

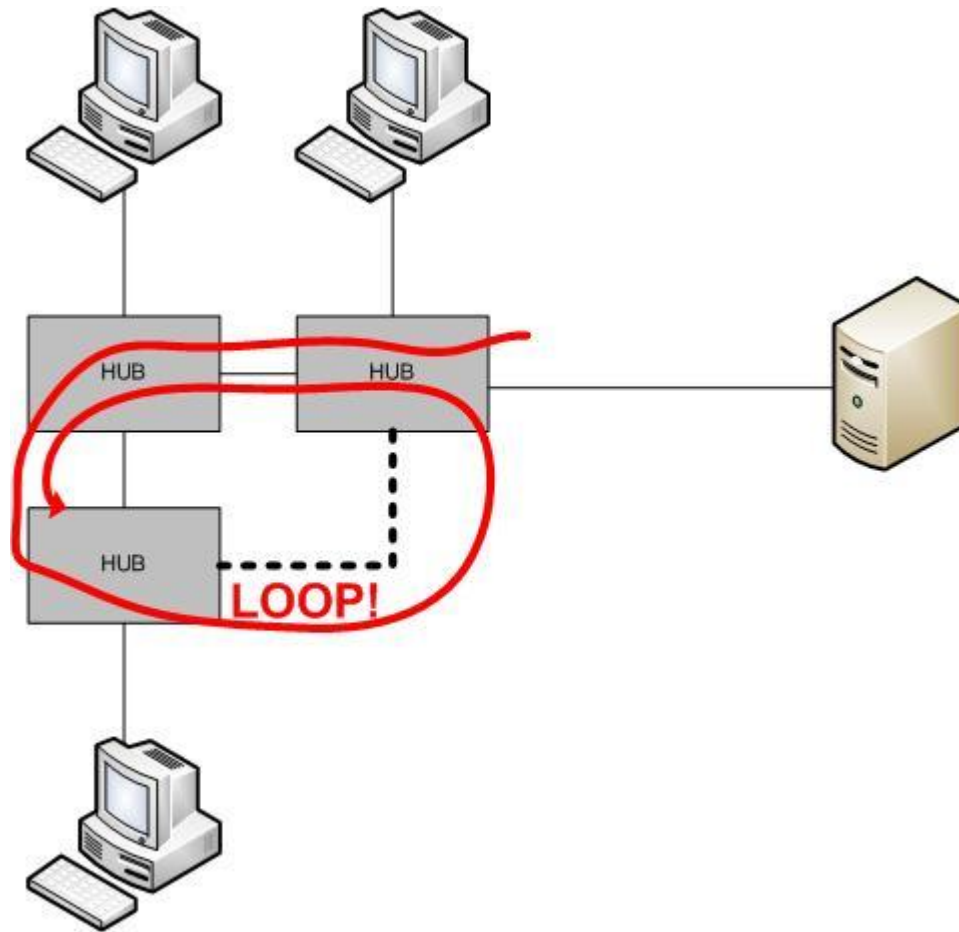


STP

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chenshh

# Why STP?



# Problems

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1. Broadcast Storms
2. Mac-Table Inestability
3. Multiples copies of frames

# Basic STP (802.1d)

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Before we start we need talks about these

1. Bridge Protocol Data Unit(L2)
2. Bridge ID

# BPDU

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1.L2 -> MAC Address

2.Sent to a special multicast address

01:80:C2:00:00:00

# Bridge ID

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Generate by switch macs and its priority

The default priority is 32768

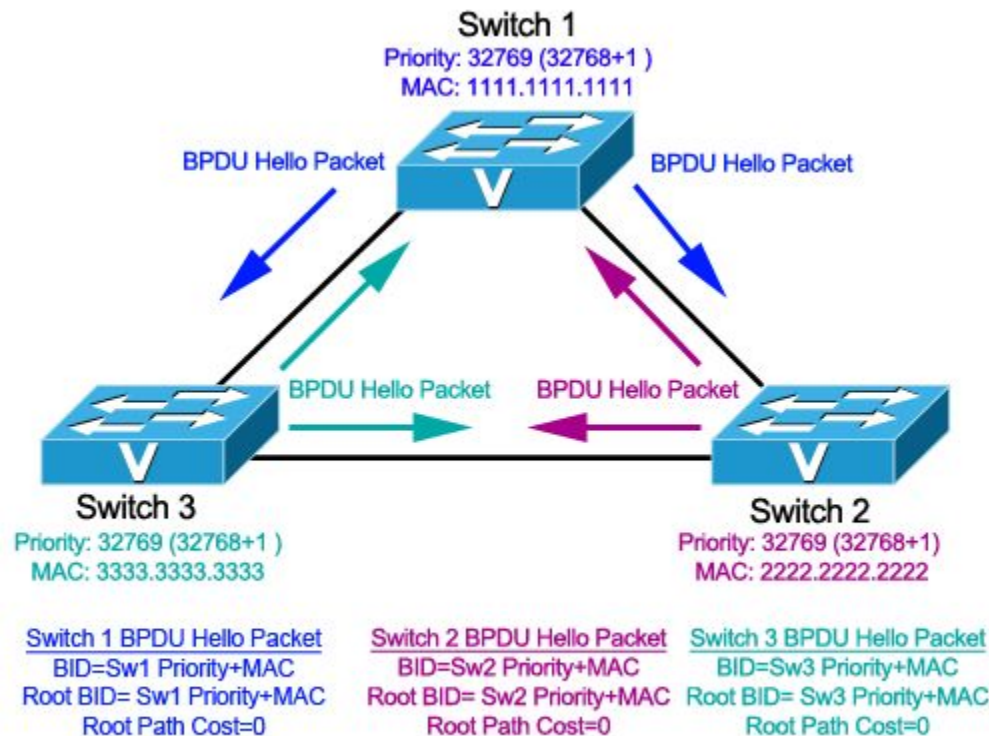
# How STP works?

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1. Root Bridge Election
2. Set port state

## Root Bridge Election

Passing BPDUs, Choosing the smallest bridge id as root bridge.





# Set port role

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Three roles:

Root port

Designated port

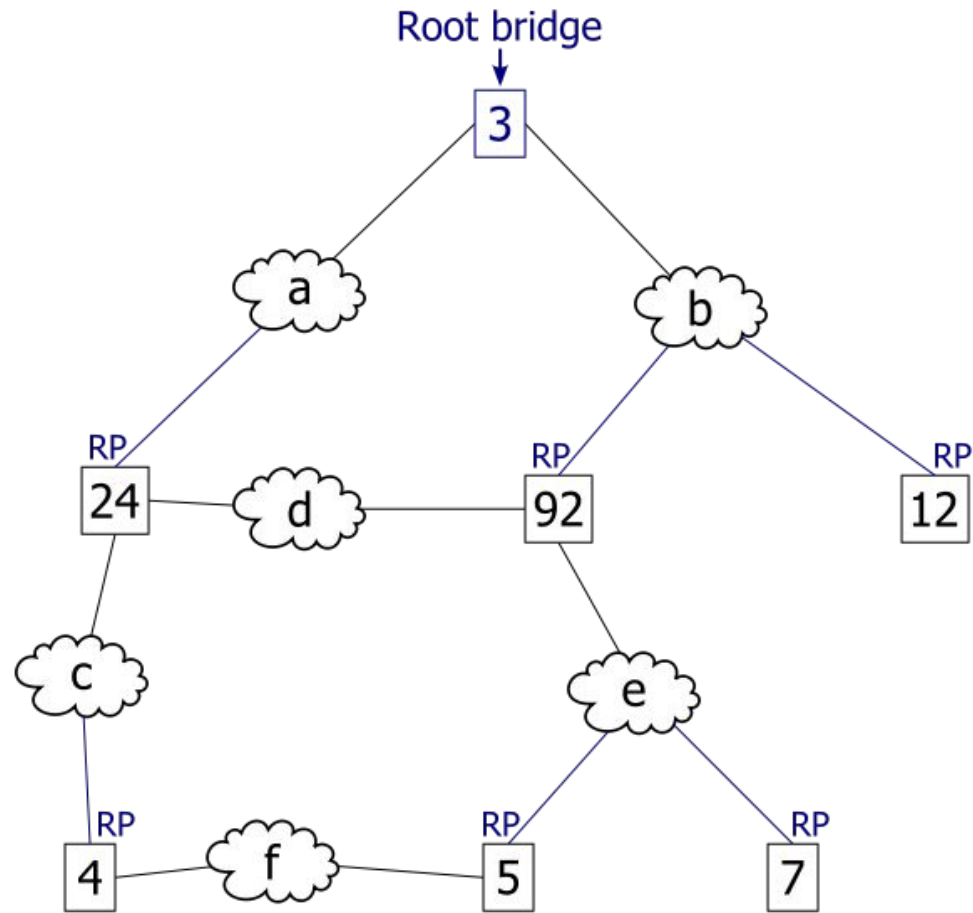
Block port

# Calculate Costs

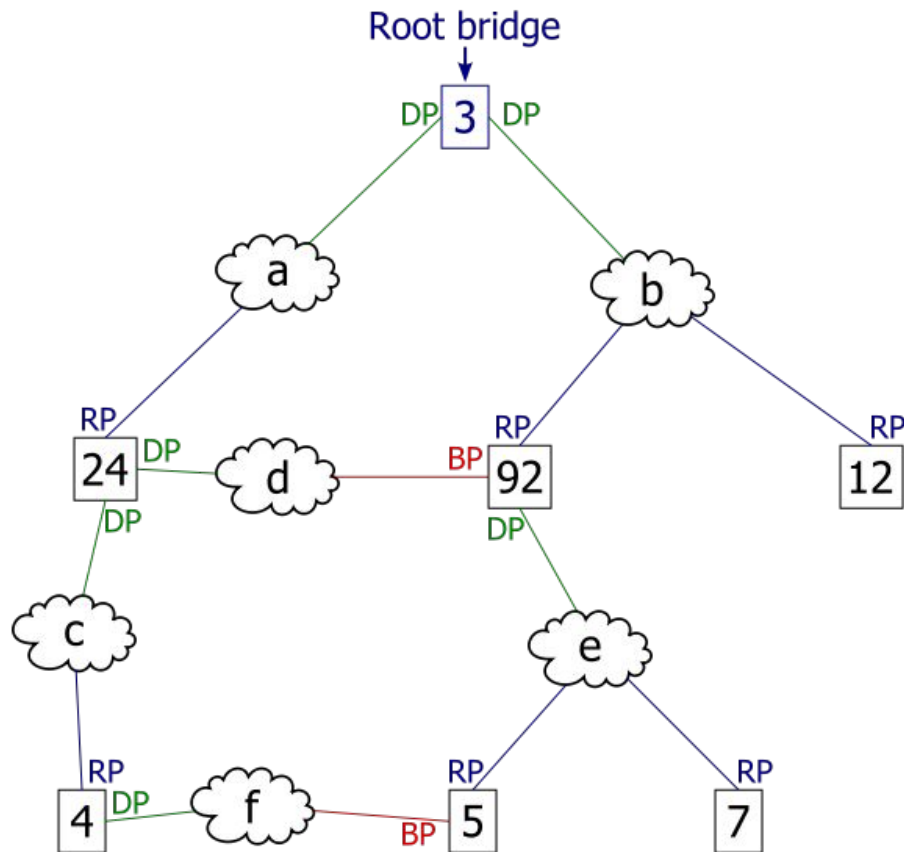
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We want the cost to root be minimal!  
Set the right root port!

# Setting states



# Setting states



# Some tips

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Who is root is important!

# Some Issues

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1. When changing states temporary cycles may appear.
2. Using timeouts is slow.

# Set port state

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Five States:

Blocking

Listening

Learning

Forwarding

Disabled

Each transitions between state cost several seconds

Will not generate loops!

## RSTP (802.1w)

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Minify response time to several seconds

Compatibility of STP



## More roles

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Root

Designated

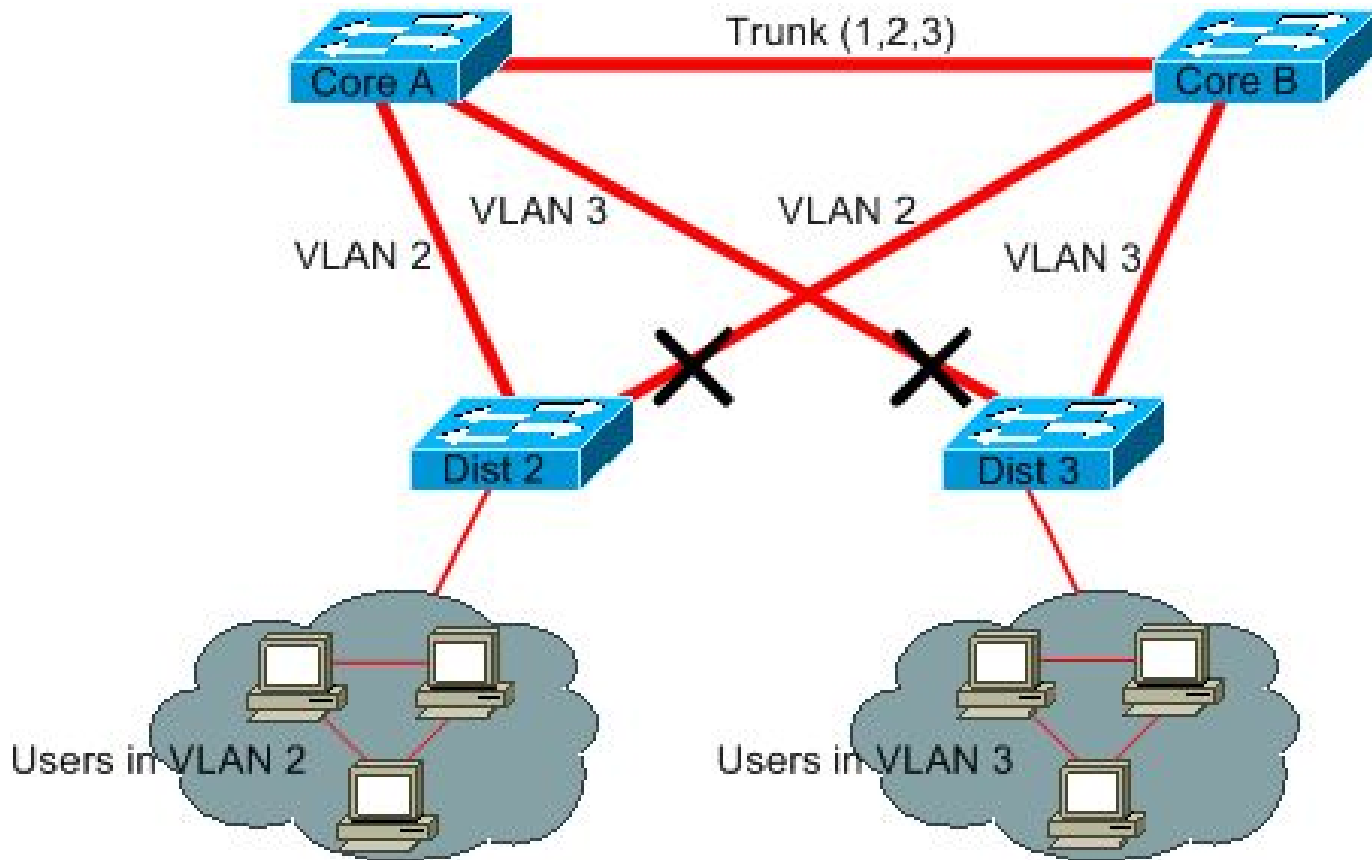
Alternative

Backup

Disabled

Edge

# VLAN Issues



# Cisco's PVST

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One VLAN One STP

802.1q tagged **modified** BDPU

# Cisco's PVST+

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Run STP at VLAN 1

Run PVST at others

Compatibility of STP/RSTP

# Cisco's Rapid-PVST+

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Add RSTP features

# Some Issues

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One VLAN -> One STP

Hundreds VLAN -> Hundreds STP

Massive PVST BPDUs on the networks

Massive Calculations

And these are cisco's protocol

not well supported on other manufacturers' products

# MSTP

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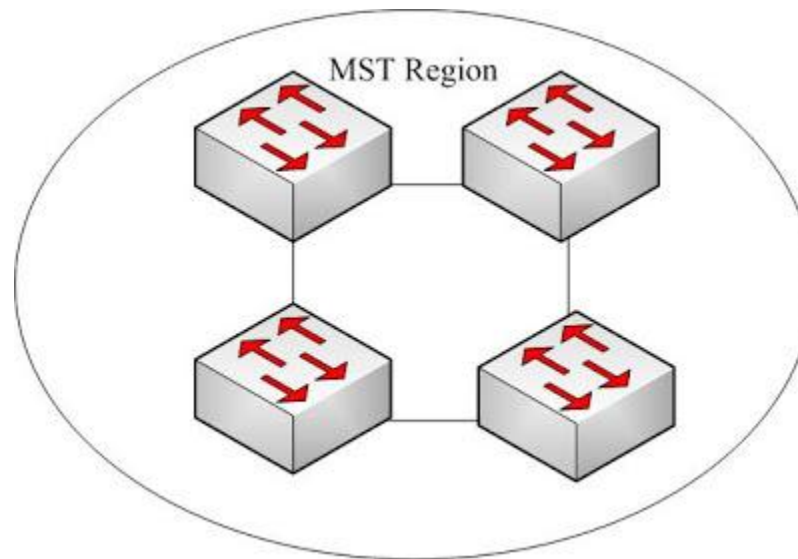
MST Region

MST Instance

CIST

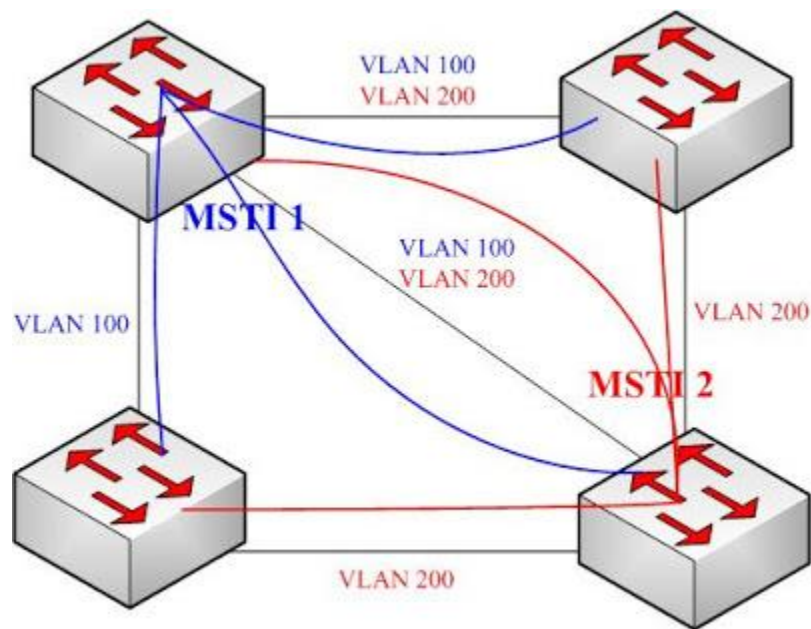
# MST Region

Looks like a switch from outside





# MST Instances



# CIST

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CST & IST

**C**ommon and **I**nternal **S**panning **T**ree

Contacting multiple regions and  
compatibility of STP/RSTP