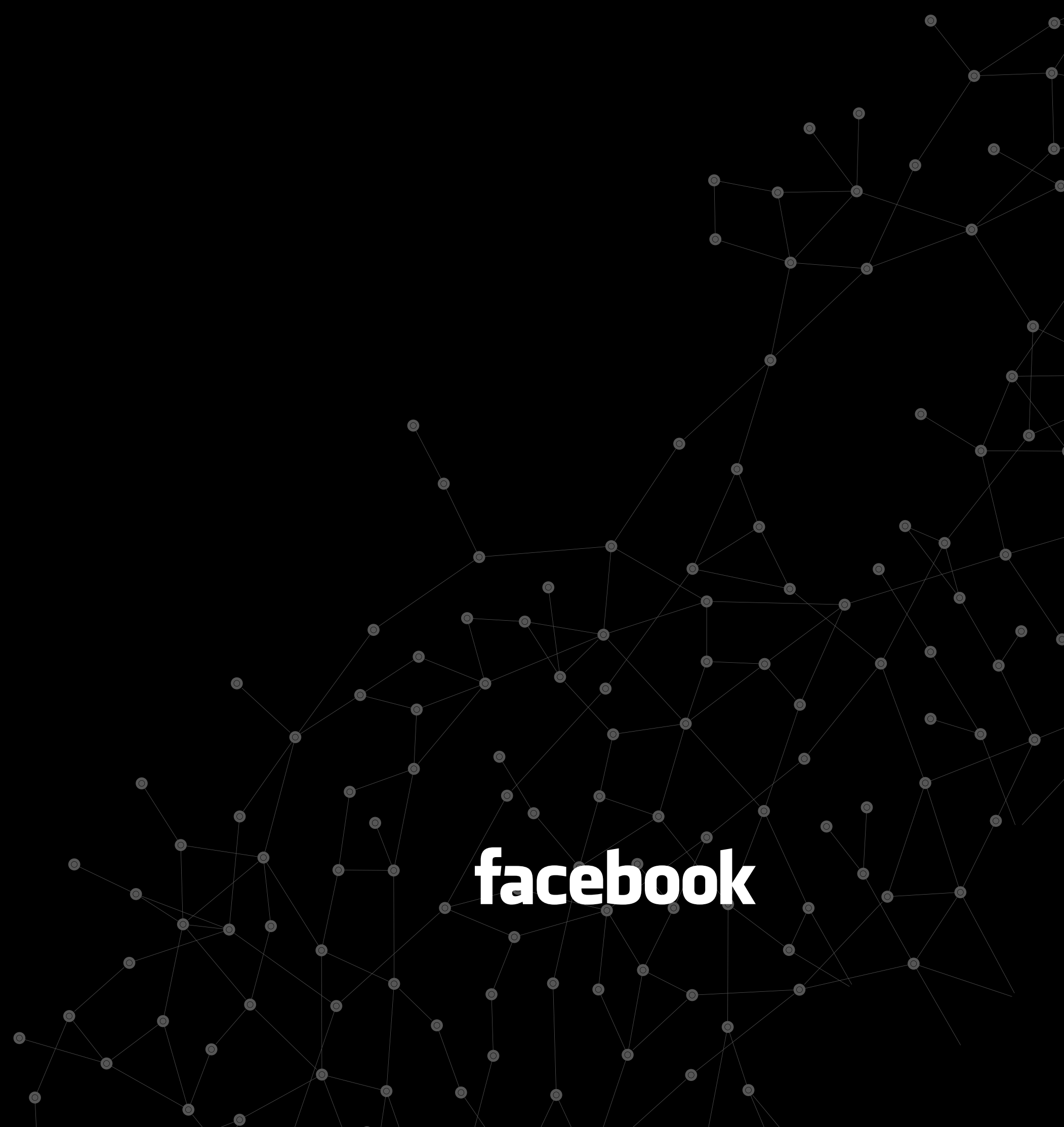




Evolving The Backbone

Gaya Nagarajan
Network Engineering

facebook





1.28+ billion

Monthly active users
Mar. 2014



600+ million

Monthly active mobile users
Mar. 2014



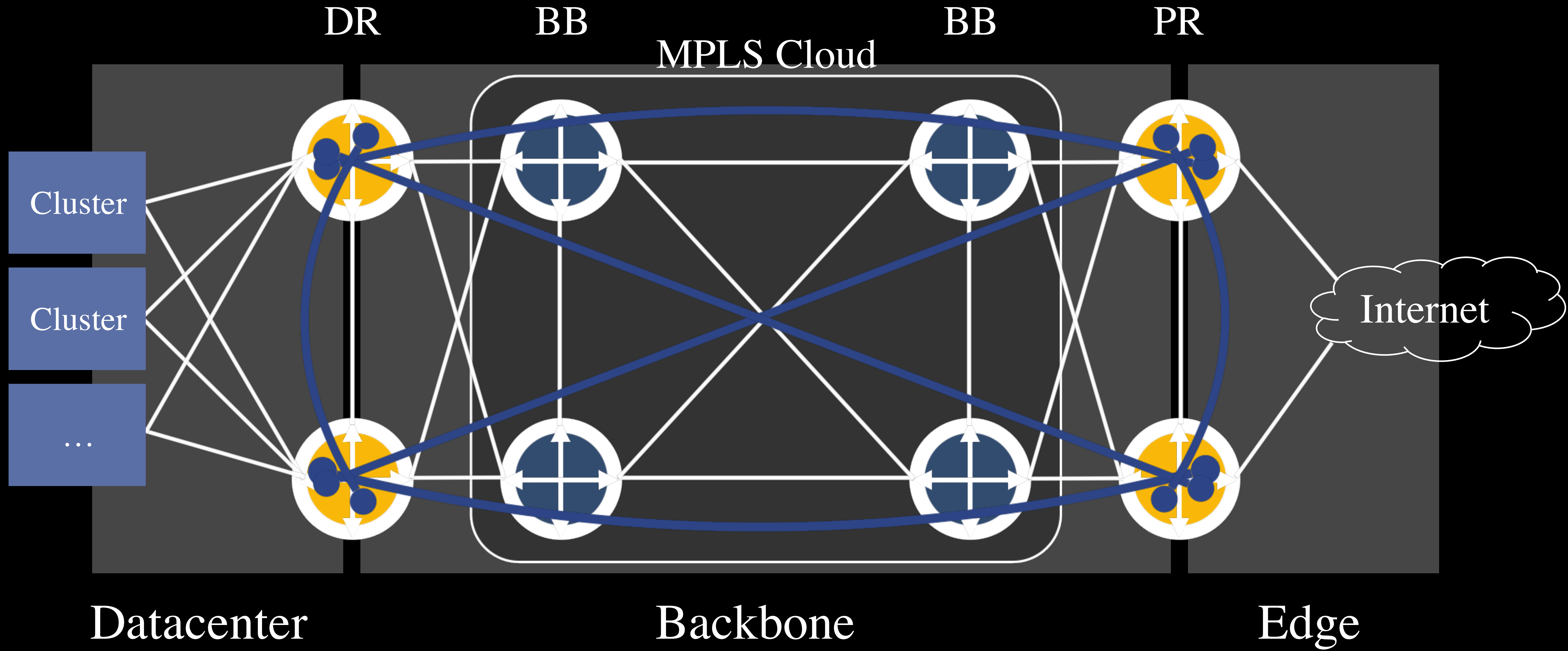
200+ million

Monthly active Instagram users
Mar. 2014

facebook

December 2010

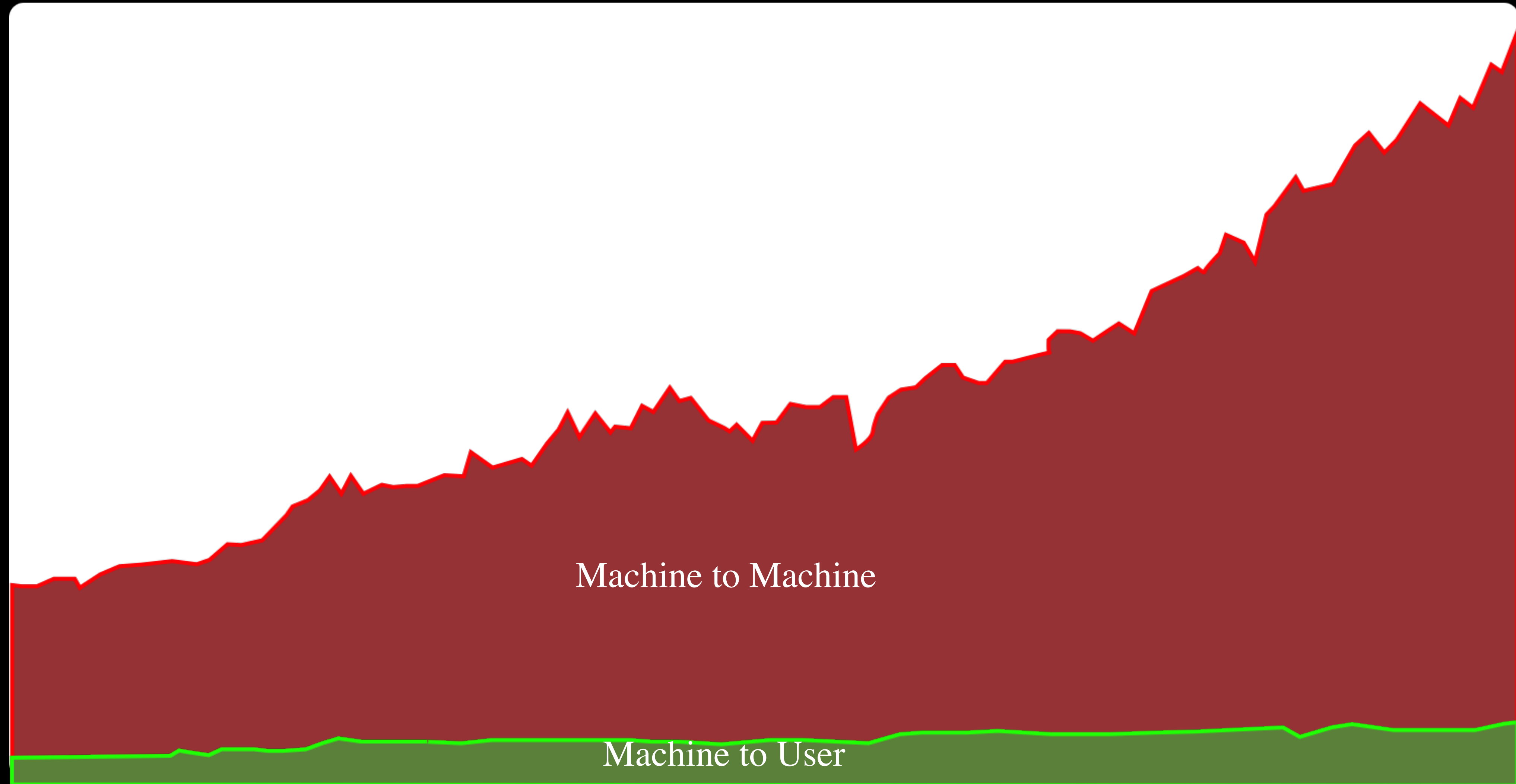
logical topology

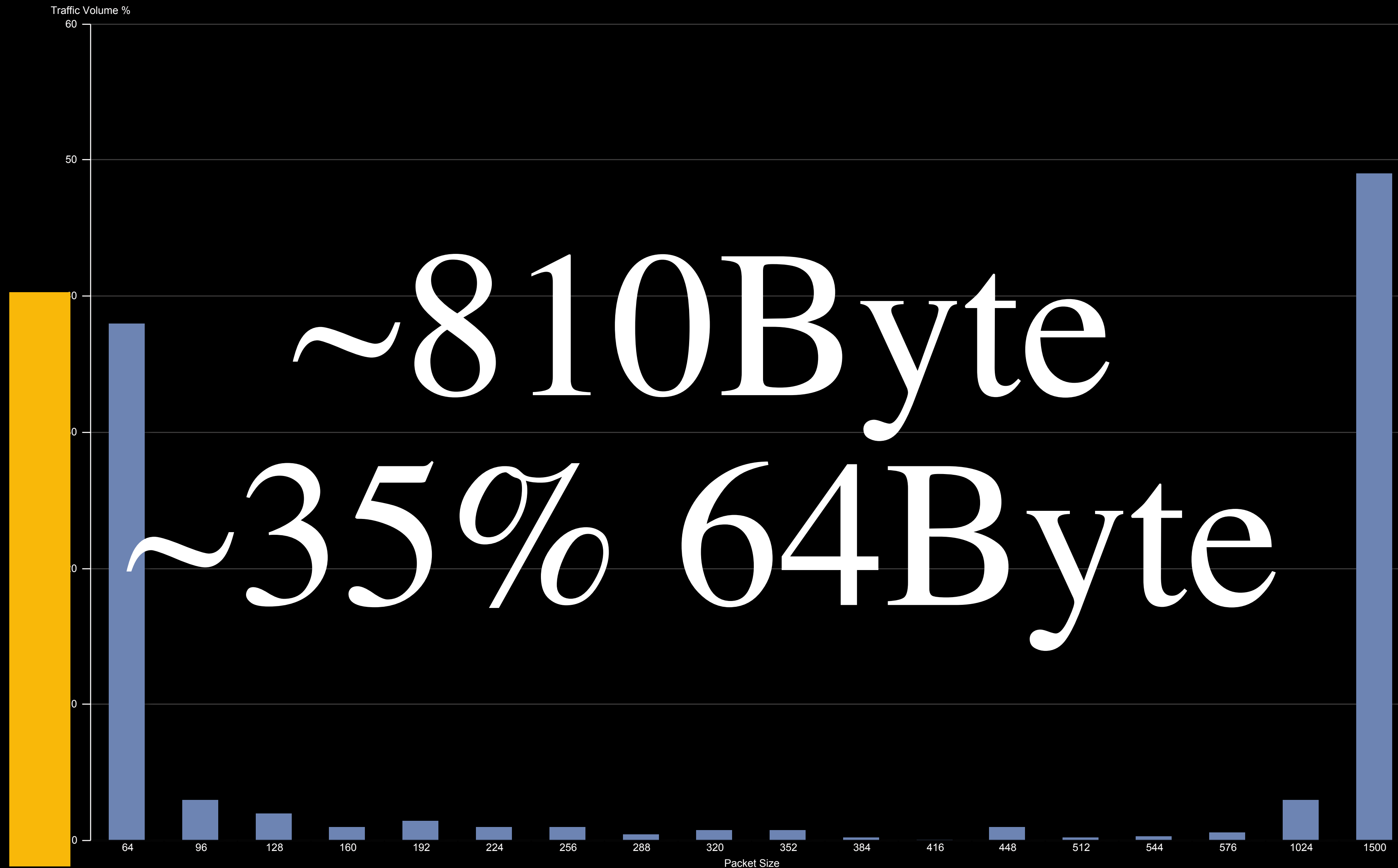


Protocols

- ISIS
- BGP
- RSVP-TE
- Auto-BW

Network Traffic

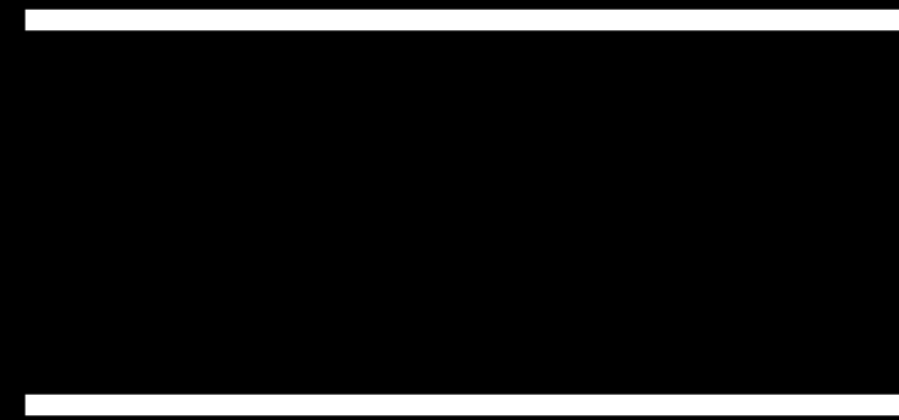
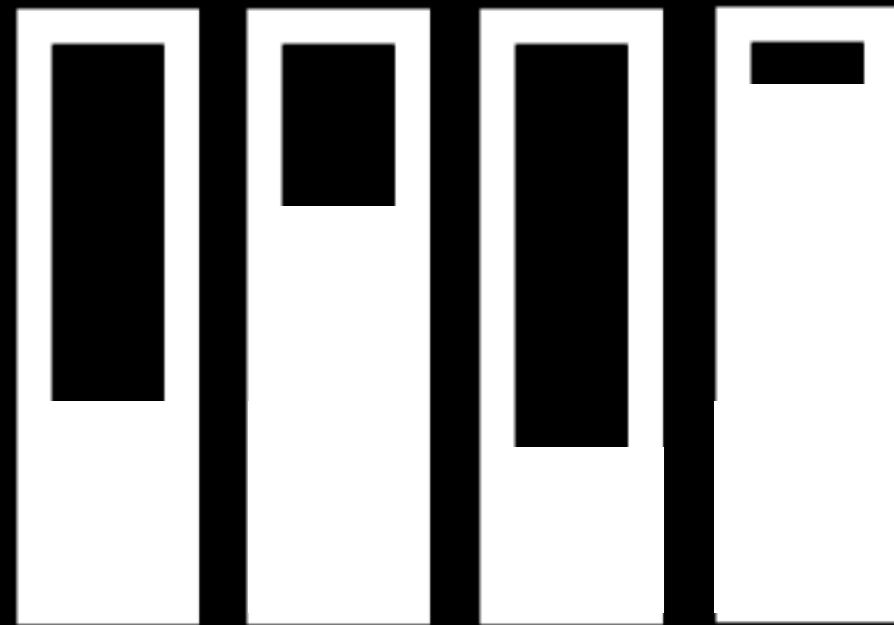




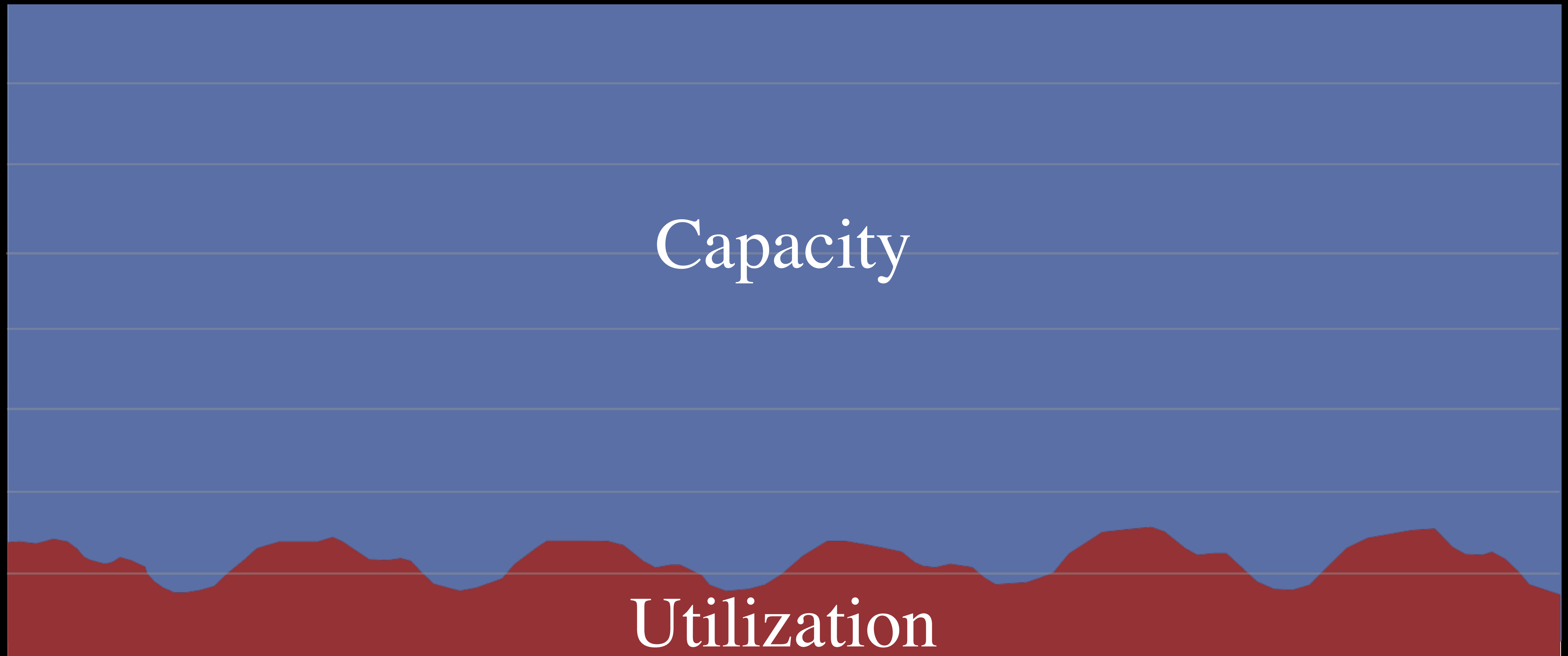
~810Byte
~35% 64Byte



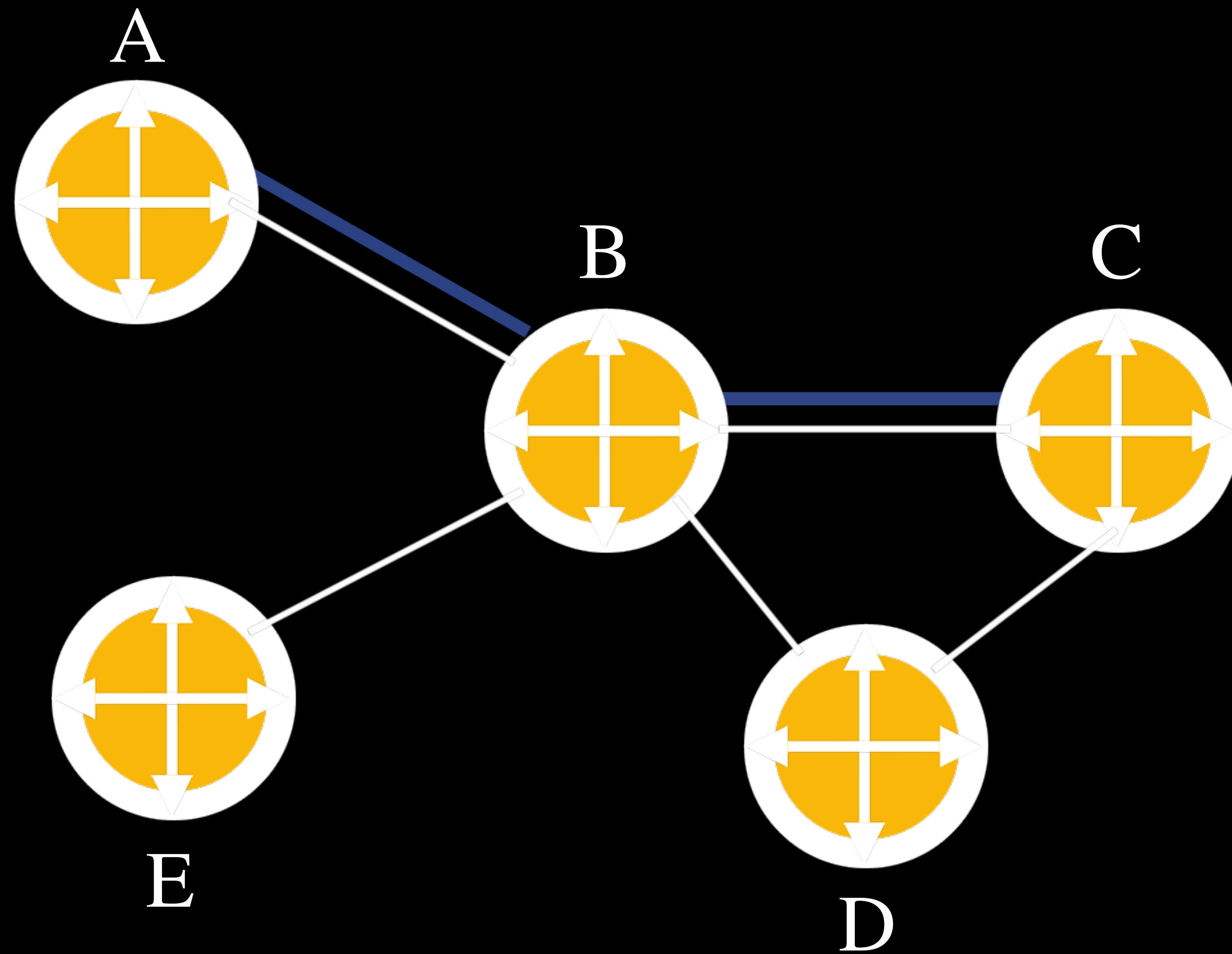
Challenges



Capacity Planning

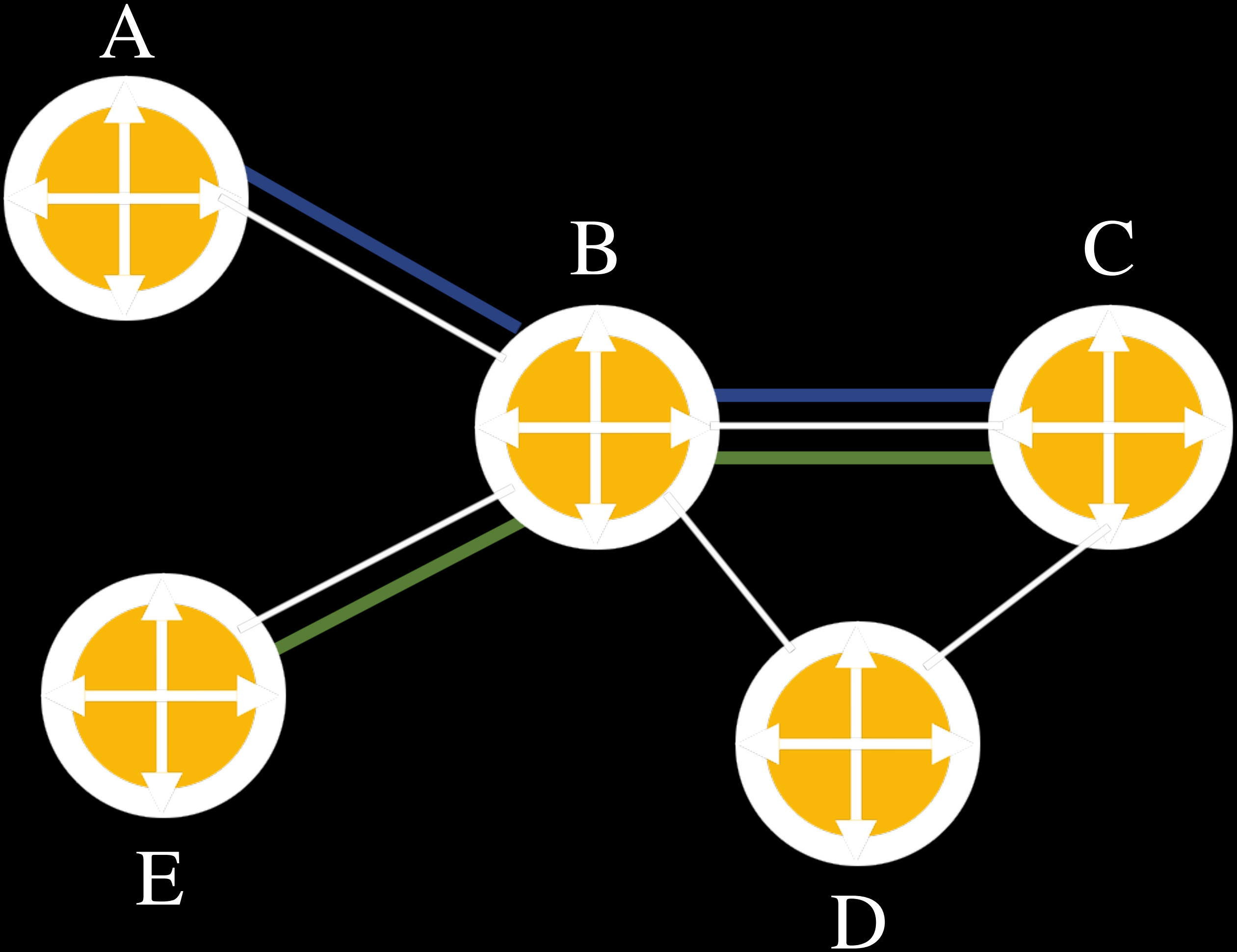


Bin Packing



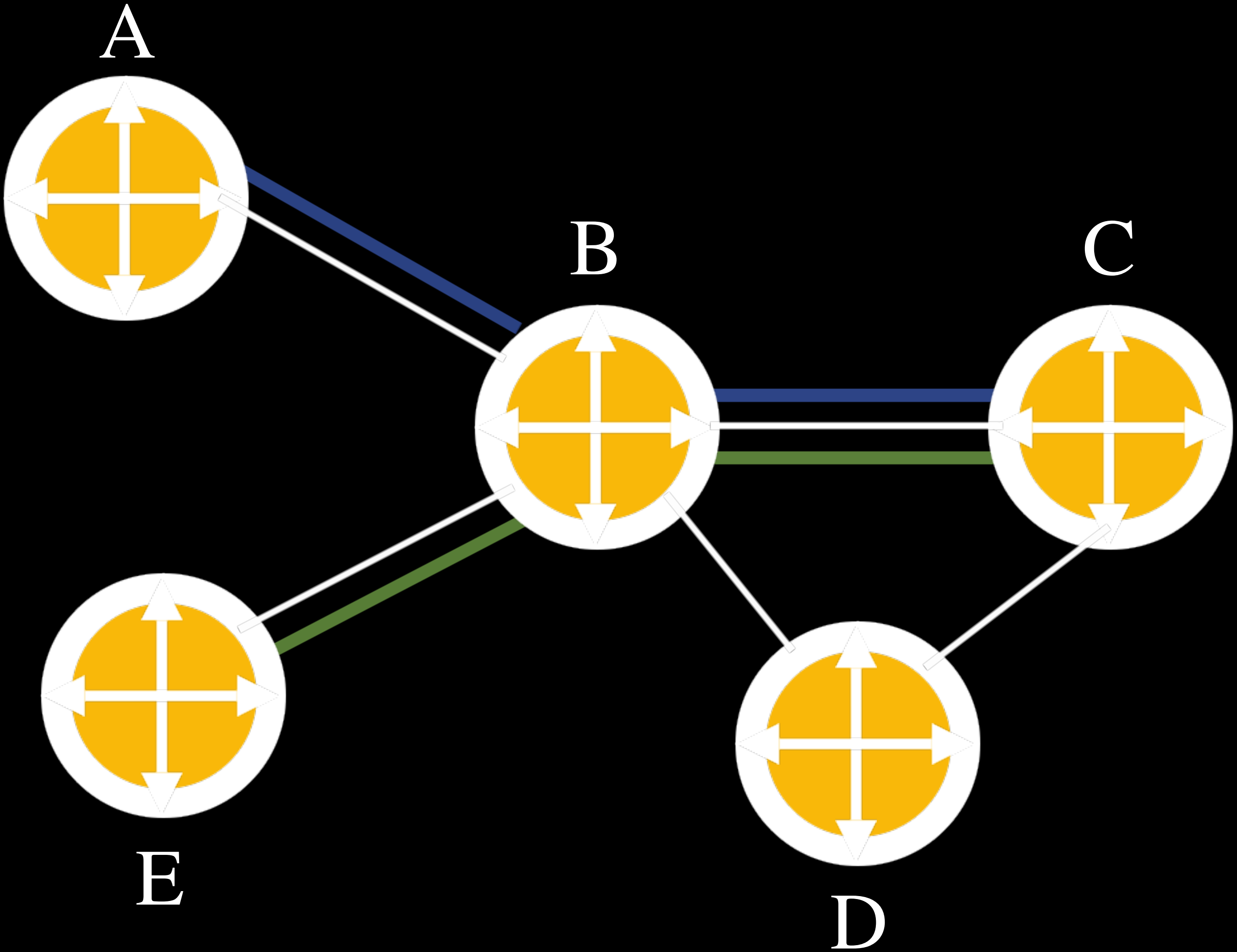
Time	LSP	Reserved BW
T=1	A <-> C	3G

Bin Packing



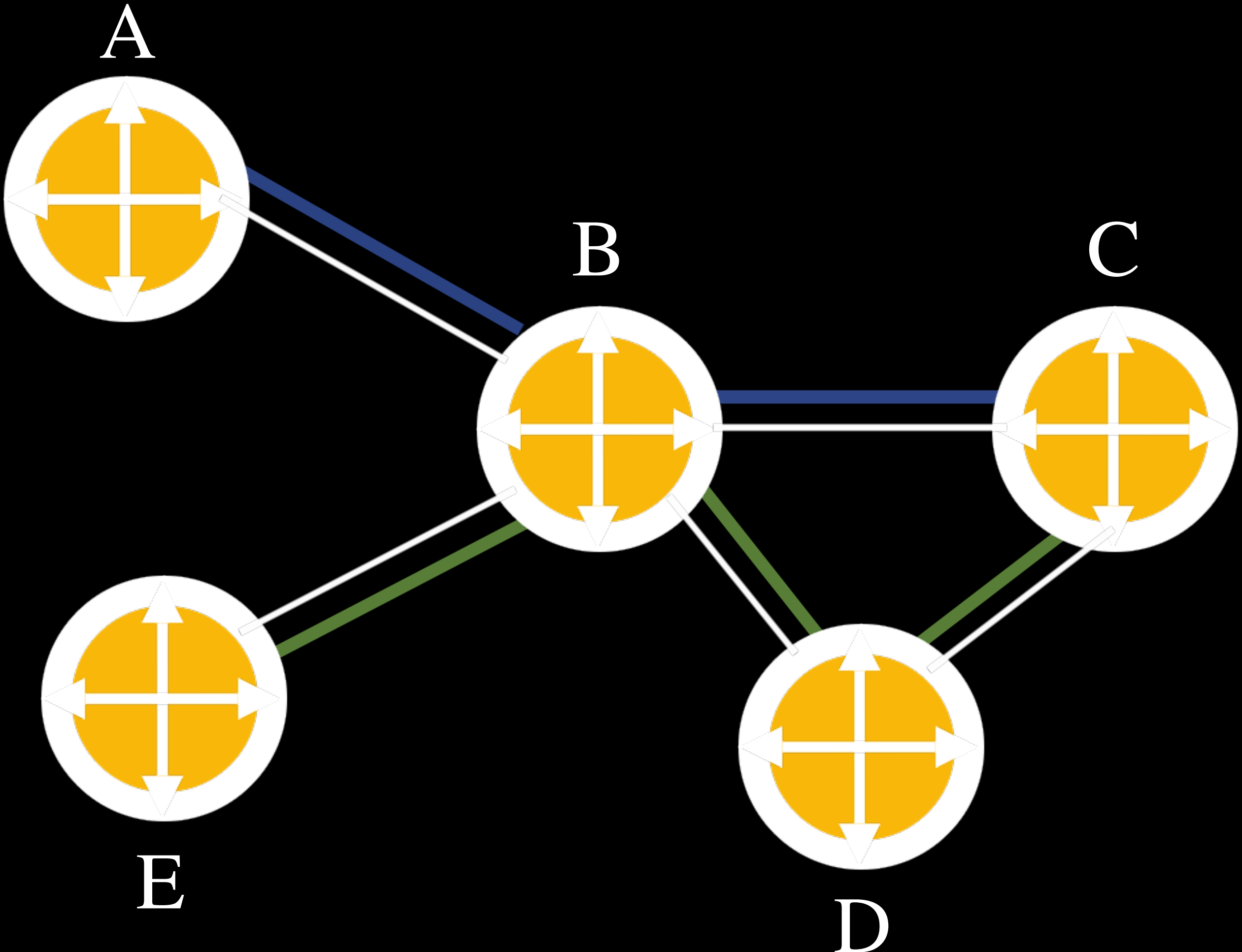
Time	LSP	Reserved BW
T=2	A <-> C	3G
T=2	E <-> C	3G

Bin Packing



Time	LSP	Reserved BW
T=3	A <-> C	6G
T=3	E <-> C	3G

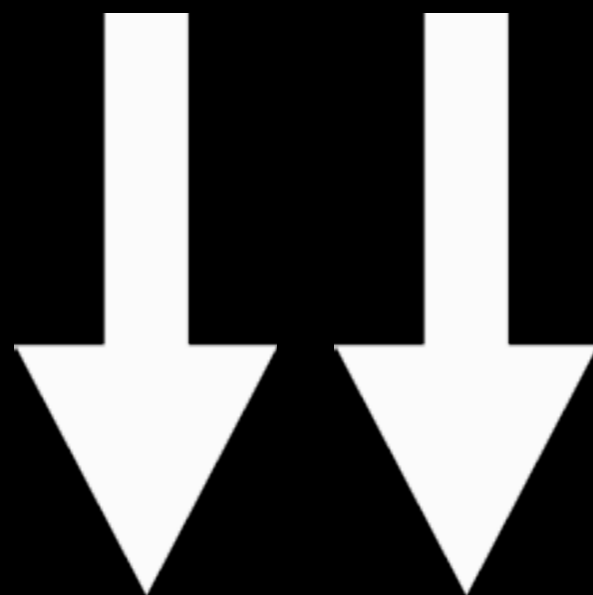
Bin Packing



Time	LSP	Reserved BW
T=4	A <-> C	6G
T=4	E <-> C	6G

Scheduling

AF4



AF2



BE



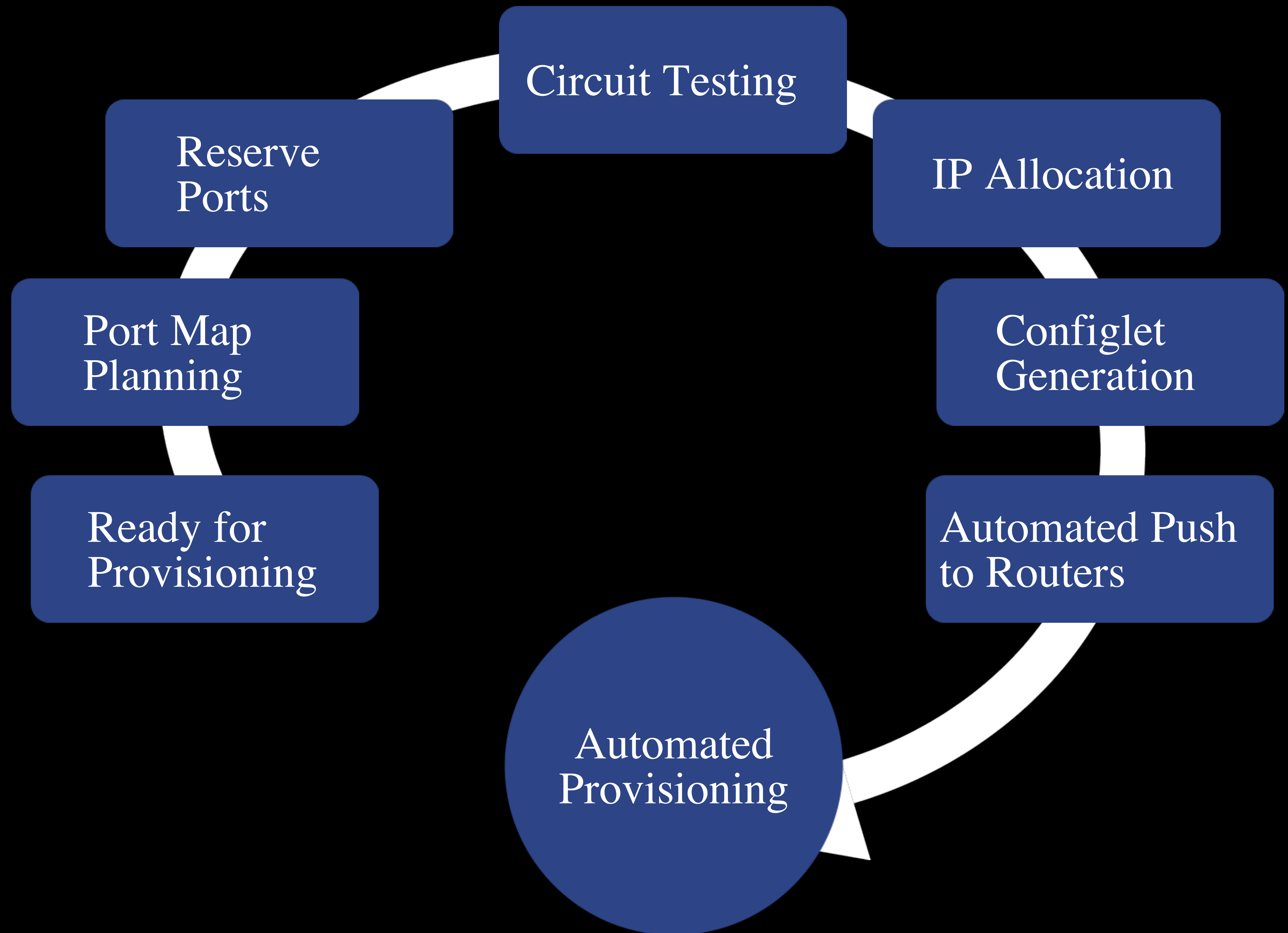
solutions

**MOVE
FAST WITH
STABLE
INFRA**

Network global view

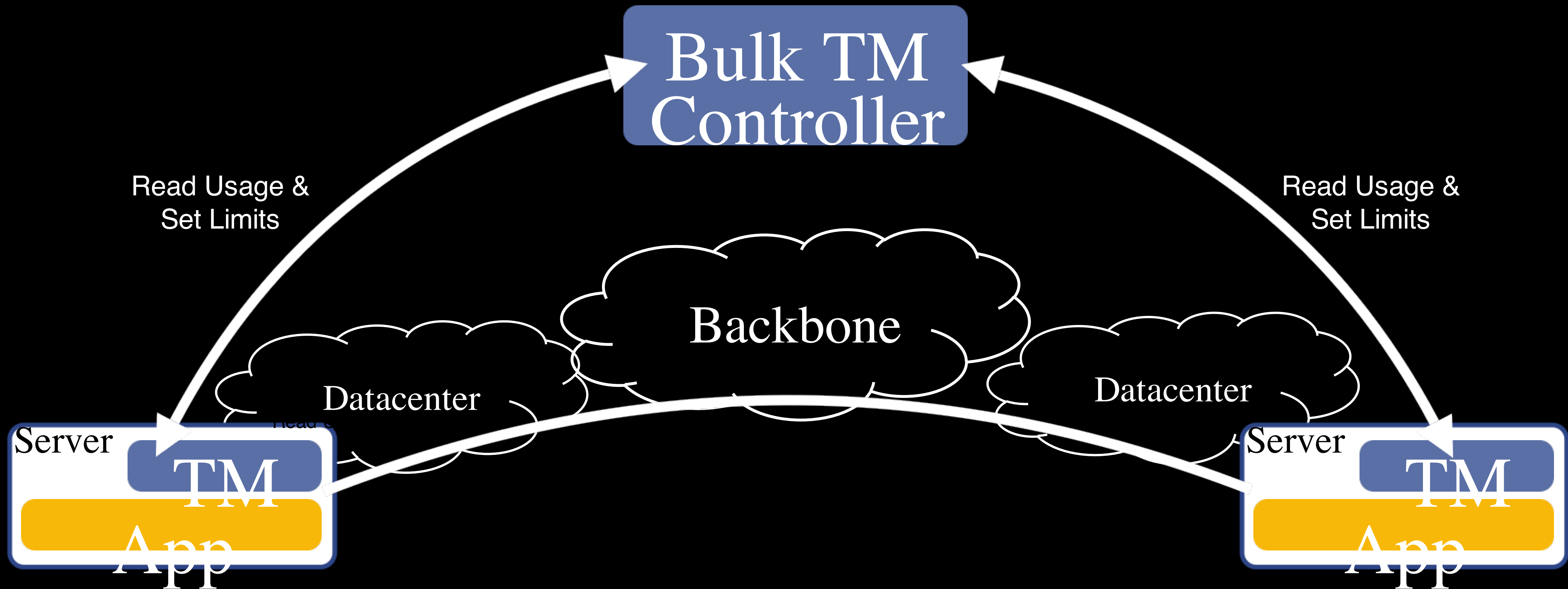
Network Global View

- CircuitDB
- Automate
- Audit
- Visibility



Traffic manager

Traffic Manager

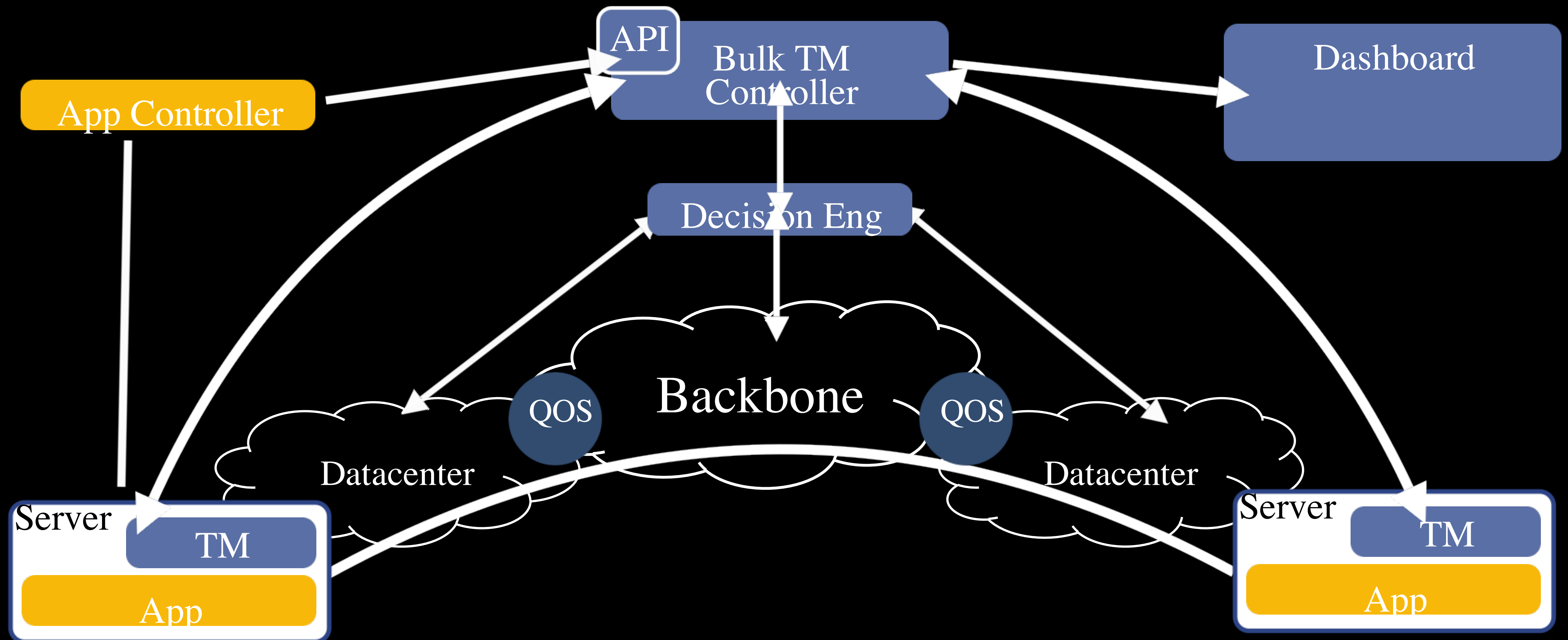


Path computation element

Path Computation Element



Visualization of the solution



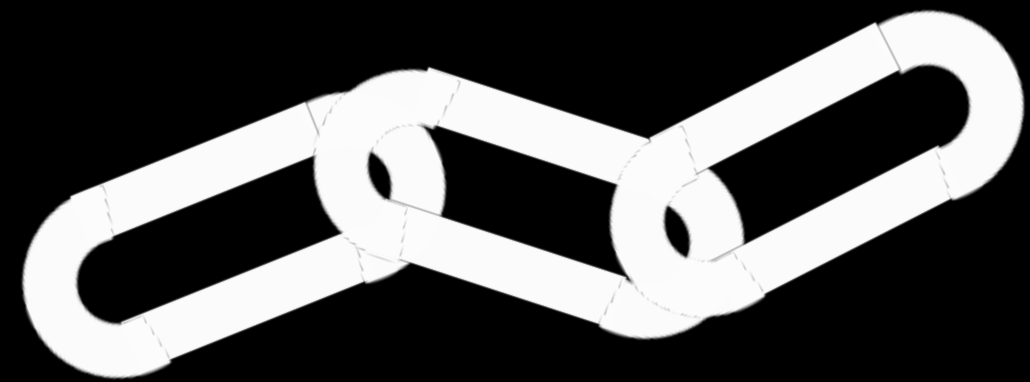
Data



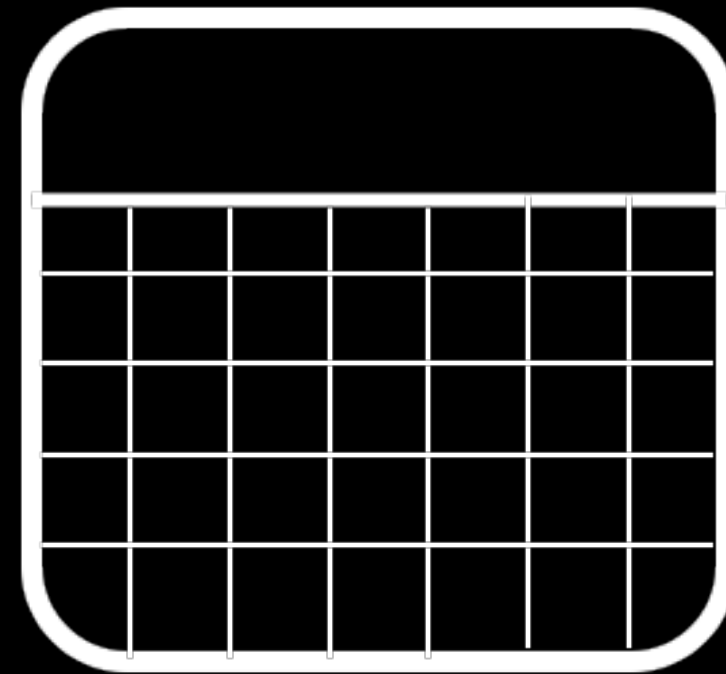


Use Cases

Durable Demand

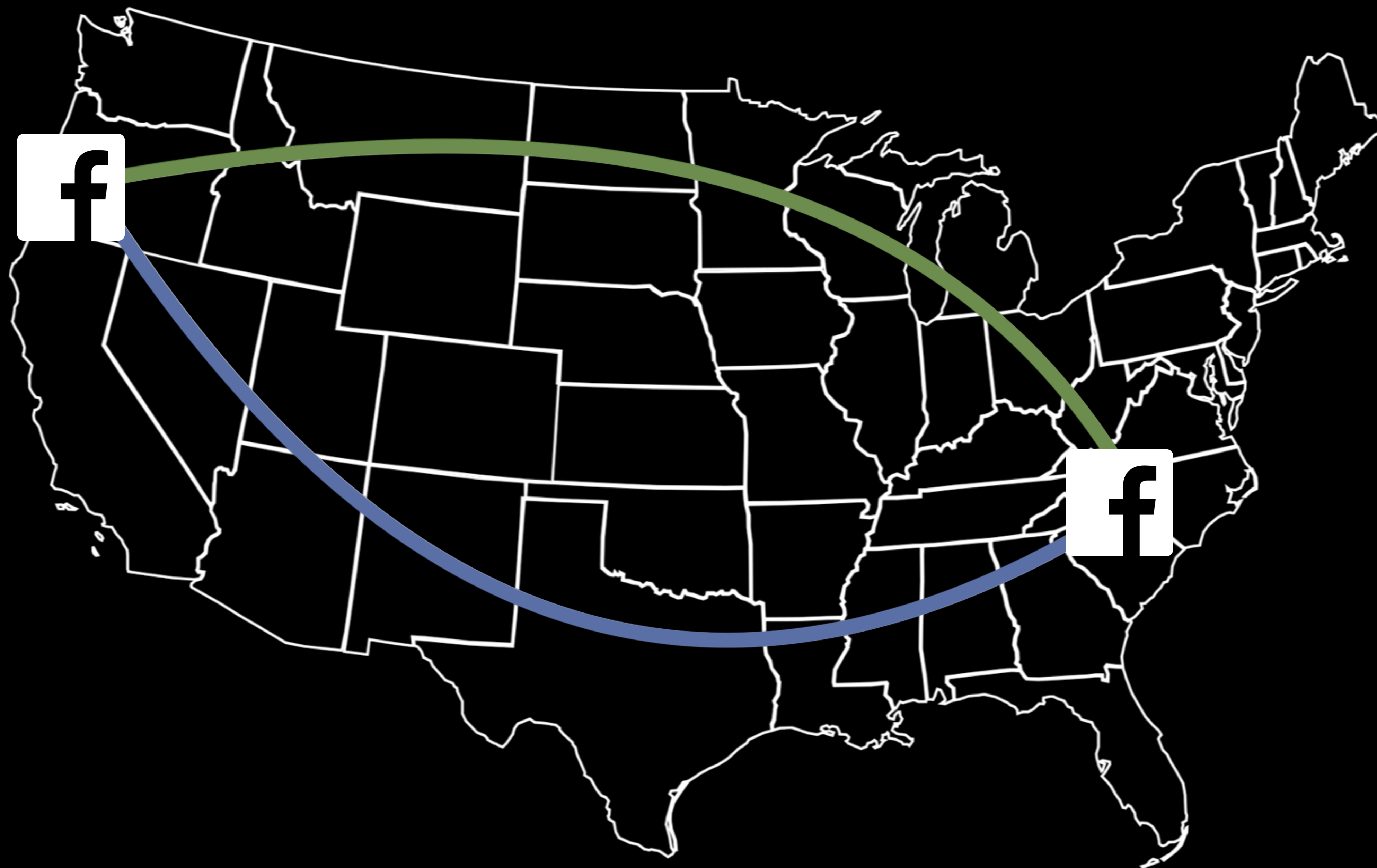


Calendaring



Periodic



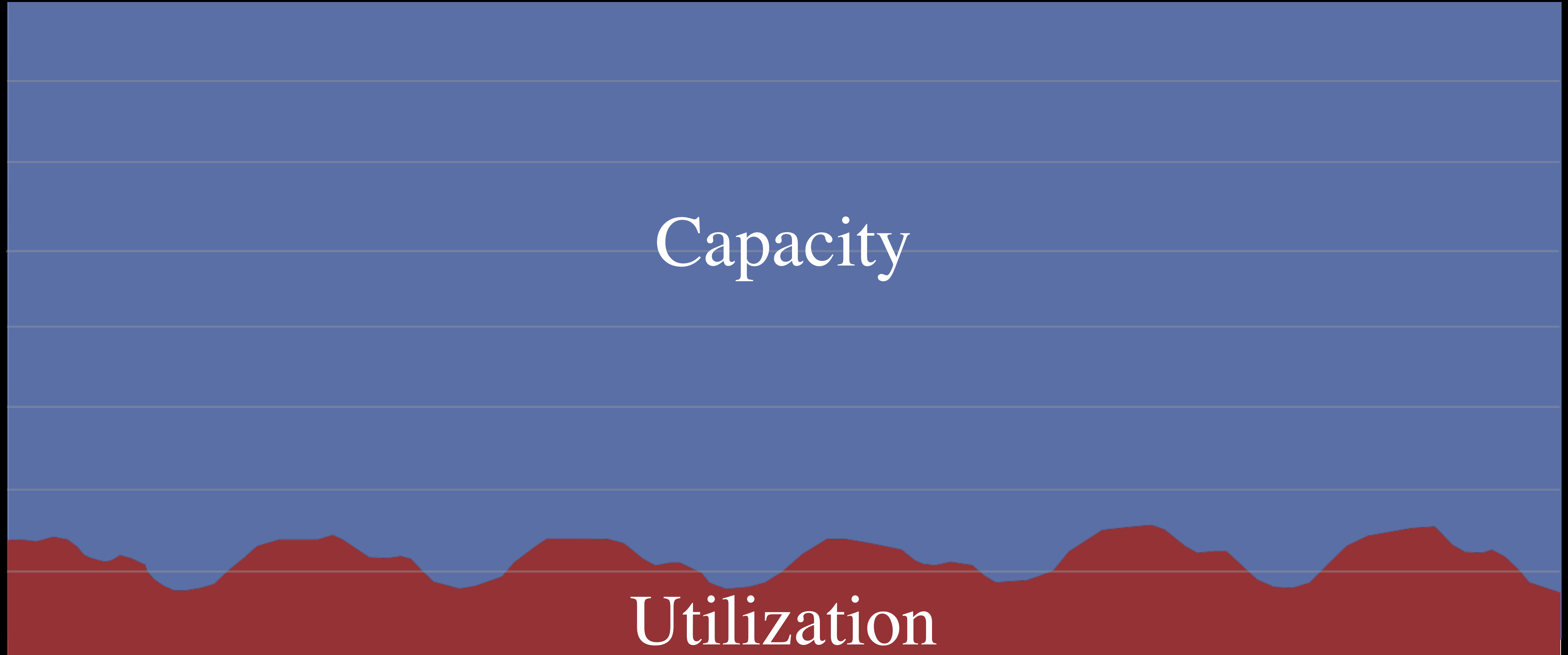


Importance of feedback

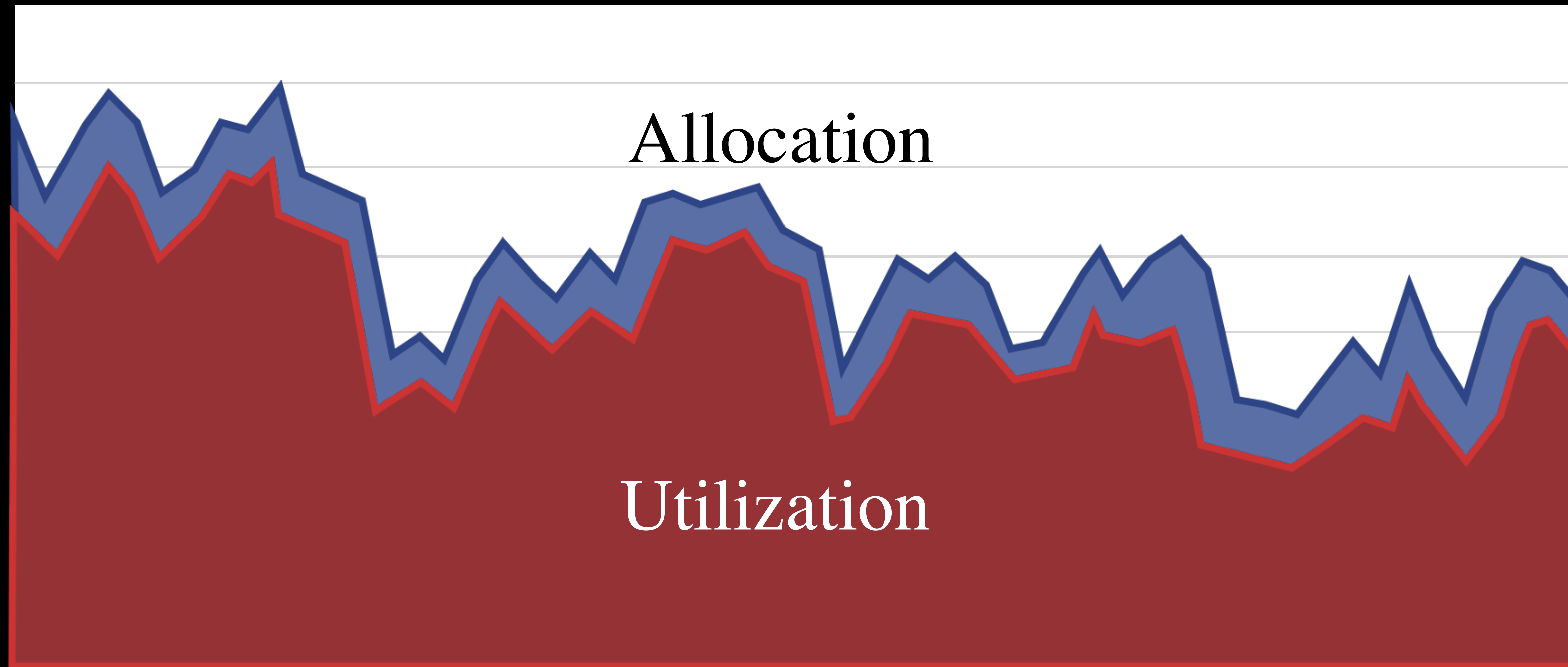


**DONE IS
BETTER
THAN
PERFECT**

Before



After



What more can we do?

- Multi-layer PCE
- Standby Transponders
- Reconfigurable ROADMs

1% Done