

CSC4200/5200 – COMPUTER NETWORKING

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SOFTWARE DEFINED NETWORKING

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Data VS Control Plane

Data plane is (mostly) in the hardware -

- Forward packets

Control plane

- How do we tell routers how to forward packets?
- BGP?
- How do you change something when network changes?

Data and Control Plane together

Problems?

- No separate channel
- Expensive
- Hard to change

What is SDN?

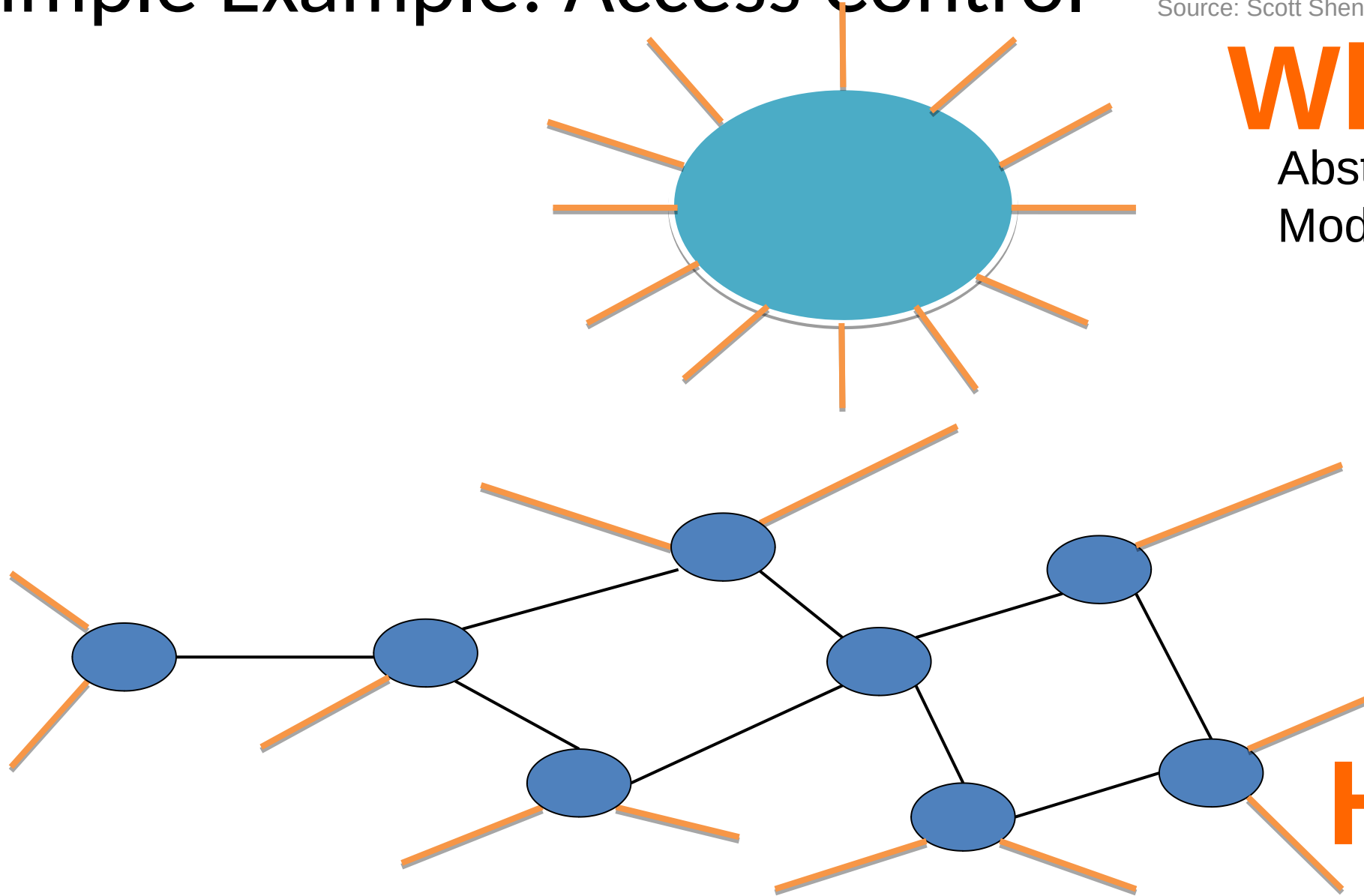
- Software-defined networking (SDN) provides abstraction for
 - Configuration, security, and forwarding
- SDN makes the network
 - Directly programmable
 - Agile: administrator can change the network
 - Centrally managed: network management is logically centralized.
 - Vendor-neutral

Simple Example: Access Control

Source: Scott Shenker, UC Berkeley

What

Abstract Network
Model



Global
Network View

How

Software Defined Networks

Source: Scott Shenker, UC Berkeley

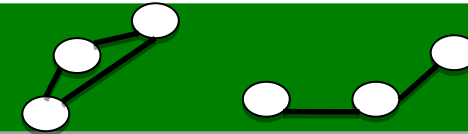
Specifies
behavior

Control Program

Abstract Network Model

Compiles to
topology

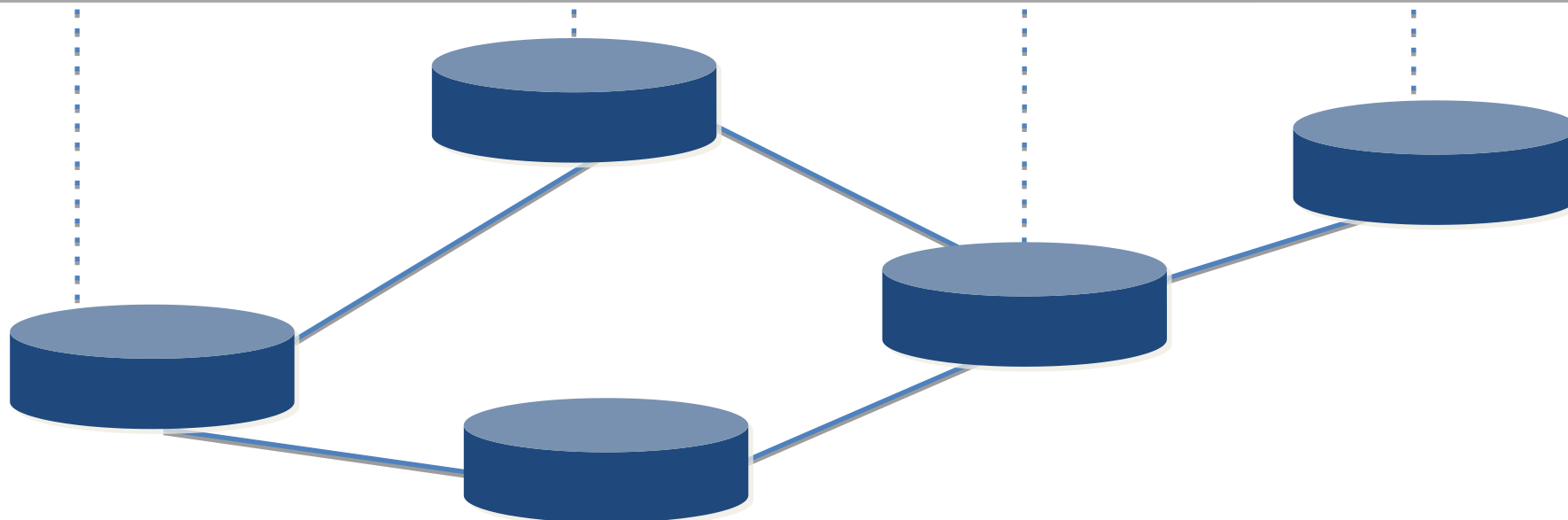
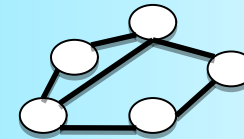
Network Virtualization



Global Network View

Transmits to
switches

Network OS

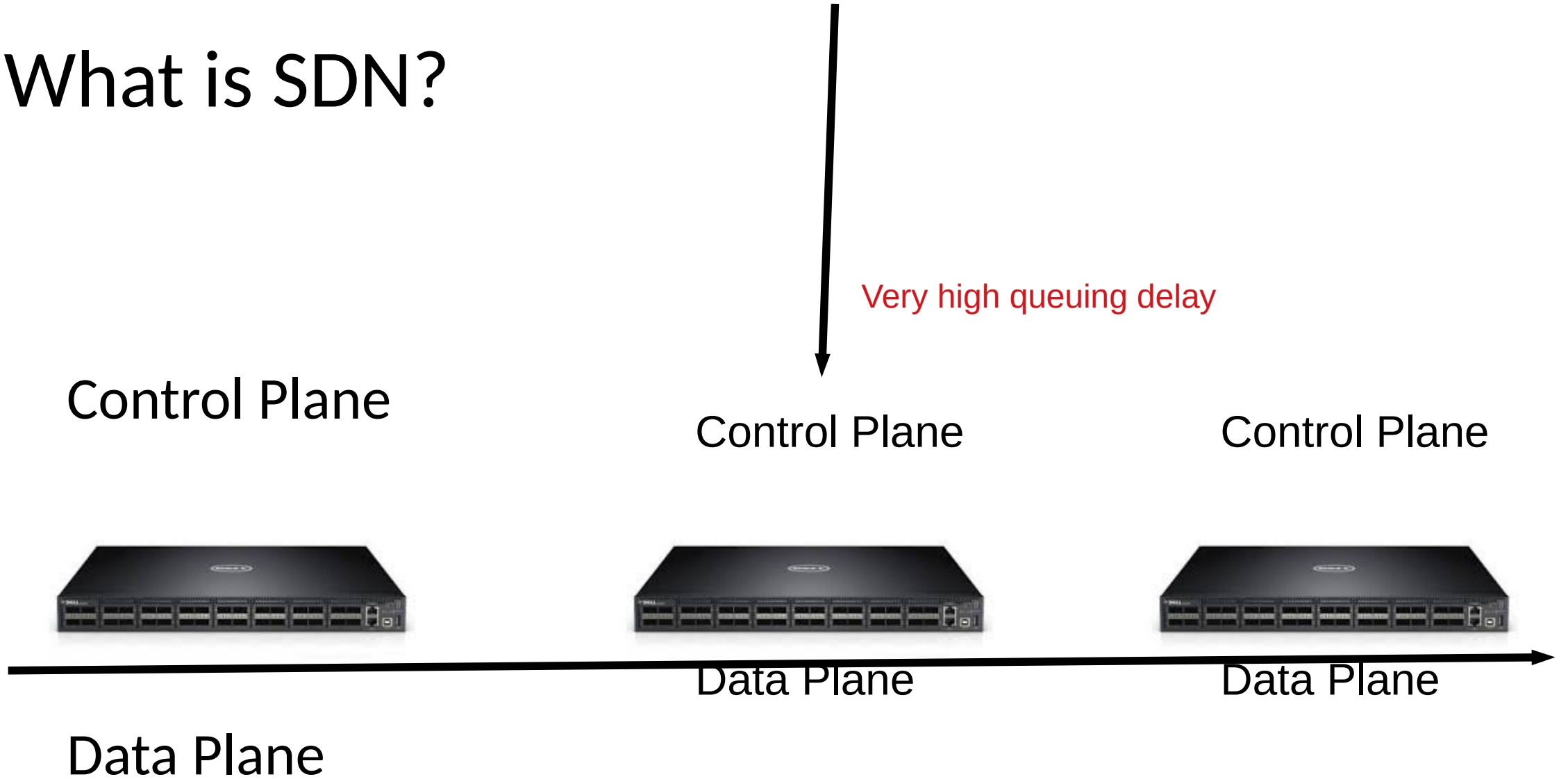


What Does This Picture Mean?

Source: Scott Shenker, UC Berkeley

- Write a simple program to configure a simple model
 - Configuration merely a way to specify what you want
- Examples
 - ACLs: who can talk to who
 - Isolation: who can hear my broadcasts
 - Routing: only specify routing to the degree you care
 - Some flows over satellite, others over landline
 - TE: specify in terms of quality of service, not routes
- Virtualization layer “compiles” these requirements
 - Produces suitable configuration of actual network devices
- NOS then transmits these settings to physical boxes

What is SDN?



What is SDN?

