Multiple Access Networks: Properties and Selection

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Scenario: Multiple Access Networks

- Host can use either access network
- Default interface not always best
- Our approach: The host
  - learns about networks
  - chooses which one to use
Research Questions

- How to get access network properties?
- Which network to choose for what traffic?
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- How to get access network properties?
- Which network to choose for what traffic?

To answer them, we developed the **Socket Intents Prototype**

- Runs in user space
- Gathers network properties
- Selects between local network interfaces

Learning about Properties

- Limitation: No data for un-used network
- Do active probing?
Learning about Round Trip Time

- Smoothed Round Trip Time of current TCP connections
- Minimum, median
- Per destination IP, subnet, ...?
Learning about Bandwidth

- Byte counter of local network interface
- Divide difference between samples by time
- “Available bandwidth” ≈ maximum seen download rate
- Assumes bottleneck in access network
Selecting a Network

- Objective: Good performance for application
- Challenge: Not always a clear “winner”
- Optimize for low RTT or high bandwidth?
- Application tells us: Socket Intent
Threshold Policy

- Estimate load time on all interfaces
- Pick interface with shortest load time
- Small transfer → Low latency interface
- Big transfer → High bandwidth interface
Future Work

- Properties
  - Do active probing?
  - Aggregate properties by endpoint?

- Selection
  - Evaluate performance benefits for web browsing, video streaming
  - Compare to MPTCP
  - Other optimization objectives, e.g., low resource consumption?