

# Internet Backbone Infrastructure in Nepal

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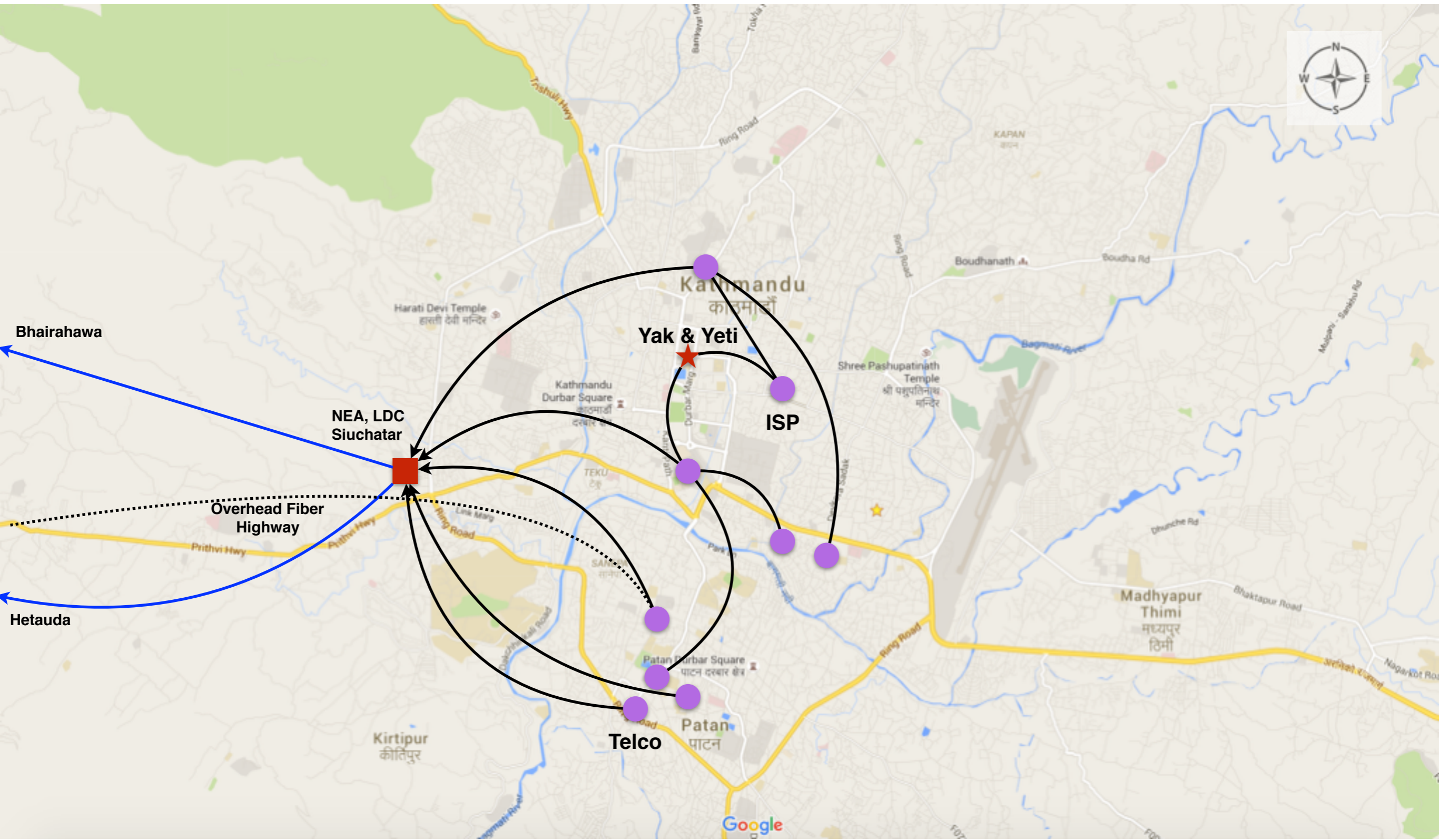
# Brief History of Connectivity Milestones

- **1913** Nepal establishes first telephone exchange in Kathmandu
- **1914 Open Wire telephone line (Aakas Bani) from Kathmandu to Raxual with India.**
- **1964** HF Radio to India and Pakistan to start International Telecom Service.
- **1982** Statellite Earth Station for direct International phone calls.
- **1994 Commercial Email Service started by Mercantile Office System**
- **1995 Launch of Internet by Private Operators, using 64kbps lease lines**

# Cont...

- **1996** Private Operators start using VSAT directly
- **1997** 1st optical fiber in Birgunj (Nepal) - Raxual (India) by Nepal Telecom with DOT India. **(No Internet)**
- **2000** Incumbant Nepal telecom finally starts Internet Service
- **2007** Internet bandwidth over Optical Link between Nepal and India via Bhairawa(Nepal)- Sunauli(India) by Nepal Telecom
- **2008** 1st Indo-Nepal crossborder connection by Private ISP in Bhairawa (Nepal) - Sunauli (India).
- **2011** 1st Nepal-China Optical Link with China by Nepal Telecom via Tatopani - Khasa (Never used)
- **2012** 2nd crossborder by Private ISP in Birgunj(Nepal) - Raxhaul(India)

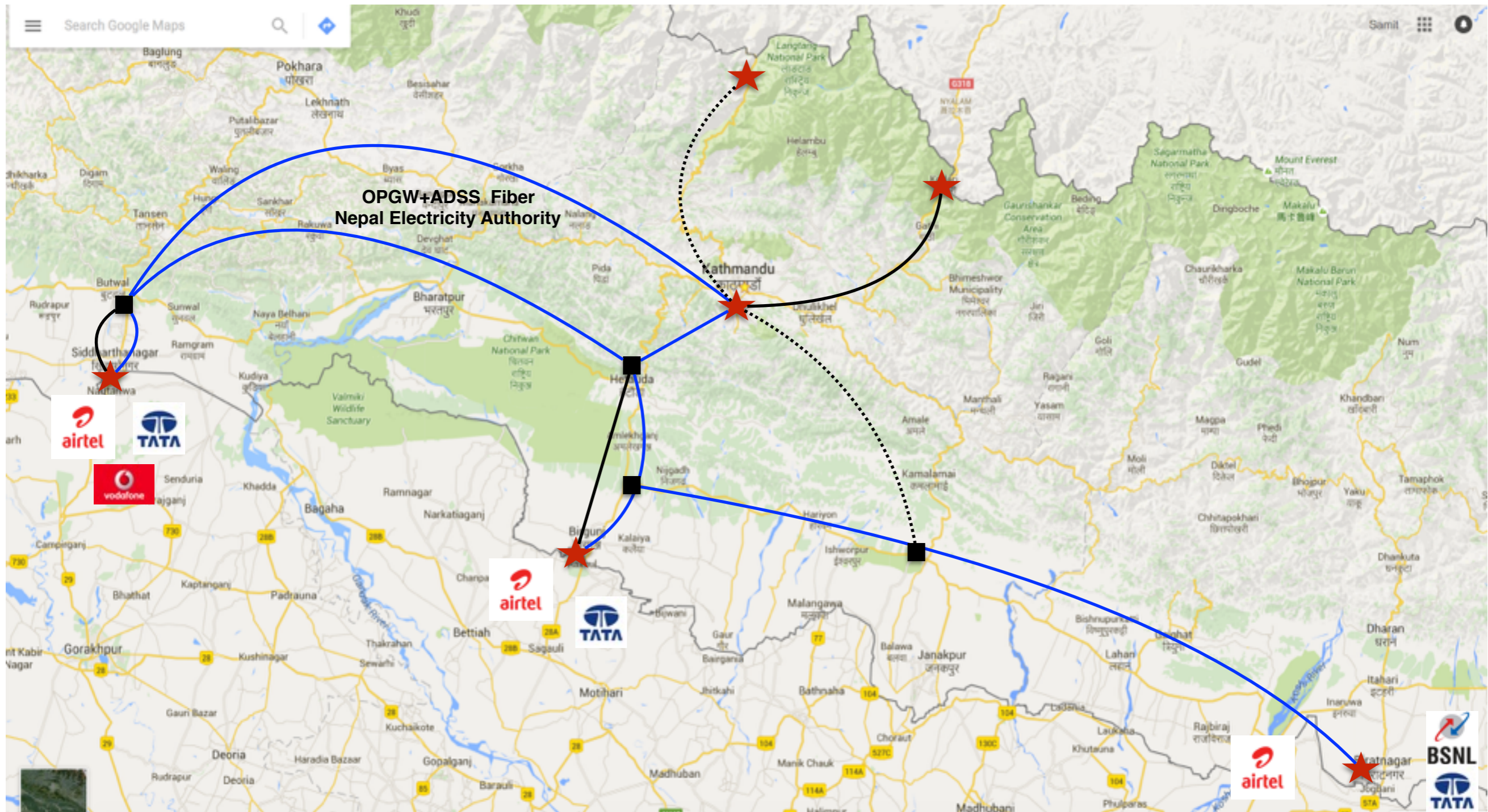
# Connectivity in Kathmandu



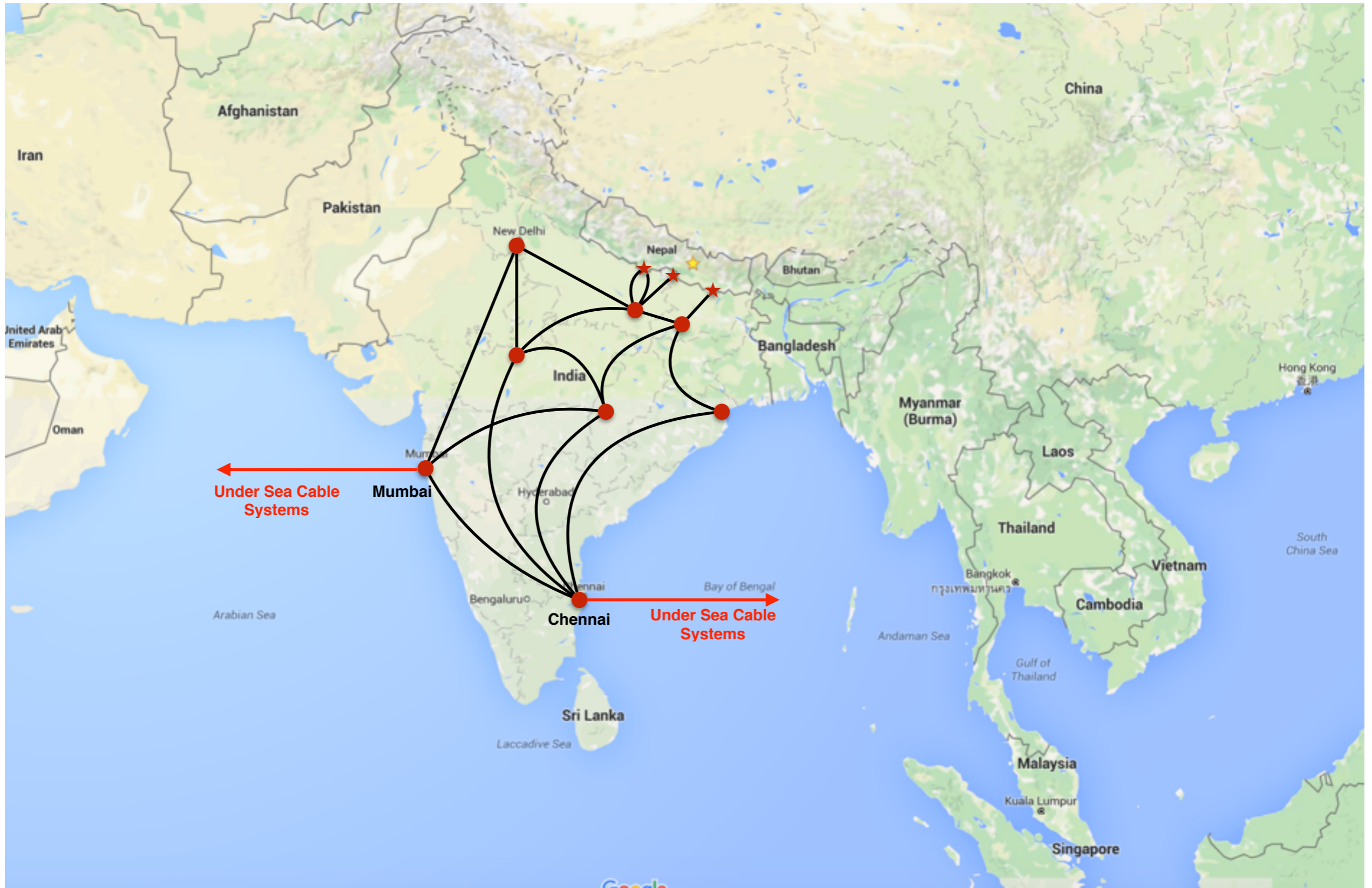
# Cross Border Points



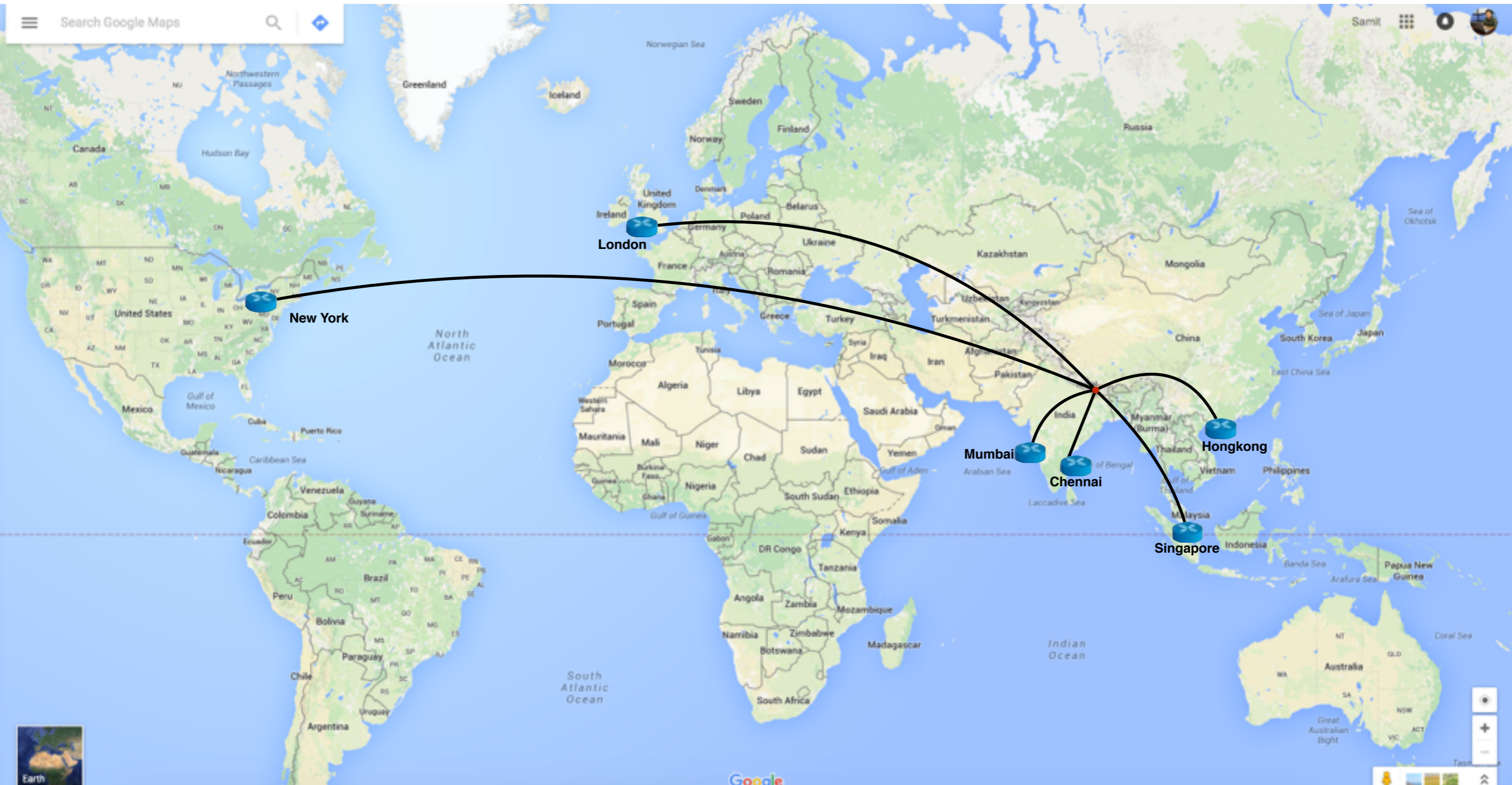
# Major Fiber Backbone and Exits



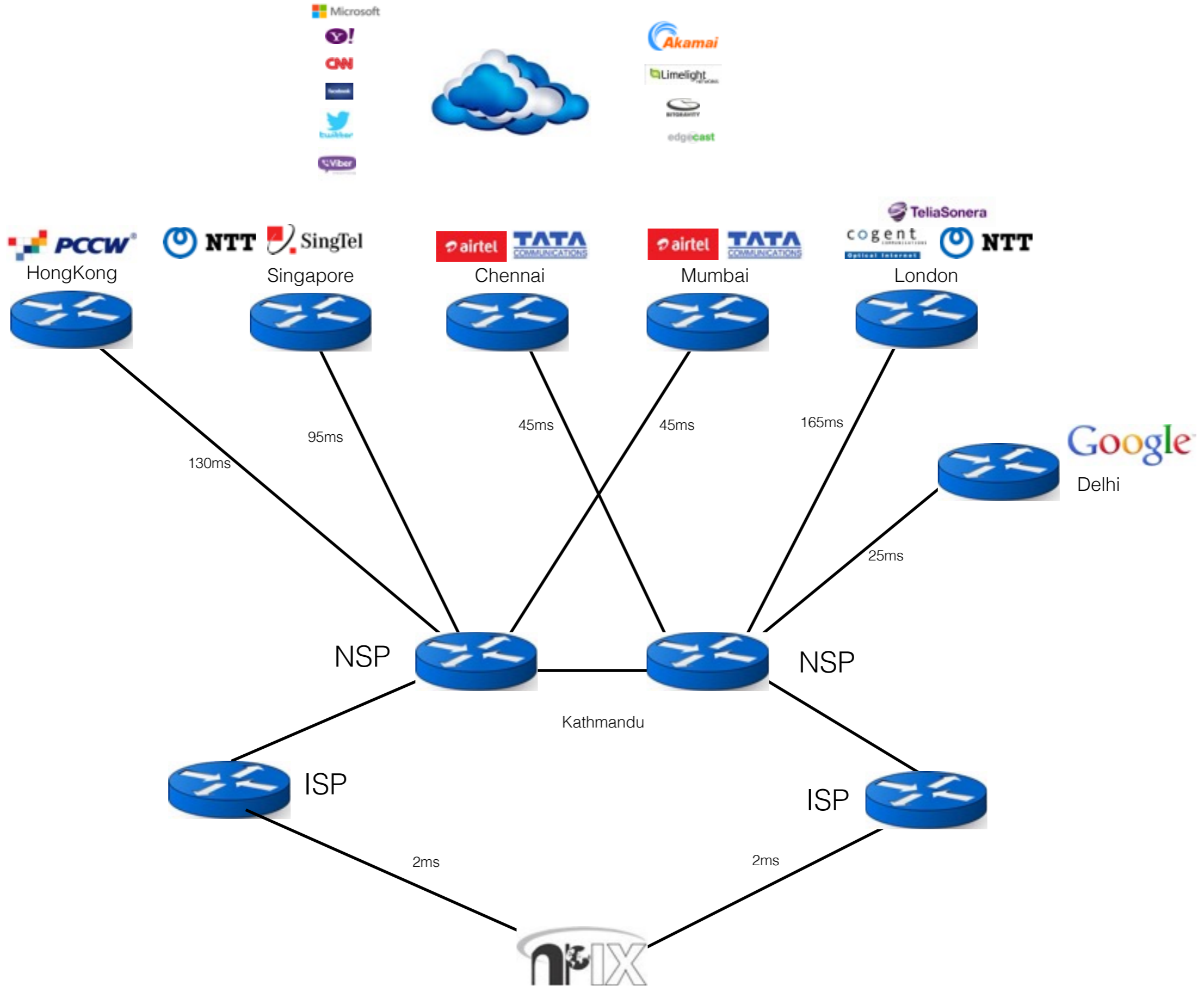
# Going Furthur...



# IP Transit Points







# Present IP Capacity

- Exponential Growth in paid IP Transit traffic
- Approx 50 Gbps of peak IP Traffic, 80-90G of connected capacity
- Approx 45-50 Gbps of peak traffic served through multiple local Google Cache
- 8-10 Gbps of localized CDN traffic.
- **Hardly 1 Gbps Internal traffic over NPIX**

# What next ?

- Capacity is never enough.
- Upgrade Upgrade and More Upgrade. How long?
- How can operators plan for next 5yrs growth? when we cannot forecast demand even for 1yr?
- What can we do?
- We = Govt, Regulatory, Service Provider, Vendors, all others?

Q&A