



GÉANT L3VPN Service Description

Multi-point, VPN services for NRENs

GÉANT L3VPN

Overview

The GÉANT L3VPN service offers the National Research and Education Networks (NRENs) the ability to profit from the network reach and versatility of the GÉANT network for multi-point to multi-point connections over great distances.

Many research projects require the additional security and reassurance of a Virtual Private Network (VPN) to ensure data services are isolated from general IP traffic. GÉANT L3VPN can provide privately routed networks over the existing GÉANT infrastructure from/to any connected locations in Europe, North America and China. This allows for a higher level of separation from the global IP routing information, when required. By creating a virtual IP network, all sites on the VPN can flexibly communicate without the need to set-up separate networks. These VPN sites will also benefit from the confidentiality and security of a private infrastructure.

L3VPN offers a cost-effective solution for teams requiring many-to-many site connectivity support where GÉANT Plus virtual circuits would be too complex to administer.

The service is delivered over the GÉANT IP network, and takes full advantage of the statistical multiplexing available at the IP layer. It is available for all NRENs and shares the NREN's existing IP capacity. The service is offered over a VLAN on the existing IP port. Per-VLAN rate limiting is available, if required, and should be specified at the time of the L3VPN request.

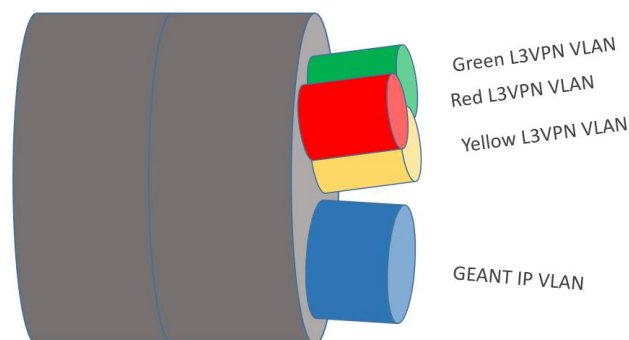


Figure 1: Representation of the VLANs within the physical access.

Robust: L3VPN services provide automated re-routing and recovery.

Flexible: Ideally suited for many-to-many connectivity requirements.

Capacity: Up to 100Gbps services are available.

Fast delivery: Only 5 days to deliver, no additional hardware requirements.

Extended footprint: Available to all GÉANT NRENs, allowing for connectivity to North America, China and more.

Cost effective: No additional cost to setup a multipoint-to-multipoint connection with the standard GÉANT L3VPN service subscription.

GÉANT L3VPN SERVICE DESCRIPTION

Technical Description of the Service

Infrastructure

The Multi-Protocol Label Switching (MPLS) Layer 3 VPNs use a peer-to-peer model that uses Border Gateway Protocol (BGP) to distribute VPN-related information:

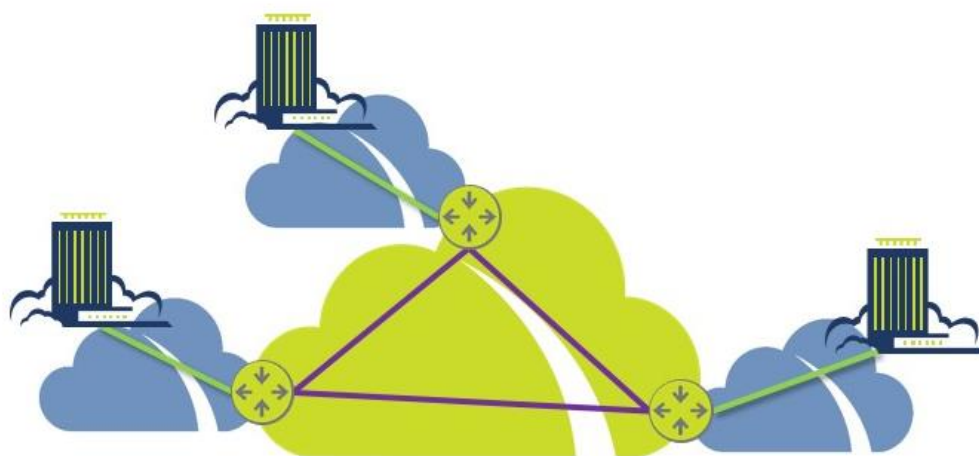


Figure 2: Virtual connection of the end users over an overlay network

This highly scalable, peer-to-peer model acts as a large-scale virtual router for the NRENs.

Each peer ("customer") network connecting to a Layer 3 VPN does so using a specific and dedicated VLAN. These VLANs are associated on the GÉANT ("provider") routers with a specific Virtual Routing and Forwarding (VRF) table. Multi-Protocol BGP (MP-BGP) is used between the provider routers to ensure that only this VRF is populated with routes advertised via the associated customer VLANs. Multi-Protocol Label Switching (MPLS) tunnels are used across the GÉANT backbone network to keep the traffic contained to that specific Layer 3 VPN.

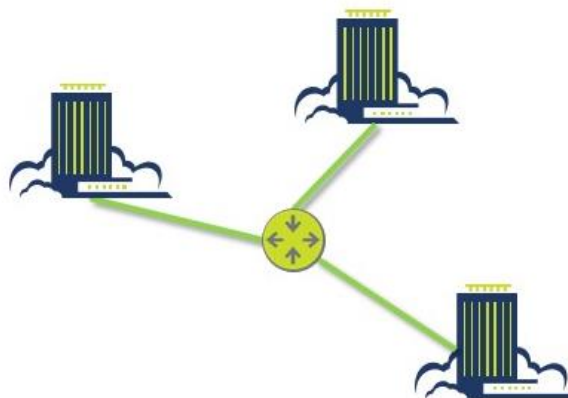


Figure 3: L3VPN logically represented by a router

Technical Parameters

This section highlights the parameters defining the standard service offered.

L3VPN interface connection

New L3VPNs are setup using a VLAN over the same interface supporting the NREN's IP subscription. If the L3VPN requires a new port, standard (one-off) port price will be charged.

L3VPN prefix limits

The number of dynamic routes that a customer is allowed to send into the GÉANT network per location, per VPN, is limited to 30. The maximum number of routes for any single Virtual Routing and Forwarding (VRF) table is 1000.

L3VPN limitation per interface

The IP capacity is limited by the NREN's IP subscription. The setup of up to 10 (ten) L3VPNs (on existing interfaces) is offered at no additional charge to the NRENs. Above that threshold, a €10k/year fee will be charged per NREN for every additional 10 VPNs configured on the NREN's access or part thereof.

L3VPN participant limit per instance

For L3VPN design involving more than 12 sites, or where the design involves connectors outside the GÉANT consortium (non-EU NRENs or organisations not connected to EU NRENs), a request for quote (RFQ) should be issued.

More information on the offered solutions can be found on the GÉANT Partner Portal:

<https://partner.geant.net/sites/Partner/SitePages/L3VPN.aspx>

Demarcation Point

A L3VPN is presented as a VLAN on an NREN's IP access interface. See the Service Description for 'GÉANT IP' for information on IP access interfaces.

Connections to Destinations Outside of Europe

Although the primary focus of the GÉANT L3VPN service is to offer European NRENs the ability to quickly and flexibly provision multi-point to multi-point connections, it is possible to extend this network reach even further. As the GÉANT L3VPN service leverages the IP infrastructure, NRENs connected to the GÉANT network can reach Internet2 and ESnet in the US, Canarie in Canada and Asia via the Orient+ link to Beijing.

The possibility of extending an NREN's global reach can be discussed on a case-by-case basis, as the remote end of the network needs to be able to accept circuits and enable BGP sessions. For further information, please contact the GÉANT Partner Relations Team: partner-relations@geant.org

Access to a Bespoke Solution

If the requirement for multi-point to multi-point connection does not fit the current description of the service, the GÉANT Partner Relations Team can be contacted to evaluate the feasibility of a bespoke implementation (partner-relations@geant.org). Such implementations may incur extra costs.

Service-Level Target

Availability Target

GÉANT L3VPN is delivered over the highly resilient IP network, and as such, offers extremely high availability:

The GÉANT L3VPN is considered unavailable when the point-to-point virtual connection is not able to transit traffic because of an outage on the GÉANT Backbone.

Time to Fix a Fault and Time to Respond Target

The targeted time to fix a fault on the network applies only to hardware issues in the GÉANT backbone.

The GÉANT OC provides 24×7 support throughout the year. Notifications are issued to the affected partner within 15 minutes of incident detection by a central network monitoring system.

Please refer the GÉANT Service Level Target documentation on the GÉANT Partner Portal for more information.

Request procedure, service implementation and delivery time

Requesting Additional GÉANT Access Capacity

The bandwidth capacity used by the L3VPN service is part of the involved NRENs GÉANT IP subscriptions. If more capacity is needed, NRENs only need to increase their subscriptions.

For any further details please contact the GÉANT Partner Relations Team: partner-relations@geant.org.

Service Implementation and Delivery Time

Please refer the GÉANT Service Level Target documentation on the GÉANT Partner Portal for more information.

Pricing

The GÉANT L3VPN Service is available for all GÉANT NRENs wishing to use it. It is included in the standard IP subscription, and the configuration of the VLANS supporting the different circuits is done when a new service is requested.

There are no additional cost for up to 10 L3VPN per NREN and up to 12 sites per VPN. If more L3VPNs are required or more sites per VPN additional costs apply.

For any information about bespoke solutions, including additional, dedicated interfaces and/or connectors outside the GÉANT network, please contact the GÉANT Partner Relations Team: partner-relations@geant.org

GÉANT L3VPN Summary Table

Supported Nominal Data Rates	<ul style="list-style-type: none"> • From 10Gbps to multiple 10Gbps (10Gbps increment) for all NRENs • Up to 100Gbps where available
Protocols Supported	<ul style="list-style-type: none"> • Ethernet IEEE 802.3-2005
Optical Connectors	<ul style="list-style-type: none"> • 1000BASE-LX • 10GBASE-LR • 100GBASE-LR4
Protection Options	<ul style="list-style-type: none"> • No client-side protection • Fully protected in the core (IP-based service)
Guaranteed Latency	<ul style="list-style-type: none"> • N/A
Supported Client Interfaces	<ul style="list-style-type: none"> • 100GE • 10GE
Operations Centre Coverage	<ul style="list-style-type: none"> • 24/7/365

Please refer the GÉANT Service Level Target documentation on the GÉANT Partner Portal for more information.