# EtherChannel

To group multiple single interfaces into a group which operates as a single logical interface. (layer 2 → switch ports), (layer 3 → routed ports), STP deals them as a single interface.
Can also be called port channel or LAG (Link Aggregation Group). PagP → Port Channel Aggregation Protocol.
LACP → Link Aggregation Control Protocol. A/access swicthes that end hosts connect to. D/Distribution layer switches are switches that access layer switches connect to.
Traffic is load balanced among interfaces using a certain algorithm based on flows which is communication between 2 nodes in a network (frames in the same flow are forwarded using the same physical interface in order not to arrive out of order), inputs that can be altered: SRC MAC, DEST MAC, SRC and DEST MAC, SRC IP, DEST IP, SRC and DEST IP.
Some switches support load balancing based on layer 4 TCP or UDP also methods used depend on the switch model.
Command: show etherchannel load-balance shows the current load balancing method.
Command: port-channel load-balance <method> to change the load balancing method.
Both LACP and PagP dynamically negotiate the creation/maintenance of the EtherChannel as DTP in trunk ports.
LACP is an industry protocol while PagP is Cisco proprietary.
Static EtherChannel: with no protocols just statically configured (avoided). up to 8 interfaces can form the EtherChannel, in LACP 16, yet only 8 are active and the remaining are in standby as a reserve if one of the active ports fails.
Command: channel-group <group number> mode <mode> to configure on a range of interfaces.
In PAGP: desirable+auto → forms, desirable+desirable → forms, auto+aut → not formed.
Channel group number of an EthrChannel must match for interfaces on the same switch but not for those on other switches.
In LACP: active=desirable and passive=auto, on for static EtherChannel only works with on mode.
The EtherChannel is created but doesn't function unless one of the switches is in active mode.
Command: channel-protocol <protocol> to configure a protocol (not useful).
Member interfaces in a group must have matching configurations as duplex,speed, switchport mode and allowed VLANs for trunk interfaces. (if an interface doesn't match it will be excluded from the channel).
Command: show etherchannel summary, Command: show etherchannel port-channel

Layer 3 EtherChannels: use command no switchport on the interface range first.
Routed ports don't forward layer broadcasts so no loops occur and there is no need for spanning-tree.
Command: interface portchannel <number> creates the port channel in advance.
Command: show cdp neighbors shows info about directly connected neighbors.
CDP → Cisco Discovery Protocol.