Telehealth in Latin America and Brazil: Current Status and Perspectives

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Topics

- Quick views of LA and Brazil
- Historical evolution of telehealth
- Recent developments
- Telehealth particularities in Latin America
- Research & development
- Technical and scientific events
- Examples of ongoing projects
- The future of telehealth in Latin America

Why Telemedicine in LA

- Several countries with continental dimensions, large distances and difficult access to many communities
- Large areas with low populational density and poor human development
- Extreme unequalities of distribution of health care resources

A Quick View of Latin America

- 33 countries
- 8.6 % of world population and 4 % of land area
- 520 million inhabitants
- 20 million km2
- 98% Spanish and Portuguese speaking
- Large regional disparities in human development
- Low priority for health and education development

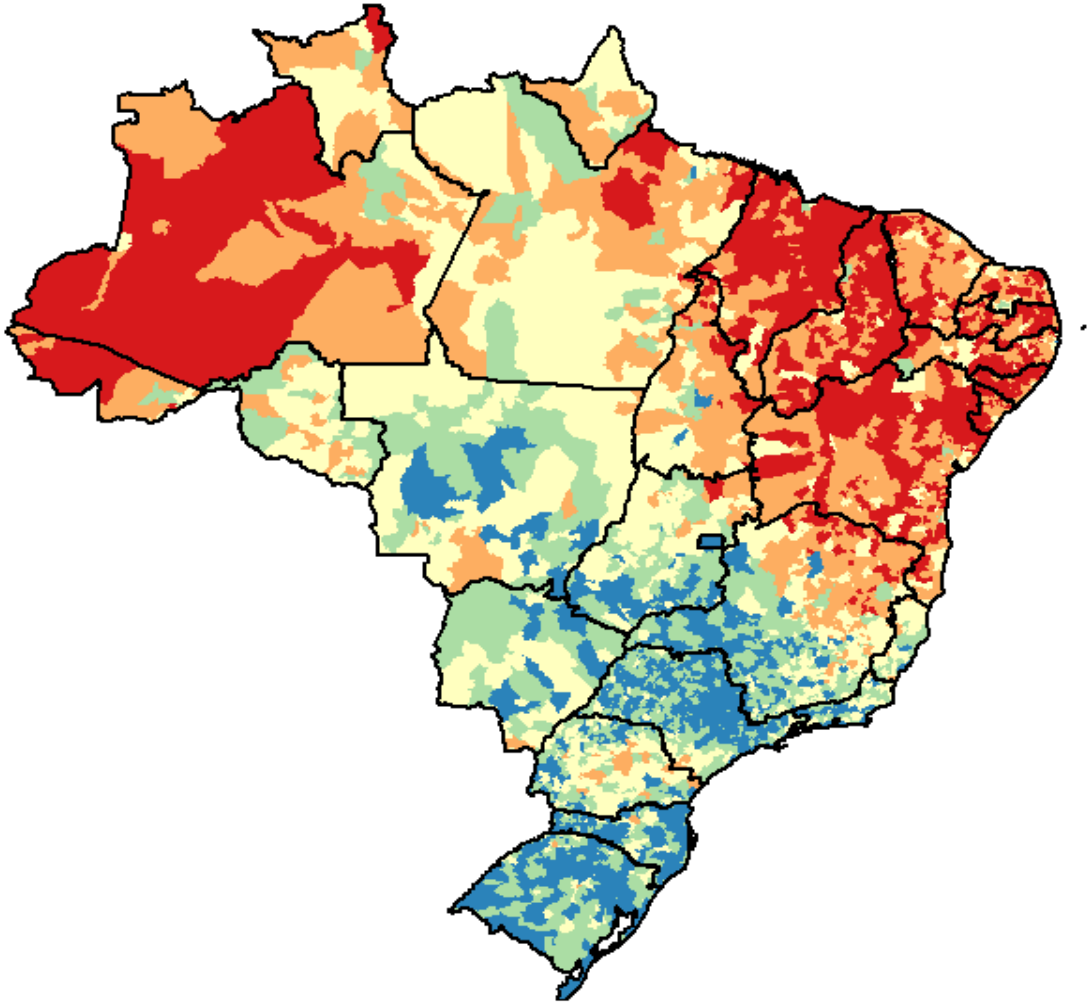
A Quick View of Brazil

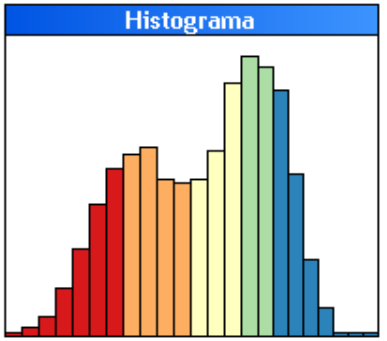
BRAZILIAN POLITICAL MAP

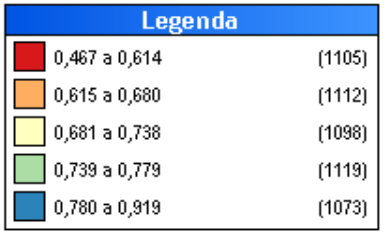
From Brasil 100 colorfotos
Christina Richter and Martin Fiegl

- Fifth largest country and 10th largest economy in the world
- 8,5 million km^2
- 187 million inhabitants
- Most advanced economy, health care, digital and telecommunications sectors in Latin America
- 20 million Internet users

A Map of Human Development







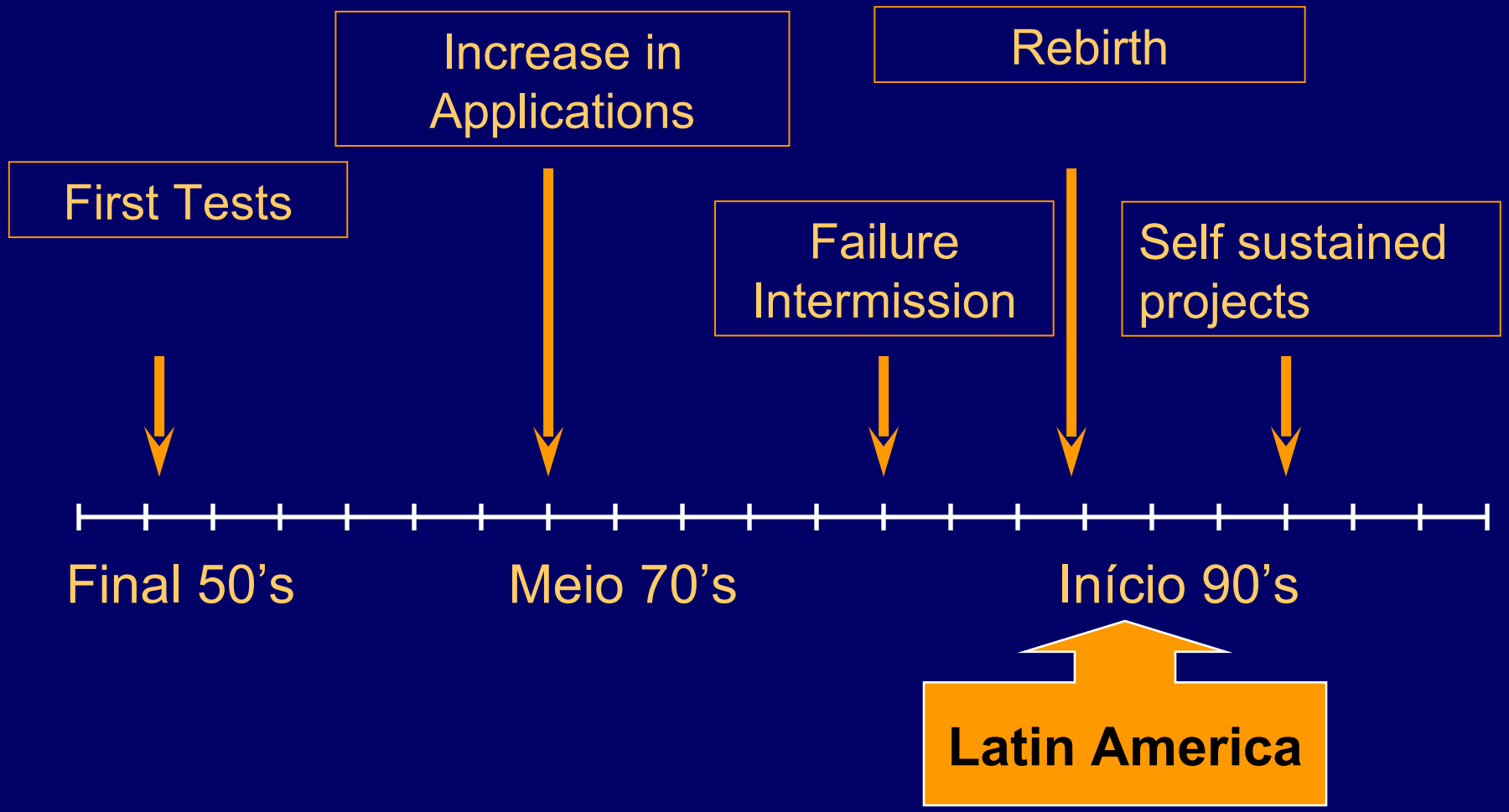
Distribution of Physicians in Brazil

- Total of 290.000 physicians
- Área of 200 km near Greater São Paulo: 85.000 physicians
- State of São Paulo: 100.000 physicians
- 20 largest cities: 82,5% of physicians
- 150 largest cities: 89% of physicians
- Cities with 100 physicians or more: 260
- 11% physicians dispersed in 3050 cidades

Distribution of Physicians

- Amazonas: 2,300 physicians in the state, but 2050 in the city of Manaus!
- More than 1,200 counties have no resident physician
- 112 medical schools (the majority is located in capital cities), 9.000 new physicians graduate each year, but only 25% have access to medical residence.

Evolution of Telemedicine



Status of Development

- More developed: Mexico, Brazil, Argentina, Costa Rica, Cuba
- Intermediate: Colombia, Venezuela, Chile, Uruguay
- Less developed: most of Central America, Caribbean, Guyanas, Paraguay, Bolivia, Peru, Ecuador

HistoricalAntecedents

- 1983-1992: Development of Brazilian packet switching network, text messaging services and file transfer (RENPAC, BITNET)
- 1985: First telemedicine projects
  - Store & Forward at 1.2 kbps via PSN

Recent Developments

- 1993-1996: Consolidation and expansion of digital infrastructure: Research Network, commercial Internet, ISDN, dedicated fiber optical networks, high performance computing and networking, satellite-based communications
- 1997: Privatization of telecommunications industry
- 1998-2000: First hospital-based telemedicine projects
- 2002-2004: First government-sponsored planning and projects

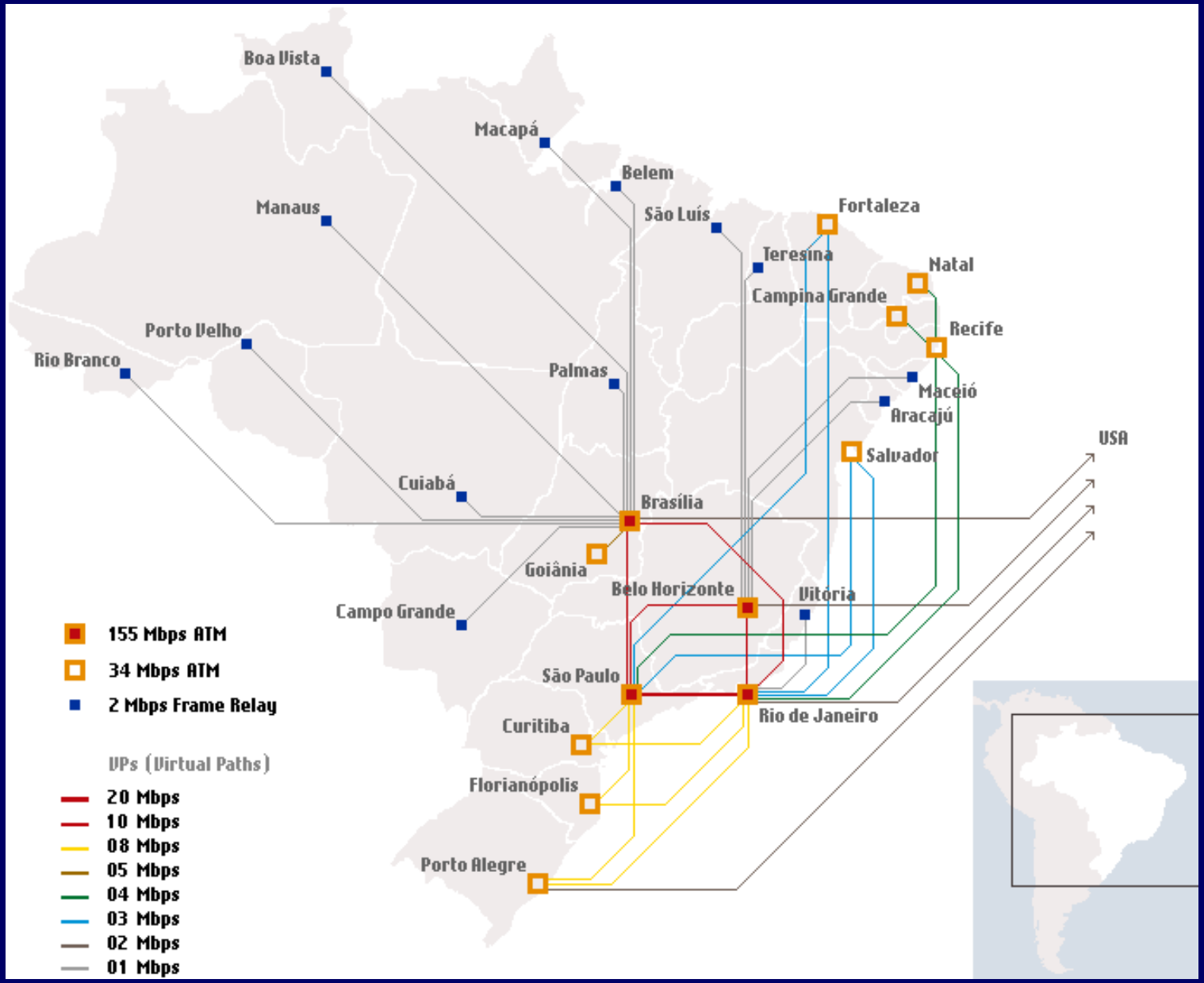
Telecommunications in Brazil

- 25 million fixed telephone lines
- 52 million mobile phone lines
- 32 broadcasting and telecommunication satellites, including 3 Brazilian-owned
- 4,5 million km fiber backbones
- 89% cities have wired communications, but only 10% with broadband
- All current technologies implemented
- Strong research, development and innovation

Applications Funding in Brazil

- FUST: Universalization of Telecommunications Tax Fund: a 1% tax levied on all telecom bills. US$ 30 million per month, US$ 900 million assets
- To be applied in health, education, digital libraries, satellite-based access in remote communities, handicapped people, social assistance projects, e-government
- FUNTTEL: Technological Development of Telecommunications Tax Fund: 0,5% levied on all telecom bills

Academic Internet 2 in Brazil



Most Common Applications

USA

- Radiology
- Cardiology
- Dermatology
- Psychiatry
- Home care
- Emergency Medicine
- Pathology

Brazil

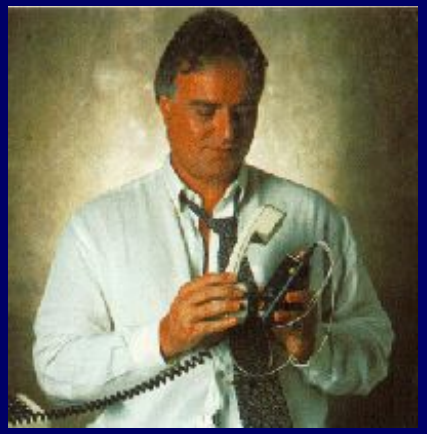
- Cardiology
- Radiology
- Clinical Psychology
- Pathology

Telemonitoring: Electrocardiogram

Portable monitor

Stethoscope

Call center



Current status in Latin America

- Great potential for expansion and universal adoption
- Still in the beginning: very few projects, most are pilot or showcasing
- Recent significant growth, both in the private and public sectors
- Still no model for financing and payment of telehealth services
- Countries in the region differ widely from one another
- Insufficient development of telemedicine as a separate technical specialty or discipline

Telemedicine as a Discipline

- Appearance of R&D and training centres
- Building of a specialized community (first associations, conferences, publications, sites, lists)
- Institutional support, first large scale projects
- International cooperation projects
- Training programmes for specialists
- Appearance of first specialized companies in the market
- Market development

Institutional Support

- Ethical and professional regulamentation of telemedicine and electronic patient record by the Federal Council of Medicine, 2002
- Technical Chambers for telemedicine and distance education in the Federal Council of Medicine
- Creation of the Health Information and Informatics Area in the Ministry of Health, 2002

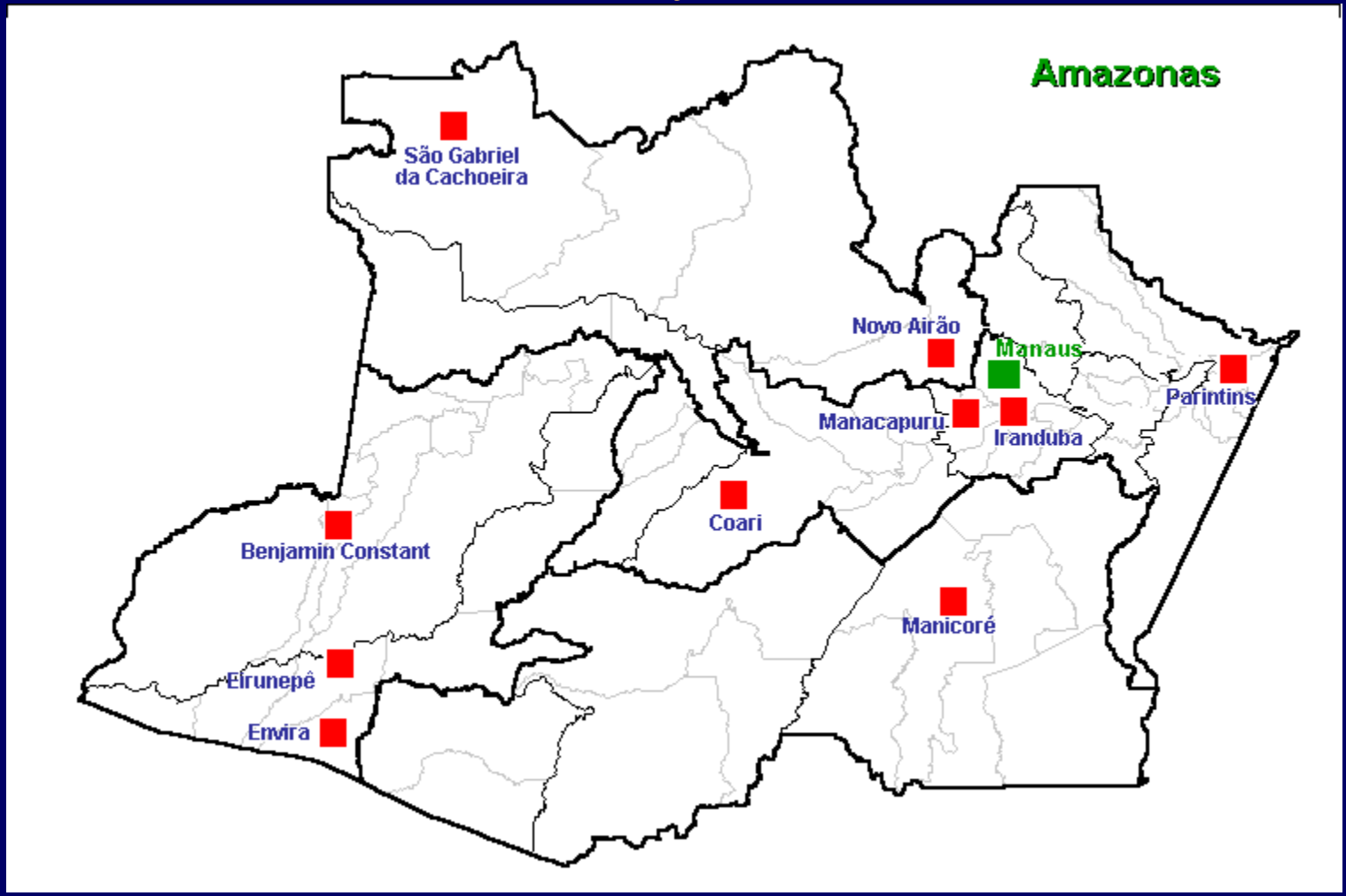
Technical and Scientific Meetings

- Brazilian Congress of Biomedical Engineering, since 1978
- Brazilian Congress of Health Informatics, since 1986
- TELMED: International Conference on Telemedicine and Distance Education, since 1999
- Others: Brazilian Computing Society, Brazilian Council of Telemedicine and Telehealth (2003), Federal Government-sponsored symposia and workshops (2004)

Interesting Ongoing Projects

- Telemedicine for the Family Health Programme
- Amazon Telehealth Project (SIVAM)
- Pediatric Oncology Network
- Telecardiology
- International Medical Second Opinion
- Teleautopsy Teaching Programme
- The Edumed.net Consortium

Rural Health Internship
Federal University of Amazonas



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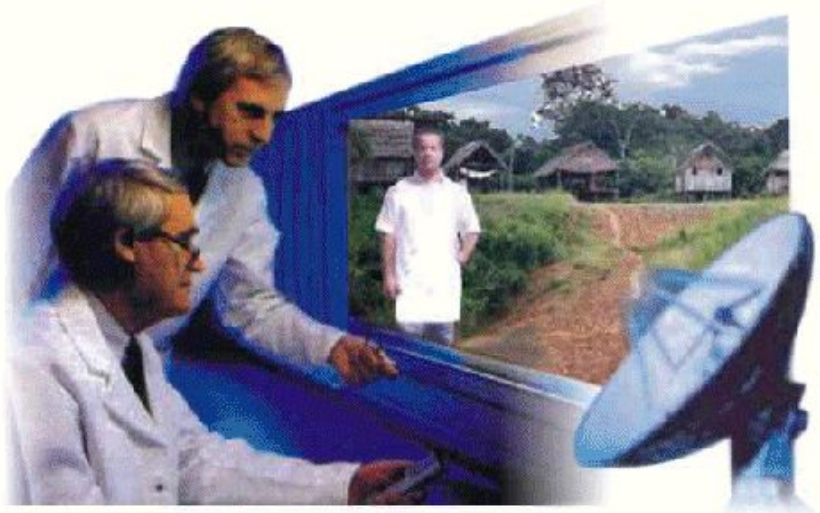
Initiative:

Instituto EduMed

AMAZON TELEHEALTH PROGRAM

Programa de Telesaúde da Amazônia



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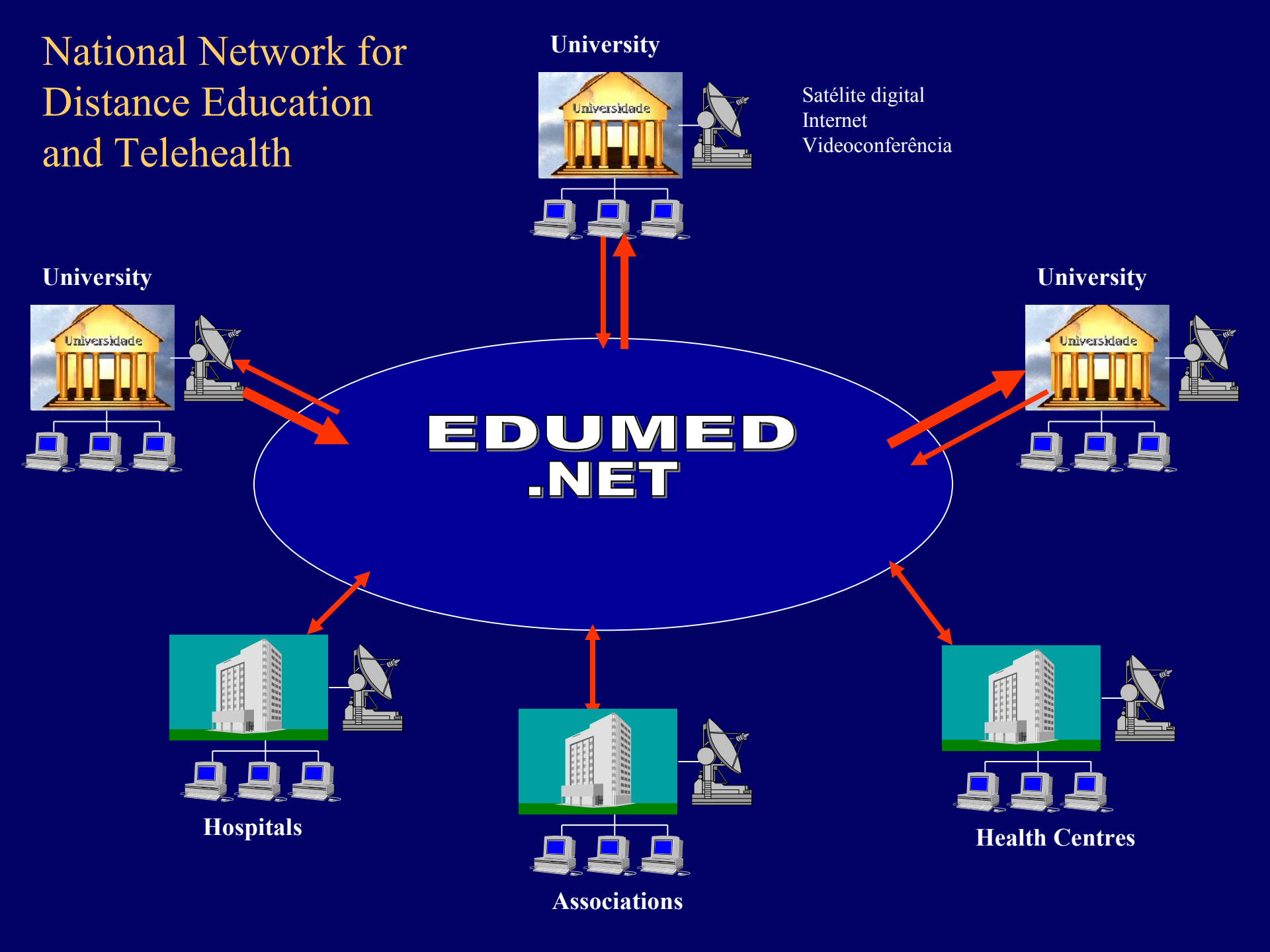
The Edumed.Net Consortium

- Satellite and videoconferencing national network for distance education in health and telehealth
- Consortium of 27 universitties, research centres and medical associations for generating certified quality content and services
- Started on June 2000, led by the Edumed Institute, a not-for-profit institution
- Targets the non-academic health sector (hospitals, government, etc.)

National Network for Distance Education and Telehealth



Technologies

- WWW
- Tele e videoconferencing
- On demand audio and video
- Digital satellite TV
- Digital libraries

Ongoing Edumed Projects

- MIDAS and EduVirt Projects
  - Wireless municipal Intranet for education and health
  - Pilot project at Sobral, Northeast
- Amazon Telehealth Programme
  - Rural Health Internship
  - Aboriginal Telehealth
- Digital Multimedia Library (EdumedSAT)
- Distance Continued Education in Health Sciences
- Pediatric Oncology and Telecardiology Projects
- CHUM-Edumed Case Teleconferences

MIDAS and EduVirt

Targets villages and counties with less than 50,000 thousand inhabitants (90% of the 5.560 Brazilian counties)

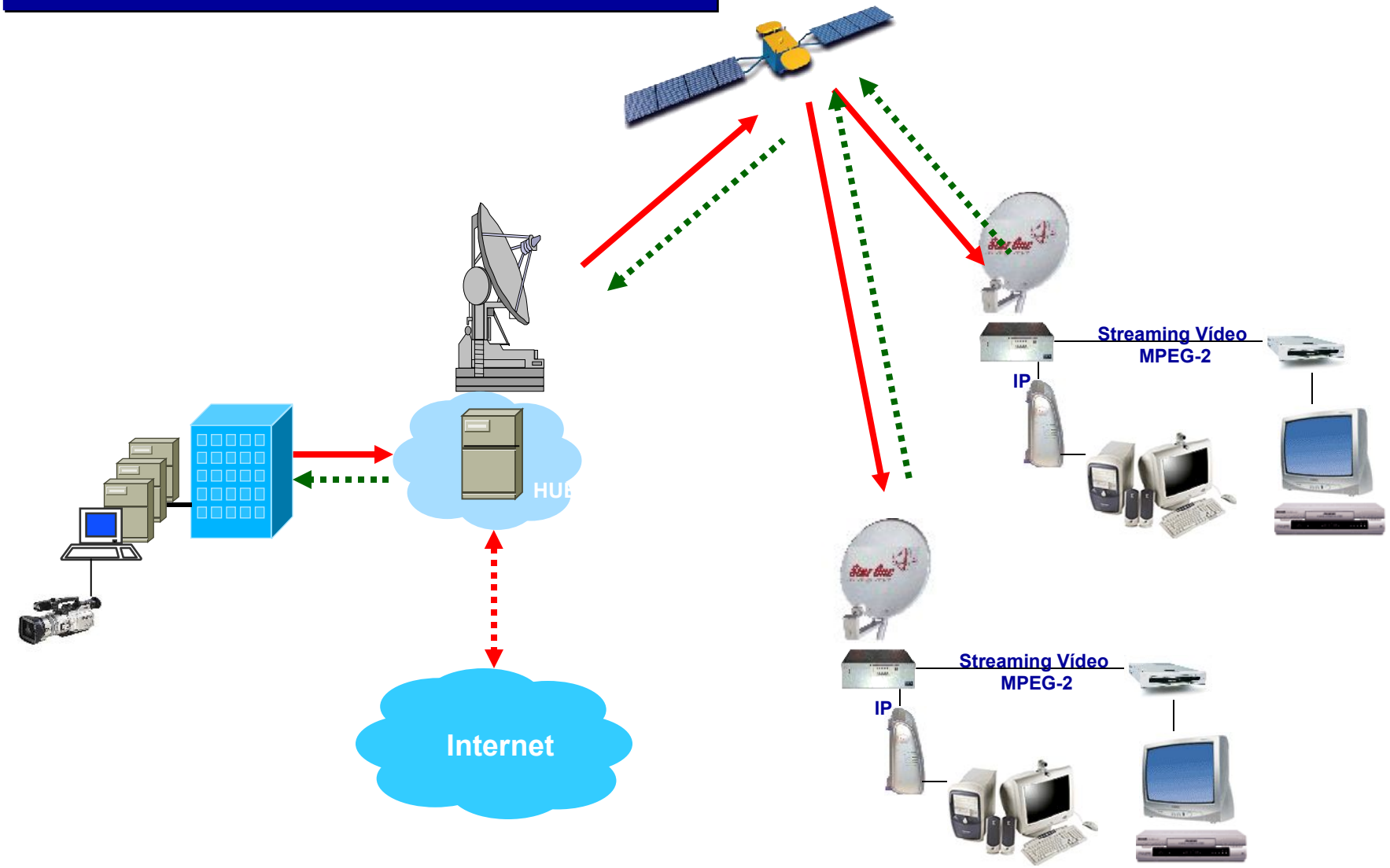
- Universal access to Internet
- Decreasing the digital divide
- Public e-libraries
- Telehealth
- Distance education
- Satellite broadband connectivity
- Wireless distribution

DVB-RCS Satellite Connection

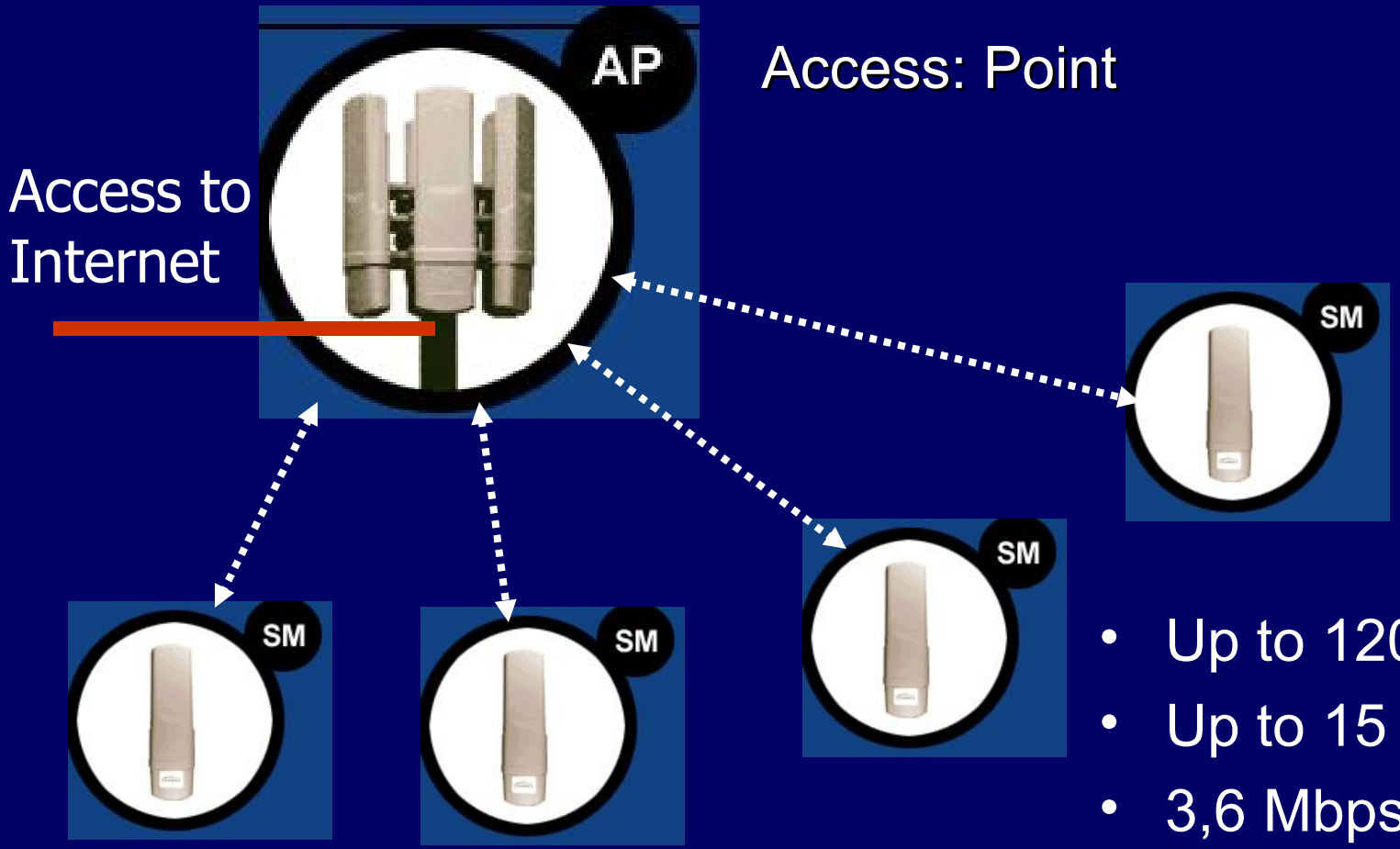
TV

Internet

Bidirectional Satellite



Wireless Broadband Network



- Up to 1200 SM per AP
- Up to 15 km coverage
- 3,6 Mbps bandwidth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Acesso a Internet via Telemar

Portable Telehealth

- Biosignal telemonitoring devices (ECG, spirometry, stethoscope, etc.)
- Glucometer, thermometer, pulse oxymeter
- PDA
- Teleconference software
- Internet-enabled mobile or satellite phone
- Wireless network enabled
- Satellite VSAT modem

Simulated product

Funções do Sistema

- Monitoração e transmissão de sinais vitais
  - ECG, temperatura, pulso, pressão sanguinea, glicemia, sons cardíacos e pulmonares, pCO2, pO2, fluxo e volumes respiratórios, etc.
    - Via modulação sonora ou comunicação de dados
- Transmissão de imagens
    - Pele, face, olhos, boca, eventos traumáticos, etc
- Teleconsulta e segunda opinião
    - Voz via celular
    - Text via SMS, WAP e Internet

Requirements for Advancing

- Market development and maturation
  - Decentralization of hospital-based care
  - Family health, increase in coverage
- Development of specific culture and acceptability
- Increase in technology transfer, offer, local expertise and manpower
- Large pilot projects with self-sustainability horizon
- Consolidation of a suitable economic model

Projects for the Future

- Multi-institutional training in telehealth, with international cooperation
- Development of a low-cost videoconferencing terminal and telehealth peripherals
- Massive expansion through federal and international funding
- Integration of telehealth to primary and family care
- Regulatory alliance
- Extensive use of standards
- Enterprise-public-academic alliance

Telehealth Sites in Brazil

- Instituto Edumed: www.edumed.net/
- Telemedicina: www.telemedicina.org.br
- Telesaúde: www.telesaude.org.br
- Edumed Newsletter: www.yahoogroups.com/group/edumednewsletter
- Telemedicine Newsletter www.yahoogroups.com/group/telemednewsletter

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