



Internet2 Overview and Arts & Humanities Initiatives

GARR Conference 05

May 12, 2005

Ann Doyle, Internet2

Internet2 Mission

Develop and deploy advanced network applications and technologies, accelerating the creation of tomorrow's Internet.

Internet2 Membership

- **University**
 - United States institutions of higher education
- **Corporate**
 - For-profit US-based companies
- **Affiliate**
 - Non-profit and other research or education organizations
- **International Partnerships**
 - For example, GARR
- **Sponsored Education Group Participants**
 - State education networks

University Members

206 University Members, January 2005



INTERNET[®]

Corporate Members

Microsoft[®]

IBM

CISCO SYSTEMS



 **Juniper[™]**
NETWORKS

Qwest.

Spirit of Service[™]

 **MCI.**


Advanced Network
& Services, Inc.


SPIRENT[™]
Communications

 **Global Crossing[®]**

WWW.SUN.COM

 **Sun[®]**
microsystems

NORTEL
NETWORKS[™]

How the world shares ideas.

 **YottaYotta**
The Yottabyte NetStorage[™] Company

Affiliate Members



New World Symphony



Manhattan School of Music



The LIBRARY of CONGRESS

The
Cleveland
Museum
of Art



Cleveland Institute of Music



United States Holocaust Memorial Museum

International Partnerships

Europe-Middle East

ARNES (Slovenia)
 BELNET (Belgium)
 CARNET (Croatia)
 CESnet (Czech Republic)
 DANTE (Europe)
 DFN-Verein (Germany)
 GIP RENATER (France)
 GRNET (Greece)
 HEAnet (Ireland)
 HUNGARNET (Hungary)
 INFN-GARR (Italy)
 Israel-IUCC (Israel)
 NORDUnet (Nordic Countries)
 POL-34 (Poland)
 Qatar Foundation (Qatar)
 FCCN (Portugal)
 RedIRIS (Spain)
 RESTENA (Luxembourg)
 RIPN (Russia)
 SANET (Slovakia)
 Stichting SURF (Netherlands)
 SWITCH (Switzerland)
 TERENA (Europe)
 JISC, UKERNA (United Kingdom)

Asia-Pacific

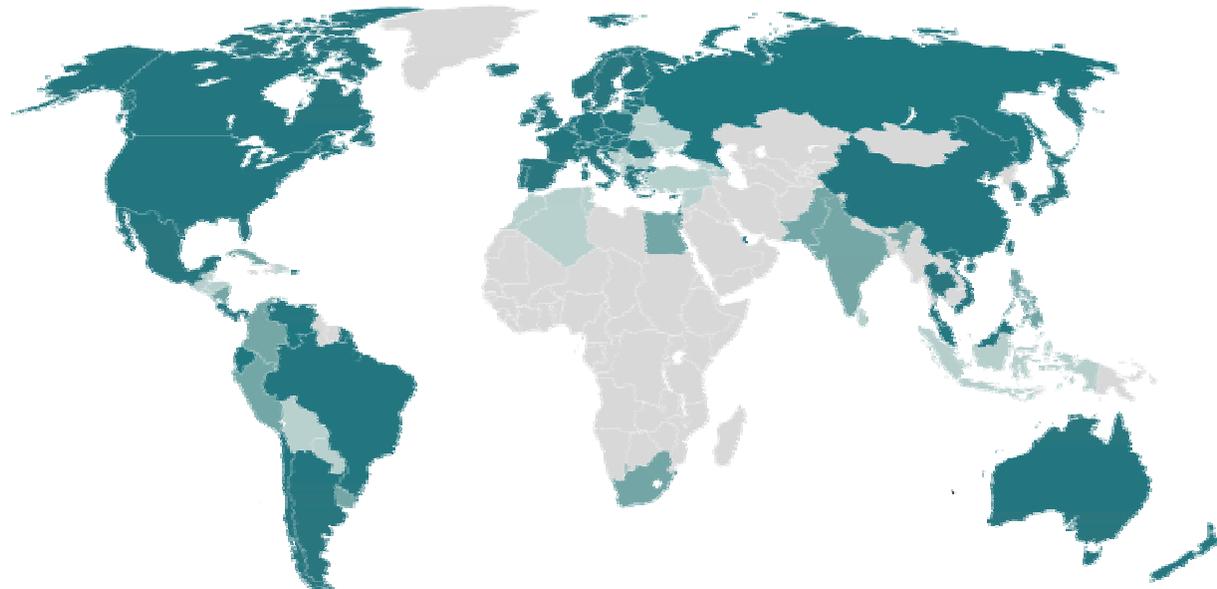
AAIREP (Australia)
 APAN (Asia-Pacific)
 APAN-KR (Korea)
 CERNET/CSTNET/
 NSFCNET (China)
 JAIRC (Japan)
 JUCC (Hong Kong)
 NECTEC/UNINET (Thailand)
 NG-NZ (New Zealand)
 SingAREN (Singapore)
 TANet2 (Taiwan)

Americas

CANARIE (Canada)
 CEDIA (Ecuador)
 CLARA (Latin
 America & Caribbean)
 CUDI (Mexico)
 CNTI (Venezuela)
 CR2NET (Costa Rica)
 REUNA (Chile)
 RETINA (Argentina)
 RNP (Brazil)
 SENACYT (Panama)

Related partnerships

APRU (Asia/Pacific)
 IEEAF



Internet2 Network Infrastructure

- Abilene backbone operates at 10 gigabits per second capacity today
- GigaPoPs provide regional high-performance aggregation points
- Local campus networks provide 100 Mbps to the desktop
- National LambdaRail (NLR) will provide access to multiple wavelengths on dedicated national fiber facility
- Fiberco provides dark fiber nationwide

What is Abilene?

The Abilene Network is an Internet2 high-performance backbone network that enables the development of advanced Internet applications and the deployment of leading-edge network services to Internet2 universities and research labs across the country.

Abilene Backbone



Abilene Community

- **235 Primary Participants**
 - Internet2 members across membership categories
- **123 Sponsored Participants**
 - Individual institutions, K-12 schools, museums, libraries, research institutes
- **34 Sponsored Educational Group Participants**
 - State-based education networks

<http://abilene.internet2.edu/>



Arts & Humanities Initiatives

Overview

The Arts and Humanities initiative has focused on outreach enabling collaborative live performances, master classes, and remote auditions in the performing arts. Outreach is ongoing to the museum and library collections communities, language instruction centers, history and film departments to foster initiatives utilizing Internet2.

Constituents

- University Member Departments – Music, Dance, Art, English, History etc.
- Affiliate Members – New World Symphony, Cleveland Museum of Art, U.S. Holocaust Memorial Museum, Cleveland Institute of Music, Manhattan School of Music
- Corporate Members – Warner Brothers, Proquest, VBrick, Polycom
- Potential members – Carnegie Hall, Kennedy Center, Curtis Institute of Music



Streaming Media/Collections

Netscape - [Sound Recording agv1224]

File Edit View Go Bookmarks Options Directory Window Help

Sound Recording

Strauss, Richard, 1864-1949.
Also sprach Zarathustra <sound recording> ; Ein Heldenleben / Richard Stra
-- <Holland> : Philips, c1994, p1982.
(Solo)

[View full bibliographic record from IUCAT](#)

Side/disc 1

- R. Strauss, Thus Spake Zarathustra, Op.3
 - 1. (Sunrise)
 - 2. Of Those at the Back of the World
 - 3. Of the Great Longing
 - 4. Of Joys and Passions
 - 5. The Dirge
 - 6. Of Science
 - 7. The Convalescent
 - 8. The Dance Song--The Night Song
 - 9. The Night Wanderer's Song

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Variations Player

File Time Format Slider Help

Also sprach Zarathustra <sound recording> ; Ein Helde...
Strauss, Richard, 1864-1949.

Track Name

(Sunrise)

Time (MMM:SS): **Track of** **Repeat**

Track Time Elapsed 0:16 1 2 None All One

▼ ▼

▶ ◻ || ◀ ▶ ◀▶

Track 1
Track 2
Track 3

SURVIVORS OF THE
SHOAH
VISUAL HISTORY FOUNDATION[®]

- A 180 terabyte multimedia archive of Holocaust testimonies
- Currently being accessed by
 - University of Southern California
 - Rice University
 - Yale University
 - University of Michigan



Master Classes

New World Symphony

Michael Tilson Thomas



photo by R. Andrew Lepley

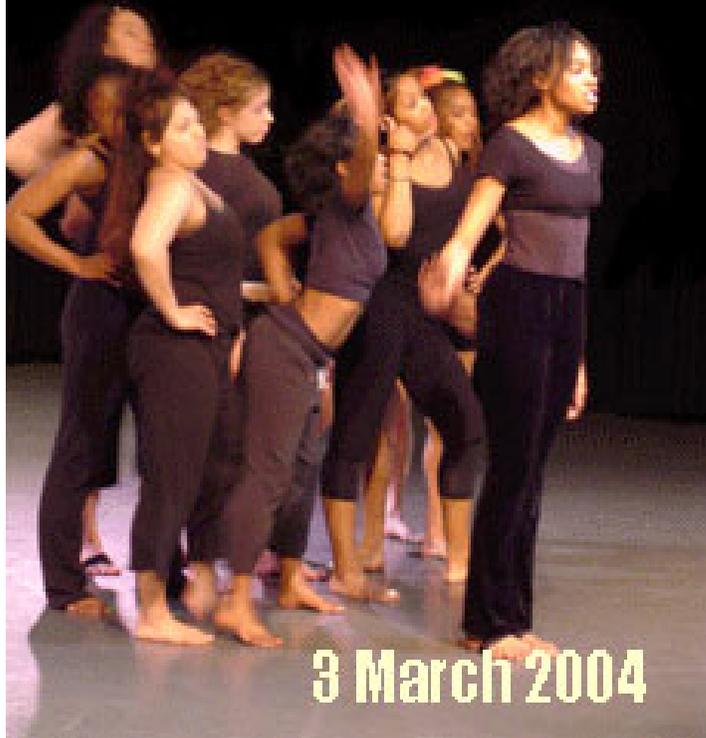
Pinchas Zukerman





WSU/FSU Telematic Dance Coaching Session

Choreography via Internet2



3 March 2004

<http://www.dance.wayne.edu/>

- Internet2 advanced networking technologies applied to distance learning for dance
- Enabling schools to collaborate and share resources
- Providing students with access to experts
- Incorporating Technology into the teaching and performing arenas



Live Performance Events

Cultivating Communities: Dance in the Digital Age

Case Western Reserve and
Cleveland Institute of Music:



The Bing Theater, University of Southern California, Oct 2002

Transcontinental Poetry: A Tribute to Kenneth Koch

- Live transcontinental reading of Kenneth Koch's "Twenty Poems"
- Seven Internet2 campuses provided videoconferencing

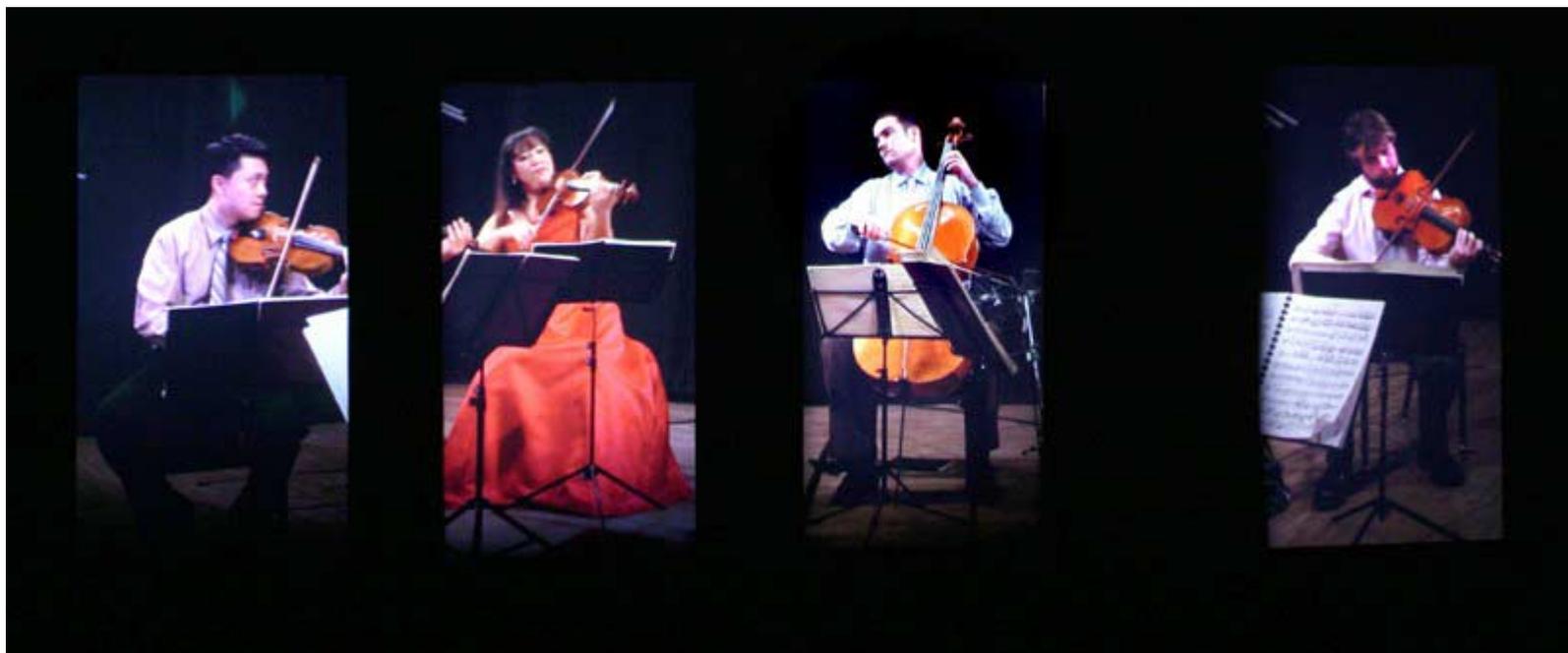


Poet Anne Waldman



The Miró Quartet: Live & Virtual

University of Texas at Austin
Integrated Media Systems Center
at the University of Southern California





New Communities

- **Museum Community**
 - Education
 - Conservation
- **Foreign Language Instruction**
 - Less commonly taught languages
- **Archaeology**
 - Shared project planning
 - Shared imaging
 - Fall 2005 MM SIG Kickoff



Technologies Utilized

Most frequently used

Options:

- H.323 ~ = 384 – 768 kbps
- Mpeg2 ~ = 4 – 16 mbps
- DV ~ = 30 mbps
- HDTV ~ = 19.2 – 270 mbps

For the following purposes:

- One way (streaming, broadcast)
- Two way (interactive voice & video)
- Many way (more than 2 end points)

MPEG2 Production Cart

MPEG2 codec: approx \$8000 - \$10,000

10/100 Switch: approx \$150 or **Gigabit Switch:** approx \$450

Camera: example; Sony PTZ (EVID30) -- approx \$1000

Video switcher: approx \$900 - \$1500

Display monitor: approx \$650

Video production monitor pair: \$1000 - \$1600 for pair

Audio mixer: example; Mackie 14 channel Mic/line Mixer -- \$530

Speaker pair: example JBL 10" BIAMPED -- \$1000 for pair

Directional Mic (two required): i.e.; Shure SM57-LC Cardioid -- \$80 - \$150

UPS (un-interruptable power supply): approx \$550

DVTS:

An emerging technology scenario

- Latency – compression introduced latency
- Cost – codecs are expensive
- Bandwidth – 60 Mbps stream

Best Practices and Guides

<http://arts.internet2.edu/files/Bing-Best-Practices.pdf>

[http://arts.internet2.edu/files/performance-capture\(v09\).pdf](http://arts.internet2.edu/files/performance-capture(v09).pdf)

[http://arts.internet2.edu/files/digital-asset-management\(v09\).pdf](http://arts.internet2.edu/files/digital-asset-management(v09).pdf)

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