EMS

Satellite Networks

BROADBAND CONNECTIVITY....... EVERYWHERE

ITU Workshop

09 December 2002

EMS Satellite Networks Introduction

- Division of EMS Technologies Inc (NASDAQ: ELMG)
  - ~US$300M revenues in 2002; 1700 employees
- Satellite broadband IP is our core business
  - 30+ years of satellite communications experience in both satellite manufacturing and ground systems; Interest in Ka slot at 91°W
  - Supplier of DVB-RCS systems to multiple satellite operators and service providers in Europe, North America and Asia.
- One of the founders of the DVB-RCS standard
  - First-to-market, with systems in operation for almost 3 years, and direct experience with several business cases

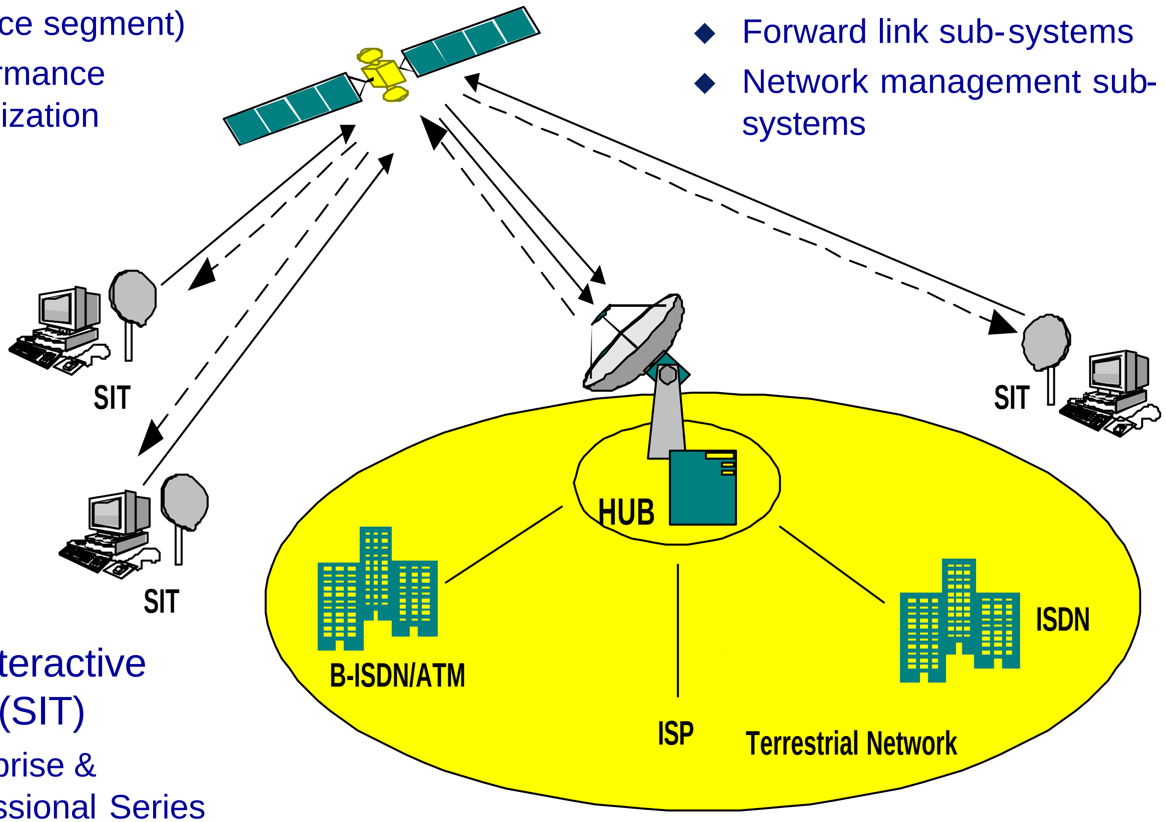
EMS Satellite Networks
Products & Systems Solutions

Systems Engineering

- Network design (ground & space segment)
- Performance Optimization

Hubs

- Return link sub-systems
- Forward link sub-systems
- Network management sub-systems

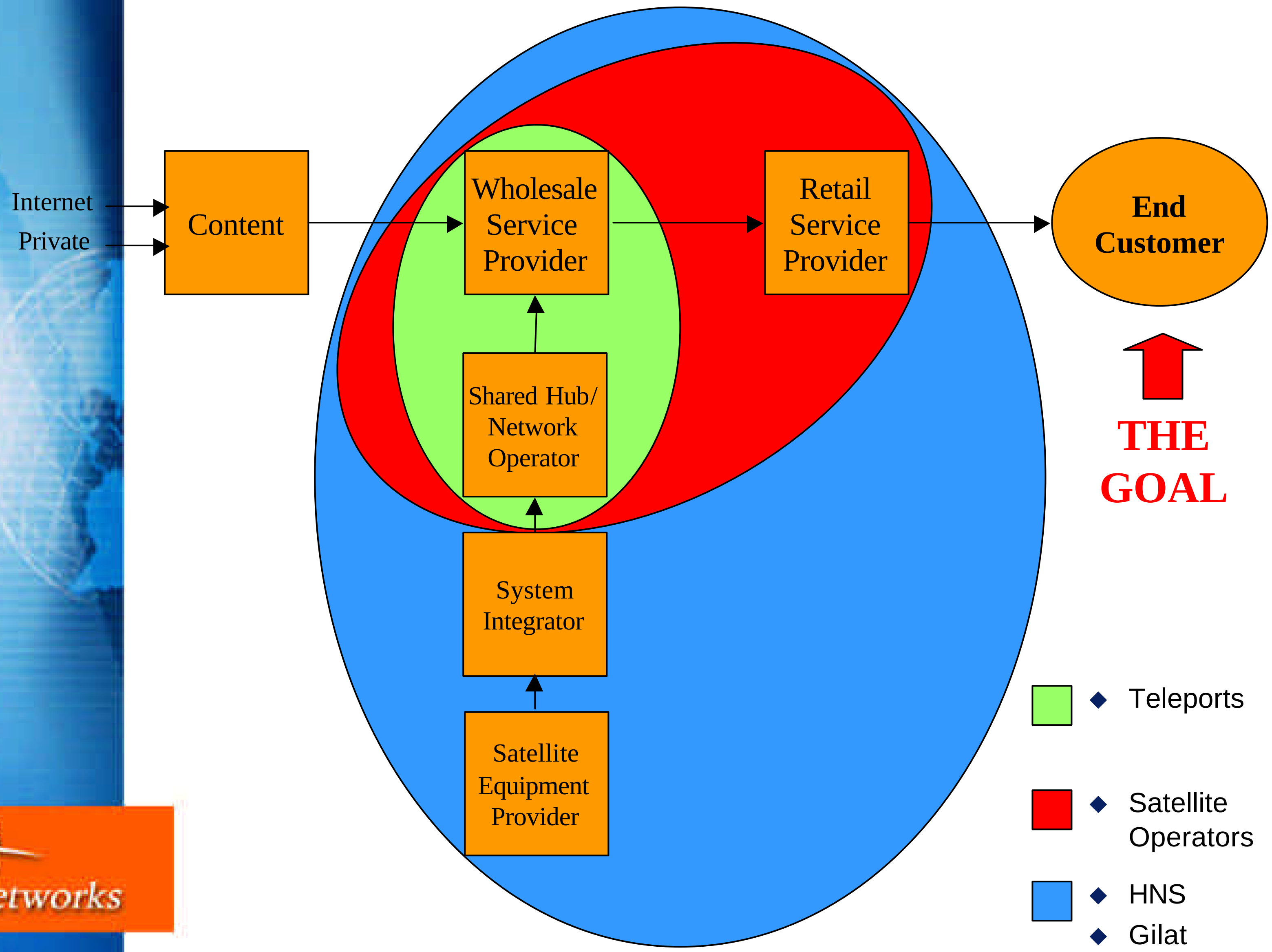


Satellite Interactive Terminals (SIT)

- Enterprise & Professional Series
- All bands - Ka, Ku, C

EMS Satellite Networks

Market Positioning
Uncertain Roles for Market Players



Target Markets
Customer vs. Technology-Lead

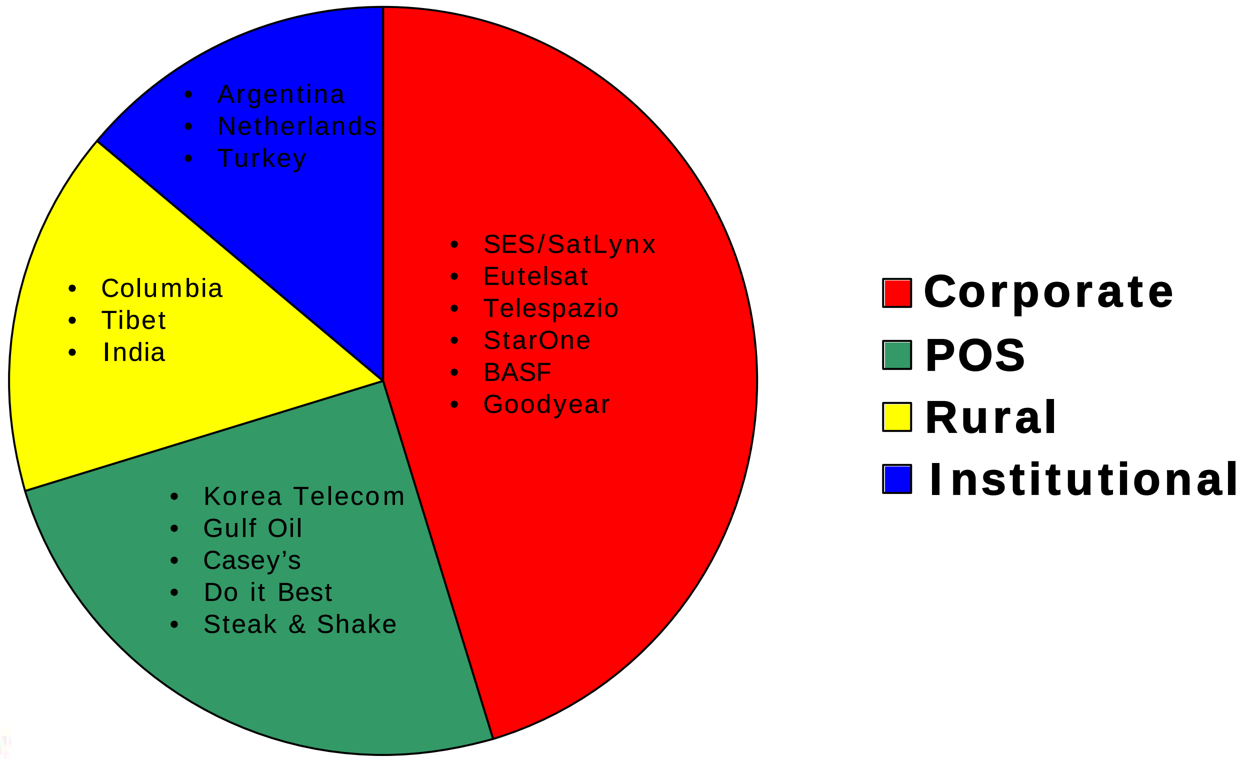
- Enterprise, Consumer or Both?
  - Start with enterprise, then as costs drop with volume, enter consumer
    - The bubble has burst – “quantum leap” to consumer solution has failed
    - Build market one enterprise niche at a time; target a niche, then serve it!
- Technology or customer, which comes first?
  - Same technology can serve both; ongoing debate is a distraction the industry cannot afford
    - Need some combination of Ka, spot beams, and more bits/Hz (eg. 8PSK)
    - Industry needs open standard to drive economies of scale, reduce costs, expand the market, and finally reach consumer price points
    - **DVB-RCS** will do the job – get on with it.

DVB-RCS Momentum

- Virtually all major satellite operators are now involved in DVB-RCS trials or procurements:
  - Eutelsat
  - France Telecom
  - Hispasat
  - Intelsat
  - JSAT
  - Loral Skynet
  - New Skies
  - Panamsat
  - SES-Americom
  - SES-Astra
  - Telesat
- Most major ground segment suppliers now actively involved:
  - Incumbents: HNS and Gilat are positioning in DVB-RCS
  - Entrants: EMS, Nera and Newtec pioneered DVB-RCS
  - Other notables are actively involved: Alcatel, Infineon, Raytheon, ST Micro, Viasat
- Continued ESA funding for DVB-RCS (eg. chipsets, interoperability, applications)
  - First Interoperability commitments from EMS, Nera & Newtec

DVB-RCS
2002 Market Shares

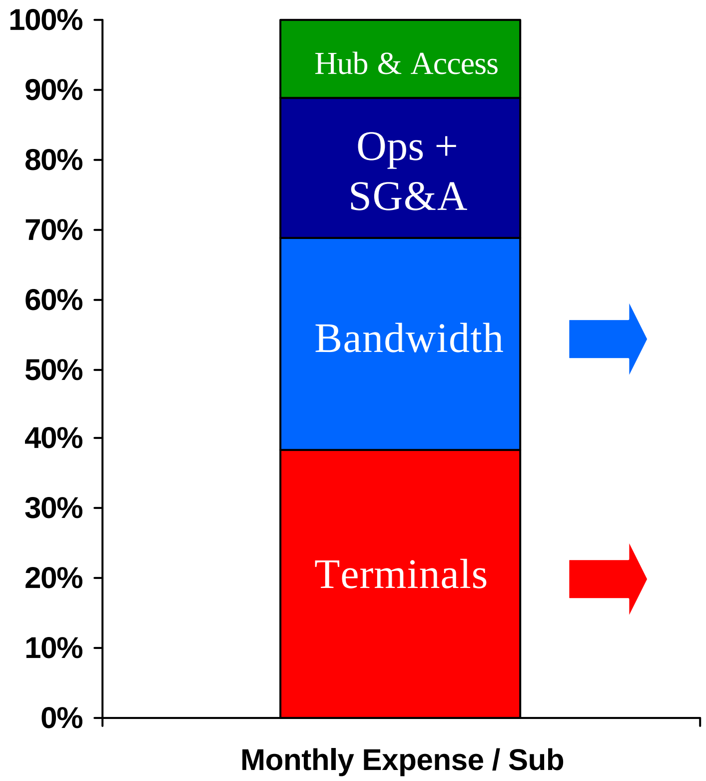
- Survey indicates 70 Contracts for >50k terminals
- ~25% DVB-RCS; ~75% VSAT (20% decline over 2001)



Source: DowJones &
EMS data Nov'01-Nov'02

Future Direction
Business Case Priorities

Typical Service Provider Cost Structure



- Reduce $/Mhz
- Improve bits/hz

- Reduce installed cost per terminal

Future Direction
Key Success Factors

- Industry must:
  - Adopt DVB-RCS open standard & realize interoperability
  - Invest R&D in key technologies (eg. Ka, spot beams, 8PSK, terminal cost reduction)
- Satellite operators must:
  - Continue deploying satellite broadband IP technologies
  - Build core infrastructure for satellite broadband IP worldwide
  - Support retail service entry into target markets