Future of the Internet

Future Content Networks Scenarios

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6 Feb. 2009

Why these scenarios…

- More (User Generated) Content
- New forms of Content
- Faster and more Intelligent Networks
- Larger and Cheaper Storage
- More processing power
- New Services/Business Models

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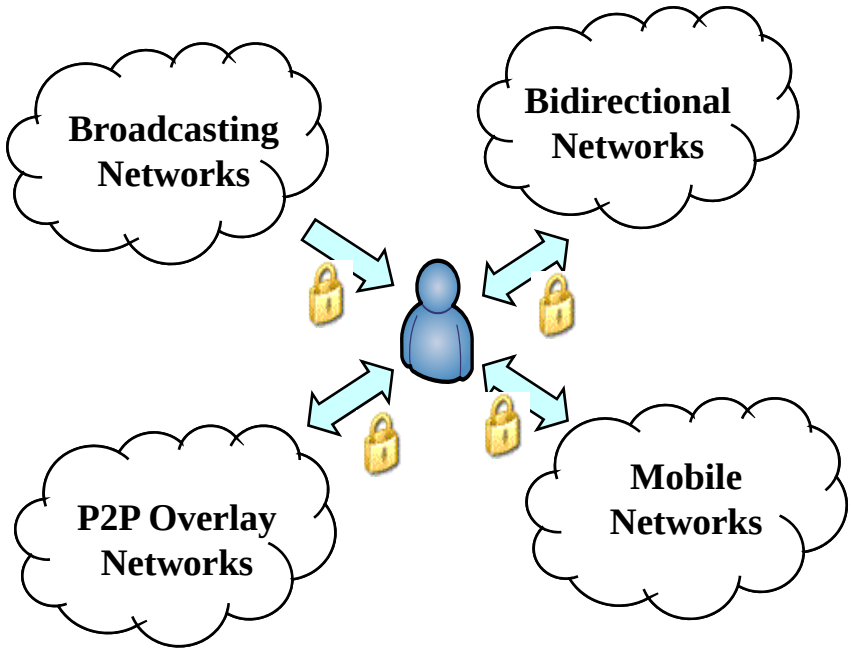
New ways of People Interactivity



Scenario 1:
Off-line or “near” off-line services

- John buys a ticket for a cinema film, he has two options: the simple ticket and the “special ticket”. The “***special ticket***” is a smart card that includes the scenario, critiques of the film, special effects, scenes that have been cut during the montage, actors CVs etc.

- Then John goes to the supermarket and has the ***Ultra-Wide band interface of his mobile phone or PDA activated***. While he is selecting what to buy, the best movies of the week (or based on his profile) are loaded on his mobile.

- When John is sleeping or when he is out of the home, his ***Set Top Box/DVR*** **downloads any film that he might like to watch**. He may select what he’ll watch, and he’ll be charged for that on-line. Otherwise the content will expire and deleted.

Research Challenges

- Storage will be much smaller, the physical media more flexible, the capacity much higher, copying may be much faster and the cost per Giga-Byte or Tera-Byte negligible.
- Content Adaptation and personalization
- Wireless LANs and Ultra-Wide Band LANs in the range of Gbps
- Co-existence of current and future Internet

Scenario 2: The Mobile will be the primary connection tool to the Internet

- John is riding the metro to the office. While on the way, **he checks and replies to the most important emails**. Wearable devices (e.g. Bluetooth glasses with screen monitors) can help him to read simpler the emails.

- Today, John has to join a meeting, but he is late due to some traffic jams. While on the way to the office ***he connects to the meeting room***. He can exchange documents and presentations with the other participants. As the discussion is about a new product, he may watch the ***3D representation at his mobile phone***.

- Today John had to do some extra work at the office, so he left late. On the way back from the office, John is watching his favorite soccer team match. The transmission is in ***HD and full 3D stereoscopic view***, so he may select the viewpoint that he refers

Research Challenges

- Faster Mobile Communication
- Content Adaptation and personalization
- Better coverage and smoother roaming capabilities
- Faster mobile network & guaranteed QoS
- Global Addressing
- HD, 3D, free viewpoint, stereoscopic watching at any device
- Wearable devices (e.g. Bluetooth glasses with screen monitors), Text to Speech and Speech to Text, Better monitors.

Scenario 3: Intelligence in the network

- John wants to browse the latest news. He connects to a service provider offering personalised news. The ***network knows*** that this service is also offered by another service provider, which has some advantages (better throughput, more & newer content, larger audience) and redirects him to the new service provider for a free trial.

- John decides to watch a movie. He connects to a service provider, who proposes him a number of videos, based on his interests and he selects a movie. The ***network knows*** that this movie is available in a number of mirrors & caches and selects the mirror closer to John. The video is in ***HD and the quality very good*** as John has a contract with the service provider for a ***guaranteed QoS when watching films***.

- John has created some content and publishes it to the network. This information is forwarded to ***his social network***. When someone is retrieving this content, the ***network detects that the streamed traffic is not license-free and informs John or don't forwards the content***.

Research Challenges

- The network will be able to:
  - Identify and classify the content
  - Identify and classify the services
  - Group and aggregate content & Services based on user–profiles and user-habits, load balance and provide extra security
- P2P streaming vs client-server
- Publish/Subscribe methods for content announcement.

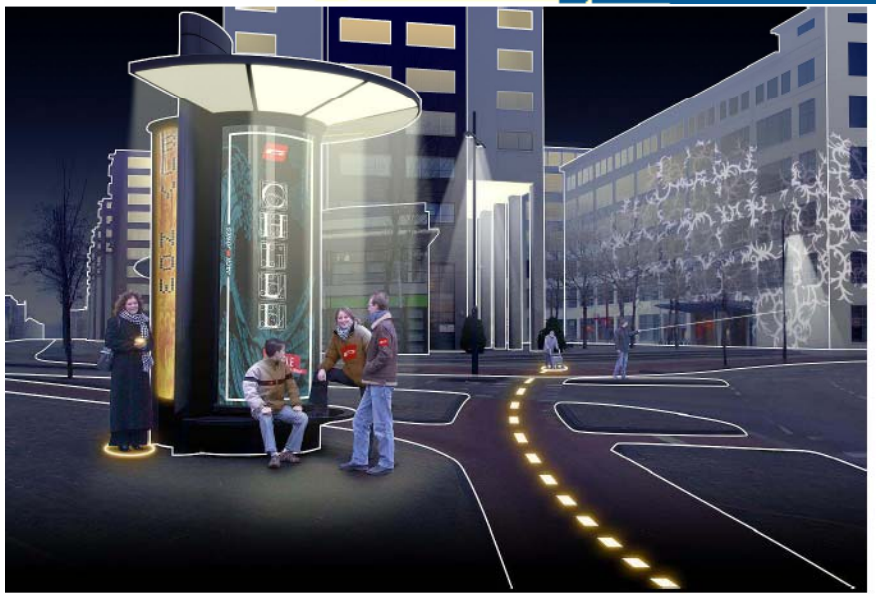
Scenario 4: Augmented reality/Interacting in artificial spaces

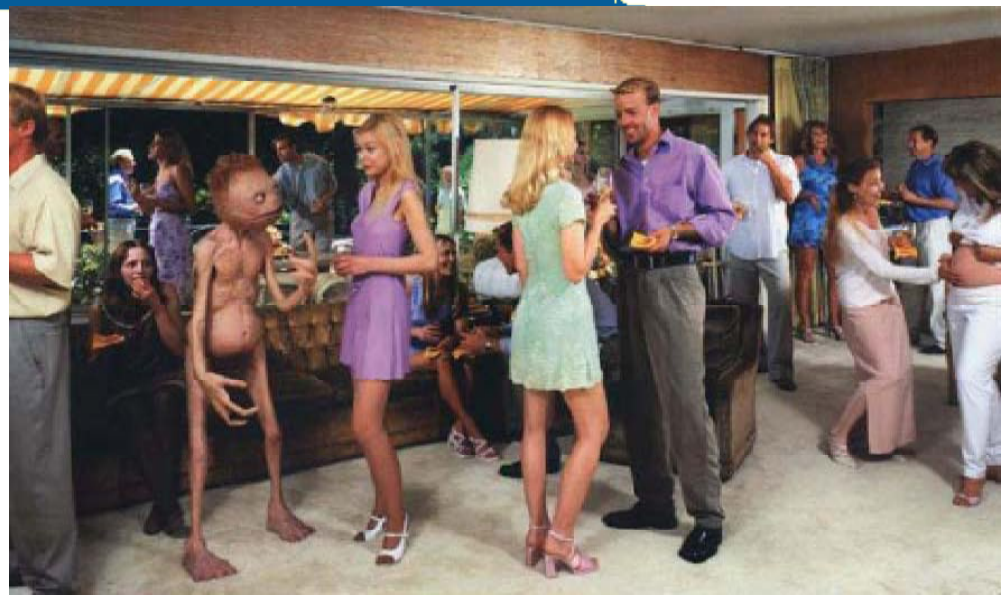
- John is a chemistry teacher. He likes to teach though virtual world. He invites ***the students to his virtual 3D laboratory***. There, he searches the repositories and quickly prepares a virtual experiment.
- John wants to recreate the experiment in reality. He ***checks whether the ingredients and items he used for the experiment are available in stock of his school's chemical laboratory*** – and if not – he is able to order them from the internet store just with few clicks.
- John is playing his favourite ***"alternative reality" massively multiplayer online game in the evening***.
- Later in the evening, he is being called by one of his friends to visit her home. ***He visits a virtual house of his friend***. They chat, exchange their daily news and decide to meet in reality (someday).
- While still in his friend's home, ***he sees a particularly interesting book*** on his friend's shelf. While browsing through the book he is informed that the ***book is an avatar of a real book***, which is ***offered for sale***. John ***enters the auction of the book at a popular online auction website*** and place his offer.

Scenario 4: Augmented reality/Interacting in artificial spaces

- He lives in ***Berlin*** and works for a automotive industry. He had an accident, 6 months ago and since then, he has a difficulty when walking due to a knee injury.
- It is Friday morning. John's company has organized a course for the young Engineers for teaching them how they can assemble parts of the new 'X-model' car. ***John enters a Hi-tech room with his colleagues, which produces a real immersive environment.*** He wears a ***haptic glove and he connects to the course***. At the same time, other young Engineers from ***Stuttgart*** join another Hi-tech room there and also connect to the course. Two expert industrial technicians in Tokyo join their Hi-tech room and the course starts. John and the rest young Engineers not only enjoy the course, but also ***feel as they were all together*** (*see, talk to each other, ask the tutors questions and inspect or even touch the parts of the 'X-model')*.
- Early afternoon, John returns home and enters his personal immersive room. He connects with his ***remote therapist which is located in Vienna. He plays a pre-recorded set of exercises sent by his therapist and he tries to repeat the exercises***. The doctor is able to ***analyze John's movements and evaluate his performance***.
- John decides to tele-meet with his friends and play their musical instruments all together…

Improving Social Relationships (++)





Research Challenges

- Photorealistic 3D Rendering
- Immersive User Interface
- High Definition Audio/Video
- Computation Modelling
- New Media Coding/Streaming
- Network Support


Photorealistic
3D Rendering


Immersive
User Interface


High Definition
Audio, Video


Computational
Modeling

Expected impact on the other sessions

- Offer New ways of interactivity
- Offer new Autonomous Applications & Supporting Services (e.g. Content Searching)
- Offer New Media Coding/Signalling/Streaming
- Offer Content Adaptation and personalization
- Offer/Require Intelligence in the Network
- Require Socioeconomic feedback
- Require End-to-end Network Availability (FN & MANA)
- Require Security/Privacy (Trust & Security)

Thank you

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