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**Лабораторная работа №3**

**«Протокол STP»**

**Выполнили:**

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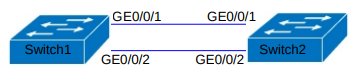
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**Цель работы:**

Изучение принципов работы протокола покрывающего дерева (Spanning Tree Protocol).

**Топология:**



**Включили STP глобально на всех интерфейсах коммутатора и настроили версии протокола STP:**

[Huawei]stp enable

[Huawei]stp mode stp

Info: This operation may take a few seconds. Please wait for a moment...done.

[Huawei]

Oct 29 2018 11:26:05-08:00 Huawei DS/4/DATASYNC\_CFGCHANGE:OID 1.3.6.1.4.1.2011.5

.25.191.3.1 configurations have been changed. The current change number is 4, th

e change loop count is 0, and the maximum number of records is 4095.

**Установили коммутатор (Switch1) в качестве корневого(root bridge):**

[Huawei]stp root primary

[Huawei]

Oct 29 2018 11:26:45-08:00 Huawei DS/4/DATASYNC\_CFGCHANGE:OID 1.3.6.1.4.1.2011.5

.25.191.3.1 configurations have been changed. The current change number is 5, th

e change loop count is 0, and the maximum number of records is 4095.

**Проверка конфигурации STP:**

[Huawei]display stp

-------[CIST Global Info][Mode STP]-------

CIST Bridge :0 .4c1f-ccc0-4bc2

Config Times :Hello 2s MaxAge 20s FwDly 15s MaxHop 20

Active Times :Hello 2s MaxAge 20s FwDly 15s MaxHop 20

CIST Root/ERPC :0 .4c1f-ccc0-4bc2 / 0

CIST RegRoot/IRPC :0 .4c1f-ccc0-4bc2 / 0

CIST RootPortId :0.0

BPDU-Protection :Disabled

CIST Root Type :Primary root

TC or TCN received :17

TC count per hello :0

STP Converge Mode :Normal

Time since last TC :0 days 0h:0m:14s

Number of TC :6

Last TC occurred :Ethernet0/0/1

----[Port1(Ethernet0/0/1)][LEARNING]----

Port Protocol :Enabled

Port Role :Designated Port

Port Priority :128

Port Cost(Dot1T ) :Config=auto / Active=200000

Designated Bridge/Port :0.4c1f-ccc0-4bc2 / 128.1

Port Edged :Config=default / Active=disabled

Point-to-point :Config=auto / Active=true

Transit Limit :147 packets/hello-time

**Краткая информация обо всех портах коммутатора:**

[Huawei]display stp brief

MSTID Port Role STP State Protection

0 Ethernet0/0/1 DESI FORWARDING NONE

0 Ethernet0/0/2 DESI FORWARDING NONE

**На switch 1 отменили предыдущую конфигурацию:**

[Huawei]undo stp root

[Huawei]

Oct 29 2018 11:28:45-08:00 Huawei DS/4/DATASYNC\_CFGCHANGE:OID 1.3.6.1.4.1.2011.5

.25.191.3.1 configurations have been changed. The current change number is 6, th

e change loop count is 0, and the maximum number of records is 4095.

**Задали приоритет:**

[Huawei]stp priority 8192

[Huawei]

Oct 29 2018 11:29:15-08:00 Huawei DS/4/DATASYNC\_CFGCHANGE:OID 1.3.6.1.4.1.2011.5

.25.191.3.1 configurations have been changed. The current change number is 7, th

e change loop count is 0, and the maximum number of records is 4095.

[Huawei]

**Также на Switch 2 отменили предыдущую конфигурацию:**

[Huawei]undo stp root

[Huawei]

Oct 29 2018 11:28:56-08:00 Huawei DS/4/DATASYNC\_CFGCHANGE:OID 1.3.6.1.4.1.2011.5

.25.191.3.1 configurations have been changed. The current change number is 6, th

e change loop count is 0, and the maximum number of records is 4095.

**И затем поменяли приоритет:**

[Huawei]stp priority 4096

[Huawei]

Oct 29 2018 11:29:26-08:00 Huawei DS/4/DATASYNC\_CFGCHANGE:OID 1.3.6.1.4.1.2011.5

.25.191.3.1 configurations have been changed. The current change number is 7, th

e change loop count is 0, and the maximum number of records is 4095.

**После этого, (Switch2) стал (root bridge), что можно посмотреть в выводе команды:**

**Switch1:**

[Huawei]display stp

-------[CIST Global Info][Mode STP]-------

CIST Bridge :8192 .4c1f-ccc0-4bc2

Config Times :Hello 2s MaxAge 20s FwDly 15s MaxHop 20

Active Times :Hello 2s MaxAge 20s FwDly 15s MaxHop 20

CIST Root/ERPC :4096 .4c1f-cc75-2513 / 200000

CIST RegRoot/IRPC :8192 .4c1f-ccc0-4bc2 / 0

CIST RootPortId :128.1

BPDU-Protection :Disabled

TC or TCN received :52

TC count per hello :0

STP Converge Mode :Normal

Time since last TC :0 days 0h:1m:0s

Number of TC :8

Last TC occurred :Ethernet0/0/1

----[Port1(Ethernet0/0/1)][FORWARDING]----

Port Protocol :Enabled

Port Role :Root Port

Port Priority :128

Port Cost(Dot1T ) :Config=auto / Active=200000

Designated Bridge/Port :4096.4c1f-cc75-2513 / 128.1

Port Edged :Config=default / Active=disabled

Point-to-point :Config=auto / Active=true

Transit Limit :147 packets/hello-time

Protection Type :None

**Switch2:**

[Huawei]display stp

-------[CIST Global Info][Mode STP]-------

CIST Bridge :4096 .4c1f-cc75-2513

Config Times :Hello 2s MaxAge 20s FwDly 15s MaxHop 20

Active Times :Hello 2s MaxAge 20s FwDly 15s MaxHop 20

CIST Root/ERPC :4096 .4c1f-cc75-2513 / 0

CIST RegRoot/IRPC :4096 .4c1f-cc75-2513 / 0

CIST RootPortId :0.0

BPDU-Protection :Disabled

TC or TCN received :58

TC count per hello :0

STP Converge Mode :Normal

Time since last TC :0 days 0h:1m:55s

Number of TC :7

Last TC occurred :Ethernet0/0/2

----[Port1(Ethernet0/0/1)][FORWARDING]----

Port Protocol :Enabled

Port Role :Designated Port

Port Priority :128

Port Cost(Dot1T ) :Config=auto / Active=200000

Designated Bridge/Port :4096.4c1f-cc75-2513 / 128.1

Port Edged :Config=default / Active=disabled

Point-to-point :Config=auto / Active=true

Transit Limit :147 packets/hello-time

Protection Type :None

**Cделали конфигурацию приоритета портов, сменили приоритет порта на Switch2 на 32:**

[Huawei-GigabitEthernet0/0/2]stp port priority 32

[Huawei-GigabitEthernet0/0/2]display stp brief

MSTID Port Role STP State Protection

0 Ethernet0/0/1 DESI FORWARDING NONE

0 Ethernet0/0/2 DESI FORWARDING NONE

**Настройка стоимости портов:**

**Switch 1:**

[Huawei]display stp interface GigabitEthernet 0/0/1

-------[CIST Global Info][Mode STP]-------

CIST Bridge :8192 .4c1f-ccc0-4bc2

Config Times :Hello 2s MaxAge 20s FwDly 15s MaxHop 20

Active Times :Hello 2s MaxAge 20s FwDly 15s MaxHop 20

CIST Root/ERPC :4096 .4c1f-cc75-2513 / 200000

CIST RegRoot/IRPC :8192 .4c1f-ccc0-4bc2 / 0

CIST RootPortId :128.1

BPDU-Protection :Disabled

TC or TCN received :52

TC count per hello :0

STP Converge Mode :Normal

Time since last TC :0 days 0h:5m:6s

Number of TC :8

Last TC occurred :Ethernet0/0/1

----[Port23(GigabitEthernet0/0/1)][DOWN]----

Port Protocol :Enabled

Port Role :Disabled Port

Port Priority :128

**Port Cost(Dot1T** ) :Config=auto / Active=200000000

Designated Bridge/Port :8192.4c1f-ccc0-4bc2 / 128.23

Port Edged :Config=default / Active=disabled

Point-to-point :Config=auto / Active=false

Transit Limit :147 packets/hello-time

Protection Type :None

**Поменяли стоимость порта, после чего порт 0/0/1 стал обратно root:**

[Huawei]interface GigabitEthernet 0/0/1

[Huawei-GigabitEthernet0/0/1]stp cost 1

[Huawei-GigabitEthernet0/0/1]display stp brief

MSTID Port Role STP State Protection

**0 Ethernet0/0/1 ROOT FORWARDING NONE**

0 Ethernet0/0/2 ALTE DISCARDING NONE

[Huawei-GigabitEthernet0/0/1]

**Таким образом стоимость влияет на выбор (root) порта на локальном коммутаторе.**

**Настройка хост-порта:**

**Switch1:**

[Huawei]interface Ethernet 0/0/10

[Huawei-Ethernet0/0/10]stp edged-port enable

[Huawei]stp bpdu-protection

[Huawei]

Oct 29 2018 11:42:35-08:00 Huawei DS/4/DATASYNC\_CFGCHANGE:OID 1.3.6.1.4.1.2011.5

.25.191.3.1 configurations have been changed. The current change number is 10, t

he change loop count is 0, and the maximum number of records

**Switch 2:**

[Huawei]interface Ethernet 0/0/10

[Huawei-Ethernet0/0/10]stp edged-port enable

[Huawei-Ethernet0/0/10]

Oct 29 2018 11:44:56-08:00 Huawei DS/4/DATASYNC\_CFGCHANGE:OID 1.3.6.1.4.1.2011.5

.25.191.3.1 configurations have been changed. The current change number is 9, th

e change loop count is 0, and the maximum number of records is 4095.

[Huawei-Ethernet0/0/10]stp bpdu-protection

[Huawei]

Oct 29 2018 11:45:16-08:00 Huawei DS/4/DATASYNC\_CFGCHANGE:OID 1.3.6.1.4.1.2011.5

.25.191.3.1 configurations have been changed. The current change number is 10, t

he change loop count is 0, and the maximum number of records is 4095.

**Посмотреть на каких портах включена функция BPDU protection:**

**Switch 1:**

[Huawei]display stp interface Ethernet0/0/10

-------[CIST Global Info][Mode STP]-------

CIST Bridge :8192 .4c1f-ccc0-4bc2

Config Times :Hello 2s MaxAge 20s FwDly 15s MaxHop 20

Active Times :Hello 2s MaxAge 20s FwDly 15s MaxHop 20

CIST Root/ERPC :4096 .4c1f-cc75-2513 / 200000

CIST RegRoot/IRPC :8192 .4c1f-ccc0-4bc2 / 0

CIST RootPortId :128.1

**BPDU-Protection :Enabled**

TC or TCN received :52

TC count per hello :0

STP Converge Mode :Normal

Time since last TC :0 days 0h:16m:10s

Number of TC :8

Last TC occurred :Ethernet0/0/1

----[Port10(Ethernet0/0/10)][DOWN]----

Port Protocol :Enabled

Port Role :Disabled Port

Port Priority :128

Port Cost(Dot1T ) :Config=auto / Active=200000000

Designated Bridge/Port :8192.4c1f-ccc0-4bc2 / 128.10

Port Edged :Config=enabled / Active=enabled

BPDU-Protection :Enabled

Point-to-point :Config=auto / Active=false

Transit Limit :147 packets/hello-time

**Switch 2:**

[Huawei]display stp interface Ethernet 0/0/10

-------[CIST Global Info][Mode STP]-------

CIST Bridge :4096 .4c1f-cc75-2513

Config Times :Hello 2s MaxAge 20s FwDly 15s MaxHop 20

Active Times :Hello 2s MaxAge 20s FwDly 15s MaxHop 20

CIST Root/ERPC :4096 .4c1f-cc75-2513 / 0

CIST RegRoot/IRPC :4096 .4c1f-cc75-2513 / 0

CIST RootPortId :0.0

**BPDU-Protection :Enabled**

TC or TCN received :58

TC count per hello :0

STP Converge Mode :Normal

Time since last TC :0 days 0h:17m:0s

Number of TC :7

Last TC occurred :Ethernet0/0/2

----[Port10(Ethernet0/0/10)][DOWN]----

Port Protocol :Enabled

Port Role :Disabled Port

Port Priority :128

Port Cost(Dot1T ) :Config=auto / Active=200000000

Designated Bridge/Port :4096.4c1f-cc75-2513 / 128.10

Port Edged :Config=enabled / Active=enabled

BPDU-Protection :Enabled

Point-to-point :Config=auto / Active=false

Transit Limit :147 packets/hello-time

