



Service Description

Carrier MPLS VPN



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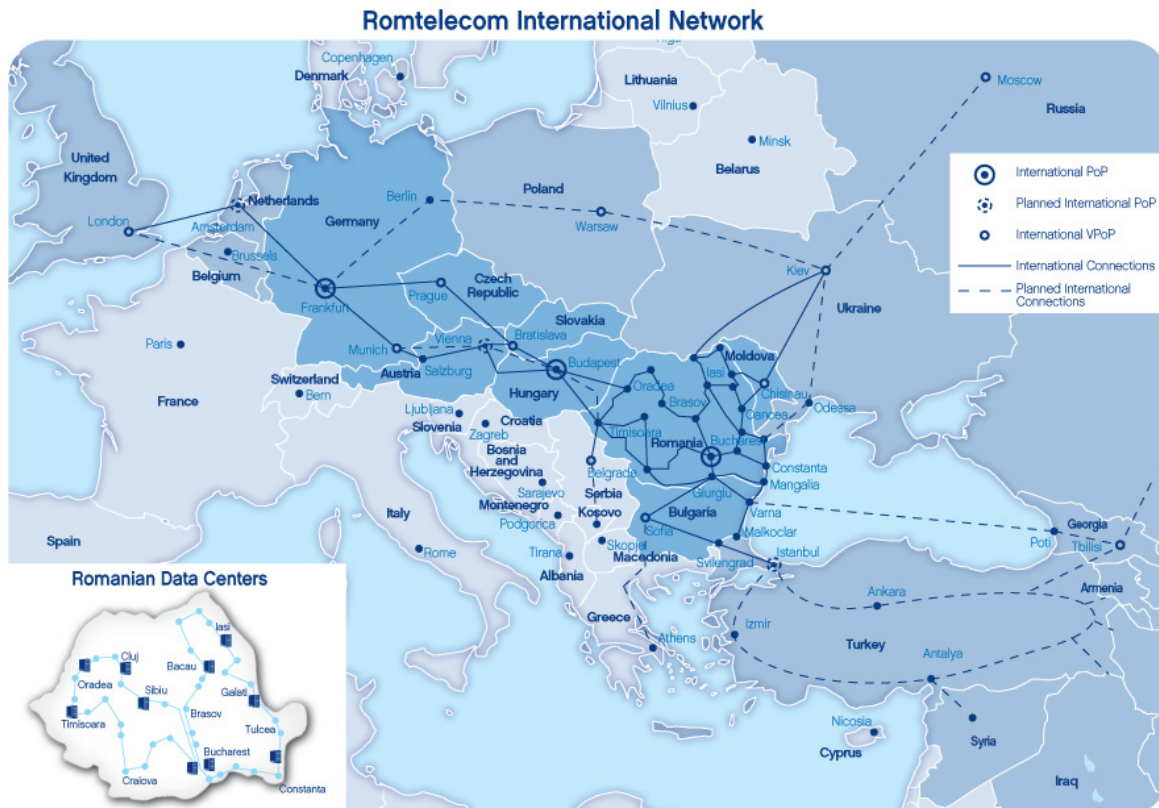
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Romtelecom Carrier Services

Romtelecom Carrier Services is the division dedicated to telecom operators and wholesale customers in Romania and abroad, offering a complex portfolio of data, internet, infrastructure, voice transit and termination. Acting on the local and regional market, with an extensive network, interconnections, and strategic partnerships with renowned global operators, Romtelecom is a reliable partner in Central and Eastern Europe.



Carrier MPLS VPN – service description

The International MPLS IP-VPN service provides a full range of VPN connectivity solutions, including:

- **Carrier MPLS IP VPN:** dedicated to operators looking for off-net 'B' end VPN services. The service provides carrier-grade solutions designed to fit carriers' network requirements. Through Romtelecom MPLS IP VPN, the carriers can rapidly increase their service portfolio with extensive connectivity solutions beyond their network boundaries. Next to the basic features, a number of supplementary features enhance the customer benefits with integrated Internet access, back-up solutions, and CPE packages.
- **Customer MPLS IP VPN:** dedicated to Romtelecom's 'A' end customers looking for global VPN services. Implemented over Romtelecom's MPLS network, enabled with state of the art technology, high resilience, enhanced customer care services, European comprehensive footprint and interconnections with a key selection of global partners, the service provides worldwide coverage, offering consistent features on a global basis.



Benefits:

Carrier MPLS VPN provides a high degree of flexibility and scalability, being designed to support full meshed or hub-and-spoke customer configuration, offering the benefit of total control and flexibility for the traffic CoS.

- **Simplified Accounting:** one stop shopping solution for worldwide communication needs, enabling the customer to save the hassle of dealing with different service providers in different countries;
- **Flexibility:** the service is specially designed to tailor various requirements, easily allowing deployment of different network topologies, increasing capacities, adding new locations, new applications, choosing among different levels of service management;
- **Transparency:** the service offers the same features worldwide, with no manipulations of customer CoS, enabling seamless integration with customer intranets;
- **High Efficiency:** through the dynamic bandwidth allocation feature, the customer can maximize the use of the service, allowing higher bandwidth consuming applications additional throughput to the bandwidth contracted, when other applications consume less and the overall transmitting capacity is below the service bandwidth value;
- **Reliability:** the service is built on a redundant and fault tolerant backbone based on Cisco carrier class routers, designed for congestion avoidance and backed by industry leading SLAs. The network security architecture is built on multiple layers to provide maximum protection, while the network survivability derives from MPLS fully meshed nature;
- **Security:** the MPLS Switching VPNs technology offers the same level of security as connection-oriented VPNs. Packets from one VPN will not inadvertently go to another VPN;
- **Strong SLAs for QoS:** two service levels, Standard or Premium, tailored to different customers' needs.

Carrier MPLS VPN features

The Carrier MPLS VPN service provides connectivity between the interconnection point implemented with the partner and the sites of the partner's customers or directly between two customers' sites, presenting a MPLS service interface in all access points to the Romtelecom network.

Available bandwidths:

Romania, All Locations	VPN Hub & Spoke	Spoke	256 / 512 kbps
			1 Mbps
			2/4/5/6/8 Mbps
			10/ 50 Mbps, granularity 10 Mbps
			100 Mbps
			200 Mbps
	VPN Any2Any	Any	10/ 100/ 1000 Mbps
			256 / 512 kbps
			1 Mbps
			2/4/5/6/8 Mbps
			10/ 50 Mbps, granularity 10 Mbps
			100 Mbps
			200 Mbps

Other tailor-made solutions might be available upon request, subject to a feasibility study.



Access Methods:

- Access over copper: g.SHDSL, Leased Lines (HDSL or ISDN), NewBridge
- Access over FO: Ethernet

Service topology:

- VPN Any2Any - each location communicates with any other location directly
- VPN Hub & Spoke - all locations communicate only with/via the Headquarter (HQ)

Service management:

- Service Managed, CPE Management included
- Service Unmanaged, CPE Management excluded

Service coverage:

- Romania: all over, within MAN, WAN
- Internationally: Moldova, Ukraine, Serbia, Bulgaria

Quality of Service (QoS): 4 tiered CoS and QoS performance levels, as follows:

- Real Time: real time applications, sensitive to jitter, highly interactive (e.g. VoIP, videoconference)
- Mission-Critical: business critical applications – transactional information, highly interactive, highly sensitive to delay (e.g. signaling, banking application)
- Standard: standard business applications (e.g. short transactions, SAP, ERP, Oracle, video streaming, network services requesting guaranteed bandwidth)
- Best Effort: E-mail, Intranet, Internet, other applications that can accommodate variable throughput delay

Bandwidth allocation (bursting rules): for each service class different bursting rules are applicable:

- For Mission-Critical, Standard and Best effort traffic classes bursting is allowed if available, up to 100% of the port contracted bandwidth
- No burst is allowed for Real Time service

Service Level Agreement (SLA)

- Standard
- Premium

Reporting:

- available online, via website for managed services and provides historical and real-time bandwidth reports

Carrier MPLS VPN supplementary services**CPE Rental**

- Provision of a CPE compliant to the service features
- CPE installation and initial configuration
- Repairs and replacements, as necessary to deliver the contracted service
- CPE recovering at service termination date

CPE Management

- Fault Management
- Administration
- Security Management

Internet Access

Permanent Internet access over the same Access Line used for VPN locations connection.



The Internet Access service is available:

- At the HQ location (Hub& Spoke configuration)
- Distributed throughout VPN

Internet Access can also be delivered over a separate Access Link.

Allocation of IP addresses from Romtelecom classes:

Allocation of public IP addresses from Romtelecom classes - 8/16/32/64/128/256 IP addresses - available only bundled with the Internet Access service.

NAT – IP addresses translation

This supplementary service is available only bundled with Internet Access service and consists in the translation of customer private IP addresses to one or more public IP addresses from Romtelecom classes.

Carrier MPLS VPN service components

Service Components	Description
Interfaces	
UNI (User Network Interface)	The service control interface between the end customer's network and Romtelecom's network.
NNI (Network to Network Interface)	Network-to-Network Interconnect (NNI) – point of interconnection between partner's network and Romtelecom's network.
CPE	
CPE xDSL UNI	CPE using DSL access technology: SHDSL/ ADSL, VDSL 2+
CPE Ethernet UNI	Router using access technology - either over Copper line – EFM or over the FO line.
NTU	Equipment exclusively owned and managed by Romtelecom, standing for technological termination of the Access Line. The NTU is connected to CPE by means of the UNI. In case the CPE is owned and managed by Romtelecom the NTU play the role of CPE too.
Access Line	Dedicated, permanent, point-to-point connection over different access technologies available in Romtelecom network. It connects the CPE to the closest Romtelecom PoP.
Cu Access Line	A point-to-point connection provided over Copper between CPE/ NTU access interface and the network interface located at DSLAM/ Switch level, using the DSL/ ETH technology. Supports bandwidths up to 20 Mbps
FO Access Line	A point-to-point connection provided over FO, between the CPE / NTU and the network interface, using the Ethernet technology. Supports bandwidths higher than 2 Mbps, up to 1 Gbps.
Transport service	
ToS	Type of Service Transparency
Quality of Service	4 CoS are available for Carrier MPLS VPN.

