

Virtual Fabrics

T11/03-777v1

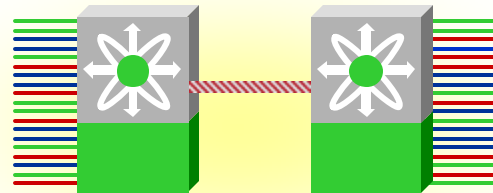
Silvano Gai

- **FabExp**: Fabric Expansion
- **VF**: Virtual Fabric, see 03-660v0, ability of the switch to host multiple sub-fabrics
- **FR**: Fabric Routing, see 03-660v0, ability to route frame between autonomous VFs
- **Gateway**: the switching function that implements FR and is therefore capable of interconnecting two or more VFs

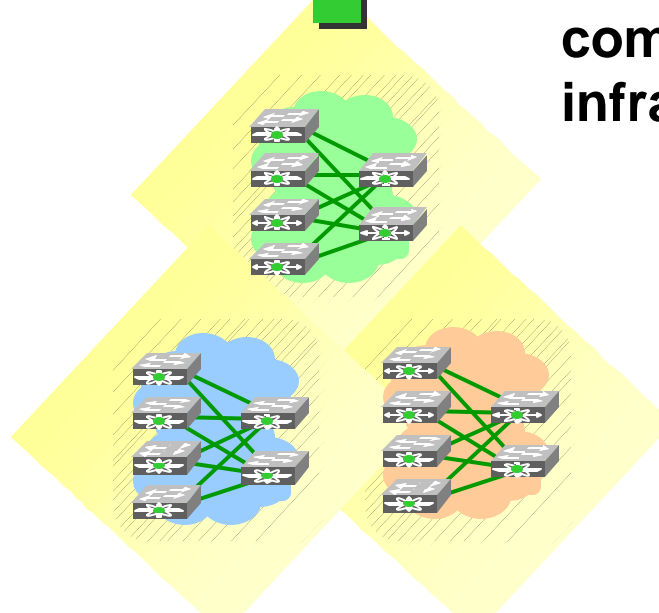
This presentation mainly discusses VFs

The need: consolidate without merging

Switches that support VF

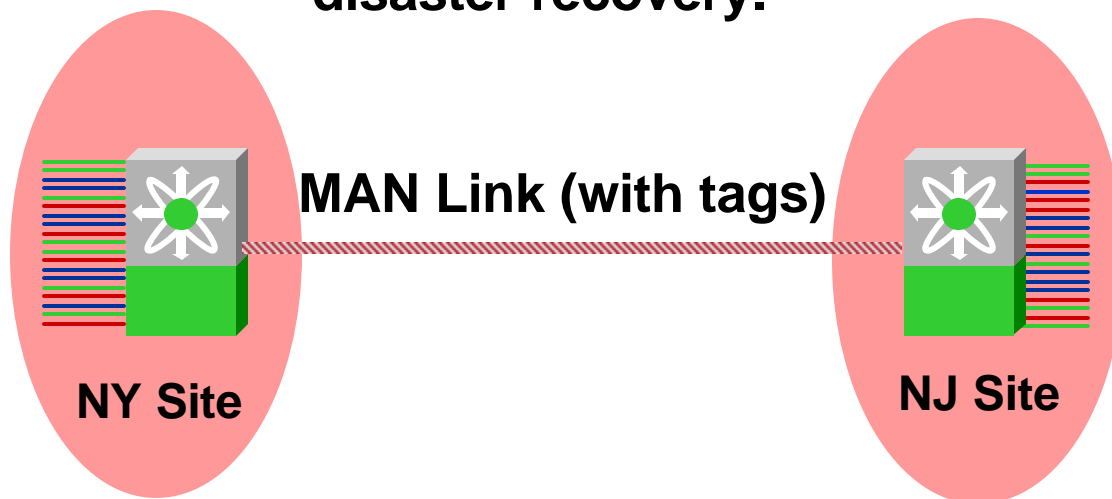


Physical SAN islands
are *virtualized* onto
common SAN
infrastructure



Independence from the physical topology

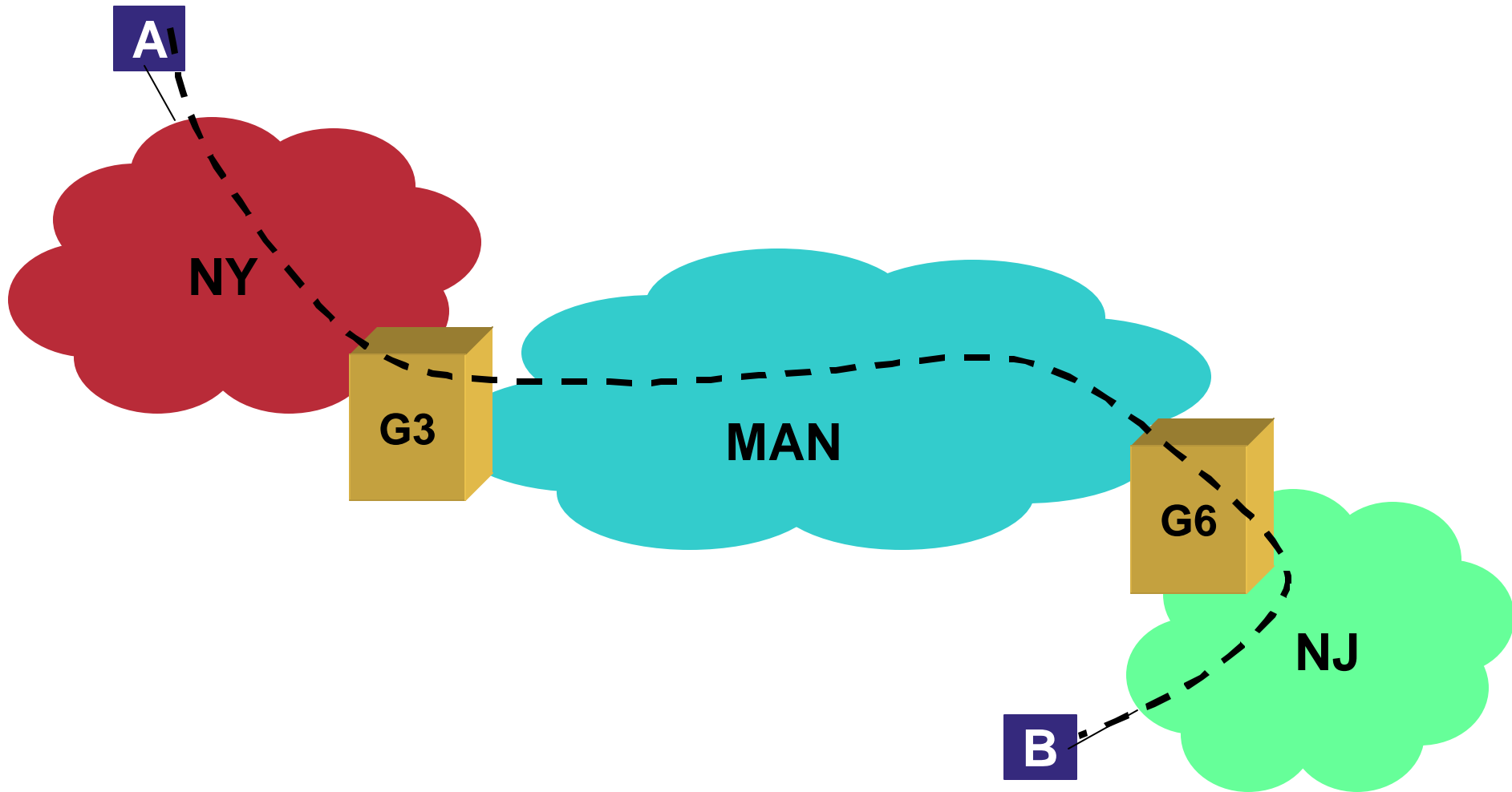
Typical example: two sites one in NY and one in NJ used for disaster recovery.



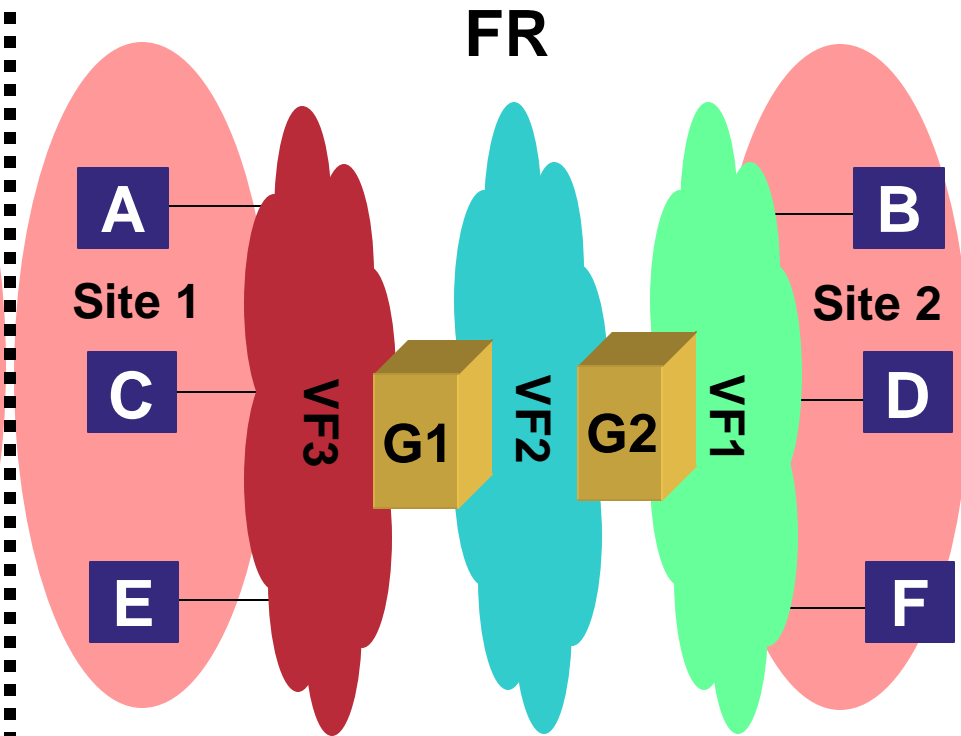
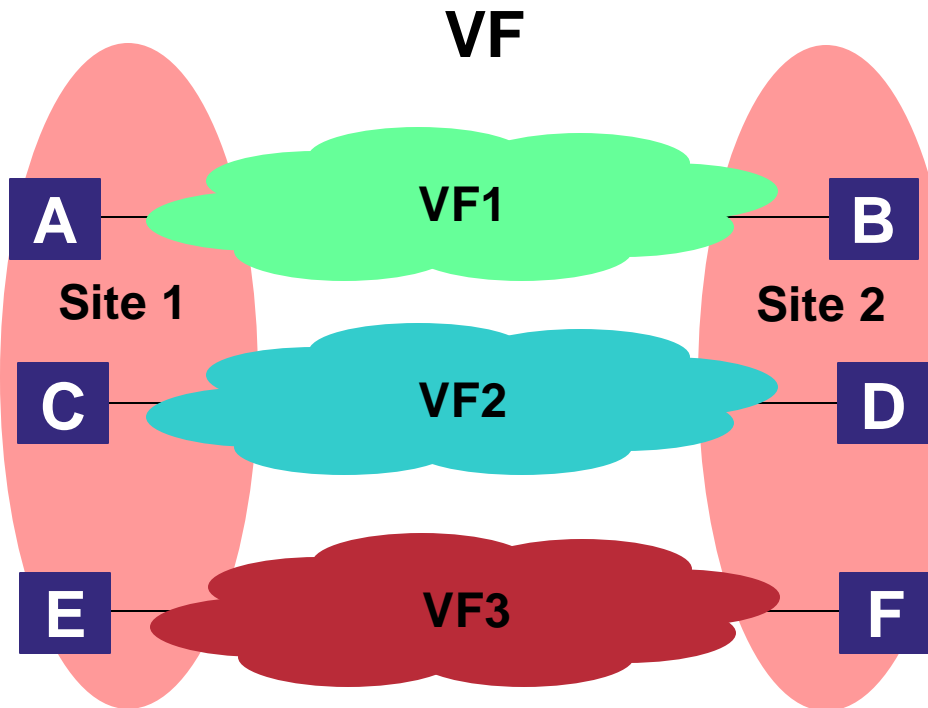
VMs are created per application to maintain isolation.

The VMs Blue, Red and Green are present on both the NY and the NJ sites, but VMs are isolated from each other

Completely different model from



Comparing the two



A and B are in two different sites and are connected to the same fabric

A and C are not connected to the same fabric, since they belong to different applications

A and B are in two different sites and are not connected to the same fabric

A and C are connected to the same fabric, even if they belong to different applications

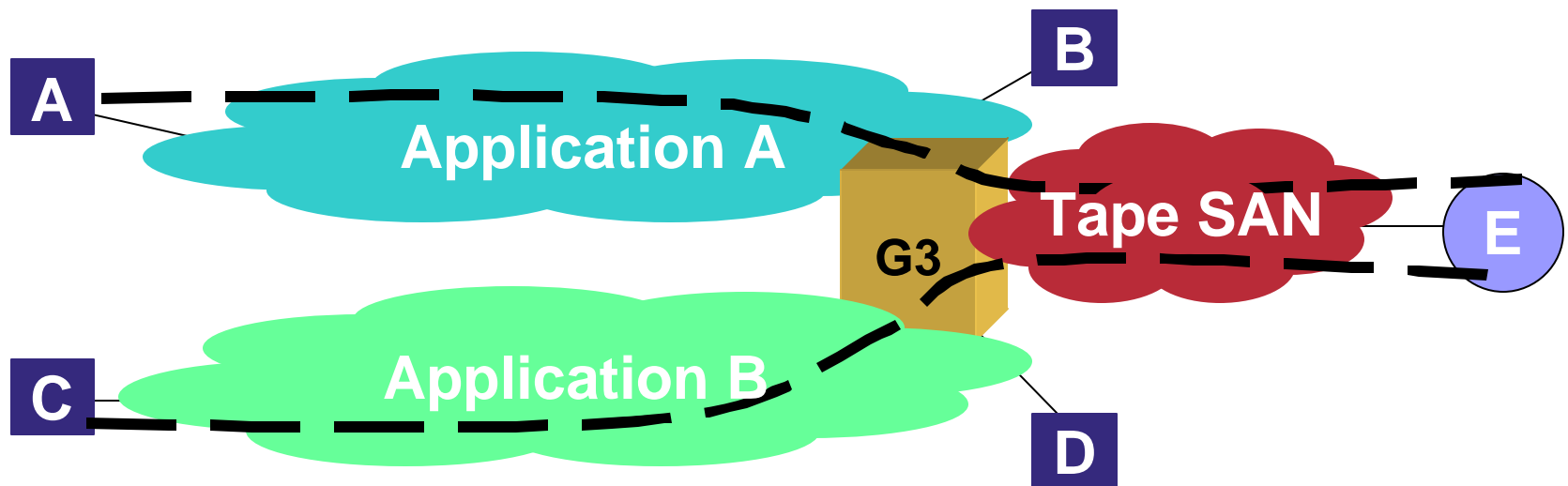
IS FR useless?

- NO
- It is useful when a resource must be shared across multiple fabrics:

Classical examples are tape libraries

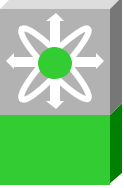
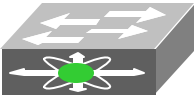

- FR is simply different from VF, since it solves a different problem

FR requires the concept that a port of a gateway belongs to a VF

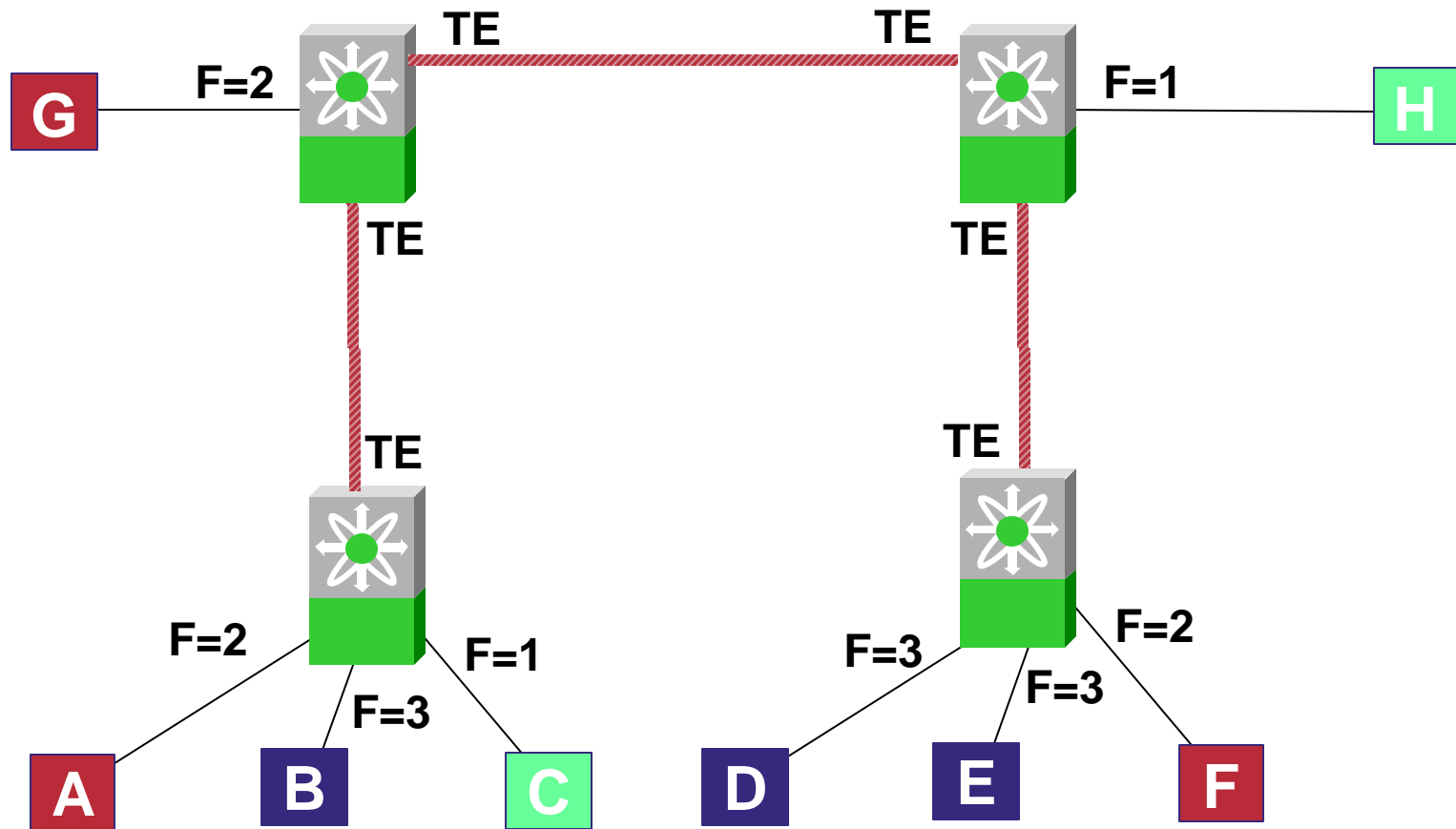


More terminology

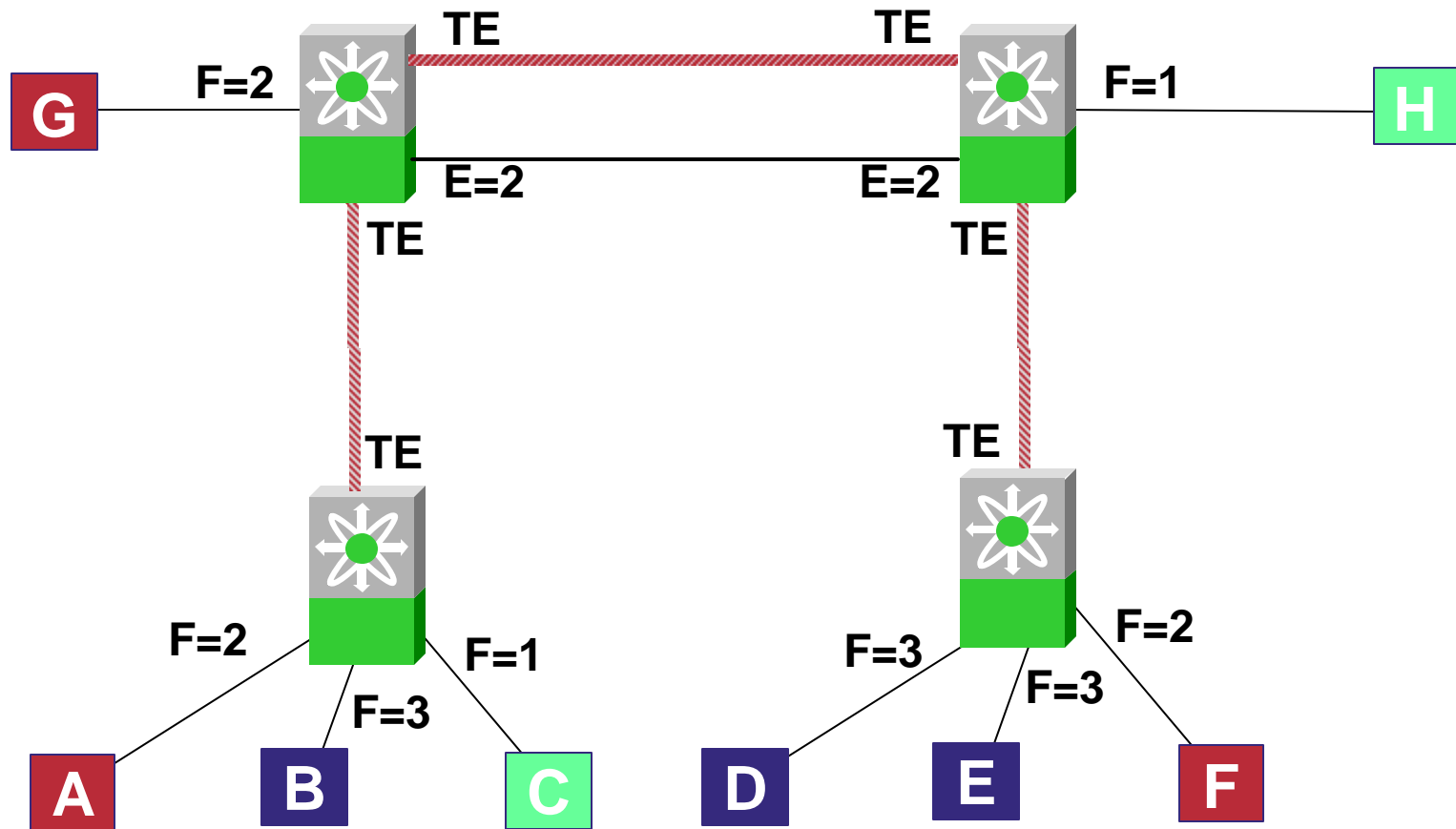
- E_port, F_port, N_port: according to T11 standards
- TE_port: Tagging E port, an E_port that supports tagging
- TF_port: Tagging F port, an F_port that supports tagging
- TN_port: Tagging N port, an N_port that supports tagging
- E=2 an E port in VF 2
- F=3 an F port in VF 3
- N=4 an N port in VF 4

-  VF capable switch
 -  Legacy switch
-  Link with Tag

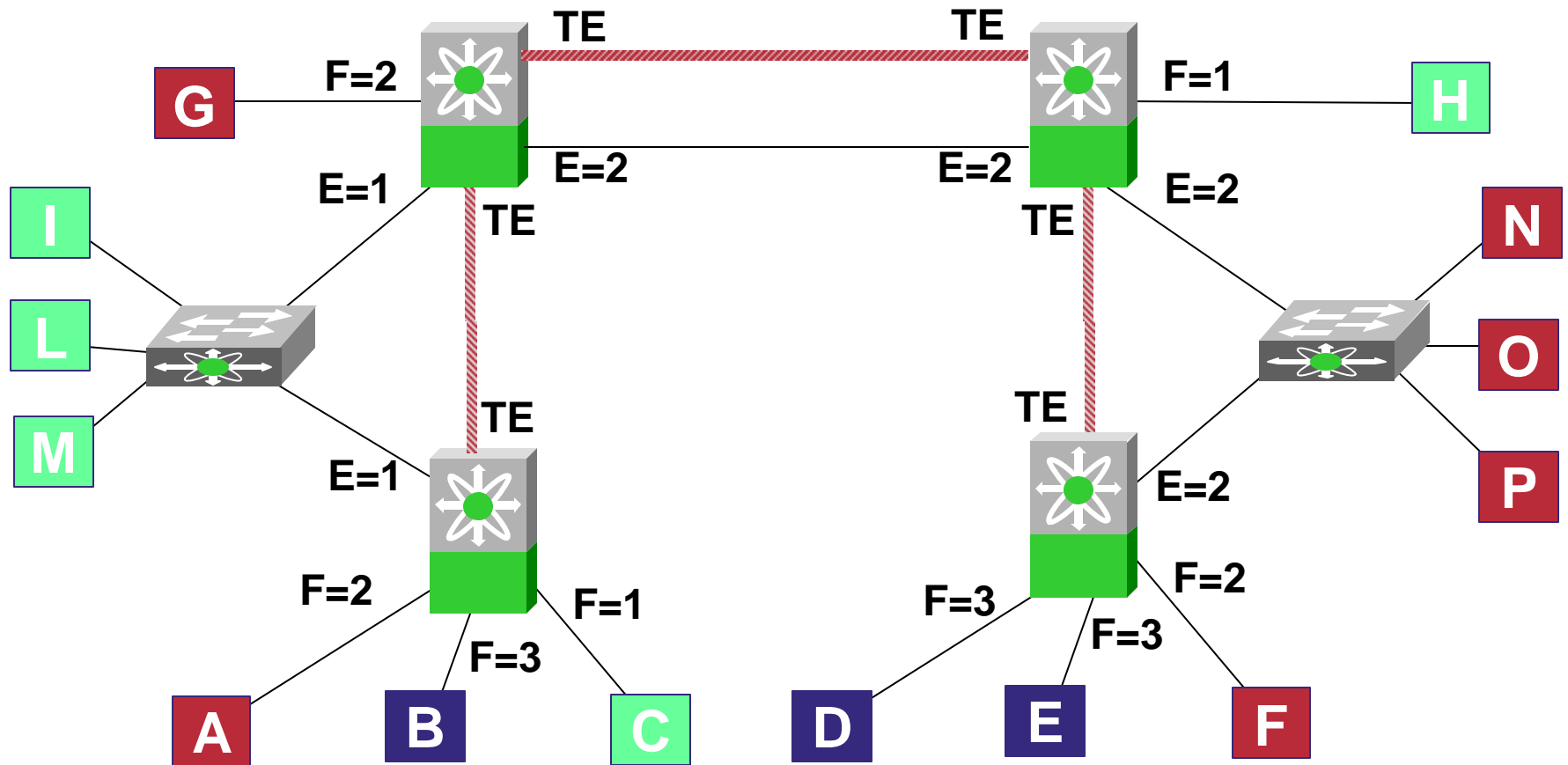
Example 1



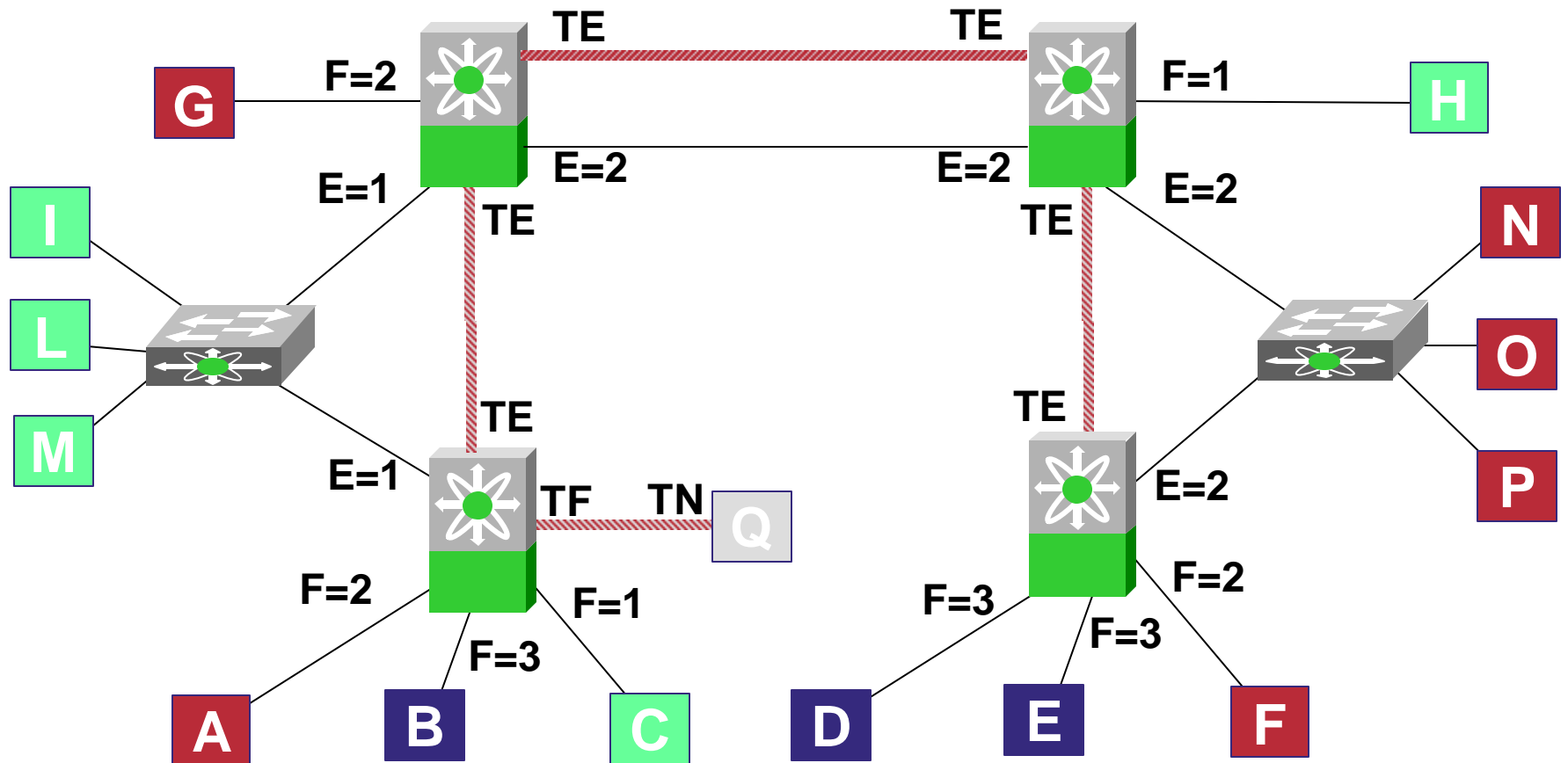
Example 2: increase bandwidth for VF 2



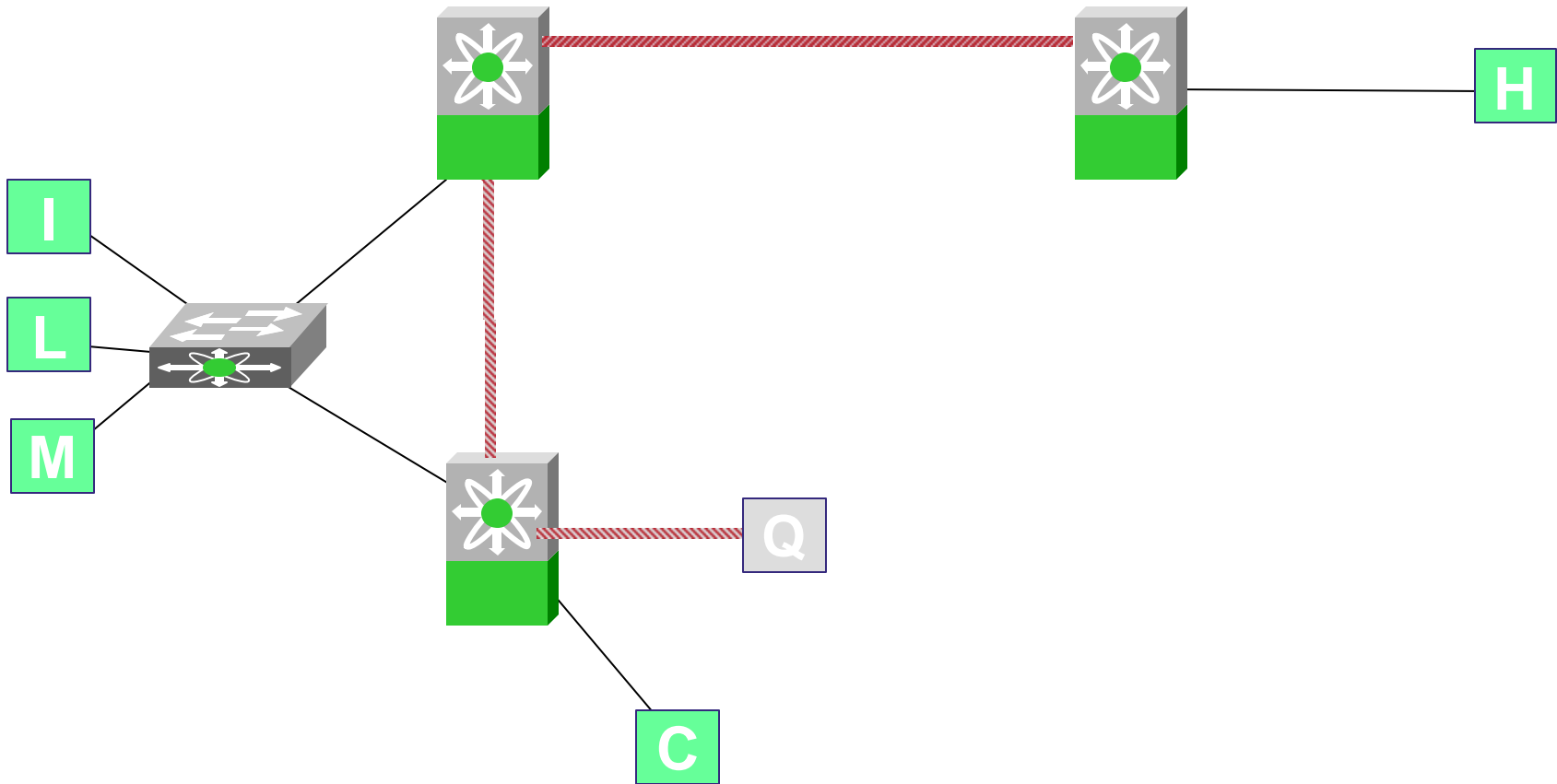
Example 3: adding two legacy switches



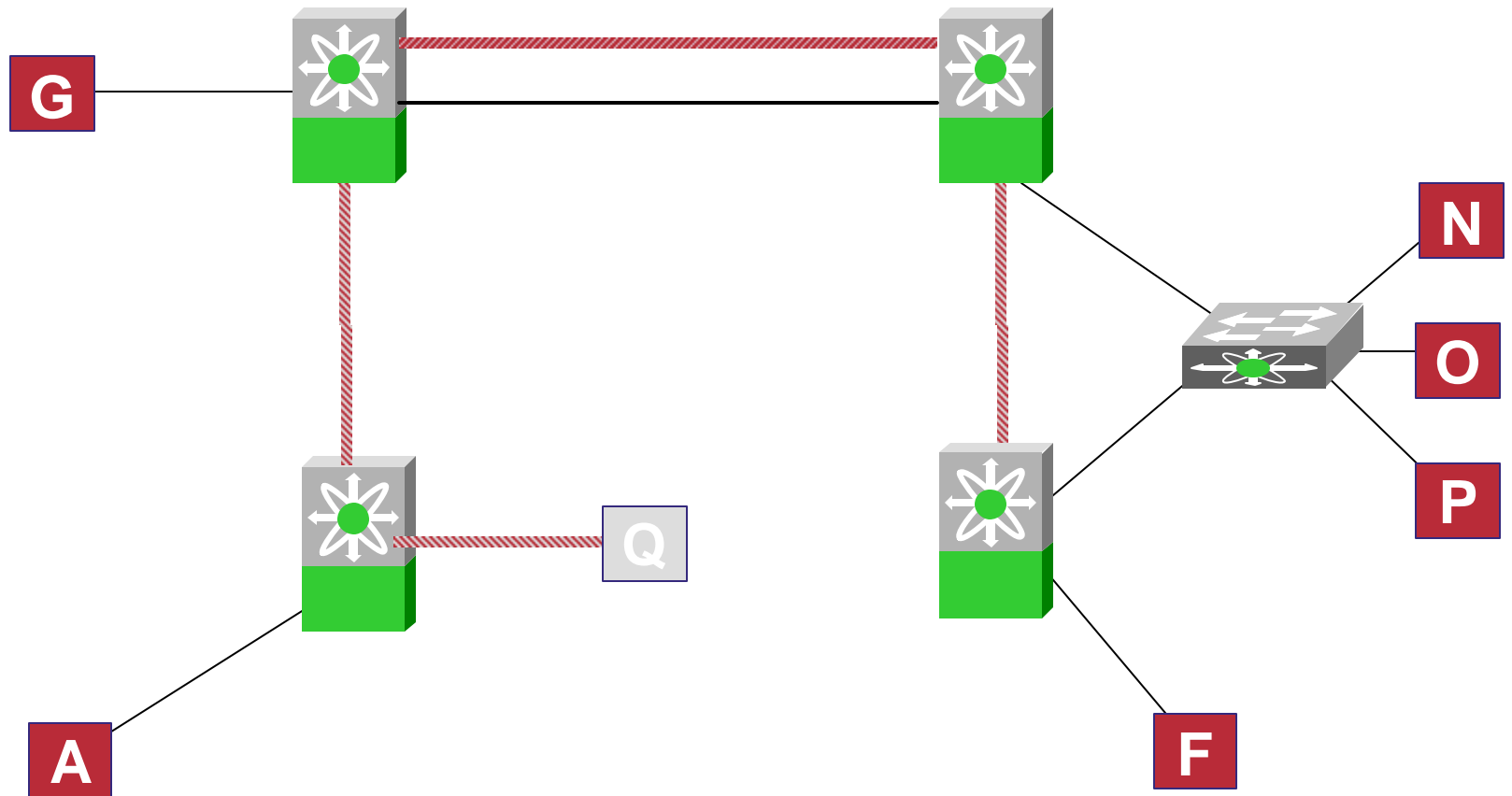
Example 4: adding a VF capable host



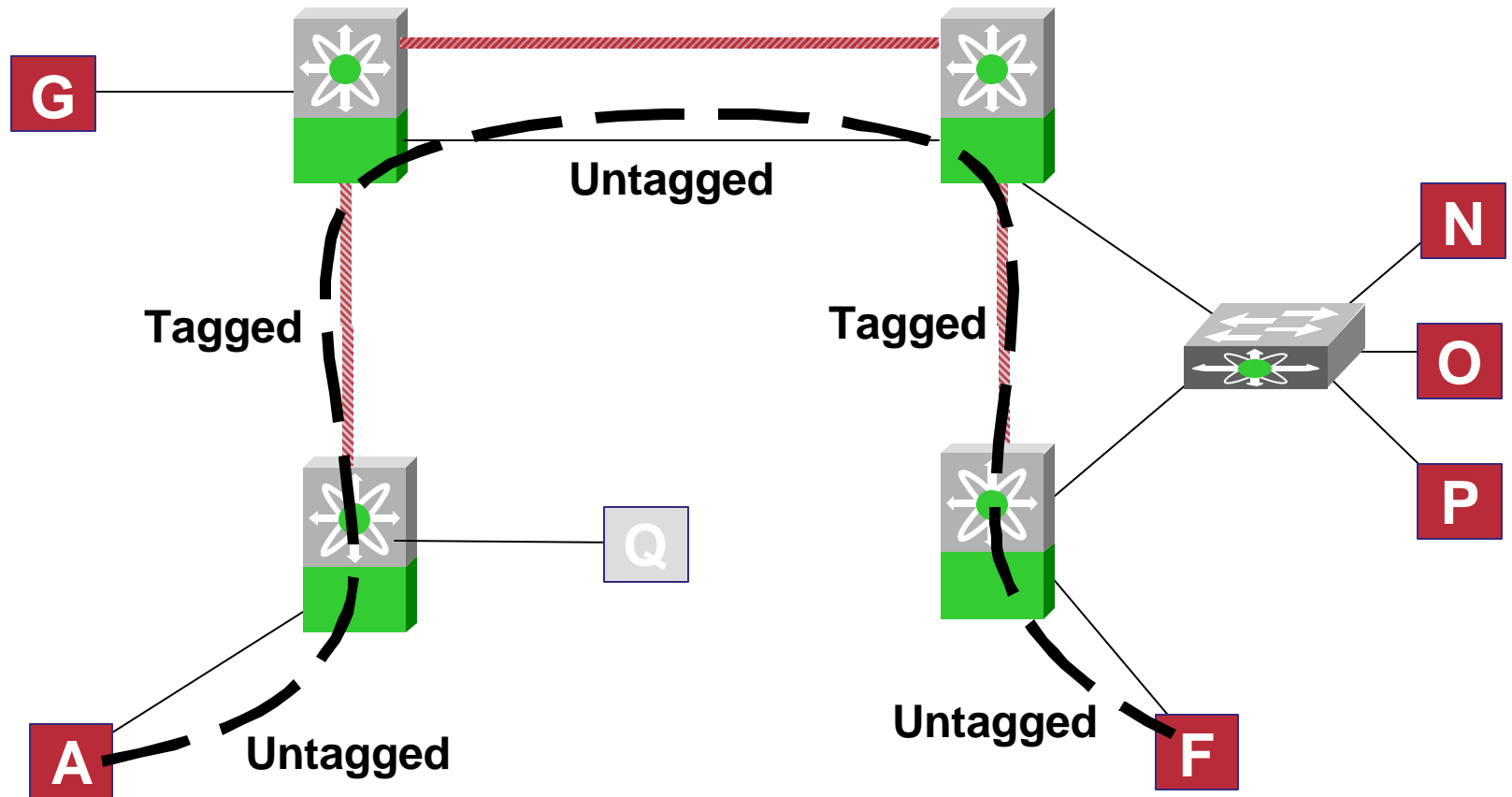
Logical topology of VF 1



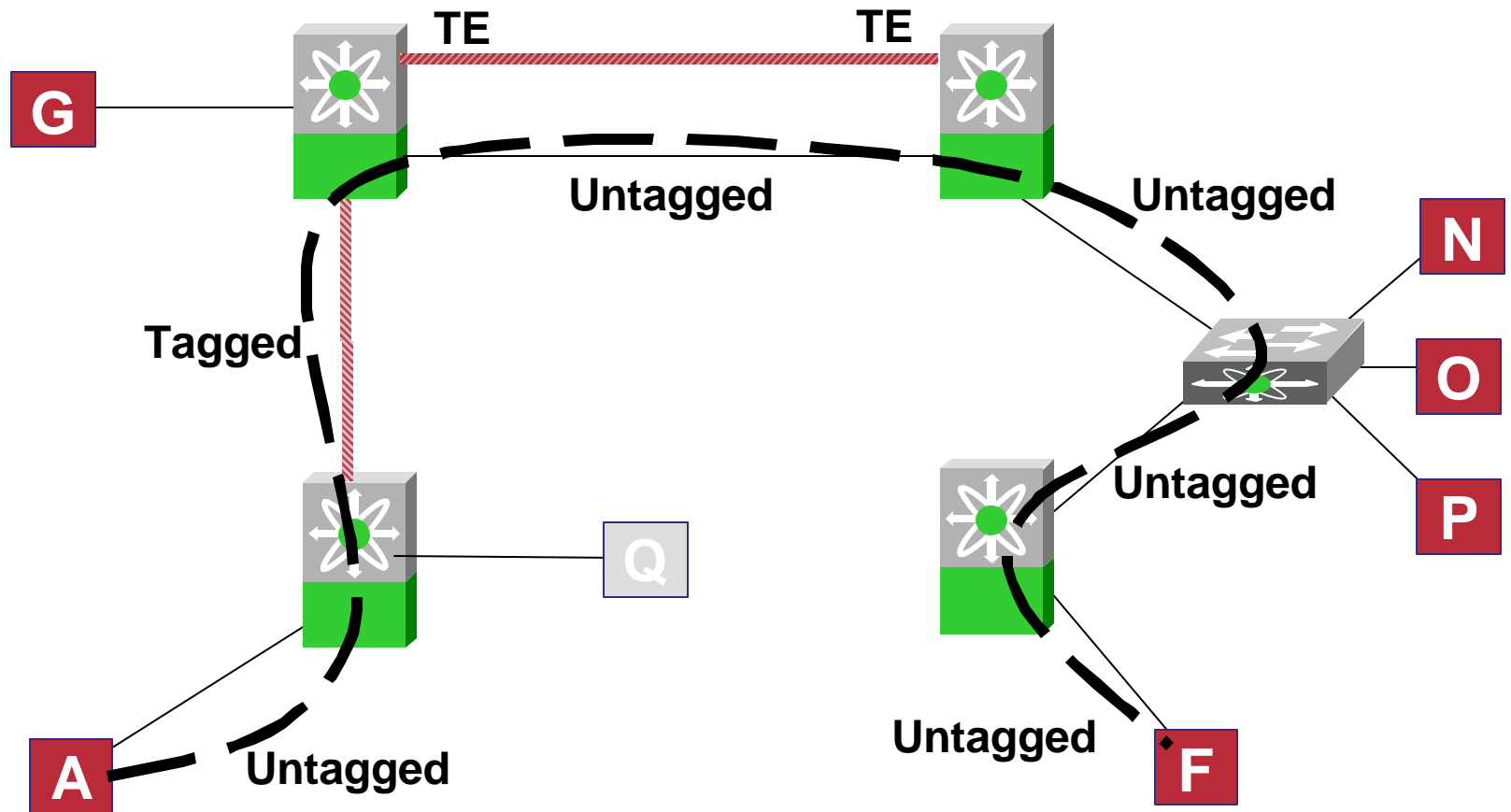
Logical topology of VF 2



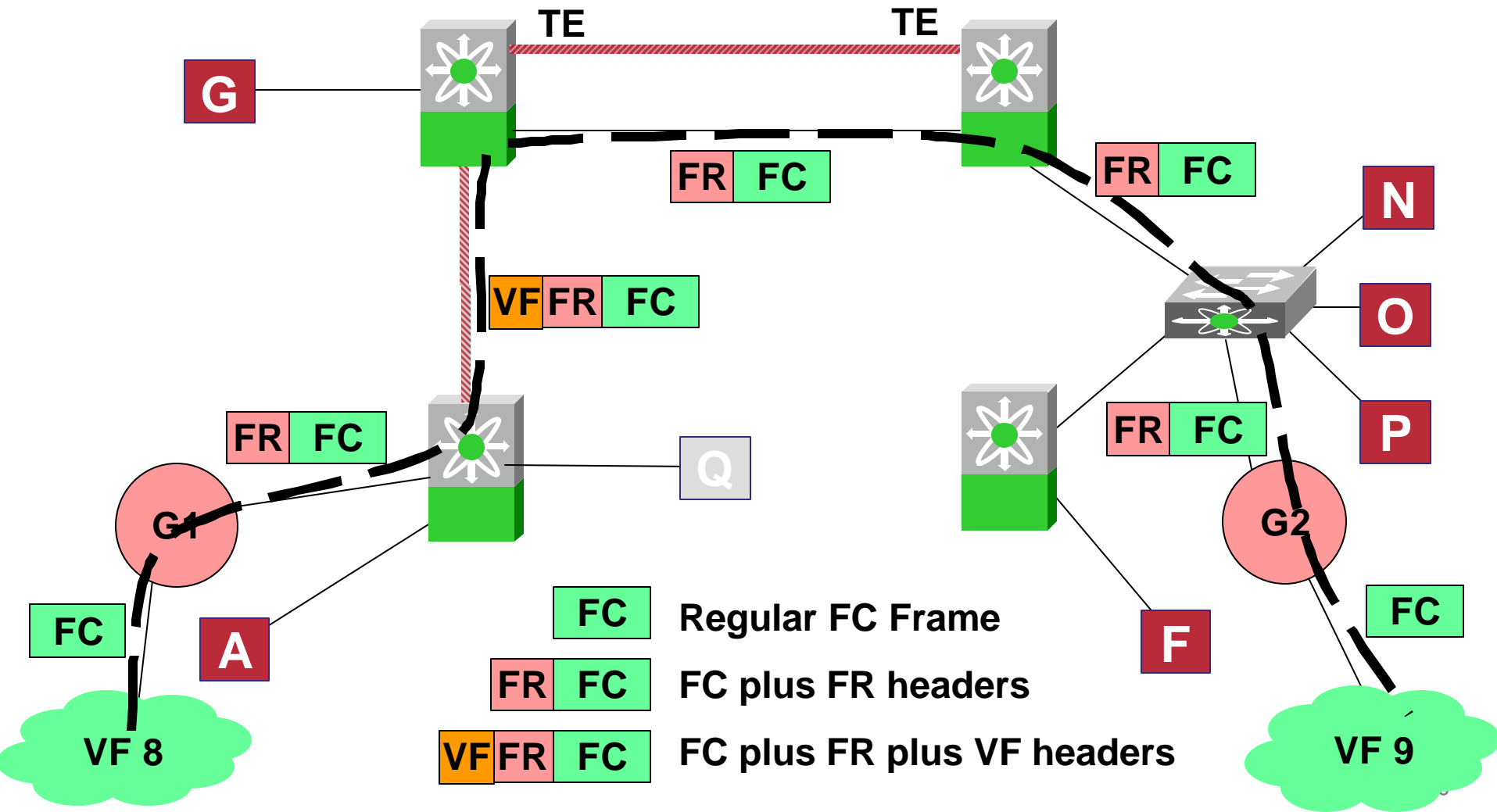
A day in the life of a frame



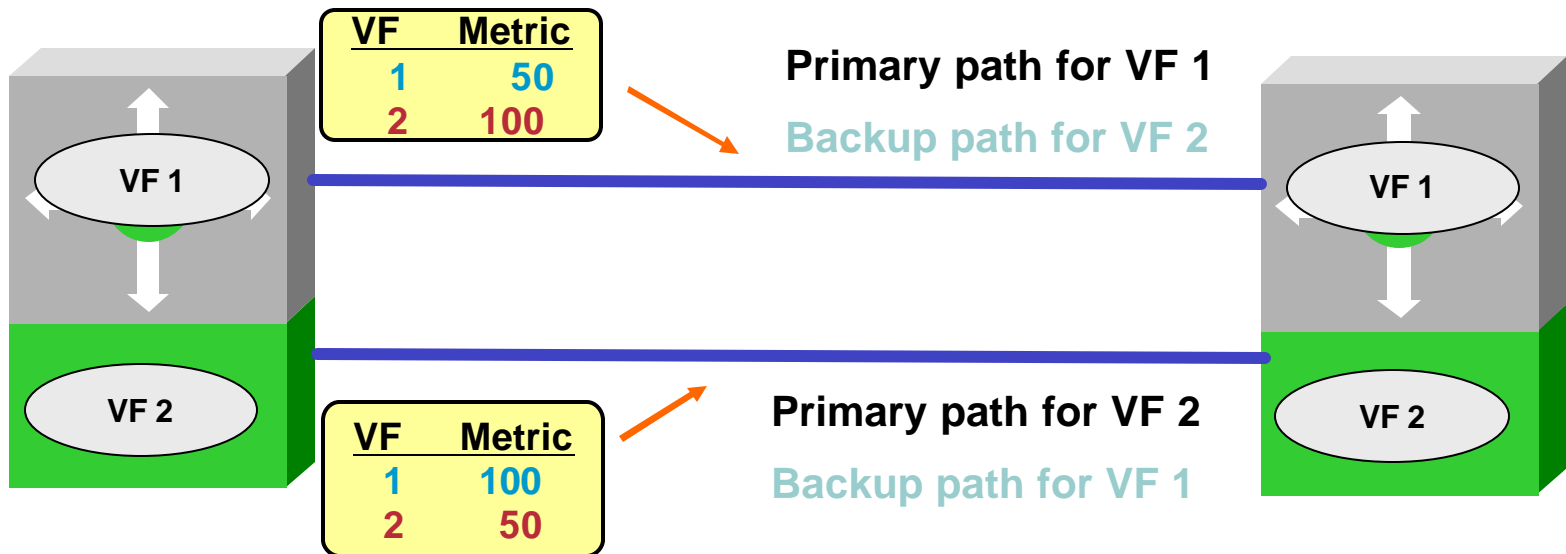
If a path fails



The role of the headers in the path from VF 8 and VF 9



VF and traffic engineering



Conclusions

- **The VF tag is a link attribute, not a SAN-wide attribute or an end-to-end attribute**

The VF tag is present only if the link carries multiple VFs

- **The VF tag is independent and orthogonal to the presence of FR and Gateways**
- **A VF solution is different from a FR solution. The two may be deployed together, but they are independent from each other**

The header infrastructure shall reflect this