Towards Securing Internet eXchange Points Against Curious onlooKers

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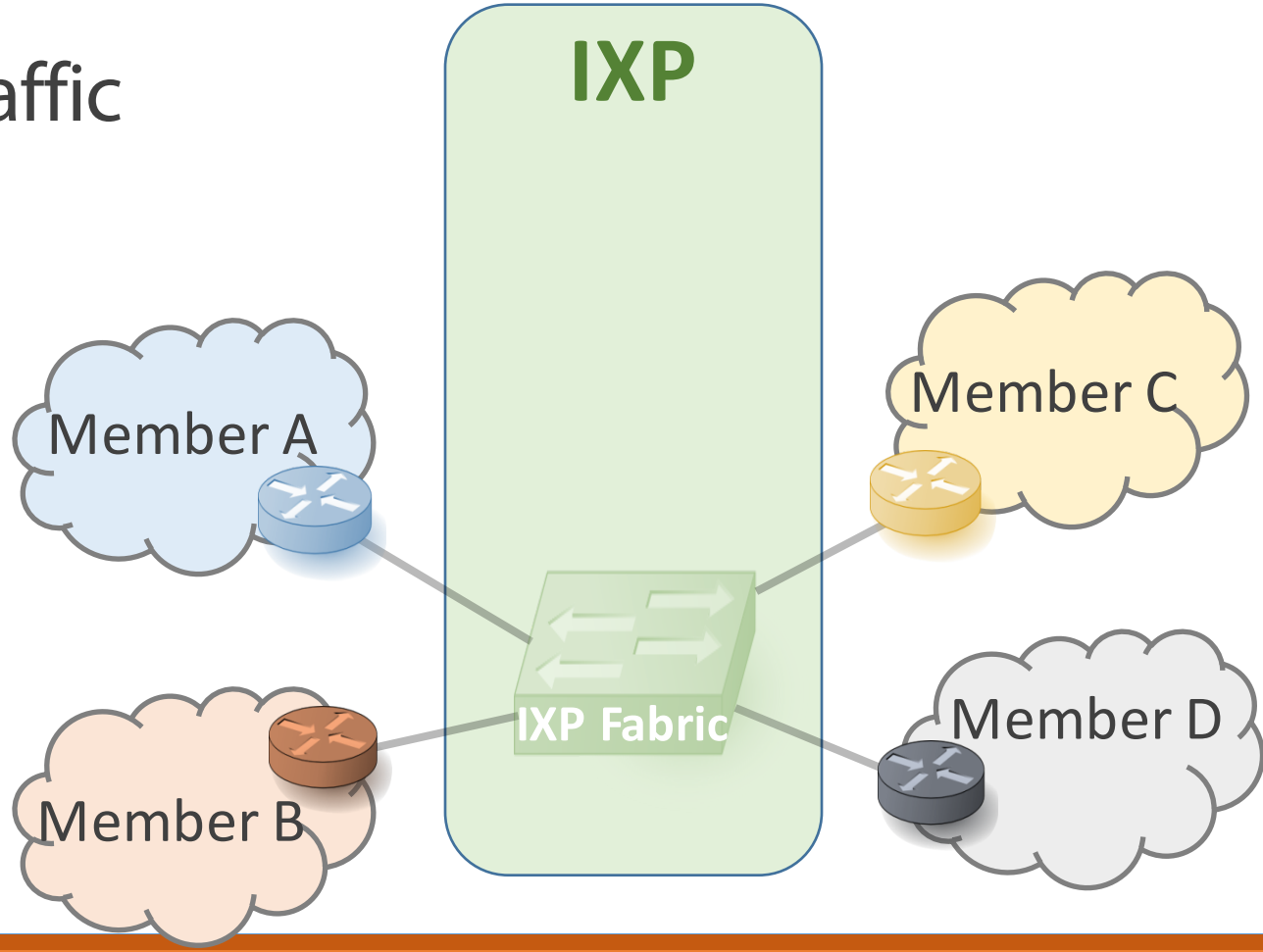
Routes exchange at IXPs

Emerging place for Internet traffic exchange

- 600+ members
- ~200k IPv4 prefixes
- 5 Tbps peak traffic

Easy physical connectivity



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- 600+ members
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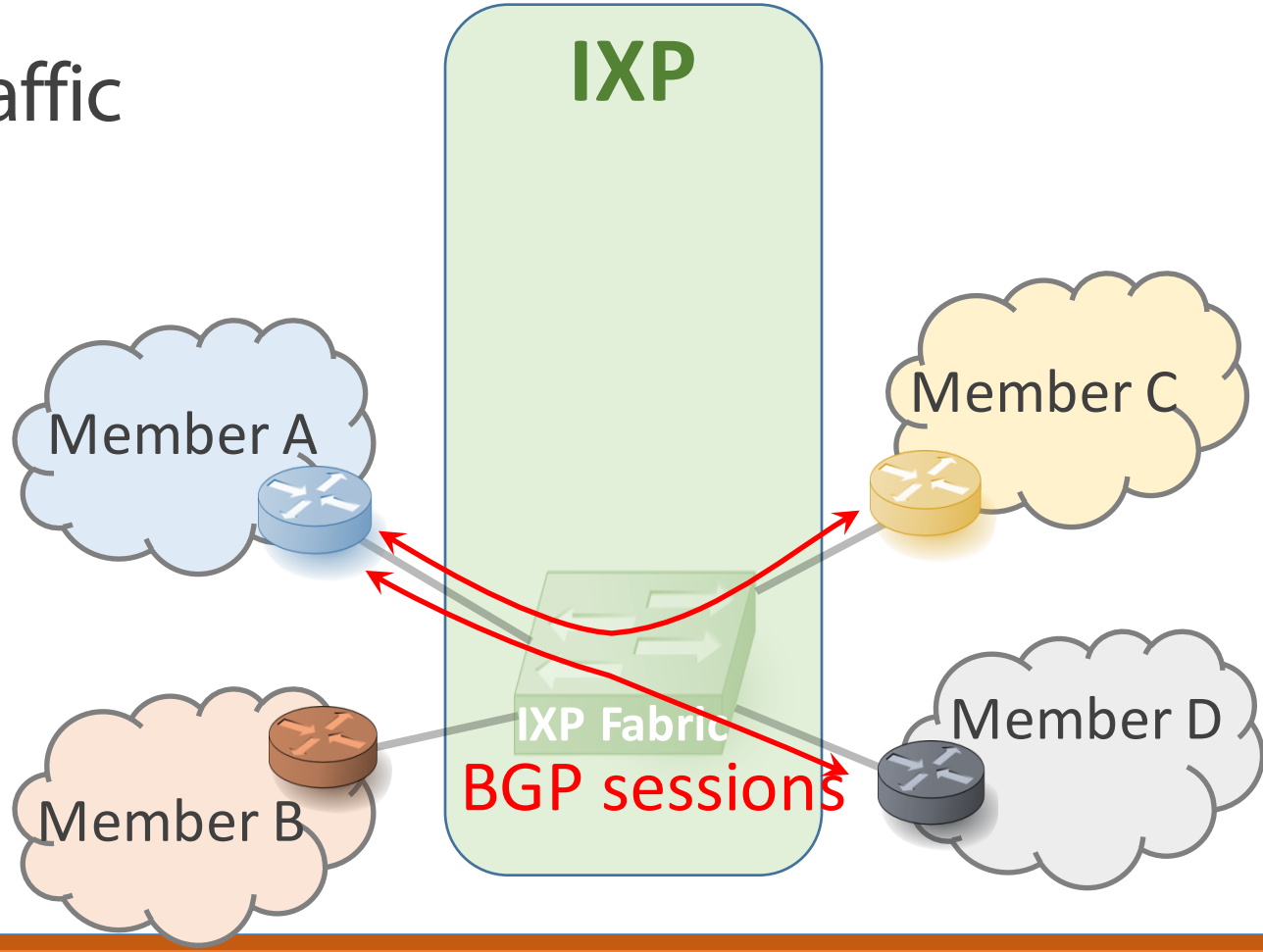
Easy physical connectivity

Routes exchanged via BGP

peer-to-peer basis

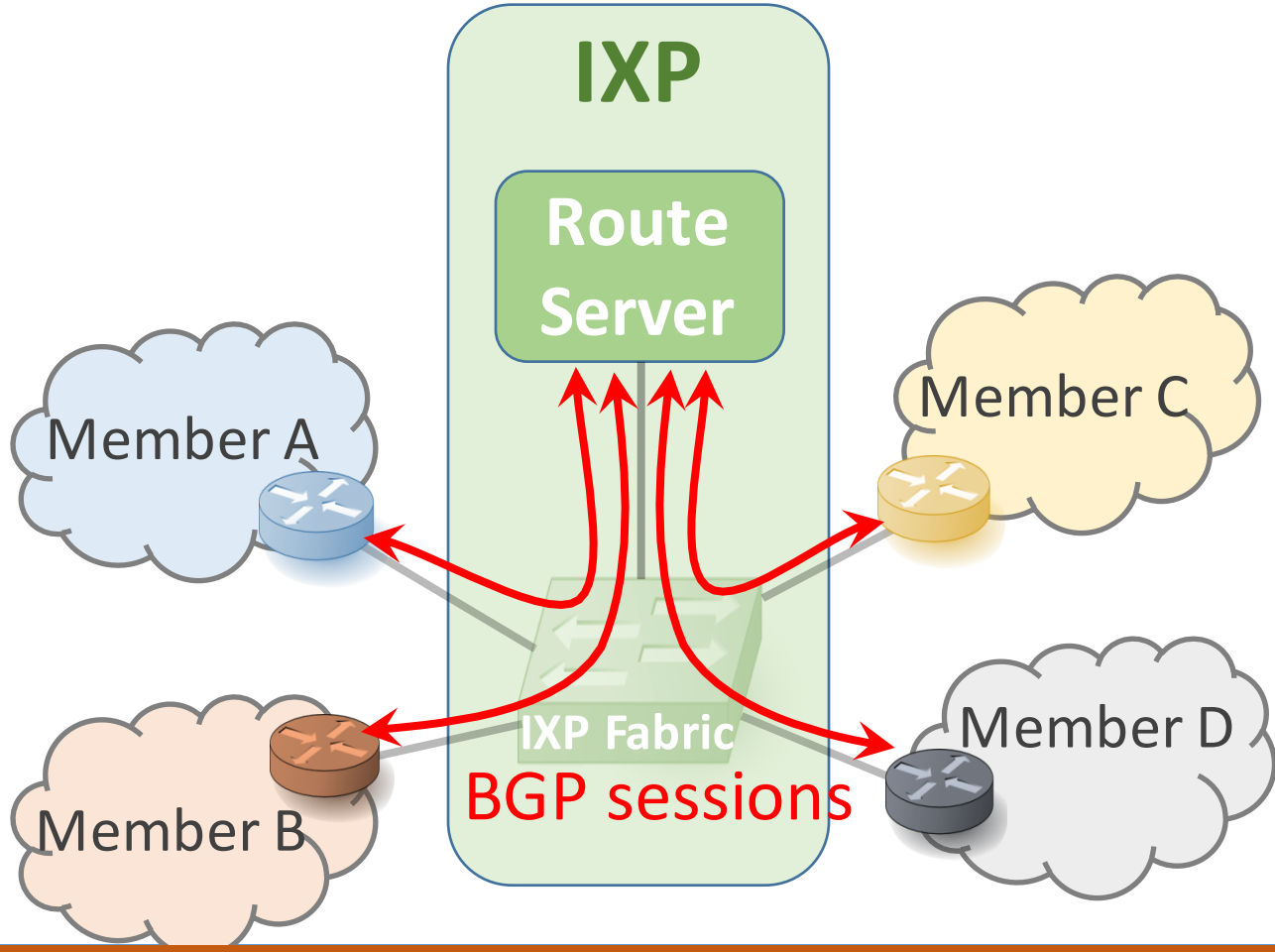


Routes exchange at IXPs

Ideal world

easy route exchange

Route Servers ease route-exchange



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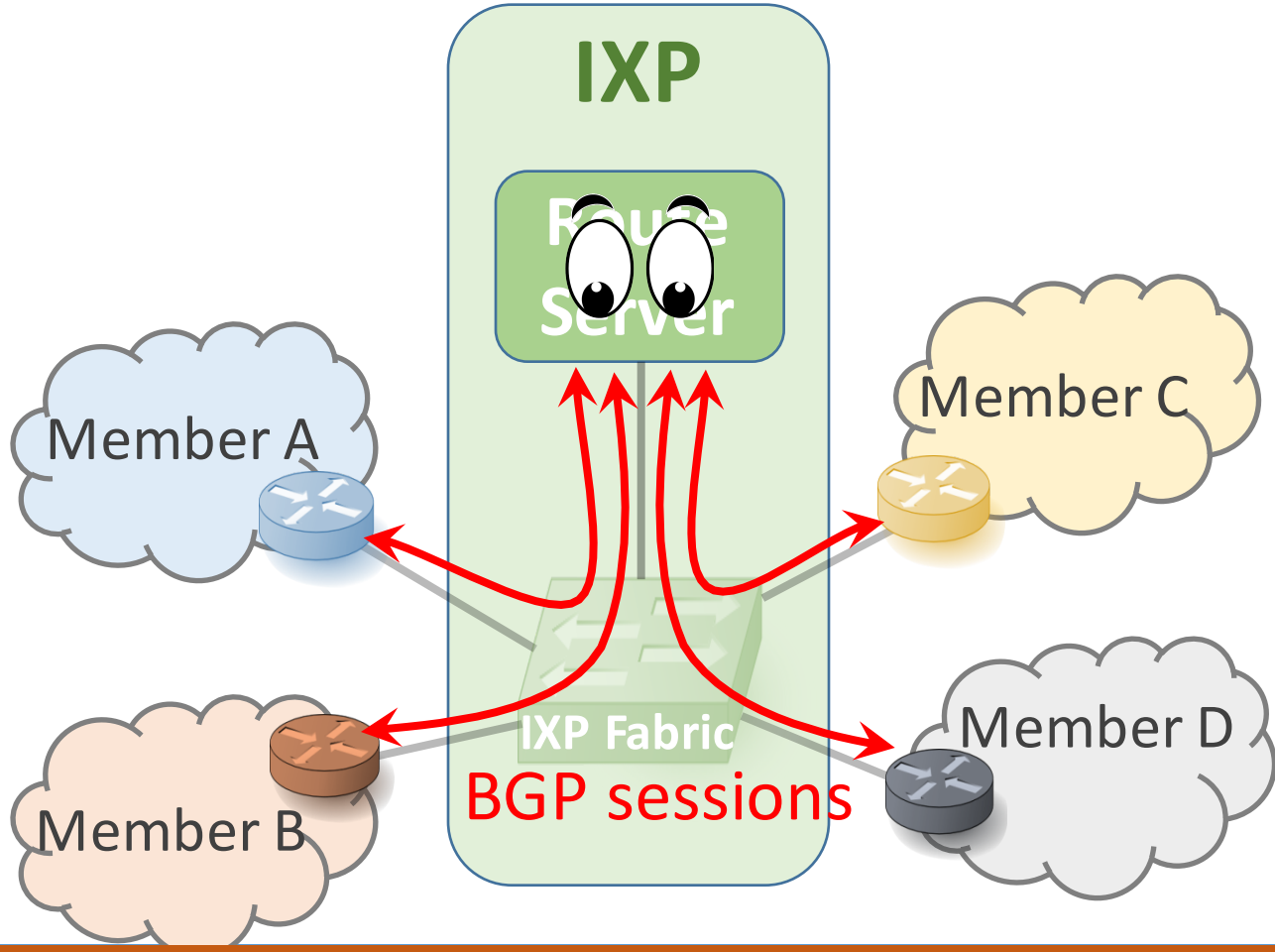
Route Servers ease route-exchange

Members disclose routing policies

Privacy concerns!



Routes exchange at IXPs

Ideal world

easy route exchange

Route Servers ease route-exchange

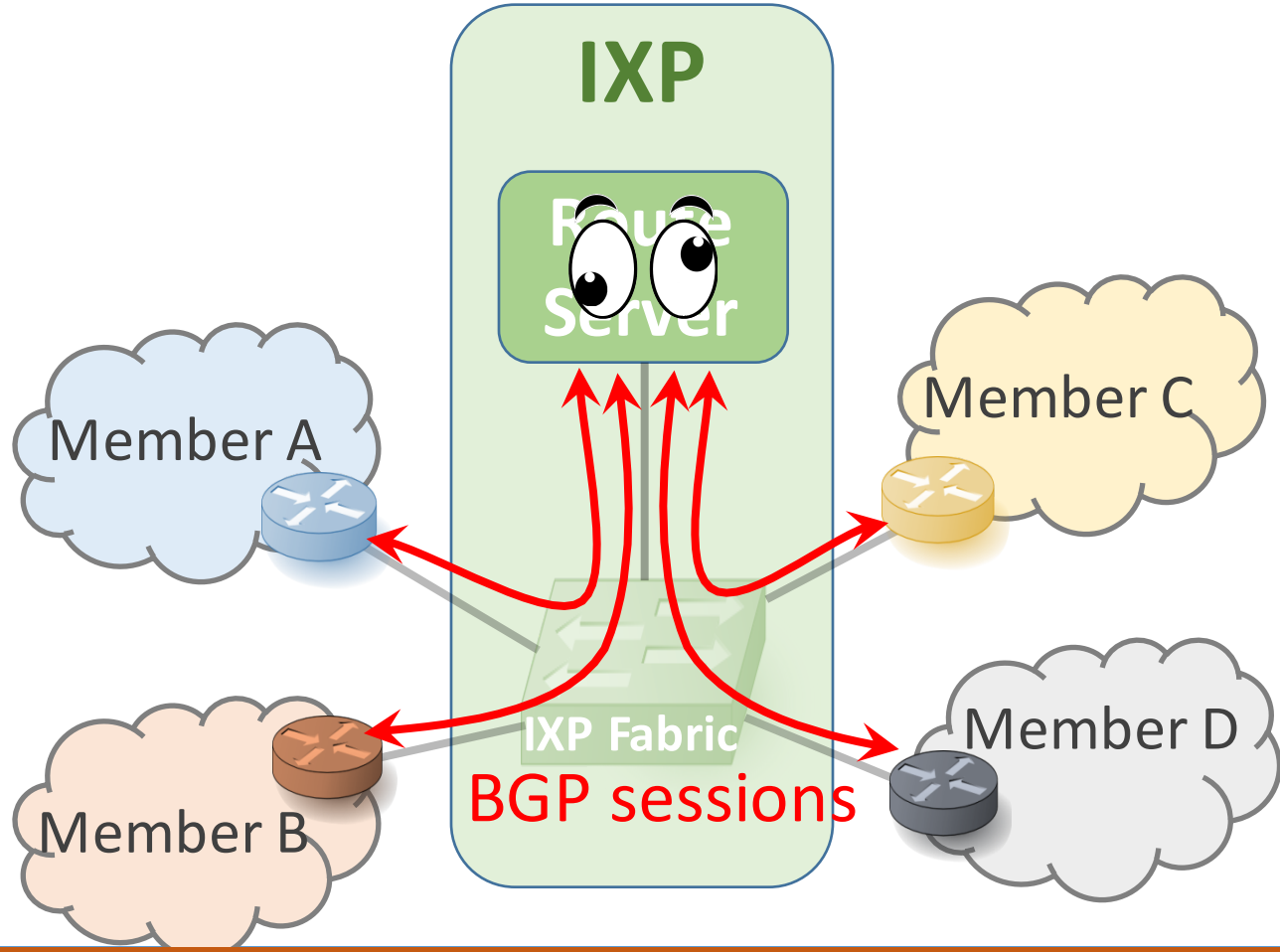
Members disclose routing policies

Privacy concerns!

Revised ideal world

easy route exchange AND

no privacy breach



Secure MultiParty Computation (SMPC)

Who is richer?

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Who is richer?

SIXPACK route dispatcher

Emulates full-mesh of BGP sessions

Privacy preserving

SMPC-based: 2 parties

Performance per-route:

cpu:	0.6 ms (±17%)
memory:	6 MB
bandwidth:	25 KiB