Felix Rohrer

PT Activity 6.4.3: Troubleshooting Inter-VLAN Routing

Topology Diagram

WEB/TFTP Server
192.168.50.254

PC1
192.168.10.21
VLAN 10

PC2
192.168.20.22
VLAN 20

PC3
192.168.30.23
VLAN 30
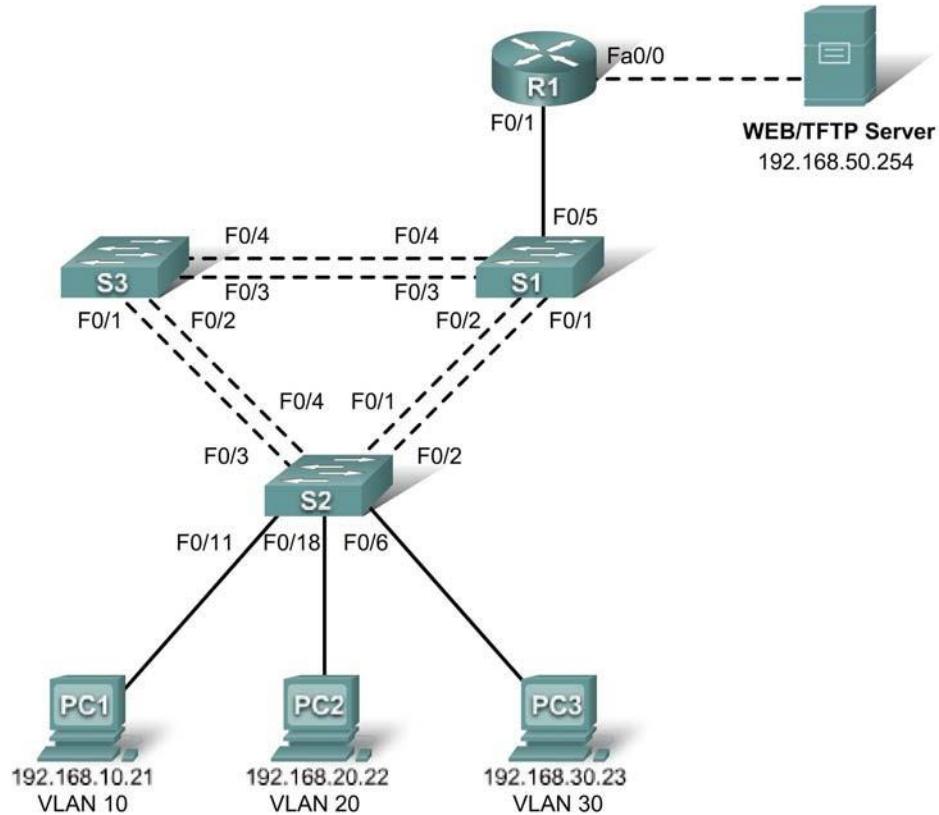
Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
S1	VLAN 99	192.168.99.11	255.255.255.0	192.168.99.1
S2	VLAN 99	192.168.99.12	255.255.255.0	192.168.99.1
S3	VLAN 99	192.168.99.13	255.255.255.0	192.168.99.1
R1	Fa0/0	192.168.50.1	255.255.255.0	N/A
	Fa0/1	See Interface Configuration Table		N/A
PC1	NIC	192.168.10.21	255.255.255.0	192.168.10.1
PC2	NIC	192.168.20.22	255.255.255.0	192.168.20.1
PC3	NIC	192.168.30.23	255.255.255.0	192.168.30.1
Server	NIC	192.168.50.254	255.255.255.0	192.168.50.1

Port Assignments – S2

Ports	Assignment	Network
Fa0/1 - 0/5	802.1q Trunks (Native VLAN 99)	192.168.99.0 /24
Fa0/6 - 0/10	VLAN 30 – Sales	192.168.30.0 /24
Fa0/11 - 0/17	VLAN 10 – R&D	192.168.10.0 /24
Fa0/18 - 0/24	VLAN 20 - Engineering	192.168.20.0 /24

Interface Configuration Table – R1

Interface	Assignment	IP Address
Fa0/1.1	VLAN 1	192.168.1.1 /24
Fa0/1.10	VLAN 10	192.168.10.1 /24
Fa0/1.20	VLAN 20	192.168.20.1 /24
Fa0/1.30	VLAN 30	192.168.30.1 /24
Fa0/1.99	VLAN 99	192.168.99.1 /24

Learning Objectives

- Troubleshoot and correct the Inter-VLAN issues and configuration errors.
- Document the network configuration.

Introduction

In this activity, you will troubleshoot the network, find and correct all configuration errors, and document the corrected network.

Task 1: Troubleshoot and Correct the Inter-VLAN Issues and Configuration Errors

Begin by identifying what is working and what is not. Use **cisco** as the user EXEC password and **class** as the privileged EXEC password on all switches and the router.

What is the state of the interfaces?

S1:   Fa0/5 ist down

R1:   Fa0/0 ist down

**   Fa0/1 ist down**

Die restlichen (benötigten) Interfaces sind up.

What hosts can ping other hosts?

Kein PC kann ein anderen pingen...

Which hosts can ping the server?

Kein PC kann den Server pingen...

What routes should be in the R1 routing table?

Die connected routes – statische braucht es keine

192.168.1.0/24

192.168.10.0/24

192.168.20.0/24

192.168.30.0/24

192.168.50.0/24

192.168.99.0/24

When all errors are corrected, you should be able to ping the remote server from any PC or any switch. In addition, you should be able to ping between the three PCs and ping the management interfaces on switches from any PC.

Your completion percentage should be 100%. If not, troubleshoot for missing configuration statements.

VLAN 20 ist nicht erfasst -> auf S1 hinzugefügt

Interface Fa0/5 auf S1 enabled

Interface Fa0/0 und Fa0/1 auf R1 enabled

VLANs auf S2 sind nicht richtig auf die Port zugewiesen - > korrigiert

S3 hatte keine IP in VLAN 99 konfiguriert - > korrigiert

Encapsulation auf R1 Fa0/1.10 ist falsch (11) auf VLAN 10 korrigiert

Task 2: Document the Network Configuration

When you have successfully completed your troubleshooting, capture the output of the router and all three switches with the **show run** command and save it to a text file.

Switch: S1

```
Building configuration...

Current configuration : 1720 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname S1
!
enable secret 5 $1$mERr$9cTjUIEqNGurQiFU.ZeCi1
!
!
!
!
spanning-tree mode pvst
!
interface FastEthernet0/1
 switchport trunk native vlan 99
 switchport mode trunk
!
interface FastEthernet0/2
 switchport trunk native vlan 99
 switchport mode trunk
!
interface FastEthernet0/3
 switchport trunk native vlan 99
 switchport mode trunk
!
interface FastEthernet0/4
 switchport trunk native vlan 99
 switchport mode trunk
!
interface FastEthernet0/5
 switchport trunk native vlan 99
 switchport mode trunk
!
interface FastEthernet0/6
 shutdown
!
interface FastEthernet0/7
 shutdown
!
interface FastEthernet0/8
 shutdown
!
interface FastEthernet0/9
 shutdown
!
interface FastEthernet0/10
 shutdown
!
interface FastEthernet0/11
 shutdown
!
interface FastEthernet0/12
 shutdown
!
interface FastEthernet0/13
 shutdown
!
interface FastEthernet0/14
 shutdown
!
interface FastEthernet0/15
 shutdown
!
interface FastEthernet0/16
 shutdown
```

```
!
interface FastEthernet0/17
 shutdown
!
interface FastEthernet0/18
 shutdown
!
interface FastEthernet0/19
 shutdown
!
interface FastEthernet0/20
 shutdown
!
interface FastEthernet0/21
 shutdown
!
interface FastEthernet0/22
 shutdown
!
interface FastEthernet0/23
 shutdown
!
interface FastEthernet0/24
 shutdown
!
interface GigabitEthernet1/1
 shutdown
!
interface GigabitEthernet1/2
 shutdown
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan99
 ip address 192.168.99.11 255.255.255.0
!
ip default-gateway 192.168.99.1
!
!
line con 0
 password cisco
 login
!
line vty 0 4
 password cisco
 login
line vty 5 15
 password cisco
 login
!
!
end


S1#
```

Switch: S2

```
Building configuration...

Current configuration : 2519 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname S2
!
enable secret 5 $1$mERr$9cTjUIEqNGurQiFU.ZeCi1
!
!
!
no ip domain-lookup
!
spanning-tree mode pvst
!
interface FastEthernet0/1
 switchport trunk native vlan 99
 switchport mode trunk
!
interface FastEthernet0/2
 switchport trunk native vlan 99
 switchport mode trunk
!
interface FastEthernet0/3
 switchport trunk native vlan 99
 switchport mode trunk
!
interface FastEthernet0/4
 switchport trunk native vlan 99
 switchport mode trunk
!
interface FastEthernet0/5
 switchport trunk native vlan 99
 switchport mode trunk
!
interface FastEthernet0/6
 switchport access vlan 30
 switchport mode access
!
interface FastEthernet0/7
 switchport access vlan 30
 switchport mode access
!
interface FastEthernet0/8
 switchport access vlan 30
 switchport mode access
!
interface FastEthernet0/9
 switchport access vlan 30
 switchport mode access
!
interface FastEthernet0/10
 switchport access vlan 30
 switchport mode access
!
interface FastEthernet0/11
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/12
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/13
 switchport access vlan 10
 switchport mode access
!
```

```
interface FastEthernet0/14
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/15
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/16
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/17
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/18
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/19
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/20
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/21
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/22
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/23
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/24
 switchport access vlan 20
 switchport mode access
!
interface GigabitEthernet1/1
 shutdown
!
interface GigabitEthernet1/2
 shutdown
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan99
 ip address 192.168.99.12 255.255.255.0
!
ip default-gateway 192.168.99.1
!
line con 0
 password cisco
 login
!
line vty 0 4
 password cisco
 login
line vty 5 15
 password cisco
 login
!
end
```

Switch: S3

```
Building configuration...

Current configuration : 1720 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname S3
!
enable secret 5 $1$mERr$9cTjUIEqNGurQiFU.ZeCi1
!
!
!
!
spanning-tree mode pvst
!
interface FastEthernet0/1
 switchport trunk native vlan 99
 switchport mode trunk
!
interface FastEthernet0/2
 switchport trunk native vlan 99
 switchport mode trunk
!
interface FastEthernet0/3
 switchport trunk native vlan 99
 switchport mode trunk
!
interface FastEthernet0/4
 switchport trunk native vlan 99
 switchport mode trunk
!
interface FastEthernet0/5
 switchport trunk native vlan 99
 switchport mode trunk
!
interface FastEthernet0/6
 shutdown
!
interface FastEthernet0/7
 shutdown
!
interface FastEthernet0/8
 shutdown
!
interface FastEthernet0/9
 shutdown
!
interface FastEthernet0/10
 shutdown
!
interface FastEthernet0/11
 shutdown
!
interface FastEthernet0/12
 shutdown
!
interface FastEthernet0/13
 shutdown
!
interface FastEthernet0/14
 shutdown
!
interface FastEthernet0/15
 shutdown
!
interface FastEthernet0/16
 shutdown
!
```

```
interface FastEthernet0/17
 shutdown
!
interface FastEthernet0/18
 shutdown
!
interface FastEthernet0/19
 shutdown
!
interface FastEthernet0/20
 shutdown
!
interface FastEthernet0/21
 shutdown
!
interface FastEthernet0/22
 shutdown
!
interface FastEthernet0/23
 shutdown
!
interface FastEthernet0/24
 shutdown
!
interface GigabitEthernet1/1
 shutdown
!
interface GigabitEthernet1/2
 shutdown
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan99
 ip address 192.168.99.13 255.255.255.0
!
ip default-gateway 192.168.99.1
!
!
line con 0
 password cisco
 login
!
line vty 0 4
 password cisco
 login
line vty 5 15
 password cisco
 login
!
!
end


S3#
```

Router: R1

```
Building configuration...
Current configuration : 1169 bytes
!
version 12.3
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname R1
!
enable secret 5 $1$mERr$9cTjUIEqNGurQiFU.ZeCi1
!
no ip domain-lookup
!
spanning-tree mode pvst
!
interface FastEthernet0/0
 ip address 192.168.50.1 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet0/1
 no ip address
 duplex auto
 speed auto
!
interface FastEthernet0/1.1
 encapsulation dot1Q 1
 ip address 192.168.1.1 255.255.255.0
!
interface FastEthernet0/1.10
 encapsulation dot1Q 10
 ip address 192.168.10.1 255.255.255.0
!
interface FastEthernet0/1.20
 encapsulation dot1Q 20
 ip address 192.168.20.1 255.255.255.0
!
interface FastEthernet0/1.30
 encapsulation dot1Q 30
 ip address 192.168.30.1 255.255.255.0
!
interface FastEthernet0/1.99
 encapsulation dot1Q 99 native
 ip address 192.168.99.1 255.255.255.0
!
interface Serial0/0/0
 no ip address
 shutdown
!
interface Serial0/0/1
 no ip address
 shutdown
!
interface Vlan1
 no ip address
 shutdown
!
ip classless
!
line con 0
 password cisco
 login
!
line aux 0
!
line vty 0 4
 password cisco
 login
!
end
```

Time	Device	Prompt	Command
Sa 15. Mrz 14:45:53 2014	S1	S1>	en
Sa 15. Mrz 14:45:56 2014	S1	S1#	sh interfaces ?
Sa 15. Mrz 14:46:00 2014	S1	S1#	sh interfaces fastEthernet ?
Sa 15. Mrz 14:46:04 2014	S1	S1#	sh ru
Sa 15. Mrz 14:46:31 2014	S2	S2>	en
Sa 15. Mrz 14:46:33 2014	S2	S2#	sh ru
Sa 15. Mrz 14:46:48 2014	S3	S3>	en
Sa 15. Mrz 14:46:50 2014	S3	S3#	sh ru
Sa 15. Mrz 14:47:10 2014	R1	R1>	en
Sa 15. Mrz 14:47:13 2014	R1	R1#	sh ru
Sa 15. Mrz 14:48:47 2014	S2	S2#	sh int fa0/18
Sa 15. Mrz 14:49:04 2014	PC1	PC>	ping 192.168.20.22
Sa 15. Mrz 14:53:08 2014	S1	S1#	sh ru
Sa 15. Mrz 14:53:26 2014	S1	S1#	sh vlan ?
Sa 15. Mrz 14:53:27 2014	S1	S1#	sh vlan
Sa 15. Mrz 14:53:33 2014	S1	S1#	sh vtp ?
Sa 15. Mrz 14:53:34 2014	S1	S1#	sh vtp status
Sa 15. Mrz 14:53:39 2014	S2	S2#	sh vtp status
Sa 15. Mrz 14:53:42 2014	S3	S3#	sh vtp status
Sa 15. Mrz 14:53:55 2014	S1	S1#	sh vla
Sa 15. Mrz 14:53:57 2014	S2	S2#	sh vlan
Sa 15. Mrz 14:54:00 2014	S3	S3#	sh vlan
Sa 15. Mrz 14:54:58 2014	S1	S1#	conf t
Sa 15. Mrz 14:55:01 2014	S1	S1(config)#	vlan 20
Sa 15. Mrz 14:55:13 2014	S1	S1(config-vlan)#	?
Sa 15. Mrz 14:55:18 2014	S1	S1(config-vlan)#	name Engineering
Sa 15. Mrz 14:55:30 2014	S2	S2#	sh vlan
Sa 15. Mrz 14:55:41 2014	S1	S1(config-vlan)#	ex
Sa 15. Mrz 14:55:44 2014	S1	S1(config)#	do sh ru
Sa 15. Mrz 14:56:08 2014	S1	S1(config)#	int fa0/5
Sa 15. Mrz 14:56:09 2014	S1	S1(config-if)#	no shutdown
Sa 15. Mrz 14:56:47 2014	R1	R1#	int fa0/1
Sa 15. Mrz 14:56:49 2014	R1	R1#	conf t
Sa 15. Mrz 14:56:54 2014	R1	R1(config)#	in fa0/1
Sa 15. Mrz 14:56:55 2014	R1	R1(config-if)#	no shutdown
Sa 15. Mrz 14:57:00 2014	R1	R1(config-if)#	in fa0/0
Sa 15. Mrz 14:57:02 2014	R1	R1(config-if)#	no shu
Sa 15. Mrz 14:57:05 2014	R1	R1(config-if)#	ex
Sa 15. Mrz 14:57:06 2014	R1	R1(config)#	ex
Sa 15. Mrz 14:57:07 2014	R1	R1#	sh ru
Sa 15. Mrz 14:57:41 2014	S2	S2#	sh ru
Sa 15. Mrz 14:58:51 2014	S2	S2#	conf t
Sa 15. Mrz 14:59:02 2014	S2	S2(config)#	int ra fa0/6 -fa0/10
Sa 15. Mrz 14:59:05 2014	S2	S2(config-if-range)#	swi mo acc
Sa 15. Mrz 14:59:10 2014	S2	S2(config-if-range)#	swi acc vlan 30
Sa 15. Mrz 14:59:15 2014	S2	S2(config-if-range)#	no shu
Sa 15. Mrz 14:59:25 2014	S2	S2(config-if-range)#	int ra fa0/11 - fa0/17
Sa 15. Mrz 14:59:28 2014	S2	S2(config-if-range)#	swi mo acc
Sa 15. Mrz 14:59:32 2014	S2	S2(config-if-range)#	swi acc vlan 10
Sa 15. Mrz 14:59:33 2014	S2	S2(config-if-range)#	no shu
Sa 15. Mrz 14:59:40 2014	S2	S2(config-if-range)#	int ra fa0/18 - fa0/24
Sa 15. Mrz 14:59:43 2014	S2	S2(config-if-range)#	swi mo acc
Sa 15. Mrz 14:59:46 2014	S2	S2(config-if-range)#	swi acc vlan 20
Sa 15. Mrz 14:59:49 2014	S2	S2(config-if-range)#	no shu
Sa 15. Mrz 15:00:21 2014	S2	S2(config)#	ex
Sa 15. Mrz 15:00:21 2014	S2	S2(config-if-range)#	ex

Time	Device	Prompt	Command
Sa 15. Mrz 15:00:22 2014	S2	S2#	sh ru
Sa 15. Mrz 15:00:50 2014	S3	S3#	sh ru
Sa 15. Mrz 15:01:16 2014	S3	S3#	conf t
Sa 15. Mrz 15:01:18 2014	S3	S3(config)#	int vlan 99
Sa 15. Mrz 15:01:31 2014	S3	S3(config-if)#	ip address 192.168.99.13 255.255.255.0
Sa 15. Mrz 15:02:06 2014	S1	S1(config-if)#	ex
Sa 15. Mrz 15:02:08 2014	S1	S1#	wr m
Sa 15. Mrz 15:02:08 2014	S1	S1(config)#	ex
Sa 15. Mrz 15:02:13 2014	S1	S1#	ping 192.168.99.12
Sa 15. Mrz 15:02:15 2014	S2	S2#	wr m
Sa 15. Mrz 15:02:20 2014	S2	S2#	ping 192.168.99.11
Sa 15. Mrz 15:02:22 2014	S1	S1#	ping 192.168.99.13
Sa 15. Mrz 15:02:25 2014	S2	S2#	ping 192.168.99.13
Sa 15. Mrz 15:02:26 2014	S3	S3(config-if)#	ex
Sa 15. Mrz 15:02:27 2014	S3	S3(config)#	ex
Sa 15. Mrz 15:02:28 2014	S3	S3#	wr m
Sa 15. Mrz 15:02:34 2014	S3	S3#	ping 192.168.99.11
Sa 15. Mrz 15:02:35 2014	S3	S3#	ping 192.168.99.12
Sa 15. Mrz 15:02:48 2014	S1	S1#	ping 192.168.99.1
Sa 15. Mrz 15:02:50 2014	S2	S2#	ping 192.168.99.1
Sa 15. Mrz 15:02:52 2014	S3	S3#	ping 192.168.99.1
Sa 15. Mrz 15:03:13 2014	S1	S1#	ping 192.168.10.21
Sa 15. Mrz 15:03:30 2014	S1	S1#	ping 192.168.20.22
Sa 15. Mrz 15:03:36 2014	S1	S1#	ping 192.168.30.23
Sa 15. Mrz 15:03:57 2014	S1	S1#	traceroute 192.168.10.21
Sa 15. Mrz 15:06:02 2014	R1	R1#	conf t
Sa 15. Mrz 15:06:08 2014	R1	R1(config)#	int fa0/1.10
Sa 15. Mrz 15:06:14 2014	R1	R1(config-subif)#	encapsulation dot1q 10
Sa 15. Mrz 15:06:18 2014	R1	R1(config-subif)#	ex
Sa 15. Mrz 15:06:19 2014	R1	R1#	wr m
Sa 15. Mrz 15:06:19 2014	R1	R1(config)#	ex
Sa 15. Mrz 15:06:25 2014	S1	S1#	ping 192.168.10.21
Sa 15. Mrz 15:06:31 2014	S1	S1#	ping 192.168.50.254
Sa 15. Mrz 15:06:36 2014	S1	S1#	ping 192.168.50.254
Sa 15. Mrz 15:06:42 2014	S2	S2#	ping 192.168.50.254
Sa 15. Mrz 15:06:46 2014	S3	S3#	ping 192.168.50.254
Sa 15. Mrz 15:06:54 2014	PC1	PC>	ping 192.168.20.22
Sa 15. Mrz 15:07:01 2014	PC1	PC>	ping 192.168.30.23
Sa 15. Mrz 15:07:07 2014	PC1	PC>	ping 192.168.50.254
Sa 15. Mrz 15:07:24 2014	PC1	PC>	ping 192.168.99.11
Sa 15. Mrz 15:07:29 2014	PC1	PC>	ping 192.168.99.12
Sa 15. Mrz 15:07:32 2014	PC1	PC>	ping 192.168.99.13
Sa 15. Mrz 15:07:36 2014	PC1	PC>	ping 192.168.99.1
Sa 15. Mrz 15:08:35 2014	S1	S1#	wr m
Sa 15. Mrz 15:08:36 2014	S1	S1#	sh ru
Sa 15. Mrz 15:10:01 2014	S2	S2#	wr m
Sa 15. Mrz 15:10:02 2014	S2	S2#	sh ru
Sa 15. Mrz 15:10:45 2014	S3	S3#	wr m
Sa 15. Mrz 15:10:47 2014	S3	S3#	sh ru
Sa 15. Mrz 15:11:07 2014	R1	R1#	wr m
Sa 15. Mrz 15:11:09 2014	R1	R1#	sh ru