



Reference Interconnect Offer (RIO)

Voipgate S.A.

February 2018

Voipgate S.A.

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1 Introduction

1.1 Scope

This Reference Interconnect Offer (RIO) defines the interconnection terms and conditions (including the list of the interconnection services) which Voipgate (VG) will apply to all Operators in order to allow end-users who are connected to the system of an Operator to communicate with end-users who are connected to the telecommunication networks of VG, or services accessible through VG's system and vice versa. This RIO focuses mainly on voice services.

1.2 Services covered

The services covered by this RIO are:

- Terminating access service;
- Interconnection link service;
- Number Portability;
- Special Services Offered to Operators.

1.3 Terms and Conditions

This RIO defines the minimal interconnection terms and conditions which VG will grant to other Operators. Nevertheless, VG reserves the right to provide more beneficial terms and conditions, in accordance with the applicable regulatory framework, including the principle of non-discrimination.

1.4 Responsibility of content

No Operator shall be responsible for the content of calls passed through his own or an interconnected Operator's network. Luxembourgish laws and regulations regarding confidentiality and access by legal authorities to calls on the Operator's and VG's network will apply.

1.5 Validity

This RIO is valid from January 1, 2017 unless

- A new RIO is published, or
- A material change occurs in the laws or regulations, governing telecommunications in Luxembourg.

This RIO shall remain in full force and effect after January 1, 2017 until such time a new RIO into force.

1.6 Reviews and Amendments

The content of this RIO may be reviewed and amended in order to comply with applicable rules and regulations. Furthermore, the ILR reserves the right to request or impose on VG modifications to the RIO or the adoption of a new RIO to be undertaken by VG.

1.7 Applicable Law

Unless defined otherwise, the terms used in this RIO must be interpreted in accordance with the Luxembourgish Law of February 27th, 2011 on Networks and Electronic Communication Services (the "Law") and its implementing regulations.

1.8 Prices

All prices mentioned in this RIO, including those specified in the Appendices attached hereto, are in EURO (€) and exclusive of Value-Added Tax (VAT) or any other legal taxes, which will be added where applicable.

2 Definitions

2.1.1 Call

The establishment of a connection through a telecommunications network and the transmission and the delivery of a signal from the terminal on which this signal was generated to the terminal to which this signal is addressed or to a network platform or any other facility giving an automatic answer in those cases where the connection cannot be established.

2.1.2 Calling Line Identification (CLI)

The CLI is the number of the calling user conveyed by each Operator's network for each call, it may also be provided by the network or partly by the calling user. This information is flagged either as “network- provided” or as “user provided, verified and passed”. If the verification of a user provided CLI fails, the network- provided CLI would be transmitted.

2.1.3 Calling Line Identification Presentation (CLIP)

Supplementary service provided for in ITU-T Recommendation I.251.3.

2.1.4 Calling Line Identification Restriction (CLIR)

Supplementary service provided for in ITU-T Recommendation I.251.4.

2.1.5 Capacity of the Interconnection Link

The capacity defined for the Interconnection Link and the corresponding VG access point to which the Operator wishes to be connected.

2.1.6 EEA

European Economic Area

2.1.7 ILR

Institut Luxembourgeois de Régulation.

2.1.8 Interconnection

The interconnection with VG, as defined by the Law.

2.1.9 Interconnect Agreement

An agreement between VG and an Operator, which defines the conditions for the Interconnection.

2.1.10 Interconnection Link

A Link between a VG Access Point and an Operator Access Point for the provision of Interconnection traffic.

2.1.11 Interconnection Service

Services described in the present Reference Interconnect Offer.

2.1.12 International Public Telecommunication Number

Defined as in ITU-T Recommendation E.164.

2.1.13 IP

Internet Protocol version 4 (RFC 791) and Internet Protocol version 6 (RFC 2460)

2.1.14 IXP

Internet Exchange Point

2.1.15 KPI

Key Performance Indicator

2.1.16 Link

Set of telecommunications facilities necessary to establish one or more transmission paths between two locations.

2.1.17 National (Significant) Number

Defined as in ITU-T Recommendation E.164.

2.1.18 Number portability

The case where a subscriber retains its originally assigned directory number when changing from one network Operator (Donor network; Donor Operator) to another (recipient network; Recipient Operator) and is not related to changing the nature of service nor the location.

2.1.19 Operator

Any person exploiting telecommunications networks and/or providing telecommunications services in Luxembourg.

2.1.20 Operator Access Gateway Exchange

An Operator exchange directly connected to an Operator Access Point at which calls are initially switched in the Operator System, when conveyed from the VG Access Point, or finally switched in Operator System when conveyed to the VG Access Point.

2.1.21 Operator Access Point

The physical interface within the Operator's System at which the Interconnection Services can be obtained.

2.1.22 Parties

VG and the Operator with which an Interconnection Agreement is (or is being) concluded.

2.1.23 Point of Interconnection (POI)

The physical point on the Interconnection Link where the telecommunications network of VG and the Operator's System are interconnected. The POI is the boundary between VG and the Operator domains of responsibility.

2.1.24 Reference Interconnect Offer (RIO)

The present offer for Interconnection Services.

2.1.25 System

All equipment and software which, an Operator uses to provide his telecommunications services.

2.1.26 SLA

Service Level Agreement

2.1.27 SIP

SIP, the session initiation protocol, is the IETF protocol for VoIP and other text and multimedia sessions.

2.1.28 TDM

Time-division multiplexing is a method of transmitting and receiving independent signals over a common signal path by means of synchronized switches at each end of the transmission line so that each signal appears on the line only a fraction of the time in alternating pattern.

2.1.29 VG Access Gateway Exchange

A VG exchange directly connected to an VG Access Point at which calls are initially switched in the telecommunications network of the VG, when conveyed from the Operator Access Point, or finally switched in the telecommunications network of the VG when conveyed to the Operator Access Point.

2.1.30 VG Access Point

The physical interface within VG's System from which the Interconnection Services can be obtained.

3 Interconnection Architecture

3.1 VG sited TDM Interconnection

VG has one (1) site that has been designed for use as TDM Interconnection Access Point ground of its optimal network integration. This is an existing VG site, containing relevant switching and transmission equipment with all digital functionality.

VG TDM Interconnection point address:

- 8 rue Henri M Schnadt, L-2530 Luxembourg (DATA4 Luxembourg – DCC)

As of December 1, 2014, Voipgate is not going to install new TDM Interconnections. Furthermore, Voipgate intends to upgrade and hence replace any TDM Interconnection to/with an IP Interconnection by no later than July 1, 2018.

3.2 VG sited IP-Core Interconnection

VG has two (2) sites that have been designed for use as IP-Core Interconnection Access Points grounds of their optimal network integration. These are existing VG sites, containing relevant IP switching, routing and equipment.

VG IP-Core Interconnection point addresses:

- 4 rue A. Graham Bell, L-3235 Bettembourg (LuxConnect DC 1.2)¹
- 3 rue Pierre Flammang, L-8399 Windhof (eBRC – RCW)

The Operator can either use both or selects only one Interconnection Access Point at which he wants to interconnect his System

3.3 VG sited IP-Edge Interconnection

VG has two (2) sites that have been designed for use as IP-Edge Interconnection Access Points grounds of their optimal network integration. These are existing VG sites, containing relevant IP switching, routing and equipment.

VG Interconnection point addresses:

- 8 rue Henri M Schnadt, L-2530 Luxembourg (DATA4 Luxembourg –DCC)
- Z.A.C. Klengbousbiérg, L-7795 Bissen / Roost (LuxConnect DC 2)

The Operator can either use all or selects only one or two Interconnection Access Point at which he wants to interconnect his System

3.4 IXP Interconnection

VG has one (1) site that has been designed for use as IXP Interconnection Access Points grounds of its optimal network integration. This is an existing IXP, containing relevant IP switching, routing and equipment,

VG IPX Interconnection point location :

- Luxembourg Commercial Internet Exchange (LuCIX)

¹ Operator may provide cross-connect to DC1.1 or DC1.3 at own expenses.

3.5 System Alteration

If VG wishes to make a system alteration, it shall give the connected Operators and the ILR no less than 6 months' written notice prior to the date of the anticipated system alteration. The notice shall specify the technical details of the system alteration and the date of the anticipated system alteration. Following such notification VG shall supply to the connected Operators such information as the connected Operator may reasonably request including, to the extent reasonably practicable, the potential impact on the service provided by the connected Operator to the End Users.

3.6 Standards

Where relevant for interconnection with VG, the following hierarchy of standards and procedures will apply:

- Any legal requirements
- IETF RFC documents
- ETSI standards
- ITU-T Recommendations
- National standards
- Any other international standards

4 Terminating access service

4.1 Scope

The terminating access service conveys a call handed over from the Operator's System, at an VG Access Point for termination on any national number of VG network. Tariffs may be different for different categories of services identified by different number ranges.

4.2 Tariffs

The tariffs applied by VG for the provision of the terminating access service are indicated in Annex 1. Only calls that have been setup successfully and answered will be charged. The charging time starts with the answering signal and ends with the first clear signal generated either by the calling or the called party.

4.3 CLI

Whenever CLI is transferred to the telecommunications network of VG, VG will not communicate such CLI to an end-user if such CLI is marked as CLIR unless the call is directed to an emergency number.

5 Interconnection Link Services

The interconnection link service consists in the physical linking between a VG Access Point and an Operator Access Point.

The Operator must interconnect to a VG Point of Interconnection as defined in paragraphs 3.1, 3.2, 3.3 and 3.4. The charges per interconnect site are defined in Annex 2.

5.1 Interconnection Link and Co-Location

For VG-sited and IXP interconnections, VG can provide a custom offer for an Interconnection Link Service or the Operator will supply and operate an Interconnection Link in its entirety.

VG will provide access to the Operator at its site for the installation and maintenance of the Operator's transmission equipment used in direct relation with the interconnect services, electric power and safekeeping.

In its request for VG-sited interconnection, the Operator will describe his needs regarding the installation of his transmission equipment on the premises of VG. Whenever VG determines that a VG-sited and an IXP interconnection is not reasonably feasible, it will inform the Operator and the ILR of the reasons of such unfeasibility within 15 days of receiving the request. VG will comply should the ILR find that VG-sited interconnection is reasonably feasible. In case of non-feasibility of VG-sited Interconnection, VG will cooperate with the Operator to find an appropriate alternative solution.

For the provision of the co-location facilities, the conditions and prices are subject to a separate offer.

5.2 Interconnection Capacity

The Operator is responsible for the dimensioning of the Interconnection Links capacity required for the conveyance of its own traffic. An Operator's own traffic consists in the traffic for which the Operator is billed by VG.

5.3 Signaling System

5.3.1 TDM Interconnection

The signaling systems between VG and the Operator shall be based, where relevant, on the ITU-T SS7 protocols, ISUP Blue Book version or other protocols to be agreed upon between the Operator and VG.

As of December 1, 2014, Voipgate is not going to install new TDM Interconnections. Furthermore, Voipgate intends to upgrade and hence replace any TDM Interconnection to/with an IP Interconnection by no later than July 1, 2018.

5.3.2 IP Interconnection

The signaling systems between VG and the Operator shall be based on the IETF SIP protocol.

At the transmission levels, the interconnection is based on IP Networks.

6 Number Portability (NP)

6.1 Scope

Number portability (NP) is applicable under the conditions defined by the document DOC-NP-ILT which describes the procedures applicable to number portability in Luxembourg (the NP-Document).

As defined by the NP-Document, the Recipient Operator transmits the electronic file containing the requested data to VG by means of an electronic messaging system. The transmission of the electronic files can be operated between 06.00 and 18.00 hours from Monday to Friday, except legal and public holidays. VG will acknowledge receipt of the transmission file by means of the same electronic messaging system.

As defined in the NP-Document, requests can be transmitted in timeframe $T1+n .. T1+m$. For VG, $n=2$ days and $m = 16$ weeks.

NP will be activated by the VG from Monday to Friday from 8.00 to 12.00 and 13.00 to 17.00 hours except legal and public holidays in Luxembourg. This time schedule may be extended to 7.00 to 19.00 hours on Monday to Friday and 8.00 to 12.00 hours on Saturday with the supplementary costs to be paid by the Recipient Operator.

6.2 Tariffs and Billing

Tariffs of number portability will be those defined in Annex 3.

Billing procedures will be as described in the Porting Agreement between the Parties.

7 Quality of service of VG's Interconnection Services

As far as the terminating access service is concerned, VG undertakes to ensure for its own System a network failure rate, which does not exceed 1,5% as a nation-wide 3 months average, for failures which are exclusively due to its System. Network failure rate is the ratio between the number of calls handed over by an Operator to be terminated on VG's Network and failed due to insufficiencies in VG Network and the total amount of calls handed over by that Operator to be terminated on VG's network (excluding, in particular, failures due to end-user behavior and failure of terminal equipment).

In the unlikely event of disturbance of the conveyance of traffic within its System, VG may be constrained to implement the classical measures of traffic regulation (limiting channels, etc.) in order to limit its effect on the quality of the service provided to its customers as well as to the Interconnected Operators. The target figures given above for network failure rate do not include failures that are caused by the mentioned Measures of traffic regulation. The Operator and the ILR shall be informed if the above-mentioned measures for traffic regulation have to be applied and how long they may last.

VG shall respect the quality conditions as they are defined in the applicable legal regulation and in accordance with the quality VG provides for its retail clients.

8 Procedure for Reaching an Interconnection Agreement

Interconnection agreements shall be negotiated and reached according to the general modalities for interconnection as determined by the ILR (Article 23 of the Law).

VG may demand the delivery of a bank guarantee on first demand of a Luxembourg based bank of 25.000,-- € in favor of VG for the provisioning of the interconnect service.

VG may also without prejudice to previous arrangements demand payment in advance.

Requests for interconnection services shall be made in writing to the following address:

Voipgate S.A.
Office of the CIO
4 rue Graham Bell
L-3235 Bettembourg
T: +352 20200200
F: +352 20300300
@: itx@support.voipgate.com

9 Annexes 1 to 4

All prices mentioned here after are given exclusive of VAT or any other legal taxes, which will be added where applicable.

10 Annex 1 Tariffs applicable to the terminating access service

10.1 Tariffs applicable to the terminating access service of calls originating within EEA

The tariffs for the terminating access service are defined in accordance with ILR regulation 16/209/ILR. Unless defined otherwise in future amendments of the present RIO, the tariffs will be automatically adapted at the start of a new billing period as featured in the following tables.

The tariffs in the following paragraph 10.1.1. of this RIO only apply to the termination of voice calls originating within the EEA, provided that the calling number can be identified as belonging to a numbering plan of one of the countries of the EEA.

10.1.1 Terminating access service to geographic numbers

From January 1, 2018 to December 31, 2018

	Call setup €cts	Charge per minute ¹ €cts
peak ²	0,00	0,135
off-peak ³	0,00	0,135

From January 1, 2019

	Call setup €cts	Charge per minute ⁴ €cts
peak ⁵	0,00	0,138
off-peak ⁶	0,00	0,138

Tariffs and billing arrangements for terminating access service to numbers not determined in the present RIO may vary according to the technical implementation chosen for the interconnection. In any circumstance, the tariffs will be cost based and non-discriminatory.

10.2 Tariffs Applicable to the terminating access service of calls originating outside of the EEA

As of February 1, 2018, VG will apply, based upon the country of the calling party number, a surcharge for the termination in its network according to the following rules:

1. Termination of calls with A-Number belonging to any of the country codes included in Table 1: VG will not apply any surcharge.
2. Termination of calls with A-Number belonging to any of the country codes included in Table 2: VG will apply a surcharge of 4,5 €cts/min.
3. Termination of calls with A-Number not belonging to any of the country codes included in Table 1 or Table 2, with no A-number (no CLI), with incorrect A-Number (either in

format or content), invalid A-Number, modified or manipulated A-Number: VG will apply a surcharge of 12€cts/min.

These surcharges will be applied in addition to the termination rate specified in paragraphs 10.1.1 of this RIO.

Table 1

Destination Zone	Destination Detail	Prefix
USA	United States Alaska	+1907
AUS	Australia	+61
AUT	Austria	+43
BEL	Belgium	+32
BGR	Bulgaria	+359
CAN	Canada	+1
CHN	China	+86
COL	Colombia	+57
HRV	Croatia	+385
CYP	Cyprus	+357
CZE	Czech Republic	+420
DNK	Denmark	+45
EST	Estonia	+372
FIN	Finland	+358
FRA	France	+33
GUF	French Guiana	+594
ATF	French Southern and Antarctic Lands	+262
DEU	Germany	+49
GRC	Greece	+30
MAF	Saint Martin	+590
USA	United States Hawaii	+1808
HUN	Hungary	+36
ISL	Iceland	+354
IRL	Ireland	+353
ITA	Italy	+39
JPN	Japan	+81
KOR	Korea, South	+82
LVA	Latvia	+371
LIE	Liechtenstein	+423
LTU	Lithuania	+370
LUX	Luxembourg	+352
MLT	Malta	+356
MTQ	Martinique	+596
MYT	Mayotte	+262
MEX	Mexico	+52
NLD	Netherlands	+31
NOR	Norway	+47
POL	Poland	+48
PRT	Portugal	+351
PRI	Puerto Rico	+1787
PRI	Puerto Rico	+1939
REU	Réunion	+262
ROU	Romania	+40
SVK	Slovakia	+421
SVN	Slovenia	+386
ESP	Spain	+34
SWE	Sweden	+46
GBR	United Kingdom	+44
USA	United States	+1

Table 1 : No surcharges will be applied for the termination of voice calls originating in these countries.

Table 2

Destination Zone	Destination Detail	Prefix
QN	United Nations	+888
QV	International National Rate Service	+883
BGD	Bangladesh	+880
BMU	Bermuda	+1441
BTN	Bhutan	+975
BRA	Brasil	+55
BRN	Brunei Darussalam	+673
KHM	Cambodia	+855
CRI	Costa Rica	+506
DOM	Dominican Republic	+1809
DOM	Dominican Republic	+1829
DOM	Dominican Republic	+1849
EGY	Egypt	+20
FRO	Faroe Islands	+298
PYF	French Polynesia	+689
GIB	Gibraltar	+350
GUM	Guam	+1671
HKG	Hong Kong	+852
IND	India	+91
IDN	Indonesia	+62
KWT	Kuwait	+965
LAO	Laos	+856
MYS	Malaysia	+60
MUS	Mauritius	+230
MNG	Mongolia	+976
SXM	Sint Maarten	+1721
NZL	New Zealand	+64
PAK	Pakistan	+92
PAN	Panama	+507
PRY	Paraguay	+595
SGP	Singapore	+65
ZAF	South Africa	+27
CHE	Switzerland	+41
TWN	Taiwan	+886
THA	Thailand	+66
URY	Uruguay	+598
VEN	Venezuela	+58
VNM	Vietnam	+84
VIR	Virgin Islands, U.S.	+1340

Table 2 : A surcharge of 4,5 €cts/min will be applied for the termination of voice calls originating in these countries.

11 Annex 2 Tariffs applicable to the interconnection link service

11.1 TDM Interconnection

Annual fee per E1 (120 Ω RJ45) Interface (annual costs for the access point equipment and maintenance):

- 1.713,--€

Monthly charge per used Interconnect Site (covering billing, maintenance and service quality control):

- 210,--€

For the provision of co-location facilities, when required, the conditions and prices are subject to a separate offer.

As of December 1, 2014, Voipgate is not going to install new TDM Interconnections. Furthermore, Voipgate intends to upgrade and hence replace any TDM Interconnection to/with an IP Interconnection by no later than July 1, 2018.

11.2 IP Interconnection

One-off charge per Operator (covering installation and testing):

- 1.300,-- €

Annual fee per Ethernet Interface (annual costs for the access point equipment and maintenance):

- Copper interface 100 Mb/s²: 600,--€
- Copper interface 1 Gb/s³: 1.142,--€
- Fiber-optic interface 1 Gb/s: 1.713,--€

Monthly charge per used Interconnect Site (covering billing, maintenance and service quality control):

- IP-Core Interconnection Access Point: 210,--€
- IP-Edge Interconnection Access Point: 210,--€
- IXP Interconnection Access Point – Public VLAN (ID 2000): 140,--€
- IXP Interconnection Access Point – Private VLAN: 190,--€

For the provision of co-location facilities, when required, the conditions and prices are subject to a separate offer.

² Not available in Bettembourg DC1.2 and Bissen/Roost DC2

³ Not available in Bettembourg DC1.2 and Bissen/Roost DC2

11.3 Modification of Interconnection Links

The establishment, the modification and the cancellation of trunks, as well as the connection or disconnection of circuits or signaling links required by an Operator, are charged to this Operator if these changes apply to existing interconnect trunks.

The necessary changes related to the extension on an existing interconnect trunk by adding supplementary interconnect links are not charges to the operator.

Establishment of a new trunk

- IP: 103,--€

As of December 1, 2014, Voipgate is not going to install new TDM Interconnections. Furthermore, Voipgate intends to upgrade and hence replace any TDM Interconnection to/with an IP Interconnection by no later than July 1, 2018.

Modification or cancellation of an existing trunk

- TDM: 485,--€
- IP: 77,--€

Connection or disconnection of circuits

- TDM: 161,--€

Connection or disconnection of a signaling link

- TDM: 323,--€

12 Annex 3 Tariffs for Number Portability (NP)

12.1 Tariff and pricing

Standard tariffs applicable to Number Portability.

Activation fee for number portability per number activation:

- 14,38€

12.2 Routing of ported numbers and routing errors

VG does not provide corrective routing for conveyance of traffic to inconsistent or erroneous codes outside of VG's network.

Additional conveyance fee per minute for inconsistent or erroneous codes if the volume of inconsistent or erroneous codes exceeds the percentage of 1% of the total calls to ported numbers:

- 0,63€cts

13 Annex 4 Tariffs for Special Services offered to Operators

13.1 Calls to 800 number terminated in the VG network (Toll-Free, Free-Phone)

This service consists in the conveyance by VG of Calls handed over by an Operator at a National Point of Interconnection between the Operator's System and VG System for termination on VG System, on one of VG's Free phone numbers in accordance with the National Numbering Plan of Luxembourg. The rates to be paid by VG for Terminating Access Service to VG's Free phone numbers are as specified below:

	Origin	Call setup €cts	Charge per minute €cts
peak	fixed	0,00	0,28
	mobile	0,00	1,11
	payphone	0,00	0,28
off-peak	fixed	0,00	0,28
	mobile	0,00	1,11
	Payphone	0,00	0,28

13.2 Terminating Access service to Shared Revenue Numbers (Premium Rate Service – 90x)

This service consists in the conveyance by VG of Calls handed over by the Operator at a National Point of Interconnection between the Operator's System and VG System for termination on VG System, on one of VG's Shared revenue numbers in accordance with the National Numbering Plan of Luxembourg.

13.2.1 Premium rate services on duration basis (price per minute)

	Charge per minute €cts	Billing period (in seconds)
Level 0	0,79	60
Level 1	10,26	30
Level 2	17,82	30
Level 3	29,42	30
Level 4	48,77	30
Level 5	64,25	20
Level 6	87,47	20
Level 7	153,25	20

13.2.2 Premium rate services on call basis (price per call)

	Charge per call €cts	Maximum call duration (in seconds)
Level 1	7,91	30
Level 2	17,59	30
Level 3	36,93	30
Level 4	56,28	30
Level 5	114,32	30
Level 6	172,37	30
Level 7	230,41	30
Level 8	462,59	30

14 Annex 5 Voipgate numbering resources

14.1 Geographic numbers

20200
20201
20202
20203
20204
2050
2071
2072
2722
2772
2779

14.2 Toll-Free numbers

80080

14.3 Shared Revenue numbers

90020
90089
90120
90520

14.3.1 Charges applicable to Shared Revenue Numbers

14.3.1.1 Premium rate services on duration basis

Charges applied according to 13.2.1

Level 0	90089
Level 1	90y201
Level 2	90y207
Level 3	90y203
Level 4	90y204, 90y208
Level 5	90y205
Level 6	90y202, 90y209
Level 7	90y200, 90y206

y = 0,1 or 5

14.3.1.2 Premium rate services on call basis

Charges applied according to 13.2.2

Level 1	90z??1
Level 2	90z??2
Level 3	90z??3
Level 4	90z??4
Level 5	90z??5
Level 6	90z??6
Level 7	90z??7
Level 8	90z??8
	z = 0, 1

-
- ¹ To be billed on a per nearest second basis.
² Peak: worked days between 8.00 and 19.00.
³ Off-peak: time outside peak.
⁴ To be billed on a per nearest second basis.
⁵ Peak: worked days between 8.00 and 19.00.
⁶ Off-peak: time outside peak.