

CALLIS MULTIMEDIA DELIVERY PLATFORM



The constant increase in Internet traffic, combined with the trends towards most popular content type consumed by subscribers (video and file downloads), face the Internet Service Providers with questions which couldn't be answered effectively until now:

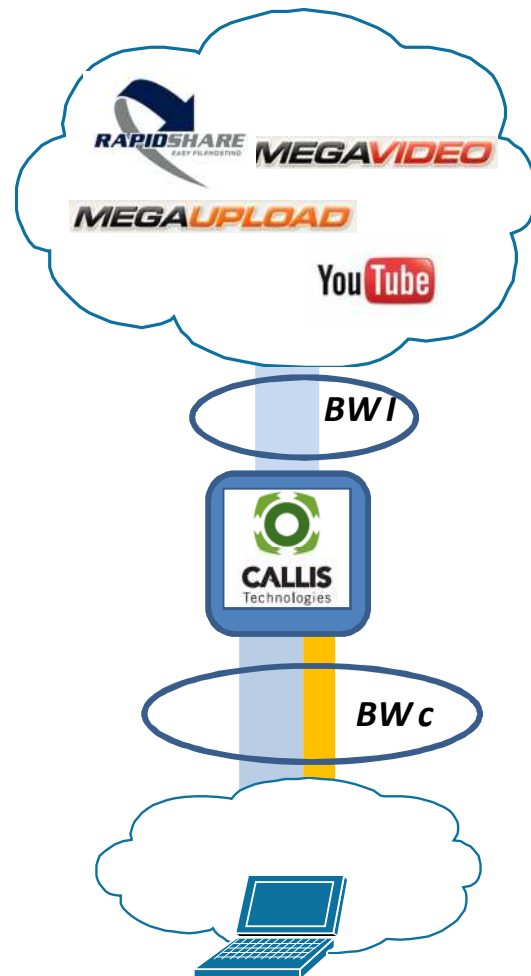
- Can the User Experience be enhanced when accessing major interest content, without increasing bandwidth and network resources costs?
- Is it possible to show users the convenience of subscribing to "Premium" packages, therefore making it possible to increase the Average Revenue per User (ARPU)?
- Could costly investments in network resources be delayed or canceled, while optimizing the User Experience?

Callis Multimedia Delivery Platform is the right answer to all of these questions.

CALLIS MULTIMEDIA DELIVERY PLATFORM

With Callis Multimedia Delivery Platform, most of popular content is placed close to the customer, allowing the Service Providers to deliver such content at the maximum speed allowed by their access network.

Using advanced and parametric algorithms that take into account subscriber's content usage tendencies and user behavior, Callis Multimedia Platform determines, in real time, what is the most popular content in the network and saves it on the platform. When the rest of the users require it, such content doesn't have to be transported from the



origin server. Instead, it is delivered immediately to the customer, at access speed.

This way, a video downloaded from services such as YouTube, multimedia content from an online newspaper or a file downloaded from a repository such as Megapupload, Rapidshare, Megavideo or Windows Update, will be downloaded immediately, taking the user experience to new levels of satisfaction, while expensive internet access is not used when is not necessary.

BANDWIDTH SAVING

When a customer views certain content of interest, Callis Multimedia Delivery Platform saves it locally in the platform so that next time it is required by another customer it can

be delivered without having to be downloaded from its origin again.

Internet bandwidth can be reduced considerably due to the fact that this kind of content is formed by several files of considerable size (many times tens or hundreds of Mbytes). User behavior regarding popular content usage, together with the traffic volume involved, assures that the platform generates easily about 30% additional “Virtual Bandwidth” over the real Internet bandwidth link.

By itself, this assures an excellent Return over Investment (ROI) when the Callis Multimedia Delivery Platform is integrated into the Network.

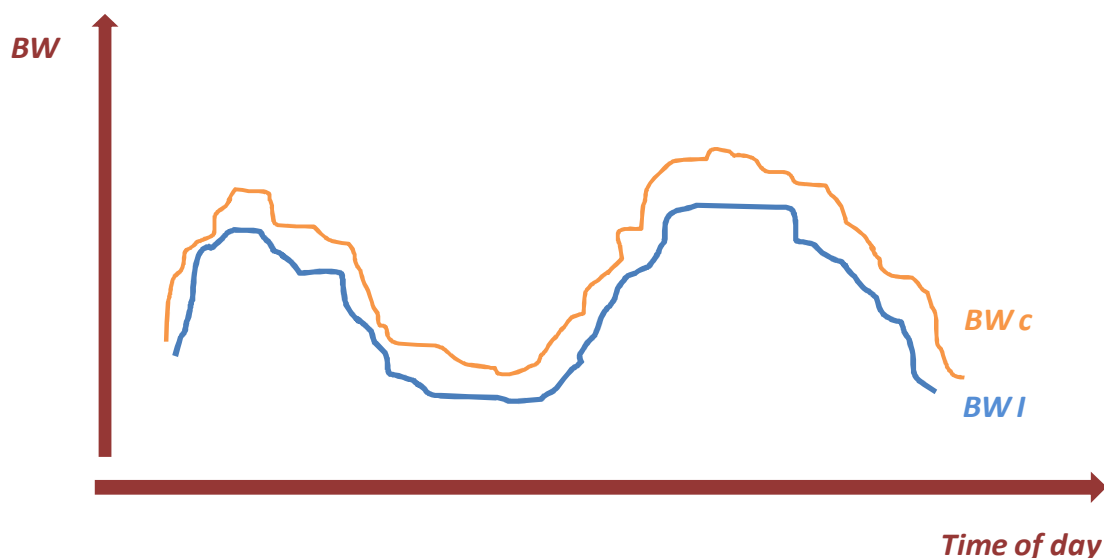
The virtually generated bandwidth, as perceived by customers, (which was not bought from an Internet access provider) and the consequent cost saving can be measured periodically.

$$BW_g [\%] = \frac{BW_c - BW_I}{BW_I} \times 100$$

Where:

BW_g= % of bandwidth virtually generated by the platform

BW_c= total bandwidth delivered to the users



BW I= bandwidth taken from the Internet.

IMPROVED USER EXPERIENCE

With the Callis Multimedia Delivery Platform, content is delivered to the final user at the maximum access speed the Network can handle.

Long waits to view a video or download a large file disappear, since the required content doesn't have to be downloaded from its origin.

Besides the immediate and visible improvement in customer's quality of experience, the fast delivery of content also helps decreasing congestion in upstream and downstream traffic interfaces within the access network.

NEW BUSINESS MODELS

The end customer's Internet experience is formed by various factors, many of which are beyond the Service Provider's reach. Variables such as congested links outside the network's limits, or overloaded origin content servers conceal the efforts made to provide a differentiated quality of service according to each commercial plan. In consequence, the benefits of hiring a "Premium" service (which

would generate a better income equation - ARPU) are hidden from customers.

Thanks to Callis Multimedia Delivery Platform, each customer receives the quality of service they pay for.

On the other hand, "Premium" content can be pre-positioned in the platform and delivered to these customers first, allowing a new source of income for the ISP, by offering new services to the content owners.

TRANSPARENCY

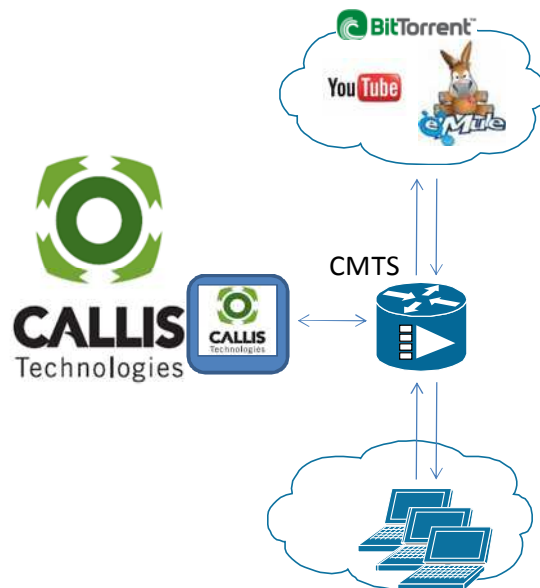
One of the main characteristics of the Callis Multimedia Delivery Platform is the way it behaves in the Network: neither the final user nor the producers of the content are aware of its presence. The only thing that is noticeable is a better service experience.

The platform is completely "transparent" and complies with all the necessary requisites to not interfere with any commercial tools used over the Internet (publicity, user authentication, measurements, etc.) and not infringe any laws regarding author's rights:

- It is invisible to both customers and content owners. Callis Multimedia Delivery Platform doesn't have an IP address, nor does it modify the transfer of packets through the Network.
- The platform only delivers the saved content if it is still available at its origin. For example, if a video or file was blocked or deleted at its origin for any reason, Callis Multimedia Delivery Platform will not deliver it to the customer, keeping complete coherence with current laws.

ARQUITECTURE, SCALABILITY AND HIGH AVAILABILITY

Callis Multimedia Delivery Platform has a highly scalable architecture, allowing an optimal implementation for every kind of customer: from small Networks with modest Internet connection capabilities to those with dozens of Gbps connectivity. By adding processors and/or storage resources, the solution scales in the most convenient way for



any kind of Network.

From a topological point of view, centralized or distributed Networks can be built.

The platform may be installed inline, or else traffic can be delivered to it by an appropriate network element (router, switch or DPI): in any case, not even a total failure of the platform (like an electrical power failure) would affect the Internet service. If any kind of problem appears, advanced control mechanisms activate a by-pass mode, making the problem unnoticeable for end customers.

CALLIS TECHNOLOGIES: A COMPLETE PRODUCT SUITE

Callis Technologies is a company oriented to build solutions that will benefit Service Providers, allowing them to face the business models of the new century.

Two other of Callis Technologies' products may be integrated with the Callis Multimedia Delivery Platform. In this way, creative and lucrative business models over the Network are available.

The Callis Traffic Congestion Manager and Callis Service Manager, combined with the Callis Multimedia Delivery Platform add maximum possible flexibility in managing the user experience, the possibility of delivering innovative and highly personalized services, increasing earnings while lowering costs related to acquisition and operation of the Network.

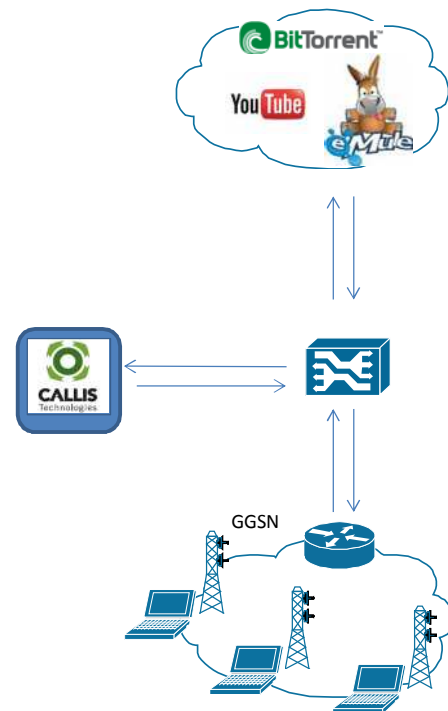
INTEGRATION WITH CALLIS TRAFFIC CONGESTION MANAGER

The Callis Traffic Congestion Manager (CTCM) platform is in charge of monitoring the Network resource usage in real time, detecting congestion points, and determining which users are causing the congestion in a specific interface.

A congested interface behaves in a chaotic way: packets are deleted regardless of any business rule. As result of this, a "Premium" user might have the same (or even worse) quality of service than a regular user.

Callis Congestion Traffic Manager's (CTCM) objective is to transform this chaotic behavior into a predictable one for the Network operator, so that business rules defined by the Service Provider are followed also during congestion periods.

Thus, when congestion is detected, access speed for specific customers can be reduced, or the bandwidth used by certain types of applications for certain users or groups of users can be decreased in order to mitigate interface congestion.



INTEGRATION WITH CALLIS SERVICE MANAGER

The Callis Service Manager (CSM) product is an advanced Policy and Charging Solution for fixed and/or mobile Access Networks that includes functions such as a self-service portal for Network users and a server which allows offering pre-paid services. The CSM includes several characteristics, such as:

- Web portal for advanced self-service.
- Pre and Post-paid services (based on time or traffic volume, differentiated by application type).
- Creation of promotional plans, with the option to change plans at the end of the trial period.
- Advanced services such as Bandwidth on Demand (BoD) – Turbo button (differentiated by service type)
- Personalized subscriber usage statistics.

When the Callis Service Manager solution is used together with the Callis Traffic

Congestion Manager, the Network resource availability verification and/or the policing are done before the service is activated, assuring the quality of experience for the customer. This way, services such as Bandwidth on Demand (BoD – Turbo Button) can be assured, obtaining the maximum possible quality.

HELPING MAKE DECISIONS

With the statistical information provided by the Callis Multimedia Delivery Platform report console (which may include information provided by other of Callis Technologies' platforms), the operator may easily view which are the Network usage tendencies, the most visited sites, the Bandwidth consumption by user, % of virtually saved Bandwidth, how traffic is modeled to maintain the interfaces at predefined usage levels, etc..

The patterns delivered by the Network usage analysis allow the operator to make the right decisions regarding which resources need to be upgraded and which can continue delivering a high quality service.

The network access equipment utilization is maximized this way, optimizing operational and network growth expenses.



Callis Technologies is a Cisco Developer Partner, with main focus in the development of products that improve Telco and Service Providers profitability, by allowing them to optimize resources and to build innovative business models for the new century. Callis Technologies' solutions are the link between the commercial needs of the service providers and the power of Cisco Systems' products.

With a heritage of more than 30 years as a solutions provider for the networking & telecommunications markets, Callis Technologies is a privately owned company founded in year 2007.

