VoIP Potating...

VoIP and Open Hardware for developing regions

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Free Telephony Project 1

- many people working in open software
- we are working in open hardware
- designs can be copied modified, re-used without restriction
- we encourage cloning of our products

Free Telephony Project 2

- trend: functionality shifting from hardware to (free) software
- trend: total system costs constantly dropping
- falling costs are a good thing for the developing world
- leverage trends using free hardware designs

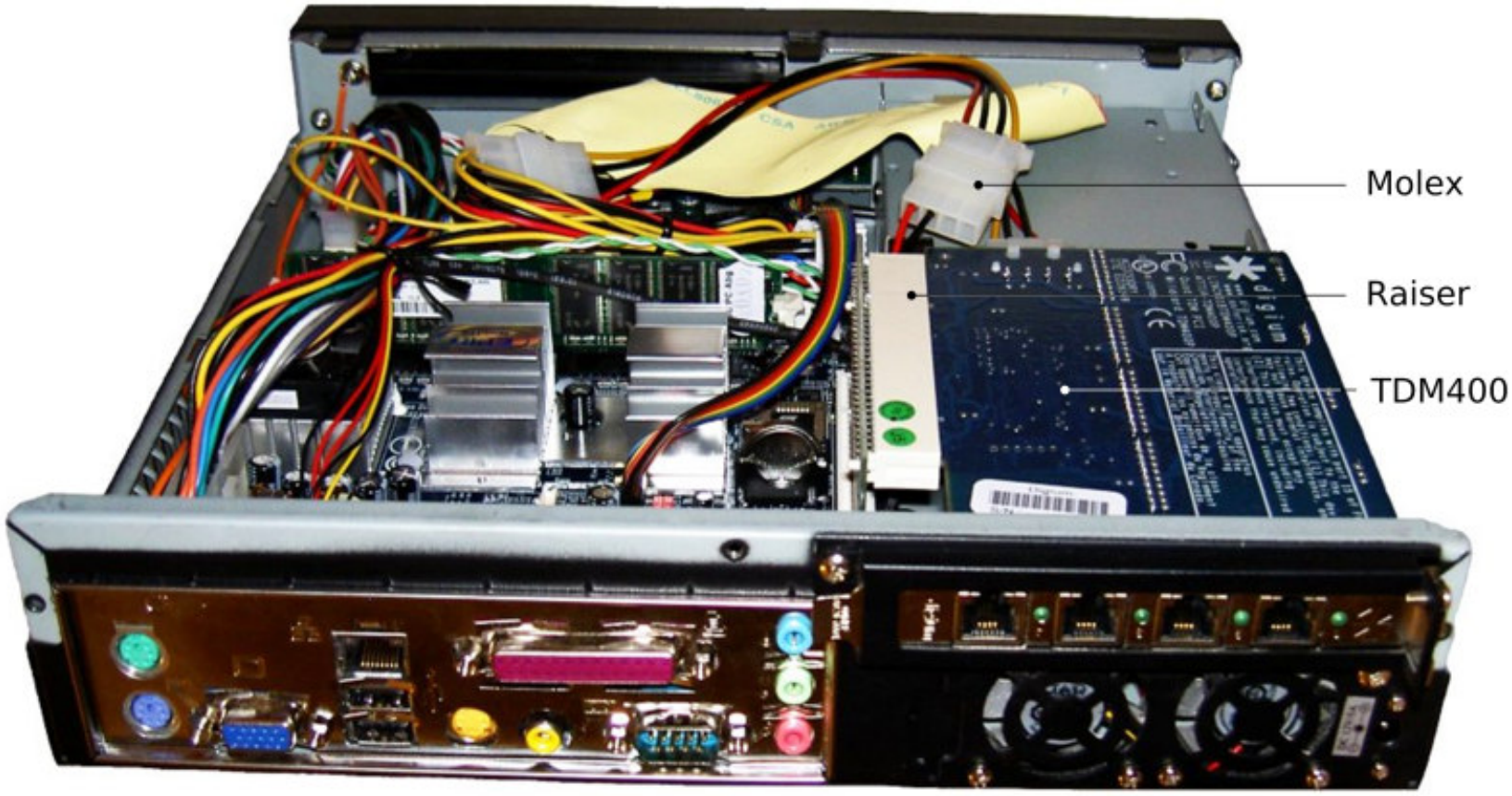
Why Free Telephony Project?

- Hardware designs are free as in speech
- Use FOSS and Open Hardware to drive system costs down
- Lower the cost of telephony for everyone on the planet
- A phone call should be a human right, not a privilege

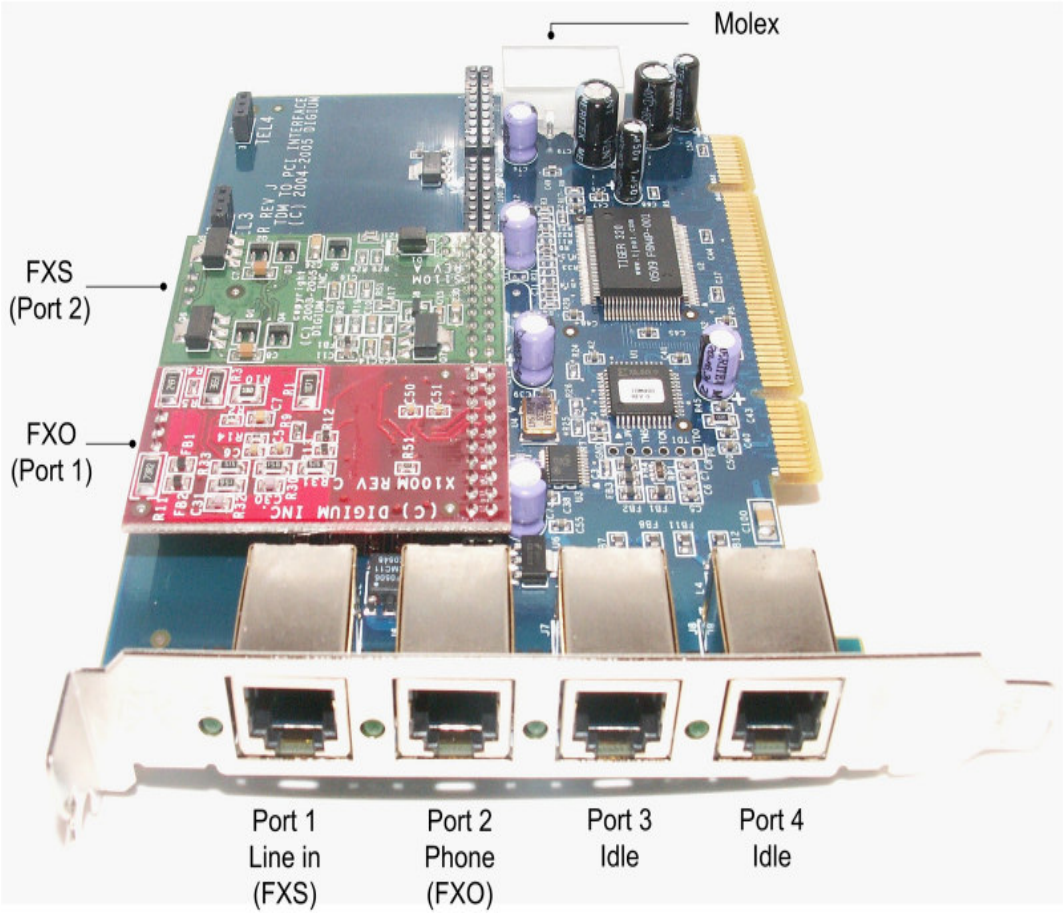
Open Hardware

- normal hardware costs include 70% overhead
- exciting new business models, e.g. OLPC
- dramatic price reductions
- local manufacture
- customisation, localisation, e.g. solar, wireless

Asterisk Hardware 1

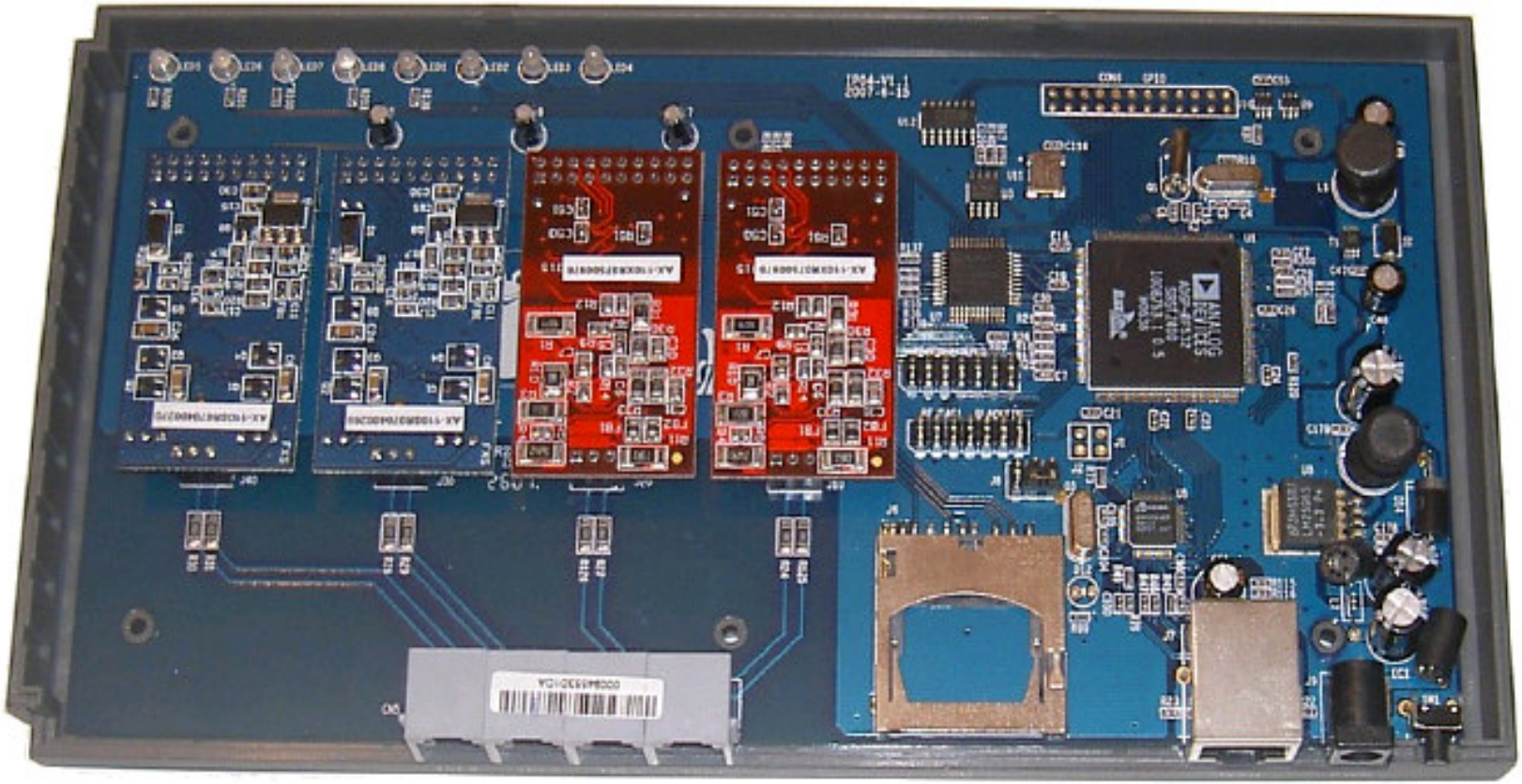


Asterisk Hardware 2



TDM400P Wildcard, 1FXO +1 FXS

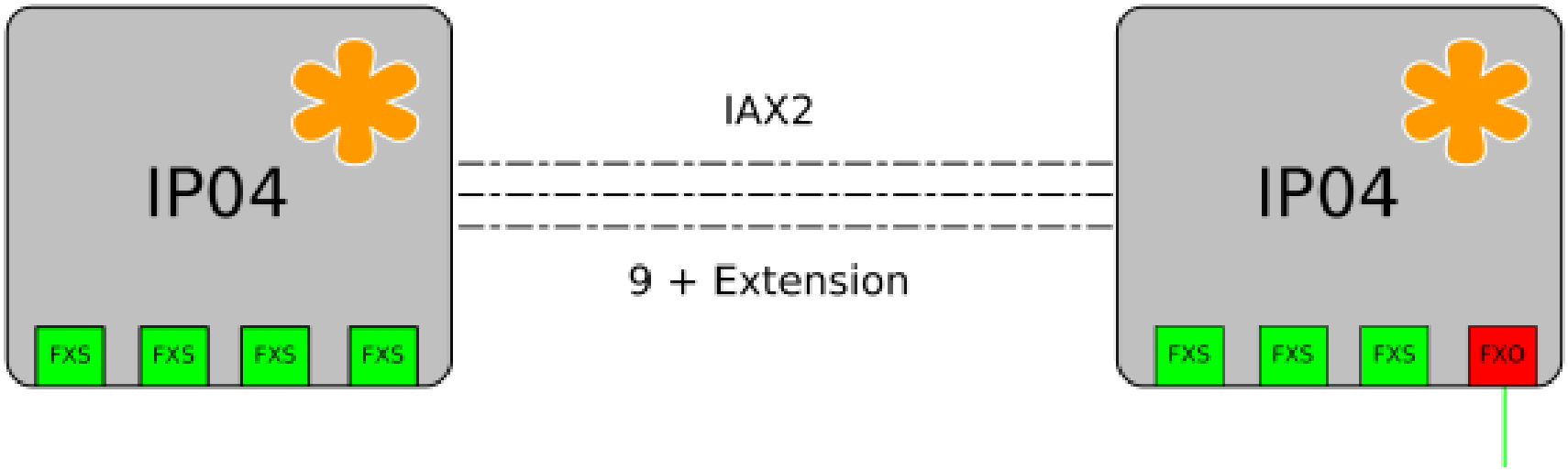
IP04 IP-PBX



Case Study - IP04

- Switches analog and VoIP calls
- fanless, low power (3W), rugged, compact
- open hardware and software
- easy to customise, e.g. simple UI
- potential for very low cost

Case Study – IP04

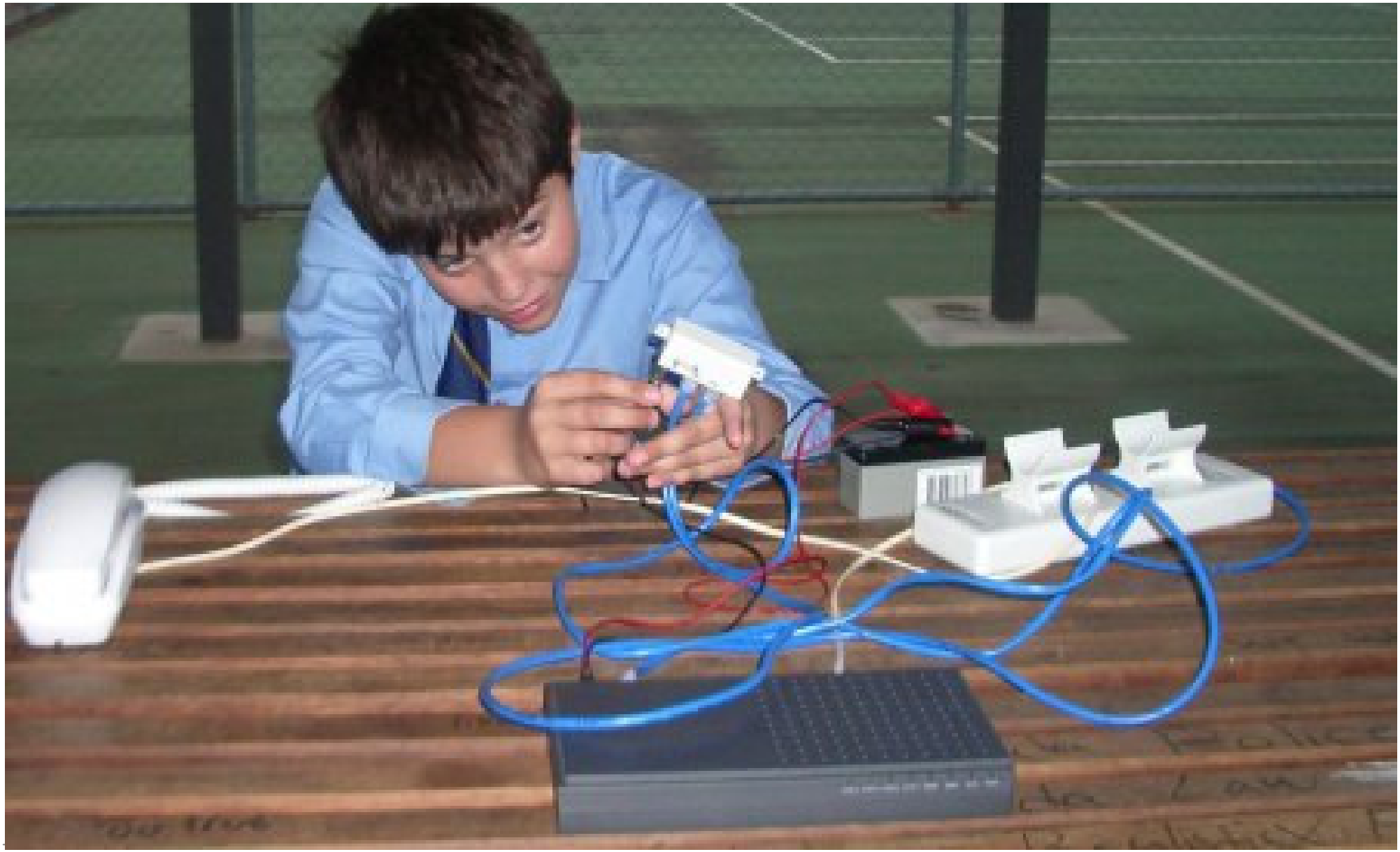


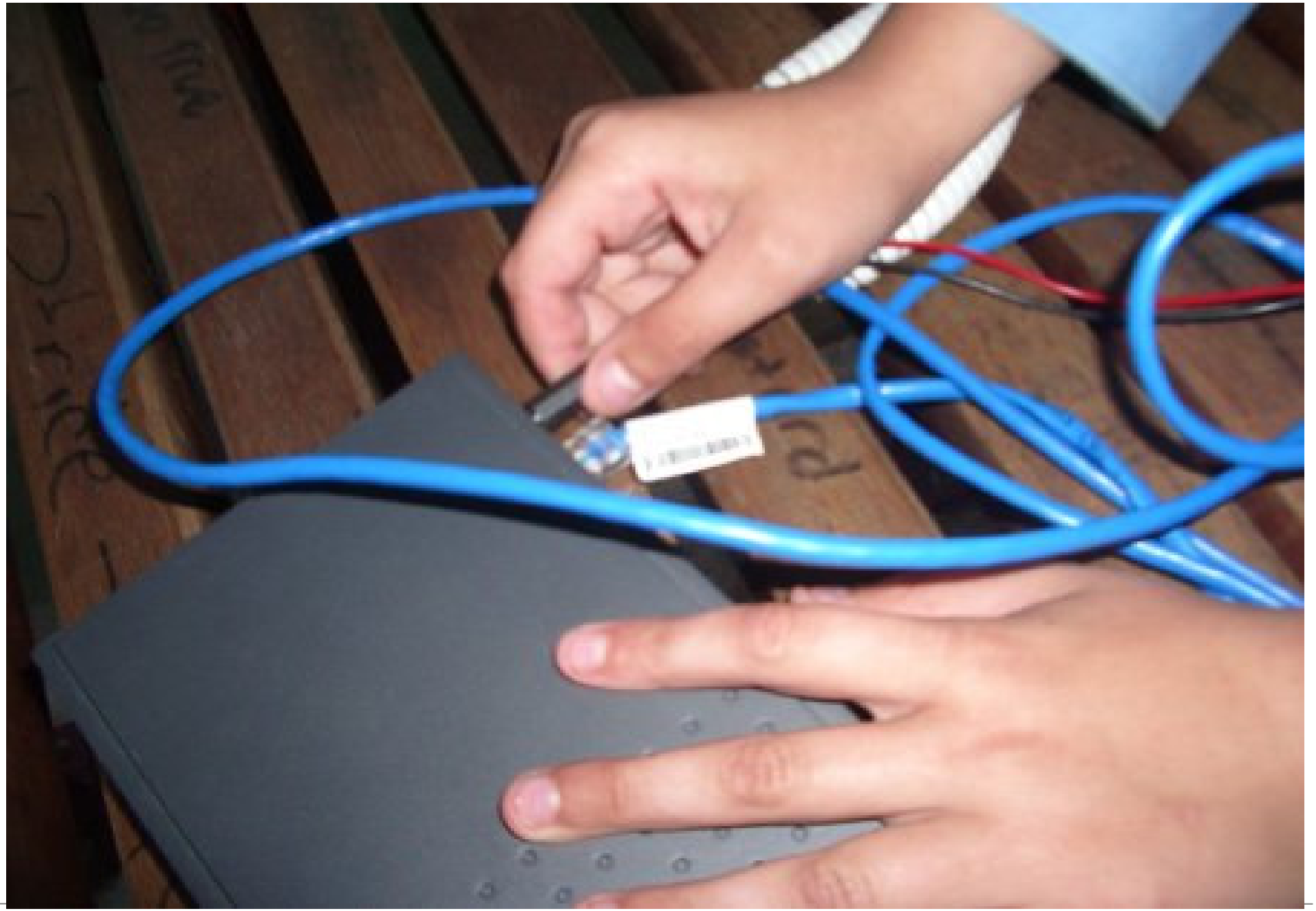
VoIP and GSM

- VoIP can extend GSM/PSTN network at edges, revenue for incumbent telcos.
- IP04 plus WiFi backhauls costs are 5% of GSM deployment (base station)
- free, untimed, community owned networks
- or local business models

VoIP in a Box

- How easy can we make VoIP over Wifi?
- First Pass – preconfigure Ubiquity NS2 and IP04
- Test on my Kids! Five minutes training

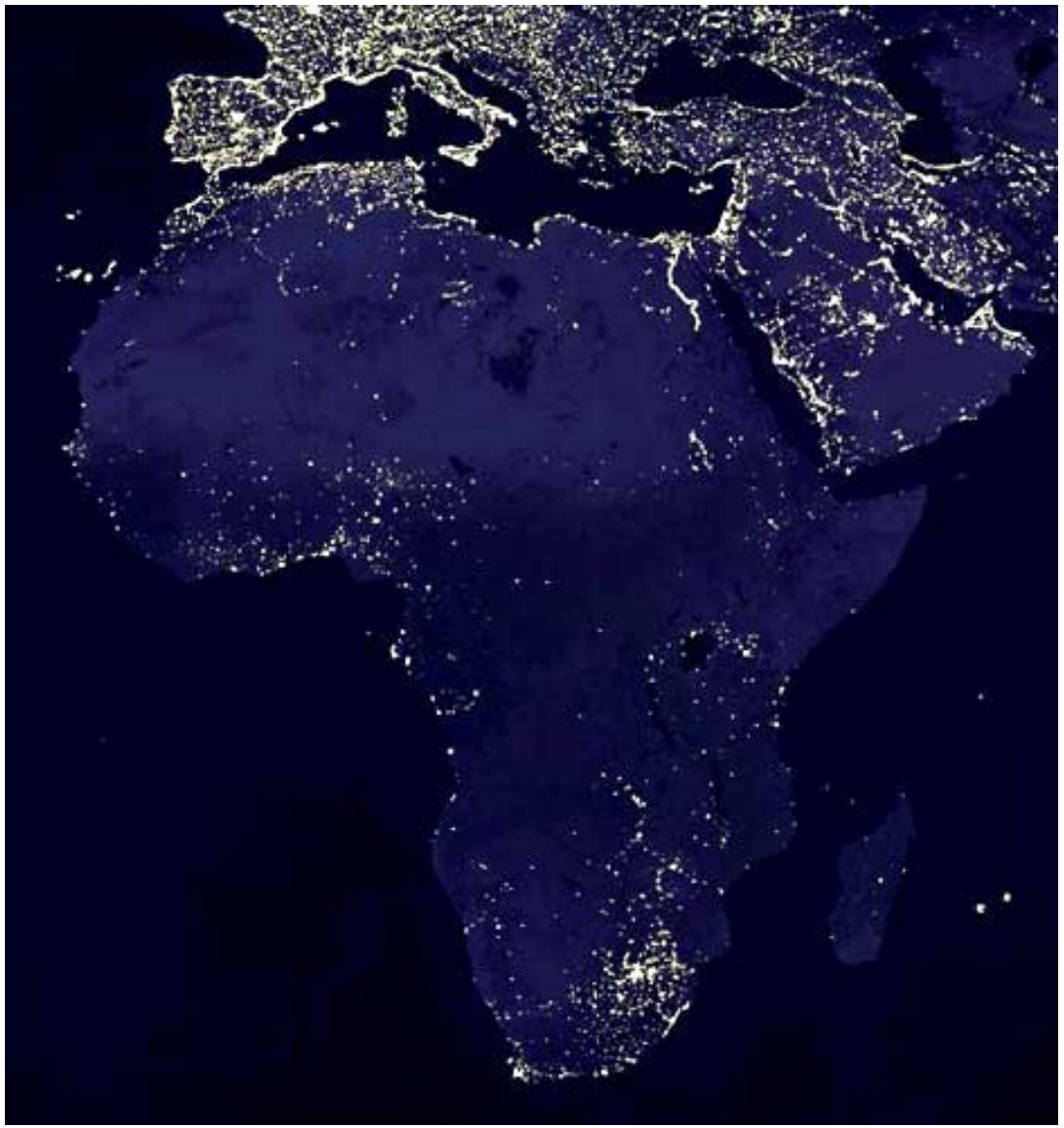




Deploying VoIP – Six Challenges

- Power
- Quality (of Service)
- Upstream connectivity
- Network management
- Business models
- Marketing

Deploying VoIP – Six Challenges



Power

- Infrastructure = Power
- Infrastructure needs access to power
- More power with less power

Power

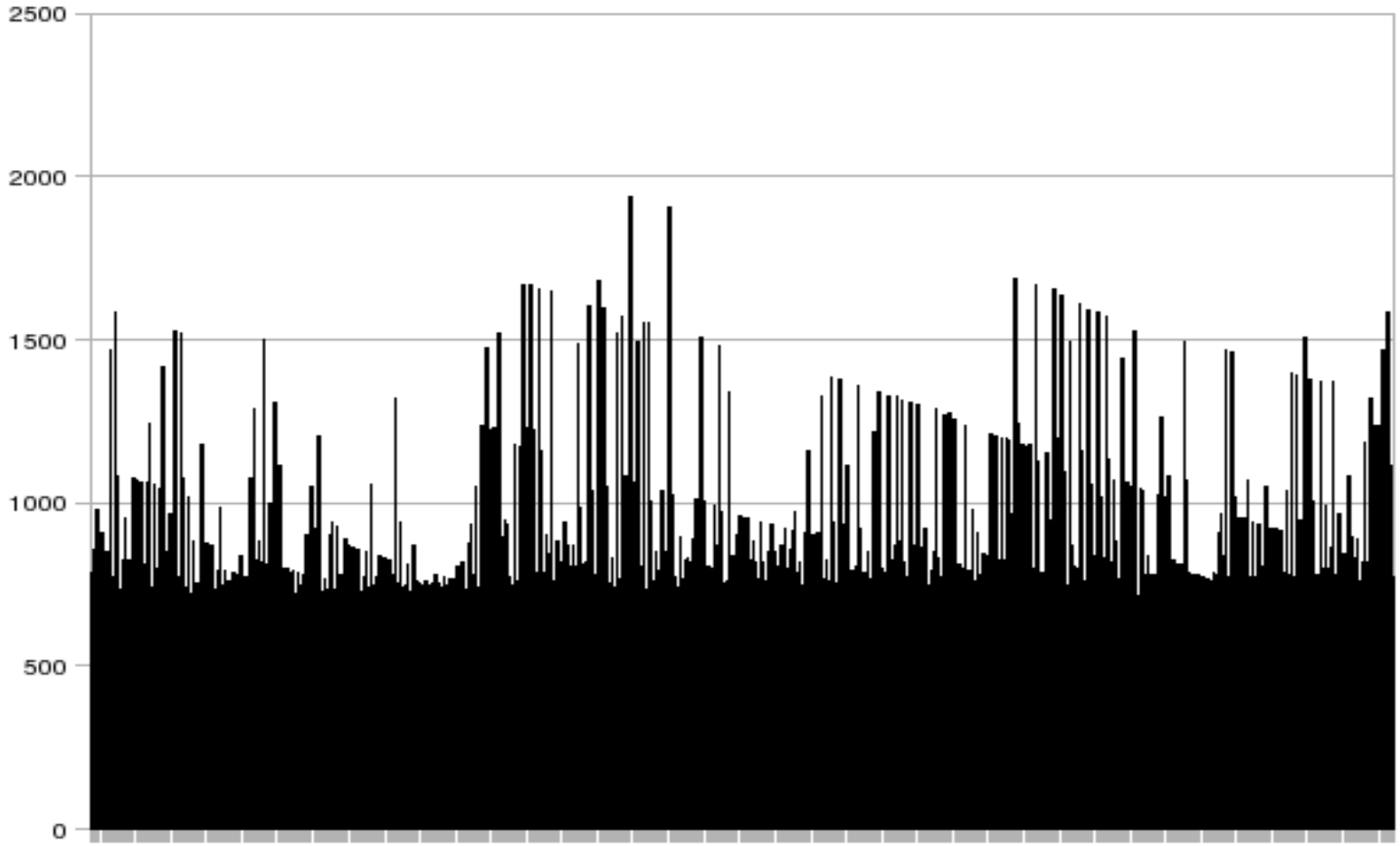
Power

Power

Quality of service

- It takes 10% of the time to make Internet to work, and 90% of the time to make it work efficiently
- Networks are not designed to differentiate between types of traffic

Quality of service



Upstream connectivity

- VoIP call requires 20-30 Kbps dedicated bandwidth
- 0.05 USD / month – local bandwidth
- 50 USD / month – international bandwidth (VSAT)
- 5 USD / month – ADSL (fiber)

Upstream connectivity

- 1/100 scale economy
- Local services are key
- Local content is key
- Build low power, high capacity backhauls

Network management

- Challenge of moving from small to medium – large scale networks
- 1 person = 4 customers
- 1 person = 150 customers

Business model

- What is profit?
- What is growth?
- Is there a business model?
- What is development?

xxx model

- Development is the possibility to “choose”
- Need to understand and measure cost/outcome

Marketing

- Marketing strategies
  - Low cost
  - Identity

Marketing

- Make business local
- Make <model> local
- Market-ing vs Community-ing

Voice Potato Bag

Addressing...

- Power – Low power
- Quality (of Service) - Traffic management
- Upstream connectivity – Local services
- Network management – Visualize your network
- Business models – Design & Evaluate

- Marketing – Make noise!