Link Aggregation

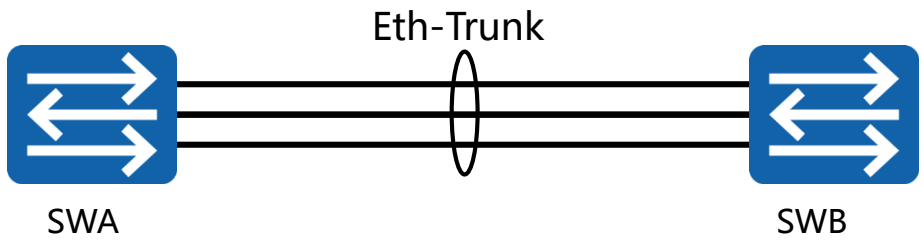
Foreword

- As a means of optimizing the throughput of data, link aggregation enables the binding of multiple physical interfaces into a single logical pipe. This effectively introduces solutions for providing higher utilization of available links, as well as extended resilience in the event that failure of individual links were to occur. Engineers are required to have a clear understanding of the conditions that define the behavior of link aggregation and the skills and knowledge for its application, to ensure effective link aggregation solutions can be applied to enterprise networks.

Objectives

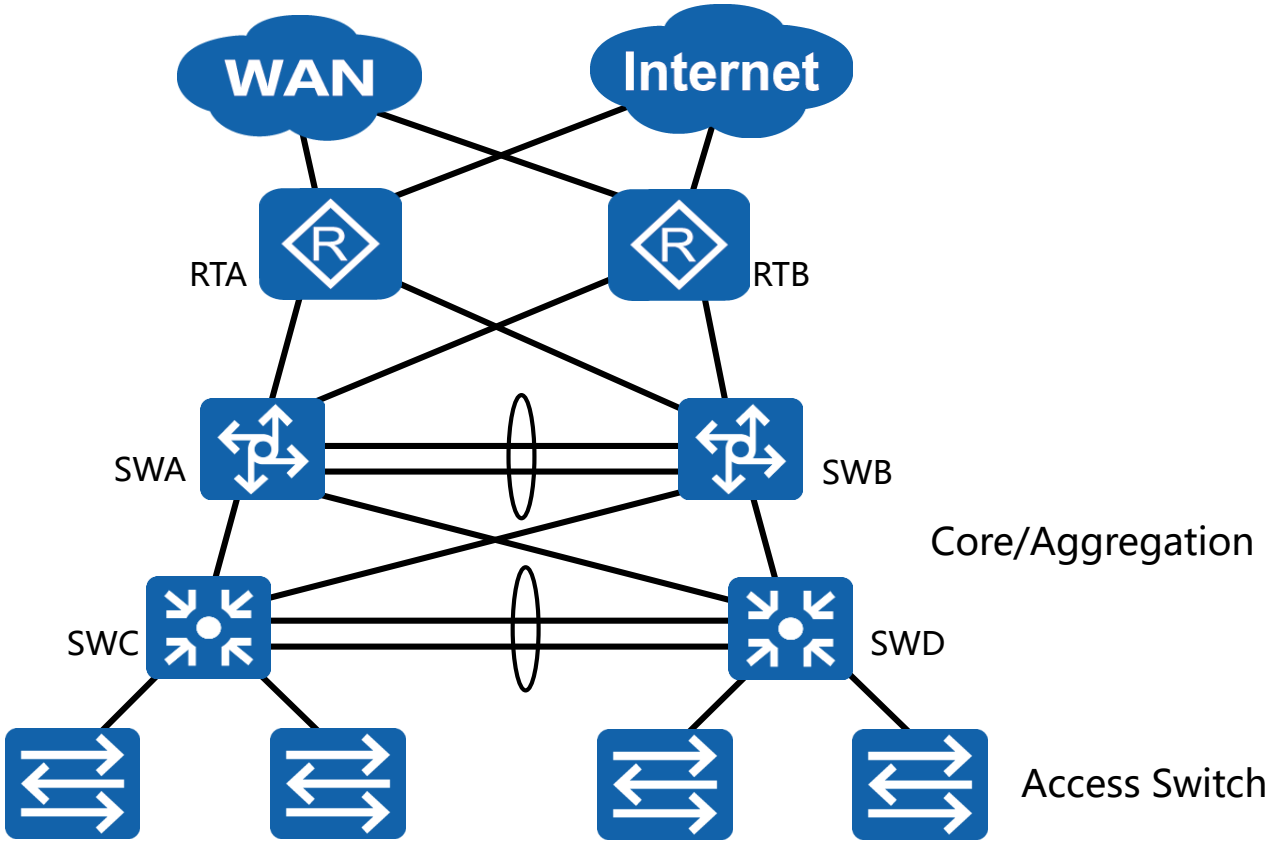
- Upon completion of this section, you will be able to:
  - Explain the use of link aggregation in the enterprise network.
  - Describe the various forms of link aggregation supported.
  - Configure link aggregation solutions.

Link Aggregation



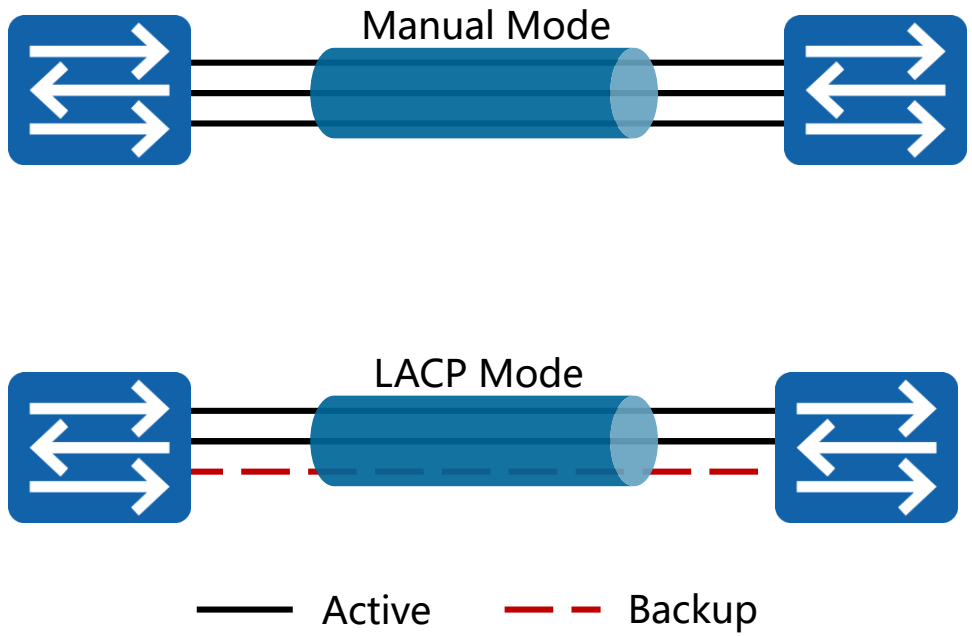
- Link Aggregation provides for increased bandwidth, enhanced reliability and support of load balancing.

Application in the Enterprise Network



- Application is made at critical points to enhance throughput.

Link Aggregation Modes



- In manual mode all links load balance and are forwarding.
- LACP mode supports backup links for redundancy.

Link Aggregation Modes

Static LACP

Ruoli dei dispositivi:

- ACTOR è il dispositivo a priorità maggiore;
- PARTNER è il restante dispositivo.

Il ruolo determina il dispositivo che sceglie le interface attive.

Priorità di default: 32768, più piccolo il numero, più grande la priorità.

Se due dispositivi hanno stessa priorità, il dispositivo con il MAC più piccolo diviene ACTOR.

Parametro globale e di interfaccia!

Link Aggregation Modes

Static LACP

Scambio di pacchetti LACP (802.3ad) tra gli end-point;

Interfacce attive/inattive -> modalità M:N;

High Availability!

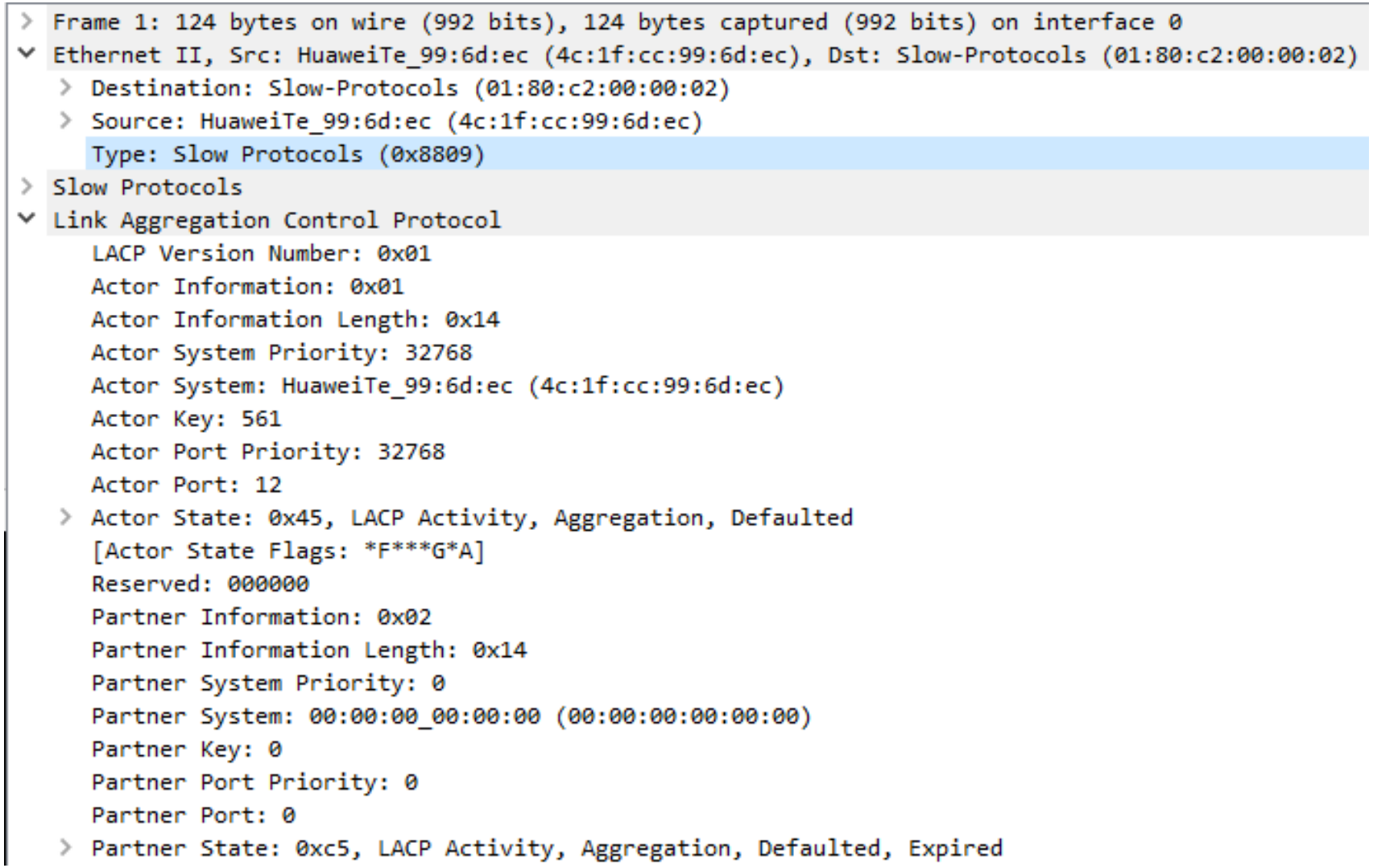
Link Aggregation Modes

Manual - Load Balancing

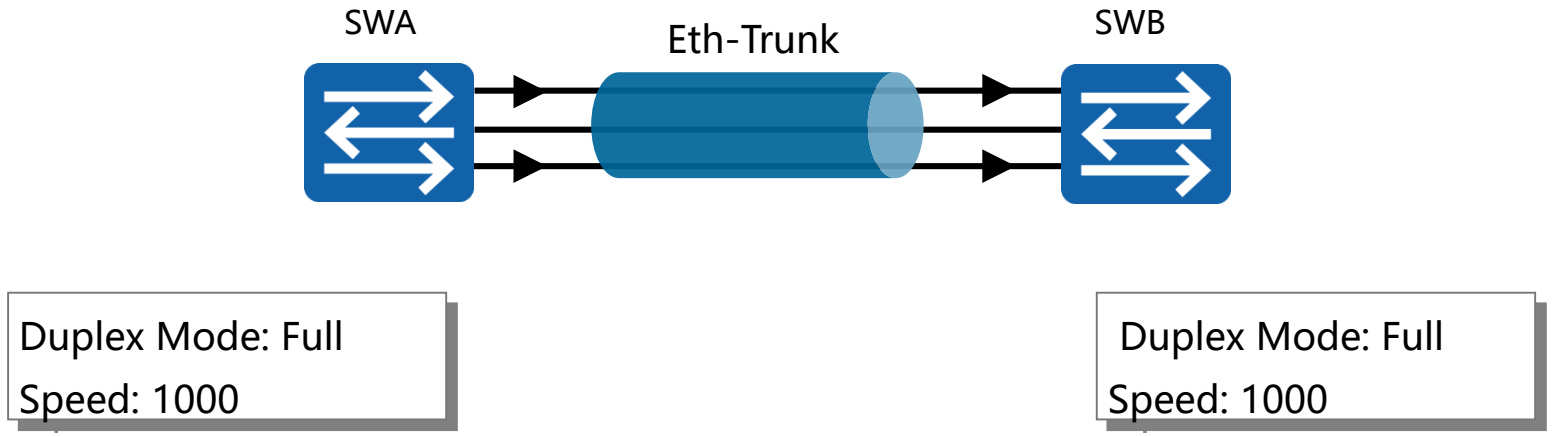
- Interfacce aggiunte manualmente al gruppo;
- Bilanciamento basato su src/dst MAC – src/dst IP address;

Non usa LACP;

Link Aggregation Modes



Data Flow Control



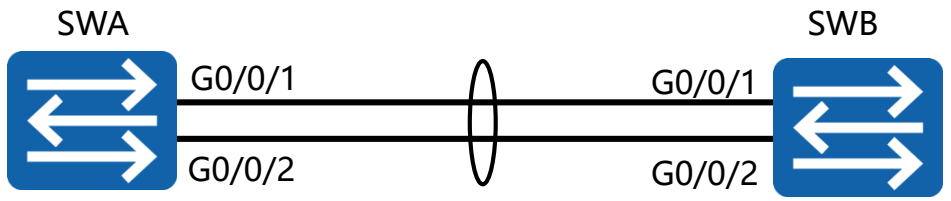
- Data flow sequence must be maintained over member links.
- Consistency of physical member interfaces must be maintained.

Data Flow Control

Regole di trasmissione dei frames (ne usa una tra...):

- **same source MAC** addresses - are transmitted over the same physical link.
- **same destination MAC** addresses - are transmitted over the same physical link.
- **same source IP** addresses **-** are transmitted over the same physical link.
- **same destination IP** addresses - are transmitted over the same physical link.
- **same source and destination MAC** addresses - are transmitted over the same physical link.
- **same source and destination IP** addresses - are transmitted over the same physical link.

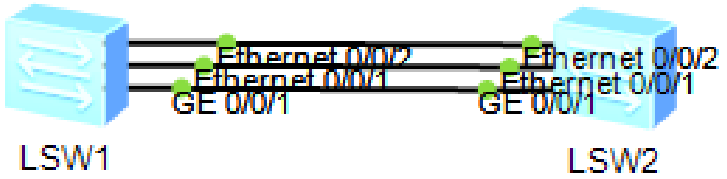
L2 Link Aggregation Configuration




```
[SWA]interface Eth-Trunk 1
[SWA-Eth-Trunk1] mode manual load-balance (opzionale)
[SWA-Eth-Trunk1]interface GigabitEthernet0/0/1
[SWA-GigabitEthernet0/0/1]eth-trunk 1
[SWA-GigabitEthernet0/0/1]interface GigabitEthernet0/0/2
[SWA-GigabitEthernet0/0/2]eth-trunk 1
```

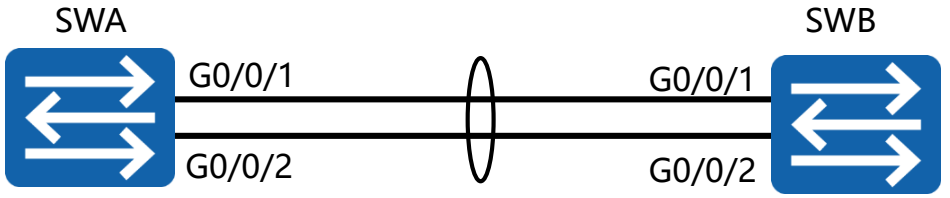
- Link Aggregation requires the binding of the physical member interfaces to the Eth-trunk.

L2 Link Aggregation Configuration




```
[Huawei]sysname SW1
[SW1]int Eth-Trunk 1
[SW1-Eth-Trunk1]trunkport GigabitEthernet 0/0/1
Info: This operation may take a few seconds. Please wait for a moment...done.
[SW1-Eth-Trunk1]
[SW1-Eth-Trunk1]trunkport Ethernet 0/0/1
Info: This operation may take a few seconds. Please wait for a moment...
Error: The trunk has added member of other port-type!
The error port is Ethernet0/0/1.
[SW1-Eth-Trunk1]
```

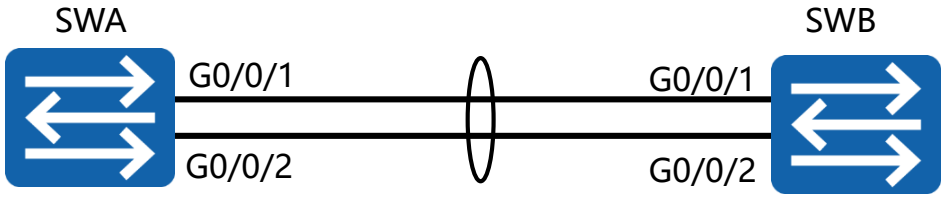
L2 Link Aggregation Configuration




```
[Huawei]int eth-trunk 1
[Huawei-Eth-Trunk1]trunkport gig 0/0/1
Info: This operation may take a few seconds. Please wait for a moment...done.
[Huawei-Eth-Trunk1]trunkport gig 0/0/2
Info: This operation may take a few seconds. Please wait for a moment...done.
[Huawei-Eth-Trunk1]dis thi
#
interface Eth-Trunk1
#
return
[Huawei-Eth-Trunk1]
```

```
interface Eth-Trunk1
#
interface GigabitEthernet0/0/1
 eth-trunk 1
#
interface GigabitEthernet0/0/2
 eth-trunk 1
#
```

L2 Link Aggregation Configuration



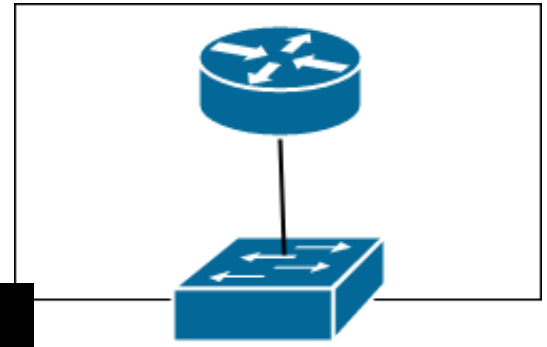

```
[SWA]interface Eth-Trunk 1
[SWA-Eth-Trunk1] mode lacp-static
[SWA-Eth-Trunk1] trunkport gig 0/0/1
[SWA-Eth-Trunk1] trunkport gig 0/0/2
[SWA-Eth-Trunk1] max active-linknumber 1
[SWA-Eth-Trunk1] bpdu enable
[SWA-Eth-Trunk1] interface gig 0/0/1
[SWA-GigabitEthernet0/0/1] lacp priority 1
```

L3 Link Aggregation Configuration

Uno switch L2/L3 lo possiamo vedere come la combinazione

- di uno switch “puro” L2
- un router L3.

Se le funzionalità L3 non sono attivate, il router è “disattivato”.



```
[Huawei]dis int gig 0/0/3
GigabitEthernet0/0/3 current state : UP
Line protocol current state : UP
Description:
Switch Port, PVID :    1, TPID : 8100(Hex), The Maximum Frame Length is 9216
Internet protocol processing : disabled
IP Sending Frames' Format is PKTFMT_ETHNT_2, Hardware address is 4c1f-cc99-6dec
Last physical up time   : 2017-07-03 15:28:23 UTC-08:00
Last physical down time : 2017-07-03 15:28:22 UTC-08:00
Current system time: 2017-07-03 15:53:01-08:00
Hardware address is 4c1f-cc99-6dec
    Last 300 seconds input rate 0 bytes/sec, 0 packets/sec
    Last 300 seconds output rate 0 bytes/sec, 0 packets/sec
    Input: 0 bytes, 0 packets
    Output: 80444 bytes, 676 packets
    Input:
      Unicast: 0 packets, Multicast: 0 packets
      Broadcast: 0 packets
    Output:
      Unicast: 0 packets, Multicast: 676 packets
      Broadcast: 0 packets
    Input bandwidth utilization  :    0%
    Output bandwidth utilization :    0%
```

L3 Link Aggregation Configuration

Il commando “undo portswitch” consente di modificare il modo di lavoro di una interfaccia da L2 ad L3.

Una volta dato questo commando, l’interfaccia viene connessa al “router interno” e può ricevere una configurazione ip.

```
[Huawei-GigabitEthernet0/0/3]dis int gig 0/0/3
GigabitEthernet0/0/3 current state : UP
Line protocol current state : DOWN
Description:
Route Port,The Maximum Frame Length is 9216
Internet protocol processing : disabled
IP Sending Frames' Format is PKTFMT_ETHNT_2, Hardware address is 4c1f-cc99-83ff
Last physical up time   : 2017-07-03 15:56:03 UTC-08:00
Last physical down time : 2017-07-03 15:56:01 UTC-08:00
Current system time: 2017-07-03 16:01:15-08:00
Hardware address is 4c1f-cc99-83ff
    Last 300 seconds input rate 0 bytes/sec, 0 packets/sec
    Last 300 seconds output rate 0 bytes/sec, 0 packets/sec
    Input: 0 bytes, 0 packets
    Output: 89845 bytes, 755 packets
    Input:
      Unicast: 0 packets, Multicast: 0 packets
      Broadcast: 0 packets
    Output:
      Unicast: 0 packets, Multicast: 755 packets
      Broadcast: 0 packets
    Input bandwidth utilization  :    0%
    Output bandwidth utilization :    0%
```

L3 Link Aggregation Configuration

Sorry, currently S5700 dose not suppor to assign a IP address on any port even if "undo portswitch " is configured, and we are working on developing this function to meet your reqirement.

This canbe refered from the product documentation as follow

Usage Scenario

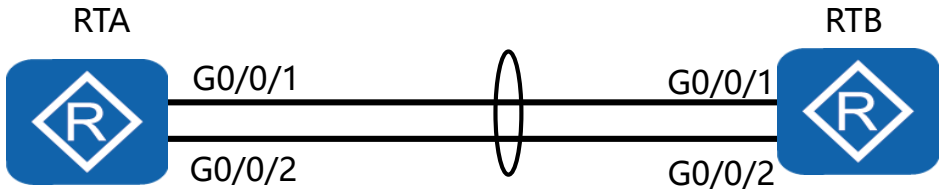
Ethernet interfaces on the switch are Layer 2 interfaces by default. In VLL or VPLS application, if the switch needs to function as a PE device and connects to a CE device through an Ethernet interface, run the **undo portswitch** command on the Ethernet interface to configure it as a Layer 3 interface

NOTE:

Only interfaces of the S5710HI, S5700HI and 5710EI can switch between the Layer 2 and Layer 3 modes.

Ethernet interfaces working at Layer 3 do not support IP address configuration.

L3 Link Aggregation Configuration




```
[RTA]interface eth-trunk 1
[RTA-Eth-Trunk1]undo portswitch
[RTA-Eth-Trunk1]ip address 100.1.1.1 24
[RTA-Eth-Trunk1]quit
[RTA]interface GigabitEthernet 0/0/1
[RTA-GigabitEthernet0/0/1]eth-trunk 1
[RTA-GigabitEthernet0/0/1] quit
[RTA]interface GigabitEthernet0/0/2
[RTA-GigabitEthernet0/0/2]eth-trunk 1
[RTA-GigabitEthernet0/0/2] quit
```

Displaying Aggregation

```
[RTA]display interface eth-trunk 1
Eth-Trunk1 current state : UP
Line protocol current state : UP
……
--------------------------------------------------
PortName                  Status              Weight
--------------------------------------------------
GigabitEthernet0/0/1        UP                  1
GigabitEthernet0/0/2        UP                  1
--------------------------------------------------
The Number of Ports in Trunk : 2
The Number of UP Ports in Trunk : 2
```

- Two member link ports have been assigned to Eth-trunk 1.

Displaying Aggregation – Spot the difference!

```
[Huawei]dis eth-trunk 1
Eth-Trunk1's state information is:
WorkingMode: NORMAL          Hash arithmetic: According to SIP-XOR-DIP
Least Active-linknumber: 1   Max Bandwidth-affected-linknumber: 8
Operate status: up           Number Of Up Port In Trunk: 2
--------------------------------------------------------------------------------
PortName                      Status      Weight
GigabitEthernet0/0/1          Up          1
GigabitEthernet0/0/2          Up          1
```

```
[Huawei]dis eth-trunk 2
Eth-Trunk2's state information is:
Local:
LAG ID: 2                     WorkingMode: STATIC
Preempt Delay: Disabled       Hash arithmetic: According to SIP-XOR-DIP
System Priority: 32768        System ID: 4c1f-ccaa-5681
Least Active-linknumber: 1    Max Active-linknumber: 8
Operate status: up            Number Of Up Port In Trunk: 2
--------------------------------------------------------------------------------
ActorPortName          Status   PortType PortPri PortNo PortKey PortState Weight
GigabitEthernet0/0/9   Selected 1GE      32768   10     561     10111100  1
GigabitEthernet0/0/8   Selected 1GE      32768   9      561     10111100  1

Partner:
--------------------------------------------------------------------------------
ActorPortName          SysPri   SystemID        PortPri PortNo PortKey PortState
GigabitEthernet0/0/9   32768    4c1f-cc99-6dec  1       11     561     10111100
GigabitEthernet0/0/8   32768    4c1f-cc99-6dec  32768   12     561     10111100
```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Note agli esercizi

Lab 1-1 pagina 9

Viene mostrato l'esito del comando display interface gig 0/0/9. Tra le tante informazioni mostrate compare anche la velocità e lo stato (duplex/half) del link.

Eseguendo il comando sul simulatore, queste informazioni non vengono mostrate. Si tratta di un limite del simulatore.

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Note agli esercizi

```
<Huawei>dis int gig 0/0/2
GigabitEthernet0/0/2 current state : UP
Line protocol current state : UP
Description:
Switch Port, TPID : 8100(Hex), The Maximum Frame Length is 9216
IP Sending Frames' Format is PKTFMT_ETHNT_2, Hardware address is 4c1f-cc6e-5c3a
Last physical up time   : 2017-09-04 11:26:17 UTC-08:00
Last physical down time : 2017-09-04 11:05:35 UTC-08:00
Current system time: 2017-09-04 15:02:31-08:00
Hardware address is 4c1f-cc6e-5c3a
    Last 300 seconds input rate 0 bytes/sec, 0 packets/sec
    Last 300 seconds output rate 0 bytes/sec, 0 packets/sec
    Input: 492882 bytes, 4128 packets
    Output: 52918 bytes, 427 packets
    Input:
      Unicast: 0 packets, Multicast: 4128 packets
      Broadcast: 0 packets
    Output:
      Unicast: 0 packets, Multicast: 427 packets
      Broadcast: 0 packets
    Input bandwidth utilization  :    0%
    Output bandwidth utilization :    0%

<Huawei>
```

```
<AR1>dis int gig 0/0/0
GigabitEthernet0/0/0 current state : UP
Line protocol current state : DOWN
Description:HUAWEI, AR Series, GigabitEthernet0/0/0 Interface
Route Port,The Maximum Transmit Unit is 1500
Internet protocol processing : disabled
IP Sending Frames' Format is PKTFMT_ETHNT_2, Hardware address is 3400-a34c-c55b
Last physical up time   : 2017-09-04 11:42:42
Last physical down time : 2017-09-04 11:41:37
Current system time: 2017-09-04 12:50:41
Port Mode: COMMON COPPER
Speed : 1000,  Loopback: NONE
Duplex: FULL,  Negotiation: ENABLE
Mdi   : AUTO,  Clock   : -
Last 300 seconds input rate 0 bits/sec, 0 packets/sec
Last 300 seconds output rate 0 bits/sec, 0 packets/sec
Input peak rate 0 bits/sec,Record time: -
Output peak rate 0 bits/sec,Record time: -

Input:  0 packets, 0 bytes
  Unicast:                0,  Multicast:                0
  Broadcast:              0,  Jumbo:                    0
  Discard:                0,  Total Error:              0

  CRC:                    0,  Giants:                   0
  Jabbers:                0,  Throttles:                0
  Runs:                   0,  Symbols:                  0
  Ignoreds:               0,  Frames:                   0

Output:  0 packets, 0 bytes
  Unicast:                0,  Multicast:                0
  Broadcast:              0,  Jumbo:                    0
  Discard:                0,  Total Error:              0

  Collisions:             0,  ExcessiveCollisions:      0
  Late Collisions:        0,  Deferreds:                0

    Input bandwidth utilization threshold : 100.00%
    Output bandwidth utilization threshold: 100.00%
    Input bandwidth utilization  :    0%
    Output bandwidth utilization :    0%
```


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Note agli esercizi

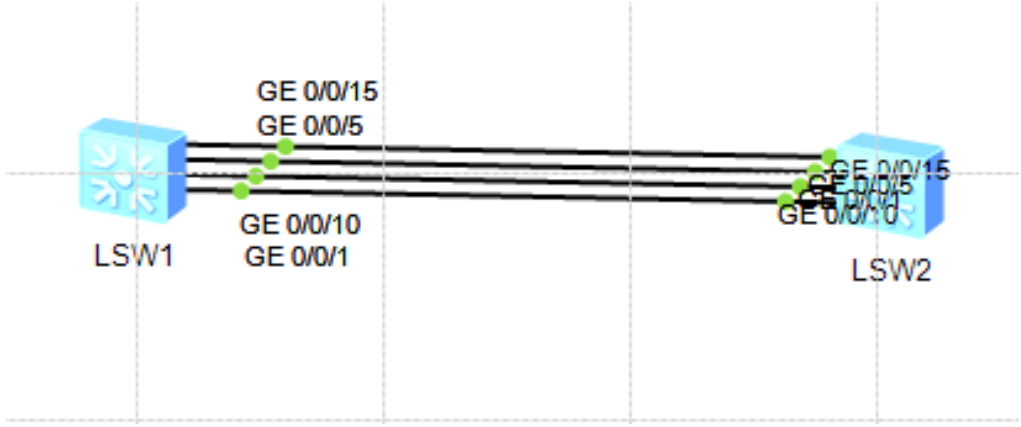
Laboratori Aggiuntivi

Gestione della priorità delle interface nei link LACP.

La priorità entra in gioco quando in modalità lacp-static, abbiamo alcune interfacce in uso ed altre in stand-by. Le interfacce con la priorità più alta o con numero più basso sono selected (attive).

Impostazione del comportamento preemptive sul eth-trunk con il comando:

lacp preempt enable



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Note agli esercizi

SW1 ed SW2 eth-trunk 1

Situazione iniziale: SW1 è PARTNER, SW2 è ACTOR (vedi i mac)

```
[SW1]dis eth-trunk 1
Eth-Trunk1's state information is:
Local:
LAG ID: 1                   WorkingMode: STATIC
Preempt Delay Time: 10      Hash arithmetic: According to SIP-XOR-DIP
System Priority: 32768      System ID: 4c1f-ccc7-4768
Least Active-linknumber: 1  Max Active-linknumber: 2
Operate status: up          Number Of Up Port In Trunk: 2
--------------------------------------------------------------------------------
ActorPortName          Status   PortType PortPri PortNo PortKey PortState Weight
GigabitEthernet0/0/1   Selected 1GE      32768   2      305     10111100  1
GigabitEthernet0/0/5   Selected 1GE      32768   6      305     10111100  1
GigabitEthernet0/0/10  Unselect 1GE      32768   11     305     10100000  1
GigabitEthernet0/0/15  Unselect 1GE      32768   16     305     10100000  1

Partner:
--------------------------------------------------------------------------------
ActorPortName          SysPri   SystemID        PortPri PortNo PortKey PortState
GigabitEthernet0/0/1   32768    4c1f-cc23-3316  32768   2      305     10111100
GigabitEthernet0/0/5   32768    4c1f-cc23-3316  32768   6      305     10111100
GigabitEthernet0/0/10  32768    4c1f-cc23-3316  32768   11     305     10100000
GigabitEthernet0/0/15  32768    4c1f-cc23-3316  32768   16     305     10100000

[SW1]
```

```
[SW2-Eth-Trunk1]quit
[SW2]dis eth
[SW2]dis eth-trunk 1
Eth-Trunk1's state information is:
Local:
LAG ID: 1                   WorkingMode: STATIC
Preempt Delay Time: 10      Hash arithmetic: According to SIP-XOR-DIP
System Priority: 32768      System ID: 4c1f-cc23-3316
Least Active-linknumber: 1  Max Active-linknumber: 2
Operate status: up          Number Of Up Port In Trunk: 2
--------------------------------------------------------------------------------
ActorPortName          Status   PortType PortPri PortNo PortKey PortState Weight
GigabitEthernet0/0/1   Selected 1GE      32768   2      305     10111100  1
GigabitEthernet0/0/5   Selected 1GE      32768   6      305     10111100  1
GigabitEthernet0/0/10  Unselect 1GE      32768   11     305     10100000  1
GigabitEthernet0/0/15  Unselect 1GE      32768   16     305     10100000  1

Partner:
--------------------------------------------------------------------------------
ActorPortName          SysPri   SystemID        PortPri PortNo PortKey PortState
GigabitEthernet0/0/1   32768    4c1f-ccc7-4768  32768   2      305     10111100
GigabitEthernet0/0/5   32768    4c1f-ccc7-4768  32768   6      305     10111100
GigabitEthernet0/0/10  32768    4c1f-ccc7-4768  32768   11     305     10100000
GigabitEthernet0/0/15  32768    4c1f-ccc7-4768  32768   16     305     10100000
```


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Note agli esercizi

Situazione iniziale: SW1 è PARTNER, SW2 è ACTOR (vedi i mac)

Cambio la priorità delle interfacce di sw1 per promuovere gig 0/0/10 e gig 0/0/15 come “selected”:

```
#
interface GigabitEthernet0/0/10
 eth-trunk 1
 lacp priority 100
#
interface GigabitEthernet0/0/11
#
interface GigabitEthernet0/0/12
#
interface GigabitEthernet0/0/13
#
interface GigabitEthernet0/0/14
#
interface GigabitEthernet0/0/15
 eth-trunk 1
 lacp priority 100
```

Non cambia nulla!

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Note agli esercizi

Situazione iniziale: SW1 è PARTNER, SW2 è ACTOR (vedi i mac)

```
has turned into UP state.
[SW1]dis eth
[SW1]dis eth-trunk 2
Eth-Trunk2's state information is:
Local:
LAG ID: 2                   WorkingMode: STATIC
Preempt Delay: Disabled     Hash arithmetic: According to SIP-XOR-DIP
System Priority: 32768      System ID: 4c1f-ccc7-4768
Least Active-linknumber: 1  Max Active-linknumber: 2
Operate status: up          Number Of Up Port In Trunk: 2
--------------------------------------------------------------------------------
ActorPortName          Status   PortType PortPri PortNo PortKey PortState Weight
GigabitEthernet0/0/20  Selected 1GE      32768   21     561     10111100  1
GigabitEthernet0/0/21  Selected 1GE      32768   22     561     10111100  1
GigabitEthernet0/0/22  Unselect 1GE      32768   23     561     10100000  1
GigabitEthernet0/0/23  Unselect 1GE      32768   24     561     10100000  1

Partner:
--------------------------------------------------------------------------------
ActorPortName          SysPri   SystemID        PortPri PortNo PortKey PortState
GigabitEthernet0/0/20  32768    4c1f-cc23-3316  32768   21     561     10111100
GigabitEthernet0/0/21  32768    4c1f-cc23-3316  32768   22     561     10111100
GigabitEthernet0/0/22  32768    4c1f-cc23-3316  32768   23     561     10100000
GigabitEthernet0/0/23  32768    4c1f-cc23-3316  32768   24     561     10100000

[SW1]
```

```
[SW2]
[SW2]
[SW2]dis eth-trunk 2
Eth-Trunk2's state information is:
Local:
LAG ID: 2                   WorkingMode: STATIC
Preempt Delay: Disabled     Hash arithmetic: According to SIP-XOR-DIP
System Priority: 32768      System ID: 4c1f-cc23-3316
Least Active-linknumber: 1  Max Active-linknumber: 2
Operate status: up          Number Of Up Port In Trunk: 2
--------------------------------------------------------------------------------
ActorPortName          Status   PortType PortPri PortNo PortKey PortState Weight
GigabitEthernet0/0/20  Selected 1GE      32768   21     561     10111100  1
GigabitEthernet0/0/21  Selected 1GE      32768   22     561     10111100  1
GigabitEthernet0/0/22  Unselect 1GE      32768   23     561     10100000  1
GigabitEthernet0/0/23  Unselect 1GE      32768   24     561     10100000  1

Partner:
--------------------------------------------------------------------------------
ActorPortName          SysPri   SystemID        PortPri PortNo PortKey PortState
GigabitEthernet0/0/20  32768    4c1f-ccc7-4768  32768   21     561     10111100
GigabitEthernet0/0/21  32768    4c1f-ccc7-4768  32768   22     561     10111100
GigabitEthernet0/0/22  32768    4c1f-ccc7-4768  32768   23     561     10100000
GigabitEthernet0/0/23  32768    4c1f-ccc7-4768  32768   24     561     10100000

[SW2]
```


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Note agli esercizi

Cambio della priorità di SW1 a 100, per impostarlo come ACTOR

Cambio della priorità delle interfacce per attivare gig 0/0/22 e 0/0/23 -> OK

```
[SW1-Eth-Trunk2]dis eth-trunk 2
Eth-Trunk2's state information is:
Local:
LAG ID: 2                   WorkingMode: STATIC
Preempt Delay Time: 30      Hash arithmetic: According to SIP-XOR-DIP
System Priority: 100        System ID: 4c1f-ccc7-4768
Least Active-linknumber: 1  Max Active-linknumber: 2
Operate status: up          Number Of Up Port In Trunk: 2
--------------------------------------------------------------------------------
ActorPortName          Status   PortType PortPri PortNo PortKey PortState Weight
GigabitEthernet0/0/20  Unselect 1GE      32768   21     561     10100000  1
GigabitEthernet0/0/21  Unselect 1GE      32768   22     561     10100000  1
GigabitEthernet0/0/22  Selected 1GE      100     23     561     10111100  1
GigabitEthernet0/0/23  Selected 1GE      100     24     561     10111100  1

Partner:
--------------------------------------------------------------------------------
ActorPortName          SysPri   SystemID        PortPri PortNo PortKey PortState
GigabitEthernet0/0/20  32768    4c1f-cc23-3316  32768   21     561     10100000
GigabitEthernet0/0/21  32768    4c1f-cc23-3316  32768   22     561     10100000
GigabitEthernet0/0/22  32768    4c1f-cc23-3316  32768   23     561     10111100
GigabitEthernet0/0/23  32768    4c1f-cc23-3316  32768   24     561     10111100
```

```
[SW2-Eth-Trunk2]dis eth-trunk 2
Eth-Trunk2's state information is:
Local:
LAG ID: 2                   WorkingMode: STATIC
Preempt Delay Time: 30      Hash arithmetic: According to SIP-XOR-DIP
System Priority: 32768      System ID: 4c1f-cc23-3316
Least Active-linknumber: 1  Max Active-linknumber: 2
Operate status: up          Number Of Up Port In Trunk: 2
--------------------------------------------------------------------------------
ActorPortName          Status   PortType PortPri PortNo PortKey PortState Weight
GigabitEthernet0/0/20  Unselect 1GE      32768   21     561     10100000  1
GigabitEthernet0/0/21  Unselect 1GE      32768   22     561     10100000  1
GigabitEthernet0/0/22  Selected 1GE      32768   23     561     10111100  1
GigabitEthernet0/0/23  Selected 1GE      32768   24     561     10111100  1

Partner:
--------------------------------------------------------------------------------
ActorPortName          SysPri   SystemID        PortPri PortNo PortKey PortState
GigabitEthernet0/0/20  100      4c1f-ccc7-4768  32768   21     561     10100000
GigabitEthernet0/0/21  100      4c1f-ccc7-4768  32768   22     561     10100000
GigabitEthernet0/0/22  100      4c1f-ccc7-4768  100     23     561     10111100
GigabitEthernet0/0/23  100      4c1f-ccc7-4768  100     24     561     10111100
```


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Note agli esercizi

Su sw2 cambio la priorità di gig 0/0/20 e gig 0/0/21 a 50 per promuoverle selected.

Non cambia nulla in quanto sw2 è PARTNER.

```
<SW1>dis eth-trunk 2
Eth-Trunk2's state information is:
Local:
LAG ID: 2                   WorkingMode: STATIC
Preempt Delay Time: 30      Hash arithmetic: According to SIP-XOR-DIP
System Priority: 100        System ID: 4c1f-ccc7-4768
Least Active-linknumber: 1  Max Active-linknumber: 2
Operate status: up          Number Of Up Port In Trunk: 2
--------------------------------------------------------------------------------
ActorPortName          Status   PortType PortPri PortNo PortKey PortState Weight
GigabitEthernet0/0/20  Unselect 1GE      32768   21     561     10100000  1
GigabitEthernet0/0/21  Unselect 1GE      32768   22     561     10100000  1
GigabitEthernet0/0/22  Selected 1GE      100     23     561     10111100  1
GigabitEthernet0/0/23  Selected 1GE      100     24     561     10111100  1

Partner:
--------------------------------------------------------------------------------
ActorPortName          SysPri   SystemID        PortPri PortNo PortKey PortState
GigabitEthernet0/0/20  32768    4c1f-cc23-3316  50      21     561     10100000
GigabitEthernet0/0/21  32768    4c1f-cc23-3316  50      22     561     10100000
GigabitEthernet0/0/22  32768    4c1f-cc23-3316  32768   23     561     10111100
GigabitEthernet0/0/23  32768    4c1f-cc23-3316  32768   24     561     10111100
```

```
[SW2]dis eth-trunk 2
Eth-Trunk2's state information is:
Local:
LAG ID: 2                   WorkingMode: STATIC
Preempt Delay Time: 30      Hash arithmetic: According to SIP-XOR-DIP
System Priority: 32768      System ID: 4c1f-cc23-3316
Least Active-linknumber: 1  Max Active-linknumber: 2
Operate status: up          Number Of Up Port In Trunk: 2
--------------------------------------------------------------------------------
ActorPortName          Status   PortType PortPri PortNo PortKey PortState Weight
GigabitEthernet0/0/20  Unselect 1GE      50      21     561     10100000  1
GigabitEthernet0/0/21  Unselect 1GE      50      22     561     10100000  1
GigabitEthernet0/0/22  Selected 1GE      32768   23     561     10111100  1
GigabitEthernet0/0/23  Selected 1GE      32768   24     561     10111100  1

Partner:
--------------------------------------------------------------------------------
ActorPortName          SysPri   SystemID        PortPri PortNo PortKey PortState
GigabitEthernet0/0/20  100      4c1f-ccc7-4768  32768   21     561     10100000
GigabitEthernet0/0/21  100      4c1f-ccc7-4768  32768   22     561     10100000
GigabitEthernet0/0/22  100      4c1f-ccc7-4768  100     23     561     10111100
GigabitEthernet0/0/23  100      4c1f-ccc7-4768  100     24     561     10111100
```


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Note agli esercizi

Quindi:

system-view -> lacp priority <value>

determina chi è actor e chi è partner (anche se non vengono esplicitati i ruoli)

interface <type> <number>

lacp priority <value>

determina le interfacce selected e quelle unselected

Le scelte fatte sull'actor si propagano sul partner.

Nella modalità lacp static è possible modificare il numero dei link attivi con:

max active-linknumber link-number

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Summary

- If an administrator attempts to add a Gigabit Ethernet and Fast Ethernet interface to the same Eth-trunk interface, what will occur?
- In order to establish backup member links, which mode of link aggregation should be used?


Thank You
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