High Availability

- Spanning-Tree is the networks worst enemy
- Everything we do from now on is trying to avoid STP
- Redundant devices
- Flexlinks
- Stacking of switches
- Unique VLANs pr. Access Switch
- Routed Access

High Availability

- **Calculating Availability**

- **Example**
    - **2950: MTBF=54 years**
    - **MTTR: 4 hours**
    - **473040/(473040+4)=0.99999154**

$$Availability = \frac{MTBF}{MTBF + MTTR}$$

MTBF = Mean Time Between Failure
MTTR = Mean Time To Repair

HA Deployment

High Availability

- **Downtime pr. Year**
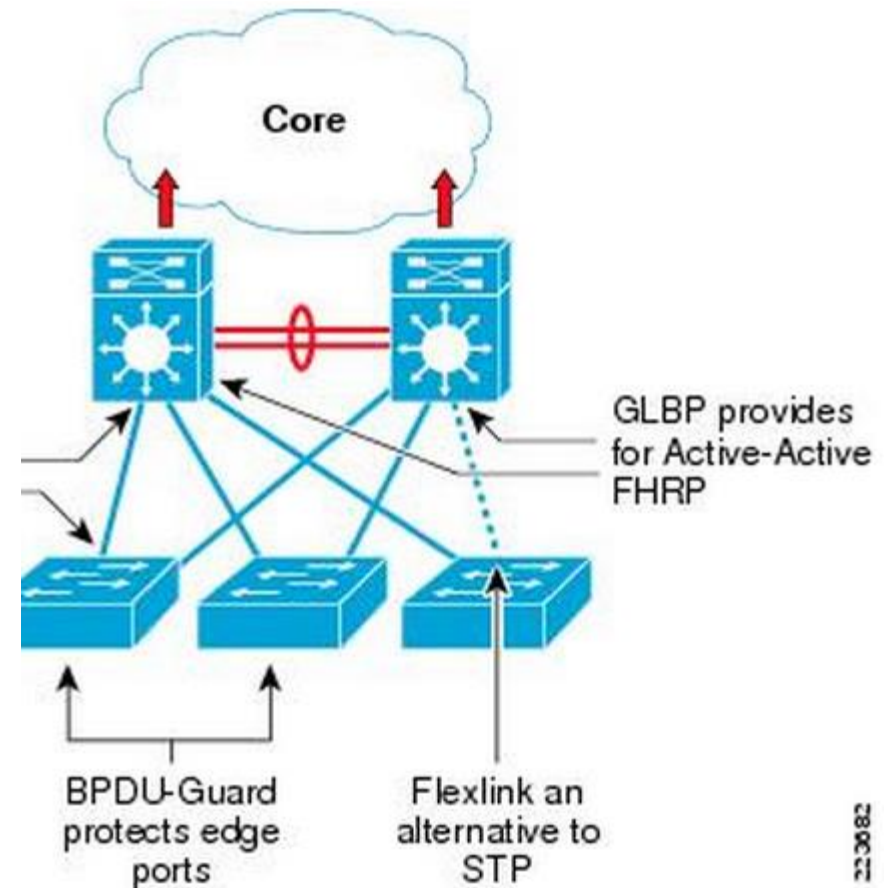- **Defects per Million**

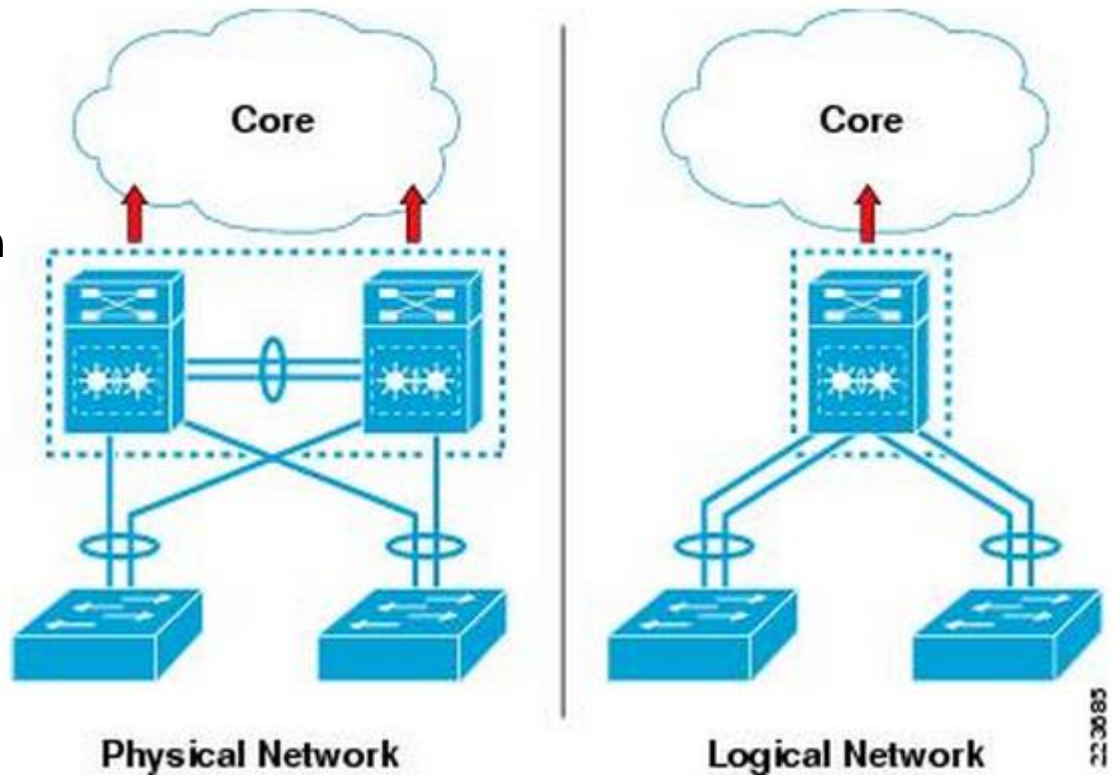| Availability (Percent)	DPM	Downtime/Year (24x7x365)		
99.000	10,000	3 Days	15 Hours	36 Minutes
99.500	5,000	1 Day	19 Hours	48 Minutes
99.900	1,000		8 Hours	46 Minutes
99.950	500		4 Hours	23 Minutes
99.990	100			53 Minutes
99.999	**10**			**5 Minutes**
99.9999	1			0.5 Minutes

FlexLink

- **Disableing spanning tree by only have one active link at a time.**
- **Configure a backup link for every active link**
- **Only changes when active link goes down!**

Core

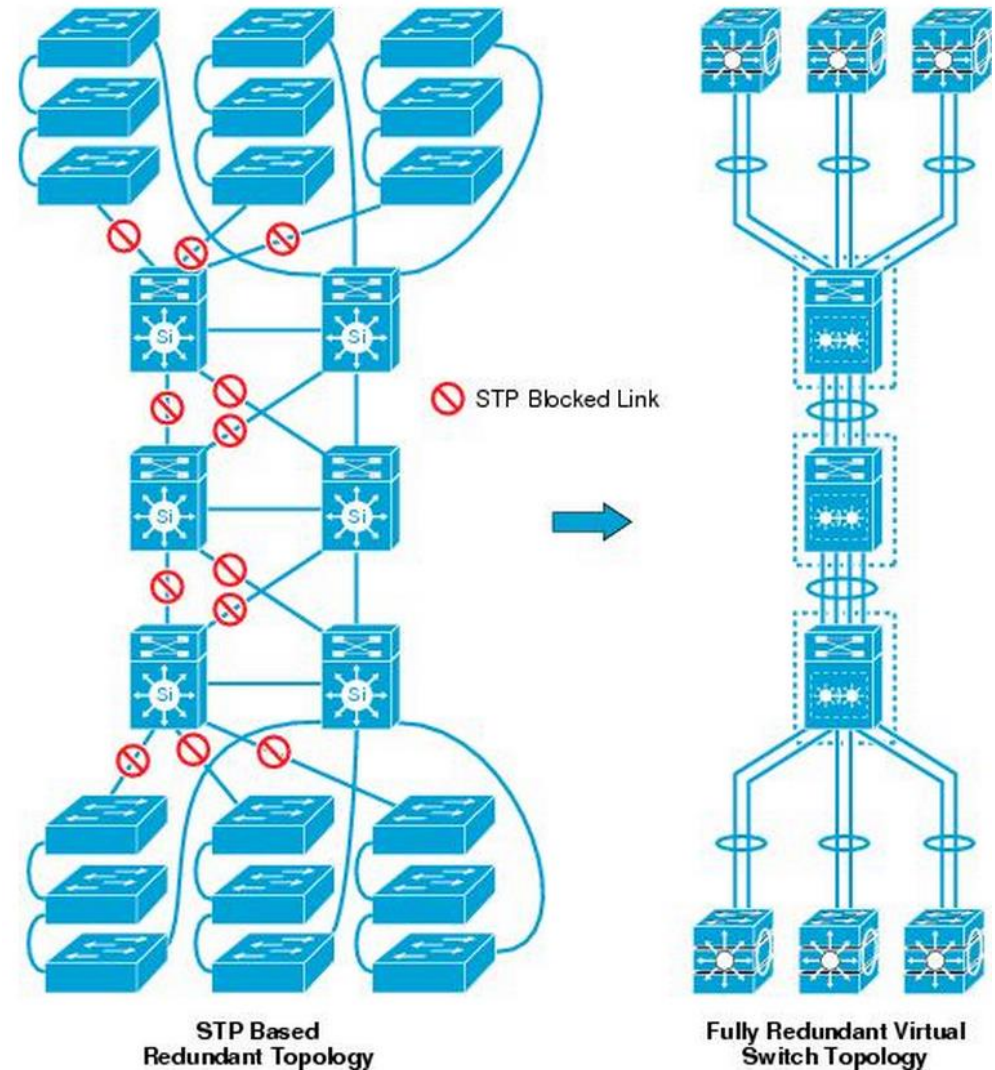GLBP provides for Active-Active FHRP

BPDU-Guard protects edge ports

Flexlink an alternative to STP

Virtual Chassis

- Used to create redundancy
- Logical grouping of network devices
- Easier to manage configuration

Physical Network | Logical Network
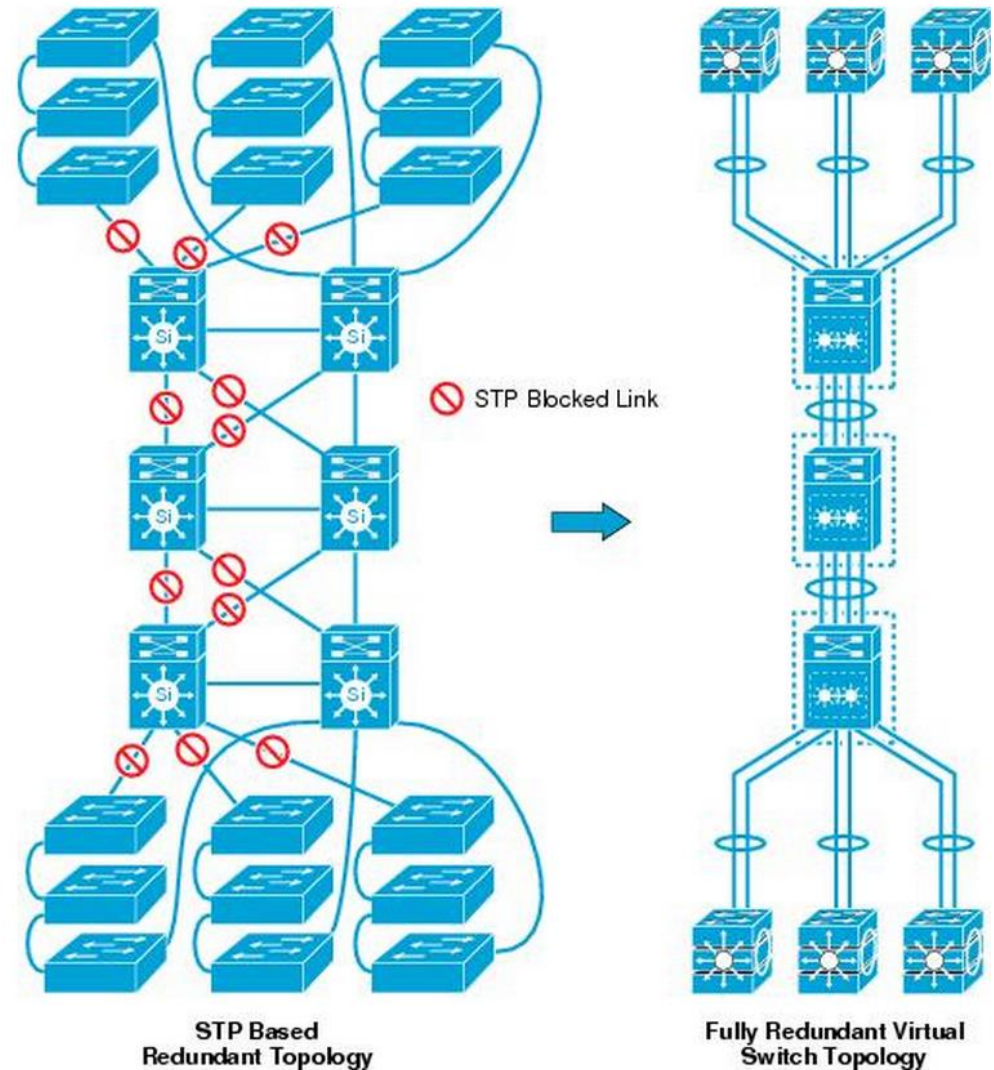
Virtual Chassis

- **Removes the need for STP**
- **Better link utilization**

STP Blocked Link

STP Based
Redundant Topology

Fully Redundant Virtual
Switch Topology

HA Deployment

Virtual Chassis

- **Removes the need for STP**
- **Better link utilization**

STP Blocked Link

STP Based
Redundant Topology

Fully Redundant Virtual
Switch Topology

HOUSE OF
TECHNOLOGY

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Non Spanning VLANs

- The Vlans does not span more than one access layer switch
- No networks loops is created
- No need for spanning tree
- Routed Interconnect

Core

Core

Loop Free Topology

Looped Topology

VLAN 10   VLAN 20   VLAN 30
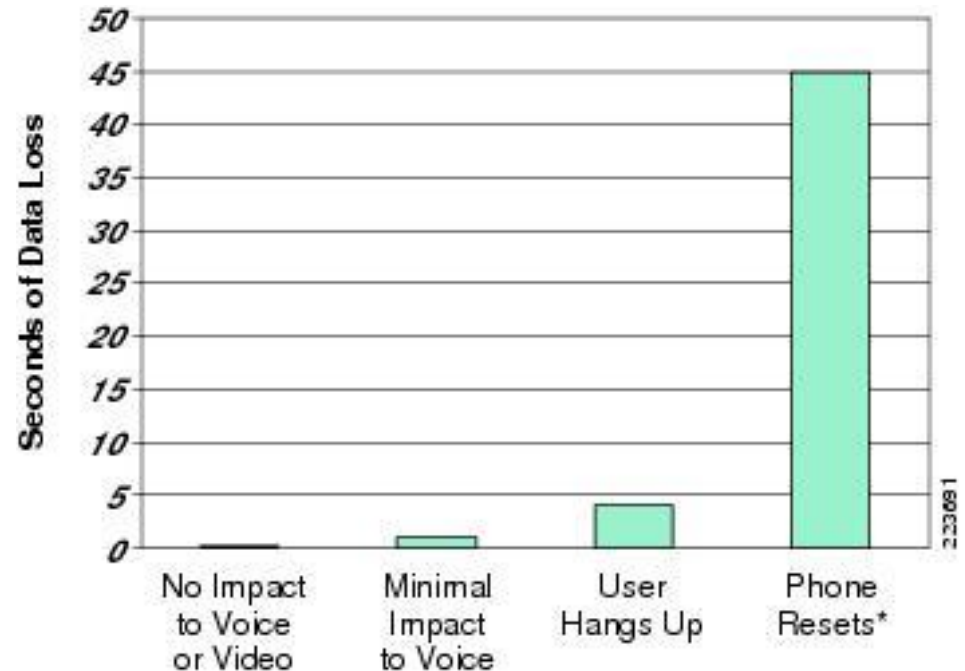
VLAN 30   VLAN 30   VLAN 30
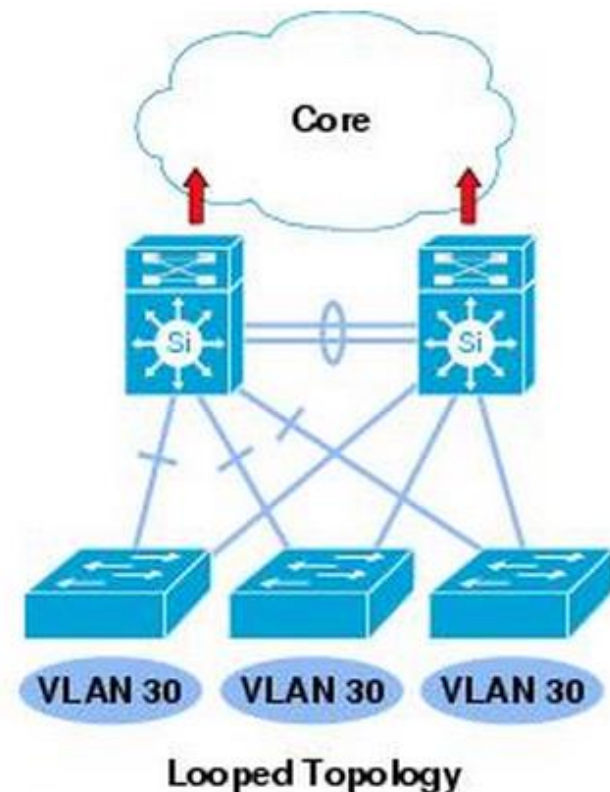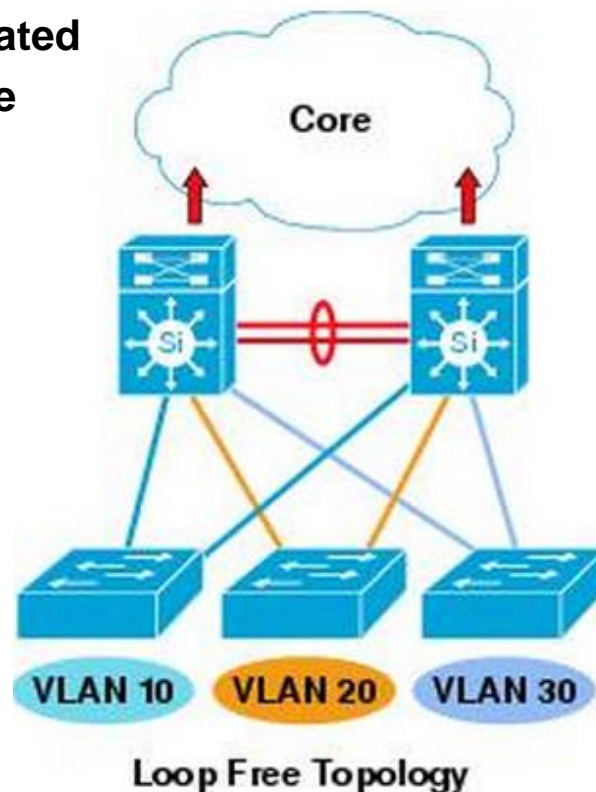
Routed Access Layer

- Routing is pulled all the way down to the Access Layer Switch
- No STP on routed interfaces
- Better uplink utilization because of equal cos loadbanlancing
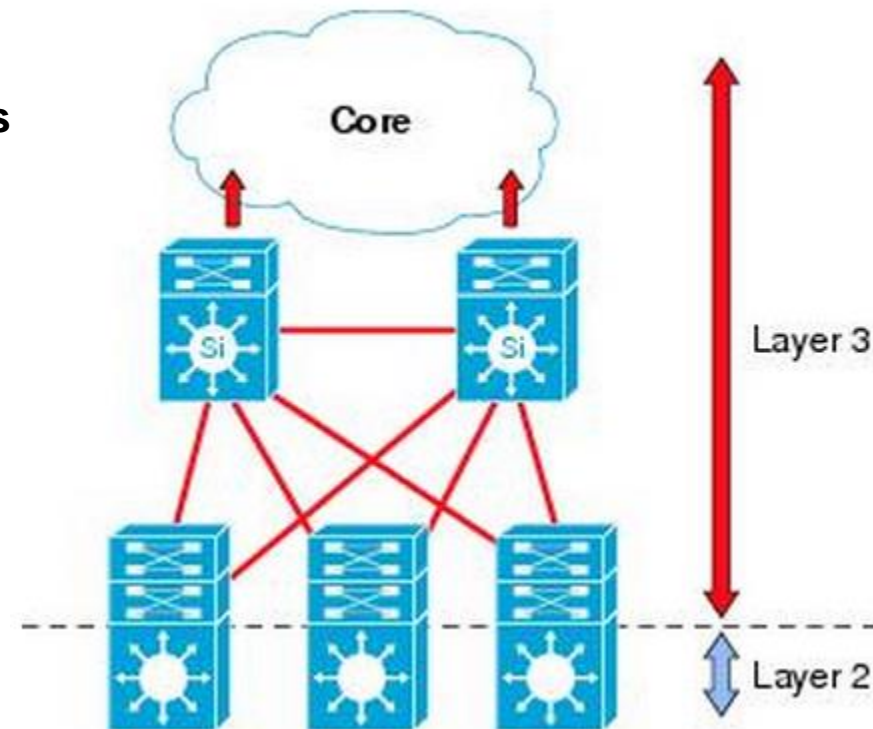
HA Deployment

Voice implementation

•**Smaller tolerance for erros then Data**
•**High Availability is required for IPT**
•**911 Calls**

*The time for a phone to reset is variable and depends on the signaling protocol, SCCP or SIP, and the state of the call, active, ringing, ...

HA Deployment

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