



Service Level Agreement: IX Connect Services

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1 Overview

This Appendix is an integral part of the Telia Carrier Master Service Agreement (“MSA”) and shall only apply, on the terms specified herein, to the following products provided to Customer by Arelion:

Arelion IX Ethernet Connect Service

Arelion IX Wave Connect Service

This document defines the service offered, levels of service and Customer’s right to apply for credits in the event that the applicable service levels are not achieved. Terms not defined herein shall have the same definition as in the MSA.

2 Service Description

The Arelion IX Connect Services connects Customer to Global Internet Exchange locations (“IXs”) of their choice, using Arelion Transport solutions outlined below:

2.1 Wavelength- IX Wave Connect Service

The Arelion Wavelength Service comprises of a bi-directional wavelength channel or a full duplex Ethernet service provisioned in one or a sequence of DWDM systems within the Arelion network.

2.2 Ethernet Virtual Private Link (EVPL) – IX Ethernet Connect Service

The Arelion EVPL service provides Ethernet connectivity between the Customer’s location and IXs across the Arelion network. The service performs Point-to-point (E-Line) frame forwarding between two UNIs, which may operate in ‘VLAN-mode’ or ‘Port-mode’.

The Service is delivered over the MEF CE 2.0 Arelion Ethernet Network and is available from more than 140 Arelion MPLS PoPs in Europe, North America and Asia. The Service has the same technical characteristics and performance at all worldwide locations.

The IX Ethernet Connect Service is not delivered with any managed Ethernet demarcation device. The demarcation point of the Service for the purpose of measurement of the Service Levels is the customer-facing port on the Arelion aggregation switch or router.

2.3 General

Dedicated capacity will be provided to the Customer at each IX enabling them to establish Peering links with parties of their choice.

Arelion is responsible for provision of the network between the Customer location and the IX port, enabling Customer to set up their own individual Peering relationships. Arelion have no responsibility for the set-up and management of those individual Peering relationships or for any of the traffic carried across these links between the Customer and any third parties.



The product offers high flexibility and can be delivered on either a Port and VLAN-mode. Services are billed as detailed on the Service Order Form and include:

- Initial set-up costs as a One Time Charge (“OTC”),
- A flat-rate Monthly Recurring Charge (“MRC”) in respect of the Customer’s bandwidth commitment,

3 Delivery

3.1 Credits for RFS Delay

The Service at each site shall be installed and operating on or prior to the committed RFS Date provided by Arelion, subject to any special conditions applicable to the Service Order. If the committed RFS Date is not met by Arelion at a particular site, and one or more of the Exclusions below does not apply, the Customer is entitled to claim credits according to the table set forth below for each day of delivery delay beyond the committed RFS Date, which shall be the Customer’s sole and exclusive remedy in connection with the delay.

Number of full working days by which Arelion fails to meet the committed RFS date for service	Service credits as a % of the committed monthly recurring charge (MRC)
1 to 5 days	10%
6 to 10 days	20%
11 to 20 days	30%
>21 days	50%

3.2 Exclusions

Arelion shall not be liable, and the Customer shall not be entitled to any credits or other remedy, for RFS delays arising out of Customer’s acts or omissions, a delay caused by Customer failing to provide access to its premises, the failure of (i) an IX deliver or provide services or (ii) a third-party not contracted by Arelion to deliver or provide services; or an Event of Force Majeure.

4 Internet Exchange Features

4.1 Membership

It is a requirement of the IX Connect service for the Customer to become a member of the Internet Exchange(s). The Customer will have access to and appear on membership lists in accordance with the current policies of each IX. As part of these policies, each IX may also publish the Customer's AS number on its memberships lists. The Customer shall have access to all direct mailings from the IX regarding service in accordance with the policy of that IX together with access to any IX reporting portal made available to members by the IX provider; (for example Looking Glass) for the purposes of traffic measurement, statistics and other features.

Arelion makes no representation as to the performance of each IX and has no responsibility to provide services including but not limited to those above, that may be offered by any IX. Arelion have no liability for any temporary or permanent failure of any IX which leads to a loss of the IX Connect Services, should Service be withdrawn by the IX.

In addition to the standard Arelion contractual documentation; Arelion shall also provide Customer with copies of any specific Membership agreements required by each IX. The Customer shall sign and ensure its own compliance with these agreements. Arelion reserve the right to suspend Service without liability at the request of any IX for a breach of the Membership Agreement or related policies by the Customer.

Arelion is not involved in the Peering policies of the Customer, which is solely responsible for arranging, implementing and managing their Peering relationships. The Customer is solely responsible for ensuring that other users at the IX are willing to exchange traffic with them. Customer shall have at least one active Peering relationship within 90 days of the signature of the Service Order Form.

Customer is prohibited from running IP Transit services over these connections, unless these have been explicitly authorised in writing in advance by Arelion. In the event that Customer does run IP Transit services over these connections without such authorisation, this shall constitute a material breach and Arelion reserves the right to terminate the Service without liability and with immediate effect.

5 Fault and Service Availability – General

5.1 Fault Time Calculation

With respect to the availability guarantees set out below in this SLA, a Fault is recognized upon initiation of an incident case by the Customer at the point that Arelion confirms the existence of a problem. The Fault or restoration time is calculated as the time between the opening of the trouble-ticket until Arelion notifies Customer that Service at the affected site has been restored through the implementation of a full or a temporary repair, reduced by the following:

- Delay of Fault repair caused by the Customer not giving access to its premises to Arelion and/or Arelion's subcontractors.



- Delay of the closure of the trouble-ticket due to Arelion not being able to reach the relevant contact of the Customer.
- Other delays caused by the Customer or Customer's employees, agents or representatives or by an act or omission of the IX, its employees, agents or representatives.

If necessary, Customer must provide Arelion and/or Arelion's subcontractors (e.g. local tail or professional services providers) with access to its premises or a third-party's premises in order to perform testing, maintenance and/or Fault repair.

A fault will be considered to have been repaired in the event that either a full repair or a temporary repair restoring the continuity of the relevant Service has been implemented.

5.2 Exclusions

A Service will not be considered to be subject to a Fault and/or a service level will not be deemed to have not been achieved to the extent caused by any of the following:

- Planned Work (see The Customer Service Handbook)
- Environmental conditions at the Customer site such as power supply, climate or housing
- The Customer's actions or intervention
- An Event of Force Majeure
- The suspension, interruption or termination of Service in accordance with the MSA
- Any Fault or problem with third party connections provided from the Arelion network into Customers location,
- A Fault or problem with an unmanaged CPE provided to Customer by Arelion,
- A temporary or permanent withdrawal of the service by the IX to Arelion and/or Customer,

5.3 Service Availability Calculation

The measurement period for the availability of the Service at an IX shall be coterminous with the monthly billing cycle. The availability is calculated monthly, beginning with the first full month of Service at the site.

Service levels for availability are measured on a per-site basis and not as an entire network.

$$Availability = \frac{TotalTime - \sum(FaultTime_n)}{TotalTime} * 100 \%$$

where $TotalTime$ = the total time during the measurement period

and $\sum(FaultTime_n)$ = the sum of all fault times of the faults that occurred during the measurement period

Availability of the IX Connect Service at each IX is dependent on the transport method used to provide access to this location as detailed in Sections 6 to 9 below.



6 Fault and Service Availability – IX Ethernet Connect

Sections 6 & 7 of this SLA apply only to the IX Ethernet Connect Service where Customer is using an Arelion Ethernet Virtual Private Link (EVPL) to access the IX location.

6.1 Definition of Fault

A Fault is considered to have occurred when the Service is unavailable, or the Service suffers frame loss of greater than ten percent (10%) for a continuous period of at least 10 minutes between the demarcation points of the Service.

6.2 Measurement of Frame Loss and Network Latency

Frame Loss and Network Latency will be measured based on monthly average measurements taken between sites. Backbone frame loss and network latency are measured by sending approximately 1000 UDP-Datagrams with a length of 96 bytes every 10 minutes to designated servers located at MPLS Backbone Core Nodes, which are primary nodes in the network designated by Arelion. Arelion will use these measurements in order to determine an average monthly measurement between sites. The Customer's interface in the MPLS Backbone routers/switches will be measured using Simple Network Management Protocol ("SNMP"). The term "UDP-Datagram" refers to the User Datagram Protocol, a connectionless transport-layer protocol in the TCP/IP protocol suite.

7 Service Levels – IX Ethernet Connect

7.1 Availability

Availability of the IX Ethernet Connect Service is 99.99%, measured as specified above. Customer shall be entitled to request a credit equal to the pro-rated charges for Service at the affected IX for 1/60 of a day (i.e. 1/60 of 1/30 of the MRC for Service at the affected IX) for every minute where Service fails to meet guaranteed availability levels for that month at the IX due to a Fault.

7.2 Network Latency Service Level and Credits

The term "network latency" refers to the average time taken for test IP packets to travel between designated routers within Arelion's Backbone and back again (also referred to as RTT or Round-Trip Time). Arelion guarantees that the monthly average Network Latency for IX Ethernet Connect services shall not exceed the committed values as specified in the latency tables as published in our portal [My Carrier \(arelion.com\)](http://arelion.com) under Network Performance measured over a calendar month. For the avoidance of doubt, measurements are based on Arelion's Backbone only.

Network Latency for IX Ethernet Connect services shall be determined by Arelion based on averaging sample measurements taken between core sites during a calendar month.



When the Network Latency Service guarantee is not met between two sites, Customer shall be entitled to request a credit equal to 10% of the monthly recurring charges for the affected Service for the applicable calendar month.

7.3 Frame Loss Service Levels and Credits

Arelion guarantees that the monthly average Frame Loss between two sites on the global network for Basic Services will not exceed 0.1%, measured over a calendar month, excluding any periods of Service unavailability. Frame Loss shall be determined by Arelion based on averaging sample measurements taken between sites at core nodes using test Ethernet frames during a calendar month. When the guarantee is not met between two sites, Customer shall be entitled to request a credit equal to 10% of the MRC for Service at the two affected sites for the applicable month.

8 Fault and Service Availability – IX Wave Connect

The following Sections 8 & 9 of this agreement shall apply only in respect of Customers using the IX Wave Connect Service.

8.1 Definition of a Fault

A fault is considered to have occurred during the period of time in which ES and SES exceed the limits for unacceptable performance level given in ITU-T recommendation M.2101 due to problems within the Arelion network. Subject to the terms below, every sequence of unavailability is considered to be a fault.

9 Service Levels – IX Wave Connect

The credit percentages stated in section 9.2 are applied to the committed monthly recurring charges (“MRC”) for the affected site.

9.1 Service Availability Guarantees

The availability is set forth in the following table:

Service Option	Guaranteed Monthly Availability
Protected Link *	99.99%
Dual Link **	99.99%
Single Link ***	99.40%



* Service with automatic protection.

** Service in a package with two diversified Single Links with the same endpoints.

*** Service without automatic protection and low priority to restore in case of failure.

Notwithstanding anything to the contrary herein, Dual Link Service shall be considered unavailable only if both of the two Links, with separate routed ways, are unavailable at the same time.

9.2 Availability Credits

If the availability levels are not achieved, then Customer shall be entitled to claim credits from Arelion according to the following table:

Fault Time (Per Month)	Protected and Dual Link	Single Link
5 mins – 4 Hours	10% of monthly charge	
4-8 Hours	20% of monthly charge	5% of monthly charge
8-12 Hours	30% of monthly charge	10% of monthly charge
>12 Hours	40% of monthly charge	20% of monthly charge

10 Claim of Credits

10.1 Limitation of Credits

Notwithstanding the occurrence of multiple events of unavailability or failures to meet the service level guarantees set forth in this SLA, the maximum credit across every category of fault or unavailability to the Customer during a monthly billing period is limited to 50% of the previous month's charges for Service at the affected site.

10.2 Procedure

In order to receive credits, Customer must submit a claim utilizing Arelion's standard credit request form within thirty (30) days of the end of the calendar month in which the fault occurred. The credits will be based on the actual fault time. In the event of any dispute concerning the duration of a fault, Arelion's fault monitoring and clearance records will govern. If the Customer fails to submit a claim within the applicable thirty days (30) period as defined above, the Customer shall irrevocably waive the right to claim any credits for the Services affected by the fault.



Notwithstanding anything to the contrary in the Agreement, the claim and award of credits pursuant to this Service Level Agreement shall be Customer's sole and exclusive remedy in the event that the Service is unavailable or fails to meet the specified service level guarantees.