MECaNO

Enabling efficient, decentralized media (post)production by developing the world's first wide area network (WAN) that guarantees 100% quality of service and in-time delivery of IP-media content

Media industry professionals increasingly have to work together at a distance. Animation movies, for instance, are typically being developed in a decentralized way – i.e. by several designers in parallel, often located miles apart. For this to work, an infrastructure is needed that allows them to share large amounts of video content easily, cost-effectively and rapidly (ideally even in real time) – over greater distances and with a guaranteed quality of service (QoS).

Wide area network (WAN) technology comes closest to answering those needs, but current WAN solutions still suffer from a number of shortcomings (such as distance, QoS and operational efficiency limitations). MECaNO addressed those shortcomings, resulting in the building blocks for the world's first WAN that guarantees 100% QoS. It uses the network's full capacity (with zero loss) and guarantees the delivery of IP-media content within deadlines, at any distance.

The cost-efficiency and flexibility of the Internet Protocol (IP) to connect devices and exchange data is being leveraged in an increasing number of industries. Yet, media companies' world of tight deadlines and their need for a guaranteed QoS makes IP's best-effort nature less suited for their specific needs. Thus, today they still use dedicated (expensive) leased lines or microwave technology to share content at a distance; or they resort to traditional, 20th century approaches – such as physically sharing video material via tapes and disks.

"In order to have media companies switch to more cost-effective IP-based WAN approaches to support decentralized video (post)production, a number of WAN's shortcomings needed to be addressed. That's what we achieved with MECaNO: we came up with the building blocks that allow for the creation of one big network which could extend to the whole of the Flemish creative media industry. As such, existing content owners, production companies and broadcasters could work together more efficiently and cost-effectively, while new players could more easily find new collaboration opportunities – thus fostering the whole industry's further growth." – Luc Andries, CTO of SDNsquare, and MECaNO's project lead.

THE OUTCOMES

1. The foundation for the world's first wide area network with 100% QoS and in-time delivery guarantees

A world's first, the MECaNO project consortium developed a patented WAN solution that accommodates traffic from various customers over the same WAN links, while achieving minimal latency and guaranteeing 100% QoS (using the network link's full capacity).

The demonstrator resulting from the MECaNO project shows how production and post-production activities (such as video editing) can be made much more efficient – with editors being able to work directly and in real-time on video files that remain stored at the content owner. Thus, the transfer of files via costly channels such as leased lines, or through inefficient (read: slow) means (such as tapes and disks) can be avoided.

2. New algorithms to operate wide area networks more efficiently and use their full capacity at all times

The MECaNO project also resulted in new algorithms to set up and operate WANs more efficiently – taking into account deadlines and potential network failures, and using that input to dynamically (re)configure the network so that its full capacity can be leveraged at all times.

3. A wide area network that is less dependent on distance limitations

The MECaNO research laid the foundation for another important breakthrough: the creation of WANs that are independent of the number of intermediary nodes. In the future, this might lead to the deployment of cross-country or even cross-continental WANs, facilitating cost-effective and easy data sharing on an even wider scale, and with even more potential contributors.

4. Techno-economic research quantifies cost-savings and identifies new collaboration opportunities

Using the technological innovations developed within MECaNO, media partners can collaborate on a single, coverged IP-network - using more cost-effective, off-the-shelf equipment and requiring less frequent network upgrades. The 100% QoS WAN furthermore allows for the centralization and sharing of expensive post-production equipment - increasing its utilization rate.

NEXT STEPS

Building on MECaNO, all components (both the network technologies and the optimization algorithms) are now available to support the creation of a unique wide area network for the Flemish creative media industry; The remaining barrier is the development and operation of the underlying fiber network - as currently leased lines are not available or not a viable option (in terms of cost) for most media companies.

Going forward, some of the research paths related to the MECaNO project continue to be explored by iMinds researchers – such as the creation of the hardware (chipsets) to accommodate cross-continental WANs.

In terms of future challenges for techno-economic research, the needs of smaller companies can be investigated as well - to evaluate their potential cost gains from joining the MECaNO network.

But even today's research results are making waves already on an international level, giving Flemish consortium partners such as SDNsquare some powerful insights and assets to explore international business opportunities.

FACTS

NAME	**MECaNO**
OBJECTIVE	Enabling efficient, decentralized media (post)production by developing the world's first wide area network (WAN) that guarantees 100% quality of service and in-time delivery of IP-media content
TECHNOLOGIES USED	WAN, IP, SDN^2-GRID, Lossless Ethernet, SCAP (Shared Content Addressing Protocol), Inter-Burst Segregation Protocol
TYPE	ICON project
DURATION	01/01/2014 – 31/12/2015
PROJECT LEAD	Luc Andries, SDNsquare
RESEARCH LEAD	Prof. dr. ir. Didier Colle, iMinds - IBCN - UGent
BUDGET	1,467,700 euro
PROJECT PARTNERS	Alcatel-Lucent, Limecraft, SDNsquare, Videohouse, VRT
IMINDS RESEARCH GROUPS	IBCN - UGent MOSAIC - UAntwerpen iMinds Technical Testing Center

WHAT IS AN
ICON PROJECT?

iMinds is the digital research center and business incubator for Flanders, Belgium. Its ICON research projects are agile and demand-driven, combining academia and industry partners. ICON projects typically have a duration of two years, yet quickly adapt to the rapidly-evolving digital landscape. ICON partners intend to use the project results in their products or services.

MECaNO project partners:

The MECaNO project was co-funded by iMinds, with project support from IWT.