The Privacy Hazards of Abstraction in the Network Stack

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St Andrews

Gregor Haywood

The Network Stack

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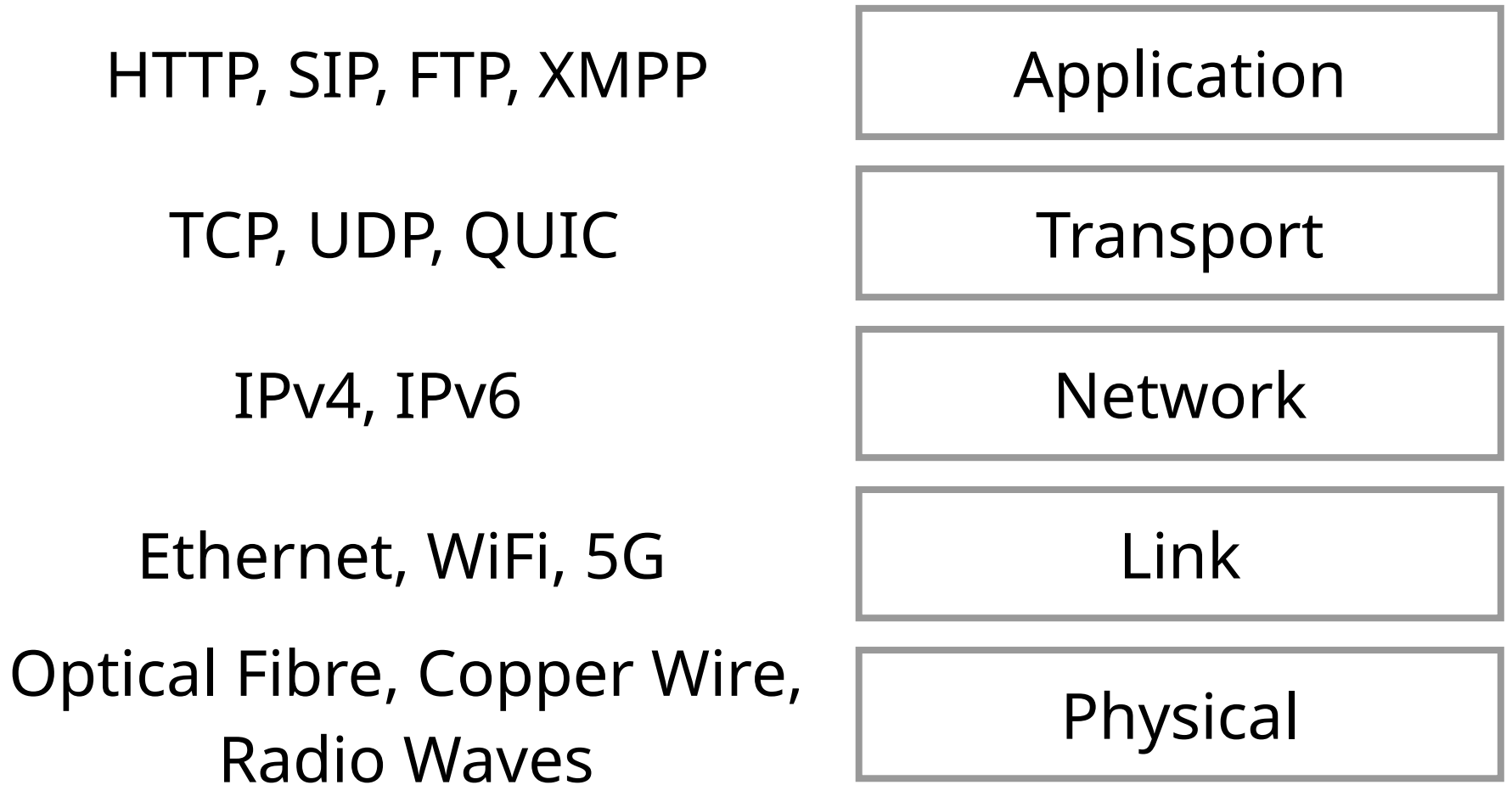
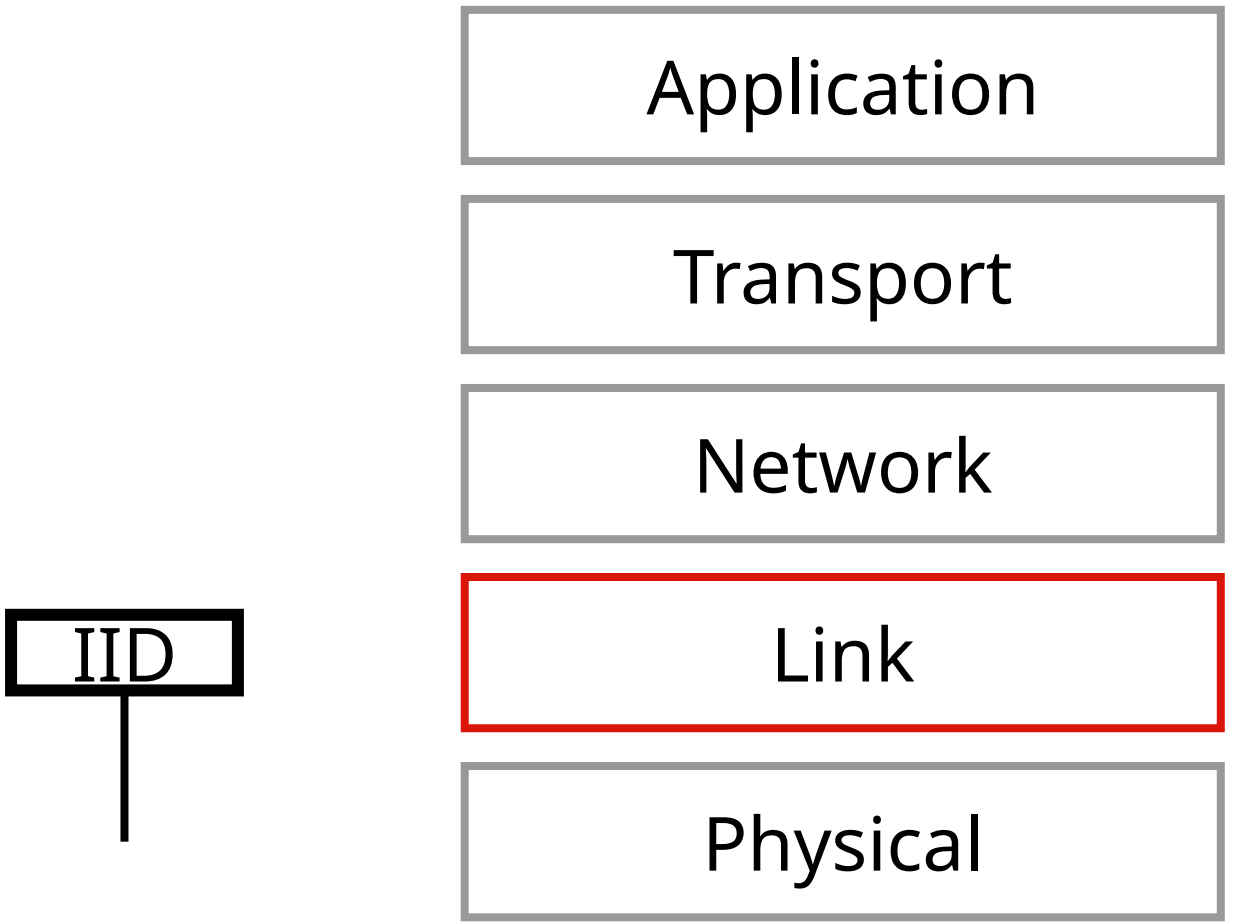
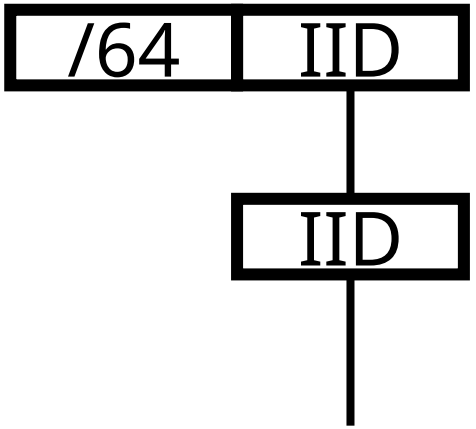


The Network Stack



The Network Stack



Application

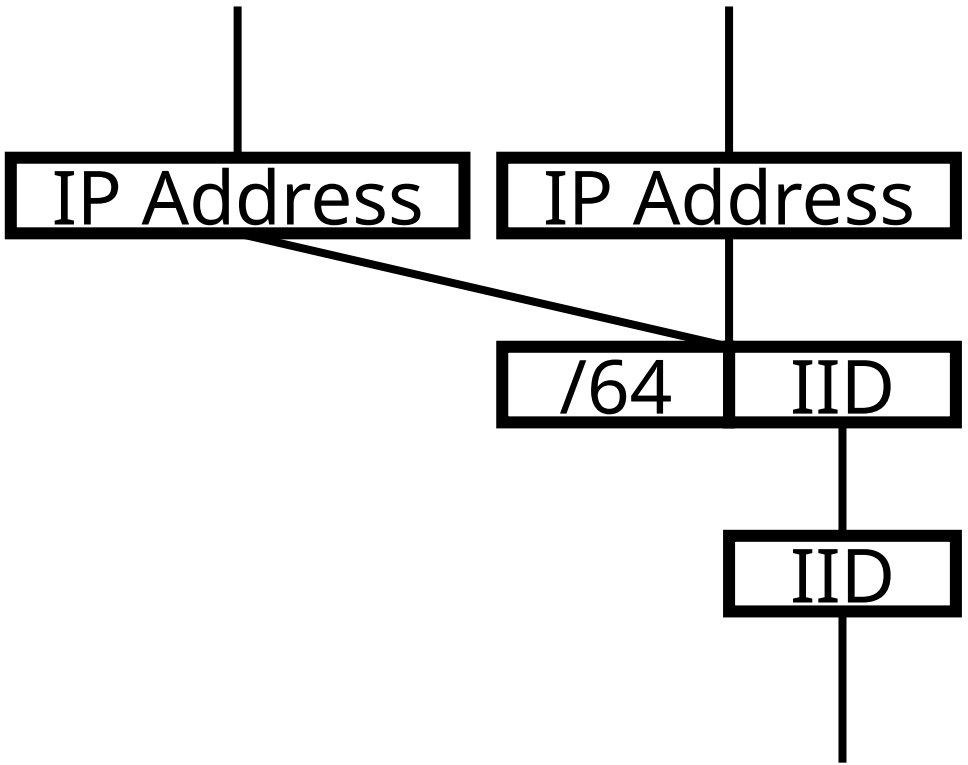
Transport

Network

Link

Physical

The Network Stack



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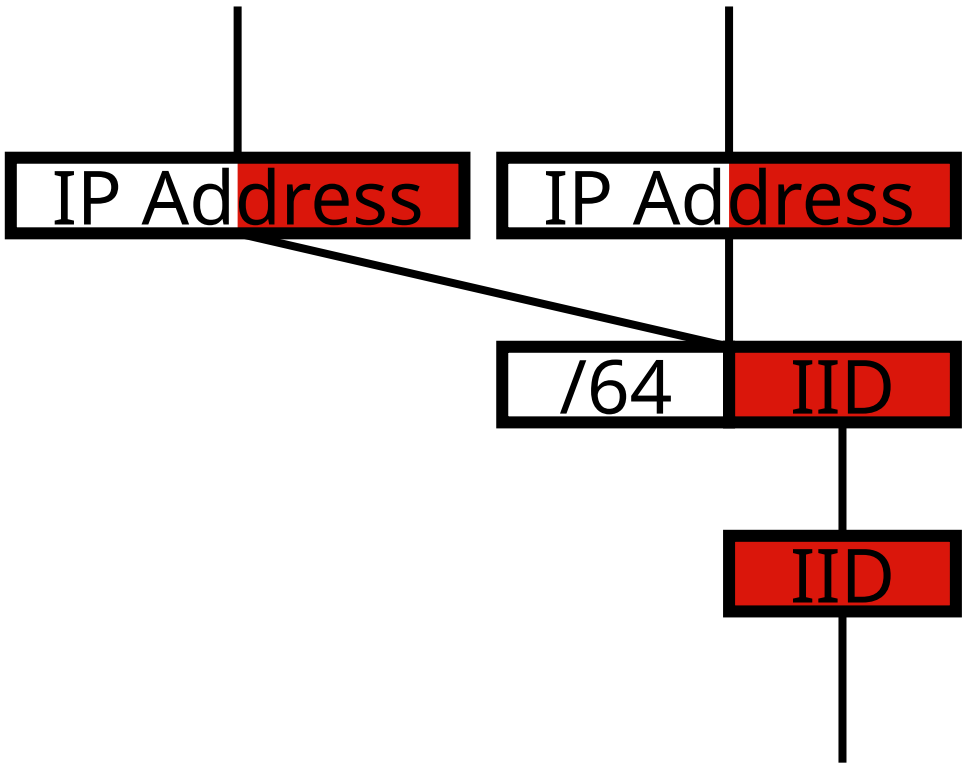

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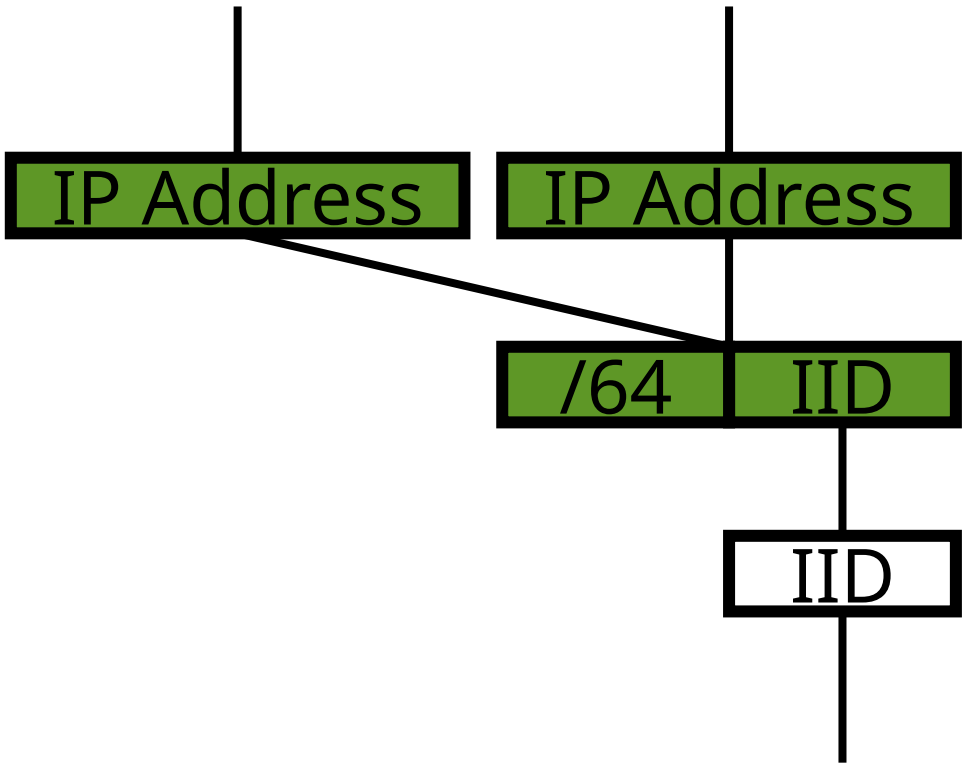

Application

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Physical

Flow Correlation

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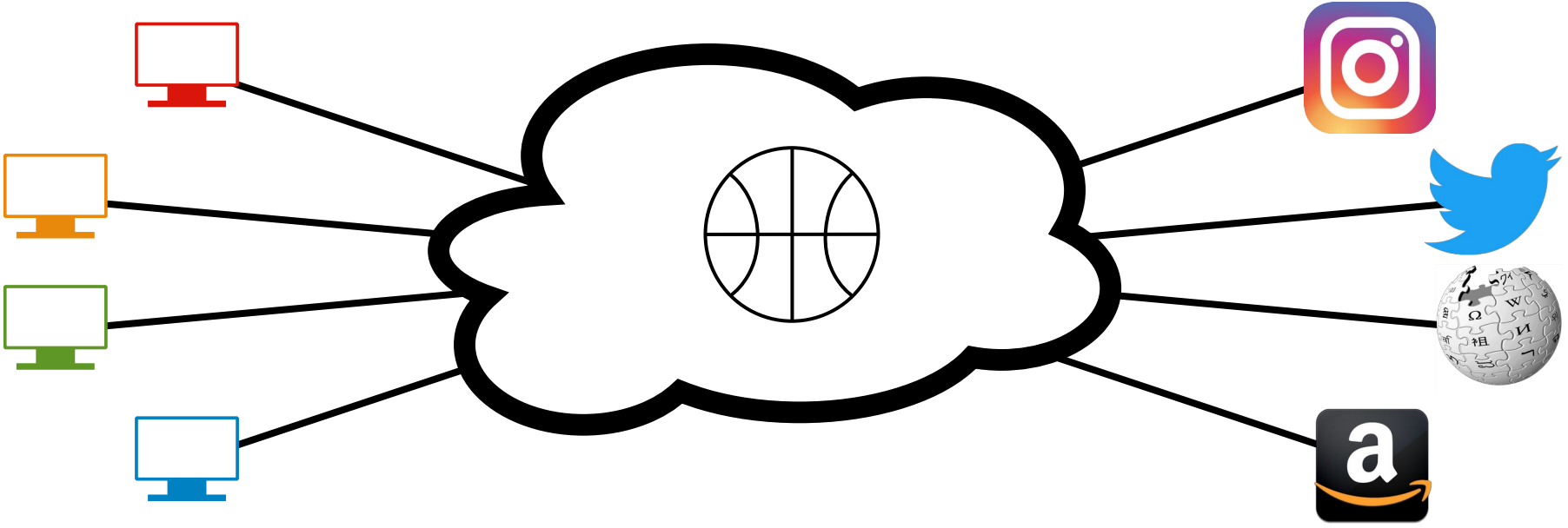
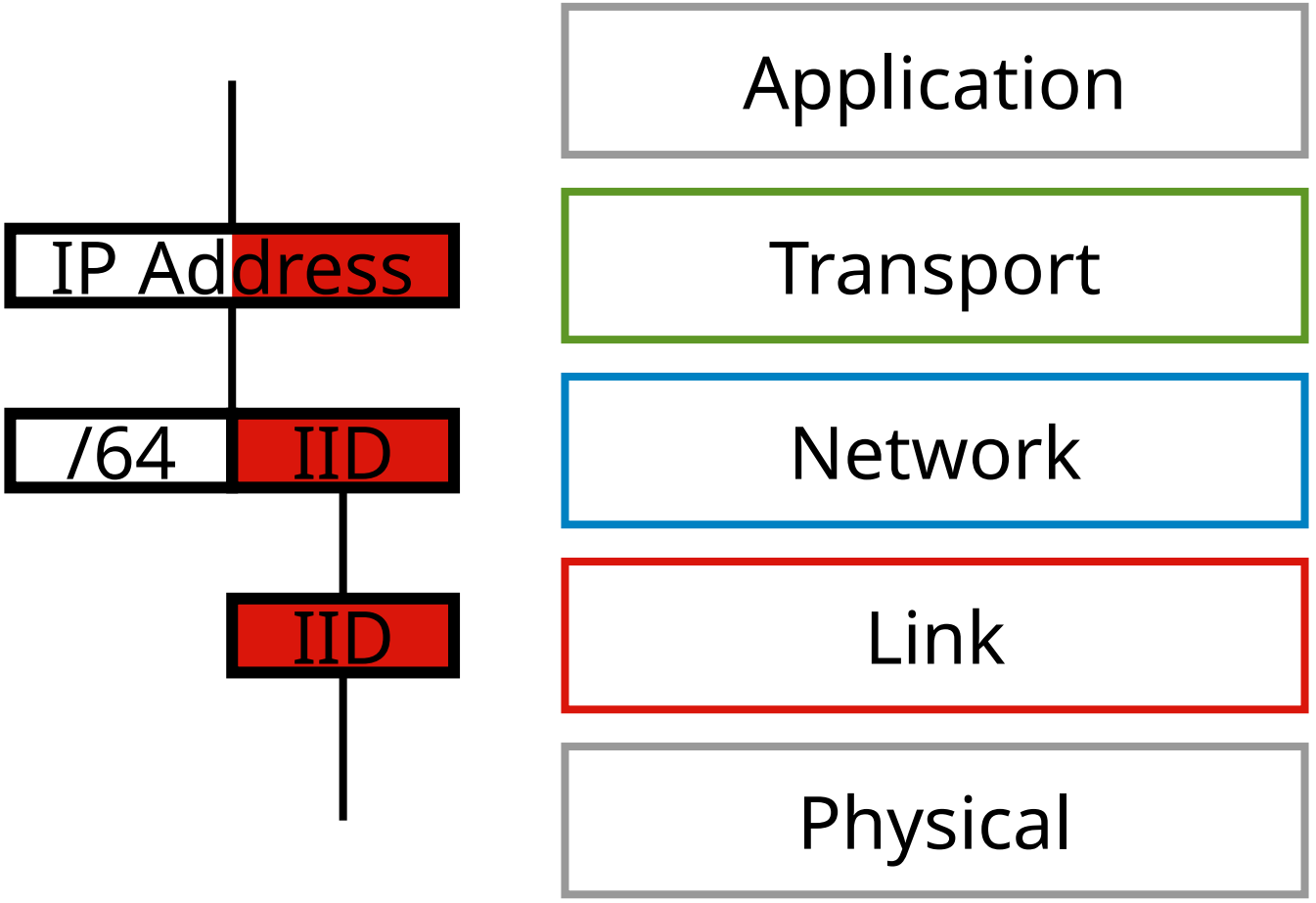


IPv6


IP Address
/64
IID
IID
Application
Transport
Network
Link
Physical

IPv6

ILNP

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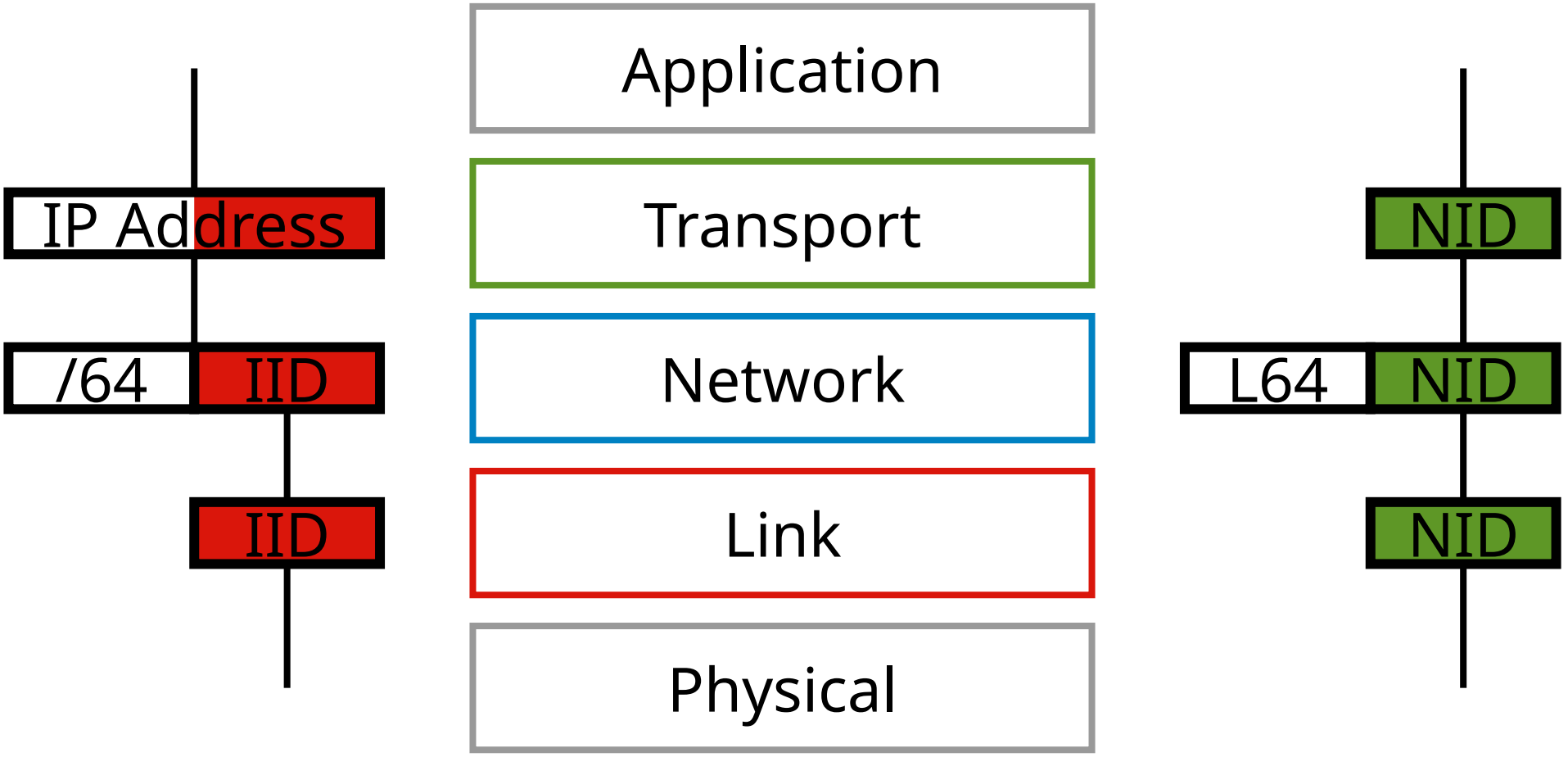

Traffic Analysis

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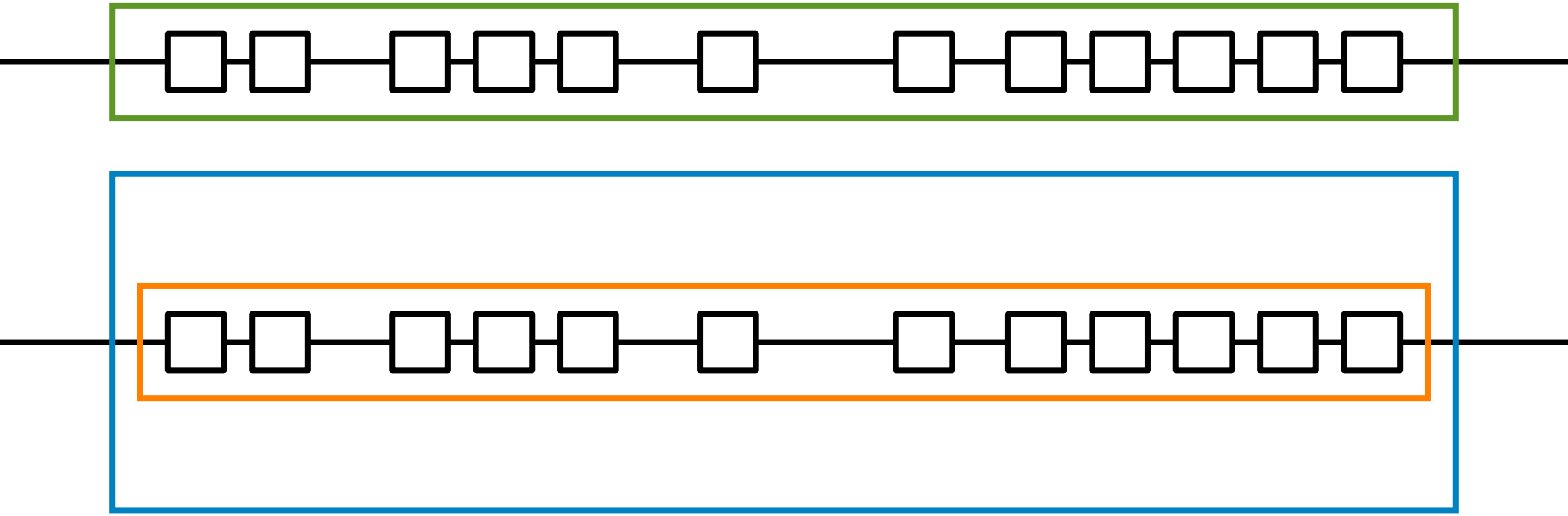
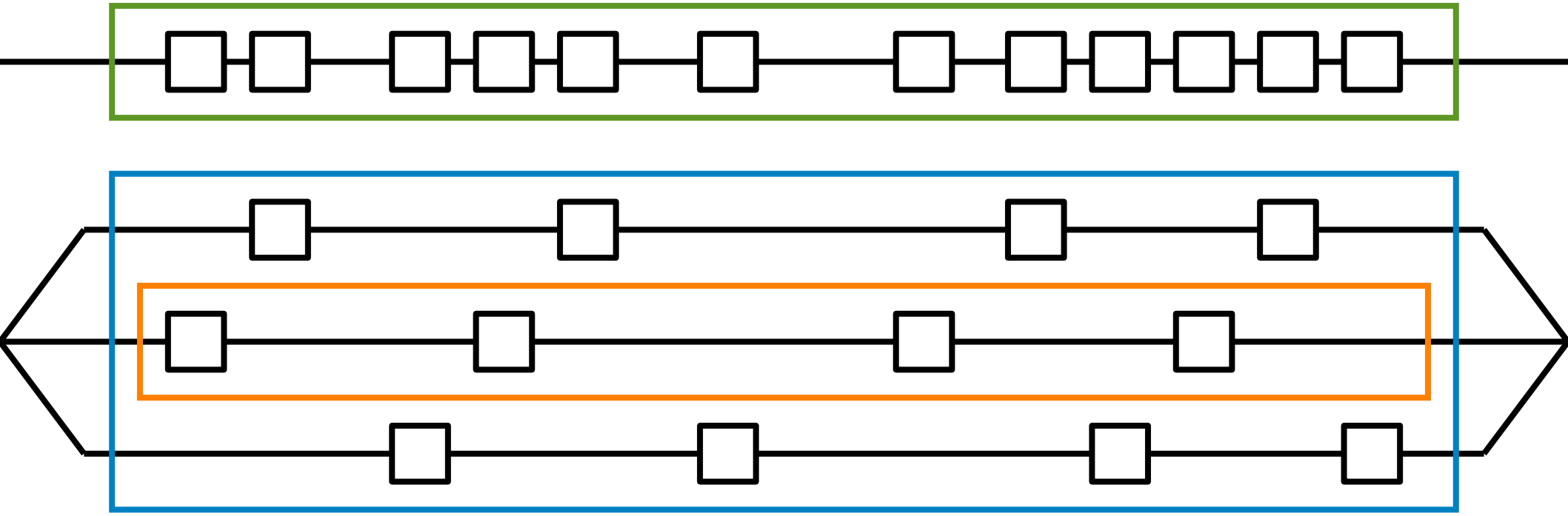


Traffic Analysis

University of St Andrews



IPv6

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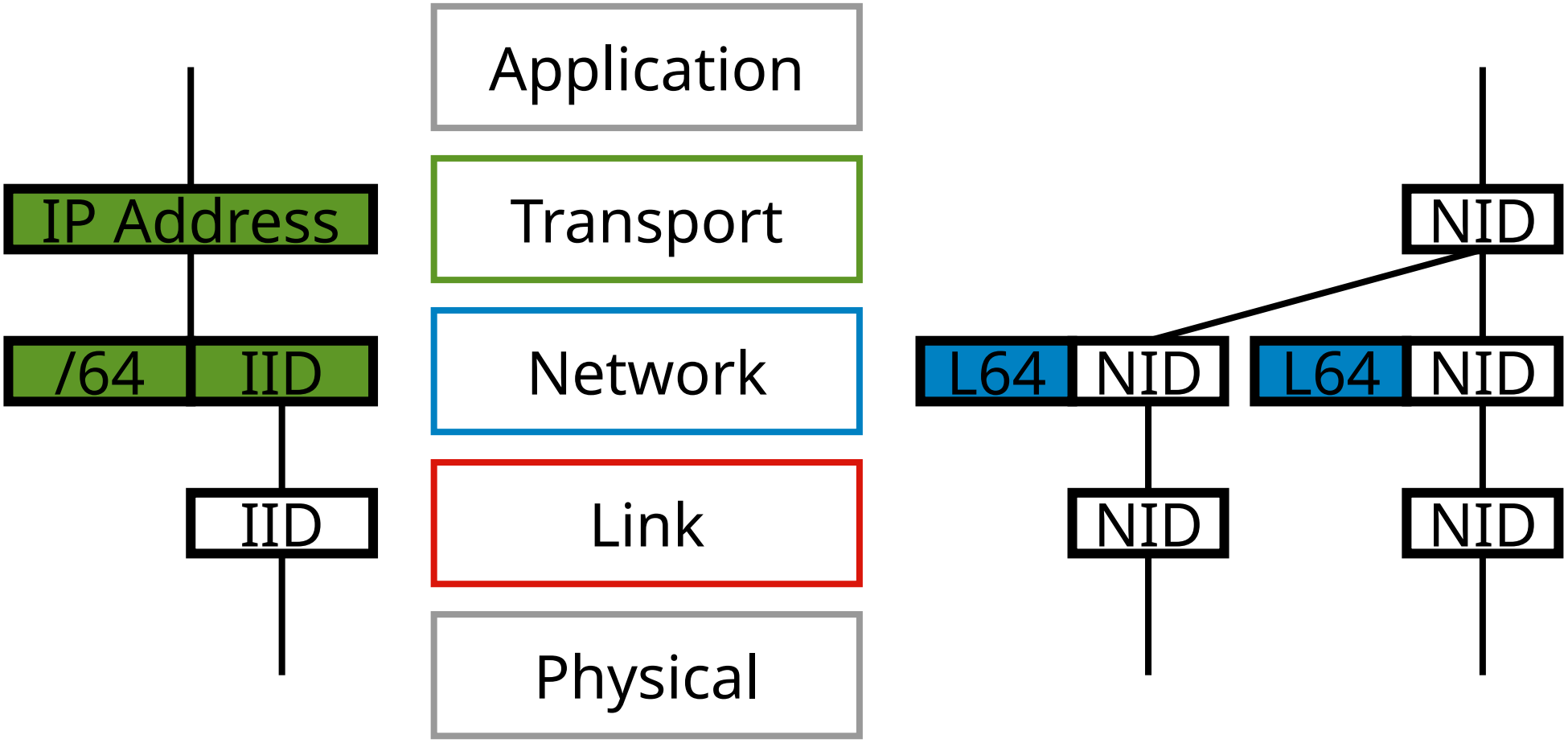

FreeBSD Implementation

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- Ephemeral NIDs work
- Multipath Evasion works in one direction

Summary

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- Abstraction has unintended consequences!
- Engineering (careful) changes to API is tricky
  - …but not **too** tricky

Questions?

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