

# Campus Networking Best Practices

## Session 2: Layer 3

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# Routing versus Switching

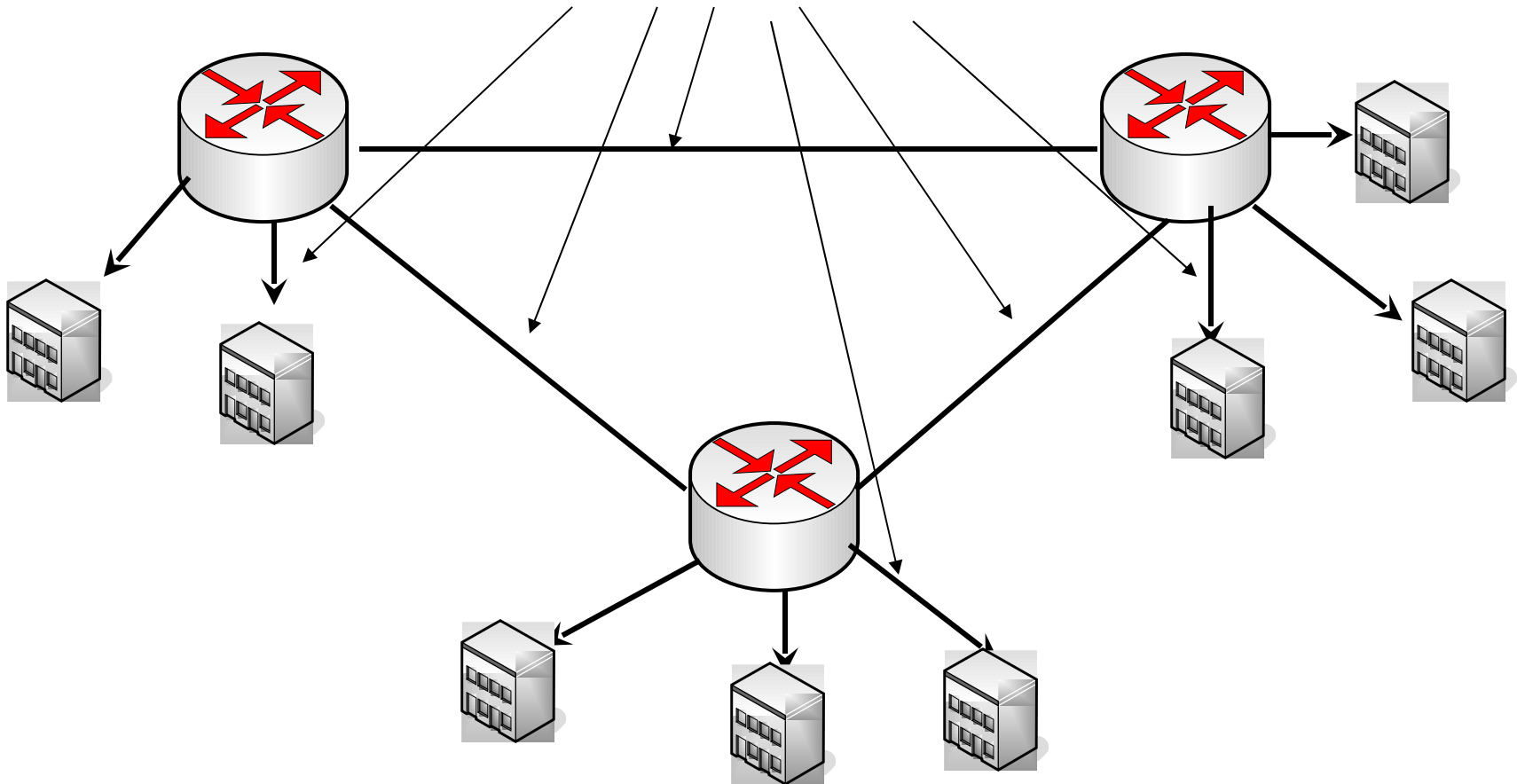
## Layer 2 versus Layer 3

- Routers provide more isolation between devices (they stop broadcasts)
- Routing is more complicated, but also more sophisticated and can make more efficient use of the network, particularly if there are redundancy elements such as loops



# Switching versus Routing

These links must be routed, not switched



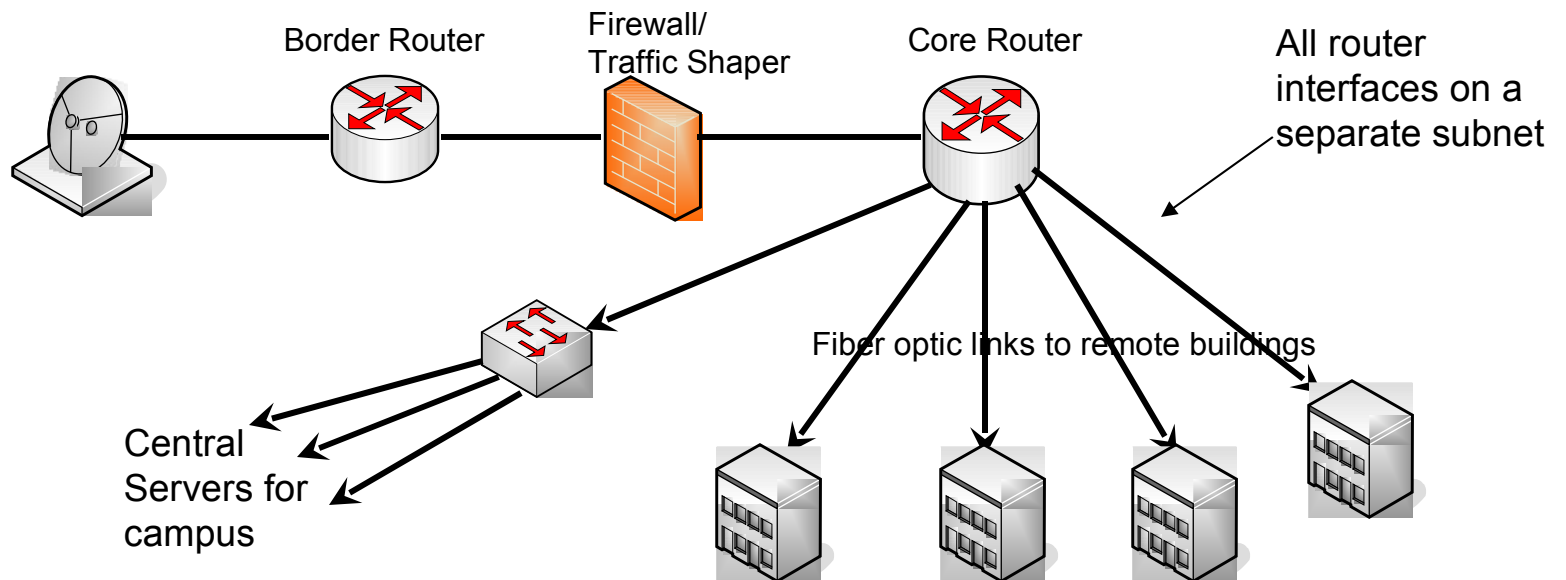
# Core Network

- Reliability is the key
  - remember many users and possibly your whole network relies on the core
- May have one or more network core locations
- Core location must have reliable power
  - UPS battery backup (redundant UPS as your network evolves)
  - Generator
- Core location must have reliable air conditioning
- As your network evolves, core equipment should be equipped with dual power supplies, each powered from separate UPS
- Border routers separate from Core
- Firewalls and Traffic Shaping Devices
- Intrusion Detection
- Intrusion Prevention
- Network Address Translation



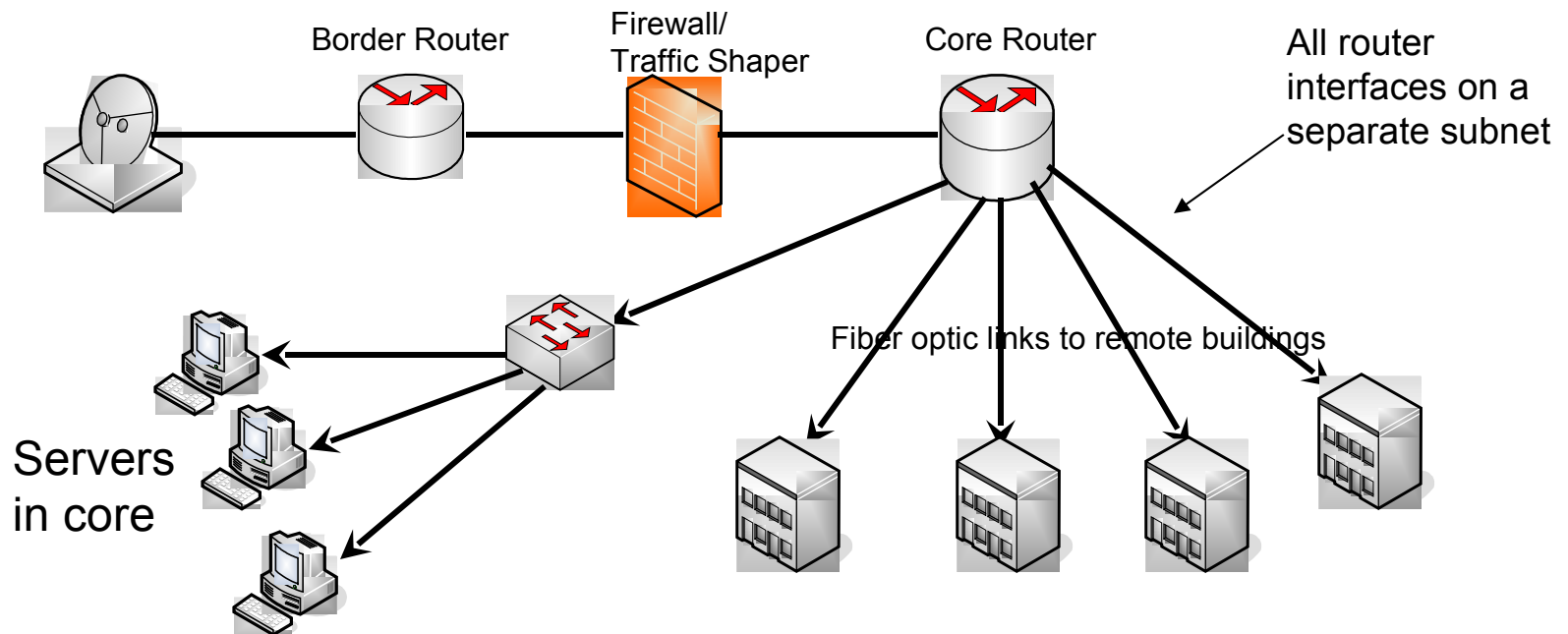
# Core Network

- At the core of your network should be routers – you must route, not switch.
- Routers give isolation between subnets
- A simple core:



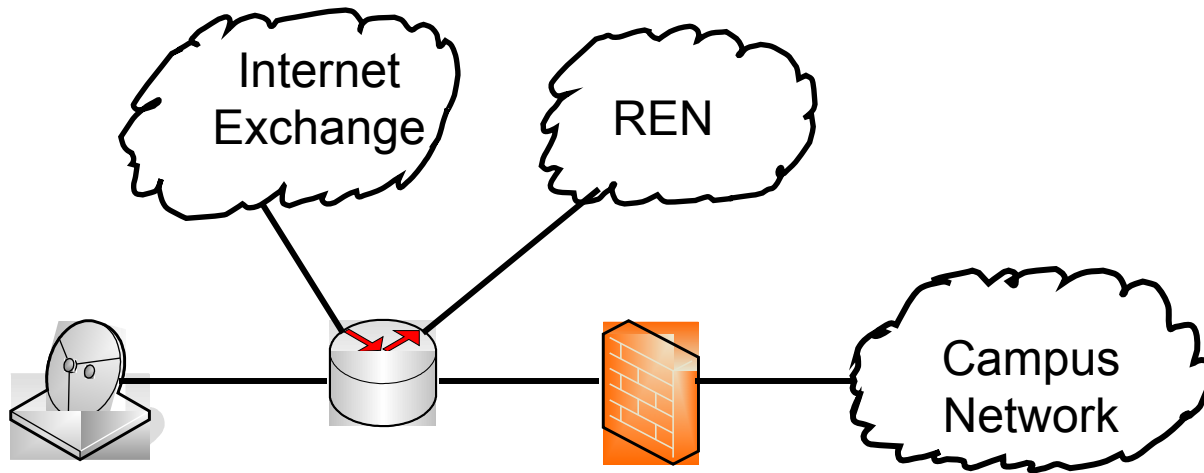
# Where to put Servers?

- Servers should be on a high speed interface off of your core router
- Servers should be at your core location where there is good power and air conditioning

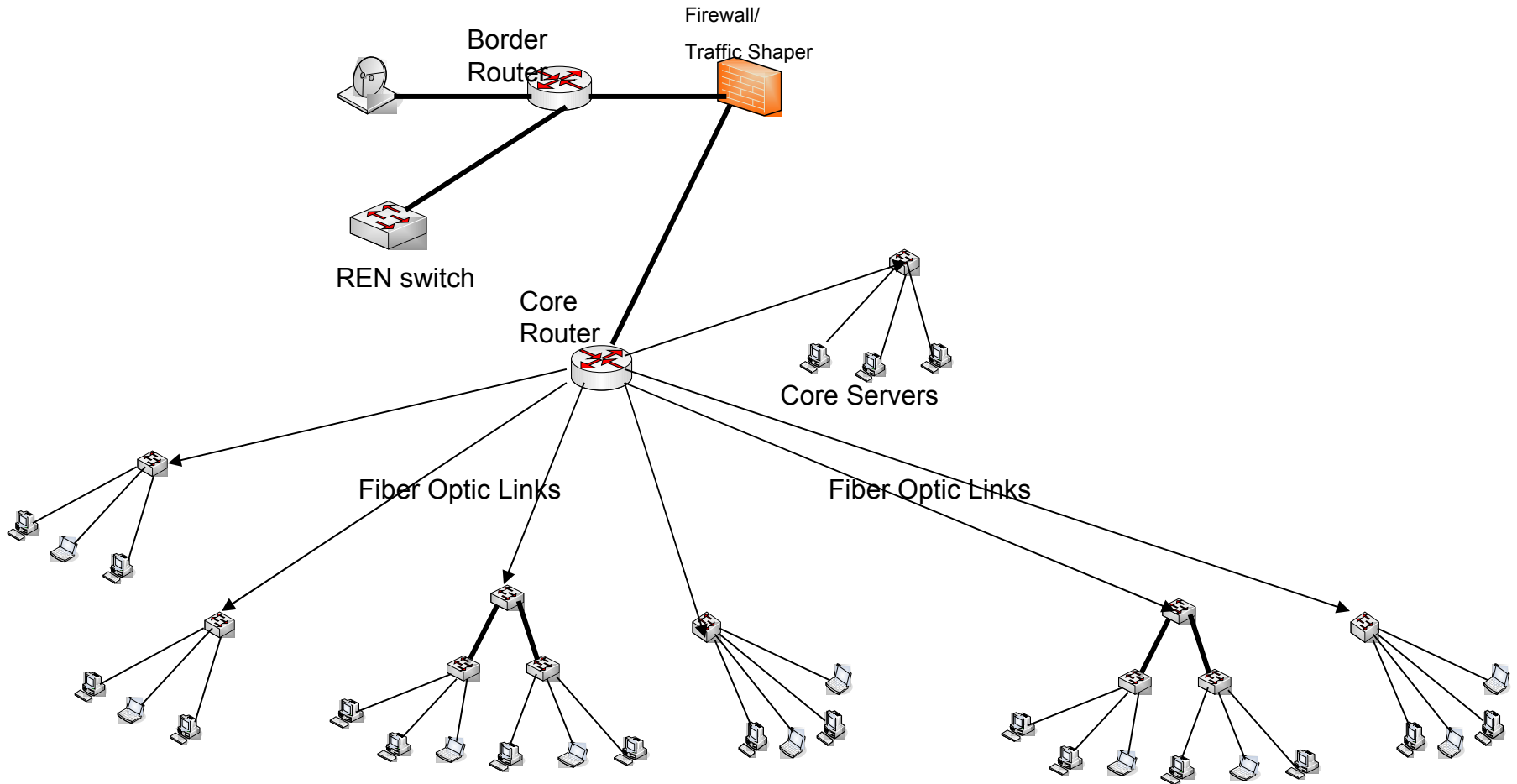


# Border Router

- Connects to outside world
- RENS and Peering are the reason you need them
- Must get Provider Independent IP address space to really make this work right



# Putting it all Together



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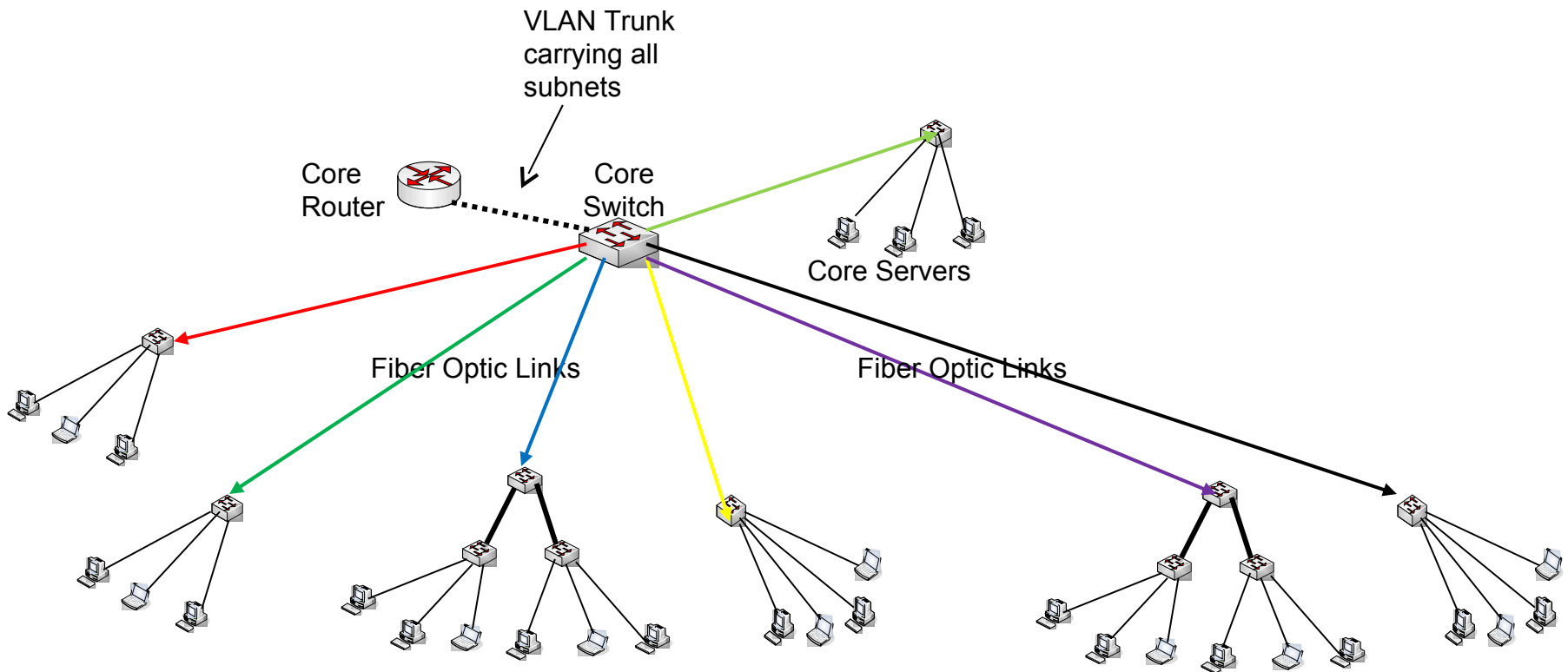
# Notes on IP Addressing

- Get your own Public IP address space (get your V6 block when you get your V4 one)
- Make subnet IP space large enough for growth
- Use DHCP to assign addresses to individual PCs
- Use static addressing for switches, printers, and servers



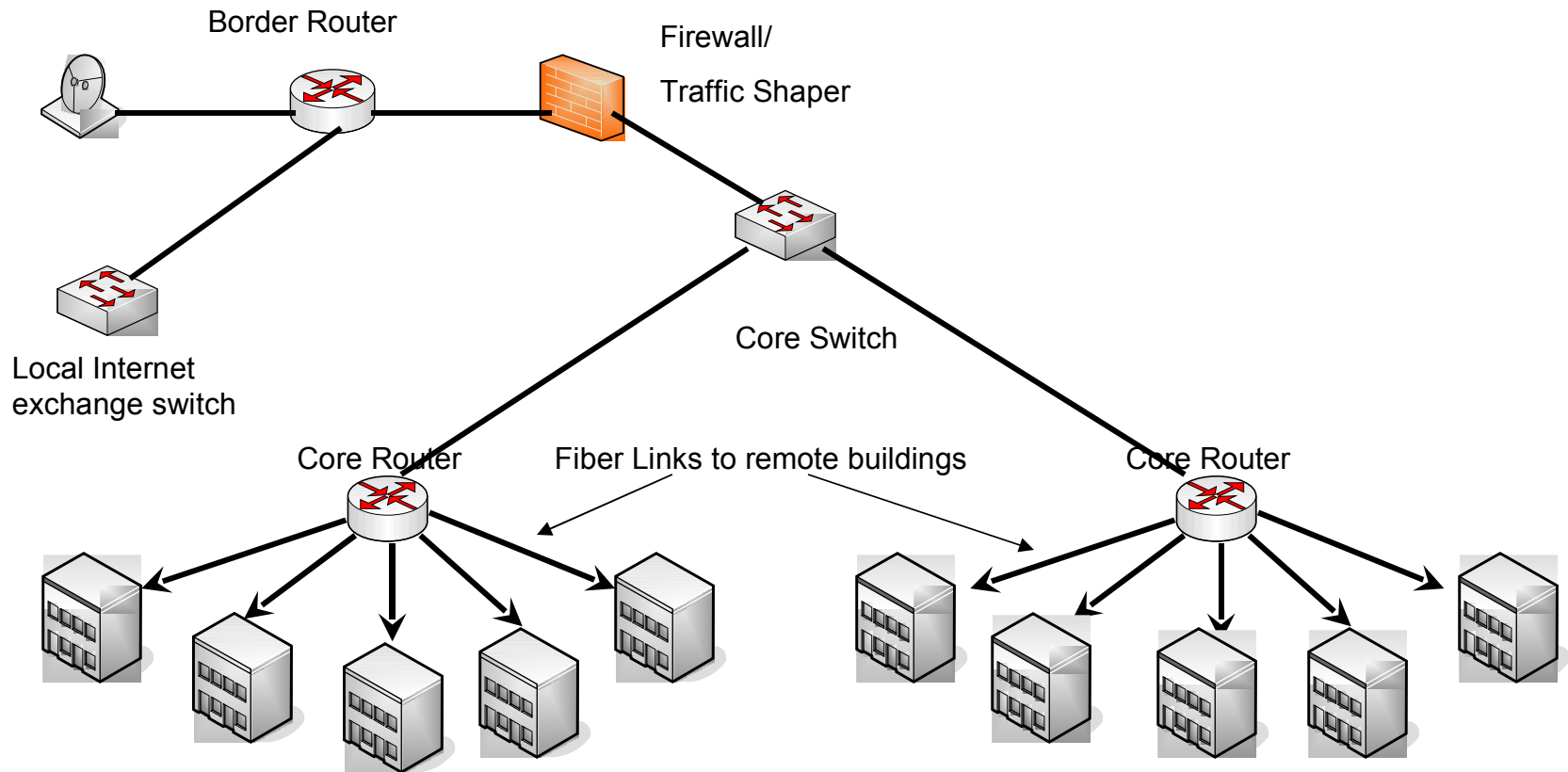
# More Complex Core Designs

- One Armed Router for Core



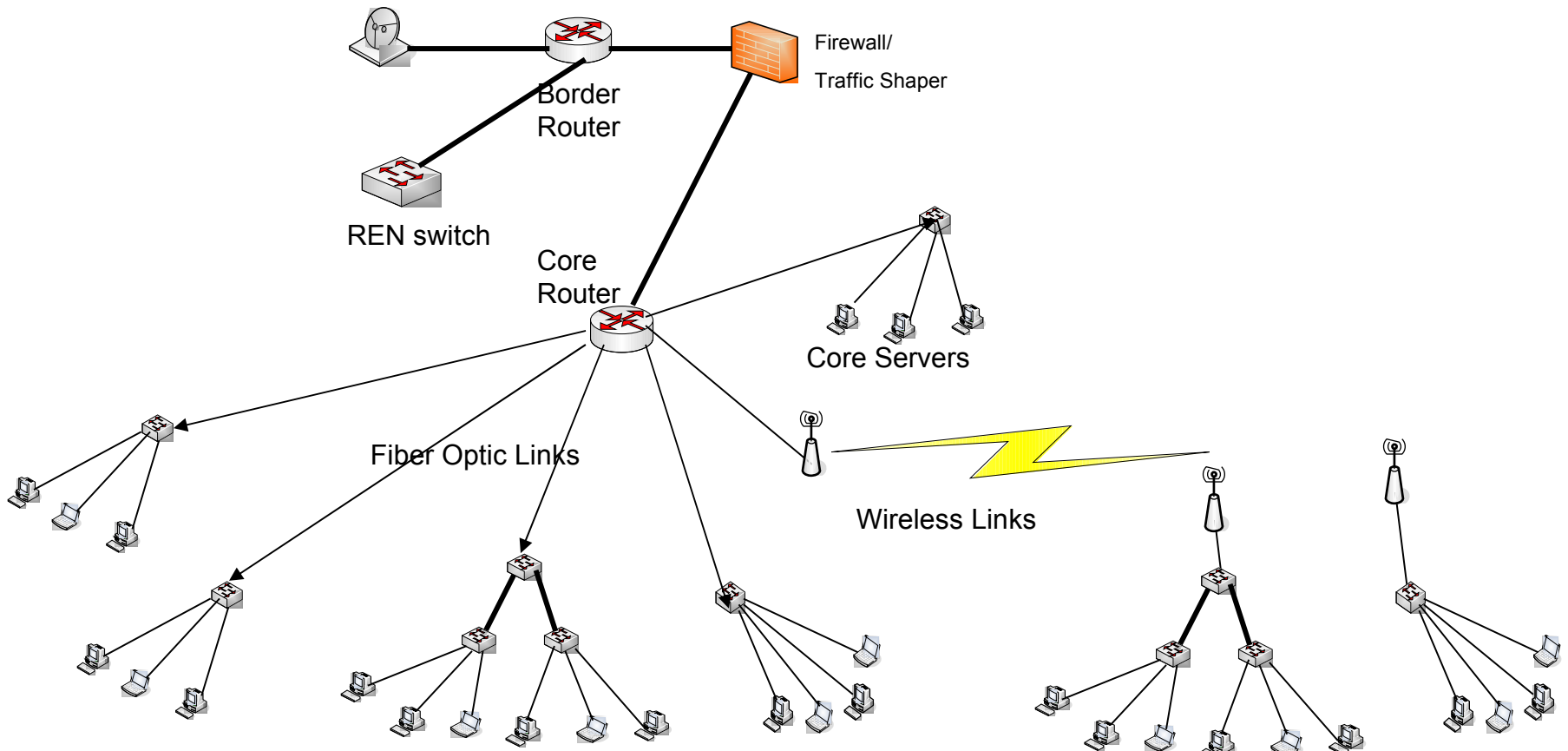
# Complex Core Designs

- Multiple Core Routers



# Alternative Core Designs

- Wireless Links versus Fiber



# Layer 2 and 3 Summary

- Build star networks – don't daisy chain
- Use managed switches – re-purpose your old unmanaged switches for labs
- Route in the core – don't switch



# Thanks

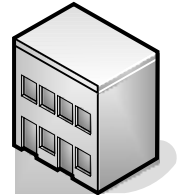
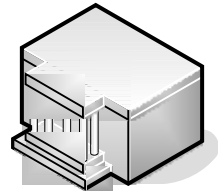
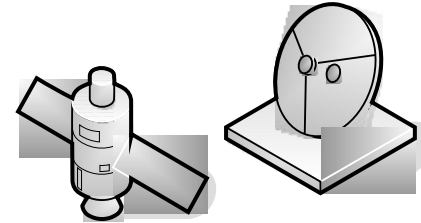
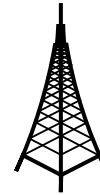
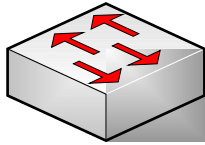
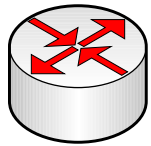
## Questions?



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# Symbols to use for diagrams



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