Liberty Global Peering Principles

Introduction

Liberty Global B.V. and affiliates in its group (together "**Liberty Global**") strive to provide excellent internet access to all of its customers. To accomplish this, Liberty Global uses these peering principles as guidance on the technical and operational requirements for potential peering partners.

Peering is here defined as a form of IP interconnection where each party bears its own costs. IP interconnection is the interconnection of administratively separate internet networks for the purpose of exchanging traffic between the customers of each network. Other IP interconnect products are available from Liberty Global. For those that do not wish to enter into a peering or other IP interconnect relationship with Liberty Global, access to Liberty Global IP networks is also available via third parties.

Generally speaking, Liberty Global will only enter into a peering relationship where this is to the mutual benefit of it and its potential peering partner. It will only establish peering when this has the potential to improve the quality of experience of its internet customers.

This document is not a peering agreement. No contractual nor any other rights or any formal offer shall be inferred or arise out of this document. Liberty Global cannot be obliged to enter into negotiations based on this statement, nor does any liability arise out of this document. Peering relationships will only be established on the basis of a formal contract.

Minimum Requirements

In order for a request to be considered for peering the potential peering partner should:

- Operate a redundant international backbone network, in which the majority of inter-hub connectivity shall have a capacity of at least 100 Gbps.
- Actively cooperate to achieve a balanced benefit and investment contribution to ensure that the relationship is and continues to be in the mutual interests of the parties.
- Interconnect only using direct (10 or 100) gigabit Ethernet or future more cost effective technologies.
- Exchange a maximum of 3 Gbps per location where peering is established over a public internet exchange.
- For Global Peering (traffic exchange with all Liberty Global footprints):
    - Must have a European footprint with presence in five countries and able to interconnect to Liberty Global in at least three locations inside Europe *or* must have a non-European footprint and able to interconnect to Liberty Global in at least two locations outside Europe.
    - Must exchange a minimum 95th percentile of 7 Gbps inbound or outbound traffic with Liberty Global's AS6830 network with traffic ratio between 95th percentile inbound and 95th percentile outbound between 1:3 and 3:1.
- For Regional Peering (traffic exchange with a single Liberty Global footprint):
    - Must be able to interconnect resiliently to Liberty Global in at least two locations in the requested country, of which one will be at the sole discretion of Liberty Global.
    - Must exchange a minimum 95th percentile of 70 Gbps inbound or outbound traffic with Liberty Global network(s) in that specific country.

In the requirements above measurement of 95th percentile is defined as sampling every 5 minutes the bits transferred, during a calendar month, ignoring the top 5% values and then taking the highest remaining value.

If a potential peering partner doesn't fulfil these requirements Liberty Global may nonetheless consider peering on the basis of other commercial and technical arrangements if this is in its interest.

Technical and Operational Requirements

In order for a potential peering partner's request to be considered it must agree to enter into a peering agreement in which it commits to:

- Operate a professionally managed 24x7 NOC and provide Liberty Global with all contact details concerning this NOC.
- Ensure good communication regarding network maintenance with regard to the traffic exchange, agree to actively cooperate to resolve security incidents and other operational problems and in principle follow the practices outlined in BCP38 and BCP46 (see https://www.ietf.org/rfc/bcp-index.txt).
- Not to engage in activities which will undermine the peering relationship including but not limited to: pointing a default route or otherwise forwarding traffic for destinations not explicitly advertised, resetting BGP next-hop, selling or giving next hop to others.
- Participate in capacity reviews at least twice a year and aim for timely expansion and upgrading interconnect infrastructure where required and mutually beneficial, agree to review upgrades of individual interconnects when 70% peak utilization is reached.

Requesting Peering with Liberty Global

Potential peering partners shall send a written peering application to peering@aorta.net. The application shall provide:

- A description of the potential peering partner's network; geographic scope, backbone capacities & type of traffic including expected initial traffic volume exchanged and one year forecast.
- The desired technical & commercial type of relation requested, including reference(s) to peering DB (https://www.peeringdb.com/) or exhaustively list all of the exchange points and facilities where the potential peering partner has ability to interconnect.
- Confirm agreement to relevant minimum as well technical & operational requirements outlined in sections above.

Potential peering partners providing information requested above will be contacted within 1 calendar month to further discuss their requests. Note that Liberty Global:

- Evaluates requests based upon actual long term observed traffic and will not setup trial peering.
- Requires an NDA before formal discussion of a peering agreement can begin.
- Requires a formal contract for any new peering agreement.

General Information

Periodic review of this statement of principles will be conducted by Liberty Global to ensure that the eligibility requirements are consistent with Liberty Global's business needs. Liberty Global may amend this document at any time.

Effective Date

This statement of principles takes effect from March 1st, 2017 onwards. We seek to apply these principles to new peering relationships established after that date and to the extent reasonable to changes to existing peering relationships. Recognizing that we have a considerable number of legacy arrangements which pre-date this policy we do not generally seek to apply this policy retrospectively where peering relationships have not changed. In case of operational necessity, for example the merger of previously separate Autonomous Systems or the termination of our physical presence in a particular location, a different approach may be followed.