使用FMC CLI计算访问列表元素(ACE)计数

目录

简介

本文档介绍如何查找访问控制策略中的哪条规则扩展为多少个访问列表元素。

先决条件

要求

Cisco 建议您了解以下主题：

- Firepower技术知识
- 有关在FMC上配置访问控制策略的知识

使用的组件

本文档中的信息基于以下软件和硬件版本：

- 思科安全防火墙管理中心(FMC)
- 思科Firepower威胁防御(FTD)

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

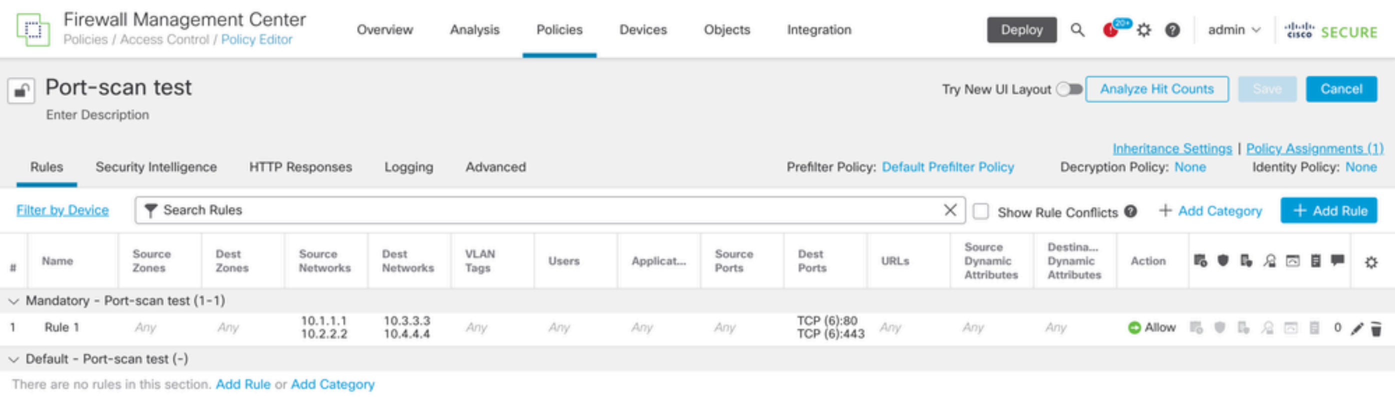
使用以下参数的一个或多个组合创建访问控制规则：

- IP地址（源和目标）
- 端口（源和目标）
- URL（系统提供的类别和自定义URL）
- 应用检测器
- VLAN
- 区域

根据访问规则中使用的参数组合，传感器上的规则扩展将会改变。本文档重点介绍FMC上的各种规则组合以及传感器上各自的关联扩展。

如何使用FMC CLI计算访问列表元素计数(ACE)

考虑从FMC配置访问规则，如图所示：



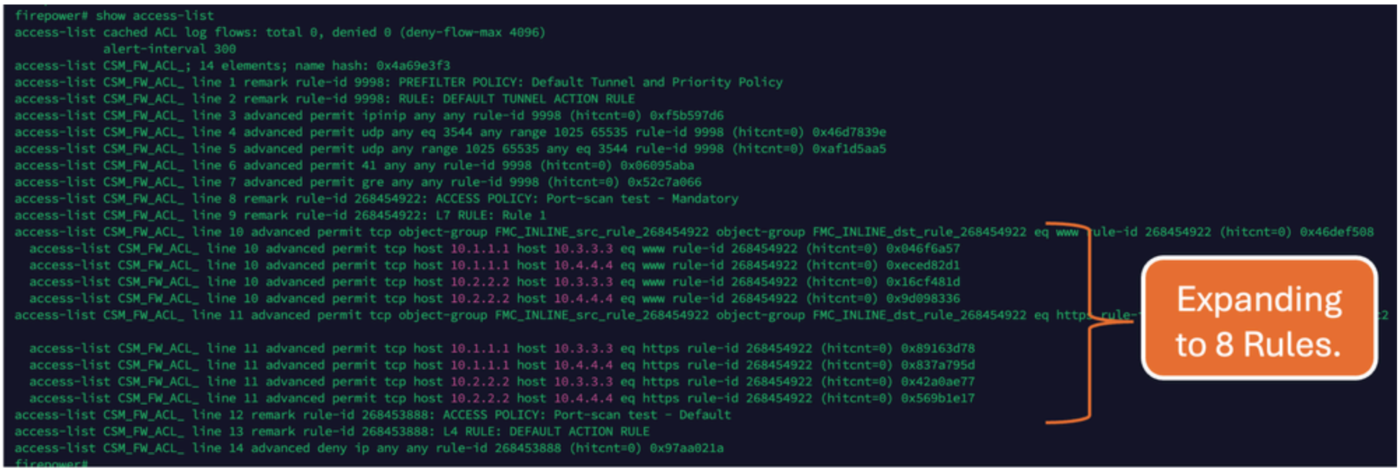
Prefilter Policy: Default Prefilter Policy
Decryption Policy: None
Identity Policy: None

#	Name	Source Zones	Dest Zones	Source Networks	Dest Networks	VLAN Tags	Users	Applicat...	Source Ports	Dest Ports	URLs	Source Dynamic Attributes	Destina... Dynamic Attributes	Action	
Mandatory - Port-scan test (1-1)															
1	Rule 1	Any	Any	10.1.1.1 10.2.2.2	10.3.3.3 10.4.4.4	Any	Any	Any	Any	TCP (6):80 TCP (6):443	Any	Any	Any	Allow	0
Default - Port-scan test (-)															

There are no rules in this section. Add Rule or Add Category

访问控制策略中的规则配置

如果在FTD CLI中看到此规则，您会注意到此规则已扩展为8个规则。



```
firepower# show access-list
access-list cached ACL log flows: total 0, denied 0 (deny-flow-max 4096)
            alert-interval 300
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access-list CSM_FW_ACL_ line 2 remark rule-id 9998: RULE: DEFAULT TUNNEL ACTION RULE
access-list CSM_FW_ACL_ line 3 advanced permit ipinip any any rule-id 9998 (hitcnt=0) 0xf5b597d6
access-list CSM_FW_ACL_ line 4 advanced permit udp any eq 3544 any range 1025 65535 rule-id 9998 (hitcnt=0) 0x46d7839e
access-list CSM_FW_ACL_ line 5 advanced permit udp any range 1025 65535 any eq 3544 rule-id 9998 (hitcnt=0) 0xaf1d5aa5
access-list CSM_FW_ACL_ line 6 advanced permit 41 any any rule-id 9998 (hitcnt=0) 0x06095aba
access-list CSM_FW_ACL_ line 7 advanced permit gre any any rule-id 9998 (hitcnt=0) 0x52c7a066
access-list CSM_FW_ACL_ line 8 remark rule-id 268454922: ACCESS POLICY: Port-scan test - Mandatory
access-list CSM_FW_ACL_ line 9 remark rule-id 268454922: L7 RULE: Rule 1
access-list CSM_FW_ACL_ line 10 advanced permit tcp object-group FMC_INLINE_src_rule_268454922 object-group FMC_INLINE_dst_rule_268454922 eq www rule-id 268454922 (hitcnt=0) 0x46def508
  access-list CSM_FW_ACL_ line 10 advanced permit tcp host 10.1.1.1 host 10.3.3.3 eq www rule-id 268454922 (hitcnt=0) 0x046f6a57
  access-list CSM_FW_ACL_ line 10 advanced permit tcp host 10.1.1.1 host 10.4.4.4 eq www rule-id 268454922 (hitcnt=0) 0xeced82d1
  access-list CSM_FW_ACL_ line 10 advanced permit tcp host 10.2.2.2 host 10.3.3.3 eq www rule-id 268454922 (hitcnt=0) 0x16cf481d
  access-list CSM_FW_ACL_ line 10 advanced permit tcp host 10.2.2.2 host 10.4.4.4 eq www rule-id 268454922 (hitcnt=0) 0x9d098336
access-list CSM_FW_ACL_ line 11 advanced permit tcp object-group FMC_INLINE_src_rule_268454922 object-group FMC_INLINE_dst_rule_268454922 eq https rule-

  access-list CSM_FW_ACL_ line 11 advanced permit tcp host 10.1.1.1 host 10.3.3.3 eq https rule-id 268454922 (hitcnt=0) 0x89163d78
  access-list CSM_FW_ACL_ line 11 advanced permit tcp host 10.1.1.1 host 10.4.4.4 eq https rule-id 268454922 (hitcnt=0) 0x837a795d
  access-list CSM_FW_ACL_ line 11 advanced permit tcp host 10.2.2.2 host 10.3.3.3 eq https rule-id 268454922 (hitcnt=0) 0x42a0ae77
  access-list CSM_FW_ACL_ line 11 advanced permit tcp host 10.2.2.2 host 10.4.4.4 eq https rule-id 268454922 (hitcnt=0) 0x569b1e17
access-list CSM_FW_ACL_ line 12 remark rule-id 268453888: ACCESS POLICY: Port-scan test - Default
access-list CSM_FW_ACL_ line 13 remark rule-id 268453888: L4 RULE: DEFAULT ACTION RULE
access-list CSM_FW_ACL_ line 14 advanced deny ip any any rule-id 268453888 (hitcnt=0) 0x97aa021a
firepower#
```

您可以使用FMC CLI中的perl 命令检查哪个规则正在扩展为多少个访问列表元素：

<#root>

`perl /var/opt/CSCOpx/bin/access_rule_expansion_count.pl`

```
root@firepower:/Volume/home/admin# perl /var/opt/CSCOpx/bin/access_rule_expansion_count.pl

  Secure Firewall Management Center for VMware - v7.4.1 - (build 172)

  Access Control Rule Expansion Computer



  Enter FTD UUID or Name:

  > 10.70.73.44

-----------------------------------------------------------------------------------------------------------

  Secure Firewall Management Center for VMware - v7.4.1 - (build 172)

  Access Control Rule Expansion Computer

  Device:

    UUID: 93cc359c-39be-11d4-9ae1-f2186cbddb11

    Name: 10.70.73.44

  Access Control Policy:

    UUID: 005056B9-F342-0ed3-0000-292057792375

    Name: Port-scan test

    Description:

  Intrusion Policies:
```

```
-----------------------------------------------------------------------------------------------

|  UUID                                    |  NAME                                                      |

-----------------------------------------------------------------------------------------------

-----------------------------------------------------------------------------------------------

  Date: 2024-Jul-17 at 06:51:55 UTC

  NOTE: Computation is done on per rule basis. Count from shadow rules will not be applicable on device

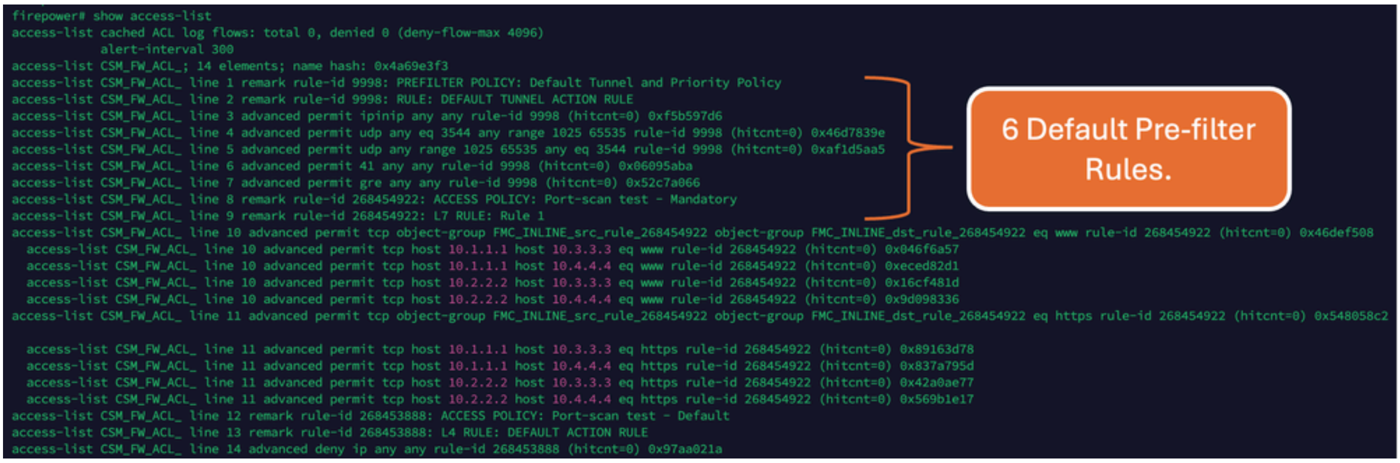
  Run "Rule Conflict Detection" tool on AC Policy for specified device to detect and optimise such rule


--------------------------------------------------------------------------------------------------------------
| UUID                                          | NAME                       |              COUNT
--------------------------------------------------------------------------------------------------------------
| 005056B9-F342-0ed3-0000-000268454919        | Rule 1                     |                8
--------------------------------------------------------------------------------------------------------------
|   TOTAL: 8
--------------------------------------------------------------------------------------------------------------
| Access Rule Elements Count on FTD: 14
--------------------------------------------------------------------------------------------------------------

>>> My JVM PID : 19417
```

注意：访问规则元素依赖于FTD：14。这也包括默认的FTD规则集（预过滤器）和默认访问控制规则。

默认预过滤器规则可在FTD CLI中看到：



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  access-list CSM_FW_ACL_ line 10 advanced permit tcp host 10.1.1.1 host 10.4.4.4 eq www rule-id 268454922 (hitcnt=0) 0xeced82d1
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access-list CSM_FW_ACL_ line 11 advanced permit tcp object-group FMC_INLINE_src_rule_268454922 object-group FMC_INLINE_dst_rule_268454922 eq https rule-id 268454922 (hitcnt=0) 0x548058c2

  access-list CSM_FW_ACL_ line 11 advanced permit tcp host 10.1.1.1 host 10.3.3.3 eq https rule-id 268454922 (hitcnt=0) 0x89163d78
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```

6 Default Pre-filter Rules.

高ACE的影响

- CPU使用率较高。
- 可以看到高内存。
- 可以观察到设备运行缓慢。
- 部署失败/部署时间更长。

决定何时启用对象组搜索(OGS)

- ACE计数超过设备ACE限制。
- 设备的CPU使用率还不高，因为启用OGS会给设备的CPU带来更多压力。
- 在非生产时段启用它。

注意：请在启用OGS之前从FTD CLI点击模式下启用asp rule-engine transactional-commit access-group。这配置为在启用OGS时，避免在部署过程中和部署之后发生流量丢弃。

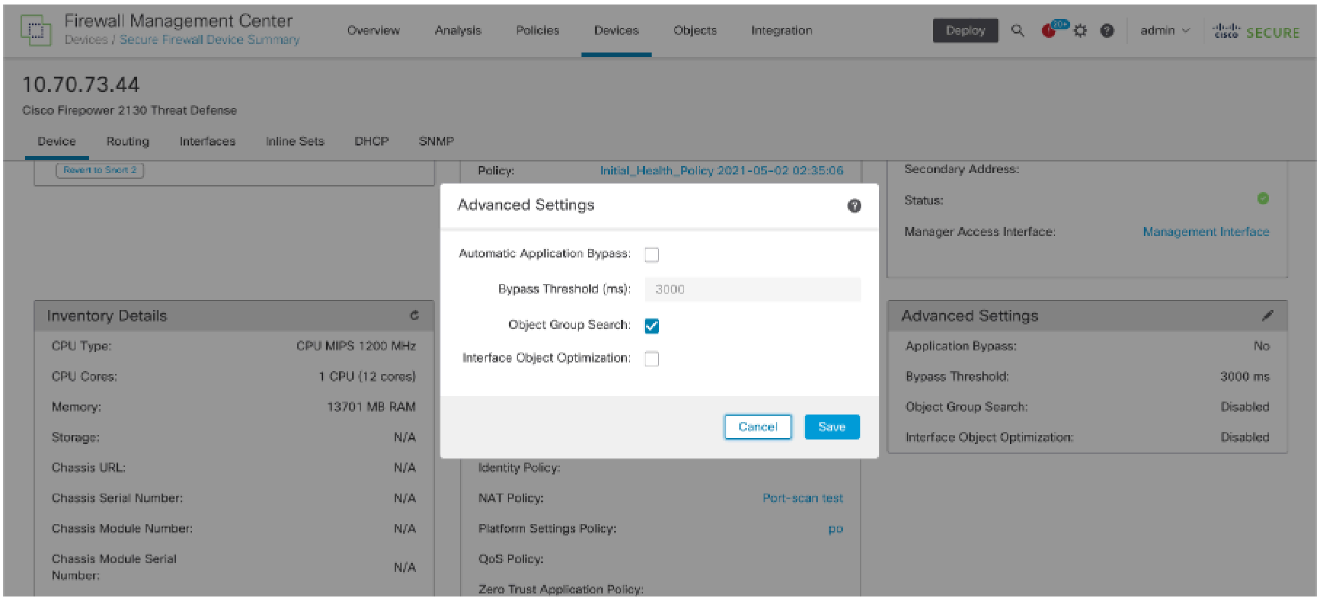
```
>
>
>
>
> asp rule-engine transactional-commit access-group
>
>
>
```

启用对象组搜索

当前未启用OGS：

```
firepower#
firepower#
firepower#
firepower# show run object-group-search
firepower#
firepower#
firepower#
```

1. 登录到FMC CLI。导航到设备>设备管理>选择FTD设备>设备。从“高级设置”启用对象组搜索：



10.70.73.44
Cisco Firepower 2130 Threat Defense

Policy: Initial_Health_Policy 2021-05-02 02:35:06

Advanced Settings

Automatic Application Bypass: □
Bypass Threshold (ms): 3000
Object Group Search: ☑
Interface Object Optimization: □

Secondary Address:
Status: ●
Manager Access Interface: Management Interface

Inventory Details

CPU Type:	CPU MIPS 1200 MHz
CPU Cores:	1 CPU (12 cores)
Memory:	13701 MB RAM
Storage:	N/A
Chassis URL:	N/A
Chassis Serial Number:	N/A
Chassis Module Number:	N/A
Chassis Module Serial Number:	N/A

Identity Policy:
NAT Policy: Port-scan test
Platform Settings Policy: pp
QoS Policy:
Zero Trust Application Policy:

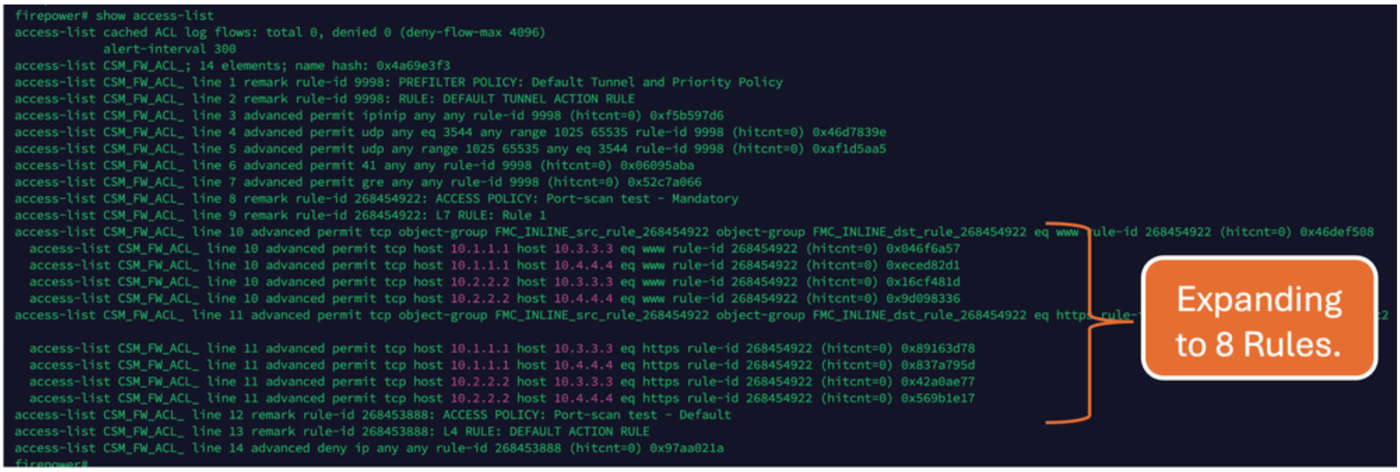
Advanced Settings

Application Bypass:	No
Bypass Threshold:	3000 ms
Object Group Search:	Disabled
Interface Object Optimization:	Disabled

2. 单击Save和deploy。

验证

启用OGS之前：



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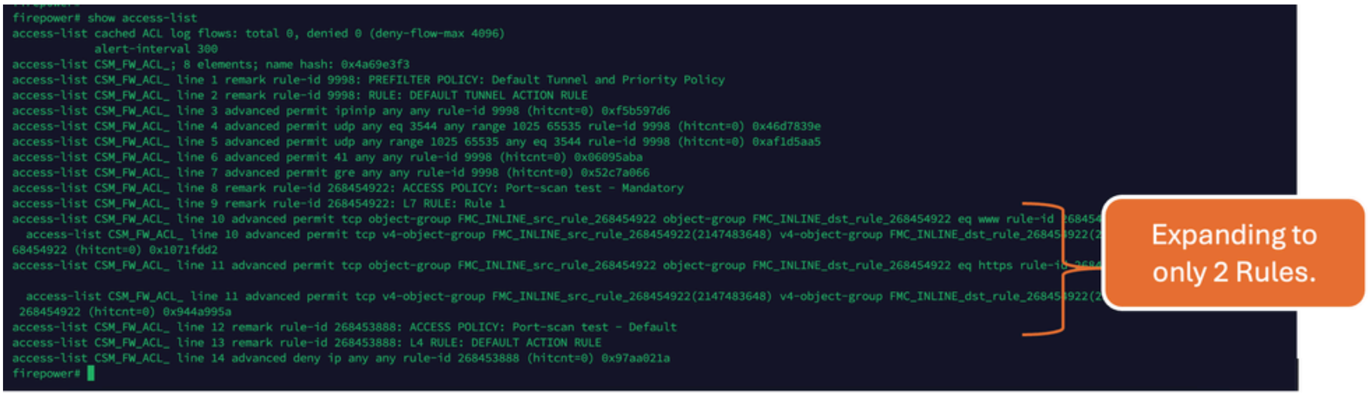
access-list CSM_FW_ACL_ line 14 advanced deny ip any any rule-id 268453888 (hitcnt=0) 0x97aa021a
firepower#
```

启用OGS后：



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access-list CSM_FW_ACL_ line 9 remark rule-id 268454922: L7 RULE: Rule 1
access-list CSM_FW_ACL_ line 10 advanced permit tcp object-group FMC_INLINE_src_rule_268454922 object-group FMC_INLINE_dst_rule_268454922 eq www rule-id 268454
  access-list CSM_FW_ACL_ line 10 advanced permit tcp v4-object-group FMC_INLINE_src_rule_268454922(2147483648) v4-object-group FMC_INLINE_dst_rule_268454922(2
68454922 (hitcnt=0) 0x1071fdd2
access-list CSM_FW_ACL_ line 11 advanced permit tcp object-group FMC_INLINE_src_rule_268454922 object-group FMC_INLINE_dst_rule_268454922 eq https rule-id 2684

  access-list CSM_FW_ACL_ line 11 advanced permit tcp v4-object-group FMC_INLINE_src_rule_268454922(2147483648) v4-object-group FMC_INLINE_dst_rule_268454922(2
 268454922 (hitcnt=0) 0x944a995a
access-list CSM_FW_ACL_ line 12 remark rule-id 268453888: ACCESS POLICY: Port-scan test - Default
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firepower#
```

相关信息

有关如何在FTD中扩展规则的详细信息，请参阅文档了解FirePOWER设备上的规则扩展。

有关FTD体系结构和故障排除的详细信息，请参阅剖析(FTD) Firepower威胁防御。

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