Clover

How do your packets flow?

Leslie Carr

Clover Health

SRECon17 Americas

Leslie Carr

@lesliegeek

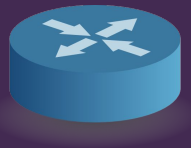
Recovering Network Engineer

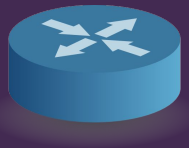
Clover Health, Infrastructure Eng

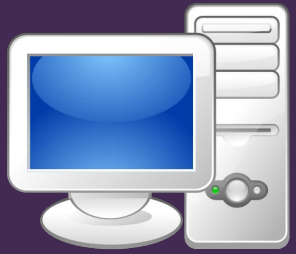
SFMIX, Board of Directors

Previously Google, Craigslist, Twitter, Wikimedia, Cumulus

Kittens







You!

Clover

Kittens

You!

Clover

Kittens

You!

Clover

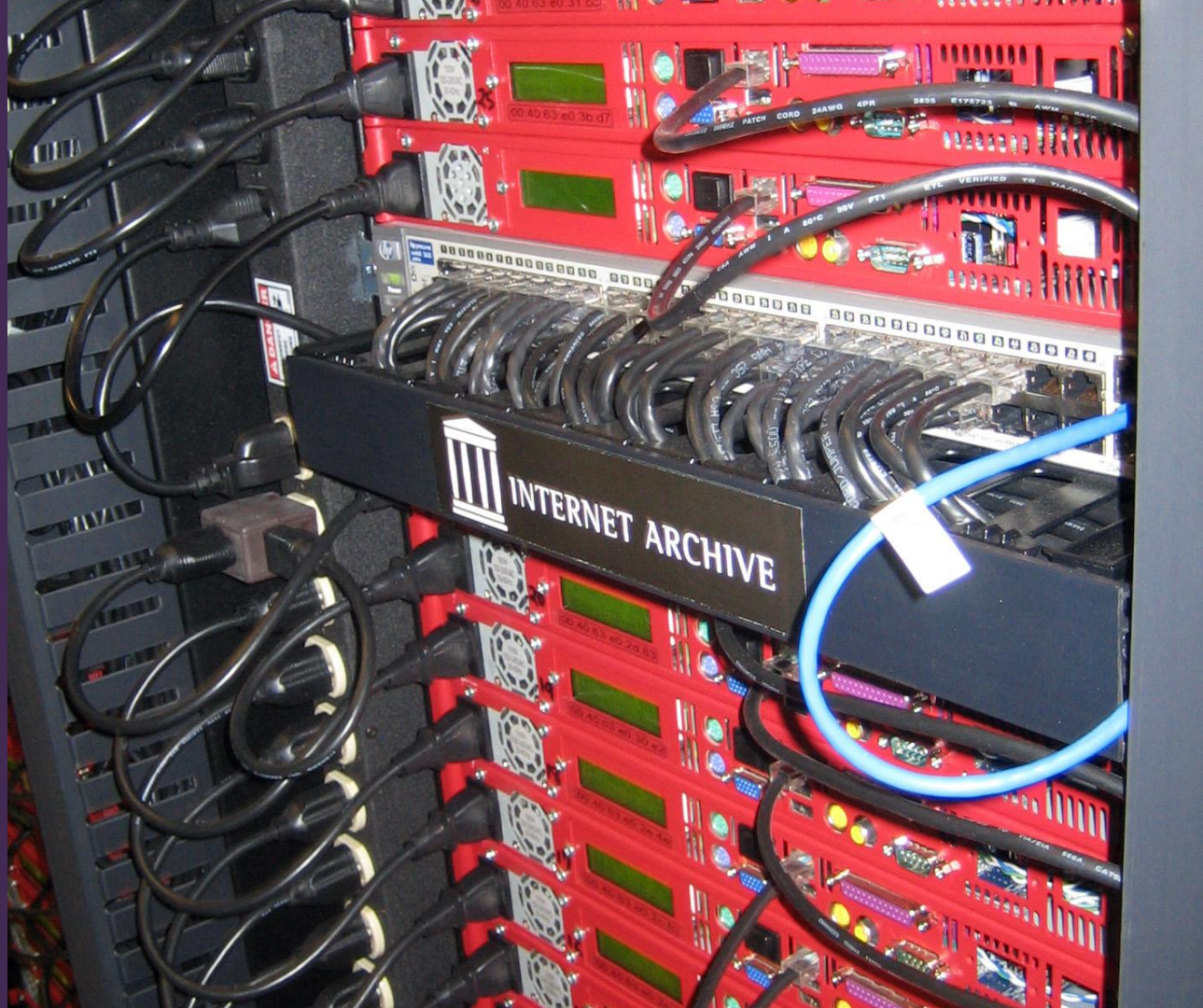
Kittens

You!

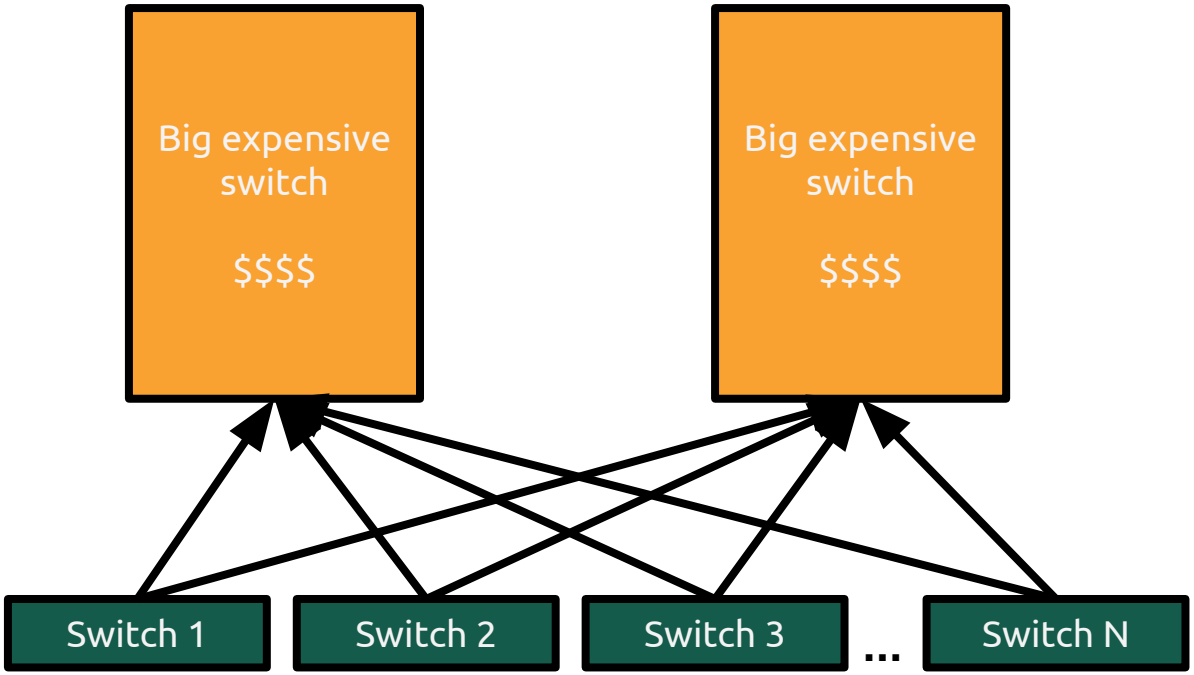
Clover

Physical

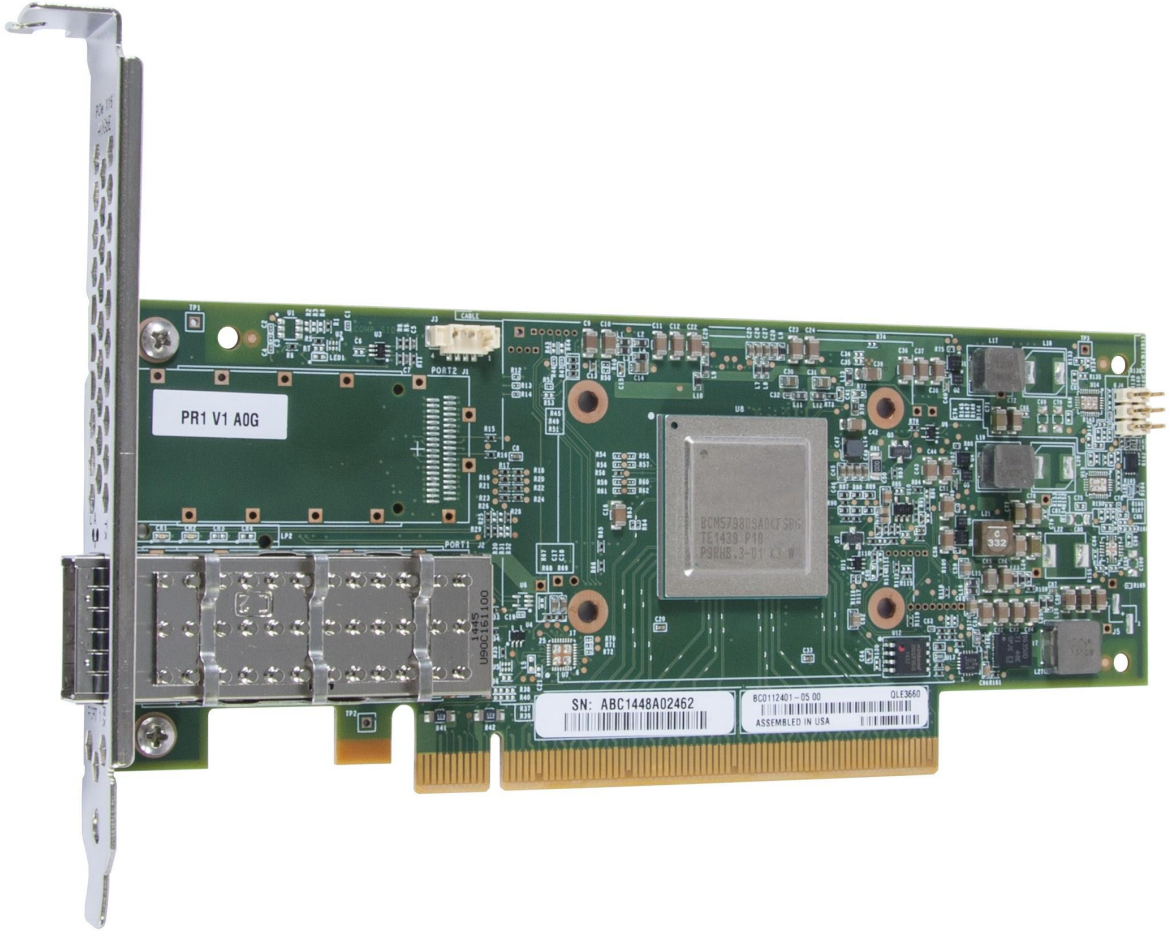
Server to the switch



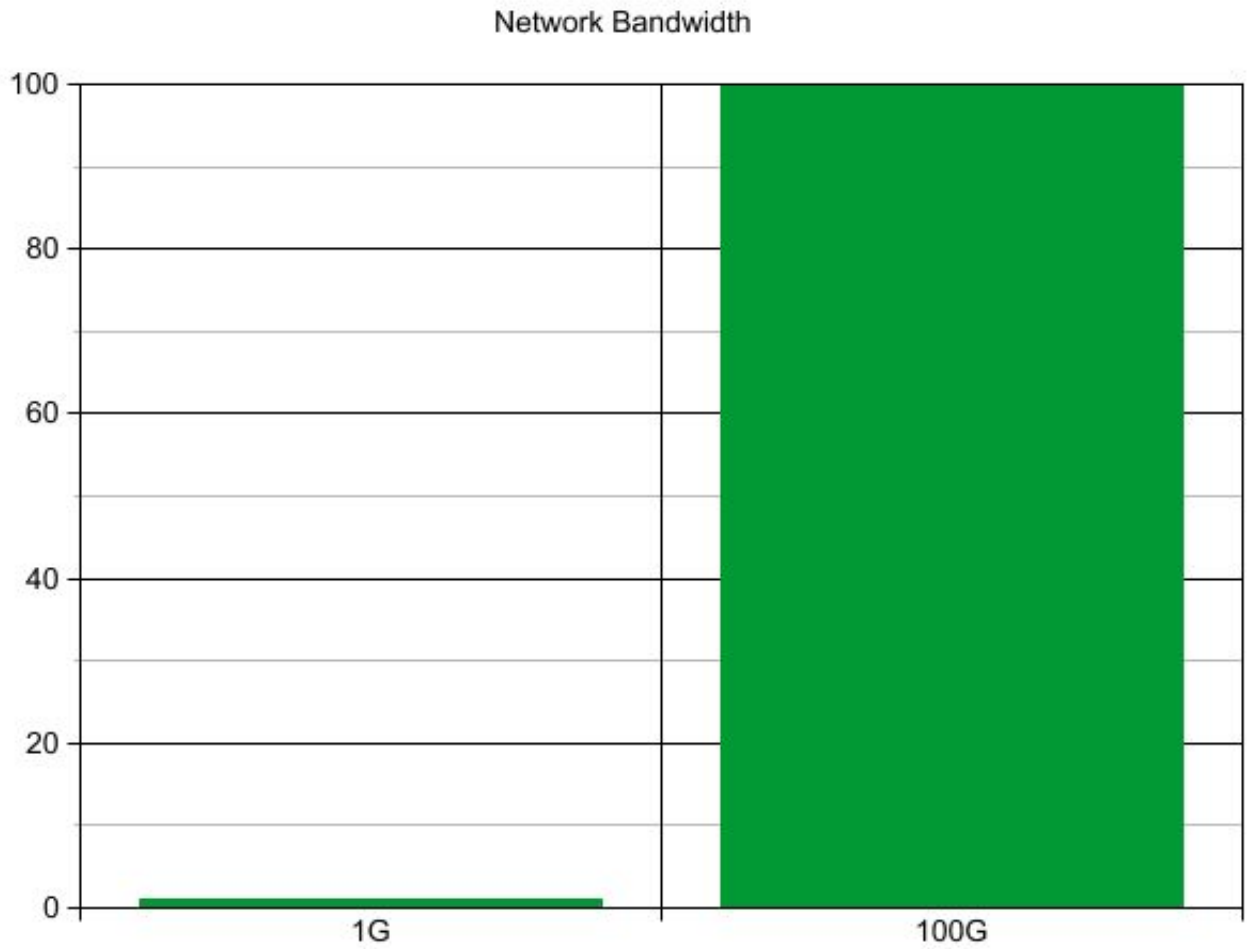
Aggregation Layer



Network Bandwidth

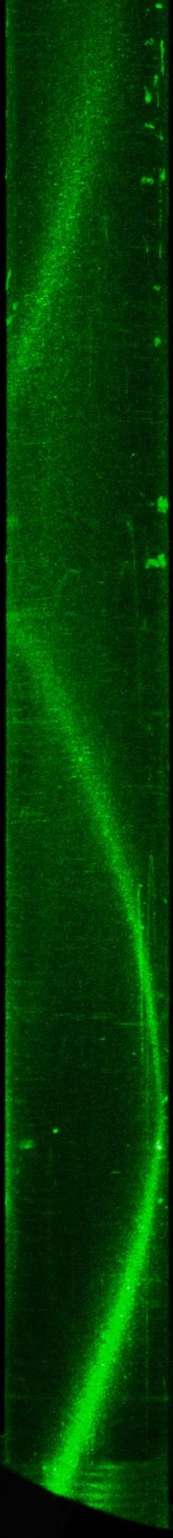


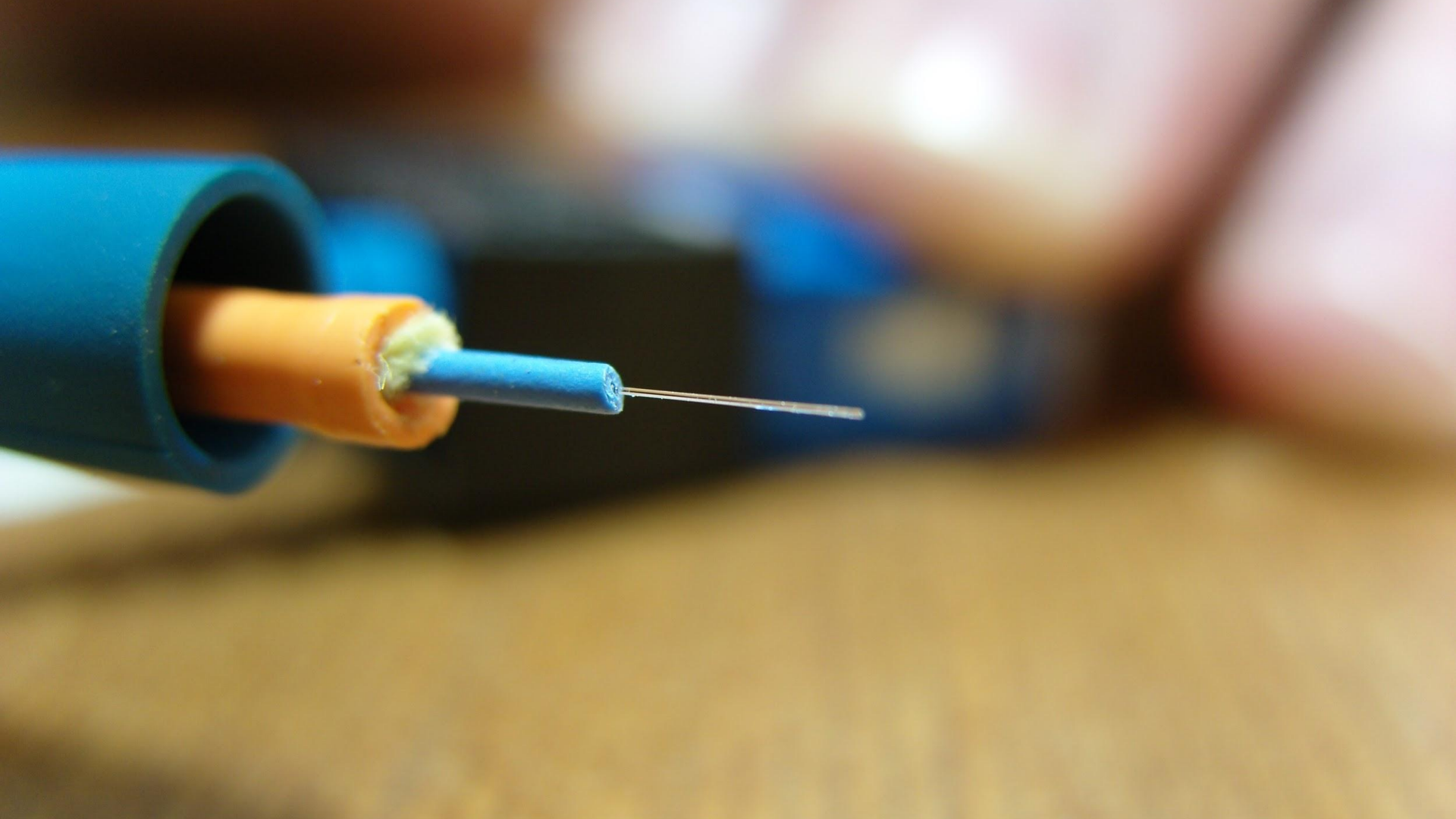
Network Bandwidth

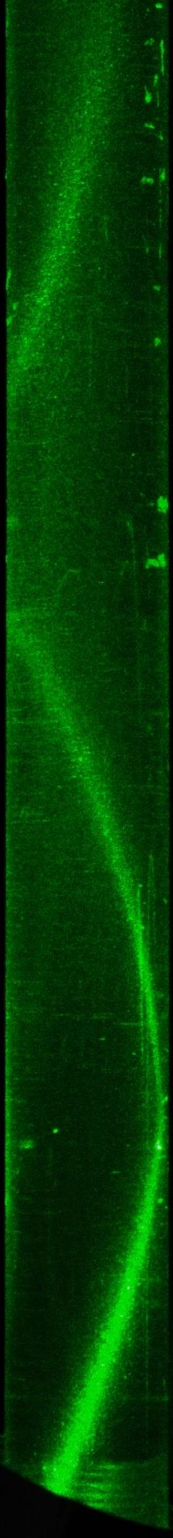


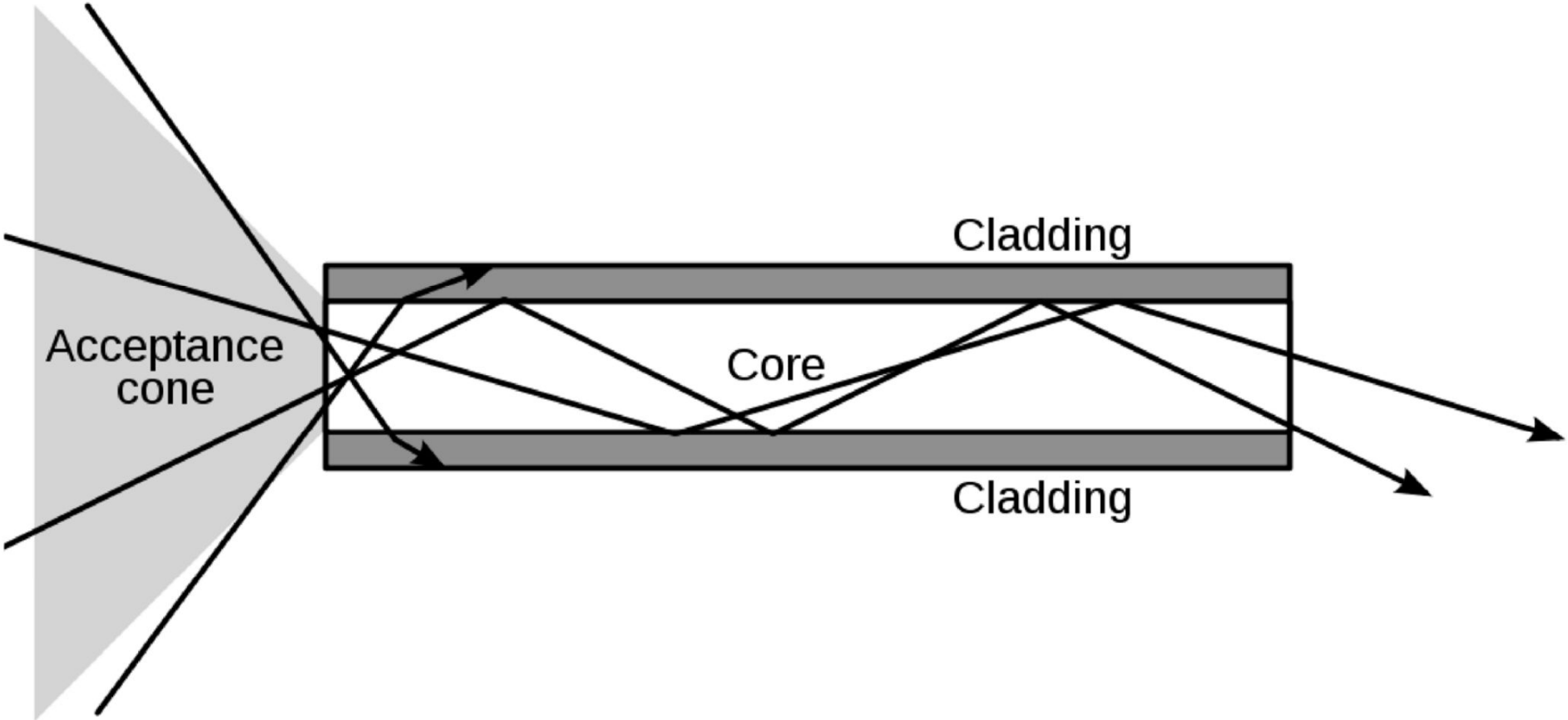
Clover

"LASERS"

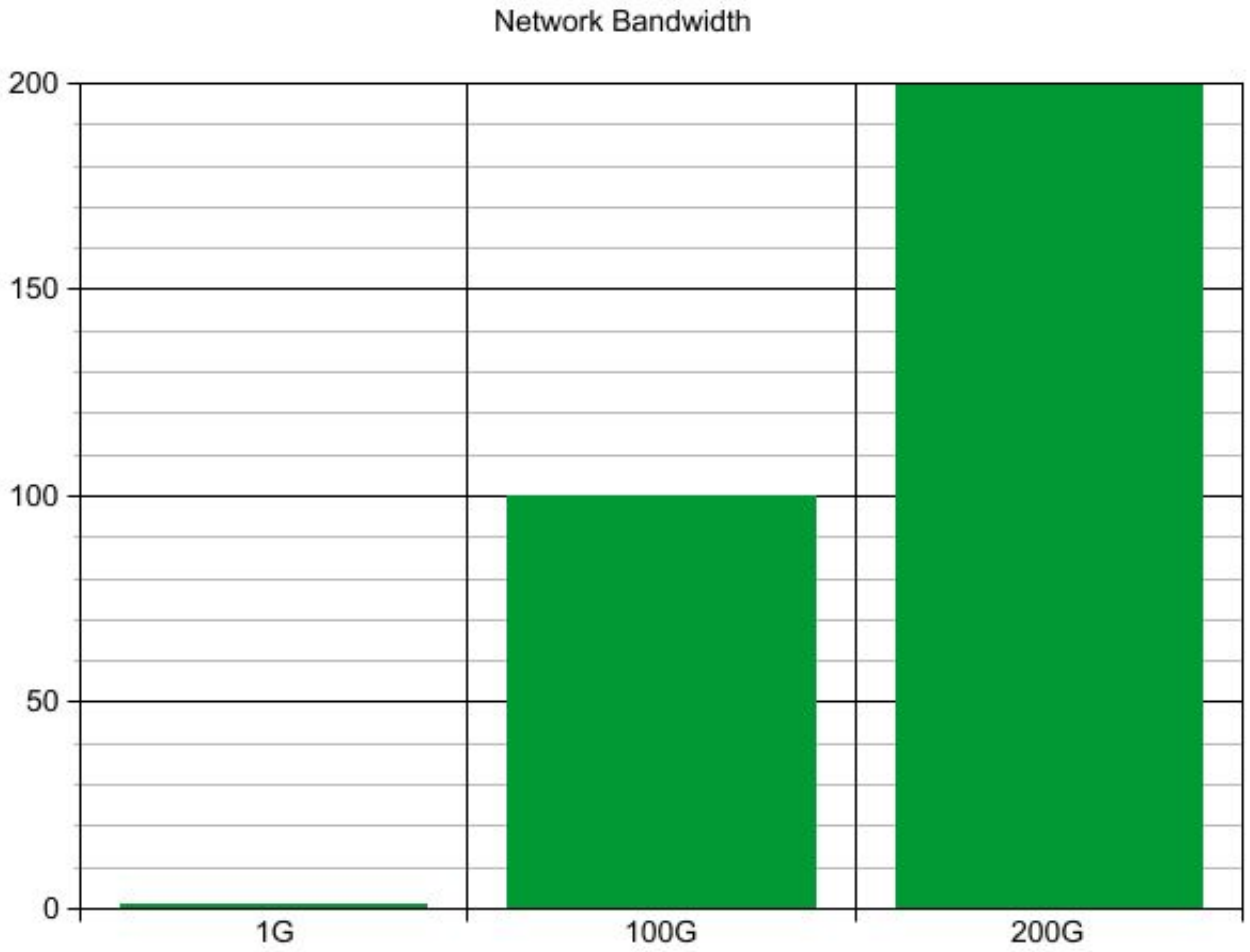


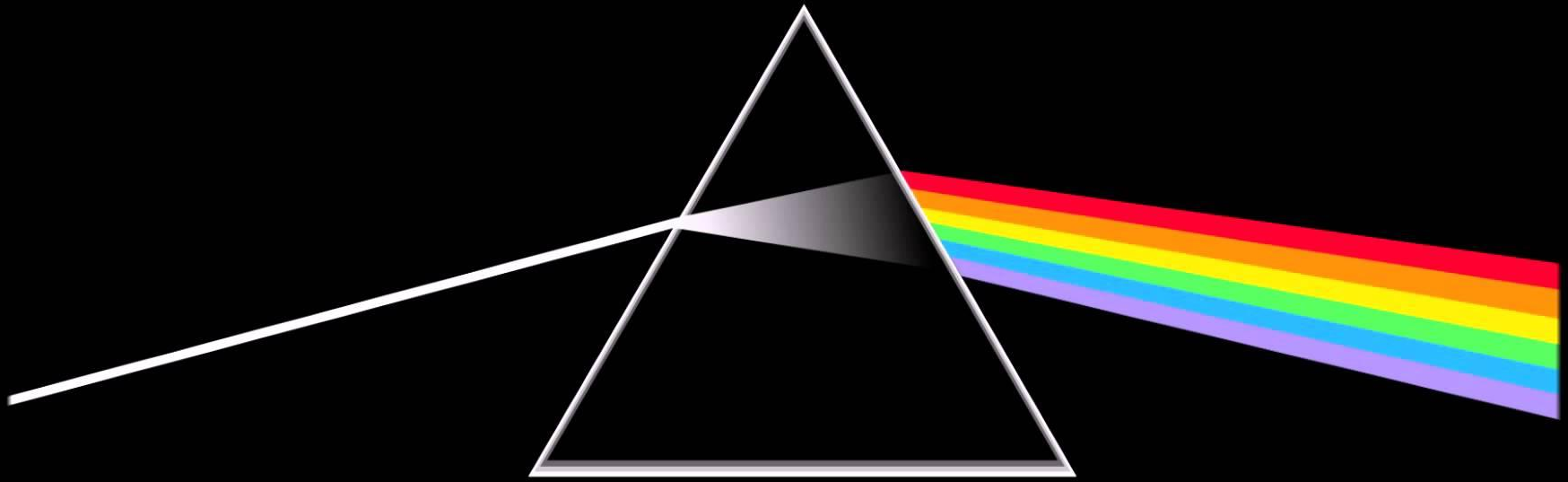




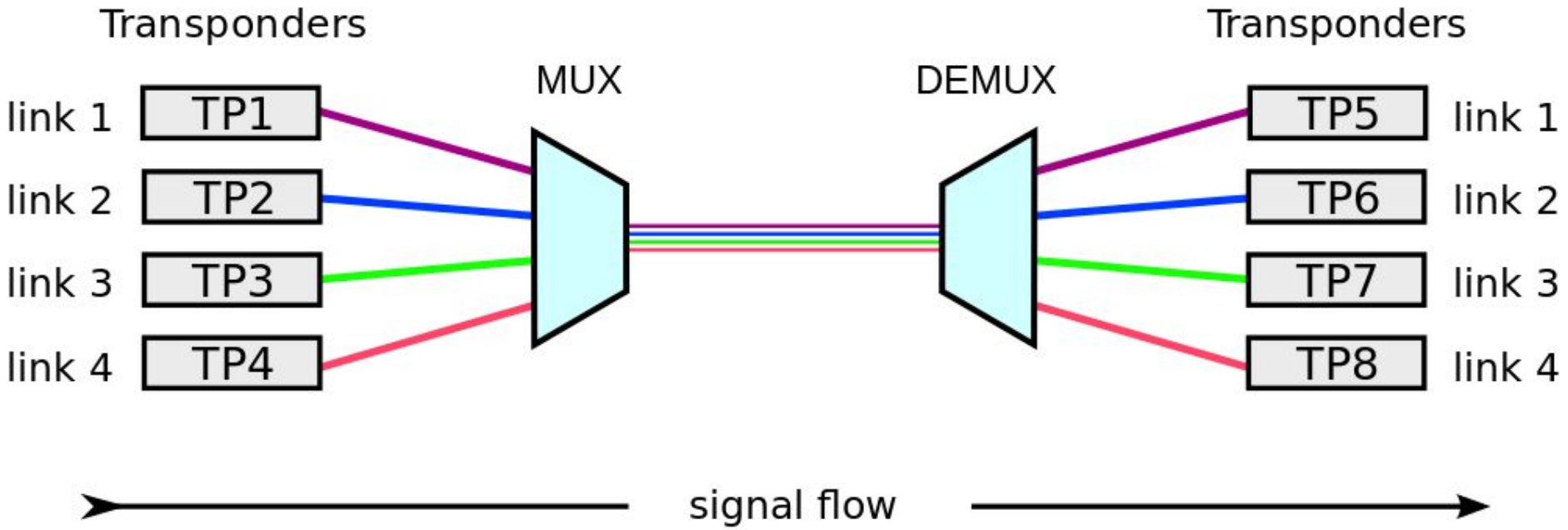

Cladding
Acceptance
cone
Core
Cladding

Network Bandwidth

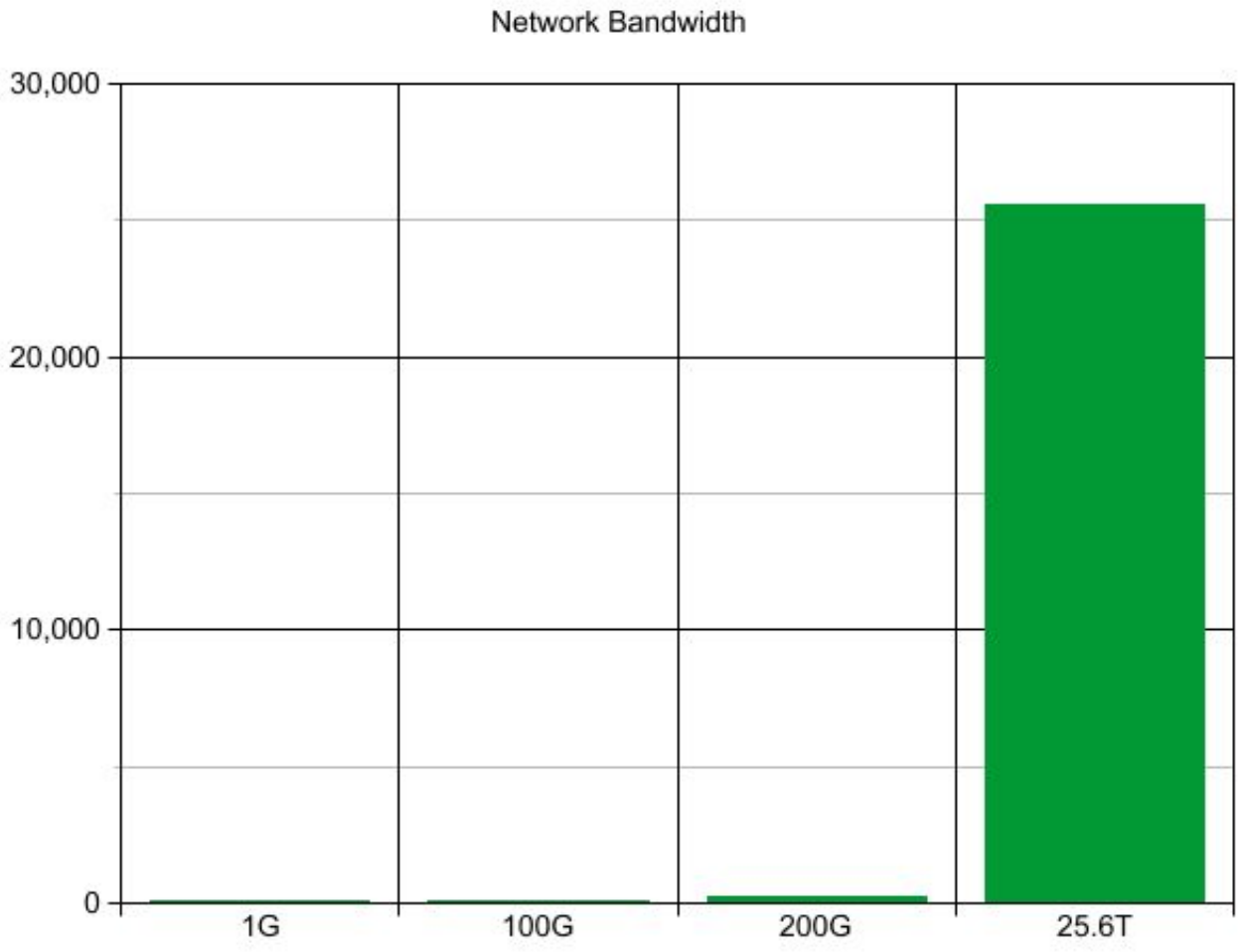


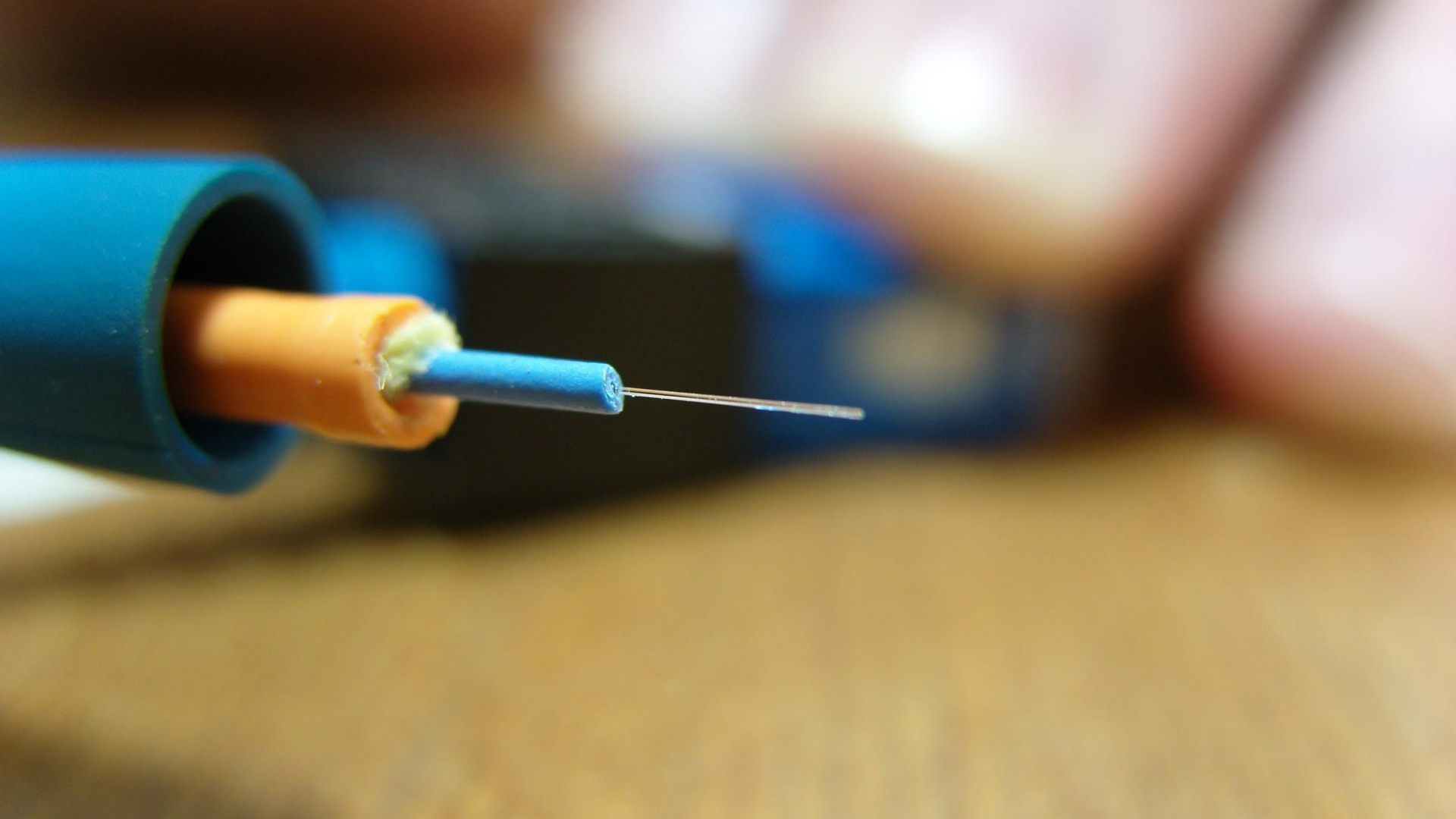


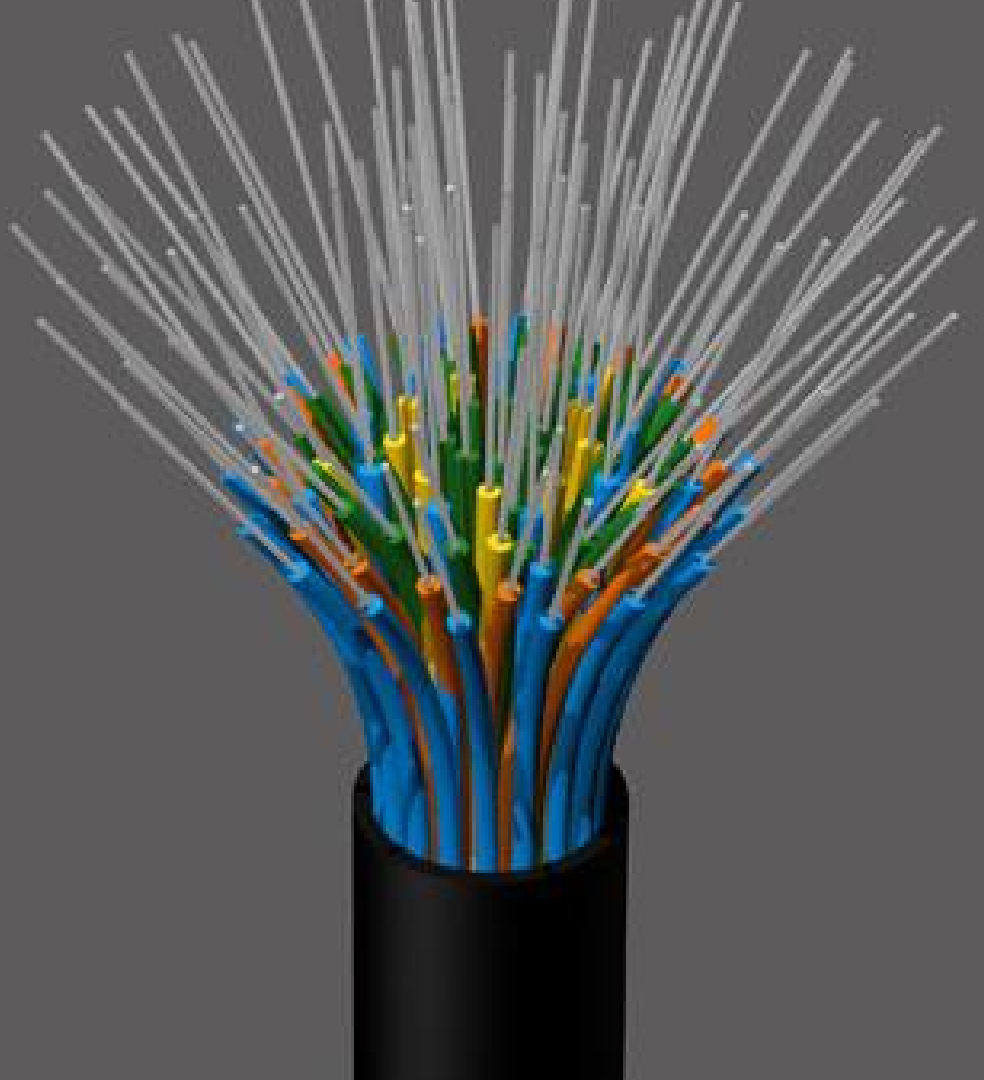
wavelength-division multiplexing (WDM)



Network Bandwidth

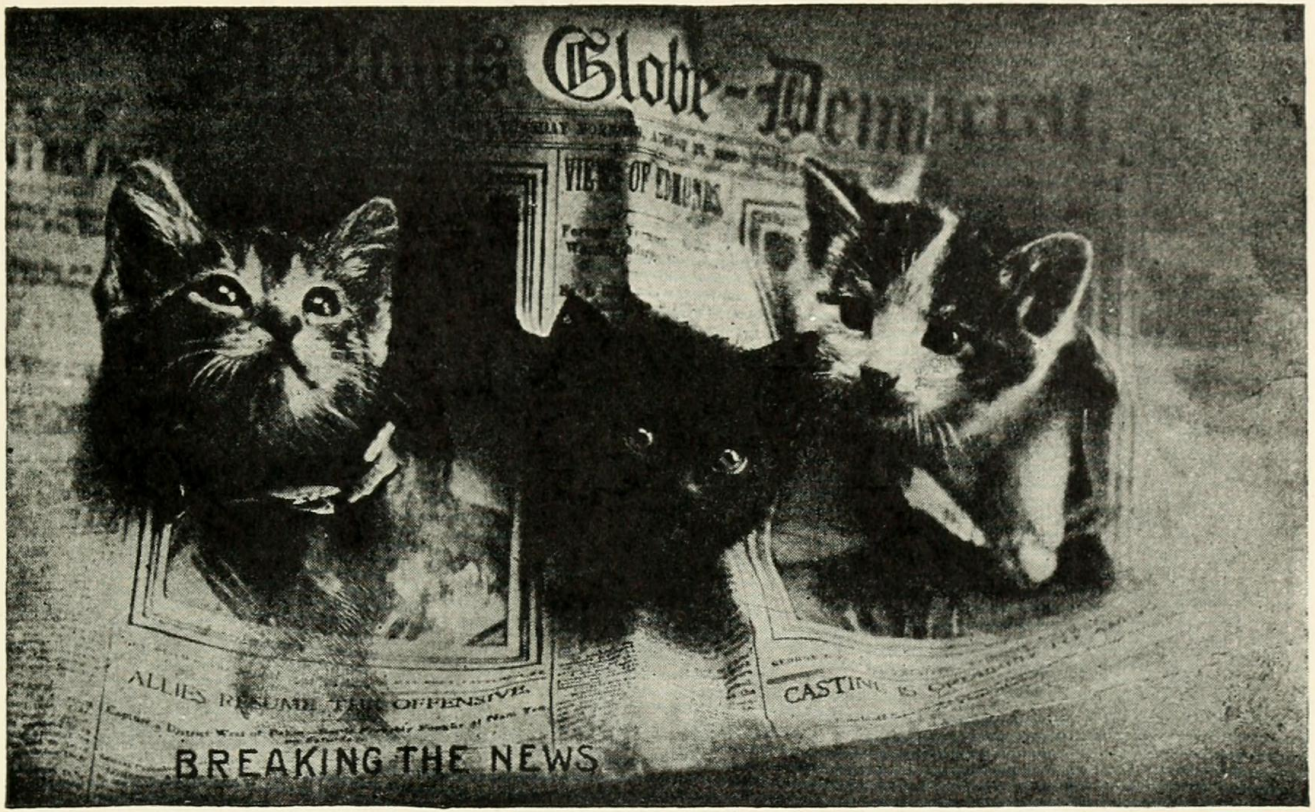






Clover

Fiber Trilogy



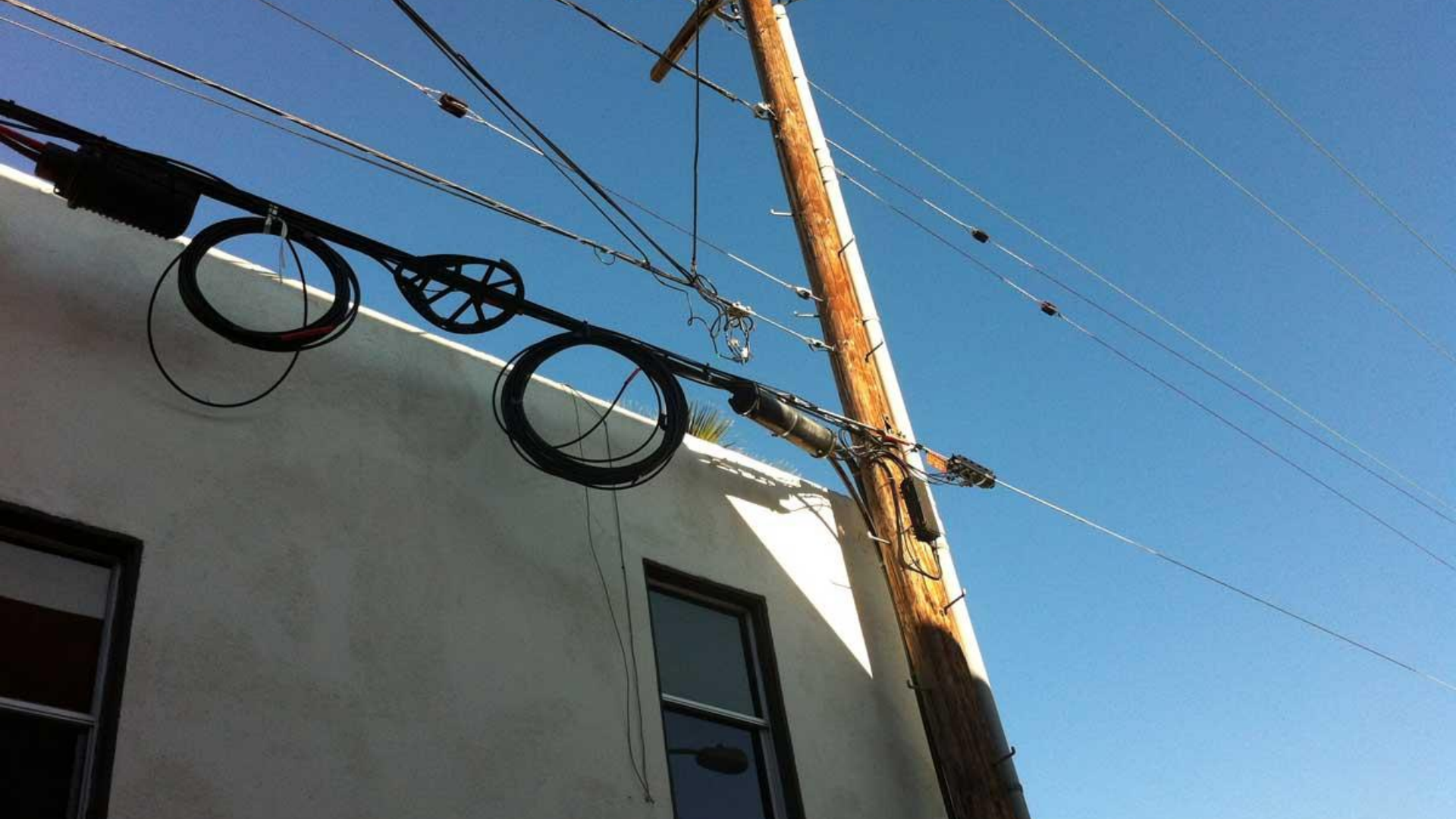
BREAKING THE NEWS

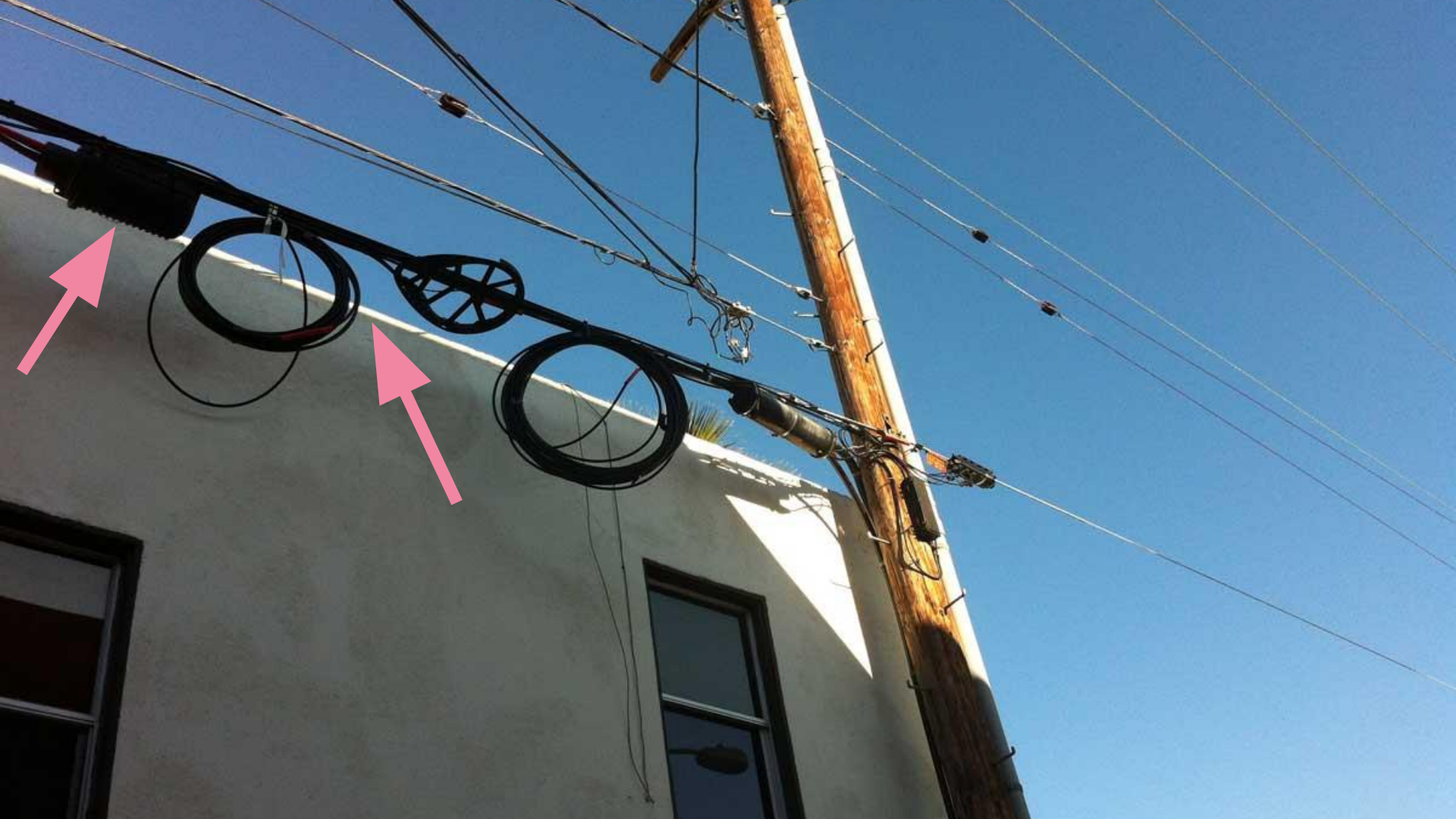
Clover

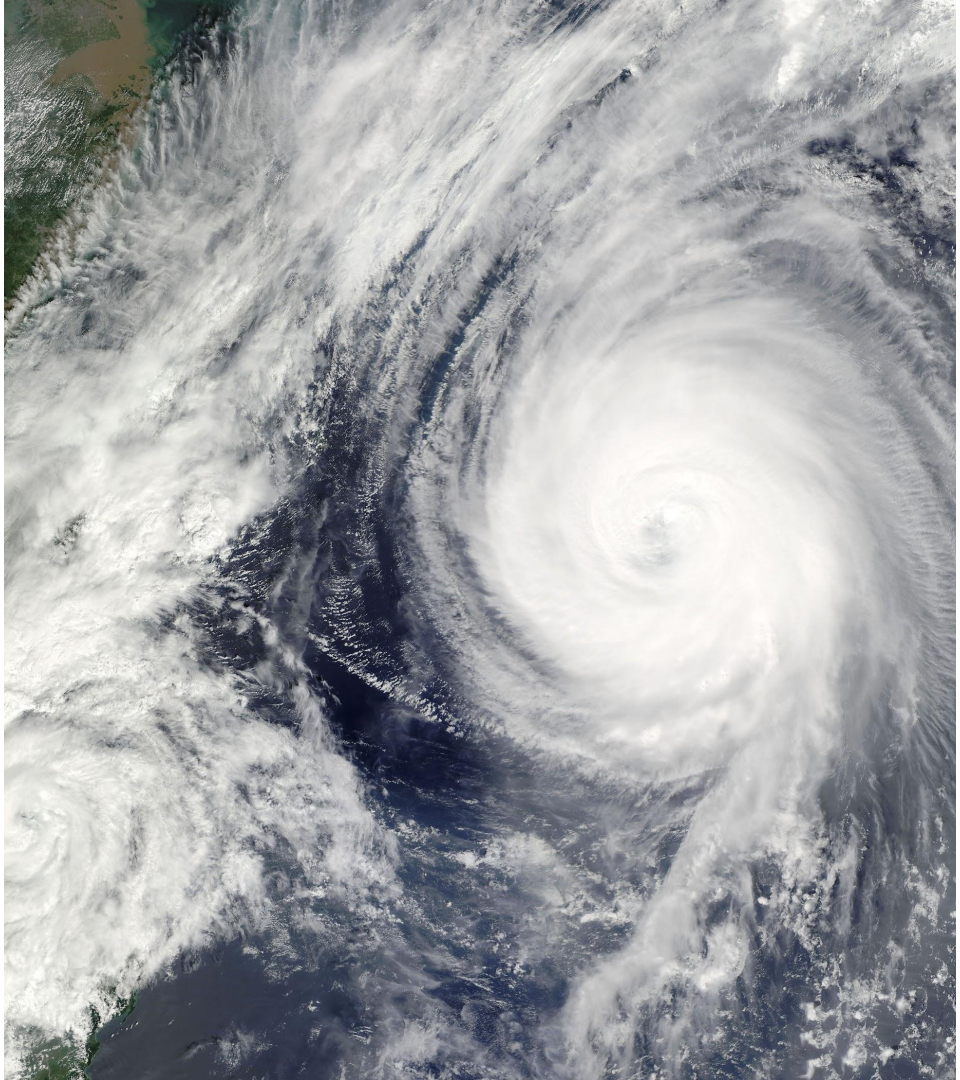
Fiber Trilogy

BREAKING THE NEWS

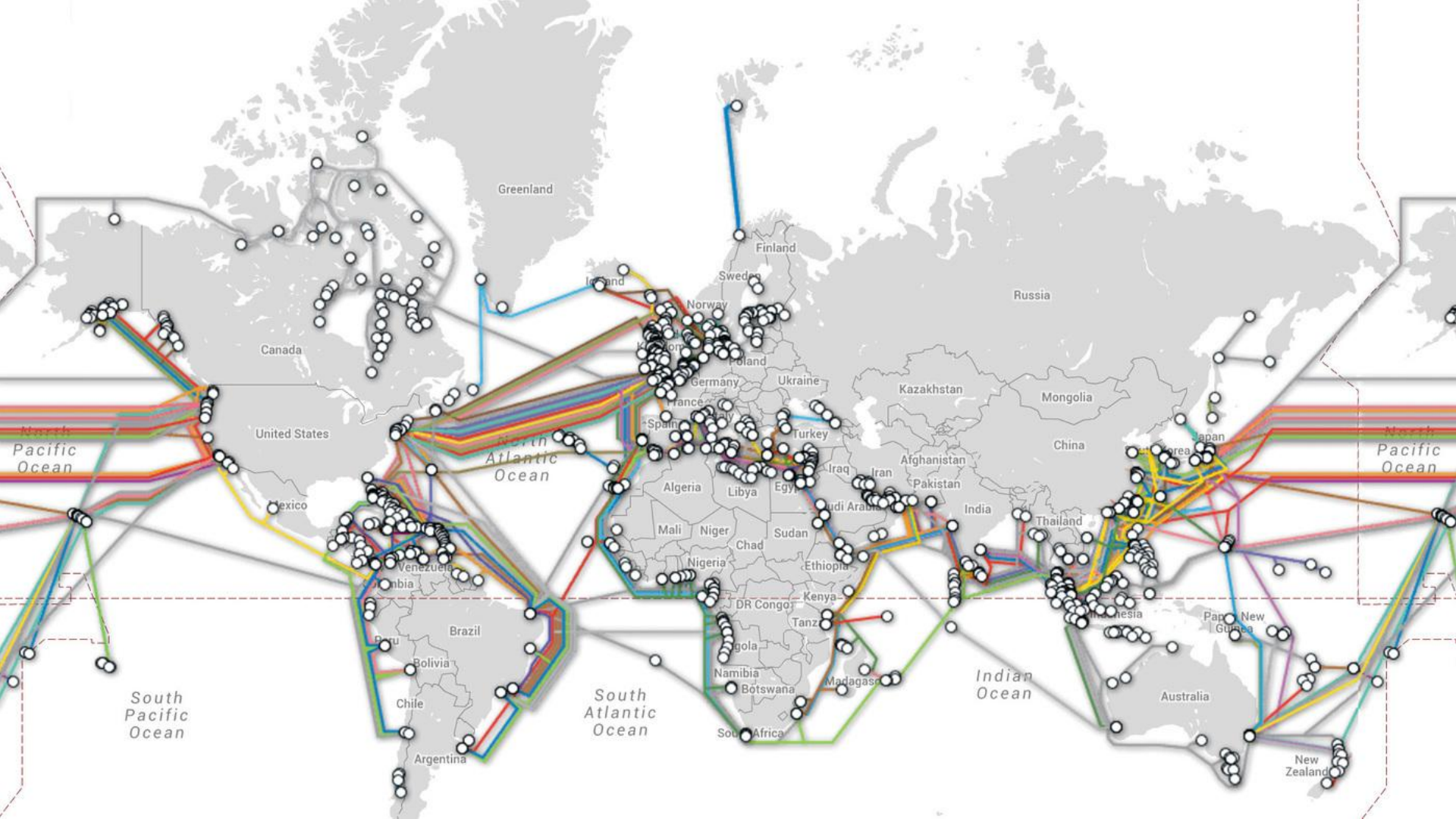
Clover







T 600
S300
Bobcat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Mexico
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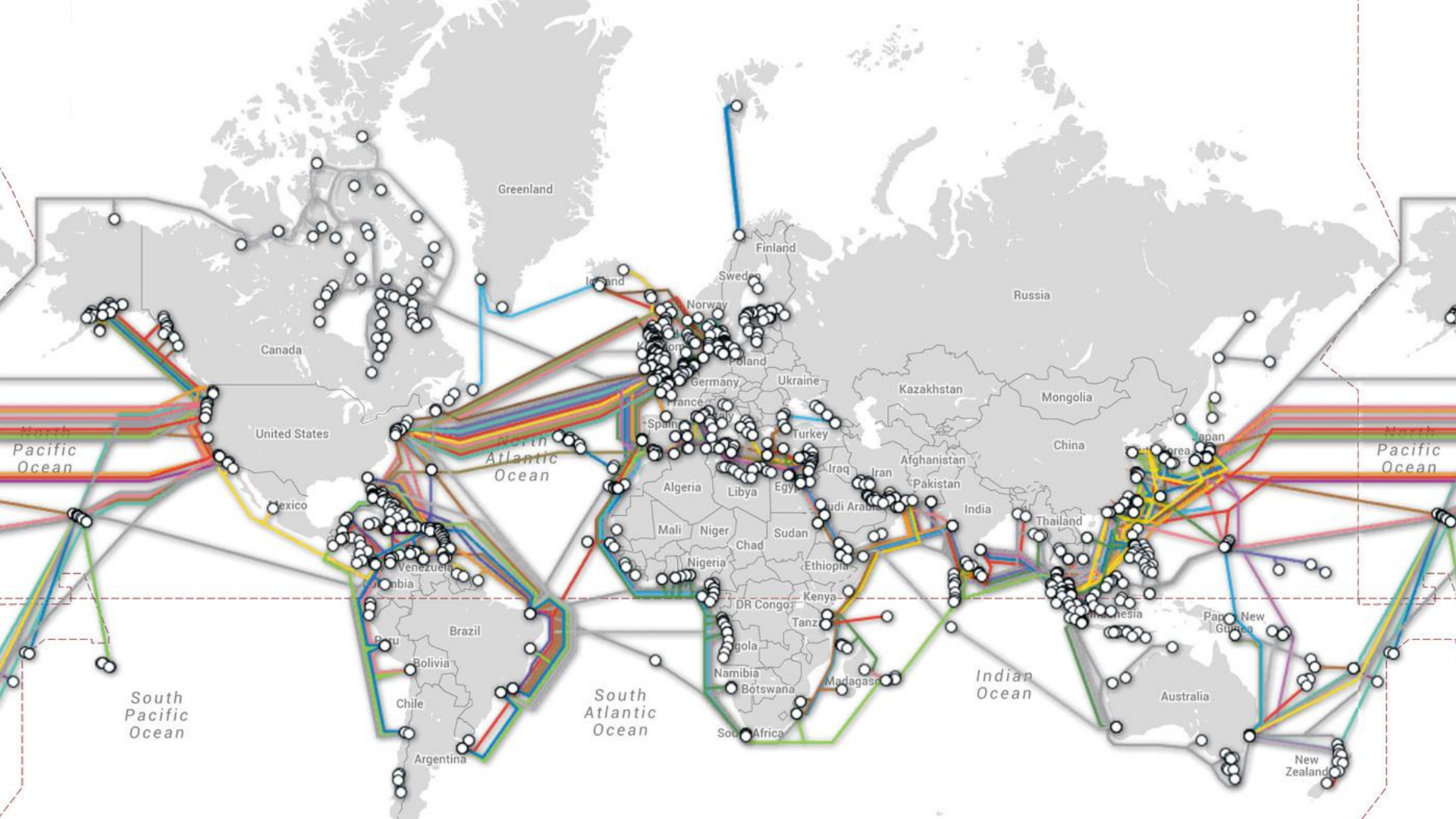
Peru
Bolivia
Chile
Argentina
Finland
Sweden
Norway
Poland
Germany
France
Spain
Ukraine
Russia
Kazakhstan
Mongolia
China
Japan
Turkey
Iraq
Iran
Afghanistan
Pakistan
India
Thailand
Algeria
Libya
Egypt
Mali
Niger
Chad
Sudan
Nigeria
Ethiopia
Kenya
DR Congo
Tanzania
Angola
Namibia
Botswana
Madagascar
South Africa
Australia
New Zealand
Papua New Guinea
North Pacific Ocean
North Atlantic Ocean
South Pacific Ocean
South Atlantic Ocean
Indian Ocean
North Pacific Ocean

JAWS!!!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Canada
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Ukraine
Russia
Kazakhstan
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Niger
Chad
Sudan
Nigeria
Ethiopia
Kenya
DR Congo
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Angola
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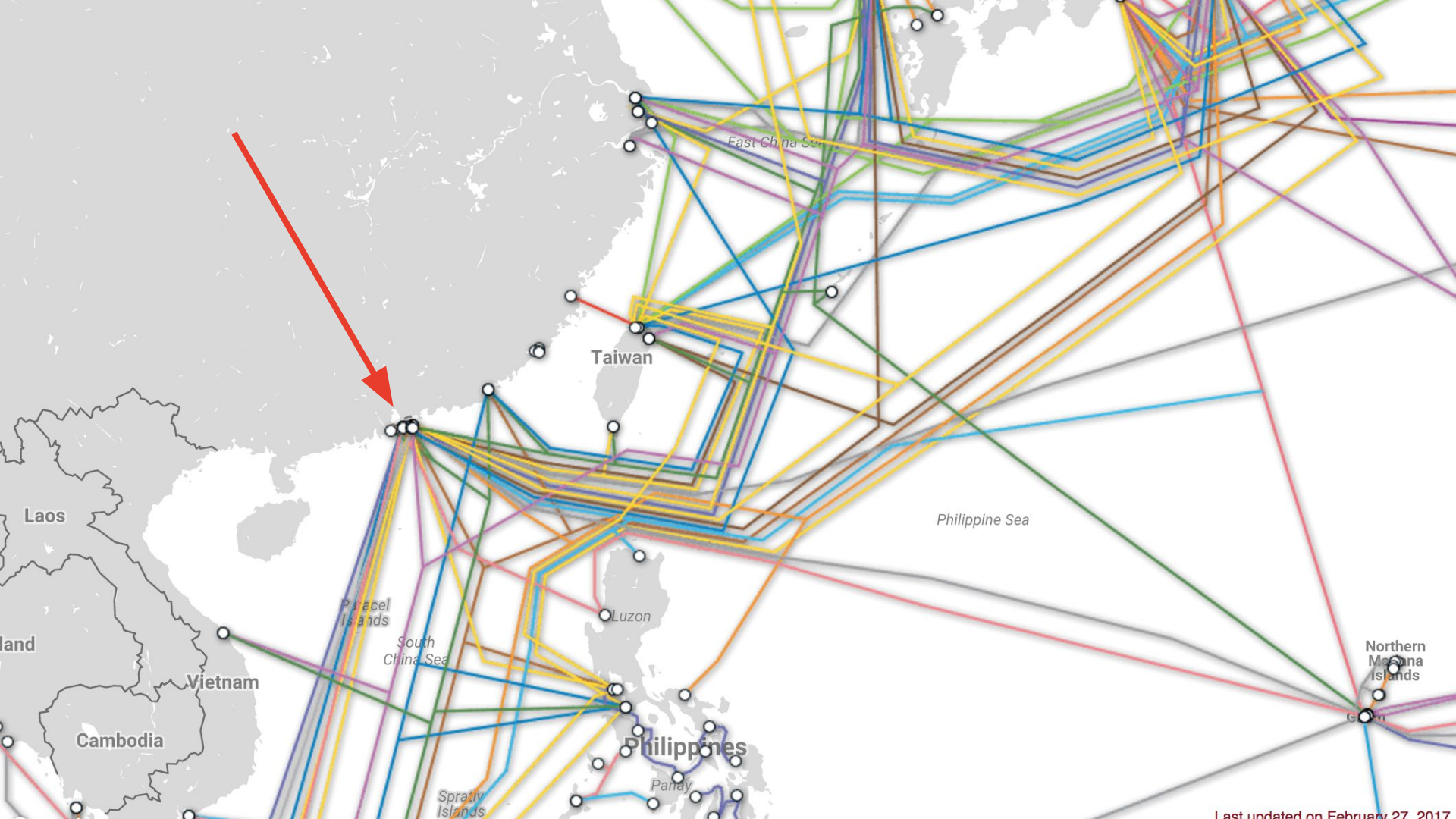
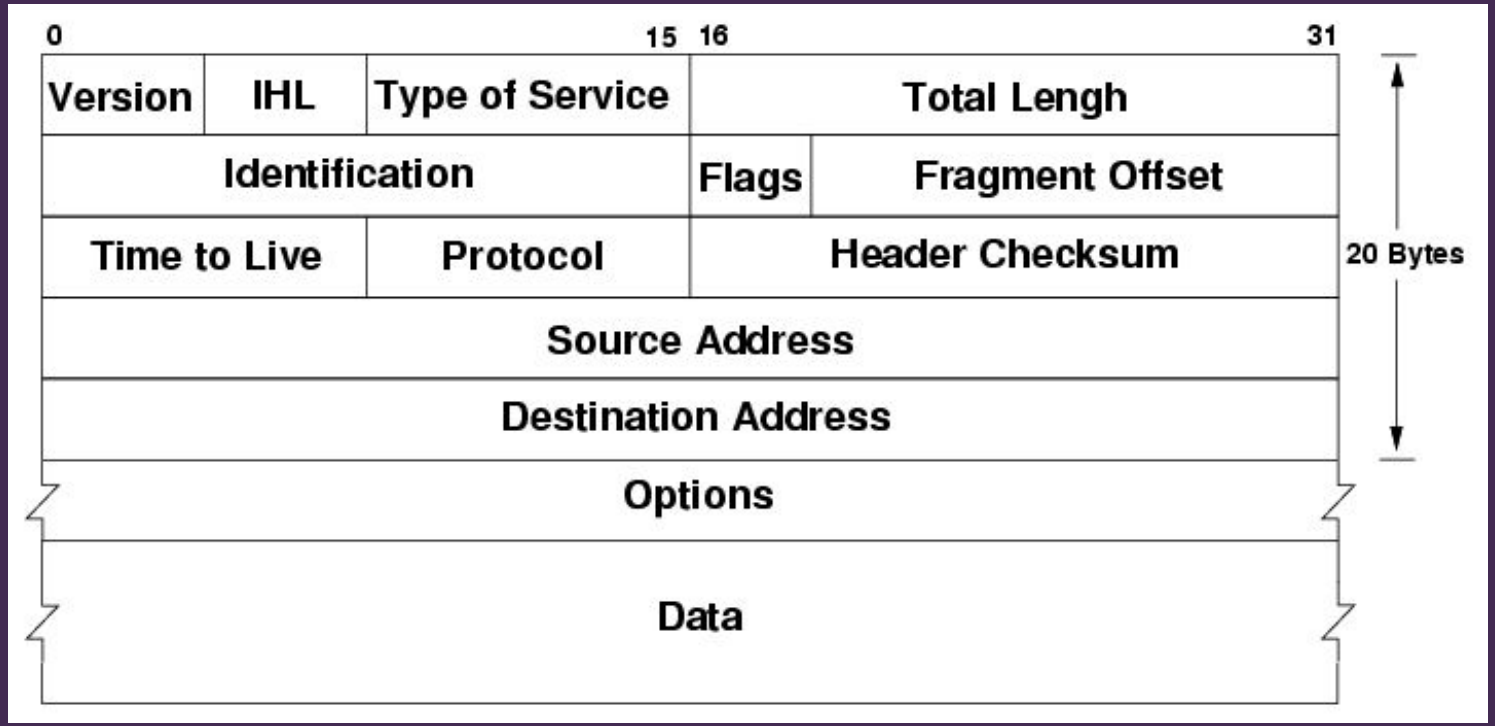
North Pacific Ocean

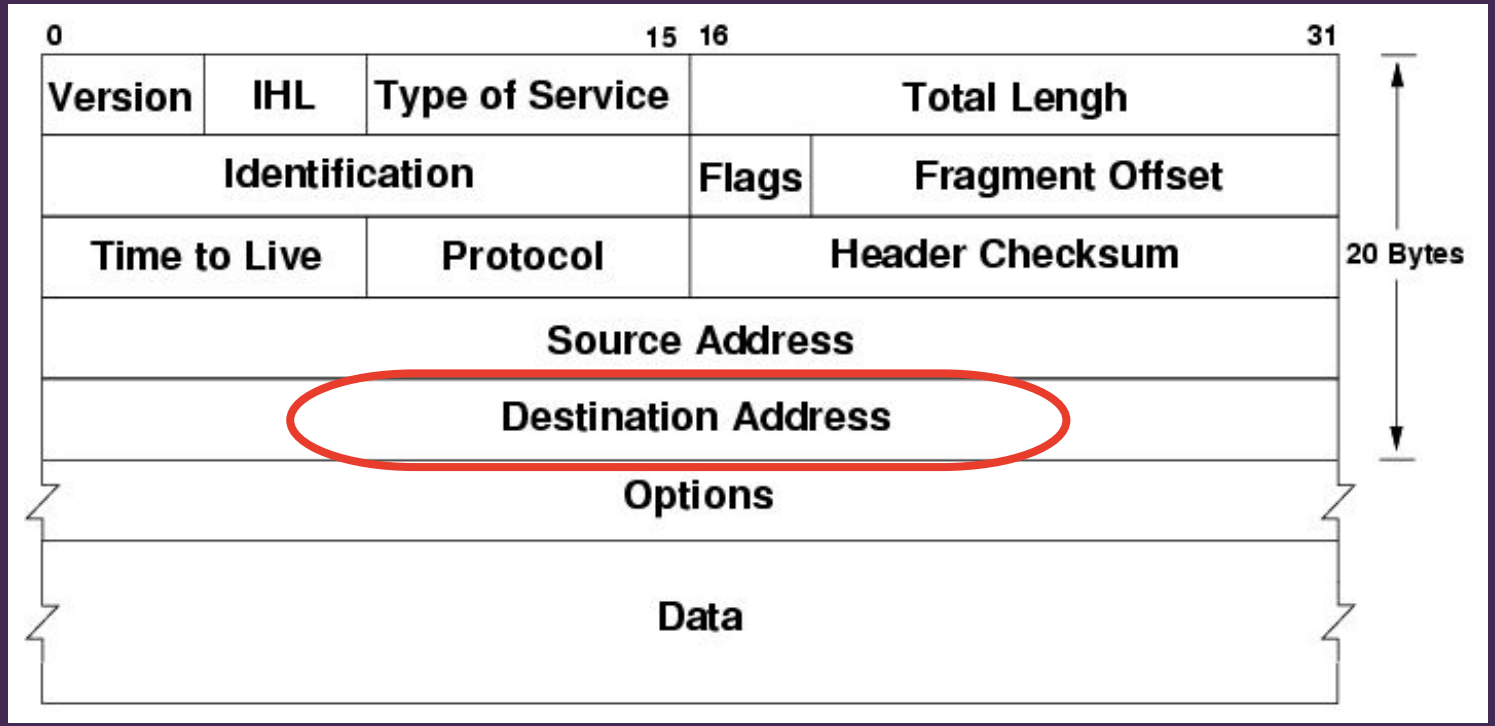

East China Sea
Taiwan
Philippine Sea
Laos
Vietnam
Cambodia
Paracel Islands
South China Sea
Luzon
Philippines
Palawan
Spratly Islands
Northern Mariana Islands
Last updated on February 27, 2017

Logical

Packet Diagram

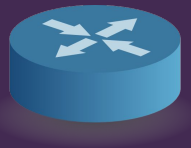


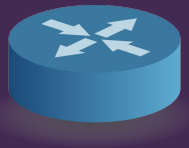
Packet Diagram



Routing

Kittens





You!

Clover

Kittens

I’m 1.1.1.1 and I want a kitten!

You!

Clover

1.1.1.1? That goes out interface 1

Kittens

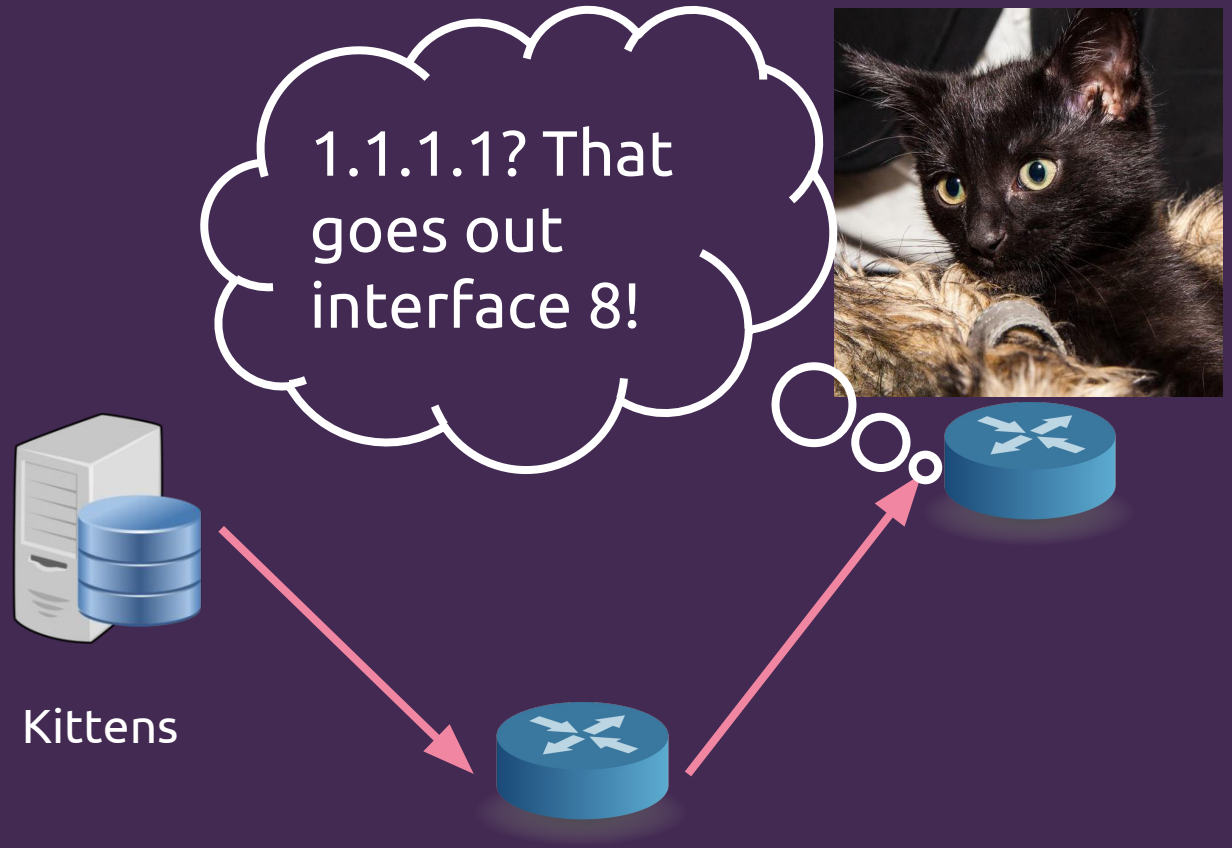
You!

Kittens

1.1.1.1? That goes out interface 4

You!

Clover


1.1.1.1? That goes out interface 8!
Kittens
You!

Kittens

You!

Clover

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208.108.96.0/20    via 206.197.187.12 on vtnet1 [R7 2017-02-14] * (100) [AS29941i]
131.108.51.0/24    via 206.197.187.12 on vtnet1 [R7 18:40:50] * (100) [AS61687i]
203.113.15.0/24    via 206.197.187.12 on vtnet1 [R7 2017-02-21] * (100) [AS131293i]
209.115.29.0/24    via 206.197.187.12 on vtnet1 [R7 2017-01-17] * (100) [AS14001i]
74.116.154.0/24    via 206.197.187.12 on vtnet1 [R7 2017-02-04] * (100) [AS53263i]
45.121.201.0/24    via 206.197.187.12 on vtnet1 [R7 2017-01-17] * (100) [AS23881i]
203.124.59.0/24    via 206.197.187.12 on vtnet1 [R7 2017-02-16] * (100) [AS7590i]
98.126.154.0/24    via 206.197.187.12 on vtnet1 [R7 2017-02-24] * (100) [AS35908i]
222.127.34.0/23    via 206.197.187.12 on vtnet1 [R7 2017-01-24] * (100) [AS132199i]
202.129.206.0/24   via 206.197.187.12 on vtnet1 [R7 2017-01-17] * (100) [AS45328i]
202.130.194.0/24   via 206.197.187.12 on vtnet1 [R7 2017-01-20] * (100) [AS9499i]
104.132.120.0/24   via 206.197.187.50 on vtnet1 [R36 2017-02-09] * (100) [AS41264i]
221.134.197.0/24   via 206.197.187.54 on vtnet1 [R39 2017-03-01] * (100) [AS9583i]
67.138.107.0/24    via 206.197.187.12 on vtnet1 [R7 2017-02-14] * (100) [AS29951i]
41.138.1.0/24      via 206.197.187.12 on vtnet1 [R7 2017-02-28] * (100) [AS327959i]
174.139.130.0/24   via 206.197.187.12 on vtnet1 [R7 2017-02-24] * (100) [AS35908i]
64.140.112.0/20    via 206.197.187.12 on vtnet1 [R7 2017-01-17] * (100) [AS40788i]
120.142.64.0/22    via 206.197.187.12 on vtnet1 [R7 07:29:20] * (100) [AS10036i]
204.144.140.0/23   via 206.197.187.12 on vtnet1 [R7 2017-03-01] * (100) [AS13345i]
216.145.156.0/24   via 206.197.187.12 on vtnet1 [R7 01:42:32] * (100) [AS62943i]
24.146.80.0/20     via 206.197.187.12 on vtnet1 [R7 2017-01-17] * (100) [AS7311i]
216.147.148.0/24   via 206.197.187.12 on vtnet1 [R7 2017-01-17] * (100) [AS11300i]
104.149.60.0/24    via 206.197.187.12 on vtnet1 [R7 2017-02-05] * (100) [AS40676i]
192.150.152.0/21   via 206.197.187.12 on vtnet1 [R7 2017-01-17] * (100) [AS21947i]
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207.151.147.0/24   via 206.197.187.12 on vtnet1 [R7 13:10:42] * (100) [AS3832i]
104.152.8.0/21     via 206.197.187.12 on vtnet1 [R7 2017-01-17] * (100) [AS27531i]
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Connections

Transit

xfinity®

verizon

Clover

Transit

xfinity

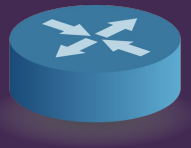
Level (3)

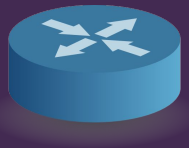
zayo

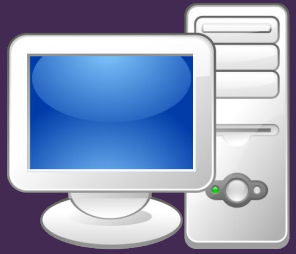
verizon

Clover

Kittens

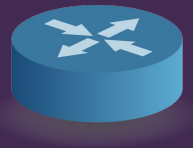






You!

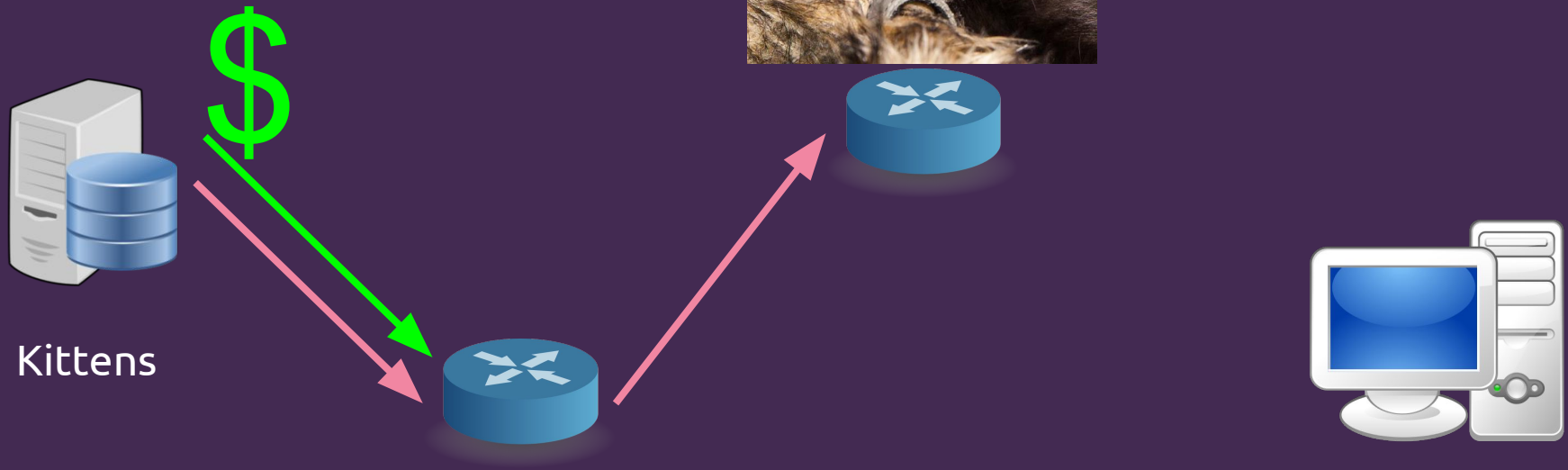
Clover



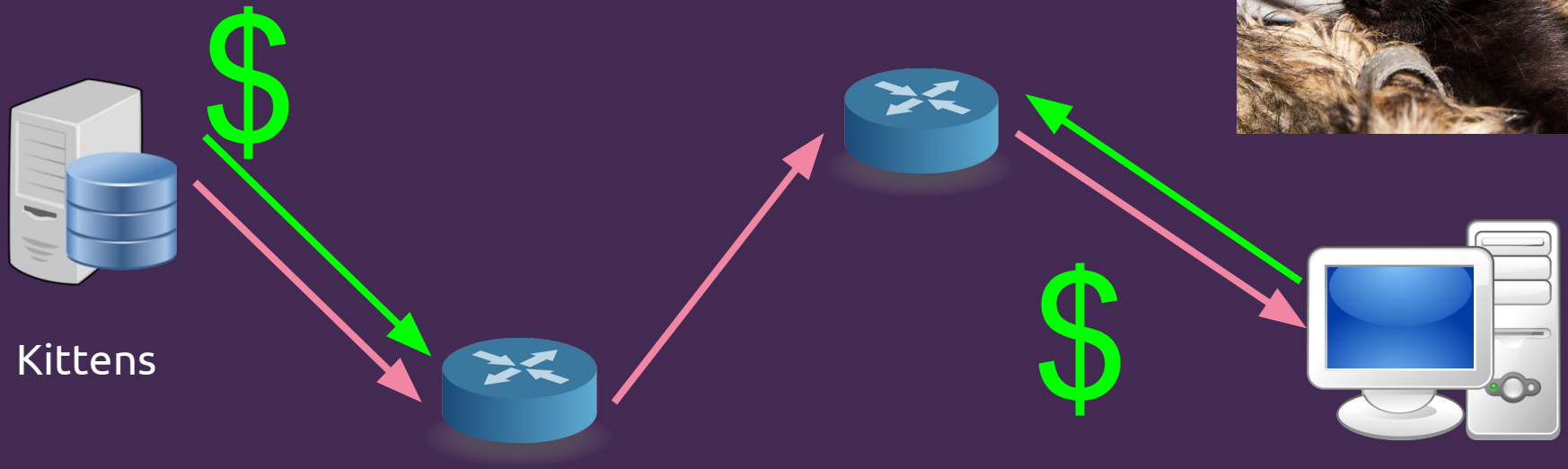
Kittens

You!

Clover



Clover



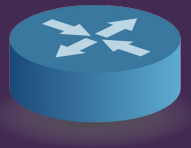
Clover

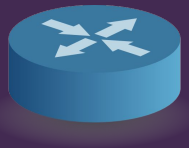
THE UNITED STATES OF AMERICA
ONE DOLLAR

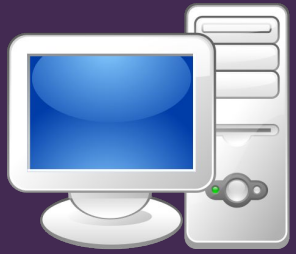
Latency

Private Peering

Kittens



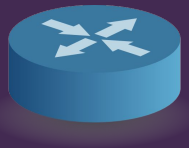


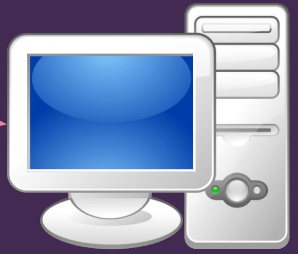


You!

Clover

Kittens





You!

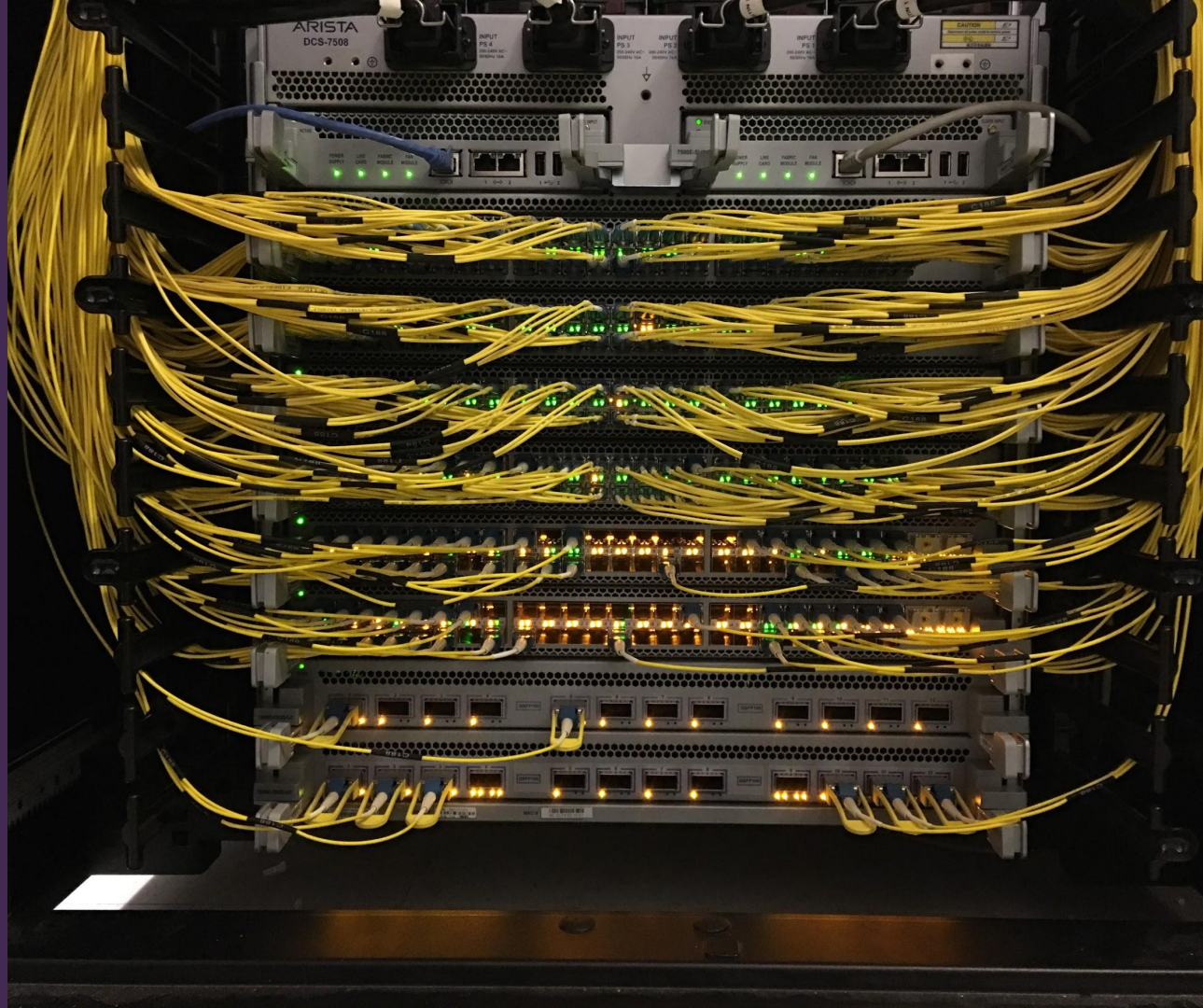
Clover

CISCO

Cross connects

Meet Me Room

Peering Exchange!



Peering Exchanges

Questions?

Leslie Carr

@lesliegeek