在FMC管理的FTD上为双ISP配置PBR的IP SLA

目录

简介

本文档介绍如何在由(FMC)管理的FTD上配置PBR和IP SLA。

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先决条件

要求

Cisco 建议您了解以下主题：

- 上的PBR配置 **Cisco Adaptive Security Appliance (ASA)**
- FlexConfig开启 **Firepower**
- IP SLA

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FTD版本7.0.0（内部版本94）
- 思科FMC 7.0.0版（内部版本94）

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。

背景信息

本文档介绍如何配置 **Policy Based Routing (PBR)** 以及 **Internet Protocol Service Level Agreement (IP SLA)** 在思科 **Firepower Threat Defense (FTD)** 由思科Firepower管理**中心(FMC)管理**。

传统路由仅根据目的IP地址做出转发决策。PBR是路由协议和静态路由的替代方案。

它提供对路由的更精细控制，因为它允许使用源IP地址或源和目标端口等参数作为除目标IP地址以外的路由标准。

PBR的可能方案包括源敏感应用或专用链路上的流量。

与PBR一起，可以实施IP SLA以确保下一跳的可用性。IP SLA是一种通过交换常规数据包来监控端到端连接的机制。

在发布时，PBR不直接通过FMC支持 **Graphical User Interface (GUI)** ，配置功能需要使用FlexConfig策略。

另一方面，只有 **Internet Control Message Protocol (ICMP)** FTD支持SLA。

在本例中，PBR用于通过主路由器路由数据包 **Internet Service Provider (ISP)** 根据源IP地址的电路。

同时，IP SLA会监控连接性，并在出现任何故障时强制回退到备用电路。

配置

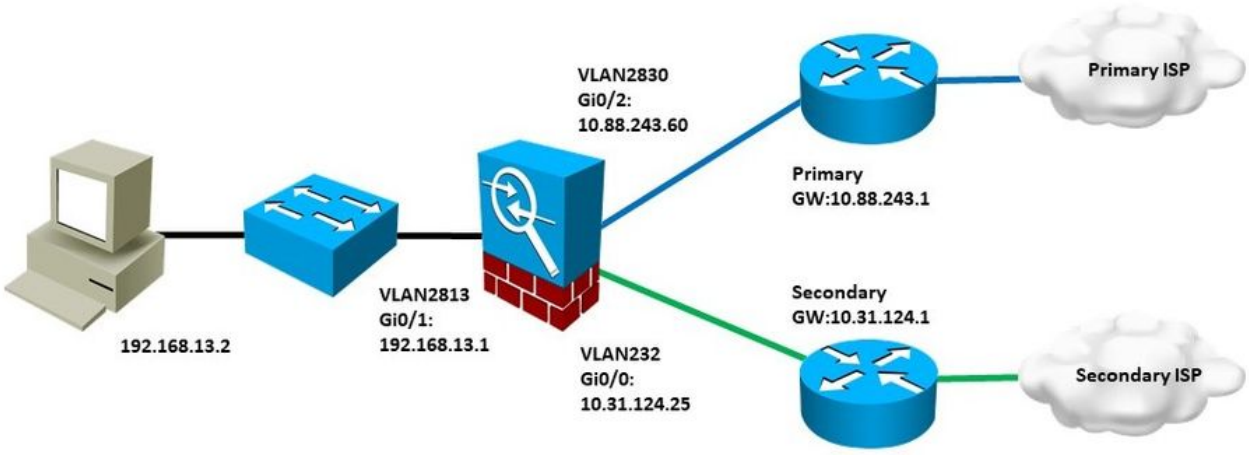
网络图

在本示例中，Cisco FTD有两个外部接口：VLAN230和VLAN232。每个交换机都连接到不同的ISP。

来自内部网络VLAN2813的流量通过使用PBR的主要ISP路由。

PBR路由映射仅根据源IP地址做出转发决策（从VLAN2813接收的所有内容都必须路由到VLAN230中的10.88.243.1），并且应用于FTD的接口GigabitEthernet 0/1。

同时，FTD使用IP SLA来监控与每个ISP网关的连接。如果VLAN230中发生任何故障，FTD会故障切换到备用电路VLAN232。

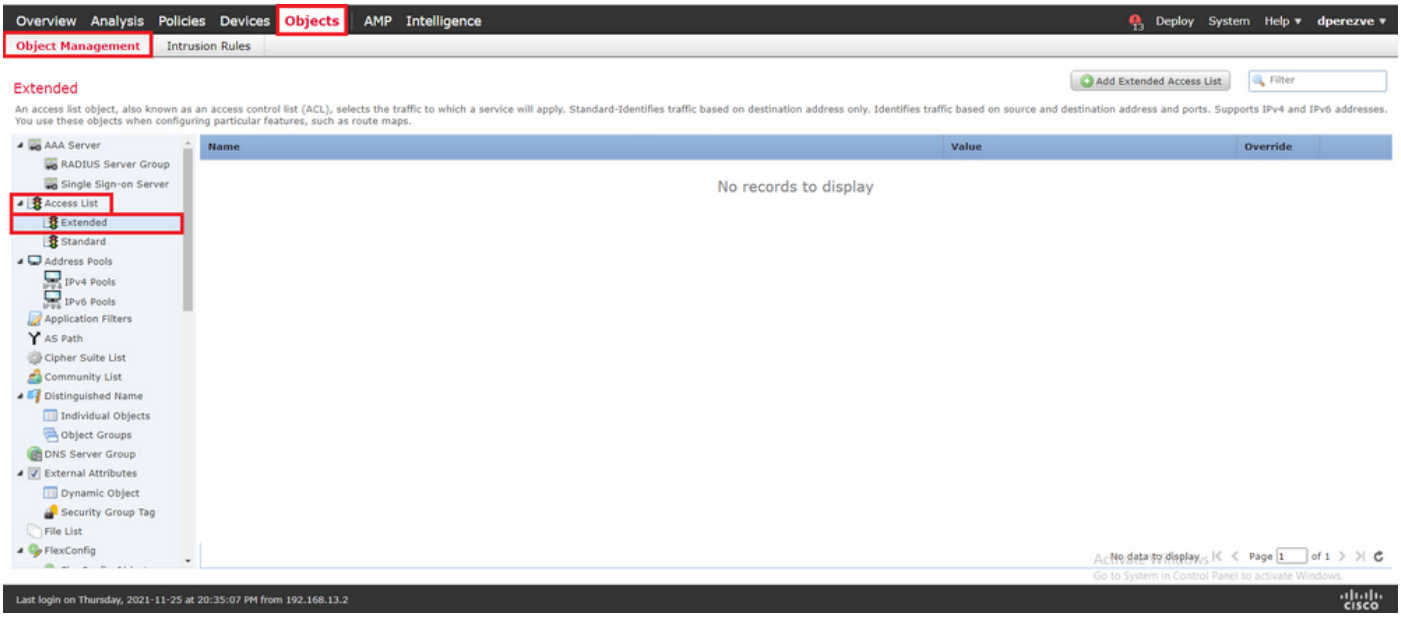


配置

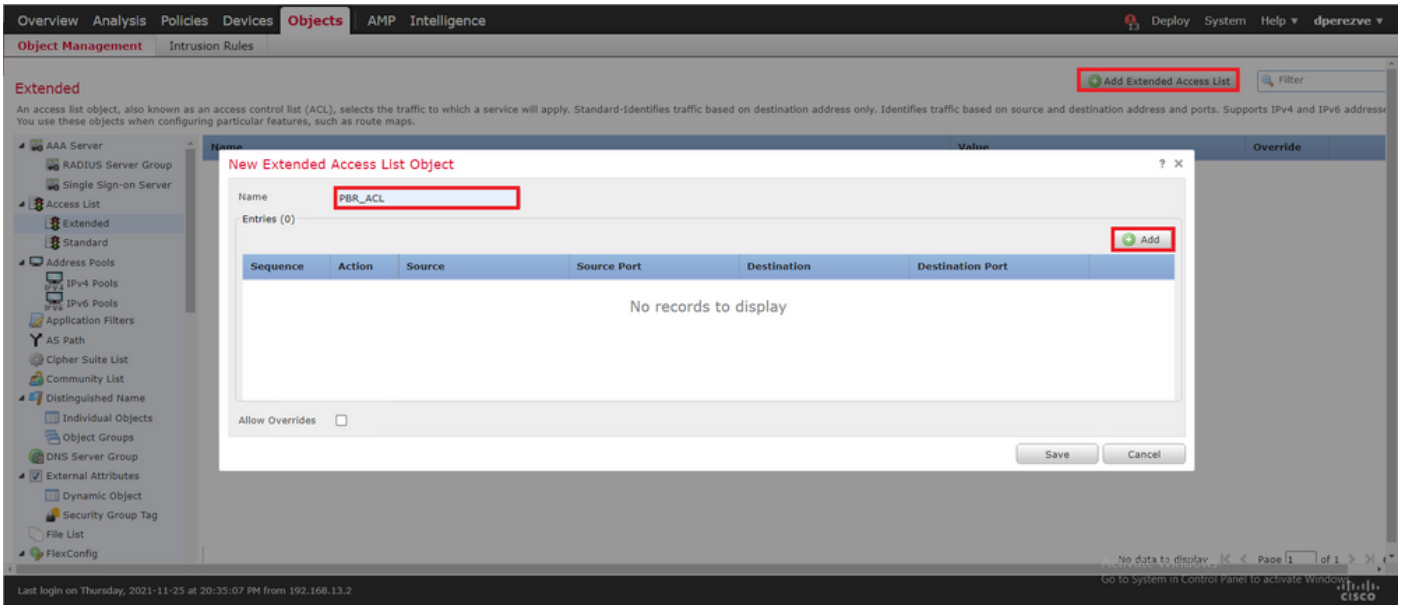
步骤1:配置PBR访问列表

在PBR配置的第一步中，定义哪些数据包必须遵循路由策略。PBR使用路由映射和访问列表来识别流量。

要定义匹配条件的访问列表，请导航至 **Objects > Object Management** 并选择 **Extended** 在 **Access List** 目录中的类别。



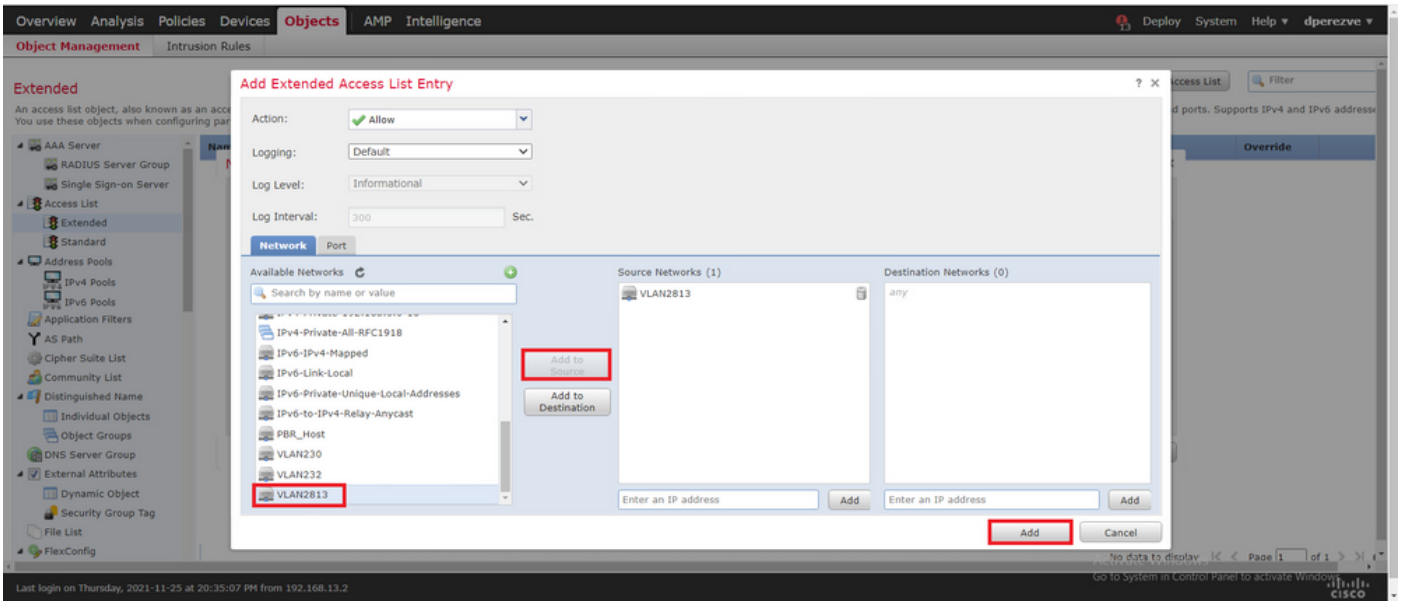
点击 **Add Extended Access List** .如果 **New Extended Access List Object** 窗口中，为对象指定名称，然后选择 **Add** 按钮以从访问列表配置开始。



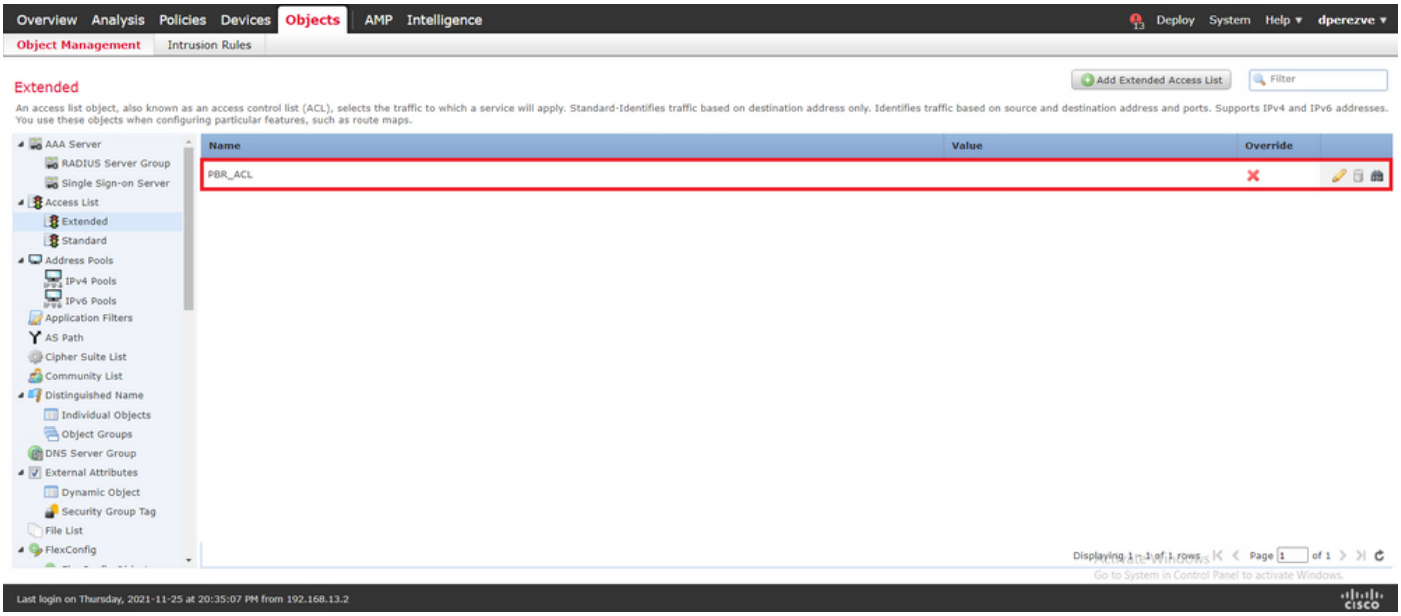
如果 **Add Extended Access List Entry** 窗口中，选择代表内部网络的对象，本例中为VLAN2813。

点击 **Add to Source** 将其定义为访问列表的源。

点击 **Add** 创建条目。



点击 **Save** .必须将对象添加到对象列表中。

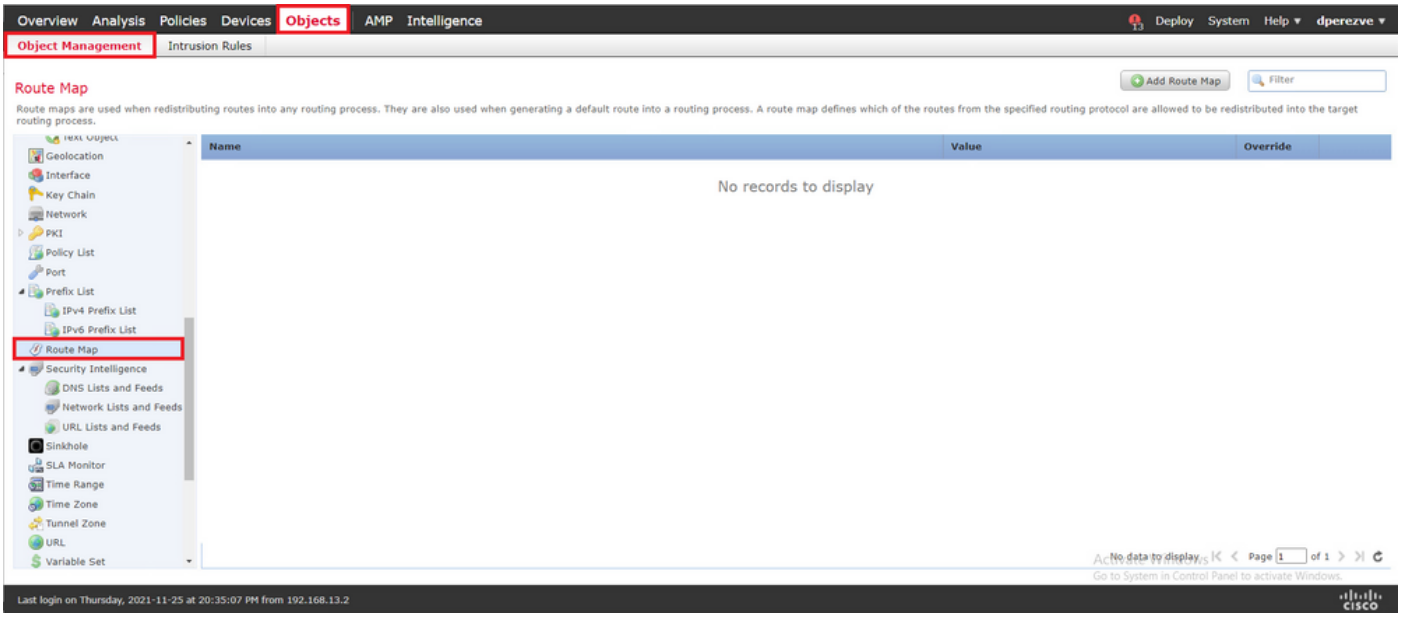


第二步：配置PBR路由映射

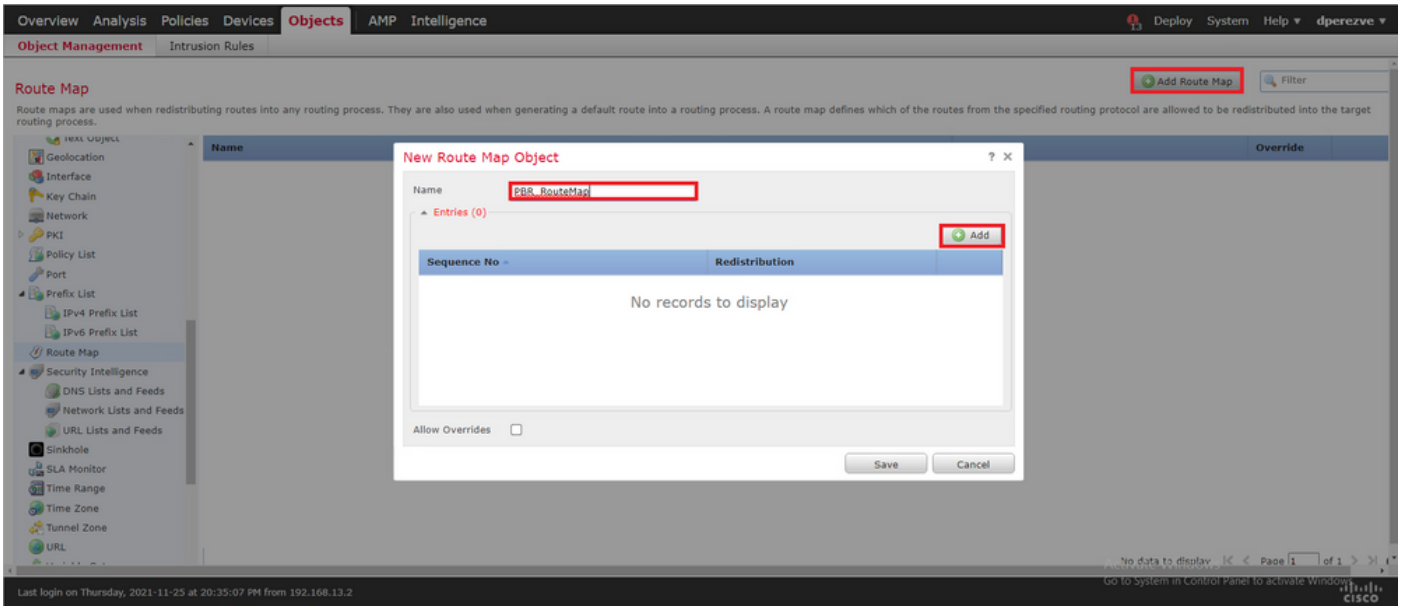
配置PBR访问列表后，将其分配给路由映射。路由映射根据访问列表中定义的match子句评估流量。

匹配发生后，路由映射将执行路由策略中定义的操作。

要定义路由映射，请导航至 **Objects > Object Management** 并选择 **Route Map** 在目录下。



点击 **Add Route Map >**.如果 **New Route Map Object** 为对象指定名称，然后单击 **Add** 以创建新的路由映射条目。



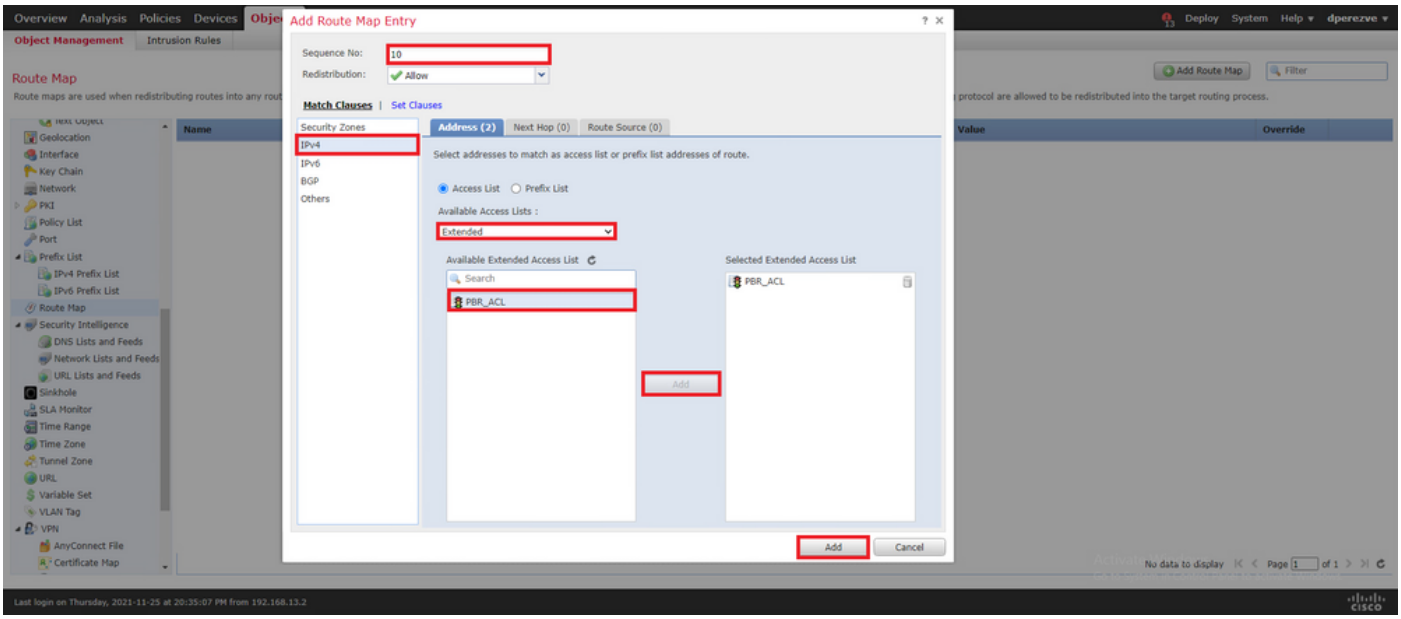
如果 **Add Route Map Entry** 窗口中，定义新条目的位置的序列号。

导航至 **IPv4 > Match Clauses** 并在中选择**Extended Available Access List** 下拉菜单。

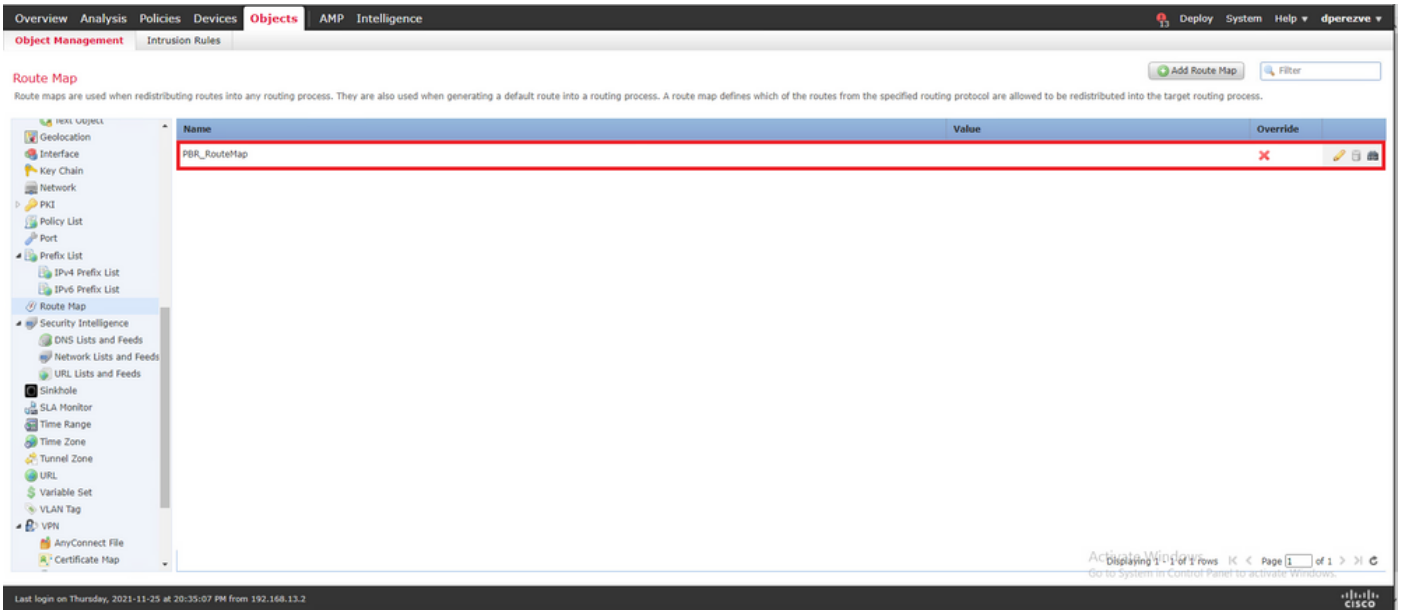
选择在第1步中创建的访问列表对象。

点击 **Add** 创建条目。

注意:FTD最多支持65536(从0到65535)个不同的条目。数字越低，优先级评估越高。



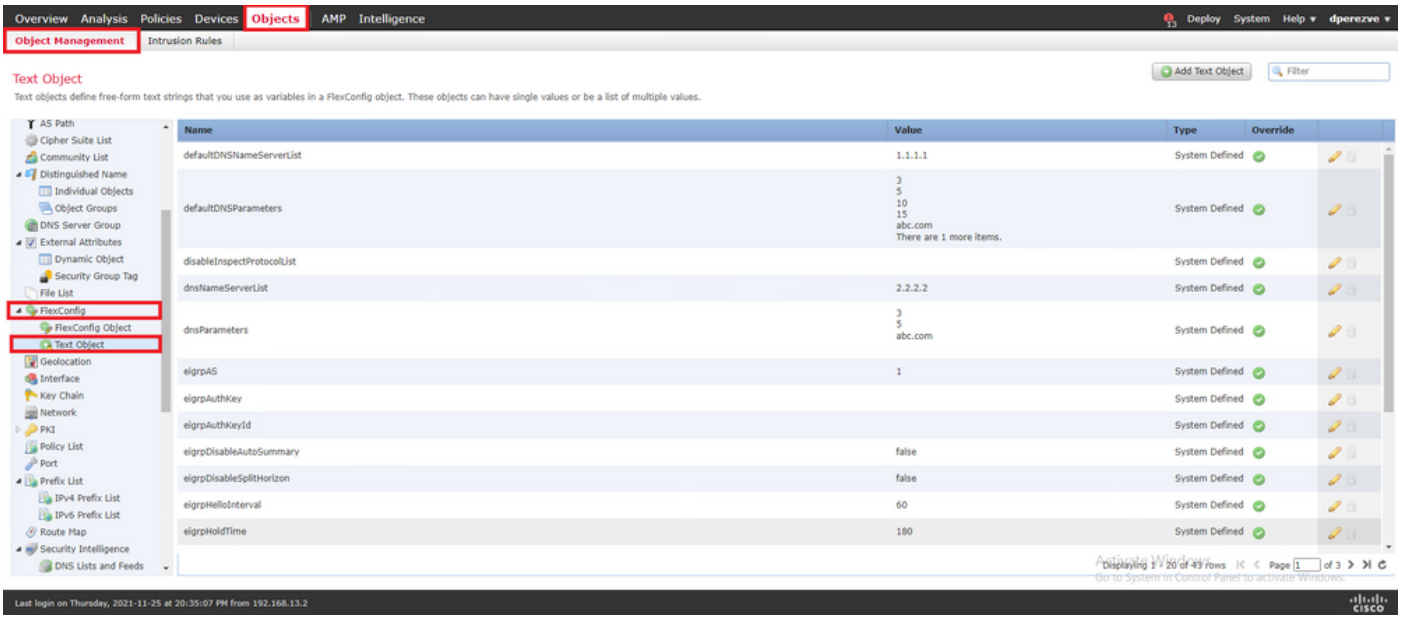
点击 **Save** . 将对象添加到对象列表。



第三步：配置FlexConfig文本对象

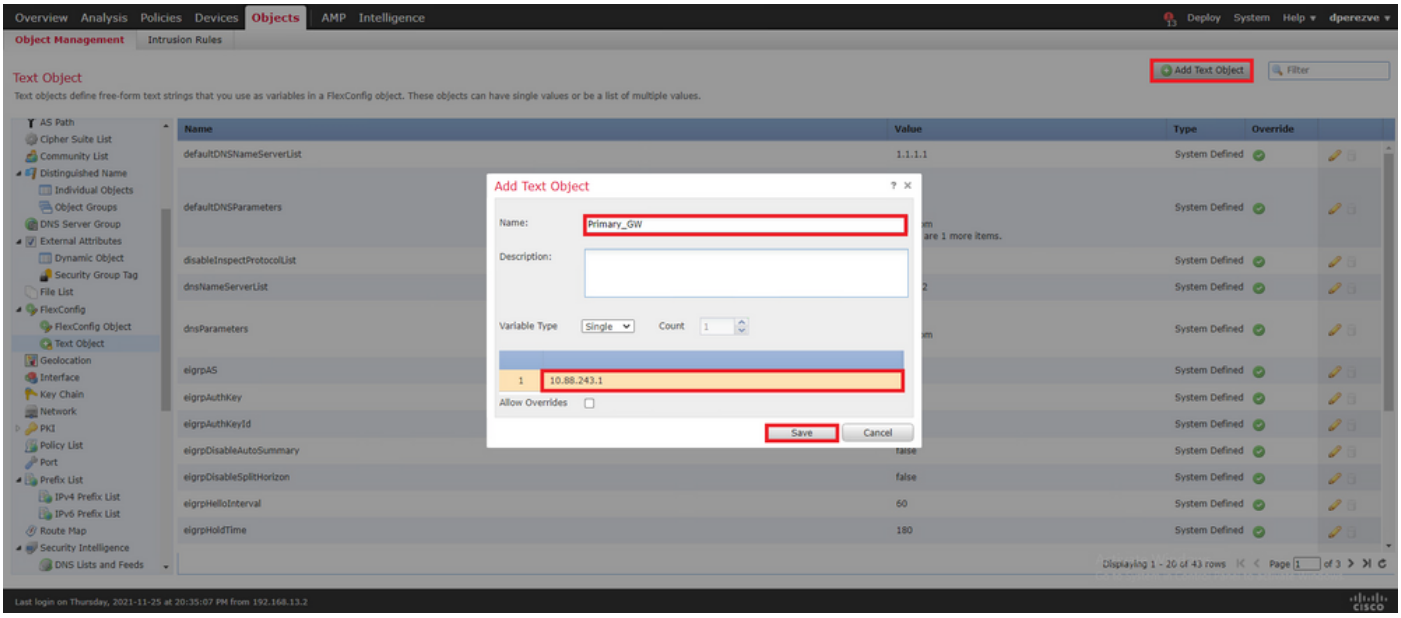
下一步涉及定义代表每个电路的默认网关的FlexConfig文本对象。这些文本对象稍后将用于将PBR与SLA关联的FlexConfig对象的配置中。

要定义FlexConfig文本对象，请导航至 **Objects > Object Management** 并选择 **Text Object** 在 **FlexConfig** 目录中的类别。



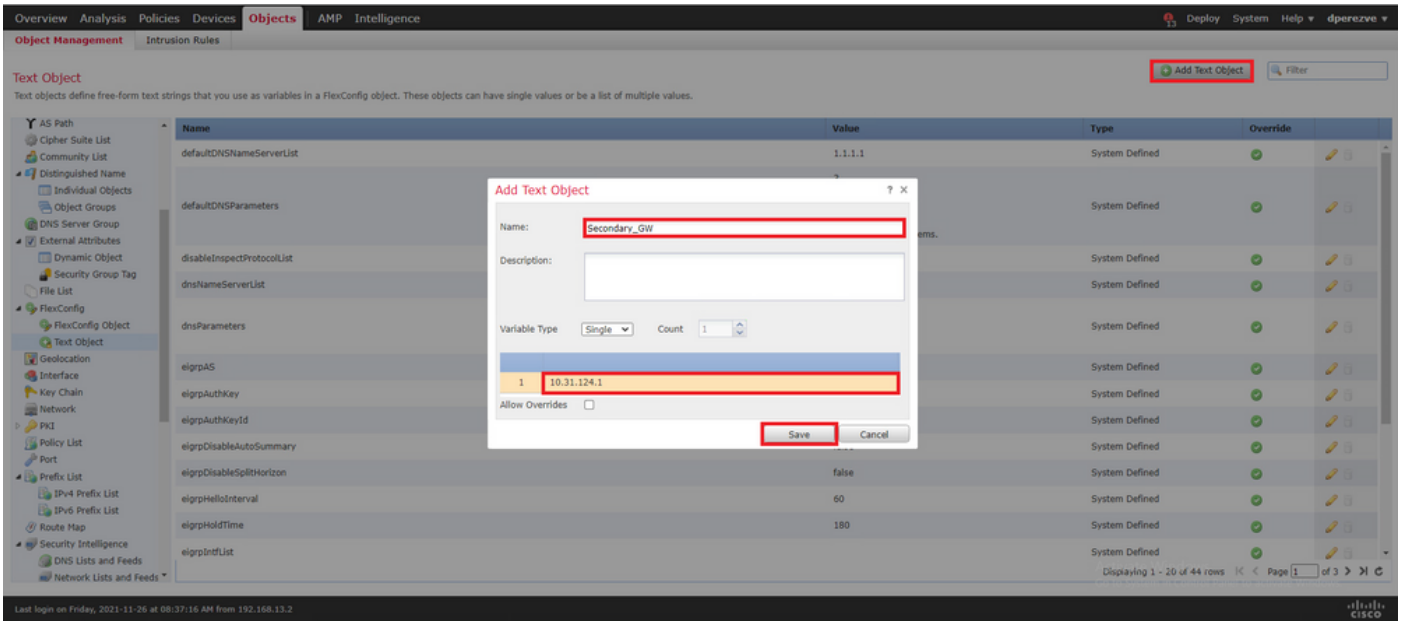
点击 **Add Text Object** .如果 **Add Text Object** 窗口中，为代表主网关的对象分配名称，并指定此设备的IPv4地址。

点击 **Save** 添加新对象。

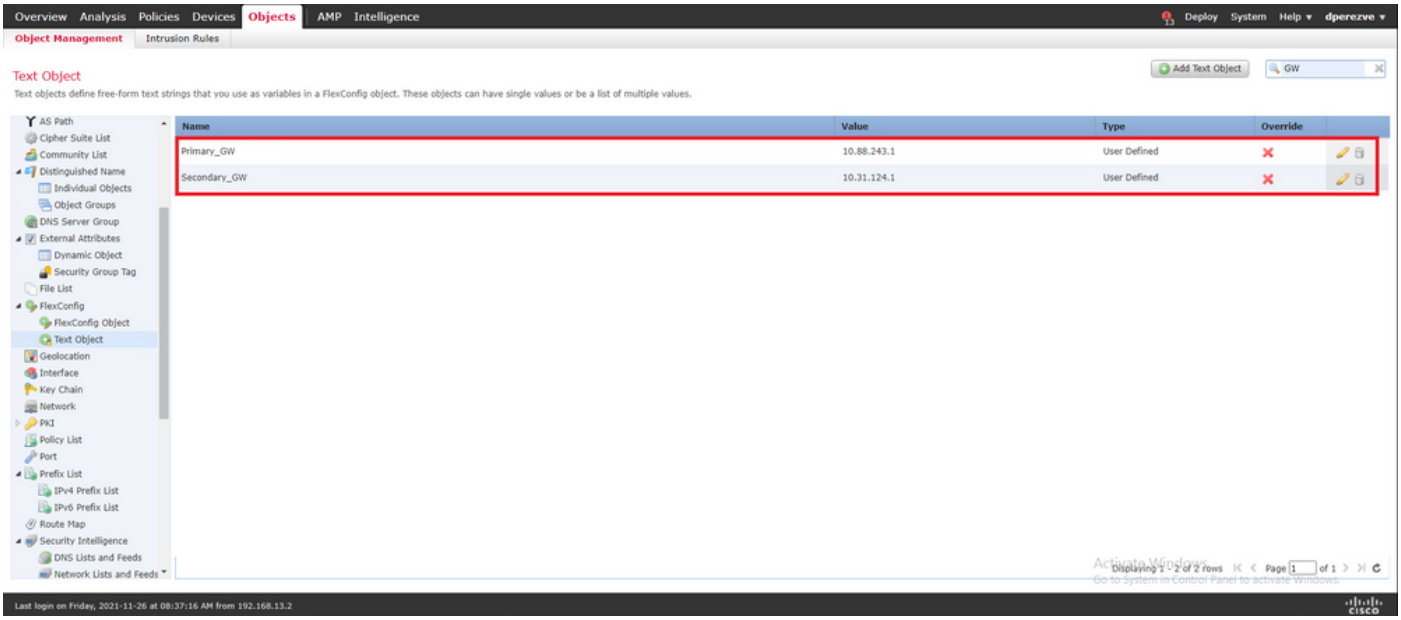


点击 **Add Text Object** 再次创建第二个对象，这次用于备份电路上的网关。

使用适当的名称和IP地址填充新对象，然后单击 **Save** .

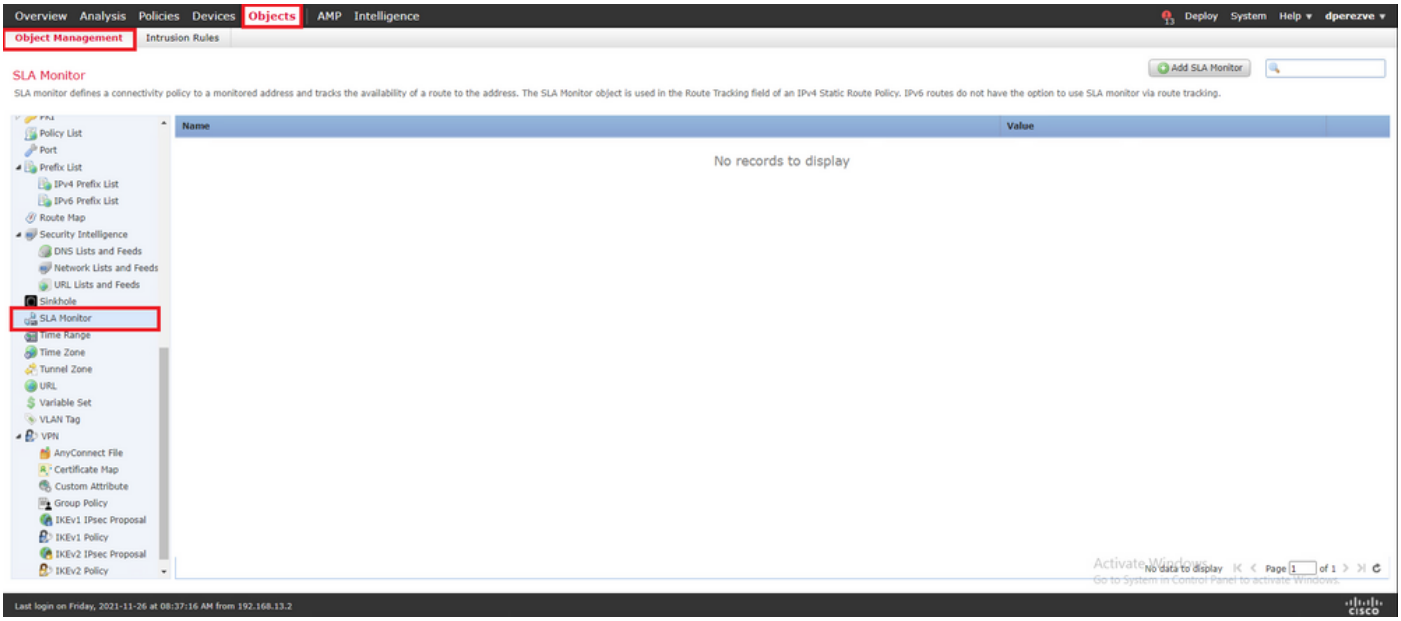


必须将这两个对象连同默认对象一起添加到列表中。



第四步：配置SLA监控器

要定义用于监控每个网关连接的SLA对象，请导航至 **Objects > Object Management** 并选择 **SLA Monitor** 在目录下。



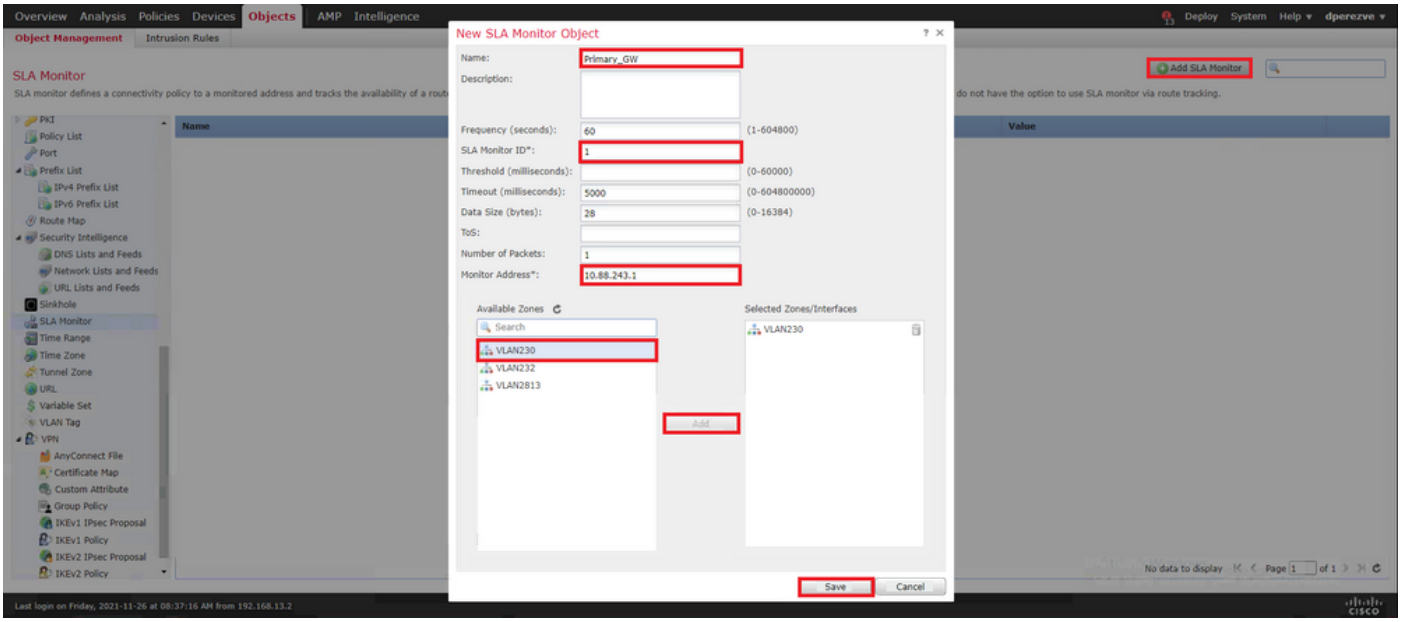
选择 **Add SLA Monitor** 对象。

如果 **New SLA Monitor** 窗口中，定义名称以及SLA操作的标识符、必须监控的设备的IP地址（在本例中是主网关），以及可访问设备的接口或区域。

此外，还可以调整超时和阈值。点击 **Save** .

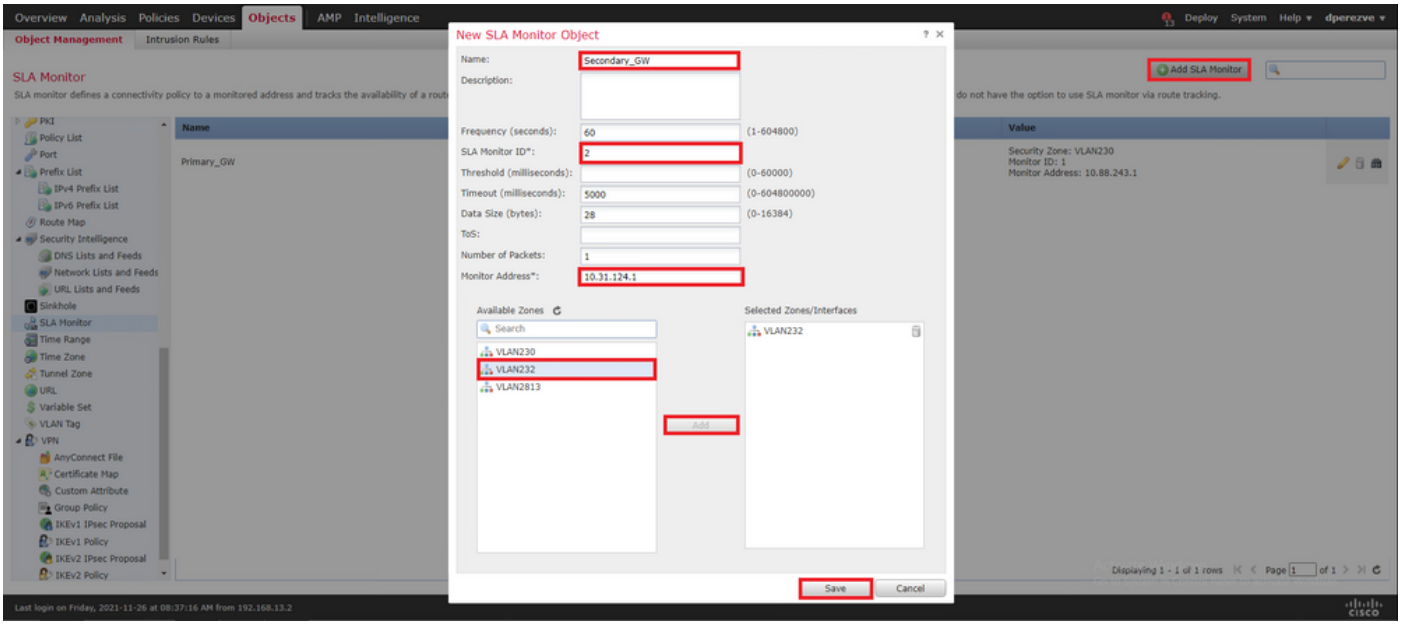
注意:FTD最多支持2000个SLA操作。SLA ID的值范围为1至2147483647。

注意：如果未指定超时和阈值，则FTD使用默认计时器：每种情况下均为5000毫秒。

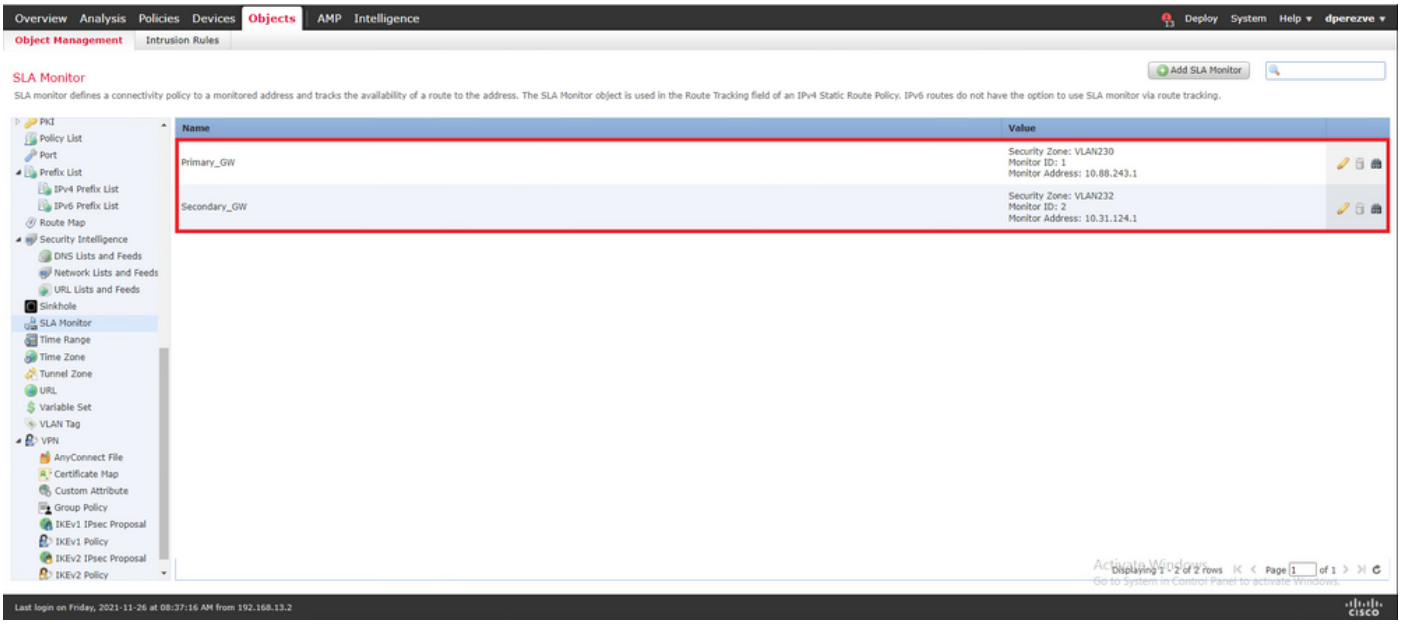


选择 **Add SLA Monitor** 按钮，以创建第二个对象，此时间用于备用电路上的网关。

使用适当信息填充新对象，确保SLA ID不同于为主网关定义的SLA ID，并保存更改。



必须将这两个对象添加到列表中。

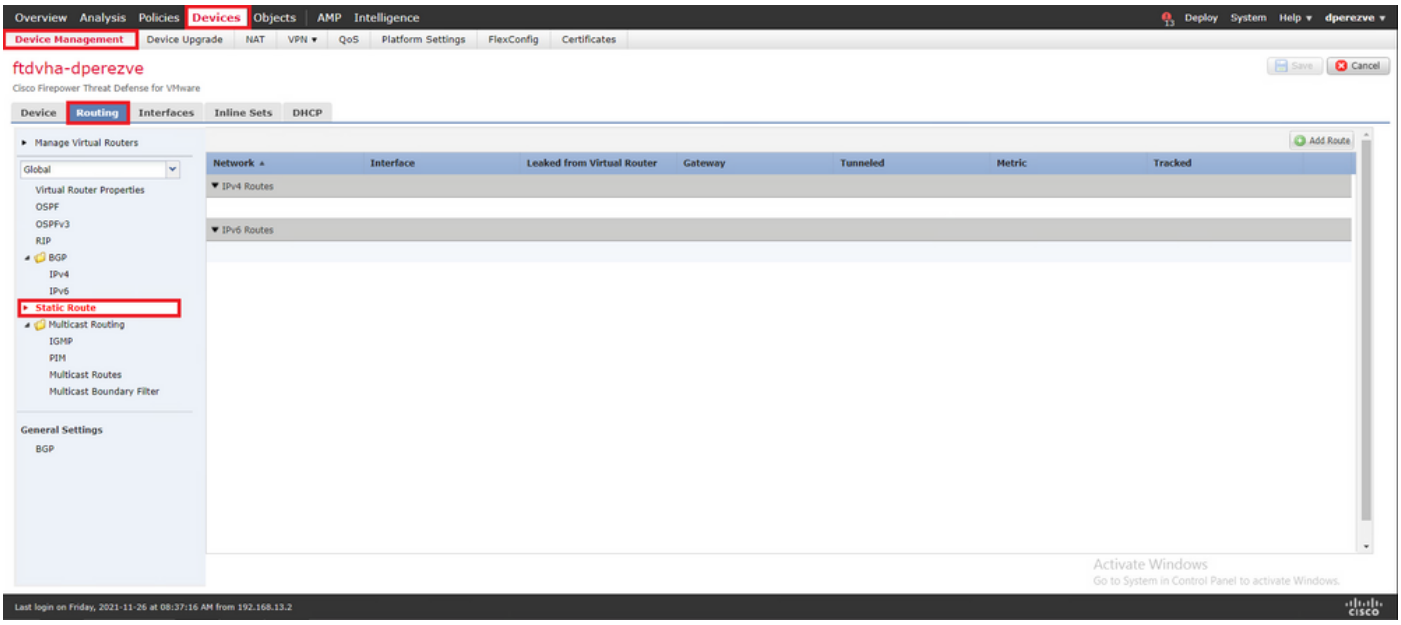


第四步：使用路由跟踪配置静态路由

创建IP SLA对象后，为每个网关定义路由并将它们与SLA关联。

这些路由实际上并不提供从内部到外部的连接（所有路由都通过PBR执行），而是需要它们通过SLA跟踪到网关的连接。

要配置静态路由，请导航至 **Devices > Device Management** ，编辑手头的FTD并选择 **Static Route** 在目录内 **Routing** 选项卡。

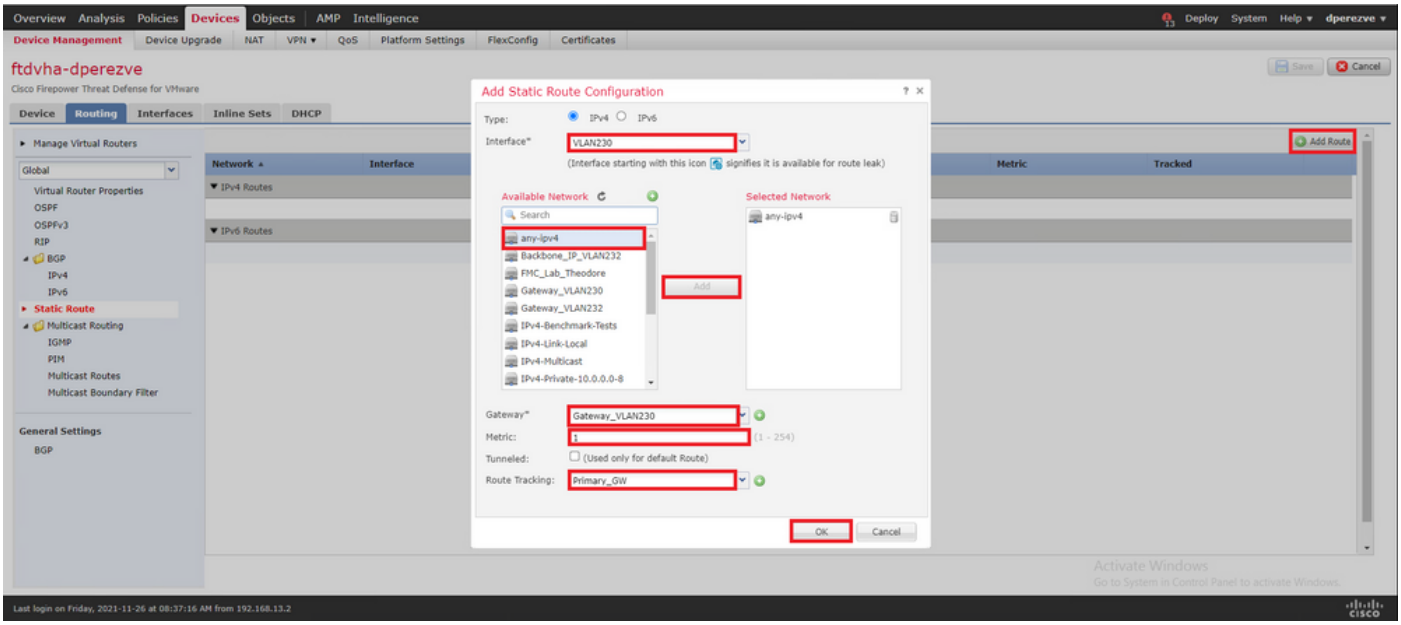


如果 **Add Static Route Configuration** 窗口中，在Interface下拉列表中，指定必须通过其到达主网关的接口的名称。

然后在列表中选择目标网络和主网关 **Gateway** 下拉列表。

指定路由的度量，并在 **Route Track** 下拉列表，并为第3步中创建的主网关选择SLA对象。

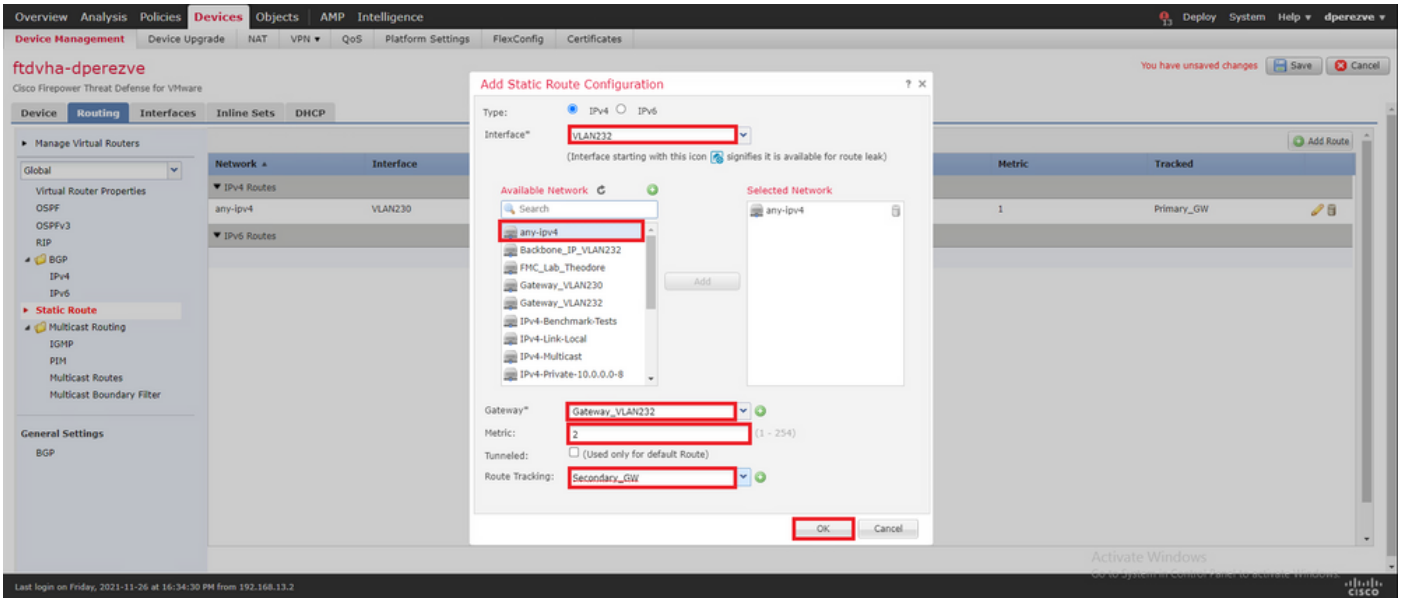
单击OK添加新路由。



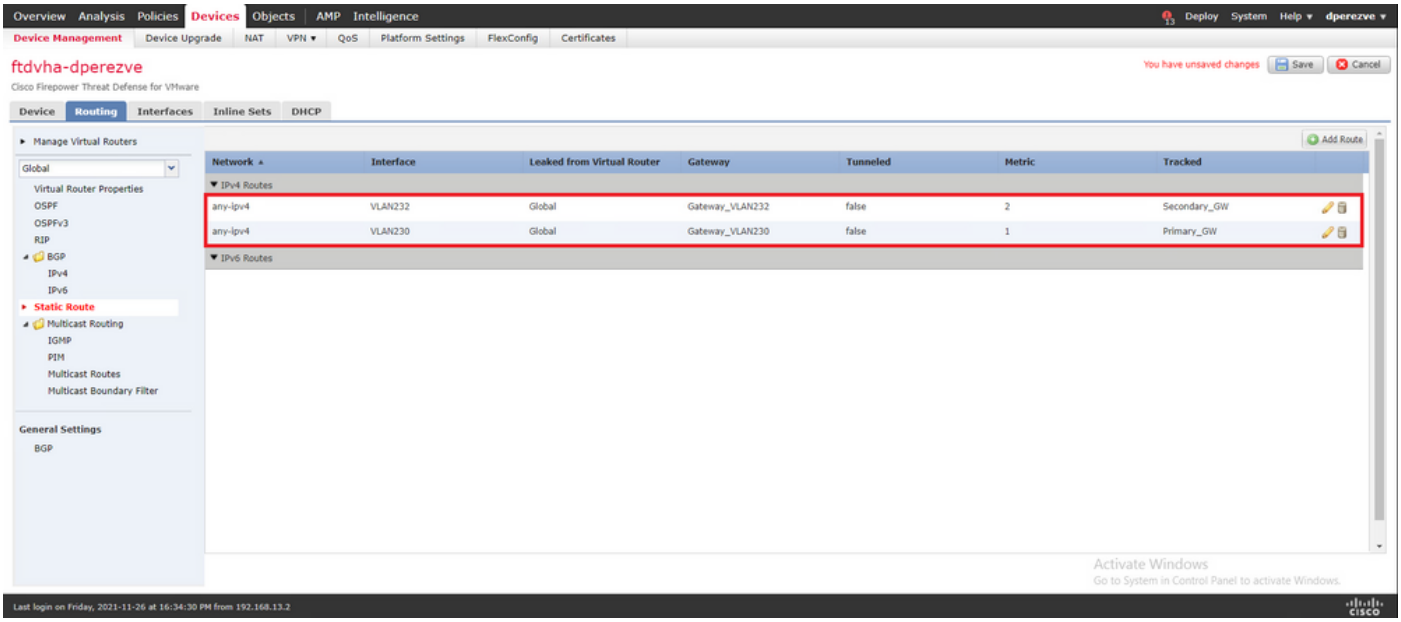
必须为备用网关配置另一条静态路由。

点击 **Add Route** 定义新的静态路由。

填写 **Add Static Route Configuration** 和备份网关的信息，并确保此路由的度量高于第一个路由中配置的度量。



必须将这两条路由添加到列表中。

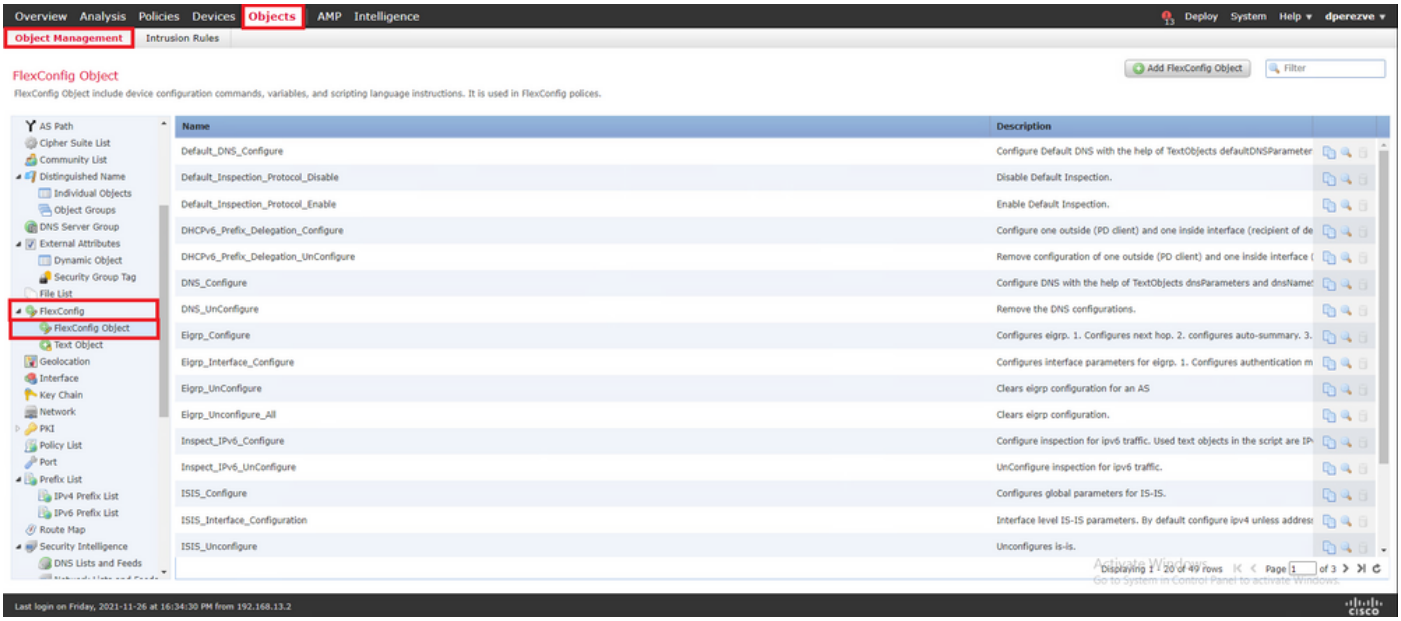


第五步：配置PBR FlexConfig对象

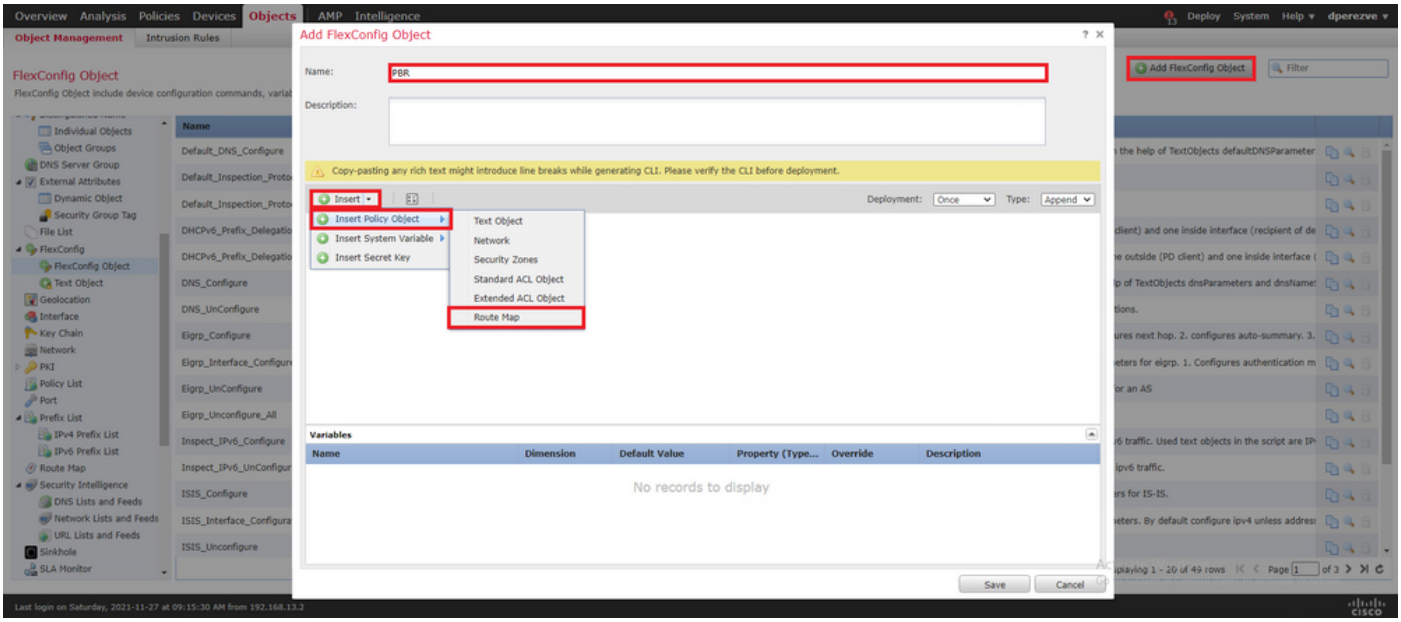
在用于PBR的路由映射下启用SLA，并在FTD的接口中应用此路由映射。

到目前为止，路由映射只与定义匹配条件的访问列表相关联。但是，FMC GUI不支持最后的调整，因此需要一个FlexConfig对象。

要定义PBR FlexConfig对象，请导航至 **Objects > Object Management** 并选择 **FlexConfig Object** 在 **FlexConfig** 目录中的类别。

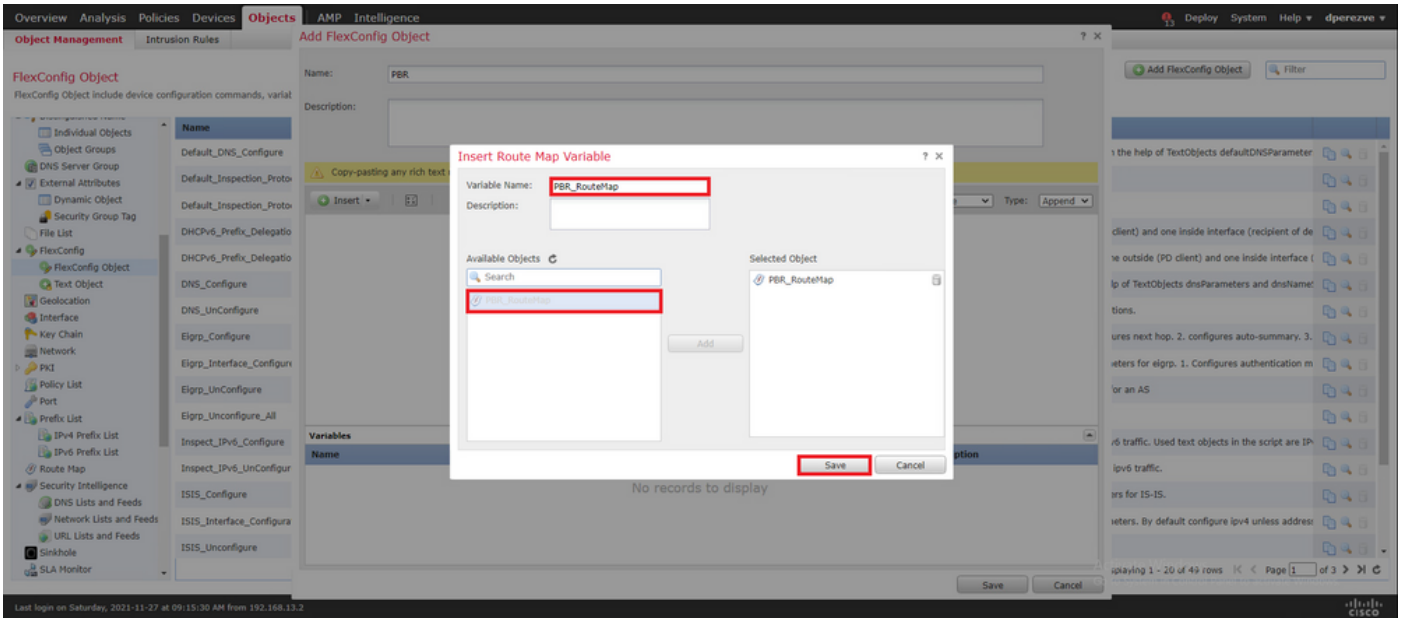


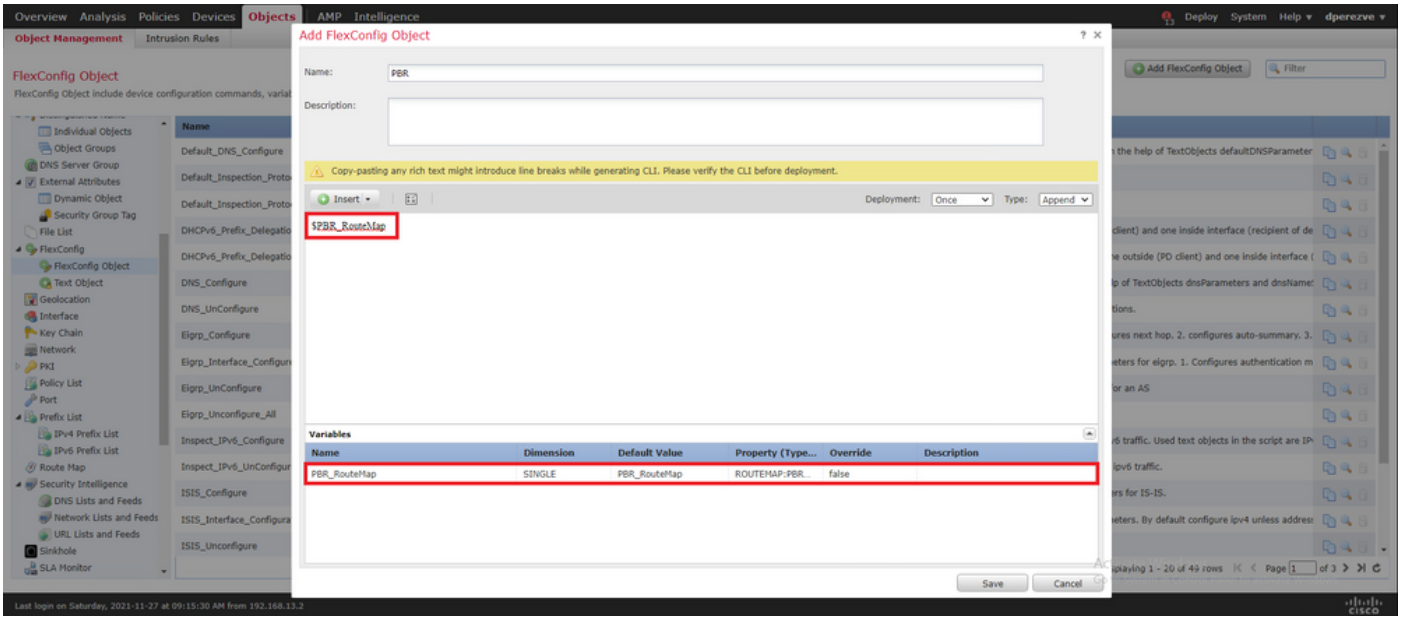
选择 **Add FlexConfig Object** 按钮。如果 **Add FlexConfig Object** 窗口指定名称并导航至 **Insert > Insert Policy Object > Route Map** .



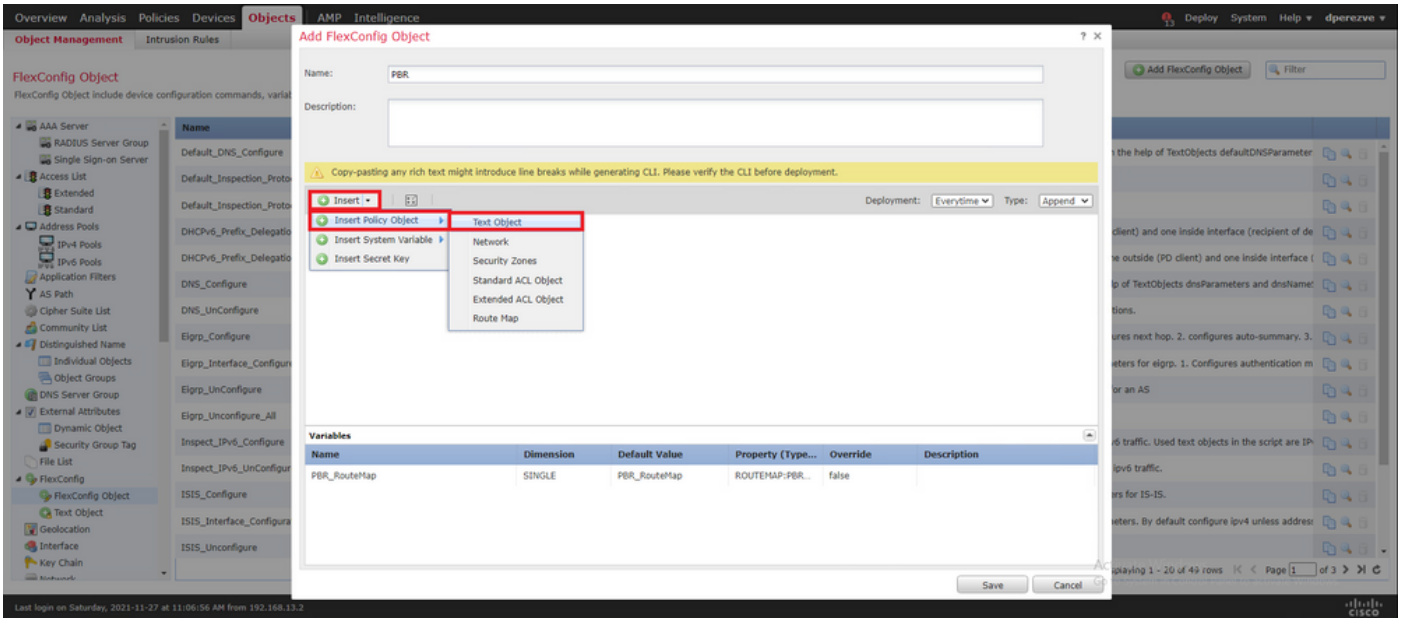
如果 **Insert Route Map Variable** 窗口中，为变量指定名称，并选择在步骤2中创建的PBR对象。

点击 **Save** 添加路由映射作为FlexConfig对象的一部分。



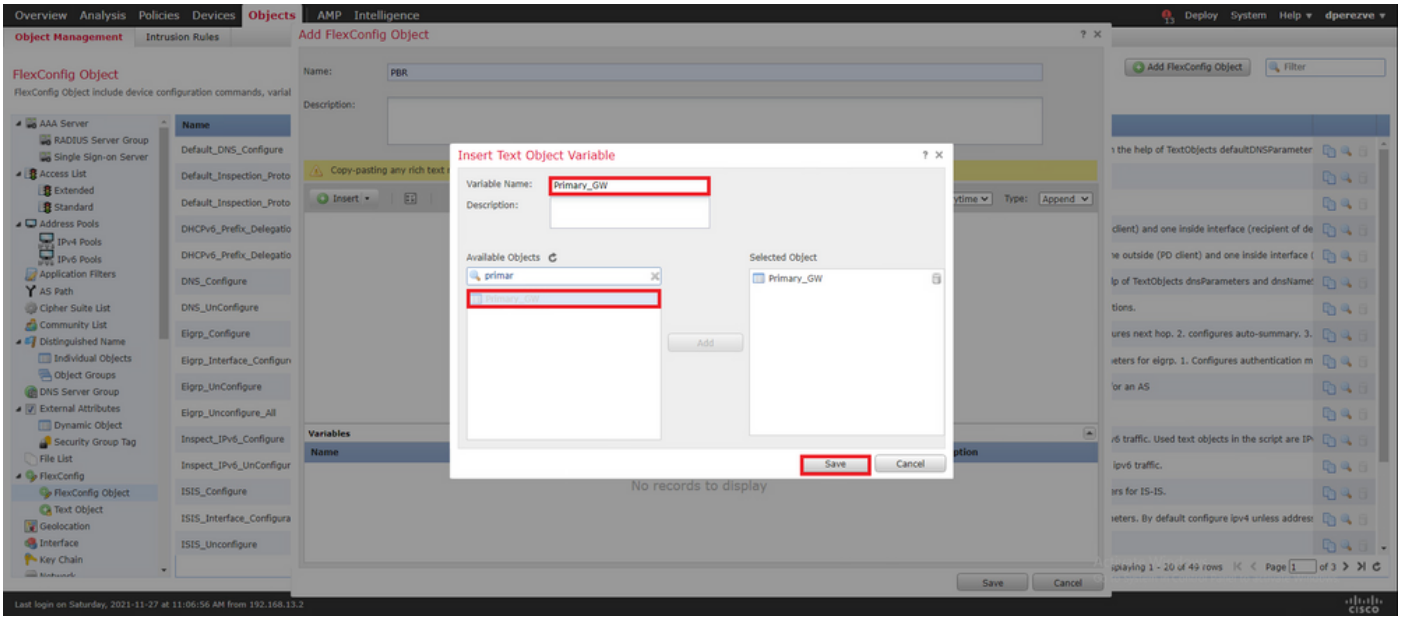


除了路由映射变量之外，我们还必须添加代表每个网关的FlexConfig文本对象（在步骤3中定义）。如果 **Add FlexConfig Object** 窗口导航至 **Insert > Insert Policy Object > Text Object** .

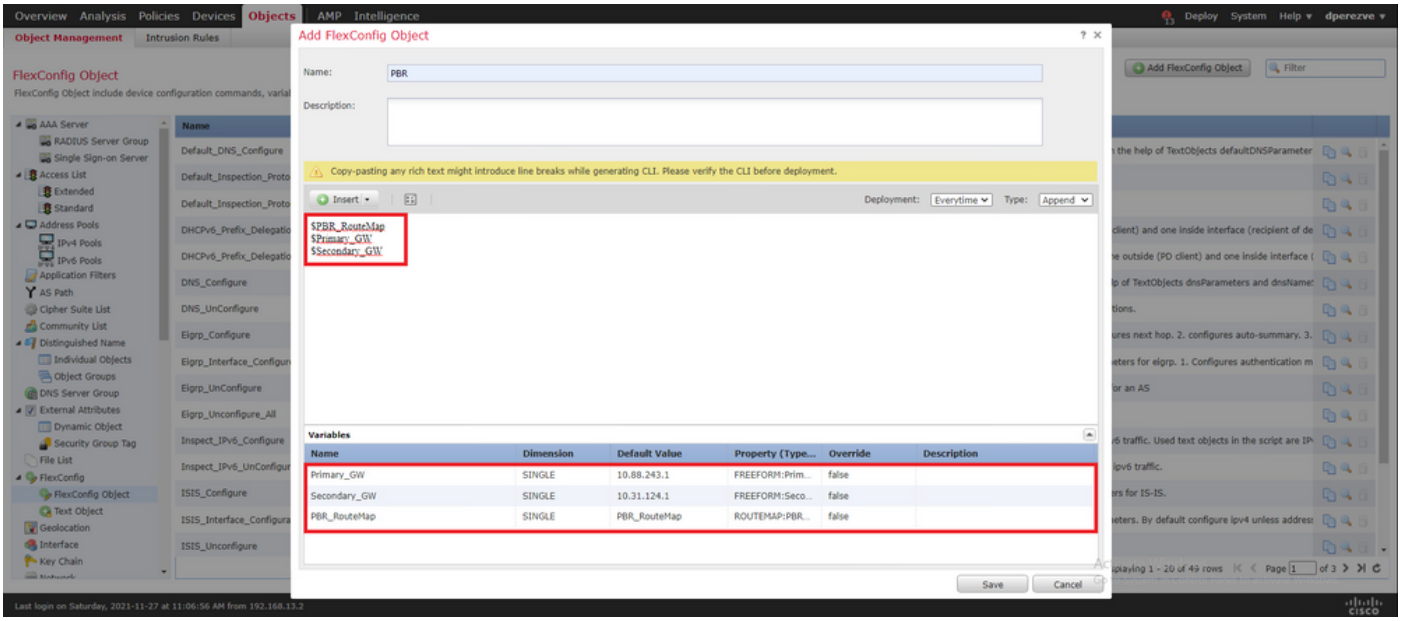


如果 **Insert Text Object Variable** 窗口为变量指定名称，并选择代表步骤3中定义的主网关的文本对象。

点击 **Save** 按钮将其添加到FlexConfig对象。



对备用网关重复上述最后步骤。在过程结束时，必须将这两个变量附加到FlexConfig对象中。

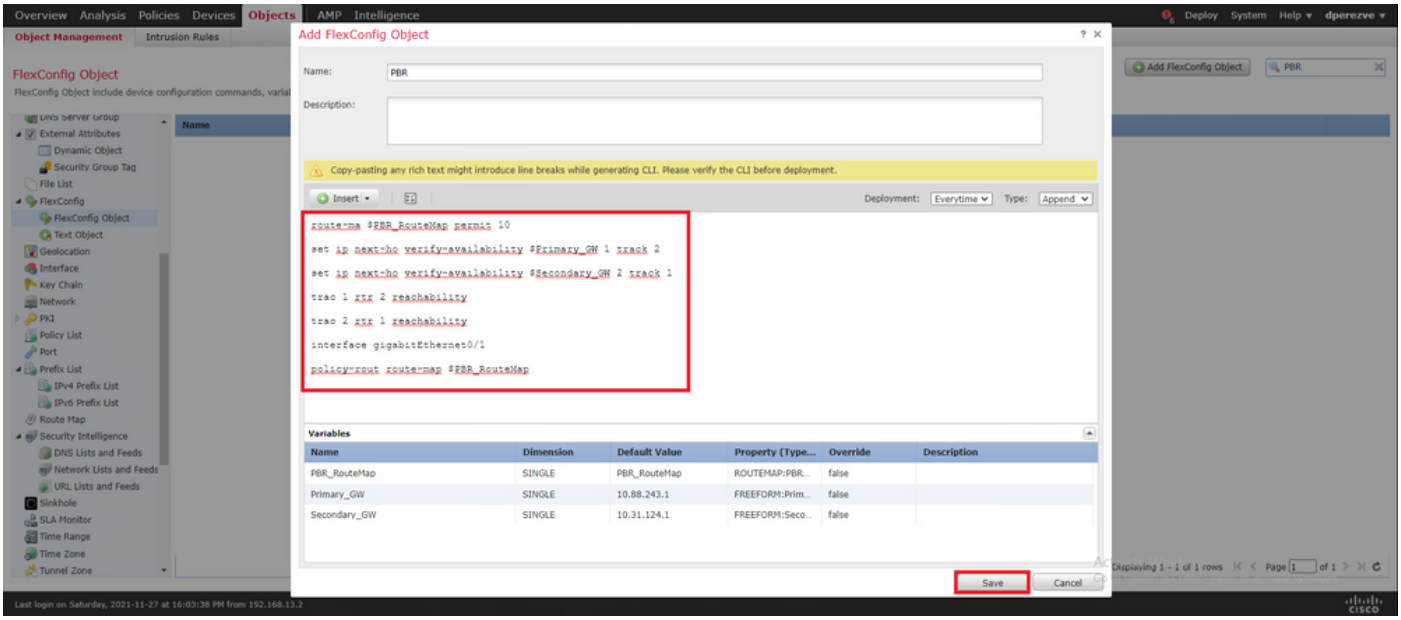


PBR配置的语法必须与思科ASA中的语法相同。路由映射的序列号必须与步骤2中配置的序列号（本例中为10）以及SLA ID匹配。

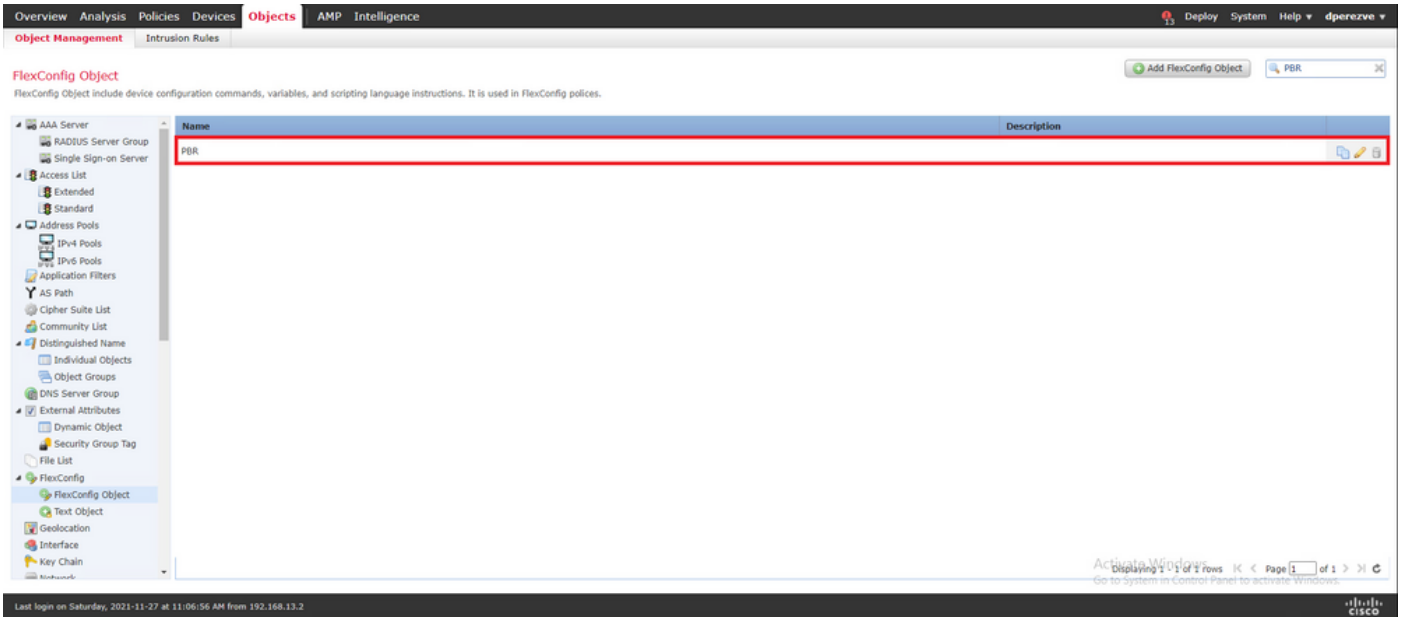
要配置PBR以检查下一跳的可用性，请 **set ip next-hop verify-availability** 命令。

路由映射必须应用于内部接口，本例中为VLAN2813。使用 **policy-route route-map** 命令。

点击 **Save** 配置完成后。



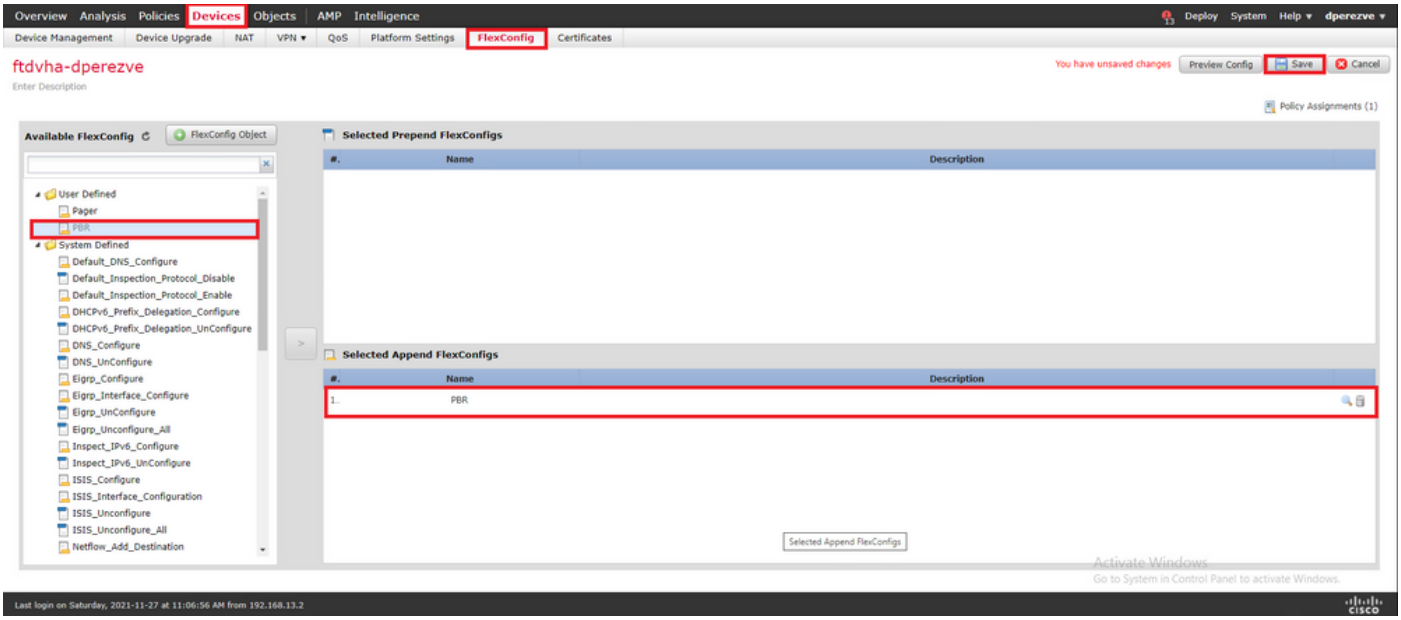
必须将FlexConfig对象添加到列表中。



第六步：将PBR FlexConfig对象分配到FlexConfig策略

导航至 **Devices > FlexConfig** 并编辑手头的FlexConfig策略。

选择中的PBR FlexConfig对象 **Available FlexConfig** 目录、保存更改并将更改部署到FTD。



验证

部署完成后，FTD必须定期向受监控设备发送ICMP回应请求，以确保可达性。同时，必须将到达主网关的跟踪路由添加到路由表中。

```
firepower# show route-map route-map PBR_RouteMap, permit, sequence 10 Match clauses: ip address (access-lists): PBR_ACL Set clauses: ip next-hop verify-availability 10.88.243.1 1 track 2 [up] ip next-hop verify-availability 10.31.124.1 2 track 1 [up] firepower# show route 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, V - VPN 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 o - ODR, P - periodic downloaded static route, + - replicated route SI - Static InterVRF Gateway of last resort is 10.88.243.1 to network 0.0.0.0 S* 0.0.0.0 0.0.0.0 [1/0] via 10.88.243.1, VLAN230 C 10.31.124.0 255.255.255.0 is directly connected, VLAN232 L 10.31.124.25 255.255.255.255 is directly connected, VLAN232 C 10.88.243.0 255.255.255.0 is directly connected, VLAN230 L 10.88.243.60 255.255.255.255 is directly connected, VLAN230 C 192.168.13.0 255.255.255.0 is directly connected, VLAN2813 L 192.168.13.1 255.255.255.255 is directly connected, VLAN2813
```

由于与主网关的连接已建立，因此必须通过主ISP电路转发来自内部子网(VLAN2813)的流量。

```
firepower# packet-tracer input vlan2813 icmp 192.168.13.2 8 0 8.8.8.8 detailed Phase: 1 Type: PBR-LOOKUP Subtype: policy-route Result: ALLOW Config: route-map PBR_RouteMap permit 10 match ip address PBR_ACL set ip next-hop verify-availability 10.88.243.1 1 track 2 set ip next-hop verify-availability 10.31.124.1 2 track 1 Additional Information: Matched route-map PBR_RouteMap, sequence 10, permit Found next-hop 10.88.243.1 using egress ifc VLAN230 Phase: 2 Type: ACCESS-LIST Subtype: log Result: ALLOW Config: access-group CSM_FW_ACL_ global access-list CSM_FW_ACL_ advanced trust ip ifc VLAN2813 object VLAN2813 any rule-id 268437505 event-log flow-end access-list CSM_FW_ACL_ remark rule-id 268437505: PREFILTER POLICY: ftdvha-dperezve access-list CSM_FW_ACL_ remark rule-id 268437505: RULE: Internet_Traffic Additional Information: Forward Flow based lookup yields rule: in id=0x1461708f7a90, priority=12, domain=permit, trust hits=172250, user_data=0x146183cf8380, cs_id=0x0, use_real_addr, flags=0x0, protocol=0 src ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any, ifc=VLAN2813(vrfid:0) dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, ifc=any, vlan=0, dscp=0x0, nsg_id=none input_ifc=any, output_ifc=any Phase: 3 Type: CONN-SETTINGS Subtype: Result: ALLOW Config: class-map class-default match any policy-map global_policy class class-default set connection advanced-options UM_STATIC_TCP_MAP service-policy global_policy global Additional Information: Forward Flow based lookup yields rule: in id=0x146170d472a0, priority=7, domain=conn-set,
```

deny=false hits=176701, user_data=0x146170d413f0, cs_id=0x0, use_real_addr, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=any Phase: 4 Type: NAT Subtype: Result: ALLOW Config: nat (VLAN2813,VLAN230) after-auto source dynamic VLAN2813 interface Additional Information: Forward Flow based lookup yields rule: in id=0x146170013860, priority=6, domain=nat, deny=false hits=168893, user_data=0x1461af306540, cs_id=0x0, flags=0x0, protocol=0 src ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=VLAN230(vrfid:0) Phase: 5 Type: NAT Subtype: per-session Result: ALLOW Config: Additional Information: Forward Flow based lookup yields rule: in id=0x1461af9c3320, priority=0, domain=nat-per-session, deny=true hits=188129, user_data=0x0, cs_id=0x0, reverse, use_real_addr, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=any, output_ifc=any Phase: 6 Type: IP-OPTIONS Subtype: Result: ALLOW Config: Additional Information: Forward Flow based lookup yields rule: in id=0x1461aff02da0, priority=0, domain=inspect-ip-options, deny=true hits=176710, user_data=0x0, cs_id=0x0, reverse, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=any Phase: 7 Type: ACCESS-LIST Subtype: log Result: ALLOW Config: access-group CSM_FW_ACL_ global access-list CSM_FW_ACL_ advanced trust ip ifc VLAN2813 object VLAN2813 any rule-id 268437505 event-log flow-end access-list CSM_FW_ACL_ remark rule-id 268437505: PREFILTER POLICY: ftdvha-dperezve access-list CSM_FW_ACL_ remark rule-id 268437505: RULE: Internet_Traffic Additional Information: Forward Flow based lookup yields rule: in id=0x1461708f7a90, priority=12, domain=permit, trust hits=172250, user_data=0x146183cf8380, cs_id=0x0, use_real_addr, flags=0x0, protocol=0 src ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any, ifc=VLAN2813(vrfid:0) dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, ifc=any, vlan=0, dscp=0x0, nsg_id=none input_ifc=any, output_ifc=any Phase: 8 Type: CONN-SETTINGS Subtype: Result: ALLOW Config: class-map class-default match any policy-map global_policy class class-default set connection advanced-options UM_STATIC_TCP_MAP service-policy global_policy global Additional Information: Forward Flow based lookup yields rule: in id=0x146170d472a0, priority=7, domain=conn-set, deny=false hits=176702, user_data=0x146170d413f0, cs_id=0x0, use_real_addr, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=any Phase: 9 Type: NAT Subtype: Result: ALLOW Config: nat (VLAN2813,VLAN230) after-auto source dynamic VLAN2813 interface Additional Information: Forward Flow based lookup yields rule: in id=0x146170013860, priority=6, domain=nat, deny=false hits=168893, user_data=0x1461af306540, cs_id=0x0, flags=0x0, protocol=0 src ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=VLAN230(vrfid:0) Phase: 10 Type: NAT Subtype: per-session Result: ALLOW Config: Additional Information: Forward Flow based lookup yields rule: in id=0x1461af9c3320, priority=0, domain=nat-per-session, deny=true hits=188129, user_data=0x0, cs_id=0x0, reverse, use_real_addr, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=any, output_ifc=any Phase: 11 Type: IP-OPTIONS Subtype: Result: ALLOW Config: Additional Information: Forward Flow based lookup yields rule: in id=0x1461aff02da0, priority=0, domain=inspect-ip-options, deny=true hits=176710, user_data=0x0, cs_id=0x0, reverse, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=any Phase: 12 Type: ACCESS-LIST Subtype: log Result: ALLOW Config: access-group CSM_FW_ACL_ global access-list CSM_FW_ACL_ advanced trust ip ifc VLAN2813 object VLAN2813 any rule-id 268437505 event-log flow-end access-list CSM_FW_ACL_ remark rule-id 268437505: PREFILTER POLICY: ftdvha-dperezve access-list CSM_FW_ACL_ remark rule-id 268437505: RULE: Internet_Traffic Additional Information: Forward Flow based lookup yields rule: in id=0x1461708f7a90, priority=12, domain=permit, trust hits=172250, user_data=0x146183cf8380, cs_id=0x0, use_real_addr, flags=0x0, protocol=0 src ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any, ifc=VLAN2813(vrfid:0) dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, ifc=any, vlan=0, dscp=0x0, nsg_id=none input_ifc=any, output_ifc=any Phase: 13 Type: CONN-SETTINGS Subtype: Result: ALLOW Config: class-map class-default match any policy-map global_policy class class-default set connection advanced-options UM_STATIC_TCP_MAP service-policy global_policy global Additional Information: Forward Flow based lookup yields rule: in id=0x146170d472a0, priority=7, domain=conn-set, deny=false hits=176702, user_data=0x146170d413f0, cs_id=0x0, use_real_addr, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=any Phase: 14 Type: NAT Subtype: Result: ALLOW Config: nat (VLAN2813,VLAN230) after-auto source dynamic

VLAN2813 interface Additional Information: Forward Flow based lookup yields rule: in id=0x146170013860, priority=6, domain=nat, deny=false hits=168894, user_data=0x1461af306540, cs_id=0x0, flags=0x0, protocol=0 src ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=VLAN230(vrfid:0) Phase: 15 Type: NAT Subtype: per-session Result: ALLOW Config: Additional Information: Forward Flow based lookup yields rule: in id=0x1461af9c3320, priority=0, domain=nat-per-session, deny=true hits=188129, user_data=0x0, cs_id=0x0, reverse, use_real_addr, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=any, output_ifc=any Phase: 16 Type: IP-OPTIONS Subtype: Result: ALLOW Config: Additional Information: Forward Flow based lookup yields rule: in id=0x1461aff02da0, priority=0, domain=inspect-ip-options, deny=true hits=176710, user_data=0x0, cs_id=0x0, reverse, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=any Phase: 17 Type: ACCESS-LIST Subtype: log Result: ALLOW Config: access-group CSM_FW_ACL_ global access-list CSM_FW_ACL_ advanced trust ip ifc VLAN2813 object VLAN2813 any rule-id 268437505 event-log flow-end access-list CSM_FW_ACL_ remark rule-id 268437505: PREFILTER POLICY: ftdvha-dperezve access-list CSM_FW_ACL_ remark rule-id 268437505: RULE: Internet_Traffic Additional Information: Forward Flow based lookup yields rule: in id=0x1461708f7a90, priority=12, domain=permit, trust hits=172250, user_data=0x146183cf8380, cs_id=0x0, use_real_addr, flags=0x0, protocol=0 src ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any, ifc=VLAN2813(vrfid:0) dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, ifc=any, vlan=0, dscp=0x0, nsg_id=none input_ifc=any, output_ifc=any Phase: 18 Type: CONN-SETTINGS Subtype: Result: ALLOW Config: class-map class-default match any policy-map global_policy class class-default set connection advanced-options UM_STATIC_TCP_MAP service-policy global_policy global Additional Information: Forward Flow based lookup yields rule: in id=0x146170d472a0, priority=7, domain=conn-set, deny=false hits=176702, user_data=0x146170d413f0, cs_id=0x0, use_real_addr, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=any Phase: 19 Type: NAT Subtype: Result: ALLOW Config: nat (VLAN2813,VLAN230) after-auto source dynamic VLAN2813 interface Additional Information: Forward Flow based lookup yields rule: in id=0x146170013860, priority=6, domain=nat, deny=false hits=168894, user_data=0x1461af306540, cs_id=0x0, flags=0x0, protocol=0 src ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=VLAN230(vrfid:0) Phase: 20 Type: NAT Subtype: per-session Result: ALLOW Config: Additional Information: Forward Flow based lookup yields rule: in id=0x1461af9c3320, priority=0, domain=nat-per-session, deny=true hits=188130, user_data=0x0, cs_id=0x0, reverse, use_real_addr, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=any, output_ifc=any Phase: 21 Type: IP-OPTIONS Subtype: Result: ALLOW Config: Additional Information: Forward Flow based lookup yields rule: in id=0x1461aff02da0, priority=0, domain=inspect-ip-options, deny=true hits=176710, user_data=0x0, cs_id=0x0, reverse, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=any Phase: 22 Type: ACCESS-LIST Subtype: log Result: ALLOW Config: access-group CSM_FW_ACL_ global access-list CSM_FW_ACL_ advanced trust ip ifc VLAN2813 object VLAN2813 any rule-id 268437505 event-log flow-end access-list CSM_FW_ACL_ remark rule-id 268437505: PREFILTER POLICY: ftdvha-dperezve access-list CSM_FW_ACL_ remark rule-id 268437505: RULE: Internet_Traffic Additional Information: Forward Flow based lookup yields rule: in id=0x1461708f7a90, priority=12, domain=permit, trust hits=172250, user_data=0x146183cf8380, cs_id=0x0, use_real_addr, flags=0x0, protocol=0 src ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any, ifc=VLAN2813(vrfid:0) dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, ifc=any, vlan=0, dscp=0x0, nsg_id=none input_ifc=any, output_ifc=any Phase: 23 Type: CONN-SETTINGS Subtype: Result: ALLOW Config: class-map class-default match any policy-map global_policy class class-default set connection advanced-options UM_STATIC_TCP_MAP service-policy global_policy global Additional Information: Forward Flow based lookup yields rule: in id=0x146170d472a0, priority=7, domain=conn-set, deny=false hits=176702, user_data=0x146170d413f0, cs_id=0x0, use_real_addr, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=any Phase: 24 Type: NAT Subtype: Result: ALLOW Config: nat (VLAN2813,VLAN230) after-auto source dynamic VLAN2813 interface Additional Information: Forward Flow based lookup yields rule: in id=0x146170013860, priority=6, domain=nat, deny=false hits=168894, user_data=0x1461af306540, cs_id=0x0, flags=0x0, protocol=0 src ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0),

```
output_ifc=VLAN230(vrfid:0) Phase: 25 Type: NAT Subtype: per-session Result: ALLOW Config:
Additional Information: Forward Flow based lookup yields rule: in id=0x1461af9c3320, priority=0,
domain=nat-per-session, deny=true hits=188130, user_data=0x0, cs_id=0x0, reverse, use_real_addr,
flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0,
mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=any, output_ifc=any Phase: 26
Type: IP-OPTIONS Subtype: Result: ALLOW Config: Additional Information: Forward Flow based
lookup yields rule: in id=0x1461aff02da0, priority=0, domain=inspect-ip-options, deny=true
hits=176711, user_data=0x0, cs_id=0x0, reverse, flags=0x0, protocol=0 src ip/id=0.0.0.0,
mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=anyError: not enough
buffer space to print ASP rule Result: input-interface: VLAN2813(vrfid:0) input-status: up
input-line-status: up output-interface: VLAN230(vrfid:0) output-status: up output-line-status:
up Action: allow
```

如果FTD在SLA监控器对象中指定的阈值计时器内没有收到来自主网关的回应应答，则认为主机不可达，并标记为关闭。通向主网关的跟踪路由也将被通向备用对等体的跟踪路由取代。

```
firepower# show route-map route-map PBR_RouteMap, permit, sequence 10 Match clauses: ip address
(access-lists): PBR_ACL Set clauses: ip next-hop verify-availability 10.88.243.1 1 track 2
[down] ip next-hop verify-availability 10.31.124.1 2 track 1 [up] firepower# show route 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, V - VPN 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 o - ODR, P - periodic downloaded static route, + - replicated route SI - Static
InterVRF Gateway of last resort is 10.31.124.1 to network 0.0.0.0 S* 0.0.0.0 0.0.0.0 [2/0] via
10.31.124.1, VLAN232 C 10.31.124.0 255.255.255.0 is directly connected, VLAN232 L 10.31.124.25
255.255.255.255 is directly connected, VLAN232 C 192.168.13.0 255.255.255.0 is directly
connected, VLAN2813 L 192.168.13.1 255.255.255.255 is directly connected, VLAN2813
```

每次FTD都会生成参考消息622001，以便从路由表中添加或删除跟踪的路由。

```
firepower# show logg | i 622001 %FTD-6-622001: Removing tracked route 0.0.0.0 0.0.0.0
10.31.124.1, distance 2, table default, on interface VLAN232%FTD-6-305012: Teardown dynamic UDP
translation from VLAN2813:192.168.13.5/49641 to VLAN230:10.88.243.60/49641 duration 0:02:10
```

现在，所有来自VLAN2813的流量必须通过备用ISP电路转发。

```
firepower# packet-tracer input vlan2813 icmp 192.168.13.2 8 0 8.8.8.8 detailed Phase: 1 Type:
PBR-LOOKUP Subtype: policy-route Result: ALLOW Config: route-map PBR_RouteMap permit 10 match ip
address PBR_ACL set ip next-hop verify-availability 10.88.243.1 1 track 2 set ip next-hop
verify-availability 10.31.124.1 2 track 1 Additional Information: Matched route-map
PBR_RouteMap, sequence 10, permit Found next-hop 10.31.124.1 using egress ifc VLAN232 Phase: 2
Type: ACCESS-LIST Subtype: log Result: ALLOW Config: access-group CSM_FW_ACL_ global access-list
CSM_FW_ACL_ advanced trust ip ifc VLAN2813 object VLAN2813 any rule-id 268437505 event-log flow-
end access-list CSM_FW_ACL_ remark rule-id 268437505: PREFILTER POLICY: ftdvha-dperezve access-
list CSM_FW_ACL_ remark rule-id 268437505: RULE: Internet_Traffic Additional Information:
Forward Flow based lookup yields rule: in id=0x1461708f7a90, priority=12, domain=permit, trust
hits=172729, user_data=0x146183cf8380, cs_id=0x0, use_real_addr, flags=0x0, protocol=0 src
ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any, ifc=VLAN2813(vrfid:0) dst
ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, ifc=any, vlan=0, dscp=0x0, nsg_id=none
input_ifc=any, output_ifc=any Phase: 3 Type: CONN-SETTINGS Subtype: Result: ALLOW Config: class-
map class-default match any policy-map global_policy class class-default set connection
advanced-options UM_STATIC_TCP_MAP service-policy global_policy global Additional Information:
Forward Flow based lookup yields rule: in id=0x146170d472a0, priority=7, domain=conn-set,
deny=false hits=177180, user_data=0x146170d413f0, cs_id=0x0, use_real_addr, flags=0x0,
protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0,
port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=any Phase: 4
Type: NAT Subtype: Result: ALLOW Config: nat (VLAN2813,VLAN232) after-auto source dynamic
VLAN2813 interface Additional Information: Forward Flow based lookup yields rule: in
id=0x146170032540, priority=6, domain=nat, deny=false hits=8251, user_data=0x1461af306740,
cs_id=0x0, flags=0x0, protocol=0 src ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any dst
```

ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=VLAN232(vrfid:0) Phase: 5 Type: NAT Subtype: per-session Result: ALLOW Config: Additional Information: Forward Flow based lookup yields rule: in id=0x1461af9c3320, priority=0, domain=nat-per-session, deny=true hits=188612, user_data=0x0, cs_id=0x0, reverse, use_real_addr, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=any, output_ifc=any Phase: 6 Type: IP-OPTIONS Subtype: Result: ALLOW Config: Additional Information: Forward Flow based lookup yields rule: in id=0x1461aff02da0, priority=0, domain=inspect-ip-options, deny=true hits=177189, user_data=0x0, cs_id=0x0, reverse, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=any Phase: 7 Type: ACCESS-LIST Subtype: log Result: ALLOW Config: access-group CSM_FW_ACL_ global access-list CSM_FW_ACL_ advanced trust ip ifc VLAN2813 object VLAN2813 any rule-id 268437505 event-log flow-end access-list CSM_FW_ACL_ remark rule-id 268437505: PREFILTER POLICY: ftdvha-dperezve access-list CSM_FW_ACL_ remark rule-id 268437505: RULE: Internet_Traffic Additional Information: Forward Flow based lookup yields rule: in id=0x1461708f7a90, priority=12, domain=permit, trust hits=172729, user_data=0x146183cf8380, cs_id=0x0, use_real_addr, flags=0x0, protocol=0 src ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any, ifc=VLAN2813(vrfid:0) dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, ifc=any, vlan=0, dscp=0x0, nsg_id=none input_ifc=any, output_ifc=any Phase: 8 Type: CONN-SETTINGS Subtype: Result: ALLOW Config: class-map class-default match any policy-map global_policy class class-default set connection advanced-options UM_STATIC_TCP_MAP service-policy global_policy global Additional Information: Forward Flow based lookup yields rule: in id=0x146170d472a0, priority=7, domain=conn-set, deny=false hits=177181, user_data=0x146170d413f0, cs_id=0x0, use_real_addr, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=any Phase: 9 Type: NAT Subtype: Result: ALLOW Config: nat (VLAN2813,VLAN232) after-auto source dynamic VLAN2813 interface Additional Information: Forward Flow based lookup yields rule: in id=0x146170032540, priority=6, domain=nat, deny=false hits=8251, user_data=0x1461af306740, cs_id=0x0, flags=0x0, protocol=0 src ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=VLAN232(vrfid:0) Phase: 10 Type: NAT Subtype: per-session Result: ALLOW Config: Additional Information: Forward Flow based lookup yields rule: in id=0x1461af9c3320, priority=0, domain=nat-per-session, deny=true hits=188612, user_data=0x0, cs_id=0x0, reverse, use_real_addr, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=any, output_ifc=any Phase: 11 Type: IP-OPTIONS Subtype: Result: ALLOW Config: Additional Information: Forward Flow based lookup yields rule: in id=0x1461aff02da0, priority=0, domain=inspect-ip-options, deny=true hits=177189, user_data=0x0, cs_id=0x0, reverse, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=any Phase: 12 Type: ACCESS-LIST Subtype: log Result: ALLOW Config: access-group CSM_FW_ACL_ global access-list CSM_FW_ACL_ advanced trust ip ifc VLAN2813 object VLAN2813 any rule-id 268437505 event-log flow-end access-list CSM_FW_ACL_ remark rule-id 268437505: PREFILTER POLICY: ftdvha-dperezve access-list CSM_FW_ACL_ remark rule-id 268437505: RULE: Internet_Traffic Additional Information: Forward Flow based lookup yields rule: in id=0x1461708f7a90, priority=12, domain=permit, trust hits=172729, user_data=0x146183cf8380, cs_id=0x0, use_real_addr, flags=0x0, protocol=0 src ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any, ifc=VLAN2813(vrfid:0) dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, ifc=any, vlan=0, dscp=0x0, nsg_id=none input_ifc=any, output_ifc=any Phase: 13 Type: CONN-SETTINGS Subtype: Result: ALLOW Config: class-map class-default match any policy-map global_policy class class-default set connection advanced-options UM_STATIC_TCP_MAP service-policy global_policy global Additional Information: Forward Flow based lookup yields rule: in id=0x146170d472a0, priority=7, domain=conn-set, deny=false hits=177181, user_data=0x146170d413f0, cs_id=0x0, use_real_addr, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=any Phase: 14 Type: NAT Subtype: Result: ALLOW Config: nat (VLAN2813,VLAN232) after-auto source dynamic VLAN2813 interface Additional Information: Forward Flow based lookup yields rule: in id=0x146170032540, priority=6, domain=nat, deny=false hits=8252, user_data=0x1461af306740, cs_id=0x0, flags=0x0, protocol=0 src ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=VLAN232(vrfid:0) Phase: 15 Type: NAT Subtype: per-session Result: ALLOW Config: Additional Information: Forward Flow based lookup yields rule: in id=0x1461af9c3320, priority=0, domain=nat-per-session, deny=true hits=188612, user_data=0x0, cs_id=0x0, reverse, use_real_addr,

flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=any, output_ifc=any Phase: 16 Type: IP-OPTIONS Subtype: Result: ALLOW Config: Additional Information: Forward Flow based lookup yields rule: in id=0x1461aff02da0, priority=0, domain=inspect-ip-options, deny=true hits=177189, user_data=0x0, cs_id=0x0, reverse, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=any Phase: 17 Type: ACCESS-LIST Subtype: log Result: ALLOW Config: access-group CSM_FW_ACL_ global access-list CSM_FW_ACL_ advanced trust ip ifc VLAN2813 object VLAN2813 any rule-id 268437505 event-log flow-end access-list CSM_FW_ACL_ remark rule-id 268437505: PREFILTER POLICY: ftdvha-dperezve access-list CSM_FW_ACL_ remark rule-id 268437505: RULE: Internet_Traffic Additional Information: Forward Flow based lookup yields rule: in id=0x1461708f7a90, priority=12, domain=permit, trust hits=172729, user_data=0x146183cf8380, cs_id=0x0, use_real_addr, flags=0x0, protocol=0 src ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any, ifc=VLAN2813(vrfid:0) dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, ifc=any, vlan=0, dscp=0x0, nsg_id=none input_ifc=any, output_ifc=any Phase: 18 Type: CONN-SETTINGS Subtype: Result: ALLOW Config: class-map class-default match any policy-map global_policy class class-default set connection advanced-options UM_STATIC_TCP_MAP service-policy global_policy global Additional Information: Forward Flow based lookup yields rule: in id=0x146170d472a0, priority=7, domain=conn-set, deny=false hits=177181, user_data=0x146170d413f0, cs_id=0x0, use_real_addr, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=any Phase: 19 Type: NAT Subtype: Result: ALLOW Config: nat (VLAN2813,VLAN232) after-auto source dynamic VLAN2813 interface Additional Information: Forward Flow based lookup yields rule: in id=0x146170032540, priority=6, domain=nat, deny=false hits=8252, user_data=0x1461af306740, cs_id=0x0, flags=0x0, protocol=0 src ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=VLAN232(vrfid:0) Phase: 20 Type: NAT Subtype: per-session Result: ALLOW Config: Additional Information: Forward Flow based lookup yields rule: in id=0x1461af9c3320, priority=0, domain=nat-per-session, deny=true hits=188613, user_data=0x0, cs_id=0x0, reverse, use_real_addr, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=any, output_ifc=any Phase: 21 Type: IP-OPTIONS Subtype: Result: ALLOW Config: Additional Information: Forward Flow based lookup yields rule: in id=0x1461aff02da0, priority=0, domain=inspect-ip-options, deny=true hits=177189, user_data=0x0, cs_id=0x0, reverse, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=any Phase: 22 Type: ACCESS-LIST Subtype: log Result: ALLOW Config: access-group CSM_FW_ACL_ global access-list CSM_FW_ACL_ advanced trust ip ifc VLAN2813 object VLAN2813 any rule-id 268437505 event-log flow-end access-list CSM_FW_ACL_ remark rule-id 268437505: PREFILTER POLICY: ftdvha-dperezve access-list CSM_FW_ACL_ remark rule-id 268437505: RULE: Internet_Traffic Additional Information: Forward Flow based lookup yields rule: in id=0x1461708f7a90, priority=12, domain=permit, trust hits=172729, user_data=0x146183cf8380, cs_id=0x0, use_real_addr, flags=0x0, protocol=0 src ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any, ifc=VLAN2813(vrfid:0) dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, ifc=any, vlan=0, dscp=0x0, nsg_id=none input_ifc=any, output_ifc=any Phase: 23 Type: CONN-SETTINGS Subtype: Result: ALLOW Config: class-map class-default match any policy-map global_policy class class-default set connection advanced-options UM_STATIC_TCP_MAP service-policy global_policy global Additional Information: Forward Flow based lookup yields rule: in id=0x146170d472a0, priority=7, domain=conn-set, deny=false hits=177181, user_data=0x146170d413f0, cs_id=0x0, use_real_addr, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=any Phase: 24 Type: NAT Subtype: Result: ALLOW Config: nat (VLAN2813,VLAN232) after-auto source dynamic VLAN2813 interface Additional Information: Forward Flow based lookup yields rule: in id=0x146170032540, priority=6, domain=nat, deny=false hits=8252, user_data=0x1461af306740, cs_id=0x0, flags=0x0, protocol=0 src ip/id=192.168.13.0, mask=255.255.255.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=VLAN232(vrfid:0) Phase: 25 Type: NAT Subtype: per-session Result: ALLOW Config: Additional Information: Forward Flow based lookup yields rule: in id=0x1461af9c3320, priority=0, domain=nat-per-session, deny=true hits=188613, user_data=0x0, cs_id=0x0, reverse, use_real_addr, flags=0x0, protocol=0 src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0, nsg_id=none input_ifc=any, output_ifc=any Phase: 26 Type: IP-OPTIONS Subtype: Result: ALLOW Config: Additional Information: Forward Flow based lookup yields rule: in id=0x1461aff02da0, priority=0, domain=inspect-ip-options, deny=true

```
hits=177190, user_data=0x0, cs_id=0x0, reverse, flags=0x0, protocol=0 src ip/id=0.0.0.0,
mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0,
nsg_id=none input_ifc=VLAN2813(vrfid:0), output_ifc=any Result: input-interface:
VLAN2813(vrfid:0) input-status: up input-line-status: up output-interface: VLAN232(vrfid:0)
output-status: up output-line-status: up Action: allow
```

故障排除

为了验证在中实施哪个PBR条目 **interesting traffic** ，运行命令**debug policy-route**。

```
firepower# debug policy-route debug policy-route enabled at level 1 firepower# pbr: policy based
route lookup called for 192.168.13.5/45951 to 208.67.220.220/53 proto 17 sub_proto 0 received on
interface VLAN2813, NSGs, nsg_id=none pbr: First matching rule from ACL(2) pbr: route map
PBR_RouteMap, sequence 10, permit; proceed with policy routing pbr: evaluating verified next-hop
10.88.243.1 pbr: policy based routing applied; egress_ifc = VLAN230 : next_hop = 10.88.243.1
pbr: policy based route lookup called for 192.168.13.5/56099 to 208.67.220.220/53 proto 17
sub_proto 0 received on interface VLAN2813, NSGs, nsg_id=none pbr: First matching rule from
ACL(2) pbr: route map PBR_RouteMap, sequence 10, permit; proceed with policy routing pbr:
evaluating verified next-hop 10.88.243.1 pbr: policy based routing applied; egress_ifc = VLAN230
: next_hop = 10.88.243.1 pbr: policy based route lookup called for 192.168.13.2/24 to 8.8.8.8/0
proto 1 sub_proto 8 received on interface VLAN2813, NSGs, nsg_id=none pbr: First matching rule
from ACL(2) pbr: route map PBR_RouteMap, sequence 10, permit; proceed with policy routing pbr:
evaluating verified next-hop 10.88.243.1 pbr: policy based routing applied; egress_ifc = VLAN230
: next_hop = 10.88.243.1 pbr: policy based route lookup called for 192.168.13.5/40669 to
208.67.220.220/53 proto 17 sub_proto 0 received on interface VLAN2813, NSGs, nsg_id=none
```

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