



ROYAL INSTITUTE  
OF TECHNOLOGY

ONLab



# From the north to the very north

Carlos Natalino

Federal University of Pará

KTH Royal Institute of Technology

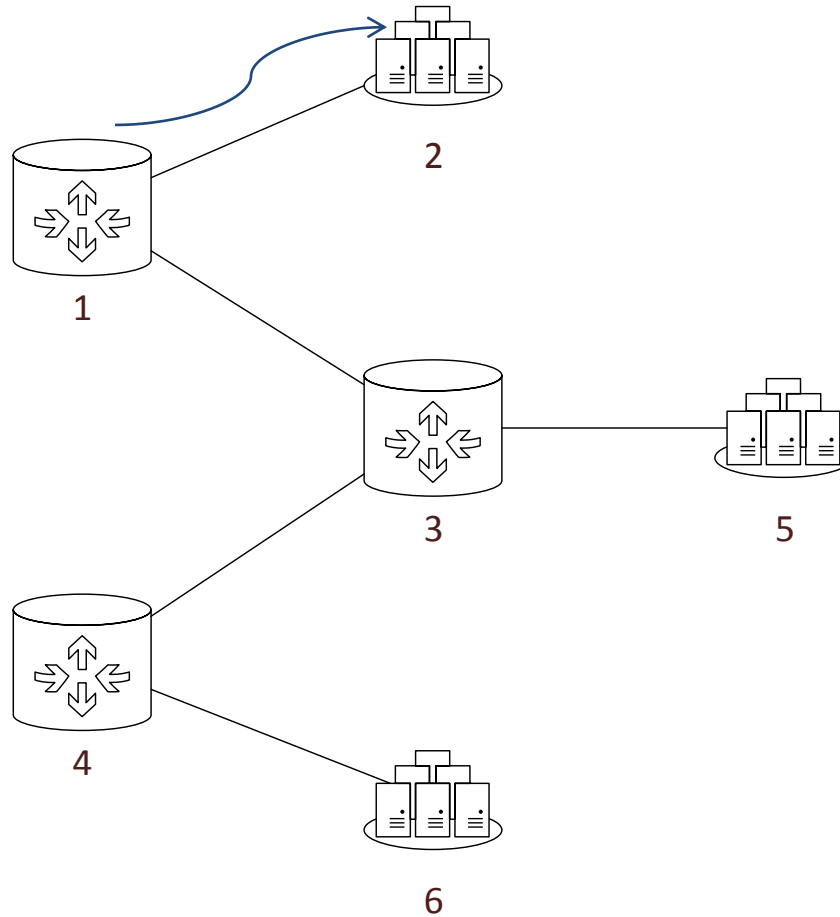
# Agenda

- PhD work
  - Optical networks and optical clouds
- Experience in Sweden

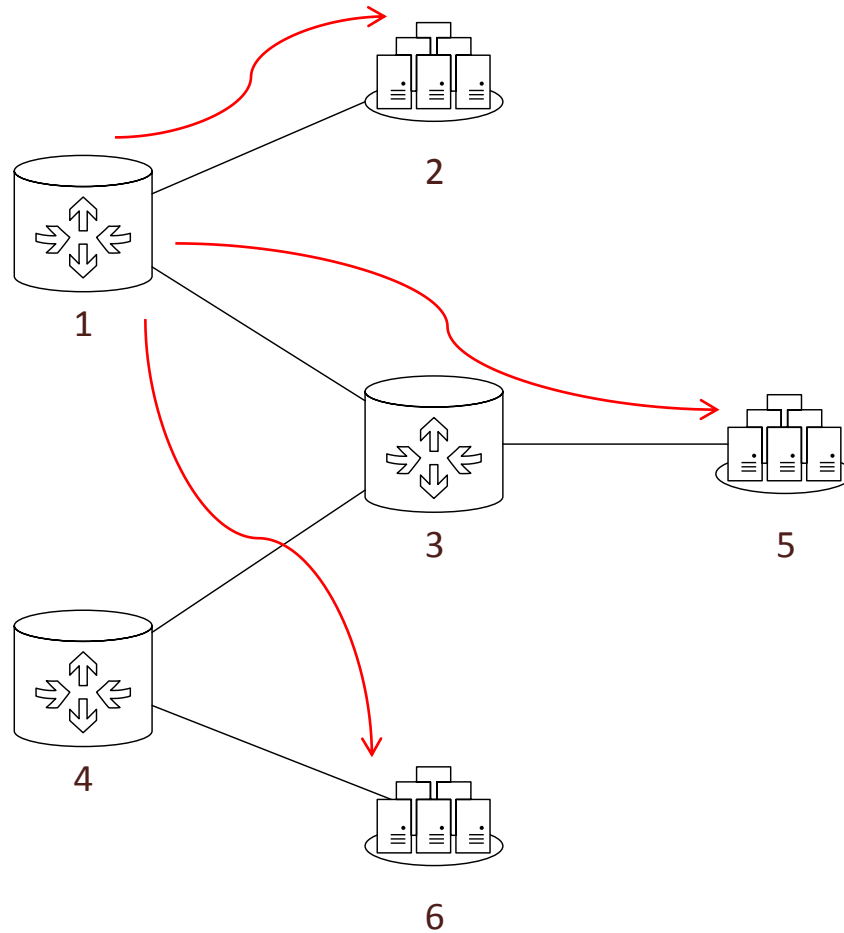
# Universities

- Federal University of Pará
  - LPRAD (Laboratory on Planning High Performance Networking)
  - Electrical engineering (ongoing PhD)
- KTH Royal Institute of Technology
  - ONLab (Optical Networks Laboratory)
  - ICT (Information and Communication Technology)
  - Prof. Dr. Paolo Monti

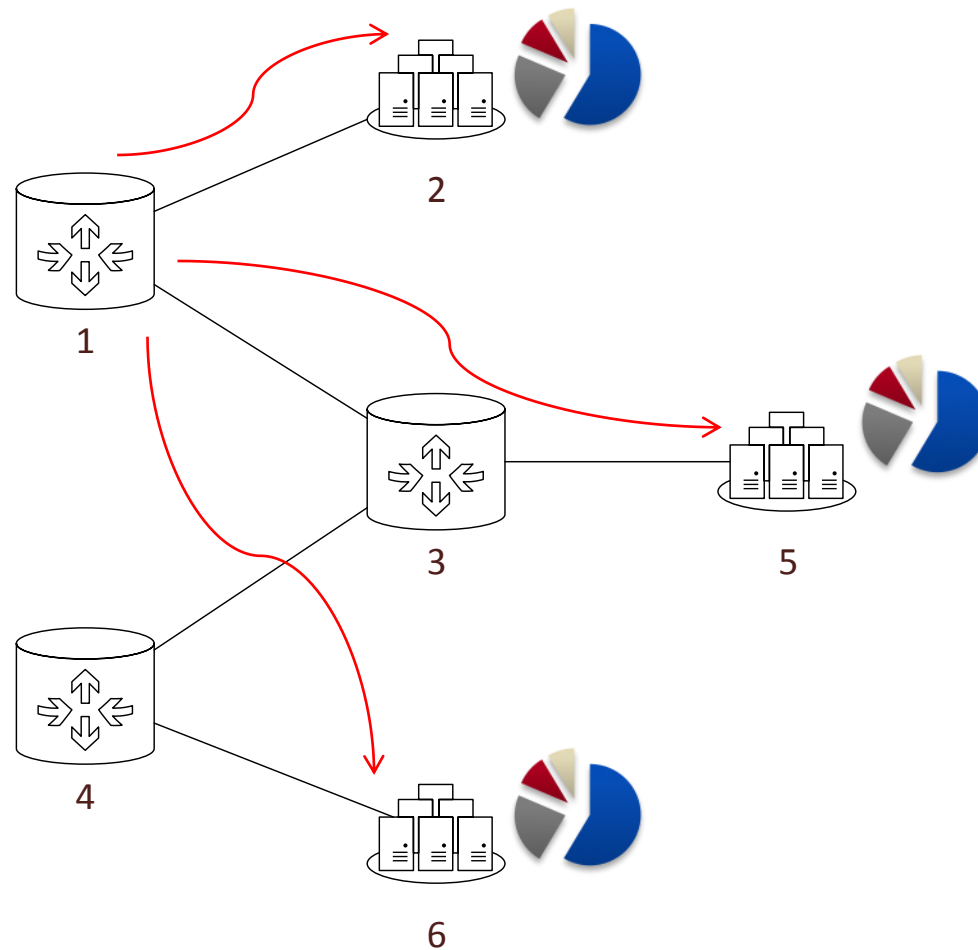
# Optical Networks



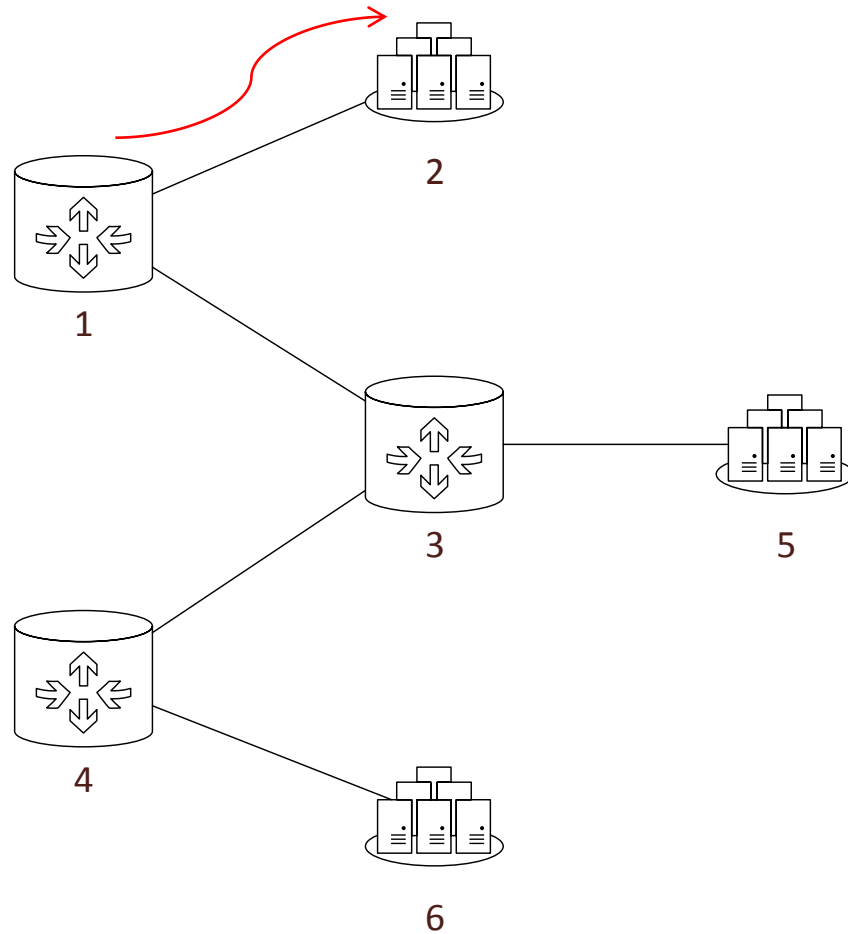
# Optical clouds



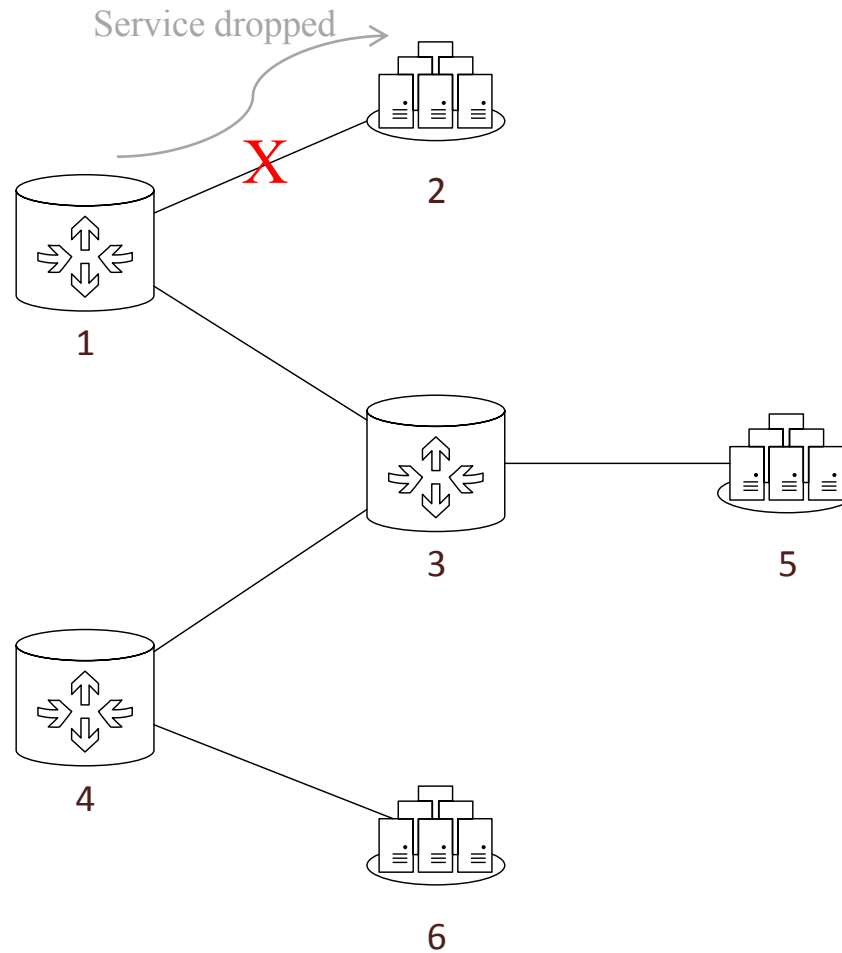
# Optical clouds



# Optical Networks

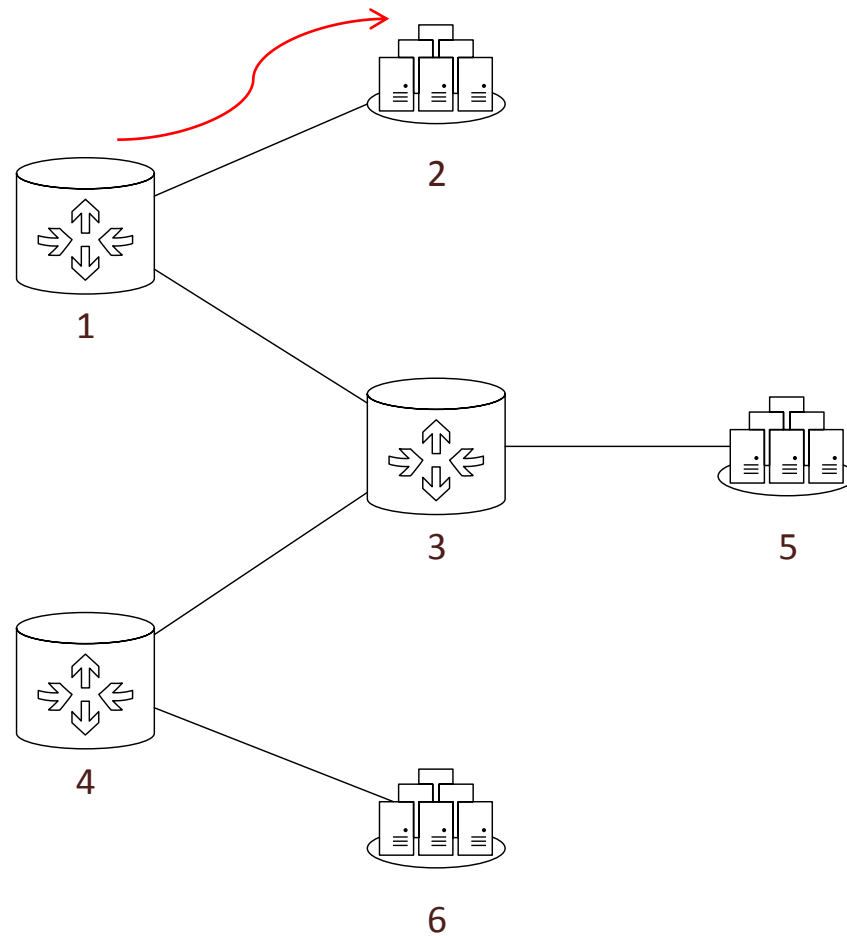


# Optical Networks

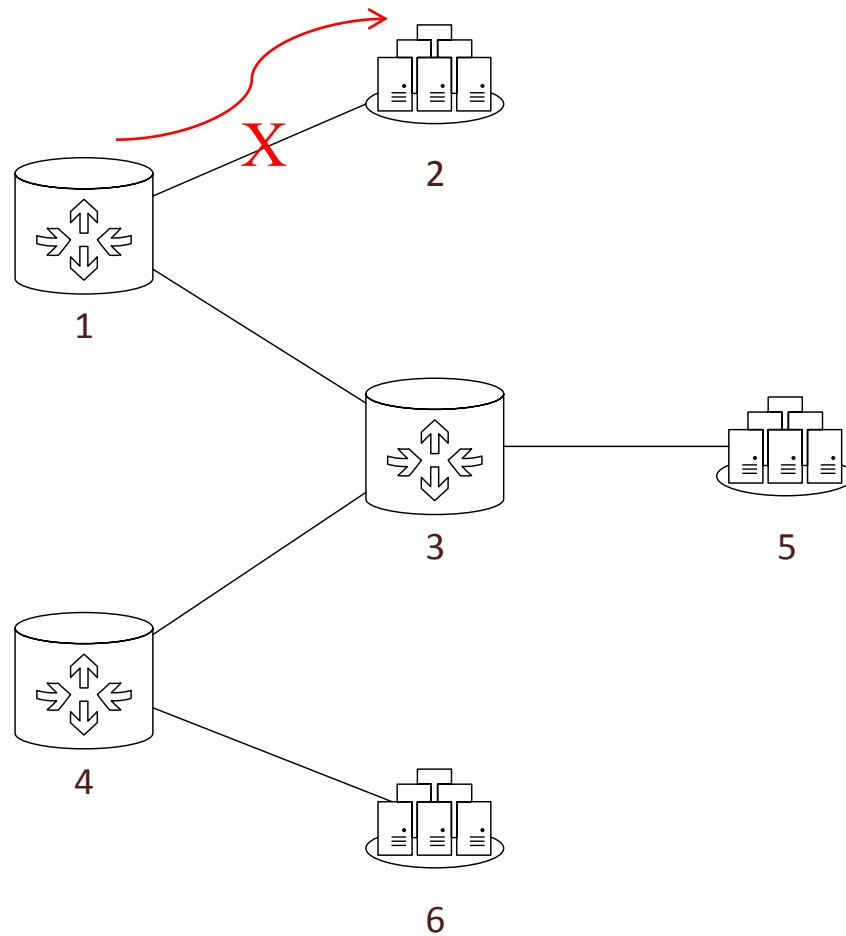




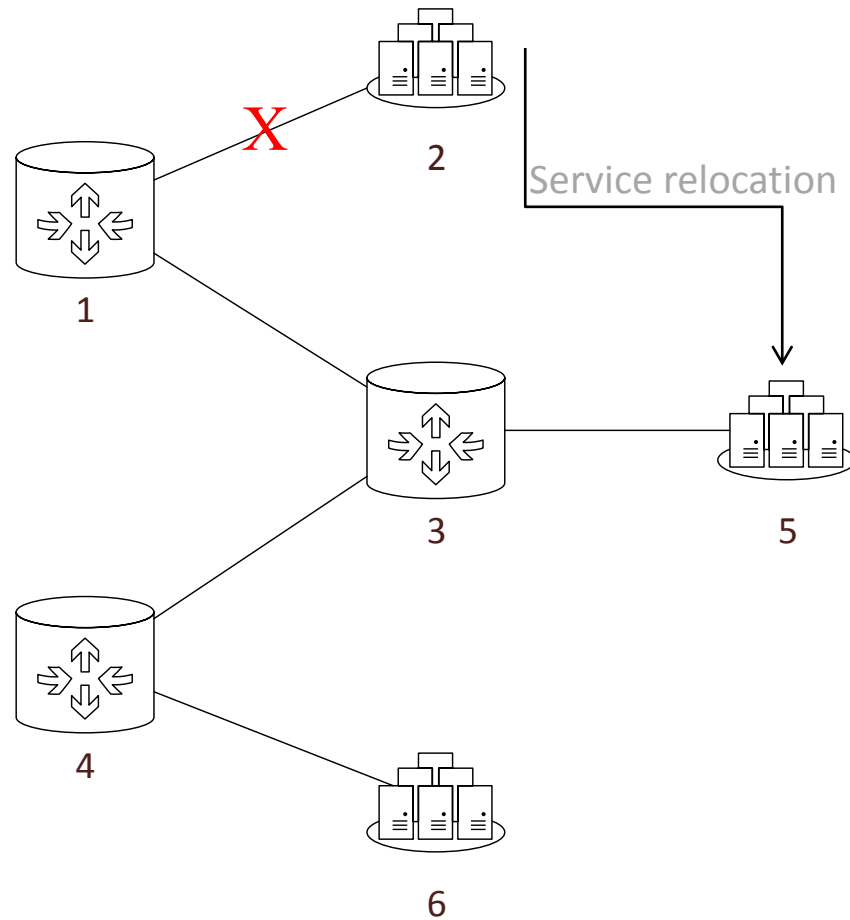
# Optical Clouds



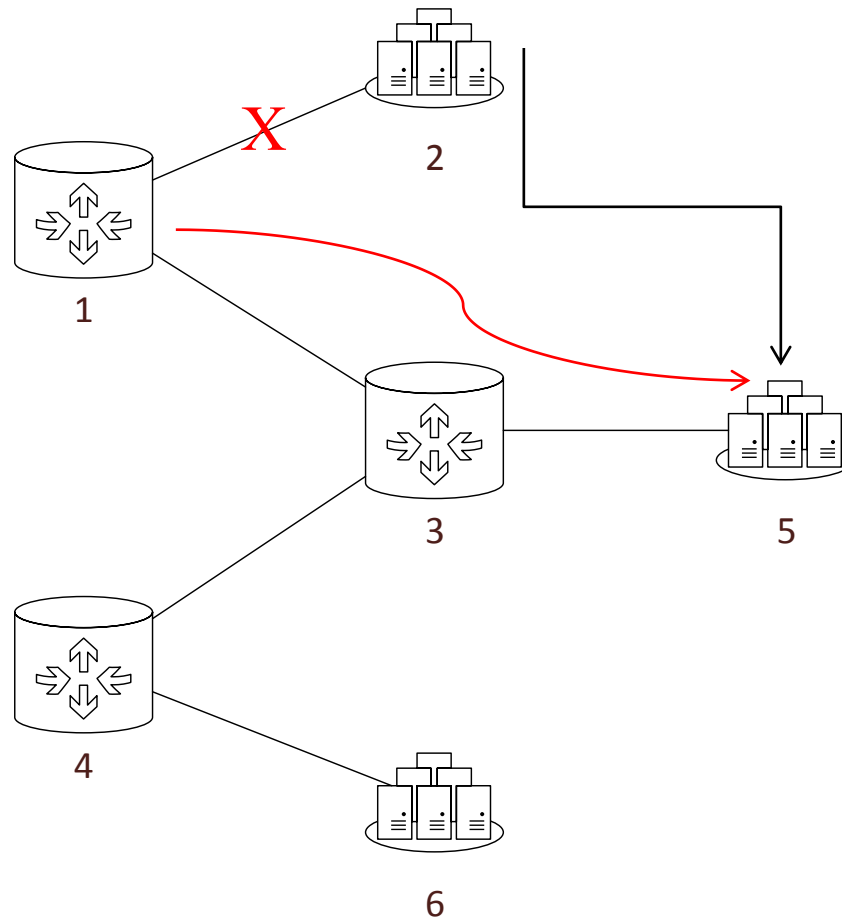
# Optical Clouds



# Optical Clouds



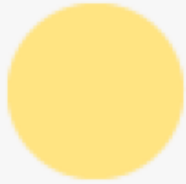
# Optical Clouds



# Next steps

- Design and planning optical cloud infrastructure
  - Networking infrastructure
  - Datacenter infrastructure
  - Use of optimization models
  - Enhance protection level
  - Reduce needed infrastructure
  - How can cities collaborate to improve ICT resilience without high investment?

# What is different?



28° - Clear



Belém



23° - Mostly Cloudy



São Paulo



10° - Drizzle

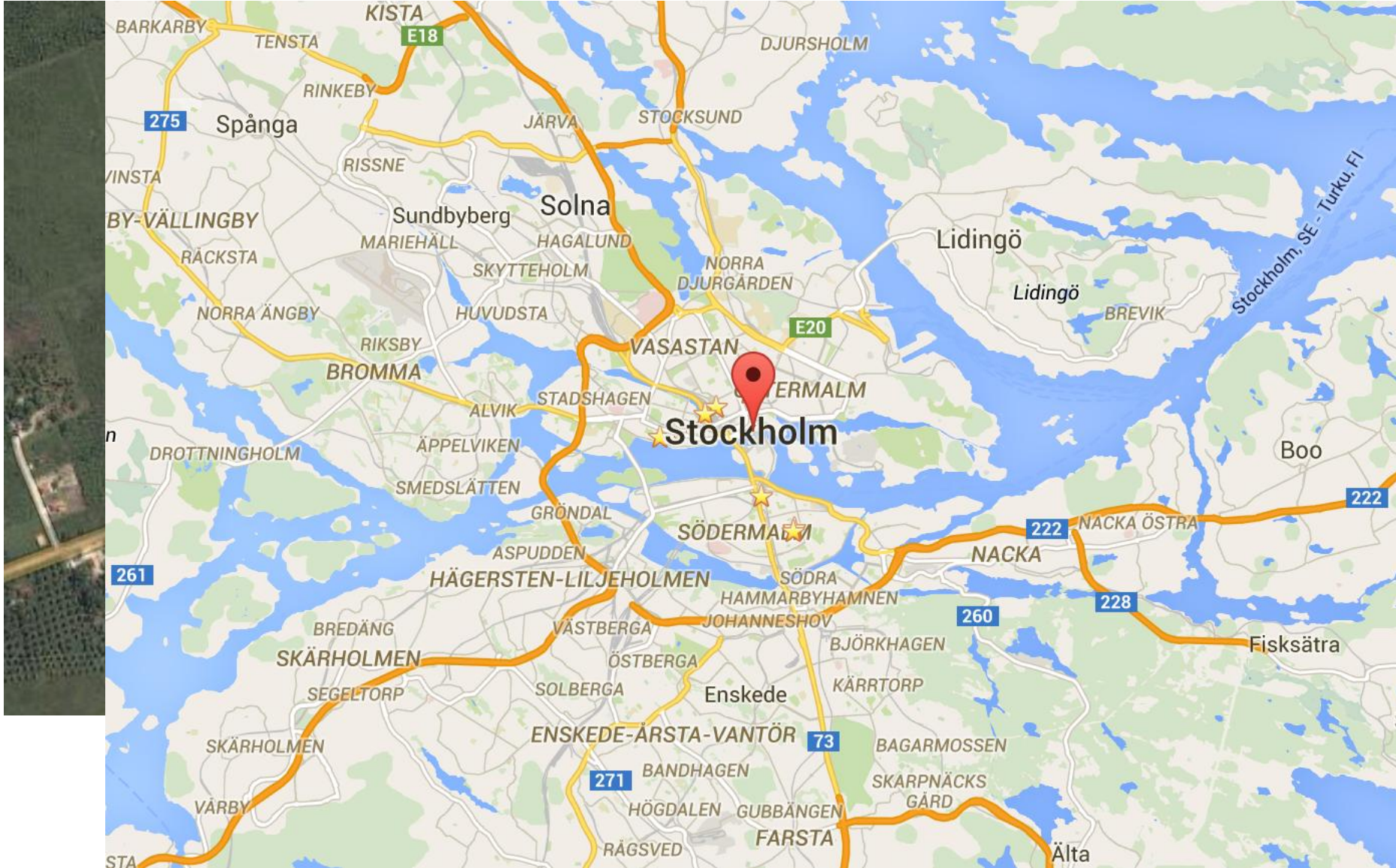


Stockholm

# What is different?



# What is different?





# What is different?

- Opportunity
  - Interact with other cultures
  - Interact with other people
  - Turn your project into something real
  - Enhance as person and researcher
  - People, friends
  - Green grass on the summer, and snow on the winter (as I had never seen)

**QUESTIONS?**



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