

Campus Networking Best Practices

Session 2: Layer 3

Dale Smith

University of Oregon & NSRC

dsmith@uoregon.edu



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Routing versus Switching

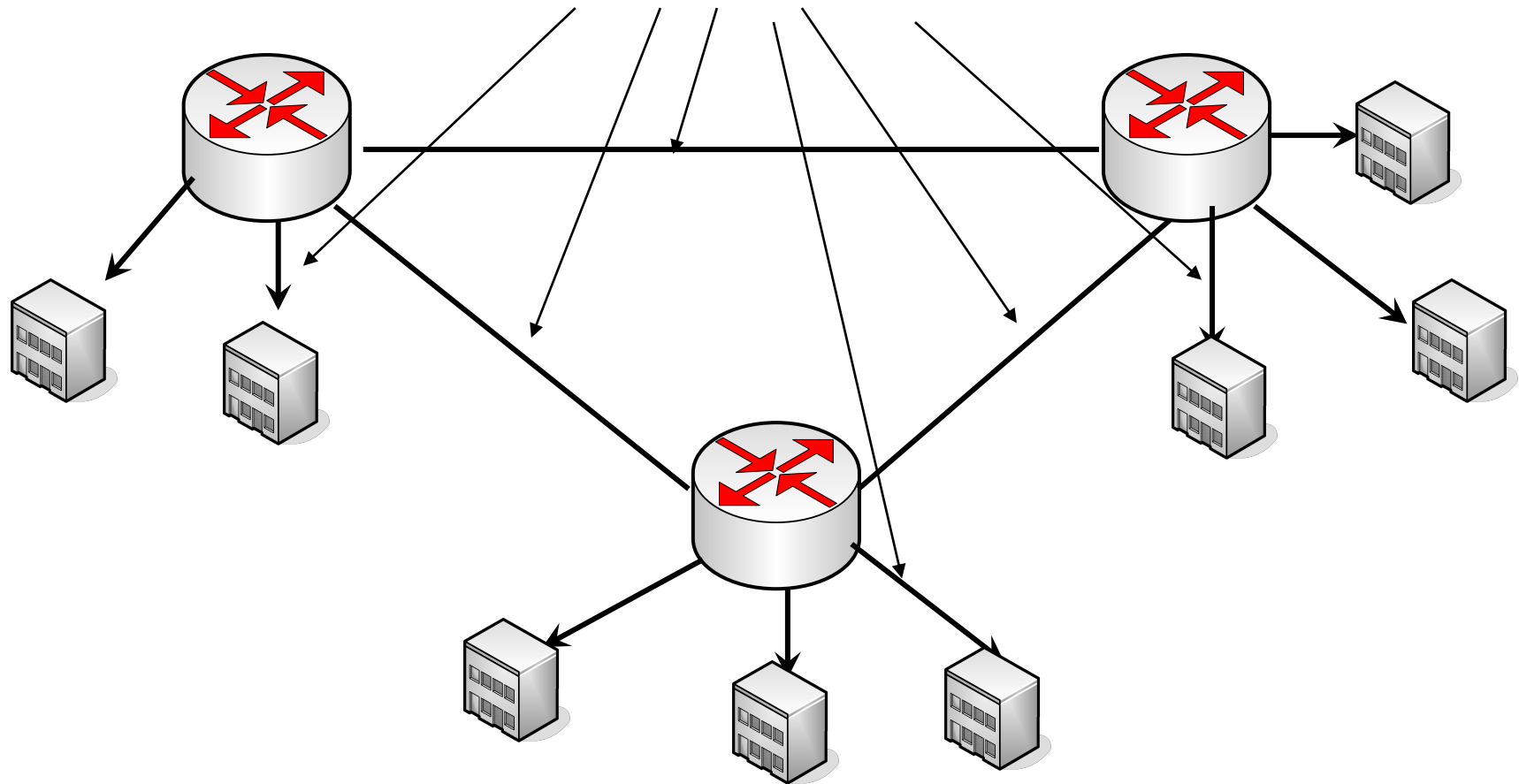
Layer 2 versus Layer 3

- 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



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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

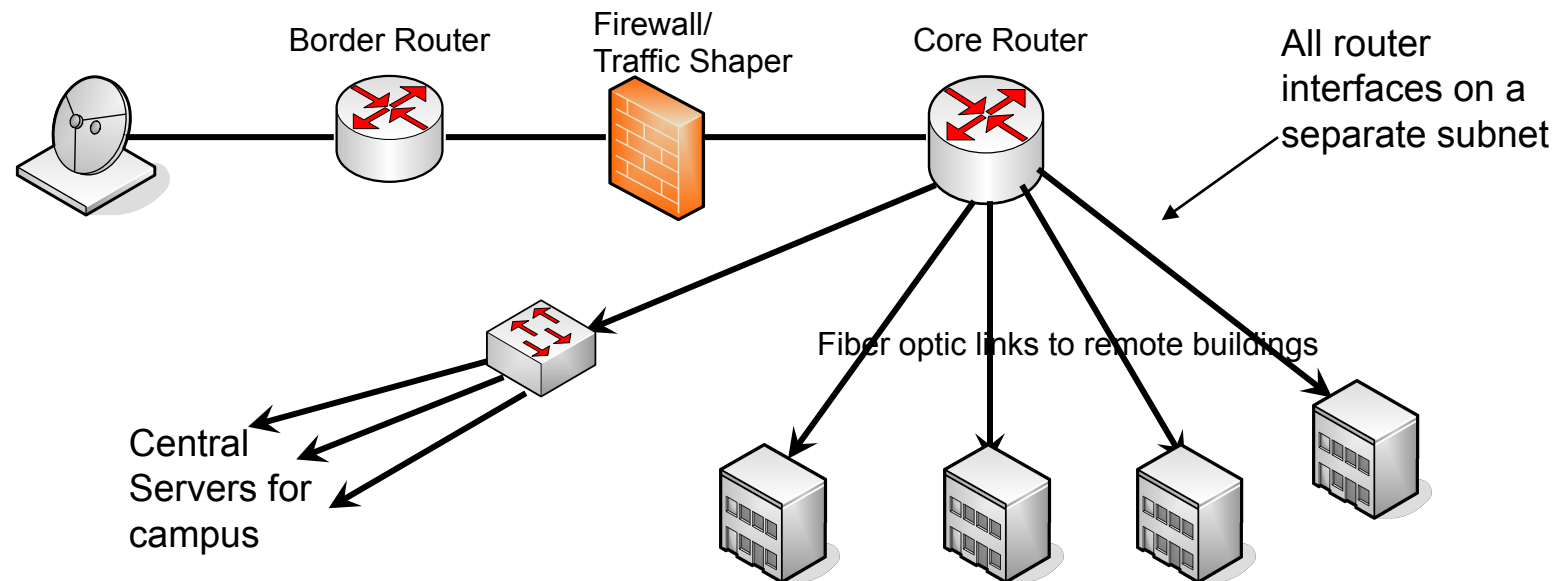


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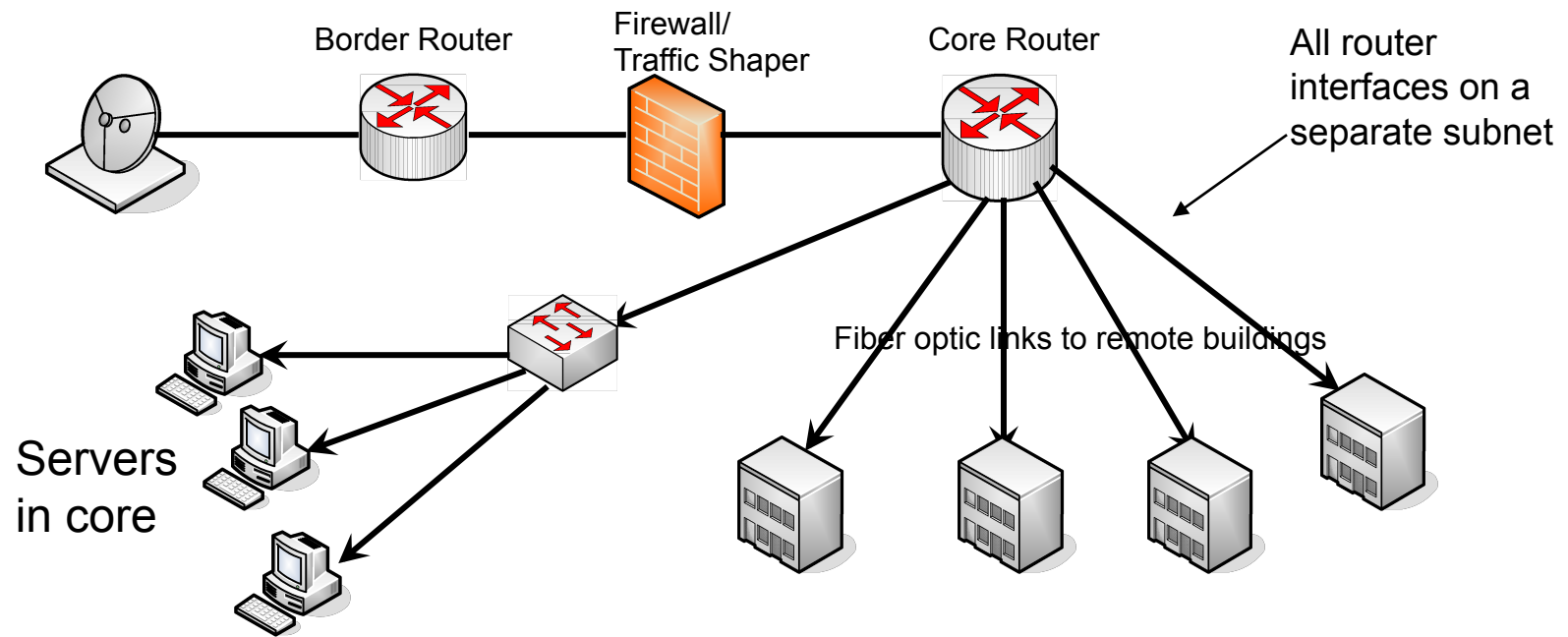
Core Network

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



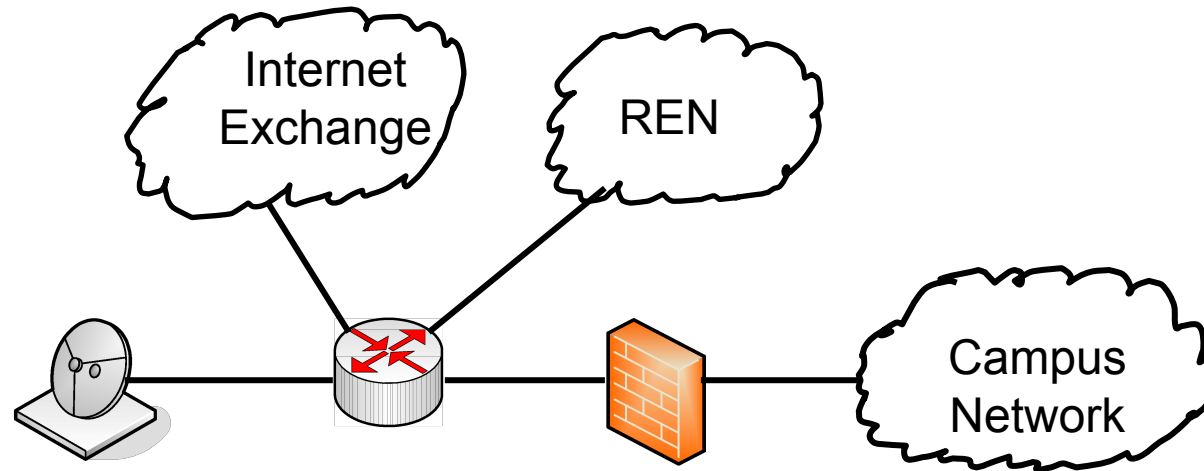
Where to put Servers?

- 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

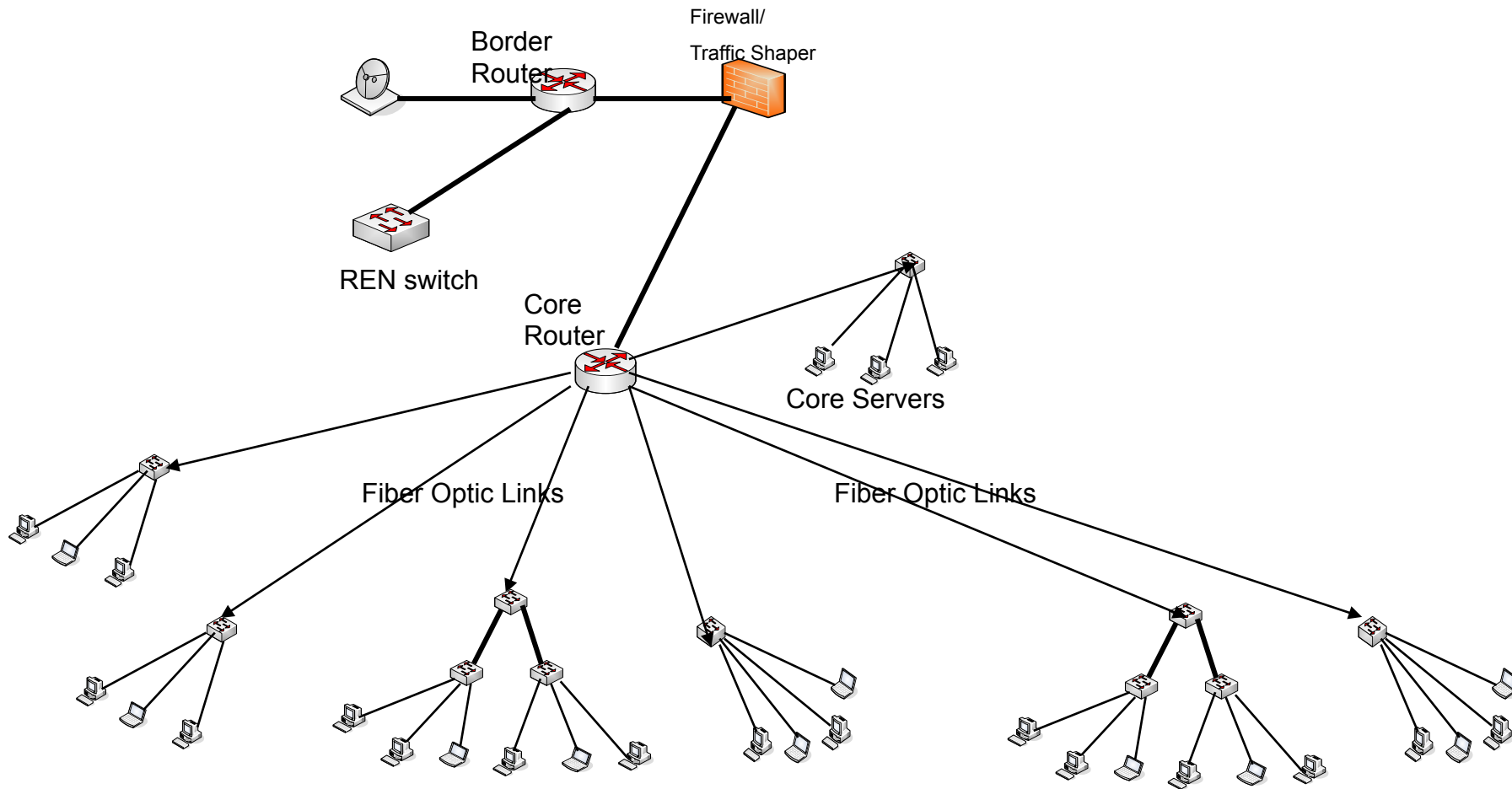
- Connects to outside world
- RENS and Peering are the reason you need them
- Must get Provider Independent IP address space to really make this work right



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Putting it all Together



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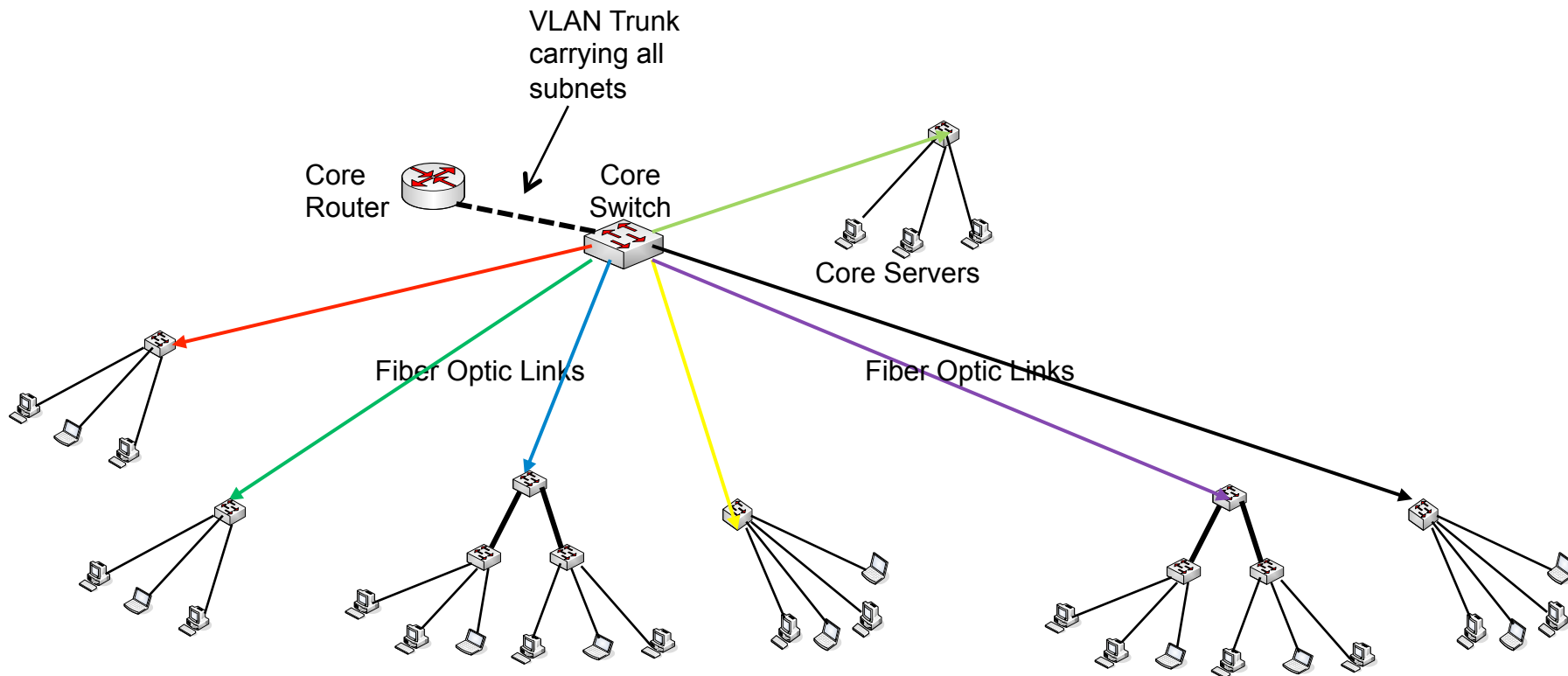
Notes on IP Addressing

- 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

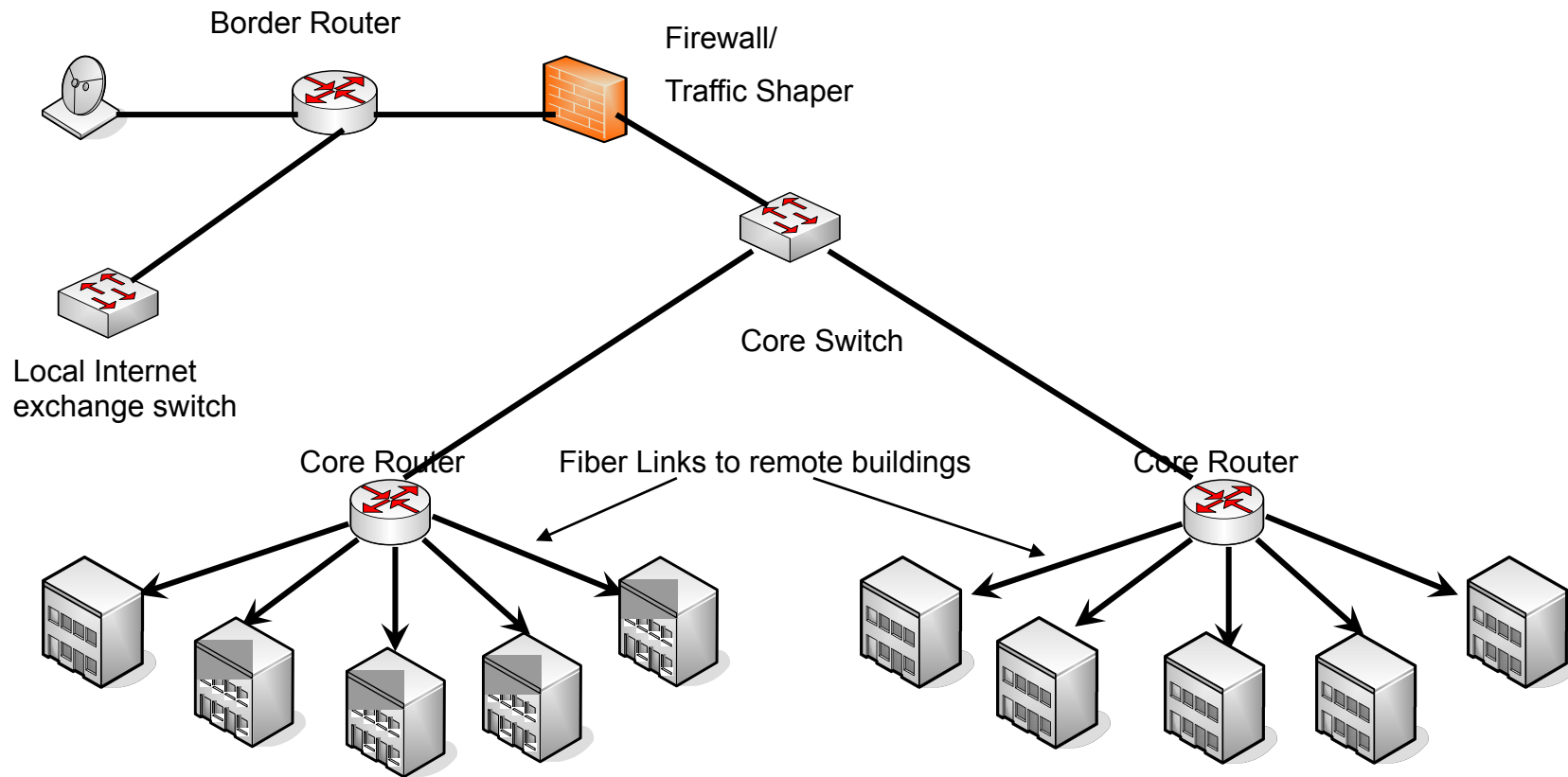


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Complex Core Designs

- Multiple Core Routers

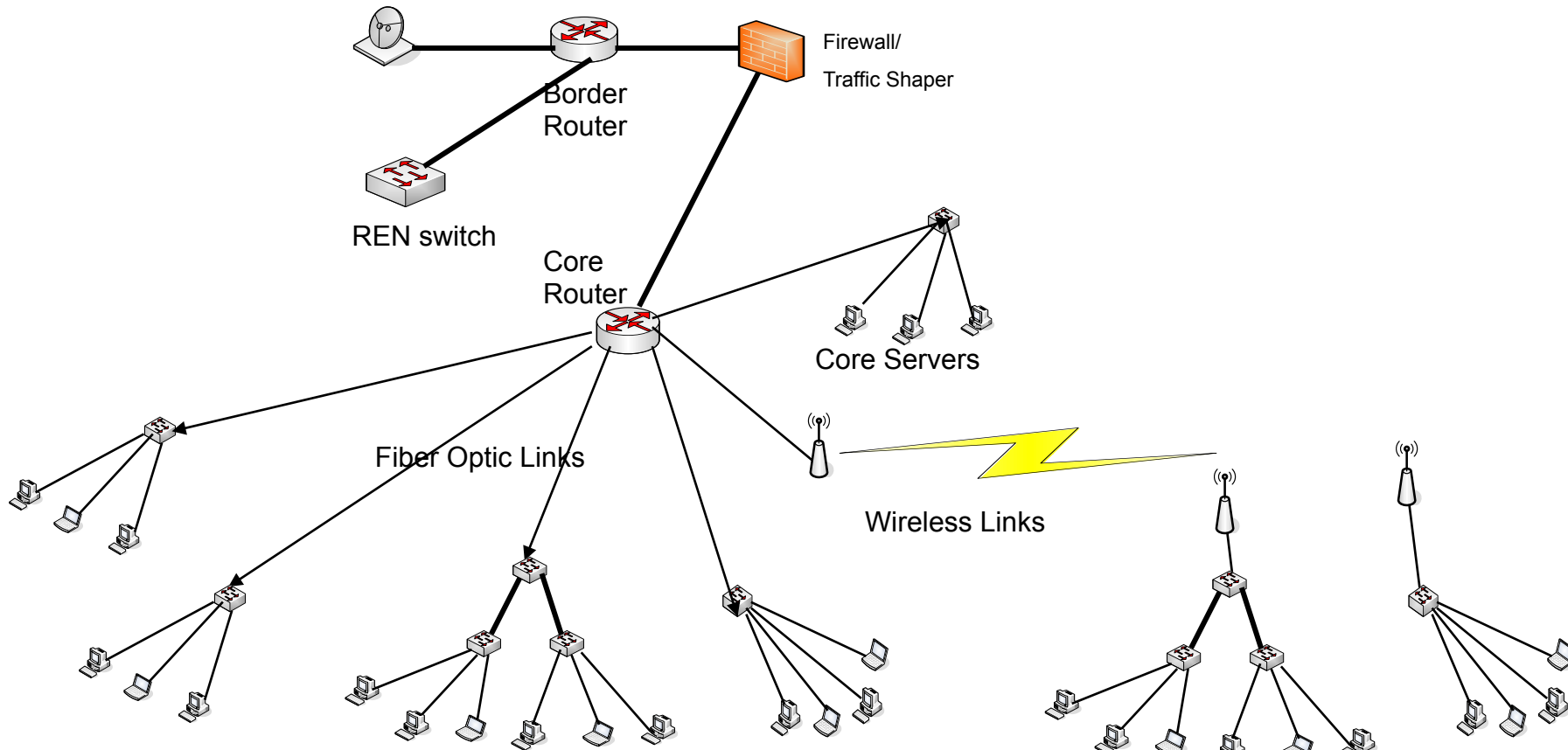


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Alternative Core Designs

- Wireless Links versus Fiber



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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



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Thanks

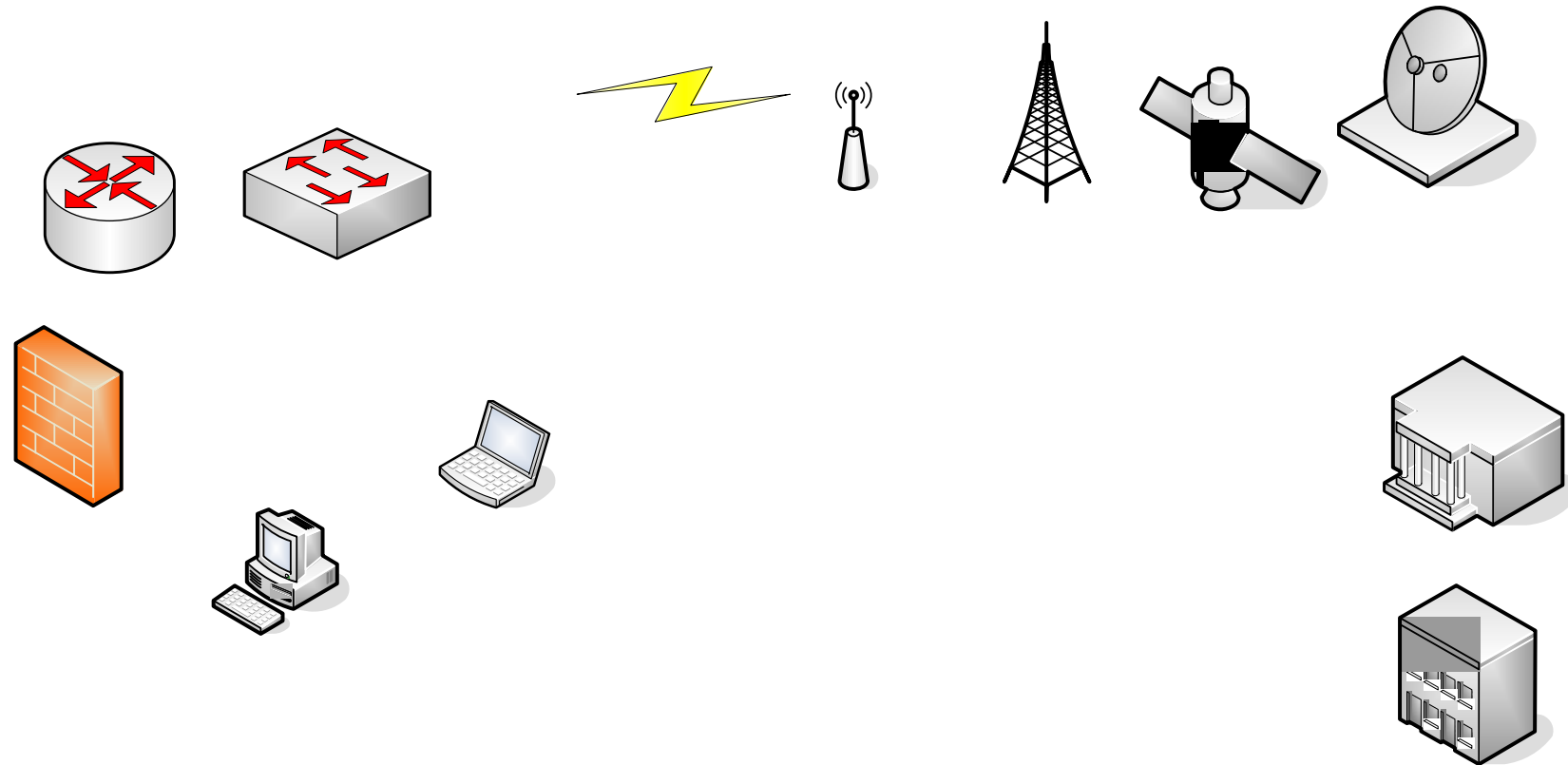
Questions?



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Symbols to use for diagrams



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