Project Impact Fact Sheet

CONTENT VALUE CHAIN PROBLEMS

The majority of current Internet usage is for content access. However, the Internet continues to operate in a host-centric manner. This has caused two main problems:

1. Networks are unaware of the content they are transporting, and so are unable to provide preferential treatment, and,
2. Global content search and access are fragmented amongst many intermediaries.

These problems affect all the involved stakeholders in the content value chain:

- Small **Content Creators** (single users or small organizations) creating their own content, have to publish it through multiple intermediaries.
- **Content Providers** (e.g., YouTube, Facebook) are not able to provide QoS for content delivery over the Internet and are forced to degrade the quality of content.
- **Content Distributors** (e.g., Akamai, BitTorrent) cannot be aware of the network capabilities, traffic conditions, or the transmission requirements of the content.
- Proliferation of Internet content has led to inefficient utilisation of the existing network and server resources (e.g. increase in consumed BW), while **Network Operators** (e.g., AT&T, Telefonica) provide content delivery without guaranteed QoS support.
- **Content Consumers** do not have the option of accessing all available content of the Internet due to the abundance of intermediaries and the lack of a unified naming architecture, while the QoE offered is rather low.

THE COMET APPROACH

COMET proposes an approach for content access in the Future Internet architecture based on the concept of mediation. This mediation lies in the provision of a mediation plane between the world of content and the world of data transmission, by Network Operators.

This mediation plane is aware of content characteristics, network, server and routing conditions, and offers common interfaces for content publication and consumption, so that content is treated as a first-class citizen on the Internet.

Key technical advantages that can be achieved thanks to this mediation plane are:

- Unified access to the content independently of its nature and location.
- Content delivery with guaranteed QoS.
- Point-to-multipoint content delivery, reducing bandwidth needs for live content.
- Graceful handover of the content delivery path, providing more resilience and flexibility for multi-homed users.
- Advanced publication mechanisms, allowing Content Providers to update content servers on-the-fly, while switching among different ways of distribution.

EXPECTED BENEFITS

The COMET approach will benefit all stakeholders in the content value chain in multiple ways:

- Small **Content Creators** will benefit from lower entry barriers in terms of cost, being able to share their content without too much bandwidth costs thanks to the capability to exploit network multicast, peer to peer, server distribution, etc.
- **Content Providers** will benefit from content mediation and awareness, since content will be widely available, without search and access fragmentation limitations. Bandwidth requirements will also decline due to efficient caching/storage and different distribution schemes, such as point-to-multipoint. In addition to this, reliability and user reachability and QoE will increase due to more efficient content delivery services.
- The easier integration with Network Operators will be a major advantage for **Content Distributors**, while also being able to offer and distribute content with higher QoS.
- **Network Operators** will reduce infrastructure costs by efficient resource allocation, e.g., optimal content server selection and deployment at the domain edges. Busy-link offloading through network awareness is another feature that Network Operators can take advantage of and further reduce infrastructure extensions, e.g., bandwidth over-provisioning. Furthermore, efficient content delivery together with the appropriate business models will present Network Operators with the opportunity to provide new services that they cannot offer today.
- **Content Consumers** will experience higher QoE, in the form of improvement in data throughput, lower delivery delays, and increased security and reliability. In addition, content consumers' access to content will be defragmented and simplified.