

SERVICE DESCRIPTION FOR EQUANT IP VPN SERVICE

- 1 **GENERAL SERVICE DESCRIPTION.** Equant IP VPN is a managed network service that provides secure IP internetworking, which enables connectivity between many Customer routers in an “any-to-any” environment using IP switching. The IP VPN architecture is comprised of Customer Edge (“CE”), Provider Edge (“PE”), and Provider (“P”) routers. The CE Router, installed at the Customer Location, connects to the PE router through an access medium that is fully transparent to the Service. Each router is equipped with one or more LAN interface types that connect the Customer’s LAN to the Equant IP VPN network. As further explained below, Customer can elect to receive an IP VPN Service where it provides, manages and maintains the CE routers or where Equant provides, manages and maintains such CE routers.
- The standard topology for the IP VPN network is the “any-to-any” connection, which allows any Customer router within the VPN to communicate with any other Customer routers in the same VPN. Unless otherwise specified and configured, the IP VPN network does not allow Customer routers in different VPNs to communicate with one another.
- 2 **STANDARD SERVICE ELEMENTS.** The Equant IP VPN Service standard elements consist of the following:
- Bandwidth for each Customer Location;
 - Location-specific service and traffic management through Classes Of Service mechanisms (“COS”), enabling prioritization of Customer applications with one level of priority for voice traffic, one level of priority for video and three levels of priority for data traffic according to the selected service type for each access;
 - Service Levels depending on the Service Type selected by Customer; SLA commitments are detailed in the Service Level Agreement for IP VPN Service.
 - Secured VPN is provided through Multi Protocol Label Switching (“MPLS”) technology;
 - Access leased line including its provisioning and monitoring;
 - Regular reporting on the VPN performance (Quality of Service indicators); and
 - Network Management and Fault management for all Service elements, which can be provided on a 7x24x365 basis depending on the scope of Fault management that Customer subscribes from Equant and the distance of Customer’s Locations from Equant’s service centers.
- 3 **IP PLUG.** Dedicated access to the IP VPN is supplied through a Tail Circuit provided by Equant, and in which the requested IP bandwidth is configured for Customer based upon the Location requirements. The dedicated access is defined by:
- (a) **The Tail Circuit Bandwidth.** Tail Circuit or (physical access) bandwidth depends on the bandwidth availability in each country where the Location is situated. Tail Circuit bandwidth should reflect the mid to long-term bandwidth needs of the Location;
 - (b) **The IP Bandwidth.** A subdivision of the Tail Circuit bandwidth, the IP bandwidth represents the short-term bandwidth needs of the Location. This pure logical parameter is fully flexible and enables Equant to upgrade the IP bandwidth upon Customer’s request. The IP bandwidth parameter is limited to the bandwidth of the Tail Circuit.
 - (c) **The Service Type.** IP VPN Service is categorized according to Silver, Silver Lite, Gold, Gold Lite, Platinum, flexible-Gold, or flexible-Platinum Service Types. These Service Types determine the behavior of Customer’s access to, and management of its application traffic. Each Service Type is more fully described in Clause 6 (*IP VPN Service Types*) below.
 - (d) **The Location Profile.** By default each Location is allowed to communicate with any other Customer international Location. In certain countries, Customer can select a specific domestic Location profile that limits the communication of such Location to other Customer Locations that are located in the same country.
- 4 **ROUTER MANAGEMENT FEATURE.** As a mandatory component of the IP VPN Service, Equant will manage the Provider Edge and Provider routers. In addition, the following is applicable depending on the IP VPN Service Type that Customer selects to subscribe from Equant:
- (a) **Equant-Managed CE Router.** In an Equant-managed CE router, Equant will provide all CE router hardware and software, as well as all hardware and software maintenance, including all required IOS upgrades.
 - (b) **Customer-Managed CE Router.** In a Customer-managed router, Customer will supply, manage and maintain all CE routers, unless otherwise agreed in writing by both Parties.
- 5 **EQUANT IP VPN SECURITY.** The following is a summary of the security aspects of the IP VPN Service and how they are managed within the scope of the Service:
- **Physical Security.** P and PE routers, which are sensitive for the integrity of MPLS-VPN logical security, are located and physically protected in Equant premises.
 - **Connection to Network Devices.** Telnet or SNMP access to network devices is restricted to a defined set of management stations located in a protected administration area. In addition, both SNMP and Telnet sessions are controlled by passwords.
 - **Separate Routing Tables per VPN.** The PE router holds one VPN Routing Forwarding table (“VRF”) per customer. Each PE-CE sub-interface is assigned to a VRF by the PE configuration, and each VRF contains only the routes of Customer VPN. Each VPN is assigned to a

unique identifier (i.e., BGP Route target attribute), which is used by the network to route and to separately filter the individual customer's traffic.

- **CE routers.** The CE routers do not hold the VPN definition logically defined on the PE router, which is physically protected in the Equant premises. Therefore, if CE router configuration is compromised, the MPLS-VPN logical security features are not compromised.
- **Customer Security.** The MPLS-VPN provides some security protection and VPN isolation in the frame of this Service. Subject to additional charge, Customer may enhance the security feature using other Equant security services (e.g., firewall, IPSec.) to protect the IP VPN network against internal attacks.

6 IP VPN SERVICE TYPES

6.1 **Service Types, Generally.** Customer may designate the IP VPN Service at each Location as Silver, Silver Lite, Gold, Gold Lite, or Platinum service type (collectively, "Service Types"). These Service Types enable Customer to purchase IP VPN Service that is most appropriate for a Location's traffic needs, end users, and applications. The main criteria that Customer must consider when selecting a Service Type for each Location are as follows:

- (a) **End-to-End IP SLA Requirements:** Whether Customer needs end-to-end IP performance SLAs for traffic sent / received by the Location;
- (b) **Application Awareness:** Whether Customer requires traffic prioritization for designated applications at that Location;
- (c) **Complexity of the Solution:** Whether Customer needs a multi-protocol encapsulation solution rather than pure IP service for the Location;
- (d) **Multimedia Integration:** Whether Customer needs voice or video combined with data on a single IP plug at that Location; and
- (e) **Router Management.** Whether Customer will provide, manage and maintain the CE routers or requires Equant to provide, manage and maintain such CE routers.

The table below summarizes the main differentiators of the five Service Types.

	SILVER	SILVER LITE	GOLD	GOLD LITE	PLATINUM
Any-to-Any IP Plug	Yes	Yes	Yes	Yes	Yes
Design and Configuration of Customer's IP VPN Service	Yes	No	Yes	No	Yes
Management, Provisioning, Configuration and Maintenance of Customer-Edge Routers	Yes	No	Yes	No	Yes
End-to-End IP SLA	No	No	Yes	No	Yes
PE-to-PE IP SLA	No	Yes	No	Yes	No
Application Awareness	No	No	Yes	Yes	Yes
Multi-Protocol Integration	No (IP only)	No (IP only)	Yes	Yes	Yes
Multimedia Integration	No	No	No	No	Yes
Value Added Options	No	No	Yes	Yes	Yes

6.2 **Silver.** The Silver Service Type is the basic Service Type for the Equant IP VPN Service. The Silver Service Type allows Customer to start with the IP VPN solution to obtain an "any-to-any" IP VPN Plug for Locations that require IP-only service. Silver Service Type does not provide multi-protocol encapsulation or application prioritization.

6.3 **Gold.** The Gold Service Type allows Customer to manage application traffic by using CoS management standard profiles that allocate and distribute bandwidth in case of traffic congestion and, it provides multi-protocol management. Customer can classify each of its data applications into one of three categories of priority, each of which is directly linked to one of three different CoS.

6.4 **Platinum.** In addition to the multi-protocol management and data application traffic management, the Platinum Service Type provides two additional Classes of Service options, thereby providing Customer with a total of five- (5) IP VPN CoS. This enables Customer to give priority for either voice traffic or video traffic, or for both traffics.

6.5 **Silver Lite Service Type.** Under Silver Lite Service Type, Customer will provide, manage and maintain the CE routers. The Silver Lite Service Type also allows Customer to start with the IP VPN solution to obtain an "any-to-any" IP VPN Plug for Locations that require IP-only service. Silver Lite Service Type does not provide multi-protocol encapsulation or application prioritization. Equant will provide configuration and design guidelines for the CE routers and for Customer's IP VPN network but Customer is solely responsible for implementing and executing such guidelines. In addition, Customer must follow the router type and IOS guidelines provided by Equant.

- 6.6 **Gold Lite Service Type. Gold Lite Service Type.** Under Gold Lite Service Type, Customer will provide, manage and maintain the CE routers. Equant will provide configuration and design guidelines for the CE routers and for Customer's IP VPN network but Customer is solely responsible for implementing and executing such guidelines. In addition, Customer must follow the router type and IOS guidelines provided by Equant. The Gold Lite Service Type allows Customer to manage application traffic by using CoS management standard profiles that allocate and distribute bandwidth in case of traffic congestion and, it provides multi-protocol management. Customer can classify each of its data applications into one of three categories of priority, each of which is directly linked to one of three different CoS.
- 6.7 **Flexible Options for Gold and Platinum Service Types.** If Customer requires greater control over the bandwidth management, then Equant can provide "flexible options" for Gold and Platinum Service Types. The flexible options allow customization of the bandwidth for each CoS and traffic prioritizations. Prior to implementing Gold or Platinum flexible options, Equant must perform an Application Performance Analysis to define the Classes of Service profiles. These flexible options are available through Equant's Enterprise Network Management Service, which Customer must purchase separately from the IP VPN Service.

7 CLASSES OF SERVICE

- 7.1 **Classes of Service, Generally.** The main objective of IP Classes of Service is to implement a traffic management approach that includes application awareness so that traffic congestions are addressed as they occur. Equant offers five Classes Of Service, and whereby three Classes of Service are dedicated to data traffic with bandwidth allocation and prioritization principles, one Class of Service is dedicated to video traffic with specific video performance considerations., and one Class of Service is dedicated to voice traffic with real-time traffic management considerations.

The three Classes of Service for data traffic as well as the Class of Service dedicated to video employ bandwidth management and prioritization mechanisms, which assign a "relative weight" for the fair share of bandwidth between the four CoS when congestion occurs on Customer access. This mechanism enables congestion avoidance by proactively detecting over-capacity needs, and provides congestion management if this capacity needs exceed all of the "buffer" capacity of the installed router and access.

The CoS are categorized as follows:

(a) **Data Classes of Service**

- **Data 1 (D1):** The D1 class has the highest priority for data traffic and benefits from the highest allocated bandwidth for data traffic in case of congestion. Customer uses this class for its most important applications that need the highest level of service regarding performances and availability of the bandwidth.
- **Data 2 (D2):** The D2 class has an intermediate level of priority. This class is used for 'standard business' application traffic, which requires a high level of performance and service reliability.
- **Data 3 (D3):** The D3 class has the lowest priority. It is used by Customer to manage all other applications that are not critical for its business. This class benefits from the same level of service as the other data Classes of Service; however, D3 traffic slows down in case of access congestion in order to provide the other two data CoS the maximum available bandwidth and greater priority.

Each data Class of Service is allowed to use all the available IP bandwidth on the access up to 100% of the configured IP bandwidth.

- (b) **RT-Vi (Video Class).** The RT-Vi class employs class-based weight, fair queuing mechanisms, and it benefits from guaranteed bandwidth in case of congestion. Customer uses this class for videoconferencing applications transport that requires performance and availability of the bandwidth. All traffic exceeding the allocated bandwidth, as determined by the speed and number of simultaneous video sessions to be supported, is discarded in order to protect Data Classes of Service.
- (c) **RT-Vo (Voice Class).** The RT-Vo uses a "real time" priority mechanism to manage voice traffic over an IP network. This mechanism allows Equant to provide specific performances parameters and associated SLA on jitter, which is the main quality indicator for voice services.

The Voice CoS has priority over the three Data CoS, but is limited to a maximum bandwidth, which is defined by the number of configured voice channels (as determined by Customer's choice) multiplied by the numbers of kbps per channels (*i.e.*, 11 kbps to 21 kbps depending on the level of voice compression). The maximum bandwidth for Voice CoS is limited in any case to 75% of the IP bandwidth.

7.2 Class of Service Limitations.

(a) The following table provides a summary of the bandwidth allocations for each Class of Service:

	IP BANDWIDTH	RT Vi/Vo	D1	D2	D3
SILVER and SILVER LITE	64Kbps — 155Mbps	N/A	N/A	100% of IP bandwidth	N/A
GOLD and GOLD LITE	64Kbps — 155Mbps	N/A	60% of IP bandwidth	30% of IP bandwidth	10% of IP bandwidth
		N/A	66% of IP bandwidth	33% of IP bandwidth	N/A
		N/A	N/A	100% of IP bandwidth	N/A
PLATINUM	128Kbps — 155Mbps	Max 75%	60% of (IP bandwidth minus RT bandwidth)	30% of (IP bandwidth minus RT bandwidth)	10% of (IP bandwidth minus RT bandwidth)
		Max 75%	66% of (IP bandwidth minus RT bandwidth)	33% of (IP bandwidth minus RT bandwidth)	N/A
		Max 75%	N/A	100% of (IP bandwidth minus RT bandwidth)	N/A

(b) Silver Lite, Gold Lite, Gold and Platinum Service Types are not supported when using satellite and DSL unless indicated otherwise.

(c) The following limitations apply for Silver, Gold, Platinum Service Types and the Gold and Platinum flexible options:

- Minimum bandwidth for D1: 16 Kbps
- Minimum bandwidth for D2: 12 Kbps

8 **APPLICATION CLASSIFICATION RULES.** After selecting the Service Types for each Location, Customer must define a set of classification rules for its applications. While these rules must be defined at the start of the network planning, with the assistance of an Equant Professional Services Consultant, they can be modified during the life cycle of the network.

8.1 **From the CE to the Backbone.** Equant (in cases where it provides managed router service) or Customer (in cases where it manages the CE router) will configure Customer's application classification rules that define how the CE router manages the application traffic classification (*i.e.*, prioritization) for the outgoing traffic. Applications are affected to the corresponding Class of Service (data or voice).

Customer must focus on the main applications with high level of awareness. The other applications will be automatically classified in the "by default" Class of Service configured on the access.

8.2 **From the Network to the CE.** In this direction, the network takes precedence over the sender Location (using CoS) and automatically classifies the received data in the same Class of Service. If the CoS used is not configured on the access, then the received traffic is classified as "unknown type of traffic" and put in the "by default" Class of Service configured on the access.

The per-CoS traffic assignment rules correspond to how traffic flow is mapped to a class of service, and is similar to specifying an access control list. If any incoming traffic is received that does not match any of the provided rules, then this traffic is sent into the lower level class (might be D2 or D3).

8.3 **Application Performance Analysis for the FLEXIBLE Options.** If Customer selects the flexible options for Gold or Platinum Service Types, then it is mandatory for Customer to also purchase Equant's Application Performance Analysis Service. Upon Customer's request, Equant will provide Customer with a description of the Application Performance Analysis.

9 **SERVICE MANAGEMENT AND FAULT SUPPORT**

- 9.1 **Service Management.** Service Management is a set of tools and services that provide Customer with operational support.
- For all Service Types except Silver Lite Service Type, it is mandatory for Customer to subscribe to Equant's Extended Service Management. Extended Service Management is described in a separate Service Description.
 - For Silver Lite and Gold Lite Service Types, Equant's Standard Service Management is mandatory for IP VPN Service. Standard Service Management is described in a separate Service Description.
- 9.2 **Fault Management.** Unless indicated otherwise in an Order or in a Charges Schedule, Equant will provide Customer with Standard Fault Management. Standard Fault Management is described in a separate Service Description.

- 10 **DYNAMIC ROUTE LIMITATION.** The total number of dynamic routes (*i.e.*, the paths to another network dynamically learned by the routers rather than configured into a router's profile) that Customer is allowed to send into the Equant Network per Location and per VPN is limited as follows:
- The number of dynamic routes that a *single CE router* (whether Customer-managed CE router or Equant-managed CE router) is allowed to send cannot exceed 100 prefixes; and
 - The total number of dynamic routes that Customer's IP VPN (*i.e.*, the sum of prefixes that all CE routers send) is allowed to send cannot exceed the lesser of (i) 1,000 prefixes, or (ii) 30 times the number of Locations connected to the IP VPN.

- 11 **Acceptance Test.** The Acceptance Tests for voice, data and video are independent from each other. An Acceptance Test is considered successful if Equant is able to establish Internet Protocol connectivity between a CE router at the new Location and a CE router at any other Location within the same IP VPN community.



END OF SERVICE DESCRIPTION FOR IP VPN SERVICE