

Internet2 Panel

Partnering Industry and Higher Education to Advance VoIP and Integrated Communications

VON Enterprise Forum
March 31st, 2003

Dennis Baron (MIT)

- Senior Project Director, Information Systems

Mike Enyeart (Indiana)

- Telecommunication Scientist
- VoIP working group co-chair

Jeremy George (Yale)

- Director, Advanced Networking Group

Walt Magnussen (Texas A&M)

- Associate Director for Telecommunications
- VoIP working group co-chair

Ben Teitelbaum (Internet2)

- Program Manager, Voice and Integrated Communications Initiatives



Outline

Internet2 overview (Ben)

H.323 VoIP testbed (Walt)

Higher education market (Walt)

MIT case study (Dennis)

SIP deployment initiatives (Dennis)

Integrated communications (Jeremy)

Q&A (all)

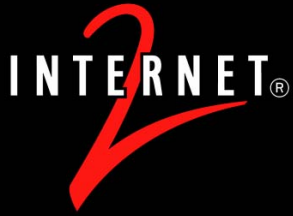


Internet2 Overview

Ben Teitelbaum

*Program Manager, Voice and Integrated
Communications Initiatives*

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“Internet Who?”

Elevator Explanation

- Internet2's mission is to develop and deploy advanced network applications and technologies, accelerating the creation of tomorrow's Internet

Who we really are

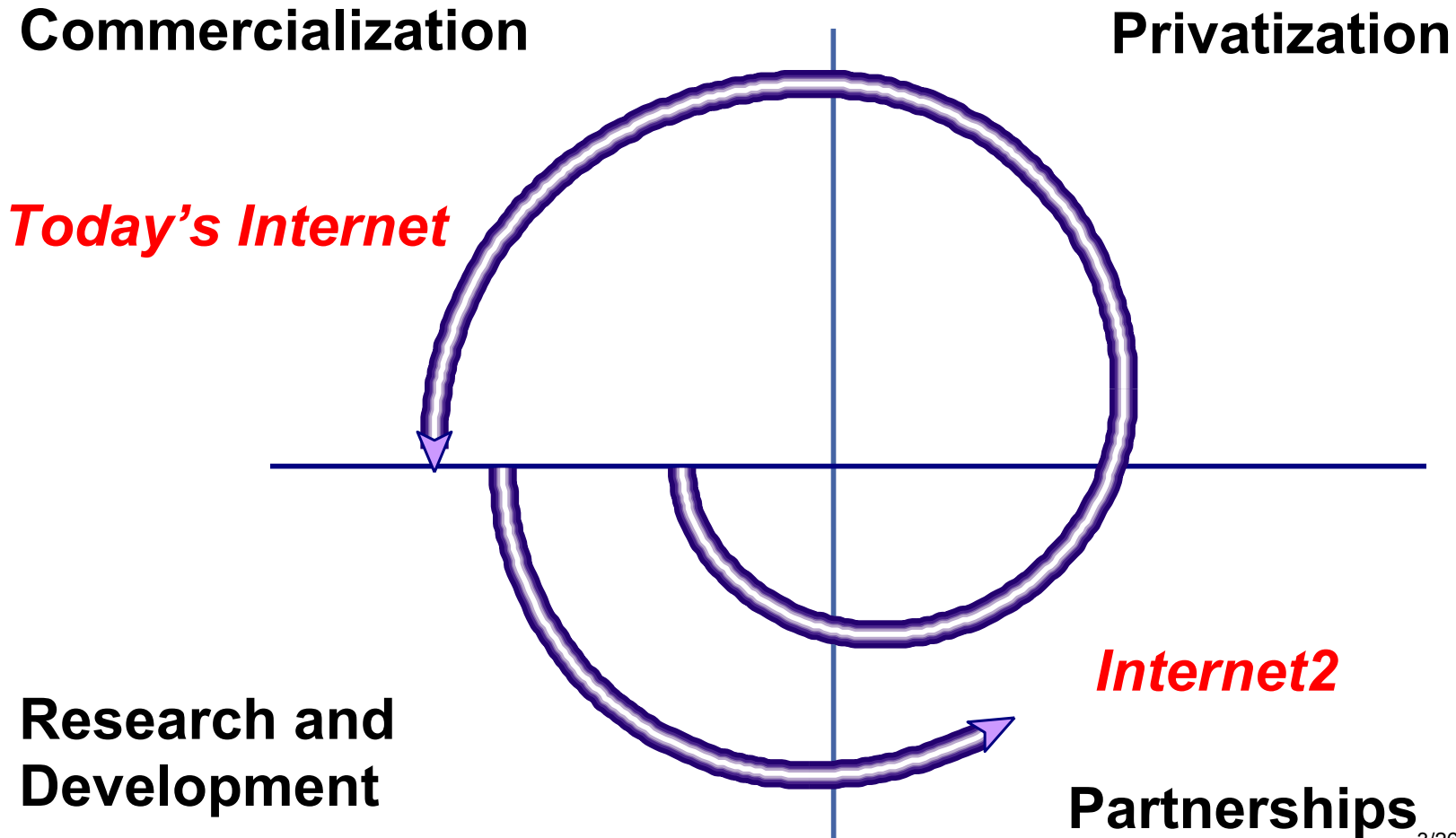
- Membership organization of 200+ US research universities
- Parent 501.3c (UCAID) has board of university presidents
- Project supported by numerous partnerships (government, industry, international)

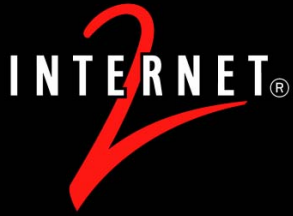
Goals

- Enable new generation of applications
- Re-create leading edge R&E network capability
- Transfer capability to global production internet



Internet Development Spiral





Internet2 Focus Areas

Advanced Network Infrastructure

- 10 GB Abilene backbone • Advanced regional networks • 100 MB to the desktop • National fiber-optic facility

Middleware

- Directories • Authentication • Authorization • Call routing

Engineering

- Multicast • IPv6 • Measurement • Gigabit+ file transfer

Advanced Applications

- Tele-immersion • Remote instrumentation • Distributed computation • Virtual laboratories • Distributed learning • Digital video • VoIP • Integrated Communications

Superior network connectivity

- High-bandwidth, low jitter
- End-to-end transparency (few NATs)
- IPv6 and multicast too

Eager adopters

- ~4,000,000 students (who grew up with AIM and love to chat, chat, chat)
- Strong institutional commitments to stay at the leading edge of communications



VoIP Working Group

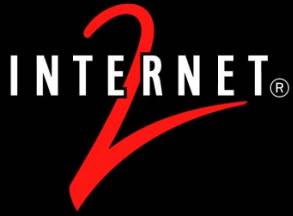
Walt Magnussen

Texas A&M University

Mike Enyeart

Indiana University

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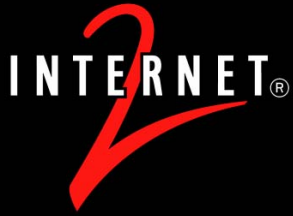
Working with other Universities – Internet2 VOIP Working Group

Charter

- Increase knowledge
- Disseminate information
- Drive Standards

By

- Collaborating with other working groups
- Working with industry
- Developing white papers and best practices
- Developing applications that will drive VOIP deployment



Membership

About 100 members

http://netlab.indiana.edu/i2_voip_working_group/Members/Internet2%20Voice%20Over%20IP%20Working%20Group%20Member%20List.htm

*Co-Chaired by Mike Enyeart – Indiana University and
Walt Magnussen – Texas A&M University*

UCAID Liaison – Ben Teitelbaum

*SIP leadership from Dennis Baron – MIT and Jeremy
George – Yale*



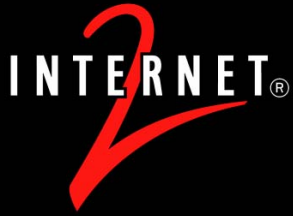
Major Activities

VOIP Testbed

SIP@edu

Workshops

Test labs



VOIP Testbed -- Long distance over Internet 2 network works great!

- Indiana University
- Penn State University
- University of Virginia
- University of Wisconsin, Madison
- University of Washington
- Indiana Higher Education Telecommunication System
- Australian Academic and Research Network
- University of Illinois at Urbana-Champaign
- Universidade Federal do Rio de Janeiro – Universidade do Brasil
- University of Florida
- Czech National Research & Education Network
- University of Cincinnati
- Texas A&M University
- Universidad Nacional Autónoma de México
- SURFNET (Netherlands)
- Colorado State University
- Tecnológico De Monterrey

CUDI meeting in Juarez

- UNAM connected
- Monterrey Tech connected
- Working with University in Veracruz (Avaya)

Netherlands

- Entire country – Egon Verharen



Requirements to participate in VOIP testbed

Gateway to campus switch

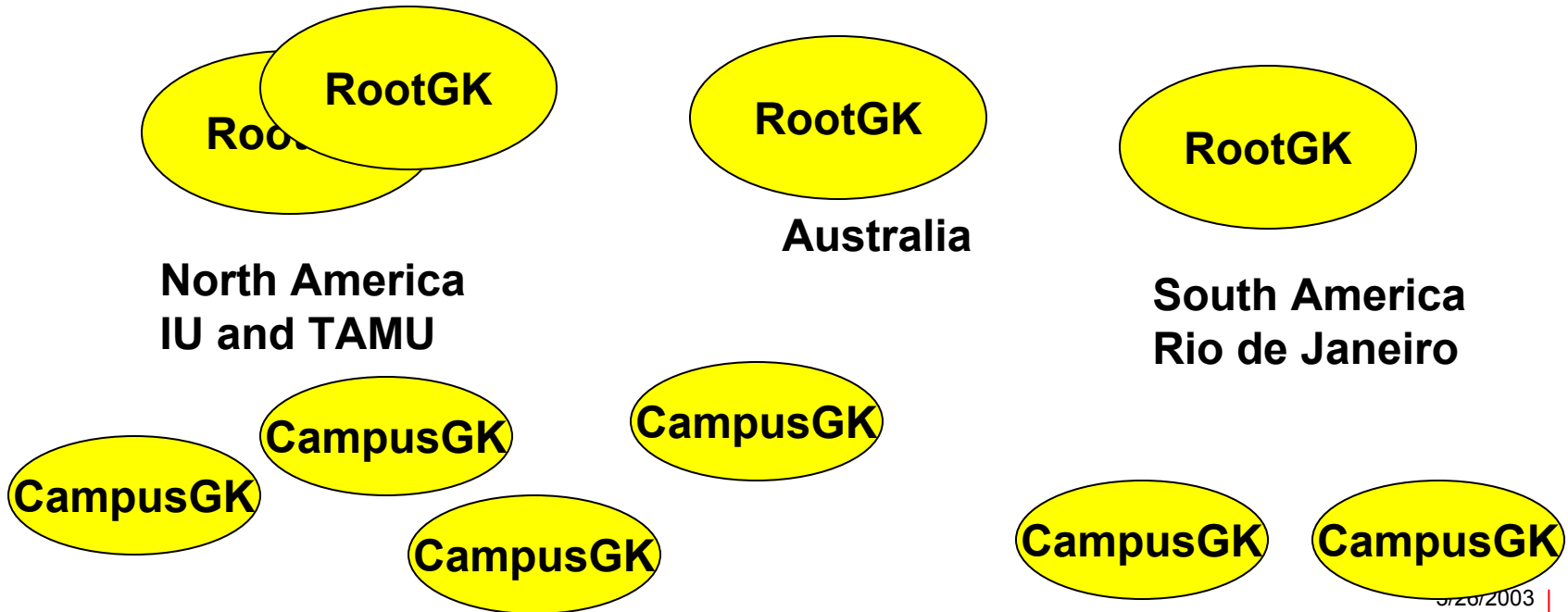
H.323 compliant Gatekeeper

Vendors underway

- Cisco - connected
- Nortel – in progress
- Avaya – in progress
- Alcatel – in progress

Gatekeeper peering

Multicast desired but not possible - YET
Decide upon hierarchy not unlike DNS –
local DNS refers to root DNS



Gatekeeper maps NNX to IP address of Gateway

Uses wildcards

- Zone prefix IUGK 1317274....
- Zone prefix TAMUGK 1979845....
- Zone prefix TAMUGK 1979862....
- Zone prefix AARnet 61.....

Cisco discount negotiated

- 50% discount on packages (up to 90% on software)

Microsoft SIP implementation



VOIP Workshops

Initial Workshop April 2002 Texas A&M University

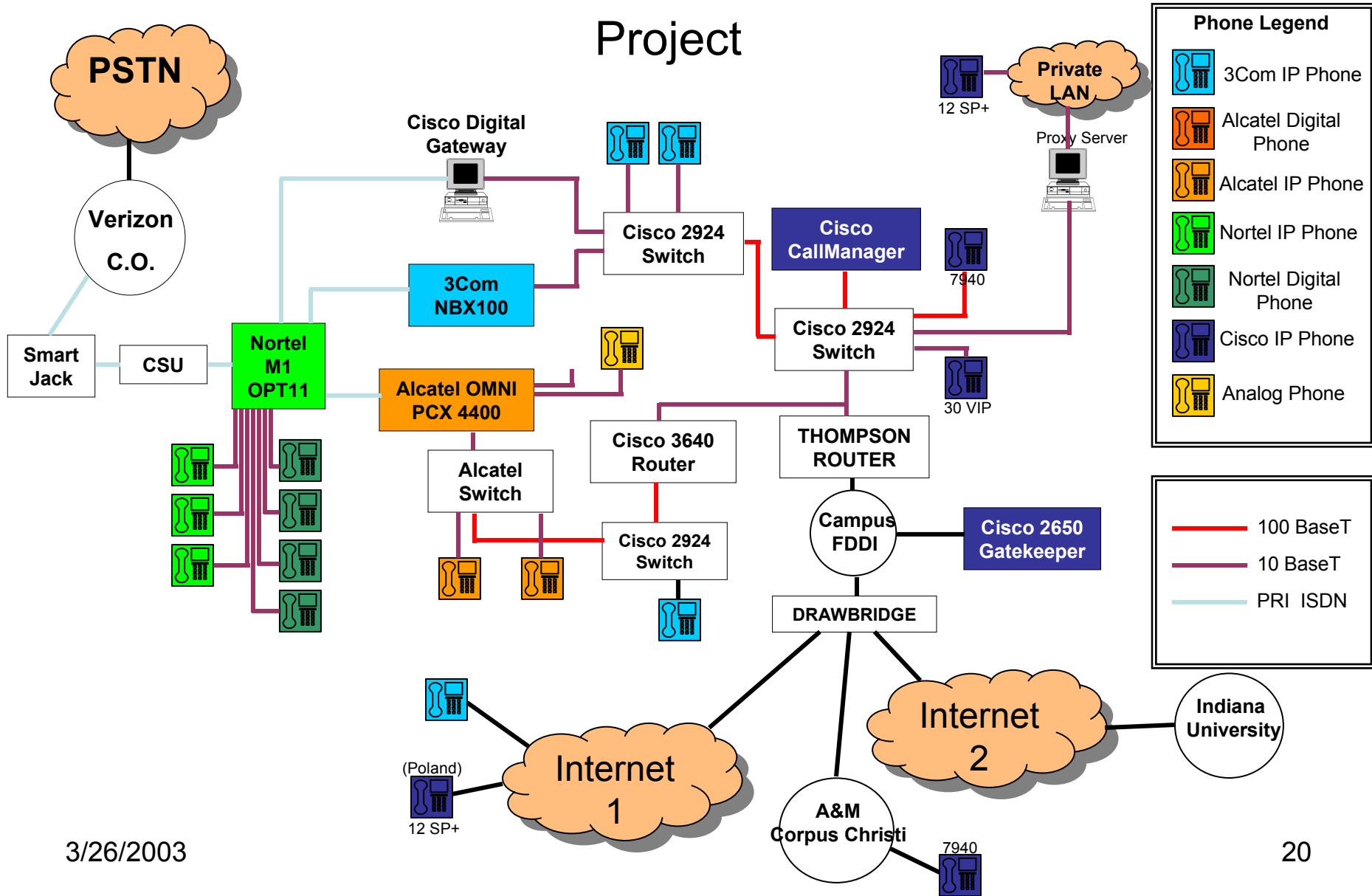
Second one scheduled for October 2003 at Indiana University

VOIP technical presentation at Boulder CO. Joint Techs meeting

VOIP test lab

Internet 2 Voice

Project



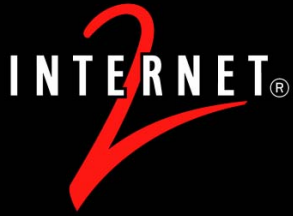


SIP

Dennis Baron

Massachusetts Institute of Technology

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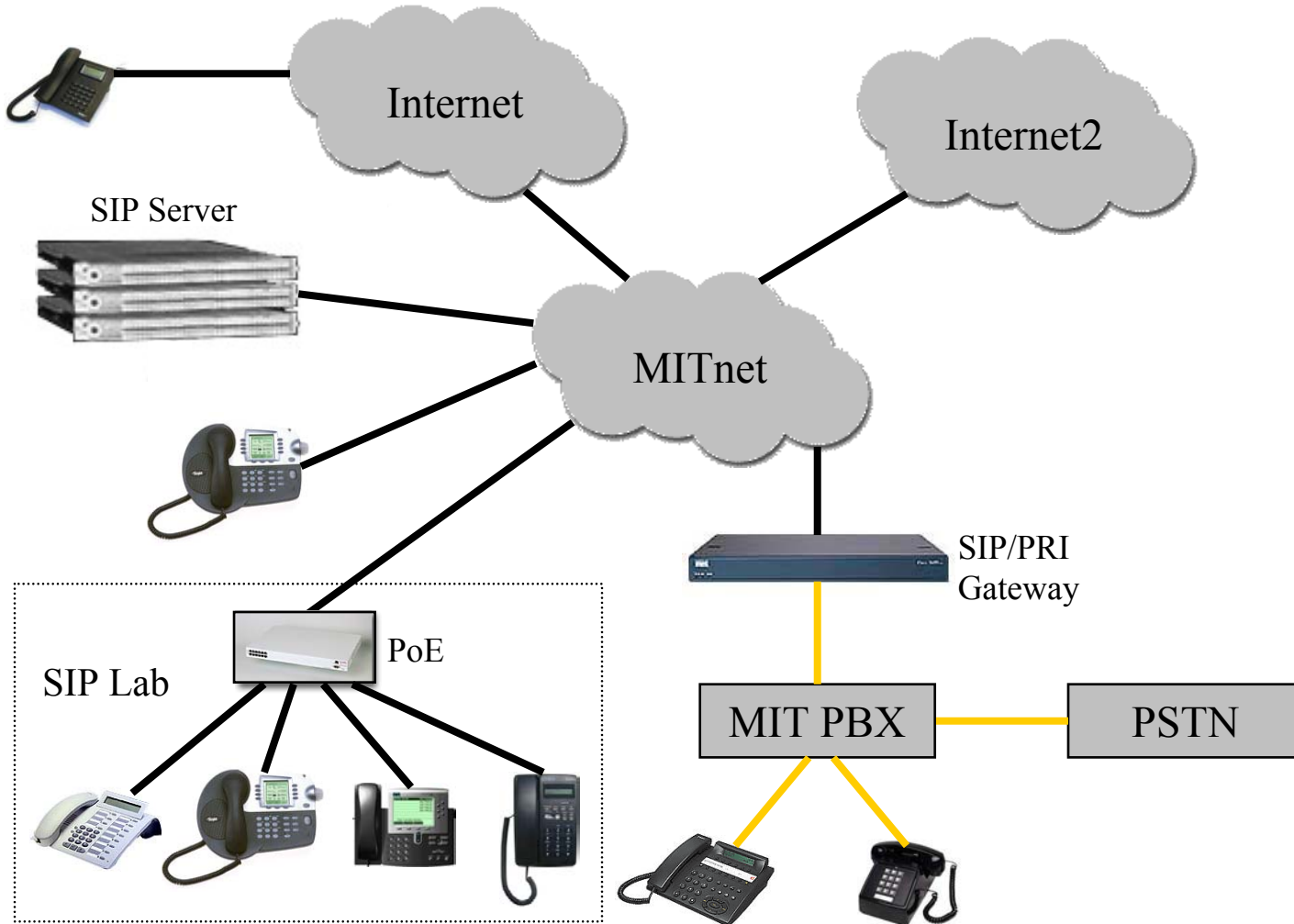


SIP Technology Trial @ MIT

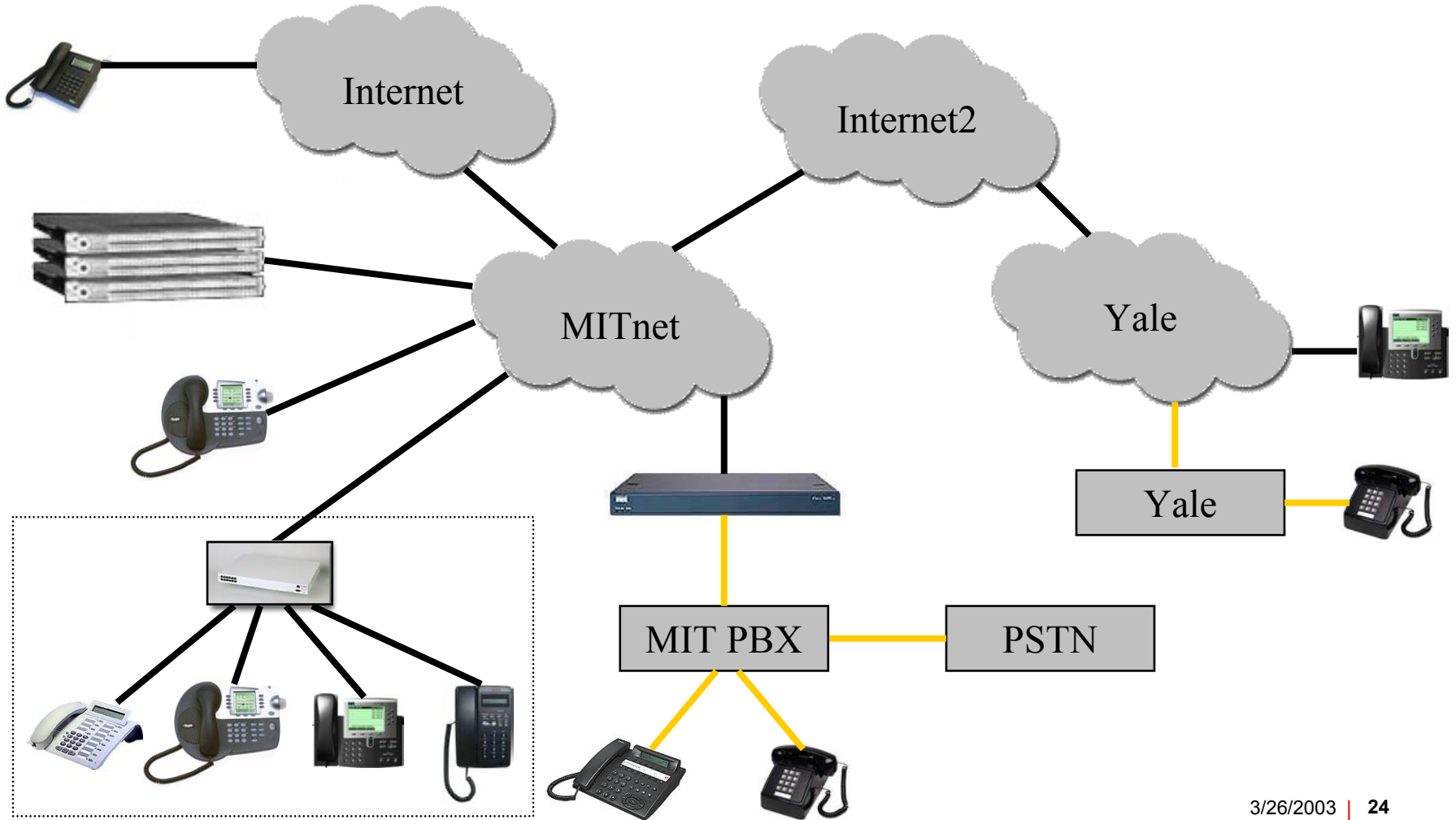


- Why we're looking at SIP
- Current test configuration
- Observations to date
- Internet2 SIP.edu project

MIT Test Configuration



MIT Test Configuration



SIP Interoperability Testing



The “Lab”

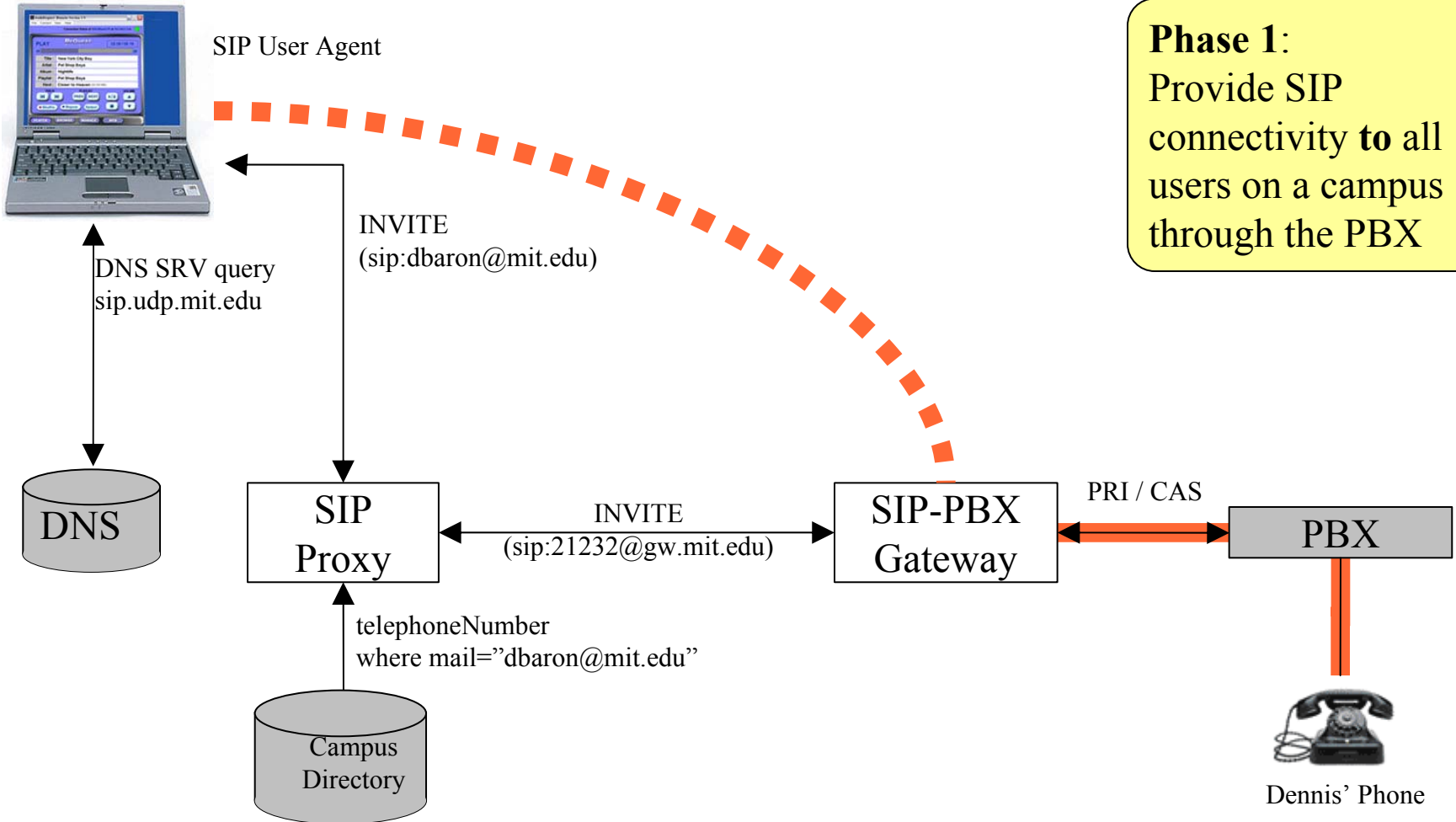


SIP Drawer of Shame

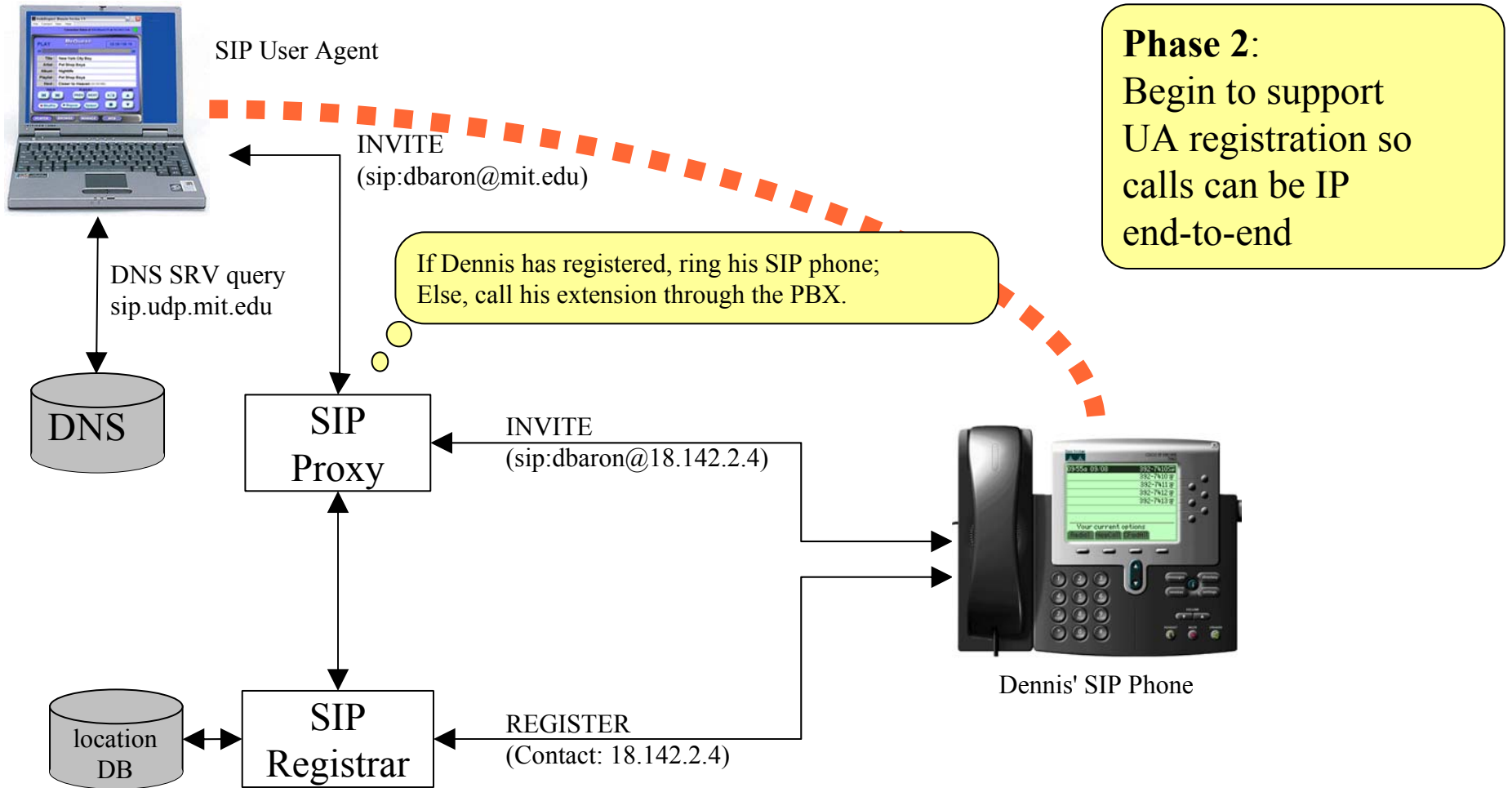


SIP.edu – Phase 1

Phase 1:
Provide SIP connectivity to all users on a campus through the PBX



SIP.edu – Phase 2



Phase 2:
 Begin to support
 UA registration so
 calls can be IP
 end-to-end

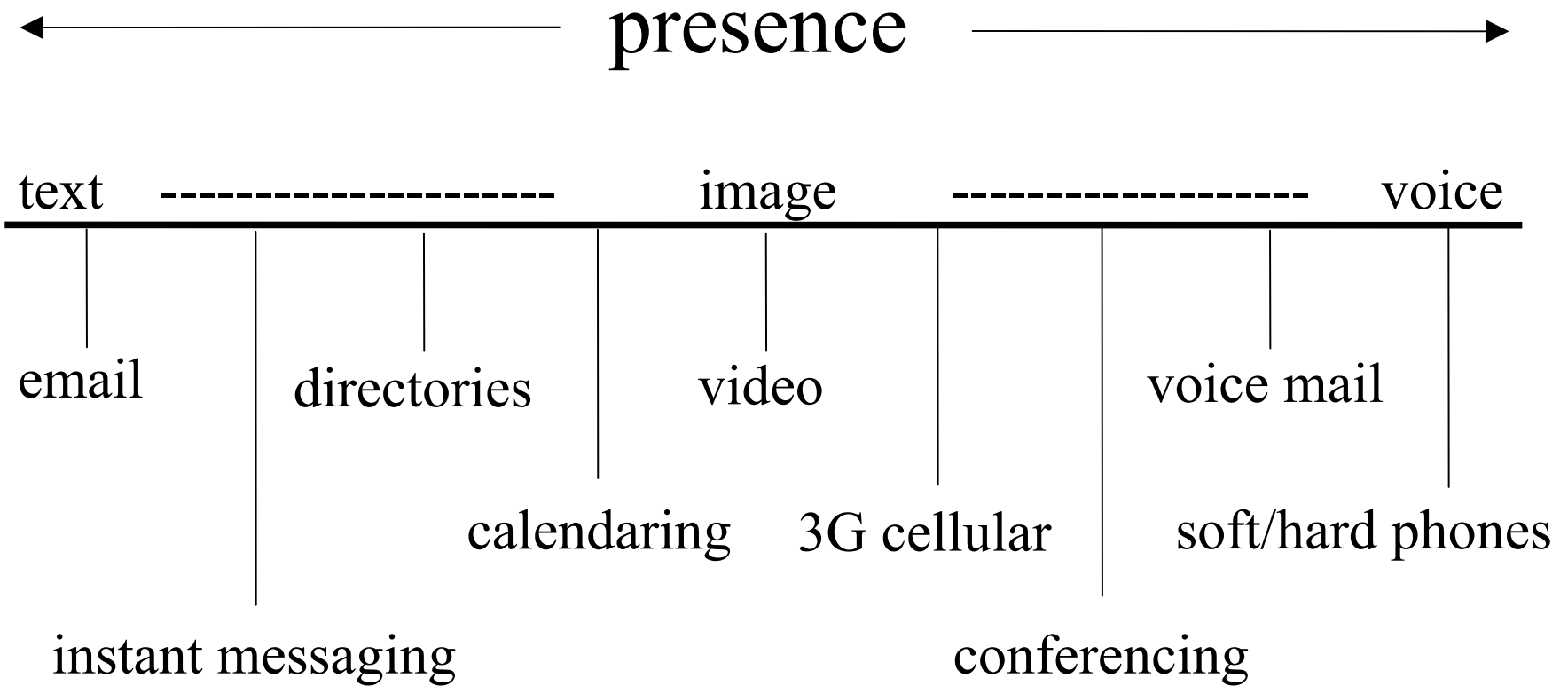


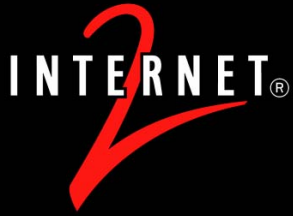
Integrated Communications

Jeremy George
Yale University

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IntCom Elements Include





The motive for IntCom – just Yale

About 8,000 undergraduates

About 20,000 people in all

Roughly 10,000 people in the 18-25 demographic

They peak at six megabits/second of IM

Most have cell phones

Music is popular, possibly too popular

All have email

In short – the students already get it



The larger motive for IntCom

The motives for Yale

times

200 Internet2 members

The Issues

- Disruptive change - Management is on the sidelines
- Organization - Reorganizing is painful
- Culture - Telco v Internet
- Stranded Investment - Absent feature pull, what's the rush?

Yikes, the students really like this stuff!
Now what are we going to do?

The problem isn't failure, it's viral success.

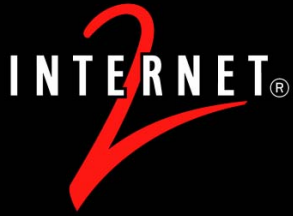


The Timing

Now – for the thin end of the wedge

IF

- 1) The geopolitical environment doesn't deteriorate significantly
- 2) Ditto the economy
- 3) No significant legislative, regulatory or law enforcement roadblocks are erected



The Private Sector Opportunity

Paths in the Snow

Disaster Recovery

Emergency Services



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