

Cellusys[®]

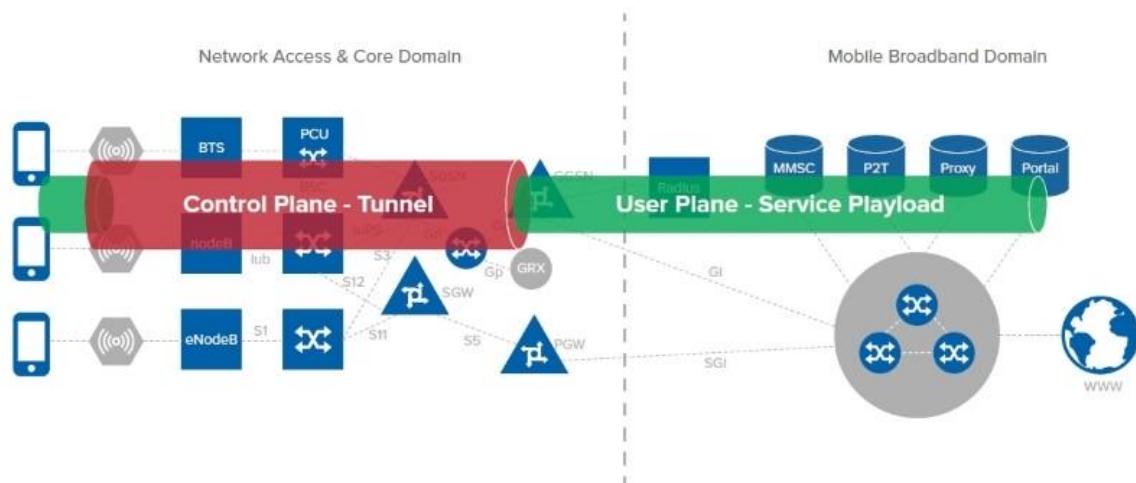


Mobile Broadband

Customer Experience and Service Monitoring

Measuring Service Delivery & Usage

Cellusys Mobile Broadband is a Service Payload Analyzer that provides real-time answers about what subscribers do with broadband data. It is unique in that it illuminates the User Plane, providing full access to transaction details for each individual subscriber for wireless broadband data service accessed through your network. DPI (Deep Packet Inspection) technology and Extended Analytics are used to further classify those applications and services that are using encryption, non-standard protocols or others to avoid detection at the operator's firewall.



Monitor Subscriber Behavior & Preferences

Proactive intelligent service monitoring of the user plane enables analysis of exactly which subscribers are accessing what services from where, providing comprehensive insight as to how subscribers are using your services.

DPI Deep Packet Inspection

With DPI capability, the details of all the applications used are detected and classified providing full details of which services are consuming the most bandwidth, especially services and applications using encryption, non-standard protocols or other methods to avoid detection at the operator's firewall. Cellusys Mobile Broadband gets to the root of customer experience by showing, for example, exactly how your most valuable customers use your services.

Rank Service Usage to Optimize Service Offerings

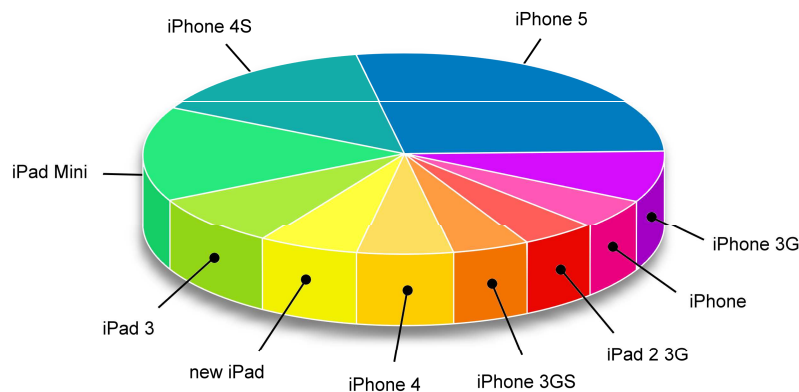
When fine-tuning your packet network and data service platform resources, detailed service usage ranking and analysis results are crucial. Cellusys Mobile Broadband provides the following measurements with unique subscribers over time:

- Ranking of accessed HTTP/WAP page hits
- Access delay statistics for these pages
- From which cell and region, including error rates, response delay times and more

Mobile Device - End Terminal Profiling

Data Session performance is often degraded by faulty end-terminal configuration or new software version of the respective mobile device. Cellusys Mobile Broadband provides answers to help identify the source:

- What is the ranking and distribution of end-terminal types used by subscribers?
- Which device types are most likely to perform poorly in terms of accessing certain data services?



Daily User Error Distribution Count

Pinpoint Service Issues & Respond Pro-actively

Monitoring network signaling information will tell you if a connection was established, but all activity in the tunnel between the mobile end-terminal and the services platform remains a mystery – unless you monitor user activities at the User plane level.

With Mobile Broadband, you can immediately respond to complaints about data services by retrieving a full and detailed account of the subscriber's activities, further imparting to the customer a strong sense of highly prioritized, direct and comprehensive support in restoring data services:

- HTTP or WAP page access
- MMS upload and/or download
- FTP, VoIP and VoD sessions
- Throughput per context or network site
- Session Abort causes/Download Abort detection
- Alarms

Visualize Customer Experience

Graphical Representation of Service Delivery

As individual subscribers each have different service expectations and perceptions, quantifying customer experience is difficult at best. So, how do you know what subscribers actually experience when accessing services through the network? After all, user content and fast communications are the only reason users will pay for data services! You need to know about service availability, configuration, usage and throughput issues directly impacting customer experience of wireless broadband data services.

Monitoring the user plane helps determine exactly why a wireless data service (e.g. email or access to the Blackberry server) is not working, or which mobile device types have poor performance. Cellusys Mobile Broadband not only monitors the user plane, it also provides real-time web-based graphical reports and statistics for all mobile broadband services.

- Quickly determine if 100 faults are affecting one subscriber - or if one fault is hurting 100!
- Subscriber Satisfaction Ratio KPI: the ratio of service affected customers related to the total number of unique subscribers in a specific time interval
- DPI and Extended Subscriber Analytics are application modules that classify all detected services accessed through mobile broadband. This information is recorded in each CDR for reporting KPIs per accessed service or URL, and to understand the mobile broadband customer behavior
- See the network impact of specific mobile devices
- Optimize traffic flow and reduce bandwidth costs

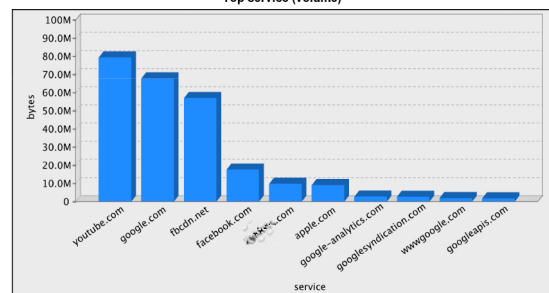
Payload Data to Evaluate Customer Experience

As a key driver to ultimate business success, customers experience needs to be managed properly. In the telecom industry, this means evaluating the quality of service provided in order to gauge ultimate satisfaction.

Top service (volume)

Nr	Label	Category	Count	%
1.	service	youtube.com	79.4M	6.057
2.	service	google.com	67.9M	5.177
3.	service	fbcdn.net	57.0M	4.350
4.	service	facebook.com	17.6M	1.345
5.	service	apple.com	9.8M	0.747
6.	service	apple.com	9.06M	0.691
7.	service	google-analytics.com	2.77M	0.211
8.	service	googlesyndication.com	2.69M	0.205
9.	service	www.google.com	2.00M	0.153
10.	service	googleapis.com	1.75M	0.134

Top service (volume)



Managing Traffic Generation Types

By distinguishing between GPRS/EDGE and LTE/3G influx traffic, Cellusys Mobile Broadband helps you to manage the types and quality of data processed to help you focus on the higher-valued data your subscriber's access.

Intelligent Monitoring

In today's telecom market, full coverage and data analysis is simply cost-prohibitive. Use Cellusys Mobile Broadband to focus on the data you really require, the payload data, and visualize end-to-end customer experience as perceived by your subscribers.

The system provides a fast analysis of the overall subscriber satisfaction with the mobile broadband data service. Report views include the SSR (Subscriber Satisfaction Ratio). This KPI is calculated per VIP group, network cell, mobile device, roaming customers and service accessed.

Key to Understanding Service Expectations

Usage Payload to Optimize Network Resources

With growing network service complexity, the cost of assuring services is climbing constantly, compounded by the fact that ever-increasing number of services and their bandwidth consumed are cutting into service providers' revenues.

Business Intelligence

DPI technology and Extended Subscriber Analytics (ESA) also provide the classification of the low revenue services that are consuming high network bandwidth in peak traffic times.

Building this business intelligence provides valuable input for your Policy Management and bandwidth optimization measures.

Understand Service Usage & New Service Entrants

Cellusys Mobile Broadband significantly helps operators to understand the IP service usage of their customers and how new smart-phone entrants like iPhones, Blackberries and Samsung change the landscape of service usage. It further assists them to recognize customer needs for respective network, services and bandwidth design challenges.

- Full content analysis for any GBit/s throughput
- DPI and Extended Subscriber Analytics
- 2.5/3G/LTE enabled on data service network links
- User-definable relative alarms, such as success and error rates, usage, etc.
- Drill-down to service, network, terminal or subscriber details Analyze KPIs over customizable axis including time, network, services, customers, etc.
- Many different statistical reports at different aggregation levels (e.g. MMS, HTTP, FTP, SMTP, WAP, PoC, Radius, Email, VoIP)

Cellusys^o

Cellusys founded in 2004 is a privately held company, based in Dublin, Ireland. It provides leading edge solutions for mobile networks including comprehensive Data Solutions, Security Solutions and Roaming Management Solutions.



Dublin, Ireland

- Research & Development
- Signalling Solution & Circuit Switched Engineering



Berlin, Germany

- Research & Development
- Mobile Broadband & Pocket Switched Solutions Engineering



Bangkok, Thailand

- Sale & Technical Support Asia Pacific



Atlanta, USA

- Sales & Technical Presales



Dubai, UAE

- Sales & Technical Presales