



Utilizing the Cyberinfrastructure to support GIScience

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<http://www.cisc.gmu.edu/>

<http://esgs.gmu.edu/>

Agenda

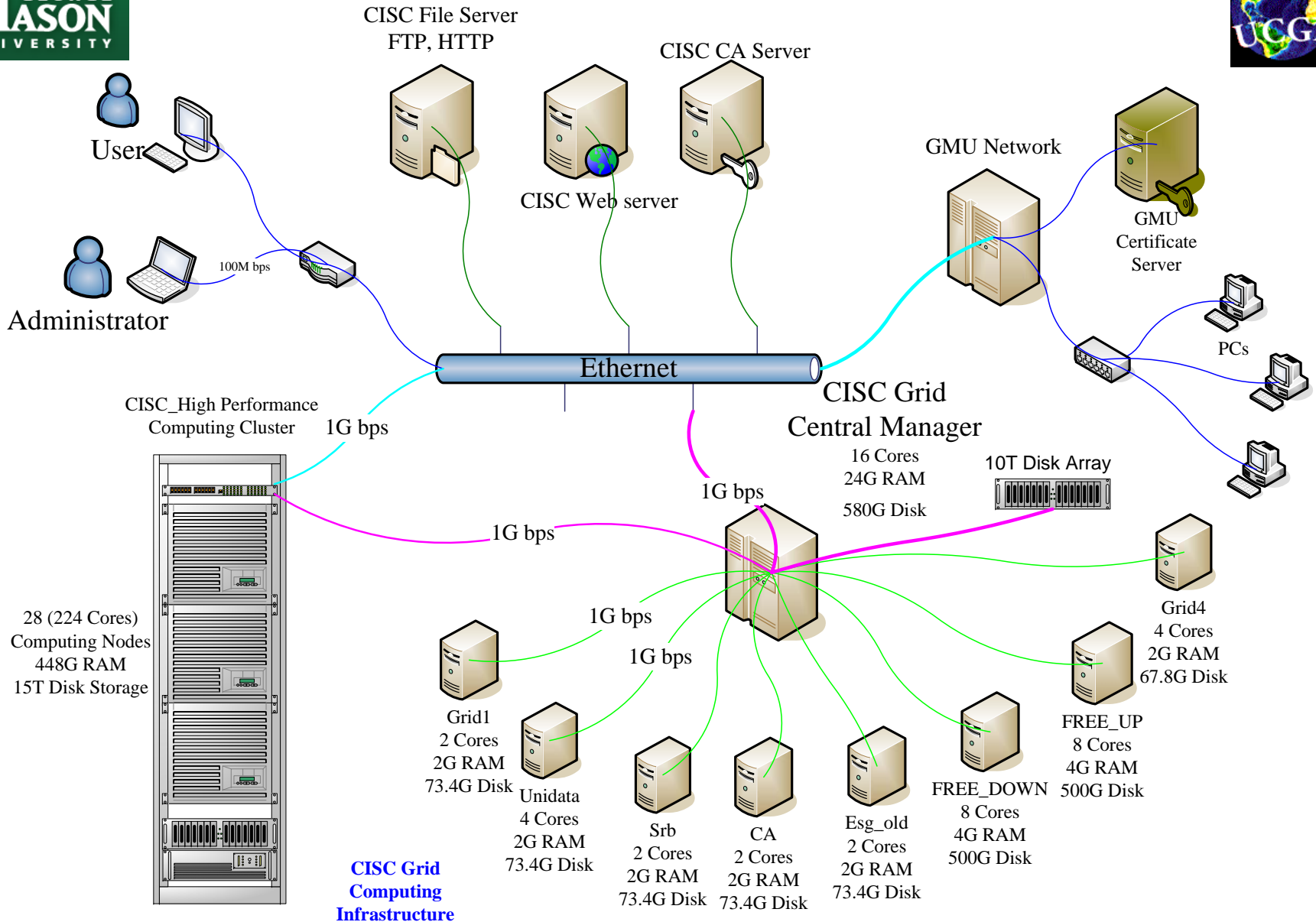
1. Introduction
2. Cyberinfrastructure Platform
3. GeoInformation Sciences
4. GeoInformation Applications
5. Lessons Learned
6. CI Specialty Group of AAG

Introduction

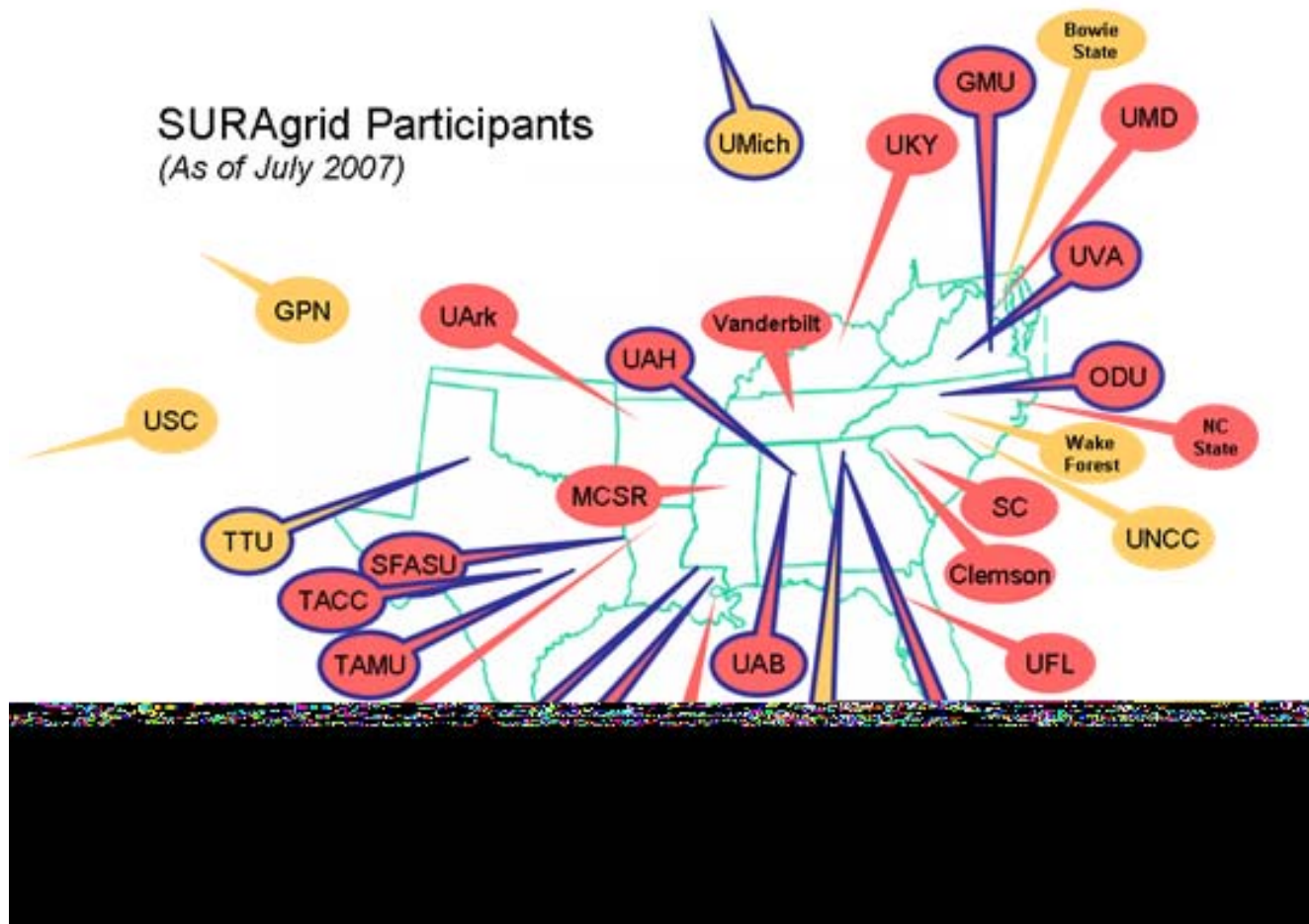
- Significant computing power is wasted while the resources are widely needed for geospatial processing.
- Grid computing and other network computing technologies enable us to leverage the wasted computing power.
- An infrastructure is needed to ship the computing tasks to the wasted computing power and collect the computing results.
- The infrastructure is under investigation to support different fields, such as Spatial Data Infrastructure and Geoscience.
- Research & development at CISC/GMU will be reported to share our practices in this effort.

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5. Conclusion

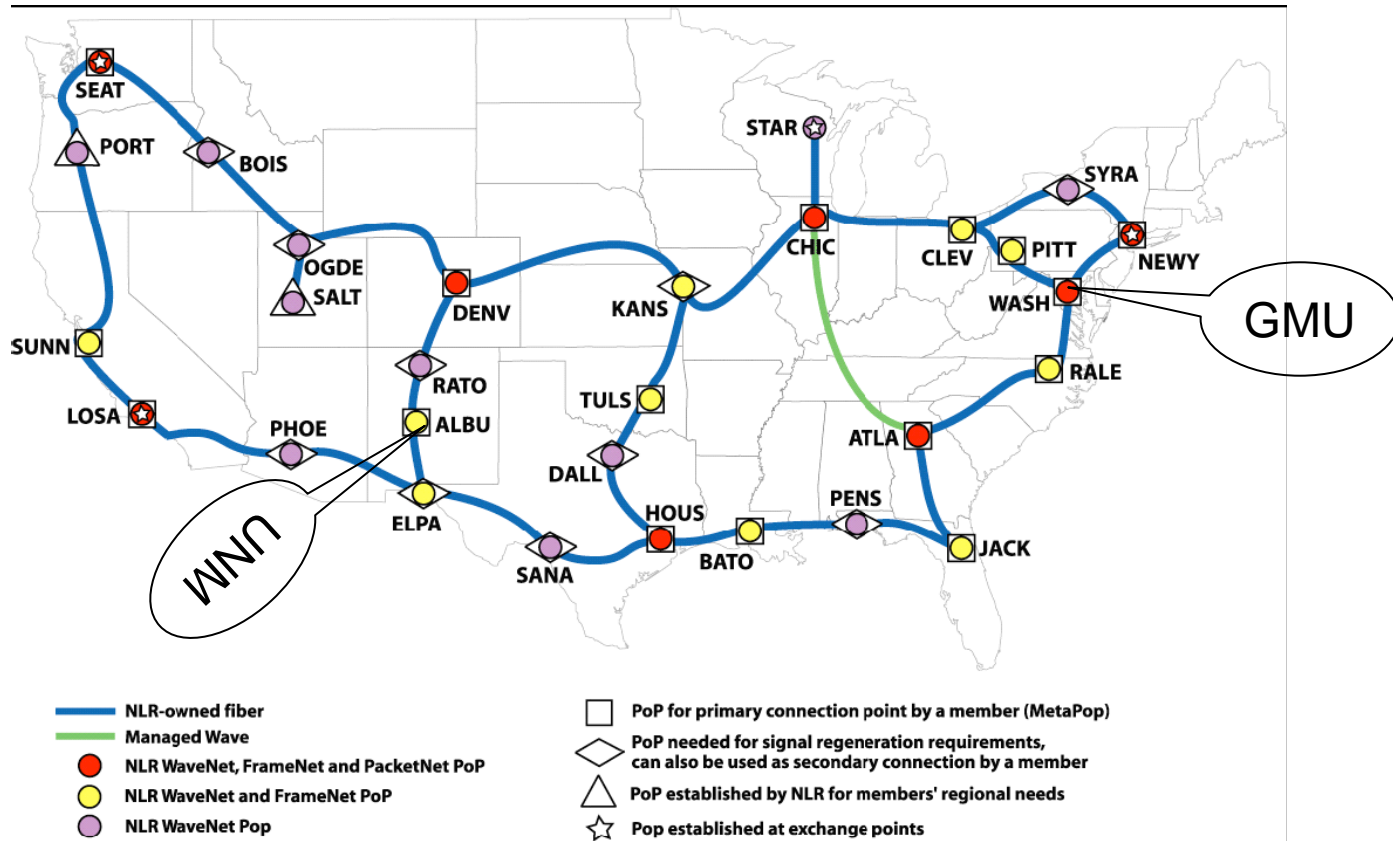


SURAGrid Environment



CISC Grid can access the computing resources contributed by SURAGrid member universities

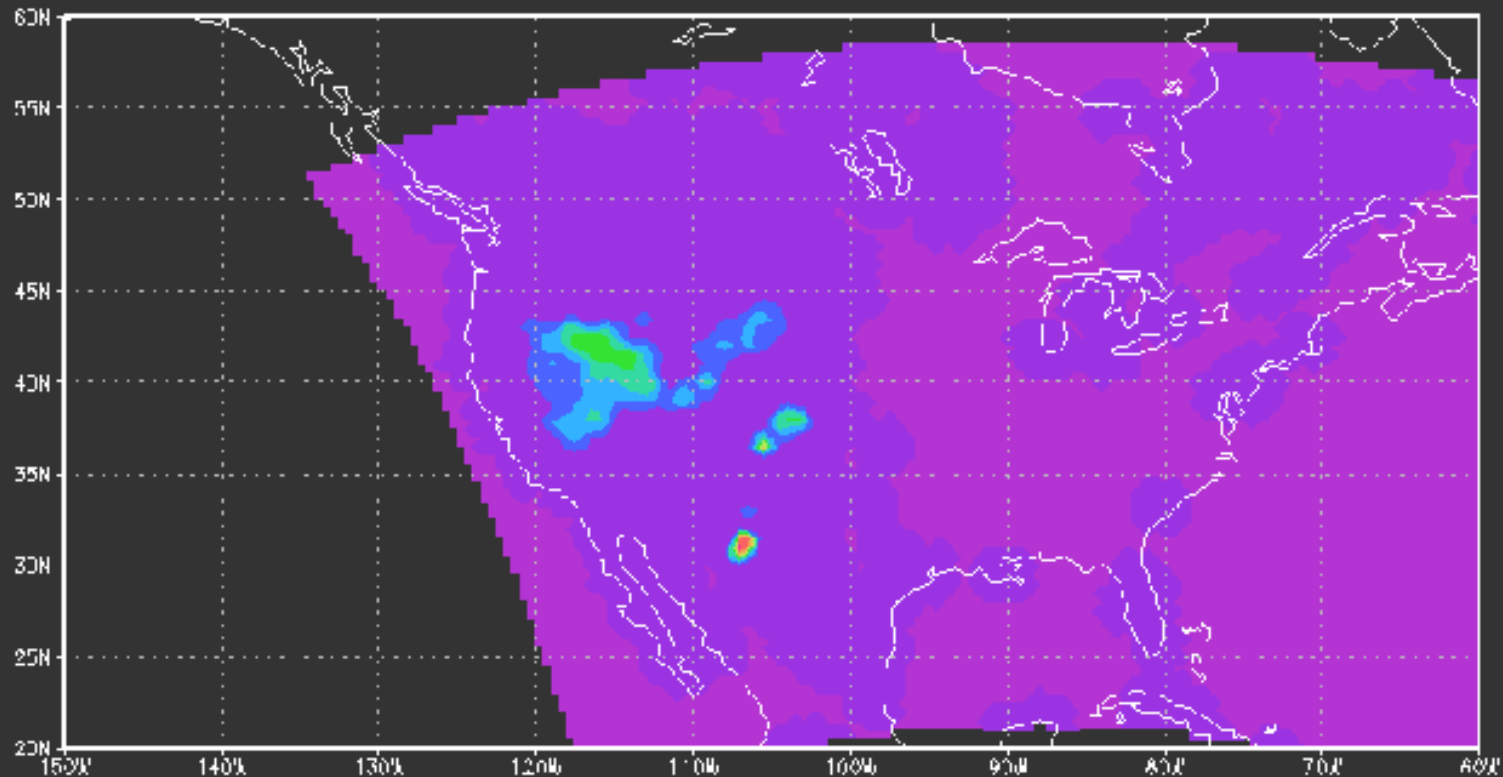
LambdaRail



Agenda

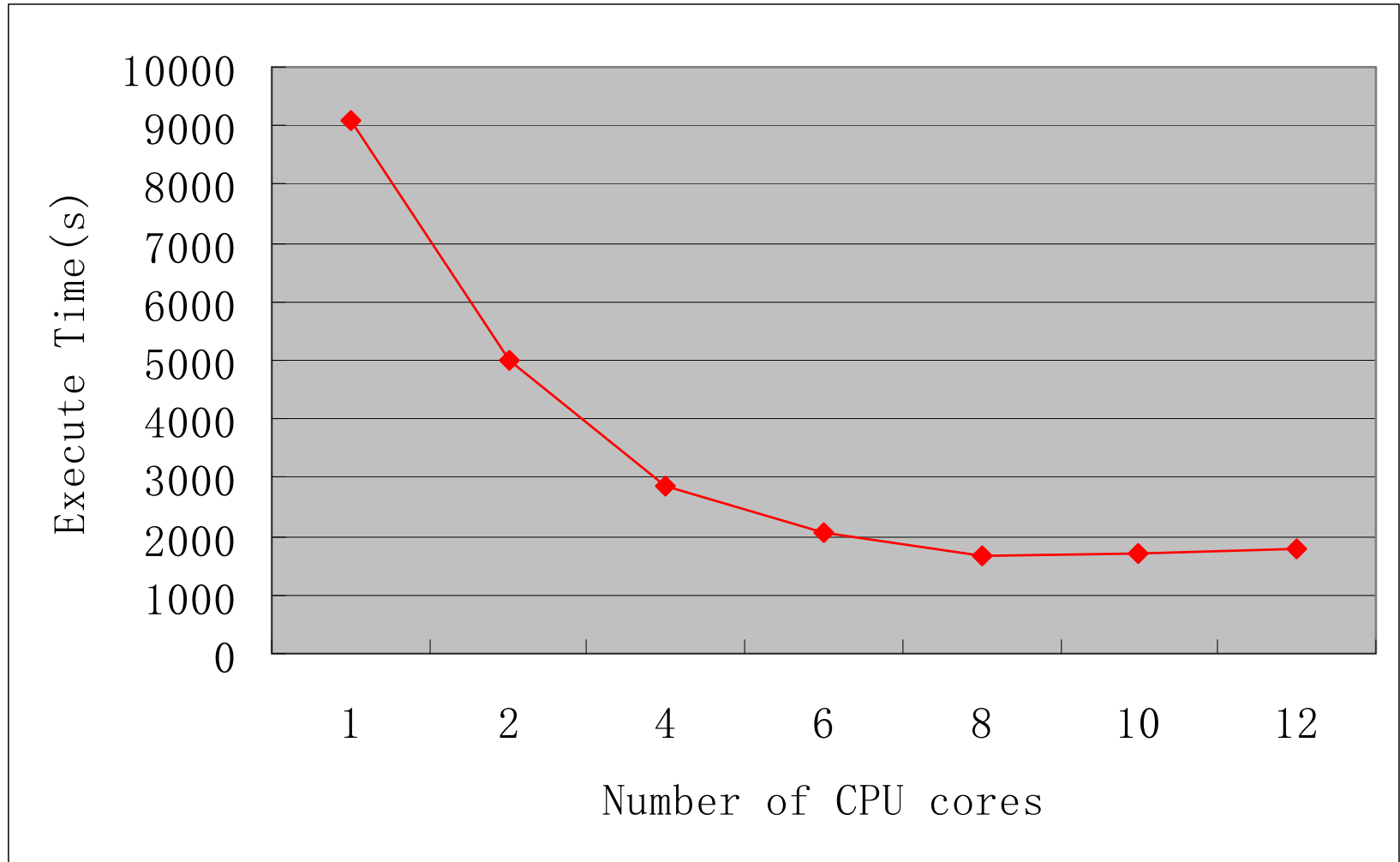
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Southwest Dust Forecasting



GrADS: G014/IGFS

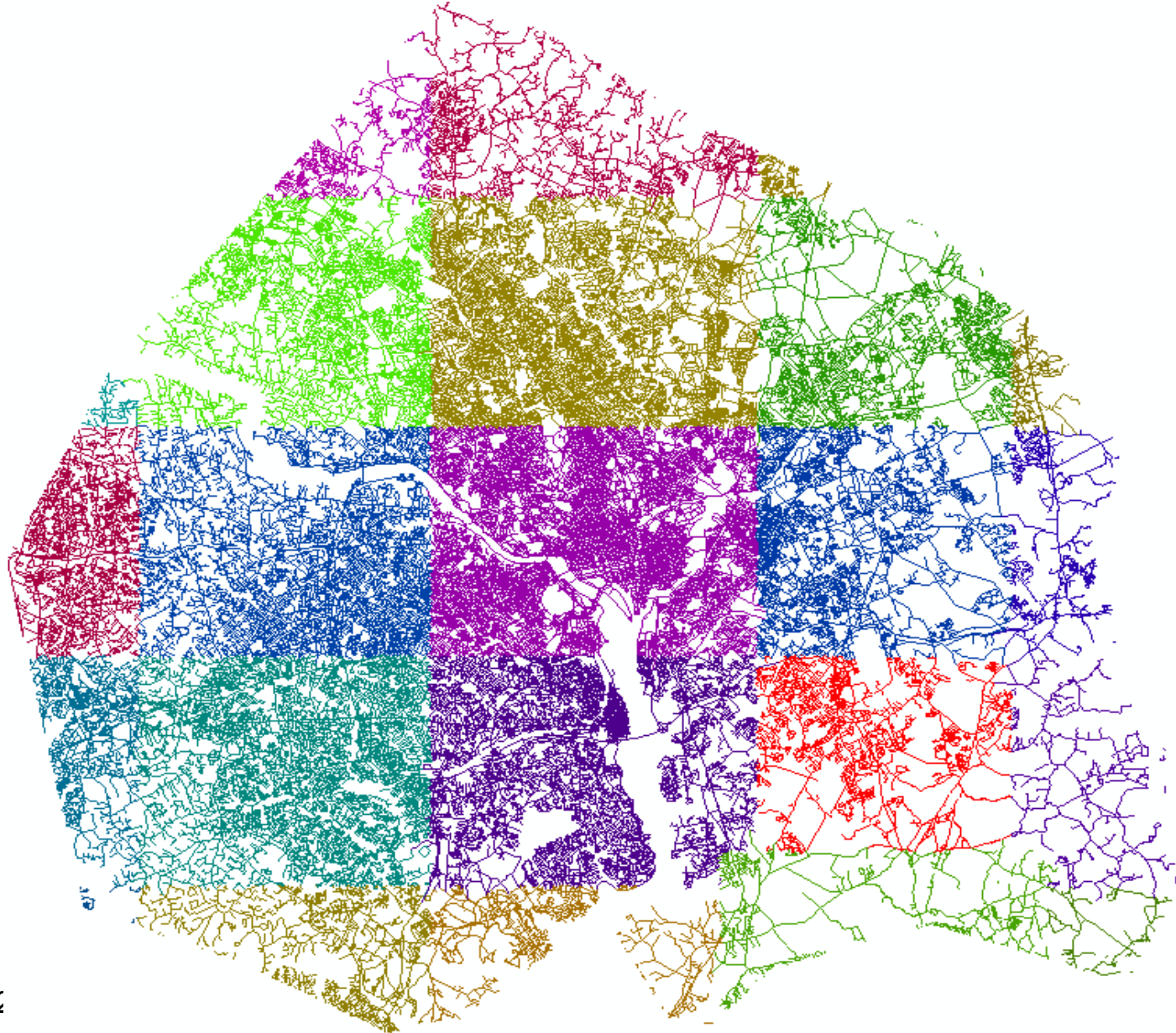
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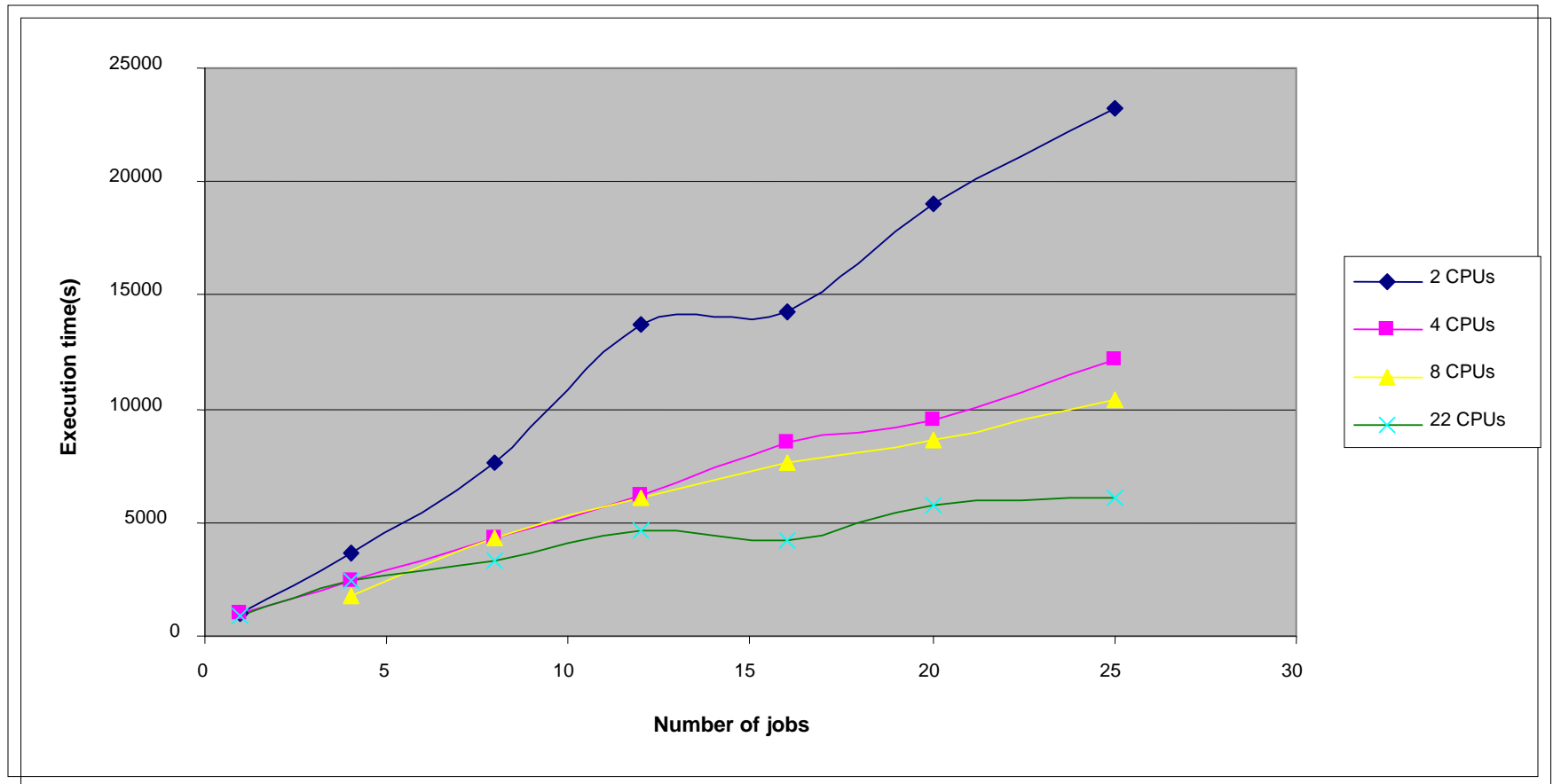
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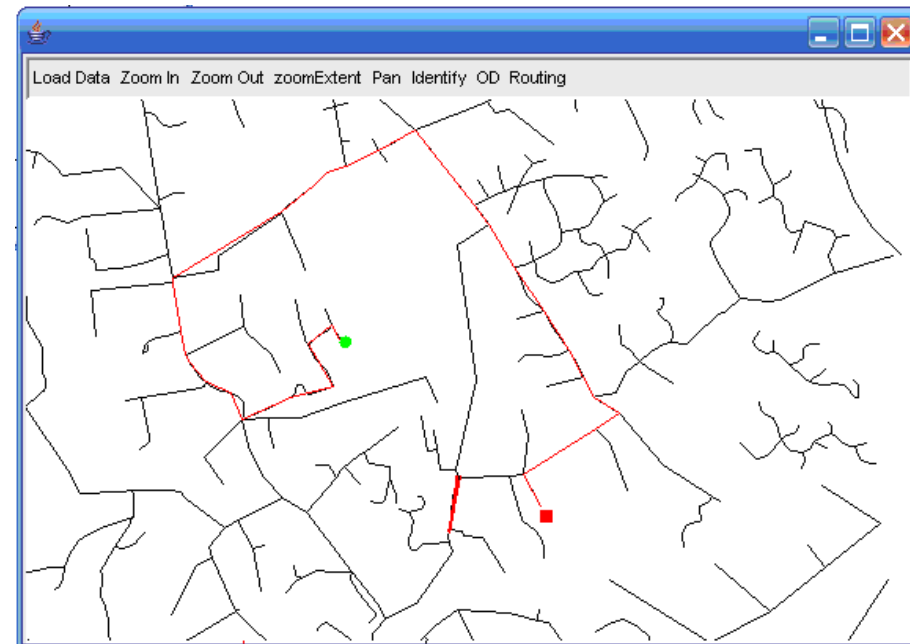
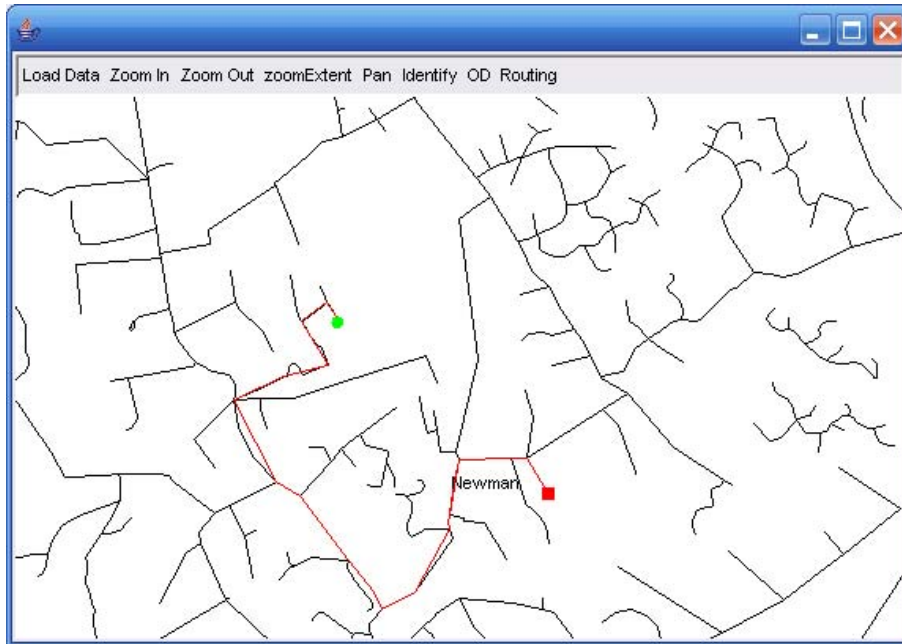
Traffic Simulation



Simulation Performance

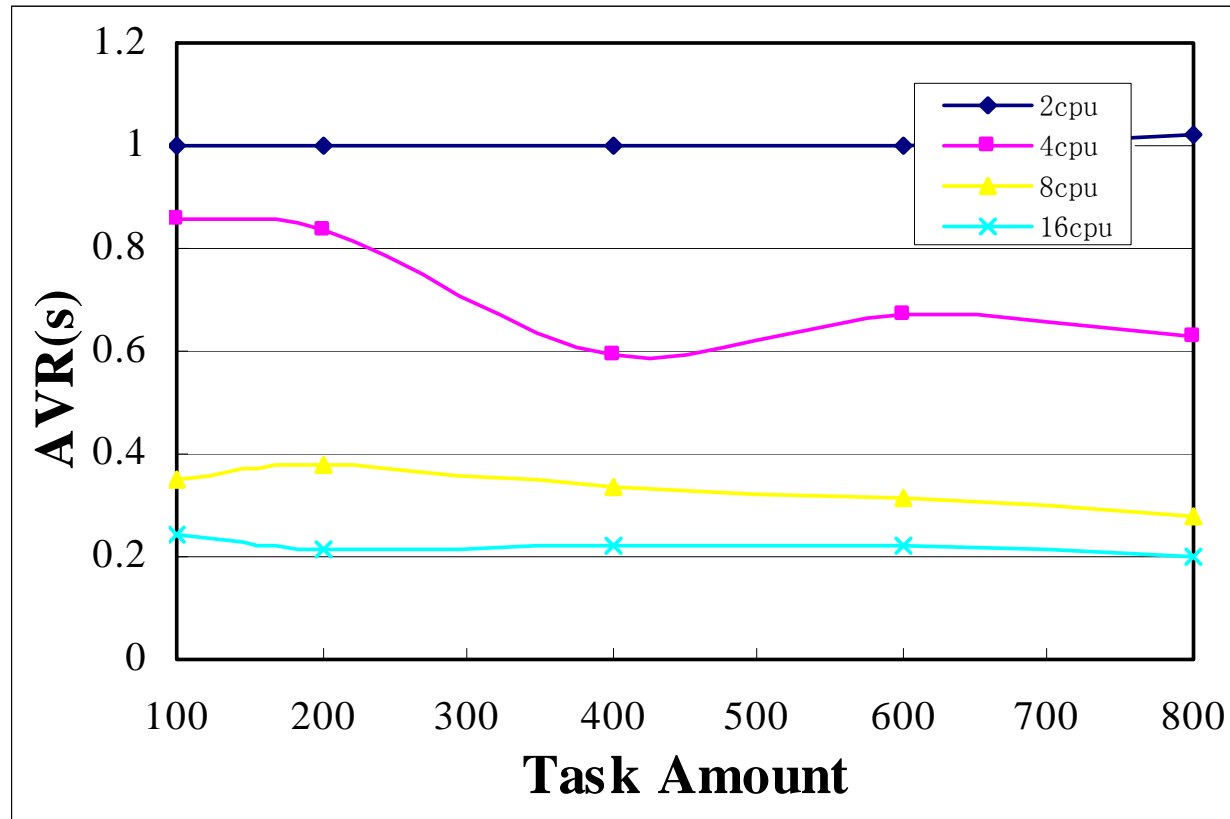


Near Real-Time Routing



Route change with congestion on Newman Road, Clifton, VA

Routing Performance



Effect of Different CPU Numbers and Task Amounts

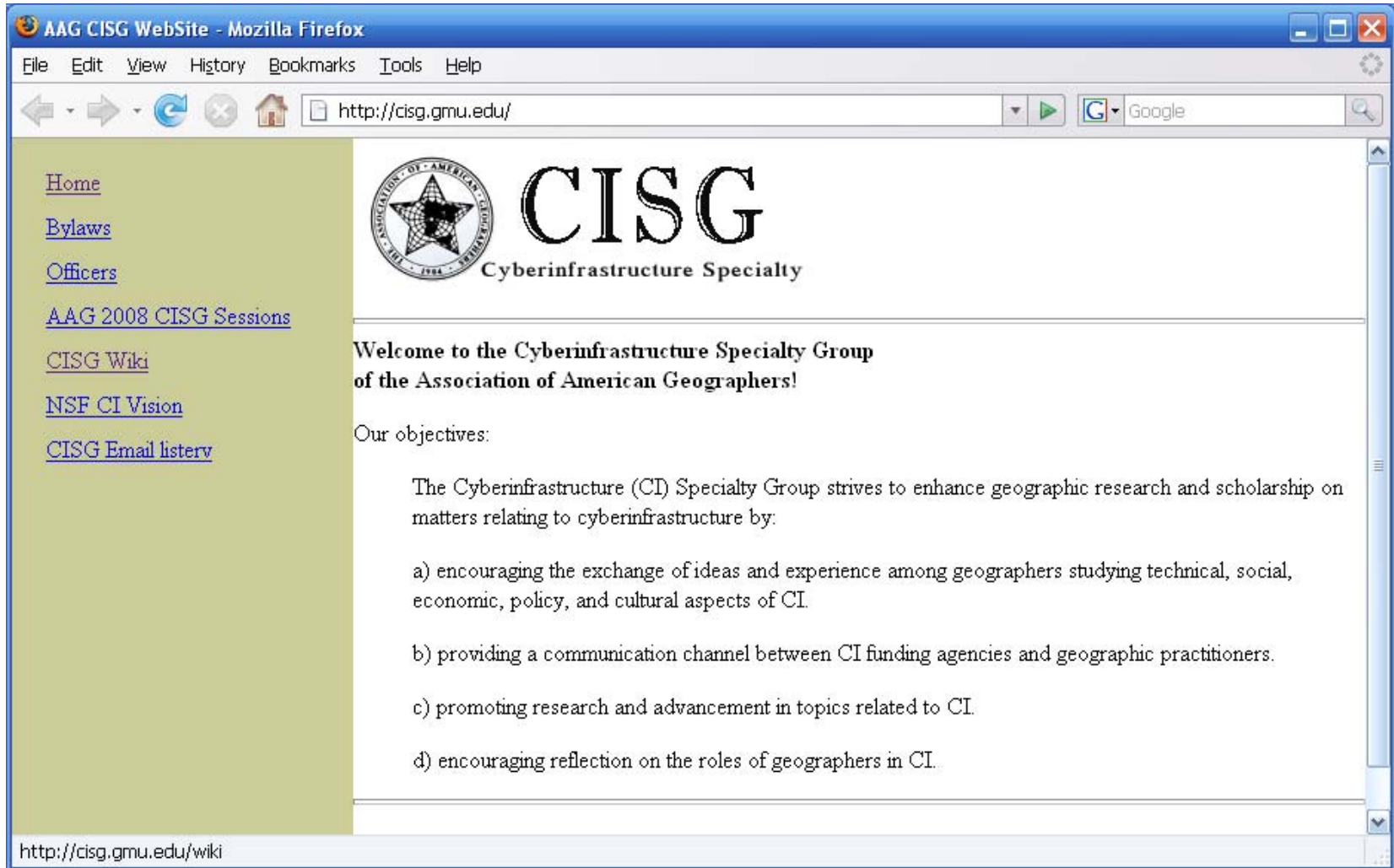
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Lessons Learned

1. Cyberinfrastructure **enables** us to conduct research and development that could not be done previously.
2. **Interdisciplinary** field among Geography, Computing, Earth Science, and other disciplines.
3. **High Performance Computing** is still widely needed for time-consuming and real-time tasks.
4. **Geospatial Middleware** are needed.
5. **Gaps** exist between workforce needs and the education of students.
6. **More Applications**, such as emergency response, will need Cyberinfrastructure.

- Website: <http://cisg.gmu.edu/>

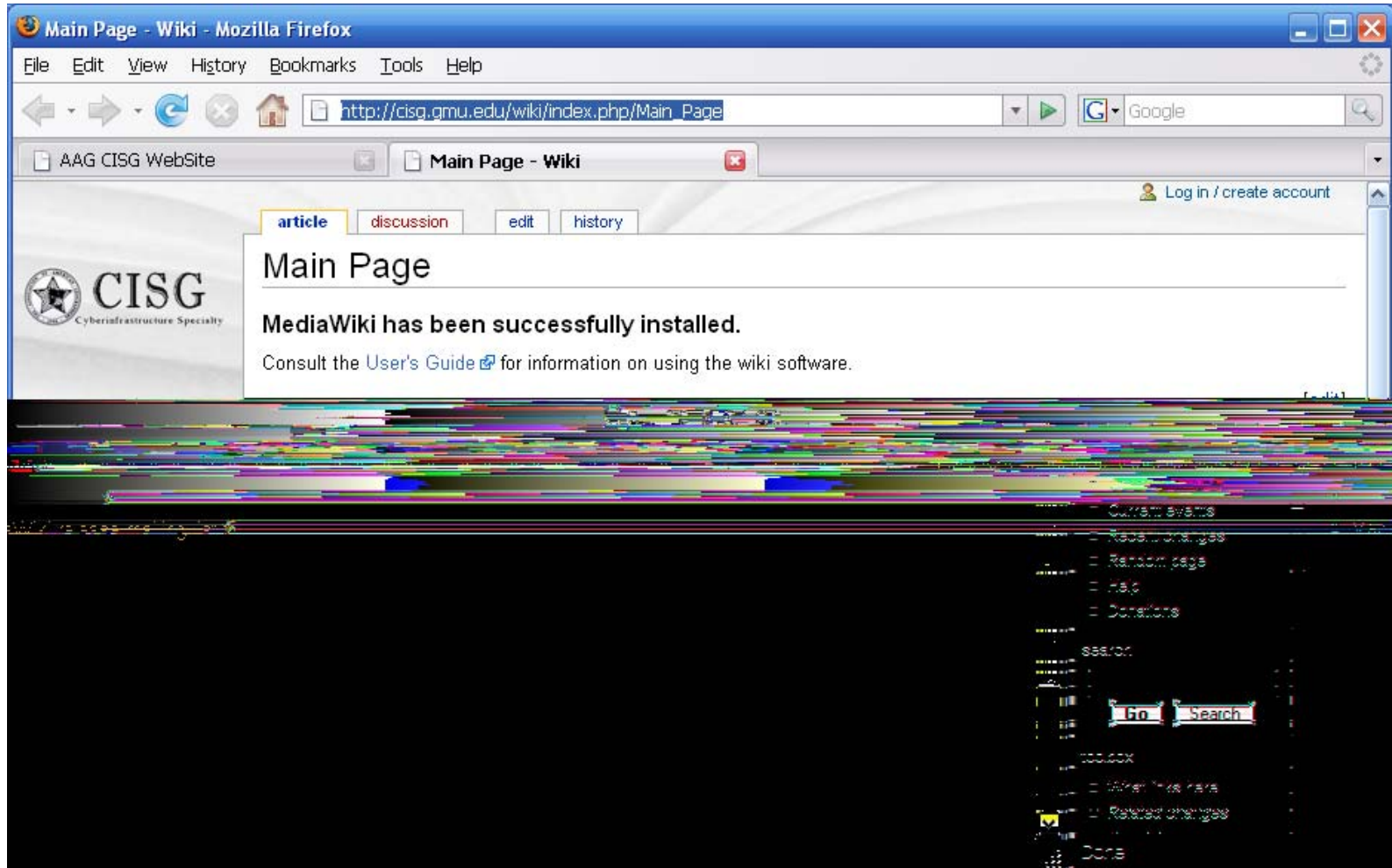


The screenshot shows a Mozilla Firefox browser window displaying the AAG CISG Website. The browser title is "AAG CISG WebSite - Mozilla Firefox". The address bar shows "http://cisg.gmu.edu/". The website content includes a navigation menu on the left with links for Home, Bylaws, Officers, AAG 2008 CISG Sessions, CISG Wiki, NSF CI Vision, and CISG Email listerv. The main content area features the CISG logo (a star in a circle) and the text "CISG Cyberinfrastructure Specialty". Below this, it says "Welcome to the Cyberinfrastructure Specialty Group of the Association of American Geographers!" and "Our objectives:". The objectives are listed as follows:

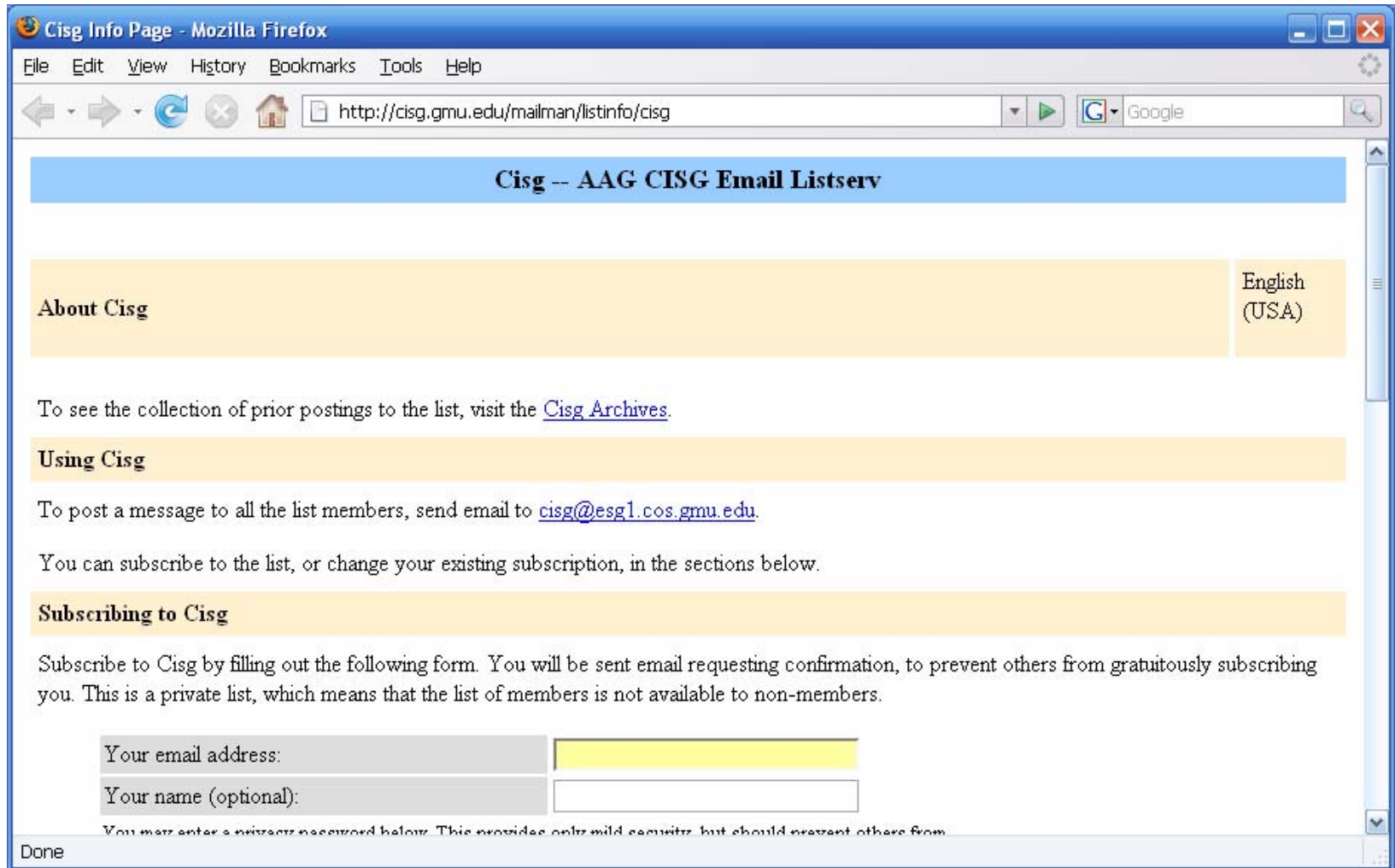
- The Cyberinfrastructure (CI) Specialty Group strives to enhance geographic research and scholarship on matters relating to cyberinfrastructure by:
- a) encouraging the exchange of ideas and experience among geographers studying technical, social, economic, policy, and cultural aspects of CI.
- b) providing a communication channel between CI funding agencies and geographic practitioners.
- c) promoting research and advancement in topics related to CI.
- d) encouraging reflection on the roles of geographers in CI.

The status bar at the bottom of the browser window shows "http://cisg.gmu.edu/wiki".

- Wiki: http://cisg.gmu.edu/wiki/index.php/Main_Page



- Email list: <http://cisg.gmu.edu/mailman/listinfo/cisg>



The screenshot shows a Mozilla Firefox browser window titled "Cisg Info Page - Mozilla Firefox". The address bar contains the URL <http://cisg.gmu.edu/mailman/listinfo/cisg>. The page content includes a blue header with the text "Cisg -- AAG CISG Email Listserv". Below this is a yellow section titled "About Cisg" with a language dropdown menu set to "English (USA)". The text in this section reads: "To see the collection of prior postings to the list, visit the [Cisg Archives](#)." Below this is another yellow section titled "Using Cisg" with the text: "To post a message to all the list members, send email to cisg@esg1.cos.gmu.edu. You can subscribe to the list, or change your existing subscription, in the sections below." The next yellow section is titled "Subscribing to Cisg" and contains the text: "Subscribe to Cisg by filling out the following form. You will be sent email requesting confirmation, to prevent others from gratuitously subscribing you. This is a private list, which means that the list of members is not available to non-members." Below this text is a form with two input fields: "Your email address:" and "Your name (optional):". The "Your email address:" field is highlighted in yellow. At the bottom of the page, there is a partially visible line of text: "You may enter a privacy password below. This provides only mild security, but should prevent others from". The browser's status bar at the bottom left shows "Done".

Acknowledgements

- Sponsors

NASA, FGDC/USGS, UCAR/NSF, EPA, CUE/NPS, Intergraph Inc., Virtual Learning Systems

- Partners

University of New Mexico, University of Arizona, NASA JPL, EPA, Intergraph Inc.

- Clients

NASA, ESIP, AAG CISG