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Collapse Multiple STP Instances into a Single STP Instance with E-Series Ethernet on ONS 15454

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Introduction

Prerequisites

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Introduction

This document describes the procedure to collapse multiple Spanning Tree Protocol (STP) instances into a single STP instance in order to overcome the limitation of eight STP instances for every 15454 node.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Cisco ONS 15454
- Spanning Tree Protocol

Components Used

The information in this document is based on these software and hardware versions:

- Cisco ONS 15454 version 5.x

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

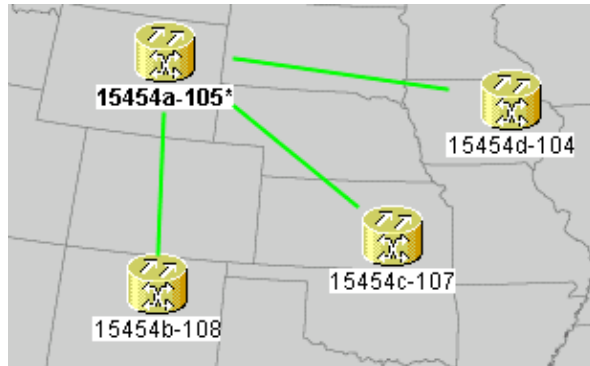
Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Topology

This document uses a lab setup with four ONS 15454 nodes, namely 15454a-105, 15454b-108, 15454c-107 and 15454d-104 (see Figure 1). These four nodes form a star network, where 15454a-105 serves as the common point.

Figure 1 Topology



Each node has one E100T-12 card.

Problem

The spanning tree software on the ONS 15454 runs on the Timing, Communications and Control (TCC) card, which is a shared resource.

Note: This document uses 'TCC' to generically refer to all variations of the card.

This document addresses the limitation of a maximum of eight STP instances for a node.

Complete these steps in order to understand the problem:

1. Log into the Cisco Transport Controller (CTC) for 15454a-105.

Figure 2 Expanded STP Instances

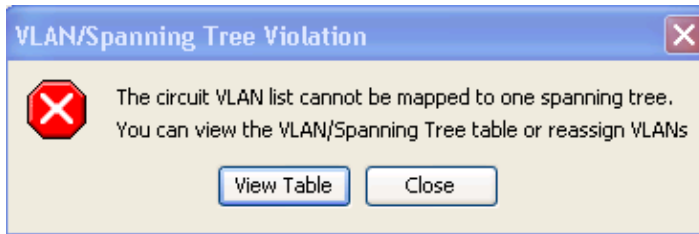
Type	Circuit Name/Port	STP ID	VLANs
EtherSwitch point-to-point	Circuit 1	1	VLAN10(10)
EtherSwitch point-to-point	Circuit 2	2	VLAN20(20)
EtherSwitch point-to-point	Circuit 3	3	VLAN30(30)
EtherSwitch point-to-point	Circuit 4	4	VLAN40(40)
EtherSwitch point-to-point	Circuit 5	5	VLAN50(50)
EtherSwitch point-to-point	Circuit 6	6	VLAN60(60)
EtherSwitch point-to-point	Circuit 7	7	VLAN70(70)
EtherSwitch point-to-point	Circuit 8	8	VLAN80(80)

2. Click the **Maintenance** tab (see arrow A in Figure 2).
3. Click the **Ether Bridge** tab (see arrow B in Figure 2).

4. Click the **Circuits** tab (see arrow C in Figure 2).

The STP ID column displays eight different instances of STP. An attempt to create a circuit with a ninth STP instance fails with an error message (see Figure 3).

Figure 3 VLAN/Spanning Tree Violation Error Message



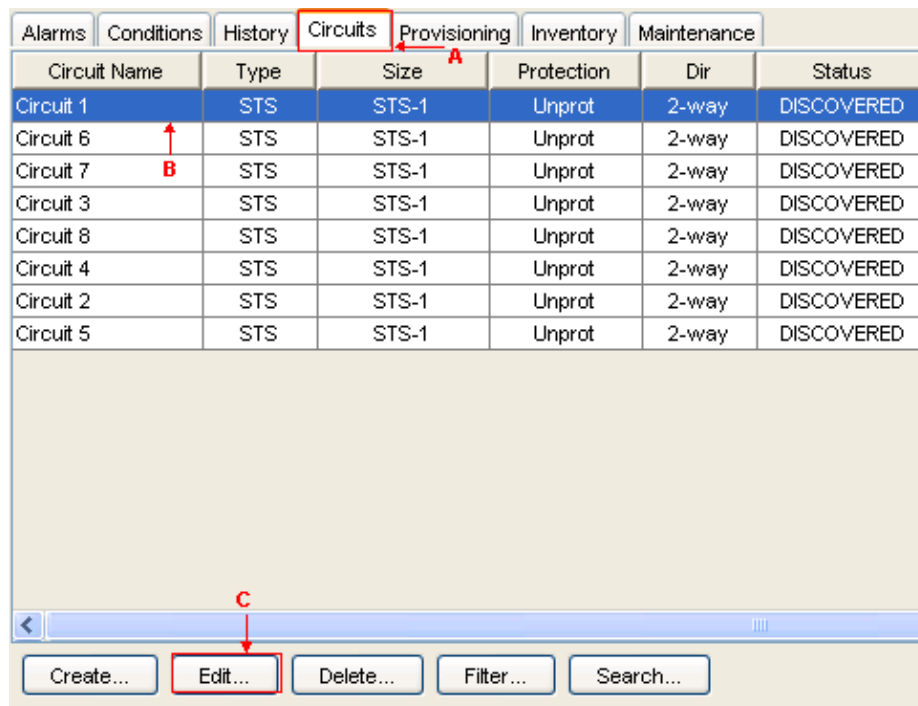
Solution

One way to avoid the error is to assign phantom VLANs that do not carry traffic. A phantom VLAN forces the spanning tree to collapse into the same instance. The solution is to collapse Circuit 1, Circuit 2, Circuit 3 and Circuit 4 into one STP instance.

Complete these steps:

1. Create a phantom VLAN. Complete these steps:
 - a. Log into CTC for 15454a-105.
 - b. Click the **Circuits** tab (see Arrow A in Figure 4).
 - c. Select **Circuit 1** (see arrow B in Figure 4).

Figure 4 Edit the Circuit



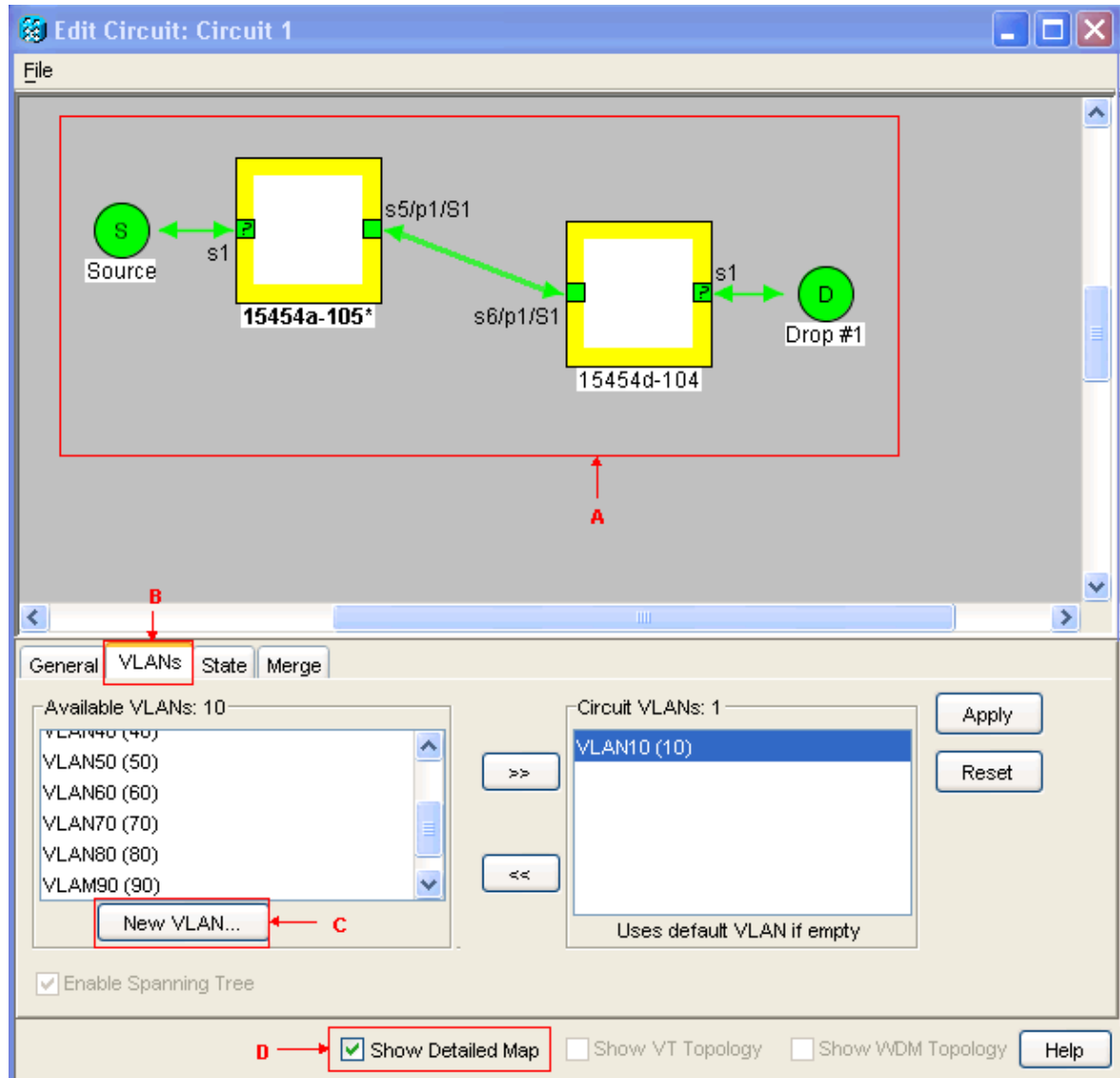
Circuit Name	Type	Size	Protection	Dir	Status
Circuit 1	STS	STS-1	Unprot	2-way	DISCOVERED
Circuit 6	STS	STS-1	Unprot	2-way	DISCOVERED
Circuit 7	STS	STS-1	Unprot	2-way	DISCOVERED
Circuit 3	STS	STS-1	Unprot	2-way	DISCOVERED
Circuit 8	STS	STS-1	Unprot	2-way	DISCOVERED
Circuit 4	STS	STS-1	Unprot	2-way	DISCOVERED
Circuit 2	STS	STS-1	Unprot	2-way	DISCOVERED
Circuit 5	STS	STS-1	Unprot	2-way	DISCOVERED

-
-
-
- d. Click **Edit** (see arrow C in Figure 4). The Edit Circuit window appears (see Figure 5).

Observe the circuit map (see arrow A in Figure 5).

Note: In order to view the circuit map, you must check the **Show Detailed Map** check box (see arrow D in Figure 5).

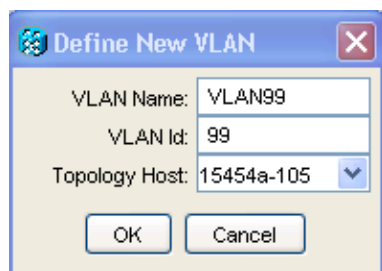
Figure 5 Edit Circuit: Circuit 1



e. Click the **VLANs** tab (see arrow B in Figure 5).

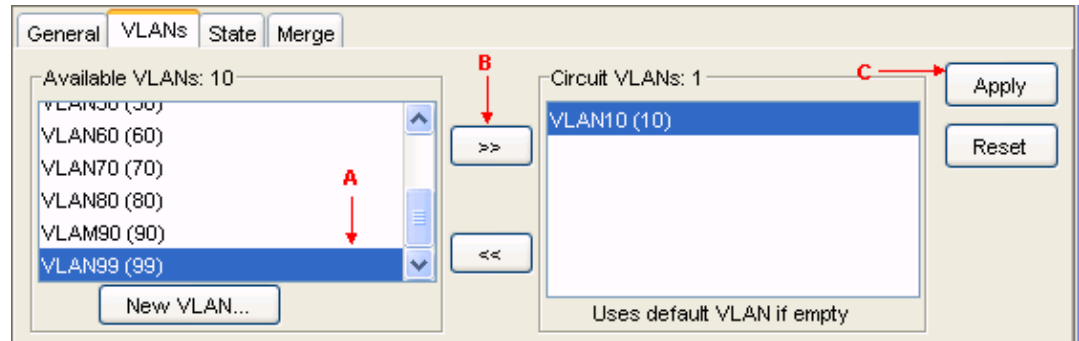
f. Click **New VLAN** (see arrow C in). The Define New VLAN dialog box appears.

Figure 6 Define New VLAN



- g. Enter the VLAN Name and VLAN Id in the appropriate fields. In this case, the VLAN Name is VLAN99 and VLAN Id is 99.
 - h. Click **OK**.
2. Add VLAN99 to Circuit 1. Complete these steps:
- a. Select VLAN99 from the Available VLANs (see arrow A in Figure 7).

Figure 7 Add a VLAN to a Circuit



- b. Click the >> button (see arrow B in Figure 7)
 - c. Click **Apply** (see arrow C in Figure 7).
3. Add VLAN99 to Circuit 2.
 4. Add VLAN99 to Circuit 3.
 5. Add VLAN99 to Circuit 4.

Verification

Complete these steps in order to verify the result:

- 1. Click **Maintenance > Ether Bridge > Circuits**.
- 2. Compare arrow D in Figure 2 and arrow A in Figure 8. Observe that circuits 2, 3 and 4 collapse into STP ID 1 from STP ID 2, 3 and 4.

Figure 8 Collapsed STP Instance

Maintenance					
Circuits					
Type	Circuit Name/Port	STP ID	VLANs		
EtherSwitch point-to-point	Circuit 1	1	VLAN10(10)	VLAN99(99)	
EtherSwitch point-to-point	Circuit 2	1	VLAN20(20)	VLAN99(99)	
EtherSwitch point-to-point	Circuit 3	1	VLAN30(30)	VLAN99(99)	
EtherSwitch point-to-point	Circuit 4	1	VLAN40(40)	VLAN99(99)	
EtherSwitch point-to-point	Circuit 5	5	VLAN50(50)		
EtherSwitch point-to-point	Circuit 6	6	VLAN60(60)		
EtherSwitch point-to-point	Circuit 7	7	VLAN70(70)		
EtherSwitch point-to-point	Circuit 8	8	VLAN80(80)		

After the merge, the number of STP instances successfully reduces from 8 to 5. Now you can add another STP instance.

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Service Providers: Optical Networking
Service Providers: Metro

Related Information

- **Technical Support & Documentation – Cisco Systems**

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Updated: May 12, 2006

Document ID: 67194
