

**Tusass A/S
(Referred to as Tusass)
Wholesale Data Services**

**Annex D4
Global IP Service
Technical Description**

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Abbreviations

Abbreviation	Description
ASN	Autonomous System Number
BGP	Border Gateway Protocol
EBGP	External BGP
DDoS	Distributed Denial of Service
CPE	Customer Premises Equipment
IP	Internet Protocol
L2VPN	Layer 2 VPN
NTP	Network Termination Point
QoS	Quality of Service
PA	Provider Aggregate
PI	Provider Independent
RIPE	Réseaux IP Européens (European IP Networks)
VPN	Virtual Private network

1. Introduction

This Annex defines the technical description of the Global IP Service.

This document describes the technical aspects of the Global IP Service which is part of Tusass's wholesale portfolio. The Service Taker must provide the following at the premises where the Service is going to be implemented:

- RIPE address space, and
- ASN.

The Service description and processes to support the implementation of this Service are located in the Service description (Annex C4 of this Agreement) and the Operations & Maintenance Manual (Annex E4 of this Agreement).

All equipment and plant that is deployed as part of the implementation of this Service shall comply with relevant national and international standards.

All installation procedures used must comply with standard industry practices and national and international standards.

2. General definitions

The Tusass wholesale portfolio consists of the following Services:

- Bit Stream Access Service;
- Co-location Service;
- Connect IP Service;
- Global IP Service;
- Local IP Service, and
- National IP Service.

A service description for each of the Tusass wholesale Services is included in Annex C to this Agreement. A technical description for each of these Services is included in Annex D to this Agreement.

The service description and technical description for each of the Tusass Services describes how each of the Services connects to allow the Service Taker to provide its end to end service to its customer.

3. Service overview

The Global IP Service is an Internet connectivity service that presents a virtual connection from a Layer 3 sub-interface on Tusass's external BGP routers through a Service Taker's National IP Service to a Layer 2 sub-interface on (one of) the Service Taker's Connect IP Service instances in Nuuk.

4. Transport

Transportation of traffic in the Global IP Service is implemented as a L2VPN between Tusass's external BGP router and the Service Taker's Connect IP Service.

5. Interfaces

The Global IP Service transport will be presented at a routed 802.1Q sub-interface in the Service Taker's Connect IP Service.

The actual termination in the Connect IP Service is a Layer-2 sub-interface, but since the head-end of the virtual circuit is a Layer-3 sub-interface on Tusass's external BGP router, the logical interface presented to the Service Taker behaves as a Layer-3 sub-interface.

IP addressing of the link-nets is at Tusass's discretion. Public IP addresses from Tusass's PA space will always be used.

Tusass's BGP router will be configured to only accept prefixes from the Service Taker if the following conditions are met:

- The prefix is allocated as PI space to the Service Taker by the relevant authority (RIPE);
- The prefix mask is a maximum of 22 bits long, and
- The RIPE database is updated with relevant objects including AS/Prefix announcements

Announcement of routing information from Tusass towards the Service Taker can be chosen as any one of the following options:

- Default only - Tusass will only announce a default route to the Service Taker
- Own + Default - Tusass will announce its own prefixes (aggregated) and a default route to the Service Taker
- Full BGP Table - Tusass will announce the full BGP routing table to the Service Taker

Only IPv4 is currently supported in the Global IP Service. IPv6 support will be made available at a later stage.

6. Traffic measurement

The total amount of upstream and downstream traffic will be measured. QoS is not offered for the Global IP Service and so no class-based measurements will be carried out.

7. DDoS protection

DDoS protection detects Rogue IP traffic from the internet to IP addresses belonging to the RIPE address space of the Service Taker.

Upon detection of a DDoS attack, traffic to the affected addresses are discarded before it enters the network of Tusass.

The detection is based on automatic learning of the traffic pattern.

DDoS protection may be disabled by submitting a Service Change Request.

Configuration for particular combinations of origin and destination IP addresses may be requested by submitting a Service Change Request.