Interconnecting ISPs

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Note - The views expressed in this presentation belong to the author and do not necessarily reflect the opinions of ITU or its membership.

Technical demands of Interconnection

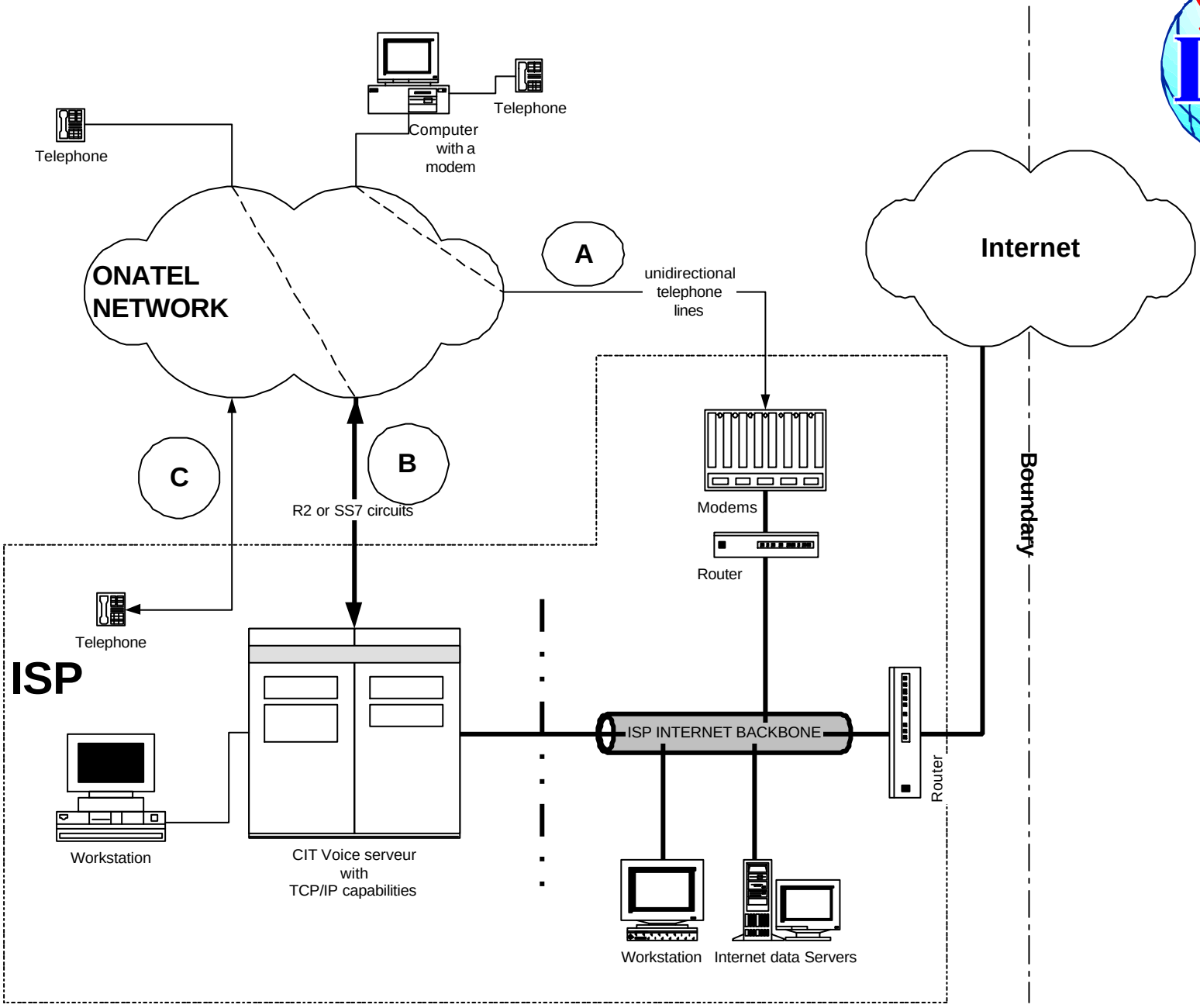
- Definition of an interface responding to ITU-T standards (e.g.: R2, SS7);
- Creation of a physical link
  - ***Belonging to one of the proponents;***
  - ***Co-owned by the proponents using « half circuit » principles***
  - ***Made of a combination of two unidirectional dedicated trunks***

Basic responsibility of NRAs

- The interconnection interfaces must be clearly specified and publicly known;
- Should be part of the specifications common to all operators and recognised during the licensing process;
- The basic principles for interconnection rate calculation , including those related to volume discounts, must be public and common to all operators;
- The effect of the enforcement of the USO policy must be equitably shared by all the network operators;
- The main goal of interconnection should be to maximise the economic benefits of externalities and reduce the cost/price of services.

Particular case of Internet telephony

- There are three basic ways to access the global telephone network through the Internet:
  - ***A direct dedicated link to the ISP (including through cybercafés): no interconnection with other national operators;***
  - ***A national call to an ISP's set of modems connected to the Internet backbone;***
  - ***A national call to a VoIP server connected to the Internet backbone.***
- The costs incurred to provide end-to-end service in each of those situations are different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A
unidirectional telephone lines
Internet
C
B
R2 or SS7 circuits
Modems
Router
Boundary
Telephone
ISP
ISP INTERNET BACKBONE
Router
Workstation
CIT Voice serveur with TCP/IP capabilities
Workstation
Internet data Servers

Avoid regulatory arbitrage

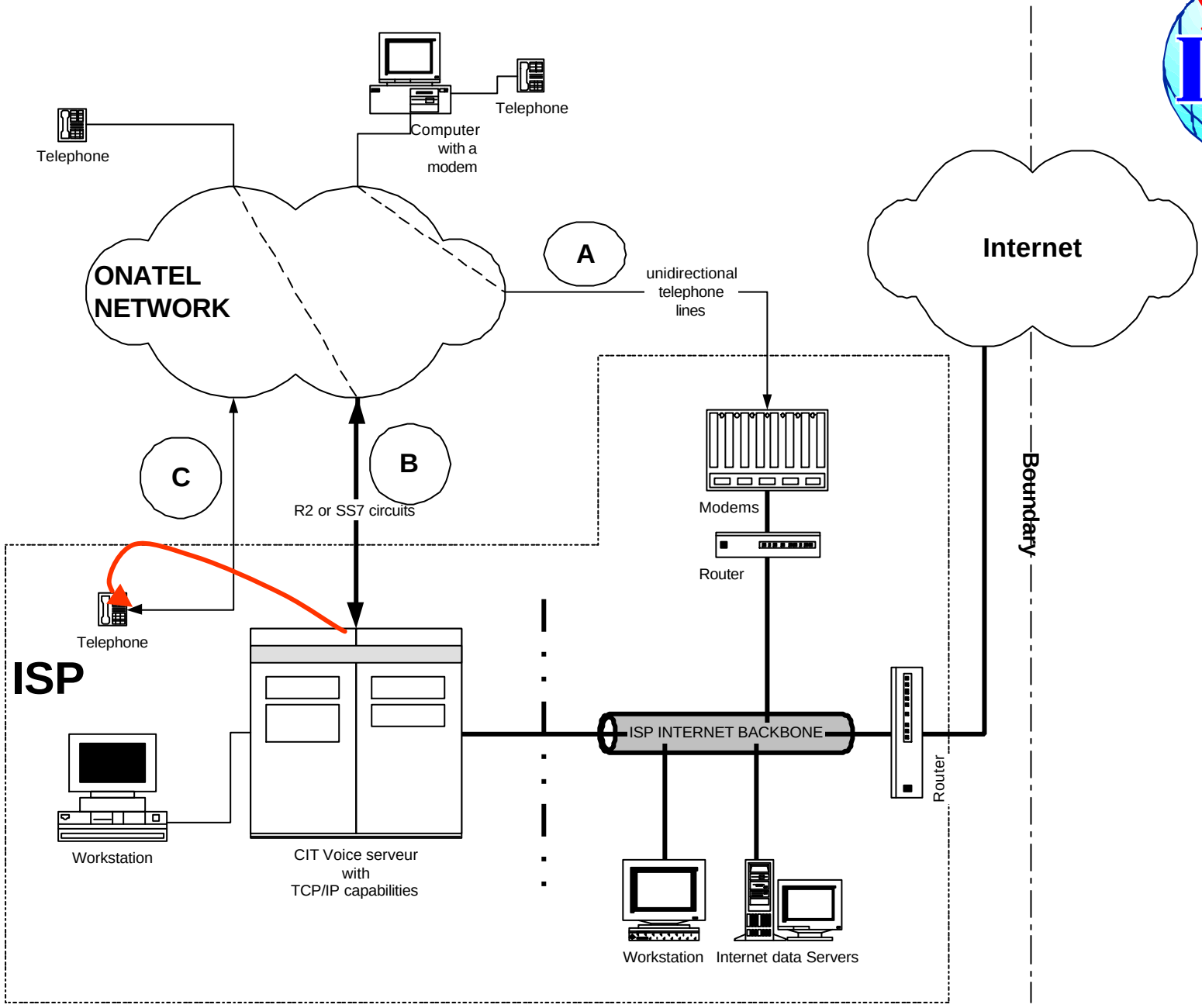
- Countries that ban Internet telephony may deprive their economies of important opportunities;
- But introduction of VoIP must not be done outside the global regulatory framework only because of the technology used;
- Economic efficiency of VoIP could be reduced if the cost orientation rules are not applied equitably to all the network segments used, where applicable;
- Where access deficit exists, the equitable allocation of USO costs to all network operators, including VoIP providers, will be crucial to the overall service growth.

Types of VoIP communications

- The communications in VoIP are different in nature:
  - ***C1: A national end user calling through link A (Computer-To-Computer/Phone);***
  - ***C2: A national end user calling through link B (Phone-To-Phone);***
  - ***C3: An international ISP calling through link A (Computer-To-Computer termination: the connection must be set locally before);***
  - ***C4: An international ISP calling through link B(Computer/Phone-To-Phone termination)***

Fraudulent link

- If the ISP's VoIP gateway is connected to the network through end user lines and terminates calls on those lines at the cost of national calls, the interconnection interface would no longer be respected and the interconnection regulation would then be violated;
- This can be done by deviating regular letephone lines from their basic role;
- To avoid it, « A » type links should be dedicated to outgoing calls, and « C » type line consumption monitored regularly.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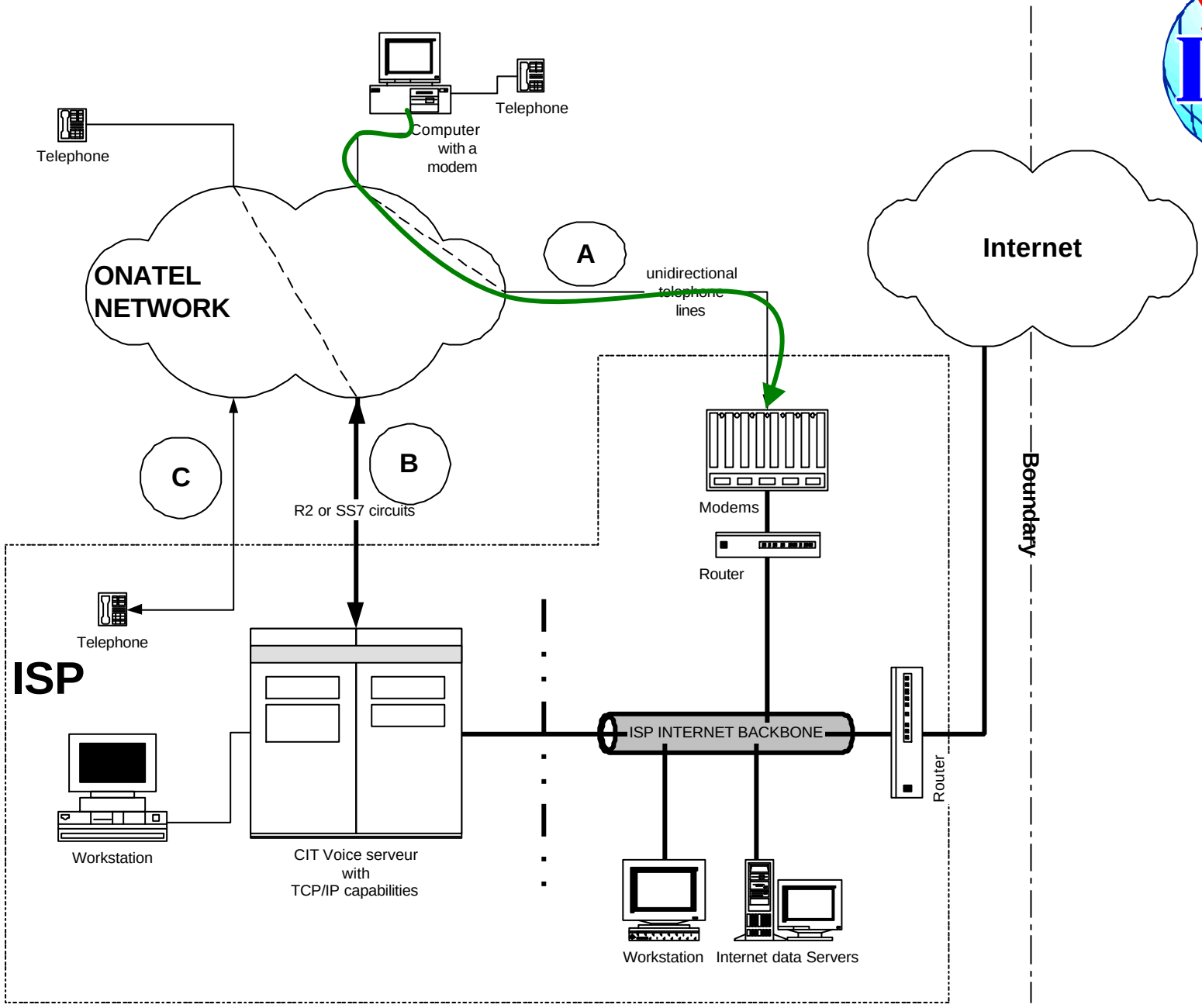
Analysis of C1 type communications

- The end user pays the price of a national call to access the ISP modems;
- If there is access deficit, the telephone call will be subsidised but as it is an end-to-end national call, the Internet access will be considered as a value added service, so no special measure is needed for VoIP outgoing calls using that link;
- But, a « professional rate », if it exists, should be applied to the monthly rental fee applied to the lines of that link. To avoid fraud, those lines should be restricted to outgoing only.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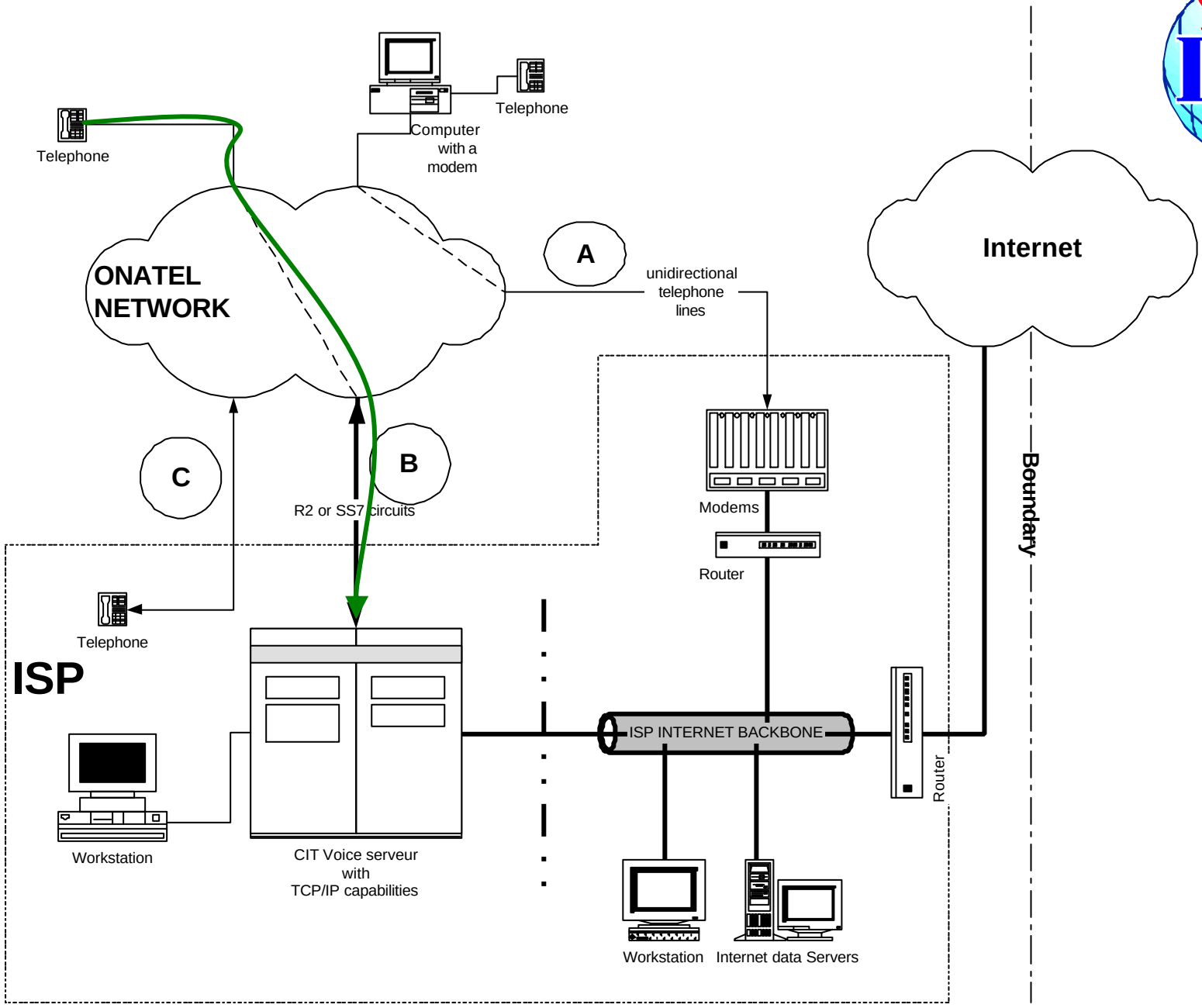
Analysis of C2 type communications

- The link B responds to interconnection rules;
- The telephone network operator will incur the cost of a National outgoing call whose endogenous cost is easily calculated with the TAF cost model;
- It takes into account not only CAPEX , OPEX and capital costs, but also corporation tax and USO cost distribution;
- Depending on who is collecting the rate from the end user (direct or cascade), different kinds of agreements could exist among TPH and VoIP providers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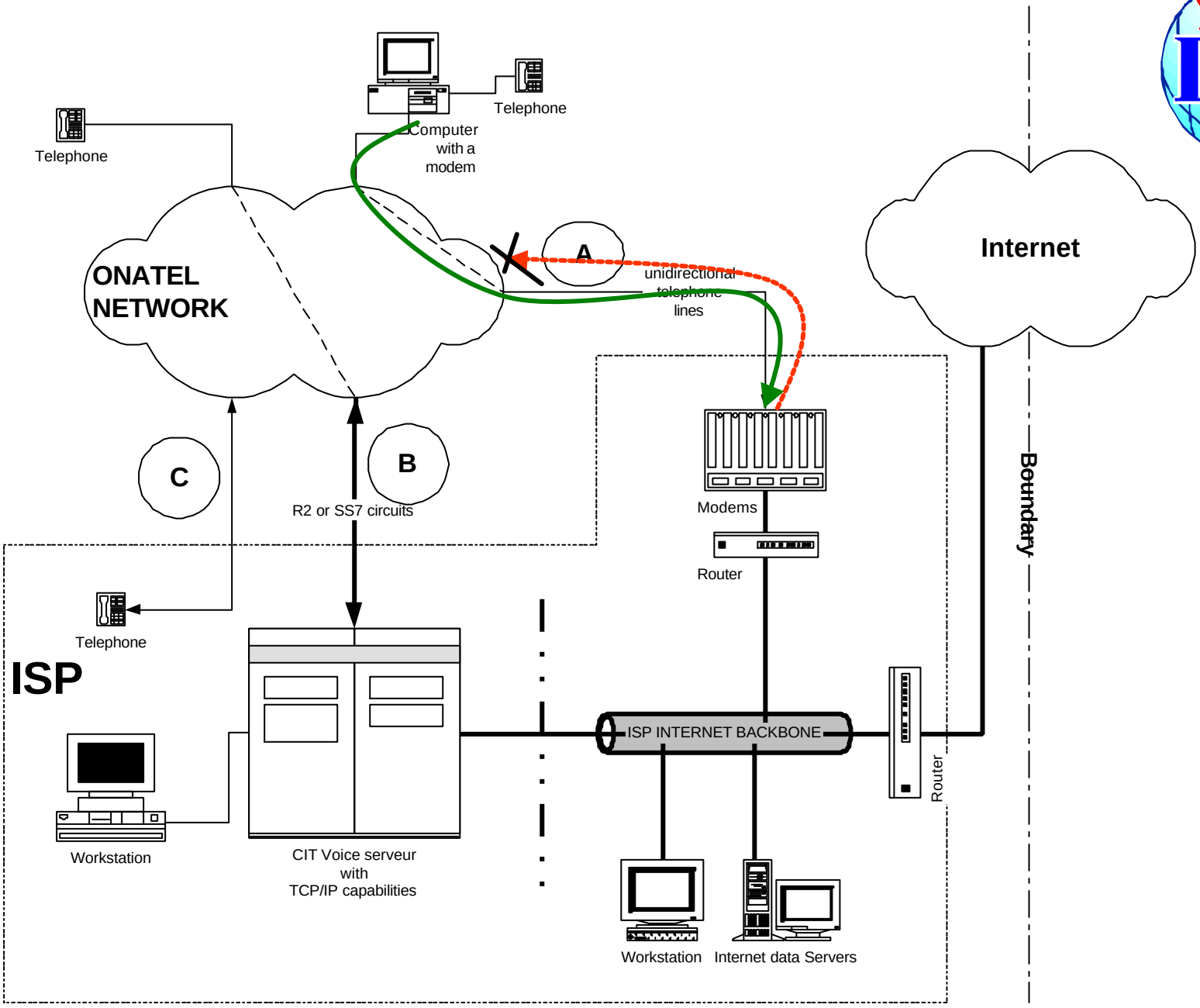
Analysis of C3 type communications

- In order to avoid frauds, the phone call from the VoIP provider to the TPH provider should be barred;
- But if the call is set by the local user, an international call using IP can be established (e.g.: Netmeeting call);
- The VoIP is then a value added service;
- No impact on the interconnection rules.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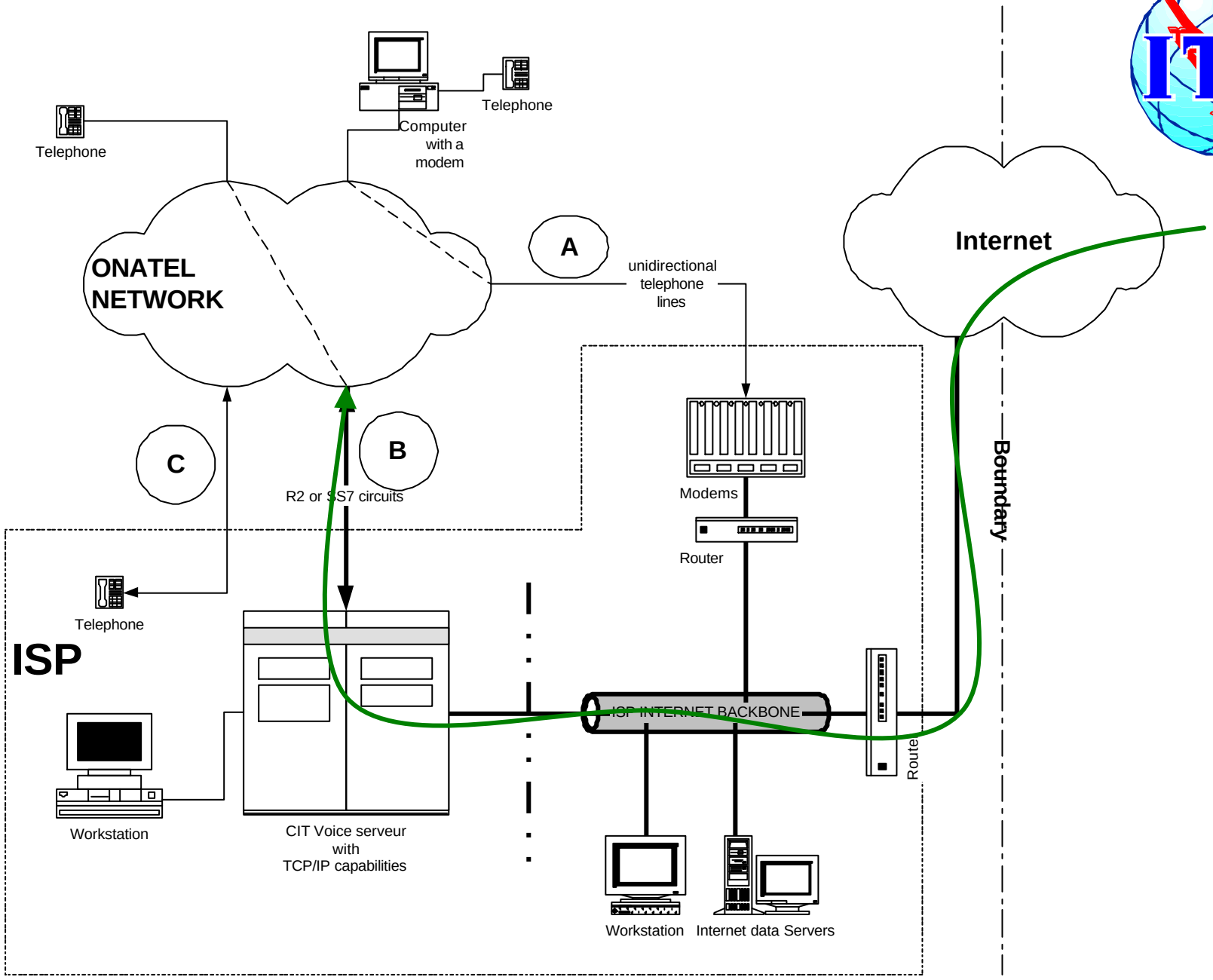
Analysis of C4 type communications

- Regular call termination
- The TPH operator will be paid for a national incoming call, depending on where it terminates:
  - ***single transit rate if it terminates at the interconnection point tariff zone;***
  - ***Double transit rate if it terminates beyond.***
- The TAF model easily calculates the basis for those rates;
- If this type of call is terminated on the TPH network through a « C » type of link, this will lead to a fraudulent situation because the price of domestic calls is very likely highly subsidised where access deficit exists (see TAF Model)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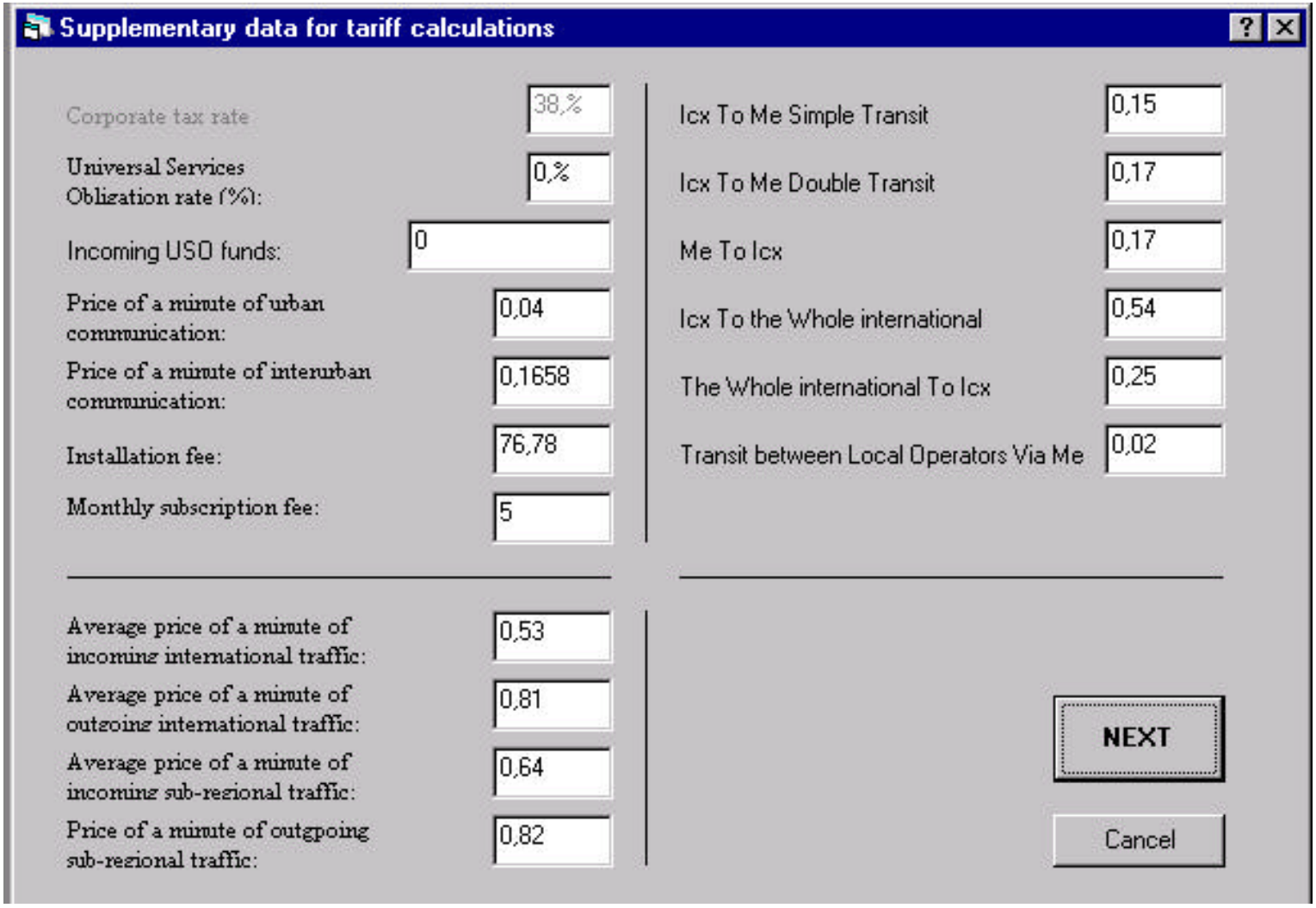
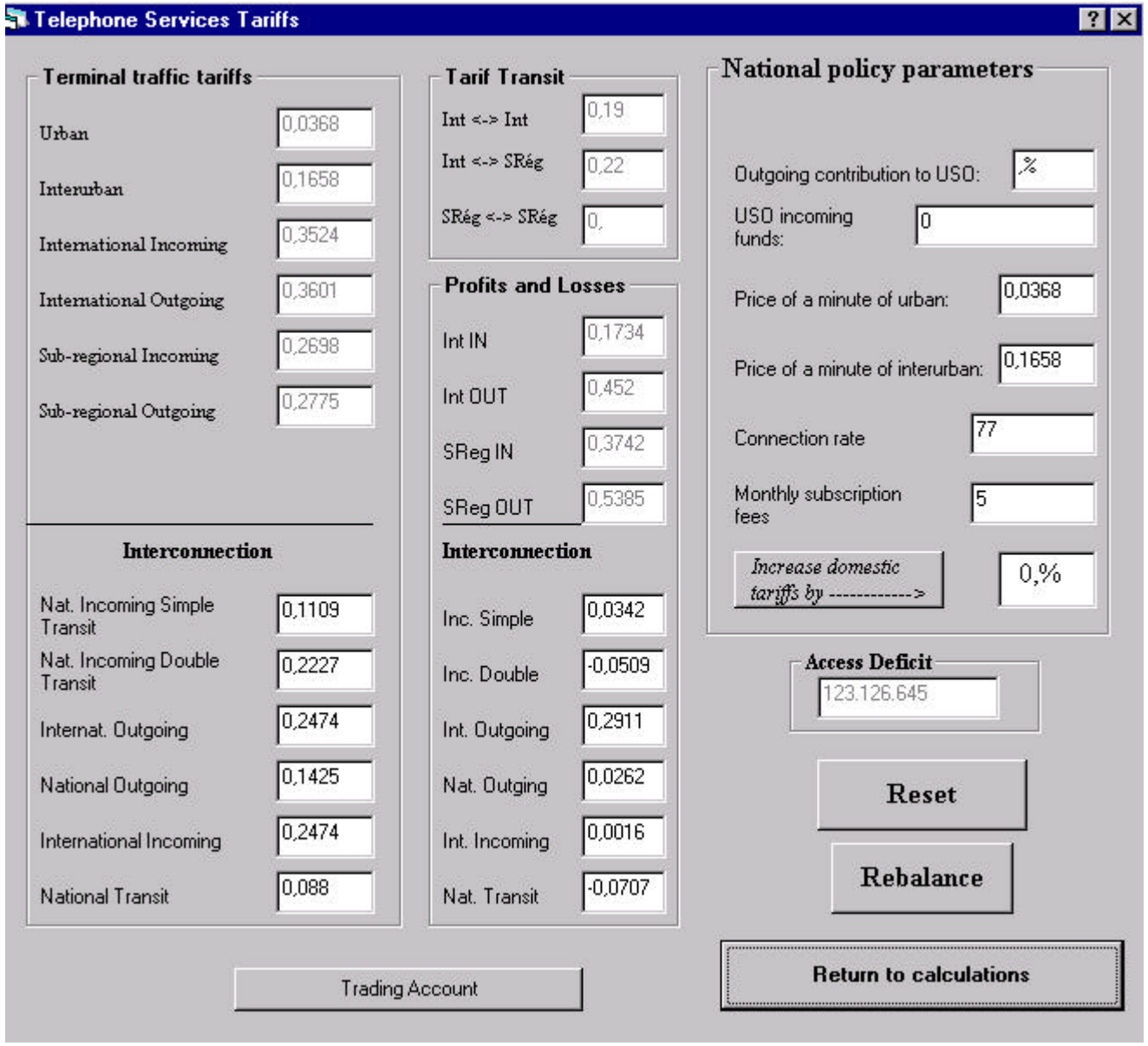
Case of AFRICOM

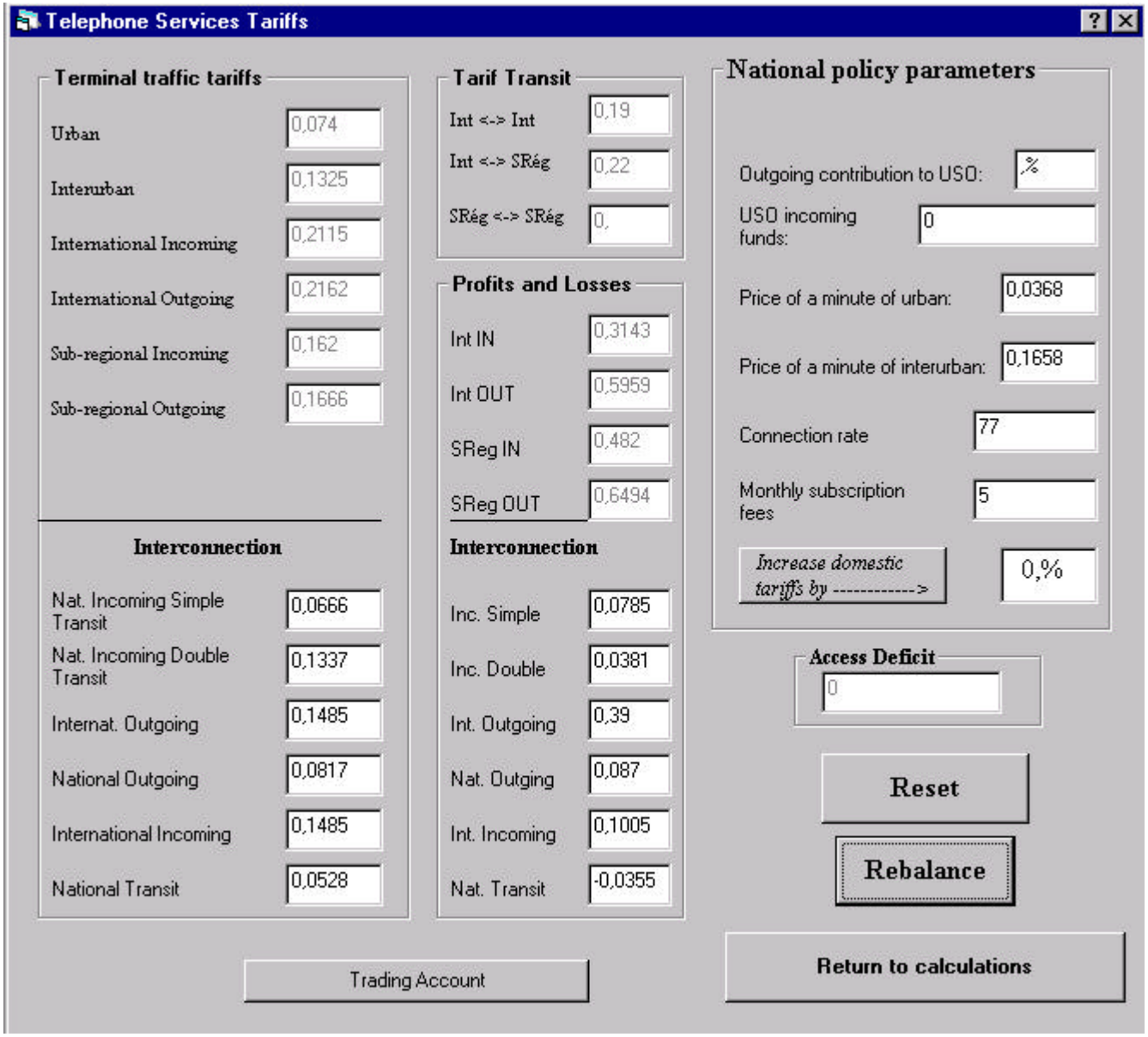
Actual prices



Cost orientated tariffs basis



Cost based tariffs basis



Status of VoIP service providers in Afriland

- The USO choices of the policy maker in Afriland creates an Access Deficit of 123 million dollars for Africom;
- With such a deficit, any telephone service provider must bear an equitable part;
- If those service providers are running a network, regardless of the technology, they must be recognised as operators and be subject to the prescribed USO constraints;
- This should apply to VoIP providers

Levelling out tax

- The USO policy of Afriland creates a transfer of charges from domestic to international and from domestic to national;
- The charge transferred to international outgoing is equal to the difference between the cost orientated and the cost based levels, ie.: $0.36-$0.21=$0.15;
- That additional charge, free of any inefficiency cost and exclusively due to the USO policy, is called « levelling out tax »;
- It should be applied to all international telephone service providers who are not participating in USO costs through the interconnection mechanism, in order to avoid regulatory arbitrage: e.g.: cybercafés;
- The levelling out tax is a State tax, the imcumbent cannot claim it.

Monthly rental fee

- The telephone lines composing the « A » type link must not be subsidised. Africom should apply a monthly rental fee of $17.5 instead of the actual $5

Interconnection fees through « B » link

From	To	Via	Africom share
Africom	International or National	National	$0.1425
International	National	Africom	$0.2474
National 1	National 2	Africom	$0.088
National	International	Africom	$0.2474
National	Africom single	Africom	$0.1109
National	Africom double	Africom	$0.2227

Example 1: Africom customer to international via ISPTEL

- Afriland-ISPTEL to Euroland-ISPTEL termination: $0.10;
- Afriland-ISPTEL endogenous costs: $0.15
- Lowest rate when an Africom customer calls a Euroland customer via ISPTEL: 0.1425+0.15+0.10= $0.3925
- Africom keeps $0.1425 and gives $0.25 to ISPTEL and other partners

Example 2: International call from a cybercafé

- Afriland-ISPTEL endogenous costs from the cybercafé, including the cybercafé costs: $0.12;
- Afriland-ISPTEL to Euroland-ISPTEL termination: $0.10;
- Lowest rate when the cybercafé customer calls a Euroland customer via ISPTEL: 0.15+0.12+0.10=$0.37
- ISPTEL passes $0.15 on to Afriland Finance Department

Example 3: ISPTEL routes a call to be terminated by Africom

- For instance, ISPTEL terminates an international call within the interconnection point tariff zone:
  - ***ISPTEL pays $0.1109 to Africom***
- ISPTEL terminates an international call beyond the interconnection point tariff zone:

  ISPTEL pays $0.2227 to Africom
- If 60% of the terminated traffic are of « single transit » type, ISPTEL and Africom could negotiate a unique termination charge equal to 0.1109*0.6+0.2227*0.4=$0.1562

http://www.itu.int/ITU-D/finance/