REFERENCE INTERCONNECT OFFER - FIXED

Twilio Ireland Limited

Version 1.1

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1.0	14 April 2021	Published for Consultation on 14 April 2021
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1. Introduction

1.1 This Reference Interconnect Offer (**RIO**) defines the interconnection services that Twilio Ireland Limited (**Twilio**) offers Interconnected Operators for termination of Calls to the Twilio network.

1.2 This RIO has been issued and developed by Twilio in accordance with the obligations imposed on Twilo in ILR Regulation ILR/T21/1.

1.3 This RIO does not cover calls to E.164 numbers that were allocated to Twilio by the Institut Luxembourgeois de Régulation (**ILR**), but have subsequently been ported to other networks.

1.4 Twilio shall not be responsible for the content of communications passed through the Interconnection Services.

1.5 While Twilio operates its own access network, manages its own numbering range and billing to its End Users, it currently relies on Voipgate S.A. (**Voipgate**), services and switching platforms for call set-up, routing and handling and interconnection to other voice operators. Therefore, interconnection and call termination services have been delegated to Voipgate that provides these services on behalf of Twilio in accordance with the obligations set out in Regulations 1ILR/T21/1.

1.6 Operators requesting access to Twilio's public telecommunications network and call termination to E.164 numbers issued by ILR to Twilio that have not been ported out are therefore required to enter into a Interconnect Agreement with Voipgate which will covers access and call termination to Voipgate's public telephony network, but also give access to and allow call termination on Twilio's public telecommunications network on the same technical and financial terms.

2. Validity

2.1 This RIO comes into effect upon the conclusion of consultation process in accordance with article 3.4 of the Regulation 14/177/ILR.

2.2 This RIO is valid from the date it comes into effect until:

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

2.3 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 Twilio modifications to the RIO or the adoption of a new RIO to be undertaken by Twilio.

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

3.   Tariffs

All tariffs set out 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.

4.   Definitions

The following terms and expressions shall have the meaning set out below:

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.

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 will be transmitted.

Calling Line Identification Presentation (CLIP): Supplementary service provided for in ITU-T Recommendation I.251.3.

Calling Line Identification Restriction (CLIR): Supplementary service provided for in ITU-T Recommendation I.251.4.

EEA: European Economic Area

Interconnection: The interconnection with the Interconnected Operator set up by Voipgate, according to the terms and conditions specified in Voipgate's reference offer, required to convey phone calls to E.164 number allocated to Twilio by the ILR and that have not been ported out (**Twilio Numbers**) and end users.

Interconnect Agreement: The agreement that must be concluded between Voipgate and the Interconnected Operator that defines the conditions of Interconnection in view of the provision of the Terminating Access Services to Twilio Numbers..

Interconnection Link: A link between Voipgate's Access Point and an Operator Access Point for the provision of Interconnection traffic.

Interconnected Operator: Any legal or natural person operating a telecommunications network or providing telecommunication services in Luxembourg as approved by the ILR and having entered into an Interconnect Agreement with Voipgate.

Interconnection Service: The services provided by Voipgate related to the conveyance of voice calls to the Twilio Numbers and end users.

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

IXP: Internet Exchange Point

Operator Access Point: The physical interface within the Interconnected Operator's system at which the Interconnection Services can be obtained.

Point of Interconnection (POI): The physical point on the Interconnection Link where the telecommunications network of Voigate and the Interconnected Operator's system are interconnected. The POI is the boundary between Voipgate and the Operator domains of responsibility.

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

System: All equipment and software that an operator uses to provide their telecommunication services.

Terminating Access Service: Conveyance of phone calls from the POI to the terminal equipment of the end user.

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

3.   Interconnection Architecture

3.1   Point of Interconnection

Twilio has chosen Voipgate for the provision of Interconnect Services required for the termination of calls to Twilio's public telephone network.

Voipgate has defined specific locations on its network for use as a Point of Interconnection. These locations are set out in Voipgate's reference offer.

As of 1 January 2021, these sites are:

- for IP Interconnection:

  4 rue A. Graham Bell, L-3235 Bettembourg (LuxConnect DC 1.1) 1

  19 rue de Reims, L-2417 Luxembourg (POST POP0148)

  12 impasse Drosbach, L-1882 Luxembourg (European Data Hub DDC)

  3 rue Pierre Flammang, L-8399 Windhof (eBRC RCLW)

- for IPX Interconnection

  Luxembourg Commercial Internet Exchange (LuCIX)

Voipgate supports the termination of voice calls to both its own and Twilio Numbers (including numbers ported into Voipgate or Twilio on the same interconnection point. No dedicated Interconnection needs to be established with Voipgate for the termination of voice calls to Twilio Numbers.

As such, existing Interconnections established in the past according to the terms and conditions of Voipgate's reference offer for the termination of calls to Voipgate's own numbering range and numbers ported to Voipgate's network can also be used for the termination of calls to Twilio Numbers.

The Interconnected Operator is solely responsible for the dimensioning of the Interconnection to provide sufficient capacity for the conveyance of traffic handed over the Point of Interconnection.

3.2   System Alteration

If Twilio or Voipgate wishes to make a system alteration, it shall give the Interconnected Operator and the ILR no less than three (3) 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 Twilio or Vopigate shall supply to the Interconnected Operator such information as theInterconnected Operator may reasonably request including, to the extent reasonably practicable, the potential impact on the service provided by the Interconnected Operator to its end users.

3.3.   Standards

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

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

The signaling systems between Vopigate and the Interconnected Operator shall be based on the IETF SIP protocol. At the transmission levels, the interconnection is based on IP networks.

4.   Terminating Access Service

4.1   The Terminating Access Service conveys a Call handed over from the Interconnected Operator's system at a POI for termination on a Twilio Number. Tariffs may be different for different categories of services identified by different number ranges.

4.2.   The tariffs applied by Twilio via its designated provider ot Interconnection Services are set out in the Annexes.

4.3   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   Whenever CLI is transferred to the telecommunications network of Twilio and its designated provider of Interconnection Services Voipgate, Twilio 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

5.1   The initial interconnection capacity (and associated number of channels) will be divided between dedicated IP Trunk Groups within Twilio's Infrastructure for the provision of Services provided by Twilio.

5.2   An IP Trunk Group contains the dedicated bandwidth expressed in a number of concurrent Calls. An IP Trunk Group is used for the handling of traffic of one or more

Services. The possible combinations of Services in IP Trunk Groups are to be agreed between the parties.

5.3 Additional information on the Interconnection Link and Collocation including pricing can be found in Voipgate's reference interconnection offer.

6. Number Portability (NP)

6.1. Scope

NP is applicable under the conditions defined by regulation 16/204/ILR and DOC-NP-ILT which describes the procedures applicable to number portability in Luxembourg (the NP-Document).

6.2. Tariffs and Billing

Tariffs of number portability are those defined in Annex 3.

7. Quality of Service

7.1. In relation to the Terminating Access Service Twilio and Voipgate undertakes to ensure for its own Systems a network failure rate, which which does not exceed 1,5% as a nation-wide 3 months average, for failures which are exclusively due to their Systems. Network failure rate is the ratio between the number of Calls handed over by the Interconnected Operator to be terminated on Twilio's and Voipgates network and failed due to insufficiencies in Twilio's and Voipgate's network and the total amount of calls handed over by that Interconnected Operator to be terminated on Twilio's and Voipgate's network (excluding, in particular, failures due to end-user behaviour and failure of terminal equipment).

7.2. In the event of disturbance of the conveyance of traffic within its system, Twilio and Voipgate 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 set out ib Section 7.1 for network failure rate do not include failures that are caused by the mentioned measures of traffic regulation. The Interconnected 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.

7.3 Twilio and Voipgate shall respect the quality conditions as they are defined in the applicable legal regulation and in accordance with the quality provide their retail clients.

8.   Procedure for Reaching an Interconnection Agreement

8.1   Interconnection agreements shall be negotiated and entered into with Twilio's designated partner for Interconnection Services Voipgate, based on its standard terms and conditions, pursuant to and in compliance with applicable legislation.

8.2   Twilio, in addition to Voipgate, may demand the delivery of a bank guarantee on first demand of a Luxembourg based bank of €25,000 in favour of Twilio for the provisioning of the interconnect service. When, and as long as there exist serious and ascertained doubts regarding a client's solvency, Twilio may without prejudice to previous arrangements demand payment in advance. Requests for interconnection services shall be made in writing to the following address:

Twilio Ireland Limited
25-28 North Wall Quay
Dublin D01 H104, Ireland
Email : regulatory-notices@twilio.com

8.3   Twilio will relay every request for interconnection and termination of calls to numbers issued to E.164 numbers issued to Twilio to Voipgate. Voipgate will directly contract the requesting party for the conclusion of an Interconnect Agreement.

8.4   Voipgate's relevant reference offer can be found on its website at the following address: https://mvg.lu/rio.php and it sets out the tariffs payable to Voipgate for the Interconnection Link Services, Modification of Interconnection Links, Multi Transit Services and Single Transit Services.

Annex 1: Tariffs Applicable to Terminating Access Service of Calls Originating within the 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 table 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.

Table 1 - Terminating Access Service to Geographic Numbers

	Call Setup	Charge/Minute €ct[1]
Peak[2]	0,00	0,138
Off Peak[3]	0,00	0,138

Twilio 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 2: OP will not apply any surcharge.
2. Termination of calls with A-Number not belonging to any of the country codes included in 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: OP will apply a surcharge of 12,60 €cts/min.

These surcharges will be applied in addition to the termination rate specified in Table 1.

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[1] To be billed on a per nearest second basis
[2] Peak: worked days (*jours ouvrables* in French) between 8.00 and 19.00
[3] Off Peak: Time outside Peak

Table 2 - Destinations

Destination Zone	Destination Detail	Prefix
AUT	Austria	+43
BEL	Belgium	+32
BGR	Bulgaria (Republic of)	+359
CYP	Cyprus (Republic of)	+357
CZE	Czech Republic	+420
DNK	Denmark	+45
EST	Estonia (Republic of)	+372
FIN	Finland	+358
FRA	France	+33
GUF	French Guiana (French Department of)	+594
DEU	Germany (Federal Republic of)	+49
GRC	Greece	+30
HUN	Hungary (Republic of)	+36
GLP	Guadeloupe (French Department of), including Saint Martin	+590
ISL	Iceland	+354
IRL	Ireland	+353
ITA	Italy	+39
LVA	Latvia (Republic of)	+371
LIE	Liechtenstein (Principality of)	+423
LTU	Lithuania (Republic of)	+370
LUX	Luxembourg	+352
MLT	Malta	+356
MTQ	Martinique (French Department of)	+596
MYT	Mayotte	+269
NLD	Netherlands (Kingdom of the)	+31
NOR	Norway	+47
POL	Poland (Republic of)	+48
PRT	Portugal, including Azores and Madeira	+351
REU	Reunion (French Department of)	+262
ROU	Romania	+40
SVK	Slovak Republic	+421
SVN	Slovenia (Republic of)	+386
ESP	Spain, including Canary Islands	+34
SWE	Sweden	+46

Annex 2: Terminating Access Service to Toll Free Numbers

The rates to be paid by Voipgate for Terminating Access Service to Twilio's Free phone numbers are as specified below:

	Origin	Call Setup	Charge/Minute[4] €ct
Peak[5]	Fixed	0,00	0,28
	Mobile	0,00	1,11
	Payphone	0,00	0,28
Off Peak[6]	Fixed	0,00	0,28
	Mobile	0,00	1,11
	Payphone	0,00	0,28

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[4] To be billed on a per nearest second basis
[5] Peak: worked days (*jours ouvrables* in French) between 8.00 and 19.00
[6] Off Peak: Time outside Peak

Annex 3: Tariffs for Number Portability (NP)

1.   Activation fee for number portability per number activation: €14,38.

2.   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: €ct 0,63.