Considerations in Improving the International Connectivity Globally

China Academy of Information and Communication Technology
Chen Hui

International Connectivity Is The Need For ICT Development of a Country

- **Shortage of international Internet connections is an important factor restricting the development of Internet, and restricts the efforts of various countries to develop themselves by utilizing Internet resources.**
- **Currently, submarine cables are the main method for connecting to international Internet, however, many countries have no landing sites of submarine cables.**

Among 64 countries in the Asia and Pacific regions, only 29 countries can use submarine cables. For the other 35 countries, either they are landlocked countries or can not afford the cost of submarine cables.

UNITED NATIONS ESCAP
Economic and Social Commission for Asia and the Pacific

- ESCAP reported that, countries with submarine cable sites usually enjoy a cheaper, more rapid high-quality Internet connections, but the landlocked countries didn't fully benefit from the Internet broadband.

TERABIT Consulting

- Terabit Consulting research found that, the lack of Internet connectivity is causing great digital divide between ASEAN member states.

1956 2016
CCITT / ITU-T

ITU-T Bridging the Standardization Gap

Most International Internet Traffic Can Only Be Carried By Submarine Cables and Terrestrial Tables Are Not Fully Utilized

- 95% of global Internet traffic is carried by submarine cables
- Only 5% of global Internet traffic is carried by terrestrial cables

Advantage of submarine cables

Do not have the problem of communication sovereignty of different countries

Shortcomings of submarine cables

High construction cost

Difficult to operate and maintain

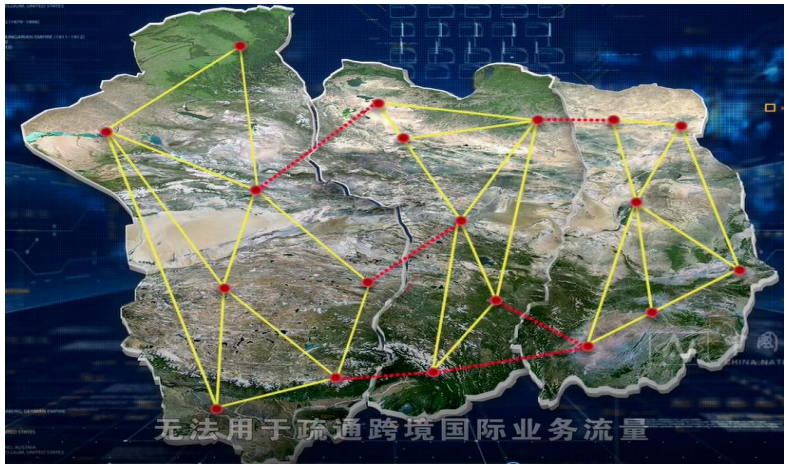
Single route

Long Detours

The Reason and Result of Under Utilization of Trans-multi-country Terrestrial Cable

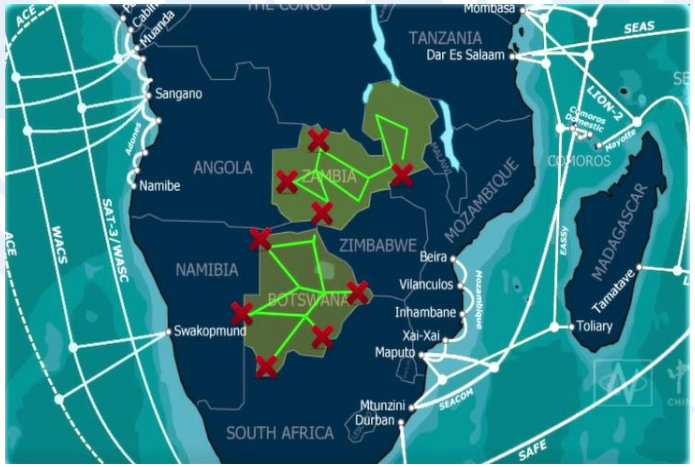
Terrestrial cables involve national sovereignty over communications

- Terrestrial cables is under utilized because different countries have dis-unified standards for charge on international circuits' transit



The result of Under Utilization of Trans-multi-country Terrestrial Cable

- Under such conditions, land-locked countries have great difficulty in finding a way out for their international communications

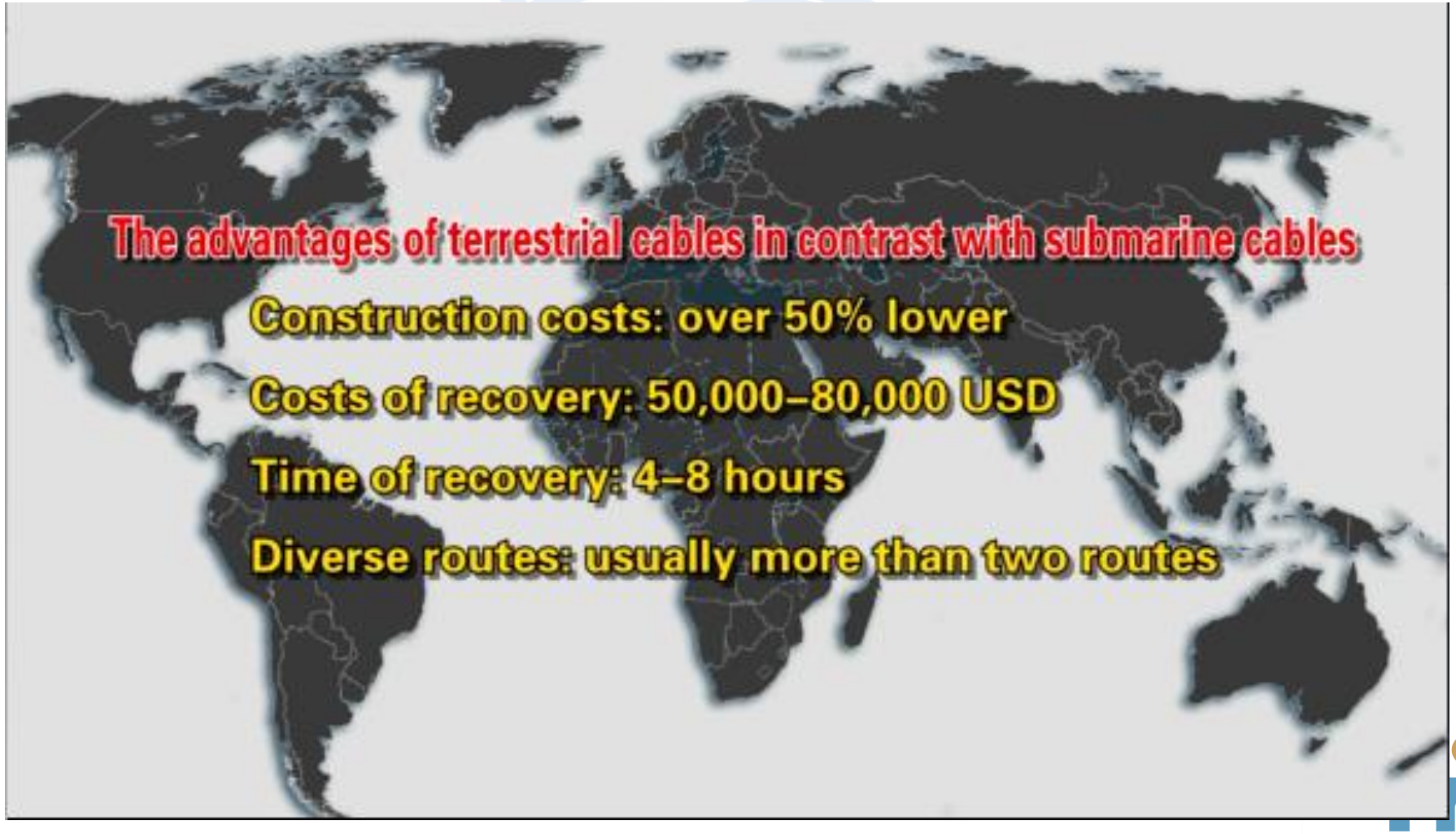


- Many countries can not reach submarine cable to access the Internet in an affordable price Under this situation

1956 2016 CCITT / ITU-T

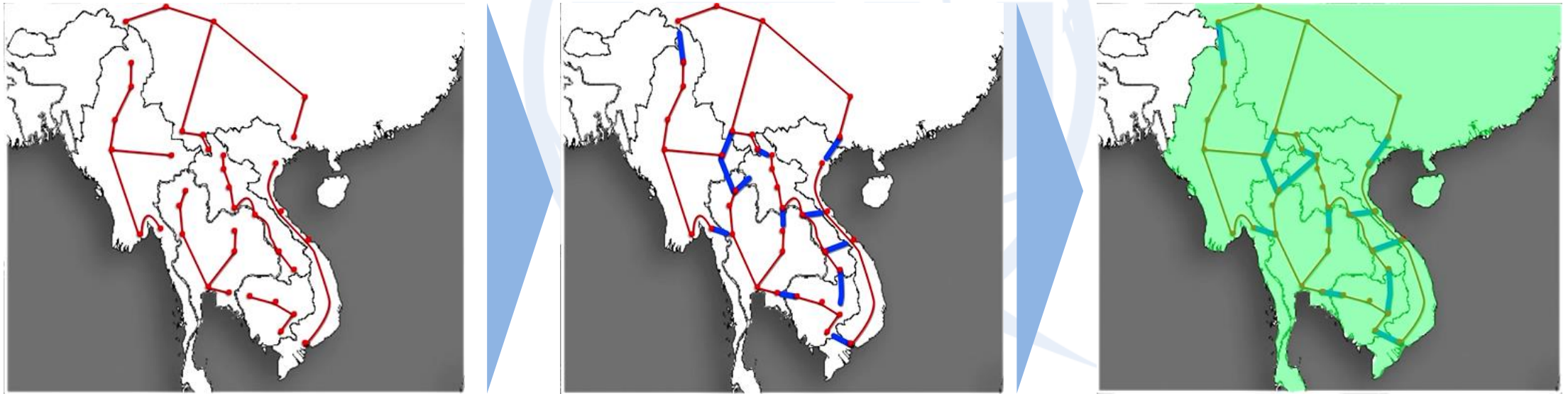
ITU-T Bridging the Standardization Gap

Terrestrial Cable Have a lot of Advantages Except Concerning National Sovereignty Over Communications



The Benefits of Fully Utilizaton of Trans-multi-country Terrestrial Cable (1)

- By connecting the domestic backbones with dispersed trans-border terrestrial cables, we can establish large-capacity international terrestrial cable networks that cover **each region.**



The Benefits of Fully Utilizaton of Trans-multi-country Terrestrial Cable (2)

- By connecting the domestic backbones with dispersed trans-border terrestrial cables, we can establish large-capacity international terrestrial cable networks that **cover each continent**.

The Benefits of Fully Utilizaton of Trans-multi-country Terrestrial Cable (3)

- By connecting the domestic backbones with dispersed trans-border terrestrial cables, we can establish large-capacity international terrestrial cable networks that cover **even the whole world.**

The Benefits of Fully Utilization of Trans-multi-country Terrestrial Cable (4)

- **This will greatly increase the capacity of the existing transmission channels between countries, especially for those land-locked ones.**
- **This will also greatly increase the traffic flowing on the submarine cable** because more inland countries can reach submarine cables in an affordable price and get connected to other countries through submarine cable.
- **The cost of this solution is low,** because to a large degree it utilizes the existing domestic backbone transmission networks in each country.

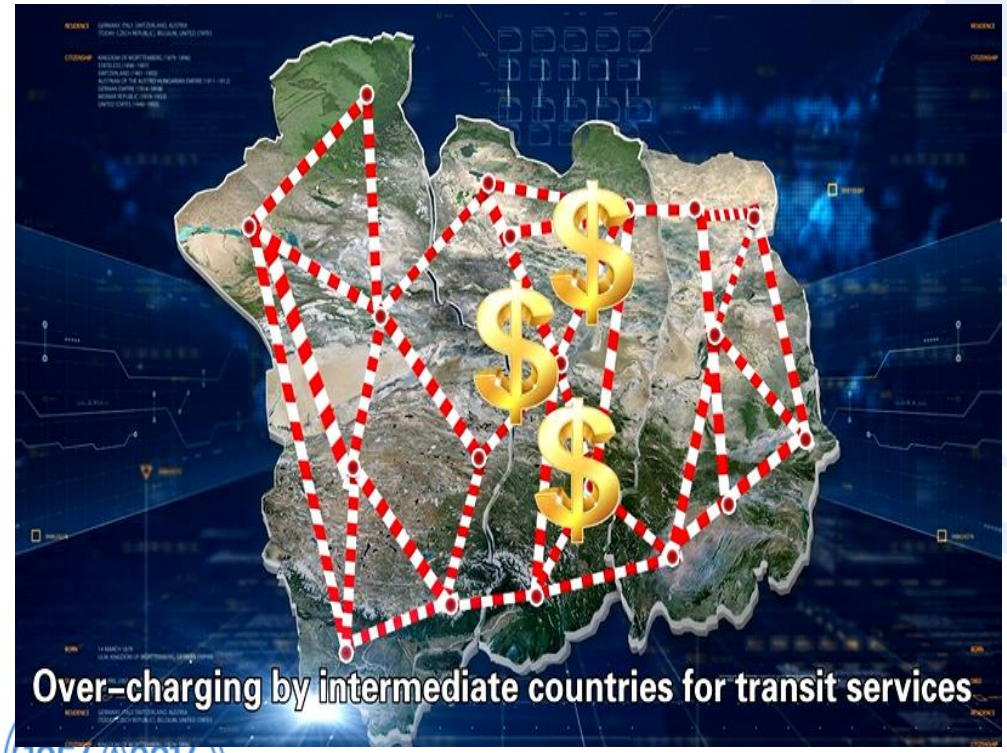
The Disadvantages in the Absence of a set of International Standards and Rules on Charging issues of Trans-multi-country Terrestrial Cables (1)

The existing terrestrial cable resources are effectively utilized only between two neighboring countries

Once a third or more countries are involved, these resources will lie under-used due to over- charging by the intermediate countries for the transit services.

The Disadvantages in the Absence of a set of International Standards and Rules on Charging issues of Trans-multi-country Terrestrial Cables (2)

As large quantities of existing domestic terrestrial cables fail to be utilized in carrying the traffic of international trans-border service, they become sunken gold.



The High Cost of Landlocked Countries Access to The Internet

- International connectivity route of Country A to UK :

Capital of Country A-**City A**

VS

City A-United Kingdom

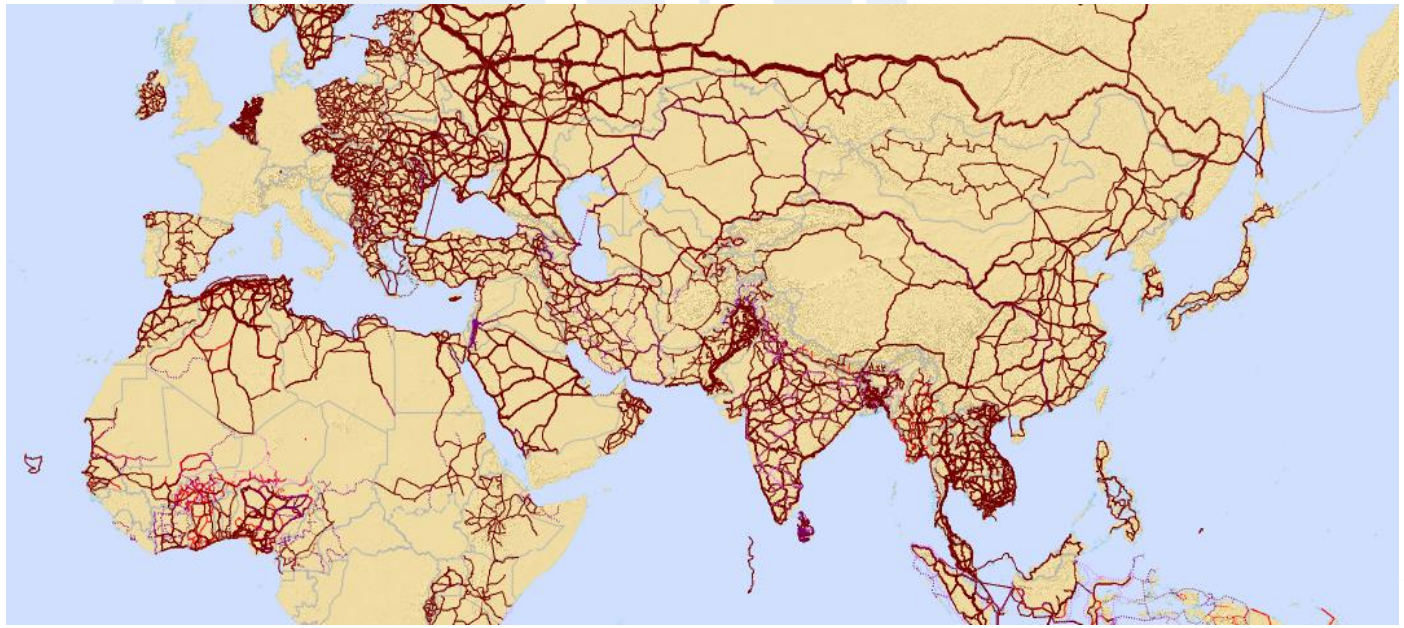
- Distance：1/6
- Price：10 times

Increasing The International Connectivity of Trans-multi-country Terrestrial Cable: Fundamental Conditions Are Ready

- Most countries in the world have built their own domestic backbone optical networks.
- Cross-border terrestrial optical cable systems are already established between neighboring countries and can be utilized to improve the international connectivity among different countries in the world.

Global Terrestrial Optical Cable Map

Source: ITU



Explore the New Charging and Operation Mode of International Terrestrial Cable Systems

- **Lack of feasible construction and operation modes for international land**.
- **Interconnection needs the cooperation of countries and carriers along the lines:** the operation modes of international submarine cables, International Through Railway Transport, international crude oil transport, and international electric transmission can be used as reference.

Chongqing-Xingjiang-Europe

Agreement on International Railroad Through Transport of Goods (2015)

- Agreement on International Railroad Through Transport of Goods has **25 member states** and the applicable scope of the agreement is **over 270000 kilometers**.
- Regulations and rules on international through railway transport have been established, including **Rules for Unified Transborder Rate of International Through Railway Transport**, which provides the methods for calculating and checking transborder rates.

Successful Cases of the Aviation Industry and the Transport Industry Can Provide References and Inspirations

The International Air Services Transit Agreement Successfully Solved the Cross-border Charging Problems of International Aviation Industry.

more than 40 Asian & Pacific countries signed **the Inter-Governmental Agreement on Trans-Asia Railway Network and Inter-Governmental Agreement** on **Trans-Asia Road Network** recently, which successfully solved the problem in settlement of railway and road transportation cross multiple countries in the Asia and Pacific region .

The Meaning of establish relevant "standards and rules regarding the transit charges on trans-multi-country terrestrial cables "

Develop " Standards and rules regarding the transit charges on trans-multi-country terrestrial cables "

- Connecting the existing domestic backbone networks in each country via trans-border terrestrial cables
- To form an ideal international terrestrial cable network
- Large quantities of existing domestic terrestrial cables can be utilized in carrying the traffic of Internet among countries
- Turn the unlit capacity of domestic backbone networks from sunken gold to flowing gold

A New Study Question Has Been Established to Solve the Problems Regarding the Transit Charges Issues on Trans-multi-country Terrestrial Cables

Name of the Newly Established Study Question 13 of ITU-T SG3

Study of Tariff, Charging Issues of Settlements Agreement of Trans-multi-country Terrestrial Telecommunication Cables

Link of the Newly Established Study Question 13 of ITU-T SG3

https://www.itu.int/en/ITU-T/studygroups/2017-2020/03/Pages/questions.aspx

Please Give Your Contribution to This New Study Question

1956 2016
CCITT / ITU-T

ITU-T Bridging the Standardization Gap

CAICT 中国信通院

Thanks !