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**Brochure, Datasheets
of the QOSIPS System (V1)**



QOSIPS



QOSIPS

**Quality of Service and Pricing Differentiation
for IP Services**

Monday, 25 June 2001

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Executive Summary

This document contains the brochure and datasheets of the QOSIPS system. The brochure is a general overview material describing the added value for the operator by using the QOSIPS system. Two datasheets are included. The first datasheet covers the main functionality of the pricing module whereas the second highlights the main characteristics of the quality module.

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GLOSSARY

ANNEX A: OVERVIEW



QOSIPS Quality of service and pricing differentiation for IP Services.

QOSIPS - a powerful, robust and 'market first' optimisation solution for Virtual Private Networks (VPN), which addresses the business challenges faced by Network Service Providers (NSP's) by improving the VPN service offering, optimising tariffs, increasing market share and enabling profitable customer retention and acquisition.

Providing a competitive VPN solution is not just about technical expertise, it's also about pure economics and providing a service which wholly meets customer requirements at a cost which is acceptable to customer and right for the NSP bottom-line. In today's competitive market and following the immense investment in their IP networks, NSP's cannot afford to ignore the revenue generating capability and high return on investment that the QOSIPS business solution will provide.

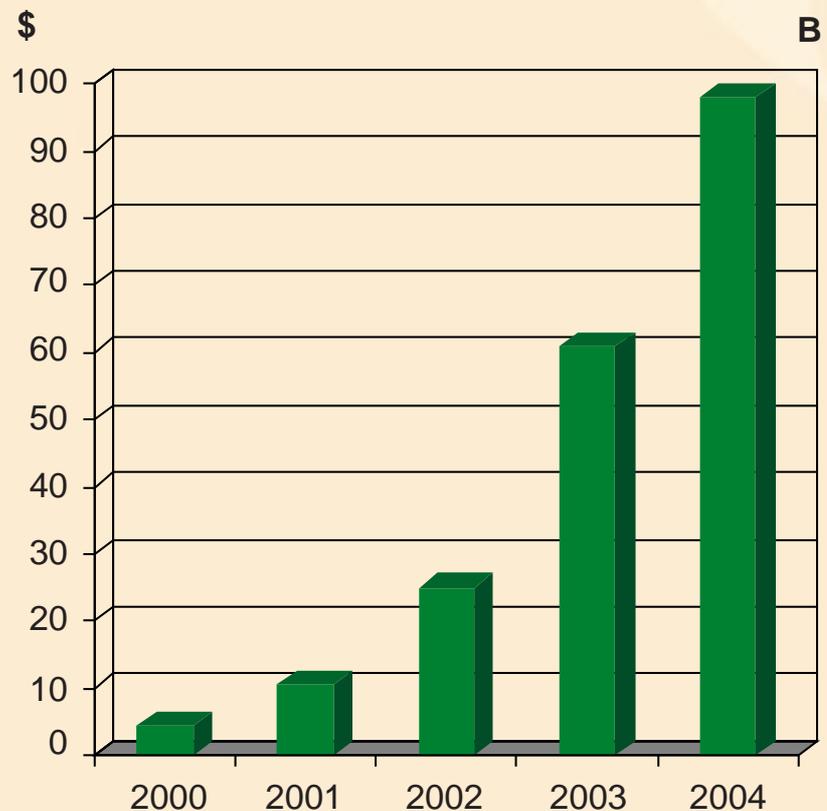
Clear differentiation required for market success

In the accelerating world of IP networks, VPN's are the backbone for business and enterprise mission critical applications which are driving the new market economy. With market forces generating enormous opportunities for network providers to deliver new value-added IP services to their business class customers, the issue of optimising QoS (Quality of Service), together with pricing is now at the forefront of the customer proposition.

There is a huge market potential for IP VPN's, with industry experts predicting that it will reach \$100 billion by 2005.

However, an inherent business case issue which is still to be addressed, is ensuring true optimisation of the investment and service 'offering' and hence optimisation of revenue and profitability streams.

*Diagram 1
Market Growth by IP VPN Explosion*



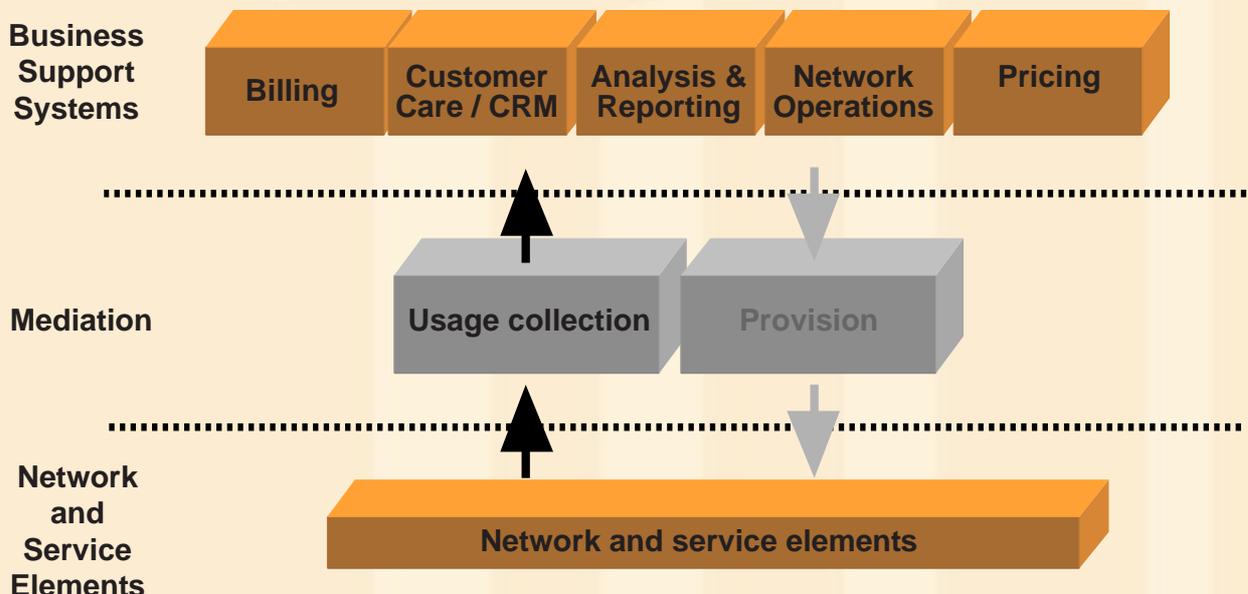
Strong Economic Impact of QOSIPS

Historically, IP network SLA's have been based on 'best effort' traffic management schemes, which led to no other solution but over provisioning to offer guarantees of QoS to users. QoS and price optimisation provide a powerful differentiator. Today's IP VPN users demand end to end QoS across network boundaries. If this is not delivered, customers will simply communicate this by spending their money elsewhere.

Ipanema's and KSS's combined and powerful QOSIPS solution cuts to the heart of the service providers business challenge by:

- 1 Modelling the impact of QoS on subscriber acquisition, churn and migration and the impact of usage and subscriber base on QoS
- 1 Optimising the IP service 'offering' with regard to customers usage, subscriber acquisition, churn, migration, QoS parameters and competitor 'offering'
- 1 Evaluating price and QoS based on demand elasticities - whilst quantifying cross-effects between tariff elements
- 1 Real time profiling of customer usage traffic
- 1 Prioritising IP traffic with regard to SLA requirements
- 1 Optimising trade-off between the cost of network provisioning and customer acquisition/satisfaction
- 1 Addressing user satisfaction and enterprise productivity requirements
- 1 Optimisation of profitability and ROI
- 1 Selling the customer service proposition on value, not bandwidth
- 1 Offer compelling SLA's
- 1 Maximise return on customer relationship, whilst increasing retention and customer acquisition

Diagram 1
QOSIPS Solution



The Intelligence behind QOSIPS

The benefits of QOSIPS can be divided into 3 key areas:

Service Differentiation

A more sophisticated understanding of customer profile and behaviour, as well as a more innovative way of generating service differentiation. QPO will enable the customer NSP to

- 1 Classify customers traffic
- 1 Understand the actual sensibility of users about real time network characteristics
- 1 Help CoS to QoS bridging
- 1 Follow trends, in order to anticipate network engineering actions and service provisioning
- 1 Better use of the capacity of the network without degradation of QoS

Real-time measurement of QoS

QPO solution will provide an accurate measurement of real-time QoS. The quality module will provide the network service provider (NSP) with a measurement system which is :

- 1 Exact - real time users traffic packets are the object of the measure
- 1 Accurate - approximately one order of magnitude below service level specification and application sensitivity
- 1 Exhaustive - each packet is measured
- 1 Non intrusive - no injection of test packets in the network occurs

Price optimisation of QoS

The pricing module will enable the NCP to manage the pricing process more effectively by :

- 1 Manage the complexity generated by multiplication of different services
- 1 Make a trade off between possible services
- 1 Generate scenarios to predict the impact of new offers before they are brought to market
- 1 Simulate the impact of competitor product moves or new product introductions
- 1 Optimise prices across the whole portfolio to generate optimum profit uplift, within the strategic constraints of the NSP

QOSIPS - Best of Breed solution

The QOSIPS solution is based on a comprehensive research project which has been commissioned by the EC (European Commission) on the subject of Quality of Service and Pricing Differentiation for IP Services.

The solution is a powerful combination of the innovative and leading edge products provided by Ipanema and KSS plc. The integration of these two products has led to a 'first to market' product solution, which is set to address the key IP VPN business issues, whilst optimising the ROI from their investments and service 'offerings'.

KSS is a world leader in the provision of Customer Profitability Management (CPM) solutions, using market adaptive pricing tools and was founded in 1993, following 20 years extensive research into price and revenue optimisation techniques. The markets applicable to KSS's technology include telecommunications, mass & convenience retailing, petroleum industries and financial services. KSS's technology enables clients to significantly increase their profitability and competitive edge, through superior price management, within their specific competitive environment

KSS's unique market adaptive pricing software will supply clients with all the information they need to optimise both their strategic and tactical pricing decisions.

KSS's telecommunications product TelPrice is already making a dramatic impact in the global telecoms market and numerous global players have already realised its potential. Since implementing TelPrice all companies report growth in volume, increased profitability and a much sharper competitive edge.

Ipanema Technologies is the first company to offer a complete system for the control of Quality of Service of Virtual Private Networks (VPN) IP, (Internet and Extranet). Intended for service providers and large enterprises, Ipanema solutions are based on innovative and patented technology of the real time measurement and dynamic optimisation of all IP communications.



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ANNEX B: PRICING MODULE DATASHEET



Customer Profitability Management (CPM)

QOSIPS Pricing Module, an untapped source of profitability
for Network Service Providers (NSPs)

In today's fiercely competitive telecoms market, operators have one clear and over-riding key goal which all paths lead to - increased profitability. Network Service Providers (NSPs) have invested huge sums in their IP network and the challenge is now to turn this into a profitable business model.

NSP's must now, for the first time turn their attention to Customer Profitability Management (CPM). When compared with other IT investments, few would be capable of producing such the speedy and high return on investment (ROI) that CPM solution provide

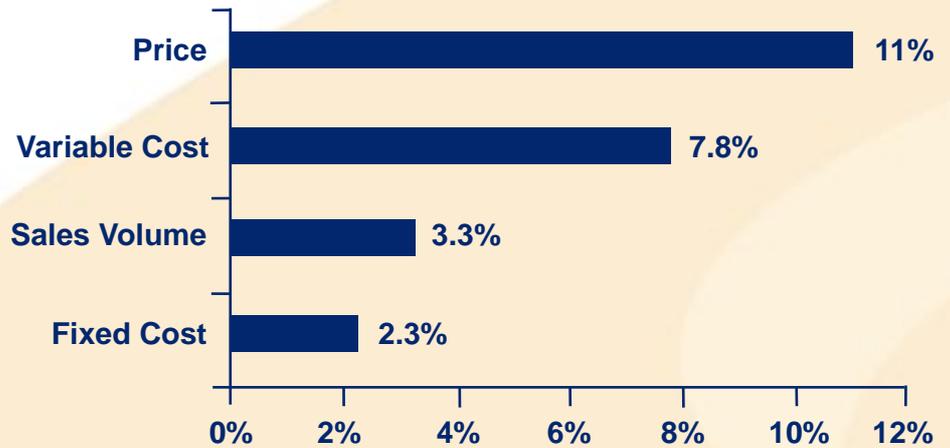
Pricing - Direct Impact on Bottom-line Profitability

The importance of pricing and the profitable returns generated from more effective pricing, is endorsed by research from McKinsey and Co, as far back as 1993.

Following a study of over 2000 companies, McKinsey concluded that a 1% improvement in price can produce an uplift in profits of 11.1%. In comparison a 1% improvement in sales volume, fixed cost and variable cost produced a profit uplift of 3.3%, 2.3% and 7.8% respectively (see diagram 1).

Over the past 5 years, we have witnessed an enormous change in the IP industry. The IP VPN market is exploding. Experts predict that it will reach \$100 billion by 2005. Right now most IP NSPs are pricing for the access links using flat fees.

Diagram 1
Source: McKinsey and Co.



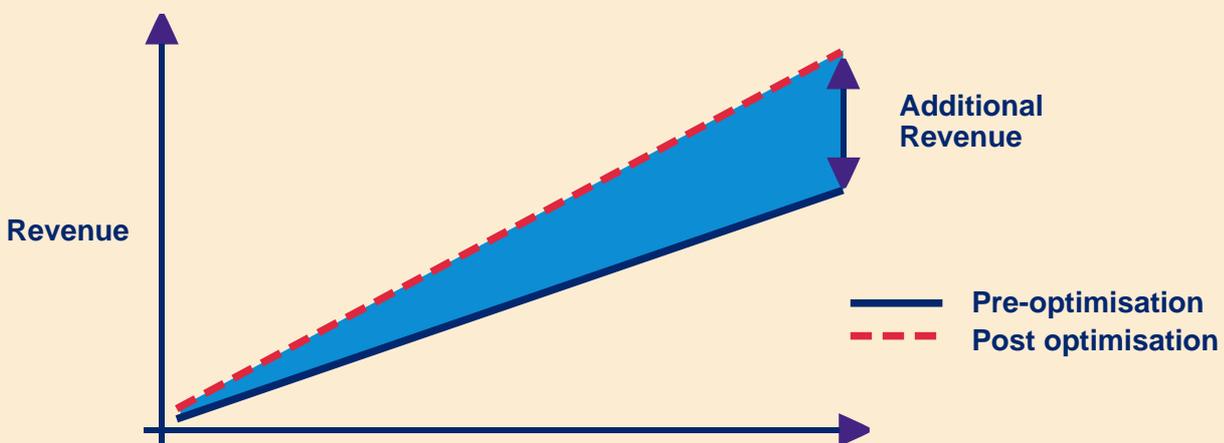
A more appropriate market segmentation coupled with the ability to measure usage and QoS will enable NSPs to formulate more intelligent customer centric tariffs, i.e tariffs that address the customer needs and take the focus of the network technology that is used.

This will lead to an explosion in the number of pricing variables that managers will need to take into account when pricing.

The fact remains that the use of spreadsheets to manage the pricing process has no place in today's economy, due to their inability to take large numbers of variables into account.

By failing to adopt a usage based pricing approach to their service 'offering', coupled with an inability to optimise their pricing process and effectively manage churn and migration, NSPs are losing millions of euros on an annual basis.

Diagram 2
Revenue increase using optimisation tools



Taking Network Service Providers (NSPs) to the top of the profitability league

A CPM approach, provides a leading edge capability to manage profit, revenue and market share goals for NSPs, with an ability to optimise a complete product suite, taking into account direct effects, cross effects between products and competitive alternatives.

Price for QoS differentiated tariffs is going to be a big differentiator in the IP VPN world of communications. The 'right' services with guaranteed QoS characteristics and associated penalties, at the 'right' price, is what will separate the winners from the losers.

NSPs will soon be operating in an IP market more aggressive than anything previously experienced, built around a new breed of sophisticated customer.

More than ever before, NSPs will need to optimise their pricing strategy, sharpen competitive edge whilst increasing per customer revenues and profitability.

With increasing variables and thousands of inter-relations or cross effects, NSPs cannot afford to guess at something this critical to their profit and their future. This is why they need a QOSIPS pricing module

The QOSIPS pricing module is a sophisticated market adaptive pricing (MAP) tool which will equip NSPs with all the information they need to optimise both their strategic and tactical pricing decisions. Getting the price 'right' for your customers and right for your bottom-line involves a multitude of factors.

It involves evaluating your current service 'offering', your market's perception of it, how it compares with the competition, current market conditions and future market probabilities, are to mention but a few.

The fact is, even a room full of the best brains in the business are not capable of processing all the factors involved in getting the prices absolutely right. Even to price just four tariffs in association with various QoS parameters at any point in time, could involve several thousand variables.

There is an infinity of permutations and combinations that need to be constantly evaluated if NSPs are to achieve optimum profitability.

Price Revenue Optimisation



The intelligence behind the QOSIPS Pricing Module

The QOSIPS Pricing module is based on four core modules

1 The modelling module - modelling for SLA s geared towards specific market segments - incorporates every possible pricing rule and constraint, your own prices and penalty rates, your achieved QoS and your competitor prices to fully represent the pricing effects from all known sources

1 The simulation tool - forecasts sales and marketing trends and analysing new offers across a whole spectrum of competitive scenarios

1 The optimisation tool - outlines the best prices for QoS differentiated tariffs to achieve the highest profits or the maximum acquisition of new customers in the context of a defined strategy and costs

1 The learning module - combines existing market data with a NSP vision and management expertise to update parameters ready for the next modelling phase. In other words the QOSIPS pricing module will learn from experience

The technology behind such sophisticated CPM tools is indeed impressive, with algorithms that are multi-dimensional, due to consideration of the effects of tariffication changes on acquisition, churn, migration and usage, in conjunction with one another.

The models use elasticities to calculate the effect of price changes/new products in conjunction with market forces.

Built on top of this predictive model is a sophisticated mathematical non-linear optimisation algorithm, which determines the best price mix in association with QoS parameters and subject to an NSPs business rules and strategy.

Maximum Profitability

High ROI

Price Revenue Optimisation



Key Benefits of QOSIPS Pricing Module

Key Benefits of the Simulation Tool

- 1 The ability to price for QoS differentiated services
- 1 The ability to test scenarios instantaneously for any combination of prices
- 1 Provides an accurate forecasting tool to predict levels of new customers, churn and migration which will enable the calculation of revenues, costs and profit
- 1 Systematically run a range of different price changes in a flexible and sophisticated way
- 1 Provides a framework to evaluate real or anticipated competitor moves

1 Ensures strategic goals are met whilst maintaining market position

1 Allows NSP to model the effects of new products and services, quickly and intelligently

1 Provides a mechanism for evaluating and refining market model information

1 Provides the ability to represent and compare simulations in a graphical and tabular form

1 Predicts usage and QoS achievements

1 Predicts penalty costs for not meeting the QoS guarantees

Key Benefits of the Optimisation Tool

1 A NSP can find the best and most optimum price mix

1 Achieve an uplift in revenue, taking into consideration all of the complex interactions in the market

1 Optimise either a few prices or many prices, depending on NSP objectives

1 Ability to set optimum prices for new tariffs

1 Provides optimal response to competitor moves and attacks

1 Optimise penalty guarantees

Optimum Profitability for NSPs

Industry visionaries have long stated that the supply chain no longer provides a long term source of competitive advantage - with forward thinking companies focusing their strategic direction on optimisation of the demand chain.

CPM, although a relatively late arrival to the industry, is here to stay. NSPs will find it difficult to ignore the impressive financial gains and ability to have a direct impact on bottom-line profitability, and hence that all important shareholder value.

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ANNEX C: QUALITY MODULE DATASHEET



Real - time measurement of QoS

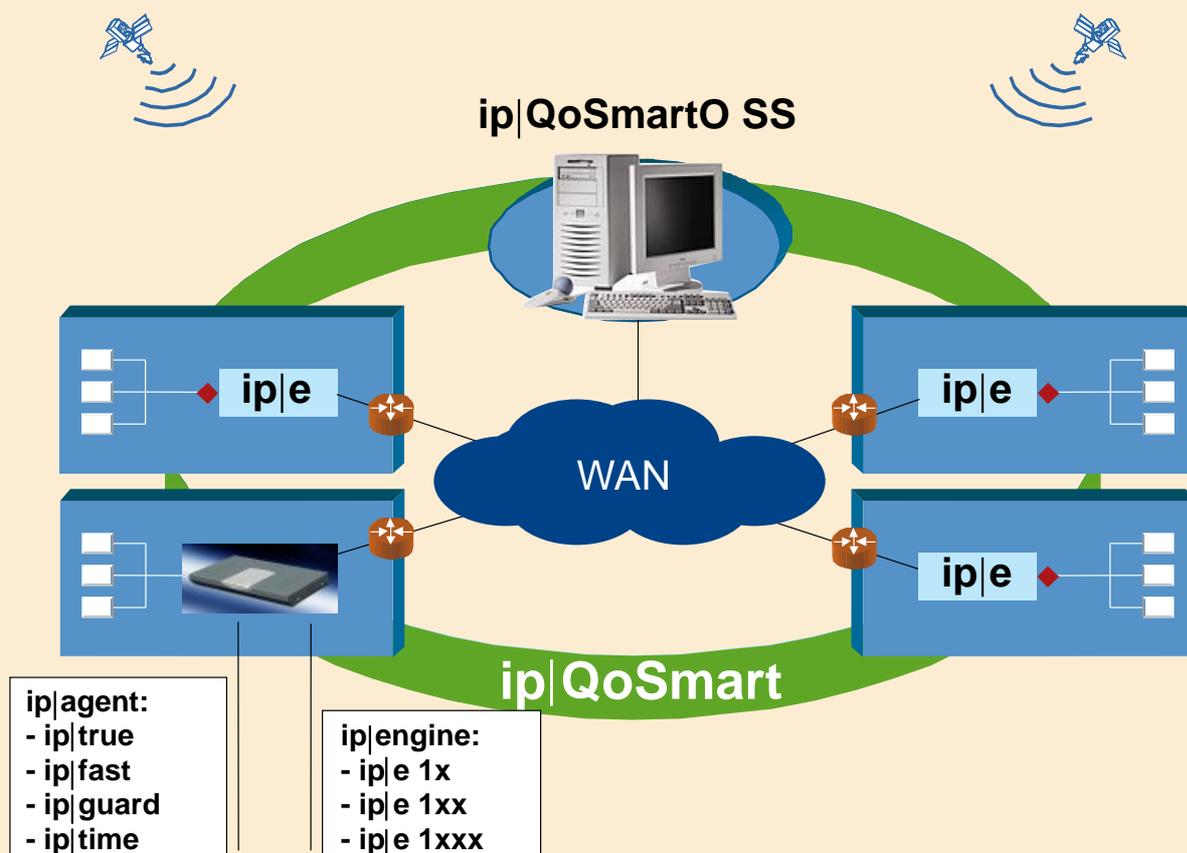
Service Providers are challenged by the explosion of Internet-based computing with its mix of critical business applications (ERP, ...), time sensitive communications (voice, video, ...), bulky file transfers and Web accesses. Despite larger pipes and decreasing prices, customers are not satisfied by the Quality of Service, the lack of meaningful SLA and the absence of end-to-end service guarantee.

Ipanema Technologies has developed ip|QoSmart to enable Service Providers and Enterprises to bring end-to-end QoS to IP/VPNs.

The ip|QoS Smart system is made of:

- 1 *ip|engines*, located on each VPN access point to execute all real-time functions (QoS measure of all packets and automatic traffic control). A full range of ip|engines allows a cost effective deployment.
- 1 *ip|agents* running on the ip|engines, to provide the following functions:
 - 1 *ip|true*: QoS measures bearing on each packets (one way delay, jitter, loss, throughput and goodput, ...);
 - 1 *ip|fast*: real-time traffic optimization to match the dynamic user demand to the current network capability;
 - 1 *ip|guard*: IP level intrusion detection;
 - 1 *ip|time*: delivery of an accurate absolute time to local servers.
- 1 *ip|QoS SmartOSS* (server based) to manage the whole system (configuration, fault management, definition of user QoS requirements, measure collection, analysis and reporting, interfaces to central OSS ...).

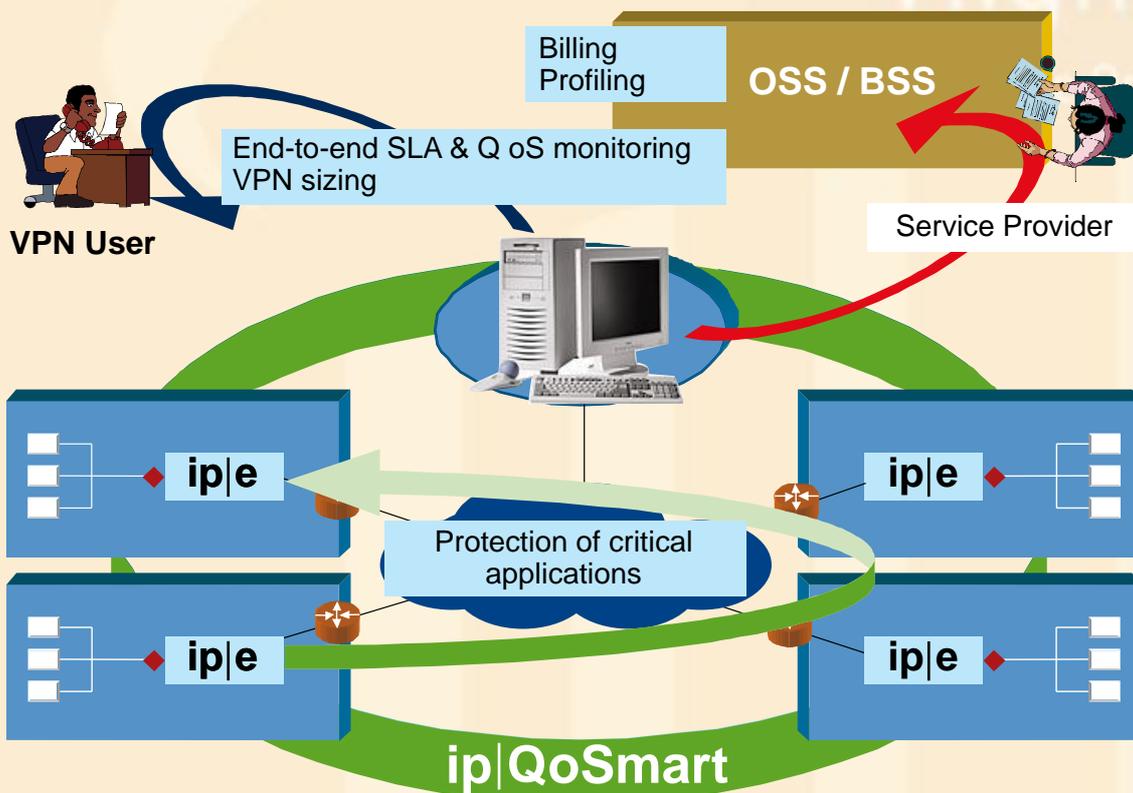
ip|QoS Smart distributed architecture monitors and controls very large VPN (10 k+ access points). It has multi-VPN capabilities that allows Service Providers to serve many customers.



Architecture Benefits

- 1 Designed for Network Service Providers and Enterprises
- 1 Scalable architecture to support very large configurations
- 1 Multi-VPN capability
- 1 Very small service traffic overhead
- 1 Users define high level requirements in term of business criticality and performance objectives (users classes)
- 1 Unquestionable and exhaustive end-to-end QoS measures and SLA monitoring
- 1 Dynamic optimization generates traffic policies automatically and in real-time to meet users classes requirements according to the VPN traffic demand
- 1 Full range of ip|engines for cost effective deployment
- 1 Very easy to install
- 1 Protect customers investment: independent from the WAN technology

End - to - end QoS optimisation and measure



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Glossary

9 Telecom: 9 Telecom

CoS: Class of Service

CPM: Customer Profitability Management

DTG: Decision Technologies Group is a research group at **UMIST:**

University of Manchester Institute of Science and Technology

ERP: Enterprise Resource Planning

IP: Internet Protocol

IPANEMA: Ipanema Technologies

KSS: Knowledge Support Systems

MAP: Market Adaptive Pricing

NSP: Network Service Provider

QoS: Quality of Service

QOSIPS: Quality of Service and Pricing Differentiation for IP Services

ROI: Return on Investment

SLA: Service Level Agreement

VPN: Virtual Private Network

WUT: Politechnika Warszawska