

DRAFT SUBMISSION OF BHUTAN
Broadband Priorities for the Asia-Pacific Information Superhighway Master Plan
[21/10/2017]

Objective: This form is sent to the representative of each country in order to prioritise activities and better align broadband connectivity gaps with solutions. All country submissions will be consolidated as per AP-IS Pillar and subregion to develop an implementation plan for 2018 and will be presented by the Secretariat during the First Session of the Asia-Pacific Information Superhighway (AP-IS) Steering Committee, 1-2 November 2017, Dhaka, Bangladesh. A similar template is sent to partners to identify their planned activities.

Please complete this form and submit to ESCAP (escap-ids@un.org) by **no later than 25 October 2017**.

(a). Background Information

(i). Government Ministry/Organization in charge of ICT connectivity: Ministry of Information & Communications/Department of IT & Telecom

(ii). National Broadband Policy: Bhutan Telecommunications & Broadband Policy 2014

(iii). Completed/Current/planned fibre-optic broadband project: Under National Broadband Masterplan Implementation project, 18 Districts are connected with OPGW and remaining 2 Districts and 201 out of 205 blocks of villages have been connected with ADSS fibers. Remaining 4 blocks of villages are off-grid and shall be connected with alternate technologies as per the Rural Electrification Project. Current national fiber network lacks reliable domestic optic fibre network due to lack of redundancy caused by a linear network topology and lack of fiber rings. The Department of IT & Telecom will be connecting missing links to form domestic redundant self healing rings in the national fiber network in the coming years. Additionally Fiber Monitoring and Management System shall be installed to oversee national fiber network in Bhutan for effective network management to improve the maintenance efficiency and the network reliability. Telcos and ISPs are provided with a pair of fibers for free from the National Fiber Network to deliver their services (voice+data) in Bhutan.

Bhutan has two international Internet Gateways today; one from Phuntsholing (South West Border Town in Bhutan) and the other from Gelephu (South Central Border Town in Bhutan). However, we have been informed by potential FDI companies that the geographic separation of the two gateways are not adequate and has been identified as a weakness for FDI entrants to the country. The Department of IT & Telecom is therefore exploring redundancy options to strengthen International connectivity.

There are 3 major ISPs in Bhutan importing international internet bandwidth, roughly around 9.35 Gbps currently, viz Bhutan Telecom Ltd., Tashi

InfoComm Pvt. Ltd and Nano. Bhutan Telecom Ltd., Tashi InfoComm Pvt. Ltd., and Nano imports around 6.2 Gbps, 3 Gbps and 155 Mbps of International Internet Bandwidth respectively using IPLC or IP Transit or combination of both. Bhutan Telecom Ltd. is planning to increase their international internet bandwidth to 20 Gbps. The two other ISPs in Bhutan in also planning to to increase their international internet bandwidth.

(b). Challenges and Opportunities on promoting broadband connectivity:

Within the scope of the AP-IS four pillars

- (1). Connectivity;
- (2). Internet Traffic & Network Management;
- (3). E-resilience; and
- (4). Broadband for all,

ESCAP member countries and partners outlined seven strategic initiatives in the AP-IS Master Plan (http://www.unescap.org/sites/default/files/pre-ods/CICTST11_2E_rev1.pdf) to be implemented between 2016-2018 (please refer to attached chart of AP-IS 4 Pillars and AP-IS Strategic Initiatives).

The AP-IS seven strategic initiatives are as follows:

1. Identification, coordination, deployment, expansion and integration of the regional backbone networks at the cross-border intra- and interregional levels, in collaboration with member countries and subregional organizations;
2. Establish a sufficient number of Internet exchange points at the national and subregional levels and set out common principles on Internet traffic exchange to prevent Internet traffic tromboning, decrease transit costs and improve service quality
3. Regional social and economic studies;
4. Enhancing ICT infrastructure resilience in the Asia-Pacific region;
5. Policy and regulations for leveraging existing infrastructure, technology and inclusive broadband initiatives;
6. Capacity-building; and
7. Asia-Pacific information superhighway project funding mechanism based on public-private partnerships

(c). AP-IS 7 Strategic Initiatives Implementation Plan 2016-2018: priority challenges and proposed activities

In order to match country's sub-region's and region's priorities within the scope of the AP-IS seven strategic initiatives, please complete the matrix below accordingly. Please add a row as deemed necessary.

Priority Challenges	Focus Area	AP-IS Strategic Initiatives (1-7)	AP-IS Pillars (1-4)	Remarks
Priority Challenges:	Limited Domestic Fiber Optic Network Redundancy	(i) AP-IS Strategic Initiative 4, 7	(i) AP-IS Pillar 1, 3	
	Limited International Internet Redundancy	(ii) AP-IS Strategic Initiative 1, 3, 7	(ii) APIS Pillar 1, 2, 3, 4	
	High Cost for International Internet Bandwidth	(iii) AP-IS Strategic Initiative 1, 3, 5	(iii) APIS Pillar 1, 2	
	Limited CDNs in the Region	(iv) AP-IS Strategic Initiative 2, 6	(iv) AP-IS Pillar 2	
	Providing affordable broadband connectivity to all citizens	(v) AP-IS Strategic Initiative 1, 2, 3, 5, 7	(v) AP-IS Pillar 1, 4	
	Limited Last Mile Connectivity	(vi) AP-IS Strategic Initiative 4, 7	(vi) AP-IS Pillar 1, 4	
Opportunities	(i) Absence of Content Distribution Networks in the region. The lack of presence of major CDNs in the region makes it necessary for Bhutanese ISPs to establish POPs in distant countries like Singapore and the UK. The presence of CDNs in the region would help bring down the cost of connectivity for countries like Bhutan.			

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Proposed solutions/actions	(i) Bhutan's IX will instituted by November of this year. An initiative of the stakeholders with DITT spearheading it	
<p>(d). Update to terrestrial/submarine fibre-optic cable projects: Based on the ESCAP/ITU interactive transmission map (access via link: http://www.unescap.org/our-work/ict-disaster-risk-reduction/asia-pacific-information-superhighway/asia-pacific-information-superhighway-maps), please check and list down if there is any recent fibre-optic cable project completed/planned for your country, which is not reflected in the interactive map. The input provided below will be used to update the interactive map accordingly.</p> <p><i>(i) Thimphu to Wangdichodrang in Bhutan has been connected with ADS Fiber recently forming the first domestic redundant ring.</i></p>		

First Session of the Asia-Pacific Information Superhighway Steering Committee, 1-2 November 2017, Dhaka, Bangladesh.