Campus Networking Workshop

Layer-2 Network Design

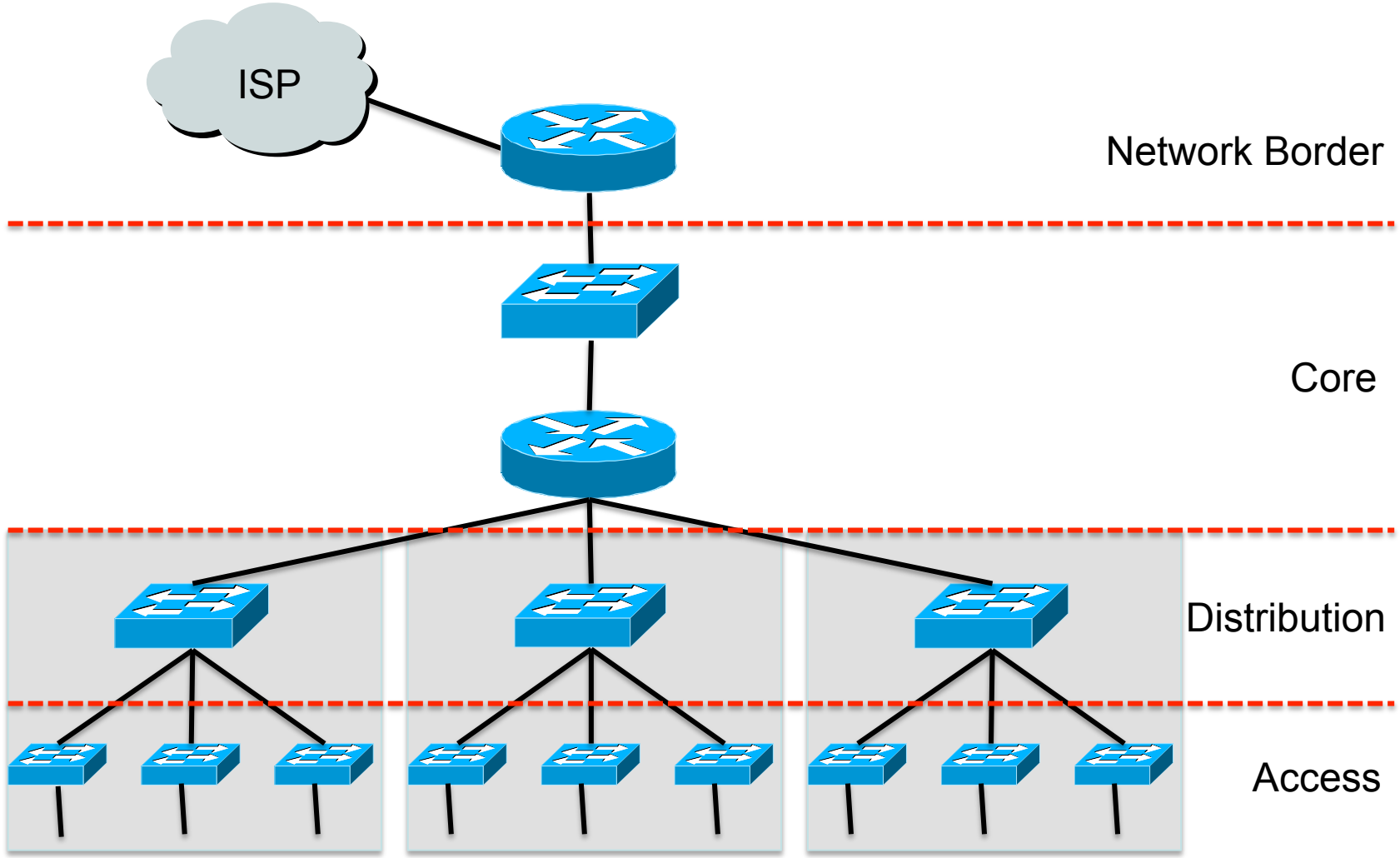
UNIVERSITY OF OREGON

NSRC
Network Startup Resource Center

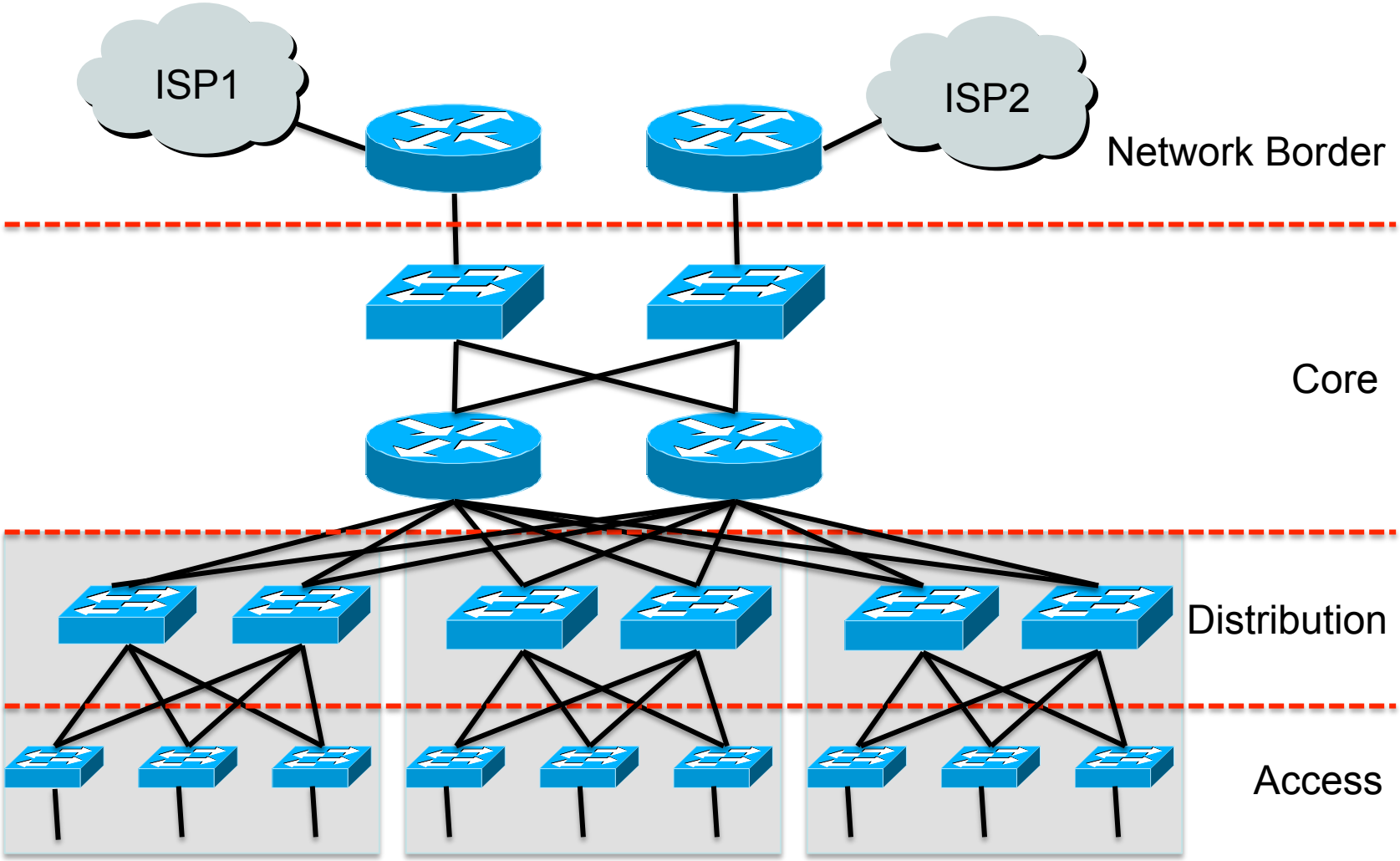
Campus Network Design - Review

- A good network design is modular and hierarchical, with a clear separation of functions:
  - Core: resilient; few changes or features; high bandwidth; CPU power
  - Distribution: aggregation; redundancy
  - Access: port density; affordability; security features; many adds, moves and changes

Campus Network Design - Simple



Campus Network Design - Redundant



In-Building and Layer 2

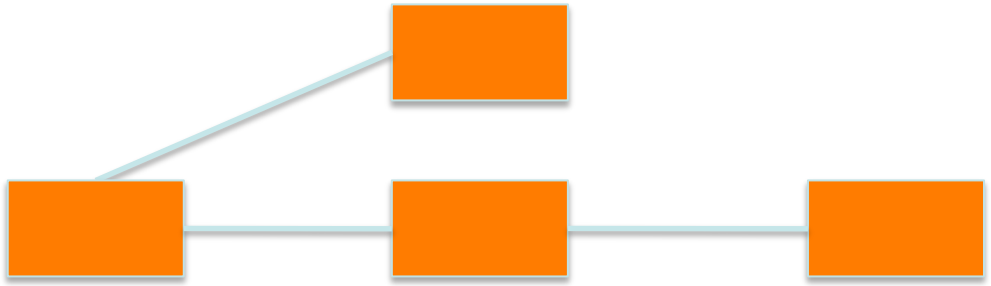
- There is usually a correspondence between building separation and subnet separation
  - Switching inside a building
  - Routing between buildings
- This will depend on the size of the network
  - Very small networks can get by with doing switching between buildings
  - Very large networks might need to do routing inside buildings

Layer 2 Network Design Guidelines

- Always connect hierarchically
  - If there are multiple switches in a building, use an aggregation switch
  - Locate the aggregation switch close to the building entry point (e.g. fiber panel)
  - Locate edge switches close to users (e.g. one per floor)
    - Max length for Cat5 is 100 meters (according to TIA/EIA 568-5-A)

Building Network

Minimize Path Between Elements



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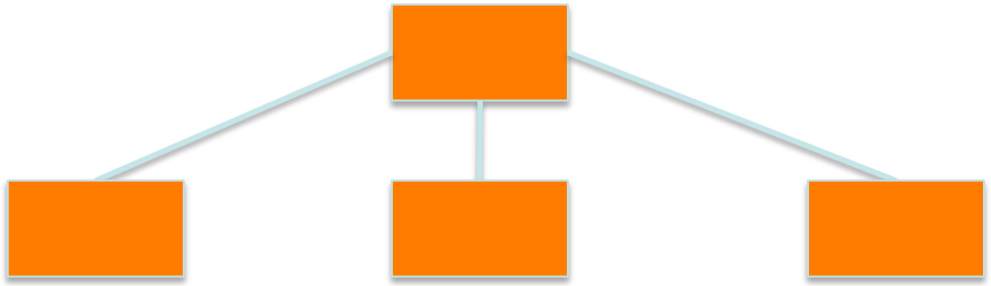

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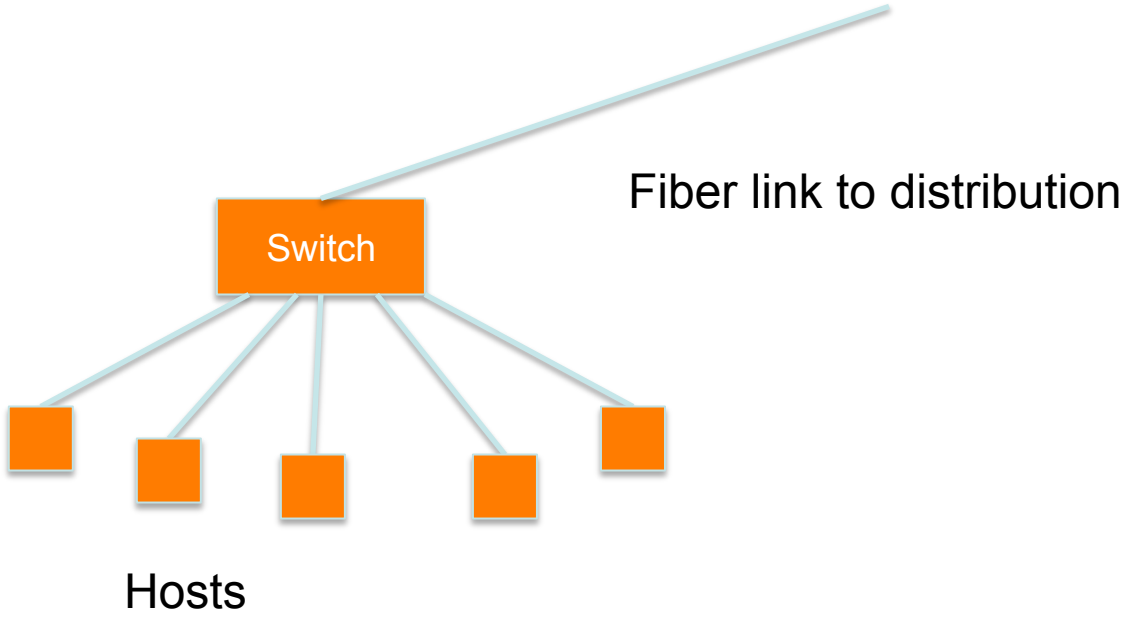
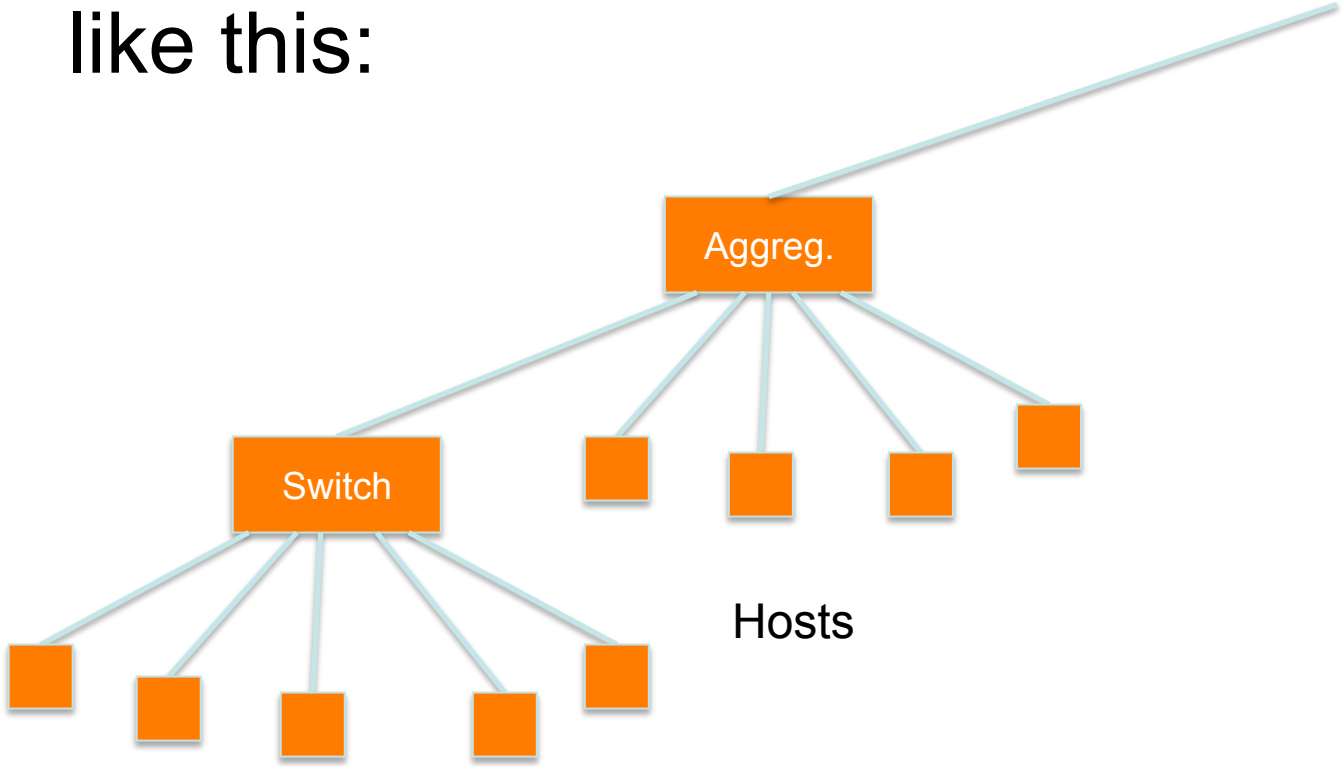
Build Incrementally

- Start small



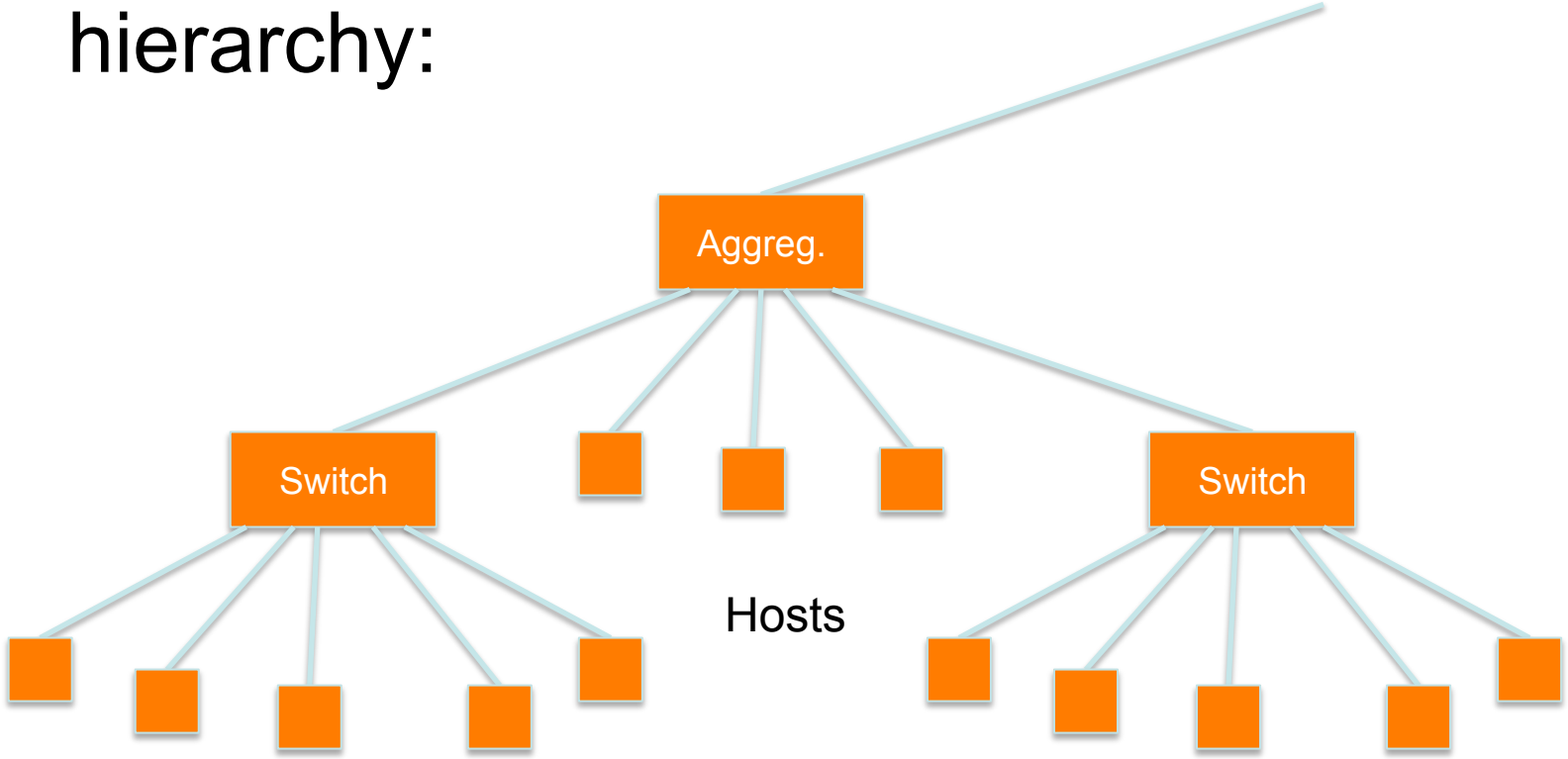
Build Incrementally

- As you have demand and money, grow like this:



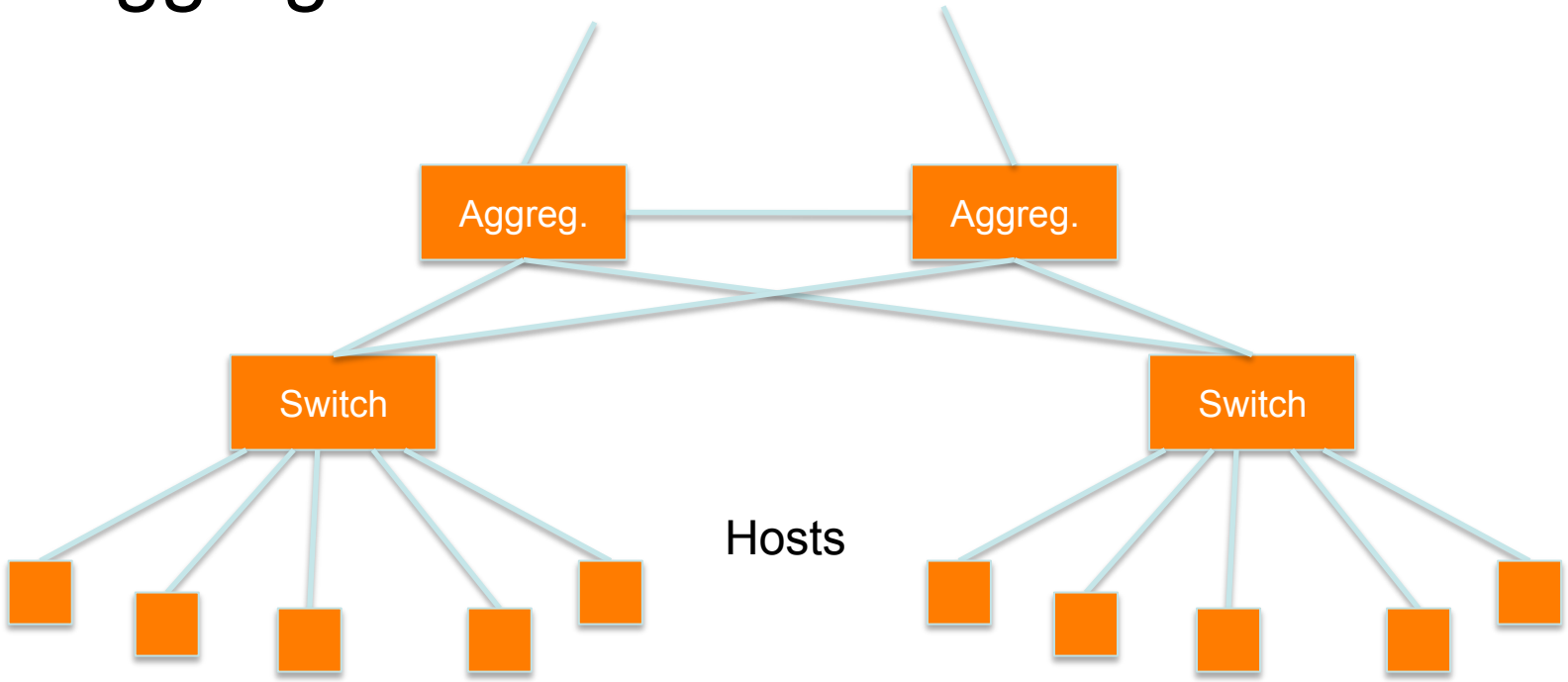
Build Incrementally

- And keep growing within the same hierarchy:



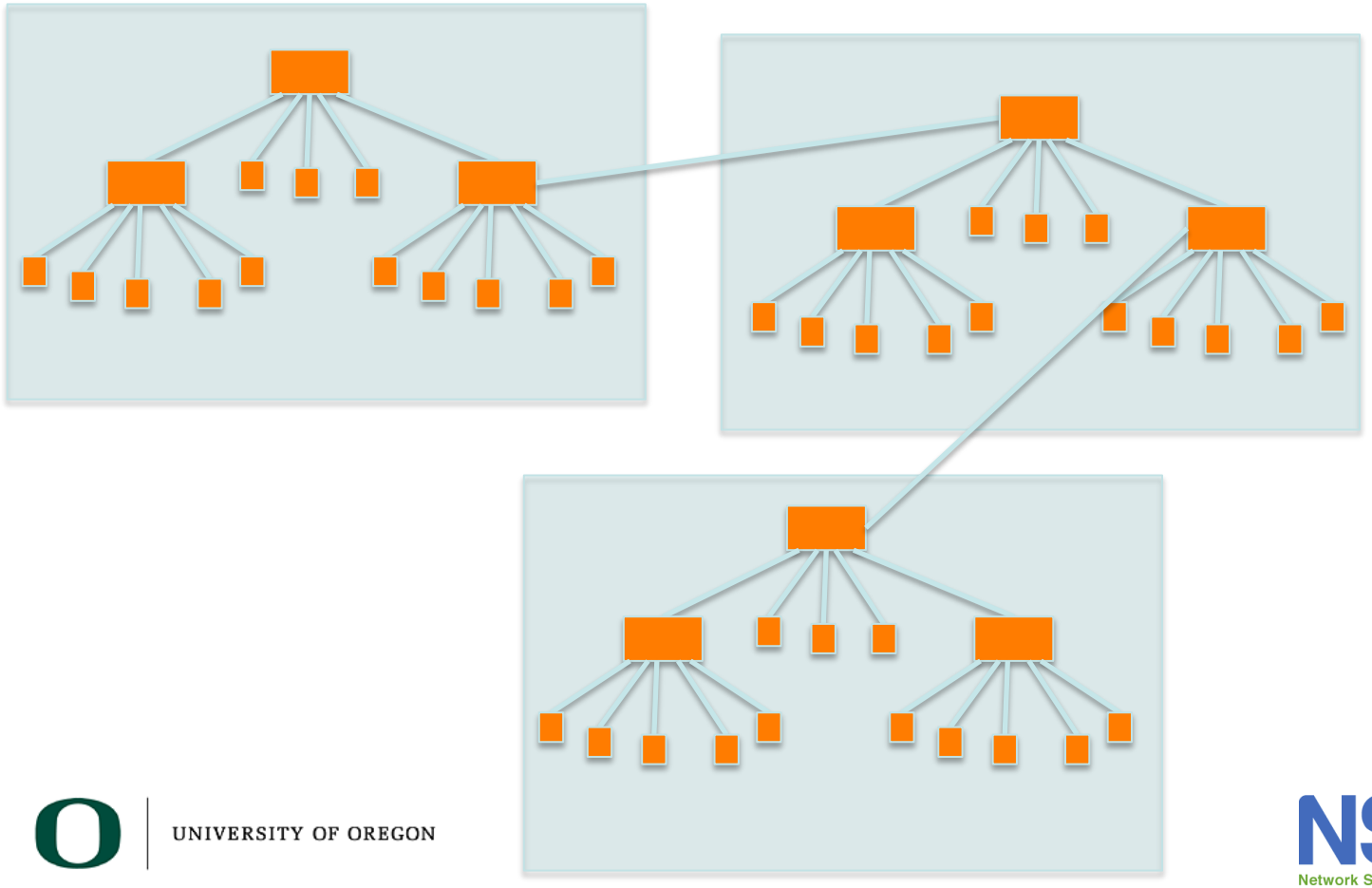
Build Incrementally

- At this point, you can also add a redundant aggregation switch

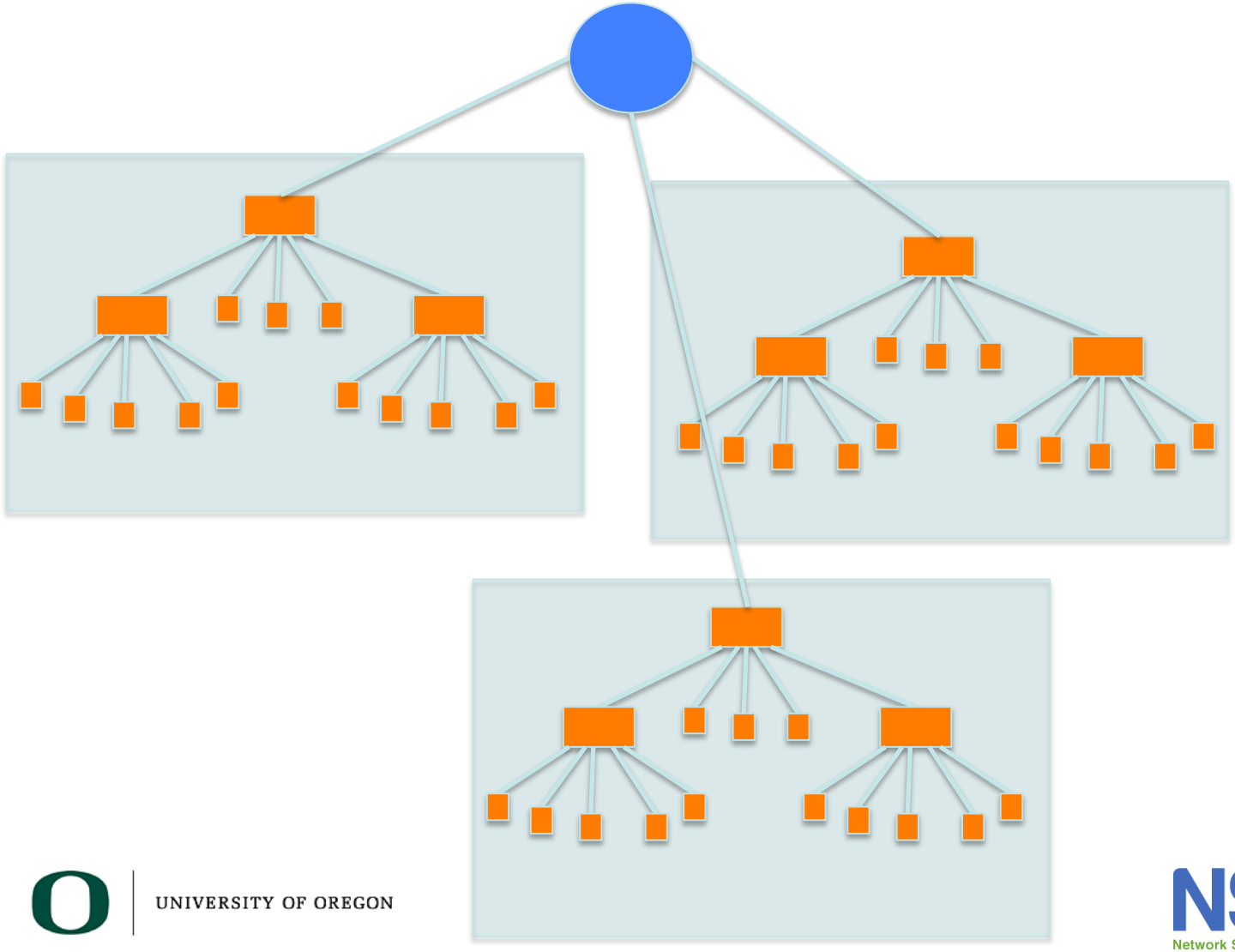


Do not daisy-chain

- Resist the temptation of doing this:



Connect buildings hierarchically



Questions?