Global trends in telecom development & new challenges for developing countries

Saburo TANAKA
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Agenda

- Market trends
  - Network evolution
  - Paradigm shift
  - Tariff evolution

- Challenges for developing countries
  - Service issues
  - Regulatory issues
  - Network issues
  - Internet issue

- Some solutions studied in SG3
A Mobile Revolution

Source: ITU World Telecommunication Indicators Database.
Calling opportunities worldwide

Source: ITU Fixed-Mobile Interconnect website: http://www.itu.int/interconnect
Growth rate in phone subscribers

Source: ITU Asia-Pacific Telecom Indicators, 2003
Regional share of the world’s phone subscribers

Source: ITU Asia-Pacific Telecom Indicators
Distribution of mobile and Internet users by region, 2002

Estimated Internet users, 500 million

Mobile phone users 1'154 million

Asia-Pacific, 38%
Europe, 31%
Americas, 28%
Africa, 3%

Asia-Pacific, 32%
Europe, 29%
Americas, 37%
Africa, 1%
Revenue growth (US$bn)

- Domestic Telephone/fax
- Int'l
- Mobile
- Other: Data, Internet, Leased lines, telex, etc

Source: ITU.
Traditional regime: Joint provision of service

Country A

Country B
Emerging regime: Market entry and interconnection

Country A

Jointly provided circuit

Country B

Circuit provided by operator B
Once a foreign carrier accepts the benchmark rate, it can negotiate ISR arrangements with US carriers.
Telephone service using data transmission
(By-passing accounting rate)

Voice is packetized = data transmission
Telephone regulations do not apply
Call from International Telecommunication Network (ITN) to another ITN via IP-based Network
Falling prices (1)

Average retail price of one minute call to USA.

Source: ITU adapted from FCC and national data (34 countries).
Falling Price (2):
SwissCom, price per minute of local call and call to US

Swiss call prices.
US cents per minute.

Source: ITU.
Delivering international voice traffic in 2002

- Originating international voice traffic
  - Via a wholesale carrier: 30%
  - Direct dealing with the terminating country: 70%
  - Refile via a third country: 20%
  - Sender keeps all exchange of traffic: 65%
  - Via a point of presence in the terminating country: 15%

- Traditional bilateral settlement rate system: 20%
  - 70%
  - 15%
  - 30%
Infrastructure capacity and costs, TransAtlantic cables, 1983-2000

Capacity (voice paths), growing by 64% p.a.

Cost per voice path (US$), declining by 41% p.a.

Source: ITU, TeleGeography Inc., FCC.
Note: Voice-path numbers assume a compression ratio of 5:1 to number of circuits.
If distance is dead, and bandwidth is infinite ... What do we bill for?
What do we bill for?

- **Bill for network connection**
  - Increasing integration of monthly telephone subscription and Internet subscription prices

- **Bill for privacy/advertising**
  - Privacy-protected customer pays premium
  - Customer agreeing to receive advertising pays less

- **Bill for quality of service**
  - Differentiated by transmission quality, waiting time, bandwidth on demand, value-added secretarial support, mail functions etc.,

- **Bill for Billing**
  - Customising of billing: by service, by user, by site
Internet, price and service trends

- Towards a flat-rate price structure
  - All you can eat for US$20.00
- Towards lower service quality
  - “Best efforts” service delivery at lowest price
- Death of distance
  - Message to other side of earth costs same as a message sent next door
- Cross-promotion of Internet and other services
  - “Free PC” with three year’s ISP subscription
  - “Free Internet” with residential local loop charges
- Tendency towards industry concentration
  - AOL’s subscriber base > next ten ISPs added together
Challenges for developing countries

- Service, tariff and technical issues
  - Alternative calling procedures
  - International Internet connectivity
  - Public switched network to IP based network
  - Challenges related to mobile service

- Regulatory issues
  - Interconnection rules
  - Implementation of USO
  - Tariff Rebalancing

- Internet connectivity in developing countries
Operator in A sends traffic to operator in C under an arrangement of exclusivity:

- Operator in A is a partner of operator in C
- Settlement rates A/B > C/B

1. Origin A
   Destination B

Operator in C declares traffic to B on transit through A:

2. Operator in C "re-labels" the traffic as originated in C

3. Operator in B receives traffic at settlement rate C/B instead of A/B

Refile and other practices using accounting rate system.
Alternative calling procedures

Interconnection of two outgoing calls in country A

Country A

Call-Back

Country B

Country C

Call-Back

1.0$  
1.5$  
2.0$  
0.8$  
1.2$

4.5 $  
3.5$
Mobile tromboning (using accounting rate)

- Operator X or Operator A’s facility in another country
- Operator A’s Int’l facility
- Operator B’s Int’l facility
- Operator A’s national network
- Operator B’s mobile network
- High interconnection charge

International boundary

Caller A

Called B
The influence of IP Telephony on price

- **IDC** forecasts that “Web Talk” revenues will reach US$16.5 bn by 2004 with 135 billion mins of traffic.

- **Gartner Group** forecast that IP Telephony and competition in Europe will reduce prices by 75% by 2002.

- IP Telephony as % of all int’l calls in 2004:
  - **Tarifica** forecast 40%.
  - **Analysys** forecast 25%.

- In developing countries, the majority of IP Telephony calls are incoming.

Source: IDC.
## Challenges

### Revenue gain and revenue loss

<table>
<thead>
<tr>
<th></th>
<th>Accounting Rate</th>
<th>IP-Telephony</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PTO in Developed country</strong></td>
<td><strong>Collect US$ 1.00 from user Pays US$ 0.55 settlement.</strong>&lt;br&gt;Retains US$ 0.45</td>
<td><strong>Collect US$ 1.00 from user Pays US$ 0.30 to ISP for terminating call.</strong>&lt;br&gt;Retains US$ 0.70</td>
<td><strong>+0.25 US$</strong></td>
</tr>
<tr>
<td><strong>PTO in Developing country</strong></td>
<td><strong>Receives US$ 0.55 settlement.</strong></td>
<td><strong>Receives US$ 0.02 local call charge.</strong></td>
<td><strong>-0.53 US$</strong></td>
</tr>
<tr>
<td><strong>ISP in Developing country</strong></td>
<td><strong>0</strong></td>
<td><strong>Receives 0.30 US$ for terminating charge</strong>&lt;br&gt;Pays 0.02 US$ for local call.&lt;br&gt;Retains 0.28 US$</td>
<td><strong>+0.28 US$</strong></td>
</tr>
</tbody>
</table>
Declining prices for mobile access, global average, in US$, 1992-2000

**Connection charge, in US$**


**Monthly subscription, in US$**


Note: CAGR = Compound Annual Growth rate.
Cultivate the high-spenders

14 per cent of high-spending customers generate 53% of revenue

22%

24%

40%

14%

53%

36%

8%

3%

Source: Price Waterhouse Coopers, based on Canadian data.
Mobile generations: Hong Kong, China (million users)

Source: ITU Asia-Pacific Telecom Indicators. OFTA
### Key Interconnection Rules in the WTO Reference Paper

| Interconnection with “Major Supplies” must be available | - At any technical feasible point in the network  
- In a timely fashion  
- At cost orientated rates  
- On non discriminatory and transparent terms  
- On an unbundled basis  
- At non-traditional interconnection points if requester pays charges |
| Procedure | Procedures for interconnection to major suppliers must be made public |
| Transparency | Agreements of major suppliers’ model interconnection offers must be made public |
| Dispute resolution | An independent entity (which may be the regulator) must be available to resolve interconnection dispute within a reasonable time frame |
Regulatory and technical issues

- Policy makers must resolve such basic questions as:
  - which carriers are required interconnection
  - How the costs will be calculated and recovered, and
  - At what points in the PSTN interconnection should occur

- Regulatory issues
  - Establishing guidelines in Advance (without it, interconnection negotiation are frequently protracted, delaying the introduction of competition)
  - Introducing competition require “dominant carriers” to interconnect with other carriers
  - Cost orientation: excessive prices deter market entry, hinder competition, end user suffer and can provide a pool of revenue

- Technical issues
  - Points of interconnection: incumbent operators permit interconnection with their networks at any technically feasible point
  - Dialling Parity and Pre-selection: Call-by-call customer selection or Operator pre-selection by pre-subscription
  - Quality of Interconnection Service
The economic issues involved in interconnection largely come down to question of cost: cost definition, cost measurement, cost allocation and cost recovery.

- How can interconnection costs be measured?
  - Theoretical Frameworks (Historica, Fully Distributed costs, LRIC)
  - Cost study Approaches (Top-Down, Bottom-Up, Outside-In)

- Interconnection charge
  - Cost based charges
  - Retail-based charges
  - Price Caps
  - “Bill and Keep” or “Sender Keeps All”
  - Revenue Sharing
Cost Study Methodologies

- **Top Down**
  - (Total Company costs)

- **Outside In**
  - (Proxy inputs results)

- **Bottom UP**
  - (Facility, operating cost inputs)

- **Service Unit cost Results**
Cost model resolves every things?

- Accounting rate is established by negotiation
  - Rates need to be agreed upon negotiation
  - Market-determined prices put pressure upon negotiation

- Need to back up its claim for a charge
  - By showing the price of a comparable competitively offered service
  - Or for monopoly by providing relevant cost data

- “Costs” = tools for negotiation, “costs” do not fix automatically the level of prices
Tariff Rebalancing

- Erosion of traditional system of accounting rates for exchange of international traffic
  - Domestic interconnect fees will be dominant mode
- Major price cuts in international calls
  - Availability of new infrastructures
  - Impact of Internet pricing model (distance and duration independent)
- Competition is there
  - Cost based tariff, if not “cream skimming”
  - No subsidy allowed

Cost Methodology and Benchmark are the best way to implement tariff rebalancing.
Barriers to Internet connectivity in LDCs

- **Regulatory barriers**
  - Many LDCs retain a monopoly telecom carrier, including for data and Internet traffic
  - Some LDCs restrict market entry by ISPs

- **Economic barriers**
  - High costs for int’l leased lines in some markets, esp. those without infrastructure competition
  - For LDCs with only low levels of IP demand, unit bandwidth costs are higher than for countries with higher levels of demand (economies of scale)
  - Many countries are not served by international cables (e.g., landlocked countries, small islands)
## International Internet

### Bandwidth per capita (bit/s)

<table>
<thead>
<tr>
<th>Country</th>
<th>Bandwidth per capita (Mbps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>8014</td>
</tr>
<tr>
<td>Brazil</td>
<td>36</td>
</tr>
<tr>
<td>Botswana</td>
<td>9</td>
</tr>
<tr>
<td>Bahamas</td>
<td>7</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>5</td>
</tr>
<tr>
<td>Belize</td>
<td>2</td>
</tr>
<tr>
<td>Bolivia</td>
<td>1.0</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>0.1</td>
</tr>
<tr>
<td>Benin</td>
<td>0.04</td>
</tr>
<tr>
<td>Burundi</td>
<td>0.04</td>
</tr>
</tbody>
</table>

### Total (Mbps)

<table>
<thead>
<tr>
<th>Country</th>
<th>Total (Mbps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>81'426</td>
</tr>
<tr>
<td>Brazil</td>
<td>6'069</td>
</tr>
<tr>
<td>Botswana</td>
<td>14</td>
</tr>
<tr>
<td>Bahamas</td>
<td>2</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>44</td>
</tr>
<tr>
<td>Belize</td>
<td>.512</td>
</tr>
<tr>
<td>Bolivia</td>
<td>8</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>16</td>
</tr>
<tr>
<td>Benin</td>
<td>.256</td>
</tr>
<tr>
<td>Burundi</td>
<td>.256</td>
</tr>
</tbody>
</table>

Typical ISP cost comparisons

Commercial & operational costs

National connectivity

International connectivity

<<<Developing countries

OECD countries >>>

Commercial & operational costs

International connectivity

National connectivity

Commercial & operational costs
Something should be done ...

- Feasibility study to look at an international project to increase IP connectivity in LDCs
- Look at regulatory, economic and commercial issues and examine evidence for market failure
- Could VSATs provide a solution?
  - Evidence from Uganda and Nepal suggests opening VSAT market could make big difference
  - But, VSATs are expensive
- How could such a solution be delivered?
  - Providing a “subsidy” without interfering with the operation of market forces (avoiding creating dependency on foreign donors)
  - Working with ISPs rather than end-users
Issues for discussion

● Is there a problem?
  - Is IP connectivity more expensive and more scarce in LDCs?
  - Do higher connectivity prices feed into higher access prices?

● Can it be solved?
  - What can be done by LDCs? (e.g., liberalizing VSAT markets, liberalizing ISP markets)
  - What can be done by the international community?

● How to structure the project?
  - Which donors, which agencies, which players?
  - How to involve DOT Force, UN ICT Task Force etc?
SG3 is unique

- Because of its composition
Dealing purely with non-technical standards and ... 

- Tariff/regulatory/Policy related issues
- There are 4 Regional Tariff Groups
Main study items

- Accounting rate reform
  - Transitional arrangements
  - Action to facilitate negotiations
  - Cost Methodologies
  - Network externalities

- Mobile termination charge
  - Differences with fixed network services
  - Level of termination charges

- International Internet Connectivity
  - Implementation of Recommendation D.50
  - Improving connectivity in LDCs

- Other studies
  - International Telecommunication Regulations
Accounting rates, what’s the problem?

- Accounting rates are the traditional way of sharing revenues from int’l services
  - BUT, creates incentives among recipient countries to sustain rates at high level
  - Accounting rate system not well-adapted to competitive market environment
- Strong pressure to move towards a cost-oriented system
  - BUT, a cost-oriented system would be asymmetric
  - US want cost-oriented but reject asymmetric charges for call termination
Movement of Settlement Rates
(According Recommendation D.140, Annex E)
Solutions & difficulties

- New Remuneration system (adopted)
  - Termination charge system
  - Settlement rate system
  - Special arrangement

- Difficulty to quickly implement those systems
  - Condition is to reach cost-oriented rate, but
  - No cost data or model for some administrations? SG3 developed principles and TAF, TAS, TAL cost models

- Transitional arrangements (review at WTSA)
  - To facilitate staged reduction to cost based rate
  - to avoid sudden fall of revenue (smooth transition)

- SG3 developed:
  - Guidelines for negotiation
Termination charge

- Destination operator (or Government) set the charge
- Charge should be established based on costs
- Termination Charge includes
  - International exchange
  - National extension, including local loop
  - And if appropriate, international circuit
  - Other costs imposed on carriers by the national regulation
- Those components should be separately identified (Unbundled)
- Charge applies to all traffic from any source
- However if significant variation in costs, charge may vary (volume discount)
- Termination charge may be introduced on bilateral agreement basis
Economic issues

The economic issues involved in interconnection largely come down to question of cost: cost definition, cost measurement, cost allocation and cost recovery

• How can interconnection costs be measured?
  - Theoretical Frameworks (Historica, Fully Distributed costs, LRIC)
  - Cost study Approaches (Top-Down, Bottom-Up, Outside-In)

• Interconnection charge
  - Cost based charges
  - Retail-based charges
  - Price Caps
  - “Bill and Keep” or “Sender Keeps All”
  - Revenue Sharing
OBJECTIVES

BUSINESS DECISION SUPPORT
• Pricing and Product Planning
• Investment evaluation
• Economics of direct/transit routing

FINANCIAL CONTROL
• Monitor actual performance and compare with plan and past trends
• Cost control
• Identify Cross Subsidy

REGULATORY COMPLIANCE
• Set D.140 as globally acceptable standard
• Rationalize tariff charges
• Derive TAR, USO

MARKETING
• Minimize opportunity for arbitrage
• Generate more revenue by increased traffic

TECHNOLOGY
• Enhancement towards global technology
• Long term cost/benefit of technology and options
• Impact of technology on global relations
Costing Methodologies

ACCOUNTING CONVENTION

- HISTORICAL COST ACCOUNTING
  - Actual costs incurred

- CURRENT COST ACCOUNTING
  - Cost of today of providing service
  - Mirrors competitors potential cost

COSTING APPROACH

- FULLY DISTRIBUTED COST APPROACH
  - All costs are allocated to services

- INCREMENTAL COST APPROACH
  - Incremental costs only
  - Often long-run incremental costs only
No much differences if...

- Current cost accounting is used
  - FDC=Historical Cost is no more relevant
- Costs of efficient services provision is used
  - this should be the aim of all operators
  - spare capacity (legitimate if transparency)
  - Disagreement on time horizon to achieve this
- Principle of cost causality is applied (ABC)
  - Common cost must be attributed to the service on the basis of the causality principle
  - However an exhaustive application of an ABC approach may be very costly
- Need for cost recovery realised appropriately
  - IC approach should contain a markup
Cost Study Methodologies

Top Down
(Total Company costs)

Outside In
(Proxy inputs results)

Service
Unit cost
Results

Bottom UP
(Facility, operating cost inputs)
Cost Models

Cost model resolves every things?

- Accounting rate is established by negotiation
  - Rates need to be agreed upon in negotiation
  - Market-determined prices put pressure upon negotiation

- Need to back up its claim for a charge
  - By showing the price of a comparable competitively offered service
  - Or for monopoly by providing relevant cost data

- “Costs” = tools for negotiation, “costs” do not fix automatically the level of prices
Annex E to Recommendation D.140
“indicative target rates” by Teledensity (T) Band, in SDR (and US cents) per minute.

<table>
<thead>
<tr>
<th>T&lt;1</th>
<th>1&lt;T&lt;5</th>
<th>5&lt;T&lt;10</th>
<th>10&lt;T&lt;20</th>
<th>20&lt;T&lt;35</th>
<th>35&lt;T&lt;50</th>
<th>T&gt;50</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.327 SDR</td>
<td>0.251 SDR</td>
<td>0.210 SDR</td>
<td>0.162 SDR</td>
<td>0.118 SDR</td>
<td>0.088 SDR</td>
<td>0.043 SDR</td>
</tr>
<tr>
<td>43.7¢</td>
<td>33.5¢</td>
<td>28.0¢</td>
<td>21.6¢</td>
<td>15.8¢</td>
<td>11.8¢</td>
<td>5.7¢</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Low income</th>
<th>Lower middle</th>
<th>Upper middle</th>
<th>High income</th>
</tr>
</thead>
</table>

Note: The correspondence between teledensity band and income group shown in the bottom row is intended to be approximate, not precise. Source: ITU-T SG3 Report. 1 SDR = US$1.39.
Guidelines to facilitate the negotiation

The following non-binding guidelines could be applied when negotiating accounting rates and accounting rates share in the international service:

1. Each party should ensure that; i.e., all information to be given to the other party should be credible in order to lead the negotiations into right direction.
2. The parties should negotiate freely and make agreements voluntary, any kind of coercion should be avoided.
3. Each party should act constructively, any offer, proposal, action, etc. should be directed towards reaching an agreement. Complex concepts should be simplified as much as possible.
4. Each party should act time-saving, any delay should be avoided.
5. Regular re-negotiations and future amendments should be possible.
6. Until such time as an appropriate dispute settlement arrangement may be approved by the ITU with respect to accounting rates, both parties should have the possibility to consult a person or institution for mediation.
1 accounting rates for international telephone services should be cost-orientated and should take into account relevant cost trends;

2 each Administration should apply the above principle to all relations on a non-discriminatory basis; Accordingly, international calls should not be treated any less favorably than comparable national calls.

Alternative proposal from Vietnam:
Accordingly, under normal circumstances (where tariff rebalancing has been effectively achieved) international calls should be treated any less....
A.1.3 National extension

....

• national transmission facilities;
• national switching facilities;
• the local delivery facilities to the extent that their costs vary depending on volume; and
• the local delivery facilities, in particular for developing countries and countries having a low teledensity rate, by bilateral or multilateral agreement to the extent that their costs do not vary depending on volume.

A.2.1 Direct costs

Direct costs derive from the provision of the relevant services and consist of

• .......
A.2.2 Indirect costs

These are costs, which could be identified as having a direct causal relationship to more than one service, which would normally require further analysis to determine each service’s cost, and for which a general allocation mechanism is used instead. These may include but are not limited to:

- costs of network management and planning;
- costs of relevant frequency spectrum, rights of way and operational licenses;
- costs of interoperator billing and interoperator customer management.

A.2.3 Common costs

... ... These may include but are not limited to: ... ...
Network Externality

- Universal Service Obligation Fund = Cross Subsidy
  - Not recognized as cost
- Network extremity = increase utility of a network to users
  - Operators to provide incentives for users to join the network = this can be added to the usage price or to the monthly subscription fee
- The network externality effect has a solid basis in economic analysis and had successfully – at least with some regulators – been brought to bear by mobile operators on their case for higher termination rates
  - Can be used by the developing countries to enhancing take-up and roll-out of the network
Do Customers in A derive benefit from more Customers in B?
If so, how much?
Is benefit to calling operators in A enough incentive to agree prices above cost?
How can we be sure that an externality will be passed through to connect more customers in B?
International calls terminating on the mobile network

• SG3 revised D.93 in 2000, allowing to negotiate
  - a separate rate for traffic terminating on a mobile network
  - however, this is by bilateral negotiation and when the rate is cost orientated
  - The difference between the two rates should be as small as possible

• Many countries now request very high settlement rates (ten times)
  - SG3 revised this situation in modifying D.93
### Interconnection Rates in Selected European Countries

Calling Party Pays (CPP). In US $ per minute.

<table>
<thead>
<tr>
<th>Country</th>
<th>European fixed-to-mobile interconnect charges, (US$/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norway</td>
<td>0.156</td>
</tr>
<tr>
<td>UK</td>
<td>0.16</td>
</tr>
<tr>
<td>Denmark</td>
<td>0.17</td>
</tr>
<tr>
<td>Netherlands</td>
<td>0.18</td>
</tr>
<tr>
<td>Belgium</td>
<td>0.18</td>
</tr>
<tr>
<td>Spain</td>
<td>0.20</td>
</tr>
<tr>
<td>France</td>
<td>0.20</td>
</tr>
<tr>
<td>Finland</td>
<td>0.21</td>
</tr>
<tr>
<td>Sweden</td>
<td>0.22</td>
</tr>
<tr>
<td>Austria</td>
<td>0.23</td>
</tr>
<tr>
<td>Italy</td>
<td>0.23</td>
</tr>
<tr>
<td>Germany</td>
<td>0.24</td>
</tr>
<tr>
<td>Switzerland</td>
<td>0.30</td>
</tr>
</tbody>
</table>

### EU, range of interconnect rates, (US cents per min.)

- **Fixed-to-mobile**
  - Lowest (0.20)
  - Best-practice (20%)
  - Highest
- **Mobile-to-fixed DOUBLE TRANSIT**
- **Mobile-to-fixed SINGLE TRANSIT**
- **Mobile-to-fixed LOCAL**

![Graph showing interconnection rates](chart.png)
Interconnection rates in selected non-European countries

Calling Party Pays (CPP) vs. Receiving Party Pays (RPP). In US$ per minute.

<table>
<thead>
<tr>
<th>Country</th>
<th>Mobile-to-fixed rate</th>
<th>Fixed-to-mobile rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>0.0096</td>
<td>0.0012</td>
</tr>
<tr>
<td>Canada</td>
<td>0.007</td>
<td>0.000</td>
</tr>
<tr>
<td>HK SAR</td>
<td>0.008</td>
<td>0.008</td>
</tr>
<tr>
<td>Singapore</td>
<td>0.000</td>
<td>0.009</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>0.000</td>
<td>0.020</td>
</tr>
<tr>
<td>USA</td>
<td>0.020</td>
<td>0.020</td>
</tr>
<tr>
<td>RPP</td>
<td>0.010</td>
<td>0.005</td>
</tr>
<tr>
<td>CPP</td>
<td>0.056</td>
<td>0.105</td>
</tr>
</tbody>
</table>

Average:

Mobile-to-fixed rate: 0.056
Fixed-to-mobile rate: 0.105

CPP countries:
- Costa Rica: 0.017 (fixed), 0.017 (mobile)
- Malaysia: 0.034 (fixed), 0.034 (mobile)
- Guatemala: 0.047 (fixed), 0.047 (mobile)
- Mexico: 0.026 (fixed), 0.20 (mobile)
- Cambodia: 0.050 (fixed), 0.070 (mobile)
- Dom. Rep.: 0.042 (fixed), 0.078 (mobile)
- Philippines: 0.051 (fixed), 0.205 (mobile)
- Botswana: 0.052 (fixed), 0.208 (mobile)
- Antigua: 0.293 (fixed), 0.293 (mobile)
TAL and TAS average interconnection charges

<table>
<thead>
<tr>
<th>Year</th>
<th>TAF Average</th>
<th>Mobile-Mobile</th>
<th>Fixed-Mobile</th>
<th>Mobile-Fixed</th>
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3.2 The accounting rates for international traffic [originating or] terminating at a mobile station should be cost oriented and should be applied on a nondiscriminatory basis to all relations, **and international calls should be treated no less favorably than comparable national calls.**

3.7 Where 3.3 b) applies but the difference between the two rates cannot objectively be justified on the basis of costs, the following could be considered:

   a) The difference between the rates for calls terminating on fixed networks on the one hand and calls terminating on mobile networks on the other (arrived at by deducting the lower from the higher) **should be no greater than the corresponding difference between the average of the available inter-operator rates for national fixed to fixed calls on the one hand and the average of available inter-operator rates for all national calls terminating on a mobile network on the other.**

   b) If such a comparison is not possible, the difference should be no greater than the corresponding **difference between the average of retail rates for a national fixed to fixed call on the one hand and the average of retail rates for a national fixed to mobile call on the other hand.**
The Internet continues to grow ... 
Internet users, million, and growth rate in %

Source: ITU.
Inter-regional Internet connectivity

Asia / Pacific

USA / Canada

Europe

Latin America

Africa, Arab

41.8 Gbit/s

162 Gbit/s

14 Gbit/s

0.77 Gbit/s

0.45 Gbit/s

0.1 Gbit/s

Note: Gbit/s = Gigabits (1,000 Mb) per second.
Source: ITU adapted from TeleGeography.
The World Telecommunication Standardization Assembly (Montreal, 2000), recognizing the sovereign right of each State to regulate its telecommunications, as reflected in the Preamble to the Constitution,

noting

a) the rapid growth of Internet and Internet protocol-based international services;

b) that international Internet connections remain subject to commercial agreements between the parties concerned; and

c) that continuing technical and economic developments require ongoing studies in this area,

recommends

that Administrations involved in the provision of international Internet connections negotiate and agree to bilateral commercial arrangements enabling direct international Internet connections that take into account the possible need for compensation between them for the value of elements such as traffic flow, number of routes, geographical coverage and cost of international transmission amongst others.

Greece and the United States of America have expressed reservations and will not apply this Recommendation.
Rapporteur Groups meeting in Brussels (April 2004) and SG3 meeting (May/June 2004)

- study of the effects of peering
- Self-help by smaller networks with limited traffic
- development of general principles in Recommendation D.50
When Parties involved in the provision of international Internet connections negotiate interconnection between their respective networks, interconnect prices and other commercial arrangements between two correspondent Parties should take account of the following:

1) Network connectivity:
2) Traffic flows and peak link capacity:
3) Cost of international link capacity and its apportionment:
4) Additional customer revenues:
5) Service support commitment:
6) Service performance:
7) Interconnect and other fees:
8) Legal liability:
International Telecommunication Regulations (ITRs)

- ITRs elaborated in 1988
  - Monopoly situation
  - Basic services only (Telephony)

- New Market situation
  - Competition
  - New services (Mobile, Internet)

- Need for new ITRs?
  - Redraft ITRs
  - Integrate into Constitution and Convention

- Study Group 3 starts reviewing ITRs
  - Rapporteur Group on ITR review (tsg3itr)
Council Working Group on ITR
(See: http://www.itu.int/itr)

Chairman
Mr. Alaa Fahmy

Secretary
S. Tanaka

Secretary
R. Hill

Coordinator-1
Sub-Group-1

Coordinator-2
Sub-Group-2

Coordinator-3
Sub-Group-3

Sub G1: Analyze past work and contributions submitted
Sub G2: Examine current ITR
Sub G3: Examine need for new provisions