Office of the Director of
**Telecommunications**
**Regulation**

# Termination Rate Reciprocity

# Consultation Paper

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# Contents

## 1. Introduction

The Director of Telecommunications Regulation ("the Director") is responsible for the regulation of the Irish telecommunications sector in accordance with national and EU legislation. Interconnection is a key issue of importance to the sector. This consultation paper seeks views on a range of issues and options relating to termination rates between operators in the market.

The issue of termination rate reciprocity has been raised in the form of a dispute between MCI Worldcom Ireland (MCI Worldcom) and eircom. This dispute relates to the level of rates to be paid by eircom (Incumbent operator) to MCI Worldcom for MCI Worldcom's National Termination Service. This paper seeks to establish a framework within which the dispute may be resolved. It is without prejudice to a review of the specific terms of the dispute in the light of the conclusion of this consultation.

This request raises questions as to the basis for setting termination rates on other licensed operator (OLO) networks. Under the European Communities (Interconnection in Telecommunications) Regulations 1998 ("the Interconnection Regulations"), an operator designated as having significant market power (SMP) is obliged to provide interconnection at cost oriented rates. No such obligation exists for other operators and it has been the practice for rates on OLO networks to be agreed through commercial negotiation without regulatory intervention. Central to the above dispute is the fact that commercial negotiations relating to the termination rate on an OLO network have not produced agreement and the parties have referred the matter to the ODTR for resolution.

The Director's preference is for rates on OLO networks to be negotiated commercially and she believes that the principle of reciprocity should apply i.e. that operators should pay comparable rates to terminate traffic on each other's network as they themselves charge for terminating traffic on behalf of other operators. She recognises that the principle of reciprocity may be difficult to apply in practice and that disagreements may arise when it comes to the details of what is meant by comparable.

## 2. The Purpose of this Consultation

The Director believes that the issues raised by this dispute have wide significance and importance for the industry in general and, for that reason, she has decided to undertake a consultation on termination rates on OLO networks. In this Consultation the Director seeks industry views on a number of principles and guidelines as a basis

for agreement of reciprocal termination rates. She believes that economically efficient reciprocal termination rates should benefit all operators. A system for agreeing such rates will encourage operators to develop network infrastructure to connect at the most efficient Point of Interconnection (POI) and will also help ensure efficient routing for all operators. It enables optimum market efficiency as competition increases. As a result consumers will benefit from lower prices and greater choice.

The Director therefore favours the principle of reciprocity as a competitively neutral approach to network charges. Following this consultation the Director hopes to recommend guidelines for reciprocity which will have the support of the industry and which will form the basis for agreement on OLO network termination charges in the future.

*Q. Do respondents agree that OLO termination rates should be commercially negotiated?*

*Q. Do respondents agree with the Director's view on the principle of reciprocity?*

*Q. Do respondents agree that OLO termination rates should, in future, be negotiated on the basis of agreed guidelines?*

## 3. Legal basis

The Director is obliged by Regulation 10(1) of the European Communities (Interconnection in Telecommunications) Regulations 1998 ("the Interconnection Regulations") to encourage and secure adequate interconnection in the interests of all users in a manner that promotes economic efficiency and gives the maximum benefit to users. The Director is further obliged to have regard to the principles of non-discrimination and proportionality and the need to stimulate a competitive market in telecommunications services.

The Director is empowered by Regulation 10(3) of the Interconnection Regulations to intervene on her own initiative in order to specify issues that shall be included in interconnection agreements or lay down specific conditions to be observed by one or more parties to such agreements.

The Director is empowered to direct that those issues or conditions be included in interconnection agreements. The Director, pursuant to Regulation 10(4) of the Interconnection Regulations, may, in exceptional circumstances, direct that changes be made to an interconnection agreement to ensure effective competition or interoperability of services for users. Regulation 10(5) of the Interconnection Regulations provides that these conditions and changes may include tariffs and other conditions designed to ensure effective competition.

## 4. What is Termination?

The term ‘termination’ is used in different ways and this can lead to confusion. Firstly, different operators have different switch configurations and 'termination' takes place at different levels. For example, eircom has a hierarchy of switches, primary or local, secondary and tertiary. Smaller operators may have only one switch, so all termination happens at one level only. Diagram 2 in the Appendix illustrates graphically the concept of termination and terms used.

Termination is used in some cases to mean only the final switching stage and the transmission systems from the switch to the customers’ Network Termination Point (NTP) the 'final segment'. In other cases, however, termination refers to the service from the PoI to the customers’ NTP. This could include both the final segment to the customer and the transit element from the switch connecting that customer to the other operator's switch, in effect an inter-tandem transit element. Termination prices, as set out in the RIO, include both the final segment and, for tandem and double tandem, the ‘transit element’. In this document we refer to termination in the sense implied in the RIO (i.e. from PoI to customer NTP) as illustrated graphically in Diagram 2. If we are talking about the final segment only we use the term final segment.

These considerations are important because an OLO’s switch and an Eircom switch have different coverage areas and the definition of a like-for-like service needs careful consideration. For example, consider an OLO with one switch in Dublin. This OLO provides a final segment stage service for all its customers in Dublin. However, Eircom has many switches in Dublin and therefore the same service in terms of facilities offered to the customer (in this case a OLO) at a single PoI would in many cases comprise an extra tandem stage as well as the final segment service. The OLO switch gives far greater reach than any element of the eircom one in this instance.

**Questions**

*Question1 –Is this description sufficiently comprehensive for the purposes of the issues under consideration? Are there other aspects you consider should be taken into account?*

## 5. Economic issues

Interconnection exhibits several important economic features:

- Termination on one number is not, in general, an effective substitute for termination on another number. In a sense, termination on a given number may be in a market of its own.
- The operator on whose network a call originates has no choice when selecting the terminating operator; calls to a given number can be terminated by only one operator. This implies that each network offering termination may possess a degree of market power in respect of the calls received by its subscribers.
- However, price setting does not take place at the level of these individual termination "markets". Instead, operators negotiate interconnection agreements setting a common price for terminating all calls delivered by each operator to the other. The market power exercised by each operator in respect of terminating

calls to its subscribers manifests itself as a greater or lesser degree of bargaining power in these negotiations.

In an interconnection negotiation between operators with roughly equal numbers of subscribers, the bargaining positions of the parties would be symmetrical and both parties would have an equal incentive to agree access arrangements at reasonable rates.

However, if a new entrant were seeking interconnection from an incumbent in the absence of regulation, there would be substantial asymmetry. For the new entrant, access to the incumbent's termination service would be a crucial ingredient for any viable service offering. In other words, the ability to terminate traffic on the incumbent's large network is highly valuable to the entrant. To the incumbent, however, the ability to terminate traffic on the entrant's relatively small network would be of minimal value in first instance and might remain so for some time.

Thus the entrant would have a strong incentive to conclude an agreement but the incumbent would not, or at least would have an incentive to exploit its strong bargaining position, resulting additionally from better access to information, in setting termination rates. This is one of the reasons that regulatory oversight is imposed on interconnection, and in particular on the interconnection arrangements offered by operators with SMP in the market for interconnection. By restricting the rates that an operator with SMP may charge to a cost oriented level, the regulatory rules limit the extent that the operator can exploit its strong bargaining position.

The Director does not propose to extend such regulation to cover interconnect pricing on OLO networks. Through this consultation process the Director intends to lay down a framework within which reciprocal termination rates can be negotiated.

## 6. Reciprocity

There is general agreement that interconnecting fixed-line operators should pay comparable rates to terminate traffic on each other's networks as they themselves charge for terminating traffic on behalf of other operators. However, disagreements arise when it comes to the details of what is meant by comparable.

The divergence of views results from a number of unique features of the current structure of competition and network development in Ireland that has resulted to a large extent through the historic development of the Eircom network when compared to the more recent roll-out of the network's of newer operators. Example include:

- Network structures. Eircom's network is hierarchical with three switching levels. New operators are generally planning flatter meshed networks.
- Coverage. Eircom's is the only universal network in Ireland; other operators still cover a much more limited area of Ireland.
- Switch catchments area. Eircom switches, at least in major cities, tend to collect traffic from a smaller area.
- Volume. Eircom still handles a significantly greater volume of calls than other operators.

## 7. Principles for reciprocity

In considering alternative approaches, the Director proposes that a number of principles be borne in mind. These principles relate to economic efficiency and to practical considerations (notably the ease of implementation). These are considered in turn below.

### 7.1 Economic efficiency

Underlying any regulatory decision is the need to seek an economically efficient result. This can be taken to mean that a regulatory measure should address the problem to hand and should, as far as possible, avoid introducing secondary economic effects that might create new inefficiencies.

**(i) The charges should seek not to distort operators' incentives as to efficient network design and routing including overflow and alternative routing arrangements as appropriate.**

It is also noted that because a charge for termination may not necessarily reflect an originating operator's actual costs, that operator may not necessarily take the best economic decisions when looking at its network build decisions. It is necessary therefore to look at both sides of the equation (outpayments and inflows) to develop a regime that is more likely to lead to good overall design decisions. This can be done through a netting-off process (i.e. the lower cost operator receives a larger compensation than costs alone would justify). The issue is to consider which of the many different alternatives gives the best outcome**.**

### 7.2 Practical considerations

**(ii) Any scheme developed should be easy and practical to implement. This means that it should be simple to determine the appropriate charges and that it should be possible to record, bill and reconcile charges to be made without undue cost. Charging structures should be simple to understand and the components that comprise the charge should be easily understood, reducing the risk of disagreement over the charge as set and the consequent need for arbitration.**

**(iii) It should be possible for charges to be predictable in advance (subject to volume forecasts being achieved) so that operators can plan with confidence.**

**Questions**

*Question 1 – Do you agree with the principles set out in section 7? If not, please give your reasons, and propose alternatives.*

# 8. Options

There are a number of options that could be adopted. Some are set out below together with a brief analysis of the extent to which they satisfy the principles set out in Section 7 above. Diagram 1 in the attached Appendix provides a summary graphical illustration of the current situation with regard to payment by eircom for terminating traffic on an OLOs network.

## 8.1 OLO to eircom calls charged depending on number of switching stages used by the OLO

In this option, all Eircom to OLO calls are charged at the primary rate if only one switching stage is used and at tandem (or double tandem) if more are used. On the face of it this would appear to be fair as it matches charges levied by Eircom. However, because of different network topologies and coverage, OLOs are likely to need to pay more per call than Eircom for comparable distances. For example, for calls within Dublin, an OLO with one switch covering all parts of the city would never receive more than the primary rate. However, that same OLO could only get a comparable rate by connecting interconnection links with all of eircom's local switches in Dublin which is likely to impose an unreasonable cost burden.

## 8.2 OLOs receive a termination rate dependent upon the level in the network hierarchy of the last or highest switch used in the originating network

Diagram 3 in the attached Appendix presents a graphical illustration of how this option might work. In this option, a call sent to a PoI directly from a local switch would attract a different termination charge from one sent from a transit switch[1]. The termination charge for a call sent from a local switch (for traffic originated from subscribers directly connected to that switch[2]) would be equivalent to eircom's primary rate; from a secondary switch the rate would be equivalent to a tandem rate; and from a tertiary exchange the double-tandem rates. This approach breaks down for long distance calls and is discussed further below.

The rationale for this option is, if eircom could justify establishing a PoI from a primary switch it would do so and would therefore avoid higher termination rates. However, if there was insufficient traffic to establish the PoI higher termination charges would be accepted to avoid additional infrastructure costs. Thus this option would appear to implicitly encourage efficient network design. This option is certainly practical and simple to operate. Rates are predictable and there is little scope to disagree on how the principles should be applied. It should lead to economically sound routing principles and network investment decisions by OLOs. Unless there are substantial imbalances in the pattern of traffic flows (see below) the scheme should be competitively neutral. Eircom would also be able to decrease its

[1] It would be necessary for Eircom to route calls in an appropriate routing pattern where an OLO has more than one switch in an area.

[2] This is to avoid a primary switch being used as a tandem exchange to concentrate traffic outside of the basic design topology so as to avoid higher termination charges.

termination outpayments by providing correctly dimensioned PoIs from low levels of its network. However there could be problems in routing arrangements from eircom to the OLOs whereby eircom could reduce its costs by routing all terminating calls to a lower level exchange, which might well be an inefficient routing choice.

As a result of this and other factors, it may be practical to have two charges only: one for calls routed to a PoI directly from the originating local exchange, and one for all other local traffic. It may be necessary to consider the impact where an OLO has two or more switches in the same metropolitan area so that sensible overflow arrangements are not discouraged.

It is recognised that there are special conditions resulting from the limited rollout of OLO networks in Ireland as a whole[3]. If the approach were applied to all calls (not just local calls), anomalies could occur on long distance traffic. Consider two OLOs; OLO_1 has a PoI in Cork and OLO_2 does not. Eircom could interconnect a Dublin bound call from a local exchange in Cork and pay a primary rate termination. OLO_1 not only receives a lower rate but also has its own cost of transporting the call. OLO_2 on the other hand would receive a higher rate and incur lower costs. This is not economically efficient.

It is not appropriate, therefore, that such charging structures apply to long distance calls. A long distance call would need to continue to attract an appropriate double tandem rate[4] while calls terminating on a local area code number would be charged according to the level of last switching stage used in the Eircom network.

Without prejudging the consultation, the Director currently considers this option to have a number of attractive features.

A variation on this scheme could be adopted if a mechanism is found to bill interconnecting calls based on the highest switch used. Thus a call only using a primary switch would attract the primary rate; a call routed via a secondary switch, a tandem rate and, via a tertiary switch, a double tandem rate. This variation introduces its own problems and potential inconsistency. Billing problems may well preclude this scheme.

**8.3 OLOs' charge is based on what it would have cost eircom to route the same call[5]**

In this option, the charge would be based on the cost that would have been levied by Eircom to carry the call from the same PoI to the same customer location (network termination point). Whilst this is competitively neutral and should encourage efficient routing by Eircom, it is not necessarily a practical option. This is because it would require full analysis on a call-by-call basis derived from knowledge of eircom's routing patterns. The need to update calculation algorithms constantly as routing

[3] This clarification is needed because of the different uses of the term 'termination' as discussed in section 3. Of concern here is the final link to the customer NTP. As has been mentioned the area covered by the final local exchange will differ. We tacitly consider the comparable area to be that covered by a given area code.
[4] Double tandem is proposed to avoid OLOs being penalised simply for having flatter hierarchies
[5] from PoI to NTP.

patterns are modified and the use of alternative routing arrangements both further complicate matters.

Without prejudging the consultation, the Director currently considers this option is unlikely to be practical. However, a series of options to estimate a proxy to Option 8.3 are set out below.

### 8.4 OLO's charge is based on an estimate of average cost to eircom of handling the same call[6]

This is a series of options rather than just one and each is intended to offer a proxy to the equivalent rate to be charged by eircom as described in option 8.3. Work on LRIC may be helpful in refining some of these approaches.

#### 8.4.1 Use an average cost based on the OLO to eircom traffic

In this option, the estimate used is based on the average cost per minute incurred by the OLO. The use of a national average would counter the objective of encouraging efficient network design and therefore it would be more appropriate to look only at the sub-set of calls to customers within a geographic area code. An OLO would know the average cost of all calls to, for example, area code 1 based on its traffic profile and would require the same average rate in return.

The difficulty with this model will be the setting of a suitable period over which the average will be calculated and agreeing on suitable arrangements, if appropriate, for retrospective corrections. This is particularly important given the rapid changing profile of calls originated by OLOs. OLOs could either use last year's average weights recognising that imbalance will be corrected over time, or an estimate could be made which would be subject to an adjustment when final accounts are available. A similar effect would be achieved by netting off minutes within an area and paying a correcting charge. If traffic flows were on balance towards eircom this would actually give a good average rate.

Another problem with this approach is that it may provide little encouragement to OLOs to establish new PoIs. The benefit eircom receives through lower rates to terminate calls on its network will be partially (although not fully) off-set by reduced receipts from the calls they terminate themselves.

An alternative to this approach will be to use an average based on all traffic terminated by eircom. Again, the same problems exist on retrospection and for large OLOs a discouragement to create new PoI may still arise although the problem is diminished to some extent.

[6] From PoI to NTP.

In both cases (a per OLO charge and an average for all OLOs), there would be practical difficulties in calculating and agreeing the weights to apply. However, the simple netting-off of terminating minutes within an area code certainly has a number of practical attractions and may warrant further consideration.

#### 8.4.2 Estimation of weights based on all terminating traffic

Another approach would be to ensure that all operators do equally well by considering the routing of all terminating traffic (OLO to eircom and eircom to OLO) within an area code. Provided that there are no impediments to implementing new PoIs[7], this scheme should minimise termination costs generally and will deter poor network design. The reason for this is that all operators who are net outpayers of termination will benefit by reduced charges and will be encouraged to minimise costs through sensible network design. The exception will be a net recipient of termination revenue (most likely to be eircom only for the foreseeable future). It is for this reason that it is important that OLOs can request new PoIs and have them implemented effectively and that eircom cannot deliberately use less than efficient routing arrangements.

The Director can certainly see theoretical attractions with this scheme but also sees a number of practical difficulties that will need to be overcome.

#### 8.4.3 Estimation based on theoretical calculation of an efficient routing algorithm.

In this option, a theoretical approach would be developed based on an independent assessment of efficient network design. Current LRIC work may inform such an approach.

The Director has not assessed the feasibility or details of such an approach but would be concerned about the time it would take to implement such a scheme and the room for continuing arguments on the results produced by any model.

### 8.5 Preferred option

On the basis of information currently available to her, the Director sees certain attractions in option 8.2 (charges based on the last eircom switching stage used) and 8.4.1 where minutes within an area code are simply netted-off against each other. Before coming to a conclusion, she wishes to have the views of interested parties.

**Questions**

*Question 1– Do you agree with the analysis, on an option by option basis, as set out in section 8?*

*Question 2 – Are there any other options you would wish to propose?*

*Question 3 – Are there options you strongly oppose? Please give your reasons*

*Question 4 – Which option(s) do you prefer? Please give your reasons*

[7] and that downstream routing arrangements are rational.

## 9. Timeframe for Consultation

**Consultation Procedure, Timetable and Contact Personnel**

The consultation period will run from 2nd June to 30th June. Comments should be submitted in writing before 5.00 p.m. on 30th June, 2000 to:

Ms Brídín Farren,
The Office of the Director of Telecommunications Regulation,
Abbey Court,
Irish Life Centre,
Lower Abbey Street,
Dublin 1

OR

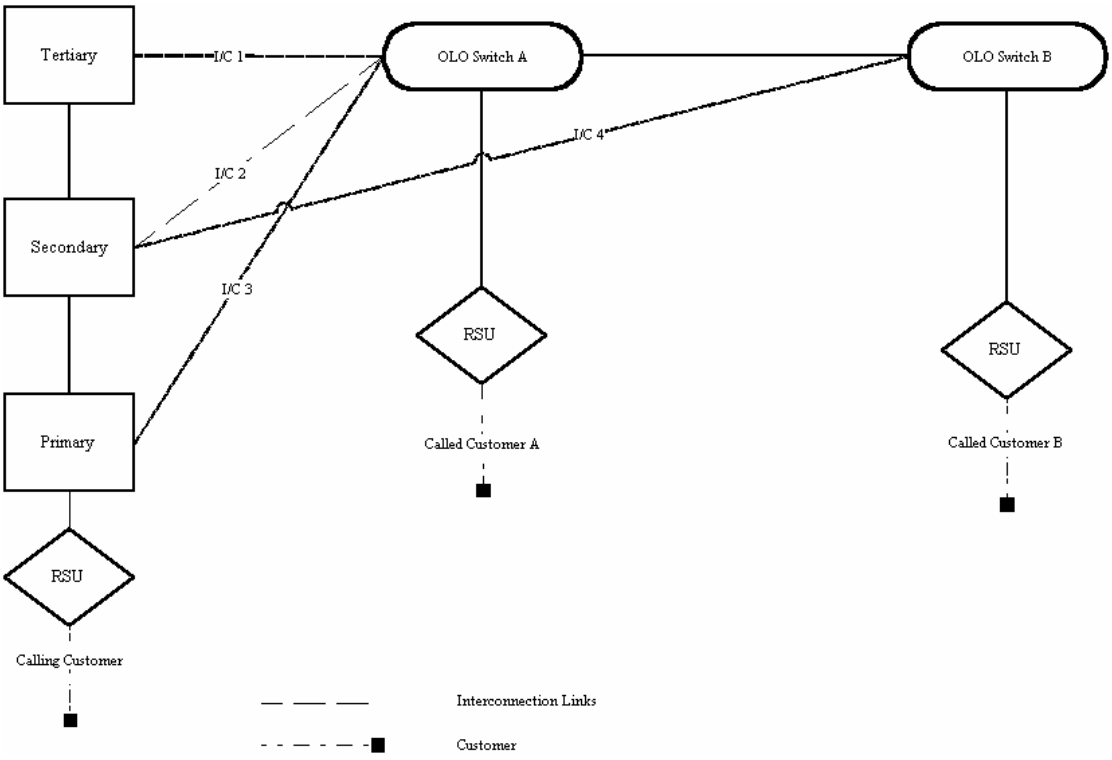
Comments may be submitted via email before 5pm on 30th June 2000 to:
farrenb@odtr.ie

The Director intends to issue her Report on Consultation on termination rate reciprocity on 31st July 2000

# Appendix

## Diagram 1

### Incumbent



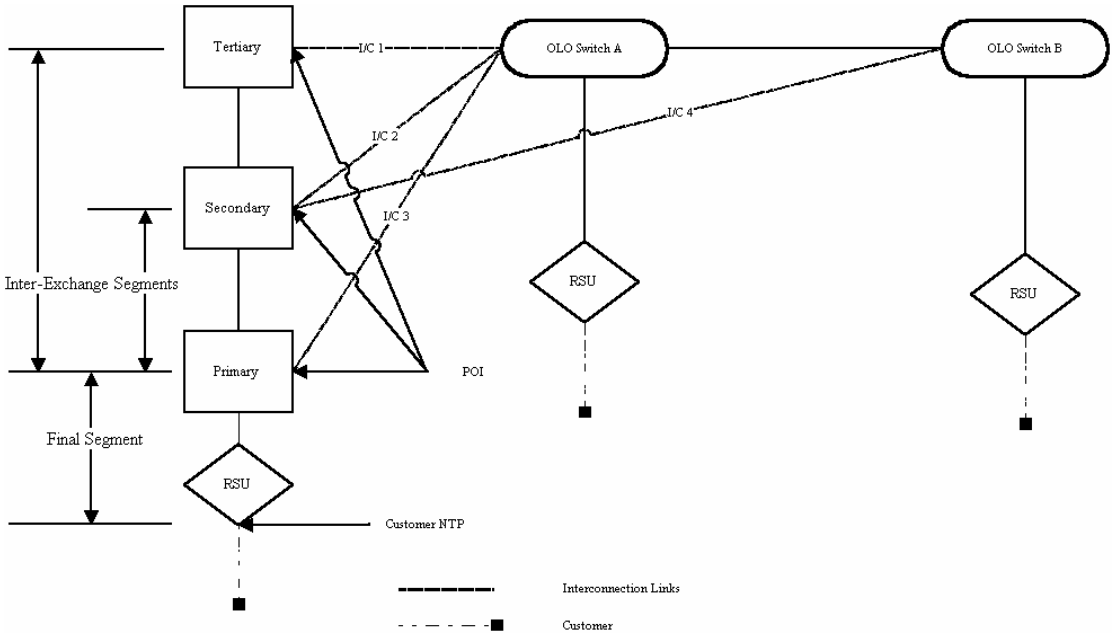

The above diagram illustrates a common situation with regard to the payment by an incumbent of call termination rates to OLOs for terminating traffic on the OLOs network.

An incumbent customer calls an OLO customer, either A or B. The incumbent pays the same call termination rate to the OLO, irrespective of which

- interconnection link is used, or
- OLO switch is the terminating switch.

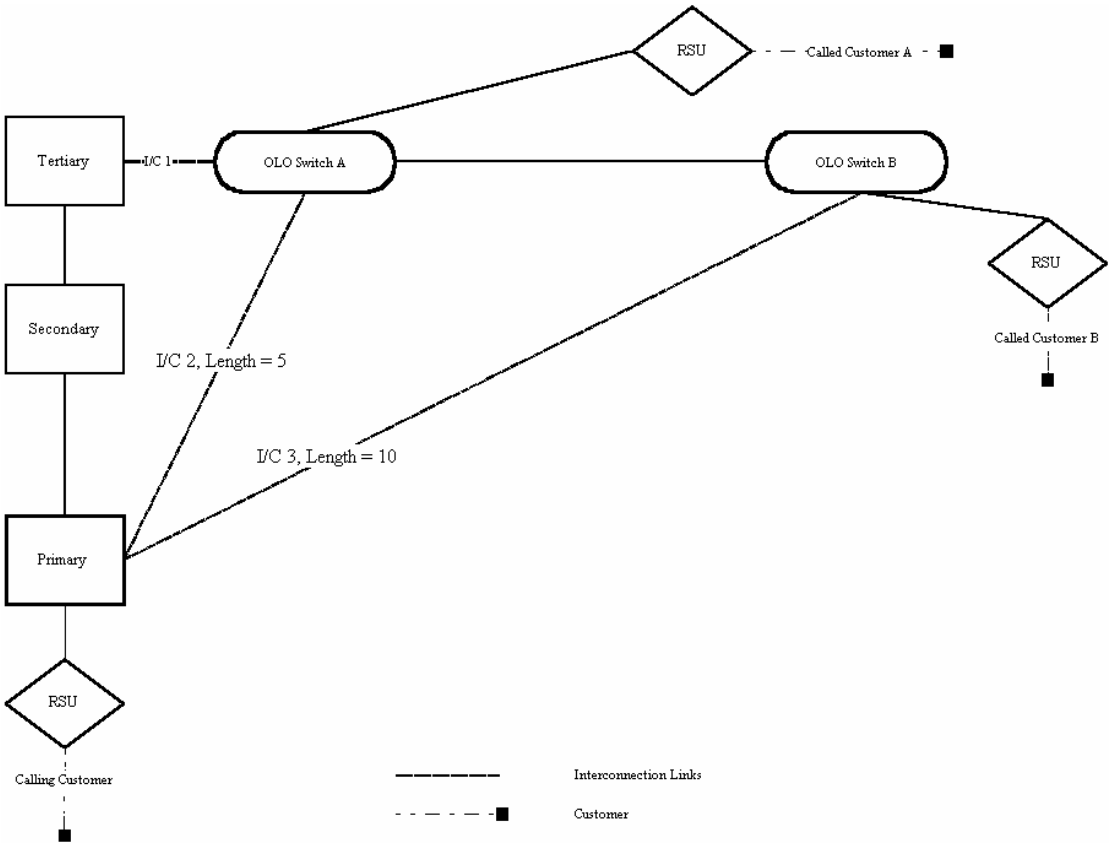
This could lead to a situation where the incumbent would in the first instance route all its traffic to the tertiary node and hand it over to the nearest OLO switch using interconnection link 1. Assuming the incumbent behaved rationally, this would continue until either the tertiary switch ran out of capacity or until the costs of conveying the calls from either the primary or secondary exceeded the costs of building interconnection links 2 or 3. In this scenario interconnection link 4 to the OLO second switch would be built only where there is a financial incentive to the incumbent to construct this link.

**Diagram 2**




The above diagram is a further elaboration of Diagram 1. It graphically displays a number of different terms used in the consultation paper.

## Diagram 3




The above diagram illustrates option 8.2 where an OLO receives a rate dependent upon the level in the network hierarchy of the last switch used in the originating network.

Assuming that in the beginning eircom builds only interconnection link 1 with an OLO network. eircom pays the OLO a termination rate equivalent to a Final Segment charge and an appropriate Inter Exchange Segment charge.
Taking the example of a Primary Switch in eircom's network hierarchy, which is acting as a local exchange. As the volume of traffic from this switch terminating on the OLO's network increases, it eventually costs eircom less to build interconnection 2 and convey the traffic direct from the Switch to the OLO's network. However, OLO Switch A (in the diagram) is acting as both a local exchange and a transit exchange. OLO switches A and B cover the same local call area. For calls terminating on Switch A, eircom would pay a termination rate equivalent to a Final Segment charge. In respect of calls terminating on OLO Switch B, eircom would pay a termination rate equivalent to a Final Segment charge and an appropriate Inter Exchange segment charge. As the volume of traffic terminating on OLO Switch B increases, it eventually costs eircom less to build interconnection link 3 and convey the traffic direct from its Primary Switch to OLO Switch B, it would then only pay a termination rate equivalent to a Final Segment charge.