



# Lawful Interception and Location Based Services

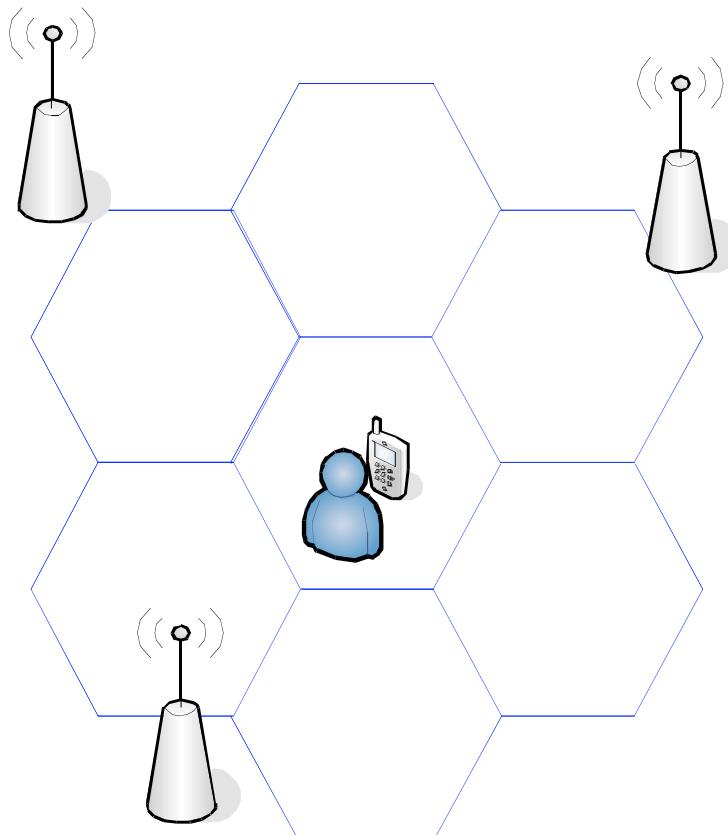
- Overview of Location Based Services (LBS)
- Integration of LBS in LI platforms
- Future trends and technical challenges



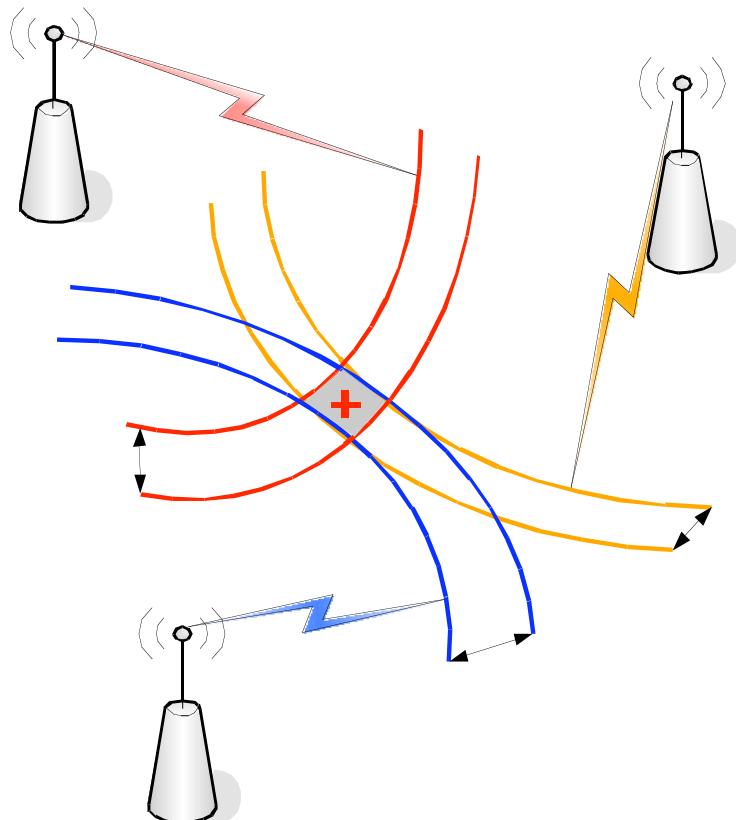
# Overview of LBS

- Location types
  - Geo-spatial coordinates
  - Civic addresses
  - Location attributes
- Market Drivers
  - Regulation  
(E911, Data Retention)
  - Competition



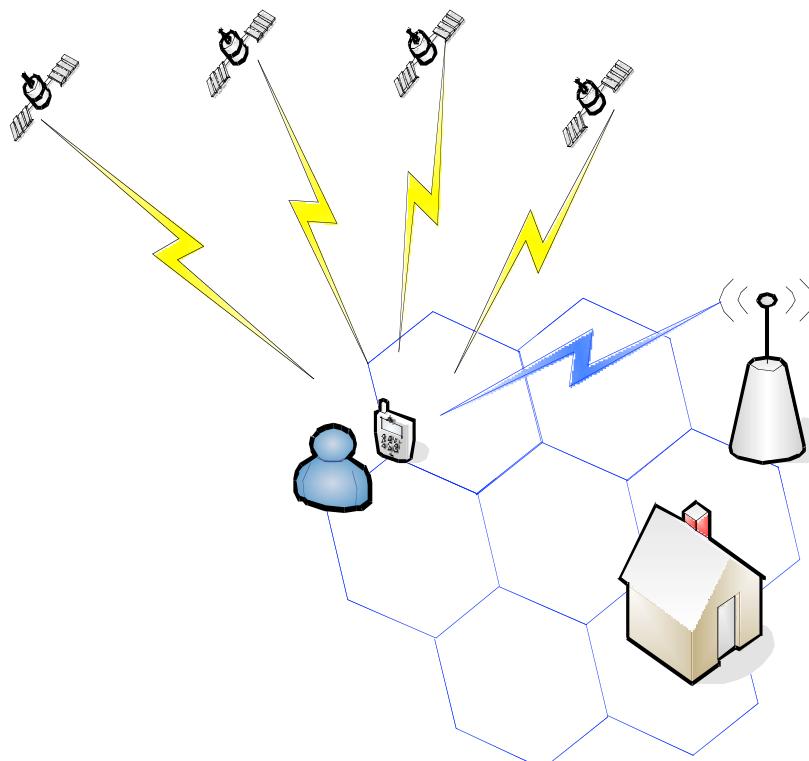


	<b>Network-based</b>	<b>UE-based</b>
<b>Cell-based</b>	<b>Cell ID</b> <b>Cell ID + TA</b>	



	Network-based	UE-based
Cell-based	Cell ID Cell ID + TA	
Triangulation-based	TDOA , AOA EFLT	E-OTD AFLT

# LBS Technology

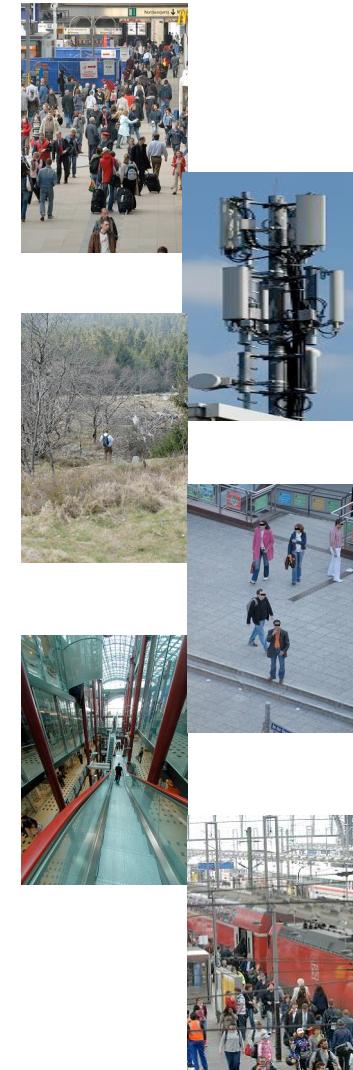


	Network-based	UE-based
Cell-based	Cell ID Cell ID + TA	
Triangulation-based	TDOA , AOA	E-OTD EFLT HYBRID AFLT
Satellite-based (GNSS)	A-GPS	GPS

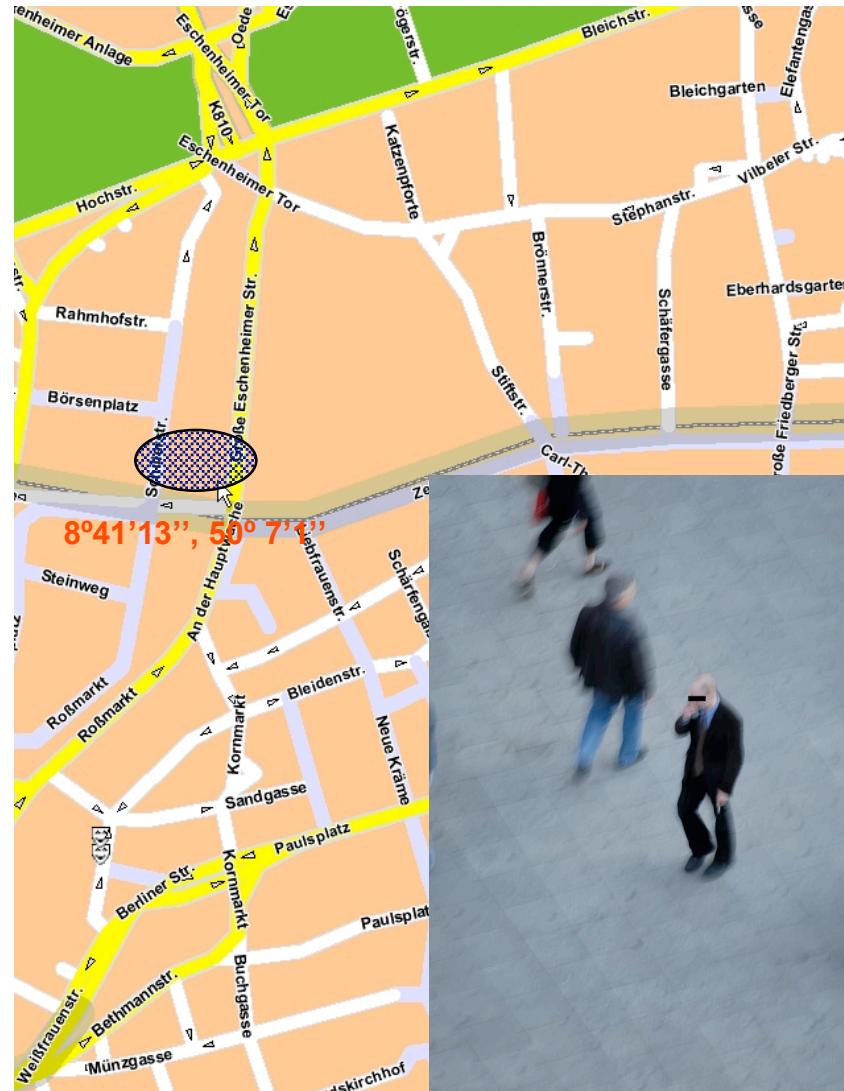
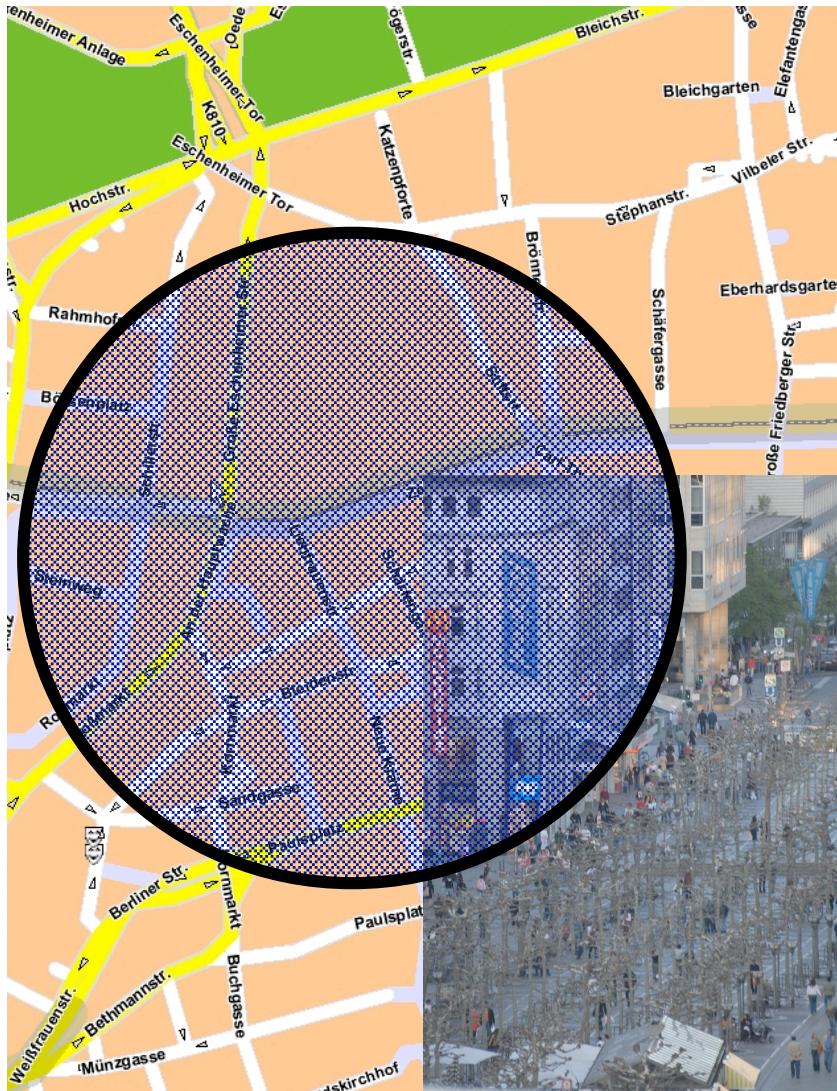
# Accuracy

Network/ UE	Technology	Accuracy
GPS + Network Assistance	AGPS, GPS, <b>GPS Hybrid</b>	<b>5-30m</b>
Network + Mobile Measurements	AFLT, EOTD	<b>100-200m</b>
	TDOA, AOA	<b>100-200m</b>
	EFLT	<b>250-350m</b>
Network	CELL ID + TA	<b>500m</b>
	CELL ID	<b>100- 3000m</b>

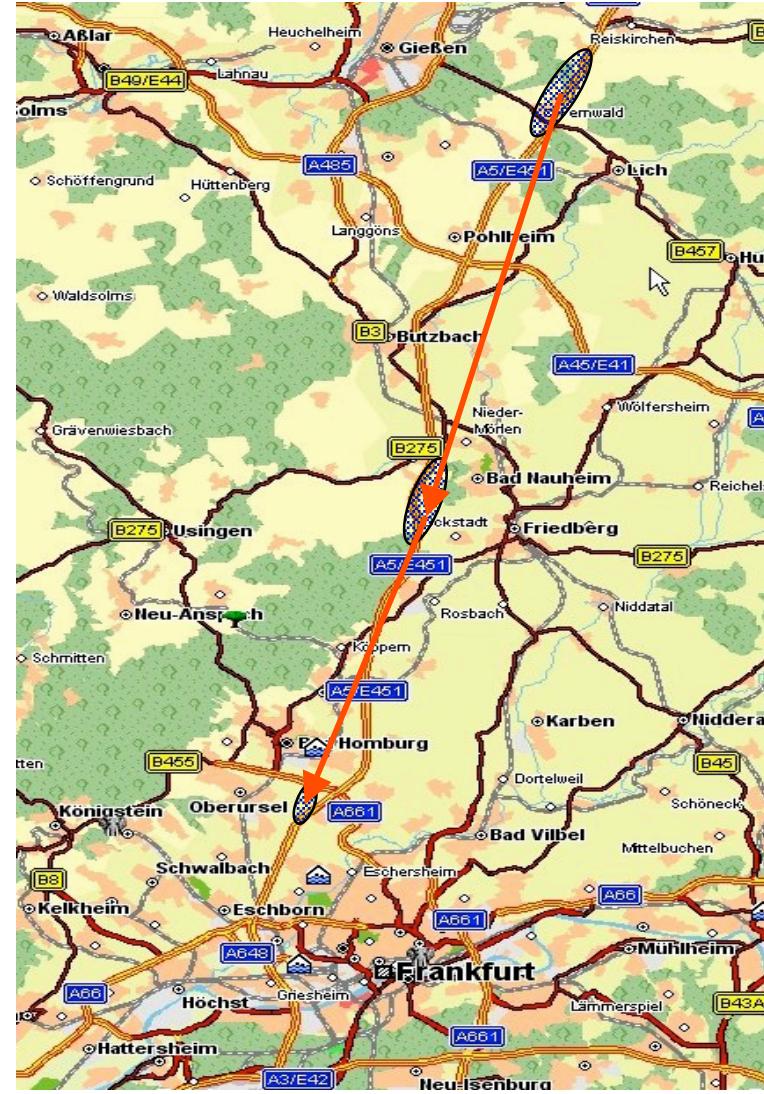
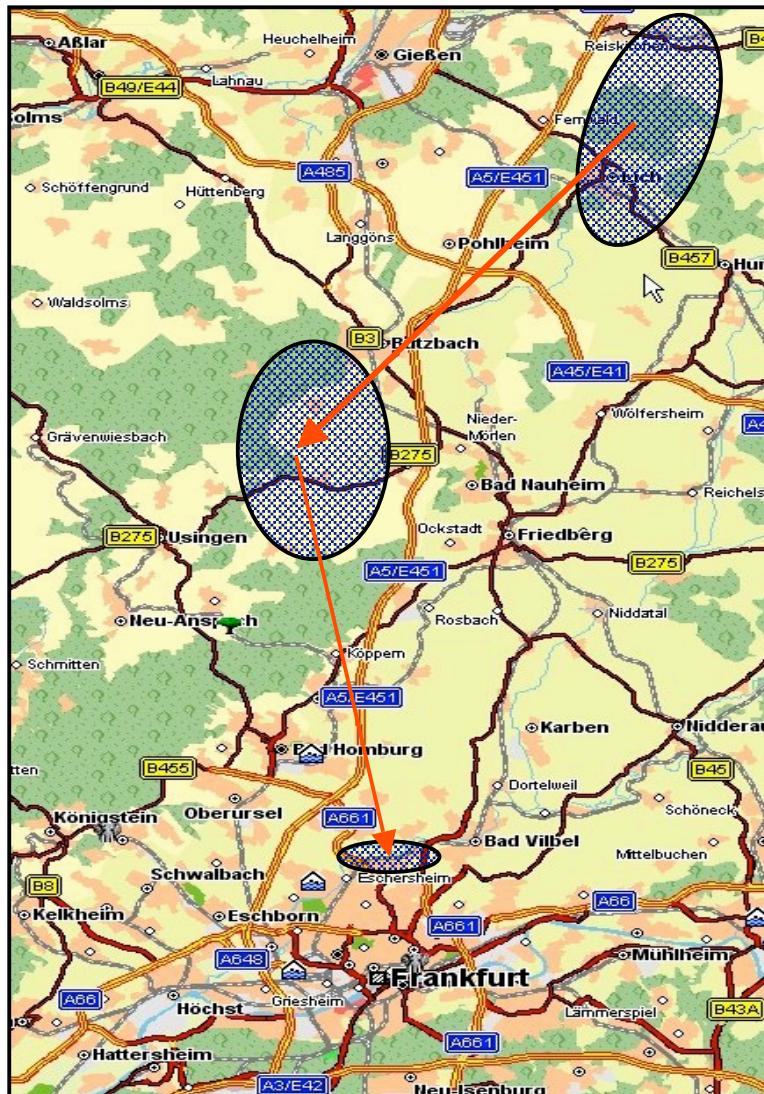
- Accurate location
- Accurate tracking
- Valid reference over time
- Hot-zone in/out alerts
- Relation analysis
- Field operations management
- “Bad guy” gathering



# LBS Effect on Positioning

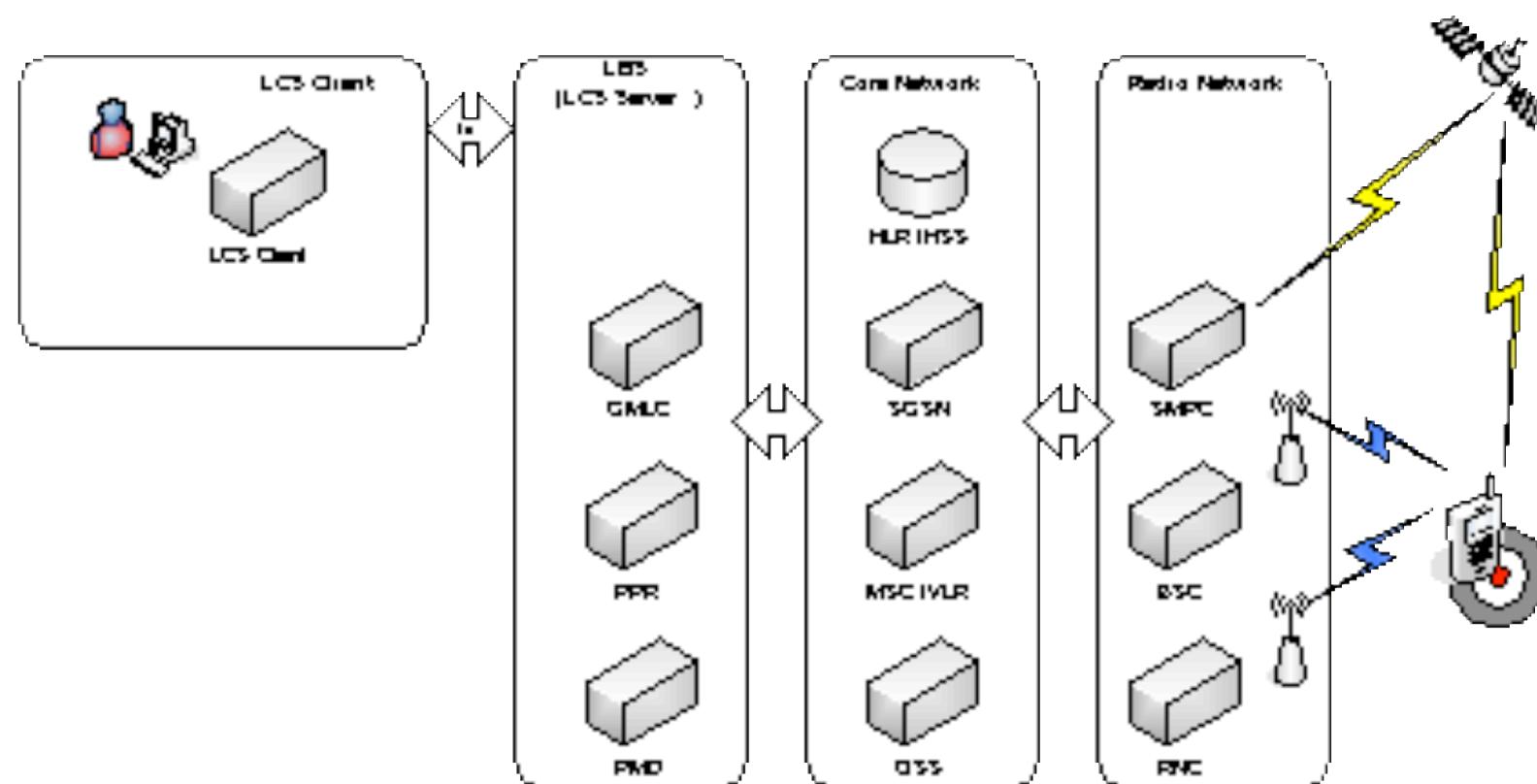


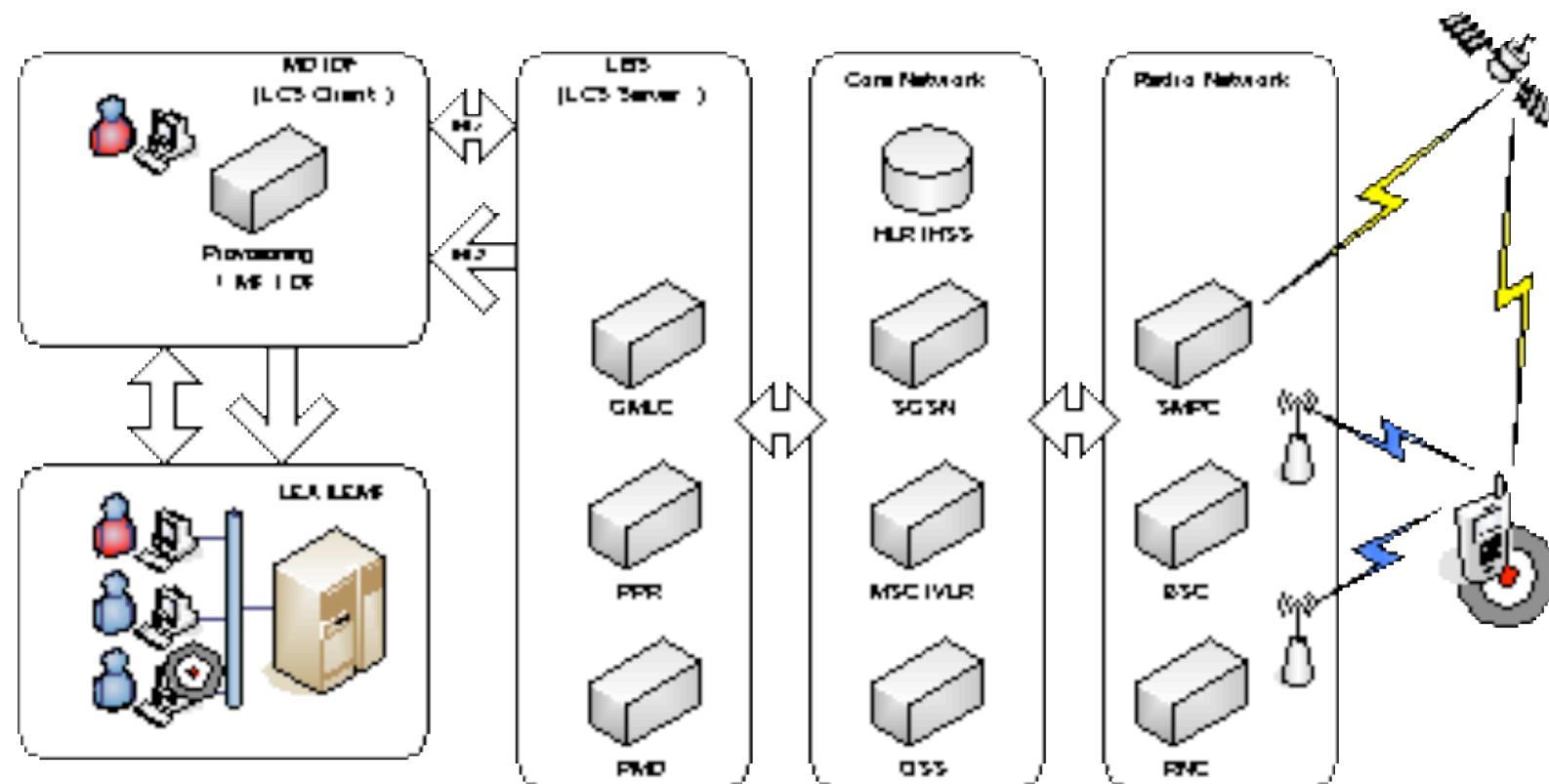
# LBS Effect on Tracking



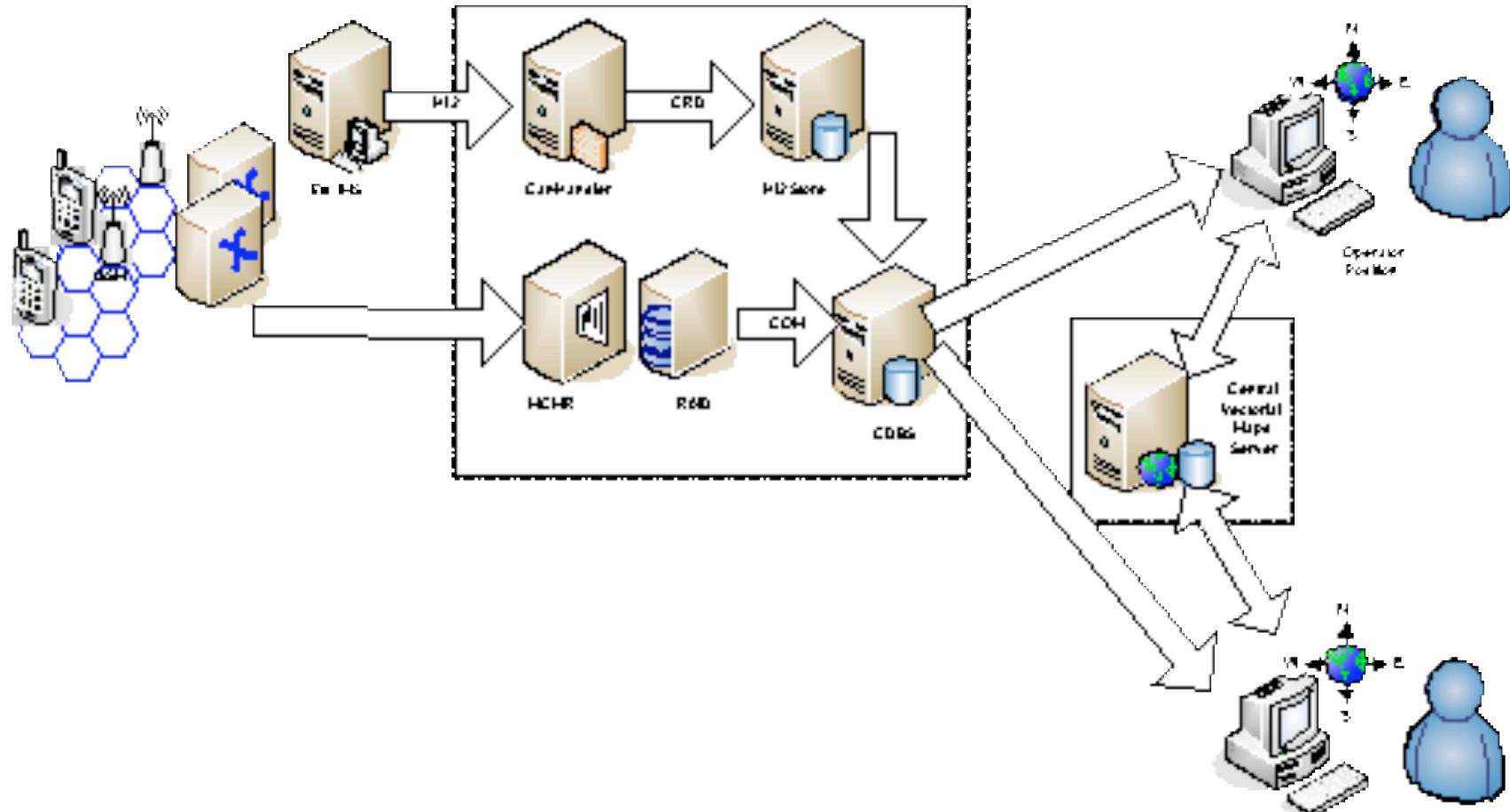
# Integration of LBS in LI Platforms

# LBS Architecture





# LBS in LEMF



# LBS in LEMF – Application

**ATIS systems KLARIOS Client - Wiedergabe**

Datei Seiten Bearbeiten Drucken Ansicht Extras Hilfe

Fr, 05 Mai. 2006 12:15:12

Anzahl: 3165 Länge: 36:55:04

Gesprächsliste

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Kommentar Zusammenfassung Filter Details Kanäle Standort

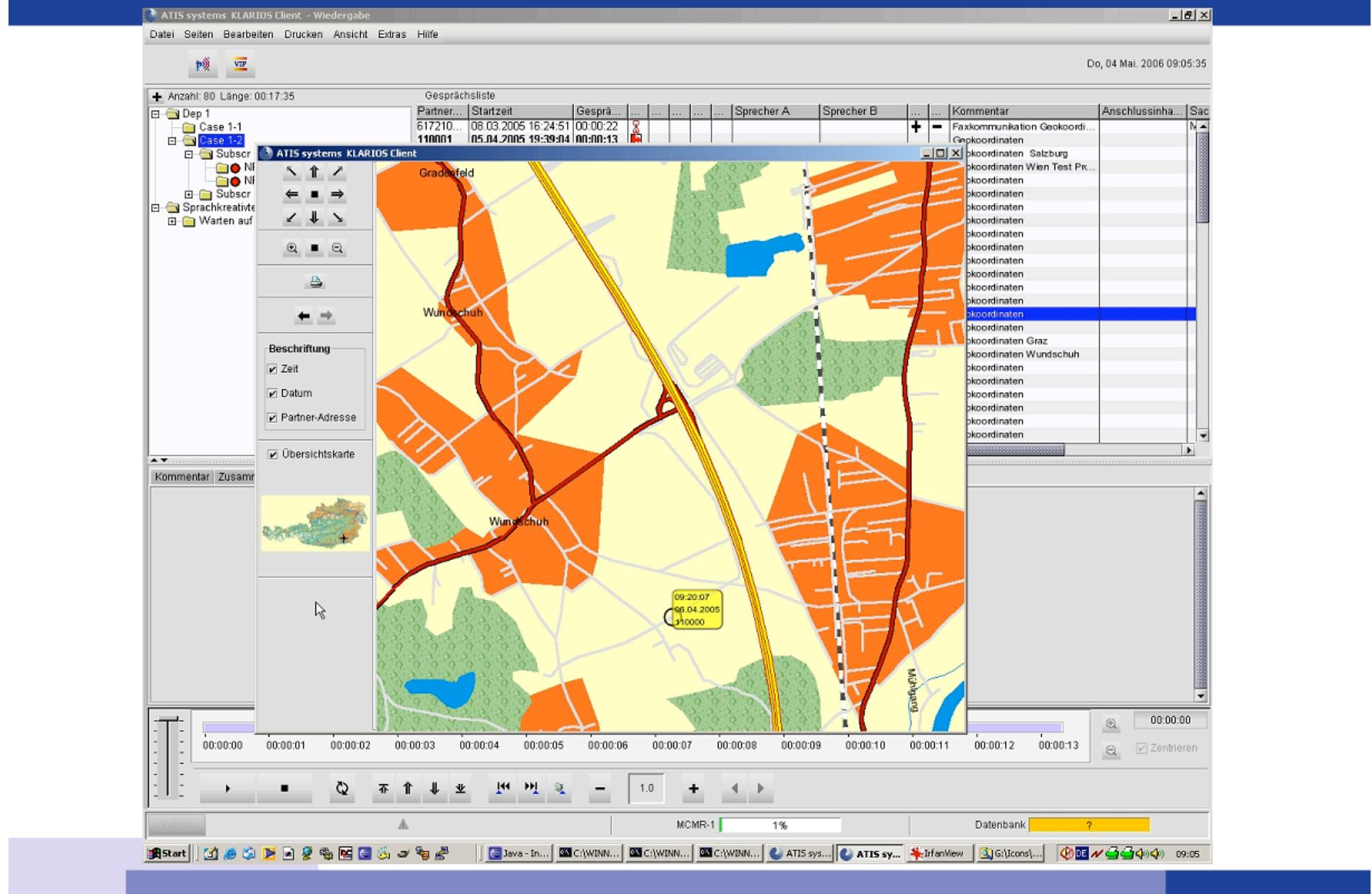
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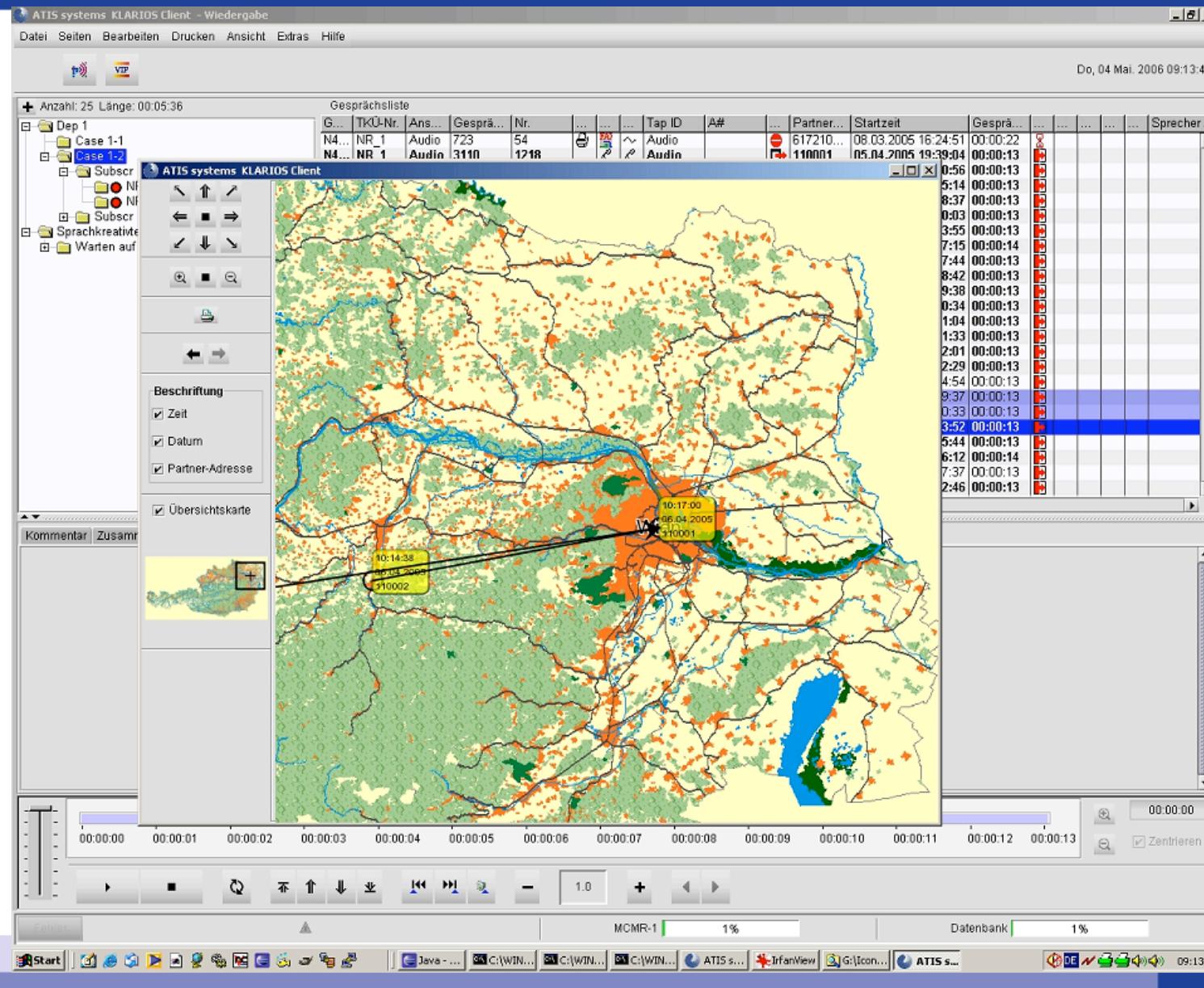
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# LBS in LEMF – Positioning



# LBS in LEMF – Tracking



# Future Trends and Technical Challenges



- IETF – work in progress
  - RFC
    - Geopriv requirements, RFC-3693, Feb '04
    - DHCP coordinates-LCI, RFC-3825, Jul '04
  - Internet Draft
    - ECRIT requirements, Apr '06
    - DHCPv4/6 CIVIC, Jan '06
    - Location types registry, Mar '06
    - Carrying location objects in RADIUS, Mar '06
- Wi/Fi LBS

- All-IP markets
  - Future growth in IP-LBS
  - Growth in LBS-enabled devices
- LI
  - Contribution to standardization efforts
  - Growth in LBS-based LI
  - Enhanced LEMFs with analysis tools based on movement profiles

## Our mission ...

- **Working as your long-term partner for integrated lawful interception, monitoring and analysis solutions for communication networks**

## ..our business ...

- **Private independent company with a 60-year history**
- **Approx. 200 employees**
- **Headquartered in Bad Homburg, Germany**
- **Offices in Switzerland, Abu Dhabi, Paris, Atlanta and Moscow**
- **Extensive track record as a partner of law enforcement, network equipment vendors and network operators**



Questions ?  
Questiōns ?