



# Vysoce dostupná síť

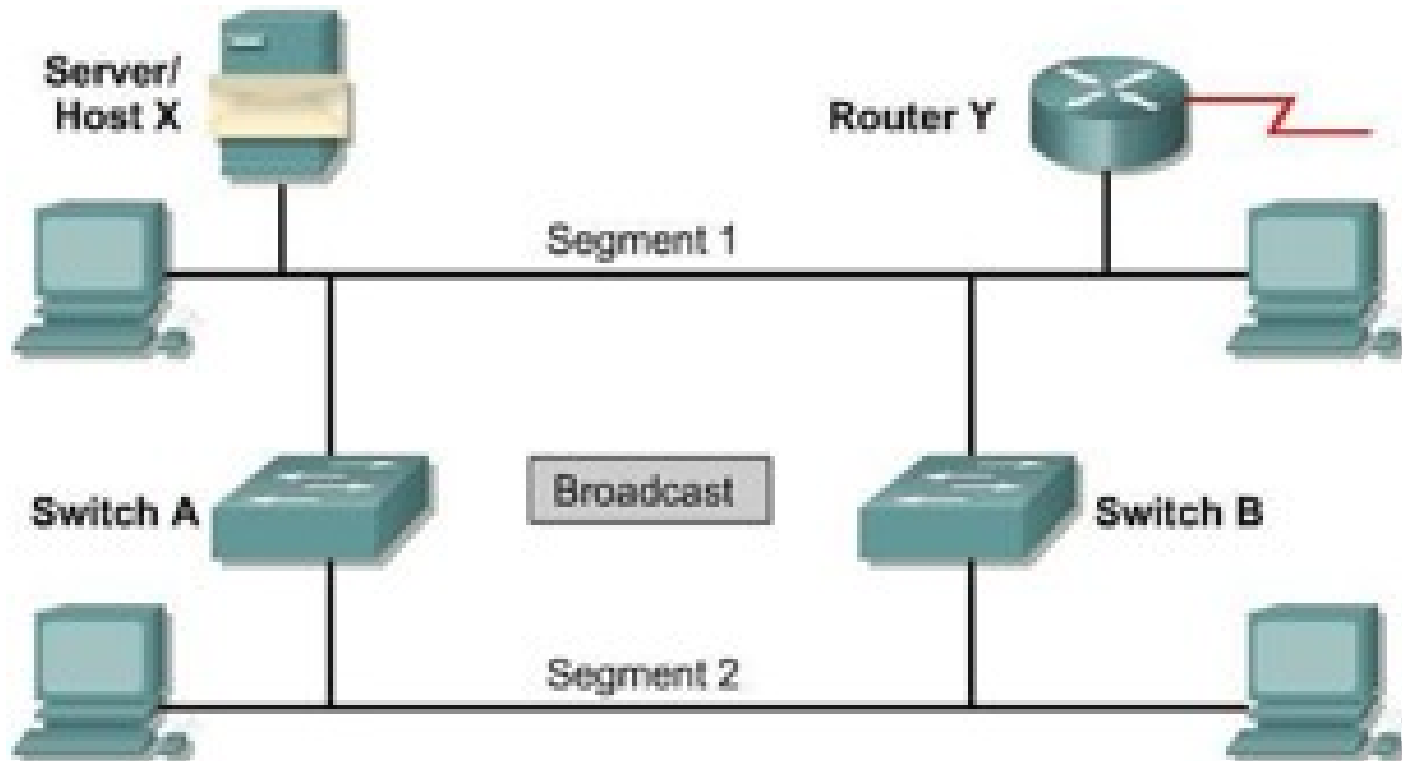


- Redundantní HW
- Linková vrstva
  - STP – Spanning Tree Protocol
  - RSTP – Rapid Spanning Tree Protocol
  - MST – Multiple Spanning Tree
- Síťová vrstva
  - Proxy ARP
  - HSRP – Hot Standby Routing Protocol
  - VRRP – Virtual Router Redundancy Protocol
  - GLBP – Gateway Load Balancing Protocol
  - AS -Autonomous System



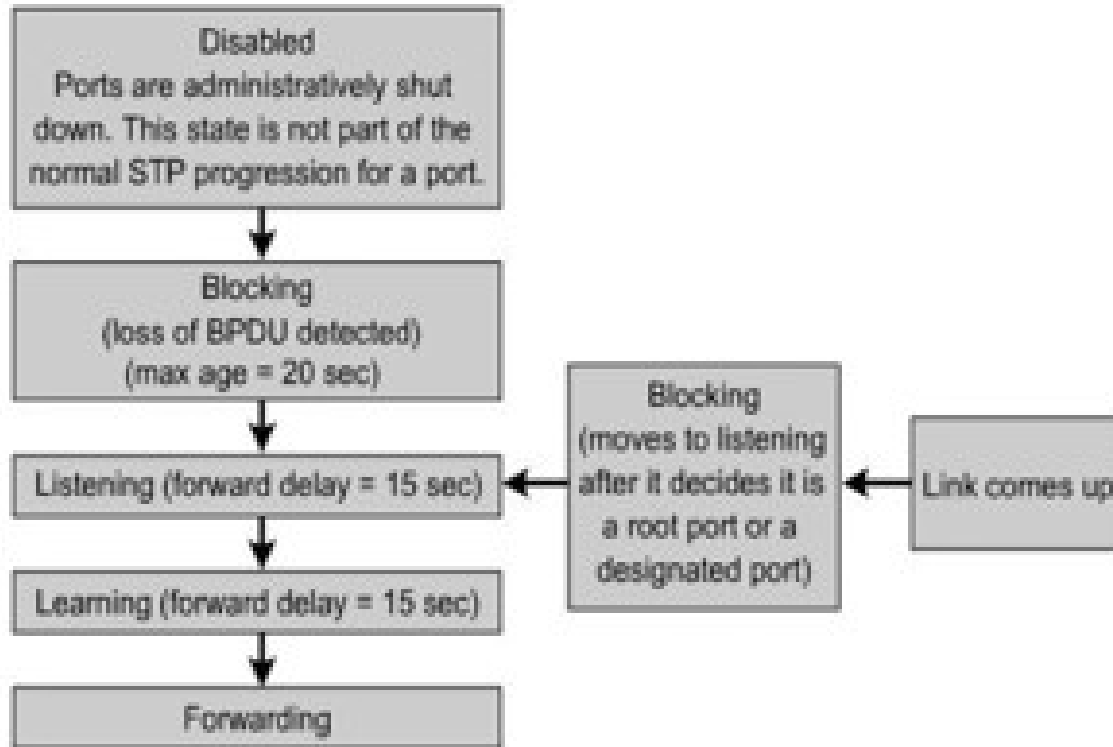
# Ethernet - cyklus

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- Viz PSI





- IEEE 802.1w (vychází z CISCO IEEE 802.1d)
- Změna stavu a rolí portu
  - Role – root, designated, backup, alternate

STP stav portu	RSTP stav portu	Je port v aktivní topologii?	Učí se port MAC adresy?
disabled	discarding	ne	ne
blocking	discarding	ne	ne
listening	discarding	ano	ne
learning	learning	ano	ano
forwarding	forwarding	ano	ano



- Port nejbliže k root switch



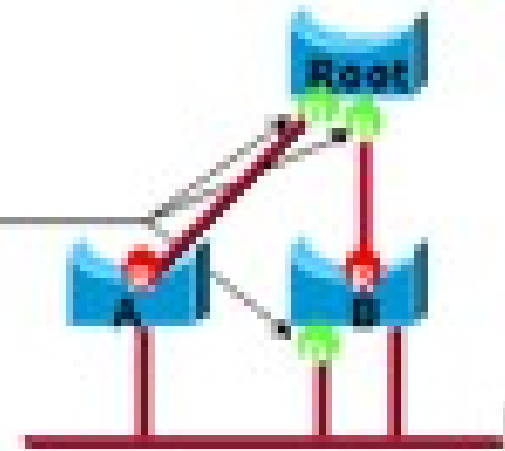


# Designated port

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- Port, který do daného segmentu posílá BPDU (Bridge Protocol Data Unit) s nejvyšší váhou

● **Designated Port**

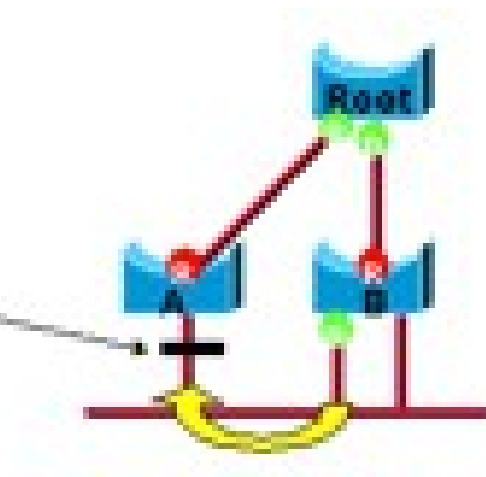




# Alternate port

- Není root ani designated (blocked v STP)
- Dostává BPDUs s vyšší vahou od jinud
- Alternativní root (při výpadku)

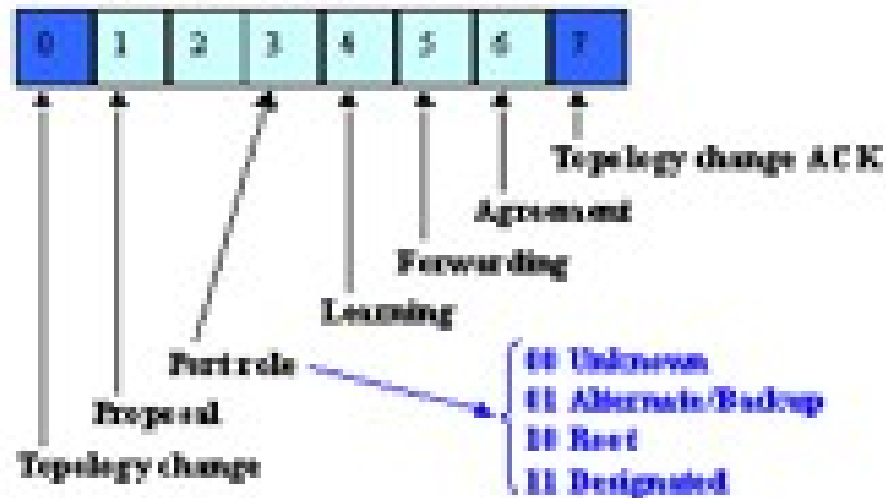
— Alternate Port







- Více příznaků

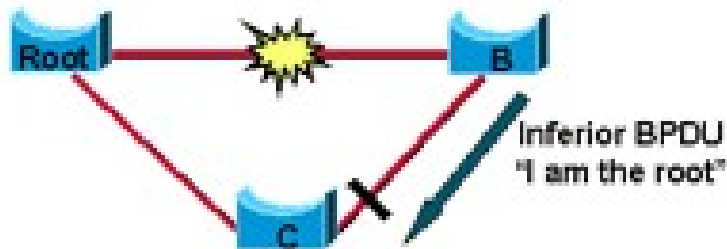




# RSTP ztráta spojení s root

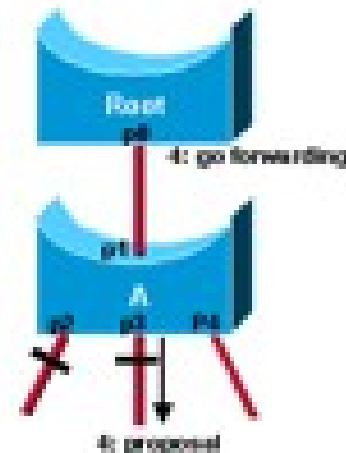
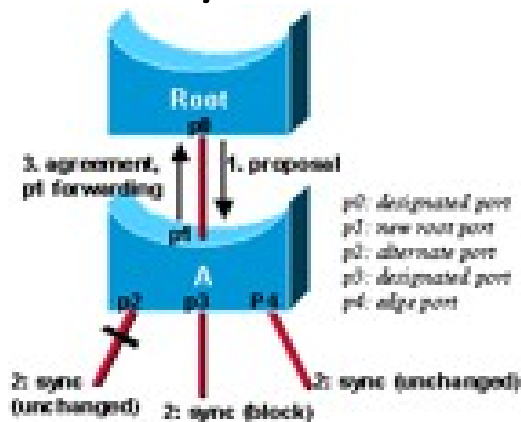
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- BPDU každé 2s
- 3x výpadek – ztráta spojení
- Okamžité nahrazení root při výpadku na root portu
- Soused root BPDU akceptuje a pošle dotaz na root





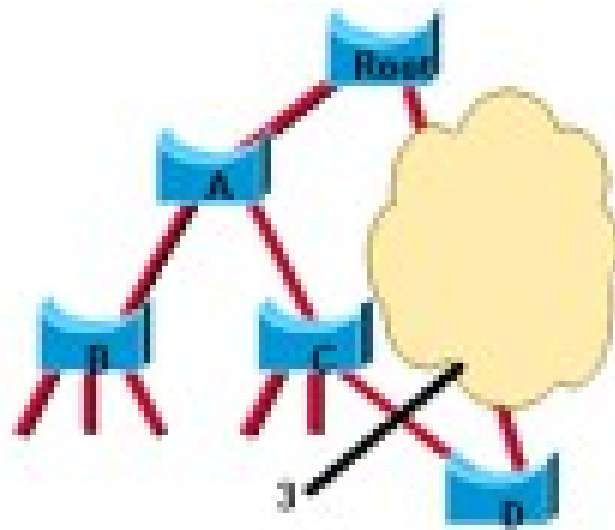
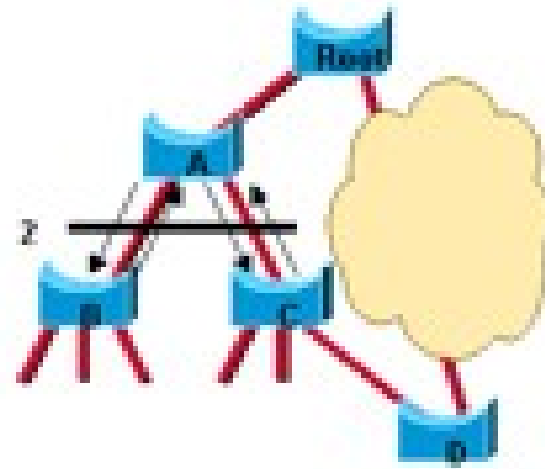
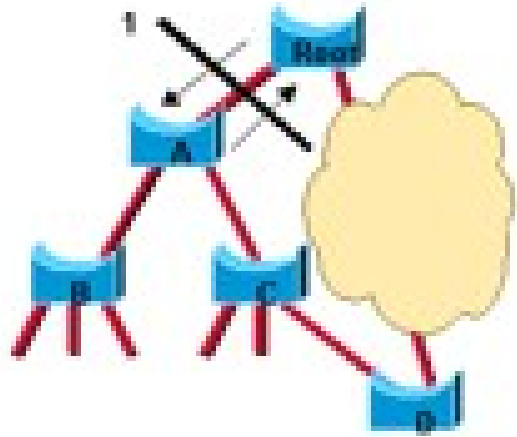
- Akti vní potvrzení o přechodu do forwarding (bez TO)
  - Edge porty – přímo ke koncovým stanicím
  - Typ linky – point-to-point (full duplex)
  - Nabídka/souhlas





# RSTP konvergence

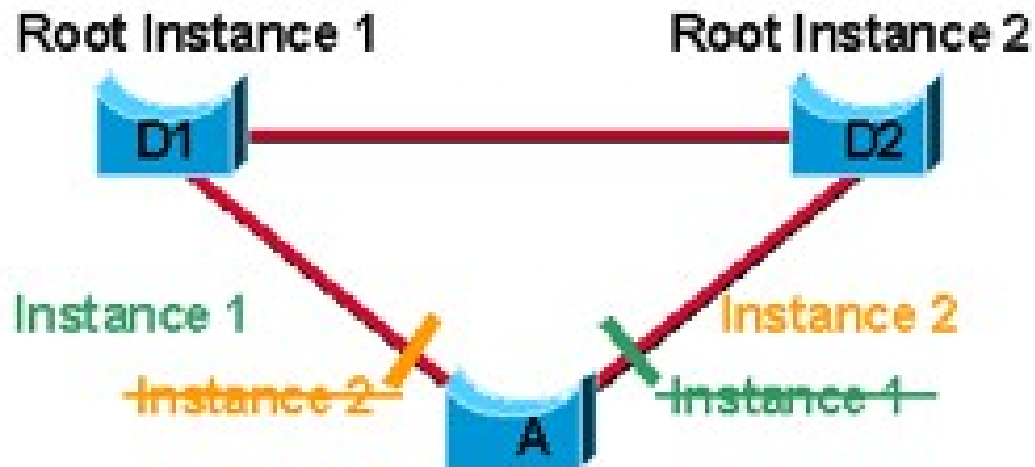
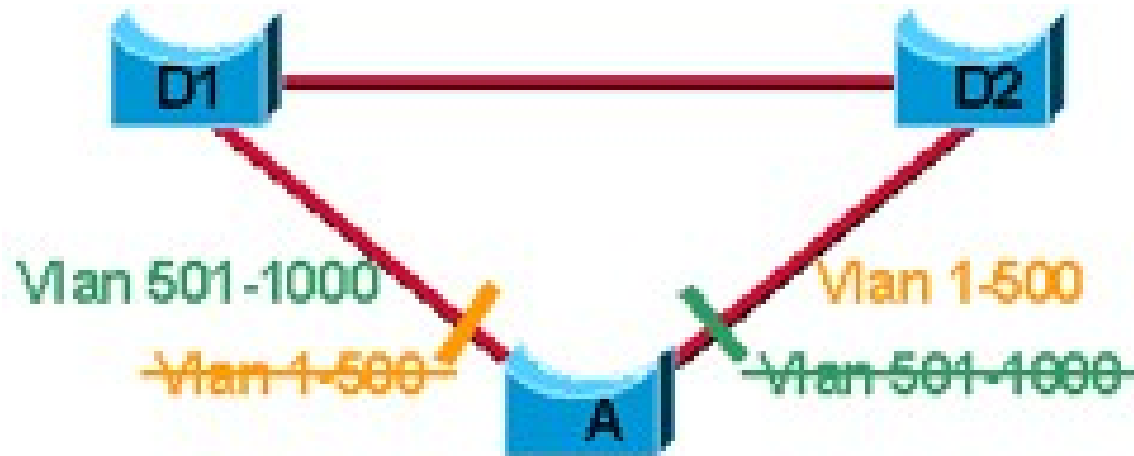
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# MST - Multiple Spanning Tree

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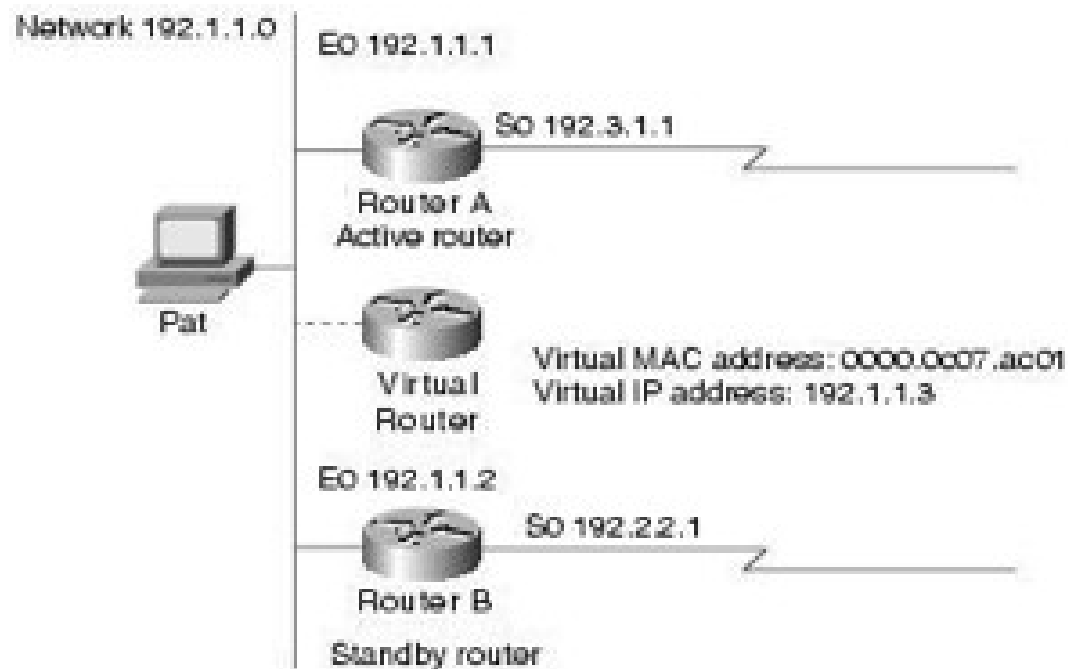
- Není default gateway
- „falešné“ ARP odpovědi



# HSRP topologie

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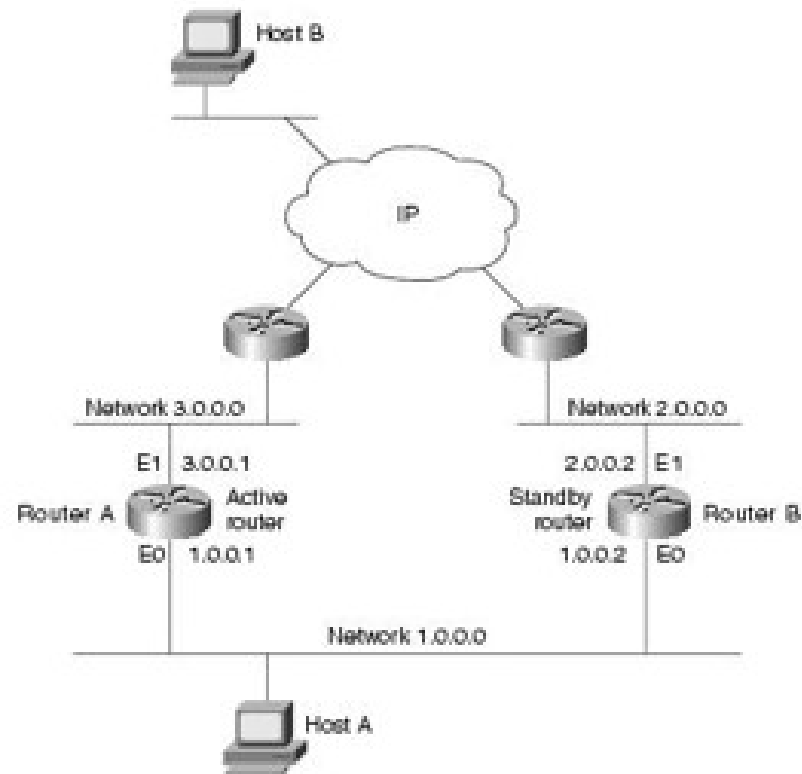
- HSRP – Hot Standby Routing Protocol
- CISCO





# HSRP příklad

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- standby priority
- standby preempt + delay
- hello message timer 3s (250ms)
- hold interval 10s (800ms)
- interface tracking + dec standby priority
- NAT



- HSRP group Id 0-4095 (v1 0-255)
- Hello and hold intervals in ms
- Hello source identification
- 224.0.0.102 x 224.0.0.2 (Cisco Group Management Protocol)
- New header
- Not compatible



**A to je vše**