

Project Results

Optimizing video access

Reducing unnecessary transfers from remote video and multimedia storage



The LINDO project developed an open system for reliable indexing and retrieval of specific objects in large distributed multimedia archives with remote selection and processing. Critical clips can be selected easily from thousands of hours of recordings. The system offers an integrated solution optimised for video over Internet, implementing a practical querying mechanism and standardised data formats.

There is continual growth in the volume of multimedia data from numerous activities, including personal videos and websites, medical files, TV news, video surveillance and company archives. Until now, access to specific clips has required transfer of massive amounts of bandwidth-hungry data files from local storage to central facilities for processing.

LINDO uses distributed storage and intelligence to limit unnecessary transfer of video and multimedia information, especially when the intention is to perform smart activity on the contents. This is crucial as telecom figures indicate transfers of video and multimedia data now account for over 50% of traffic and are forecast to grow to 75 or 80% in the near future.

TWO OPTIONS

There are two options for performing actions such as contents analysis or subject recognition on locally produced or stored video. It can either be sent to a central facility for processing or an analytical tool can be dispatched to the local node where

the information resides and only relevant data transferred back – a huge benefit in terms of the quantity of information that has to be transported.

LINDO focused on the second option. The result is that a high-end central processing facility is no longer required. The approach involves activating processing capabilities at the local nodes or, if the right tools are not installed at all relevant local nodes, setting up such tools as required to answer a query.

The principal objectives were to: optimise data flow by co-location of acquisition, storage and search functions, limiting data transfer to pertinent information with remote deletion of out-of-date archives; and improve archive exploitation through centrally monitored indexation at the input, assisting in exploitation and quality control.

WELL-STRUCTURED ARCHITECTURE

A key element was development of the necessary architecture. This is designed in such a way that even in a single node it is possible to have processing tools that run under Linux and Windows simultaneously on the same content all coordinated by a single central facility.

LINDO developed very strict and well-structured interface specifications for maximum flexibility, allowing the design of both generic and application-specific modules which in all cases are an integral part of this concept. Use of split modules ensures proper communications to accommodate different types of worlds.

LINDO

(ITEA 2 ~ 06011)

Partners

CEA-LIST
DENODO
INFOGLOBAL
IRIT
Katholieke Universiteit Leuven (KUL)
QUOTIUM (previously Hi-Stor Technologies)
SGT
Space Applications Services
SUPELEC
Telefónica I+D
Thales Security Solutions and Services

Countries involved

Belgium
France
Spain

Project start

November 2007

Project end

October 2010

Contact

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The innovation lays in mastering the communication between the modules – and agreement on a common data format.

Work on the data formats focused on the video-surveillance use case involved the French AFNOR standards organisation, supported by the French ministry of Interior. With similar global needs at the ISO level, the LINDO co-ordinator became the convener of ISO/TC 223/WG5. Its interoperability standard for video surveillance will probably be submitted in early 2011.

NUMEROUS APPLICATIONS

Applications are ubiquitous including:

- The broadcast and multimedia industry which produces information in very high quality requiring huge bandwidths. However, most of the time it is only necessary to know whether something is available and where it is for transfer for example to DVD;
- All archival organisations – including

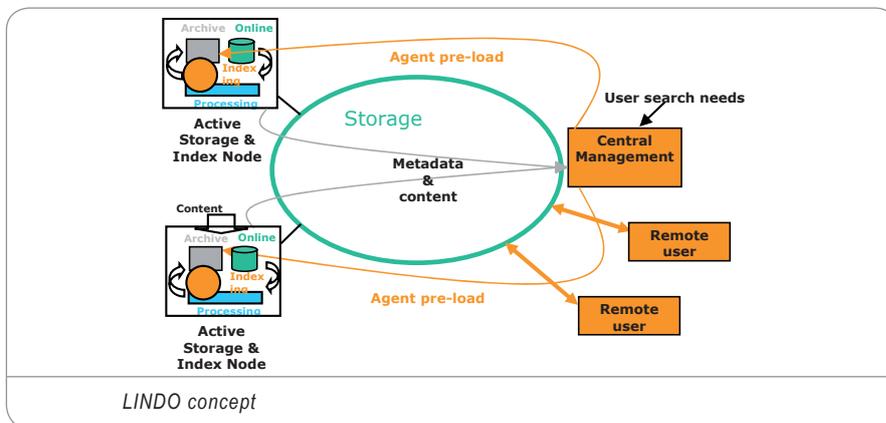
government agencies and large companies; and

- Video surveillance with large IP-based systems involving hundreds of cameras that generally store information locally.

There has also been active support in knowledge management for space applications. This involves Topics Maps which provides a model and grammar for representing the structure of information resources and the relationships between topics. LINDO implements Topic Maps in the querying process and as a representation of semantic metadata.

COMMERCIAL IMPLEMENTATION IN PROGRESS

Commercial implementation has already started. The flexibility of the architecture has enabled each partner to implement the results at modular level, like using commercial algorithms with storage nodes to locate relevant information where necessary.



Major project outcomes

DISSEMINATION

- Several tens of communications and articles around knowledge management

EXPLOITATION

- Exploitation has started as internal functionalities in smart storage nodes, like Thales' on-board systems for public transportation or voice-to-text indexing of news by SGT
- Full systems under consideration by transportation operators to retrieve events in on-board CCTV systems

STANDARDISATION

- LINDO has been instrumental in the development of ISO/TC223/WG5 (videosurveillance)
- LINDO contributed to Topic Maps (ISO/IEC 13250)

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