Some thoughts on optical and other broadband networks in Latin America…

(With special thanks to Bill St. Arnaud and the CENIC last mile symposium)

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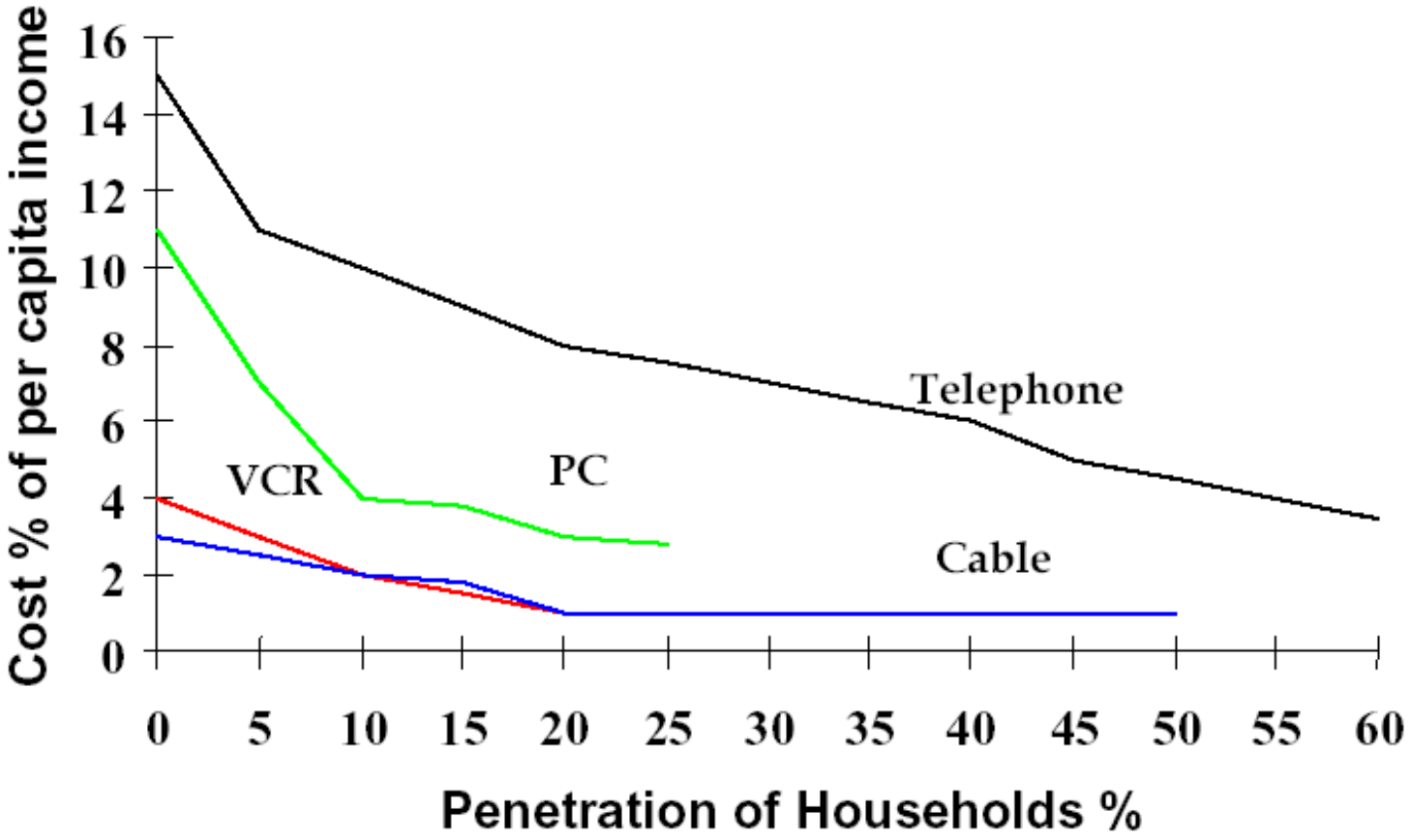
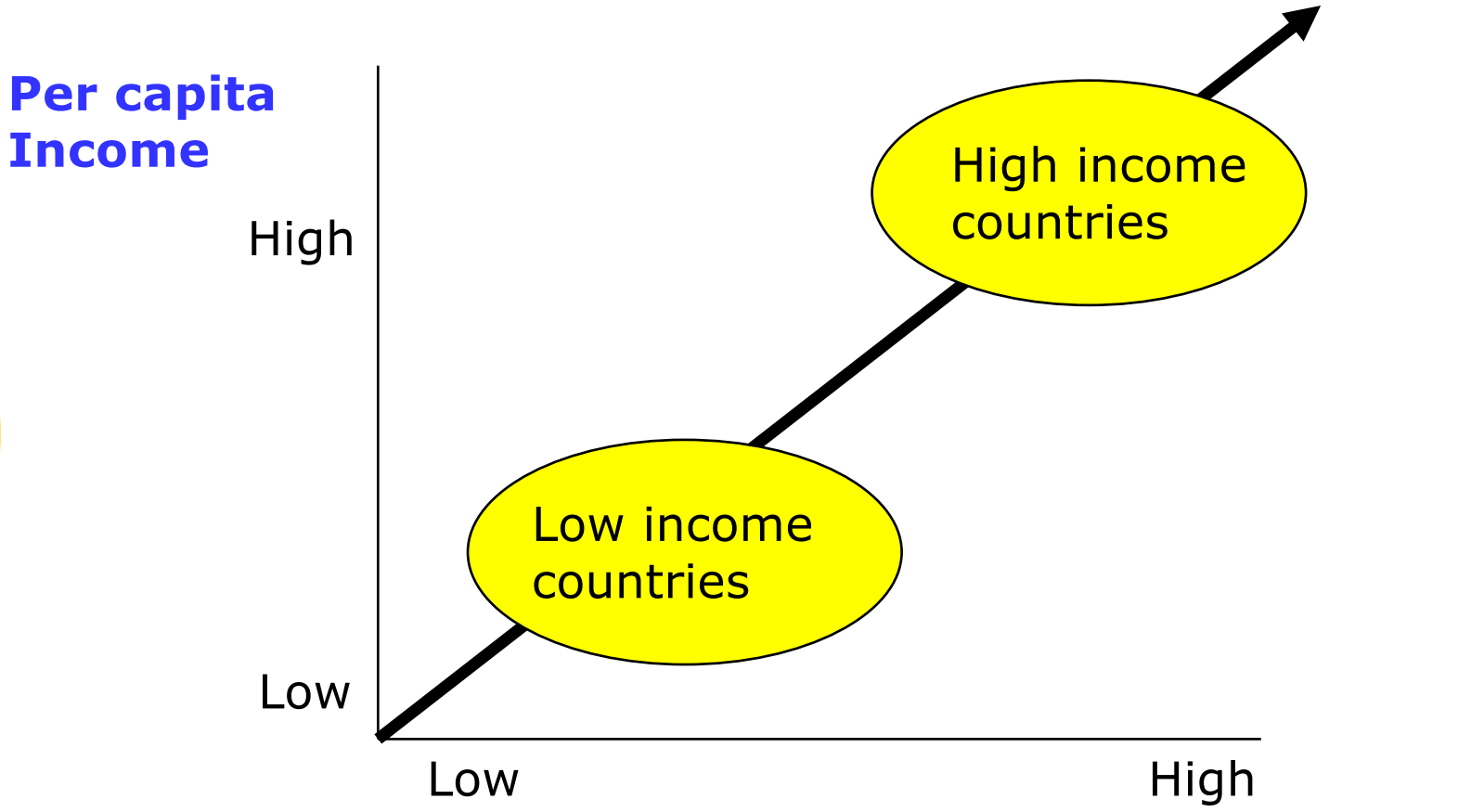
*It is generally accepted that once a technology is perceived as having broad utilitarian value, **price as a % of per capita income**, is the main driver of penetration*



Penetration of telecommunications in low income countries is further inhibited by at least 3 factors…

- Low income per capita
- Less competition. Higher prices from monopolies
- Fewer applications. No broad utilitarian value

Income vs. penetration given the price of a technology



Telecom monopolies have even higher prices in low income countries

- Fewer entrants. Less competition
- No unbundling
- Price cap regulation creates cross susidies between costumer groups. Large customers (inelastic) subsidize small costumers (elastic). High bandwidth services are very expensive
- Inefficient ROW regulation
- Inefficient spectrum policies

Telecommunications does not have broad utilitarian value…

- Key sectors are not intensive users
  - Governments. Can not use the internet to comply
  - Schools and Universities. Traditional teaching and research methods
  - Businesses. More local, less global. More agriculture and industry, less information workers.

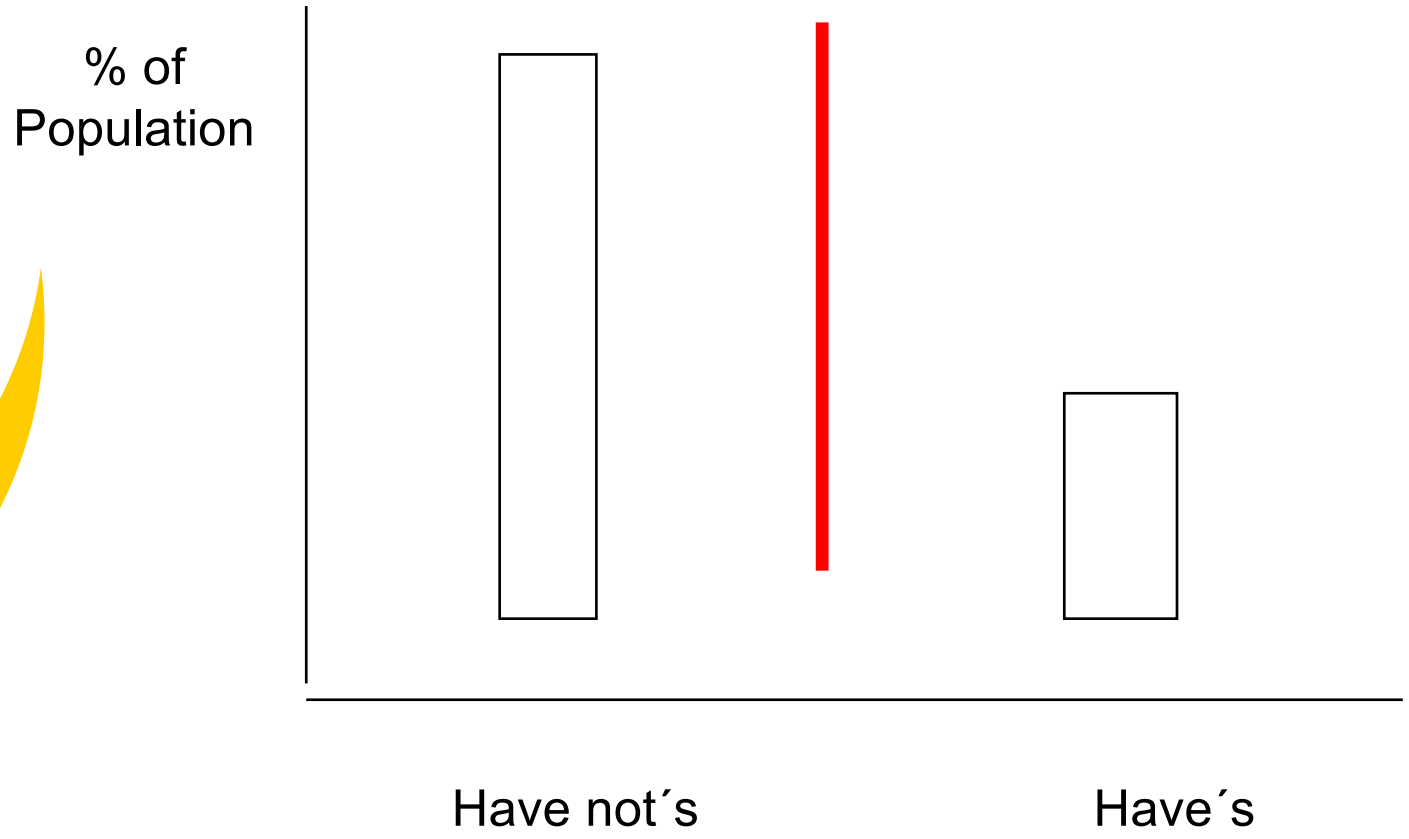
In Latin America broadband will have even less penetration than POTS and wireless

- Fiber is more a monopoly in the last mile than wire (more expensive)
- Broadband applications are practically non existent. No broad utilitarian value.
  - People to people (videoconferencing, telemedicine)
  - People to computers (video on demand servers)
  - Computer to computer (grids, peer to peer)

However, broadband is about expanding the digital divide, not narrowing it

- The ones who need it should get it
- Let educators, researchers, businesses, hospitals and governments get it
- In a second instance increased income will drive penetration

Lets not all end in the wrong end of the digital divide



Why government intervention?

- Private sector competition in an open competitive level playing field is the best vehicle for producing innovation and lowering costs.
  - As much as possible governments should not intrude into the marketplace.
- Government intrusion in the marketplace is warranted if there are significant benefits to the economy and society where otherwise "to do nothing would be to do harm"
  - Bridges displace private sector ferry service operations
- Governments have a key role in making broadband available to those that need it

Public policy tools regarding broadband in low income countries can not be based on continuing subsidies. Some ideas…

- Deregulate condominium ownership
- Promote Carrier Hotels
- Promote efficient use of spectrum
- Governments can drive applications

Condominium ownership

- Moving from a service based telecom model to an asset based model
  - Costumer own assets (like PBX´s)
  - They don't pay fees for monopoly services

One Possible Model: Municipal sponsorship

- Municipal Condominium Fiber Network using fiber ROW and fiber facilities facilitated by municipal government
- Governments partner with private sector to build condominium fiber networks to all government buildings and other key users
- Government achieves social goal of affordable bandwidth to key users
- Structural separation between ownership of fiber cable and ownership of individual strands
- Condominium fiber allows many costumers to own strands of fiber in the neighborhood. Cost of construction is shared amongst all participants
- Fiber lands in a carrier hotel where fiber strand owners can buy services from many providers

Private fiber condominium

- Organizations such as schools, hospitals, businesses, and universities become anchor tenants in the fiber build
- Each institution gets its own set of fibers on a point to point architecture, at cost, on a 20 year IRU (Indefeasible Right of Use)
- Fiber is installed and maintained by 3rd party professional fiber contractors (usually the same contractors used by the carriers for their fiber builds)
- Typical cost is $25,000 (one time for 20 years) per institution plus annual maintenance and right of way cost of approx 5% of the capital cost
- Institution lights up their own strands with whatever technology they want Gigabit Ethernet, ATM, PBX, etc

Condo fiber for business

- Significant reduction in price for local loop costs
- No increase in local loop costs as bandwidth demands increase
- Ability to outsource LAN and web servers to distant location as LAN speeds and performance can be maintained over dark fiber
- Access to lower cost competitive service providers at carrier neutral hotels
- Examples:
  - Colgate-Palmolive build in Cincinnati
  - Nortel, Cisco, Gov’t depts in Ottawa
  - Lehman Brothers in NY
  - Ford in Detroit

Condo Fiber Costs-Examples

- In Canada several next generation carriers and fiber brokers are now arranging condominium fiber builds:
  - IMS, QuebecTel, Videotron, Cogeco, Dixon Cable, GT Telecom, etc etc
- **Des Affluents**: Total cost $1,500,000 ($750,000 for schools)
  - 70 schools
  - 12 municipal buildings
  - 204 km fiber
  - $1,500,000 total cost
  - average cost per building - **$18,000 per building**
- **Mille-Isles:** Total cost $2,100,000 ($1,500,000 for schools)
  - 80 schools
  - 18 municipal buildings
  - 223km
  - **$21,428 per building**
- **Laval**: Total cost $1,800,000 ($1,000,000 for schools)
  - 111 schools
  - 45 municipal buildings
  - 165 km
  - **$11,500 per building**

Moving the Network Demarcation Point

- It is impractical to have multiple carriers own individual strands from the neighborhood node to each and every home:
  - Therefore let the customer have title to individual fiber from the residence to the neighborhood node
  - The customer connects to the service provider of their choice at the neighborhood carrier hotel
  - Customer decides if they wish to connect to an aggregator, convergence provider, or single service Internet provider
- Two technical approaches:
  - RPON which allows easy moves, adds and changes
  - Micro conduit and fiber is blown in upon customer request

Move the network demarcation point…

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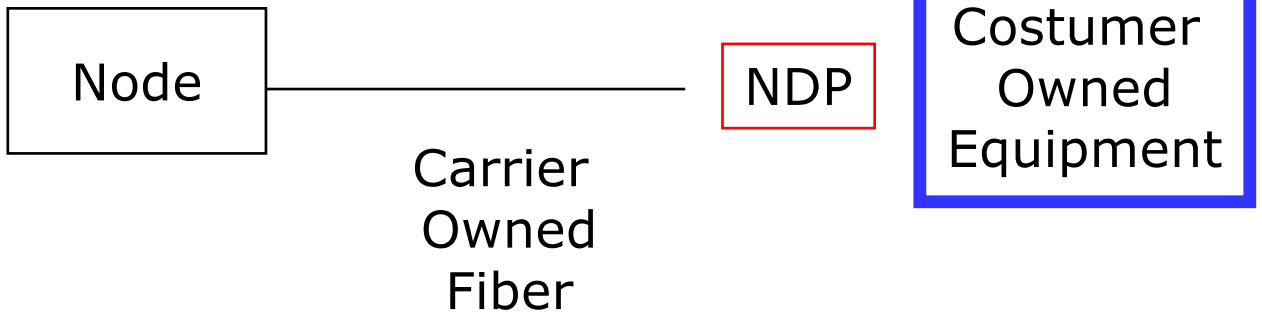

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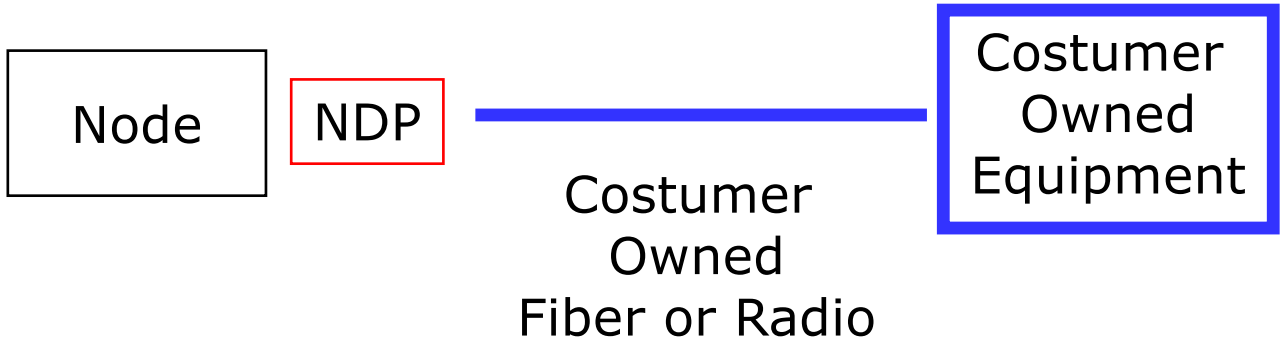
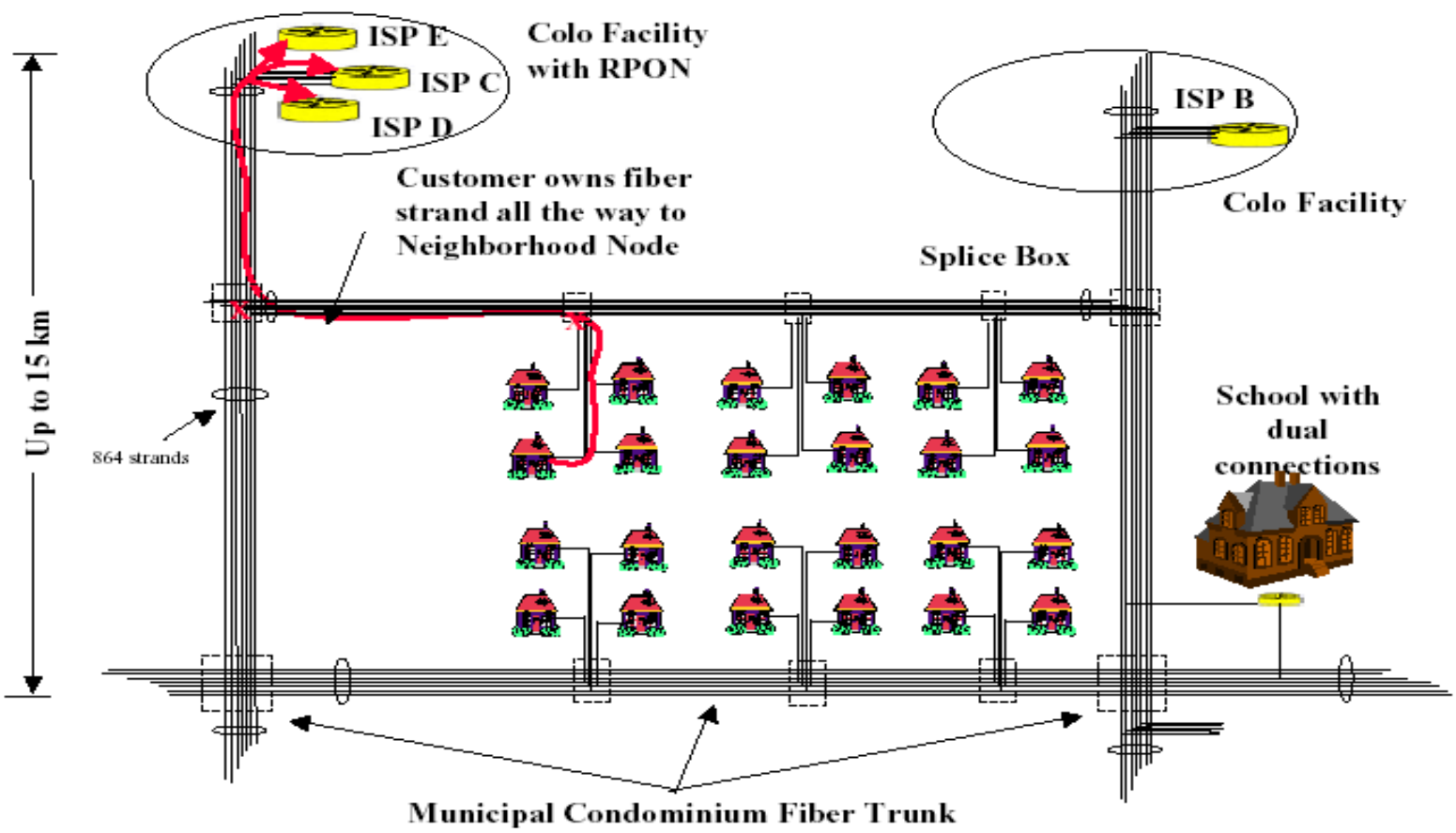


Condominium fiber architecture…



Governments should promote efficient spectrum use…

- Latin American countries don't have security spectrum needs and should make spectrum available for public use (use it or loose it). Spectrum should be very cheap in LDC´s
- Deregulate WiFi´s
- Deregulate SDR radios
- Allow costumer owned radios into carrier hotels

Governments should promote applications…

- Should adopt true e-government practices. From information to transactions
- Public education should have a growing e-education component

NREN´s

- Have the needs and the applications
- Have public/governement recognition trough all of Latin America
- Should lead the way into a new telecommunications economic model

Thank you!

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