

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

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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.

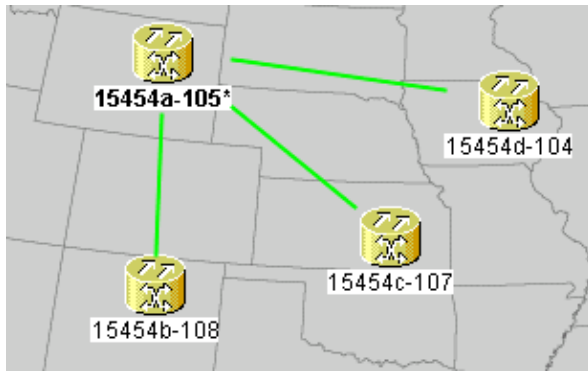
### Conventions

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.

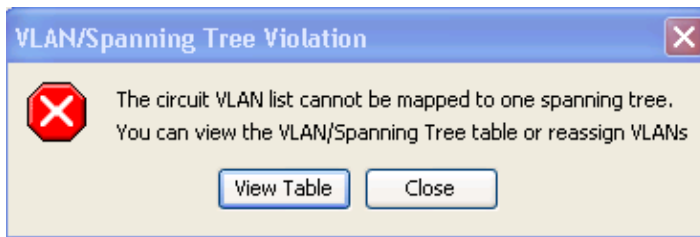
**Figure 2 Expanded STP Instances**

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**

Alarms						
Conditions						
History						
Circuits						
Provisioning						
Inventory						
Maintenance						
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	

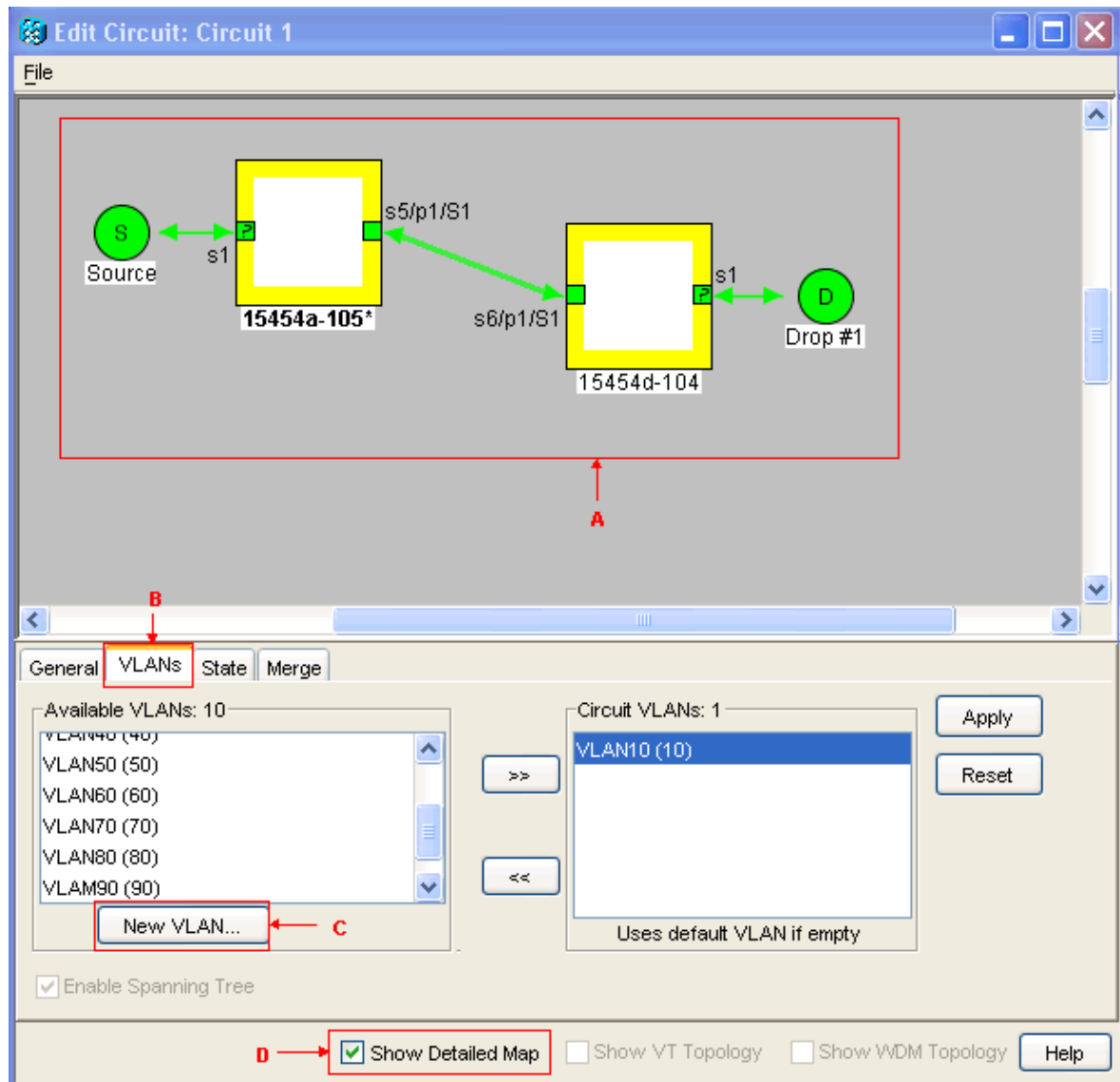
Below the table is a toolbar with buttons: Create..., Edit..., Delete..., Filter..., Search... The "Edit..." button is highlighted with a red box and a red arrow labeled 'C' points to it. The "Circuits" tab is highlighted with a red box and a red arrow labeled 'A' points to it. A red arrow labeled 'B' points to the "Circuit 7" row in the table.

- 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).

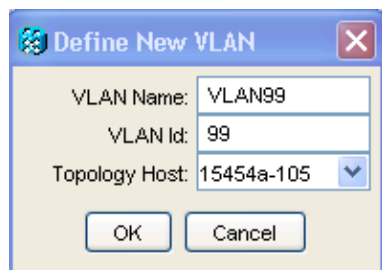
**Note:** In order to view the circuit map, you must check the **Show Detailed Map** check box (see arrow D in Figure 5).

**Figure 5 Edit Circuit: Circuit 1**



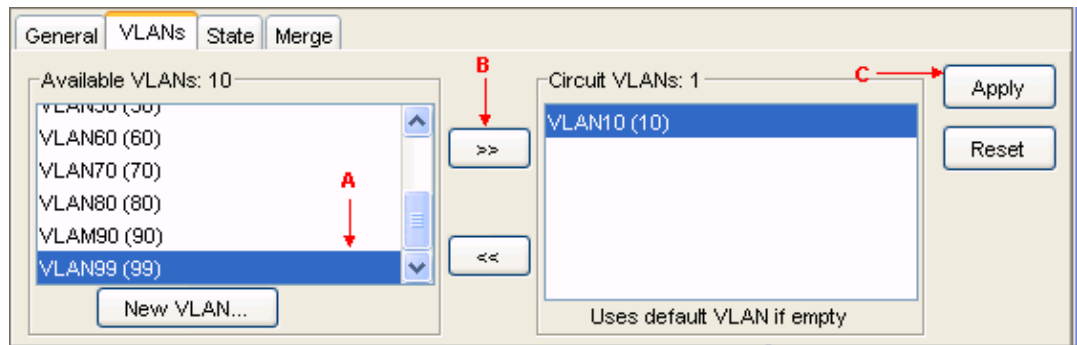
- e. Click the **VLANs** tab (see arrow B in Figure 5).
- f. Click **New VLAN** (see arrow C in ). The Define New VLAN dialog box appears.

**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**

Alarms Conditions History Circuits Provisioning Inventory Maintenance				
Database				
Spanning Trees MAC Table Trunk Utilization Circuits				
Ether Bridge				
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.

## Related Information

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