



# ***A/V Delivery in ASTRALS***

***Audio-visual STReaming plATform for domestic Leisure and Security***

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***IBC, Amsterdam***  
***11 September 2007***

# What is “ASTRALS”



- **IST-2005-028097**
- **STREP**
  
- **Duration: 24months**
- **Start Date: 01/01/2006**
- **End Date: 31/12/2007**
  
- **Total Manpower Effort: 315MM**
- **Budget: 3.3M€**
- **Funding: 1.8M€**

# ASTRALS in a glance



- **ASTRALS is focused on *personalised, scalable, A/V encoding, transcoding/transrating, storage and distribution in existing households via streaming-optimised wireless links.***
- **ASTRALS envisages a home-centred A/V architecture consisting of :**
  1. **RG with dual IPv4/IPv6 protocol stack**
  2. **Streaming-optimised, IEEE 802.16 based, Wireless Platform.** MIMO and mesh technologies will provide for higher throughput, efficient coverage and ad-hoc networking.
  3. **A/V Optimised extensions** offering H.264 AVC and Scalable Video Coding (SVC), video transcoding/ transrating, and erosion-featured storage.
  4. **Content adaptation and efficient transmission** derived from personalised preferences, terminal profiles and feedback from the wireless MAC and network layer.
  5. **Human activities analysis** in the home environment, to detect abnormal events in the context of an intelligent home surveillance/security system.
- **ASTRALS applications will be validated via an *Intelligent in-home Entertainment and Surveillance platform*, which will be tested in a modern eHome testbed.**

# Who is “ASTRALS”



Fraunhofer

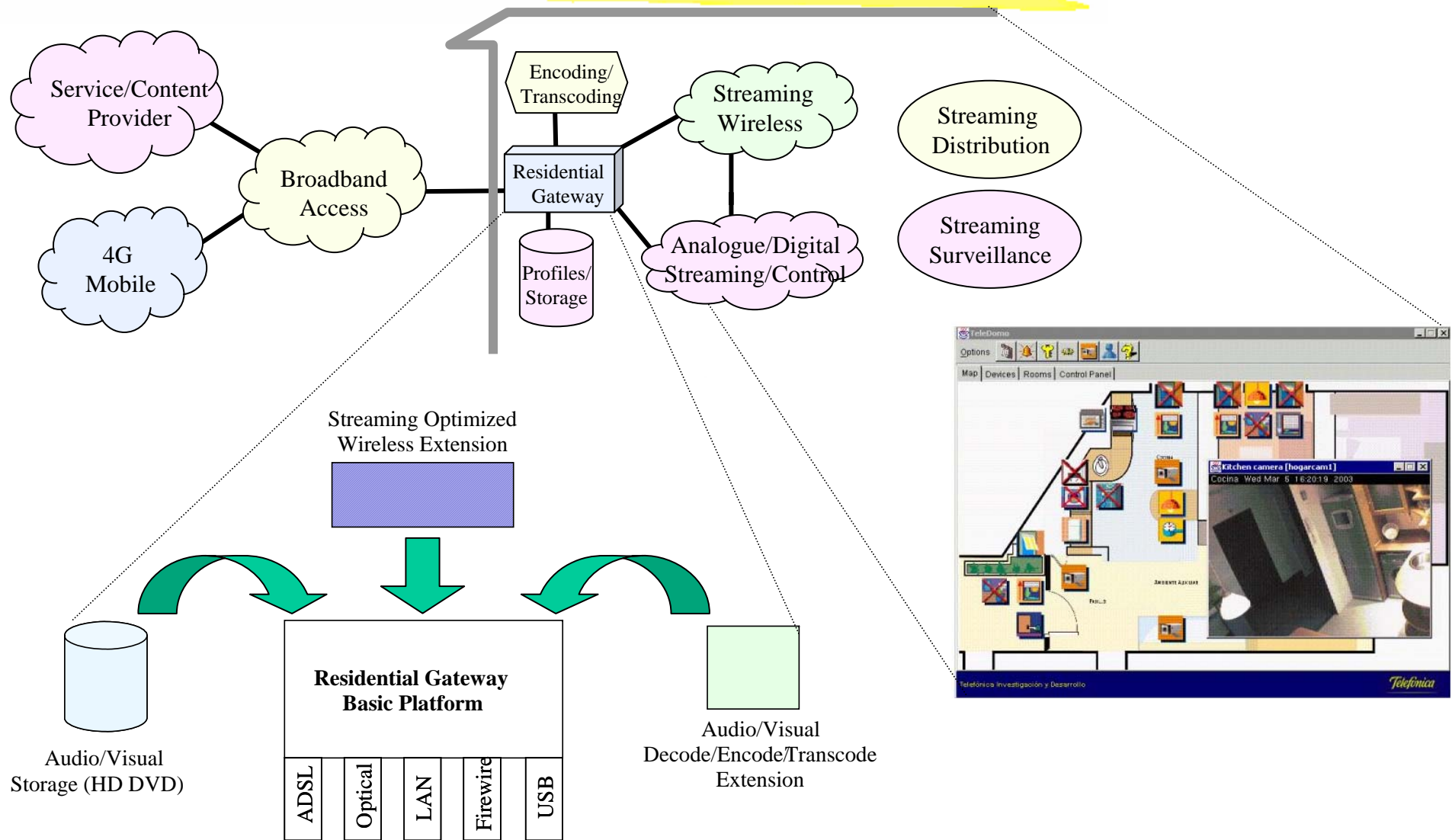


Institute for Infocomm Research

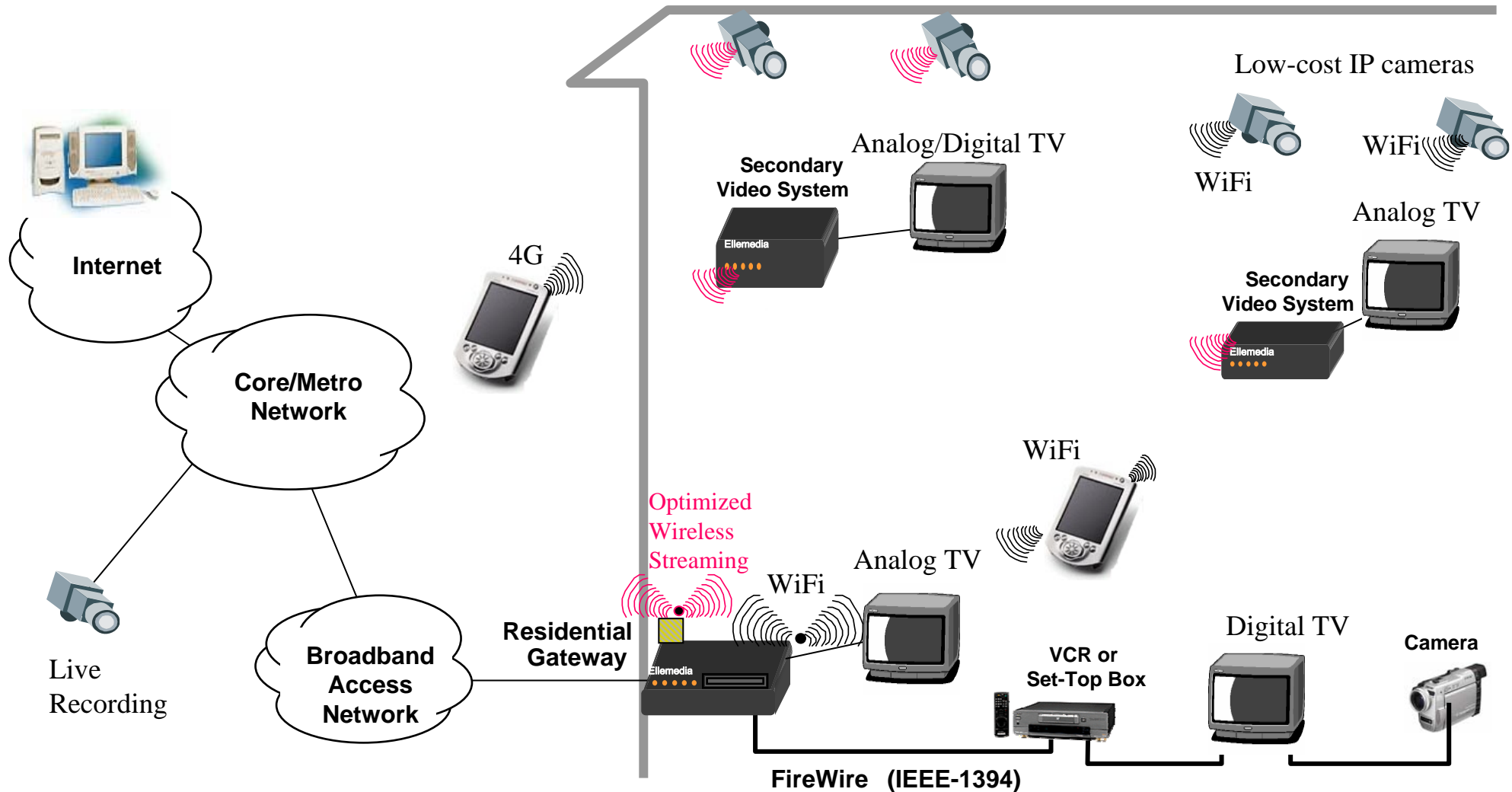
- **Algosystems (GR)**
- **STMicroelectronics (I)**
- **Thomson R&D (FR)**
- **Mitsubishi Electric (UK)**
- **Telefonica I+D (ES)**
- **Provision Communications (UK)**
- **Fraunhofer HHI (DE)**
- **I2R (SG)**
  
- **ASTRALS Consortium in numbers**
  - 8 participants from 6 Member Countries + 1 (Singapore)
  - 2 SMEs, 3 Industries, 1 Operator, 2 Institutes



# ASTRALS Concept

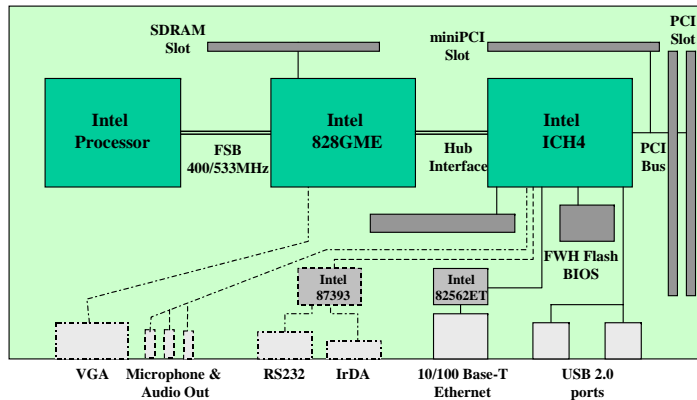


# ASTRALS Reference Architecture

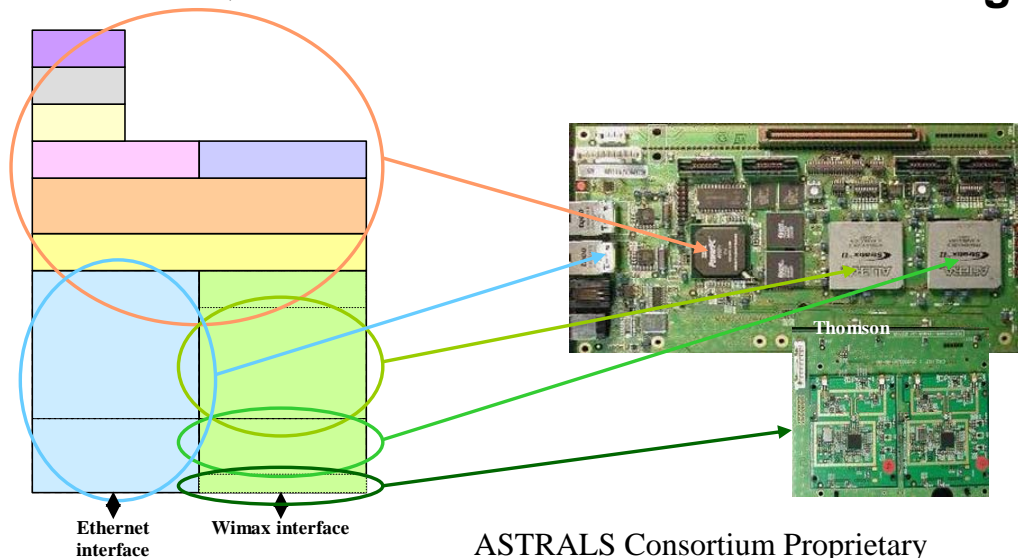


# Major Results (... so far) (1/2)

## 1. A/V platform for real-time Encoding/Transcoding



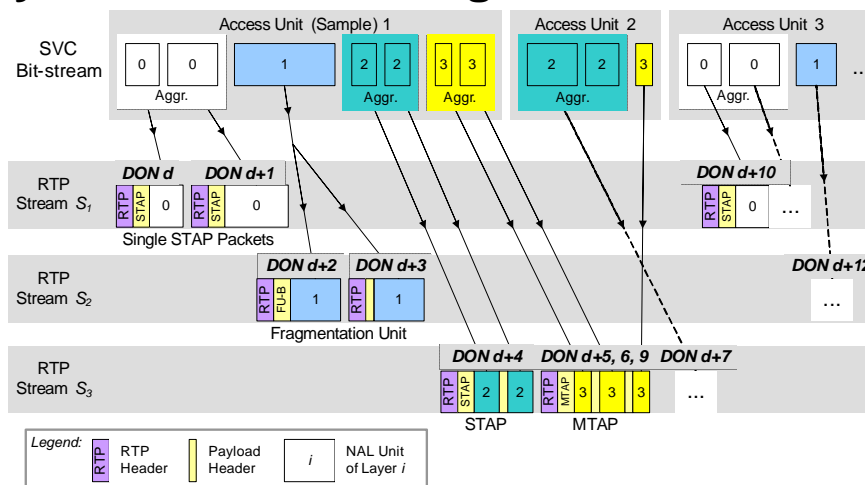
## 2. Broadband QoS-aware Wireless Home Coverage



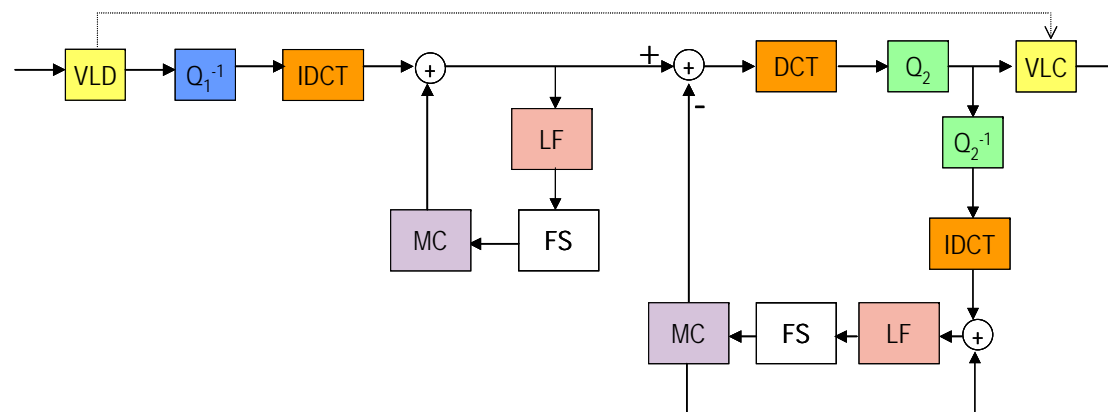
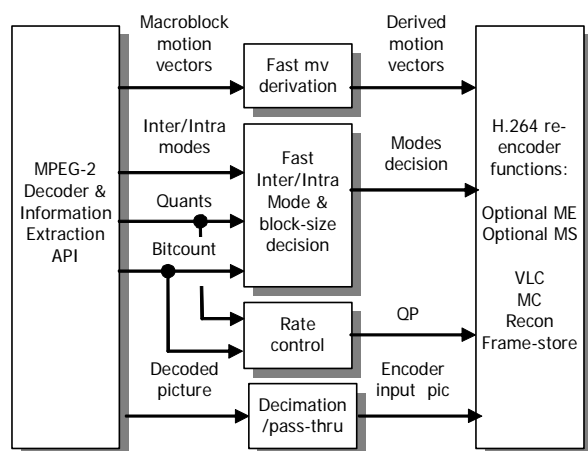


# Major Results (... so far) (2/2)

## 3. SVC Payload Format, Storage, Transmission and Signalling



## 4. MPEG-2/H.264 transcoder & H.264/H264 transrating





# Dissemination Activities

- **Magazine Publications**

1. I. Sarris, A.Nix, A.Doufexi, "High-Throughput Multiple-Input Multiple-Output Systems for In-Home Multimedia Streaming," IEEE Wireless Communications Magazine, October 2006, pp.60-66
2. Th. Schierl, K. Gänger, C. Hellge, Th. Stockhammer, and Th. Wiegand, "SVC-Based Multi-Source Streaming For Robust Video Transmission in Mobile Ad-Hoc Networks," IEEE Wireless Communications Magazine, October 2006, pp. 96-103

- **Conference Proceeding**

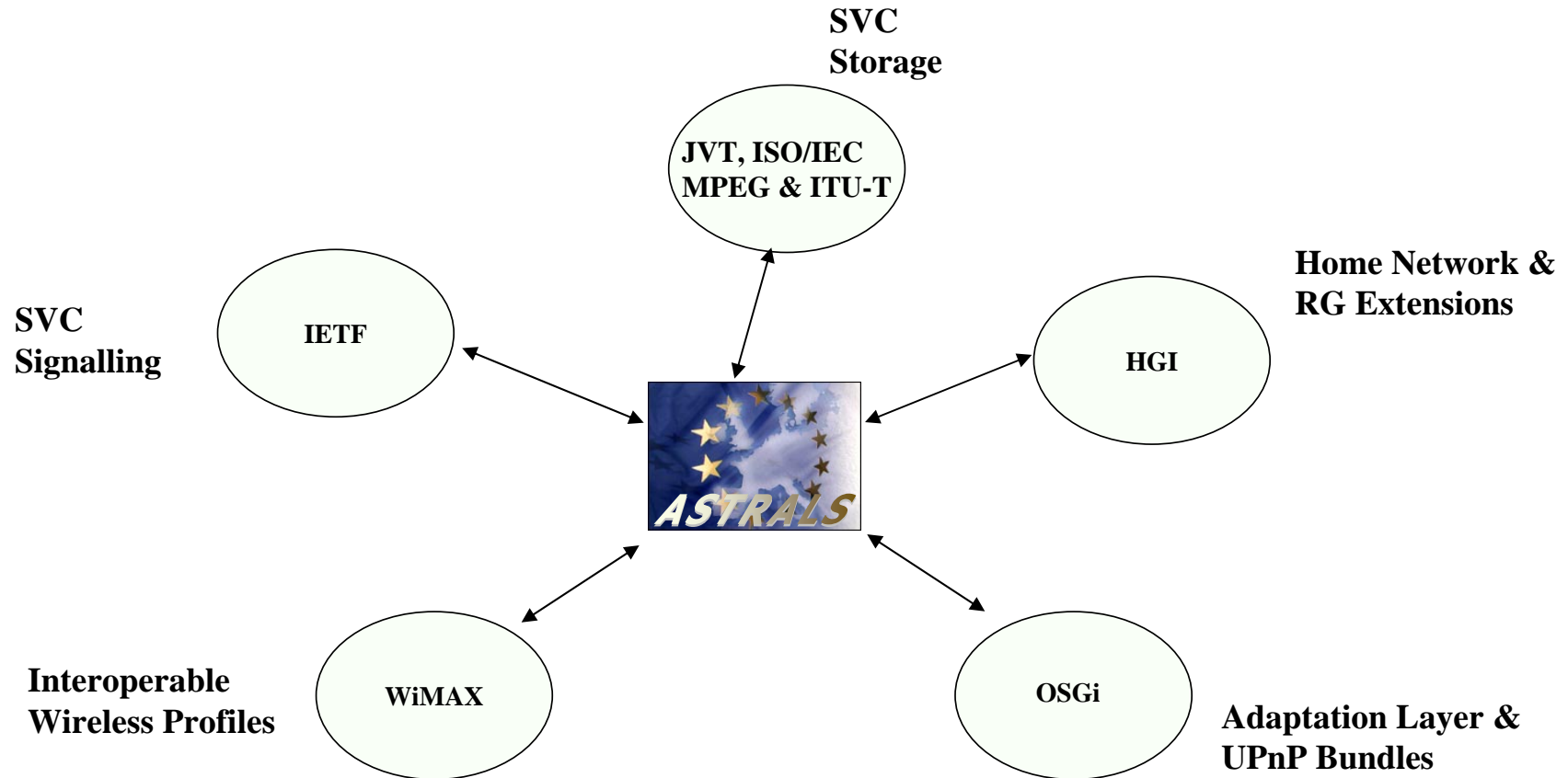
1. I. Sarris, A. Doufexi, A. Nix , "High-Performance WLAN Architectures Using MIMO Technology in Line-of-Sight" , 15th IST Mobile Wireless Communications Summit, Mykonos, 4-8 June 2006
2. TK. Chiew, "The Challenges of A/V Streaming in Smart Homes", EUSEA (Euro-Southeast Asia ICT Conference, 19-23 June 2006, Singapore
3. Th. Zahariadis, K. Gröneberg and TK Chiew, "Efficient Home Video Surveillance Platform" 13th International Conference on Systems, Signals and Image Processing (IWSSIP'06), Budapest, Hungary, 21-23 September 2006, pp.143-146
4. Alex Chia, Weimin Huang and Liyuan Li, "Multiple Objects Tracking with Multiple Hypotheses Graph Representation", International Conference on Pattern Recognition 2006 (ICPR 2006), Vol. 1, pp. 638-641, Aug 19-24, 2006 Hong Kong
5. Ya-Dong Wang, Jian-Kang Wu, Ashraf A. Kassim, and Wei-Min Huang, "Tracking a Variable Number of Human Groups in Video Using Probability Hypothesis Density", International Conference on Pattern Recognition 2006 (ICPR 2006), Vol. 3, pp. 1127 - 1130, Aug 19-24, 2006 Hong Kong
6. Thomas Schierl et al., "Video Streaming in Mobile Ad Hoc Networks," MobiMedia 2006, Alghero, Sardinia, Italy, 18-20 Sept. 2006
7. Nuria Sanz, Pierre Plaza, M<sup>a</sup> Ángeles Barba, "Plataforma de Streaming para la Seguridad y el Ocio en el Hogar" Telecom I+D, Madrid, 29 Nov. 2006.

# Dissemination Activities



9. I. Sarris and A. R. Nix, "Capacity Performance of a LoS-Optimised MIMO System Using Measurements at 5.2 GHz" IEEE VTC Spring Conference, Dublin, 22 - 25 April 2007
10. X Yu, B Xu, W Huang, B Chew, J Dai, "A framework of Context-Aware Object Recognition for Smart Home," 5th International Conference On Smart homes and health Telematics (ICOST'07), Jun 2007, Japan.
11. Nam Trung Pham, Weimin Huang, S.H. Ong, "Tracking Multiple Objects Using Probability Hypothesis Density Filter and Color Measurement," IEEE Intl. Conf. Multimedia & Expo (ICME'07), July 2007, Beijing, China
12. I. Sarris and A. R. Nix, "K-factor measurements in a Home and an Office Environment in the 60 GHz Band" IST mobile summit 2007, Budapest, 1-5 July 2007
13. I. Sarris and A. R. Nix "Power Azimuth Spectrum Measurements in Home and Office Environments at 62.4 GHz", 18th IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (IEEE PIMRC '07), Athens, Greece, 3-7 September 2007
14. I. Sarris, A. R. Nix and A. Doufexi "High performance WiMAX architecture using MIMO technology in line-of-sight" European Conference on Antennas and Propagation (EuCAP) in Edinburgh, November 2007
15. I. Sarris, Inn Inn Er, Kong Peng Yong and C. Guguen "Audio-Visual Wireless Streaming Platform for the Residential Environment Employing Mesh and MIMO Extensions", International Symposium on Wireless Communication Systems, ISWCS 2007, Trondheim, Norway, November 2007

# Standardisation efforts



# Standardization Contributions (... so far)



- **Internet Engineering Task Force (IETF)**
  1. S.Wenger, Y.-K. Wang, T. Schierl, "RTP Payload Format for SVC Video," MMUSIC Working Group, draft-wenger-avt-rtp-svc-01.txt, March 2006
  2. S. Wenger, Y.-K. Wang, T. Schierl, "RTP Payload Format for SVC Video," MMUSIC Working Group, draft-wenger-avt-rtp-svc-02.txt, June 2006
  3. T. Wenger, Y.-K. Wang, T. Schierl, "RTP Payload Format for SVC Video", Internet Draft , MMUSIC Working Group, draft-wenger-avt-rtp-svc-02.txt, June 2006, (presented in the 66th IETF meeting in Montreal, Quebec, Canada, July 10-14, 2006 in co-operation with NOKIA) (also available at the IETF web site)
  4. S. Wenger, Y.-K. Wang, T. Schierl, "RTP Payload Format for SVC Video," MMUSIC Working Group, draft-wenger-avt-rtp-svc-03.txt, October 2006
  5. ***S. Wenger, Y.-K. Wang, T. Schierl, "RTP Payload Format for SVC Video," MMUSIC Working Group, draft-ietf-avt-rtp-svc-00.txt, December 2006 (Accepted as AVT Work Group Item)***
  6. T. Schierl, S. Wenger, "Signaling media decoding dependency in Session Description Protocol (SDP)", Internet Draft, MMUSIC Working Group, draft-schierl-mmusic-layered-codec-01.txt, October, 2006
  7. T. Schierl, S. Wenger, "Signaling media decoding dependency in Session Description Protocol (SDP)", Internet Draft, MMUSIC Working Group, draft-schierl-mmusic-layered-codec-02.txt, December, 2006
  8. T. Schierl, S. Wenger, "Signaling media decoding dependency in Session Description Protocol (SDP)", Internet Draft, MMUSIC Working Group, March 5, 2007
  9. T. Schierl, S. Wenger, "Signaling media decoding dependency in Session Description Protocol (SDP)", Internet Draft, MMUSIC Working Group, June 22, 2007

# Standardization Contributions (... so far)



- **Joint Video Team (JVT), ISO/IEC MPEG & ITU-T**
  1. S. Wenger, Y.-K. Wang, T. Schierl, "Status of RTP Payload Format for SVC," Joint Video Team (JVT) of ISO/IEC MPEG & ITU-T VCEG(ISO/IEC JTC1/SC29/WG11 and ITU-T SG16 Q.6)
- **OSGi**
  1. Telefonica\_OSGi\_Remote\_Management\_requirements contribution presented at the webinar OSGi 100% Solution – Remote Management, November 28th, 2006
  2. Telefonica, OSGi Remote Management requirements specification according to the initial proposals from interested companies, 23 January 2007



**Thank you**

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**[www.ist-astrals.org](http://www.ist-astrals.org)**