

Connectivity Challenges of Landlock Countries

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A Yam between Two Boulders





VSAT the first Medium

- From early days of internet , bandwidth was possible **only through VSAT** to Nepal.
- Internet was **expensive** but it was **consistent and free from third country** regulation.
- **Many VSAT bandwidth providers** were available like Singtel ,Hawaii teleport, Loral, PCCW, Thaicom, Mabuhay etc.

Cross Border Fiber

Cross border fiber was introduced in Nepal **in 2008 from India.**

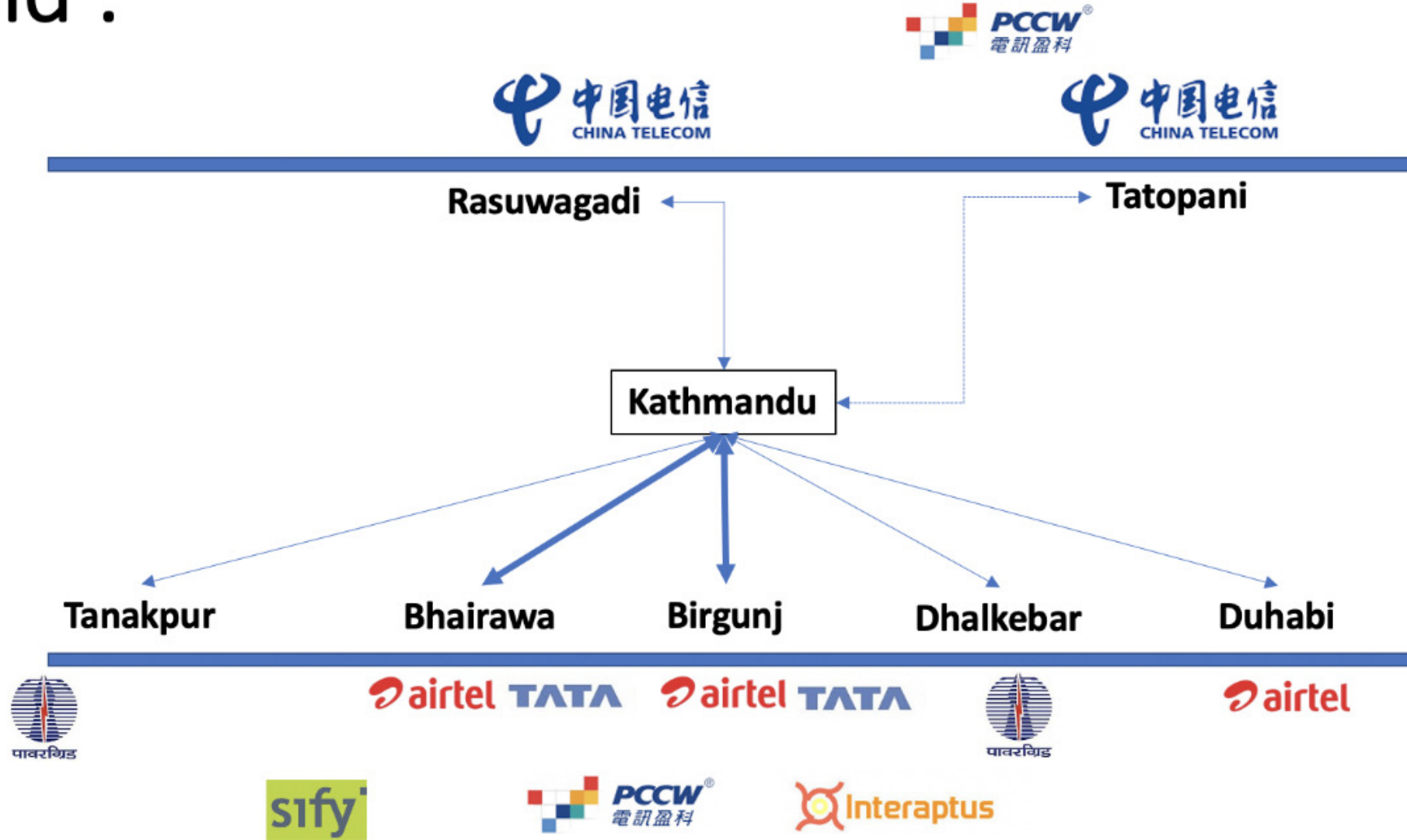
From capacity of **100s of Mbps in VSAT;** after cross border fiber introduction, total international bandwidth stands at around **800 Gbps+ currently**

Dependency on neighboring countries for connectivity?

With India, Nepal has **5 major transits**, out of which **3 have internet transborder permits**.

With China, **only 2 international transits** in Rasuwa and Tatopani, connectivity through it is low capacity and frequently broken

Our Internet Connectivity to the outside World :



Challenges

1. **Dependency** on neighboring/costal countries for connectivity
(geo-political, geographical)
2. **High Costs** in infrastructure development in LLDC
3. Transit routes are **long, difficult and expensive**
4. **Low Interest** in investment in LLDCs
5. High costs to ISPs **because of limited Operators.**

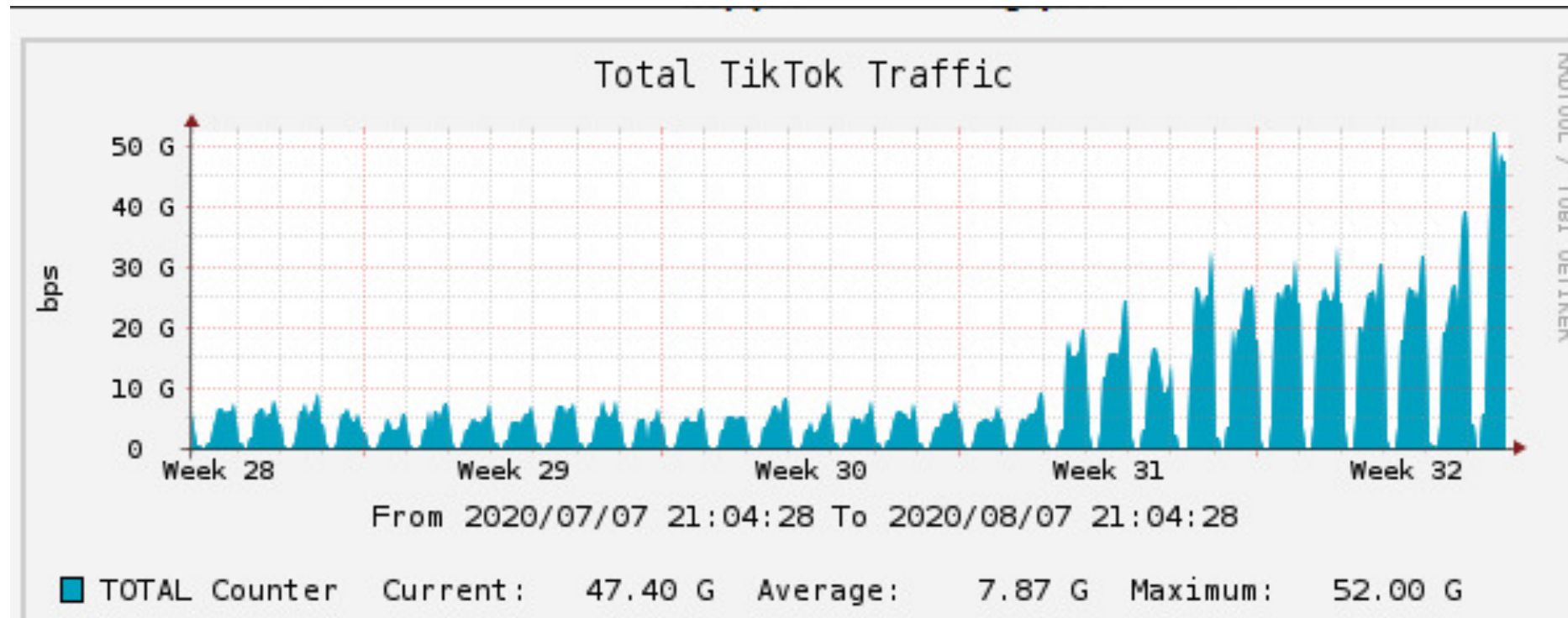
Typical distribution of International content in Nepal

Content	IPT %
Google	35%
Facebook	18%
Tiktok	7%
Netflix	2%
Microsoft	2%
Amazon	1%
Pubg	3%
Others	32%

CDN Challenges

1. **Lack of Internet Exchange Providers** where content providers could come on their own, the reason being the absence of compelling business case??
2. **Expensive IP transit** discourages content providers to host directly in the exchanges locally.
3. **CDN** is provided for hosting on **ISP premises or data centers only**
4. **Lack of business priority** and **supply chain issue**, bottleneck is created for CDN to scale as per the customer bandwidth growth.

Impact of change in **protocol** from http to https



Landlocked but not Mindlocked

1. **Create business case for CDNs** to come on their own cost to Nepali Data Centers and IXs **for ISPs to peer locally.**
2. **Create more local content and local e-commerce.**
3. **Compelling and attractive regulatory framework** to make foreign content providers to do business and host their content in Nepal.
4. **Explore the possibility** of right of way through to the third country, to connect to IXs there for local content and also for a possible connectivity to submarine landing stations.
5. **Attract more upstream providers** to connect at the border , providing more choices and introduce more competition to lower the rates.