



GÉANT OPEN

High Performance Interconnectivity
for Research



GÉANT Open Exchange

Overview

Facilitating collaboration has always been the cornerstone of GÉANT, and GÉANT Open adds to its portfolio of collaboration services to enable NRENs and researchers to interconnect with commercial teams and third party organisations.

GÉANT Open allows NRENs to arrange interconnections between external services and partners quickly and easily without the need for dedicated circuits. For example NRENs can interconnect with cloud service providers or research labs to offer access for their users. The service uses a dedicated switch onto which all users can connect their own circuits and then interconnect with other participants in order to provide inter-organisation connectivity. The interconnections can be either at the full circuit capacity or the circuit can be subdivided to allow one-to-many or many-to-many connections as required.

This has particular benefits to international partners needing to manage multiple interconnections and wishing to harmonise their international circuits.

As a first within the European Research and Education (R&E) community, approved commercial organisations will be able to connect to GÉANT Open. This will help R&E users to access a wide variety of commercial third parties as part of private/public research projects or to access privately operated facilities or services.

Supports European and global connectivity

Protocol Neutral: Open, layer 2 interconnectivity allows maximum flexibility.

Supports Multiple Virtual Connections: One physical interface can be logically subdivided into separate VLANs allowing the participant to connect with many other members simultaneously.

Onward Connectivity: Participants can also make connections from GÉANT Open through the GÉANT network to support multiple uses such as commercial research facilities or cloud service providers.

Flexible: GÉANT Open allows interconnections to be made for short or medium terms – for example to support a major event or project - without the need to contract a long-term dedicated circuit.

GÉANT Service Description

Technical Description of the Service

Infrastructure

The eligible connectors are as described in the eligibility document (see section “Eligibility and Connection Policies”).

The London Open Exchange implements an open connection policy. The Open Exchange will enable traffic to be exchanged between Research and Education Networks like European NRENs, the GÉANT backbone, regional networks (e.g. CAREN, TEIN, RedCLARA), GÉANT sister networks across the globe (e.g. ESnet, Internet2, CANARIE), and international research organisations. Traffic exchanges between connected commercial organisations and Research and Education Networks are also allowed.

GÉANT IP will be connected to the Open Exchange but only Research and Education Networks can switch traffic with it.

The Open Exchange consists of the Open Exchange switch and the PoP facilities. DANTE will operate the GÉANT connection(s) to the Open Exchange. Other connectors are responsible for operating their own connections to the Open Exchange. The link between the Open Exchange switch and the GÉANT IP Network is implemented with a L2 switched circuit.

Service Options

The Open Exchange offers two core services:

1. Peer-to-peer policy-neutral interconnections between participating organisations connecting on GÉANT Open (with the exception of GÉANT).
2. Interconnectivity between GÉANT and other participating organisations.

These are described in more detail below.

The two services are not differentiated on a technical basis. At the technology level, the connectivity between the GÉANT network and the Open Exchange is similar to that of any other peering partner.

1. Peer-to-Peer Neutral Interconnections

This service provides connectivity between any two members. The service can be offered in two options: VLAN ID and Port to Port (or “transparent”). These are described in more detail below. The VLAN-ID and Port-to-Port-based modes are mutually exclusive. It is not possible to provision a Port-to-Port service together with a VLAN-ID service based on the same port.

The default service will be the VLAN-ID-based service.

VLAN-ID-Based Interconnection

The VLAN-ID-based mode interconnects two Open Lightpath Exchange (OLE) members with a Layer 2 (L2) circuit (“pseudowire”). Multiple VLAN-ID-based circuits can be provisioned for a single connector on a single port. This is shown conceptually in Figure 1 below.

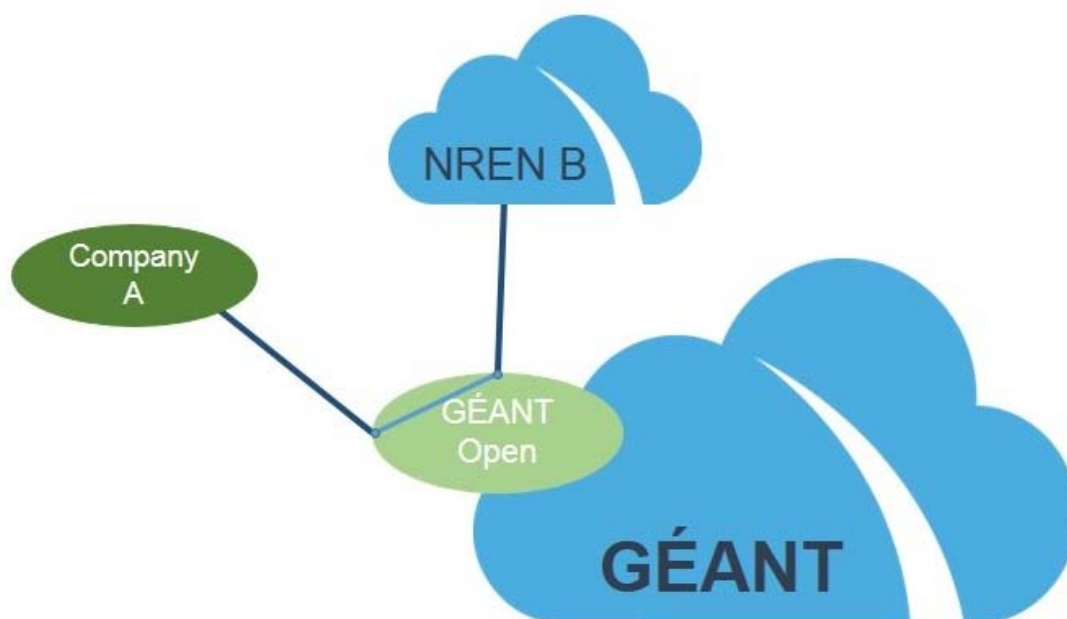


Figure 1: Peer-to-peer switching within the Open Exchange

1.2 Port-to-Port-Based Interconnection

The port-to-port-based or transparent mode interconnects two OLE members’ ports together and provides transparent transmission of all Ethernet frames, independently from the VLAN-ID.

2. Partner Access to GÉANT Network

Access from GÉANT Open into the GÉANT network infrastructure is regulated by the GÉANT Open Policy, in order to facilitate access to the GÉANT network and for any onward connectivity to services on the GÉANT network. This is shown conceptually in Figure below. This connectivity will be via the VLAN-ID mode only, as using the Open Exchange to provide

port-to-port connectivity will not offer any commercial or technical advantages compared with a direct connection to GÉANT.

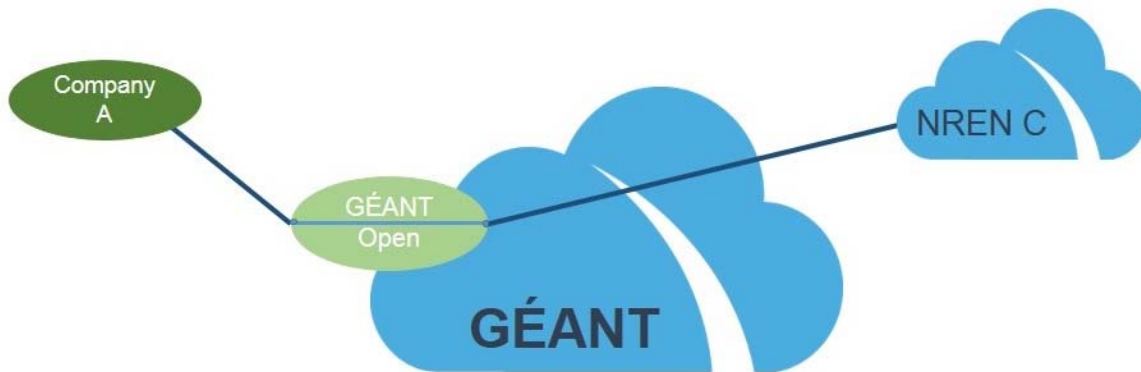


Figure 2: Access into the GÉANT infrastructure

Demarcation Points

The management demarcation point between DANTE and the NREN is a port on the Optical Distribution Frame (ODF) rack. The exact port will be specified at the time of the connection. The responsibility of the GÉANT Operations Centre (OC) ends at the declared demarcation point, patching beyond that point is the responsibility of the ordering NREN.

Service-Level Target

Availability Target

Availability is defined as the total number of minutes in a calendar month during which the GÉANT Open service is available to exchange data between two connectors, divided by the total number of minutes in a calendar month and represented as a percentage.

The GÉANT Open Exchange service is considered unavailable when connection is not able to transit traffic. The target availability for the service is greater than 99.4%

Time to Fix a Fault and Time to Respond Target

The GÉANT Operations Centre (OC) is responsible for supporting the GÉANT Open service and provides the point of contact for all trouble ticket reports. The first-level support coverage is 24/7/365. Notifications are issued to the partner experiencing the incident within 15 minutes of incident detection by the central monitoring system.

Critical, service impacting incidents

Support availability	24 hours a day, 7 days per week
Interaction method	Email and telephone call
Time to raise ticket	15 minutes

The Time to Fix a Fault Objective applies only to incidents relating to a total loss of traffic for a service instance. Other service degradation will be investigated in-line with the non-critical incidents response level.

Non-critical incidents

This service level will apply in the event of an incident which does not result in a total loss of traffic for the service instance.

Support availability	08.00-18.00UK Local time
Interaction method	Email and telephone call
Time to raise ticket and begin investigation	15 minutes

Request Procedure, Service Implementation and Delivery Time

Service Implementation and Delivery Time

Service	Delivery time
GÉANT Open connection	5 working days from order acceptance (subject to hardware availability)
Connection to the GÉANT backbone (via GEANT Open)	5 working days from order acceptance
Moves, adds and changes to existing service	5 working days

Requesting connection to the GÉANT Open service

Interested connectors should address their request to connect to the GÉANT Open service to the DANTE Partner Relations team: partner-relations@geant.net

Eligibility and Connection Policies

Eligibility and connection policies are reported in the "GEANT Open Exchange Production Policy" document, available here: https://services.geant.net/plm/connectivity/geant-open/Shared%20Documents/GN3PLUS13-1439-12_geant_open_exchange_production_policy_v4_3.pdf

Pricing

GÉANT Open is provided only on a contractual basis arrangement between the DANTE and the customer. To connect, the organisation must:

- Finance their own way to the Open Exchange point.
- Pay an annual connection fee

The current annual connection fee is:

- €3,300 for 1Gb/s
- €10,500 for 10 Gb/s
- €36,000 for 100Gb/s

GÉANT Open Exchange Summary Table

Supported Nominal Data Rates	<ul style="list-style-type: none"> • 1Gbps • 10Gbps • Up to 100Gbps, where available
Protocols Supported	<ul style="list-style-type: none"> • Ethernet
Supported Client Interfaces	<ul style="list-style-type: none"> • 1GE • 10GE • 100GE
Optical Connectors	<ul style="list-style-type: none"> • 1000BASE-LX • 10GBASE-LR • 100GBASE-LR4
Service Options	<ul style="list-style-type: none"> • Connection to GÉANT Open • Connection to GEANT IP network (via GÉANT Open) • Onward Connection to remote termination point via GÉANT Plus services
Protection Options	<ul style="list-style-type: none"> • N/A
Guaranteed Latency	<ul style="list-style-type: none"> • N/A
Target Monthly Availability	<ul style="list-style-type: none"> • At least 99.4%
Target Service Restoration, PoP to PoP	<ul style="list-style-type: none"> • Time to respond to a fault: 15 minutes • Time to fix a fault: 5 hours (GÉANT PoPs in Europe)
Service Delivery Time	<ul style="list-style-type: none"> • 5 days if interface capacity exists • 10 weeks if upgrades to interface capacity required
Operations Centre Coverage	<ul style="list-style-type: none"> • 24/7/365