为SD-WAN实施直接互联网接入(DIA)

目录

简介

本文档介绍如何实施Cisco SD-WAN DIA。它是指直接从分支机构路由器断开Internet流量时的配置。

先决条件

要求

Cisco 建议您了解以下主题：

- 思科软件定义的广域网(SD-WAN)
- 网络地址转换 (NAT)

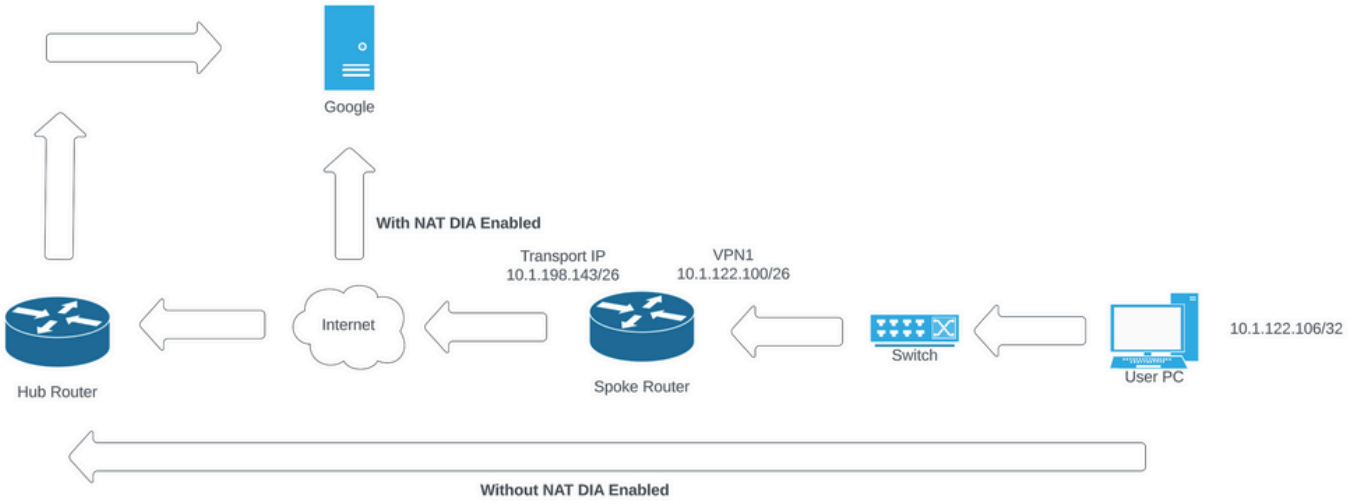
使用的组件

本文档中的信息基于以下软件和硬件版本：

- 思科vManage版本20.6.3
- 思科广域网边缘路由器17.4.2

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。如果您的网络处于活动状态，请确保您了解所有命令的潜在影响。

网络图



网络拓扑

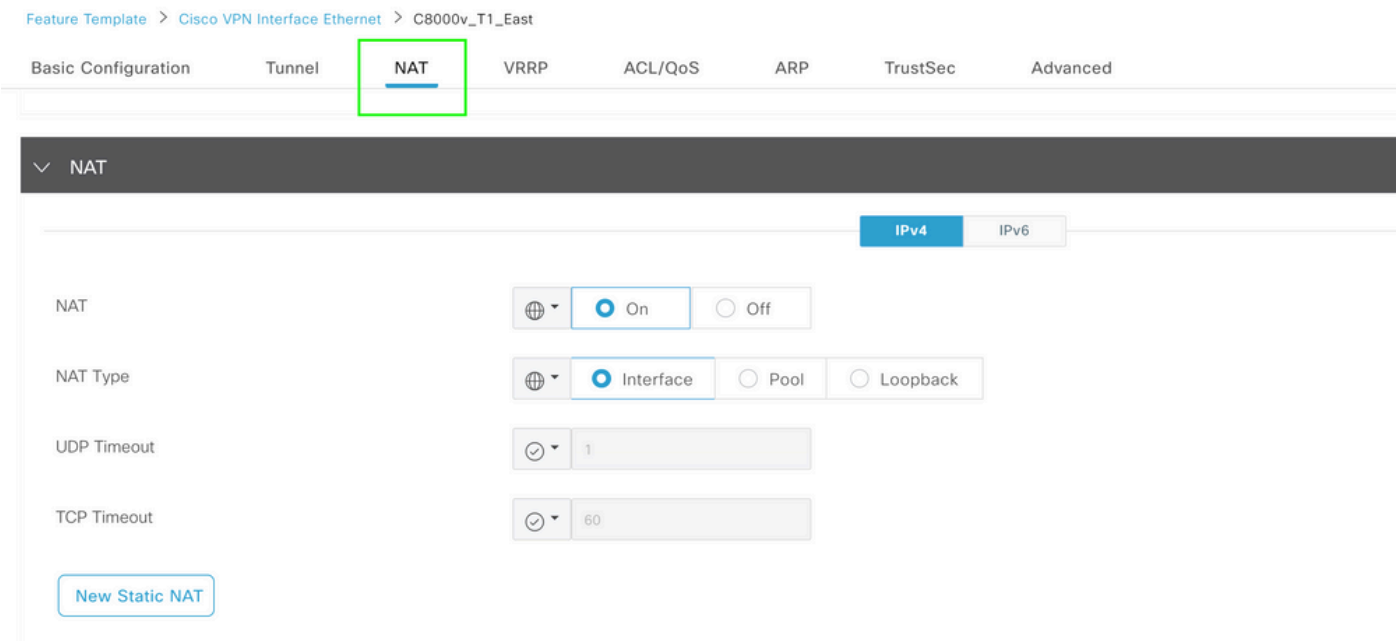
配置

思科SD-WAN路由器上的DIA分两个步骤启用：

1.在传输接口上启用NAT。

2.使用静态路由或集中数据策略从服务VPN直接传输流量。

在传输接口上启用NAT



VPN接口NAT模板

这是配置在启用NAT后的状态。

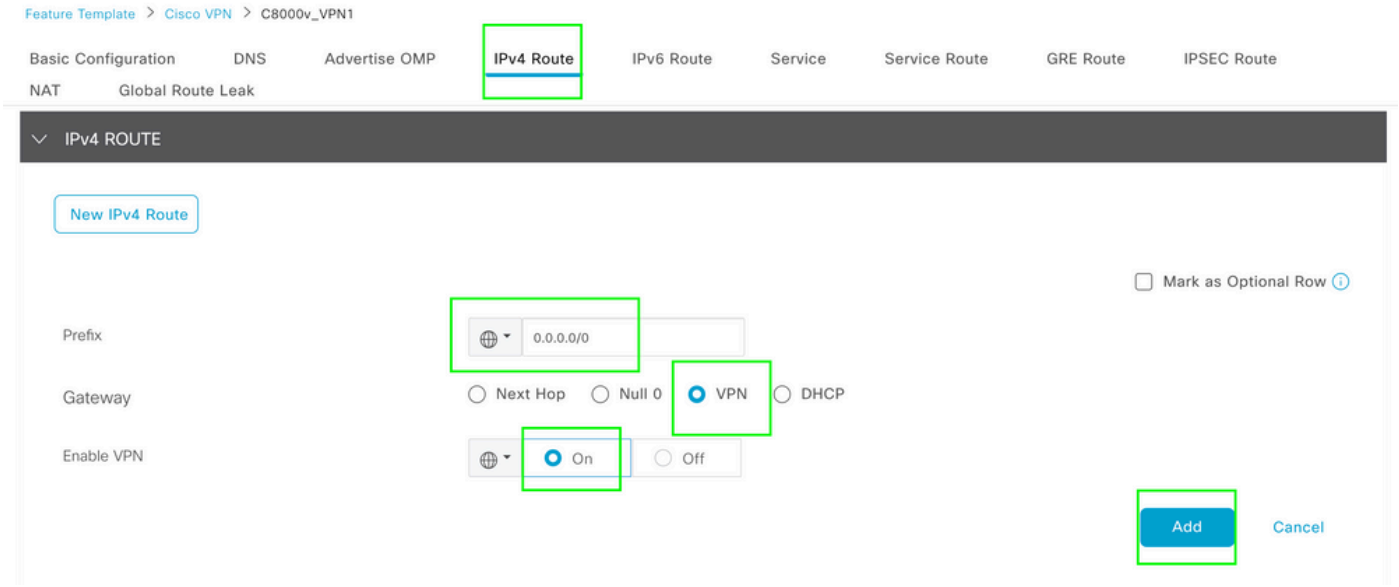
```
ip nat inside source list nat-dia-vpn-hop-access-list interface GigabitEthernet2 overload
ip nat translation tcp-timeout 3600
ip nat translation udp-timeout 60

interface GigabitEthernet2
ip nat outside
```

来自服务VPN的直接流量

这可以通过两种方式实现：

1.静态NAT路由：需要在服务VPN 1功能模板下创建静态NAT路由。



VPN 1 IPV4路由模板

此行作为配置的一部分推送。

```
ip nat route vrf 1 0.0.0.0 0.0.0.0 global
```

2.集中数据策略：

创建数据前缀列表，以便允许特定用户通过DIA访问Internet。

集中策略自定义数据前缀列表

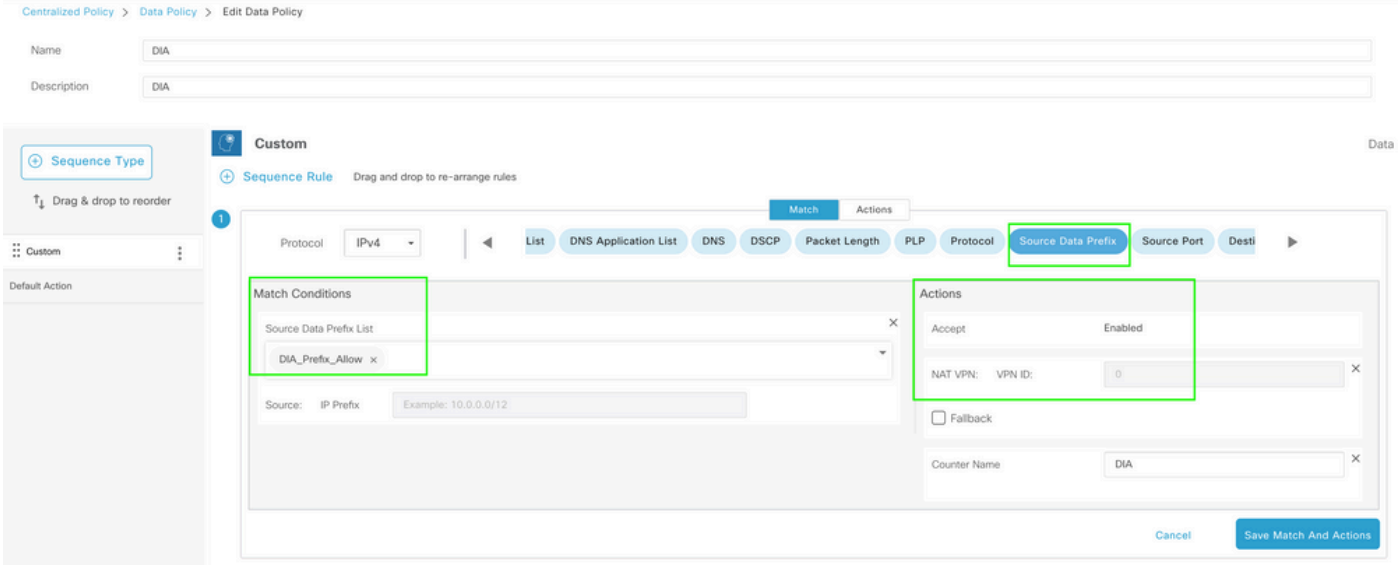
创建VPN列表，以便特定VPN用户可以发起流量。

集中策略自定义VPN列表

创建站点列表，以便将策略应用于特定站点。

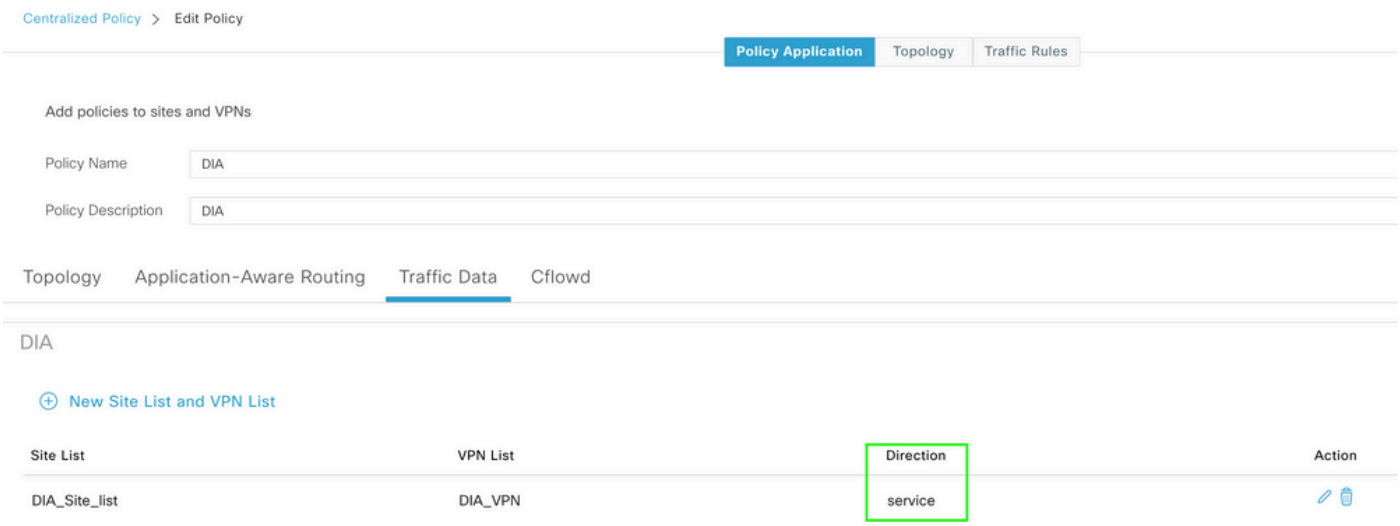
集中策略自定义站点列表

创建自定义数据策略以匹配源数据前缀，并将操作设置为使用NAT VPN 0，使其可以通过DIA。



集中数据策略

此策略的方向必须来自服务端。



流量数据规则

这是集中数据策略的预览。

```
viptela-policy:policy
 data-policy _DIA_VPN_DIA
  vpn-list DIA_VPN
    sequence 1
     match
      source-data-prefix-list DIA_Prefix_Allow
     !
     action accept
      nat use-vpn 0
      count DIA_1164863292
     !
    !
```

```
  default-action accept
 !
 lists
  data-prefix-list DIA_Prefix_Allow
   ip-prefix 10.1.122.106/32
  !
  site-list DIA_Site_list
   site-id 100004
  !
  vpn-list DIA_VPN
   vpn 1
  !
 !
!
apply-policy
 site-list DIA_Site_list
  data-policy _DIA_VPN_DIA from-service
 !
!
```

确认

无DIA

下一个输出捕获在服务端未启用NAT DIA时。

```
cEdge_Site1_East_01#show ip route vrf 1 nat-route

Routing Table: 1
Codes: L - local, C - connected, S - static, 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, m - OMP
       n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       H - NHRP, G - NHRP registered, g - NHRP registration summary
       o - ODR, P - periodic downloaded static route, l - LISP
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR
       & - replicated local route overrides by connected

Gateway of last resort is not set

cEdge_Site1_East_01#
```

默认情况下，VPN 1上的用户无法访问Internet。

```
C:\Users\Administrator>ping 8.8.8.8

Pinging 8.8.8.8 with 32 bytes of data:
Reply from 10.1.122.100: Destination host unreachable.
Reply from 10.1.122.100: Destination host unreachable.
Reply from 10.1.122.100: Destination host unreachable.
Reply from 10.1.122.100: Destination host unreachable.

Ping statistics for 8.8.8.8:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

C:\Users\Administrator>
```

使用DIA

1.静态NAT路由：下一个输出捕获在服务端上启用的NAT DIA。

```
cEdge_Site1_East_01#show ip route vrf 1 nat-route

Routing Table: 1
Codes: L - local, C - connected, S - static, 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, m - OMP
       n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       H - NHRP, G - NHRP registered, g - NHRP registration summary
       o - ODR, P - periodic downloaded static route, l - LISP
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR
       & - replicated local route overrides by connected

Gateway of last resort is 0.0.0.0 to network 0.0.0.0

n*Nd  0.0.0.0/0 [6/0], 01:41:46, Null0

cEdge_Site1_East_01#
```

VPN 1中的用户现在可以访问Internet。

```
C:\Users\Administrator>ping 8.8.8.8

Pinging 8.8.8.8 with 32 bytes of data:
Reply from 8.8.8.8: bytes=32 time=1ms TTL=52
Reply from 8.8.8.8: bytes=32 time=1ms TTL=52
Reply from 8.8.8.8: bytes=32 time=1ms TTL=52
Reply from 8.8.8.8: bytes=32 time=1ms TTL=52

Ping statistics for 8.8.8.8:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
```

```
Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\Users\Administrator>
```

后续输出捕获NAT转换。

```
cEdge_Site1_East_01#sh ip nat translations
Pro  Inside global         Inside local          Outside local         Outside global
icmp 10.1.198.143:1        10.1.122.106:1        8.8.8.8:1             8.8.8.8:1

Total number of translations: 1
```

下一命令捕获数据包必须采用的路径。

```
cEdge_Site1_East_01#show sdwan policy service-path vpn 1 interface GigabitEthernet 4 source-ip 10.1.122
Next Hop: Remote
  Remote IP: 10.1.198.129, Interface GigabitEthernet2 Index: 8
```

2.集中数据策略：

将集中数据策略推送到vSmart后， show sdwan policy from-vsmart data-policy 命令可用于广域网边缘设备，以验证设备已接收的策略。

```
cEdge_Site1_East_01#show sdwan policy from-vsmart data-policy
from-vsmart data-policy _DIA_VPN_DIA
 direction from-service
 vpn-list DIA_VPN
  sequence 1
   match
    source-data-prefix-list DIA_Prefix_Allow
   action accept
    count DIA_1164863292
    nat use-vpn 0
    no nat fallback
  default-action accept

cEdge_Site1_East_01#
```

VPN 1中的用户现在可以访问Internet。

```
C:\Users\Administrator>ping 8.8.8.8

Pinging 8.8.8.8 with 32 bytes of data:
Reply from 8.8.8.8: bytes=32 time=4ms TTL=52
```

```
Reply from 8.8.8.8: bytes=32 time=1ms TTL=52
Reply from 8.8.8.8: bytes=32 time=1ms TTL=52
Reply from 8.8.8.8: bytes=32 time=1ms TTL=52

Ping statistics for 8.8.8.8:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 4ms, Average = 1ms

C:\Users\Administrator>
```

下一命令捕获数据包必须采用的路径。

```
cEdge_Site1_East_01#show sdwan policy service-path vpn 1 interface GigabitEthernet 4 source-ip 10.1.122
Next Hop: Remote
  Remote IP: 10.1.198.129, Interface GigabitEthernet2 Index: 8
```

后续输出捕获NAT转换。

```
cEdge_Site1_East_01#sh ip nat translations
Pro  Inside global         Inside local          Outside local         Outside global
icmp 10.1.198.143:1        10.1.122.106:1        8.8.8.8:1             8.8.8.8:1

Total number of translations: 1
```

此输出捕获计数器增量。

```
cEdge_Site1_East_01#show sdwan policy data-policy-filter
data-policy-filter _DIA_VPN_DIA
 data-policy-vpnlist DIA_VPN
  data-policy-counter DIA_1164863292
   packets 4
   bytes   296
  data-policy-counter default_action_count
   packets 0
   bytes   0

cEdge_Site1_East_01#
```

此输出捕获由于源IP不属于数据前缀列表而被黑洞的流量。

```
cEdge_Site1_East_01#show sdwan policy service-path vpn 1 interface GigabitEthernet 4 source-ip 10.1.122
Next Hop: Blackhole
```

```
cEdge_Site1_East_01#
```

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