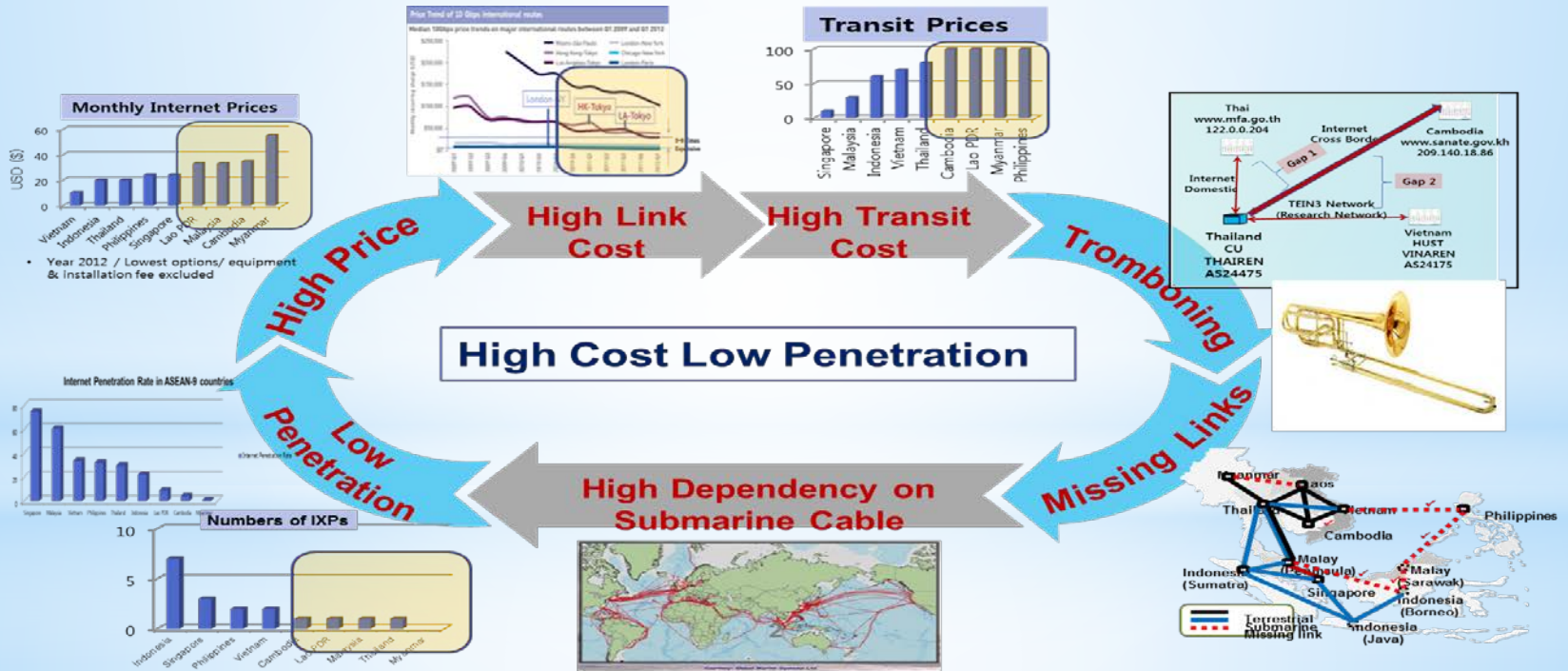


Connectivity – Action Items for the Network and Internet Connectivity

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Understanding "Cost" of Internet in the AP Region

High link cost, high transit cost, traffic tromboning, high dependency on submarine cable, and low penetration rate all influence each other in a cycle to the **relatively high price**



Understanding the “Connectivity”

Connectivity(= Physical Network Interconnectivity, Internet Connectivity) and **Open Internet**(= Neutral IXP, Network Neutrality, Equal Network Access) is and will continue to be an essential tool in facilitating the implementation of all SDG goals, as well as a key means to leverage the ingenuity, **collaboration and partnerships**(=Non-discriminatory Peering/Transit) needed to make them a reality. This panel shall examine the types, quality, and extent of connectivity in being the underpinning platform for the growth of ICTs and for an emerging digital economy by exploring its two main components: **accessibility**(= Network & Service Readiness) and **affordability**(= Low cost, Regulation for Fair Market Competition)

Connectivity

✓ Physical Network Inter-Connectivity

Demand : Seamless Fiber Optic Network by filling **Missing Links**



Sub-region	Missing Links
South-East Asia	Indonesia/Malaysia Lao PDR/China
South and South-West Asia	Bangladesh/Myanmar, Bhutan/India, India/Myanmar, India/Pakistan Nepal/China, Pakistan/China
North and Central Asia	Kyrgyzstan/Turkmenistan Kyrgyzstan /Uzbekistan, Tajikistan/Uzbekistan, Turkmenistan/Uzbekistan Turkey/Armenia., Mongolia/China, Mongolia/Russia

Source: ESCAP, based on Terabit Consulting.

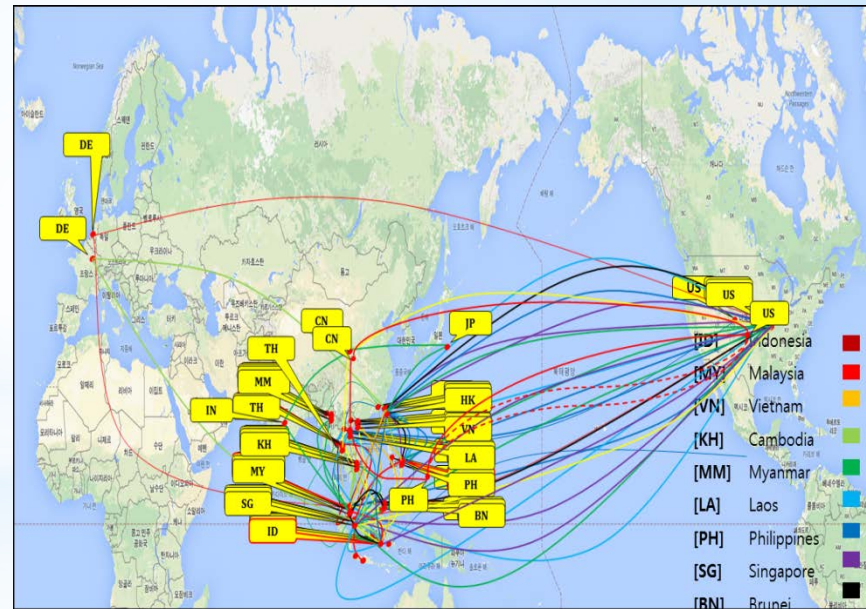
Connectivity

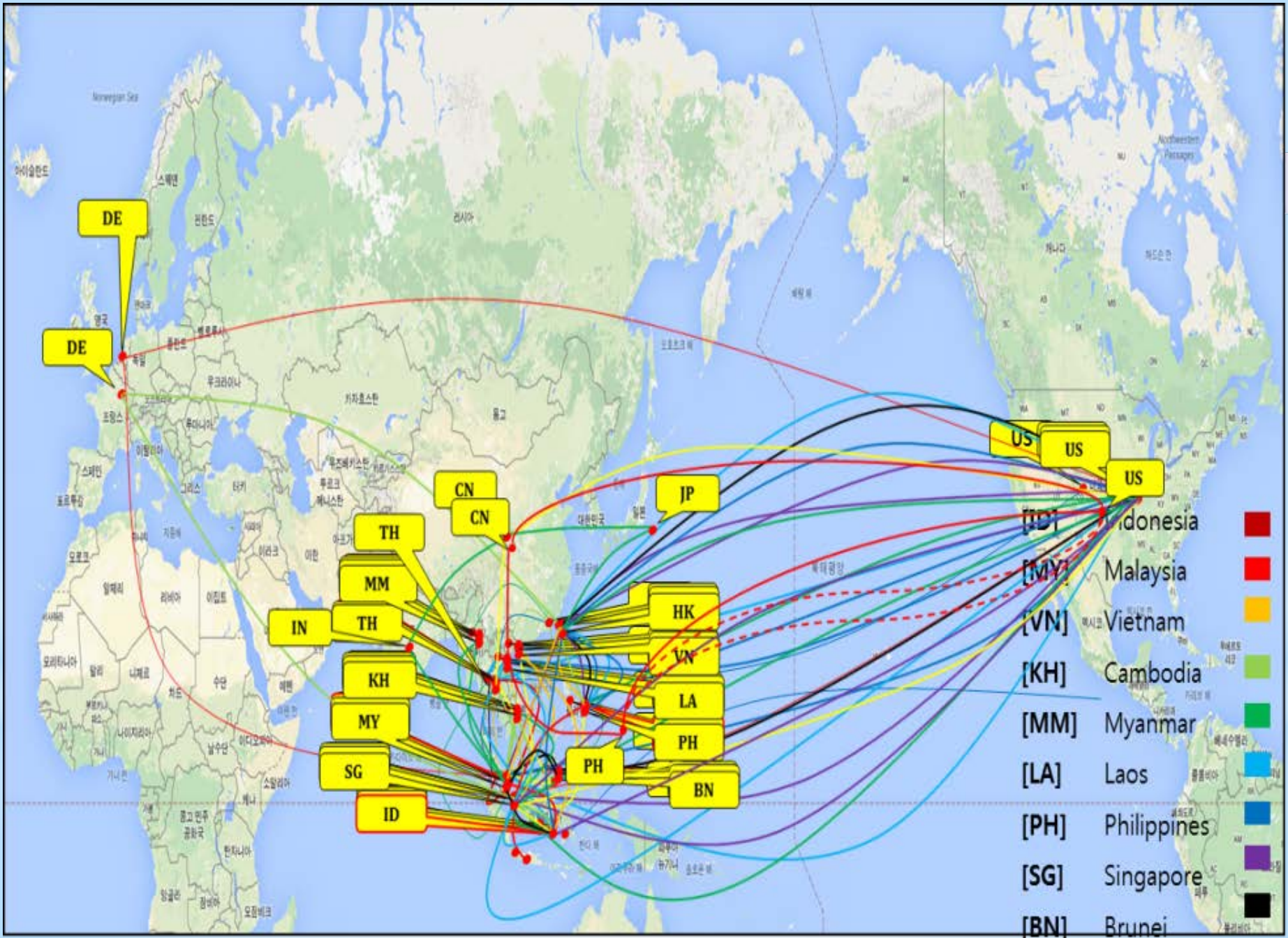
✓ Internet Connectivity :

Actually Internet traffic routes among AP countries seem to be unnecessarily long. In some countries, even domestic ISPs have no direct traffic exchange, resulting in tromboning to the outside of the continent

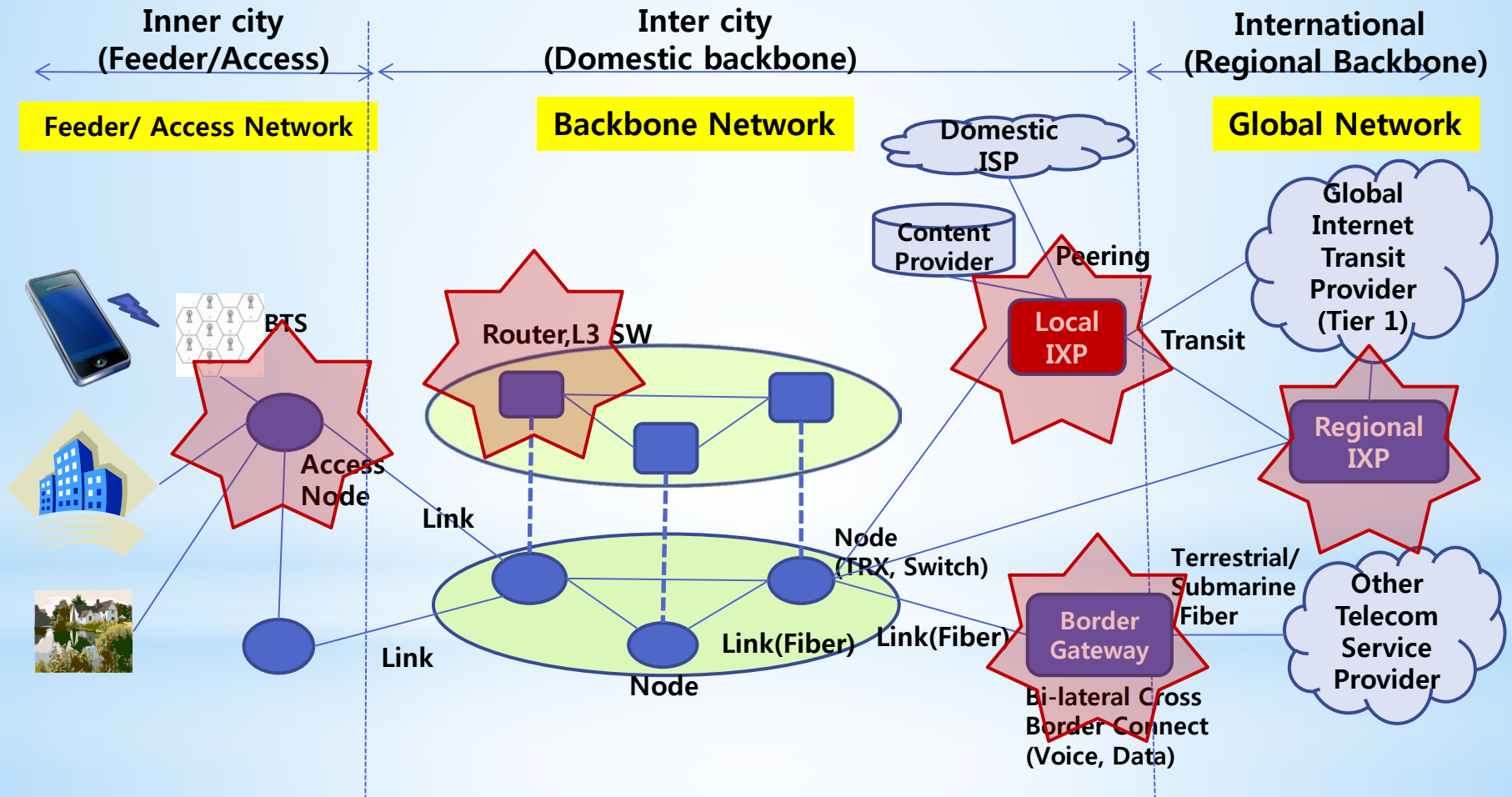
Demand :

- Establishing Sufficient Neutral Internet Traffic eXchange
- Direct Traffic eXchange among Border States





[Ref] Choke Points in the Internet



Open Internet

✓ Neutral IXP, Network Neutrality, Equal Network Access

Demand :

- Reducing Incumbent Carrier Dependency
- One Carrier Network Multi Use
- Equal Right to Access Critical Network

Collaboration and partnerships

✓ Non-discriminatory or Fair Market Peering/Transit

Demand :

- Un-paid full Peering between Domestic ISPs
- Transit Cost down for International connectivity

Accessibility

✓ Network & Service Readiness

Demand : Access/Subscriber Network Coverage
ex> Last Mile, Landing Station

Affordability

✓ Low cost, Regulation for Fair Market Competition

Demand : - Connection Cost Down(Peering/Transit)
- Competition among Service Providers

[Ref] Targeted Policy Goals for the “Connectivity”

Category		As-Is	To-Be
Infrastructure & ICT Connectivity	Terrestrial Backbone Network	<ul style="list-style-type: none"> • Most countries are interconnected with fiber • Some weak or insufficient capacity observed 	<ul style="list-style-type: none"> • At least one direct land based fiber link to each neighboring country • Regional Terrestrial Backbone Network, hybrid mesh and ring • Center Node establishment for low cost and reliable delivery of traffics
	Internet Traffic Exchange	<ul style="list-style-type: none"> • Dependent on global transit providers • Poor direct peering • Some countries no peering among domestic ISPs 	<ul style="list-style-type: none"> • Direct bilateral peering/transit between neighboring states • Intra/Inter Regional Transit Nodes • Domestic Traffic exchanged domestically
Transit Price and Quality	Monthly Internet Transit Cost (US\$/Mbps)	<ul style="list-style-type: none"> • Min 10 US\$ • Max 100 US\$ 	less than 2 US\$ <ul style="list-style-type: none"> • re-adjustable year by year, • Min < 2 US\$ in US, Europe Market
	Average Speed	• 0.2~43 Mbps	More than 25 Mbps
	Down Up	• 0.3~57 Mbps	More than 25 Mbps
	Latency (msec)	• 13~363 msec	less than 100 msec
	Tromboning Index	• 1~34	less than 5

End Note

- We recognize “Today, more than 80% of households in developed countries have internet access. Meanwhile, **two out of three households in developing countries do not**”
- ICT Infra as a Catalyst for the UN SDG, we need to take action **to secure AP regional level Connectivity and realize Affordable End User Prices**

[Ref] Hierarchical Image of APIS

Pillars

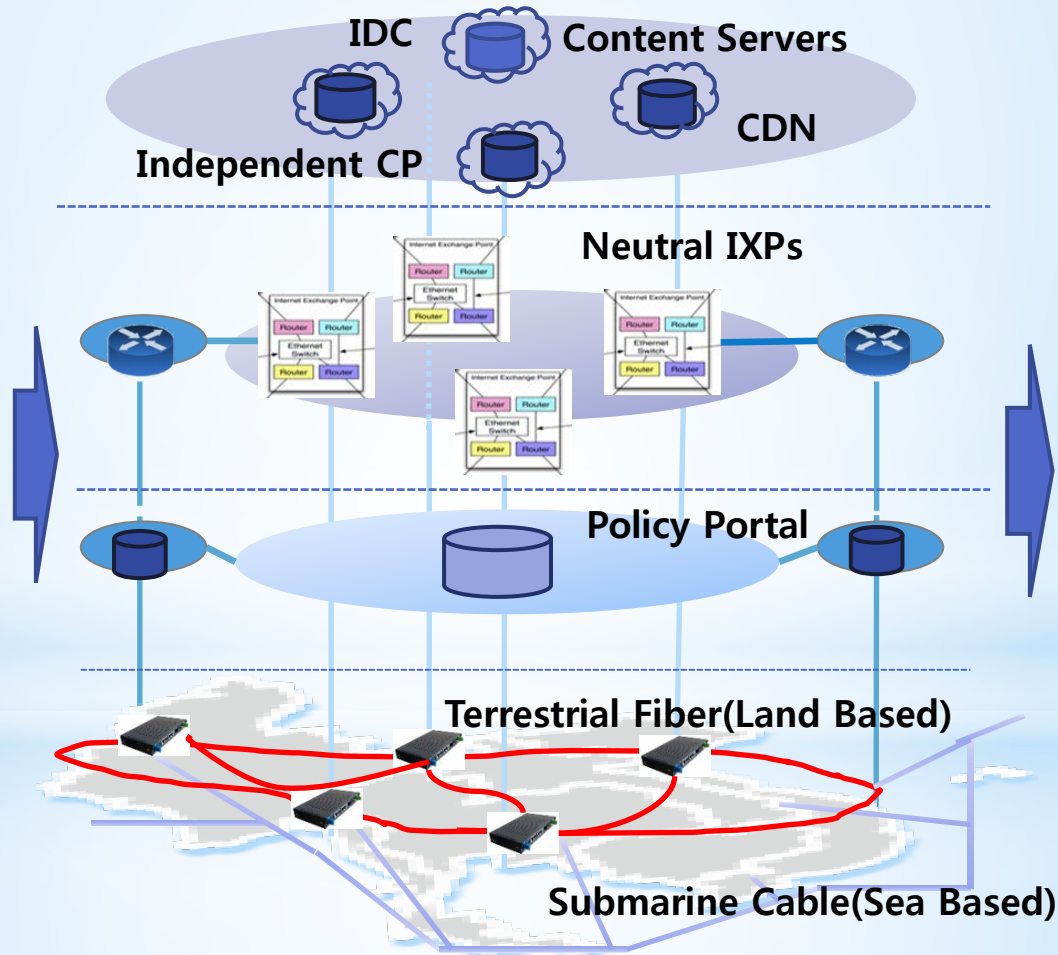
Contents/
Contents Delivery
System

Open/Neutral IXPs
(ITEC)

Policy and
Regulation Registry
(Open Access &
E-resilience)

Broadband
Backbone Network
(TBBC + Submarine)

Image



Goals



17 GOALS TO TRANSFORM OUR WORLD
SUSTAINABLE
DEVELOPMENT
GOALS

- **Feasibility study and Infra Design for the Asia Pacific Region**
 - **In-depth study for Establishing Asian Regional IXPs in 2016**

- **Inter-Governmental Study (or Steering) Group for the in-depth survey on APIS**
 - **Integrating TACIM, SASEC, ABC, GMS projects**
 - **Overall Pictures of APIS and Rough Amount of Investment**

- **Developing APIS Master Plan**
 - **Mile stone and collaborative Action Items**
 - **Preparing Draft of Inter-Governmental Agreement**