CS 725/825 & IT 725
Lecture 1
Course Introduction

August 25, 2025

Course website

▶ The "entry point" for all aspects of the course:

https://www.cs.unh.edu/~cs725/

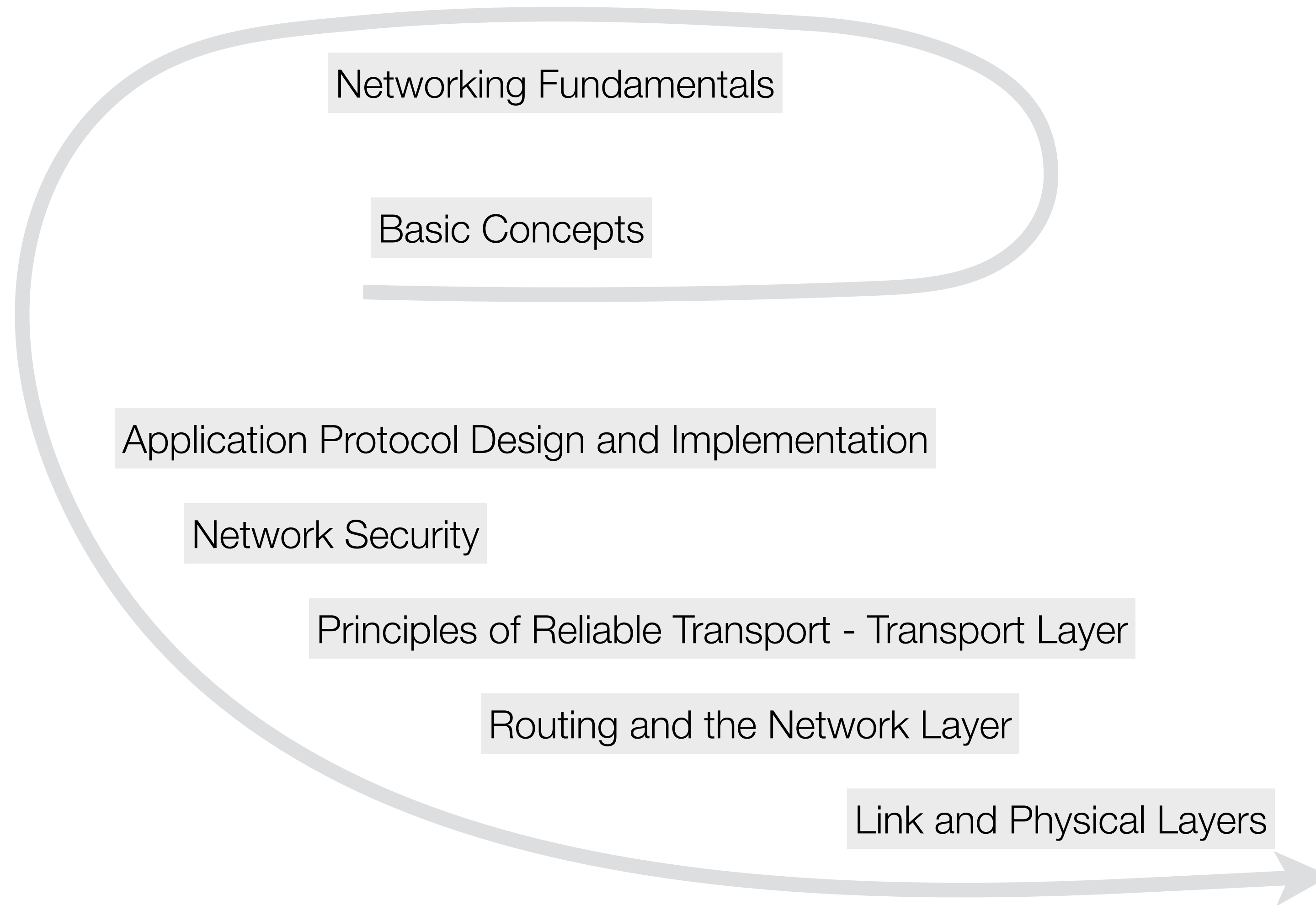# Coursework & Evaluation

▸ Five homework assignments: 40%

  – Assuming no major schedule disruption, assignments will be due at the start of the class (2:10 pm) on Wednesdays: September 24, October 15 and 29, November 19, and December 3, 2025

▸ Two in-class exams: 40%

  – October 8 and November 5, 2025

▸ Final exam/project: 20%

  – Take-home paper and problem answers due December 12, 2025, —OR—

  – Networks-related project presented during the CS Poster Symposium on Friday, December 5, 2025

▸ Watch out for extra credit problems…

Course Outline

Networking Fundamentals

Basic Concepts

Application Protocol Design and Implementation

Network Security

Principles of Reliable Transport - Transport Layer

Routing and the Network Layer

Link and Physical Layers

Yes, we will visit some subjects multiple times!

Teaching Method

▸ Lectures (conceptual and practical subjects)

▸ Guided exploration and reading

▸ Paper and pencil problems

▸ Programming exercises

  – protocol implementation

  – protocol design

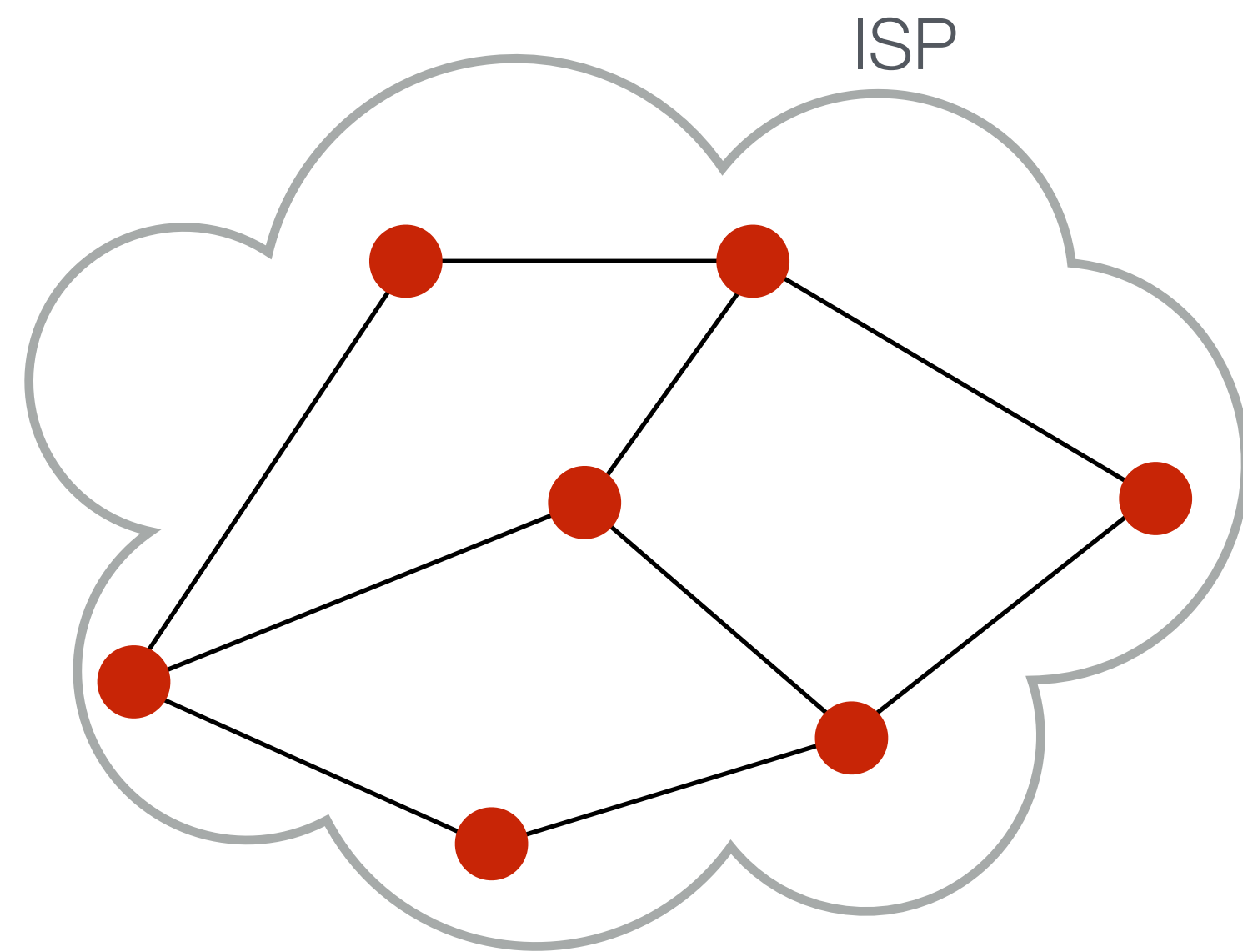▸ Hands on experimentation with networks

▸ Network performance evaluation

What is the question?

▸ What are the key network performance characteristics?

– What makes one networking technology better than another?

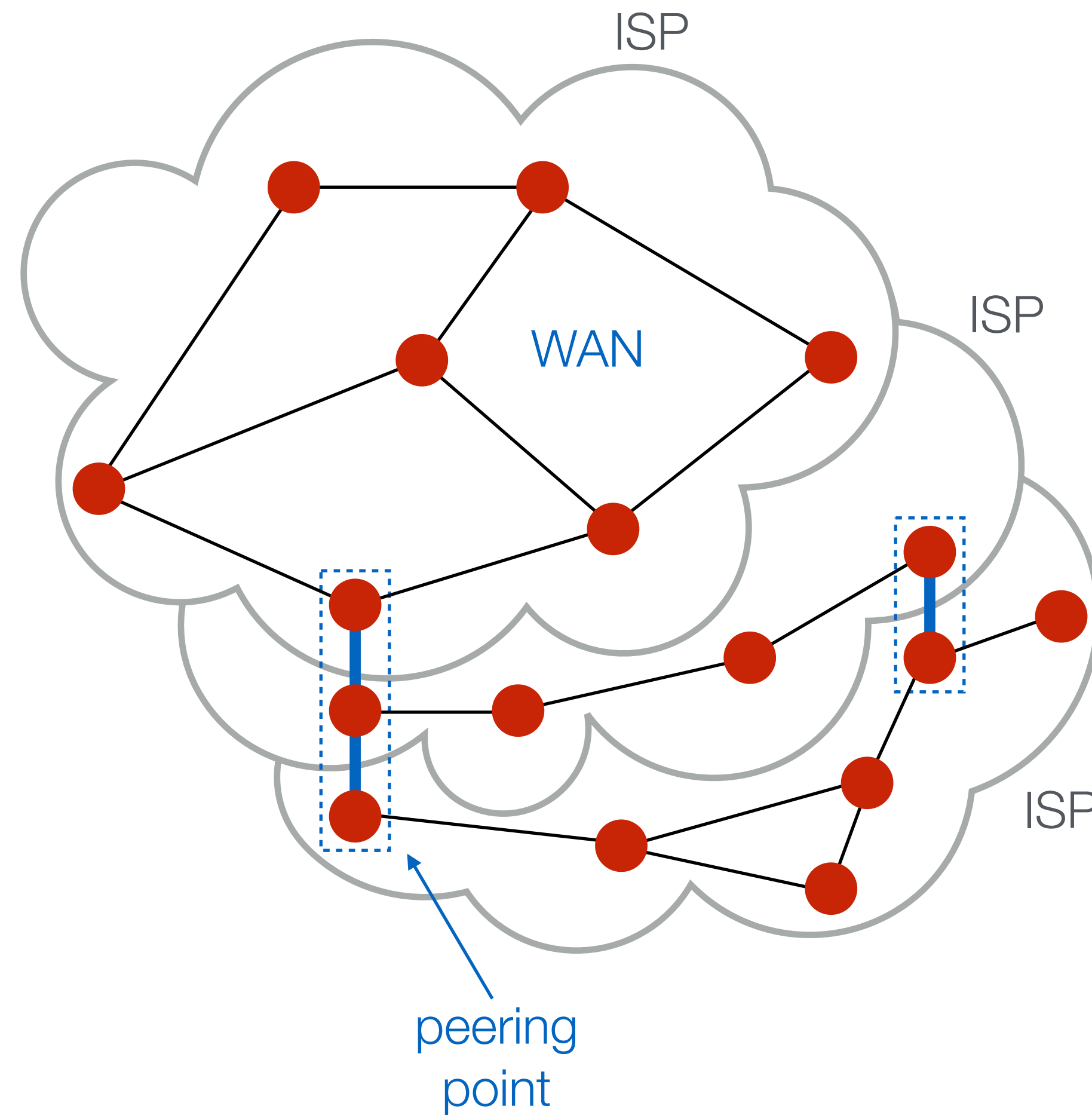– What aspects of networks we need to improve going forward?

What is the question?

▶ "Faster" networks

  – Higher transmission rate

  – Lower latency

▶ Security

▶ Lower error rate (bit error rate, packet loss probability)

▶ Higher availability (reliability)

▶ Ubiquity

▶ Lower monetary cost

▶ Improved user experience (lower complexity)

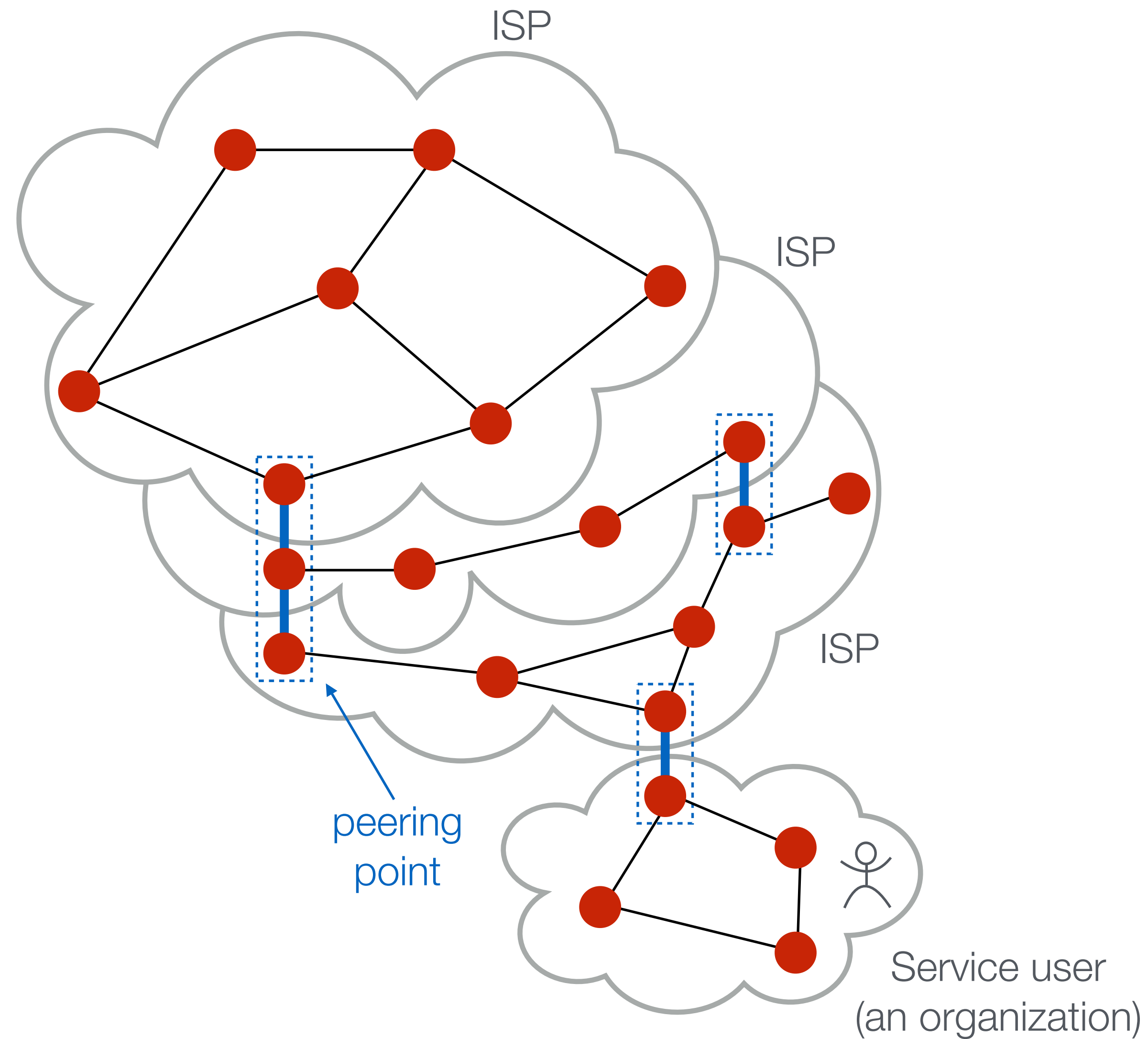# Internet…

Inter(connected)net(work)

Internet service consumer

ISP

ISP

ISP

peering point

Service user
(an organization)

Last-mile networks

ISP

WAN

ISP

(Last mile) ISP

ISP

last
mile
network

Internet
eXchange
Point (IXP)

LAN

Service user
(an organization)