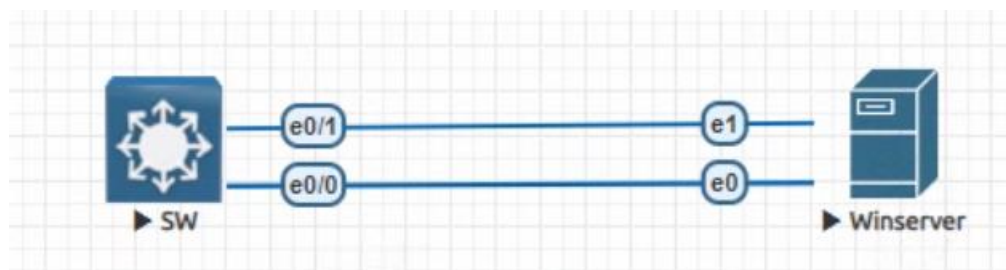


NIC Teaming:

- Load balancing and failover (LBFO), also known as NIC Teaming, is a powerful feature.
- This NIC Teaming feature was introduced by Microsoft only with Windows Server 2012.
- With previous Server Versions of Windows, you could only rely on third party software.
- The NIC Teaming allows an administrator to place in a team multiple network adapter.
- Working as a team, the network adapters improve bandwidth and protect from failures.
- Working as a team, the network adapters Sharing the same IP and network configuration.
- The reason is pretty straightforward, if one of the adapters breaks, the others will take care.
- Microsoft Windows Servers 2012 supports up to 32 adapters placed in a single logical team.

LACP (Link Aggregation Control Protocol):

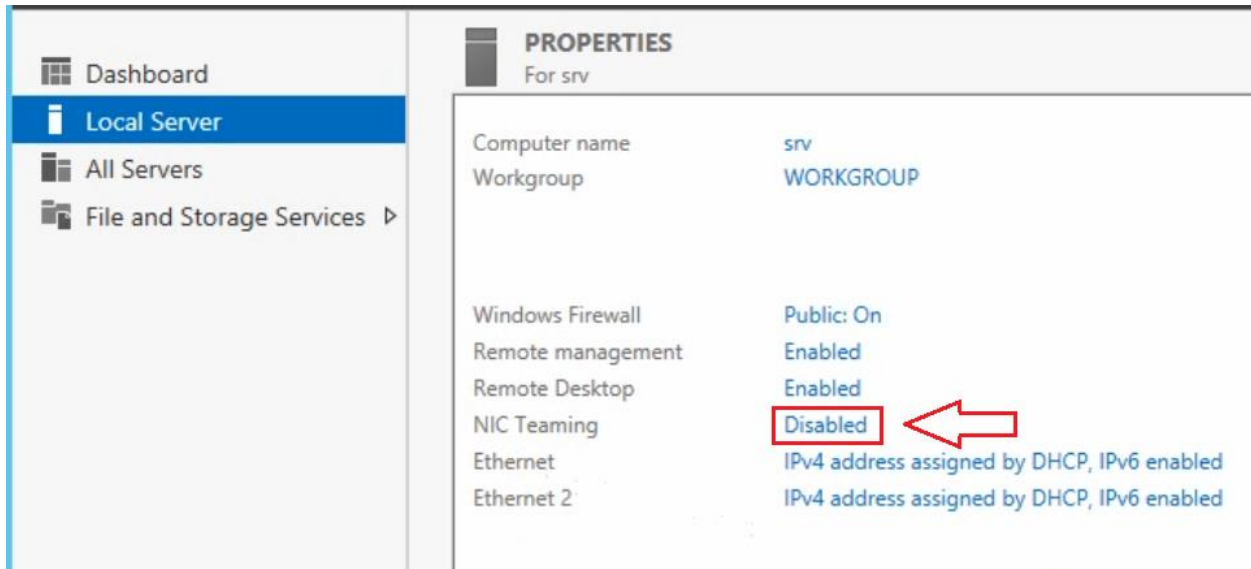
- Link Aggregation Control Protocol is the open standard 802.3ad.
- Combine multiple links into a single logical link to increase bandwidth.
- All links participating in a single logical link must have the same settings.
- All ports participating must have the same speed and duplex configuration.
- All ports participating in single logical link must be in the same VLAN.
- All ports participating in single logical link must be in same operational mode.
- No ports participating in single logical link can have SPAN configured.
- Can have up to 16 ports in LACP EtherChannel only 8 can be active at one time.
- The LACP protocol can be configured in either **passive** or **active** mode.
- In the active mode, the port or interface actively tries to bring up LACP.
- In the passive mode, it does not initiate the negotiation of LACP protocol.
- LACP advertises messages with the multicast MAC address **0180:C200:0002**.



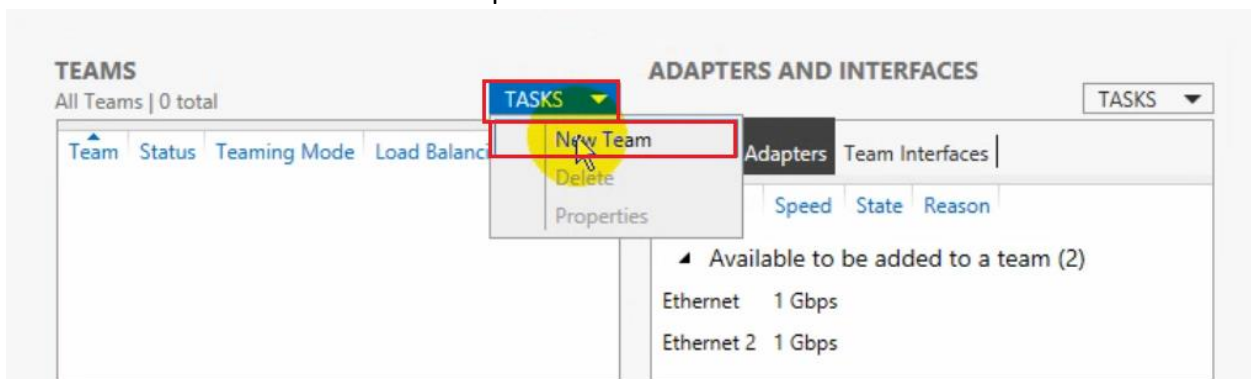
SW LACP Configuration

```
SW(config)#interface range ethernet 0/0-2
SW(config-if-range)#switchport trunk encapsulation dot1q
SW(config-if-range)#switchport mode trunk
SW(config-if-range)#channel-protocol lacp
SW(config-if-range)#channel-group 1 mode active
SW# show etherchannel summary
SW# show etherchannel detail
SW# show etherchannel port-channel
```

To create a NIC Team, open the **Server Manager** in Windows Server 2012 R2 and look for the NIC Teaming field. **Click** on **Disabled**:



Select **New Team** from the **TASKS** dropdown menu:



Select the adapters you want to include in the team click down Arrow **Additional Properties** choose **Teaming mode: LACP** and click **Ok**. The team will be created.

New team

Team name:

TEAM1

Member adapters:

In Team	Adapter	Speed	State	Reason
<input checked="" type="checkbox"/>	Ethernet	1 Gbps		
<input checked="" type="checkbox"/>	Ethernet 2	1 Gbps		

^ Additional properties

Teaming mode:

LACP

Load balancing mode:

Dynamic

Standby adapter:

None (all adapters Active)

Primary team interface:

TEAM1: Default VLAN

The team is ready:

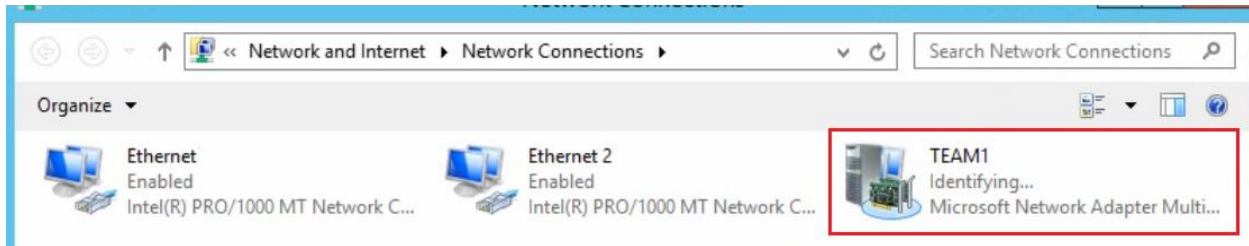
TEAMS
All Teams | 1 total

Team	Status	Teaming Mode	Load Balancing	Adapters
TEAM1	OK	LACP	Dynamic	2

ADAPTERS AND INTERFACES

Adapter	Speed	State	Reason
TEAM1 (2)			
Ethernet	1 Gbps	Active	
Ethernet 2	1 Gbps	Active	

It's time to configure the team, open the Network and Sharing Center and click the team name: Configure the team with IP address Subnet mask, Gateway etc.



```

SW#
SW#show etherchannel summary
Flags: D - down          P - bundled in port-channel
       I - stand-alone  s - suspended
       H - Hot-standby (LACP only)
       R - Layer3       S - Layer2
       U - in use       N - not in use, no aggregation
       f - failed to allocate aggregator

       M - not in use, minimum links not met
       m - not in use, port not aggregated due to minimum links not met
       u - unsuitable for bundling
       w - waiting to be aggregated
       d - default port

       A - formed by Auto LAG

Number of channel-groups in use: 1
Number of aggregators:          1

Group  Port-channel  Protocol    Ports
-----
1      Po1(SU)          LACP        Et0/0(P)   Et0/1(P)
  
```