



eircom - Operator Interconnect Network Plan

Version Control

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1.0		Original	27 th May 2005
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This document follows change control procedure:

Proposed is defined as a document status when the approved document is uploaded to Proposals Section of open eir Website.

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For information:

- Historical Document History Table located at end of Document.
- Publish means the action of uploading a document to the website regardless of status or location.
- **If there are changes to the document between 'Proposed' and 'Final', change control operates.**



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1. Introduction

This document forms part of the eircom/Operator Interconnect Agreement and deals with network planning and design of the interconnect links. It will list the Traffic routing, Signalling, Numbering, Transmission and Traffic Forecasting as applied to Operator.

Attached to this document is information on the distribution of number ranges across each switch in Operator's network (Appendix 1) and information on the Signalling test results (Appendix 2), traffic and transmission forecasts (Appendix 3), Designations and routings associated with the eircom Interconnect Network (appendix 4).

1.1 Scope of Plan

The plan is:

- II" An agreed plan between eircom and Operator that fully reflects the interconnect status between both networks, over the 6 quarter forecasting period.
- II" To be reviewed yearly, but will include a quarterly rollover of forecasts in annexe 1
- II" Focussed on the implications of quarter 4, 5, 6 developments on the network.
- II" Purely for planning purposes and not be interpreted as a strict legal document

Notwithstanding the above, changes can be made to the document from time to time, on a mutually agreed basis, to:

- II" Reflect changes in the Reference Interconnect Offer (RIO)
- II" Minor changes in the network
- II" Any other changes which are necessary to fully reflect the interconnect status between both networks

2. Location of Interconnect Nodes

2.1 Operator Nodes

The Operator network contains the following Interconnect Node:

The Operator Network will contain X Nodes. Information for the following Operator Nodes, referred to in clause 9, is detailed:



Node Name

Node Abbreviation

The following diagram shows the Operator network layout.



2.2 eircom Nodes

Information for the following eircom Interconnect Nodes is detailed:

Interconnect Nodes	Node Abbreviation
Adelaide Road, Dublin	ADLB
Dame Court, Dublin	DCTA
Crown Alley, Dublin	CRAD
Dolphins Barn, Dublin	DBND
Summerhill, Dublin	SRLD
Priory Park	PRPD
Cork Churchfield 1	CHFB
Cork Quaker Rd.	QKRA
Limerick Roches St.	LMKA
Limerick Castletroy	CTYA
Galway, Shantalla	SLAB
Galway, Mervue	MVWA
Waterford, Central	WTDB



Waterford, Tycor

TYCB

3. Traffic Routing Principles

3.1 eircom traffic towards the Operator Interconnect Node

All eircom traffic towards Operator will be routed on an equal basis on unidirectional routes to Operator's Interconnect Node from the specified eircom Interconnect Nodes. This traffic will consist of Operator traffic as defined in the Service Schedules of Annex C. eircom network resilience is provided by dual switch Interconnect Nodes with mutual alternative routing. The routing choices in each exchange will be as follows:

3.1.1 From eircom national tertiary nodes.

The routing choices in each exchange will be as follows:

1. 50% exch x with overflow to exch y
 50% exch y with overflow to exch x
2. Congestion

3.1.2 From eircom tandem nodes.

The routing choices in each exchange will be as follows:

1. 50% exch x with overflow to exch y
 50% exch y with overflow to exch x
2. As in 3.1.1

3.1.3 From eircom primary nodes.

The routing choices in each exchange will be as follows:

1. 50% exch x with overflow to exch y
 50% exch y with overflow to exch x
2. As in 3.1.2

3.1.4 From eircom International tertiary nodes.

Only terminating international traffic will be delivered through these nodes. The routing choices in each exchange will be as follows:

1. 50% exch x with overflow to exch y
 50% exch y with overflow to exch x
2. Congestion



3.2 Operator traffic towards the eircom Interconnect Node

3.2.1 Operator Traffic towards National Tertiary Interconnect Nodes

With two Interconnect Nodes:

1. 50% Tertiary Node 1 with overflow to Node 2
50% Tertiary Node 2 with overflow to node 1
2. Congestion

Generally this will apply to National Termination traffic where there is no eircom Interconnect Node for the Catchment Area, International Access, National Transit and other Services.

The Tertiary Interconnect Nodes can handle all traffic types. Only National Termination can be offered to Interconnect Nodes other than the Tertiary Interconnect Nodes.

3.2.2 Operator Traffic towards Tandem Interconnect Nodes

With one Tandem Interconnect Node (in the case of Athlone, Portlaoise and Sligo):

1. Tandem
2. as defined in 3.2.1 above

Generally this will apply to National Termination traffic to the appropriate Tandem Catchment Area.

3.2.3 Operator Traffic towards Twinned Tandem Interconnect Nodes

With twinned Tandem Interconnect Nodes (i.e. Cork, Limerick, Waterford, Galway, Dublin North, and Dublin South):

1. 50% Tandem 1 with overflow to Tandem 2
50% Tandem 2 with overflow to Tandem 1
2. as defined in 3.2.1 above

Generally this will apply to National Termination traffic to the appropriate Tandem Catchment Area.

3.2.4 Operator Traffic towards Primary Interconnect Nodes

With a single Primary Interconnect Node:

1. Primary
2. As defined in 3.2.1, 3.2.2 or 3.2.3 above, at Operator's choice (subject to the routing rules in Service Schedule 101 of the Interconnect Agreement).

Generally this will apply to National Termination traffic to the Primary Interconnect Node's Catchment Area.

3.2.5 Emergency Traffic

Emergency traffic should be routed to eircom Tertiary Interconnect Nodes.

For all emergency calls, Calling Line Identity (CLI) will be sent from the Operator Network. In order to ensure completion of emergency calls, timeslots from Operator towards eircom will be reserved on the Tertiary Interconnect Links specifically for routing of emergency calls.

The routing principles for emergency calls will be as follows:-

1. Tertiary (normal outgoing timeslots)
2. Tertiary (reserved outgoing timeslots)

3.3 Call origination from the eircom Network

3.3.1 Tertiary Nodes

eircom will route traffic using carrier access and / or carrier selection codes from its tertiary nodes towards the Operator on the incoming route from the other network as per 3.1. This route will now carry operator owned traffic in each direction.

3.3.2 Tandem Nodes

eircom will route traffic using carrier access and / or carrier selection codes from its tandem nodes towards the Operator on incoming routes from the other network (where they exist) or will route up the network to a tertiary node where such routes do not exist or in the case of overflow. The incoming route will now carry operator owned traffic in each direction.

3.3.3 Primary Nodes

eircom will route traffic using carrier access and / or carrier selection codes from its primary nodes on incoming routes from the other network (where they exist) or will route up the network to a tandem node where such routes do not exist or in the case of overflow. The incoming route will now carry operator owned traffic in each direction.

4. Signalling

4.1 Signalling Link sets

This section will list the link sets that are in place between Operator and eircom. It will also state the number of signalling links (minimum of 2) that make up each link set.

4.2 eircom Point Codes

<u>Node</u>	<u>PointCode</u>
Tertiary Interconnect Node at Adelaide Road (ADLA)	105
Tertiary Interconnect Node at Dame Court (DCTB)	111
Tertiary Interconnect Node at Adelaide Road (ADLB)	100
Tertiary Interconnect Node at Dame Court (DCTA)	110
Crown Alley, Dublin (CRAD)	280
Dolphins Barn, Dublin (DBND)	250
Summerhill, Dublin (SRLD)	210



Priory Park (PRPD)

300



Cork Churchfield 1 (CHFB)	500
Cork Quaker Rd. (QKRA)	520
Limerick Roches St. (LMKB)	760
Limerick Castletroy (CTYA)	770
Galway, Shantalla (SLAB)	900
Galway, Mervue (MVWA)	880
Waterford, Tycor (TYCB)	715
Waterford, Exchange St. (WTDB)	710

4.3 Operator Point Code

Node

PointCode

5. Numbering Plans and digit analysis

5.1 General

All Numbering Plans will be in line with the Irish Telephony Numbering document issued by the National Regulator (Office of the Director of Telecommunications Regulation).

5.2 eircom traffic towards Operator

Traffic Type	Access or STD Code	Comments
Termination	National / Local Number (see Appendix 1)	Nature of address indicator used
Customer Care Access	190x	Routed as required Note 1
Carrier Access Code	13xxx	13xxx sent on route
Carrier Selection Code	13xxx + dialled digits	13xxx plus digits as dialled sent on route
Carrier Preselection Code	139xx + dialled digits	139xx plus digits as dialled sent on route

5.3 Operator traffic types towards eircom

For International Access, National Termination and National Transit, as defined in Annex C of the RIO, the Operator Interconnect node will pass to each of the eircom Interconnect Nodes only numbers in the national (including the trunk access prefix zero) and international number formats. National numbers will not be passed in the international format.

In order to ensure correct routing and accounting, the following defines the minimum eircom Number Plan required to be implemented in the Operator Digit Analysis: -

Traffic Type	Access or STD Code	Comments
International Access	Country code (note 1), (note 4) 800 + 8 digits	NAI to be set to 'International Number'
Northern Ireland Access	048 (Note 5)	
National Termination	1 (Note 1) 2 (Note 3) (Note 1) 3 (Note 3) (Note 1) 4 (Note 3) (Note 1) 5 (Note 3) (Note 1) 6 (Note 3) (Note 1) 7 (Note 3) (Note 1) 09 (Note 3) (Note 1)	
National Transit	085, 086, 087	
Freefone normal traffic bursty traffic	1800 all except level 71 1800 71	



LoCall normal traffic bursty traffic	1890 all except level 71 1890 71	
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CallSave normal traffic bursty traffic	1850 all except level 71 1850 71	
Premium Rate Services normal traffic bursty traffic	15xx all except level 71 15xx 71	151X is excluded from this Service.
National Directory Inquiries	11811 118xx (except 11811 & 11818)	Operator will translate this to 11811XXX before being passed to eircom Operator will translate this to 118XX23XXX before being passed to eircom
International Directory Inquiries	11818	Operator will translate 11818 to 11818XXX before being passed to eircom.
National Operator Assistance	10	Operator will translate this to 1023XXX before being passed to eircom.
International Operator Assistance	114	Operator will translate this to 11423XXX before being passed to eircom.
Emergency Services	999, 112	Where 999 is dialled Operator will translate this to 11213XXX before being passed to eircom. Where 112 is dialled Operator will translate this to 11213XXX before being passed to eircom.
Packet Access	1510, 1801	
Paging Access	082	
Speaking clock	1191	
eircom Customer Care Access	1901 to 1905	
3 rd Party Customer Care Access	1907, 1909	

Note 1: Following digits dialled will not be analysed.

Note 2: Exceptions to these ranges will require further expansion within the digit analysis.

Note 3: The digit analysis will be defined to the minimum number of digits required to identify the appropriate local/trunk rate for the available routing (including alternative routing) options.

Note 4: The eircom Interconnect Nodes will not convey (00) 353.

Note 5: The eircom Interconnect Nodes will convey Northern Ireland Codes prefixed with (00) 44.

6. Transmission

This section will detail the planned transmission arrangements as agreed between Operator and eircom.

The transmission forecasting will be the output of the forecasting process specified in the Operations and Maintenance Manual and the tabular output of this process will be included in Appendix 3 of this document with separate forecasts for eircom to Operator traffic and Operator to eircom traffic.

6.1 Points of Interconnect

eircom Node	Operator Node	Interconnect Type	Traffic Type	No. of 2m
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6.2 Transmission Routing

Transmission diversity information to be inserted here.

7. Service Quality

7.1 Grade of Service for Operator to eircom Interconnect Nodes

All Interconnect Links to eircom Tertiary Interconnect Nodes will be dimensioned based on a busy hour grade of service of .005 (i.e. .5% of offered calls offer across this link will experience congestion).

Traffic from Operator to an eircom Tandem or Secondary Interconnect Node may be under dimensioned in terms of the expected busy hour traffic. Traffic that cannot be handled by these Interconnect Nodes will be offered to the Tertiary Interconnect Node. The Tertiary Interconnect Links are dimensioned for this expected traffic overflow from the Tandem and Secondary Interconnects Links.

7.2 Grade of Service for eircom to Operator Interconnect Nodes

The network will offer high quality service under normal conditions, and will offer degraded service Operator under high traffic/failure conditions, such that the majority of call attempts will be successful.

Traffic routes from eircom Interconnect Tertiary nodes to Operator Node shall be designed to operate at a busy hour grade of service of .005, i.e. 0.5% of calls offered to the route during the network busy hour will fail.

In case of failure of a single Tertiary Interconnect Node or Transmission system a reduced grade of service will be used. Total blocking of 0.3 is the maximum that should be allowed in the peak hour.

8. Traffic Forecasting

The traffic forecasting will be the output of the forecasting process specified in the Operations and Maintenance Manual and the tabular output of this process will be included in Appendix 3 of this document with separate forecasts for eircom to Operator traffic and Operator to eircom traffic.

9. Synchronisation



Synchronisation can be provided from both eircom Tertiary nodes over the PDH interconnect.

10. Number Portability

This section shall reflect commercial number portability agreements between eircom and Operator, and shall be based on number portability solutions in the Technical Manual.

Appendix 1

Number Range Distribution

This appendix contains the distribution of geographic number ranges across the Operator switch. It also indicates the routing for Transit, Non-geographic and International number ranges where appropriate.

1. Schedule of Allocation of Geographic Numbers

II" Reference Number: XXXX

II" Licensee: Operator

II" Licence No: XXXX

II" Date: DD/MM/YYYY

NDC/ Access Code	Block	Number Length	Geographic Numbering Area	Block Size

2. Schedule of Allocation of Non-Geographic Numbers

II" Reference Number: XXXX

II" Licensee: Operator

II" Licence No: XXXX

II" Date: DD/MM/YYYY

Service*	Access Code	Number Range	Numbers Allocated	Comment



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*The numbers may only be used for the services specified above, as defined in ODTR document 98/55

Appendix 2

Signalling Test Schedule and Results

This appendix contains the tests and results of the ISUP tests carried out between eircom and Operator.

Appendix 3

Transmission and Traffic Forecasts

This appendix contains the Transmission and Traffic Forecasts in accordance with the process specified in the eircom Operations and Maintenance Manual.

Operator: Operator Name Date: DD/MM/YYYY Node: Operator Node

Operator to provide one Microsoft Excel sheet in soft copy in the following format for each of Operator's nodes.

Cells to list cumulative forecast requirement for 2Mbit links.

	Interconnect Node	Qtr - Yr-	Qtr - Yr-	Qtr - Yr-	Qtr - Yr-	Qtr - Yr-	Qtr - Yr-	Qtr - Yr-
1	Castleblaney							
2	Cavan							
3	Drogheda							
4	Dundalk							
5	Mullingar							
6	Naas							
7	Churchfield 2 (Cork)							
8	Mallow							
9	Bantry							
10	Clonmel							
11	Wexford							
12	Quaker Road							
13	Tralee							
14	Ennis							
15	Castlebar							
16	Bray							
17	Dunlaoire							
18	Sandyford							
19	Clondalkin							
20	Crumlin							
21	Terenure							
22	Palmerstown							
23	Merrion							
24	Whitehall							
25	Blanchardstown							
26	Swords							
27	Belcamp							
28	Clontarf							
29	Carlow							



30	Birr							
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31	Letterkenny							
32	Castlerea							
33	Waterford							
34	Tycor (Waterford)							
35	Castletroy (Limerick)							
36	Roches Street (Limerick)							
37	Mervue (Galway)							
38	Shantalla (Galway)							
39	Priory Park							
40	Dolphins Barn							
41	Crown Alley							
42	Summerhill							
43	Portlaoise							
44	Rathedmond (Sligo)							
45	Roslevin (Athlone)							
46	Adelaide Road A							
47	Dame Court B							



Appendix 4

Traffic Designations for eircom-owned & Operator-owned Interconnection Paths

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1. Introduction

Connections between an eircom Interconnect Node and the Interconnect Node of another licensed operator (Operator) are known as Interconnect Links. These links can be of a unidirectional or bi-directional nature. The nature of the link being defined by the traffic requirements of the operator that “owns” the Link.

Each Interconnect Link consists of single or multiple Interconnect Paths, with a single Path consisting of a 2Mbit/s circuit between the eircom network node and the network node on the operator’s network.

When ordering an Interconnect Path the traffic types to be passed on the Path is indicated, the Path is then either designated to be “Operator-owned paths” or “eircom-owned paths”.

This document will detail the varying traffic types carried on each of the above Interconnect Path designations.

1.1 Background

Given that any single Interconnection Path is designated as either an ‘Operator-owned paths’, or ‘eircom-owned paths’ this would suggest that all Paths are unidirectional, allowing traffic to flow in one direction only. This however is not the case.

Interconnection Paths in Ireland only carry traffic owned by one operator. The operator that receives the retail margin from the call is said to “own” the traffic. This means that calls by customers of an operator, eircom for example, to another network operator’s geographic numbers are owned by eircom. Likewise calls made by an Operator customer calling NTC numbers in eircom’s network would also be eircom owned traffic as eircom receives the retail revenue less the origination cost for the originating network.

With the above as guidance, we can determine that both traffic types described above are eircom-owned paths, while at the same time the physical direction that traffic flows is both Inbound to and Outbound from the eircom network, leading to confusion in the designation of Interconnect Paths.

To avoid confusion the following details traffic types and their associated Interconnect Path designations. All questions relating to specific traffic types should be directed toward your account manager within Carrier Services.

In Qualitative Terms

Traffic Designations on eircom-owned paths:

- II" Geographic traffic to be terminated ‘off’ the eircom network, on an Operator’s network.
- II" Non-geographic traffic originating off the eircom network for termination ‘on’ the eircom network.
- II" Calls made by a directly connected Operator customer prefixed by eircom’s carrier access, carrier selection or carrier pre-selection code.

Traffic Designations on Operator-owned paths:



II" Operator originated traffic to geographic numbers to be terminated 'on' the eircom network.



- II" Non-geographic traffic originating on the eircom network destined to be terminated 'off' the eircom network, on an Operator's network.
- II" Calls made by a directly connected eircom customer prefixed by an Operator's carrier access, carrier selection or carrier pre-selection code.
- II" All transit traffic being offered to eircom for onward delivery.
- II" All International traffic.
- II" Outbound leg of Non-Geographic traffic transiting via the eircom network for termination "off" the eircom network.

Route Designation as Offered

Given the list of eircom service schedules as offered to both eircom and Operator's. The traffic type is shown dependant on the network of origin of the call.

Service Schedule Number	Service Title	Routing Description	Route designation
102	eircom National Termination	FEH	Operator-owned paths
103	eircom Call Origination	NEH	Operator-owned paths
104	National Transit	Tertiary Interconnect nodes only	Delivered to eircom via an Operator Operator-owned paths path and exit the eircom network by the appropriate Service Schedule route designation
105	Access to eircom Premium Rate Services	Tertiary Interconnect nodes only	eircom-owned paths
106	Access to eircom Freephone Services	Tertiary Interconnect nodes only	eircom-owned paths
107	Access to eircom LoCall Services	Tertiary Interconnect nodes only	eircom-owned paths
108	Access to eircom Callsave Services	Tertiary Interconnect nodes only	eircom-owned paths
109	eircom Universal Access Services	Tertiary Interconnect nodes only	eircom-owned paths
110	eircom Personal Numbering Services	Tertiary Interconnect nodes only	eircom-owned paths
111	eircom National Directory Enquiries	Tertiary Interconnect nodes only	Operator-owned paths
112	eircom International Directory Enquiries	Tertiary Interconnect nodes only	Operator-owned paths
113	eircom National Operator Services	Tertiary Interconnect nodes only	Operator-owned paths



114	eircom International Operator Services	Tertiary Interconnect nodes only	Operator-owned paths
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115	Emergency Services (112 / 999)	Tertiary Interconnect nodes only (note 1)	Operator-owned paths
116	Packet Services Access	Tertiary Interconnect nodes only	Operator-owned paths
118	eircom Customer Care Access	Tertiary Interconnect nodes only	eircom-owned paths
119	International Access including Northern Ireland	Tertiary Interconnect nodes only	Operator-owned paths
120	eircom Carrier Pre-Selection (CPS) Service		Operator-owned paths

121	Access to eircom 1891 internet services	Tertiary Interconnect nodes only	Operator-owned paths
122	Access to eircom 1892 internet services	Tertiary Interconnect nodes only	Operator-owned paths
124	Access to eircom VOIP services	Tertiary Interconnect nodes only	Operator-owned paths
Operator Services			
205	Access to Operator Premium Rate Service	NEH2	Operator-owned paths
206	Access to Operator Freephone Service	NEH2	Operator-owned paths
207	Access to Operator Shared Cost Timed Service	NEH2	Operator-owned paths
208	Access to Operator Shared Cost Fixed Service	NEH2	Operator-owned paths
209	Operator Universal Number Service	NEH2	Operator-owned paths
210	Operator Personal Numbering Access	NEH2	Operator-owned paths

221	Operator 1891 Internet Access Service	NEH	Operator-owned paths
222	Operator 1892 Internet Access Service	NEH2	Operator-owned paths
223	Operator 1893 Flat Rate Internet Access Call Origination Service	NEH2	Operator-owned paths
224	Operator Voip Service	NEH2	Operator-owned paths
301	Reciprocal Non-Geographic Number Portability Service		N.A.
302	Data Management Amendment		N.A.
303	Reciprocal Geographic Number Portability Service		N.A.
401	Single Billing WLR		N.A.

Note 1 – Access to emergency services will be at eircom tertiary nodes where possible but these calls will be accepted at all eircom interconnect nodes.

Near End Hand Over (NEH)

NEH allows a call, originated at a primary exchange, the opportunity to exit the eircom network at this node, should the correctly designated interconnect path with free capacity be available towards the terminating operator.

Should capacity not be available here the call origination routing scheme, as published on the eircom wholesale web site, describes the controlling twinned tandem nodes that the call will rise towards in order to exit the eircom network. Calls approach twinned tandem nodes from a primary node on a 50/50 distribution basis.

Should capacity at the tandem layer not be available the call will be passed onward to the eircom tertiary nodes at Adelaide Rd and Dame Court, where all operators support interconnect links.

NEH2 – Near end hand over only available at AXE switches for these service schedules.

Far End Hand Over (FEH)

FEH allows a call originated on an Operator network the opportunity to enter the eircom network for termination at selected nodes. In the first instance all traffic destined for termination on the eircom network will be accepted at any tertiary node.

In the second instance all geographic traffic destined for termination on the eircom network will also be accepted at any tandem node.



eircom will only accept traffic destined for termination to eircom geographic numbers at any other primary and tandem nodes provided that the geographic number resides within the catchment area of that node. The eircom call termination scheme details the catchment areas associated with all allocated eircom geographic numbers



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