



**Monitor. Protect. Deliver.**

**A guide to cost-effective  
next generation services.**



## Contents

Introduction .....	2
Real-Time Multimedia .....	3
Challenge .....	3
Solution .....	3
Benefits .....	3
Examples .....	3
Connectivity Aggregation and Offload .....	5
Challenge .....	5
Solution .....	5
Benefits .....	5
Examples .....	5
Customer Service Support .....	7
Challenge .....	7
Solution .....	7
Benefits .....	7
Examples .....	8
VoLTE .....	9
Challenge .....	9
Solution .....	9
Benefits .....	9
Examples .....	10
Policy 2.0: Application-Centric Policies .....	11
Challenge .....	11
Solution .....	11
Benefits .....	11
Examples .....	12
Cloud Services .....	13
Challenge .....	13
Solution .....	13
Benefits .....	13
Examples .....	14
M2M .....	15
Challenge .....	15
Solution .....	15
Benefits .....	15
Examples .....	15
Glossary .....	17



## Introduction

Network operators face an unprecedented demand for next generation services while continued growth in data traffic threatens to overwhelm their networks.

With this surge in demand comes a complex set of challenges that network operators have to face.

- How to guarantee the delivery of high value services while at the same time using their infrastructure efficiently?
- How to protect revenue-generating services from the non revenue-generating traffic that congests the network and competes for resources?
- How to evolve sophisticated pricing and personalisation plans that meet the demands of a new generation of users?
- How to measure and monitor the actual user experience in a way that supports customer care activities?

Traditional approaches don't meet these challenges. Cost conscious operators can't build themselves out of the problem and standard DPI or policy products don't provide the level of visibility and control required to truly manage the network from end-to-end.

The solution is to go beyond the traditional network boundary and take control at the client device, to see and manage traffic before it reaches the network.

GoS 360° is a unique solution that consists of an embeddable GoS Agent software client in the device and a centrally deployed GoS Manager. The GoS 360° solution can be used to ensure traffic is identified, prioritised and controlled at client devices, ensuring full visibility of user experience, service optimisation and the most efficient use of bandwidth.

This paper describes a number of use cases in which deployment of GoS 360° can uniquely solve data problems for network operators.

## Real-Time Multimedia

### Challenge

Delivering real-time multimedia is complex and demanding. Users expect flexibility and speed as they access a range of services, switching dynamically from audio to video and back again, inviting other parties to join a session, sharing downloads and streaming their own content to other users. These sessions present significant performance and service optimisation challenges for network operators.

Network operators have to manage real-time multimedia efficiently to ensure consistent quality of experience for their customers. They need the ability to prioritise revenue-generating or preferred services against competing services from OTT providers and other vendors.

### Solution

The solution is to deploy GoS Agent on client devices and GoS Manager in the network core, optionally connected to the PCRF (see Figure 1). The combination of GoS Agent and GoS Manager gives network operators both visibility and control of all traffic, right down to the end user device. GoS 360° is the only way to ensure the consistent, reliable end-to-end prioritisation and dynamic allocation of resources demanded by real-time multi media.

### Benefits

With the unique combination of GoS Agent and GoS Manager, network operators secure:

- Real-time visibility of customer experience and demand
- Optimised QoS for multiple, real-time services
- Efficient bandwidth utilisation
- The ability to identify, protect and prioritise preferred user traffic
- Reduced costs through efficient network optimisation and management
- Revenue generation with assured, sticky services

GoS delivers the only means to fully control upstream, user-generated traffic.

### Examples

- Rich Communications Suite (RCS)
- Mobile broadband access via dongles
- Gaming
- Video conferencing
- On-demand IPTV services

## Real-Time Multimedia

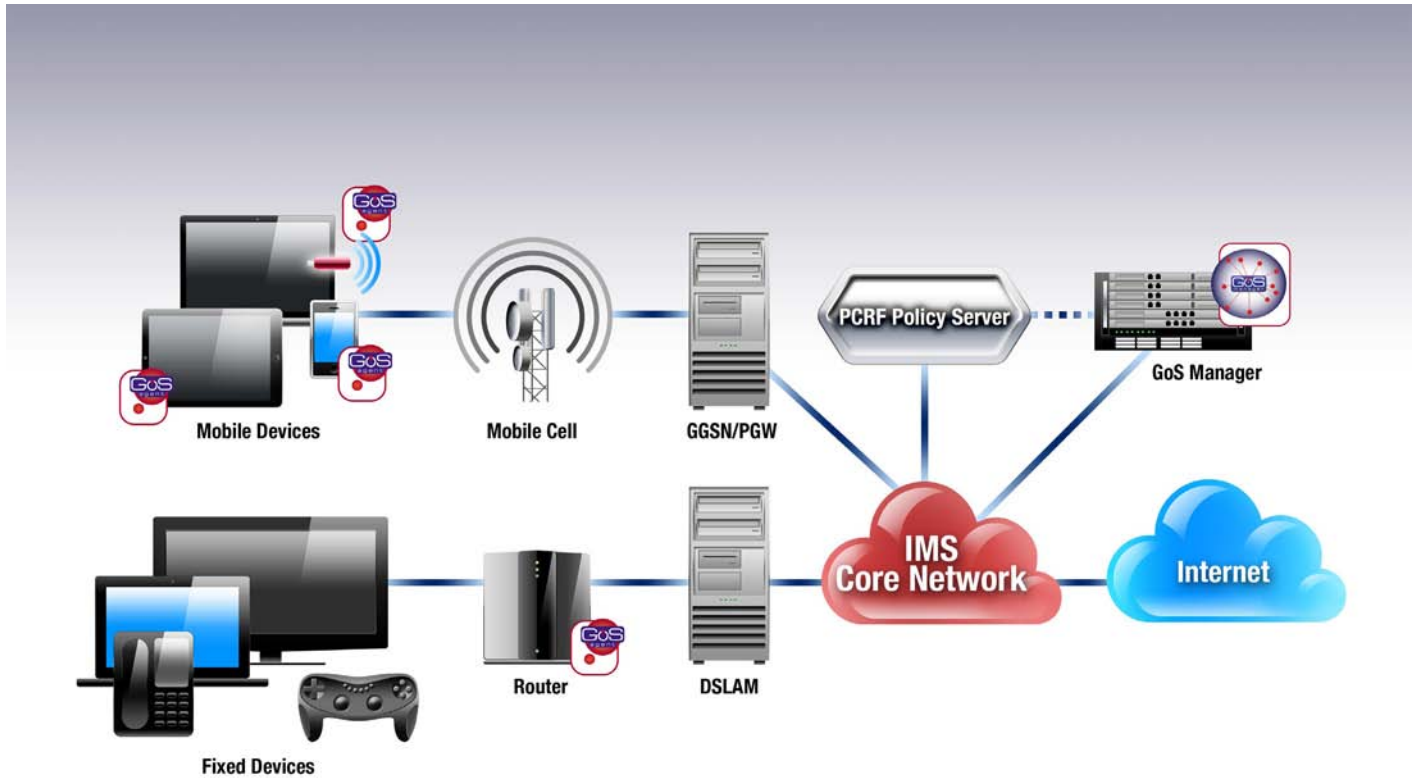


Figure 1 GoS 360° in Real-Time Multimedia Applications.

## Connectivity Aggregation and Offload

### Challenge

Many operators are attempting to manage the offload of traffic from mobile networks to WiFi connections, depending on the optimum path available. However, switching traffic between WiFi and mobile networks makes it difficult to maintain consistent QoS levels for critical applications.

In order to be able to offer this as a service, MNOs need to be able to intelligently manage this process in real-time to ensure there is no serious degradation of application performance during handover or when sessions are active.

### Solution

The solution is to deploy GoS Agent in conjunction with a dedicated connection manager that selects the optimal WAN in real-time (see Figure 2). With GoS Manager in the core network, decisions can be made regarding the prioritization of traffic on each connection for all subscribers to the service. GoS Manager can optionally be connected to the PCRF for integration with the overall policy framework.

### Benefits

With the combination of connectivity managers enabled with GoS Agent and GoS Manager, MNOs can:

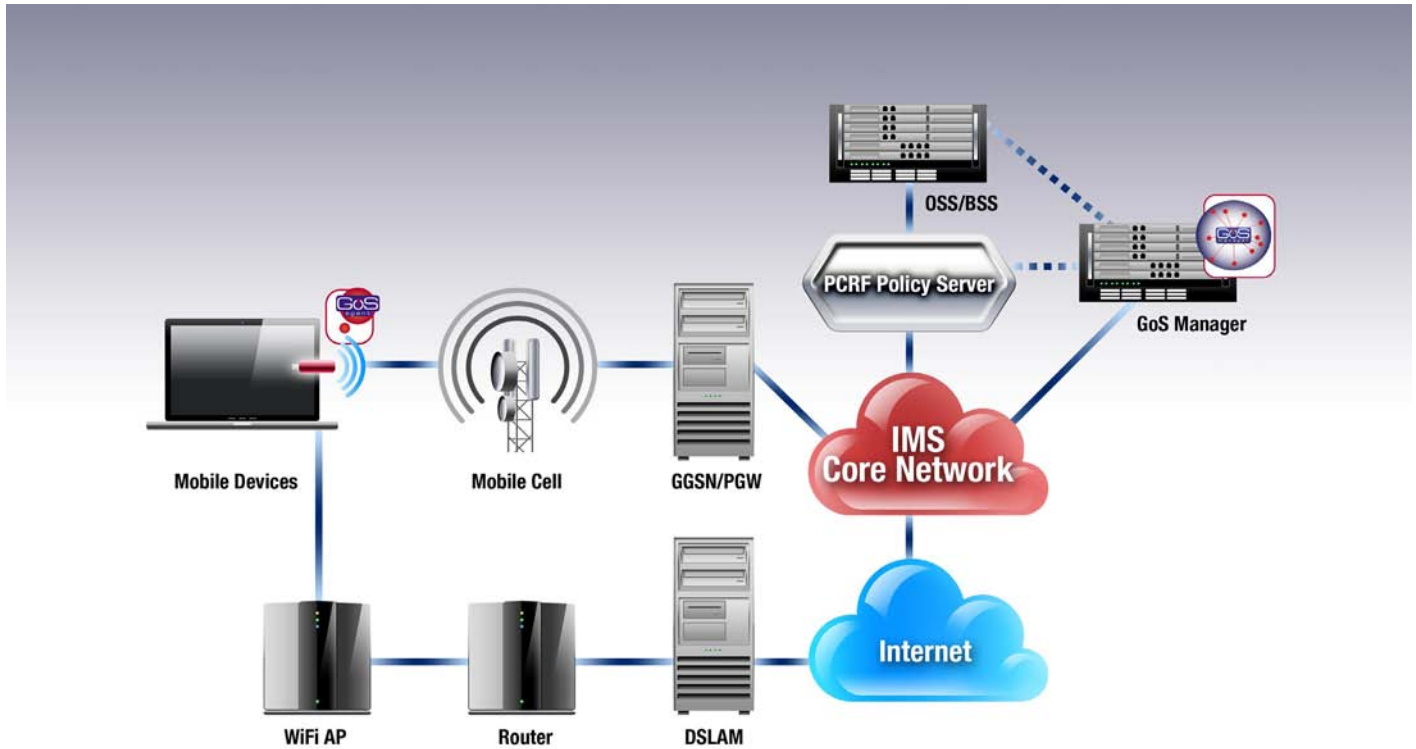
- Switch traffic between WiFi and 3G / LTE networks seamlessly, without user intervention
- Apply multiple policies in real-time based on the available WAN connections
- Optimise use of the available bandwidth
- Prioritise revenue generating traffic
- Improve customer satisfaction and retention by integrating user preferences into QoS policies
- Reduce costs through efficient network optimisation and management
- Generate revenue with assured, sticky services

GoS 360° is the only way in which upstream traffic can be controlled for efficient data offload and optimisation from client devices over multiple interfaces.

### Examples

- Mobile broadband access via dongles
- Embedded communications clients
- Femtocells

## Connectivity Aggregation and Offload



**Figure 2** GoS 360° in Connectivity Aggregation and Offload Applications.



## Customer Service Support

### Challenge

Customer support relies on accurate information yet most network operators have only a very incomplete picture of customer problems. Current network monitoring solutions cannot routinely access client devices or monitor the performance of individual applications in the subscriber domain. They cannot look beyond the CPE or network demarcation point to “see” the problem that the customer experiences, either in real-time or historically. Without this data, network operators cannot efficiently solve customer problems that originate beyond their network boundary.

This can significantly increase the time taken to resolve individual subscriber issues and lead to unnecessary costs.

### Solution

By installing GoS Agent on client devices, such as mobile handsets, broadband dongles and CPE gateways, customer support teams can view data on application performance, bandwidth problems and LAN-side issues (see Figure 3). Each instance of the GoS Agent interacts with a centrally deployed GoS Manager, accessible to customer support agents, presenting them with the information required to solve customer problems quickly and efficiently, saving time and money.

### Benefits

The combination of GoS Agents and GoS Manager provides customer support teams with:

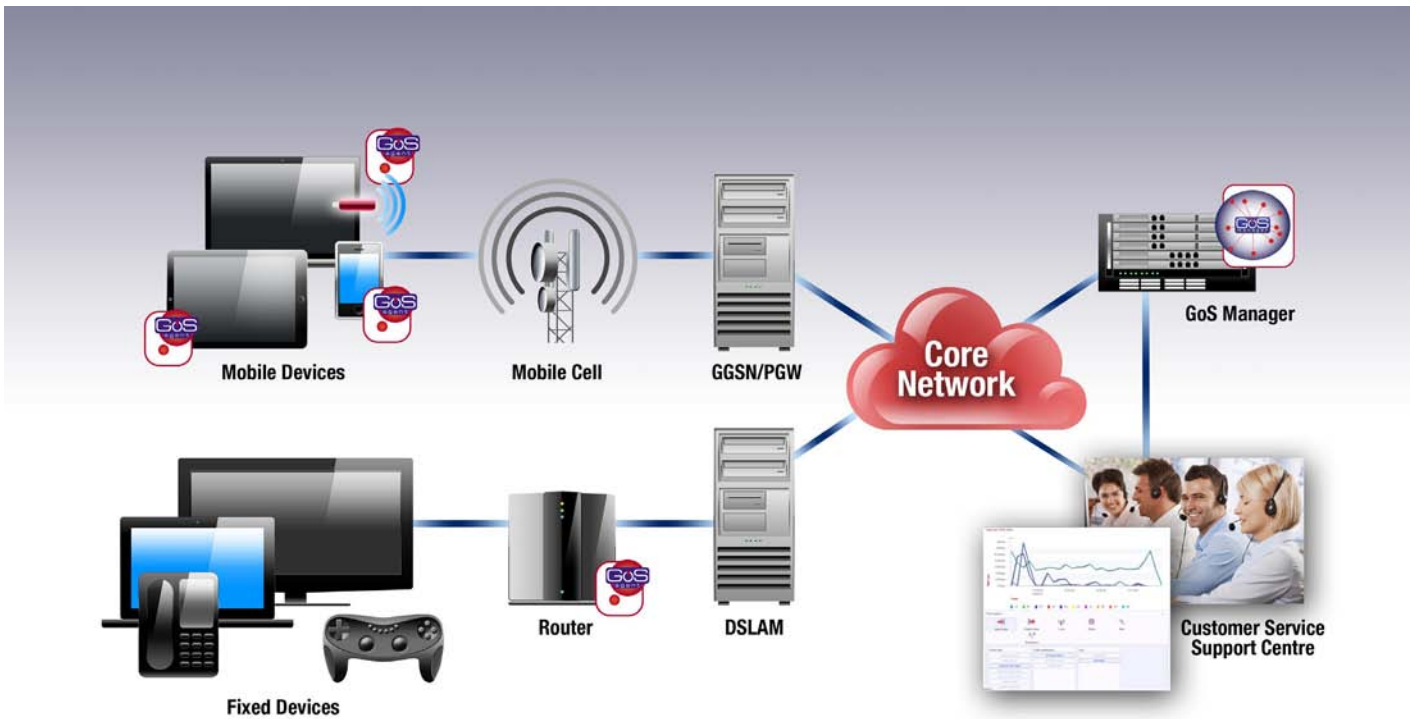
- Access to real-time and historic visibility of traffic arriving from the LAN and going to / from the WAN
- The ability to remotely identify and resolve root-causes of customer issues on the LAN
- The means to measure actual link performance and throughput, not network estimates
- The ability to shorten customer support call duration and reduce costs
- Improved customer satisfaction, reducing churn
- Increased net referrals and customer advocacy
- Reduced costs through efficient network optimisation and management
- Revenue generation with assured, sticky services

GoS 360° is the only way to obtain the complete visibility of LAN devices required for 360° customer service assurance.

## Customer Service Support

### Examples

- Fixed line broadband services such as IPTV
- Measurement of streaming video user experience
- Business services
- Mobile broadband performance
- Application specific management and support
- Gaming



**Figure 3** GoS 360° in Customer Service Support Applications.

## VoLTE

### Challenge

In the all-IP LTE network for 4th generation mobile, voice sessions compete for bandwidth with other services. Unlike in earlier generations of mobile networks, voice calls are not isolated on specific circuits. This presents a challenge for mobile network operators (MNOs), as voice calls still present a significant source of revenue and there are often clear regulatory guidelines mandating on-going support for voice services. Currently, Circuit Switched Fallback (CSFB) has been proposed for VoLTE sessions. However, this presents further challenges as, in reverting to a 3G or 2G network connection, the data path also falls back to a narrower bandwidth connection, leading to service degradation for the user and risking an increase in customer dissatisfaction.

The latest releases of the 3GPP standards include QoS facilities for VoIP and other services; however this is of no help to operators deploying LTE today based on earlier releases.

MNOs need to ensure constant service availability and consistent quality for voice sessions. They need to offer service assurance to connected devices and handsets, particularly for premium or enterprise customers. Failure to do so may result in regulatory penalties and increase the likelihood of incurring costs through failure to support SLAs.

### Solution

MNOs can deploy GoS Agent in handset devices and GoS Manager in the network. The combination allows real-time services, including voice, to be prioritised (see Figure 4). This means that voice services can be guaranteed in the face of competition from other services. MNOs can protect both core revenues and ensure performance of a fundamental part of their service offer. By deploying GoS Agent and GoS Manager, MNOs can avoid having to adopt CSFB. Alternatively, if CSFB is deployed, GoS can also be used to manage critical data services on the reduced bandwidth connection available once CSFB is activated.

### Benefits

Deploying GoS Agents and GoS Manager enables MNOs to:

- Guarantee real-time voice and video services
- Avoid CSFB and ensure no service degradation for customers
- Protect critical data services where CSFB is selected
- Throttle back other competing services

## VoLTE

### Benefits *continued*

- Maximise returns from SLAs
- Reduce risk of SLA penalties
- Reduce costs through efficient network optimisation and management
- Generate revenue with assured, sticky services

### Examples

- Voice and video in LTE
- Voice for IMS-enabled core networks

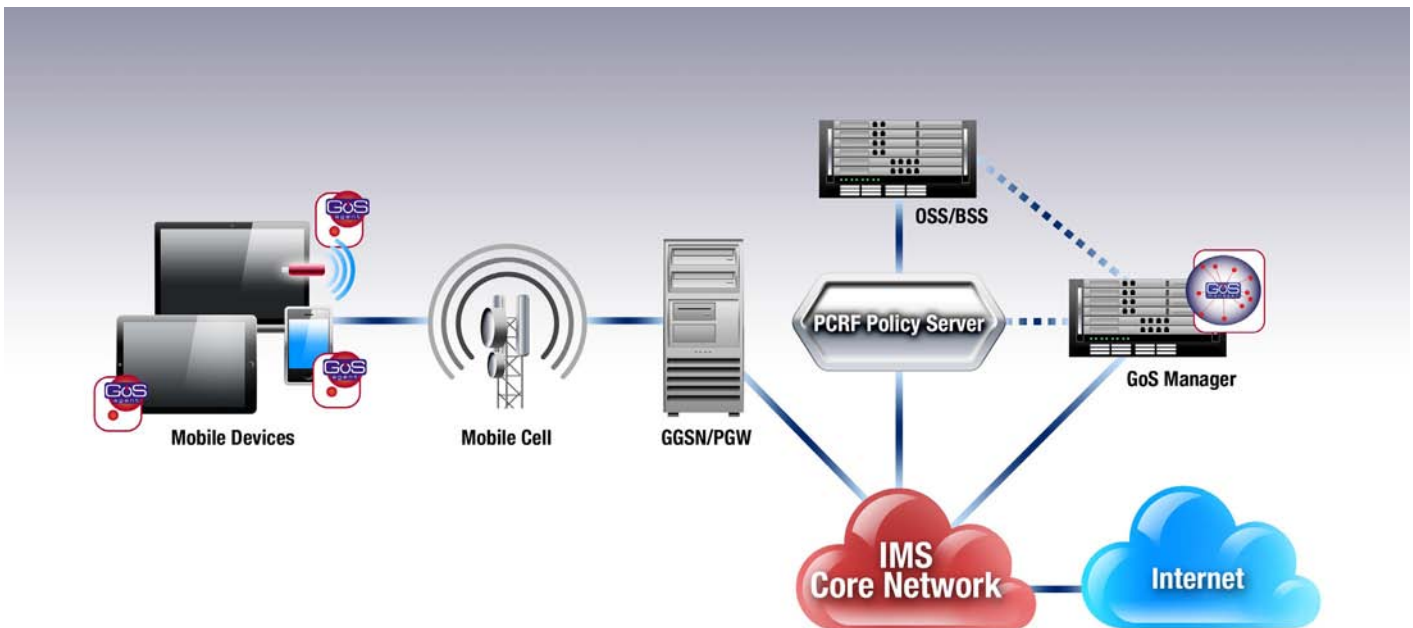


Figure 4 GoS 360° in VoLTE.

## Policy 2.0: Application-Centric Policies

### Challenge

Policy servers are a key instrument for network operators. Policies enable them to control access to services, to regulate the service experience, and to ensure that the correct charging rules are applied. Effective policy frameworks also create new opportunities to exploit emerging “two-sided” business models. Policy will move from being essentially a defensive tool to a business asset.

Under this model, Policy 2.0 will foster innovation as network operators provide access to policy frameworks to third parties who are willing to pay for service guarantees for their own customers. Current solutions do not extend to client devices, where services and applications are actually consumed by users, and this poses a challenge. Without access to client devices, network operators cannot monitor data and application consumption, or control sessions to ensure optimal experience. They cannot guarantee to deliver the policy they seek to enforce, either internally or to external customers.

### Solution

The solution is to deploy GoS Agent on client devices and GoS Manager in the network core, connected to the PCRF, typically via the Gx interface (see Figure 5). The combination of GoS Agent and GoS Manager gives network operators both visibility AND control of all traffic, right down to the end user device. This enables network operators to monitor and enforce policies effectively for their own services and as a service to third parties.

### Benefits

By deploying GoS Agent and GoS Manager to complement and extend the policy framework, network operators are able to:

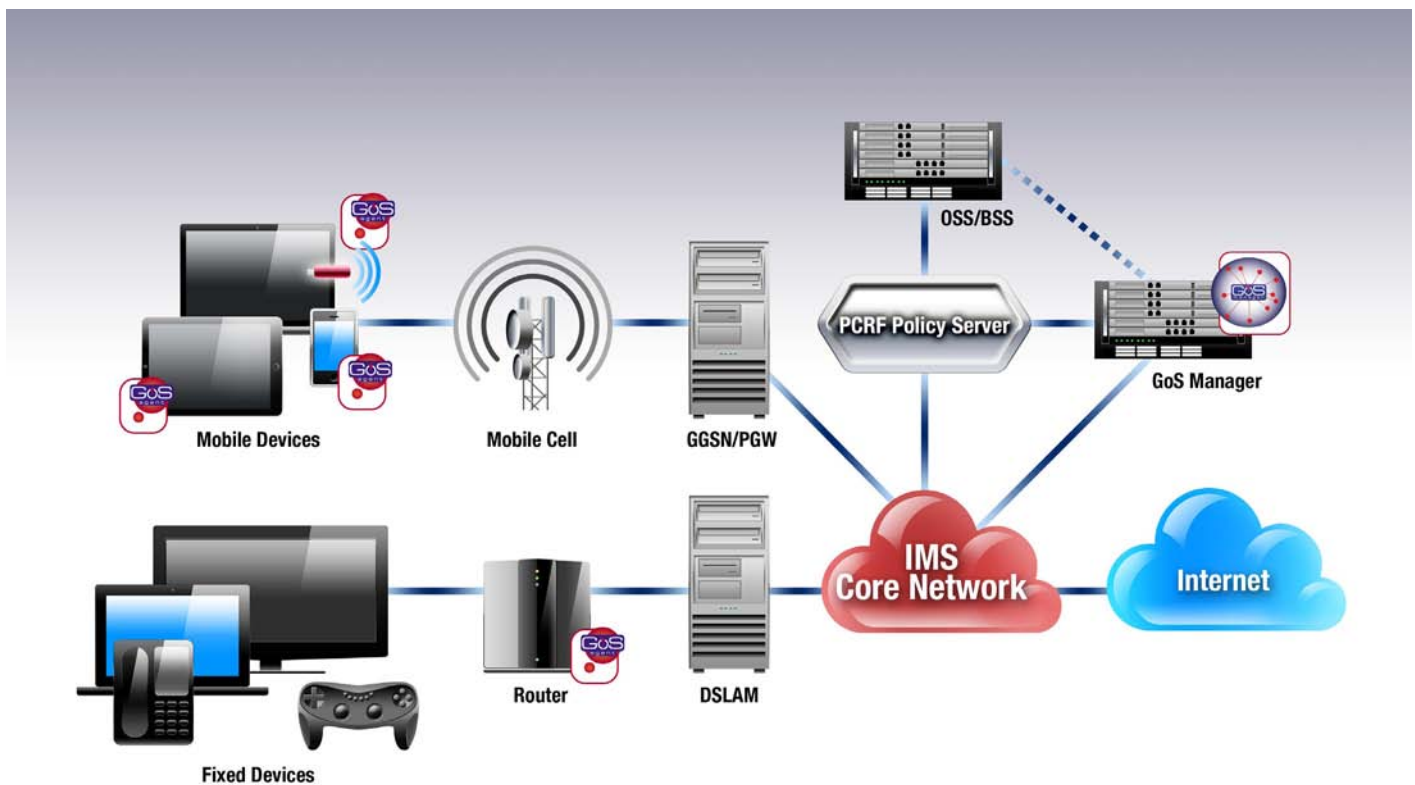
- Create differentiated policies that can be enforced in client devices
- Identify, protect and prioritise preferred user traffic
- Control upstream, user generated traffic, ensuring revenue-generating applications perform as expected
- Innovate new service offers based on visibility and control of user traffic
- Deliver services to specific devices on the customer LAN
- Ensure embedded applications perform as expected
- Reduce costs through efficient network optimisation and management
- Generate revenue with assured, sticky services

GoS 360° provides the only means by which dynamic policy decisions can be made and enforced at client devices.

## Policy 2.0: Application-Centric Policies

### Examples

- Video / VoIP clients in mobile portals for social networking
- Application identification
- IPTV delivery to Set-Top-Box
- Gaming
- Device identification and discovery



**Figure 5** GoS 360° in Policy 2.0 Applications.

## Cloud Services

### Challenge

The momentum behind cloud services is continuing to build. But as more and more services are delivered from the cloud, the challenge of delivering a consistent user experience across multiple devices has grown. Subscribers to cloud services expect them to perform consistently in fixed and mobile domains and will quickly churn from services that don't meet these expectations.

Subscription services will be supported by SLAs, which need to be monitored and enforced by providers. Many applications have low latency characteristics and real-time services will increasingly be delivered from the cloud. These will compete for the same bandwidth and resources as non real-time services.

To deliver successful, profitable cloud services, network operators must be able to ensure SLA requirements are met and that they can meet demanding performance criteria for more complex or real-time services.

### Solution

Network operators can ensure secure, reliable delivery of complex cloud-based services by deploying GoS Agent at client premises and GoS Manager in the network (see Figure 6). GoS Manager acts as a performance monitor for all connected GoS Agents, ensuring accurate, real-time information of application performance to client devices is available. Network operators can respond to the data by controlling individual sessions via the embedded GoS Agents.

### Benefits

By deploying GoS 360° Agents and Manager, network operators can:

- Introduce service assurance for subscribers
- Offer managed, secured service performance for OTT cloud network operators
- Monitor and control upstream traffic
- Enable consistent performance of cloud service across multiple devices
- Reduce costs through efficient network optimisation and management
- Generate revenue with assured, sticky services

GoS 360° is the only solution that delivers a consistent, predictable user of cloud services experience across multiple devices.

## Cloud Services

### Examples

- Hosted VoIP
- Hosted collaboration and sharing
- Hosted CRM
- Cloud-based video and audio conferencing

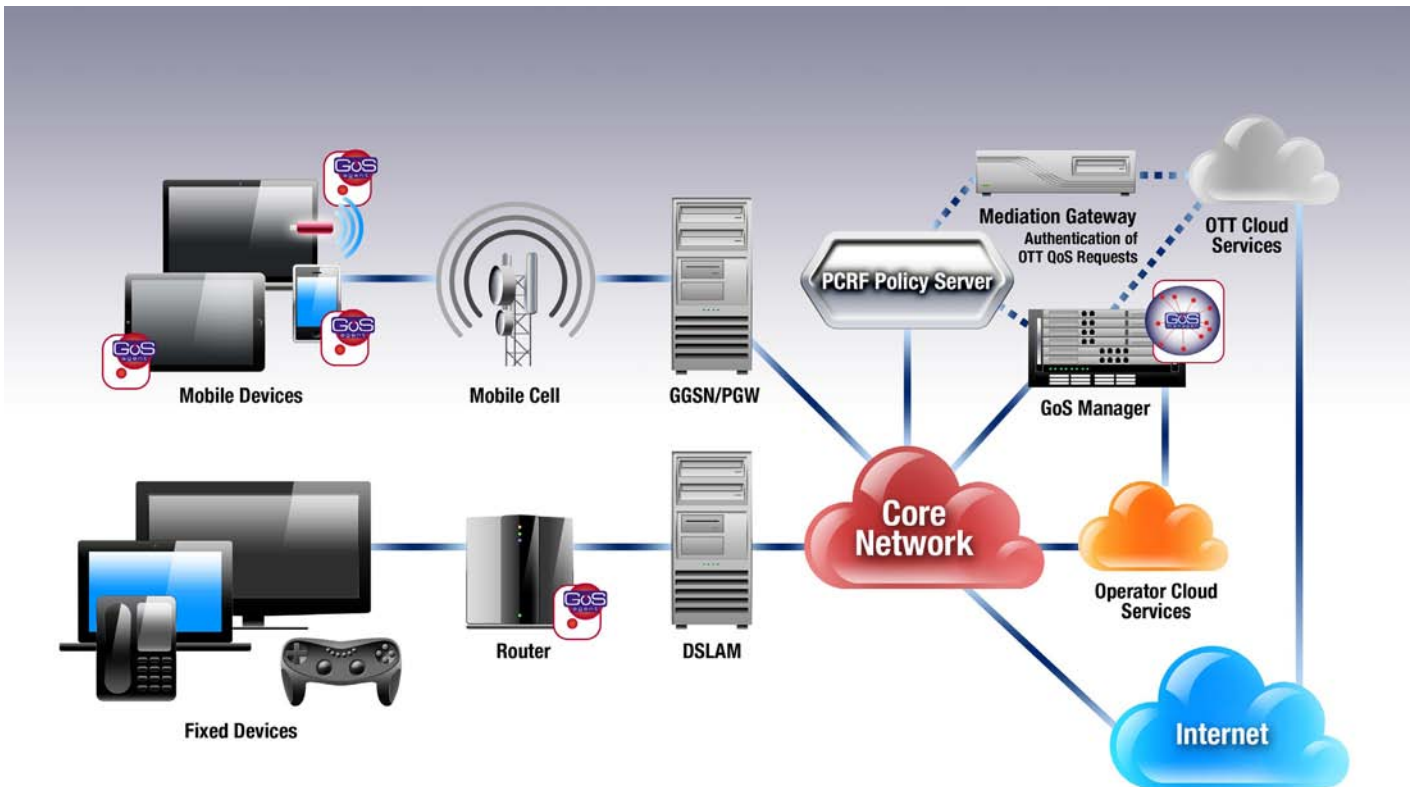


Figure 6 GoS 360° for Cloud Services.

## M2M

### Challenge

M2M communications generate significant volumes of data traffic. This is expected to grow dramatically in the coming years. Much of this data is non-critical and not real-time, but, amongst this, there is also data that does have real-time requirements. Network operators need to be able to aggregate M2M traffic and prioritise that which is real-time. M2M traffic also needs to be protected from other data streams on shared links.

This problem is compounded in areas of variable mobile coverage. Real-time M2M data from mobile sources must also be secured and protected against contention with other data streams, particularly when there are constraints on bandwidth or variable transmission quality.

### Solution

The solution is to deploy GoS Agent in M2M gateways, to perform prioritisation of traffic before it is transmitted to the network (see Figure 7). With GoS Manager installed in the network, each in-service gateway can be managed individually to ensure consistent, reliable transmission of real-time M2M data streams.

### Benefits

Enhancing M2M gateways with GoS Agent and deploying GoS Manager enables network operators to:

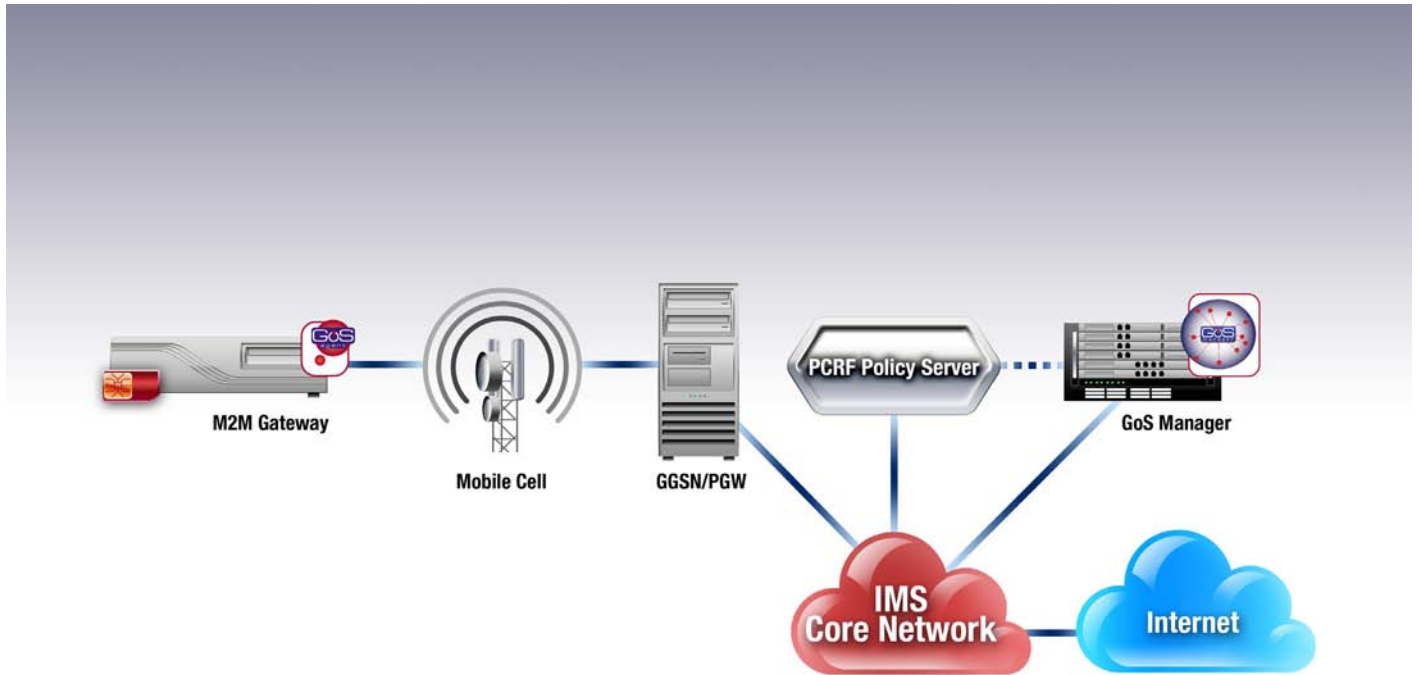
- Protect revenue generating services
- Reduce service assurance costs
- Increase service profitability
- Run M2M services across shared links with guaranteed quality
- Reduce costs through efficient network optimisation and management
- Generate revenue with assured, sticky services

GoS 360° provides the only way in which network operators can accurately prioritise real-time M2M traffic at source, before it traverses the network.

### Examples

- In-vehicle services
- Alarms, security and surveillance
- Remote video monitoring

## M2M



**Figure 7** GoS 360° in M2M Gateways.

## Glossary

2G	Second Generation Mobile Radio Technology, e.g. GSM
3G	Third Generation Mobile Radio Technology, e.g. UMTS
CPE	Customer Premise Equipment
CSFB	Circuit Switched Fallback
DSLAM	Digital Subscriber Line Access Multiplexer
GGSN	Gateway GPRS Support Node
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications, formerly Groupe Spécial Mobile
IMS	IP Multi Media Subsystem
IP	Internet Protocol
LTE	Long Term Evolution
M2M	Machine to Machine
MNO	Mobile Network Operator
OTT	Over the Top
PCRF	Policy and Charging Rules Function
PGW	Packet Data Network Gateway
QoS	Quality of Service
SGW	Serving Gateway
SLA	Service Level Agreement
UMTS	Universal Mobile Telecommunications System
VoLTE	Voice over LTE
WiFi AP	WiFi Access Point