ITU Regional ICT Indicators Workshop for Africa
Lilongwe, Manila
## 20-21 March 2018

Fixed-telephone network, mobile-cellular network and international bandwidth indicators

ICT Data and Statistics Division
Telecommunication Development Bureau
International Telecommunication Union

ITU Handbook

- Covers **81 indicators** on telecommunication/ICT services

- Covers data collected from **administrative sources** (e.g. telecom operators)

- Discussed in the ITU Expert Group on Telecom/ICT Indicators (**EGTI**)

- Available at:

http://www.itu.int/pub/D-IND-ITC_IND_HBK-2011
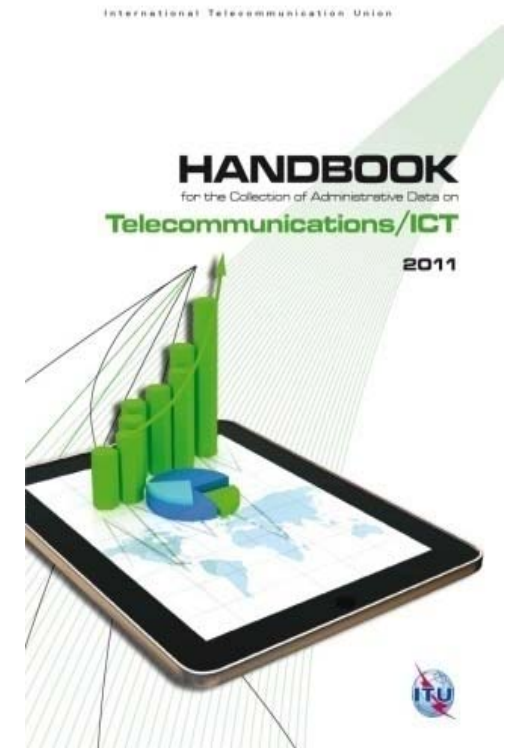
Main ITU indicators from administrative sources

Fixed-telephone network

i112: Fixed-telephone subscriptions

The sum of (active) number of:

(i)analogue fixed-telephone lines

(ii)Voice-over-IP (**VoIP**) subscriptions

(iii) fixed wireless local loop (**WLL**) subscriptions

(iv) integrated services digital network (**ISDN**) voice channel
   equivalents

(v)fixed **public payphones**

This indicator was previously called Main telephone lines in
   operation.

Fixed-telephone subscriptions
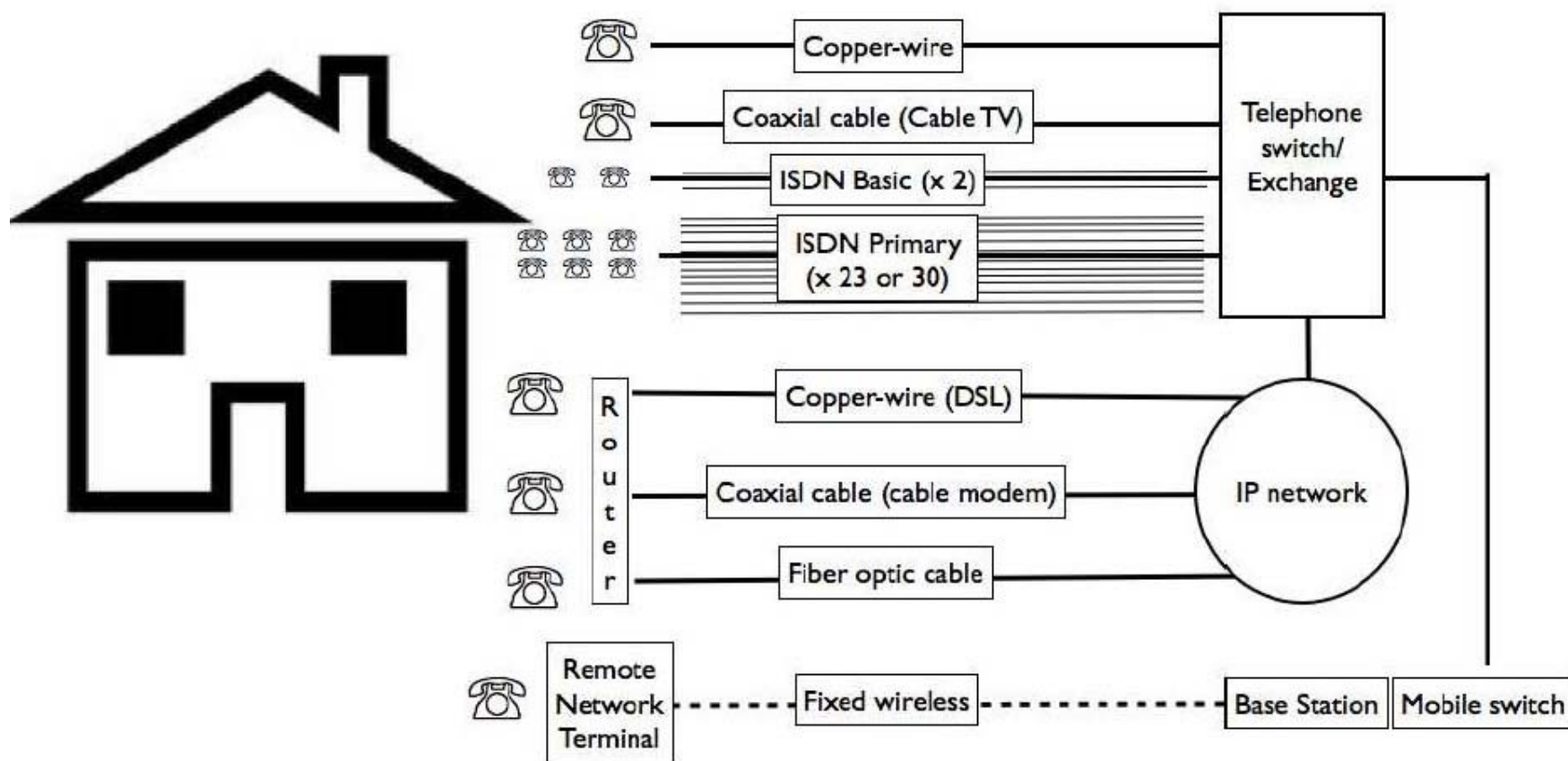
Main ITU indicators from administrative sources

Mobile-cellular network

i1271: Mobile-cellular telephone subscriptions

Number of subscriptions to a public mobile telephone service that provide **access to the PSTN using cellular technology**.

The indicator includes:
(i)postpaid subscriptions; and
(ii)prepaid accounts that are active, i.e. used during the last three months.

The indicator applies to all mobile-cellular subscriptions that offer voice communications.

It excludes subscriptions via data cards or USB modems, subscriptions to public mobile data services, private trunked mobile radio, telepoint, radio paging and telemetry services.

What do we actually measure?

Mobile-cellular…

- Subscriptions → ✓ *operator data*

- Users → *household survey data*

- Handsets → ✗

- Subscribers → ✗

i1271pop: Percentage of a population covered by a mobile-cellular network

Percentage of inhabitants <u>within range of a mobile-cellular network</u>, **irrespective** of whether or not they are subscribers or users.

Calculation: Divide number of inhabitants within range of a mobile-cellular signal by the total population and multiply by 100.
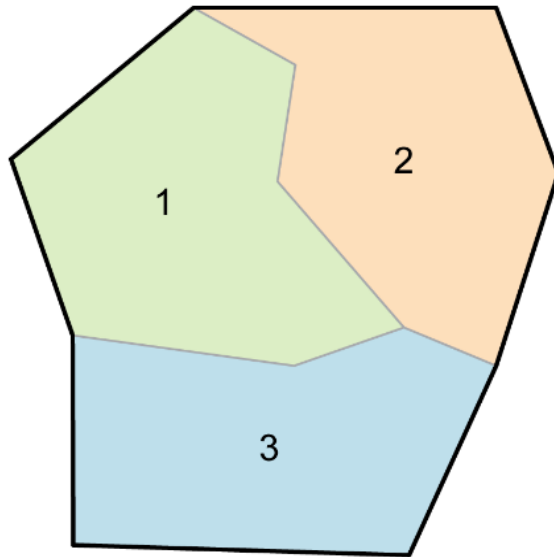
Mobile coverage – methodology

Possible ways of collecting the data:

1. Each operator reports total country coverage
   $\Rightarrow$ Max value of all reported

2. Each operator reports total per admin unit
   $\Rightarrow$ Max value of all reported per admin unit
   $\Rightarrow$ Aggregation according to population/admin unit

Mobile coverage – methodology

Example:

	Op 1	Op 2	Op 3
Region 1 (25% pop)	70%	**80%**	70%
Region 2 (25% pop)	50%	60%	**70%**
Region 3 (50% pop)	**80%**	70%	70%

Total coverage: 80% * 25% + 70% * 25% + 80% * 50% = **77.5%**

Main ITU indicators from administrative sources

International bandwidth indicators

Revised guidelines 2016

International Internet bandwidth

Lit capacity   Purchased capacity

Potential capacity   Used capacity
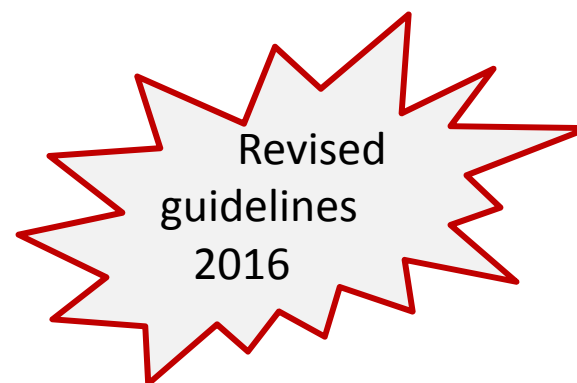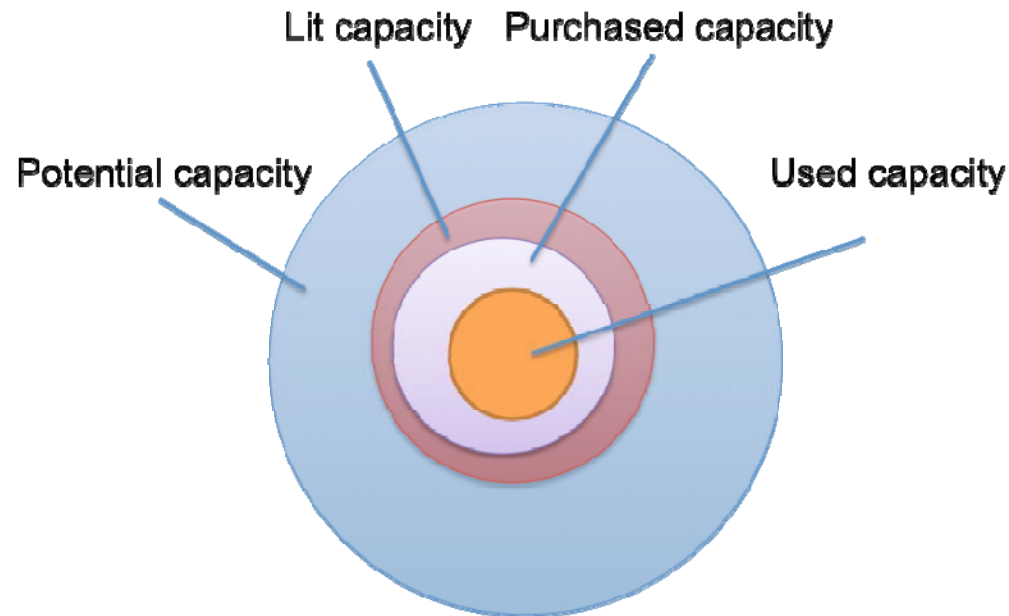
ITU collects data on two indicators:

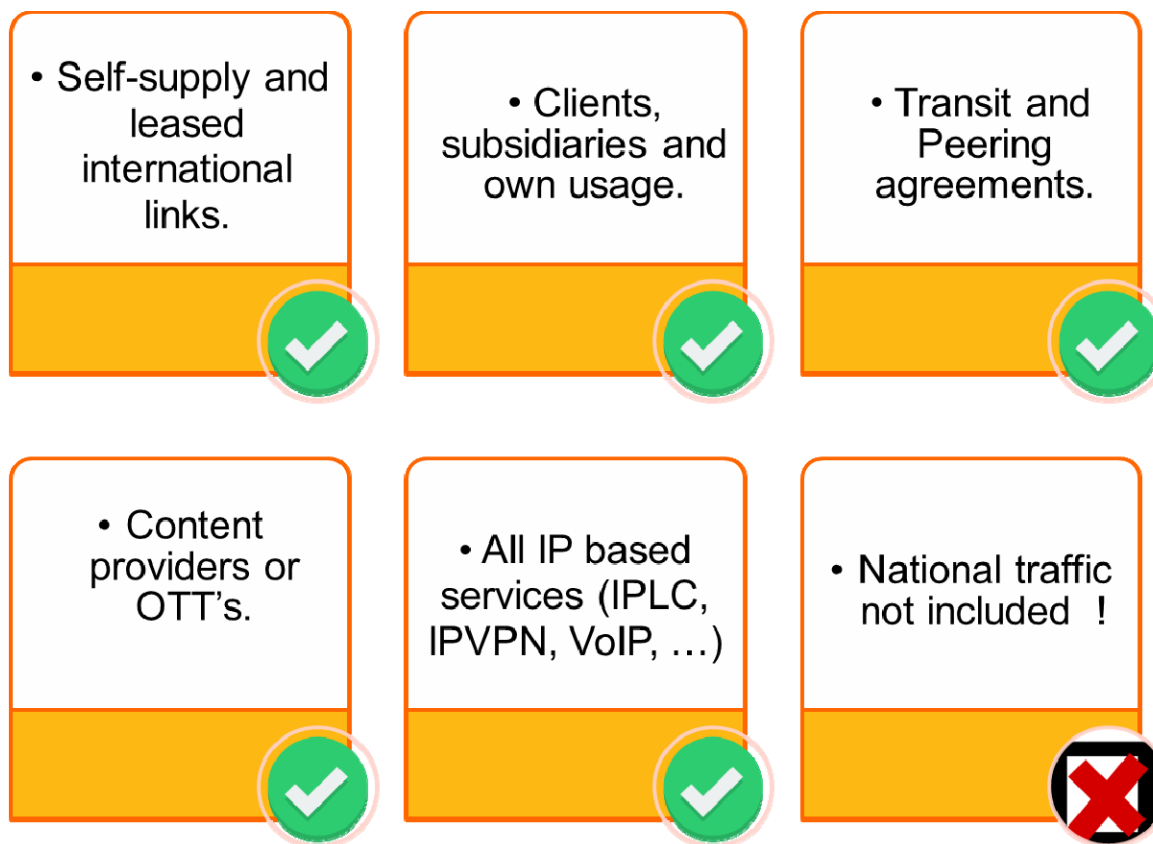| 1. Lit/equipped capacity	2. Used capacity

i4214u: Used international bandwidth (traffic), in Mbit/s

Average usage of all international links including fiber-optic cables, radio links and traffic processed by satellite ground stations and teleports to orbital satellites (expressed in Mbit/s).

All international links used by all types of operators, namely fixed, mobile and satellite operators should be taken into account. The average should be calculated over the 12-month period of the reference year.
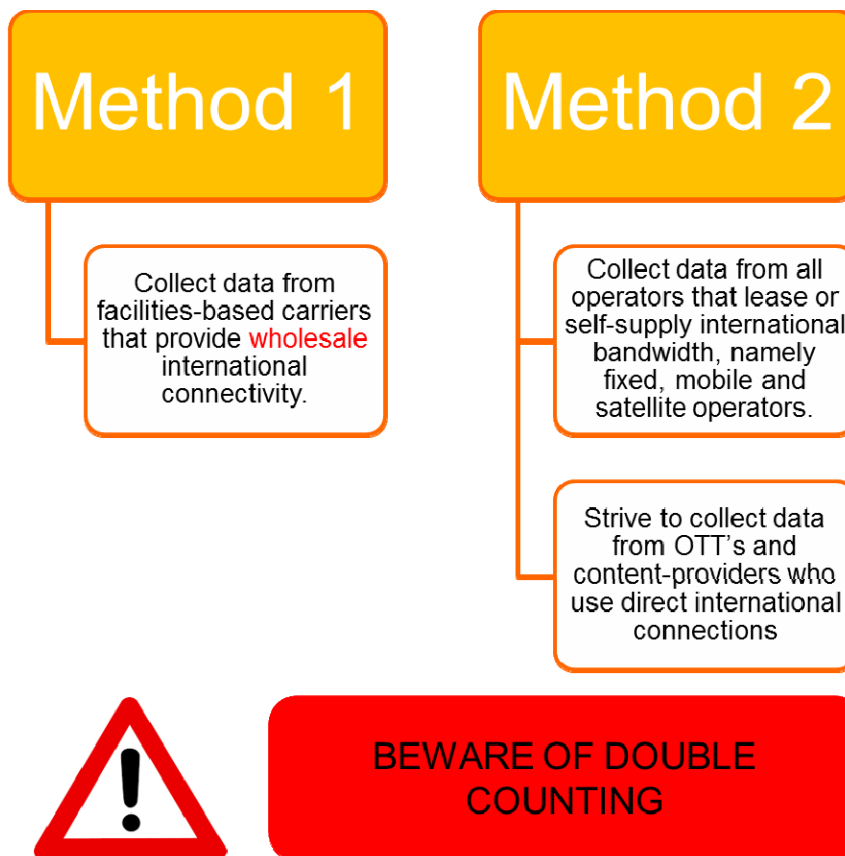
For each individual international link, if the traffic is asymmetric, i.e. incoming traffic is not equal to outgoing traffic, then the higher value out of the two should be provided. The combined average usage of all international links can be reported as the sum of the average usage of each individual link.

What is counted as usage?

- Self-supply and leased international links. ✓
- Clients, subsidiaries and own usage. ✓
- Transit and Peering agreements. ✓
- Content providers or OTT's. ✓
- All IP based services (IPLC, IPVPN, VoIP, …) ✓
- National traffic not included ! ✗

Source: ANACOM Portugal & EGTI sub-group on international Internet Bandwidth

Methods of data collection

Method 1

Collect data from facilities-based carriers that provide wholesale international connectivity.

Method 2

Collect data from all operators that lease or self-supply international bandwidth, namely fixed, mobile and satellite operators.

Strive to collect data from OTT's and content-providers who use direct international connections
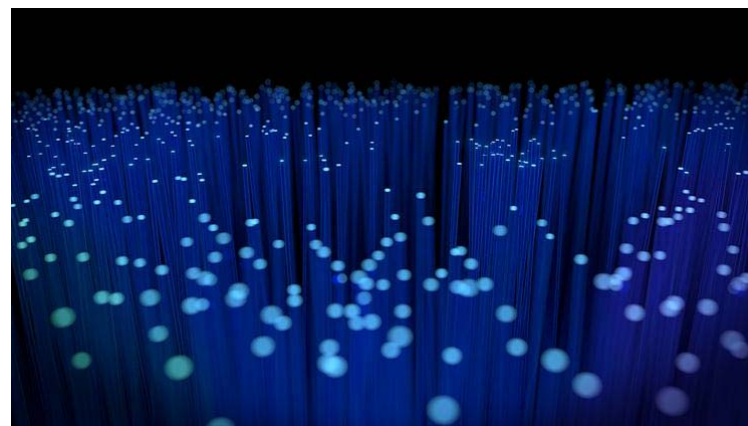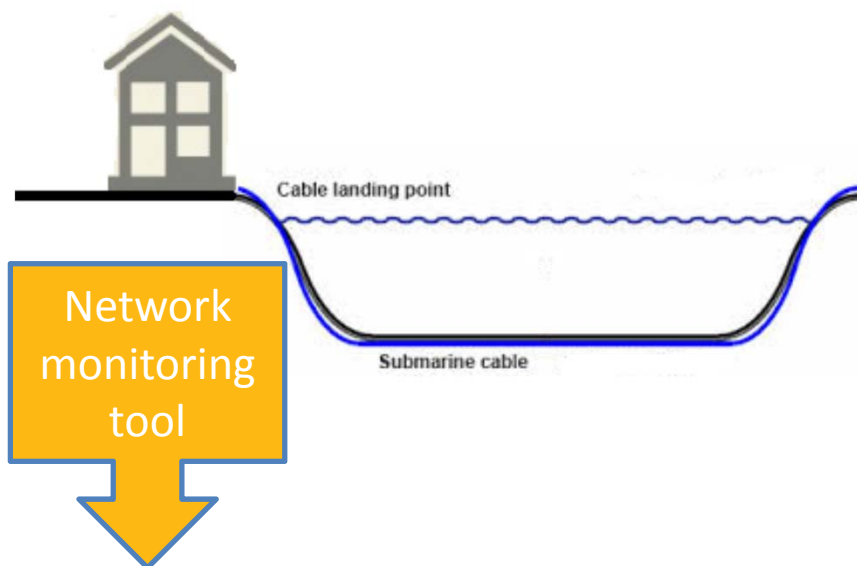
BEWARE OF DOUBLE COUNTING

Double counting can occur if data are collected from both service providers and facilities-based carriers.

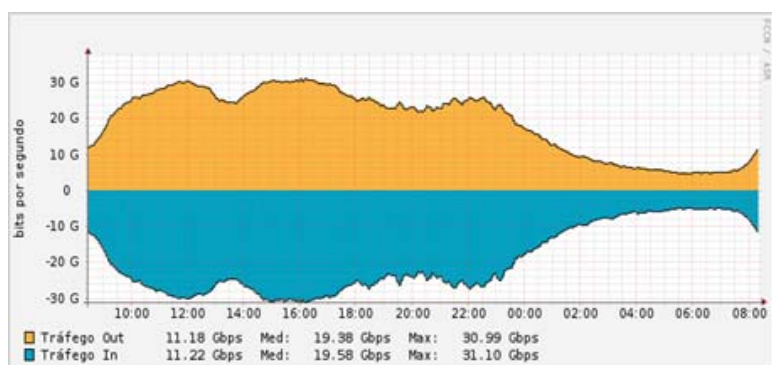*Source: ANACOM Portugal & EGTI sub-group on international Internet Bandwidth*

Lit/equipped international Internet bandwidth, in Mbit/s

Total lit/equipped international bandwidth capacity refers to the total lit/equipped capacity of international links, namely fiber-optic cables, international radio links and satellite uplinks to orbital satellites in the end of the reference year (expressed in Mbit/s). If the traffic is asymmetric (i.e. incoming traffic and outgoing traffic is not equal), then the higher value out of the two should be provided.

Network monitoring tool

Bandwidth usage in Gbps

Cable landing point

Submarine cable

Tráfego Out	11.18 Gbps	Med: 19.38 Gbps	Max: 30.99 Gbps
Tráfego In	11.22 Gbps	Med: 19.58 Gbps	Max: 31.10 Gbps

Source: Gigapix

Examples of network monitoring tools

- MRTG-Multi Router Traffic Grapher

- PRTG

- Cacti (www.cacti.net)

- OpenNMS (www.opennms.com)

Source: ANACOM Portugal & EGTI sub-group on international Internet Bandwidth

Thank you

For more information
http://www.itu.int/ict
and
indicators@itu.int