



GÉANT Lambda Service Description

**Dedicated full connectivity up to 100Gbps for
exceptionally demanding network requirements**

GÉANT Lambda

Overview

The GÉANT Lambda service provides dedicated, transparent 10Gbps, or 100Gbps connectivity between any two GÉANT PoPs on the dark fibre cloud (40Gbps circuits may be available on application). The service is of benefit to those users having extreme networking demands, for example large-scale research projects that need to transfer huge amounts of data between sites via a dedicated (guaranteed capacity), highly resilient and secure connection.

GÉANT Lambda services can be provided protected or unprotected. Protected Lambdas are available on request, and will be granted based on the availability of protected bandwidth.

GÉANT Lambda services can be connected to non-GÉANT organisations, including international destinations. Requests for those connections can only be fulfilled if GÉANT infrastructure exists to deliver the circuit to the proposed interconnection point. Circuits may be established to non-GÉANT destinations upon request.

Robust: Same award-winning levels of support and resilience offered by the GÉANT network.

High capacity: Up to 100Gbps services available.

Reliable: Resilience options offering up to 99.999% availability.

Flexible: End-to-end dedicated connections allow greater protocol flexibility.

Guaranteed capacity: Guarantees PoP-to-PoP bandwidth, capacity delivered over 10Gbps, 40Gbps or 100Gbps interfaces.

GÉANT Lambda Service Description

Technical Description of the Service

Infrastructure

The GÉANT Lambda service is delivered on the Infinera Intelligent Transport Network, featuring a DTN-X packet optical transport networking platform. The DTN-X platform provides transmission capacity using a 500Gbps super-channel based on FlexCoherent Photonic Integrated Circuits (PICs), built-in OTN (ITU G.709) which can be switched with granularity 1Gb/s, non-blocking OTN cross connect. This means that the 500Gbps line system is pre-provisioned to be 'always on' and available on demand to any client interfaces.

Service Options

The following options are available for the GÉANT Lambda service: Unprotected Lambda, SNCP Protection and Fully Protected (or "1+1")

- **Unprotected Lambda:** Provides no optical or route protection. The unprotected Lambda services provide no optical protection of the signal. If a card/optics failure or a fibre cut should occur along the optical signal paths, the circuit cannot reroute.
- **Circuit protection using GMPLS control plane:** this offers the added security of a second route without the complexity of a second circuit. This protection mode is implemented using the GMPLS control plane offered by the DTN-X. With this option enabled, GÉANT Lambda is able to reroute under 50ms in case a single circuit failure occurs. Protected Lambdas can be provided with auto-recovery, meaning the service is automatically switched back to the original circuit when restored, or with manual switching back to the original circuit by GÉANT at an agreed time.
- **Full Fibre and Optic Protection (1+1 protection):** The 'fully protected' option offers a complete backup path, including the client interfaces. This option offers two GÉANT Lambdas routed over different paths, leaving it up to the user to select which one to use. In full protection mode, path selection is left to the end user if two circuits are delivered. This offers complete control to the users.

Demarcation Point

The management demarcation point between GÉANT and the NREN is a port on the rack Optical Distribution Frame (ODF), as described in the figure below.

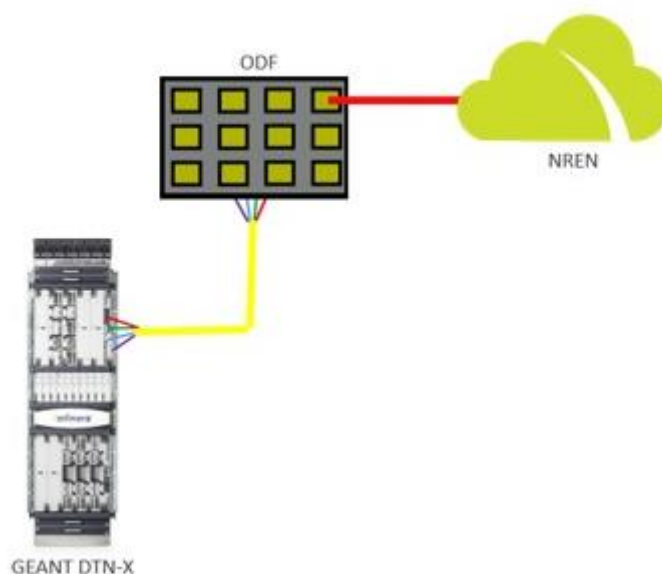


Figure 1: Illustration of the management demarcation point

The exact port will be specified at the time of the connection. The responsibility of GÉANT Operations ends at the declared demarcation point, patching beyond that point is the responsibility of the NREN requesting the service.

Lambdas to Destinations Outside of Europe

Direct Lambda connection from a GÉANT location (see Annex) to non-GÉANT organisations or destinations is possible. Any bespoke requirements will be evaluated by the GÉANT technical teams on a case-by-case basis to offer the best available solution.

The Service Level Agreement (SLA) outlined in this document is valid only between GÉANT PoPs, any bespoke solution will have a specific SLA based on the offered solution.

Please contact GÉANT Partner Relations for further information on available destinations: partner-relations@geant.org.

Service-Level Target

Availability Target

The unavailable time of GÉANT Lambda Service is calculated between any two GÉANT PoPs. The targets are calculated annually for complete loss of traffic on the GÉANT infrastructure (fibre cut), excluding planned maintenance.

For an unprotected Lambda, the availability target is 99.5% up to 1000km and then reduced by 0.5% for every 1000km.

Time to Restore Target

The Time to Restore (TTR) Target varies according to for the three levels of service in the GÉANT Lambda offering.

For full details of the Service Level Targets for GÉANT Lambda service please refer to the Service Level Target documentation on the GÉANT Partner Portal.

Request procedure, service implementation and delivery time

Requesting a GÉANT Lambda

To request a GÉANT Lambda service, please go to the Partner Portal and complete the request form at: <https://partner.geant.net/sites/Partner/SitePages/Service%20Request.aspx>

Requesting Additional GÉANT Lambda Capacity

In order for an NREN to increase its GÉANT Lambda capacity, please contact the GÉANT Partner Relations Team (partner-relations@geant.org) to discuss available options.

Service Implementation and Delivery Time

For full details of the Service Implementation and Delivery Time for GÉANT Lambda service please refer to the Service Level Target documentation on the GÉANT Partner Portal.

Pricing

Lambdas are individually priced on request to ensure they are competitive with current market rates. Please contact the GÉANT Partner Relations Team: partner-relations@geant.org, with details of your requirements for a quotation.

More details on the calculation of GÉANT Lambda prices are available on the Partner Portal at <https://partner.geant.net/sites/Partner/SitePages/geant%20Lambda.aspx>

GÉANT Lambda Summary Table

Supported Nominal Data Rates	<ul style="list-style-type: none">• 10GE• 100GE
Supported Client Interfaces	<ul style="list-style-type: none">• 100 GE:<ul style="list-style-type: none">○ LR4○ LX10• 10 GE (WAN-PHY / LAN-PHY):<ul style="list-style-type: none">○ SR1 – 1310nm○ IR2 – 1550nm• Optic type for 40GE may be available upon request
Optical Connectors	<ul style="list-style-type: none">• SC/PC (to GÉANT ODF)
Protocols Supported	<ul style="list-style-type: none">• Ethernet• OTUx to OTUx (if required)
Service Options	<ul style="list-style-type: none">• Unprotected• GMPLS• Fully Protected (1+1)
Operations Centre Coverage	<ul style="list-style-type: none">• 24/7/365

Annex

The following PoPs on the GÉANT dark fibre support GÉANT Lambda services:

Amsterdam	VANCIS B.V. RmS145 1st Floor Science Park 121 Amsterdam 1098 XG Netherlands
Bratislava	SITEL PoP2 Sitel Kopčianska ul. 20c Bratislava 85101 Slovakia
Brussels	Level 3 Avenue Leon Grosjean 2 Evere, Brussels 1140 Belgium
Budapest	NIIF NIIF Institute 18–22 Victor Hugo Street Grn Floor NIFF Computer Rm Budapest 1132 Hungary
Frankfurt	InterXion Weismüllerstrasse 21-23 BUILDING FRA3 1st Floor Rm 2-1C Frankfurt 60314 Germany
Geneva	CERN IT-CS Building 513 385 route de Meyrin Geneva 23 1211 Switzerland
Ljubljana	ARNES Jamova 39 Ljubljana 1000 Slovenia
London	Telecity 8–9 Harbour Exchange London E14 9GE UK
Madrid	TELVENT Edificio Telvent Valgrande, 6 Poligono Industrial de Alcobendas 28108 Alcobendas Madrid

	Spain
Milan	MIX s.r.l. Via Caldera 21 D/3 Milan 20153 Italy
Paris	InterXion 45 Ave Victor Hugo Batiment 260 Aubervilliers Paris 93534 France
Prague	CESNET Zikova 1905/4 PRAHA 6 Prague 160 00 Czech Republic
Vienna	InerXtion Louis-Häfliger-Gasse 10, Vienna 1210 Austria
Zagreb	SRCE Josipa Marohnića 5 Zagreb 10000 Croatia