Inmarsat Government Services

Presentation to:

UK Cabinet Office and Local Authorities

28 February 2008

Gordon McMillan
Director, Government Services

Agenda

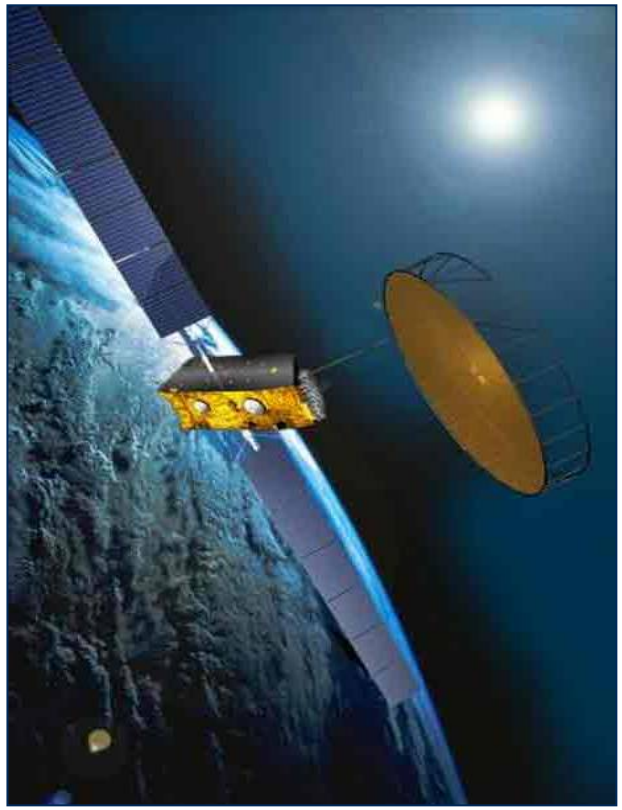
- Inmarsat – a brief overview
- I-4 Satellites & BGAN
- Government communications
- US Civil Government Sector

inmarsat

Inmarsat – an overview

The mobile satellite company™

- Organisational transformation
  - 1979: Set up as an IGO
  - 1999: Became a private company
  - 2005: IPO on London Stock Exchange
- Leading provider of Mobile Satellite Services
- Network availability 99.99%
- 10 satellite constellation - global coverage
- Commercial life to 2020+
- Strong financial growth in 2006 and 2007
- Government users ~ 35+% global revenue



inmarsat

Our Market Sectors

Global coverage

Maritime

- Unrivalled heritage
- Continuing growth in usage and terminals
- Only provider of global safety service
- Long-term purchase commitments

Land

- Helping transform the way users do business; eg media and live reporting via BGAN
- Only MSS provider of high-speed data
- Strong take-up of next-generation services

Aeronautical

- Accelerating growth in HSD services from Govt & Business aviation
- Current airline services focused on cockpit, but moving into cabin
- Installed in >80% of long-haul aircraft
- Only ICAO compliant safety services provider

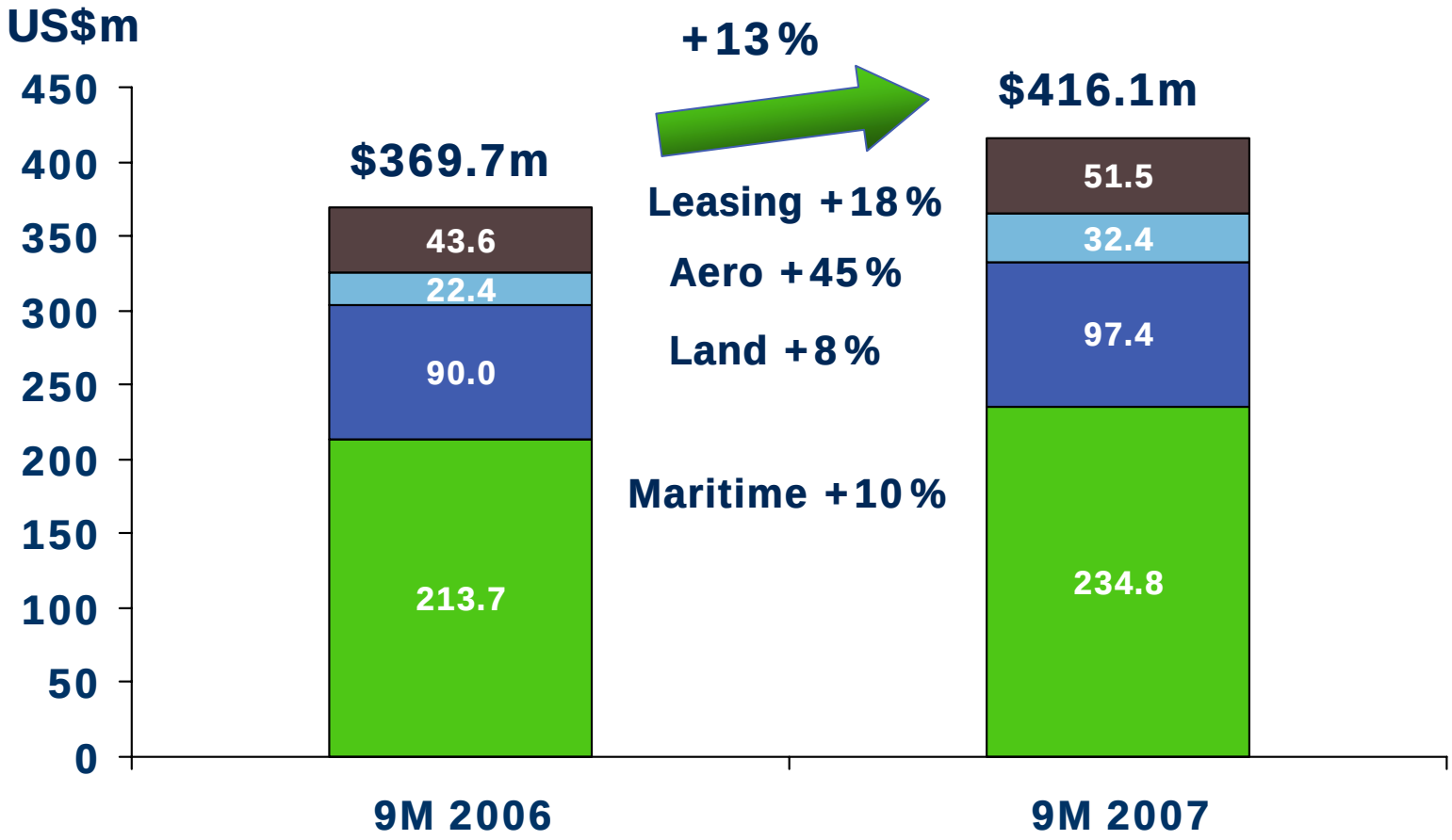
Government

- Focus on interoperability
- Mobility is key
- Supports crypto devices
- In use by US, UK, European, Middle East, African and AsPac forces
- 35% of global revenue

inmarsat

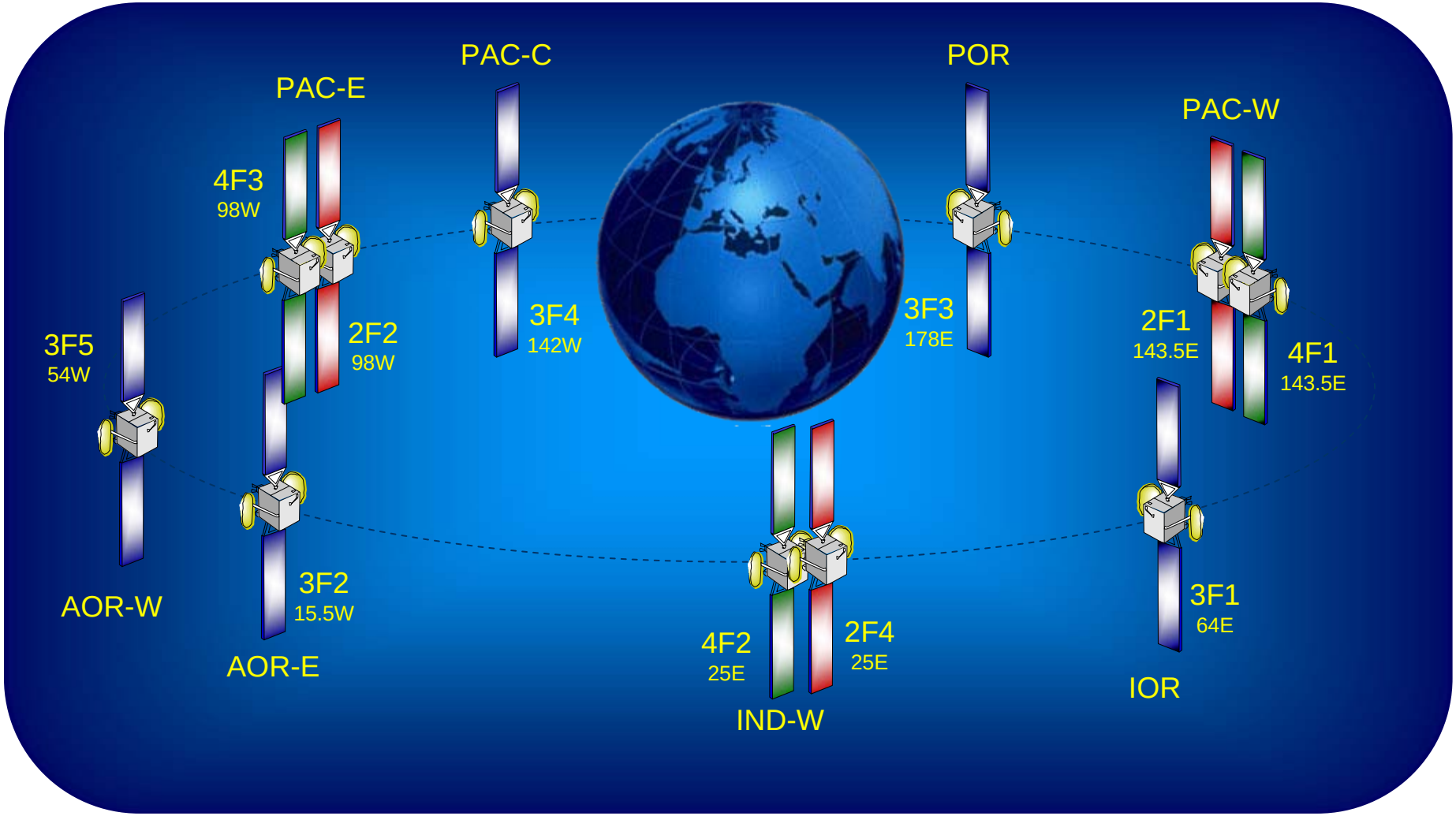
Revenue - 9 months 2007

Solid growth



inmarsat

Inmarsat constellation



Inmarsat-2s
Inmarsat-3s
Inmarsat-4s

(*) Satellite positions are always subject to change by Inmarsat

inmarsat

Inmarsat I-4 satellites

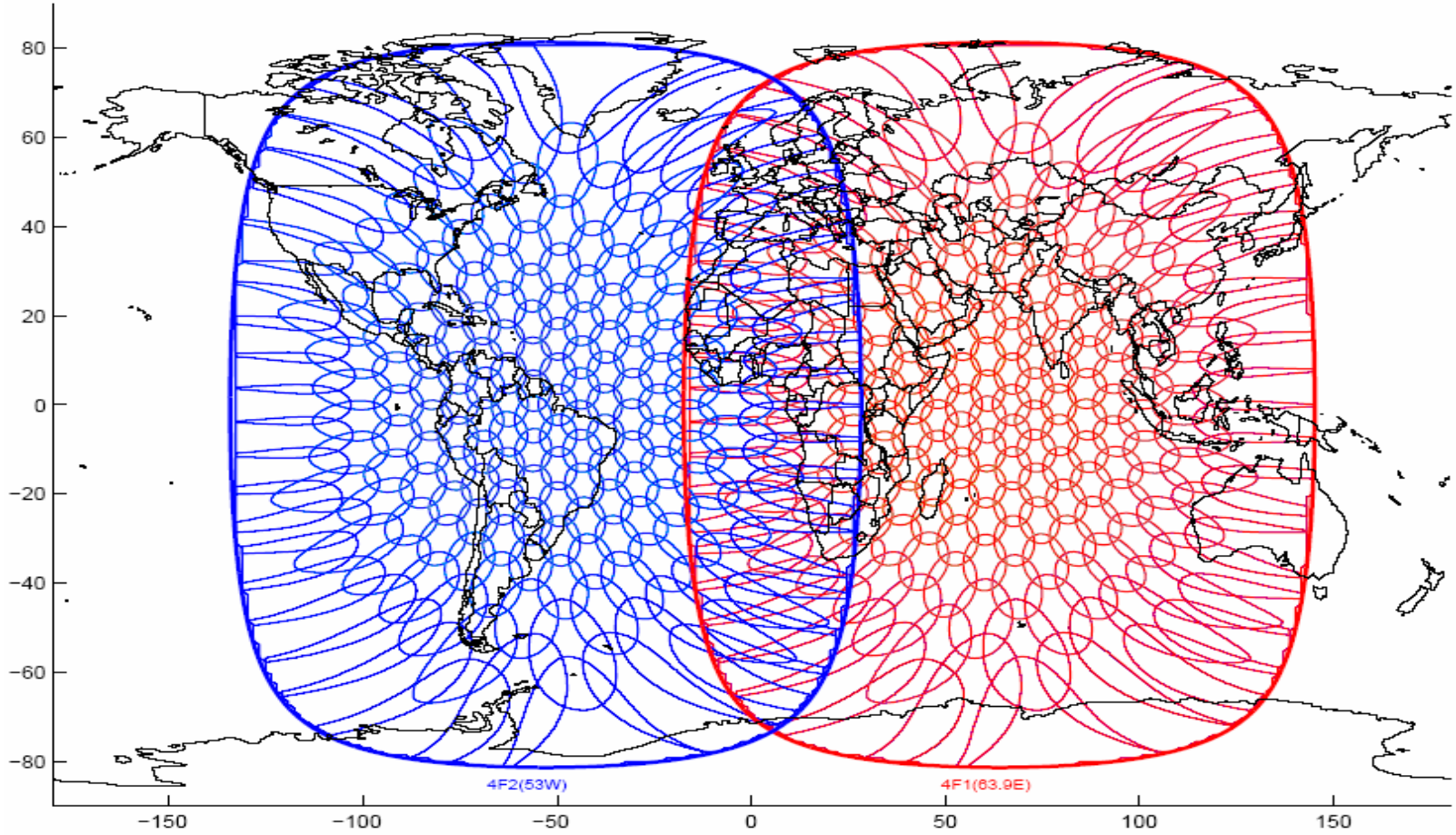
A step change

- Resilient, flexible, reliable, fully funded
- Network capacity can be automatically redeployed in real-time to areas of high service demand
- Supports advanced functionality of BGAN, SwiftBroadband and FleetBroadband
- Satellite launches
  - F1: 11th March 2005
  - F2: 8th November 2005
  - F3: booked Q2 2008

inmarsat

Inmarsat I-4 satellites

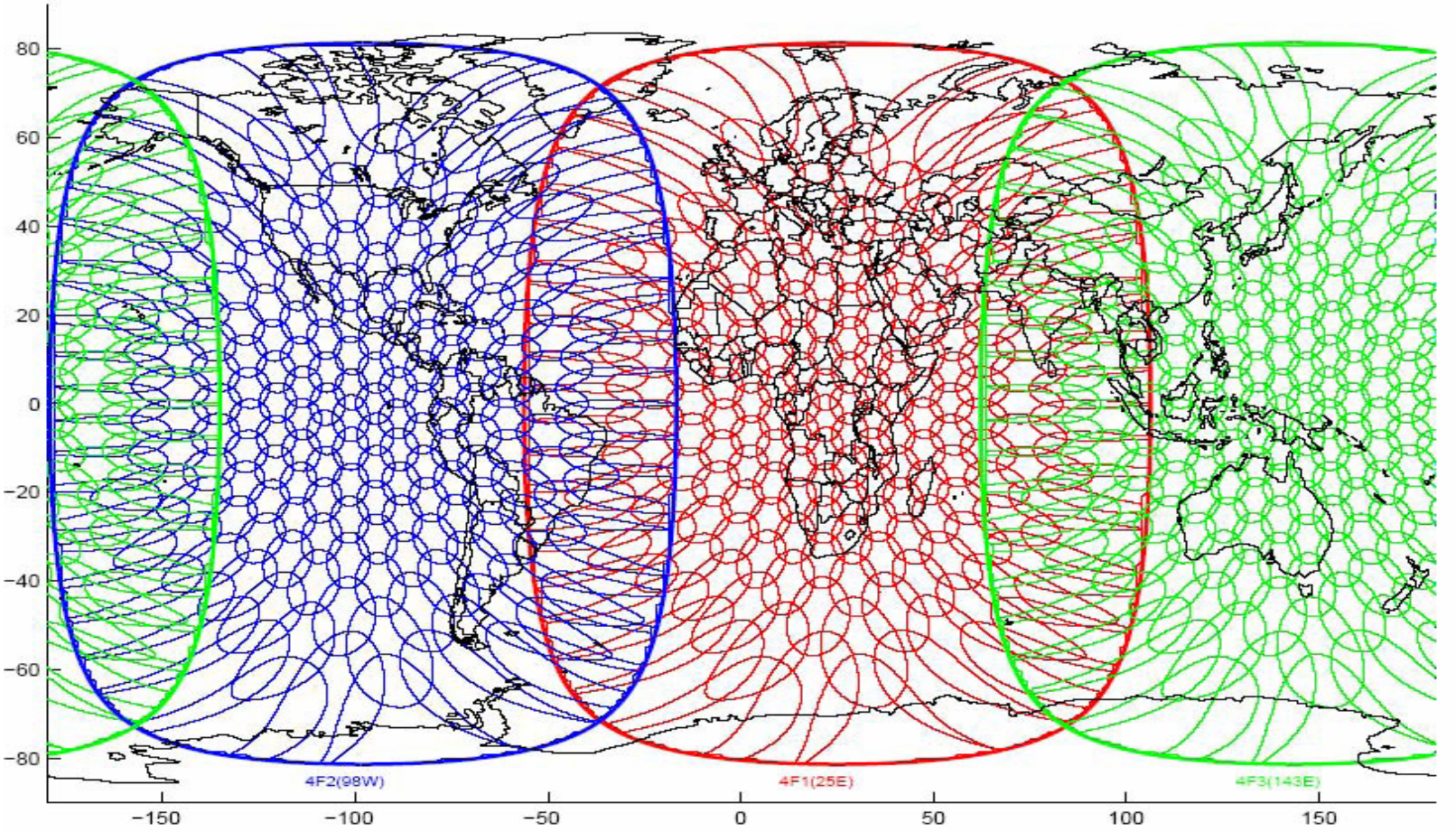
Current coverage



inmarsat

Inmarsat I-4 satellites

Coverage (after repositioning)



inmarsat

Government communications

Requirements

- global coverage
- small, light-weight
- mobile, easy-to-use
- quick to deploy
- instant connectivity
- all-weather
- high data rates
- Interoperable - IP
- comms on the move (COTM)
- information assurance

inmarsat

US Civil Government Sector

Current experience

- Established users
  - VIP communications
  - Embassies and consulates
  - Disaster response - FEMA
  - Specialized law enforcement activities
  - Back-up communications/continuity of government operations
- State/local level emergency communications experts are introducing BGAN into rest of civil government
- Opportunities to expand due to:
  - BGAN value proposition
  - Growing focus on mobility
  - Increasing use of wireless solutions
  - Increased recognition of terrestrial network vulnerabilities and limitations
  - International terrorism; global warming; high-profile natural disasters

inmarsat

BGAN Products & Services

28th February 2008

Cabinet Office / AST

Sanaa Saadani & Guy Mariz

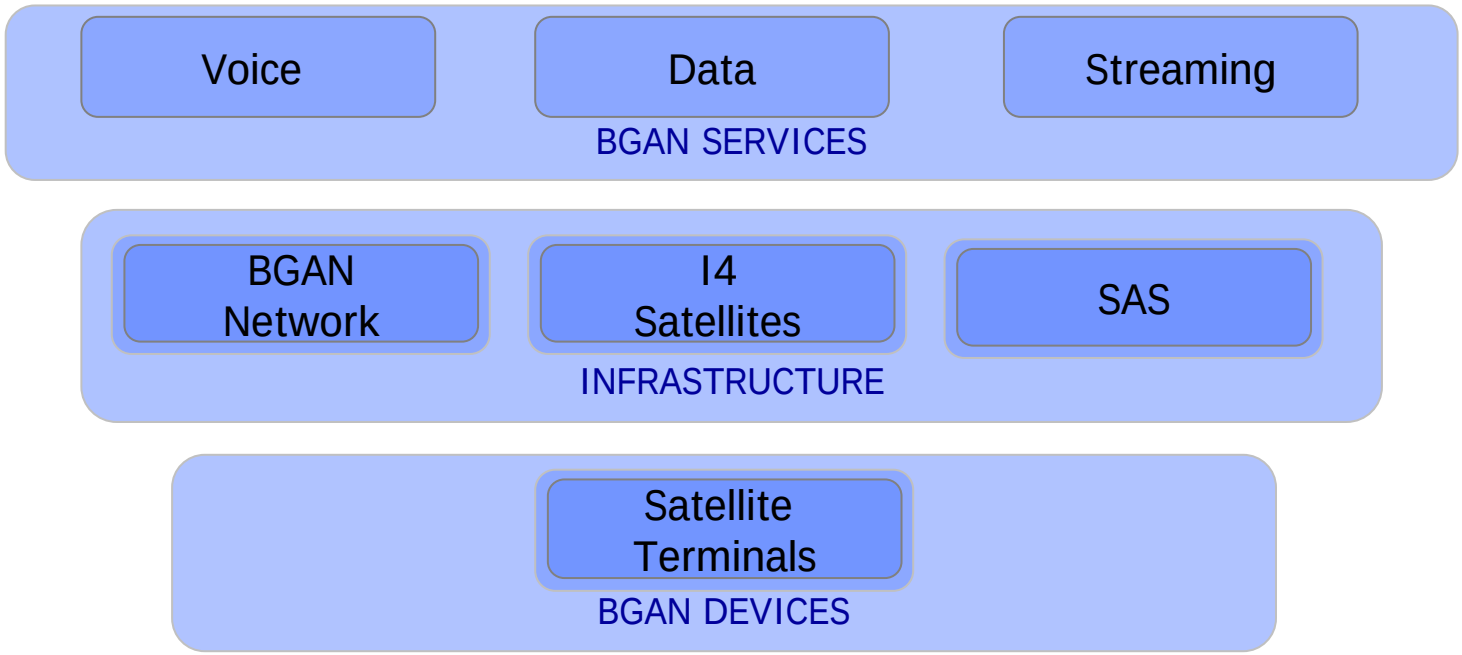
Technical Trainers (Inmarsat Training Academy)

BGAN Products & Services

Broadband for a mobile planet ™

inmarsat

What is BGAN?



inmarsat

BGAN in a nutshell…

Worlds 1st mobile communications service to offer:

Broadband data (up to half a megabit)

… plus voice

accessible simultaneously

through a single compact device

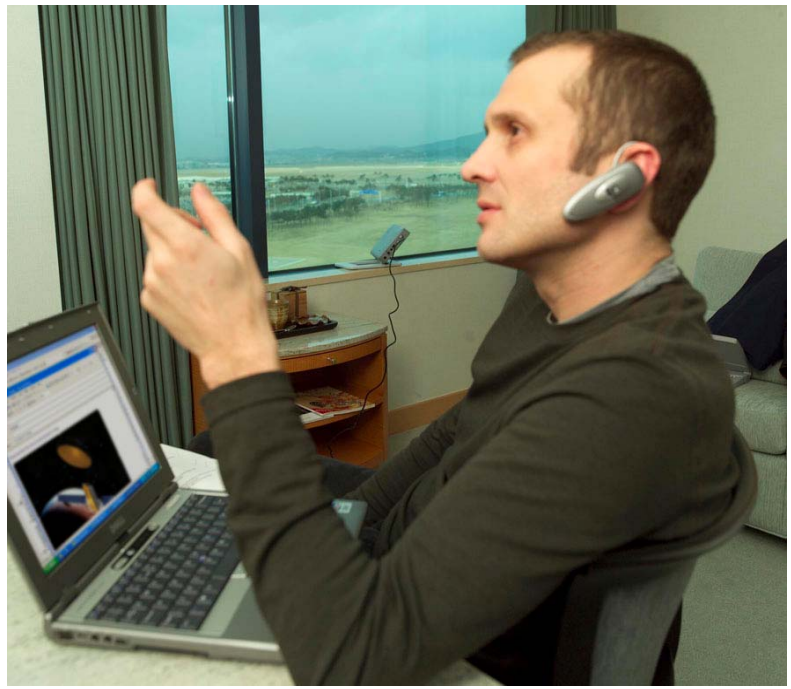
with guaranteed data rates on-demand

that will be available worldwide

inmarsat

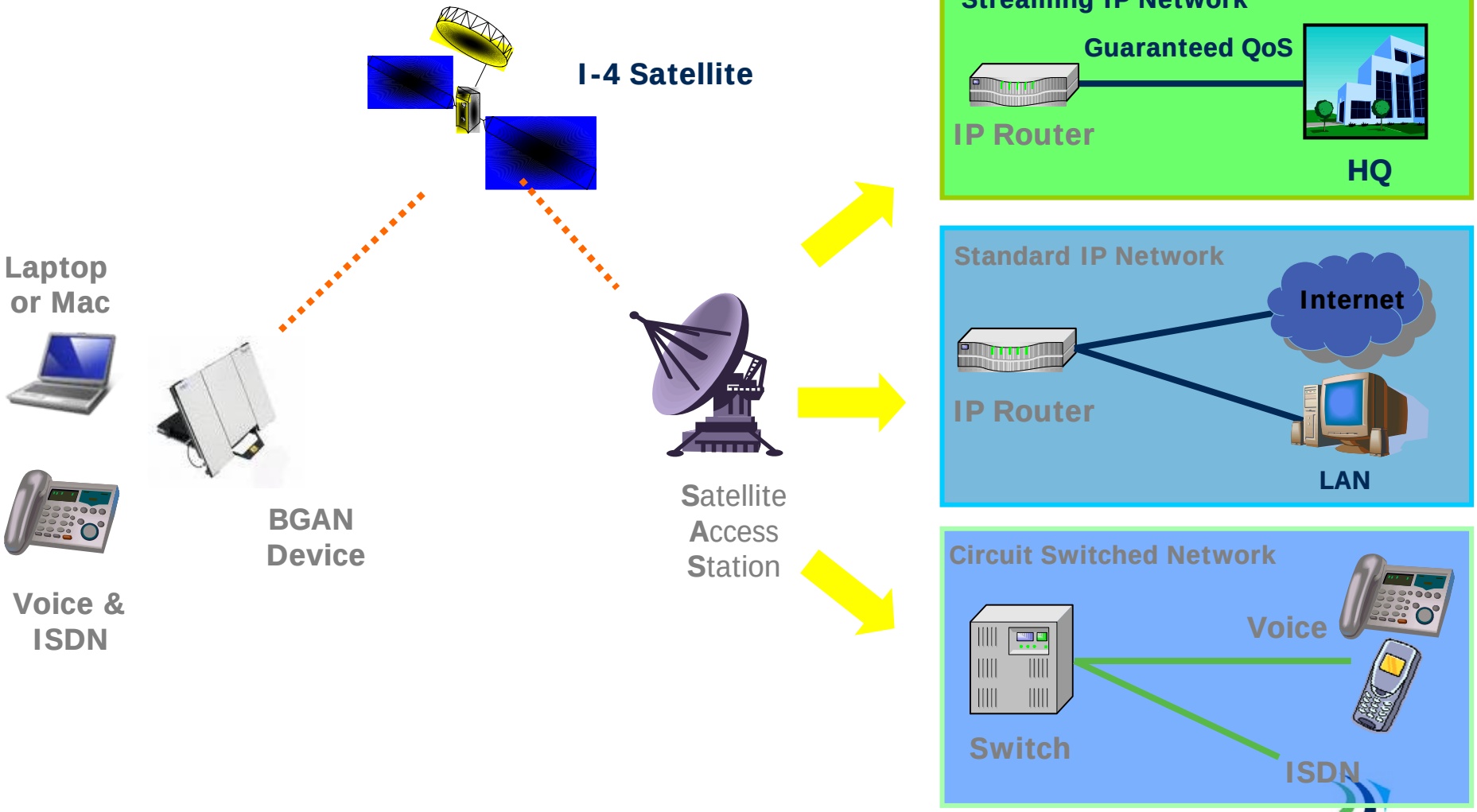
Simultaneous voice & broadband data

- Accessible through one device
- Make a phone call while downloading email or sending live video
- Performance equal to terrestrial broadband
- Up to half a megabit data rates
- Guaranteed data rates on-demand



inmarsat

BGAN: One device, three networks



inmarsat

Voice telephony

Direct dial landline quality voice

@ 4 kbps

All **new** devices support voice

Call to and from

Terrestrial networks

Mobile networks

BGAN to BGAN

Accessible via a peripheral handset

inmarsat

Voice telephony continued…

- As BGAN is essentially a 3G network it can offer the same supplementary value-added services we use everyday when using our mobile telephones

- Caller ID
- Call Holding
- Call Waiting
- Call Forwarding
- Call Barring

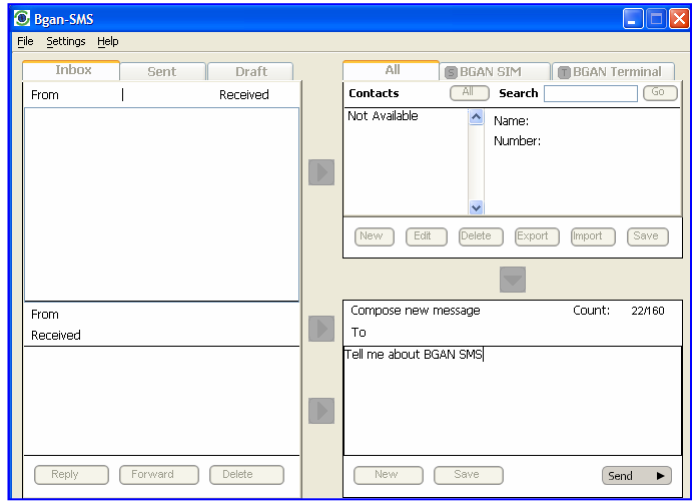
Circuit-switched ISDN (Data, Voice & Fax)

- Supported by selected user terminals
- One **64 Kbps** ISDN channel
- System will support **one** circuit switched service at any one time
- Supports legacy 64 kbps voice encryption devices e.g. STE, STU

inmarsat

SMS and Voice Mail

- **Short Messaging Services (Text)**
  - To/from other BGAN terminals
  - To/from terrestrial cellular networks (subject to commercial agreements)
  - Using LaunchPad or handset with SMS functionality



- **Voice Mail Service**
  - SMS notification

inmarsat

BGAN Numbers for Circuit Switched Services

MS-ISDN	Voice	Text	+870 77 21 {12345}
AMS-ISDN	ISDN	FAX	+870 78 21 {12345}

MSISDN = Mobile System International Integrated System Digital Network Number

AMSISDN = Additional Mobile System International Integrated System Digital Network Number

inmarsat

Two BGAN IP Services

Standard IP

Charged by Volume

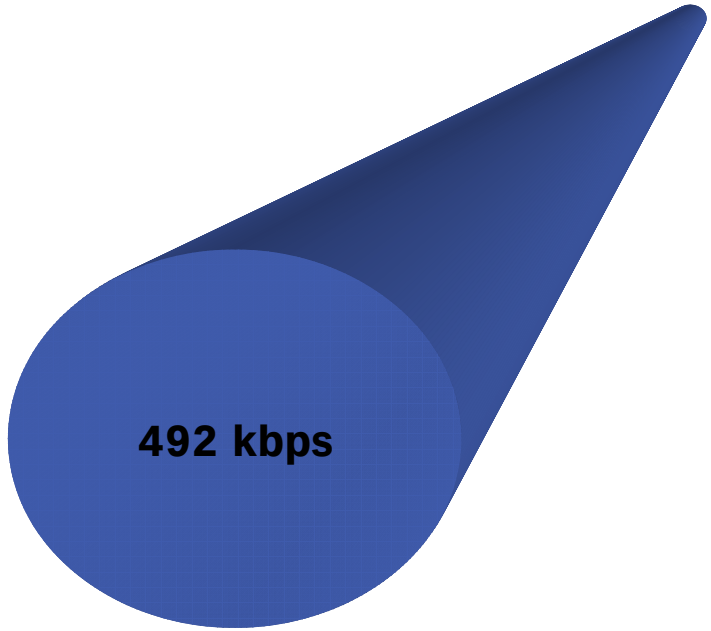
Streaming IP

Charged by Time

inmarsat

Standard IP Service (Background Class)

- Up to 492 Kbps via shared channel
- Dynamically assigned by the network on demand
- User pays for amount of data sent and received per **MB**
- Suitable for e-mail, messenger, file transfer, internet, corporate/intranet access. Your everyday applications…



inmarsat

Streaming IP Service (BGAN QoS)

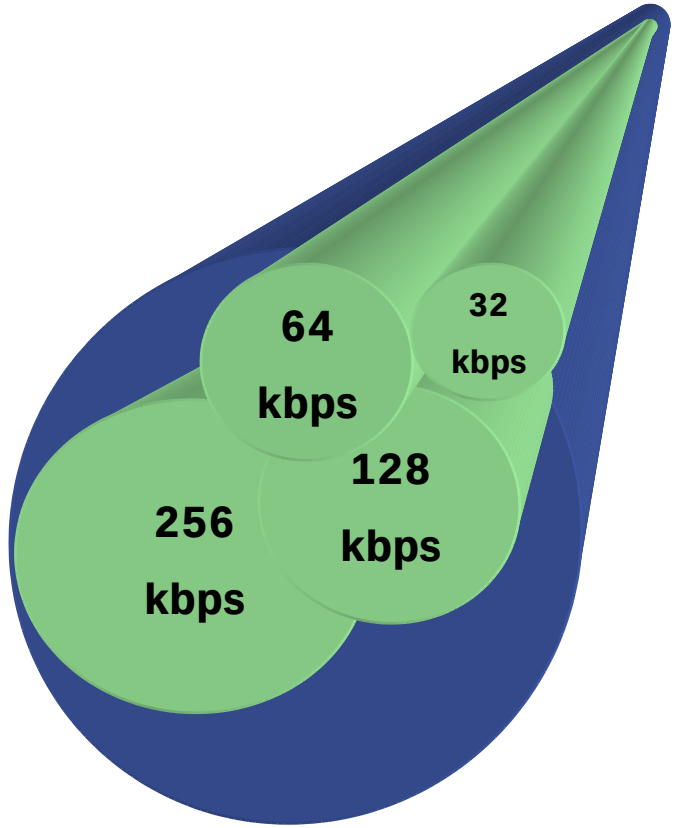
- **Guaranteed data rates of**

  32, 64, 128, 256 Kbps (symmetrically)

- Selected by user, as and when required

- User pays for **duration** of connection (per minute)

- Suitable for Live video, Live audio, VoIP or data heavy applications



inmarsat

BGAN best practice

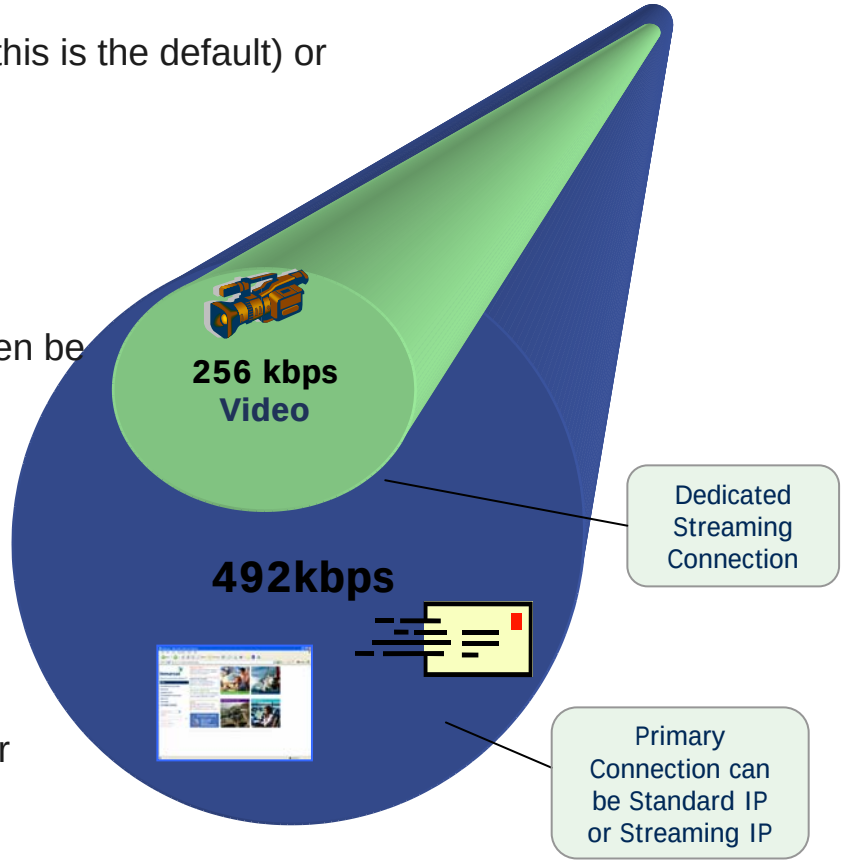
- Standard IP – e.g. e-mail, web, ftp
- Bigger pipe
- Packet retransmission intrinsic in protocol
- **Emphasis on accuracy rather than speed**

- Streaming IP – e.g. Quicktime, WinMedia, Livewire
- Dedicated connection
- No retransmission
- **Emphasis on speed of transmission**

inmarsat

Multiple connections from one device

- The first connection can be set up as a Standard IP (this is the default) or Streaming IP
- All application traffic is shared across this connection
- A second ‘customised’ Streaming Connection can then be set up to carry a specific application type
- This is called a Dedicated connection in the BGAN LaunchPad
- A Dedicated connection will not be used for any other applications other than the one specified



What BGAN can do…

Data

- Standard IP
- Variable bit rate service
- Up to 492kbps (send & receive)

Streaming

- Guaranteed bit rate service
- Available on demand
- 32, 64, 128, 256 kbps (send & receive)

Voice

- 4kbps circuit-switched service
- Voicemail
- Enhanced services: call waiting, forwarding, barring, holding
- Broadcast quality voice

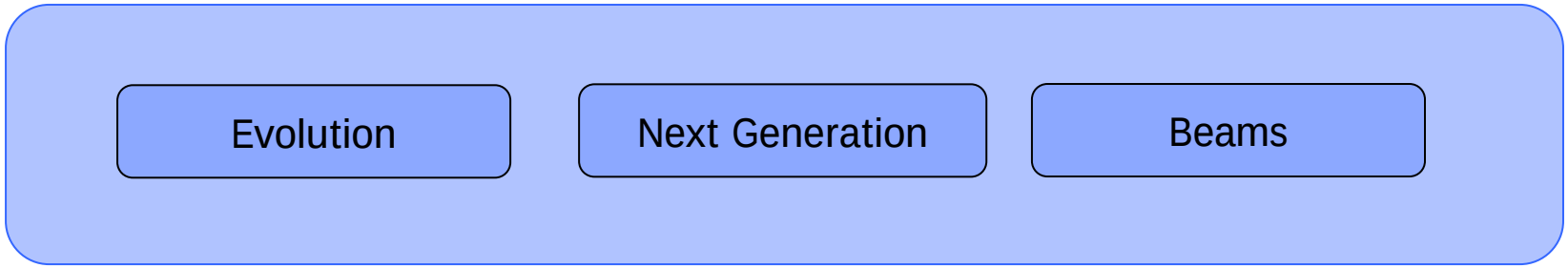
SMS/Text

- Send and receive text messages via your laptop

inmarsat

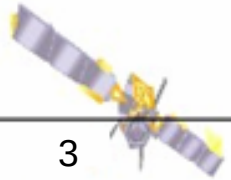
Review & Questions?

Inmarsat 4 Satellites



inmarsat

Inmarsat Satellite Constellation

	Inmarsat-2	Inmarsat-3	Inmarsat-4
			
No. Satellites	3	5	2 + 1
Coverage	1 Global Beam	7 Wide Spots 1 Global Beam	Up to 236 Narrow Spots 19 Wide Spots 1 Global Beam
Mobile Link EIRP	39 dBW	49 dBW	67 dBW
Channelisation	4 channels (4.5 to 7.3 MHz)	46 channels (0.9 to 2.2 MHz)	630 channels (200 KHz)
S/C Launch Mass	1500 kg	2050 kg	5959 kg
Solar Array Span	14.5m	20.7m	45m
Voice (4.8kbps)	250	1000	18000
M4 (64 kbps)	N/A	200	2250
BGAN (432kbps)	N/A	N/A	>600 channels

EIRP = Effective Isotropic Radiated Power

inmarsat

A new generation of satellites - I-4

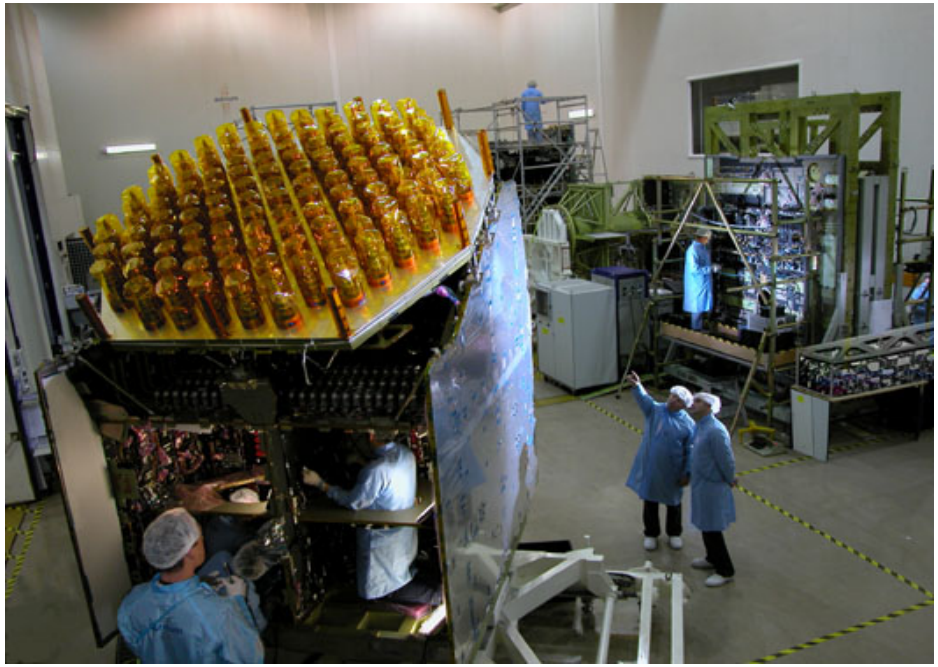
- The most advanced commercial satellites ever launched
  - 16 x capacity of I-3
  - 60 x power of I-3
- Network capacity can be redeployed real-time to areas of high service demand
- Service life until 2023
- Satellite launches
  - F1: 11.03.05
  - F2: 08.11.05
  - F3: Q1 2008 (TBC)

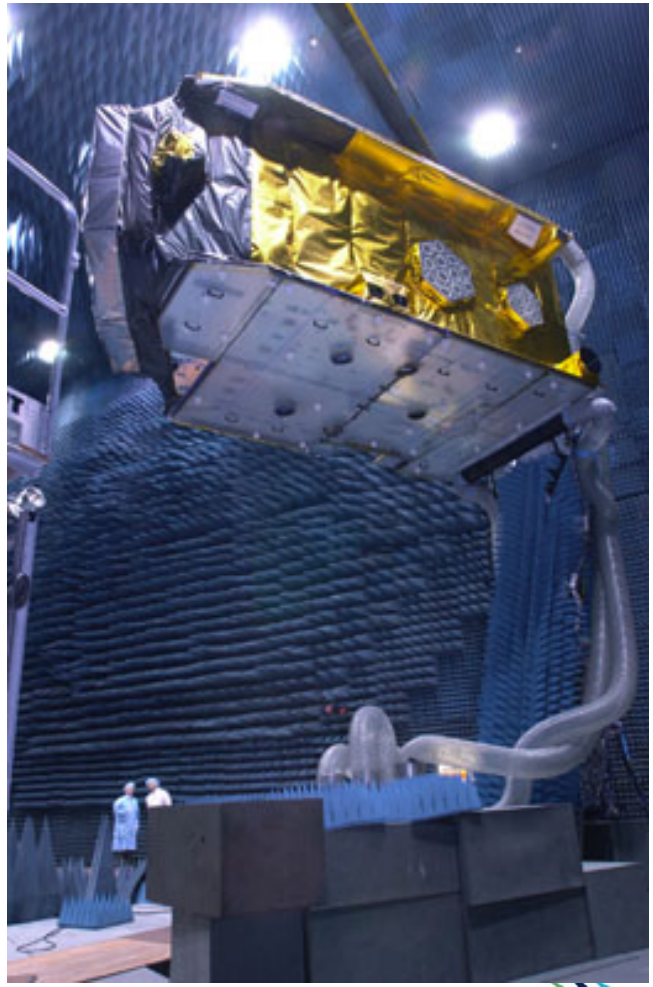
Inmarsat-4 : Satellites and Services

- User Link : L Band
- Feeder Link : C Band
- Spacecraft Power: 12 kW
- Launch Mass : 6 Tons
- Prime Contractor : Astrium
- Launchers
  - Atlas V
  - Sealaunch

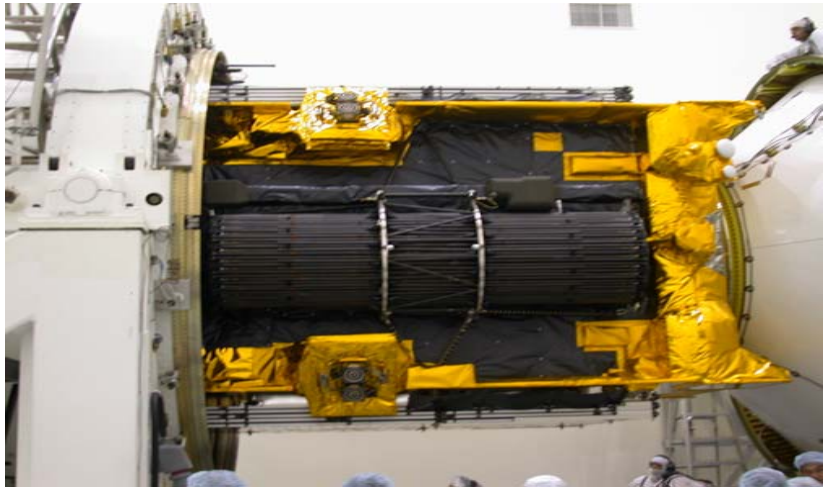
inmarsat

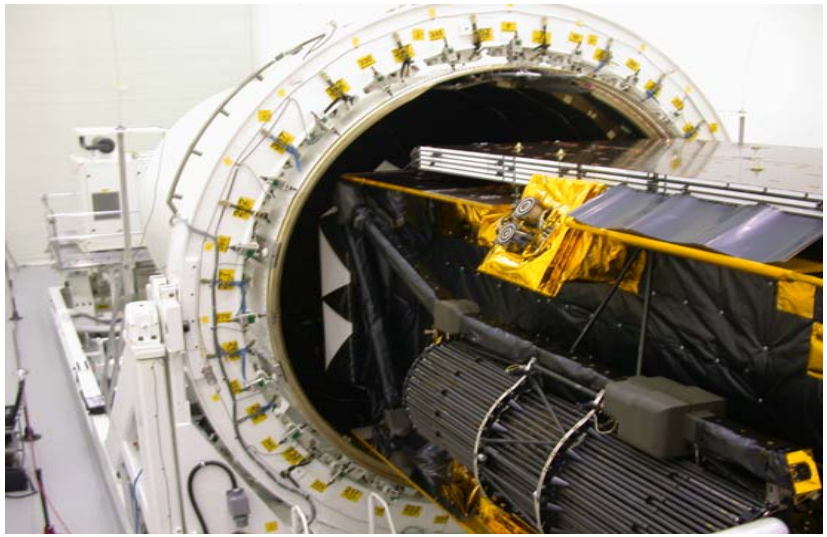
Inmarsat 4 Satellite





I-4 F3 Preparations





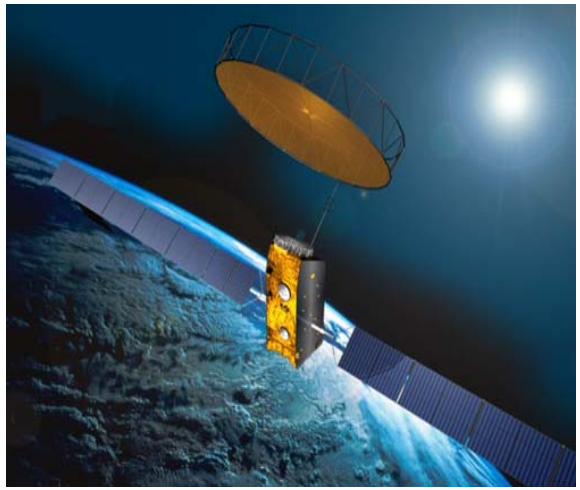
inmarsat

Benefits of I-4's

Dependable, peace-of-mind communications

Cost efficient delivery to our customers of Broadband and Streaming IP

Extended satellite lifetime to over 15 years



I-4s increase network capacity by 16 times over I-3s

Network availability increased even further to more users

Improved resource management

Delivery of service to hotspots when you need it

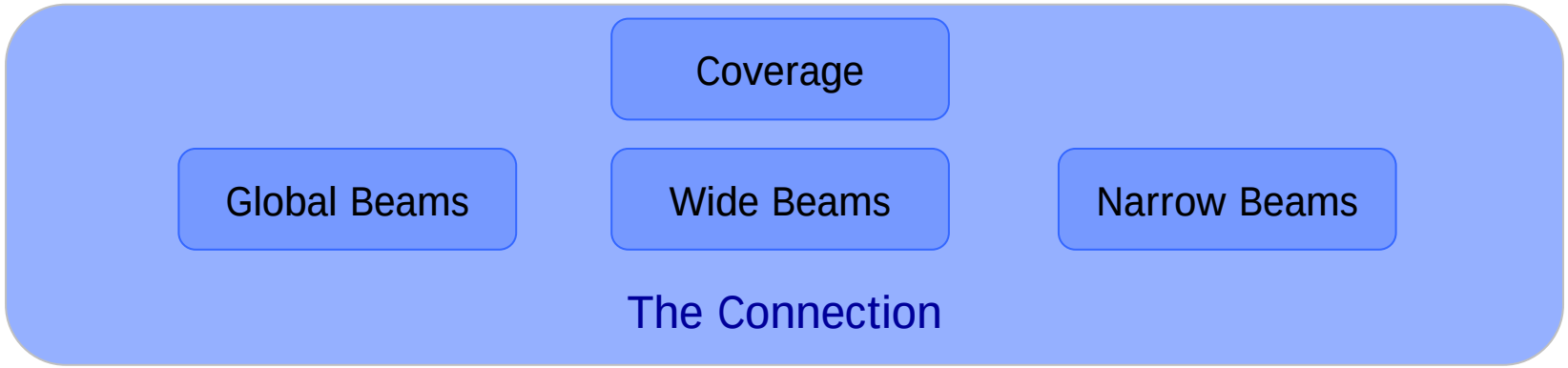
Reliability

More powerful means smaller satellite terminals

inmarsat

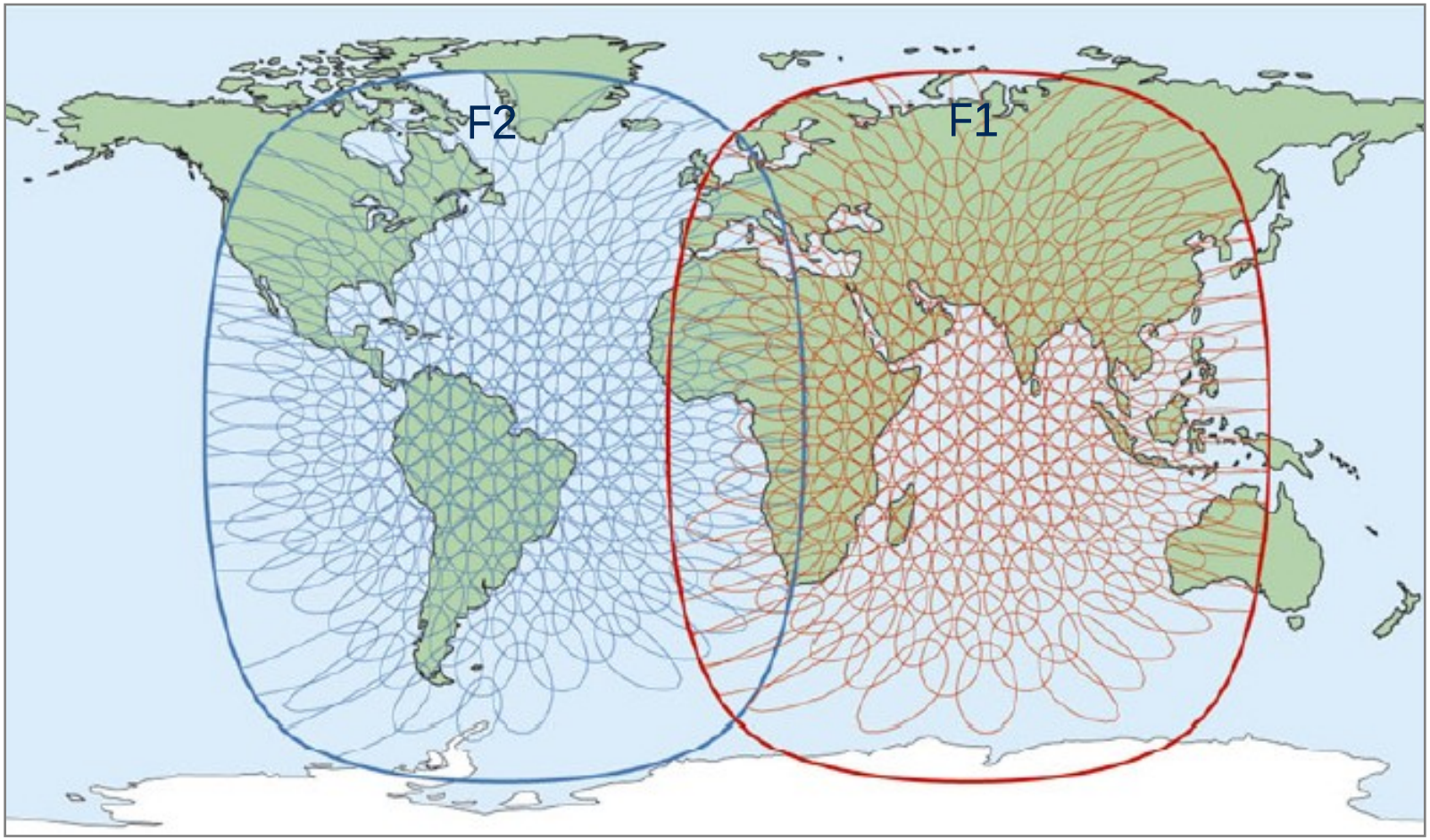
Review & Questions?

Spot Beams



inmarsat

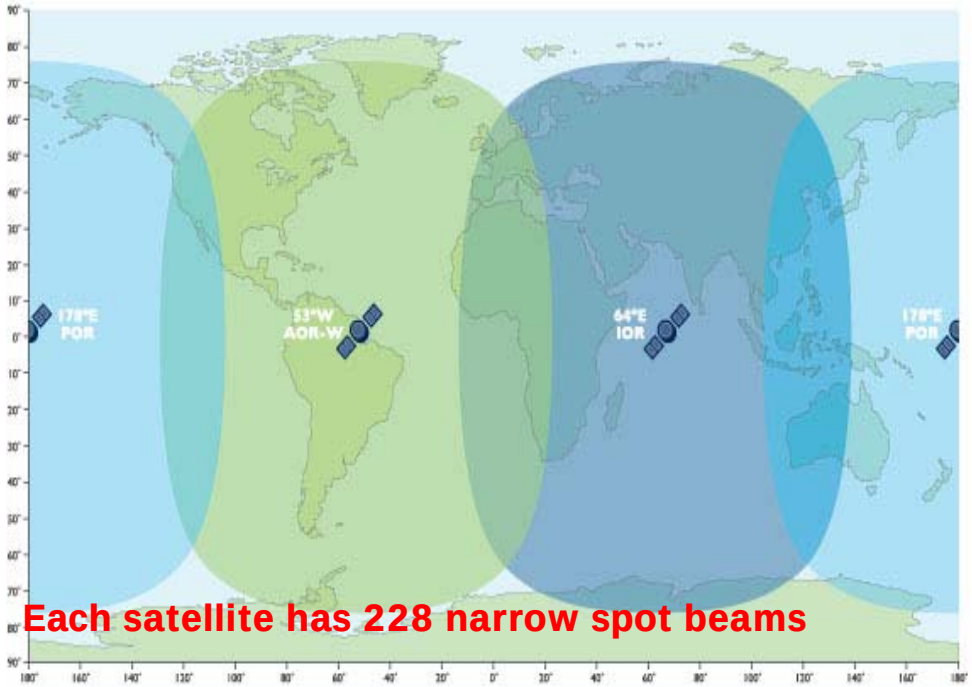
Current Global Service Coverage Area



inmarsat

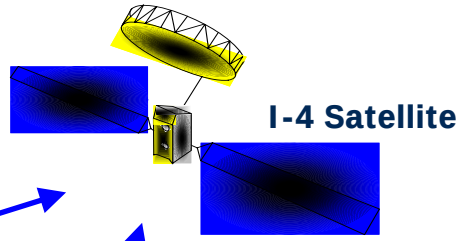
Global mobile broadband coverage

- Launch of 3rd satellite March/April 2008
- Together the first two I-4 satellites currently service about 85 per cent of the world's landmass, which is around 98% of the global population
- 3rd Satellite will increase coverage to 99.9% of the global population



inmarsat

I-4 Satellite beam hierarchy and functions



Feeder Link

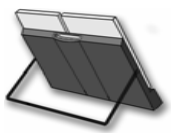
User Link

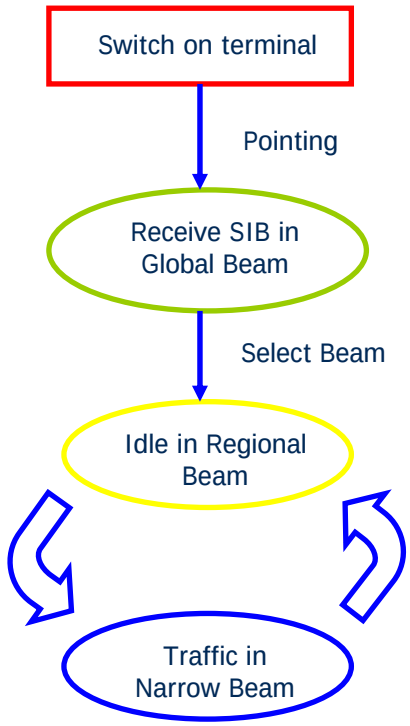
SAS

Global Beam

19 Regional Beams

228 Narrow Beams

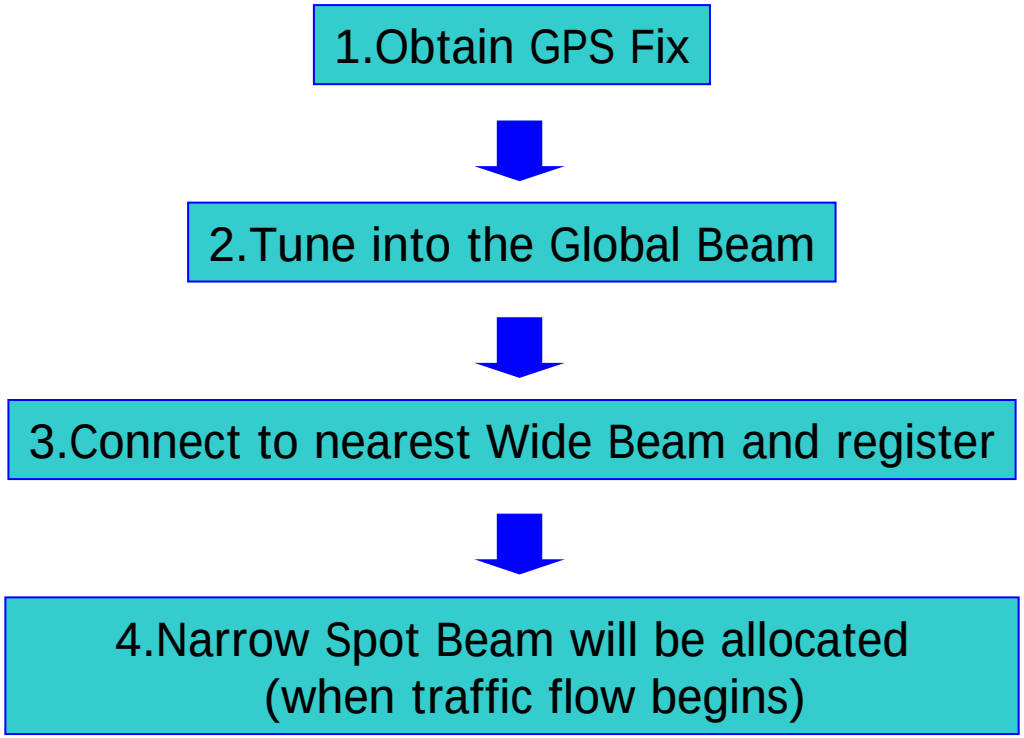




inmarsat

Accessing BGAN is simple and automated

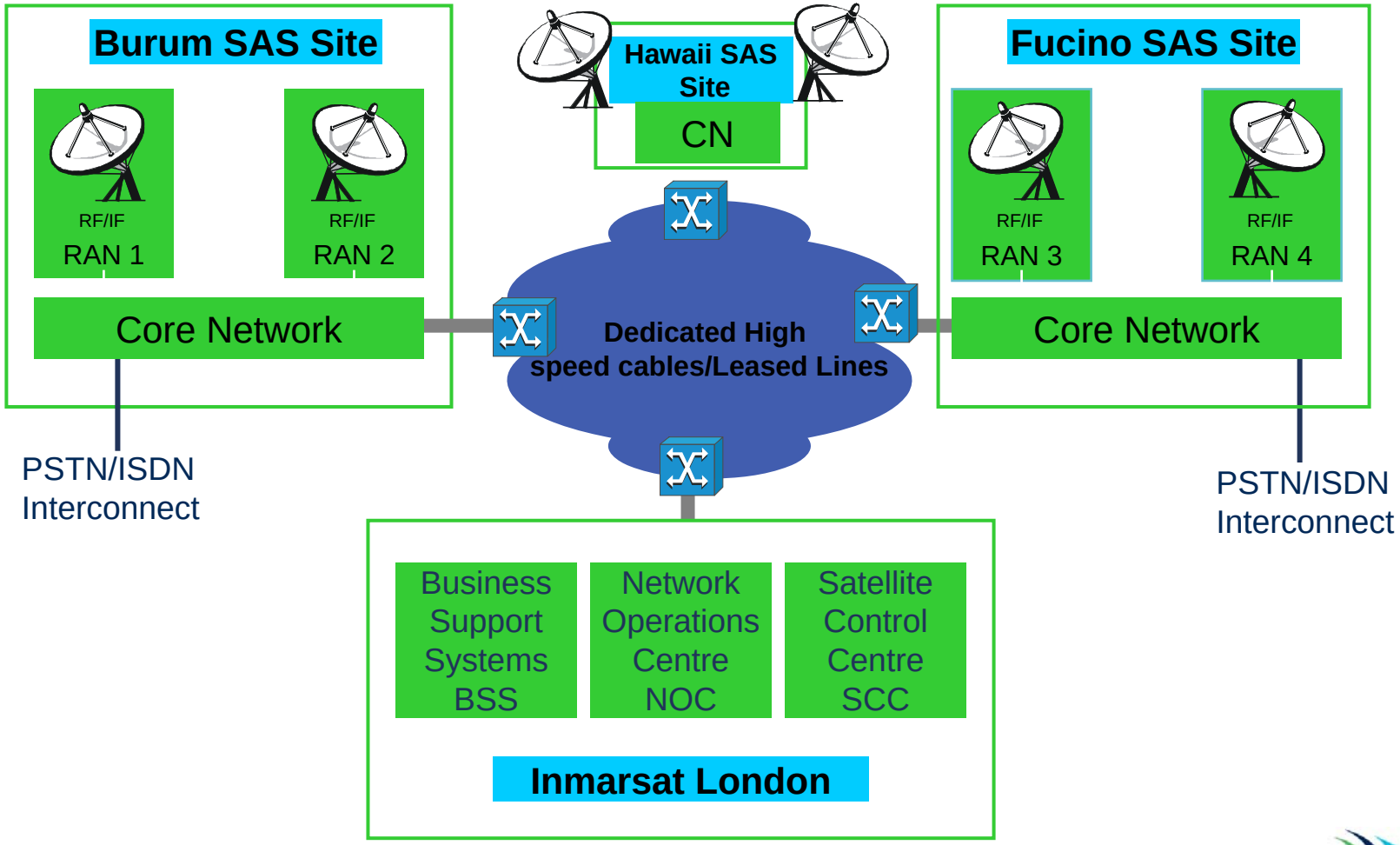
Access is easy, efficient and automated



inmarsat

Review & Questions?

BGAN Ground Network



inmarsat

Primary BGAN Ground Antenna's 'Burum'

inmarsat

Secondary BGAN Antenna's in the heart of Italy 'Fucino'

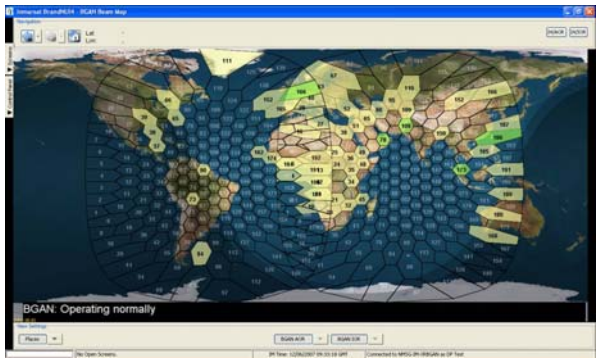
inmarsat

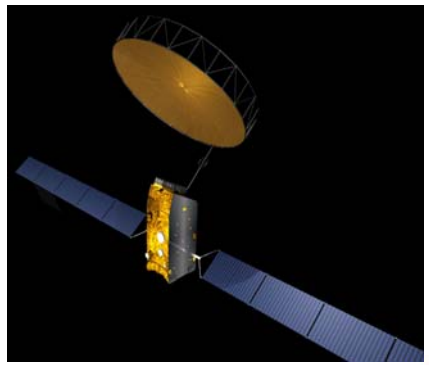
The BGAN Radio Access Network (RAN)

inmarsat

Benefits of BGAN infrastructure

Service to customers where and when needed	✓
Resilience from two sites	✓
Efficient use of spectrum-Increase capacity	✓
Availability across 85% landmass, reaching 98% world's population	✓
Cost reduction	✓





inmarsat

Review & Questions?

Satellite Terminal Overview

The Devices

Background

Terminal Range

Overview of Devices

inmarsat

Choosing the right BGAN device for your solution

Size? Weight? Environmental protection?

- Find which terminal best fulfils your requirements

What applications will you be using? What interfaces?

- Voice: VOIP handsets, Bluetooth, ISDN handset
- Shared data: Routers, Switches, Ethernet-based devices
- Single-User/Multi-user interfaces, WiFi

Desired Performance?

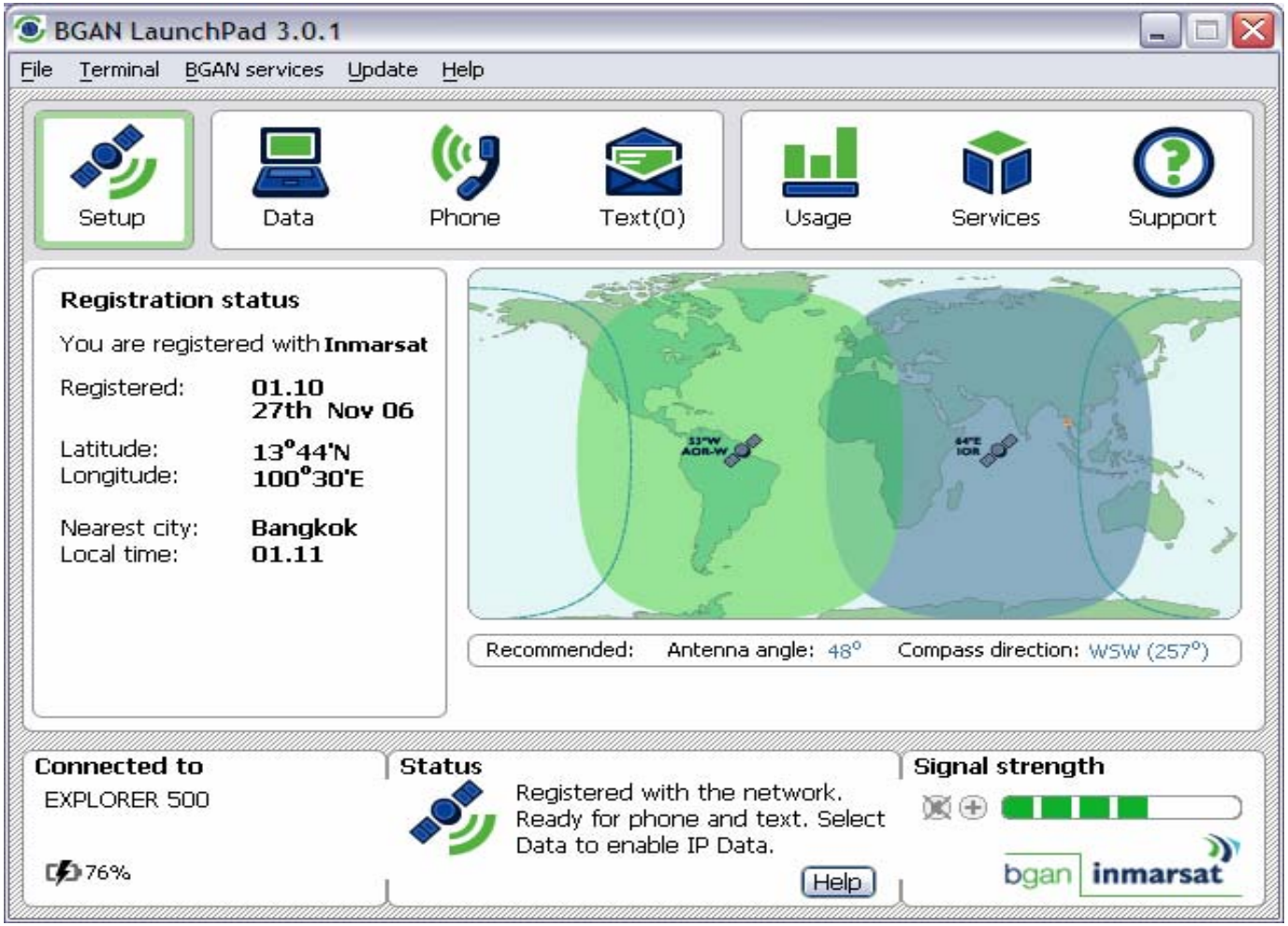
- Upload and/or Download speed requirements

Will you require streaming connections?

- 32, 64, 128 or 256Kbps

inmarsat

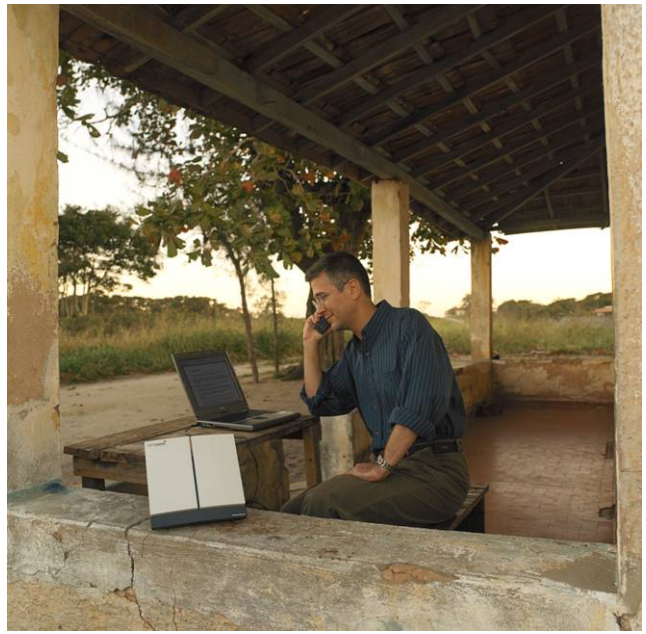
A common user interface - The BGAN LaunchPad



inmarsat

Thrane & Thrane

High bandwidth, highly portable device



Size	217 x 217 x 52 mm
Weight	<1.5 Kg
Standard IP Service	Up to 464/448kbps (receive/send)
Streaming IP service	32, 64, 128kbps (send & receive)
ISDN	Via USB
Voice	Via RJ11 or Bluetooth handset; 3.1khz audio
Data interfaces	USB, Bluetooth, Ethernet
Environmental Tolerance	IP 54
Target markets	Mobile use / semi-fixed use

inmarsat

Thrane & Thrane

Explorer 500

Via Ethernet

Via USB

G3 Fax via RJ11

Bluetooth
PDA

Bluetooth
Handset

Bluetooth Laptop

PSTN via
RJ11

inmarsat

Inmarsat Services: What's next?

- The BGAN-X (BGAN Extension) programme is ongoing to upgrade ground network and enable 6 new user terminal types:
  - 2 new Aeronautical terminal types (Swift Broadband)
  - 2 new Maritime User Terminals (Fleet Broadband)
  - 2 new Directional Land Vehicular Terminals (BGAN)
- Other exciting services like multicast, broadcast and new devices like hand-held terminals are in the pipeline…
- The 3rd I-4 satellite will be launched for Worldwide Coverage and Hawaii will become a new SAS Site
- GSPS Service

inmarsat

What you now know about BGAN…

The 1st mobile satellite service to offer:

- Broadband **Data** (up to 492Kbps)
- plus **Voice** simultaneously
- **SMS** and **Voice Mail**, **ISDN**
- **Standard IP** and **Streaming IP** connections with on demand **Guaranteed Data Rates**
- Using a variety of **purpose designed Satellite Terminals** and a secure and stable (99,9%) BGAN network
- Soon available **globally**

inmarsat

Broadband for a mobile planet™

inmarsat

Review & Questions?