Integrated Information and Communication System for Disaster Management

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Problem Statement

In an event of a **disaster** there are two major communications obstacles:

1) **First**, damaged or destroyed terrestrial networks may create communications blackout.

2) **Second**, due to sudden increase in communication demand existing communication system quickly oversubscribed and making communications difficult or sometimes impossible.

Necessity

A committed **bi-directional** communication system is required for disaster preparedness and management which should have following features;

1)Provide a reliable platform for emergency communications with broadband applications such as text, voice, video, and facilitate sharing of maps/non-spatial data.

2)Robust enough to integrate all available communication means in an affected area, bypassing the damaged or affected networks.

3)Extend its reach to any location quickly.

4)Portable, ease to deploy and cost effective.

Objectives

1) Design and develop an **integrated** communication system for emergency communications.
2) Design and develop a **disaster information system** by integrating the data and information available in various agencies and make them accessible through a web-based system for quick decision making and use at the field level.
3) Develop **multi-media applications** for supporting bi-directional communications (e.g., text, voice, video) and data sharing (maps and other non-spatial data).

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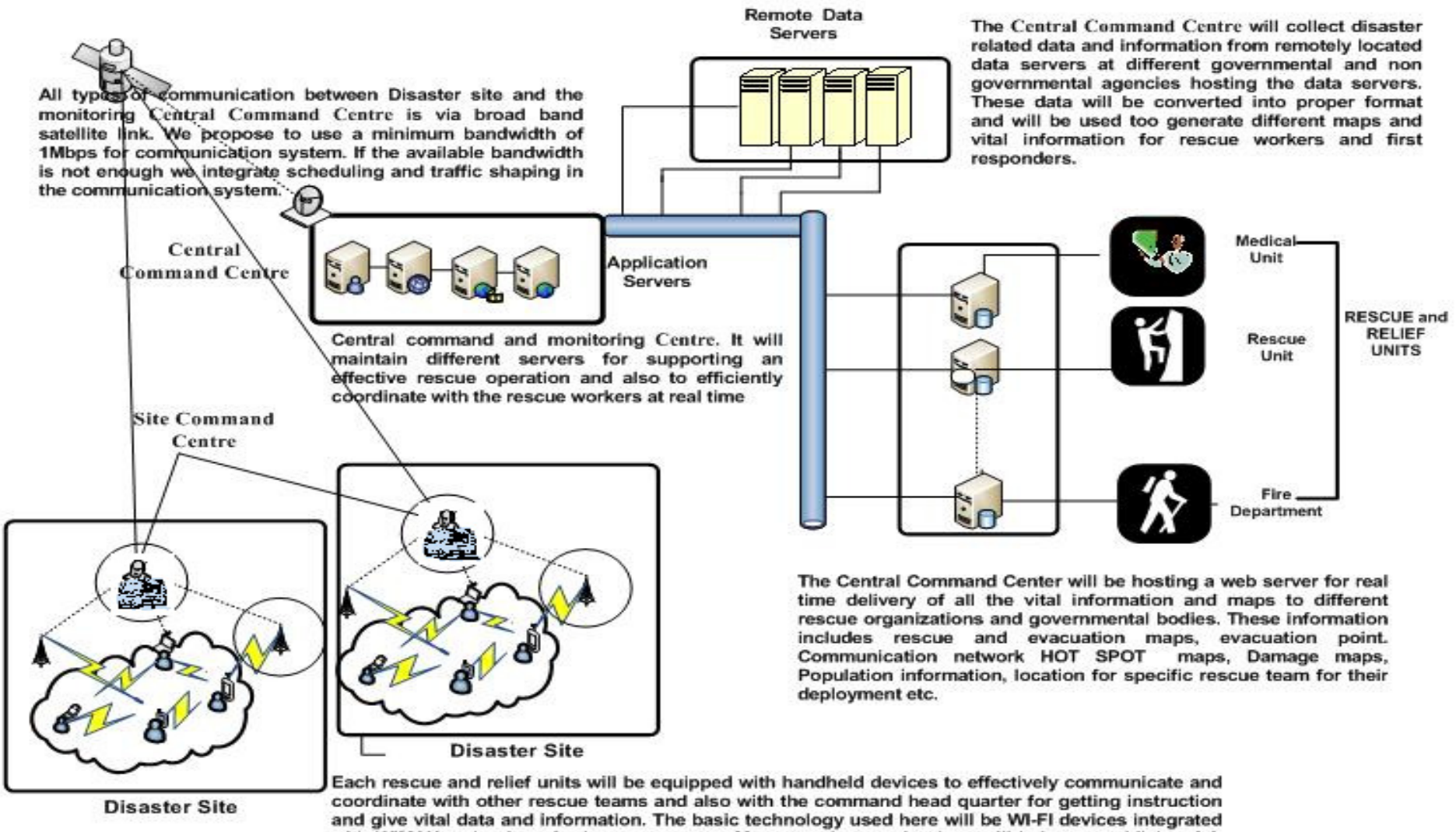
Proposed System



Disaster Information System Contd.

1) Proposed disaster information system will be a web-based system and existing as well as updated maps will be available in a **homogeneous format**.
2) Having real-time field information at hand, rapid damage assessment will be possible.
3) Central Command Center will communicate the updated information to the various line agencies through web-portal in real-time planning their respective missions.

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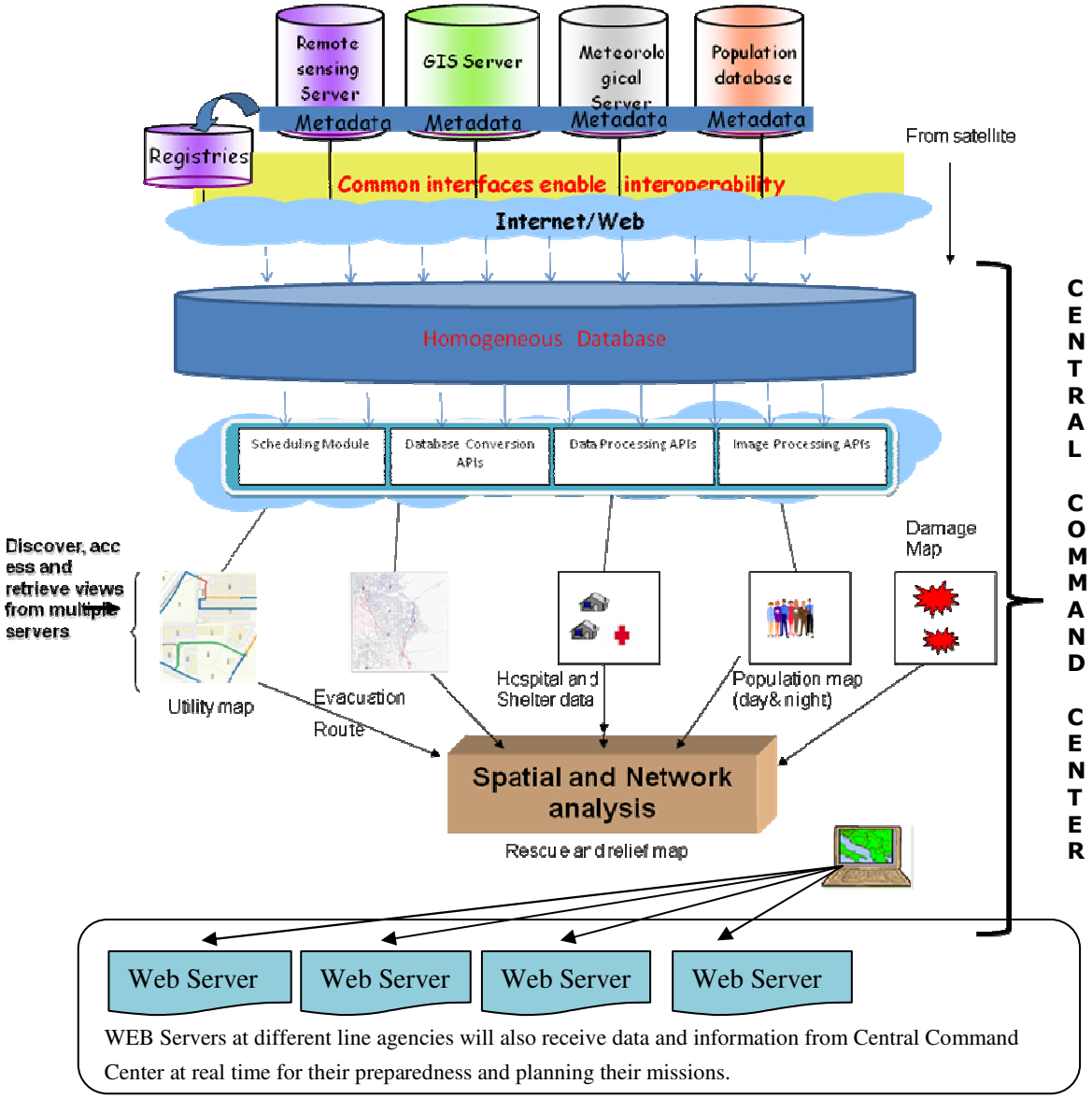
Disaster Information System



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Potential Communication Network for the System

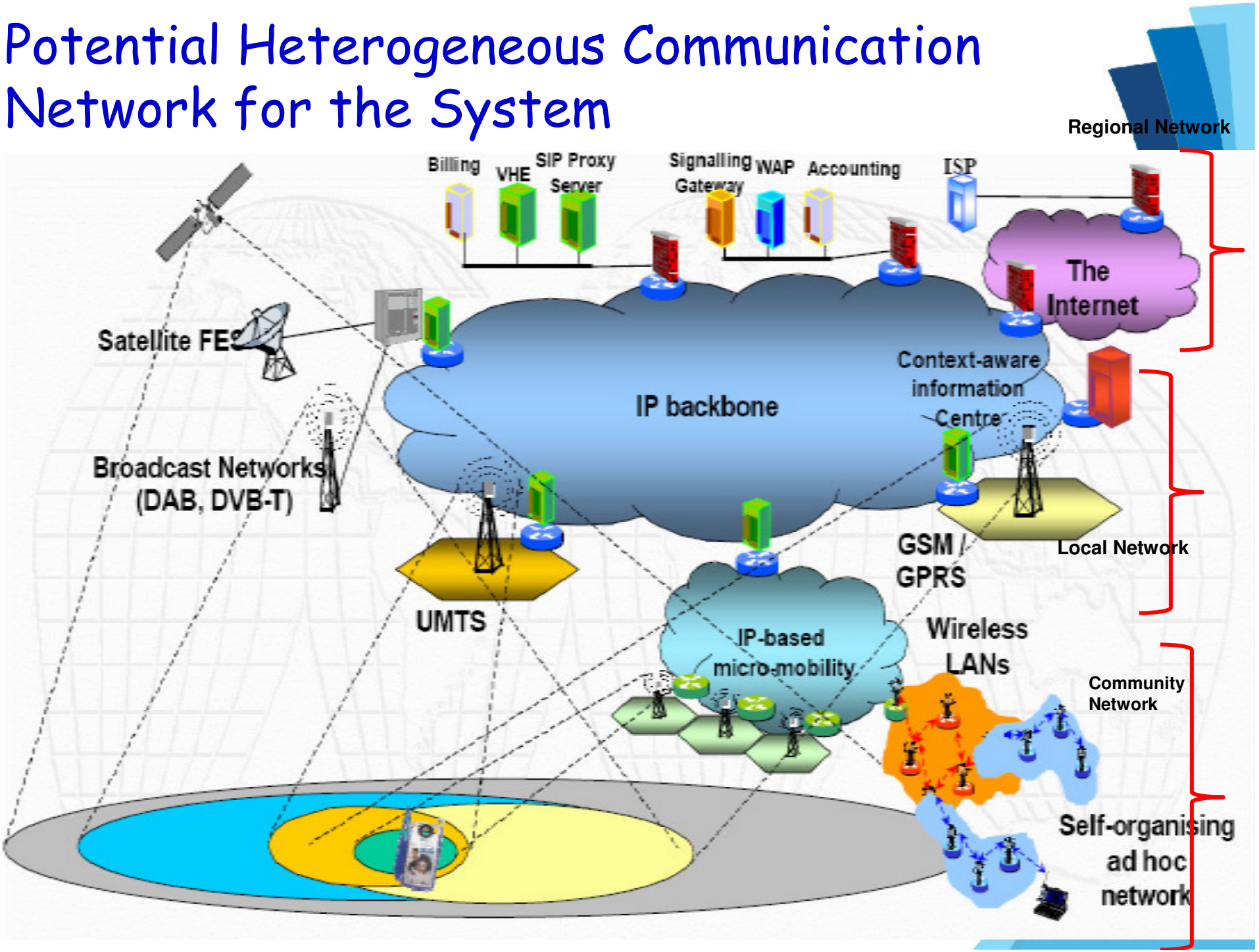
Communication Network with Infrastructures

- Telephone Network
- Cellular Network
- Internet

Infrastructure-less Communication Network

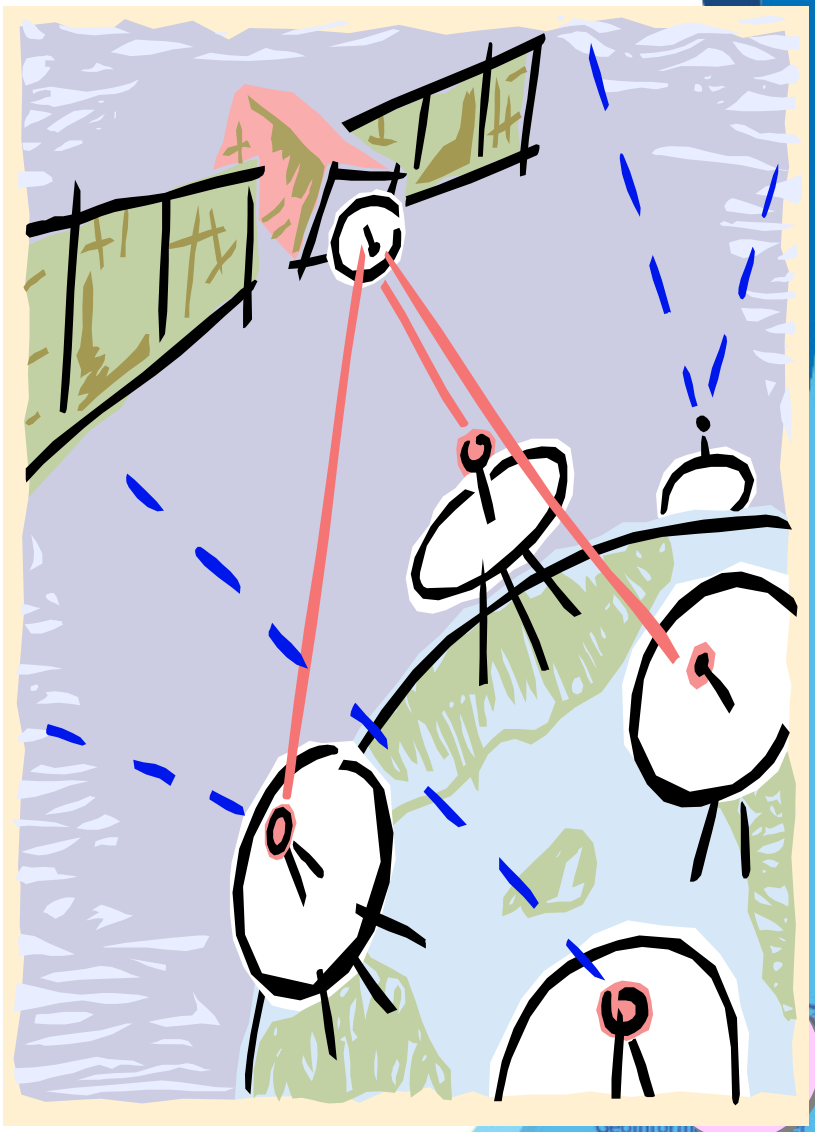
- Satellite Network
- Peer-to-Peer (P2P) Wireless Network

Potential Heterogeneous Communication Network for the System



VSAT - Broadband Satellite

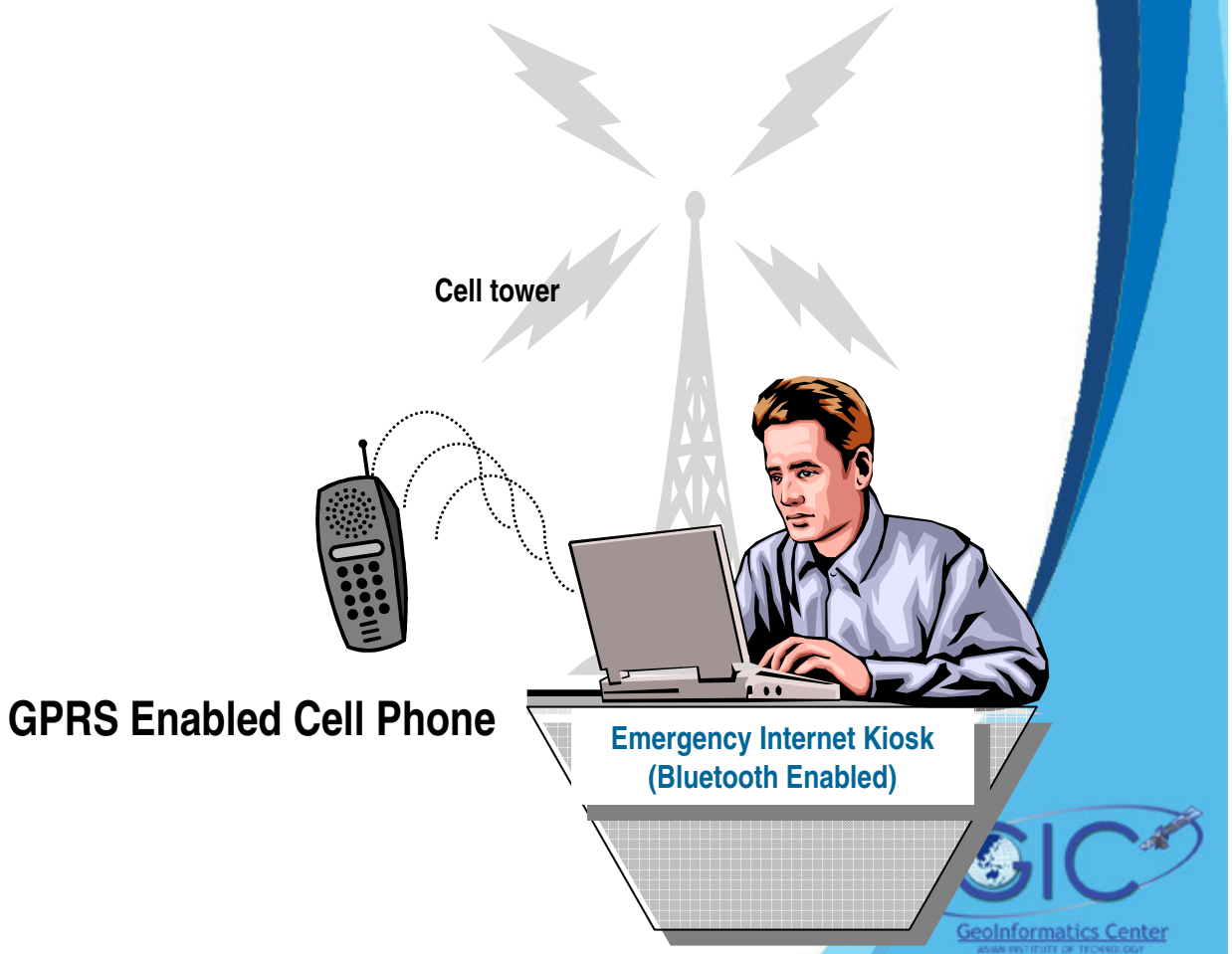
- Very small aperture transmission
- Requires Small Dish Antenna (1.0 m or less)
- High-speed connectivity
- Uses Demand Assigned Multiple Access (DAMA) System for full mesh point to point or point to multi-point connectivity
- High setup cost
- Infrastructure dependent
- Recent Advances - **WINDS** satellite from JAXA, Japan



GPRS/CDMA Cellular Phone based service

GPRS/CDMA cellular phone provides

- Reliable, Always-On Internet Connection for a fixed package
- Good penetration
- Data exchange capability



Wi-Max Devices

- Fully Common Alerting Protocol (CAP) compliant
- Support all range of data-communication text, audio (VoIP), video
- Point-to-point and base station mode capability
- Easy Interface with Wi-Fi networks
- KML over lap reports can be generated which can be viewed using Google Earth

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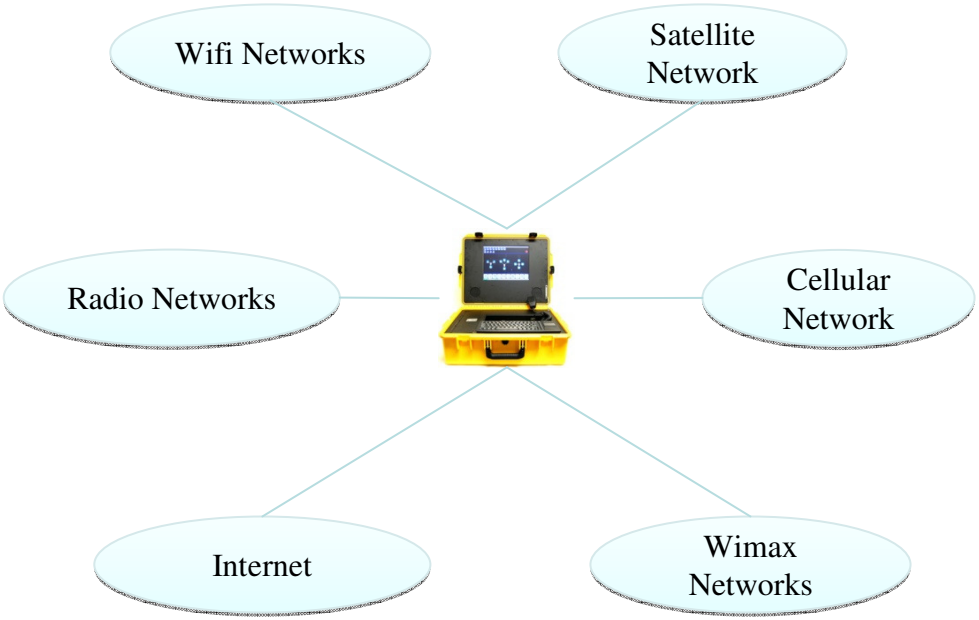
System Integration

Interoperable Devices

- Operable with all networks and capable of bridging different networks
- Support VoIP/Video application
- Portable and only one device can interface among different networks



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Thank you for your kind attention