Science and Technology Council

The Academy of Motion Picture Arts & Sciences

Setting the Stage

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How I'll do that

- Why a Symposium?
- Why are you here?
- Today's goals
- About the Council (briefly)
- Some background on digital archiving issues
- The Digital Archival Framework Project

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A Symposium because…

- This is a lot like when sound was introduced to motion pictures
  - New technology that fundamentally changes the industry
  - Not much industry experience with the new technology
- The Academy formed a "sound school" to train studio technicians
- More recently: IIF and color science

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You are here because…

- You are a practitioner dealing with digital motion pictures, or…
- You are a metadata expert, or…
- You have some interest in the topic of metadata as it relates to digital motion picture production and/or archiving

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Today's goals

- Demystify metadata for the practitioners
- Explain what it takes to get a movie made to the metadata experts
- Prepare you all for the work ahead

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Council Structure

- The Council: 25 Academy members
- Four standing subcommittees:
  - Technology History
  - Public Programs and Education
  - Advanced Technology Programs
  - Research
- Council Advisory Group: Studio CTOs
- Staff of 9 plus interns
- Project committees: over 200 volunteers

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Advanced Technology Programs

- Collaborative technical problem solving
- Establish usable specifications and best practices, then bring them to SMPTE for standarization
- Image Interchange Framework
- Digital Archival Framework Project

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Council Technical Resources

- Esmeralda™ Easel
- Stella Stage
- Dalsa Evolution 4K Cameras
- Custom spectral densitometer
- CouncilNet

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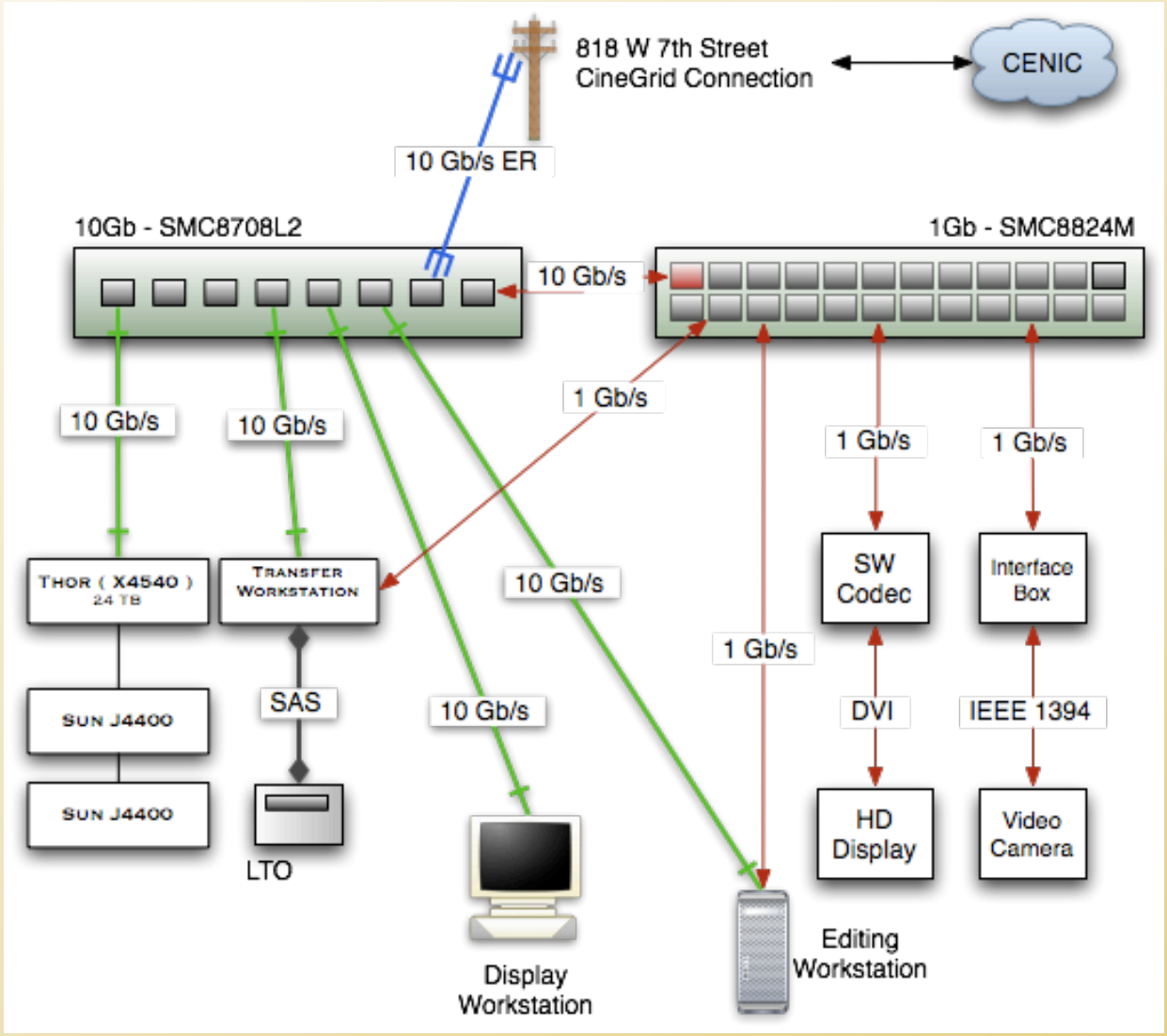
CouncilNet Topology



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Research

- Not about solving any particular problem
- Work that leads (or may lead) to improvements in the theatrical audience experience
- First project: CineGrid
  - Global research community connected by 10Gb fiber-optic network
  - Make it easier to move "4K" imagery
  - Distributed content storage: CineGrid Exchange

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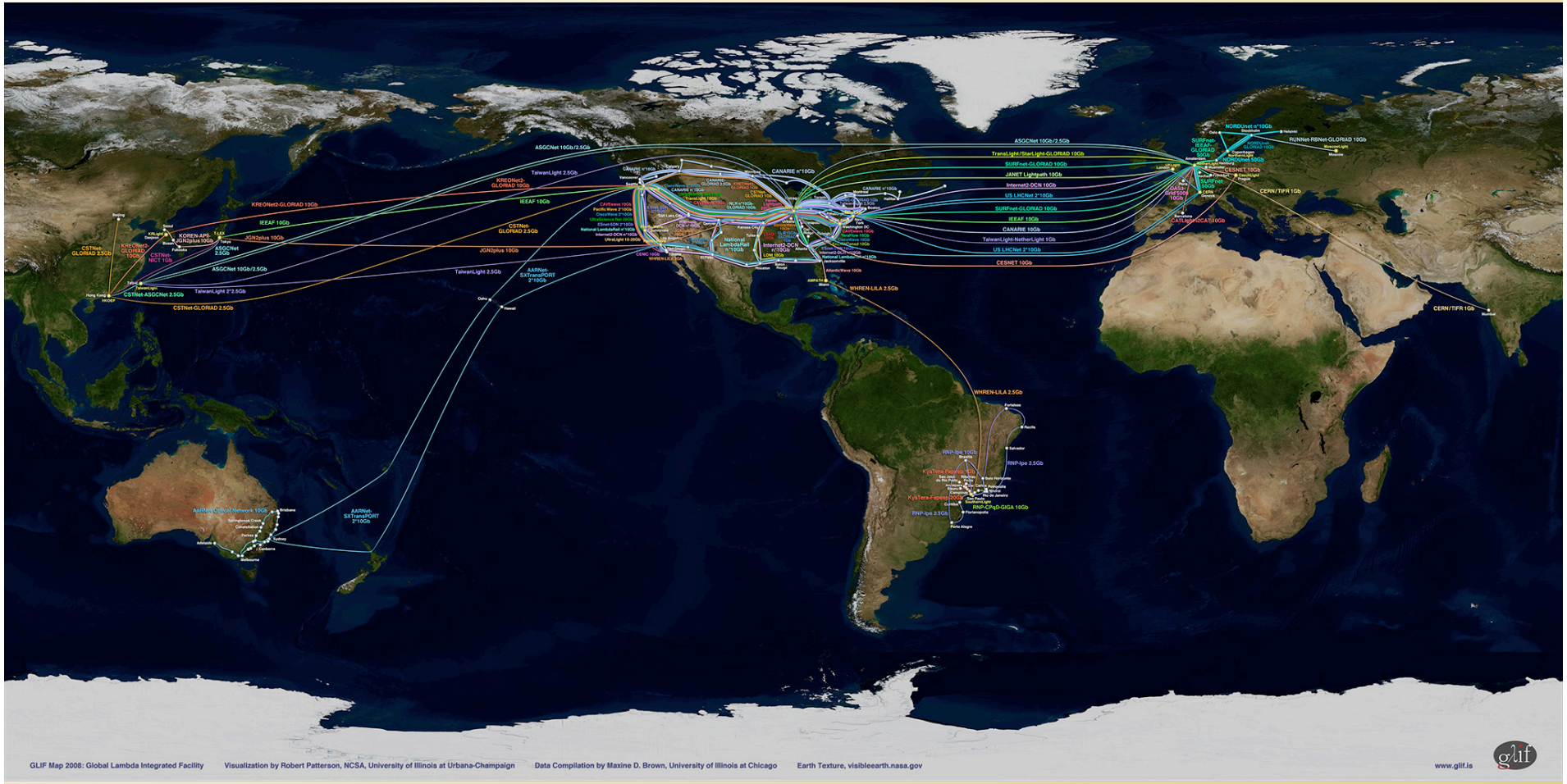
GLIF: Global Lambda Integrated Facility



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The Motion Picture Industry is Changing

- Digital technologies bring many benefits:
  - Better sound quality
  - Visual effect and animation not possible with film
  - More creative choices with "digital mastering"
  - More efficient and higher quality theatrical presentation
  - Digital Cinematography provides immediately viewable images and longer "takes"
- Film is 100 year-old technology and works very well
  - Capture, release prints, long term archiving

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Matching 35mm film's visual quality requires many very large digital files

- True 4K Digital Cinema - the only thing that's close if all visual parameters are considered
- More than 50 Megabytes/frame (and 24 frames are produced every second)
- More than 8 Terabytes per master version of a 2 hour movie (and there can be 40 different masters
- More than 2 Petabytes for an entire digital movie production
- More than 5 million digital objects to track

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Large numbers of large digital files present challenges

- Large digital files are difficult to move efficiently
  - Today's networking technologies are not fast enough
  - Today's storage technologies are not fast enough
- Large numbers of large digital files require:
  - Specialized hardware and software
  - A lot of computing and electrical power
  - Staff with specialized skills
  - A lot of money

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If you want to know more…

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What do we mean by "archiving"

- Archives and Libraries are not the same thing
- Archive:
  - Preservation without errors, access without end
  - Access model: WORSE (Write Once, Read Seldom if Ever)
- Library:
  - Temporary storage site
  - Access model: online or nearline

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Why does the Motion Picture Industry Archive?

- There is significant, long term commercial value in movie content
- Movies are part of the cultural record

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Requirements for Digital Motion Picture Archiving

- Access guaranteed for at least 100 years
- Assets survive periods of benign neglect
- The digital system should be at least as good at the photochemical system it replaces
- The cost structure should be sensible

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Consensus

- While digital motion pictures can be (and are) successfully made, today's digital storage technologies and practices do not meet these requirements:
  - They don't scale
  - They're too expensive (TCO)
  - They're error-prone
- Standards are necessary:
  - File formats (which include **metadata**)

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The Academy Film Archive's digital future

- Has digital items now: StEM, documentaries, short films
- All Academy Award®-nominated films are deposited in the Archive
  - Stereoscopic movies are digital-only, over 25 in production and one day one will be nominated that is only distributed digitally

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The Digital Motion Picture Archival Framework Project

- Response to The Digital Dilemma's Call to Action
- Academy is participating in U.S. Library of Congress' NDIIPP effort: matching funds
- Digital preservation case study: the "StEM"
- File format development/standardization: Acquisition, Mastering, Archiving
- Follow-on report: independent film-makers and archives
- Education
- Directed research

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Some things to keep in mind today

- You may hear some contradicting ideas today
- It is best to address the issues of digital preservation while today's important digital collections are relatively young and few in number
- The motion picture industry is spending .0015% of 2008 Box Office on coordinated efforts to solve The Digital Dilemma - let's make it count!

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