



WiderNet

Casting a Wider Net

.Org



The WiderNet Project

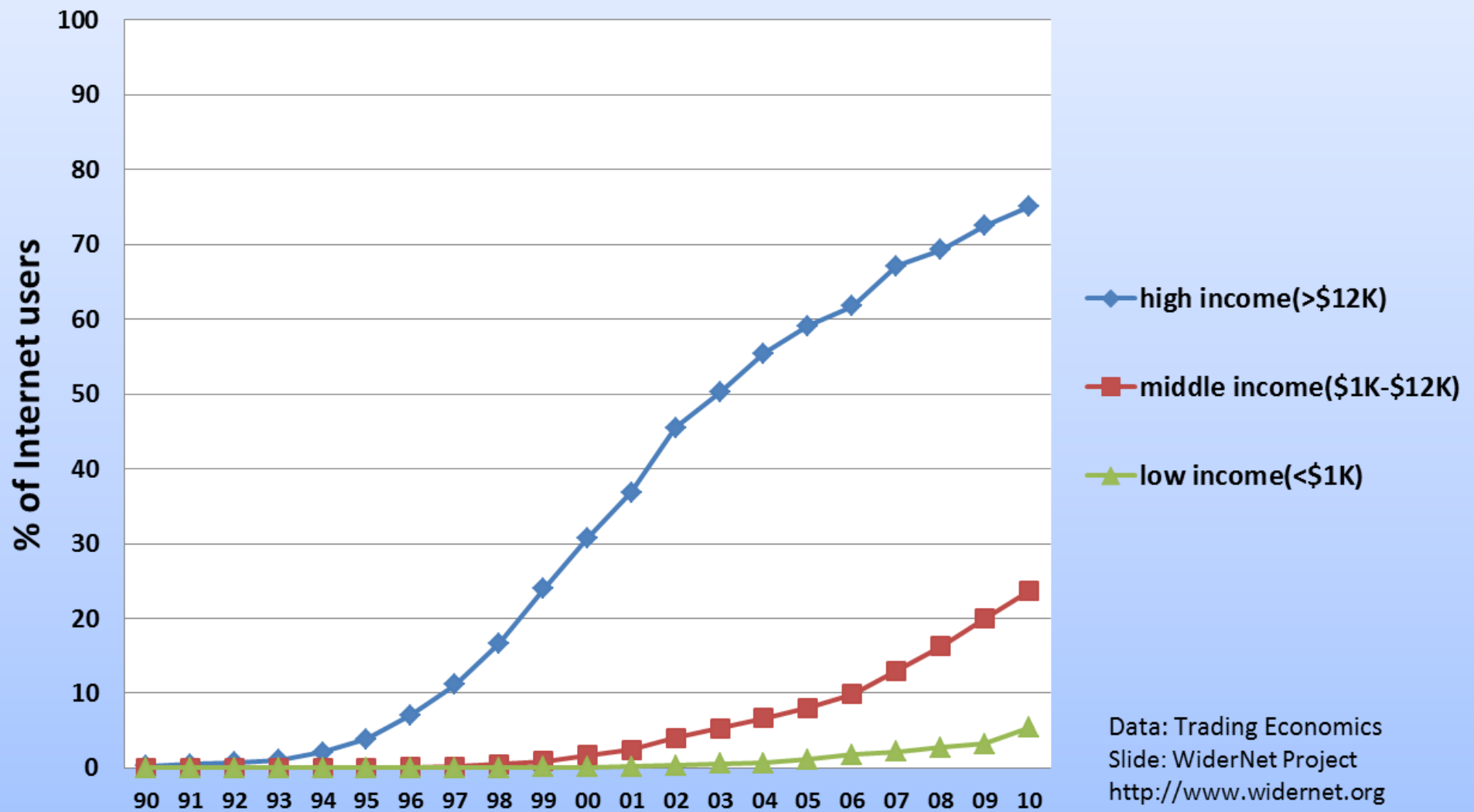
- Since 2000, building capacity at African institutions for academic collaborations
- 5,600+ trainees across sub-Saharan Africa and India (~30% women)
- Collected over \$2,100,000 in new & used hardware, software for partners in Africa
- Refurbished and shipped 1,600+ used computers for partner universities in Nigeria, Liberia, and Ethiopia
- 800+ volunteers have put in over 20,000 hours
- Focus on practical, cost effective solutions
- Helping to build a digital culture (best practices, user groups, student internships, gender equity...)
 “see one – do one – teach one”



Internet

Curb your Enthusiasm

World Internet Users by Country Income Group





African Studies Center
Boston University
<http://www.bu.edu/africa/outreach/>

The Reality of the Internet Cost

- Freakishly expensive: 100x U.S.
 - Liberia 2011 : \$150K for dedicated 1mbit
- Beware the aristocratic “Oh, let them buy bandwidth” attitude.
- Drinking Perrier
- Bandwidth Blackmail
- Internet is an extraordinary sacrifice for people with other very compelling needs

The Reality of the Internet Connection

- Very slow: no audio/video, PDF paranoia
- Can only be used by a handful of users
- “Forget it between 10am and 3pm” as connection is saturated.
- Very rarely 24 x 7. Many institutions hard pressed to deliver 6 hours a day
- Frequent lapses of a day or more
 - Occasional lapses of a week or more



Mobile is King

- Europe 120%, Africa 53%
- mHealth, mGovernance, mCommerce
- Simple phones outsell smart phones 4:1
- Usage is significantly different; rarely smorgasbord in developing countries
- Texting, email, flashing most common.
- \$2 USD to watch a single YouTube video

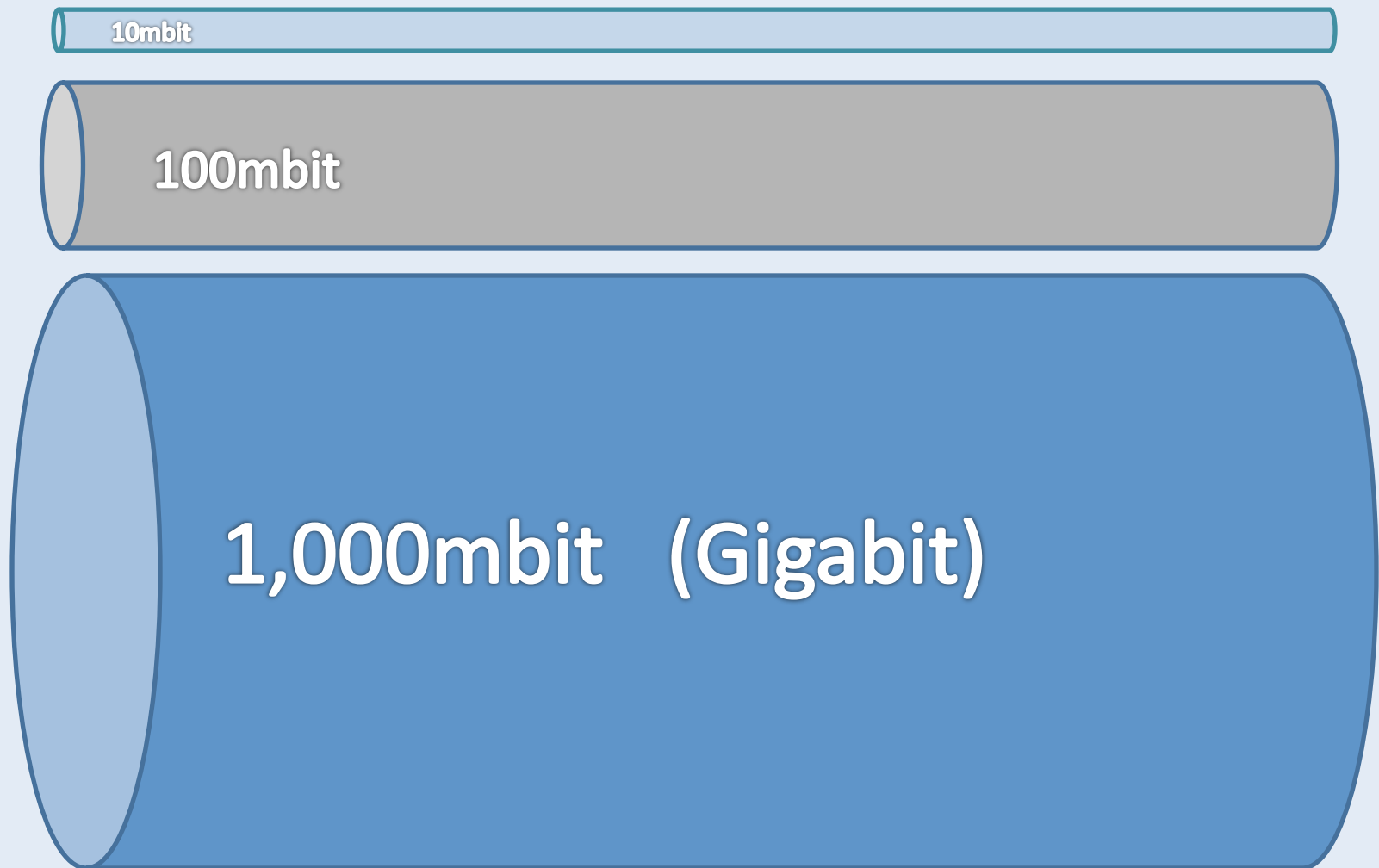
In low bandwidth situations, the

MOOC is MOOT!

The Power of the IntRAnet

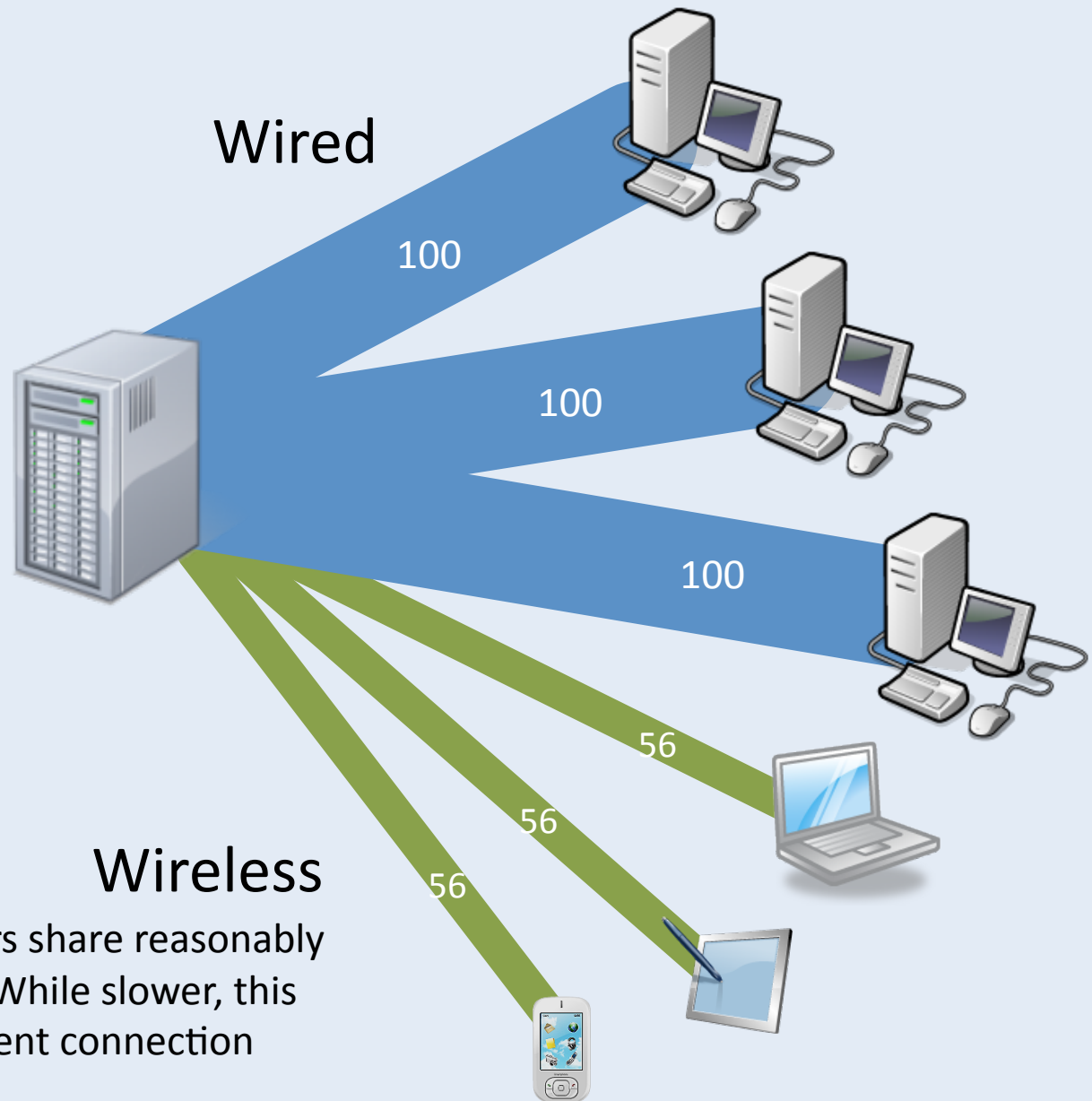
- Uses infrastructure you own
- Inexpensive to build
- No bandwidth costs
- Scales marvelously
- Incredibly fast
- With or without the Internet, the intranet is a necessary investment

Network Connections -- “Pipes” – come in various sizes



Intranet

Wired networks provide the best bandwidth. Typically, wired computers each have at least a very fast 100mbit connection. Some go 1,000mbit and some as fast as 10,000mbit.

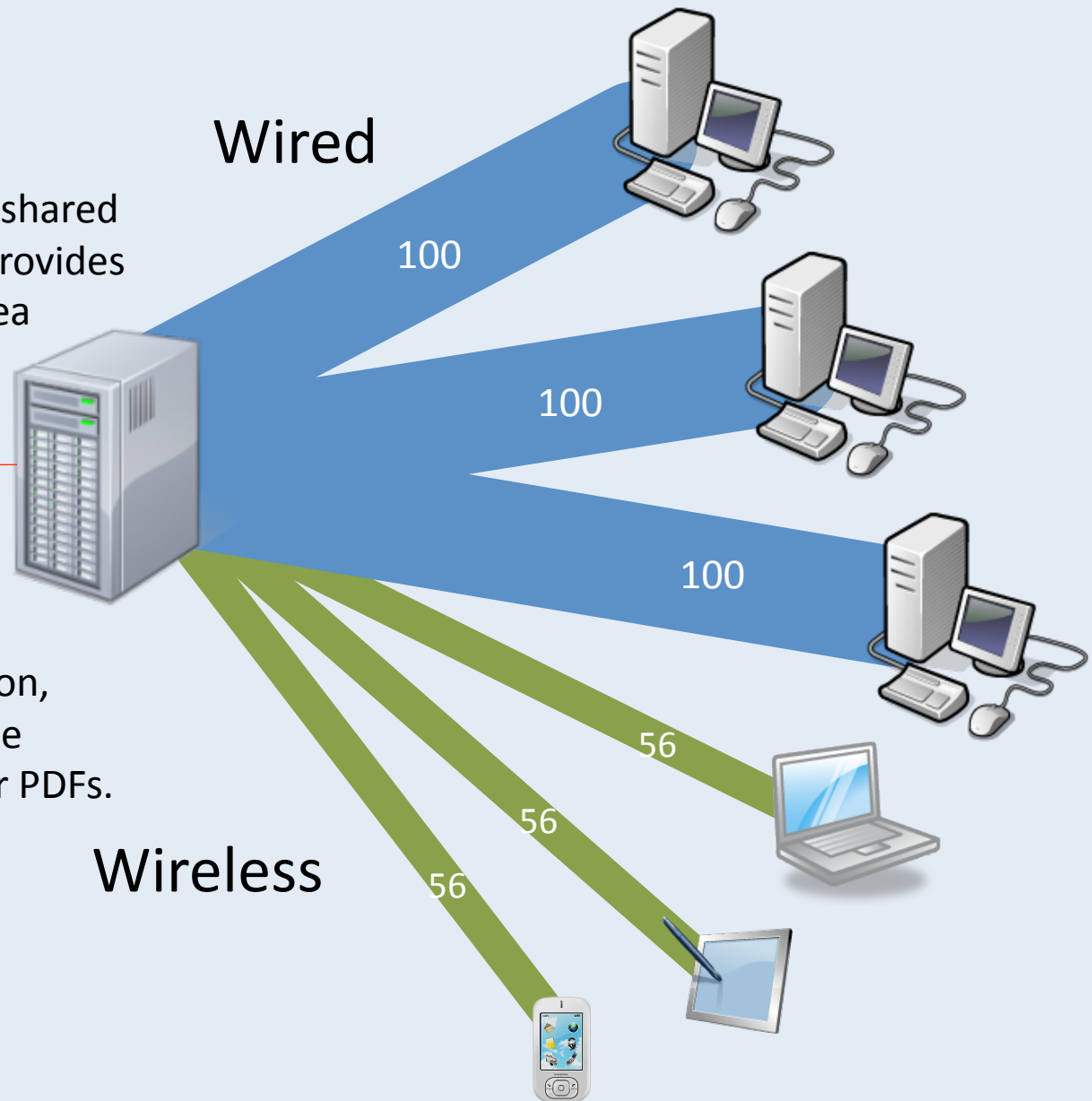


Typical wireless computers share reasonably fast 56mbit throughput. While slower, this is often the most convenient connection

Intranet

A 1mbit Internet connection, shared between all the computers, provides a tiny fraction of the Local Area Network's capacity.

With a tiny and slow connection, people are unlikely to use large resources, like audio, video, or PDFs.



Ubiquitous Intranet

- Most organizations depend on intranet
- Services that empower most important
- Large universities have 500+ servers
- Intranet connections >100GB
- Typical U.S. university spends \$2,000/student/year on ICT: mostly intranet services

The eGranary Digital Library

"The Internet in a Box"TM

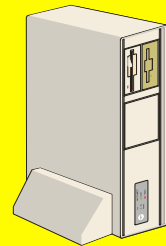
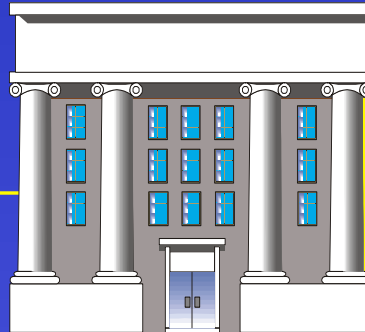


Replacing Bandwidth with Storewidth

- 4,000+ GB information store inside LAN
- Over 30 Million educational documents
- Collection created and maintained by librarians
- Multimedia, audio, video at full network speeds
- No bandwidth costs
- Augments a conventional Internet connection



Internet

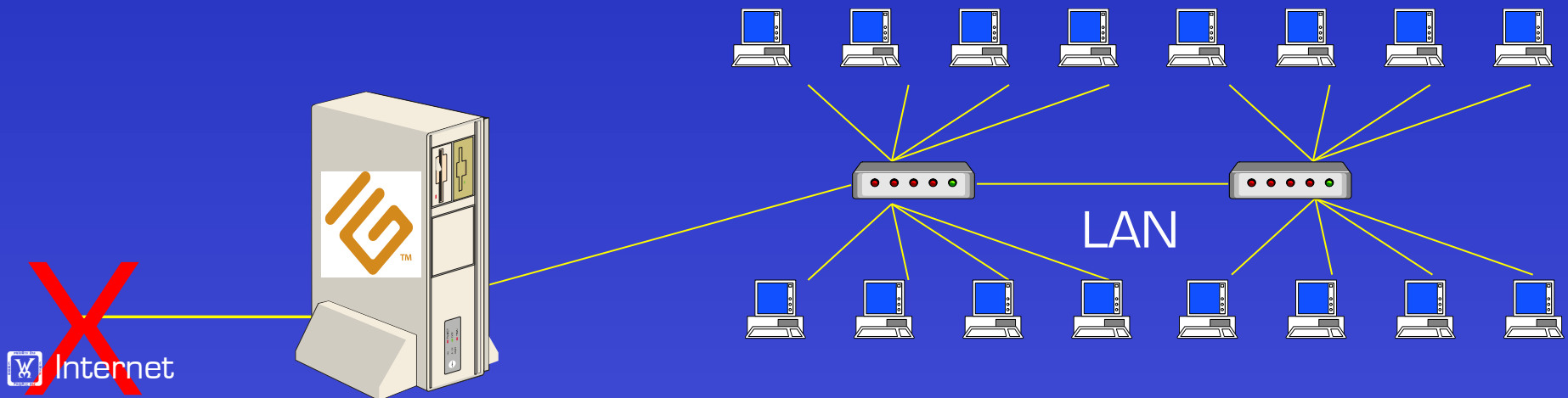


LAN



The eGranary Digital Library can provide thousands of networked computers high-speed access to millions of documents and multimedia files over a local area network.

Even when the Internet connection is broken!



The eGranary Digital Library

- Permission from over 1,600 authors & publishers (MIT OpenCourseware, Wikipedia, WHO, Math TV, Virtual Hospital, Khan Academy, etc.)
- Over 30 million documents
- 50,000+ books, hundreds of journals, hundreds of Web sites & CDs
- Patrons open documents 100 – 5,000 times faster than with their Internet connection
- Built-in search engine and catalog. Looks and acts just like the Internet.



The eGranary is already installed in more than 650 schools, hospitals, clinics, and universities in Africa, Asia, and the Caribbean.

Underlying eGranary Concepts

Information cache

Bandwidth conservation

Off-line information store

Edge technology

“The Internet in a Box”

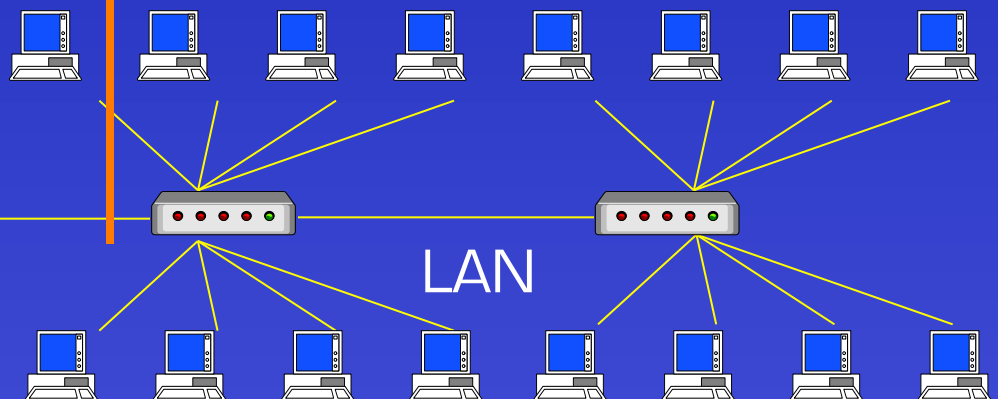
Community Information Platform

Sponsored by the Intel Corporation

- CIP adds interactive “Web 2.0” capabilities
 - Create IDs and logins (LDAP security)
 - Built-in software for making unlimited Web sites
- Easy to upload and share locally-made content
- Local content can be centrally developed and shared to other eGranary sites
- MySQL and PHP for local dynamic Web databases
 - Moodle: course management software
 - Drupal: Web content management system
 - WordPress: Blog software

Knowlegesphere

Wi-Max
Backbone



Knowlegesphere

Gov't Offices
Clinics/
Universities
Hospitals
Schools
Churches/
Private
Mosques
Internet Cafés
Homes

New Computers
Refurbished
OLPC
Computers
Mobile Phones
Kiosks
Laptops
Pocket
Computers



Knowledge is Power

Educational Resources to

Thousands of Patrons

The Cost of Internet Connection???

Computers
Refurbished
OLPC
Computers
Smartphones
Kiosks
Laptops
Pocket
Computers

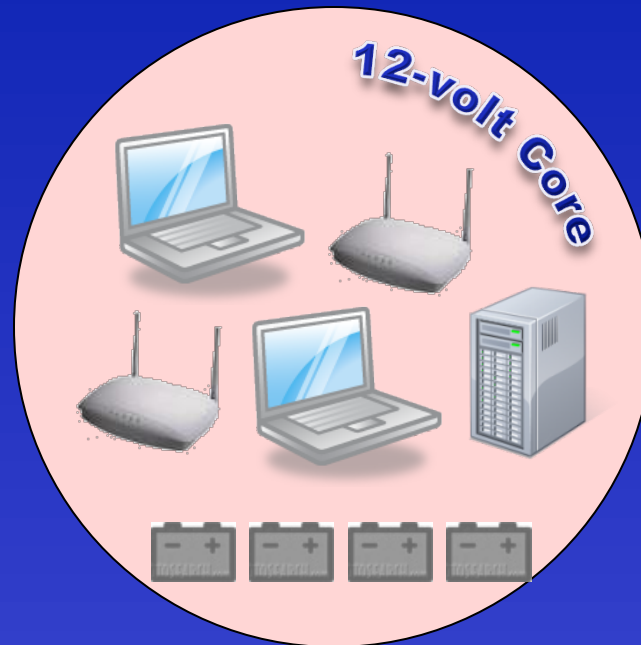
Govt Offices
Clinics/
Universities
Hospitals
Schools
Churches/
Private
Mosques
Internet Cafes
Homes



Hybrid 12-volt Power Model

12-volt Core

eGranary Server, essential 12-volt computers, and wireless network powered 24x7 by deep-cycle battery bank.



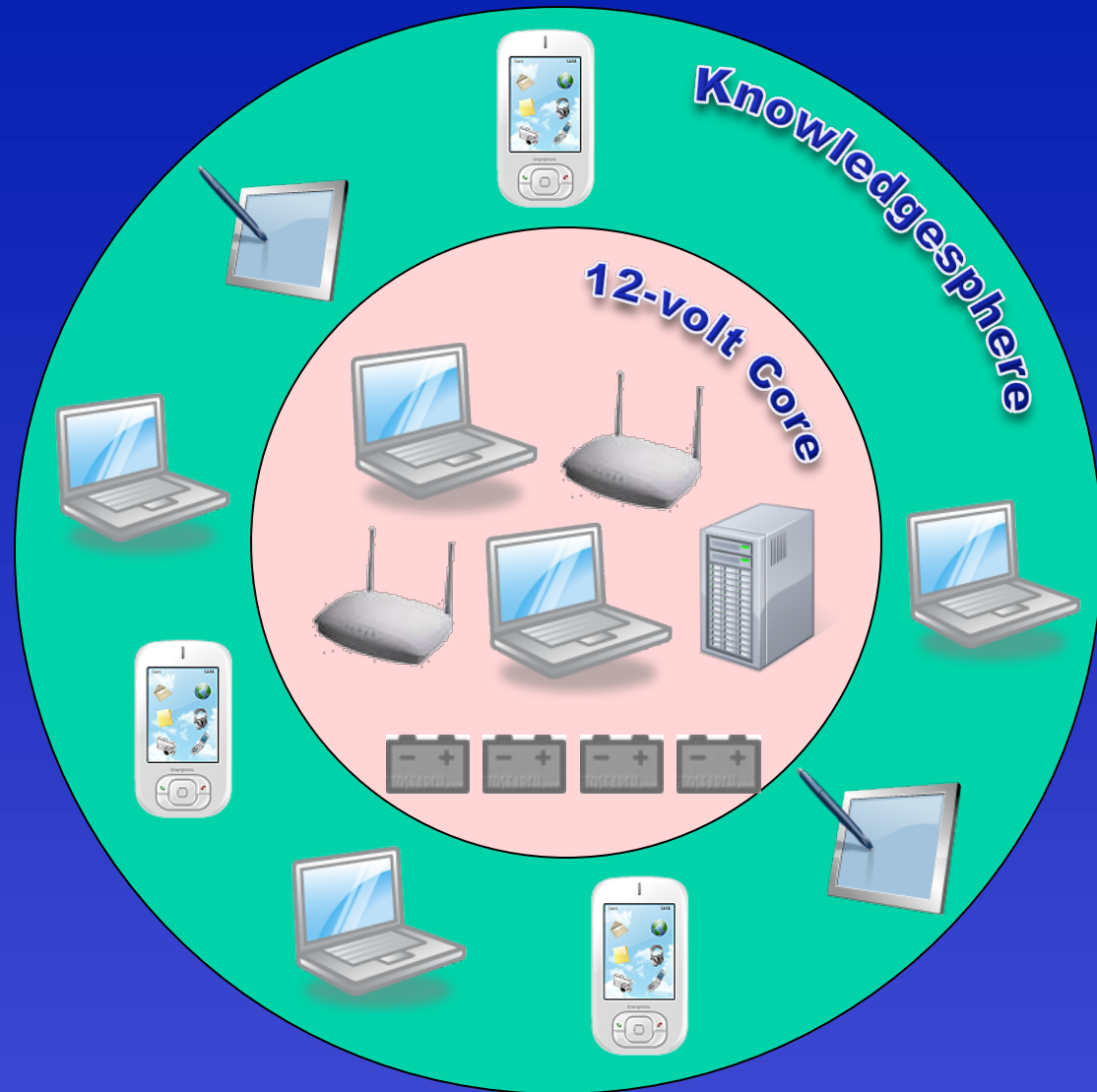
Hybrid 12-volt Power Model

12-volt Core

eGranary Server, essential 12-volt computers, and wireless network powered 24x7 by deep-cycle battery bank.

Knowledgesphere

Institutional and privately-owned battery-powered devices running for hours on their own charge that can access the services in the core.



Hybrid 12-volt Power Model

12-volt Core

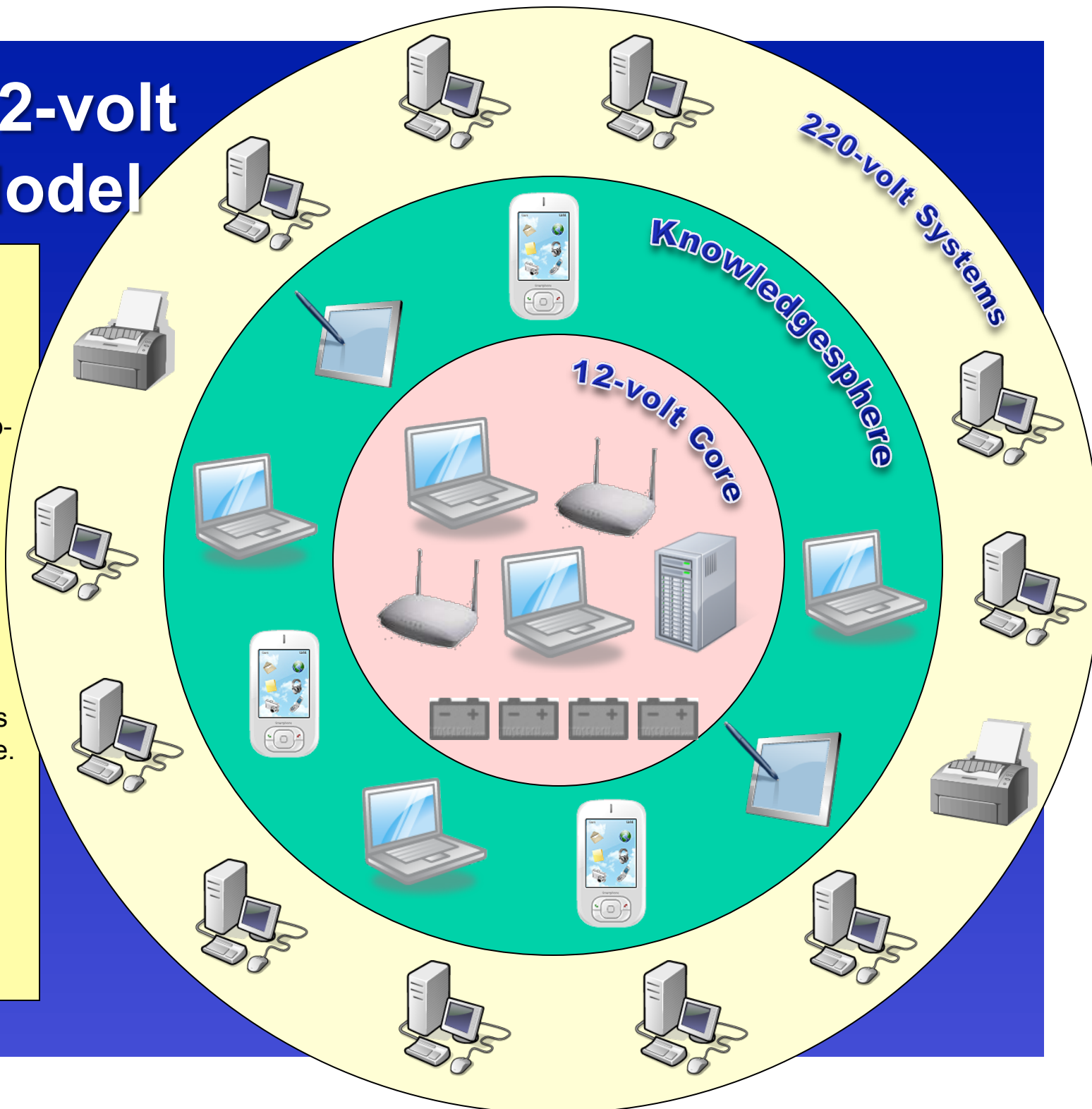
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Traditional Systems

220-volt new and refurbished computers and printers that are only usable when the power is on.



Subscriber Feedback

- Electrical power reliability issues
- Too few workstations
- “Too much information”
- Powerful instincts to control access
- Tech talent lacking: poaching
- Teaching with tech is the Holy Grail

Lessons from a Sandbox

- Easy networking has been done
- Better distinctions about user information needs leads to better technology choices and reduced costs
- Efforts to increase find-ability most rewarding
- Promote LAN / intranet strategies
- Community information is key

Personal Observations

- Few people have experienced truly functional information technology
- Those who have rarely understand the underlying mechanisms
- Here or there, the vast majority have no idea how much this stuff costs

Three Challenges to Scale

- **Face Time**

How many hours users spend with a computer

- **Information Access**

How much, how fast, and at what price

- **Human Capacity**

The ability to install, maintain, and incorporate IT

Think “Hybrid” Solutions

- **Face Time**

Employ new and refurbished computers, handhelds, smartphones, leverage privately owned devices

- **Information Access**

Off-line information stores like eGranary, flash memory, whole community knowledgesphere, managed bandwidth

- **Human Capacity**

Focus on training children to set up and manage IT systems, build culture of cooperation, “see one, do one, teach one”, service learning projects to enhance community access to ICT



User-Friendly Portals

- Having access to information is one thing, being able to use it well to meet a specific purpose is another
- Portals organize information into user-friendly, issue-centric interfaces
 - Health care, education, water development, etc.
- Reduces the time and effort for new users to integrate digital resources into their mission



Solidarity Librarianship

- Area librarianship for groups of people with similar needs/goals
- One half of good service is about listening
- Wisdom of the crowd
- Reduces the time and effort for new users to integrate digital resources into their mission
- Empowers teachers to teach with tech



The “Soul” of ICT

- Information inebriation
- Disability Rights Portal gives woman new life
- Young men in Tanzania cure disease outbreak
- Teaching medicine in Zambia
- Dr. Bonny Norton, University of British Columbia “Reimagining the Self”

The eGranary Digital Library

WiderNet@UNC

The School of Information and Library Science

University of North Carolina, Chapel Hill

<http://www.egranary.org>

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