

**Future Media and 3D Internet Task Force
(FM3DI-TF)**

**Future Content Creation & Media
Delivery Considerations**

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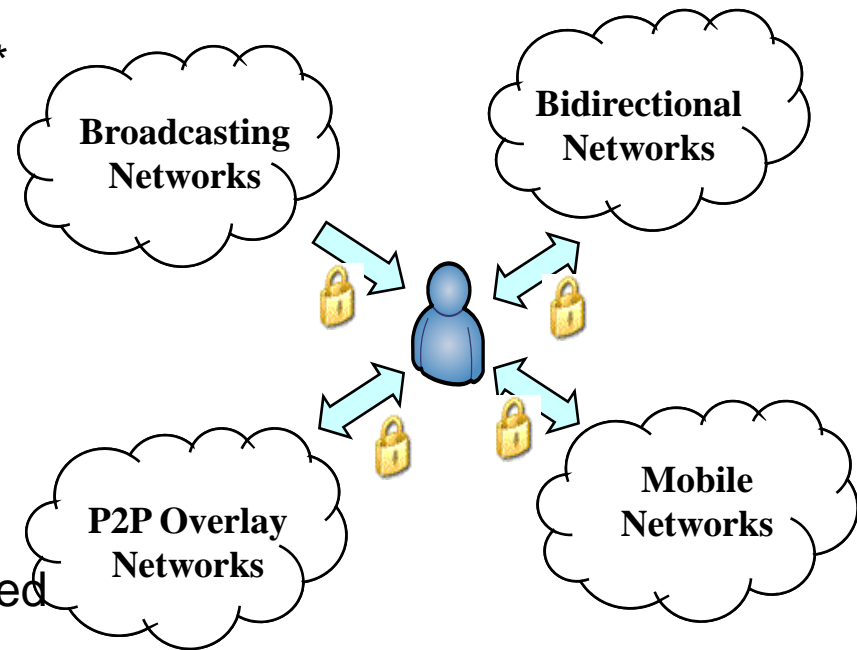
Networked Multimedia Content Today & Tomorrow

Today

- More than 100 million Internet users have downloaded at least one (multi)media file, and over 47 million of them do so regularly *
- Content: 160 Exabytes fuelled by users**

In the next few years

- Everyone will be
 - Content Producer/Provider
 - Content Mediator
 - Content Consumer
- Content: 990 Exabytes by 2012**
- Within 3 years, 70% of created and archived content expected to come from users
- New forms of media: 3D, holograms



*Source: www.instat.com

** SAPIR "Large Scale Multimedia Search & P2P"

Content Aware Networks/Edge Devices Today & Tomorrow

Today

- Content access (at no cost) is the dominant service in Internet.
- **Limited PQoE** in VoIP and VoD over IP.
- **Routing protocols (e.g. OSPF, BGP) have no knowledge** of which server is suitable for a particular content or how to route the content in order to improve the PQoS.

In the next few years

- **Streaming multimedia (IPTV, 3D TV and personalised VoD) with superior PQoE** will be the main future Internet service.
- **Content-aware networks** or at least **content-aware edge devices** are required, capable of tracking, managing and prioritizing the streams flowing through the edge of the network.
- Intelligent content-aware services, content discovery and content aware routing (without user or application level signalling) are additional key issues.
- Cross-Layer Control (CLC) and Dynamic content-aware adaptation (especially in P2P topologies) will face the network and terminal heterogeneity and take advantage of new (3D) coding schemes.

3D Media Technology

Today & Tomorrow

Today

- Only recently advances in **capturing, processing, displaying** and **networking** have turned 3D into a reality for the large majority of users.
- One of the major barriers: **3D scanning and modelling**. Depending on the geometry and the material characteristics of the object or scene, one technique may be much better suited than another.

In the next few years

- **Processing after capturing**??? E.g. improvements in automatic decimation, solving large 3D puzzles automatically, exploiting shapes in combination with texture information, semantic understanding of the data...
- Open architectures and technologies will be required for **searching, streaming, caching, filtering, aggregation** and **presentation of 3D content** with optimised PQoE and in-network content adaptation.
- P2P overlays in 3D content searching ????
- 3D Applications: 3D movies, virtual 3D worlds, 3D games,...

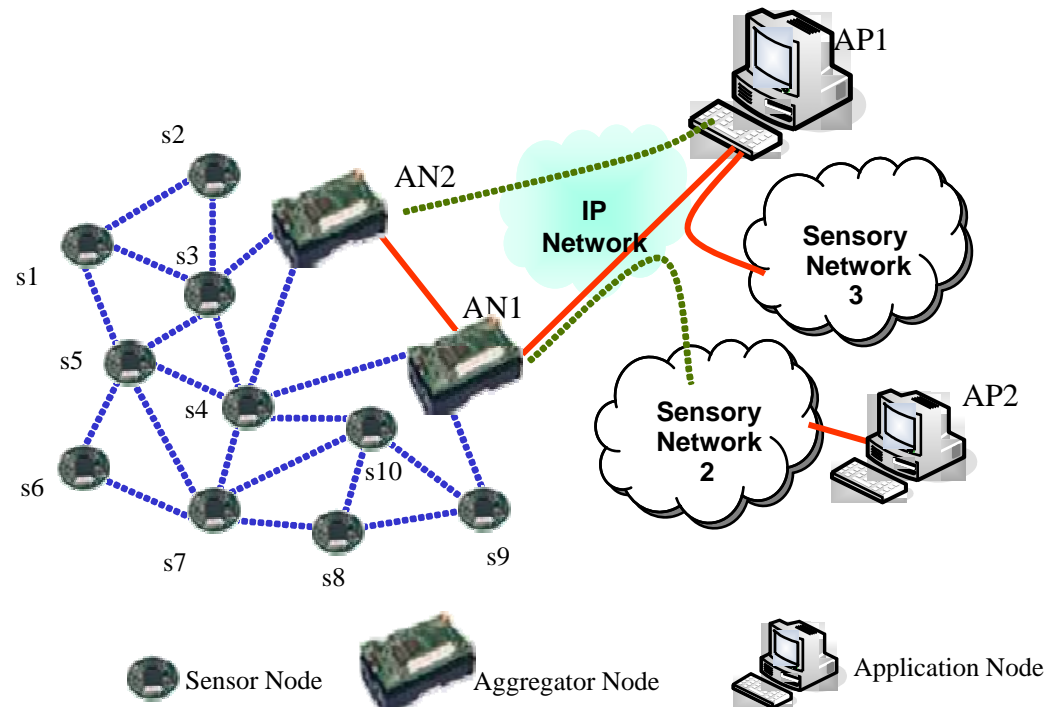
(not Multimedia) Networked Content Today & Tomorrow

Today

RFIDs and sensor applications have started to be deployed, but still in a rather isolated way due to physical limitations (power, packaging and processing).

In the next few years

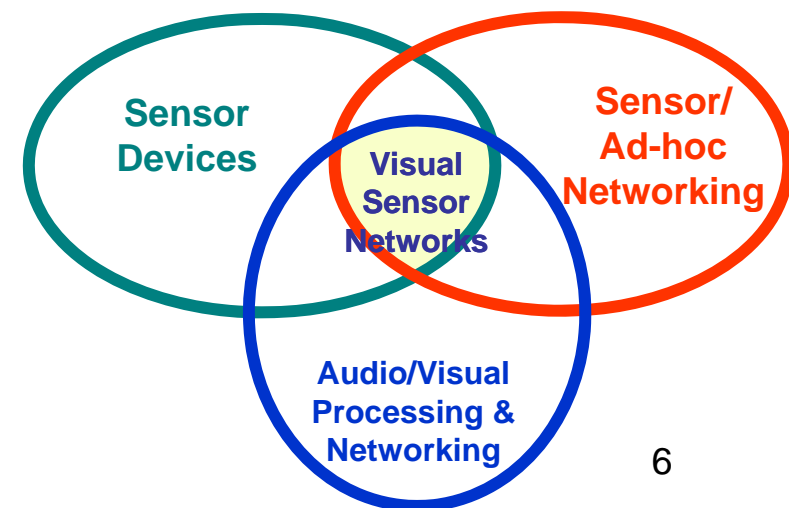
- Ride the “Moore’s law” curve down to ever-cheaper systems at fixed performance
- “Intelligent Dust”
- RFID tags and sensors embedded in objects



Visual Sensor Networks

....Tomorrow

- Typical Applications of Visual Sensor Networks (VSN)
 - **Surveillance** of facilities like buildings, homes, highways, airports, plants, stadiums.
 - **Monitoring** of inaccessible areas (e.g. environmental monitoring, toxic locations, etc.)
 - **Remote Control** combined with bi-directional communication and control messages (e.g. industrial robots, Unmanned (Aerial) Vehicles, deep space communications etc.)
 - **Creation of smart, interactive and immerse spaces** that use computer vision-based action to interpret what people are doing, and automatically provide feedback.
- Challenges in VSN
 - Multimedia capturing/processing/storing
 - Multimedia searching and retrieval
 - Multimedia streaming
 - Privacy, Security and Trust



Key Technological Challenges

- Adaptable content aware networks
- Richer Perceived Quality of Media anywhere- anytime
- Peer-to-Peer content retrieval and delivery/streaming
- Ultra HDTV – IP TV with Ultra High Quality
- 3D Media Internet
- Personalized intelligent (3D) Media for immersive experiences
- Virtual Communities –Virtual Presence - Holograms
- New Models of interaction – Visual sensations
- Visual Sensor Networking
- New Business Models

Deployment Scenarios (1/2)

- **Content Aware Networks and Dynamic Adaptation**
 - Open network architectures and technologies for seamless, converged and scalable multimedia content delivery
 - Multi-layered/Multi-viewed/Multi-Description content coding
 - P2P optimisation for content searching
 - P2P multi-source/multi-network content streaming
 - Media-to-network cross layer dynamic adaptation
 - Reduce start-up/modification/adjustment delays

- **3D Media Internet - Holograms**
 - Virtual 3D collaborative platforms
 - New 3D self-aware, self-adaptive content formats
 - Virtual 3D worlds
 - Mixing real with computer generated content
 - Efficient 3D content search
 - Holograms generation, retrieval, presentation

Deployment Scenarios (2/2)

- **New Methods of interactivity**
 - New multimodal interfaces and viewing/displaying methods for consumption of professional/user generated content
 - New methods that will enable natural communication between people (virtual presence - holograms)
 - Generating, extracting and associating of metadata to the content for optimised sharing, storage, retrieval and fusion.
 - Increased demand for personalisation and aggregation of services

- **Personalisation/Privacy/Trust/Right of User**
 - New Methods of personalisation/ personalised adaptation
 - User controlled identity management, ownership and trading of virtual digital objects
 - New payment methods and business models for commercialisation and trading of (virtual) digital objects
 - Mass market applications with open technologies.

Thank you



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