

CS 725/825 & IT 725

Lecture 1

Course Introduction

August 25, 2026

Course website

- The “entry point” for all aspects of the course:

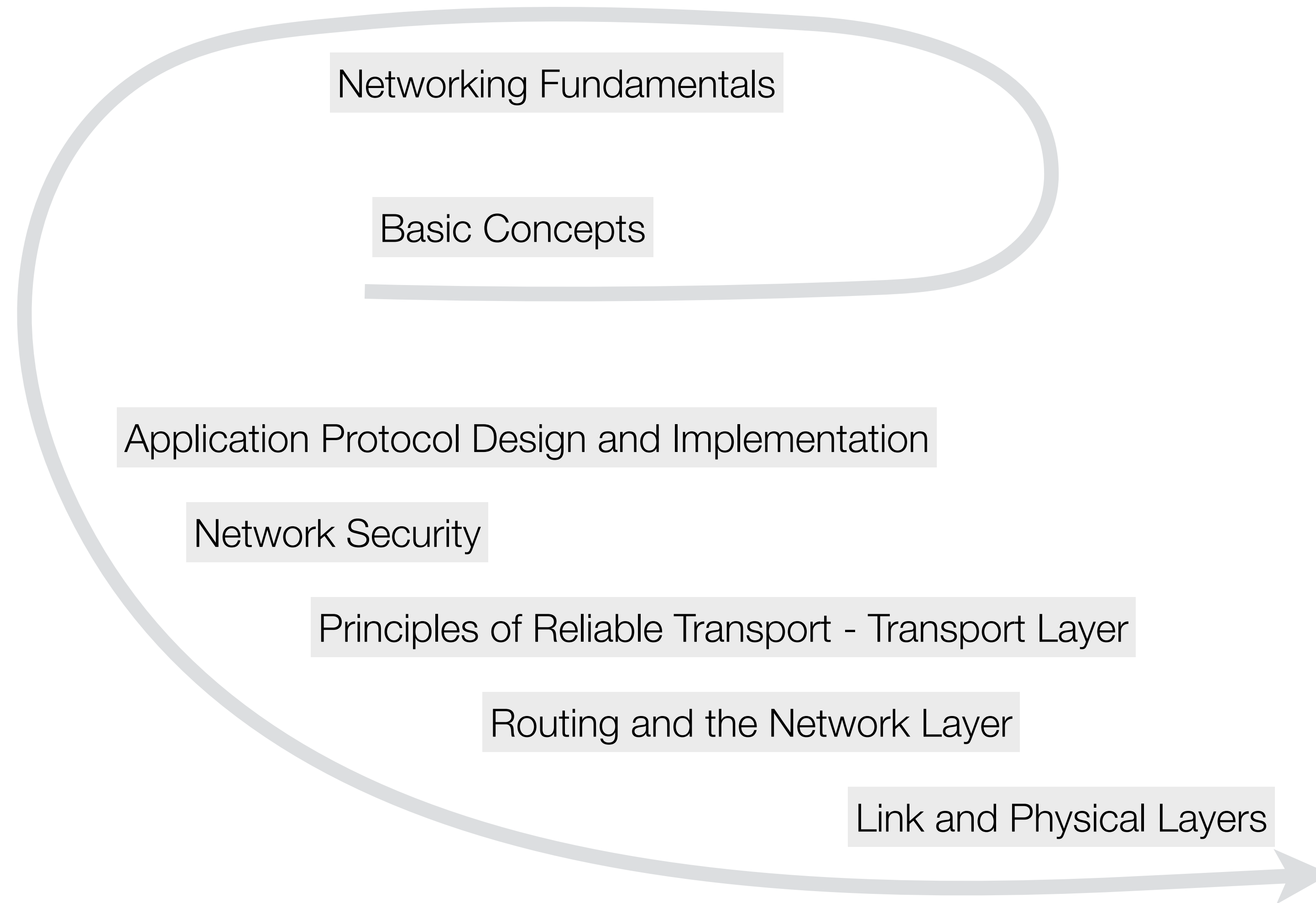
<https://www.cs.unh.edu/~cs725/>



Coursework & Evaluation

- ▶ Five **homework assignments**: 35%
 - Assuming no major schedule disruption, assignments will be due at the start of the class (2:10 pm) on Wednesdays: September 23, October 14 and 28, November 18, and December 9, 2026
- ▶ Two in-class **exams**: 40%
 - October 7 and November 4, 2026
- ▶ **Final exam/project**: 20%
 - Take-home paper and problem answers due December 18, 2026, —OR—
 - Networks-related project presented during the CS Poster Symposium on Friday, December 11, 2026
- ▶ In-class **worksheets**: 5%

Course Outline



Yes, we will visit some subjects multiple times!

Teaching Method

- ▶ Lectures (conceptual and practical subjects)
- ▶ In-class worksheets
- ▶ Guided exploration and reading
- ▶ Paper and pencil problems
- ▶ Programming exercises
 - protocol implementation
 - protocol design
- ▶ Hands on experimentation with networks
- ▶ Network performance evaluation

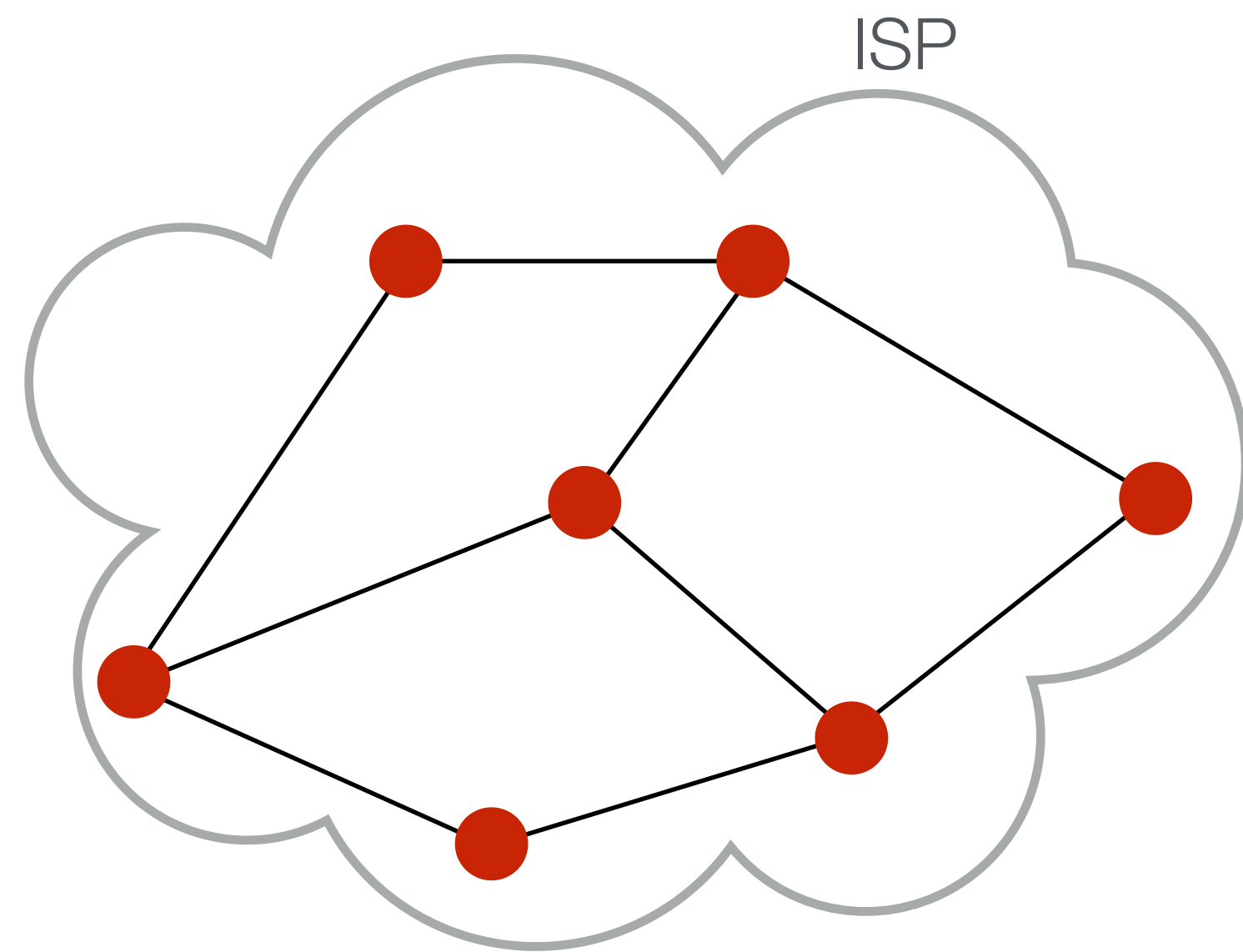
What is the question?

- ▶ 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?

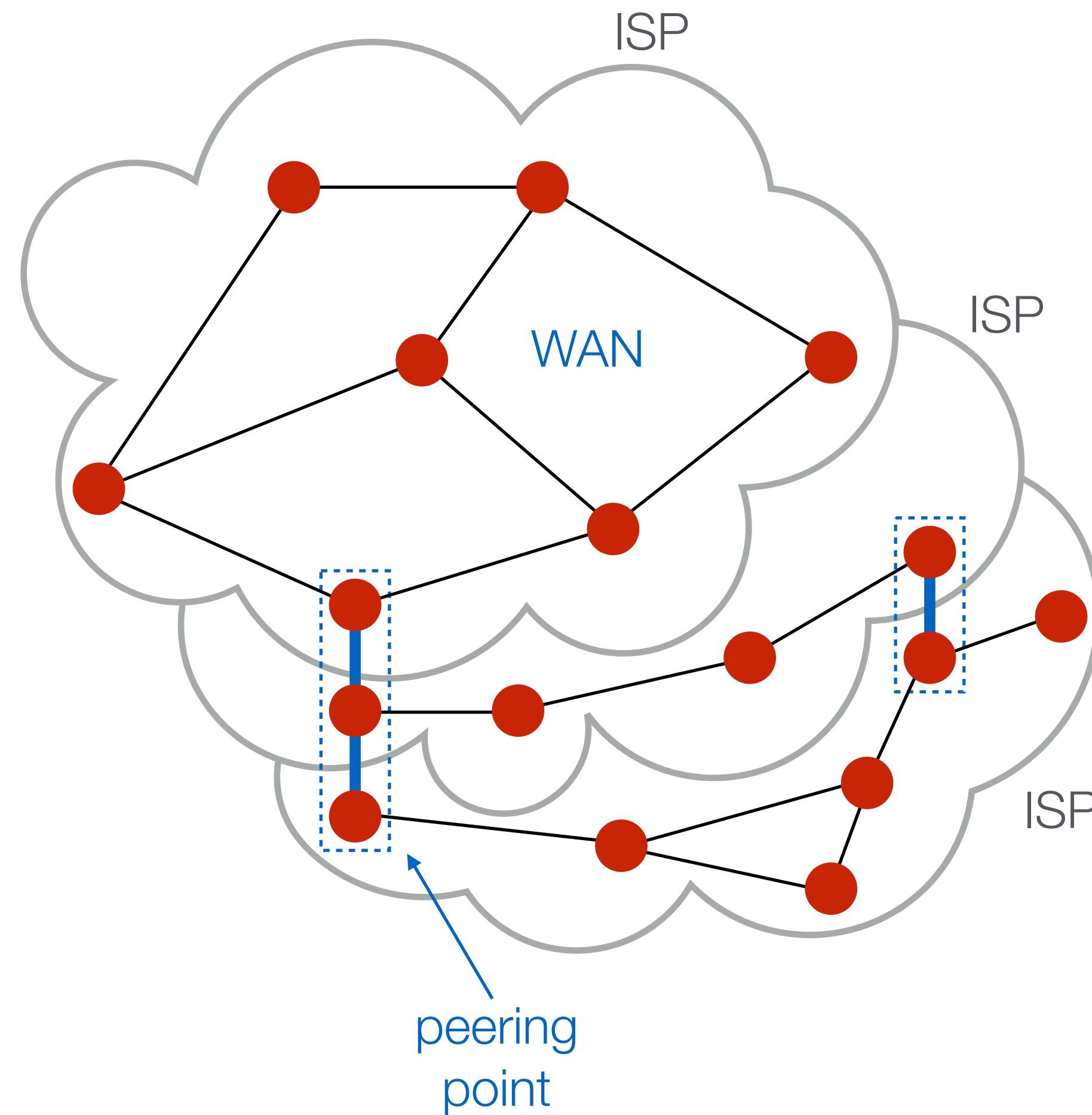
What is the question?

- ▶ "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)

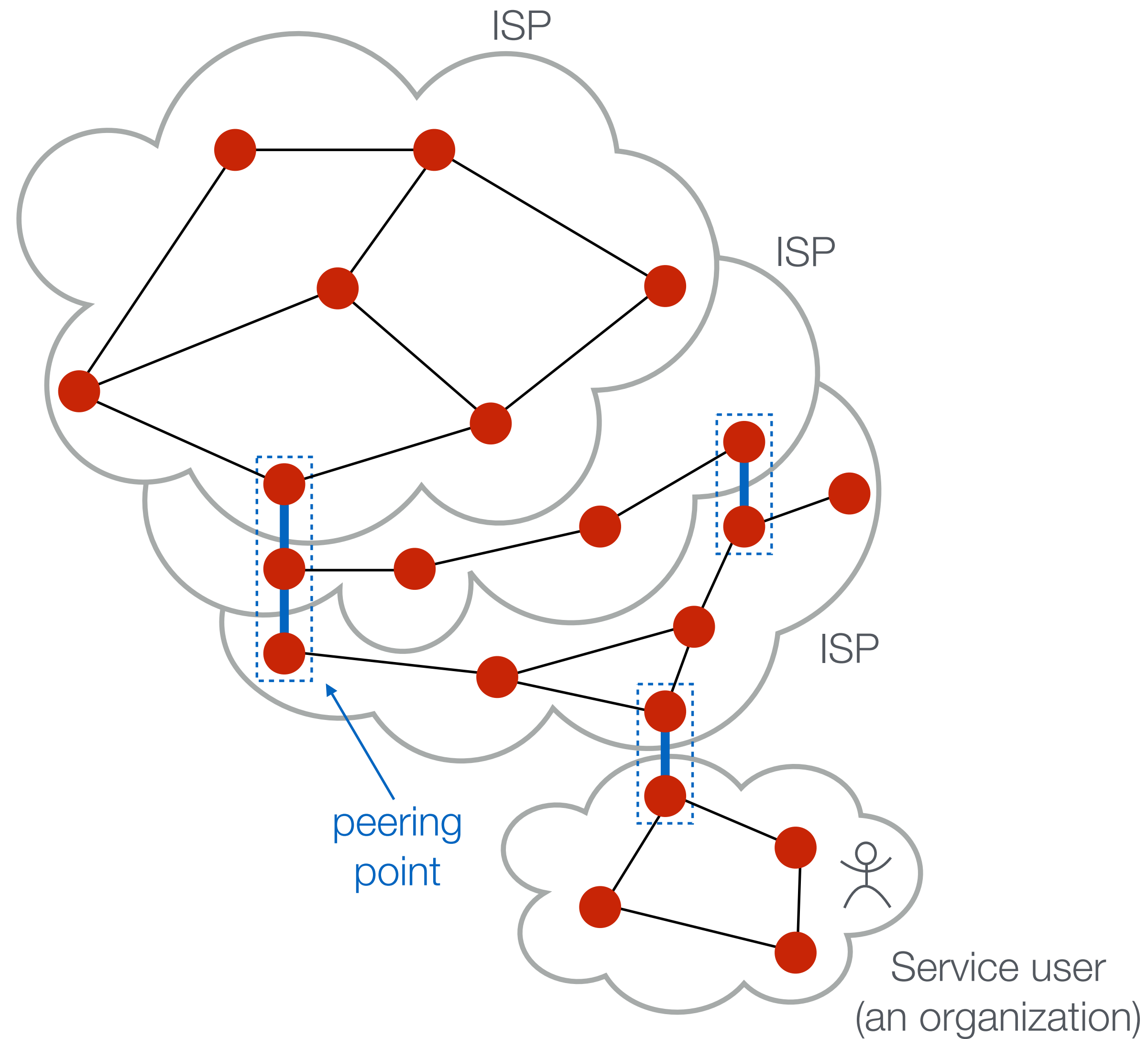
Internet...



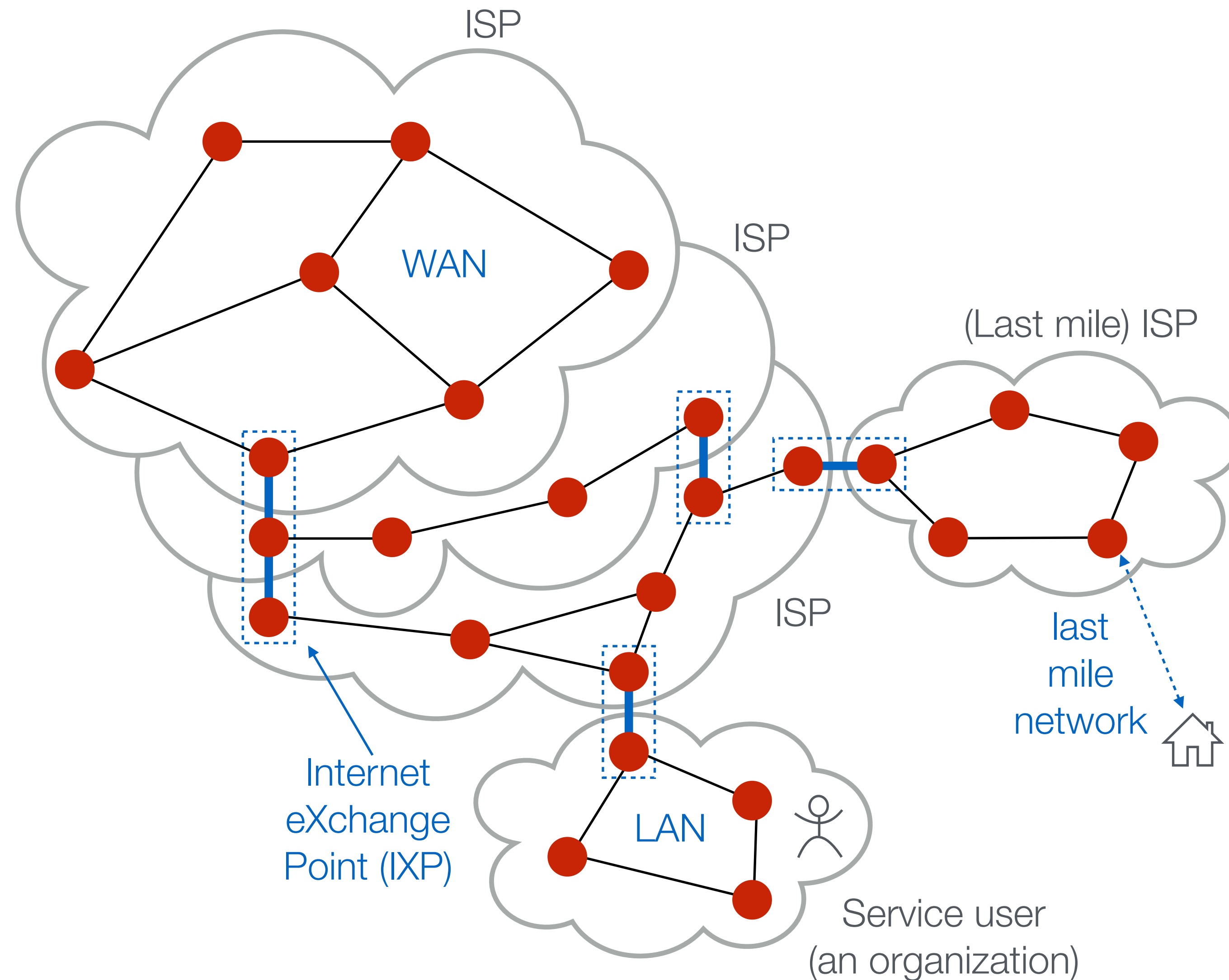
Interconnected network



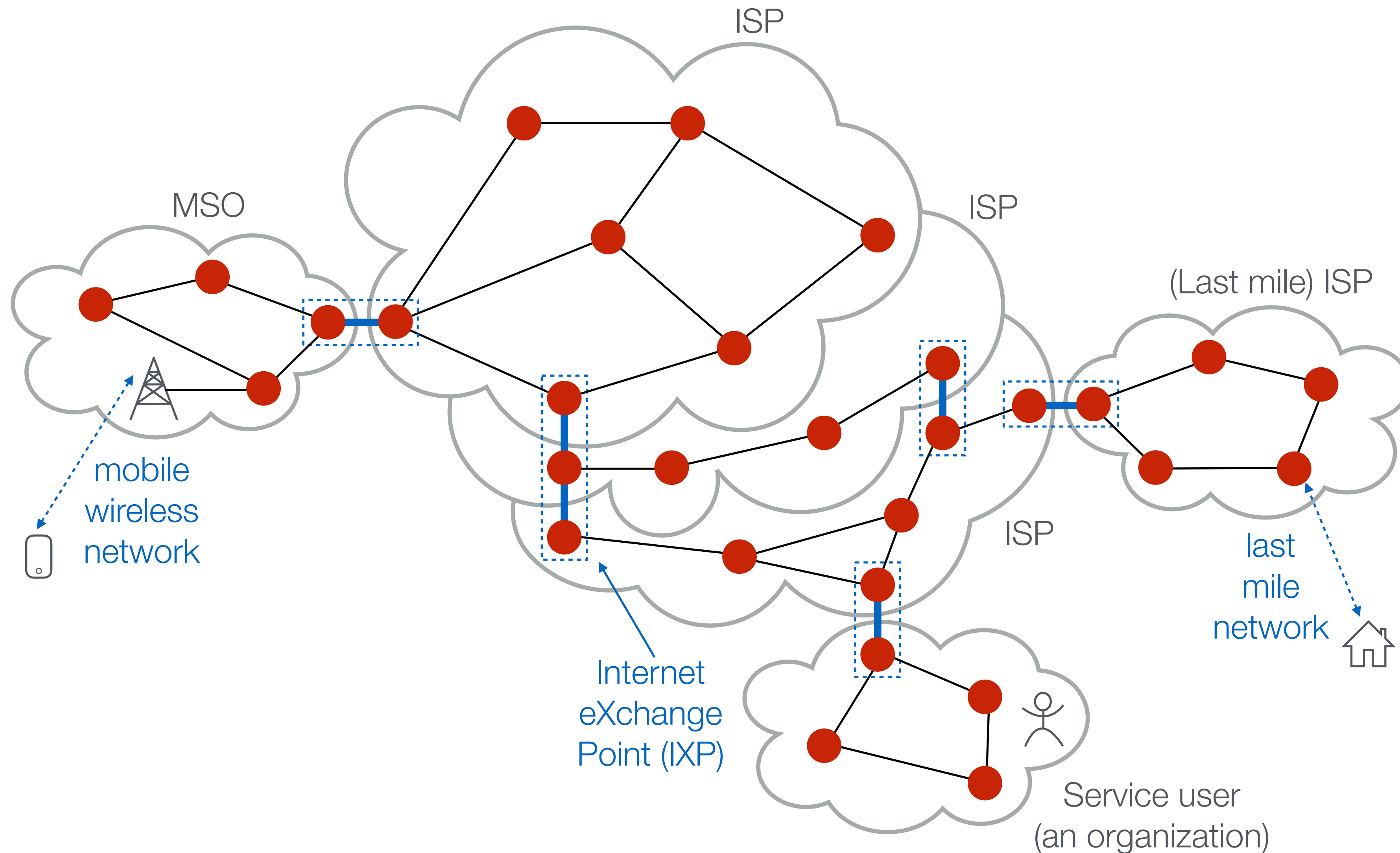
Internet service consumer



Last-mile networks

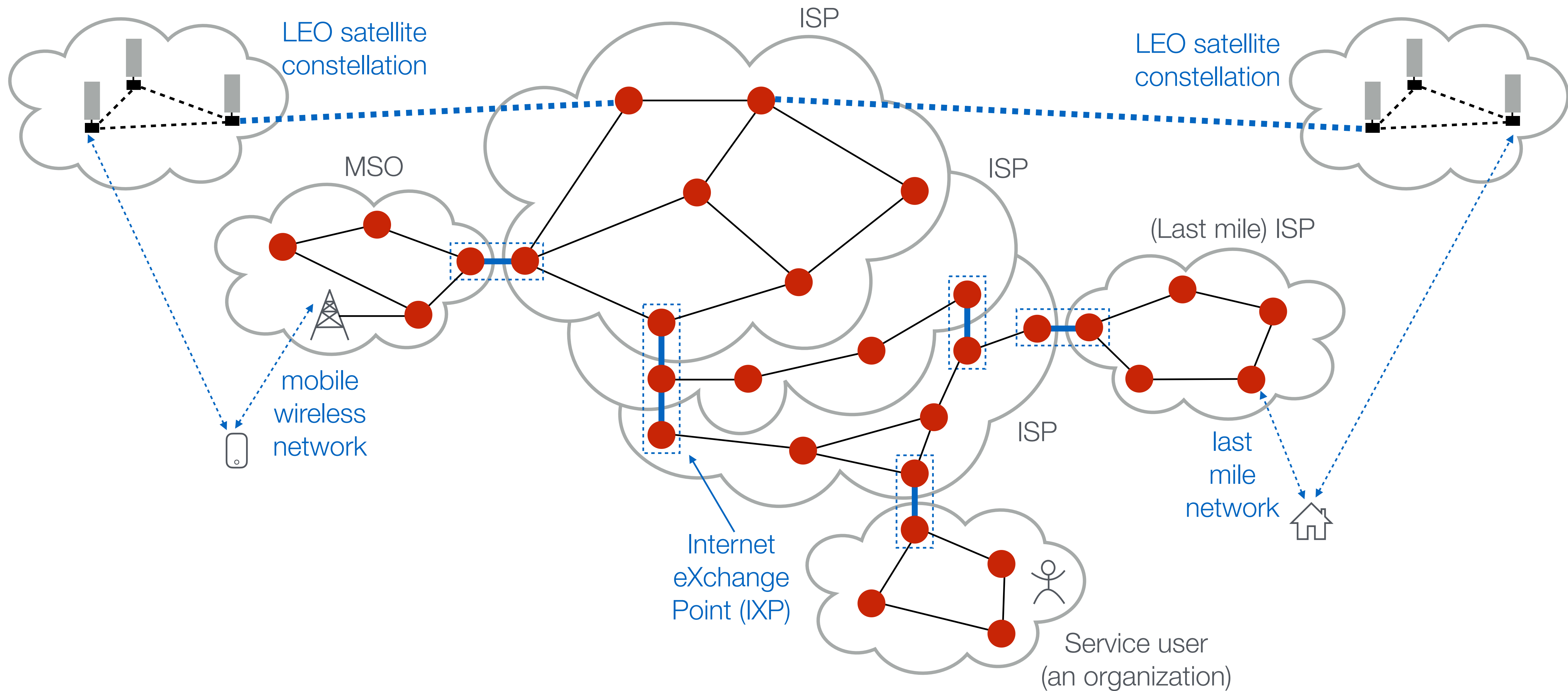


Mobile (cell) networks

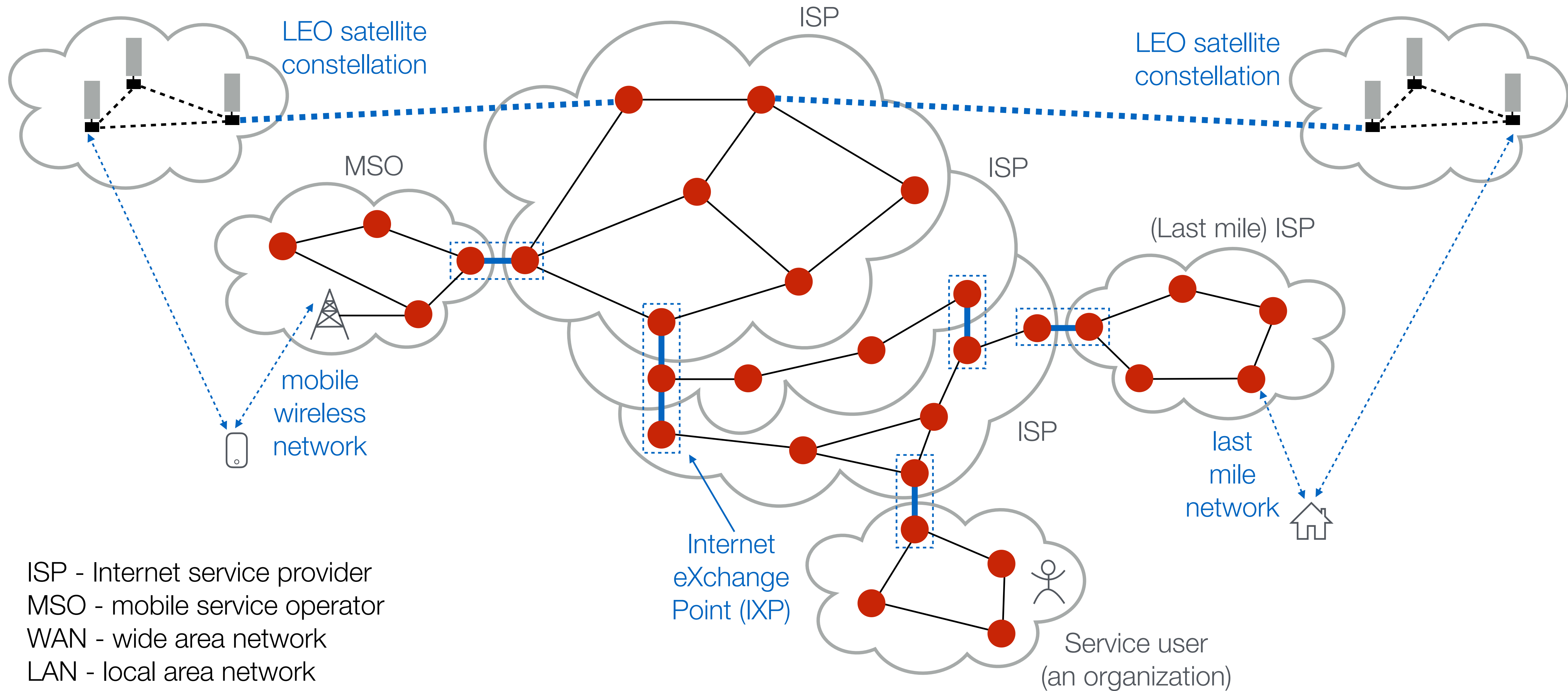




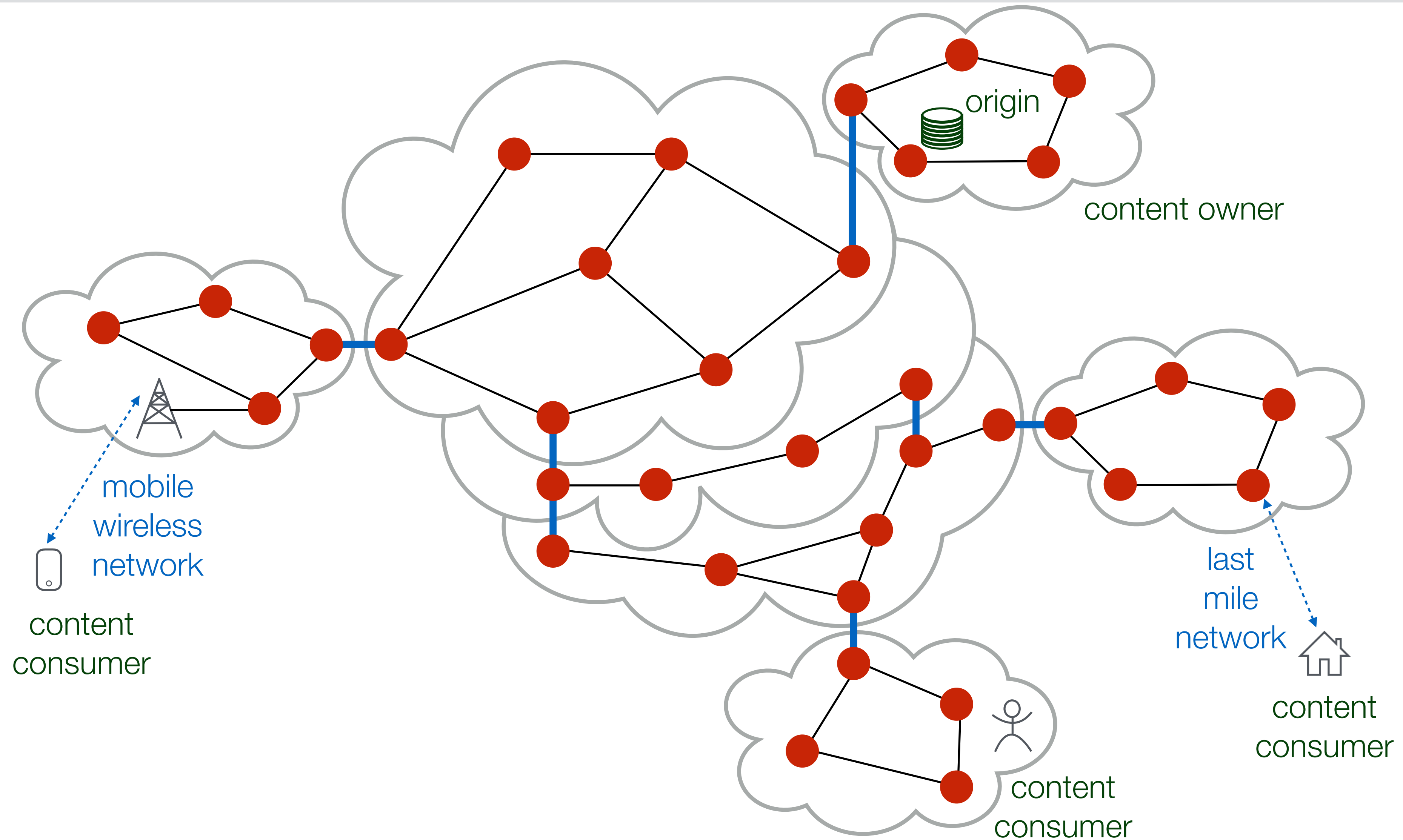
Satellite networks



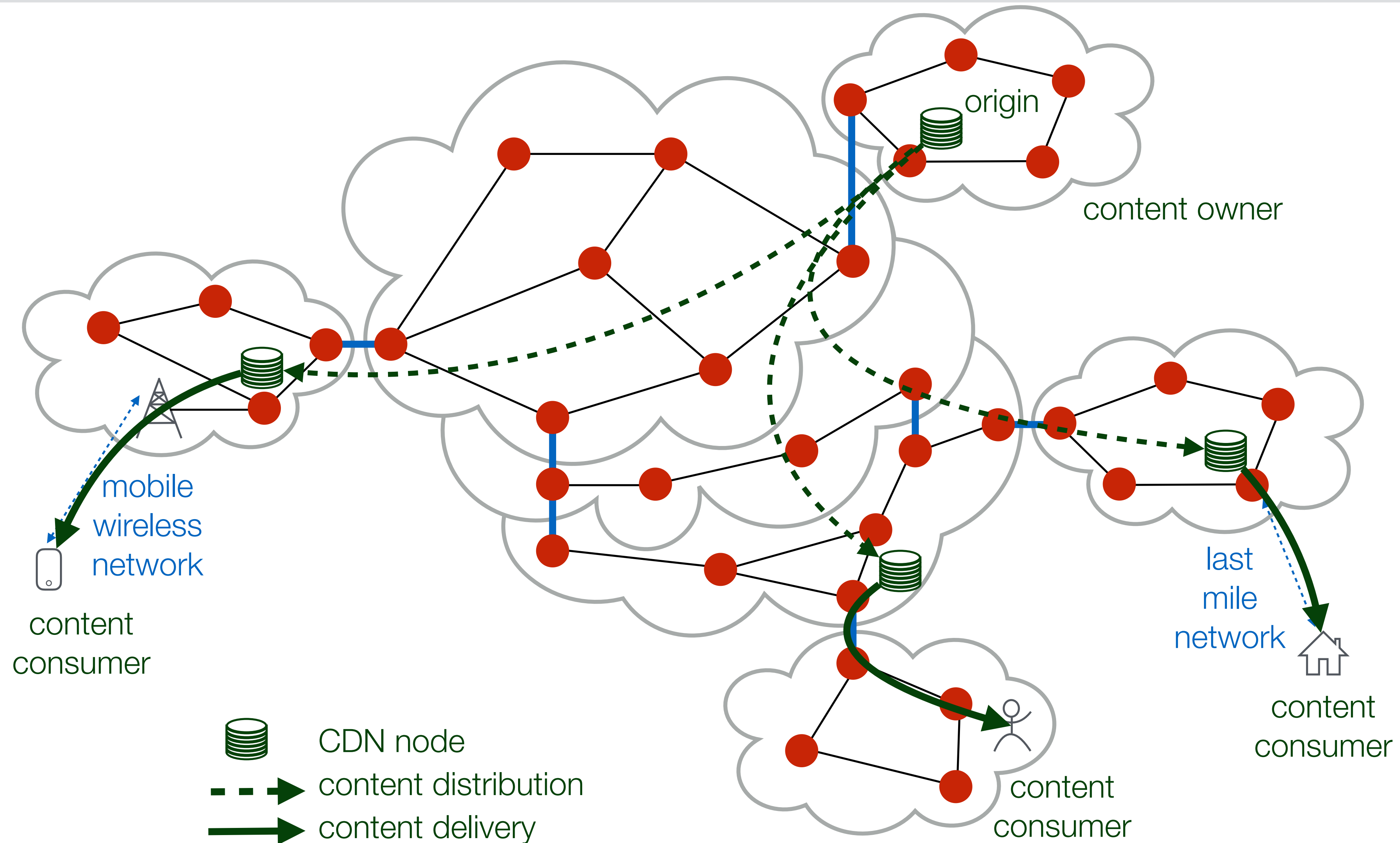
Terminology



Content Delivery



Content Delivery Network (CDN)



blog.google/around-the-globe/google-europe/united-kingdom/our-g

Our Grace Hopper subsea cable has landed in the UK

Google

The Keyword

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Jayne Stowell

Strategic Negotiator, Global Infrastructure, Google Cloud

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Grace Hopper Cable System 2022

New York, USA

Bude, UK

Bilbao, Spain

Last year, we [announced](#) a new subsea cable — named Grace Hopper after the

Curie cable route



Firmina cable route

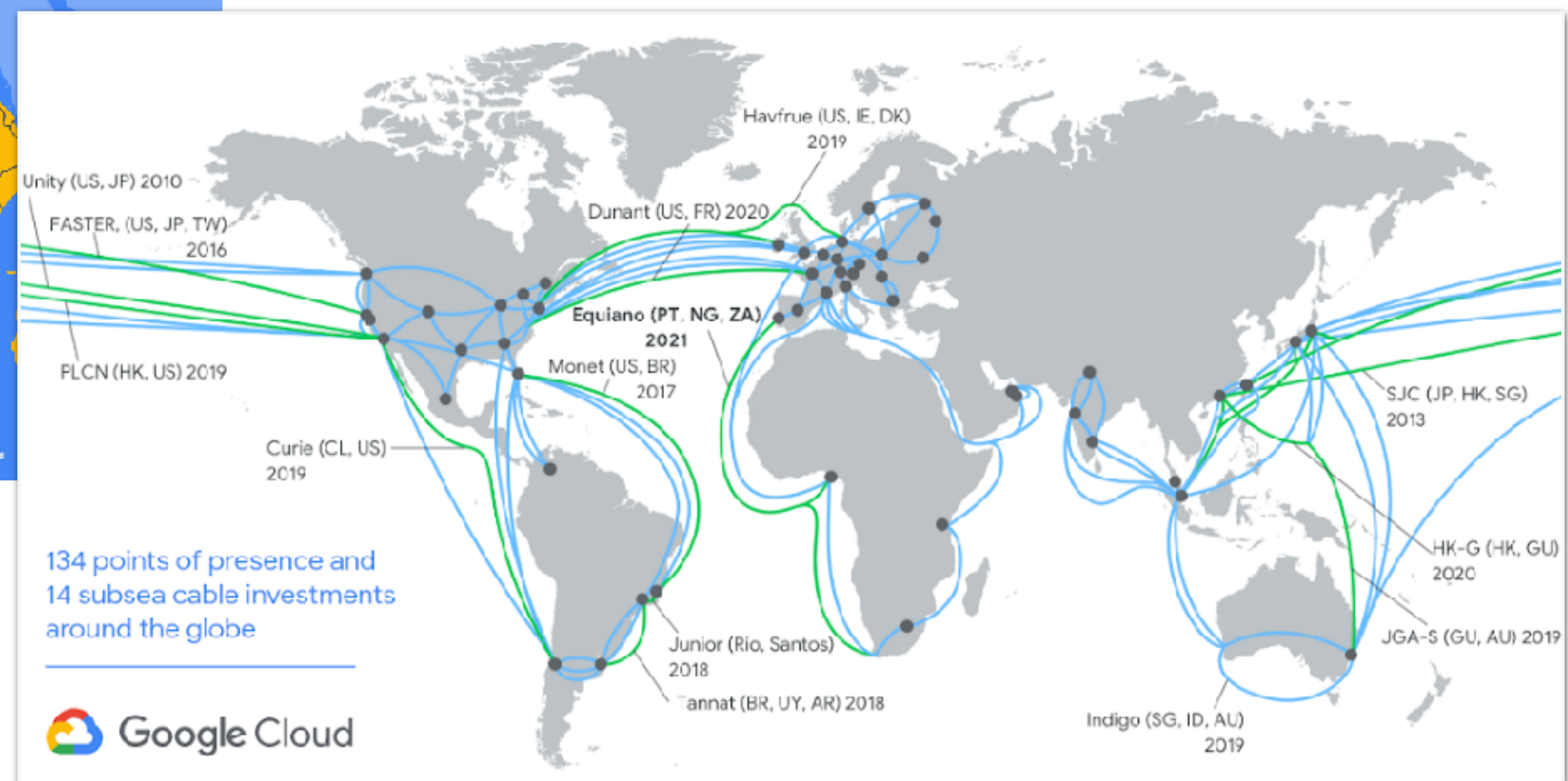
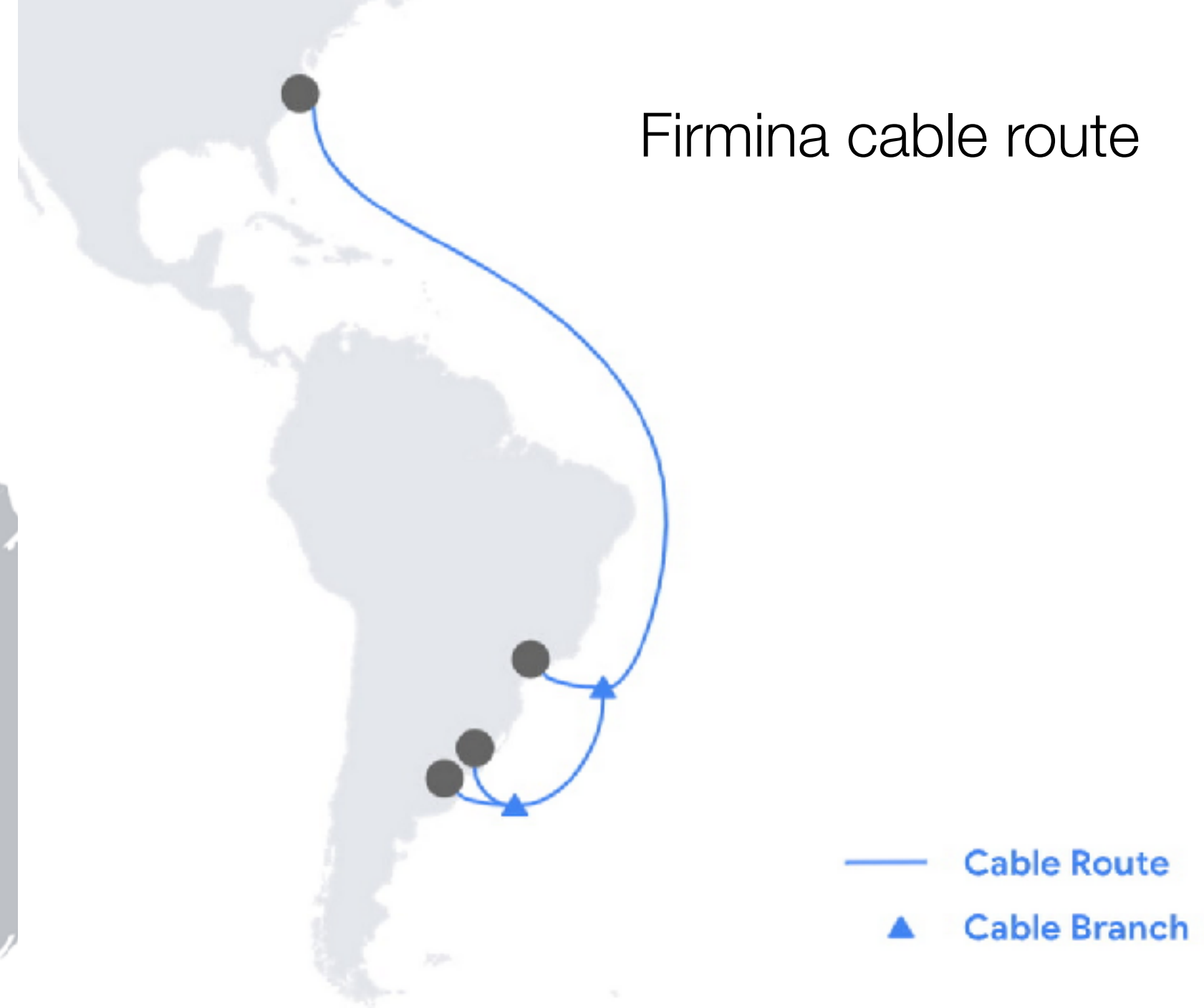


Image sources: Google Cloud Blog
<https://cloud.google.com/blog/products/infrastructure/curie-subsea-cable-set-to-transmit-to-chile-with-a-pit-stop-to-panama>
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Other network categories

- ▶ Datacenter and Storage Networks
- ▶ Personal Area Network (PAN)
- ▶ Sensor networks, Internet of Things (IoT), Cyber-Physical Systems
- ▶ Mobile and Vehicular networks
- ▶ Home automation
- ▶ Industrial networking
- ▶ etc...