The ESA SISNeT Technology

Integrating Satellite Navigation and the Internet

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Receiver Workshop, Paris (France), 3rd of July 2003.

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SISNeT

PRESENTATION OUTLINE

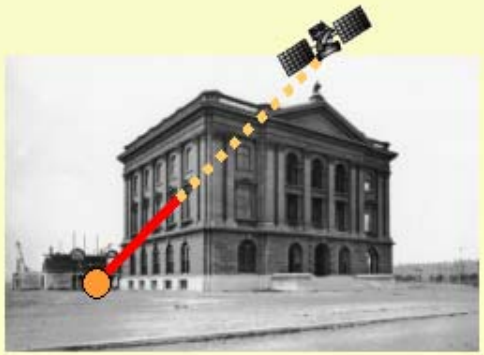
- Introduction
- Overview of the SISNET Platform
- Current Status
- SISNeT Developments
- Conclusions

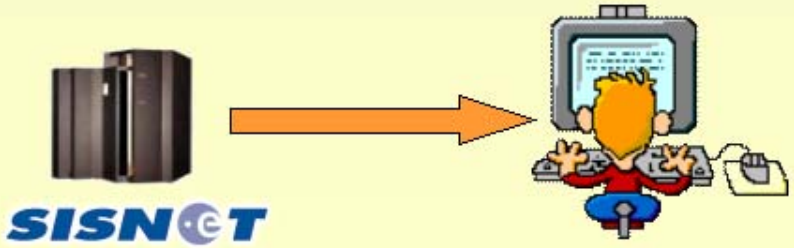
INTRODUCTION (I)

Broadcast of EGNOS messages through GEO is a very efficient strategy for many users. Yet, some users:

- may also wish transmission through other means (or combination with other navigation systems) to avoid potential GEO blocking (e.g land mobile users in cities)

- may be interested in EGNOS real-time information for scientific/technical/educational purposes without wishing to invest on a receiver (e.g. IONO map of Europe, EGNOS performance monitoring, etc)





INTRODUCTION (II)

- ESA ARTES-5 (ASTE) program: covers both the combination of EGNOS with other sensors and integration of EGNOS and terrestrial regional networks

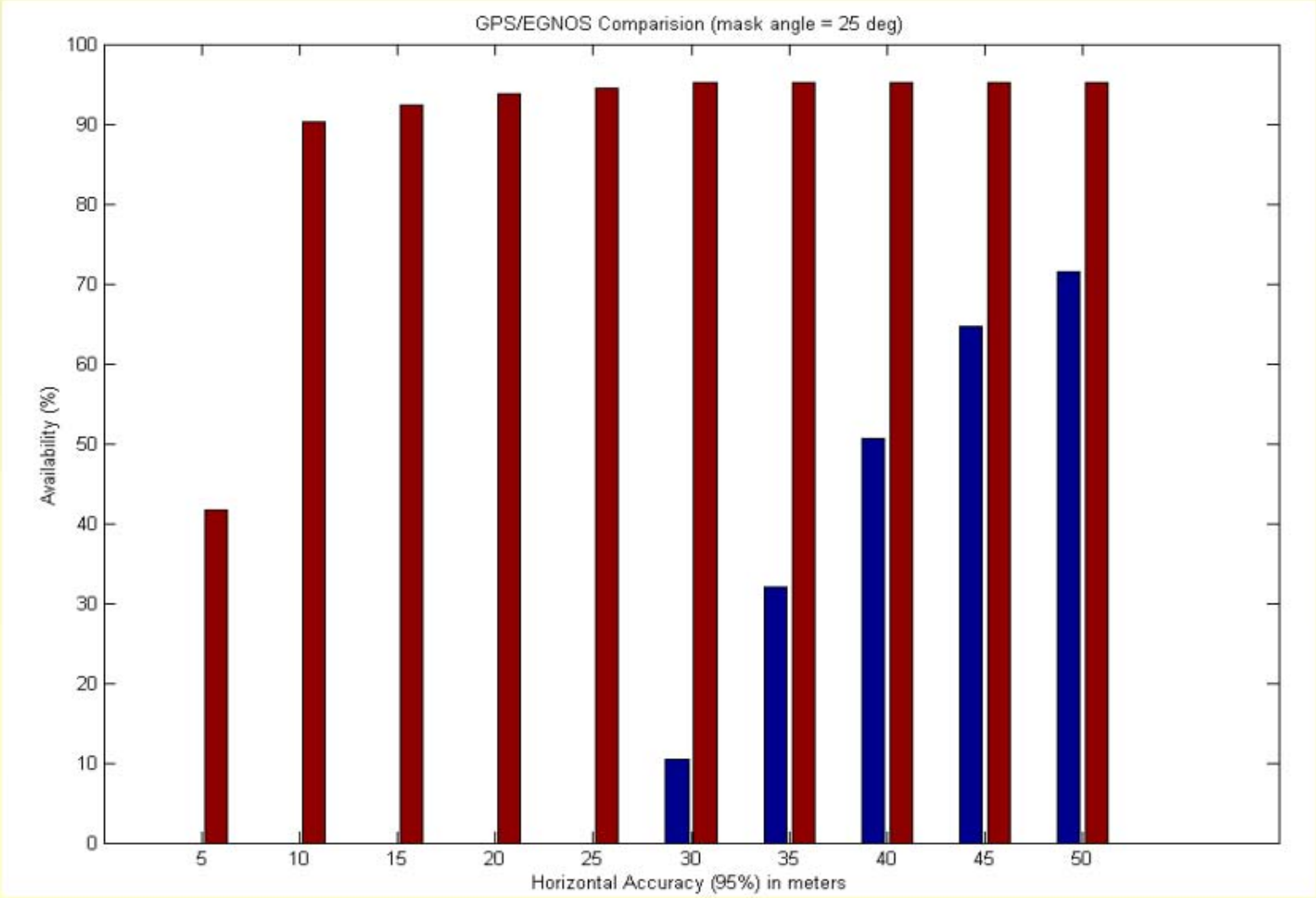
- ESA SISNET Project aims at complementing the ASTE initiatives by providing the EGNOS test bed signal through the Internet in real-time

INTRODUCTION (III)

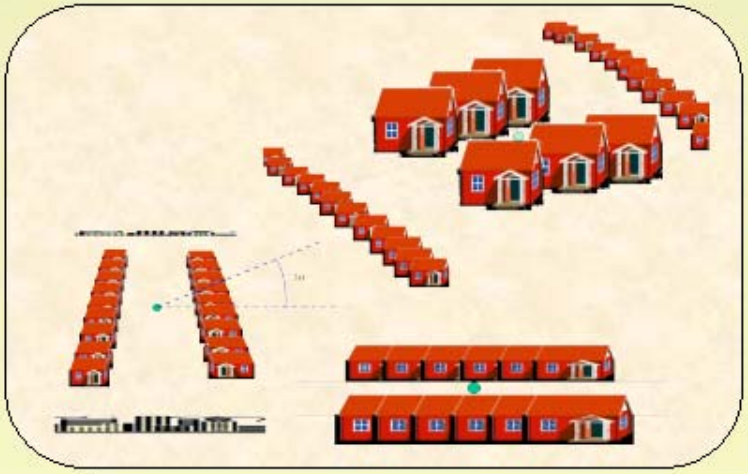
SISNET Advantages:

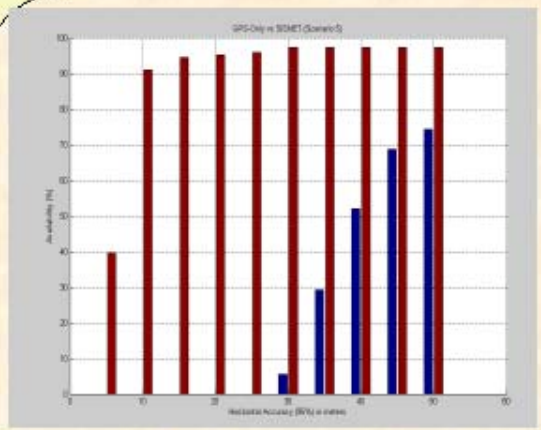
- Allows acquiring the GEO signals, even under low visibility of GEO (e.g. urban canyons or high latitudes);
- A simple connection to the Internet provides a virtual EGNOS receiver;
- The transfer rate is appropriate for use with GSM or GPRS (EGNOS message: 250 bps, SISNET: less than 800 bps).

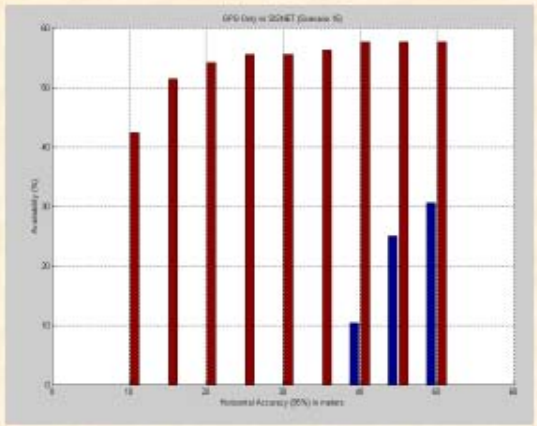
INTRODUCTION (IV)

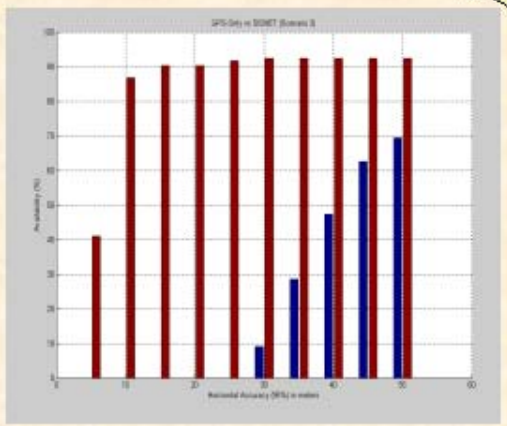


INTRODUCTION (V)









Reference: "EGNOS Performances in Urban Areas Using the ESA SISNeT Technology: Advanced Modelling of User Masking Effects." Available at http://www.esa.int/sisnet

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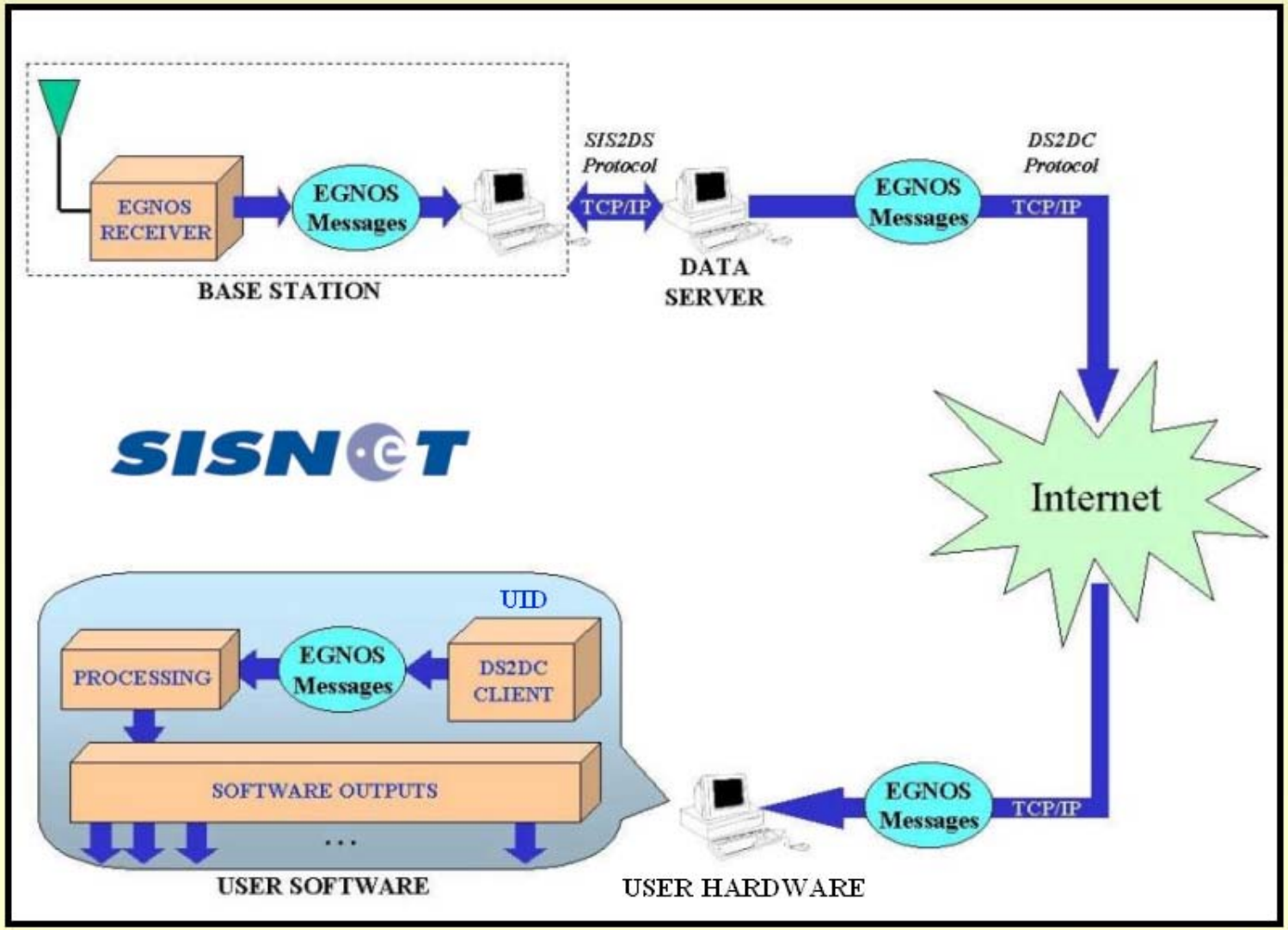
ARCHITECTURE OF SISNET



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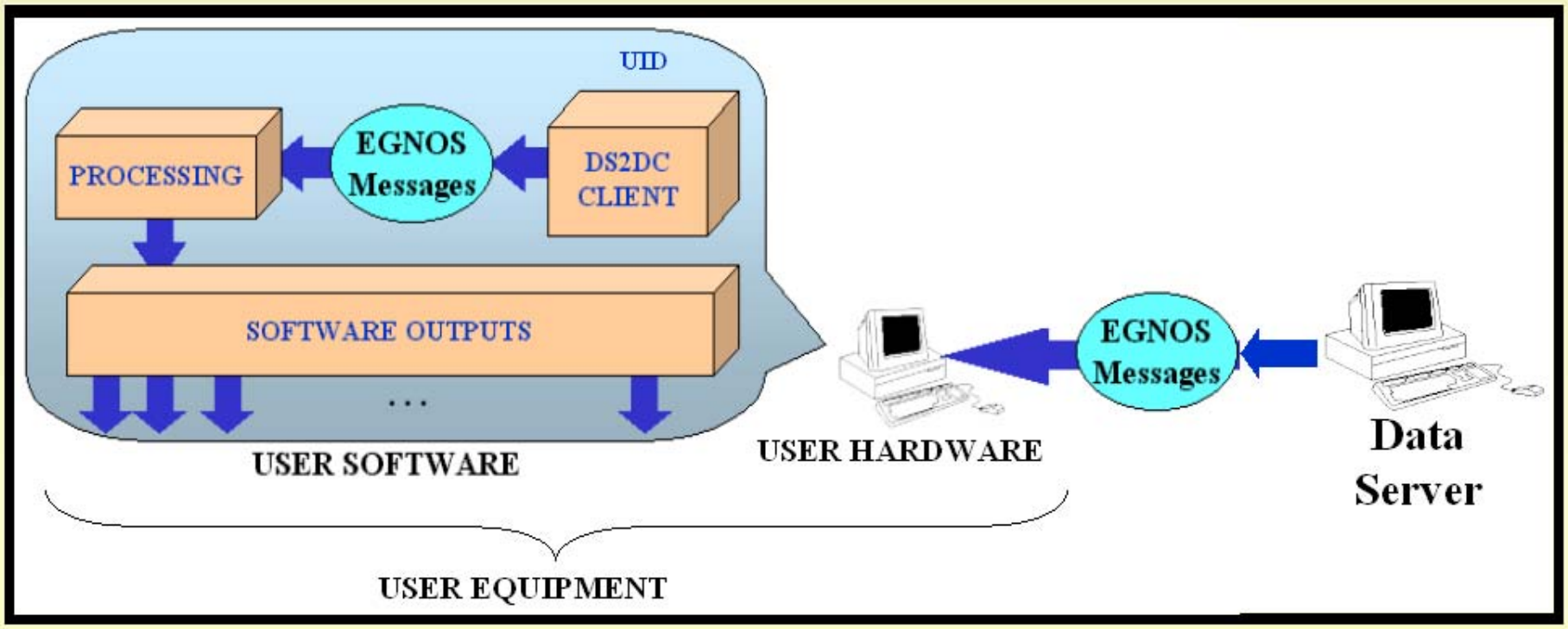
USER APPLICATION SOFTWARE ARCHITECTURE



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LOCATION OF KEY SISNET COMPONENTS

Base Station

Data Server

ESTEC
RADIONAVIGATION LAB

ESA User Application Software

EGNOS PO (TOULOUSE)

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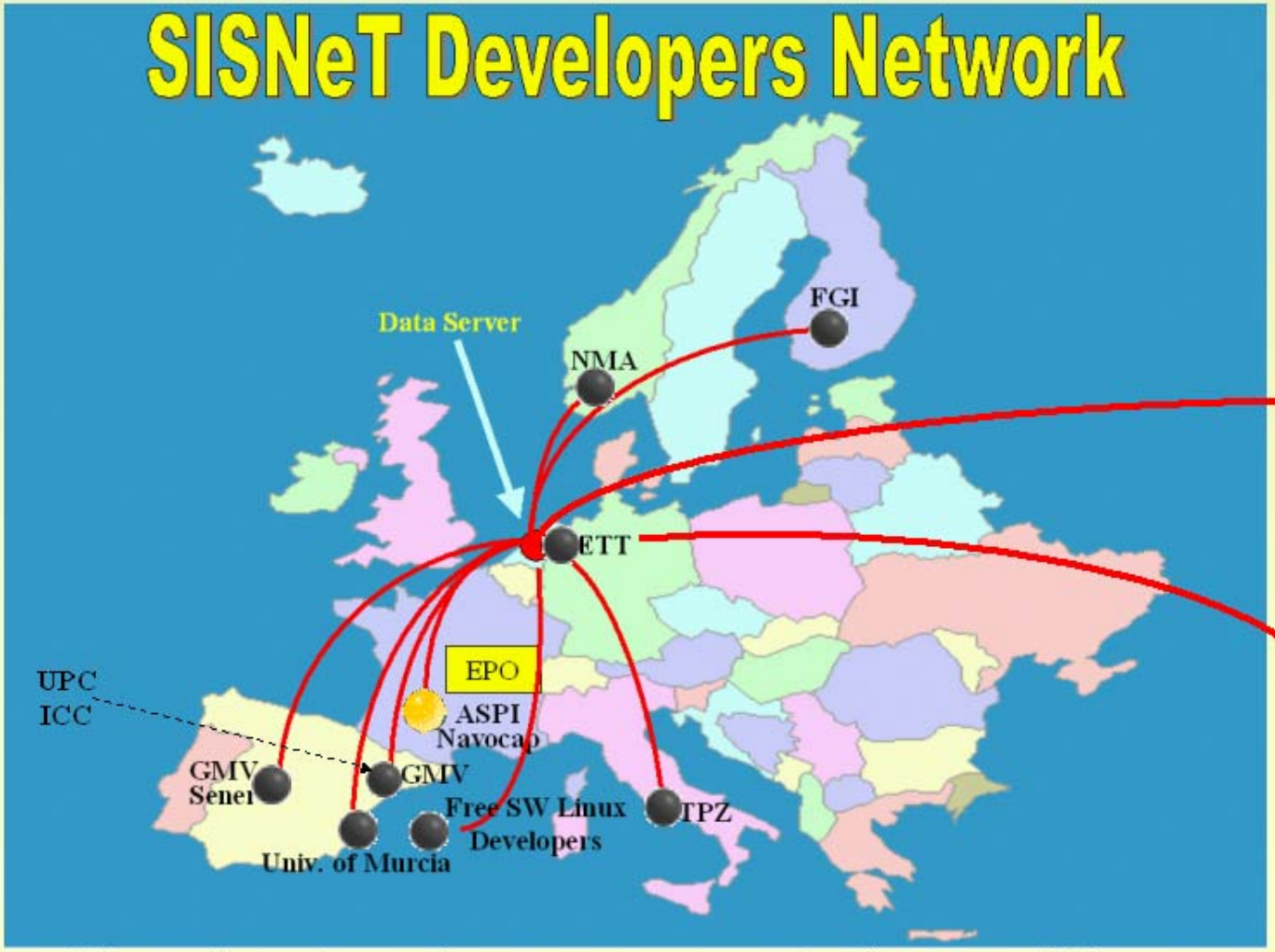
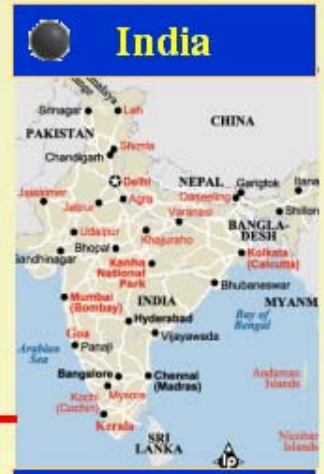
SISNET

SISNeT Developer Network





Network continuously grows: new users in Germany, UK, etc.

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SISNeT Handheld Receiver Architecture

SOFTWARE

- High performance navigation algorithms;
- Driver: connection with GIS applications;
- Smart algorithms: take the most of EGNOS and GPS;

GPS Receiver Card

POCKET PC 2002 OS

Corrected co-ordinates

DRIVER

GPRS MODEM

ALMOST ANY GIS / LBS APPLICATION CAN WORK WITH SISNeT-CORRECTED CO-ORDINATES!!!

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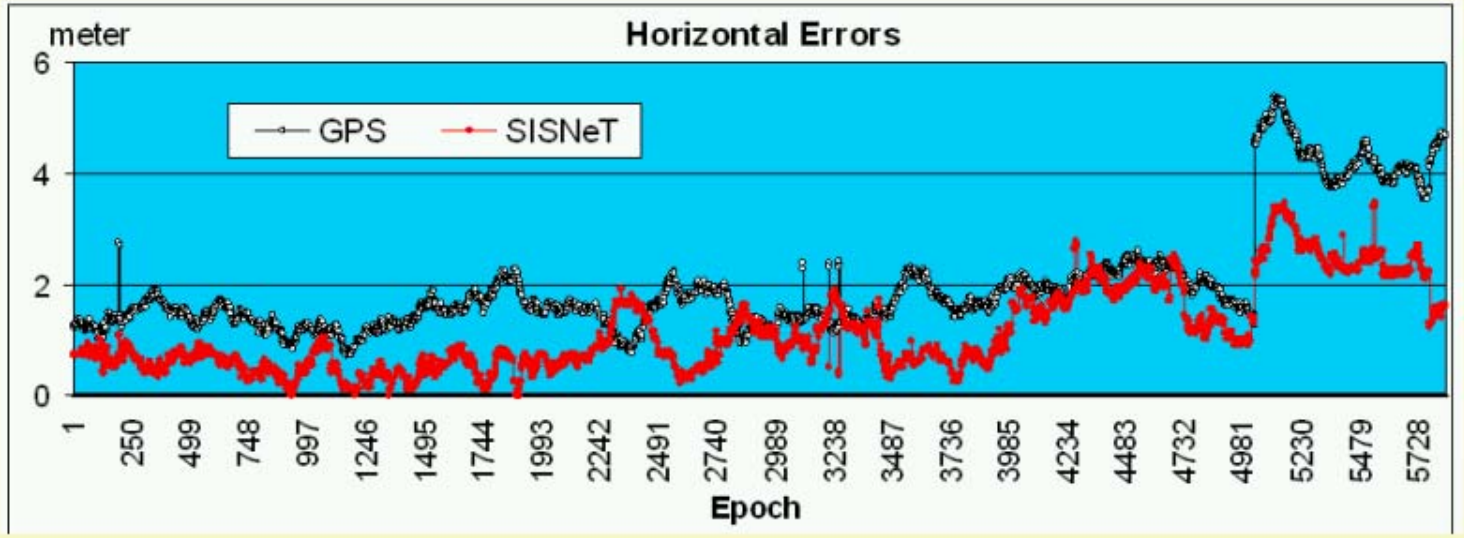
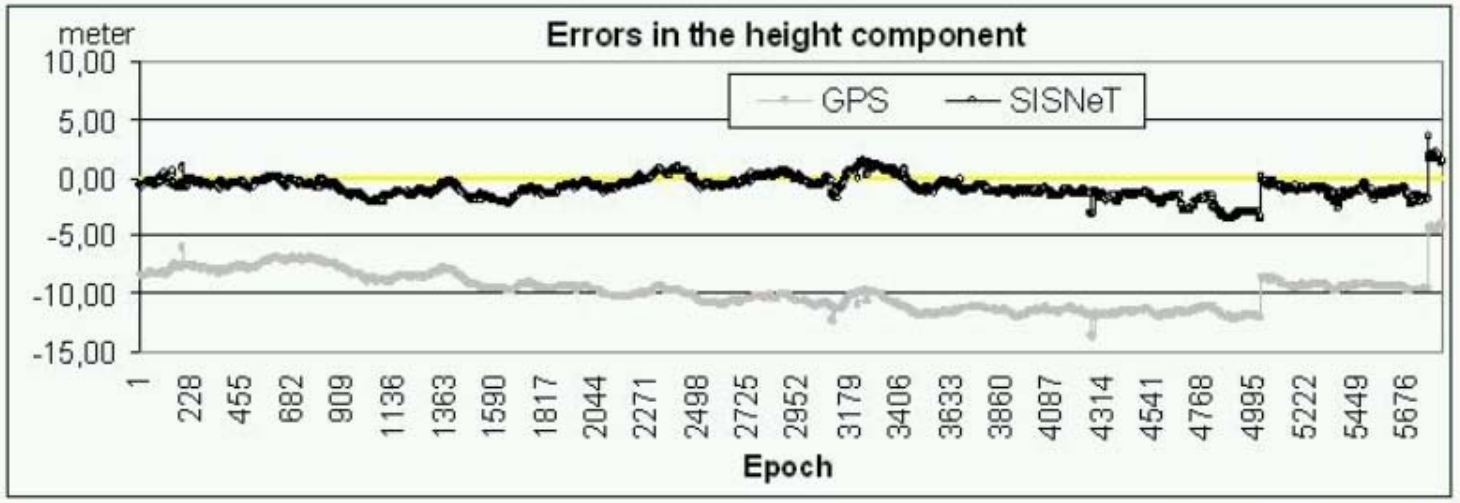
SISNET
COMPAQ
iPAQ
pocket PC
COMPAQ

TESTS IN FINLAND: GPS ANTENNA ON FGI CAR

STATIC TEST RESULTS





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Recent Achievement: SISNeT Receiver Based on a Mobile Phone (Pocket PC OS)

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ESA CONTRACT WITH NAVOCAP (Toulouse)
SISNeT for Urban Buses

STEP 1: Handheld Receiver Development

BASED ON "NETPAD" PDA (WinCE.NET)

STEP 2: Dynamic Tests

SEMVAT LINE 2 WILL BE USED

STEP 3: Recommendations for integration of SISNeT into urban buses

OBJECTIVE:

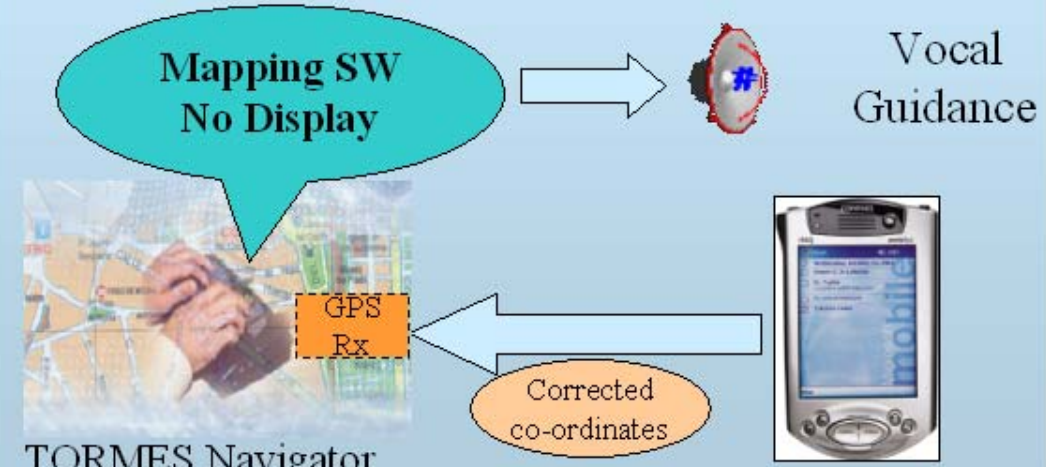
Taking into account the results of dynamic tests, recommend an strategy to integrate the SISNeT information into urban buses typical environment (UHF, TDMA, limited bandwidth,…)

SISNET - ONCE PROJECT (BLIND PEDESTRIANS)

1. Detailed definition

Objectives

- Detailed definition of tests;
- Test platform integration;



2. Tests and Conclusions

Objectives

- Execution of two parallel te
using the TORMES platform:
  - GPS-only
  - SISNeT
- Analysis of results and conclusions;

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SUMMARY

- SISNET allows the access to the ESTB signal through the Internet;
- The SISNeT services are available since February 2002 through an authentication protocol;
- **A specific SISNET User Interface Document (UID) is** already available for anyone wishing to develop SISNET-based user applications. New version 3.0 to be released soon.
- Several SISNeT-based industrial activities ongoing, showing promising results. (PDA receiver, mobile phone receiver, urban buses, blind pedestrians, etc.).
- The combination of EGNOS and the Internet can open a large amount of applications for Satellite Navigation.

Satellite Applications

SISNeT
Signal-In-Space through the InterNET

European Space Agency

ESA Home | Satellite Applications | Navigation | SISNeT

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SISNeT

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SISNeT is a new technology that combines the powerful capabilities of satellite navigation and the Internet. The highly accurate navigation information that comes from the EGNOS (European Geostationary Navigation Overlay Service) Signal-In-Space (SIS) is now available over the Internet and in real time via SISNeT.

Specifically, SISNeT gives access to the wide-area differential corrections and the integrity information of EGNOS. The SISNeT project was undertaken by ESA during the second half of 2001. In August 2001, the first prototype of the system was set-up, and the SISNeT concept was successfully validated. Since February 2002, the system has been pre-operational, broadcasting an EGNOS-like signal through the Internet, as generated by the EGNOS System Test Bed (ESTB).

Any user with access to the Internet (usually through wireless networks - GSM or GPRS) can access EGNOS through SISNeT, irrespective of the GEO visibility conditions. No EGNOS receiver is needed.

Related links

- » EGNOS
- » ESTB
- » **List of acronyms**

More Info at www.esa.int/sisnet