IP-based Satellite Communication Services in Japan

11 December 2001

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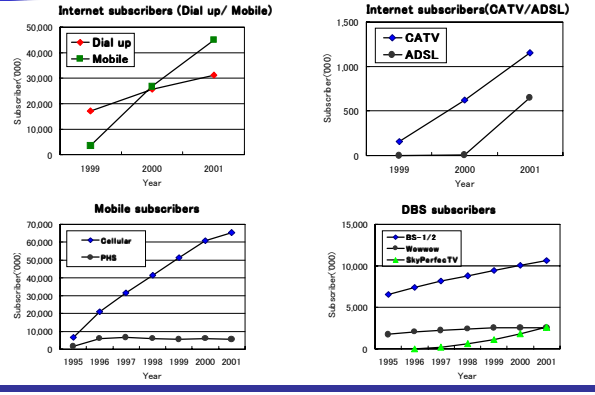
KDDI Corporation

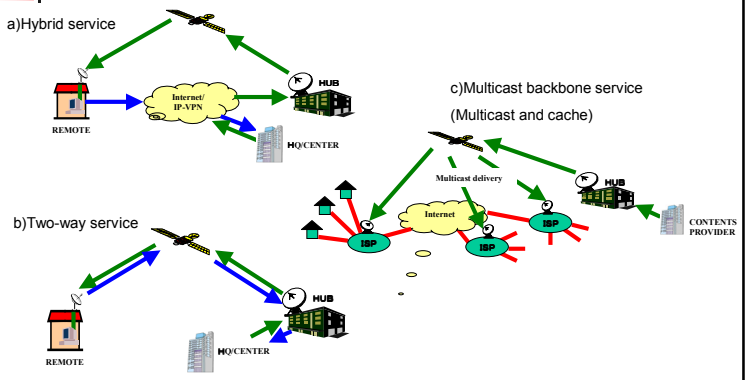
General trend of communication services in Japan



Perspective on the role of satellite IP services

- **Multicast oriented services**
  - Contents delivery to end users/ head ends of wired services
  - Intranet/Extranet for corporate users featuring “multicast”
- **Wide coverage services**
  - Broadband mobile satellite services
  - International services (regional)
  - Public infrastructure
- **Full IP transmission with advantages in flexible QOS control and highly secured transmission (Mesh/Star topology depending on the nature of traffic)**

Network model of satellite IP services (FSS)



Satellite IP services in Japan

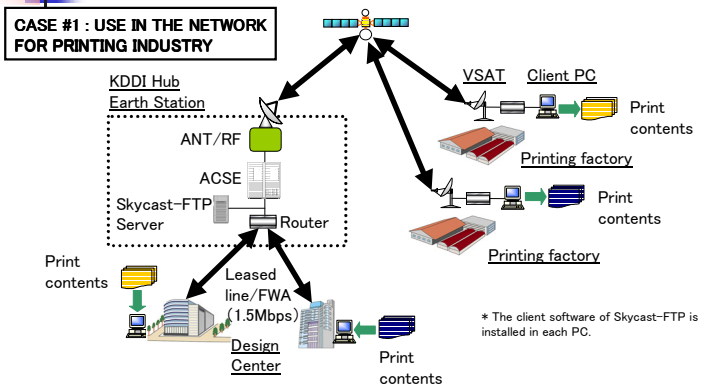
Service	Provider	Service started	Data rate	No. of customers
DirecPC	SCC	OCT/96	OUT:24Mbps (one-way)	36 corporation (20,000 terminals)
MegawavePro	NTT Satellite Communications	JUNE/99	OUT:30Mbps (one-way)	28 corporation (5,600 terminals)
Skycast	KDDI	DEC/00	OUT:1.5Mbps IN:128kbps	100 terminals (Two-way)
HitPops	HitPops (sub-sidiary of SCC)	MAY/01		40 sites (for CATV head-end)

KDDI Skycast service -Feature

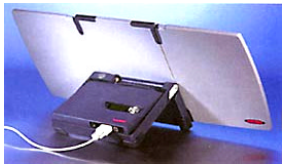
- IP-based two-way satellite communication services via Superbird B2 satellite (162.5E)
  - VSAT with 75cm antenna (+1w ODU)
  - Data rate : 1.5Mbps/outbound; 128kbps/inbound
- Original application software designed for two-way satellite IP service
  - Reliable multicast file delivery application(Skycast-FTP)
  - Multipoint interactive distant presentation/conference application(Skycast-Lesson)

Graphical User Interface of Skycast Lesson

Customer's network in KDDI Skycast



Inmarsat – New and forthcoming services

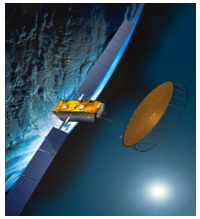


Inmarsat M4 (GAN)

- Data rate :64kbps (two-way)
- Flat antenna (40 – 45cm, 3.5kg)
- Circuit mode/ Packet mode
- In service

Inmarsat Next Generation

- Inmarsat 4 satellite (200 spot beams array)
- Briefcase terminal (432kbps symmetric)
- Laptop terminal (Forward:384kbps, Return:144kbps)
- Service available in 2004



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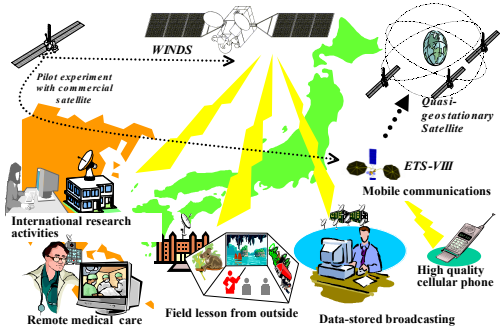
Overview of i-Space project



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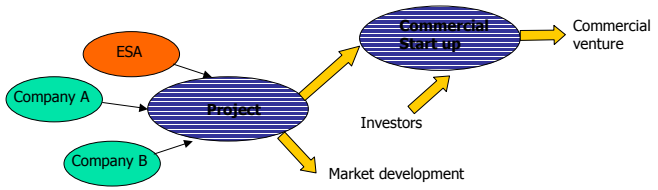
ESA's ARTES project (multimedia)

To promote the development of the market of satellite based multimedia

- Line 1 Application
- Line 2 Products
- Line 3 System



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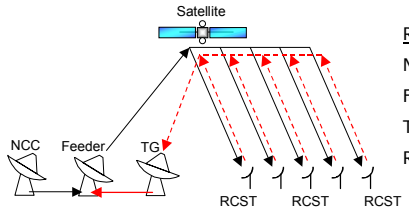
Standardization : DVB-RCS

Digital Video Broadcasting; Interaction channel for Satellite Distribution Systems (DVB-RCS001; released as ETSI standard ETSI EN 301 790 in December 2000)



Reference Network Model

NCC:	Network Control Centre
Feeder:	Feeder Station
TG:	Traffic Gateway Station
RCST:	Return Channel Satellite Terminal

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Toward full-fledged satellite IP services over Asian countries - Challenges

- Business
  - Low cost terminal and reasonable communication charge
  - Cooperation between telecoms toward new satellite business
  - Exploration of new applications/customers
- Regulatory
  - Cross-border operation (Access control on VSAT stations located in different countries; Licensing)
- Technical
  - Development of "user friendly" terminal in size and weight
  - Standardization of the satellite communication system (Physical/MAC layer; Protocol)
  - Development of application software specifically for the satellite communication

Toward full-fledged satellite IP services over Asian countries - Approach

- **Development of satellite application platform for collaboration in various business/experimental areas**
  - Independent from constraints due to variation of terrestrial infrastructures of countries
  - User friendly terminal with “All-in-One” package of user terminal
    (H/W: VSAT, PC; S/W: real time and non real time)=> Guaranteed inter-operability
  - Commercial service to be provided by telecoms