

# The Future of the Internet

## Security Cross Issues

From the Content Creation & Delivery Perspective

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# Content Creation & Media Delivery Perspective

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The Future Internet will provide...  
the means to share and distribute...  
(new) multimedia content and services with....  
superior quality and striking flexibility...  
in a **trusted** and personalized way...  
improving citizens' quality of life, working  
conditions, edutainment and safety

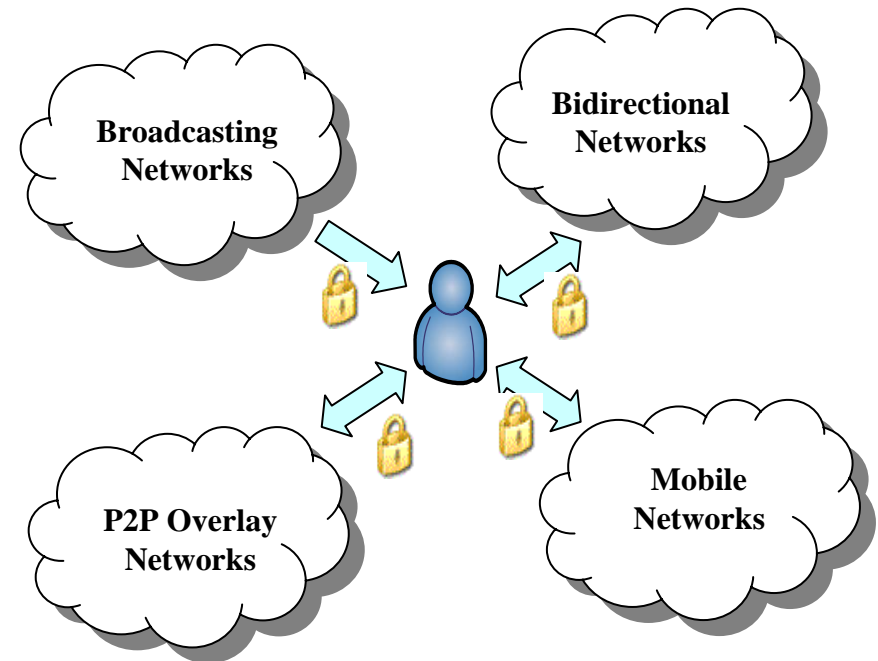
# Multimedia Content and the Internet

## 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



\*Source: [www.instat.com](http://www.instat.com)

\*\* SAPIR "Large Scale Multimedia Search & P2P"

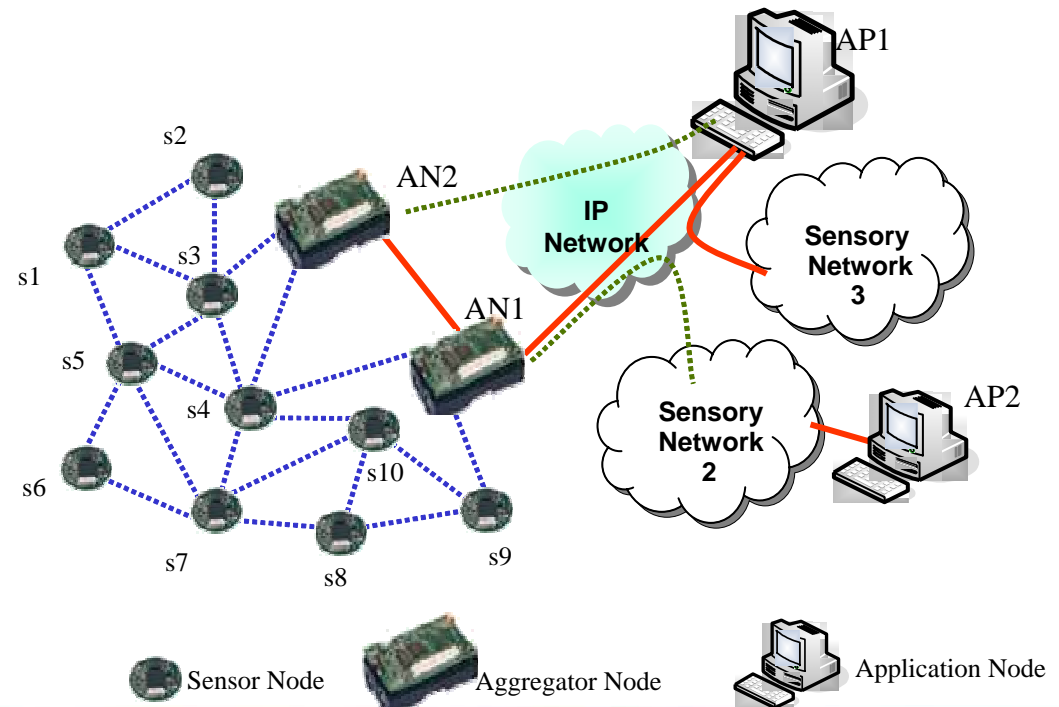
# The “Internet of Things” Perspective

## 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

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



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Perspectives emerging from R&D in Europe



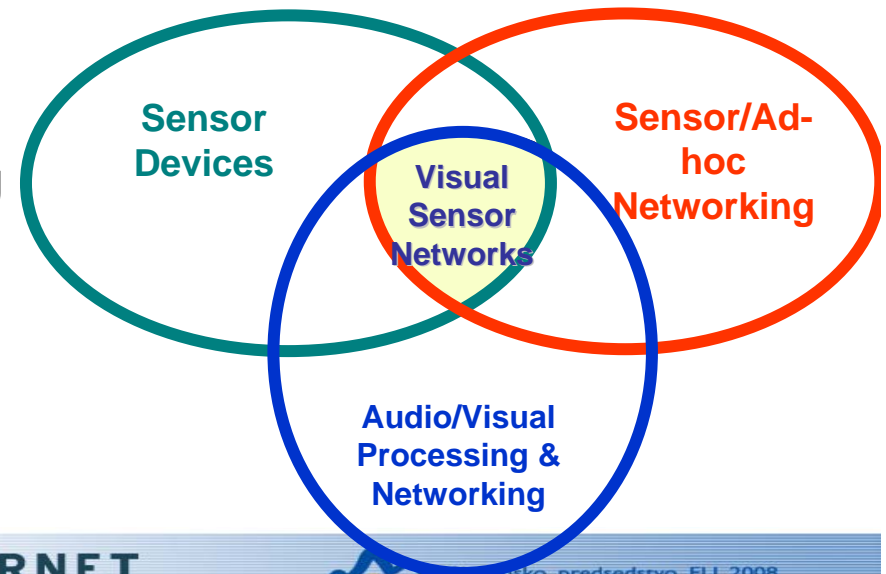
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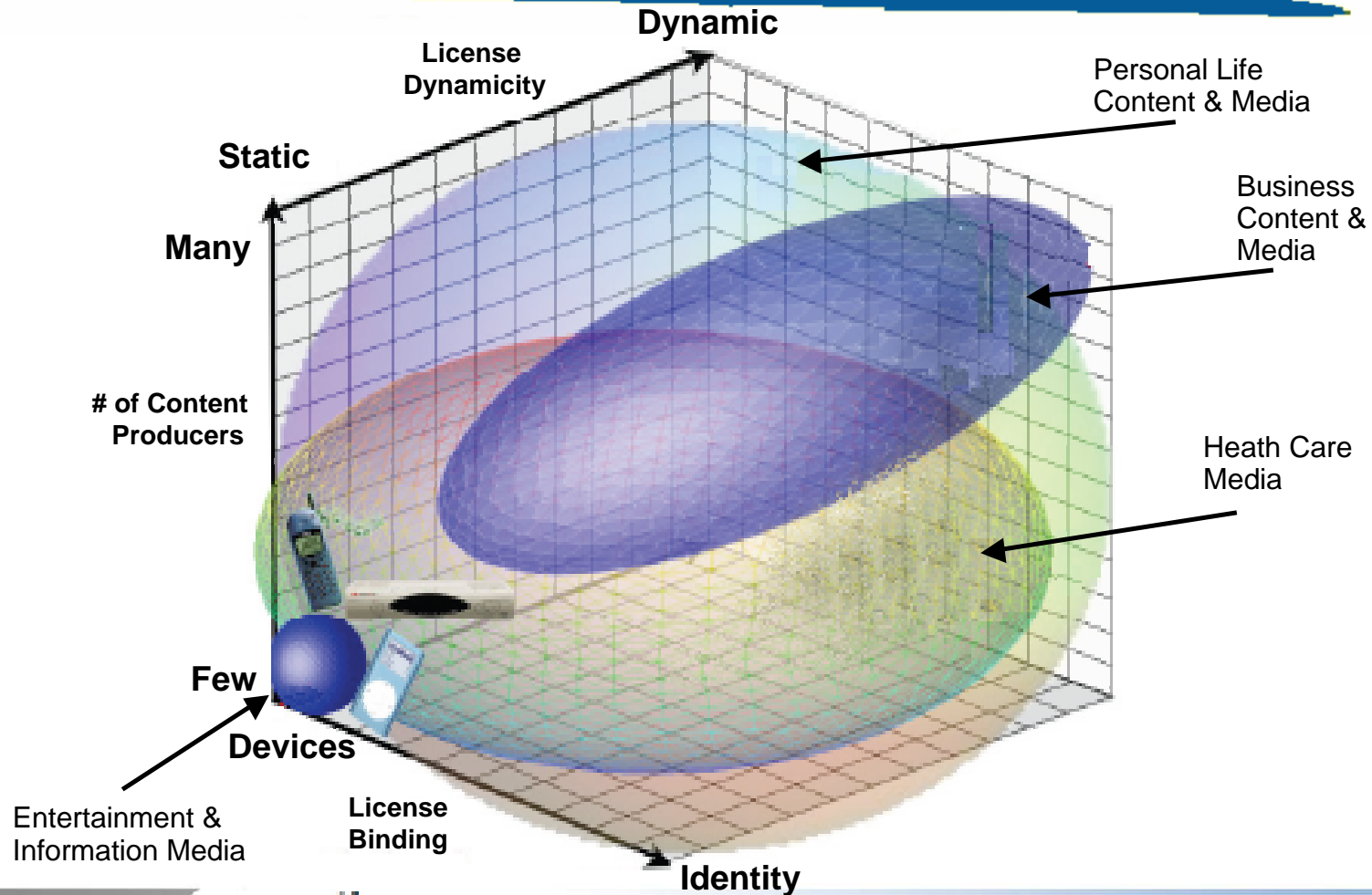
# Visual/Multimedia Sensor Networks

- Typical Applications of Virtual Sensor Networks
  - **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



# Content Grouping



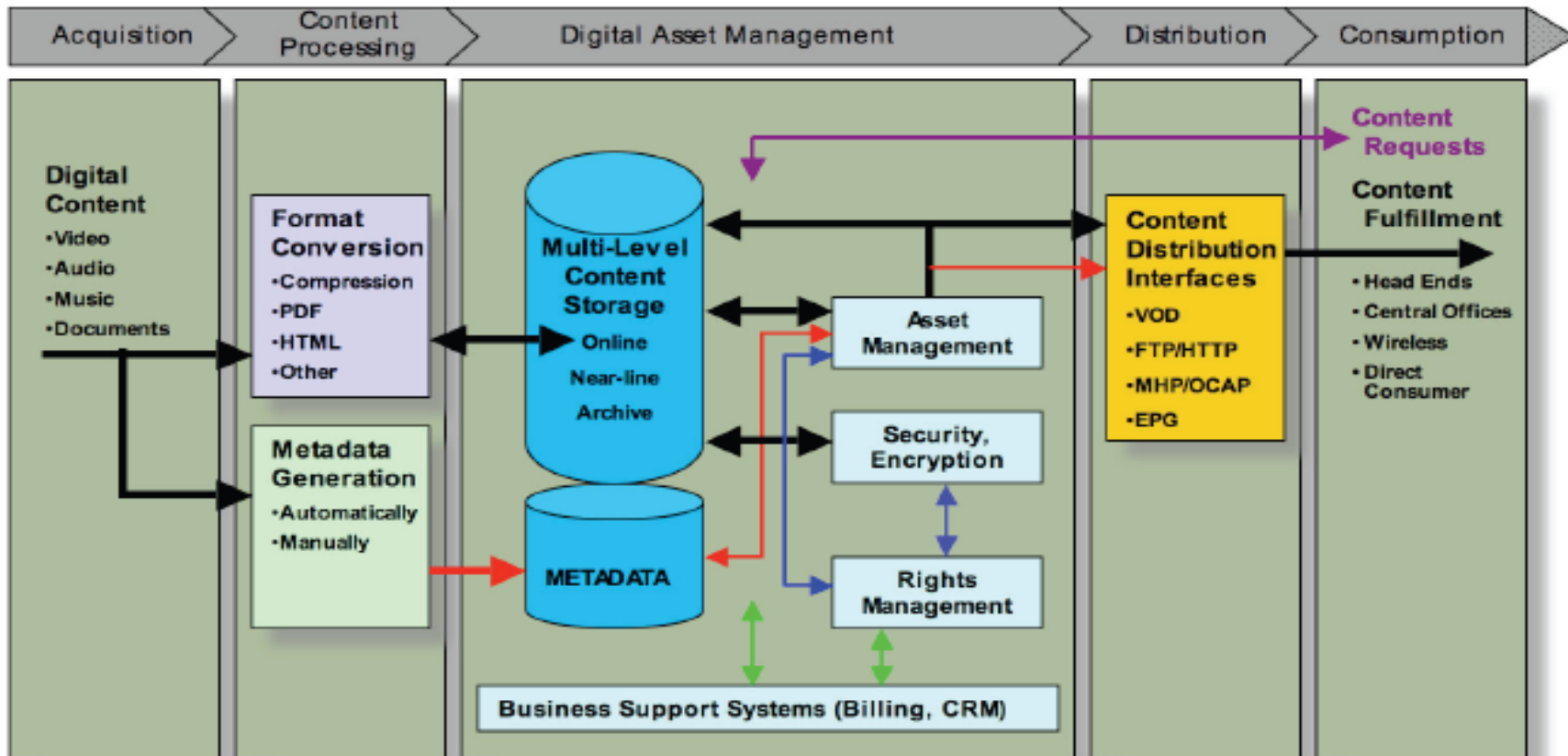
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# Is the figure outdated? (How much?)



# Content Security Issues (1/2)

## *Data Integrity and Resiliency*

- The network should be “always available” – avoid DoS cases
- Real time protection from vulnerabilities, attacks, malicious access to data, viruses, spyware, intruders, flooding in
  - Gigabytes/Terabytes networks
  - Low power/low performance WSN, VSN, RFIDs, “Intelligent Dust”.
  - Cross-border, cross-organisational environments

## *Sustainable User Privacy and Trustworthiness*

Protect user sensitive data from eavesdrop and unauthorized access

Maintain the trustworthiness over evolution and emerging behaviour

# Content Security Issues (2/2)

- **Content Ownership Management**

Controlled usage of digital media objects: DRM (?), watermarking (?), ...

Is DRM dead or should it be transformed ???

*“DRM provides improved levels of content protection that directly protects the content during its entire lifetime rather than simply managing file level access”*

- **Content Broadcasting/Distribution Rights**

e.g. Super Distribution

- **Interoperability of security mechanisms -> Standards**

- **Different Data/Applications need different levels of protection**