Overall course conclusion

General principles

- Measurement techniques
  - Active probing
  - Passive observation
- Measurement platforms
  - M-Lab, RIPE Atlas, Looking glass, RouteViews, RIPE RIS
  - PlanetLab Europe
- Sound measurement practices
  - Study the precision, accuracy of measurement tool
  - Monitor environment
  - Log meta-data
- Measurements raise ethical issues
  - Evaluate risk versus benefit

Network topology and routes

- Interdomain topology and routes
  - BGP updates
- IP level topology and routes
  - Traceroute
- Size of the network, lengths of routes
  - Small world

Connectivity, losses, latency, geolocation

- The ping tool
- Measuring connectivity, losses, latency
  - Typical loss rates and latencies
  - “Bufferbloat”
- Introduction to geolocation
  - Anycast

Bandwidth

- Definition of bandwidth metrics
  - Capacity, available bandwidth, bulk transfer capacity (BTC)
- Measurement methods
  - Flooding: BTC, available bandwidth, capacity
  - Packet pairs: capacity, available bandwidth
  - Size-delay: capacity
  - Self-induced congestion: available bandwidth

Traffic measurements

- Packet capture
  - Detailed per-packet measurements
  - High collection overhead
- Interface counts
  - Coarse measurements per link
  - Low overhead, widely available
- Flow capture
  - More details than interface counts, less than packet captures
  - Medium collection overhead controlled with sampling

Thank you!