



# APPENDIX **A**

## Network Configuration Requirements

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### Note

This topic is intended for the network administrator who is responsible for deploying the Pulse Collect and Connect Appliances in the existing IP network and for configuring the existing Cisco switches with features in support of these appliances.

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A Pulse Collect Appliance relies on these traffic-capturing features that are available on Cisco switches to observe network traffic for analysis:

- Switched Port Analyzer (SPAN)
- Remote Switched Port Analyzer (RSPAN) with VLAN Access Control Lists (VACLs)

We recommend using RSPAN with VACLs because they support packet filtering via access lists, which optimize the amount of traffic a switch forwards to a Pulse Collect Appliance.

Traffic that is captured and forwarded to the Pulse Collect Appliance should not include 802.1q encapsulation. You must ensure that the SPAN/VACL capture destination port is not configured as a trunk port. That is, the VACL capture of traffic from multiple VLANs to a capture trunk port on a switch cannot be processed by the Pulse Collector Appliance because of the 802.1q encapsulation of the packets forwarded to the appliance.

These topics provide configuration samples that illustrate how to configure RSPAN with VACLs:

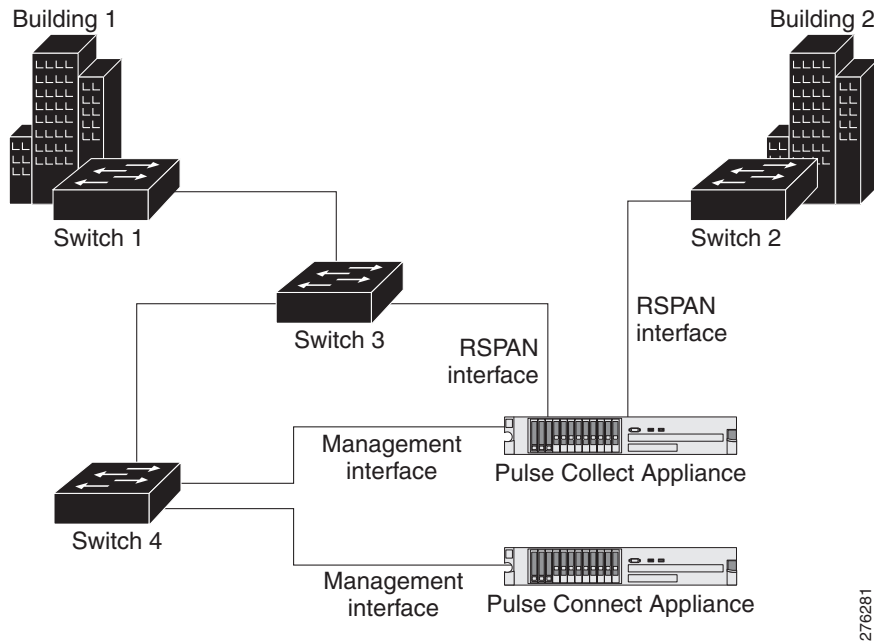
- [Sample Configuration 1: Cisco Switches Running IOS Software, page A-1](#)
- [Sample Configuration 2: Cisco Switches in Mixed Software Environment, page A-4](#)

For complete information on setting up the RSPAN with VACLs features on your Cisco switch, see the documentation that accompanies the switch.

## Sample Configuration 1: Cisco Switches Running IOS Software

In the sample Pulse topology shown in [Figure A-1](#), the XYZ business unit of Company ABC is deploying Cisco Pulse for users in a campus composed of two buildings. Switch 1 handles traffic generated by users in building 1, while switch 2 handles traffic generated by users in building 2.

A Pulse Collect and Connect Appliance are deployed in this topology. The Pulse Collect Appliance has one RSPAN connection to switch 1 and another RSPAN connection to switch 2. The Pulse Collect Appliance forwards web and email content to the Pulse Connect Appliance by way of the Pulse management port (port 0) on each appliance.

**Figure A-1 Sample Pulse Topology 1**

This sample configuration shows only the software features that are configured in support of Cisco Pulse on switches 1, 2, and 3; it does not show all features configured on each switch. All switches in this sample configuration run IOS software.

**Switch 1****Creates VACL named XYZ-VACL**

```
vlan access-map XYZ-VACL 10
```

**Specifies match condition in extended access list XYZ-TRAFFIC**

```
match ip address XYZ-TRAFFIC
```

**Specifies action to be taken when a match occurs**

```
action forward
```

**Applies XYZ-VACL to VLAN 100**

```
vlan filter XYZ-VACL vlan-list 100
```

**Creates ACL, which permits web and email traffic**

```
ip access-list extended XYZ-TRAFFIC
```

```
permit tcp any any eq www
```

```
permit tcp any any eq www any
```

```
permit tcp any any eq 88
```

```
permit tcp any any eq 88 any
```

```
permit tcp any any eq 135
```

```
permit tcp any any eq 135 any
```

```
permit tcp any any eq 445
```

```
permit tcp any any eq 445 any
```

```
permit tcp any any eq 8080
```

```
permit tcp any any eq 8080 any
```

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**List of email servers**

```
permit ip any 172.16.113.0 0.0.0.255
permit ip any 172.16.121.0 0.0.0.255
permit ip 172.16.113.0 0.0.0.255 any
permit ip 172.16.121.0 0.0.0.255 any
```

**Defines RSPAN source as port Te2/1**

```
monitor session 1 source interface Te2/1
```

**Defines RSPAN source as port Te4/1**

```
monitor session 1 source interface Te4/1
```

**Defines RSPAN destination as VLAN 100**

```
monitor session 1 destination remote vlan 100
```

**Defines RSPAN source as VLAN 100**

```
monitor session 2 source remote vlan 100
```

**Switch 2****Creates VACL named XYZ-VACL**

```
vlan access-map XYZ-VACL 10
```

**Specifies match condition in extended access list XYZ-TRAFFIC**

```
match ip address XYZ-TRAFFIC
```

**Specifies action to be taken when a match occurs**

```
action forward
```

**Applies XYZ-VACL to VLAN 100**

```
vlan filter XYZ-VACL vlan-list 100
```

**Creates ACL, which permits web and email traffic**

```
ip access-list extended XYZ-TRAFFIC
```

```
permit tcp any any eq www
```

```
permit tcp any eq www any
```

```
permit tcp any any eq 88
```

```
permit tcp any eq 88 any
```

```
permit tcp any any eq 135
```

```
permit tcp any eq 135 any
```

```
permit tcp any any eq 445
```

```
permit tcp any eq 445 any
```

```
permit tcp any any eq 8080
```

```
permit tcp any eq 8080 any
```

```
remark Exchange hosts
```

```
permit ip any 172.16.113.0 0.0.0.255
```

```
permit ip any 172.16.121.0 0.0.0.255
```

```
permit ip 172.16.113.0 0.0.0.255 any
```

```
permit ip 172.16.121.0 0.0.0.255 any
```

**Defines RSPAN source as port Te2/1**

```
monitor session 1 source interface Te2/1
```

**Defines RSPAN source as port Te4/1**

```
monitor session 1 source interface Te4/1
```

**Specifies RSPAN destination as VLAN 100**

```
monitor session 1 destination remote vlan 100
```

**Specifies RSPAN destination as port Gi3/7**

```
monitor session 2 destination interface Gi3/7
```

**Specifies RSPAN source as VLAN 100**  
 monitor session 2 source remote vlan 100

### Switch 3

**Specifies RSPAN destination as port Gi1/0/1**  
 monitor session 1 destination interface Gi1/0/1

**Specifies RSPAN source as VLAN 100**  
 monitor session 1 source remote vlan 100

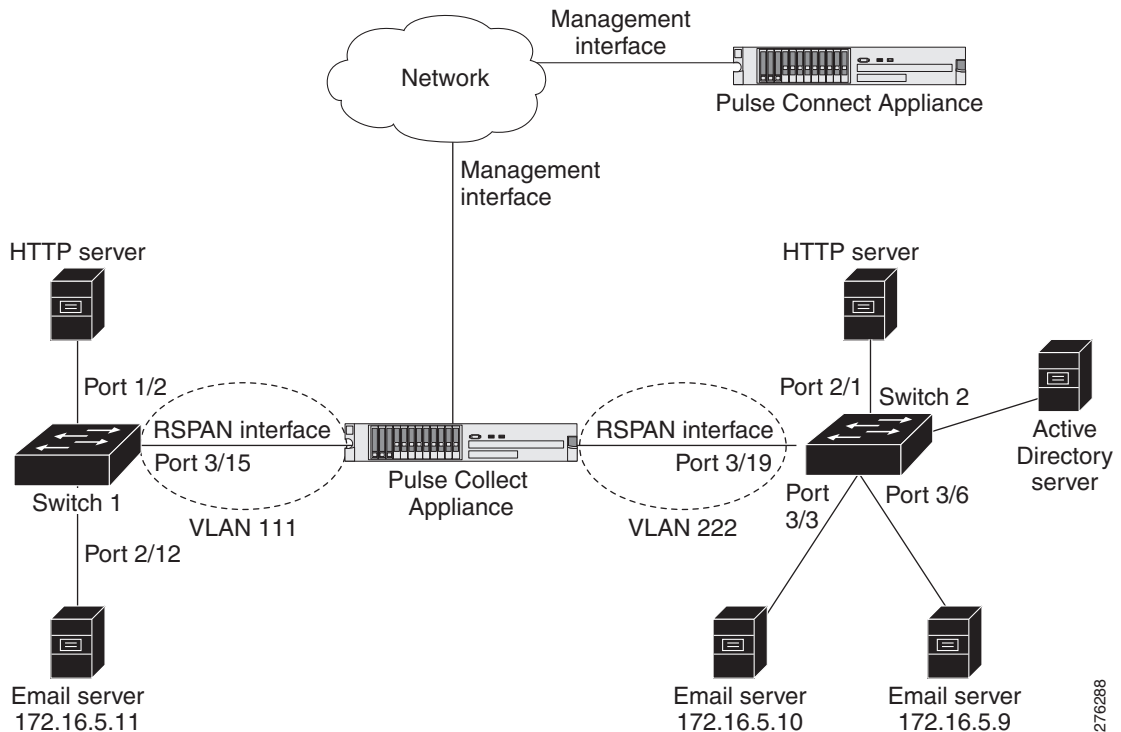
### Related Topics

- [Connecting a Pulse Collect Appliance, page 3-4](#)
- [Connecting the Pulse Collect Appliance to a Cisco Switch, page 3-5](#)

## Sample Configuration 2: Cisco Switches in Mixed Software Environment

In the sample Pulse topology shown in [Figure A-2](#), Company 123 has deployed a Pulse Collect and Connect Appliance. The Pulse Collect Appliance has one RSPAN connection to switch 1, and one RSPAN connection to switch 2. The Pulse Collect Appliance forwards web and email content to the Pulse Connect Appliance by way of the Pulse management port (port 0) on each appliance.

**Figure A-2** Sample Pulse Topology 2



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This topology uses these VLANs to segment the various types of traffic:

- VLAN 20 – email traffic
- VLAN 30 – web traffic
- VLAN 40 – Active Directory traffic
- VLAN 111 – RSPAN traffic for switch 1
- VLAN 222 – RSPAN traffic for switch 2

This sample configuration shows only the software features that are configured in support of Cisco Pulse on switches 1 and 2; it does not show all features configured on each switch. Some of the switches in this sample configuration run IOS software, while others run the Catalyst operating system.

### Switch 1

#### Creates VLAN111 for RSPAN traffic

```
set vlan 111 rspan name VLAN111 state active
```

#### Creates VACL MYLABEL that matches the specified ports and email server addresses

```
set security acl ip mylabel permit arp
set security acl ip mylabel permit tcp any any eq 80 statistics
set security acl ip mylabel permit tcp any eq 80 any statistics
set security acl ip mylabel permit tcp any any eq 88 statistics
set security acl ip mylabel permit tcp any eq 88 any statistics
set security acl ip mylabel permit tcp any any eq 25 statistics
set security acl ip mylabel permit tcp any eq 25 any statistics
set security acl ip mylabel permit ip any 172.16.5.11 0.0.0.0 statistics
set security acl ip mylabel permit ip 172.16.5.11 0.0.0.0 any statistics
```

#### Commits VACL MYLABEL to the hardware

```
commit security acl mylabel
```

#### Maps VACL MYLABEL to RSPAN VLAN111

```
set security acl map mylabel 111
```

#### Defines the RSPAN source as bidirectional traffic in VLANs 20 and 30

```
set rspan source 1/2,2/12 111 both multicast enable create
```

#### Defines the RSPAN destination as port 3/15

```
set rspan destination 3/15 111 inpkts disable learning enable create
```

### Switch 2

#### Creates VLAN 222 for RSPAN traffic

```
set vlan 222 rspan name VLAN222 state active
```

#### Creates VACL MYLABEL that matches the specified ports and email server addresses

```
set security acl ip mylabel permit arp
set security acl ip mylabel permit tcp any any eq 80 statistics
set security acl ip mylabel permit tcp any eq 80 any statistics
set security acl ip mylabel permit tcp any any eq 88 statistics
set security acl ip mylabel permit tcp any eq 88 any statistics
set security acl ip mylabel permit tcp any any eq 25 statistics
set security acl ip mylabel permit tcp any eq 25 any statistics
set security acl ip mylabel permit ip any 172.16.5.10 0.0.0.0 statistics
set security acl ip mylabel permit ip 172.16.5.10 0.0.0.0 any statistics
set security acl ip mylabel permit ip any 172.16.5.9 0.0.0.0 statistics
set security acl ip mylabel permit ip 172.16.5.9 0.0.0.0 any statistics
```

**Commits VACL MYLABEL to the hardware**

```
commit security acl mylabel
```

**Maps the VACL to RSPAN VLAN 222**

```
set security acl map mylabel 222
```

**Defines the RSPAN source as bidirectional traffic on VLANs 20, 30, and 40**

```
set rspan source 3/3, 3/6, 2/1 222 both multicast enable create
```

**Defines the RSPAN destination as port 3/19**

```
set rspan destination 3/19 222 inpkts disable learning enable create
```

**Related Topics**

- [Connecting a Pulse Collect Appliance, page 3-4](#)
- [Connecting the Pulse Collect Appliance to a Cisco Switch, page 3-5](#)