

Satellite Based Solutions for Disaster Recovery and Prevention

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on Disaster Communications
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Bangkok, Thailand

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The Asia-Pacific Satellite Communications Council
www.apsccl.or.kr

Why Satellite?

- **Terrestrial Infrastructure is vulnerable to natural disaster**
- **Safe Comm Repeater in Atmosphere**
- **Readily available in short lead time**
- **Scalable from small network to larger network network.**

- **Post-Disaster Recovery Network via Satellite Services**
 - Emergency recovery – first 3 to 6 months
- **Medium-Term Solution: Rehabilitation Network**
 - 6 months to two years
- **Reconstruction – new infrastructure**
 - Overlay by terrestrial and satellite network in disaster-prone areas
- **Prevention – Tsunami Detection System via Satellite**

Regional/National Satellite Operators

- APT Satellite (Hong Kong)
- AsiaSat (Hong Kong)
- SCC (Japan)
- JSAT (Japan)
- MEASAT (Malaysia)
- Insat (India)
- Indosat (Indonesia)
- ACeS (Indonesia)
- PT Telkom (Indonesia)
- ChinaSat (China)
- SinoSat (China)
- KoreaSat (Korea)
- Mabuhay (Philippines)
- Thaicom (Thailand)
- SingTel/OPTUS
- Thuraya (UAE)

Global Satellite Operators

- Intelsat/PanAmSat (USA)
- Loral Skynet (USA)
- SES/New Skies (Europe)
- RSCC (Russia)
- Inmarsat (UK)

Emergency Relief Network via Satellite

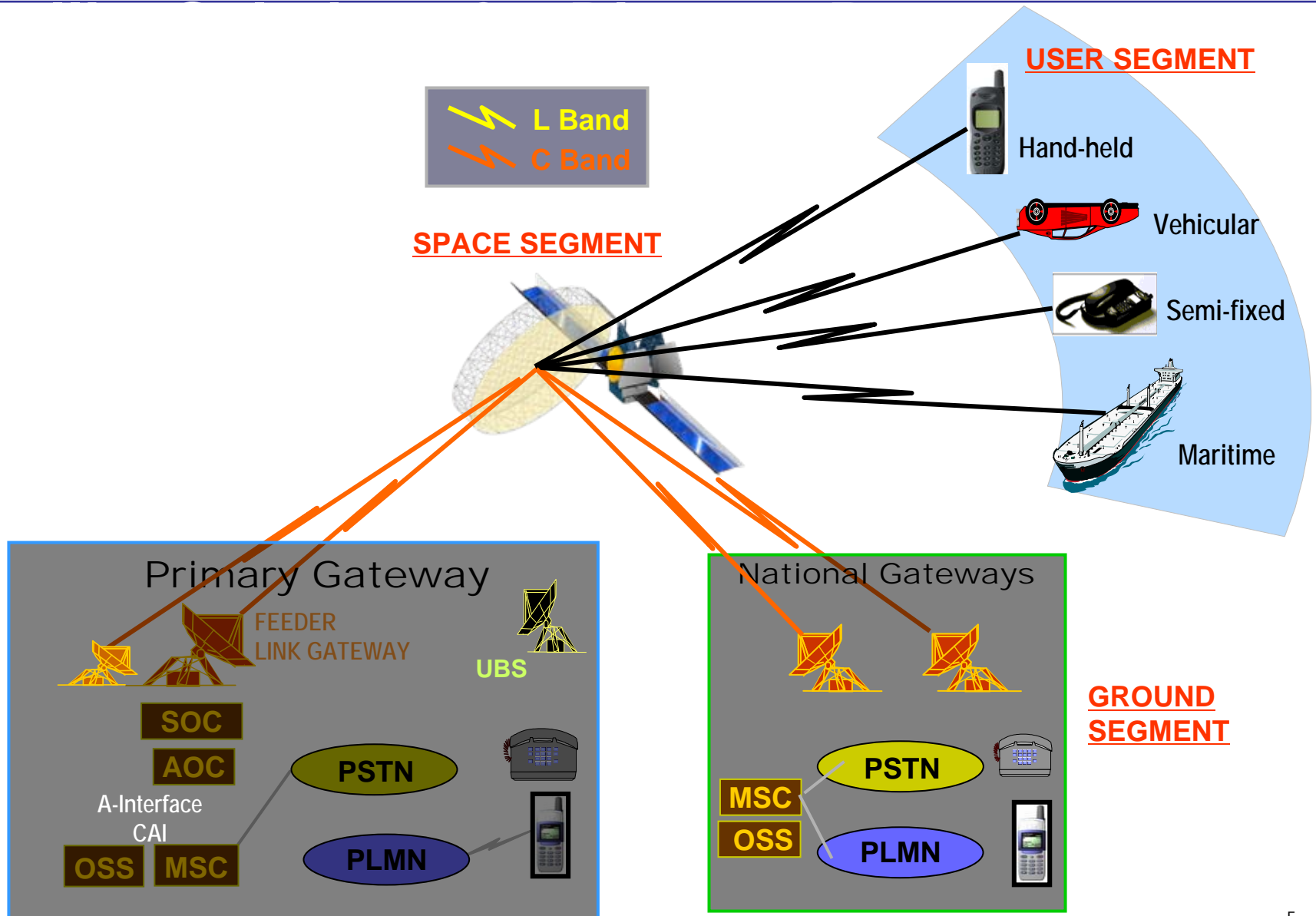
- **All terrestrial telecommunication networks could be destroyed or stymied by natural causes**

- **Viable Solutions - Recovery**
 - Satellite Phones
 - ACeS (GEO), Iridium(LEO), Inmarsat(GEO),
Thuraya (GEO)
 - DMB (Digital Multimedia Broadcasting) Services

Mobile Satellite System Architecture

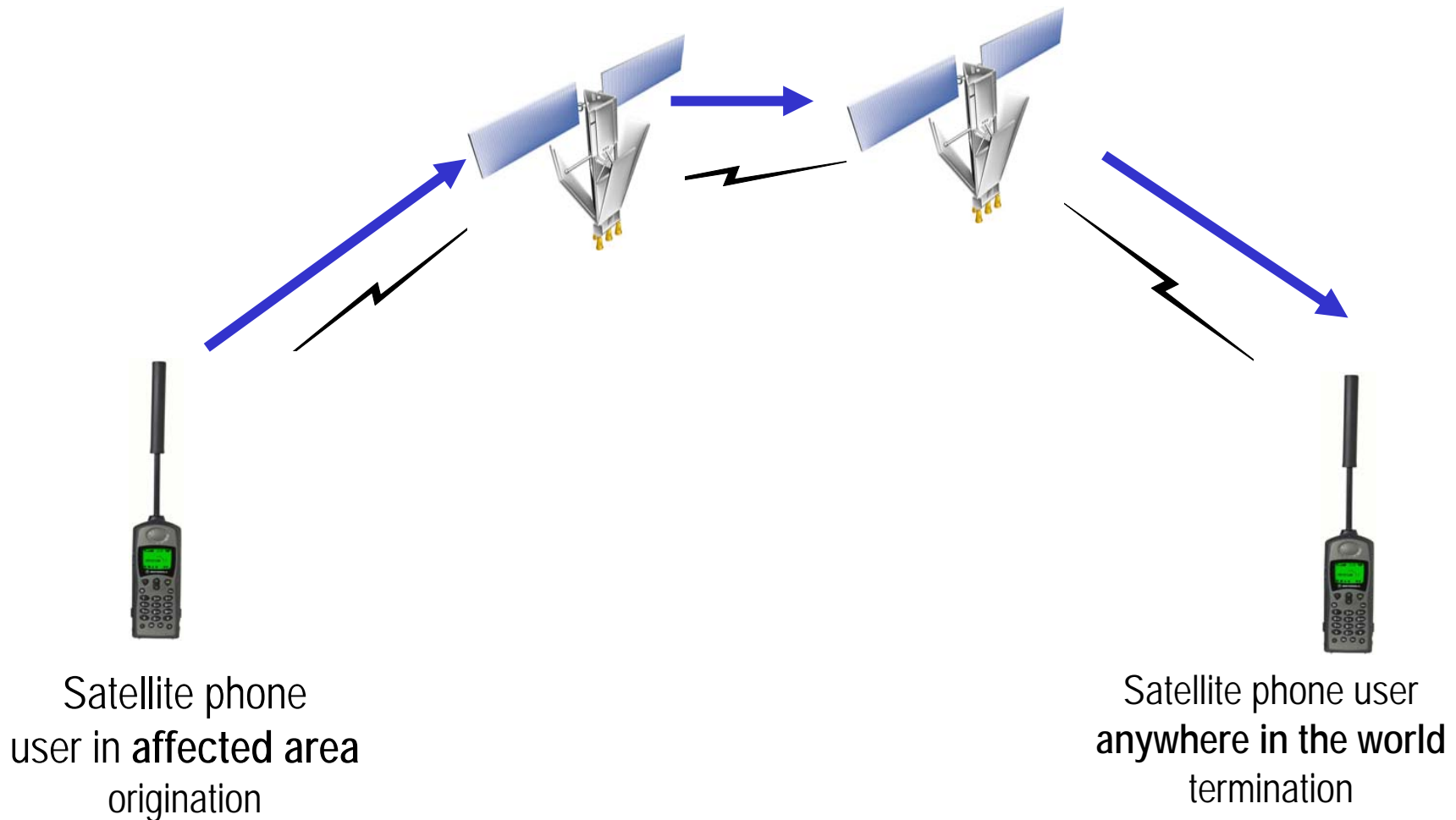


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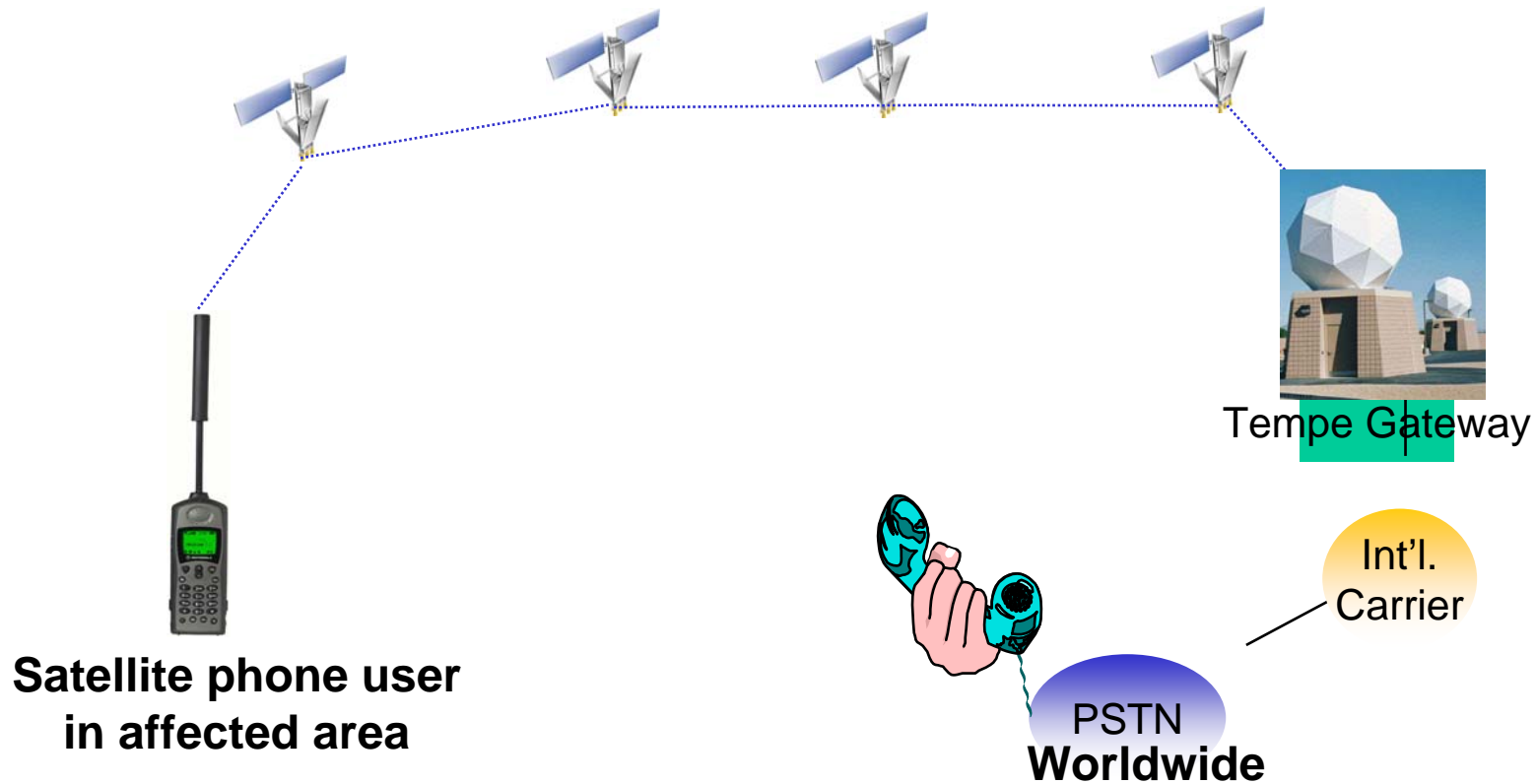


Call Flow - ISU to ISU Call

The call is not dependent on the wire-line network



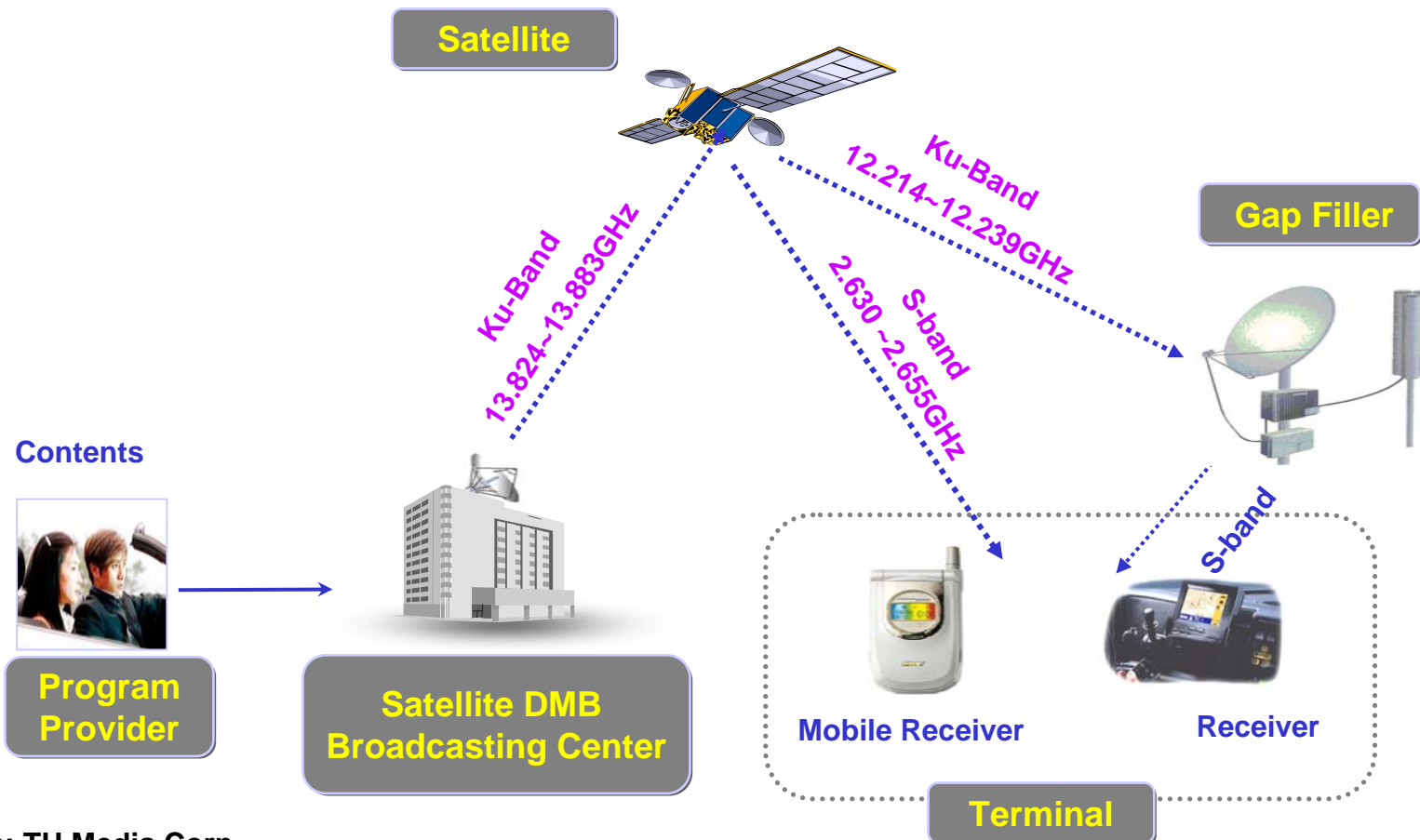
Call Flow – ISU to PSTN Call



Calls can be routed to any PSTN phone

Network Structure

- Satellite DMB signals will be delivered via multiple paths: Gap fillers as well as directly from satellite.

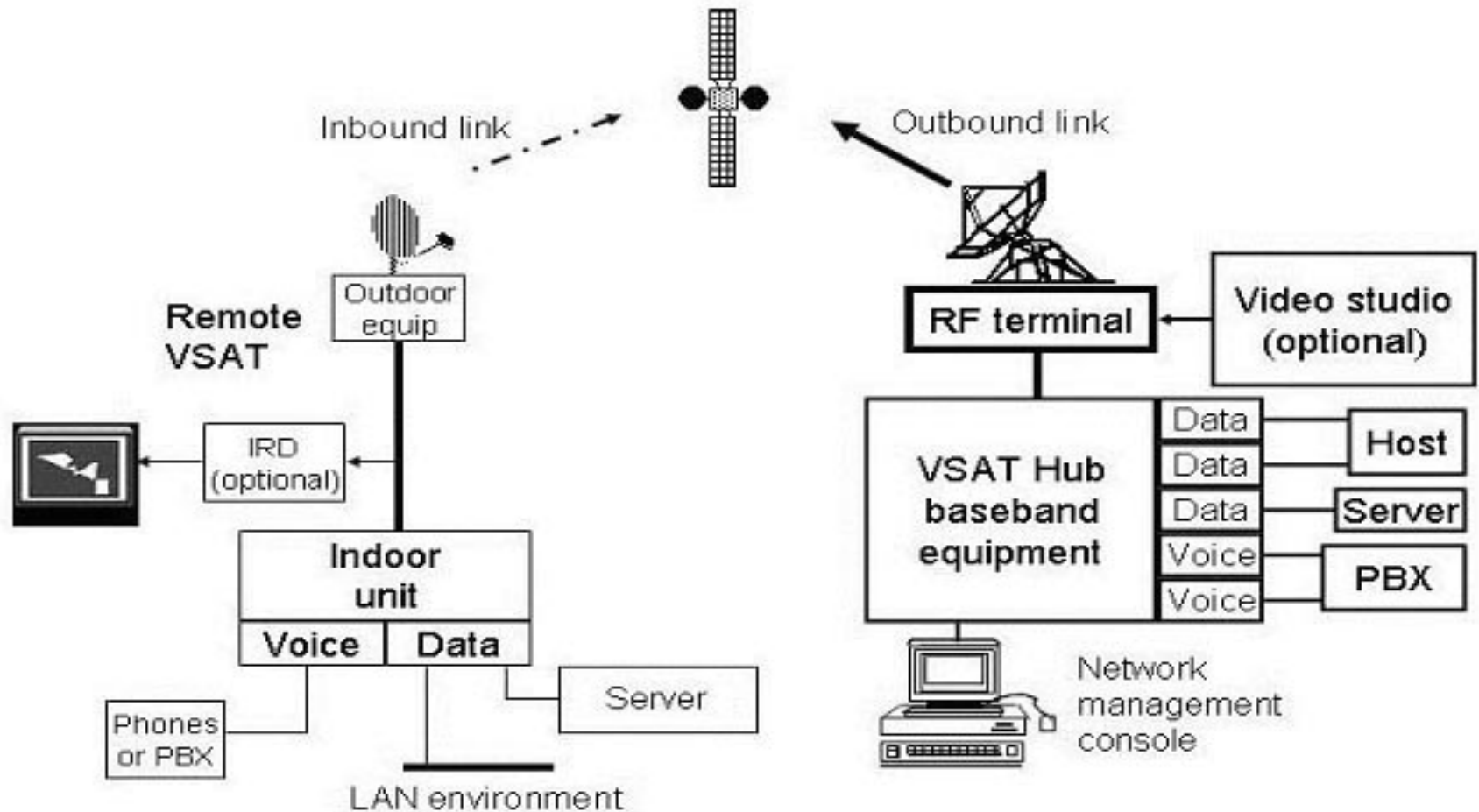


- **Internet Access – Access to the Internet for disaster-stricken area**
- **Intranet/LAN/WAN Connectivity – Connectivity between remote sites, either one way or two way services**
- **Network for Relief Agencies:**
 - Basic telecommunications for remote agencies
 - Government network for coordination
- **VoIP via Satellite**

Broadband Interactive Bi-Directional Data

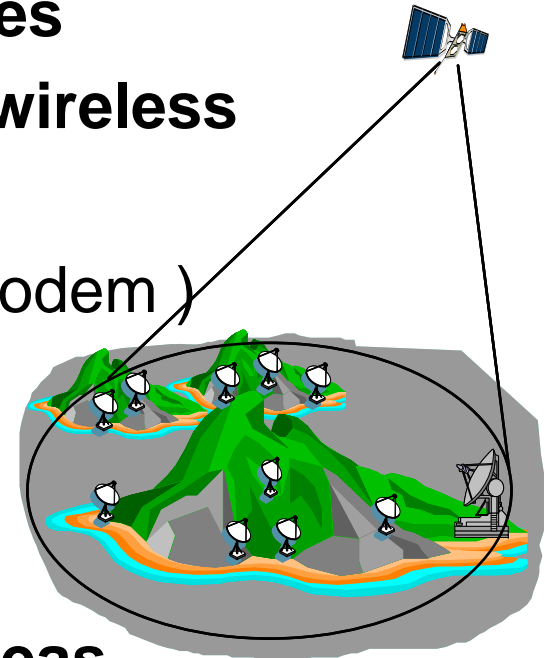


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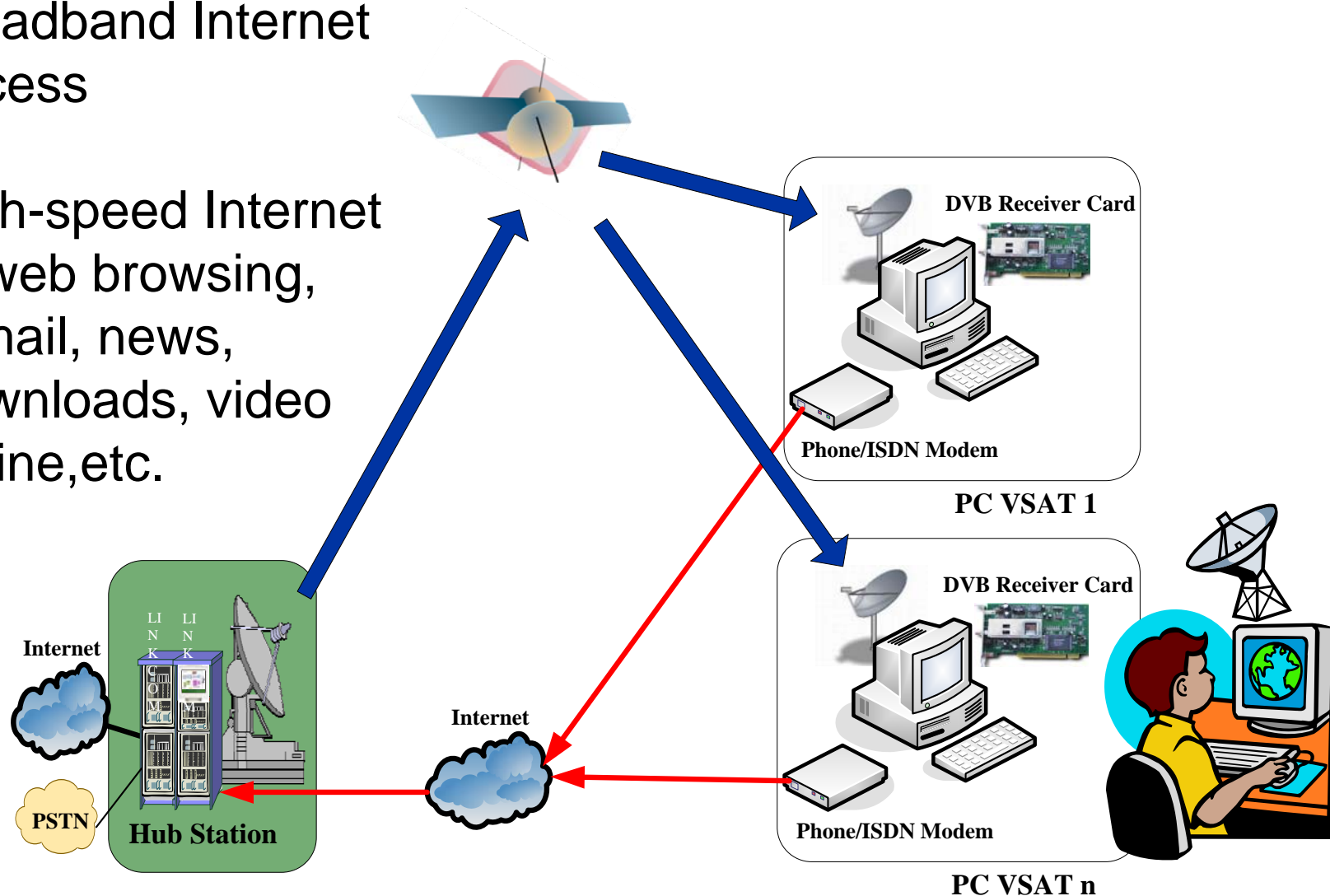
Longer Term Solution via satellite

- **Use of satellite broadband technologies**
- **Limit of terrestrial network and other wireless network**
 - Bandwidth (PSTN/ ISDN/xDSL /Cable Modem)
 - Reach and extend
- **Satellite network for disaster prone areas**
- **Satellite based e-government network**
- **Convergence of voice and data**
- **Community e-center via satellite for community development**



Broadband Applications & Services 1

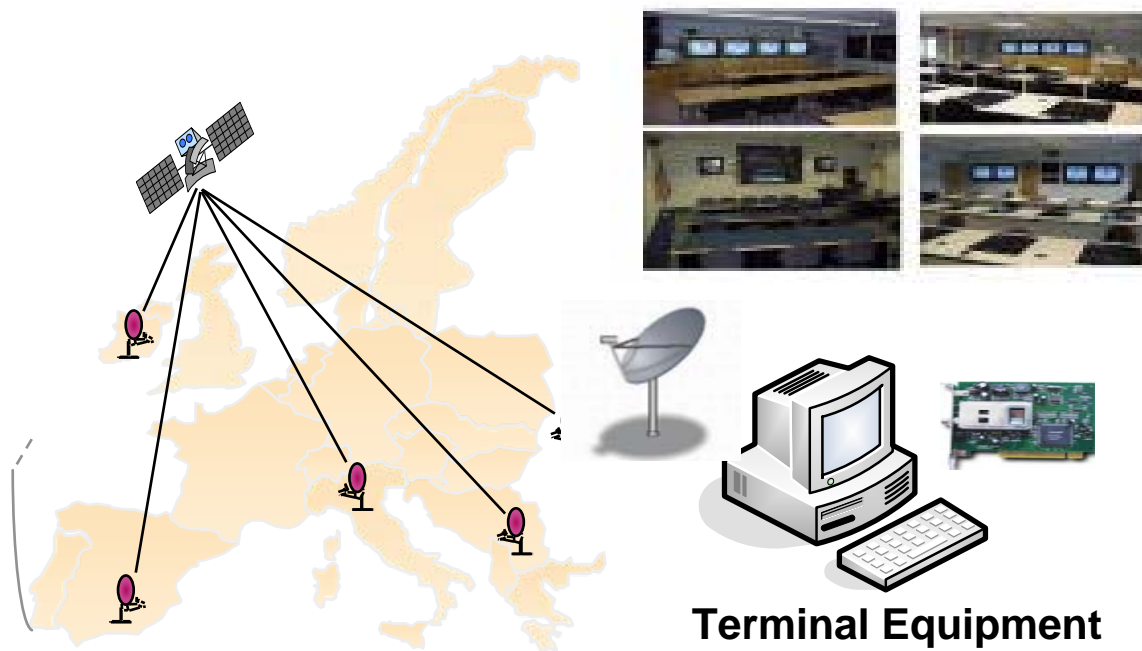
- Broadband Internet access
- High-speed Internet or web browsing, e-mail, news, downloads, video online, etc.



Broadband Applications & Services 2

➤ Distance Learning

- E-learning solutions based on satellite broadcast
- Interactive material
- Cost-effective terminal equipment
- Rich and colorful education resources



- Distance Medicine
 - Tele-diagnostics
 - Remote consultations
 - Remote training & certification



- Digital Media Streaming & Content delivery

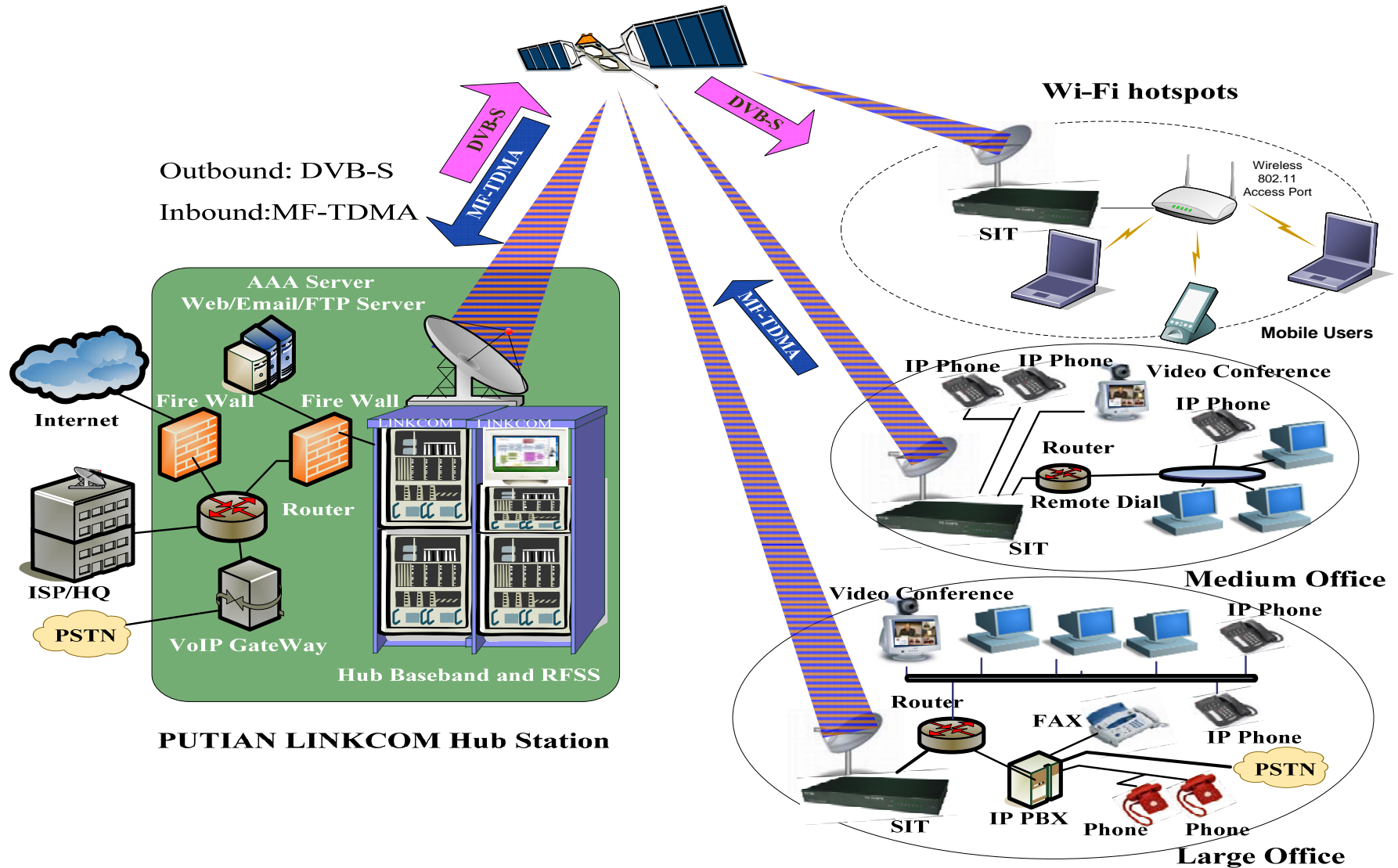
- Interactive TV
- On-demand video (movies, music, etc.)
- MPEG streaming



Broadband Applications & Services 4



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Applications to prevent Natural Disaster

➤ Monitoring & Control:

- Water management
- Environmental
- Pipeline
- Traffic
- Earthquake/tsunami
- Forest fire
- Flood

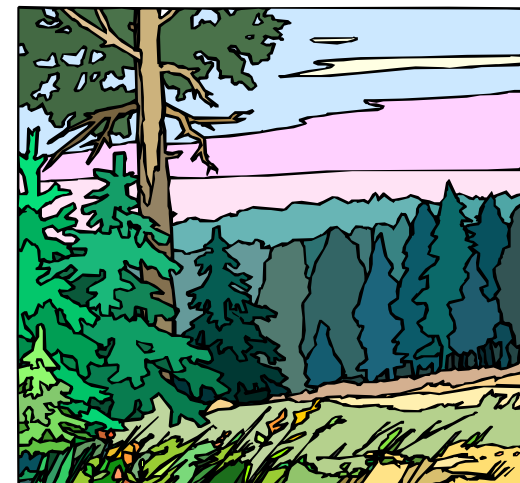


凌康VSAT – 921緊急衛星通訊
(88年9月21日)

台北全國指揮中心實況



南投救災指揮現場

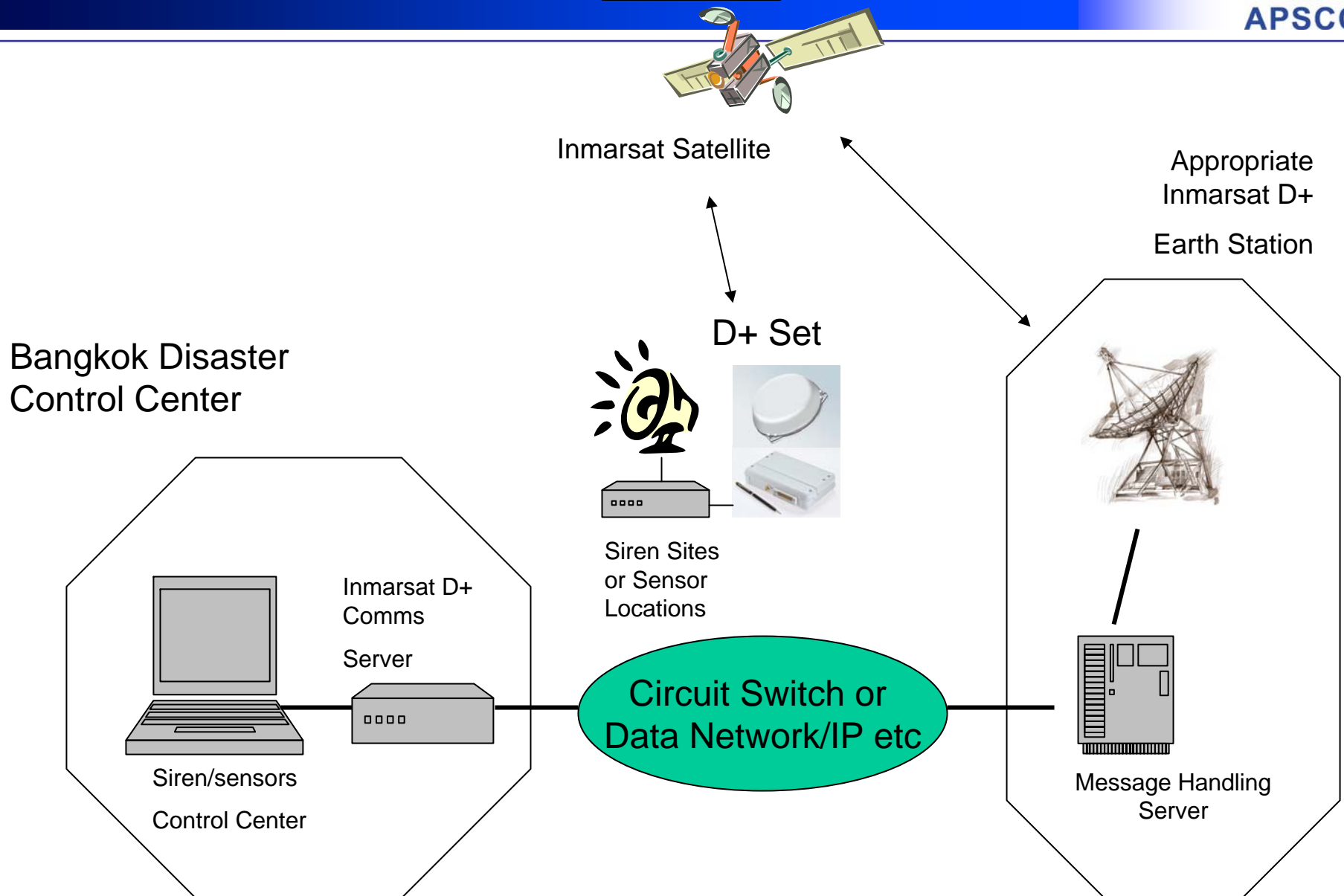


Thailand Tsunami Trigger Comms.

Schematic



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TSUNAMI EARLY WARNING SYSTEM INSTALLED IN THAILAND By Kemilinks International Group.



Disaster Warning
Centre, Bangkok

➤ **Immediate Emergency Relief**

- Satellite phones from LEO and GEO Satellites
 - DMB-Satellite terminals - GEO

➤ **Intermediary** - Rehabilitation

- VSAT Solution to connect relief agencies and government coordination

➤ **Reconstruction for Longer-Term Solution**

- Satellite based warning and prevention network in disaster-prone areas.

Thank you!!

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