

为SD-WAN实施直接互联网接入(DIA)

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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)

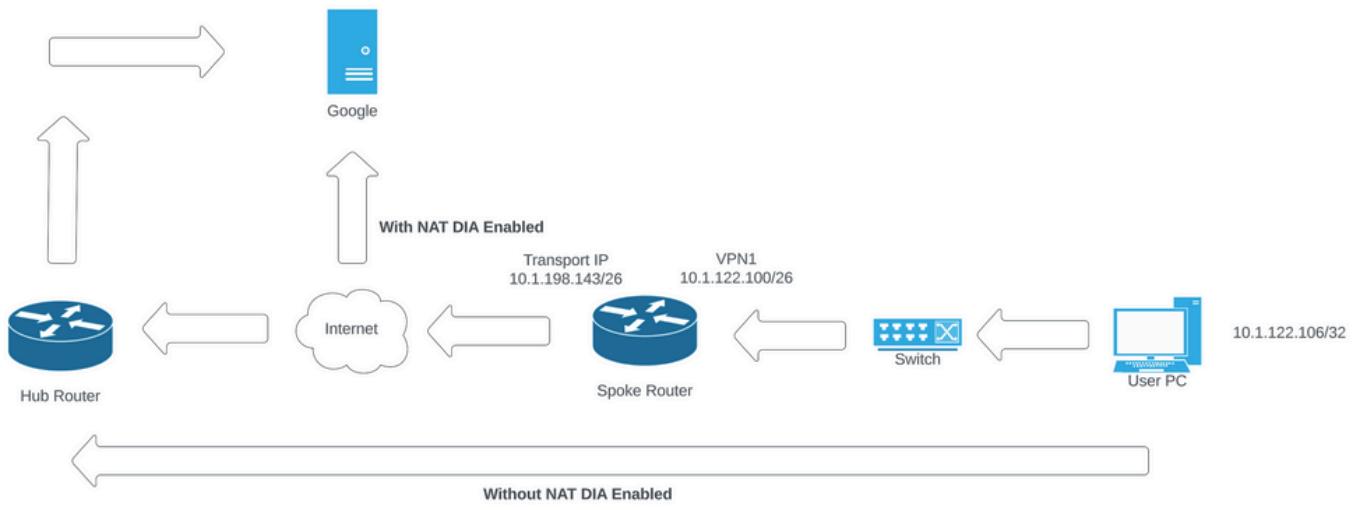
使用的组件

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

Feature Template > Cisco VPN Interface Ethernet > C8000v_T1_East

Basic Configuration	Tunnel	NAT	VRRP	ACL/QoS	ARP	TrustSec	Advanced
NAT <div style="display: flex; justify-content: space-between;"> IPv4 IPv6 </div> <div style="margin-top: 10px;"> <div style="display: flex; align-items: center;"> NAT <div style="margin-left: 10px;"> <input checked="" type="radio"/> On <input type="radio"/> Off </div> </div> <div style="margin-top: 10px;"> NAT Type <div style="display: flex; align-items: center;"> <input checked="" type="radio"/> Interface <input type="radio"/> Pool <input type="radio"/> Loopback </div> </div> <div style="margin-top: 10px;"> UDP Timeout <input type="text" value="1"/> </div> <div style="margin-top: 10px;"> TCP Timeout <input type="text" value="60"/> </div> <div style="margin-top: 10px;"> New Static NAT </div> </div>							

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

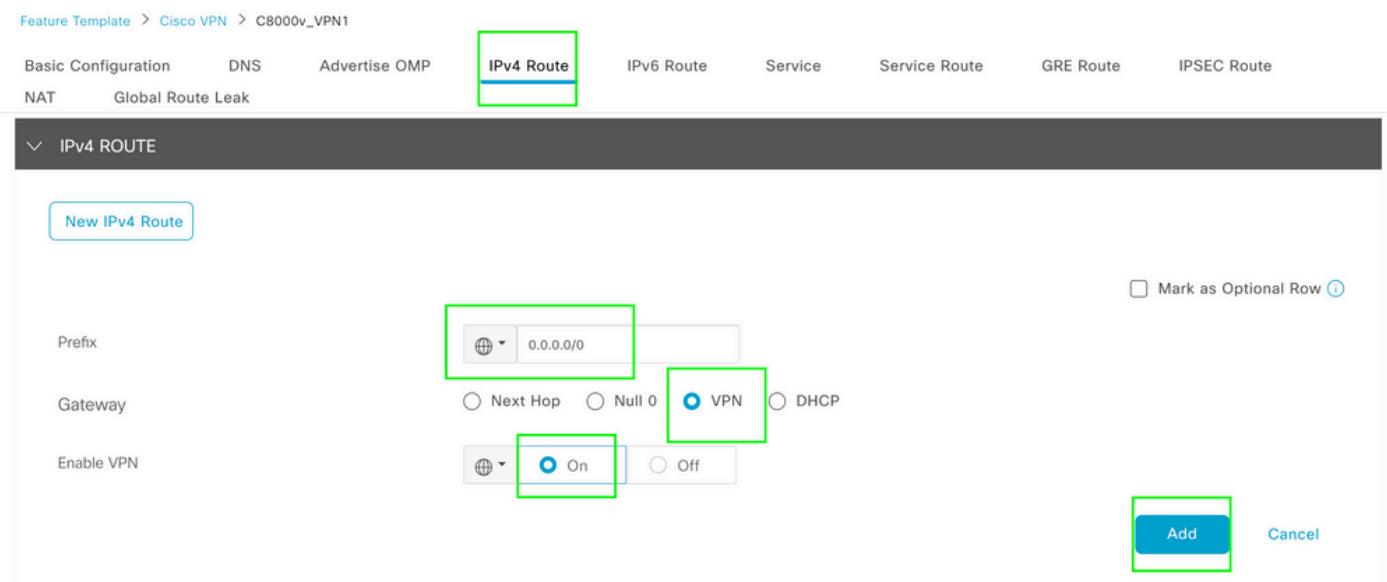
interface GigabitEthernet2
ip nat outside

```

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。

Select a list type on the left and start creating your groups of interest

Application	Name	Entries	Internet Protocol	Reference Count	Updated By	Last Updated	Action
Data Prefix	DIA_Prefix_Allow	10.1.122.106/32	IPv4	1	admin	18 Jul 2023 9:31:26 AM CDT	

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。

Select a list type on the left and start creating your groups of interest

Application	Name	Entries	Reference Count	Updated By	Last Updated	Action
VPN	DIA_VPN	1	1	admin	18 Jul 2023 9:56:21 AM CDT	

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。

Select a list type on the left and start creating your groups of interest

Application	Name	Entries	Reference Count	Updated By	Last Updated	Action
Site	DIA_Site_list	100004	1	admin	18 Jul 2023 10:03:59 AM CDT	

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。

Centralized Policy > Data Policy > Edit Data Policy

Name	DIA
Description	DIA

Custom

Sequence Type: Custom

Sequence Rule: Drag and drop to re-arrange rules

Protocol: IPv4

Match Actions

Source Data Prefix (highlighted)

Actions: Accept (Enabled), NAT VPN: VPN ID: 0, Counter Name: DIA

Save Match And Actions

集中数据策略

此策略的方向必须来自服务端。

Centralized Policy > Edit Policy

Policy Application (highlighted), Topology, Traffic Rules

Add policies to sites and VPNs

Policy Name: DIA

Policy Description: DIA

Topology, Application-Aware Routing, Traffic Data (highlighted), Cflowd

DIA

New Site List and VPN List

Site List	VPN List	Direction (highlighted)	Action
DIA_Site_list	DIA_VPN	service	

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.

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

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#

关于此翻译

思科采用人工翻译与机器翻译相结合的方式将此文档翻译成不同语言，希望全球的用户都能通过各自的语言得到支持性的内容。

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