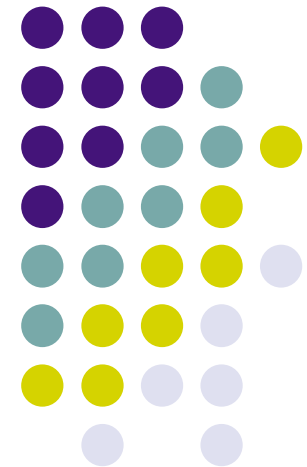


# Dynamic Web File Format Transformations with Grace

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**IWAW05**  
September 23, 2005

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Norfolk, Virginia, USA

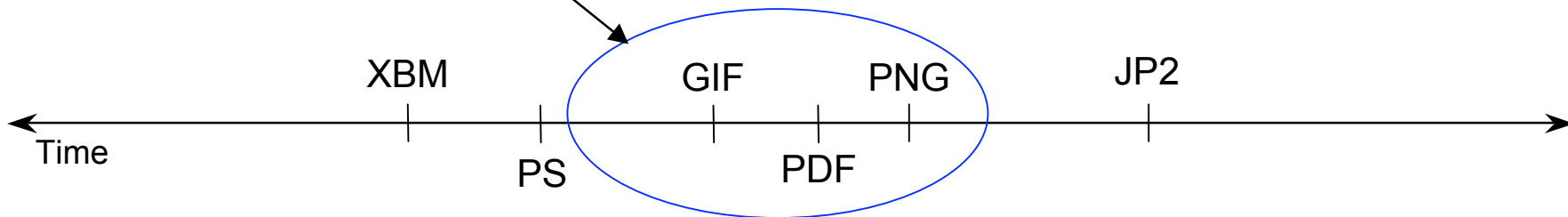




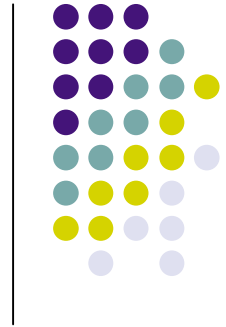
Current browser accessible formats

### JAVA SOFTWARE FREE DOWNLOAD

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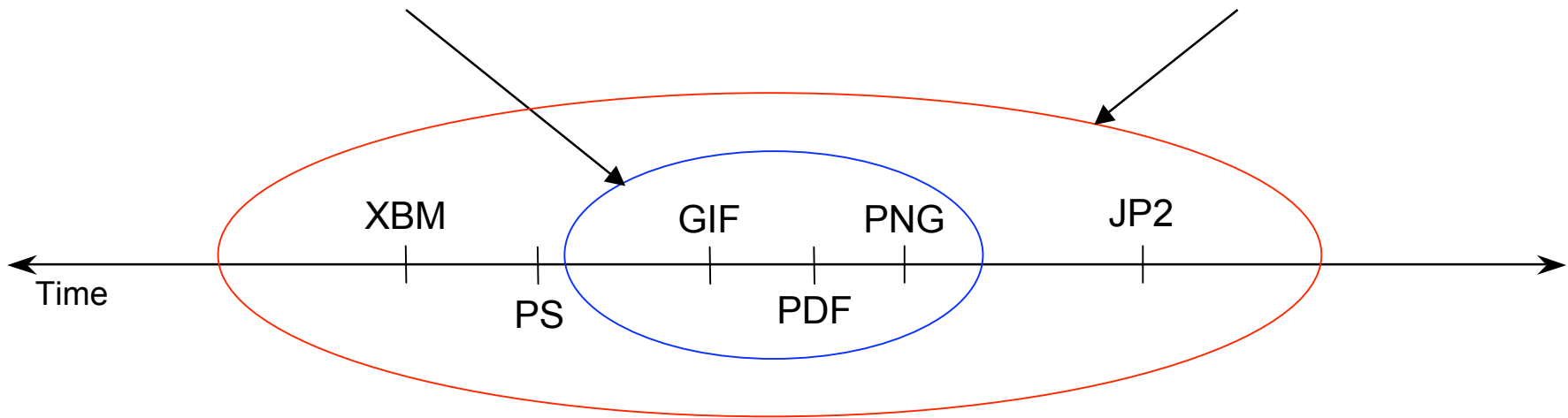


Internet Explorer JPEG2000 Plug-in not installed.  
 Click [here](#) to download it.  
 Install it and refresh this page.



Current browser accessible formats

Grace accessible formats



These animations were originally produced for US Geological Survey videos. They have been converted to animated gifs for web display. You may use these animations for any educational purpose, we simply request that you cite the US Geological Survey as their source.

Note: these are whopping big files! Smaller versions and descriptive information will be added as soon as possible!

Date last modified:  
2000-03-20

[Click here](#) to go to the plate tectonics animation page.

[Click here](#) to go to the geology potpourri animation page.



**BASINS\_3.MPG - Click on image to see animation**



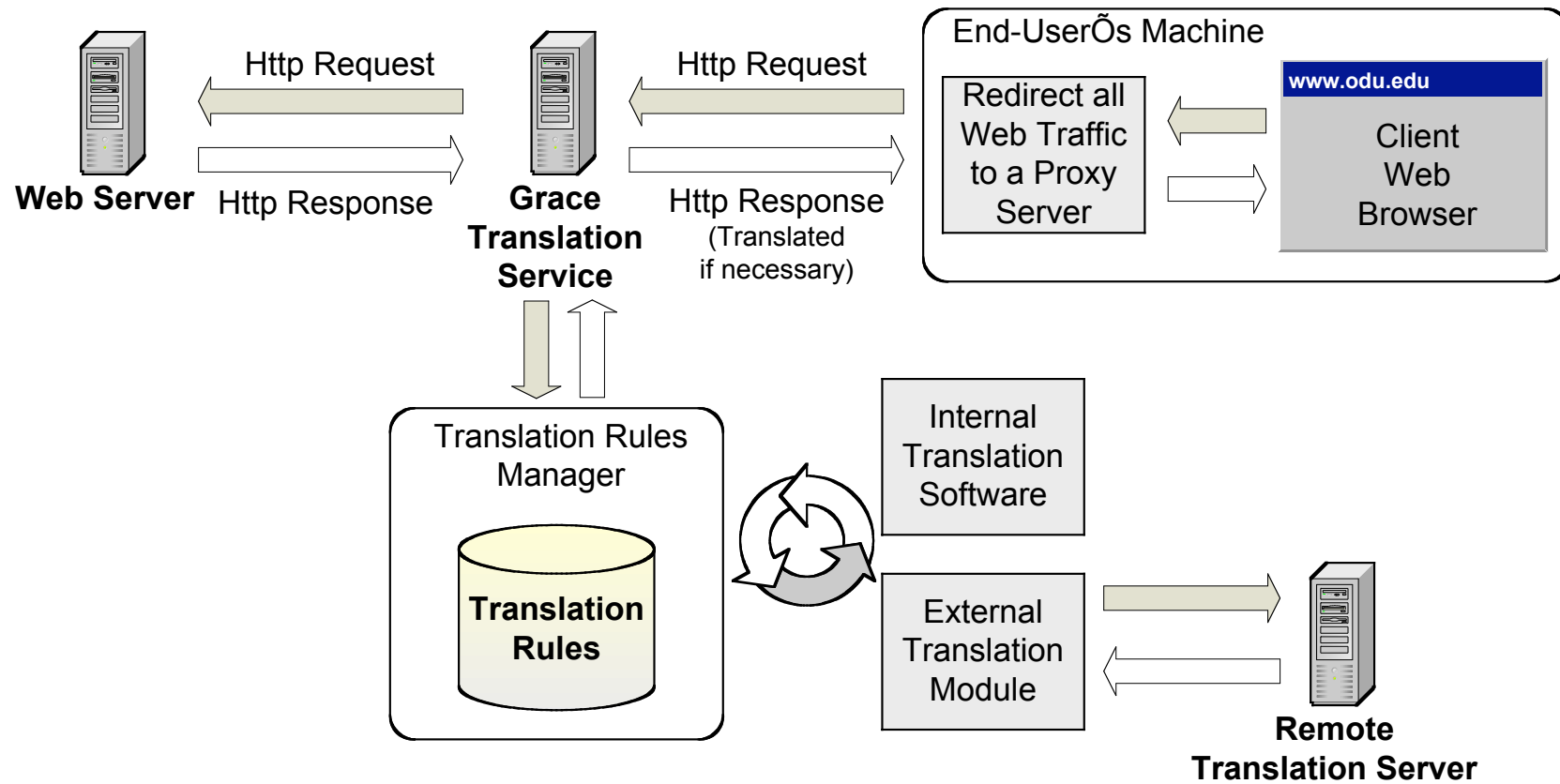
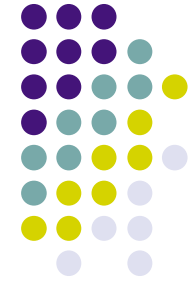
**CBGAS\_3.MPG - Click on image to see animation**



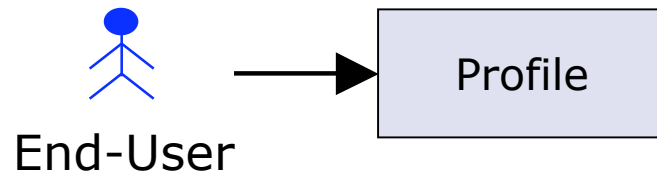
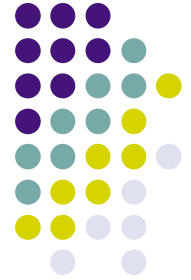
# Related Work

- Typed Object Model (TOM)
  - TOM Conversion Service  
<http://tom.library.upenn.edu/convert/>
- JSTOR/Harvard Object Validation Environment (JHOVE)  
<http://hul.harvard.edu/jhove/>
- LOCKSS (Lots of Copies Keep Stuff Safe)  
<http://lockss.stanford.edu/>

# High Level Design



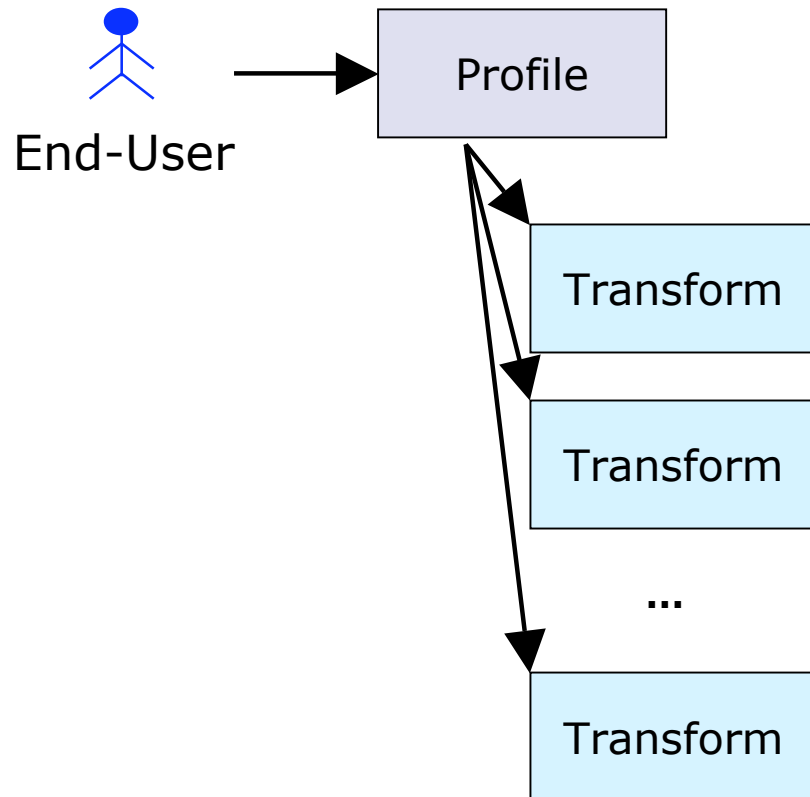
# Configuring Grace



- Uniquely identifies a user or group of users' preferences
- Contains a list of one or more transform rules to follow



# Configuring Grace






- Rules for converting one type into another
- Example:  
image/x-xbitmap → image/png
- Multiple transformations can be performed on the same object

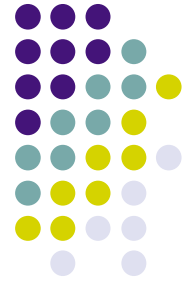




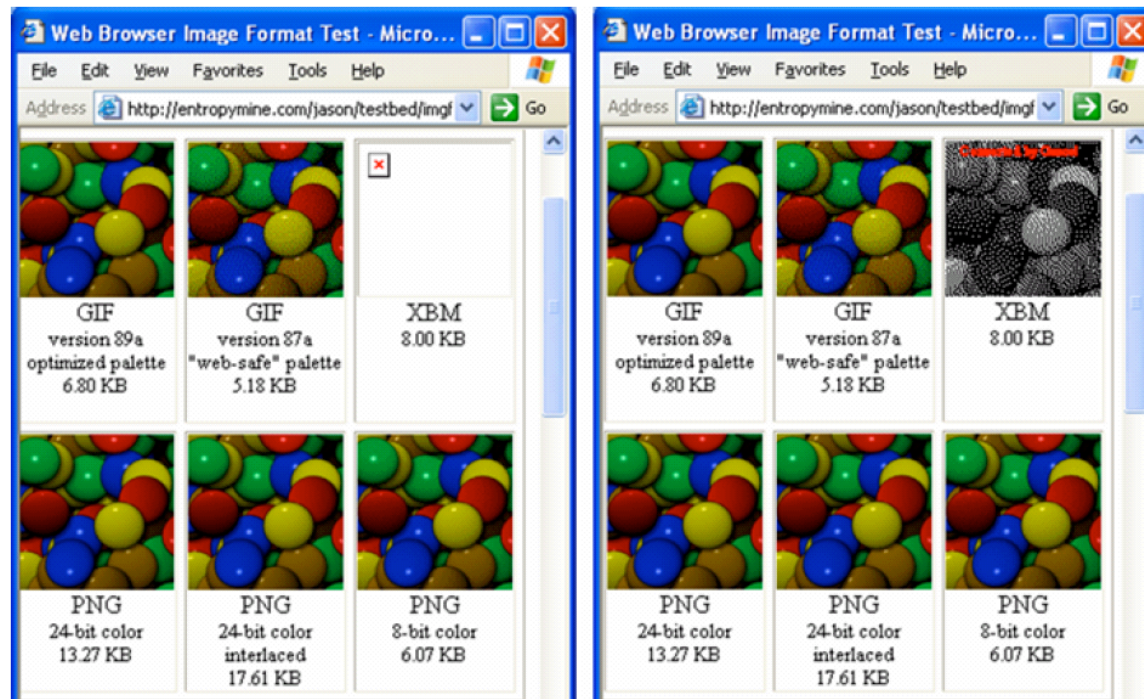
# Grace in Action

-  Test formats that are commonly available by most web browsers.
-  Test the PNG format that is improperly displayed by a variety of web browsers.
-  Test the JPEG 2000 format which can only be displayed using a browser plug-in.

# XBM Format

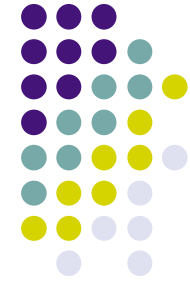


image/x-xbitmap → image/png



<http://entropymine.com/jason/testbed/imgfmts/>

# PNG Format



image/png → image/bitmap



Correct rendering



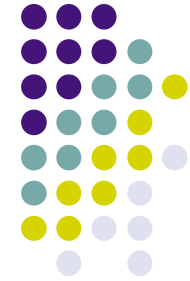
IE rendering



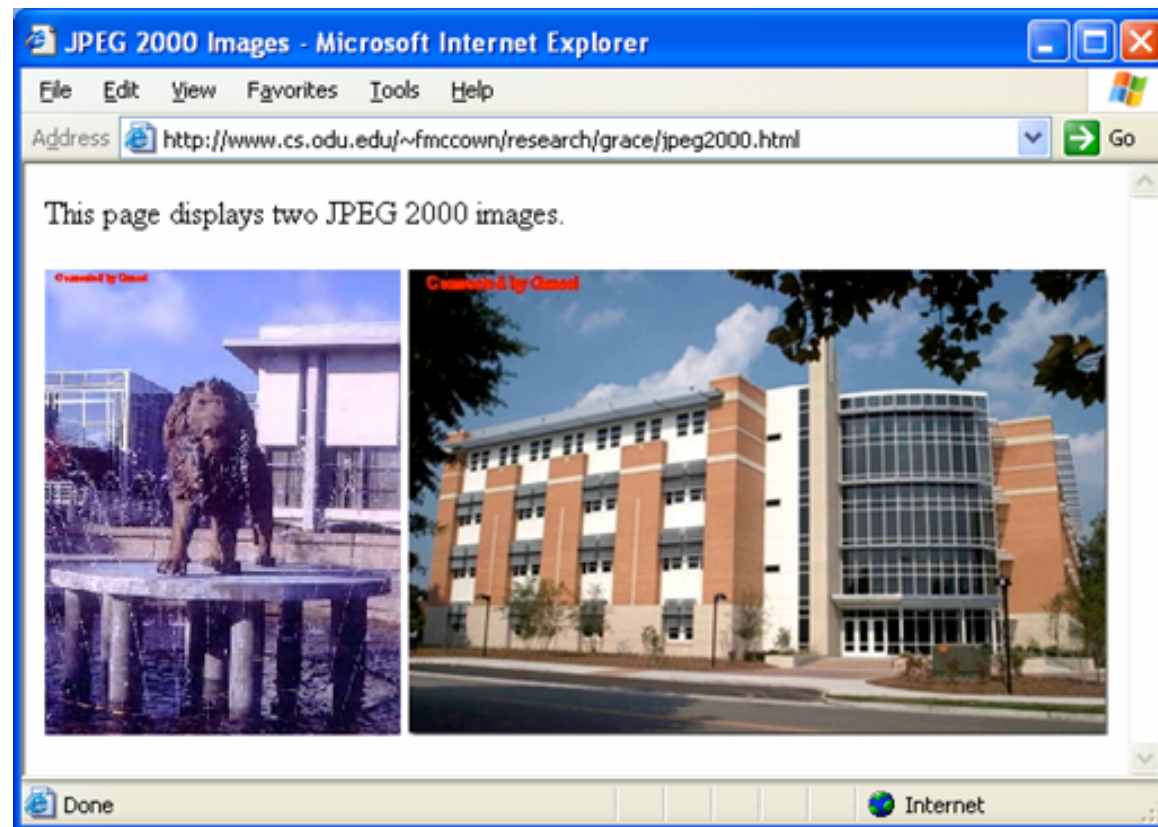
Grace conversion  
(lossy)

<http://www.ecs.soton.ac.uk/~nj198r/png-test/alpha/cmap.html>

# JPEG 2000 Format



image/jp2 → image/jpeg





# Future Work

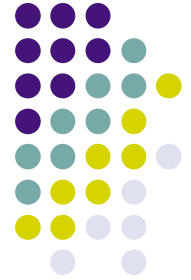
- Additional types of transformations
  - TOM conversion service
- Improve file format metadata
  - JHOVE
- Faster translation of Web content
  - Cache conversions
  - Convert before accessing
- Scalable network of Grace servers
  - OAI-PMH used for communication



# Future Work

- Find missing Web content
  - archive.org
  - Search engine caches
- Translation rules based on browser capabilities
  - Discover what transformations are needed
- Transformation Metadata
  - How will the user know something has been transformed?
  - Will they want to know?

# Thank You



# Questions?

Slides:

<http://www.cs.odu.edu/~fmccown/research/grace/>