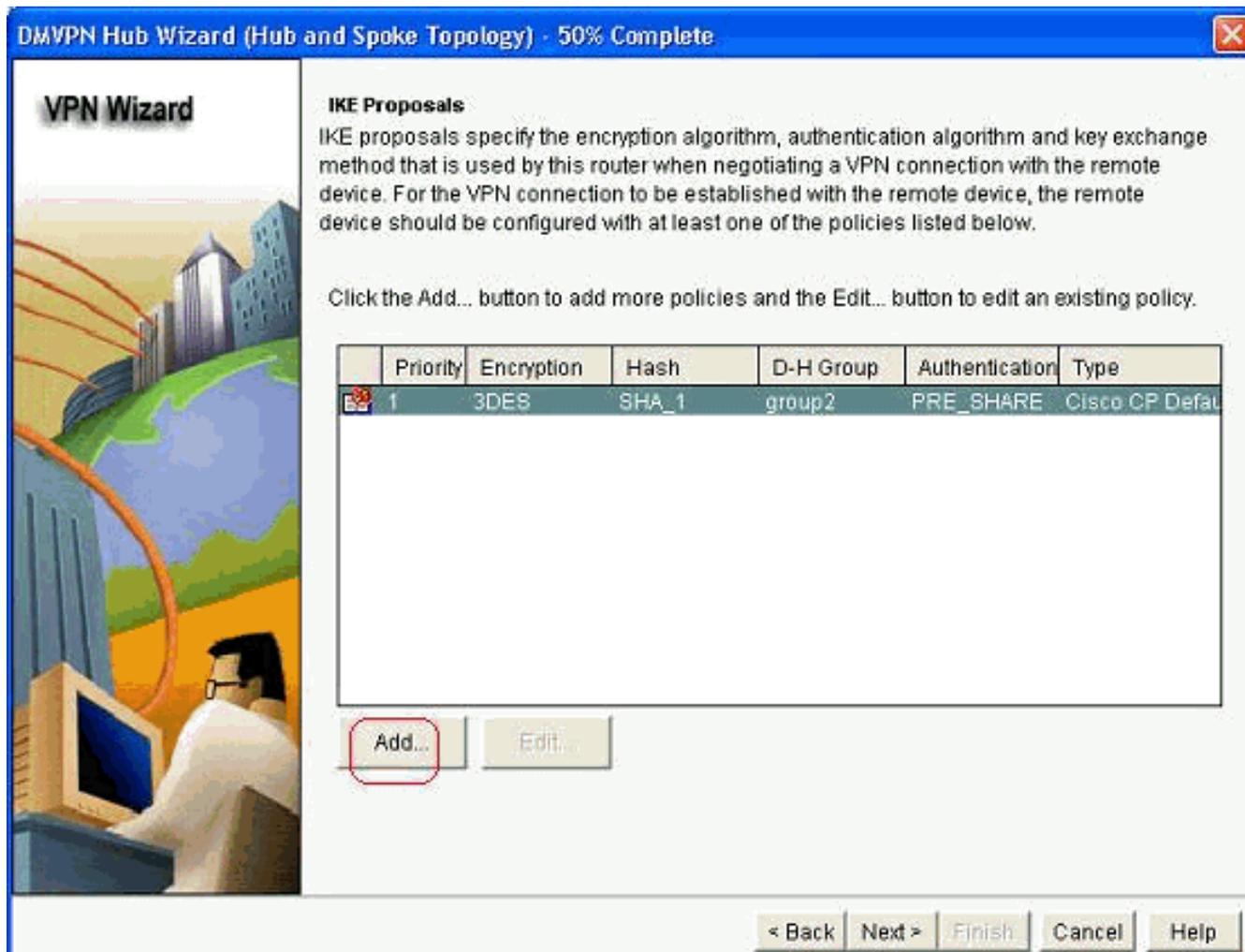
7. 根据网络设置指定选项。



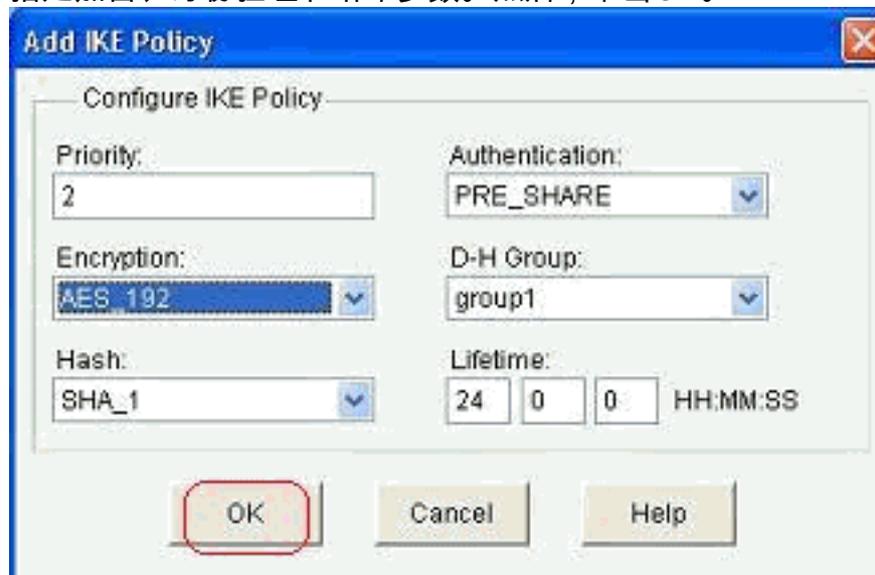
8. 选择预共享密钥并指定预共享密钥。然后单击 *Next*。



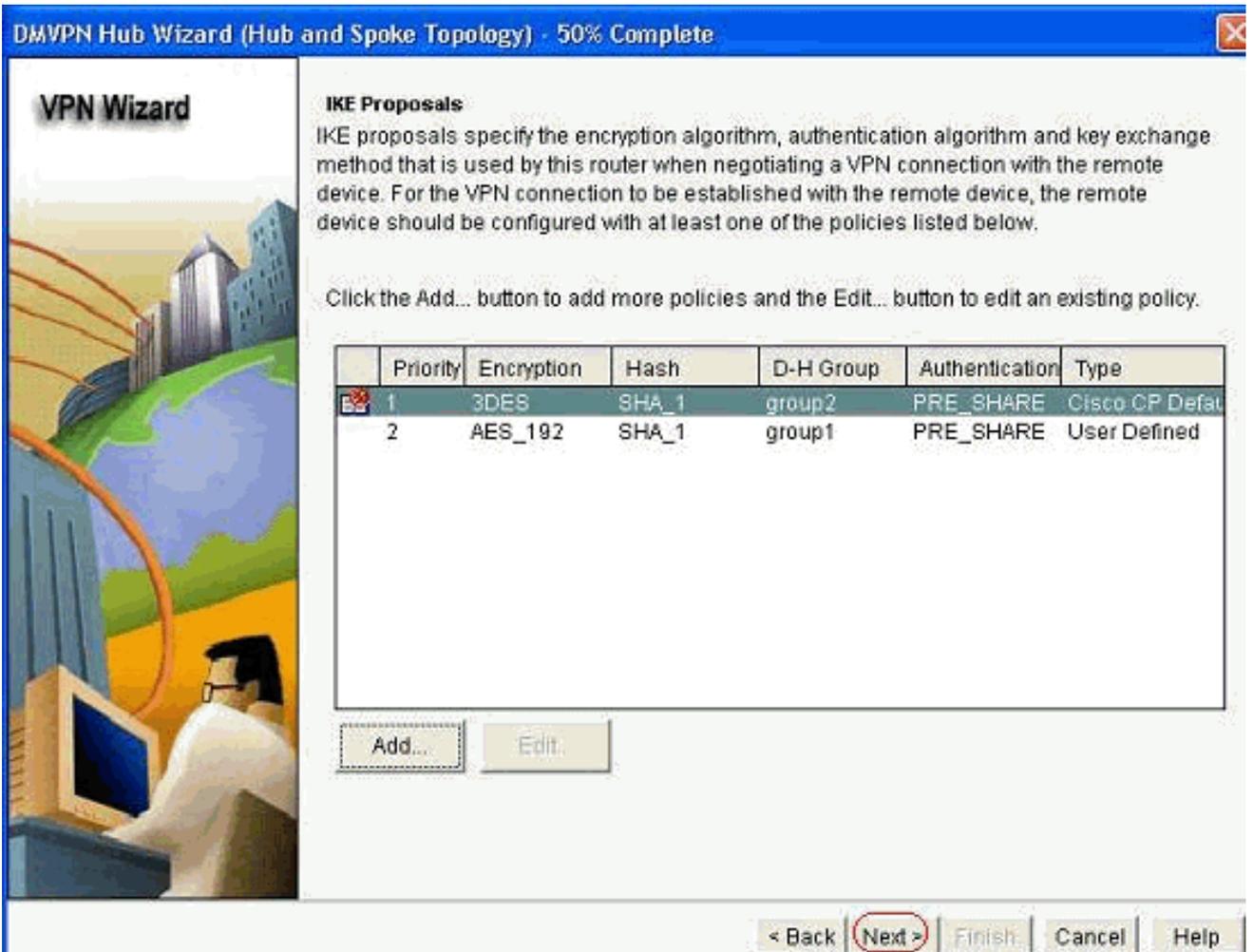
9. 单击 *Add* 以添加单独的IKE建议。



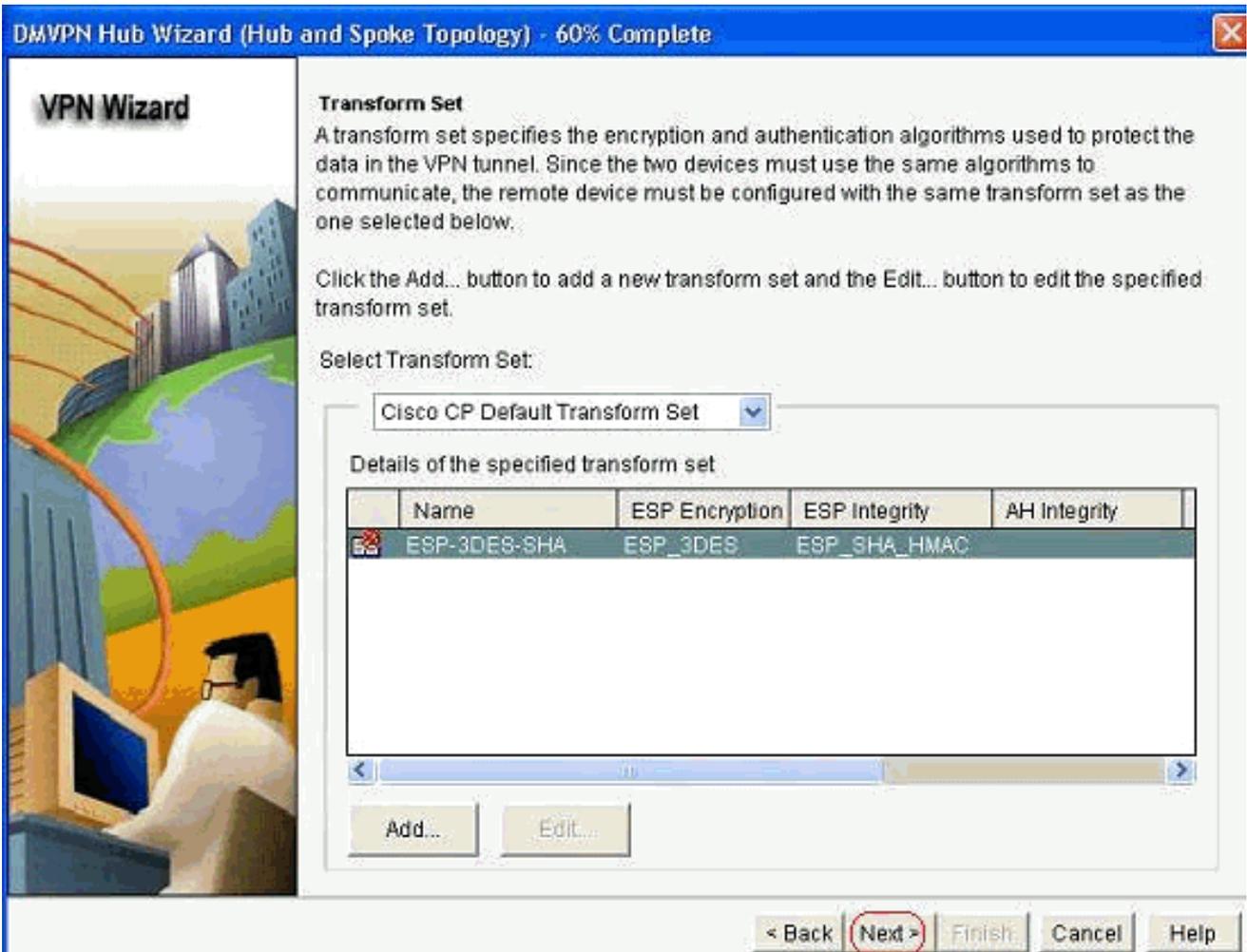
10. 指定加密、身份验证和哈希参数。然后，单击OK。



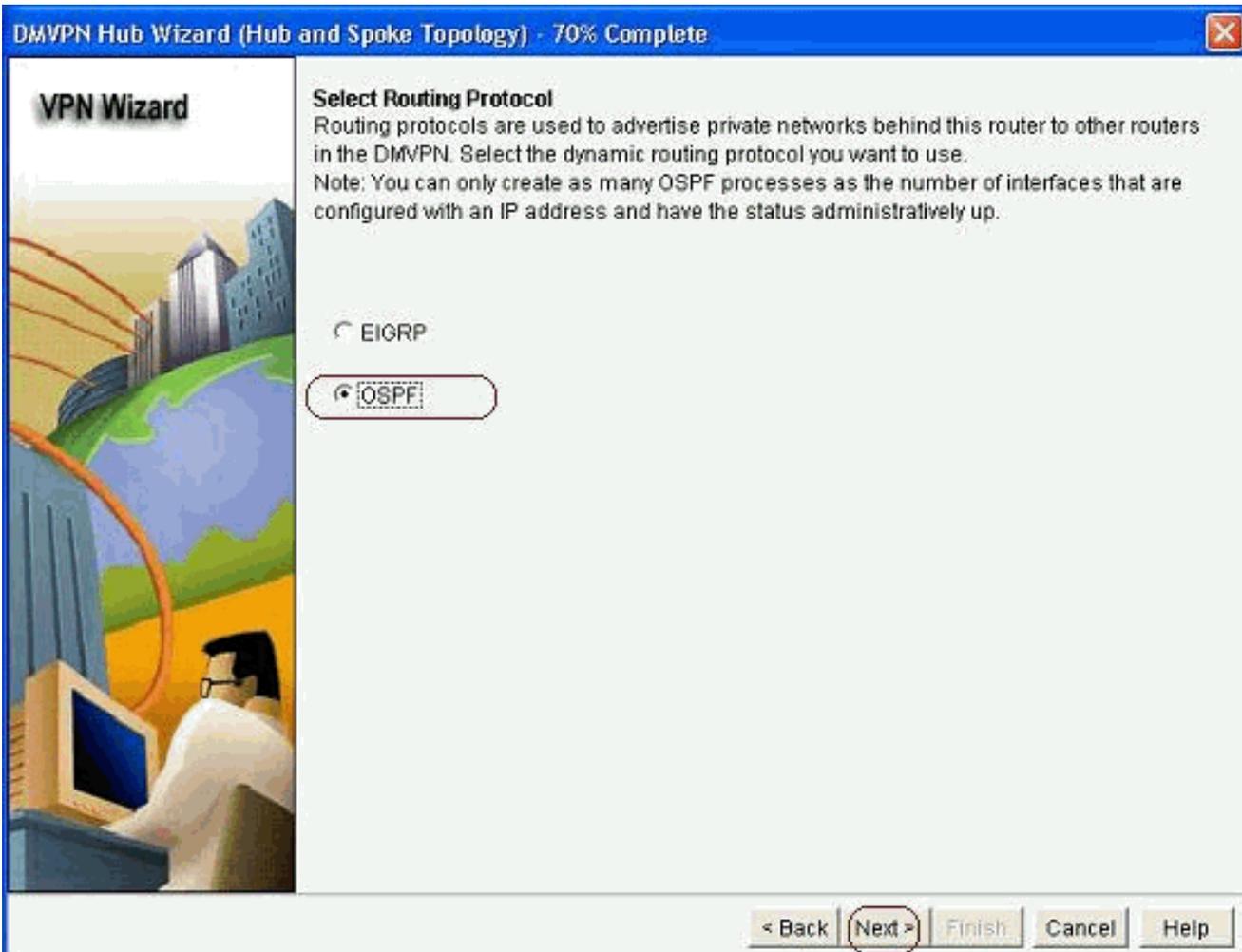
11. 可在此处查看新创建的IKE策略。单击 Next。



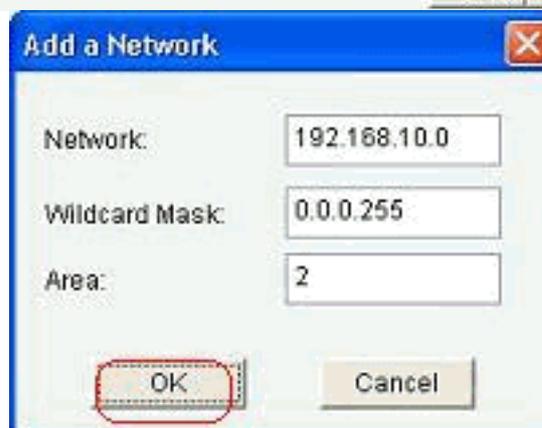
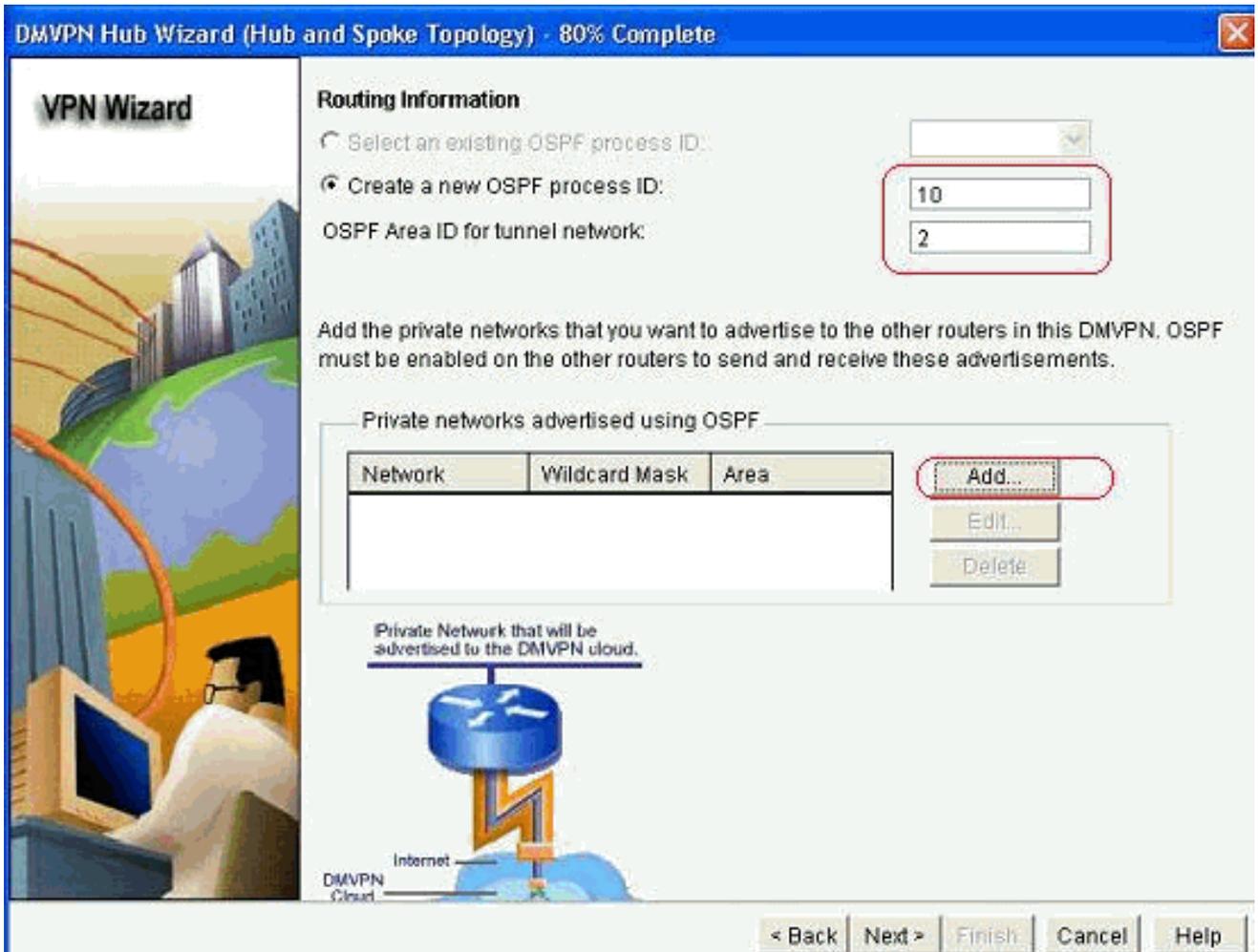
12. 单击Next继续使用默认转换集。



13. 选择所需的路由协议。此处选择了OSPF。

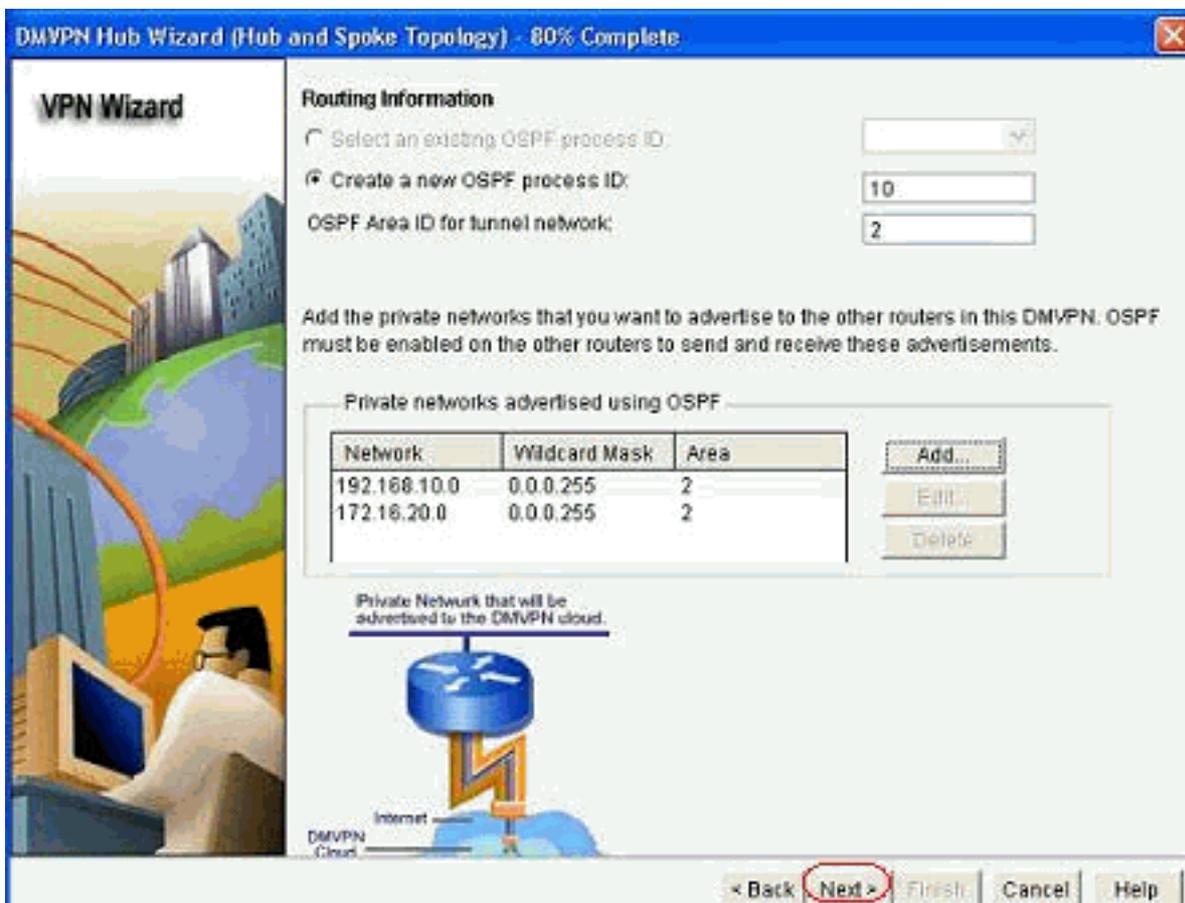


14. 指定OSPF进程ID和区域ID。单击Add以添加要由OSPF通告的网络。

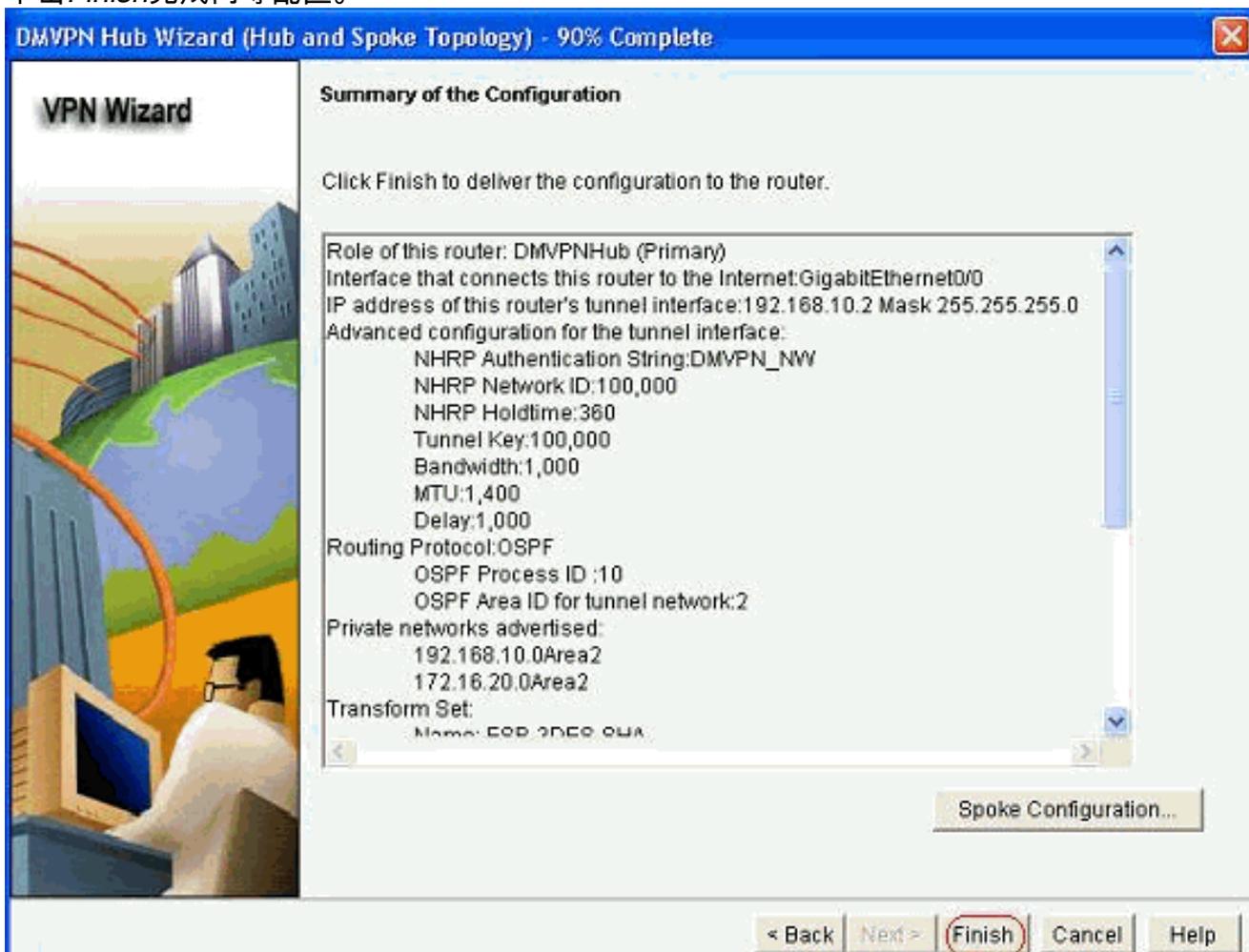


15. 添加隧道网络并单击OK。

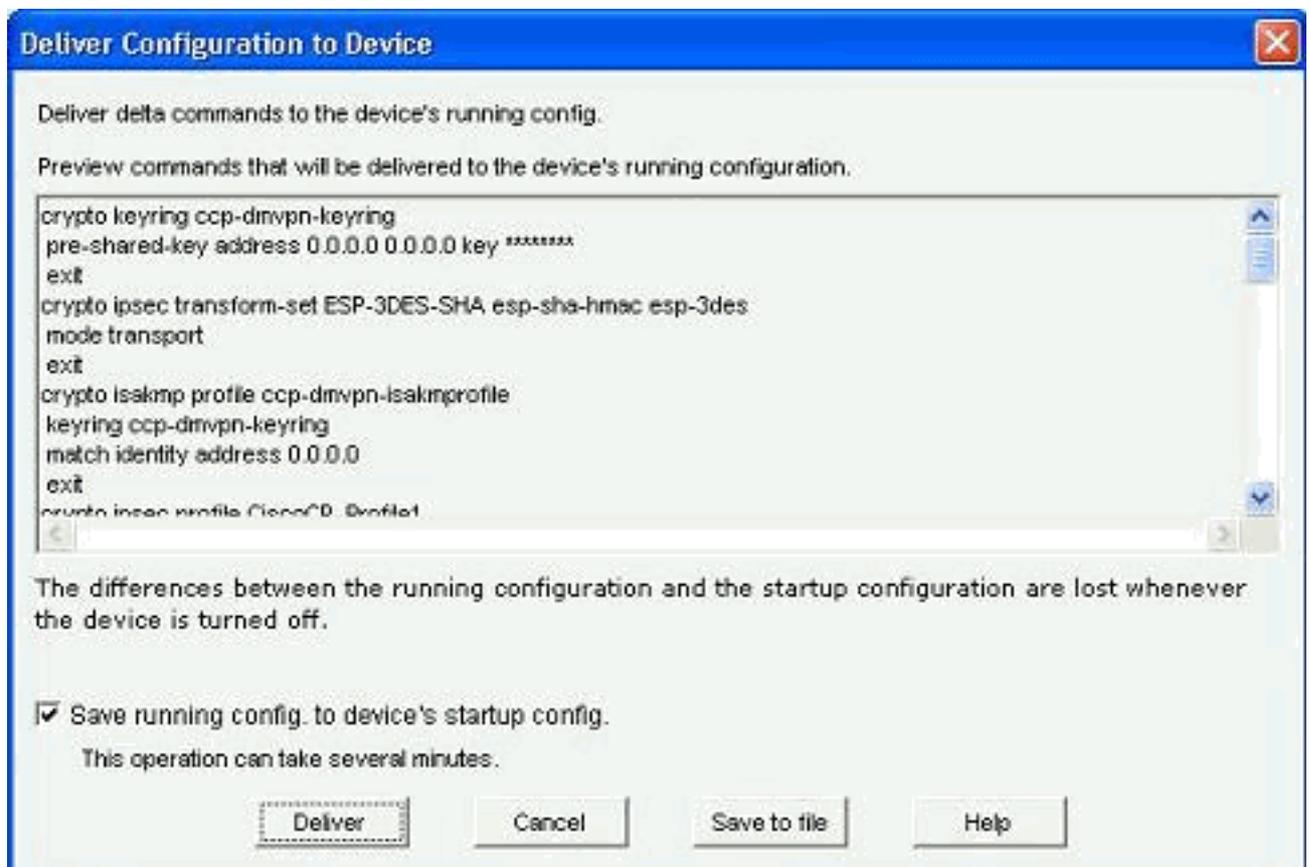
16. 在集线器路由器后添加专用网络，然后单击Next。



17. 单击*Finish*完成向导配置。



18. 单击*Deliver*执行命令。



集线器的CLI配置

相关CLI配置如下所示：

中心路由器
<pre> ! crypto isakmp policy 1 encr 3des authentication pre-share group 2 ! crypto isakmp policy 2 encr aes 192 authentication pre-share crypto isakmp key abcd123 address 0.0.0.0 0.0.0.0 ! crypto ipsec transform-set ESP-3DES-SHA esp-3des esp- sha-hmac mode transport ! crypto ipsec profile CiscoCP_Profile1 set transform-set ESP-3DES-SHA ! interface Tunnel0 bandwidth 1000 ip address 192.168.10.2 255.255.255.0 no ip redirects ip mtu 1400 ip nhrp authentication DMVPN_NW ip nhrp map multicast dynamic ip nhrp network-id 100000 ip nhrp holdtime 360 </pre>

```

ip tcp adjust-mss 1360
ip ospf network point-to-multipoint
delay 1000
tunnel source GigabitEthernet0/0
tunnel mode gre multipoint
tunnel key 100000
tunnel protection ipsec profile CiscoCP_Profile1
!
router ospf 10
 log-adjacency-changes
 network 172.16.20.0 0.0.0.255 area 2
 network 192.168.10.0 0.0.0.255 area 2
!

```

使用CCP编辑DMVPN配置

选择隧道接口并单击编辑时，可以手动编辑现有DMVPN隧道参数。

Configure > Security > VPN > Dynamic Multipoint VPN

VPN

Create Dynamic Multipoint VPN (DMVPN) Edit Dynamic Multipoint VPN (DMVPN)

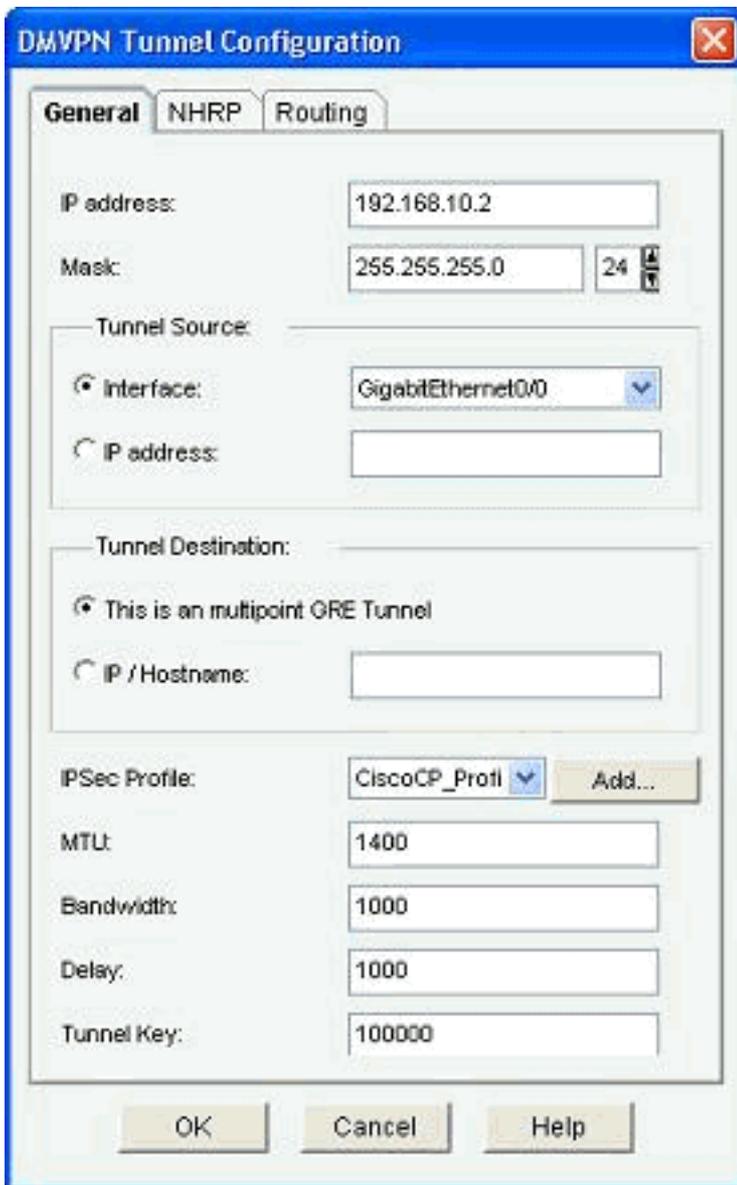
Add... Edit... Delete

Interface	IPSec Profile	IP Address	Description
Tunnel0	CiscoCP_Profile1	192.168.10.2	<None>

Details for interface Tunnel0:

Item Name	Item Value
Interface	Tunnel0
IPSec Profile	CiscoCP_Profile1
IP Address	192.168.10.2
Description	<None>
Tunnel Bandwidth	1000
MTU	1400
NHRP Authentication	DMVPN_NW
NHRP Network ID	100000
NHRP Hold Time	360
Delay{0}	1000

隧道接口参数（如MTU和隧道密钥）在“常规”选项卡下进行修改。

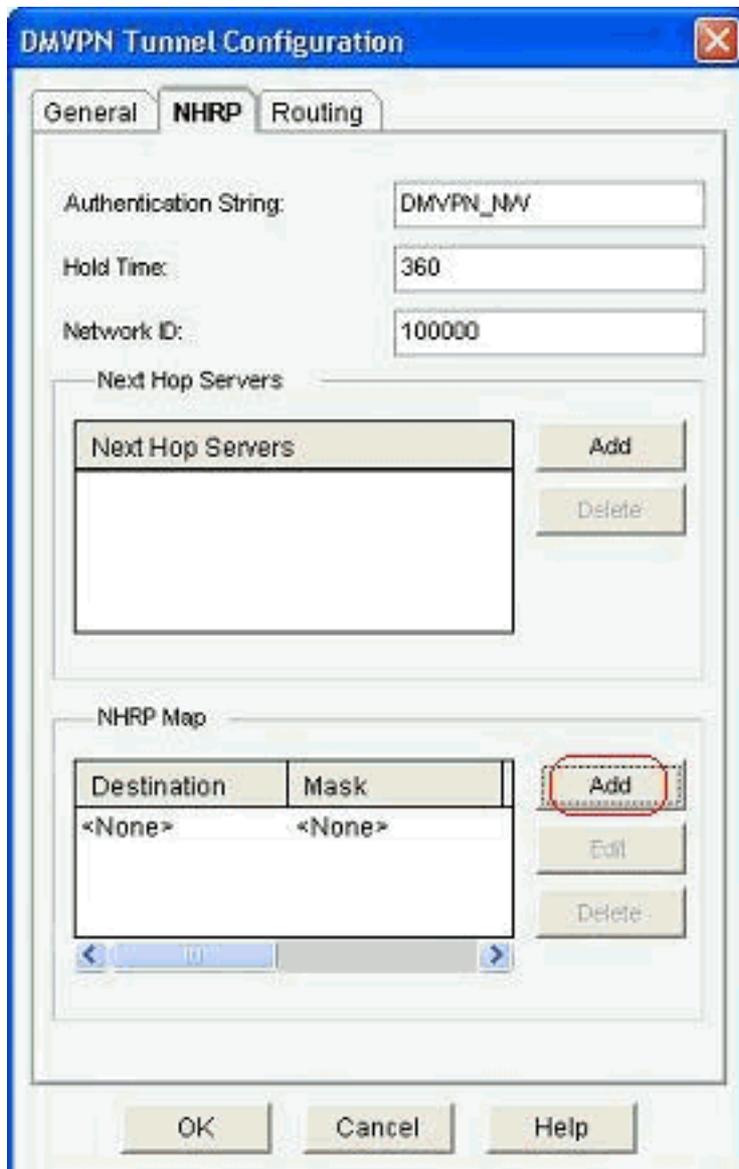


The image shows a 'DMVPN Tunnel Configuration' dialog box with three tabs: 'General', 'NHRP', and 'Routing'. The 'General' tab is active. It contains the following fields and options:

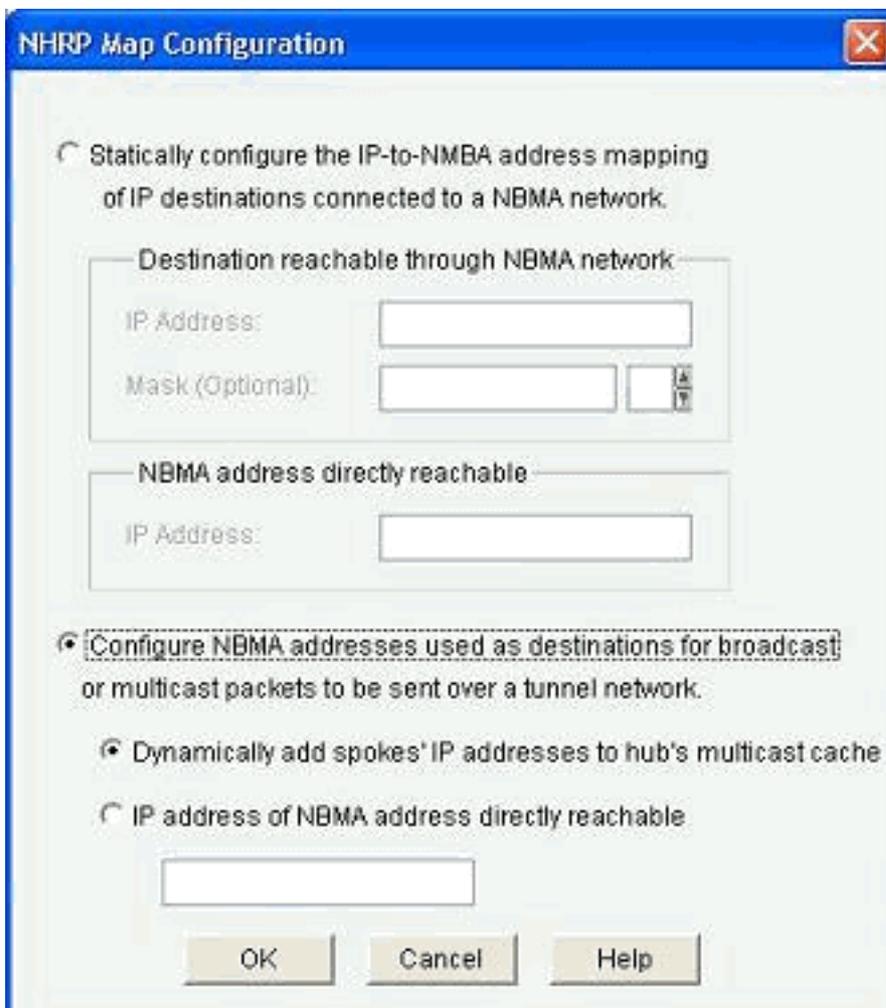
- IP address:** 192.168.10.2
- Mask:** 255.255.255.0, with a dropdown menu set to 24.
- Tunnel Source:**
 - Interface:** GigabitEthernet0/0
 - IP address:** (empty field)
- Tunnel Destination:**
 - This is an multipoint GRE Tunnel**
 - IP / Hostname:** (empty field)
- IPSec Profile:** CiscoCP_Profi, with an 'Add...' button.
- MTU:** 1400
- Bandwidth:** 1000
- Delay:** 1000
- Tunnel Key:** 100000

At the bottom, there are three buttons: 'OK', 'Cancel', and 'Help'.

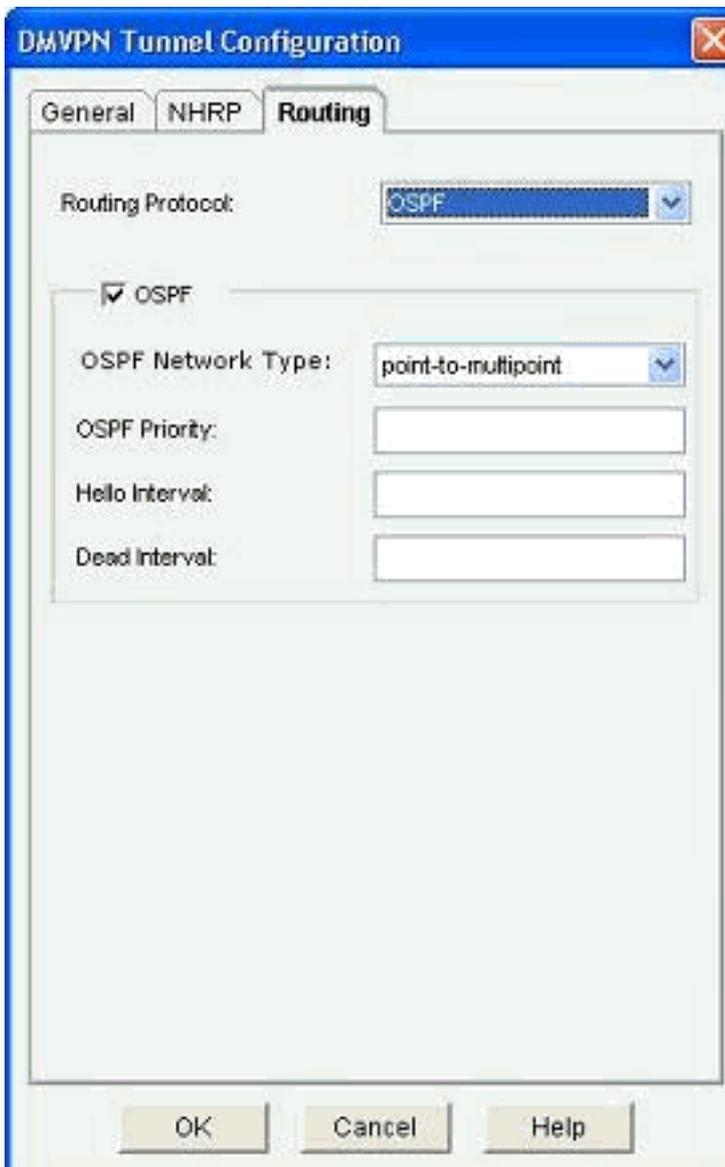
1. 根据NHRP选项卡下的要求，找到并修改NHRP相关参数。对于分支路由器，您应该能够将NHS视为中心路由器的IP地址。在NHRP Map部分中单击Add以添加NHRP映射。



2. 根据网络设置，NHRP映射参数可以配置如下



在“路由”(Routing)选项卡下查看和修改与路由相关的参数。



[更多信息](#)

DMVPN隧道的配置方式如下：

- 通过中心点的分支到分支通信
- 没有中心的分支到分支通信

在本文档中，仅讨论第一种方法。为了允许建立分支到分支的动态IPSec隧道，此方法用于将分支添加到DMVPN云：

1. 启动DMVPN向导并选择“分支”配置选项。
2. 从“DMVPN网络拓扑”窗口中，选择“全网状网络”选项，而不是“集线和分支网络”选项。

DMVPN Spoke Wizard - 10% Complete

VPN Wizard

DMVPN Network Topology

Select the DMVPN network topology.

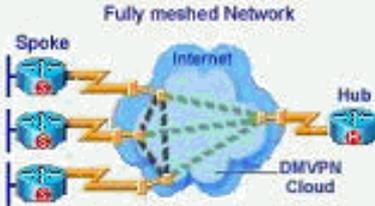
Hub and Spoke network

In this topology, all DMVPN traffic is routed through the hub. A point-to-point GRE interface will be configured on the spoke, and the spoke will use it to create a tunnel to the hub which will remain up. Spokes do not create GRE tunnels to other spokes in this topology.

Fully meshed network

In this topology, the spoke dynamically establishes a direct tunnel to another spoke device, and sends DMVPN traffic directly to it. A multipoint GRE tunnel interface is configured on the spoke to support this functionality.

Note: Cisco supports fully meshed DMVPN networks only in the following Cisco IOS images: 12.3(8)T1 and 12.3(9) or later.



< Back Next > Finish Cancel Help

3. 使用与本文档中其他配置相同的步骤完成其余配置。

验证

当前没有可用于此配置的验证过程。

相关信息

- [思科动态多点VPN:简单且安全的分支机构到分支机构通信](#)
- [IOS 12.2动态多点VPN\(DMVPN\)](#)
- [技术支持和文档 - Cisco Systems](#)