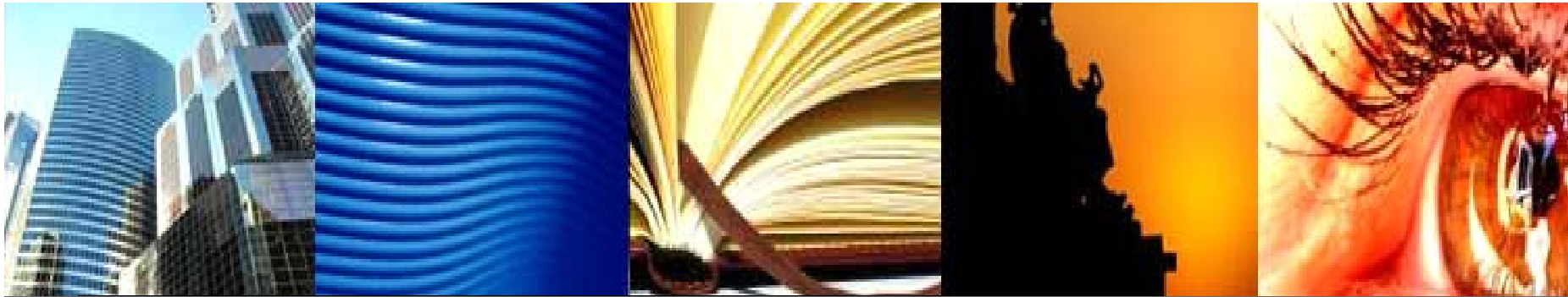


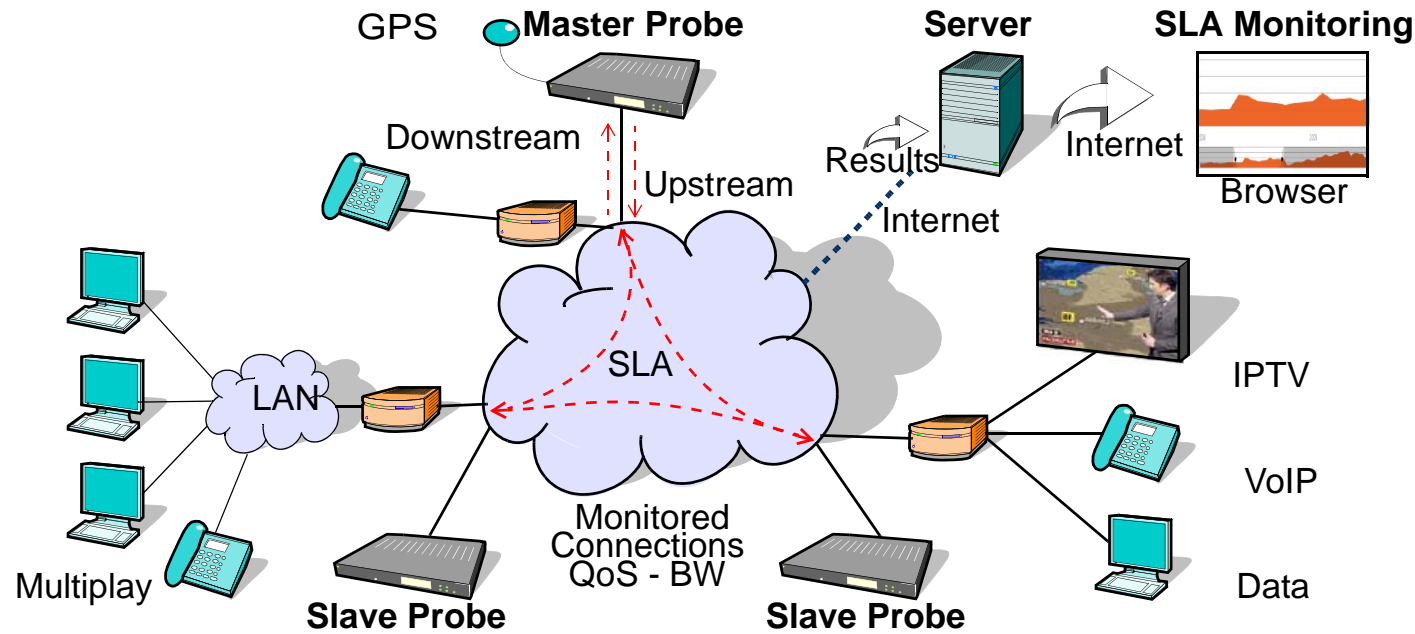
Net.Audit **SLA** & **QoS** monitoring



On line demo: www.telecom.albedo.biz/slavas

user: demo
pass: odebla





- In case of breaking the SLA, the customer may require the operator for compensation under the terms agreed in the contract.
- Service SLA verification and auditing of Albedo Telecom contract guarantees that the SLA is met 24 hours a day, 365 days a year.
- This service is based on a distributed measurement system that continuously monitors the quality. This allows a precise diagnosis of the cause of any detected degradation.



	Network Class (ITU-T rec. Y.1541)							
	0	1	2	3	4	5	6	7
IPTD	100 ms	400 ms	100 ms	400 ms	1 s	U	100 ms	400 ms
IPDV	50 ms	50 ms	U	U	U	U	50 ms	
IPLR	1x10E-3					U	1x10E-5	
IPER	1x10E-4					U	1x10E-6	
IPRR	Undefined						1x10E-6	





IPTD: IP Packet Transfer Delay, **IPDV:** IP Packet Delay Variation,
IPLR: IP Packet Loss Ratio, **IPER:** IP Packet Error Ratio
IPRR: IP Packet Recording Ratio

- The provider and their customers can fix the limits of quality they want, but ITU-T gives general rules.
- The ITU-T Y.1541 is equivalent to the old rules for TDM (G.821, G.826, M.2100) but unified IP network.
- The rules for TDM-based quality objectives defined in a single event: The bit error.
- The latency Y.1541 incorporates the objectives through new parameters: IPTD, IPDV, IPRR.
- The way that counted bit errors also changes (IPER) and now also includes the possibility of losing data (IPLR).

Class	Applications (examples)	Node Mechanisms	Network Techniques
0	Real-time, Jitter sensitive, high interaction (VoIP, VTC)	Separate queue with preferential servicing, traffic grooming	Constrained routing and distance
1	Real-time, jitter sensitive, interactive (VoIP, VTC)		Less constrained routing and distances
2	Transaction data, highly interactive (Signalling)	Separate queue, drop priority	Constrained routing and distance
3	Transaction data, interactive		Less constrained routing and distances
4	Low loss only(short transactions, bulk data, video streaming)	Long queue, drop priority	Any route/path
5	Traditional applications of default IP networks	Separate queue (lowest priority)	Any route/path
6	Real-time, Jitter sensitive, high interaction, high quality (IPTV)		Constrained routing and distance
7	Real-time, jitter sensitive, interactive , high quality (IPTV)		Less constrained routing and distances



















- **Class 0:** Real-time, jitter sensitive, highly interactive. i.e. PSTN-quality VoIP
- **Class 1:** Real-time, jitter sensitive, interactive. i.e. ISDN-quality VoIP
- **Class 2:** Transaction data, highly interactive. i.e. Signalling
- **Class 3:** Transaction data, interactive. i.e. Business Data, Internet access
- **Class 4:** Low loss only
- **Class 5:** Traditional applications of default IP networks. i.e. file transfer, back-up, P2P applications
- **Class 6:** High rate streaming, jitter sensitive, low loss, low error, highly interactive. i.e. IPTV conference
- **Class 7:** High bit rate streaming video, jitter sensitive, low error, interactive. i.e. Video on Demand.

SLA Monitoring: Configuration (viewer mode)

Probe	Enabled	Period	Tests	Status	Sync Source	Traffic Load
 atsl01	Yes	Month	4	Sync	-	details
 demo01	Yes	Day	3	Sync	-	details
 demo02	Yes	Day	2	Sync	-	details
 demo04	Yes	Week	2	Sync	-	details

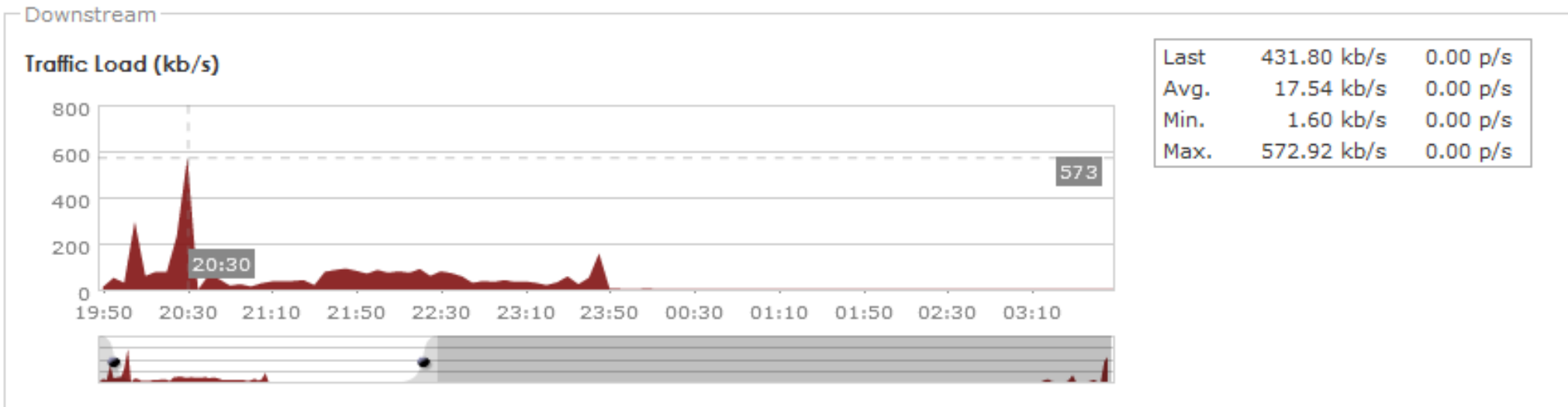
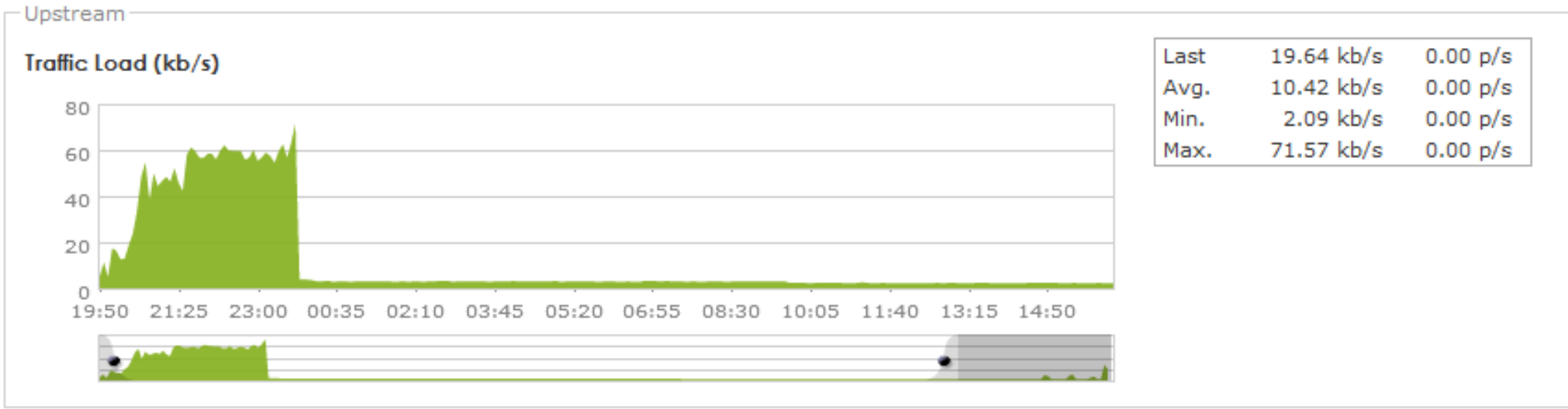
- **Probe:** Name that identifies each monitoring AT.1541 probe.
- **Enabled:** Tells results for the monitored link are available. Disabled probes cannot display results.
- **Period:** Time interval or scale used to represented the results graphically.
- **Tests:** Number of measurements that are being carried out by this probe as master and slave mode.
- **Status:** Indicates the current situation of the probe.
- **Sync Source:** Synchronization used that determines the accuracy of the Measurement
- **Traffic Load:** Upstream and downstream occupancy of the of the monitored channel at the port where the probe is connected.

SLA Reports: Global Report

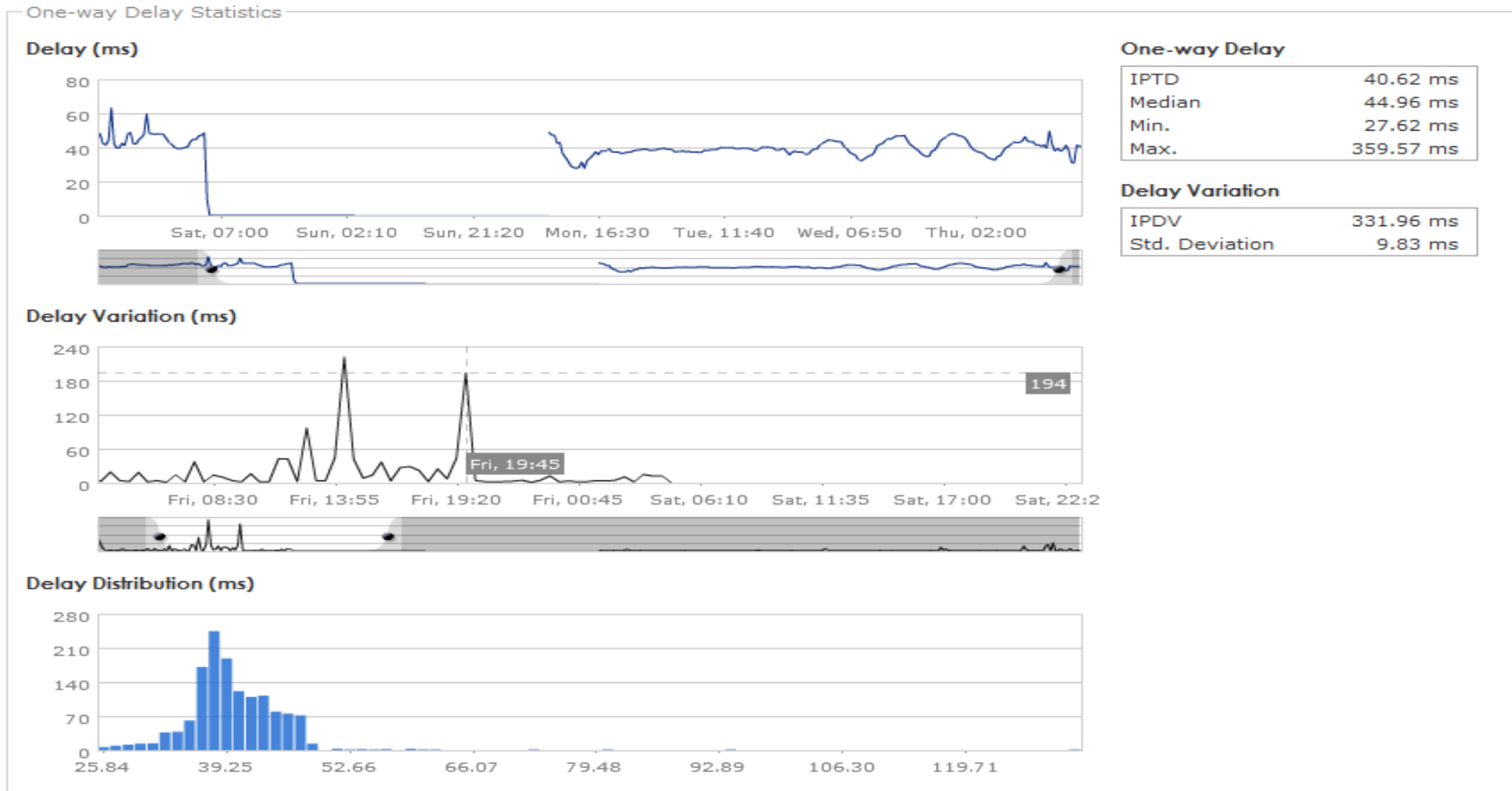
Master	Slave	Period	Connected	Upstream	Downstream	SLA
 atsl01	demo01	Week	Yes	class 2	class 2	
 demo01	demo04	Day	Yes	class 2	class 2	
 demo01	demo02	Day	Yes	class 2	class 2	
 demo02	atsl01	Week	Yes	class 6	class 6	
 demo04	atsl01	Day	Yes	class 2	class 2	
 mats01	demo04	Day	Yes	class 2	class 2	
 may_01	demo02	Day	Yes	class 2	class 2	
 mee02	atsl01	Week	Yes	class 6	class 6	
 es04	atsl01	Day	Yes	class 2	class 2	

- **Master:** Identifies the probe that manages the end-to-end measurement and the configuration parameters. Upstream results refer to the master-slave flow, while downstream refer to slave-master flow.
- **Slave:** Identifies the far-end probe that, in cooperation with a master probe, matches the extremes of the connection to be monitored. Sales probes do not require to be configured.
- **Period:** Time interval or scale used to represent the results graphically.
- **Connected:** Indicates whether the test is currently active.
- **Upstream:** Upstream network performance class for IP-based services, ITU-T Rec. Y.1541.
- **Downstream:** Downstream network performance class for IP-based services, ITU-T Y.154.
- **SLA:** Acronym for Service Level Agreement, this LED indicates if the Quality Objectives defined by the administrator have been achieved during the monitoring period.

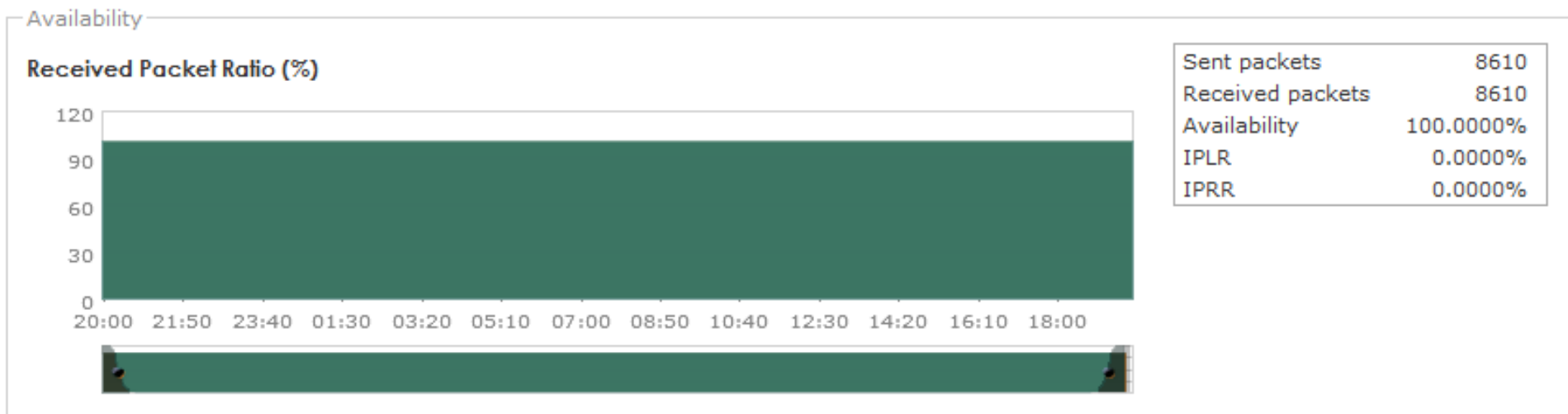
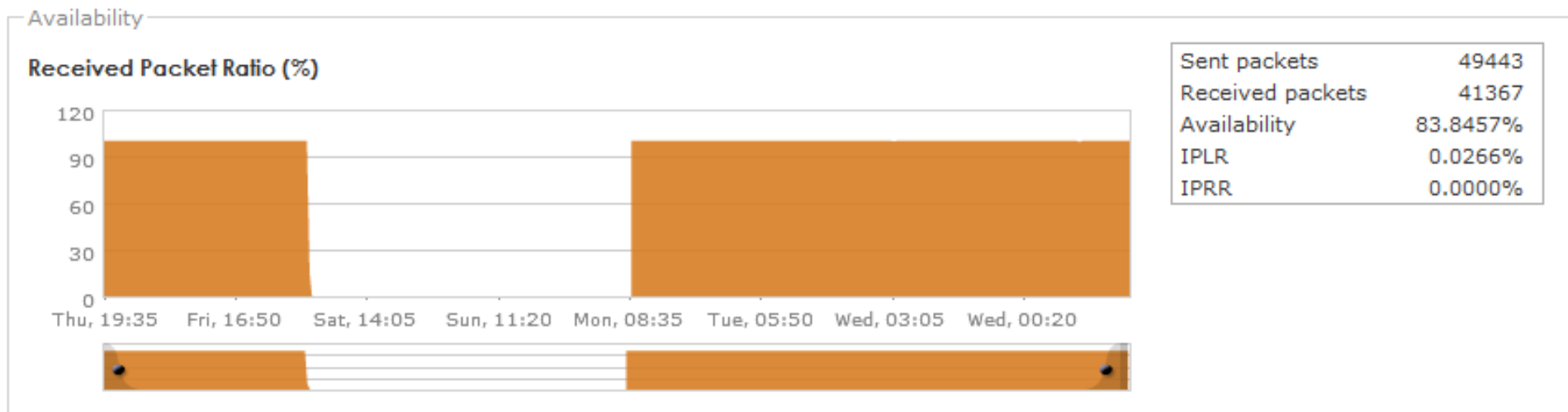
SLA Reports: Traffic Load (UP/DOWN)

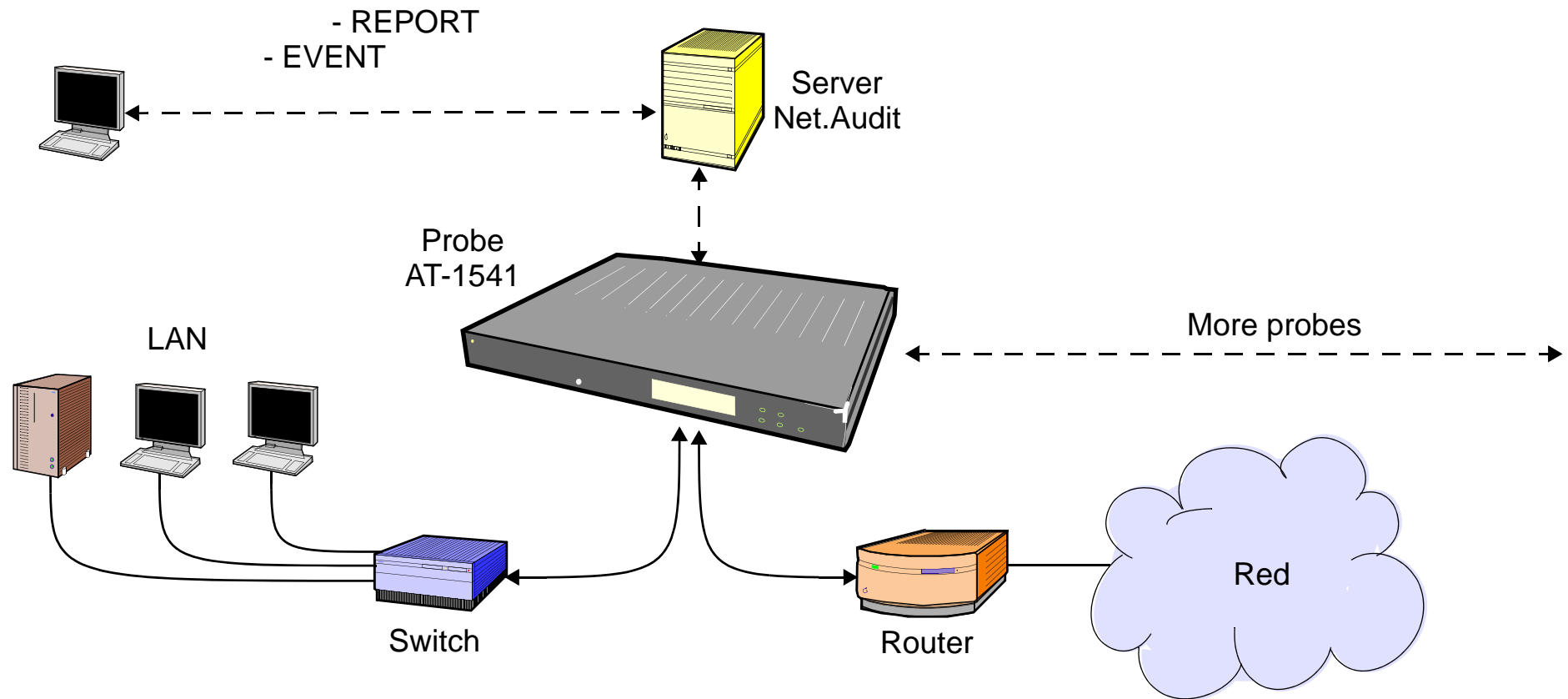


SLA Reports: Delay



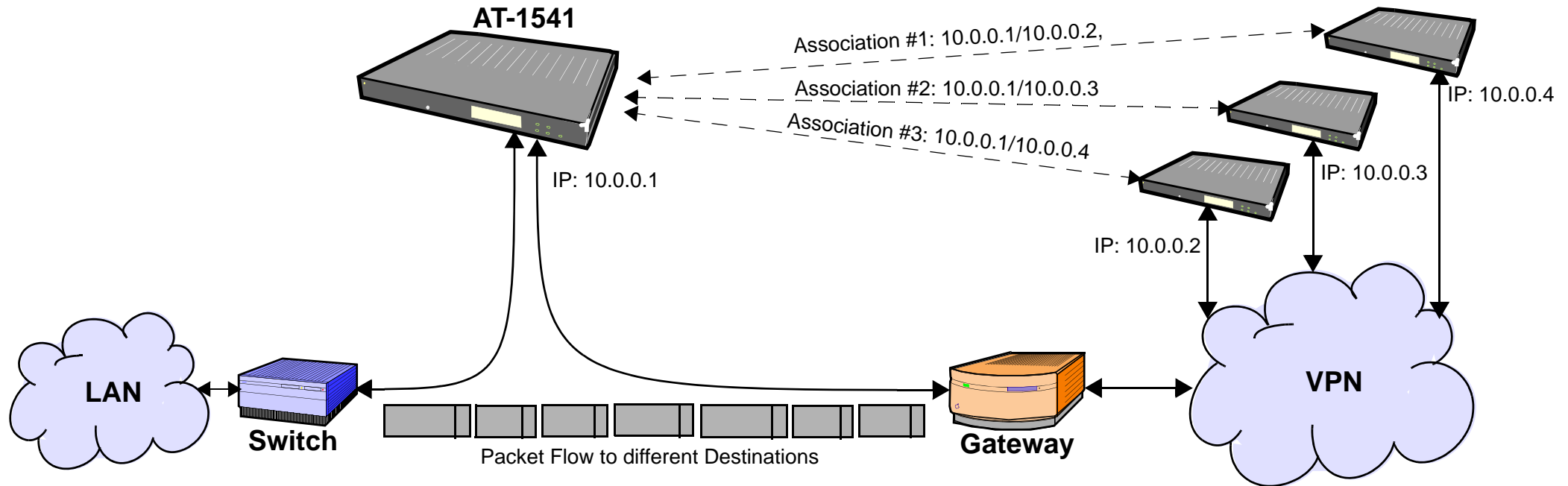
SLA Reports: Network Availability



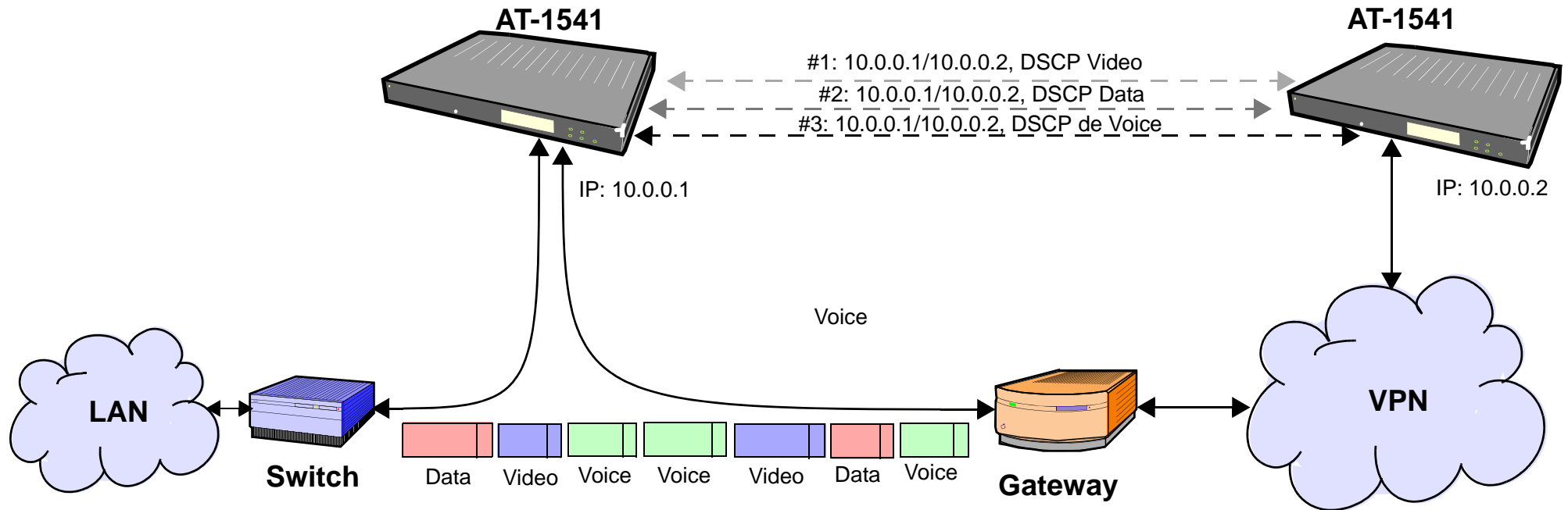


Albedo Probe AT-1541 is installed on each network access Ethernet / IP will be monitored. AT-1541 probes are periodically sent the results to the central servers of Albedo Telecom that process information received and presented to the customer through regular reports in the form of alerts by email or via web.

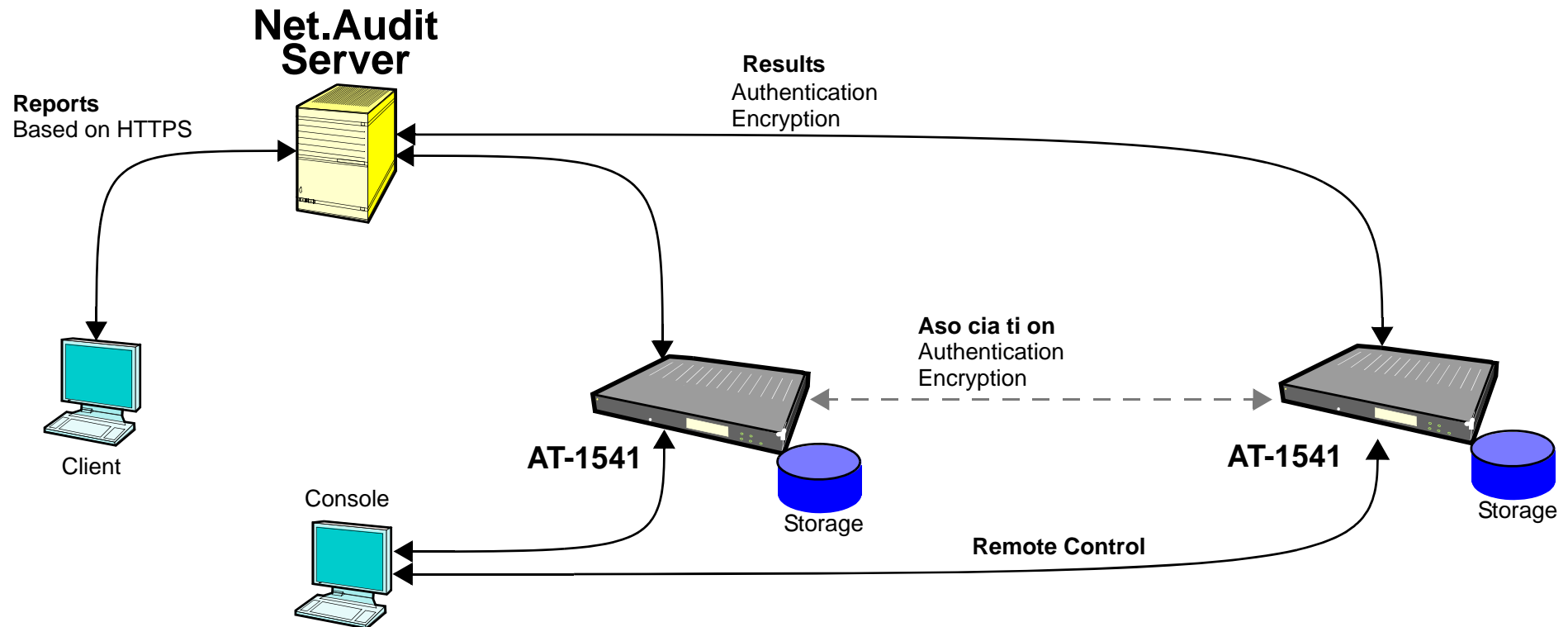
Simultaneous Monitoring



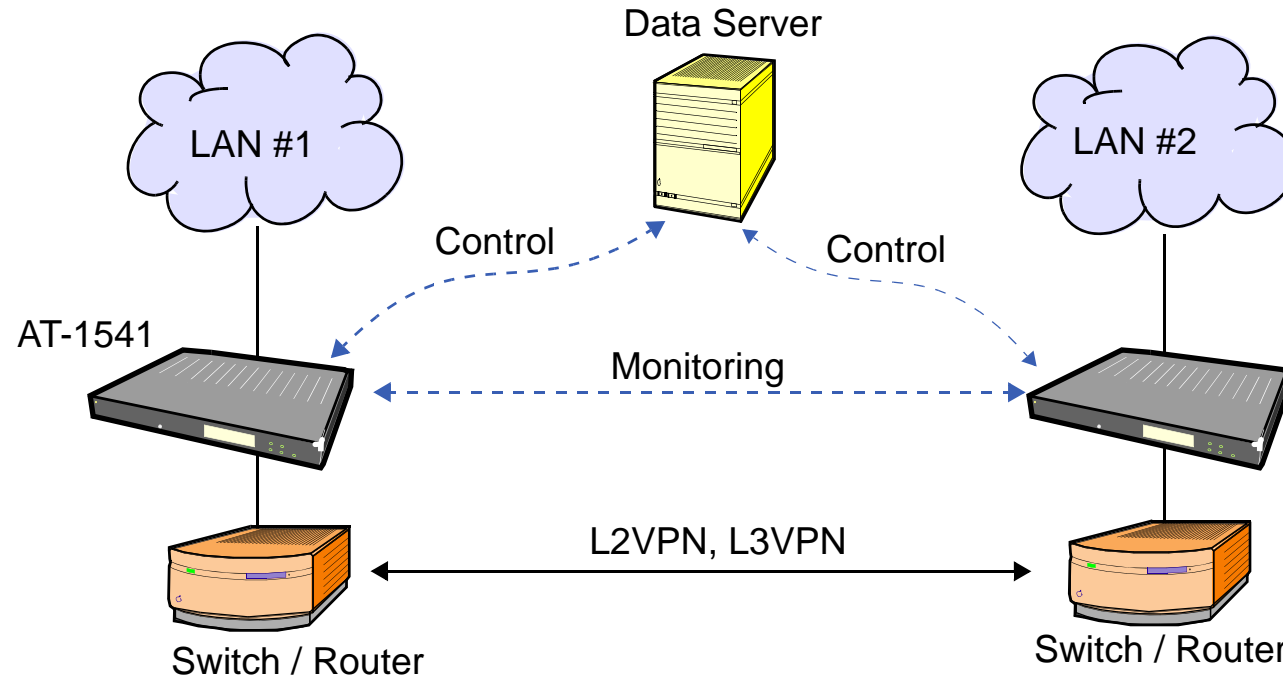
- The probe generates Albedo AT-1541 remote probes partnerships.
- You can establish multiple associations or from a single probe AT-1541.
- This will minimize the number of sensors needed to monitor the SLA.
- Different operators can be compared in a simple.



- The DSCPs enable operators and network administrators to define high-quality services for applications and selected users.
- AT-1541 probes considers DSCP to enable SLAs are met for both regular and exclusive services.

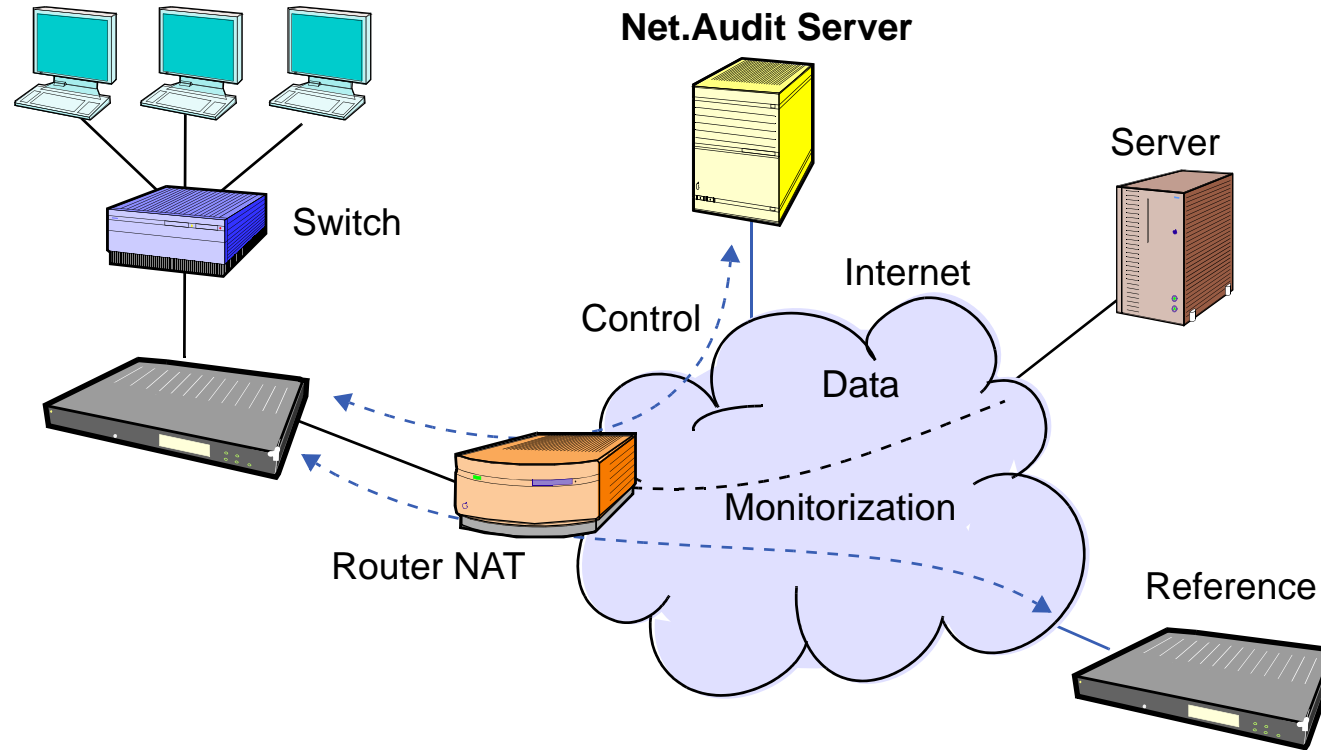


- The data from the customer's is not manipulated. The system generates its own traffic test.
- The associations between AT-1541 probes are always authenticated and optionally encrypted.
- All QoS data collected is sent over authenticated and optionally encrypted connections.
- The report generation and management protocols are based on widely publicized.



- The services of Layer3-VPN or Layer2-VPN are configured on packet switched networks are subject to potential damages caused by factors such as congestion.
- AT-1541 probes monitored permanently associated with the VPN connections to ensure that all services, including the low-latency, do not suffer any degradation.

Internet access Monitoring



AT-1541 probes can be used to determine if the loss of quality of connection is due to saturation of the remote server, network congestion or insufficient provider bandwidth contracted. Reference

Audio

VoIP

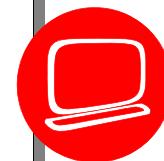
Streamed MP3

Bandwidth	12~106 kbit/s	32 ~ 320 kbit/s
Loss	1%	2%
Delay	150 ms	5 s
Jitter	30 ms	Jitter buffer



Video

Bandwidth	0.005 ~ 10 Mbit/s
Loss	2%
Delay	5 s
Jitter	Jitter buffer

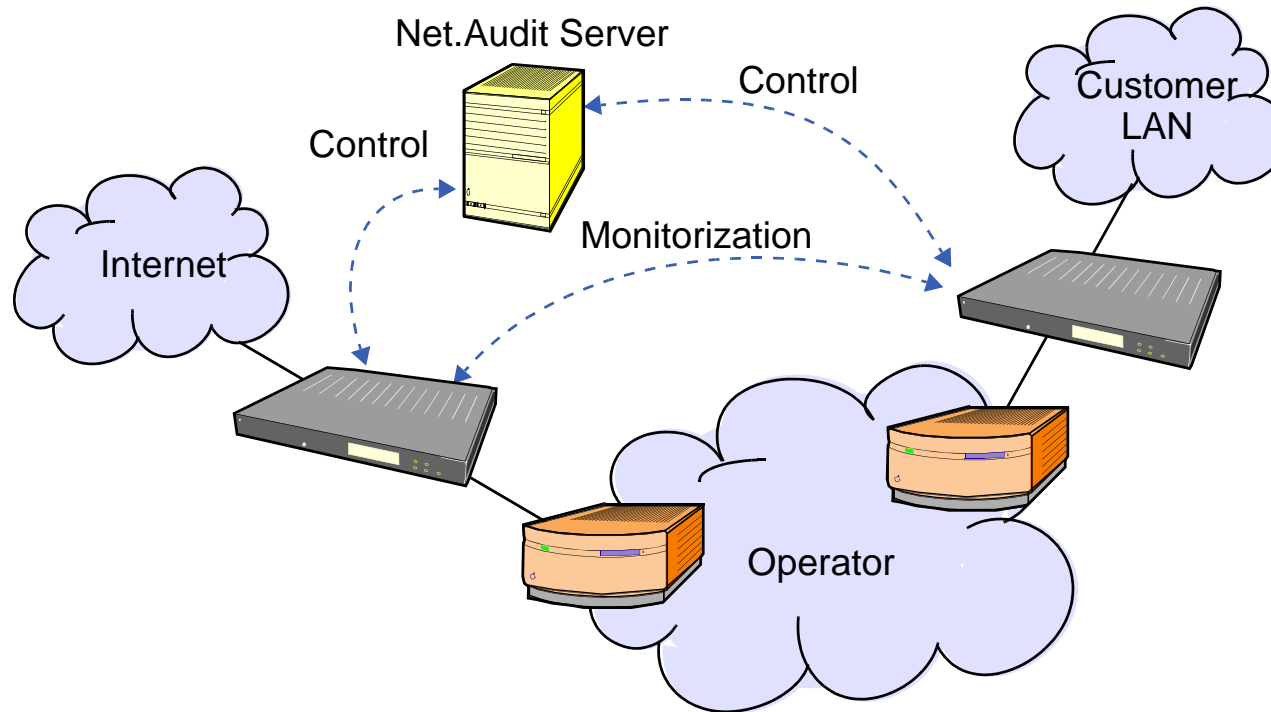


Data

Bandwidth	Variable
Loss	Sensitive
Delay	Insensitive
Jitter	Insensitive

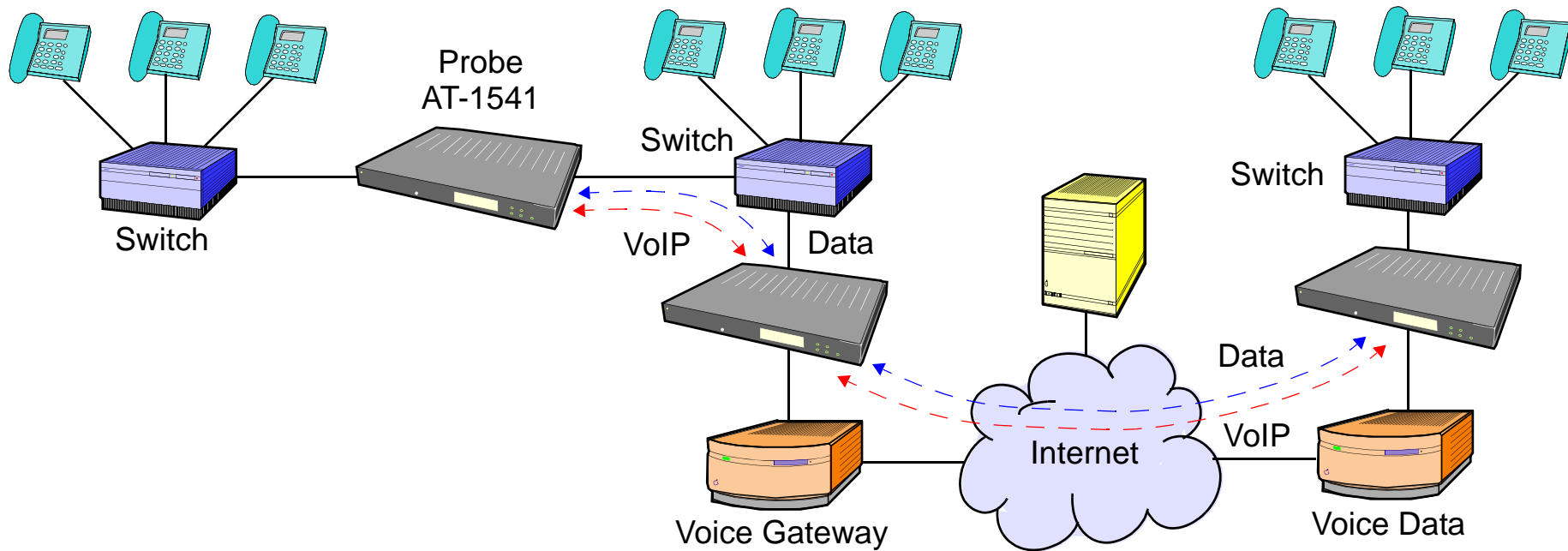


1. Over-provisioning
 - Traditional solution for private and public networks
 - May work for a while; requires regular updates
2. Traffic Engineering (MPLS)
 - Improves routing performance and indirectly helps QoS
 - Compatible with most networking technologies and protocols
3. Resource Reservation (IntServ)
 - End-to-end guarantee of QoS; needs a signalling procedure (RSVP)
4. Differentiated routing (DiffServ)
 - Edge routers classify packets into priority classes

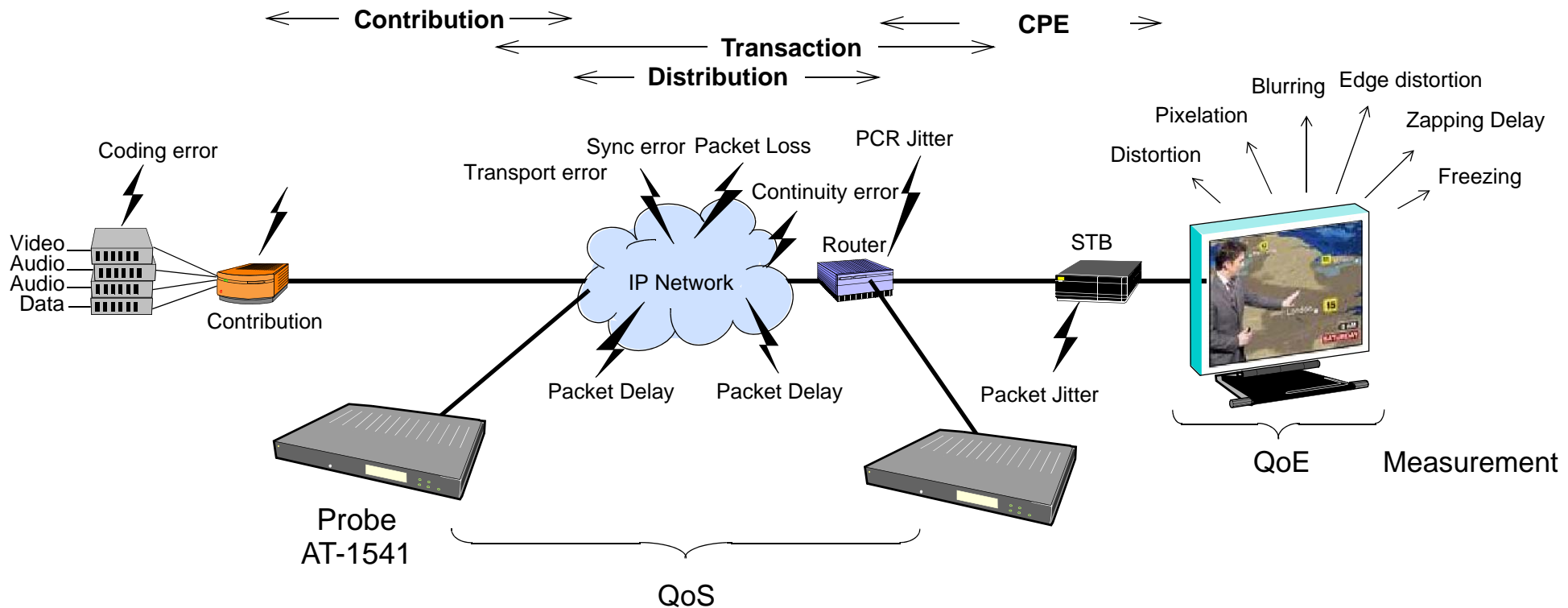


- The probe AT-1541 can be used to control the quality offered by a transit operator.
- AT-1541 probes in the administrative domain boundaries of a network to guarantee that the connection with the end customer has sufficient guarantees of quality.

VoIP Monitoring

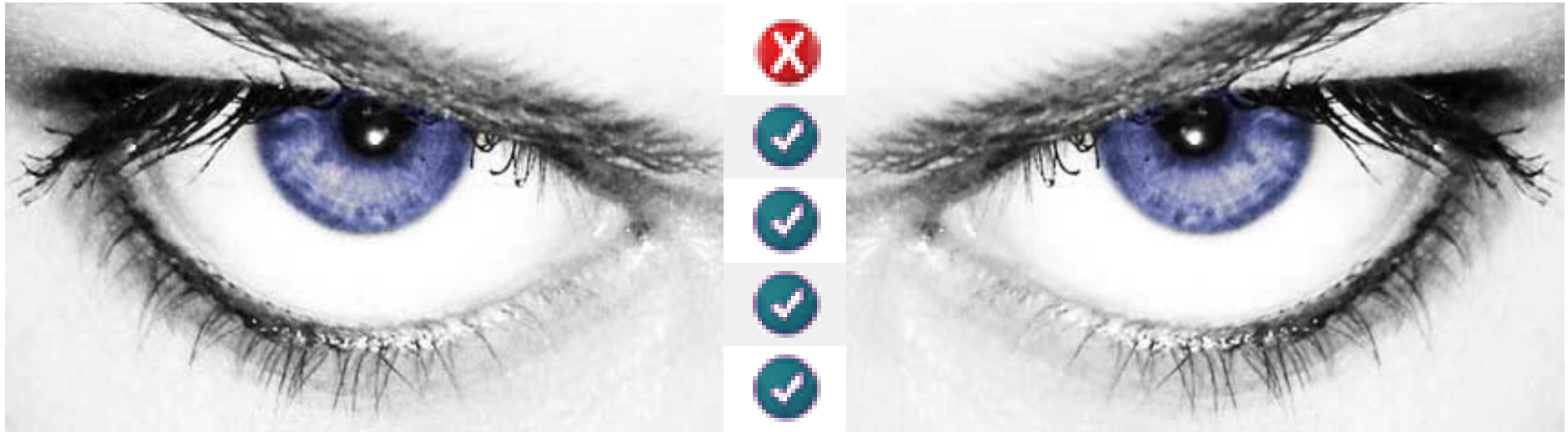


- The use of Internet or other IP networks to provide voice services in addition to traditional data services, is increasingly widespread access to both business and households. Voice Gateway
- The AT-1541 allows continuous monitoring of the key points upon which the quality of VoIP service.



Net Audit unveils causes of IPTV service degradation producing effect like:

- **No service at all**, frequent service interruptions, wrong formatting, very high latency, authentication problems to watch private programs like pay-per-view.
- **Video degradation**. freezing, blurring, visual noise, loss of color, edge distortion, pixelation, tiling.
- **Audio degradation**. Drop out, lips synchronization, voice distortion, bad signal to noise relation, echo.
- **Poor Interaction**. No zapping capability, loss of VoD functions like start/stop/fwd



ALBEDO Net.Audit System provides an optimal provision of data services based on Ethernet / IP

- Universal and independent of Network Provider, Access/Core technology, LAN/MAN/WAN topology
- Verifies SLA compliance of your Service provider.
- Selection of monitoring period: Day / Week / Month / Permanent
- Low cost High valuable information displayed in a simple web server.
- Self installation system, not experts required.
- Detects whether an IP network is ready to transport multiplay services (VoIP, IP video).
- Allows the definition of a service delivery agreement (SLA) suitable.
- Enables a migration to packet switched services with minimal risk.

That's all



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Telecom
the Path to Excellence