

# UNIFOR (Universidade de Fortaleza)



\* LAN (Local Area Network)





## Principais Tipos de Tecnologias LAN

Token Ring

FDDI

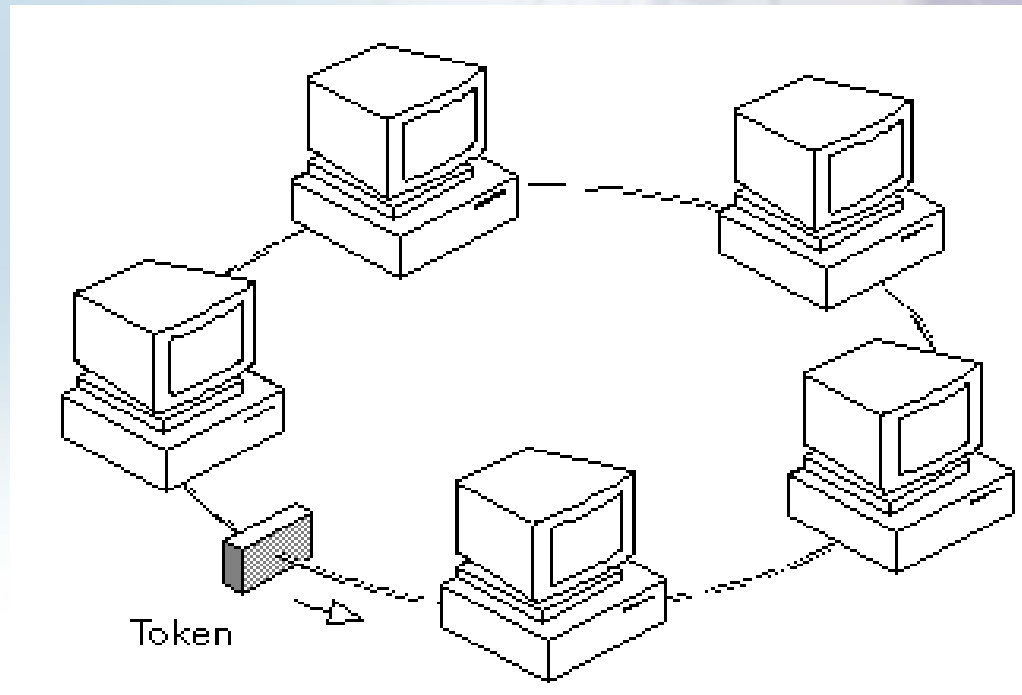
Ethernet

Fast Ethernet

Gigabit Ethernet

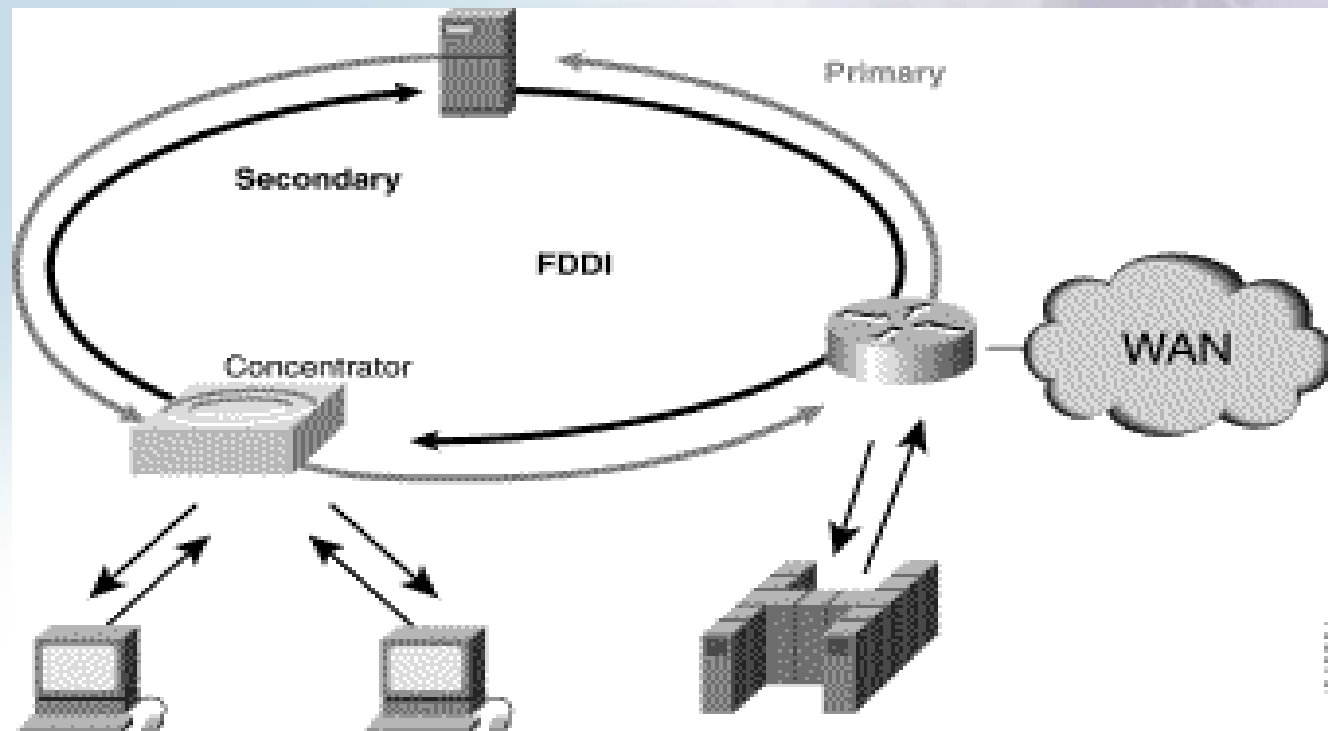


## TOKEN RING





## FDDI (Fiber-Distributed Data Interface)





## ETHERNET

Half Duplex

Full Duplex

CSMA/CD



## Padrões de Cabos

PADRÃO	ESPECIFICAÇÃO	TAMANHO	TIPO DO CABO	PARES
10Base5	802.3	500m	Coaxial	-
10Base2	802.3	185m	Coaxial	-
10BaseT	802.3	100m	UTP Cat 3,4 ou 5	2
10BaseFL	802.3	2000m	Fibra	1
100BaseTX	802.3	100m	UTP Cat 5	2
100BaseT4	802.3u	100m	UTP Cat 3	4
100BaseT2	802.3u	100m	UTP Cat 3,4 ou 5	2
100BaseFX	802.3u	400/2000m	Fibra Multimode	1
100BaseFX	802.3u	10000m	Fibra Single Mode	1
1000BaseSX	802.3z	220-550m	Fibra Multimode	1
1000BaseLX	802.3z	3000m	Multi or Single Mode	1
1000BaseCX	802.3z	25m	Shielded Copper	2
1000BaseT	802.3ab	100m	UTP Cat 5	2



## **ETHERNET**

**Cabeamento Estruturado**

**Cabeamento Vertical**

**Cabeamento Horizontal**



## ETHERNET

Unicast

Multicast

Broadcast





## ETHERNET

7	1	6	6	2	1	1	1-2	Var	4
Preamble	S D	Dest Address	Source Address	Length	D S A P	S S A P	Control	Data	F C S



## **ETHERNET**

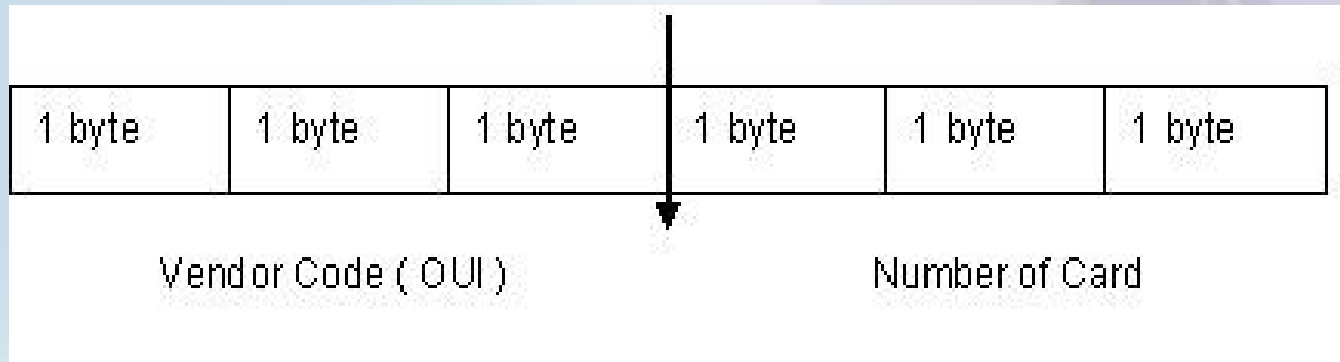
**Hubs**

**Bridges**

**Switches**



## ETHERNET



## MAC ADDRESS



## ETHERNET

Ethereal



## **ETHERNET**

**Domínios de Colisão**

**Domínios de Broadcast**



## FAST ETHERNET

Fast Speed

Autonegotiation

90% less time to transmit frame

Cable Restrictions



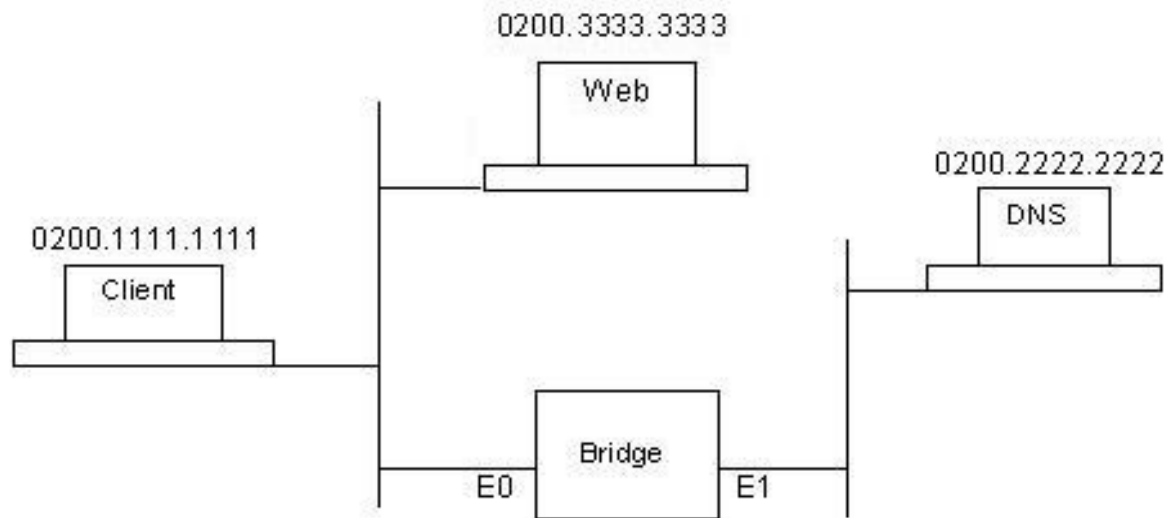
## GIGABIT ETHERNET

- 10 Vezes a velocidade da Fast Ethernet
  - 1997 (IEEE)
    - Half Duplex (CSMA/CD)
    - Full Duplex (Flow Control)

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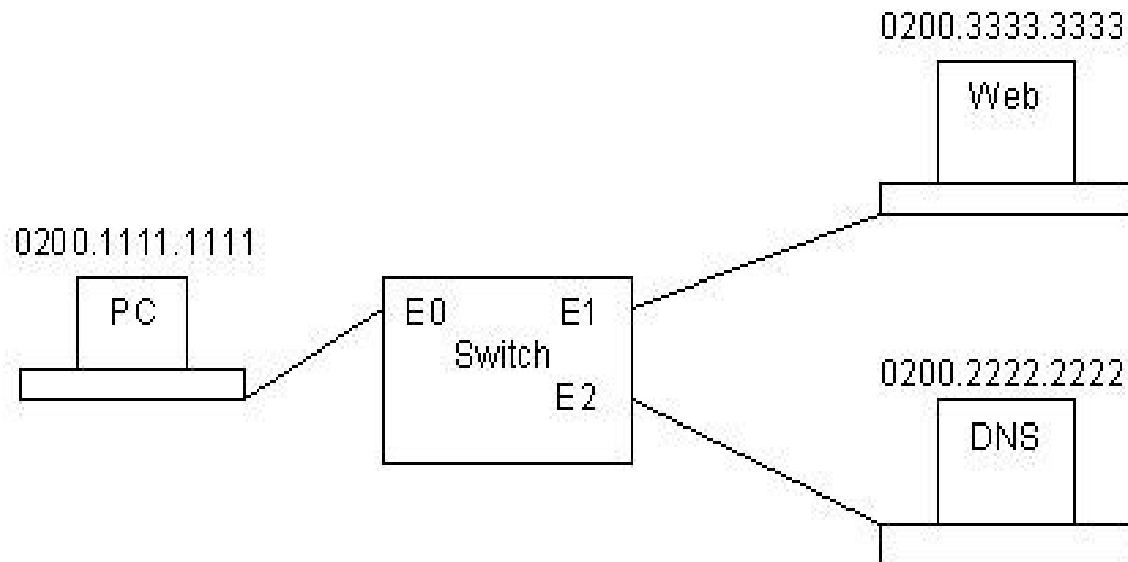
## BRIDGE





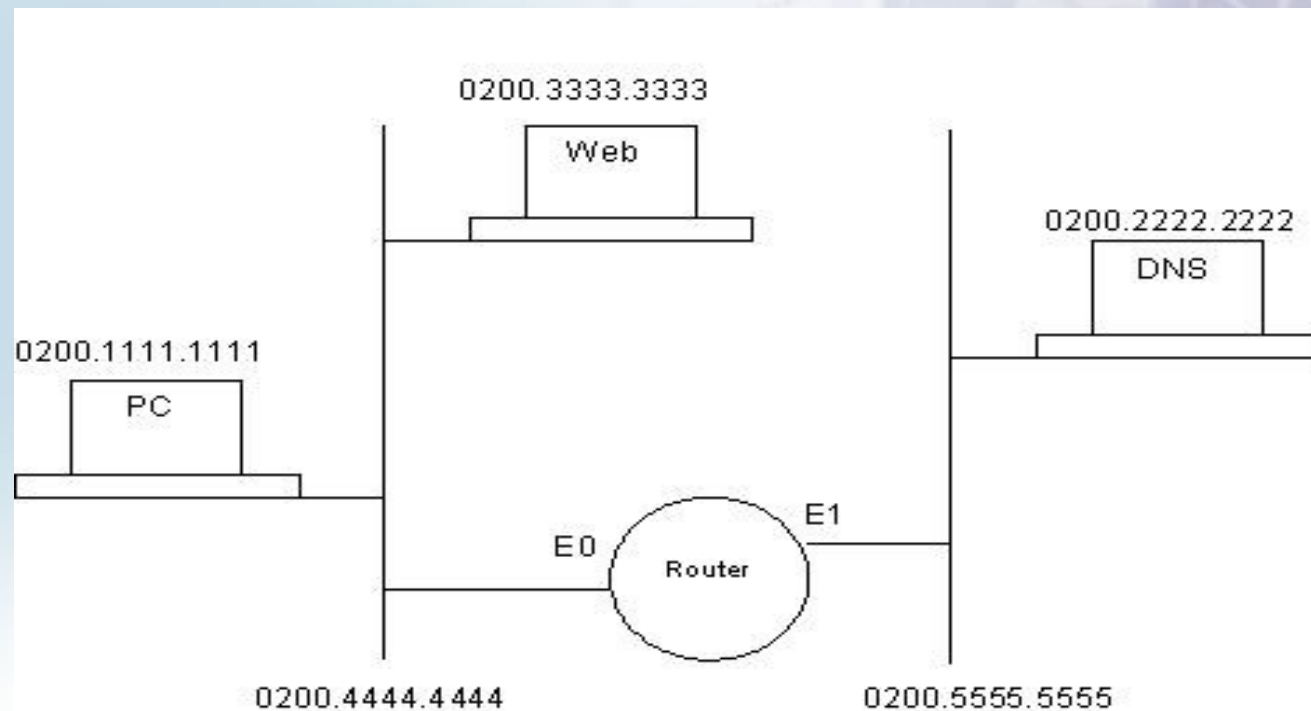


## SWITCH





## ROUTER



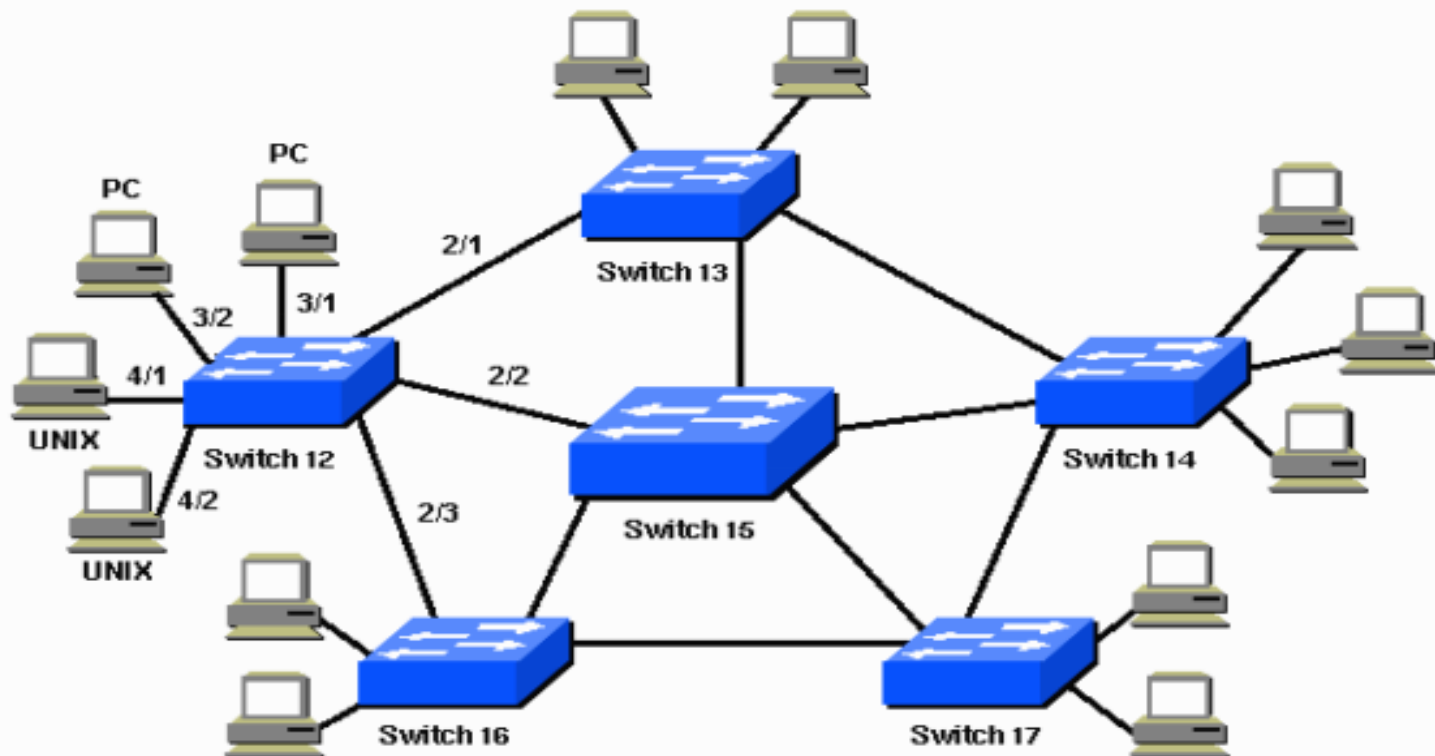


## SWITCH

Store and Forward  
Cut Through  
Fragment Free



## SPANNING TREE





## SPANNING TREE

- Evitar Loop em links redundantes
- 802.1d
- Blocking / Forward (Convergência)
- Root Bridge (Switch Raiz)



## SPANNING TREE

- BPDU (Bridge Packet Data Unit)
- Hello Time
- Max Age
- Forward Delay



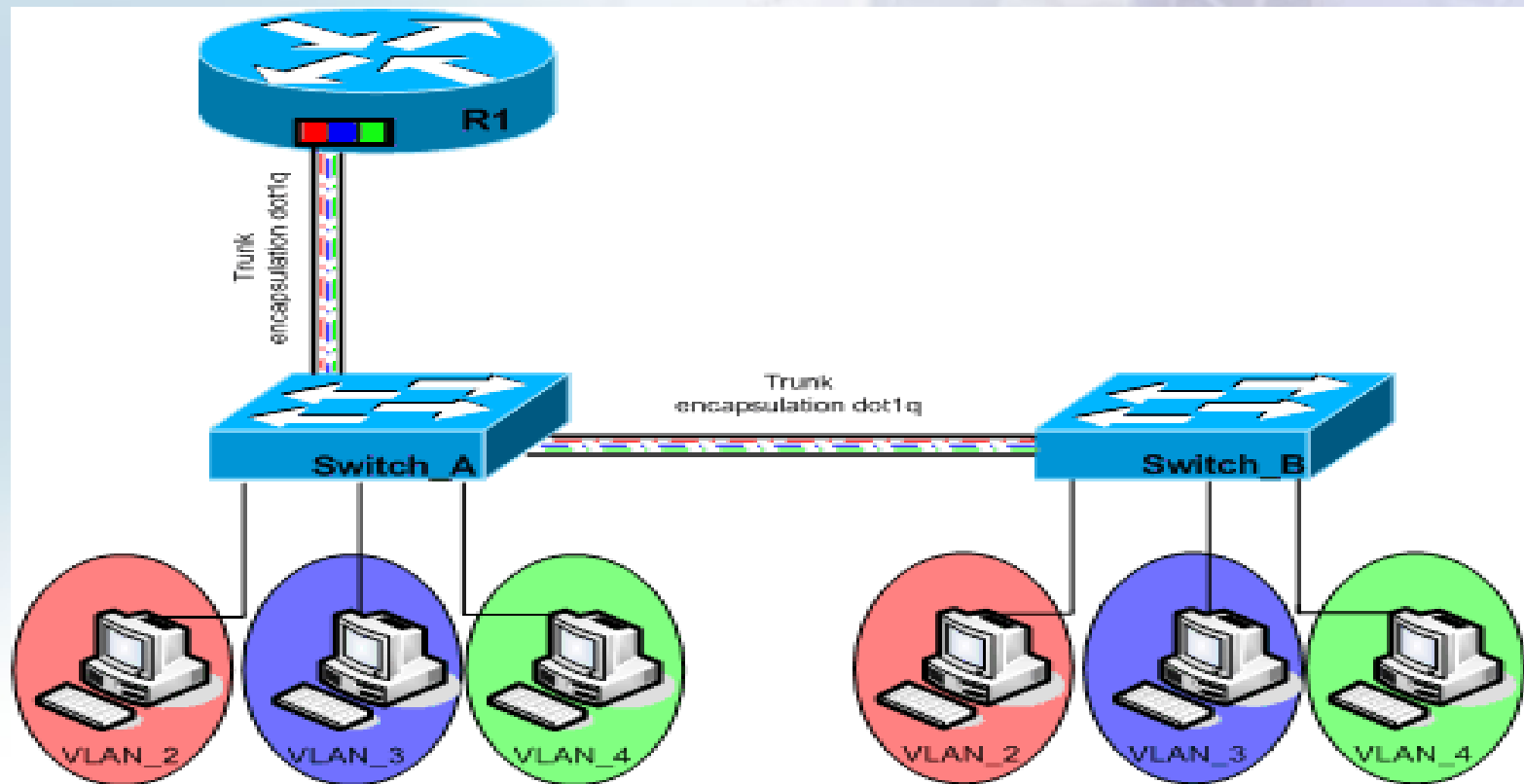
## SPANNING TREE

Blocking -> Listening -> Learning -> Forwarding

20s	15s	15s
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## VLAN (Virtual LAN)







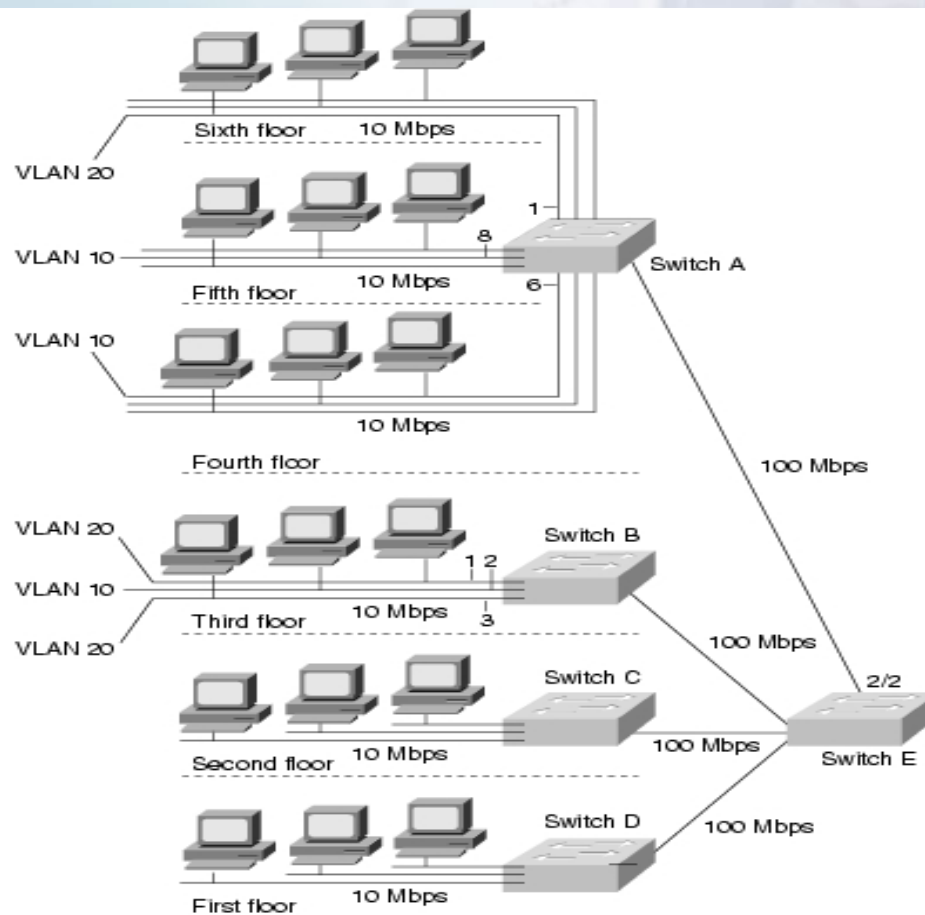
## VLANs

- Simplification
  - End-station moves, adds and changes
- Controlled Traffic Activity
- Workgroup and Network Security

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## VLANs





## VLANs

- ISL (Inter Switch Link)

Bits	40	4	4	48	16	24	24	15	1	16	16	Variable	32
	ISL Multicast Address	Type field	User field	Source port address	Length	AAAA03	OUI	VLAN ID	B	Index	R	Original Frame	FCS

- 802.1q (Padrão IEEE)

Efetua modificações no Frame Ethernet



## VTP (Vlan Trunking Protocol)

Mode Server

Mode Client

Mode Transparent



## VTP (Vlan Trunking Protocol)

<http://www.cisco.com/warp/public/473/21.html>



## VTP (Vlan Trunking Protocol) VTP Pruning

