Towards Securing Internet eXchange Points Against Curious onlookers
Routes exchange at IXPs

Emerging place for Internet traffic exchange
- 600+ members
- ~200k IPv4 prefixes
- 5 Tbps peak traffic

Easy physical connectivity
Routes exchange at IXPs

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Routes exchanged via BGP peer-to-peer basis
Routes exchange at IXPs

**Ideal world**

*easy* route exchange

Members at IXPs:
- Member A
- Member B
- Member C
- Member D
Routes exchange at IXPs

Ideal world easy route exchange
Route Servers ease route-exchange
Routes exchange at IXP

**Ideal world**

*easy* route exchange

Route Servers *ease* route-exchange

Members **disclose** routing policies

Privacy concerns!
Routes exchange at IXPs

**Ideal world**
- easy route exchange

Route Servers **ease** route-exchange

Members **disclose** routing policies
- Privacy concerns!

**Revised ideal world**
- easy route exchange **AND**
- no privacy breach
Secure MultiParty Computation (SMPC)

Who is richer?

Bill: 76B $
Warren: 66B $

Result: Bill!
SIXPACK route dispatcher

- Emulates full-mesh of BGP sessions
- Privacy preserving
- SMPC-based

Performance per-route:
  - cpu: 0.6 ms (+17%)
  - memory: 6 MB
  - bandwidth: 25 KiB