

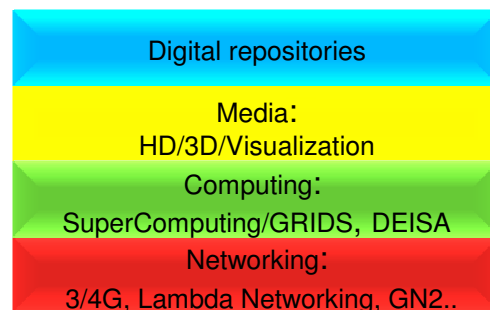
European-wide Infrastructure for Distributed HD Multimedia Content Management

New Drivers

- Rapid development in the area of multimedia technologies (2K,4k in particular) creates a set of **new requirements** in terms of:
 - Infrastructure (tera-scaling in terms of services and high traffic flows)
 - End-user access capabilities
 - Storage (with high speed file transfers in applications)
 - Video technology (equipment, codecs, applications)
 - Driven by commercial and research needs
 - Hardware and software tools and expertise for rapid development
 - Digital repositories (offering access to innovative services)
 - How network control planes adapt to such a new requirements?

- The need for a European wide Media e-Infrastructure for Future Research on Visualization and Media

European e-Infrastructures



A new Media and Visualization layer to offer experimental media services, that integrates the new digital interfaces

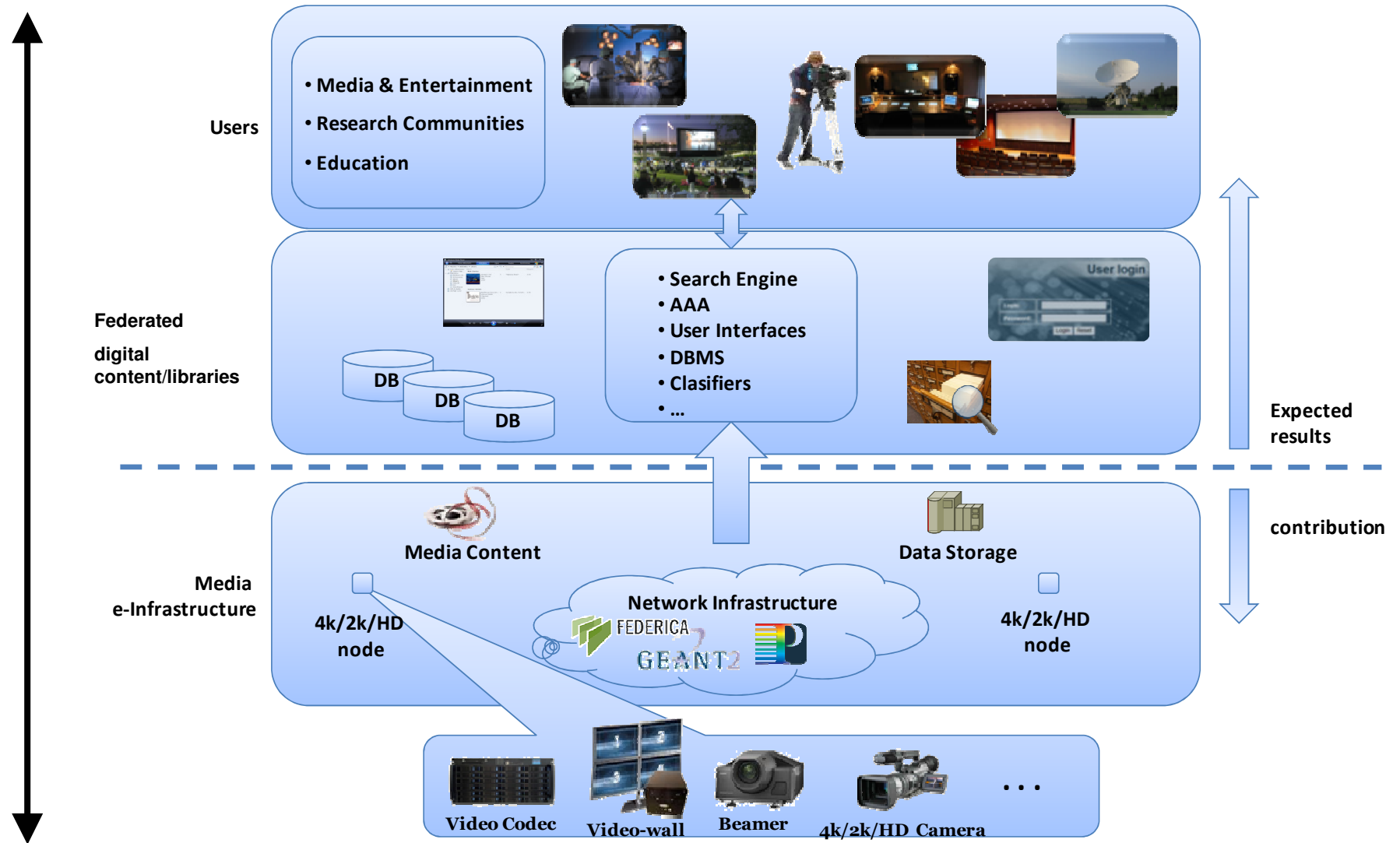
Needs

- Need of a network of centres of competence for **networked media** (HD/2k/4k Nodes)
- Develop European-wide Federated Multimedia Content Management and Distribution Infrastructure
 - Evaluate technological solutions for the implementation of the Media e-Infrastructure architecture for HDTV
- Evaluate and refine the content distribution and transmission techniques
 - The need for reference guidelines how to configure existing fibre networks to provide the necessary services
 - The size of the content files will require enormous capacity in European networks' physical and control layers
 - An environment to enable users to set up the media-network infrastructure under requests when needed
- Scalable storage repository - HD/Ultra-HD video distribution strategies across heterogeneous networks (Metadata description schemas (low-level technical))
- Semantic framework to describe services, storage, content and its connectivity to high speed transport networks
- High Quality Video - content upload & retrieval portal
 - metadata extraction and indexing, inter-domain protocols, distributed AAA, access&control and Transcoding
- Build a working demonstrator which utilizes HD/2K/4k cameras and content players, high bit rate fibre transmission networks and 4k displays
 - Experimental validation of the results of the project in distributed pan-European Media e-Infrastructure test-bed using EC results (i.e. PHOSPHORUS tools, ...)

Needs

- Compression, beyond JPEG2000
 - Real-time video quality estimation algorithms applied to HD and Ultra-HD compressed bit streams
 - Scalable video coding for both bit rate reduction and browsing. Digital Cinema files are large even compressed
- Multi-media content-based search
 - Metadata extraction, Finding the key frames, Search based on shape, colour, texture and motion
- Visualisation and quality assessment
 - High quality video cannot tolerate errors/distortions, Impact of packet loss on video quality, Video quality metrics
- A resolution-independent multimedia transmission platform
 - A platform able to capture/transmit/visualize 4K compressed and uncompressed multimedia content
 - Synchronization of 4 different 2K streams to construct a 4K one
- Adaptive, distributed video transcoding and incremental streaming for real-time and off-line
- Analyze and compare encoding and multiplex formats: assess performance and net requirements
- Content-aware optical service scheduling and reservation
 - Content aggregation and management at the network edges with protocols for high-bit rate content distribution
 - Content-based bandwidth allocation: Bandwidth provisioning (Video bit rate prediction, Statistical multiplexing, Modelling video for traffic generation)
- Multicasting and any casting protocols for video contents (e.g. photonics multicast - no O-E-O conversion)
- QoS for real time video streaming&multicasting of High Quality content (protocols, API's, mapping, allocation of photonic networks)

European-wide Networked Media Architecture



Need of a vertical approach