

Cyberinfrastructure Overview

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NYSGrid CI Days

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Cyberinfrastructure?

- Ask any number of people “What is Cyberinfrastructure?” and you will probably get an equal number of definitions
- We need a common understanding of CI in order to build and operate it.

Cyberinfrastructure Vision at NSF

NSF'S CYBERINFRASTRUCTURE VISION FOR 21ST CENTURY DISCOVERY

<http://www.nsf.gov/od/oci/ci-v7.pdf>

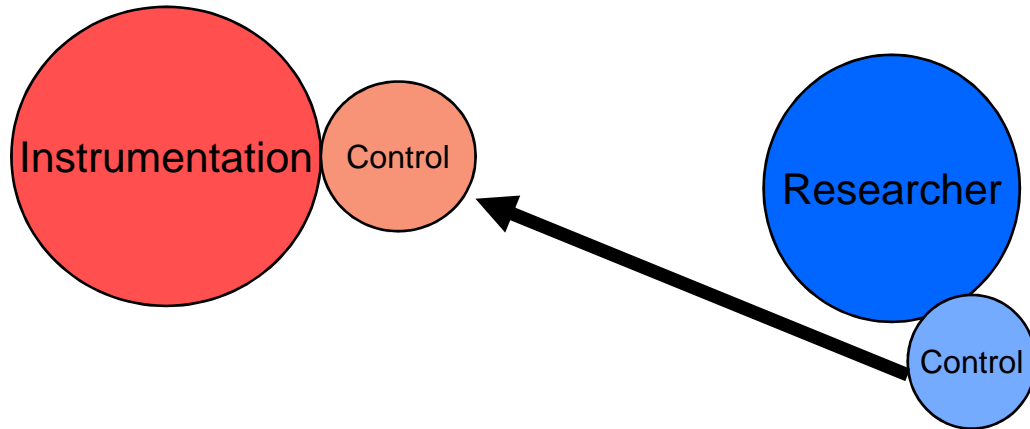
The Nature of Research Today

- Discipline groups working on a common project.
- The groups are made of researchers from multiple institutions.
- They use the network in support of Virtual Organizations (VOs)

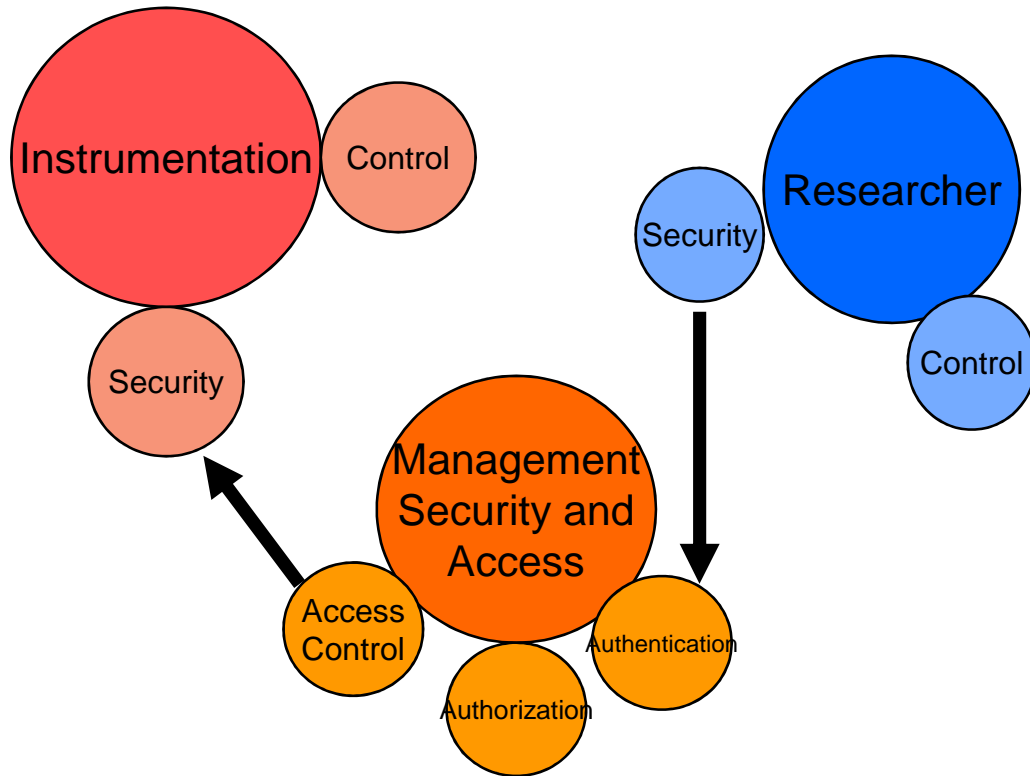
Example Researcher using CI

Jane is an environmental researcher and is going to find a solution to Global Warming. To do this she needs to collect and store data, do analysis of the data and run some simulation models to test her hypothesis. She will share ideas, data and results with her Discipline Group. Here are her steps in using CI

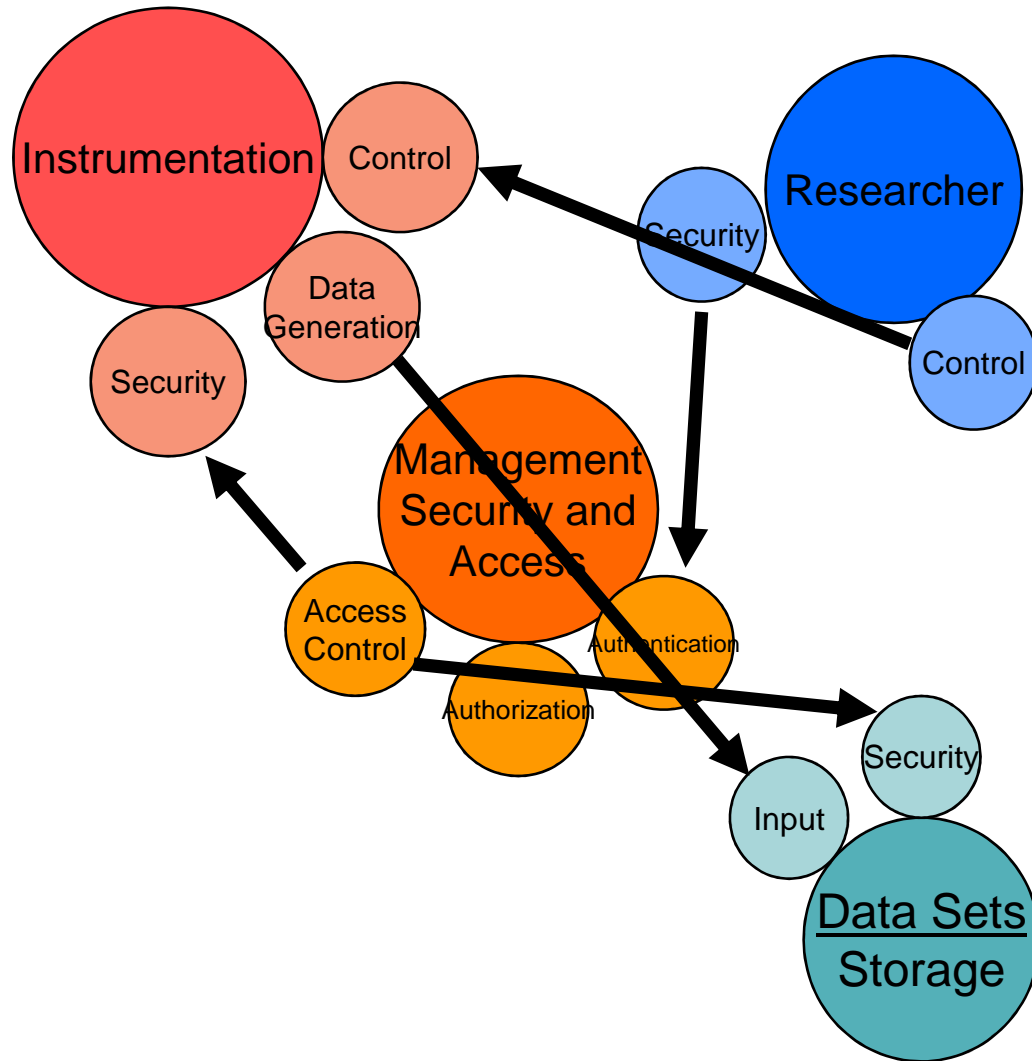
Control Instruments to Gather Data



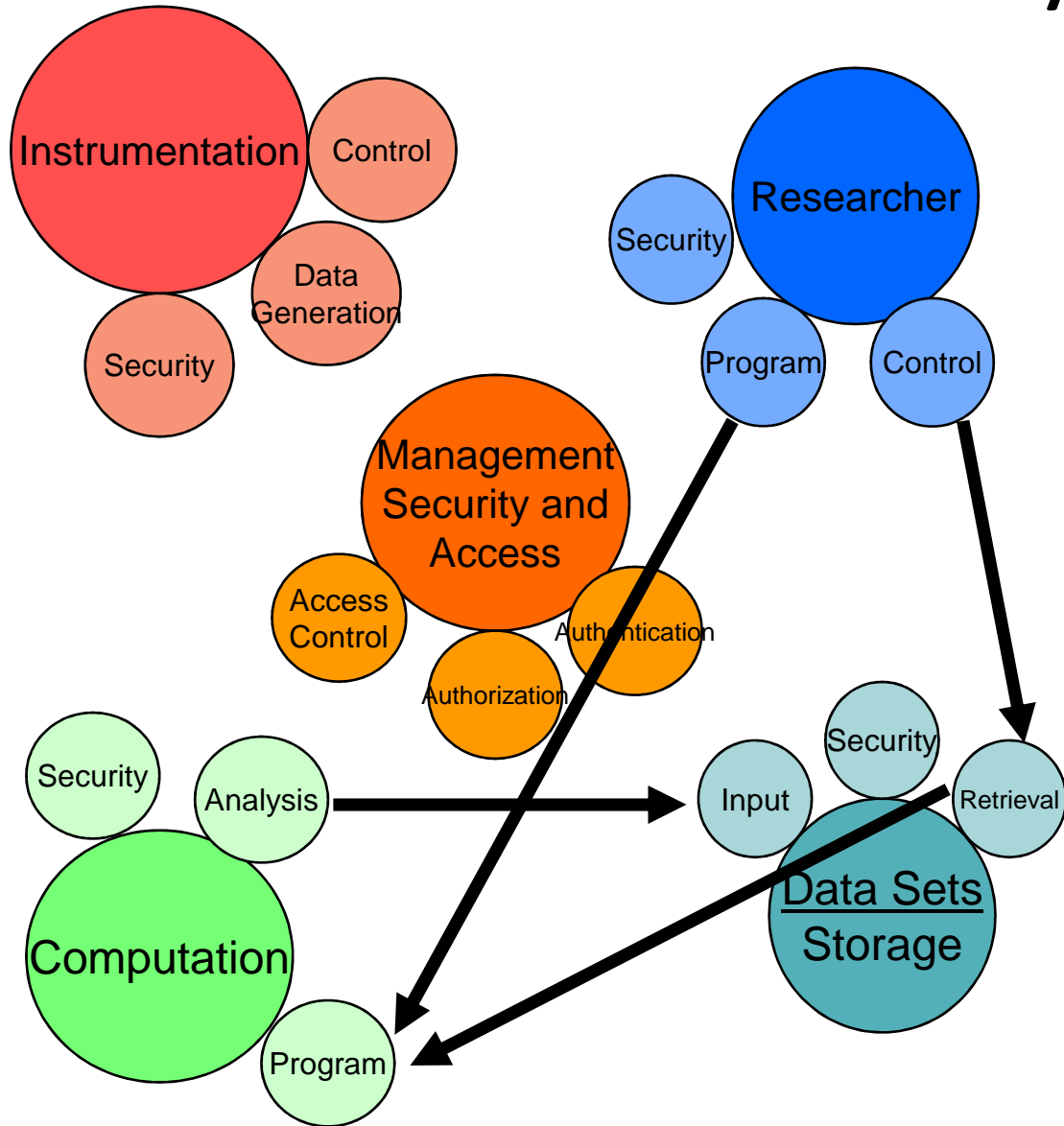
Security and Access Control



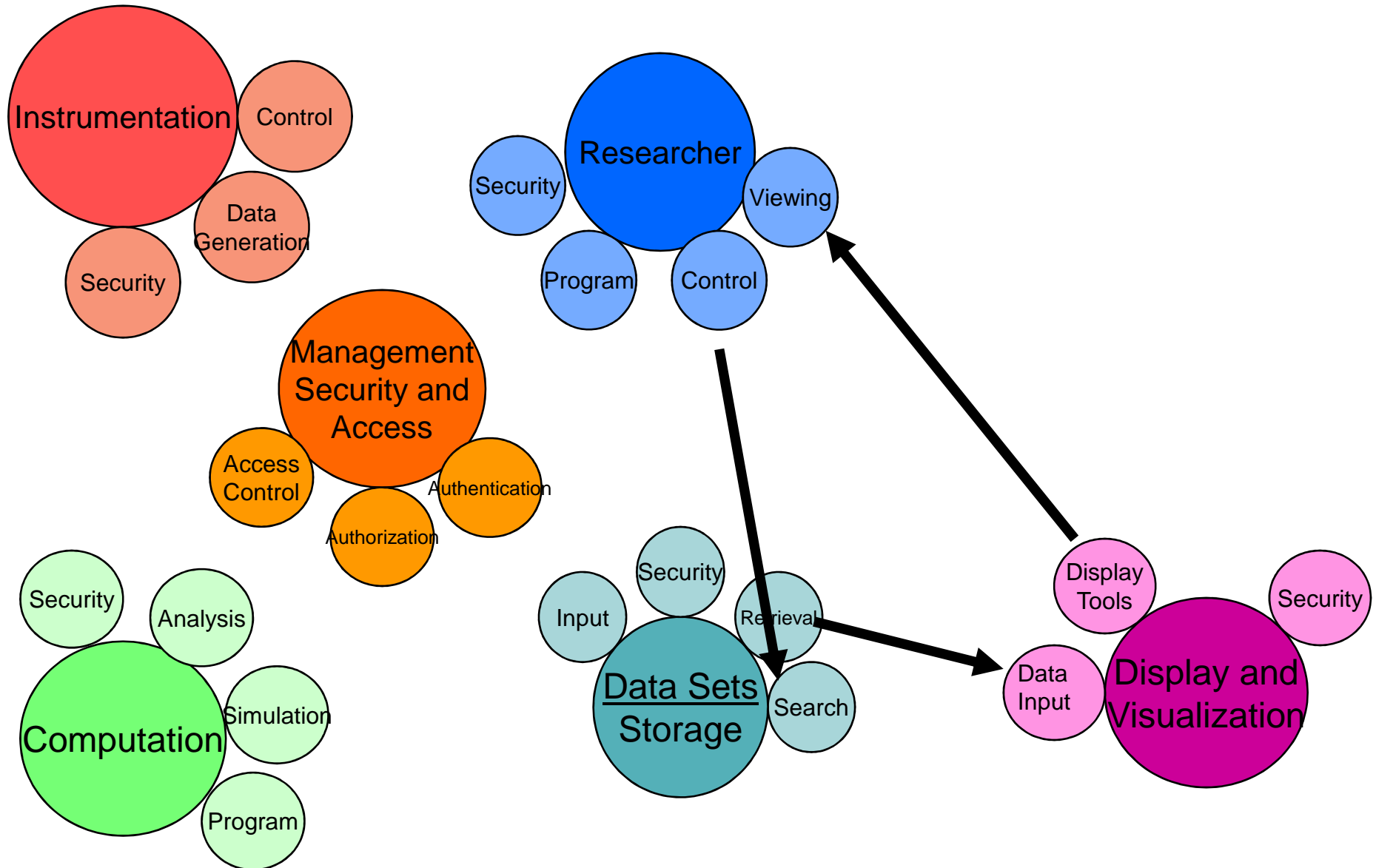
Data Transfer and Storage



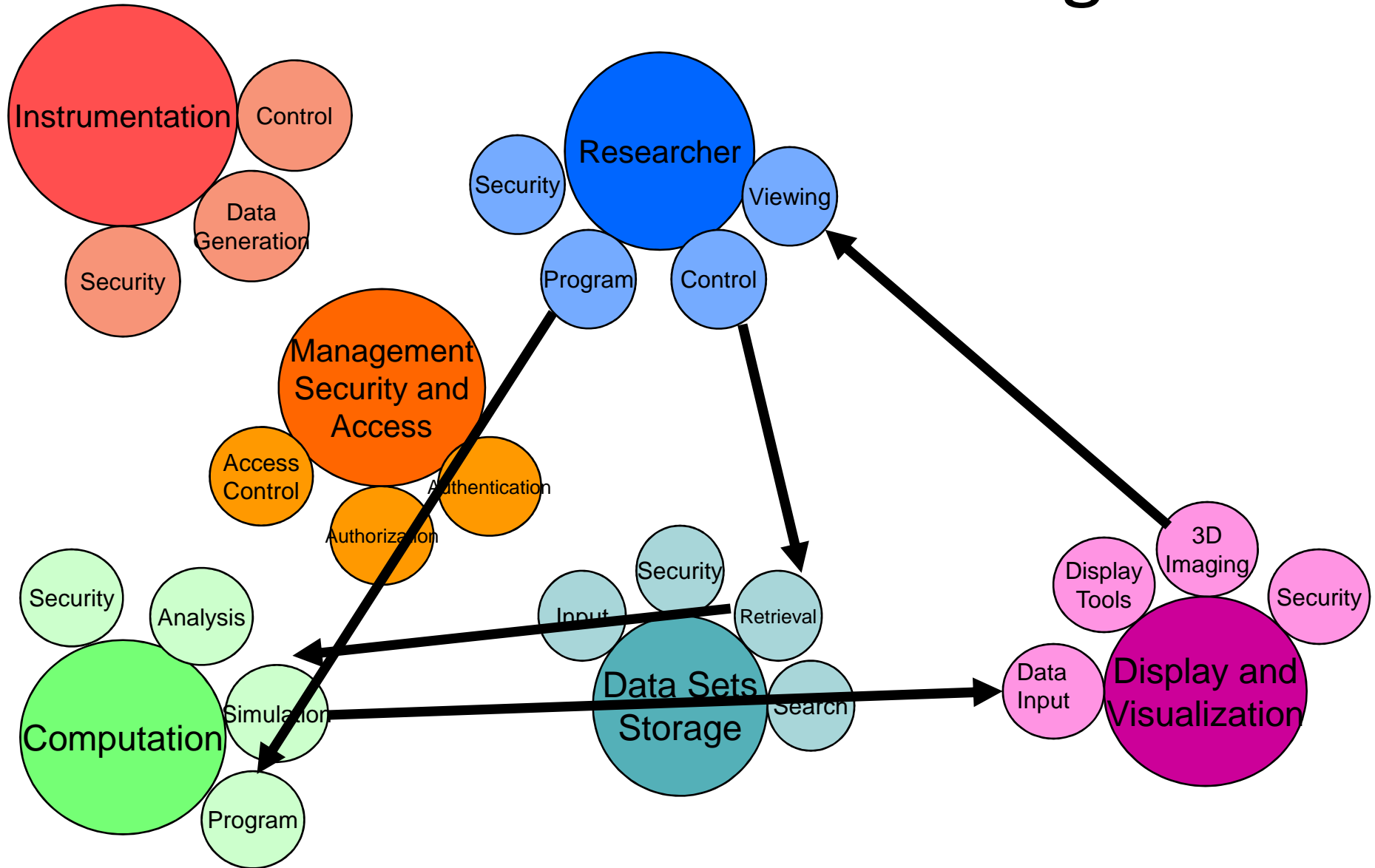
Data Analysis



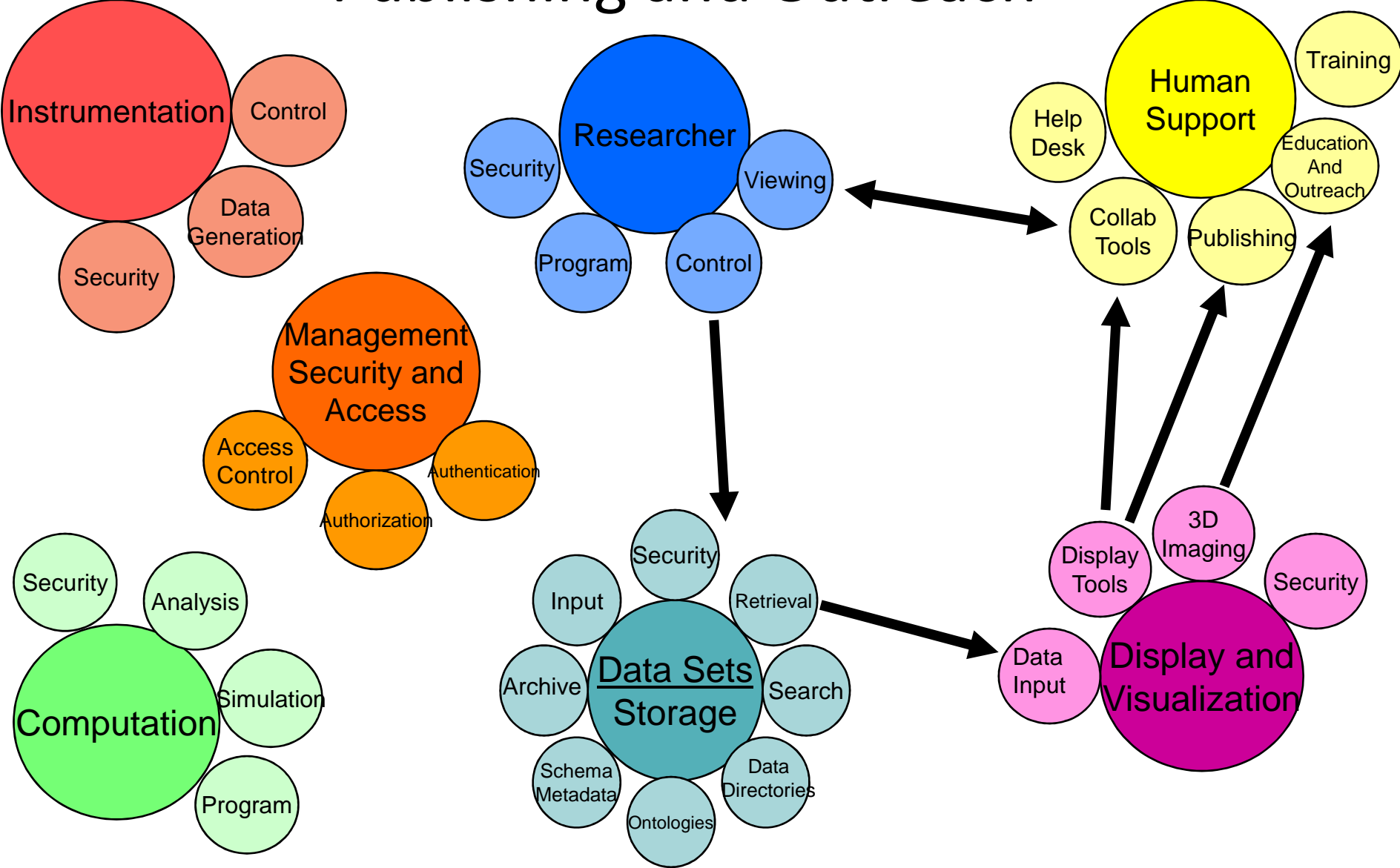
Visualization



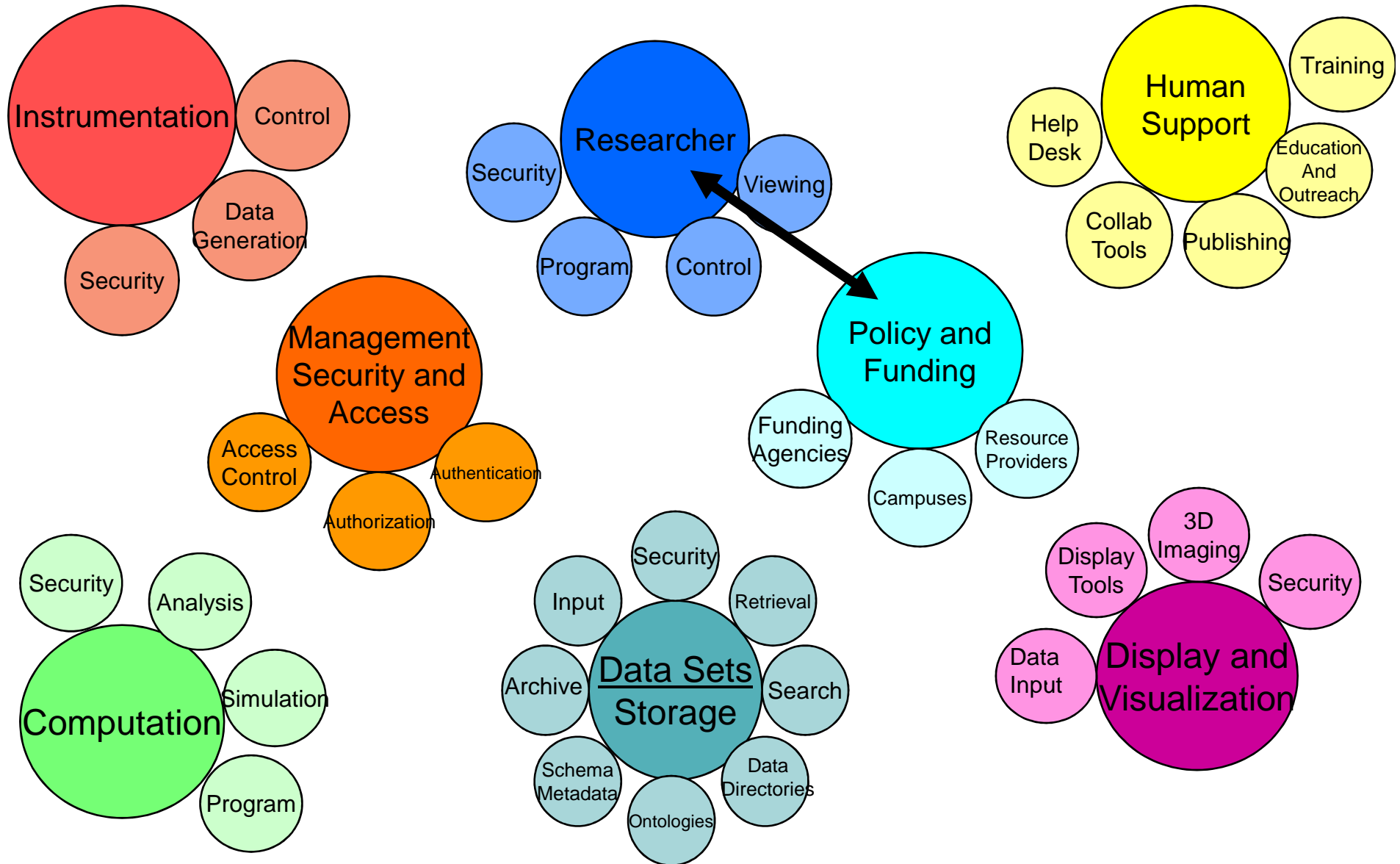
Simulation and Viewing



Sharing, Collaboration, Publishing and Outreach

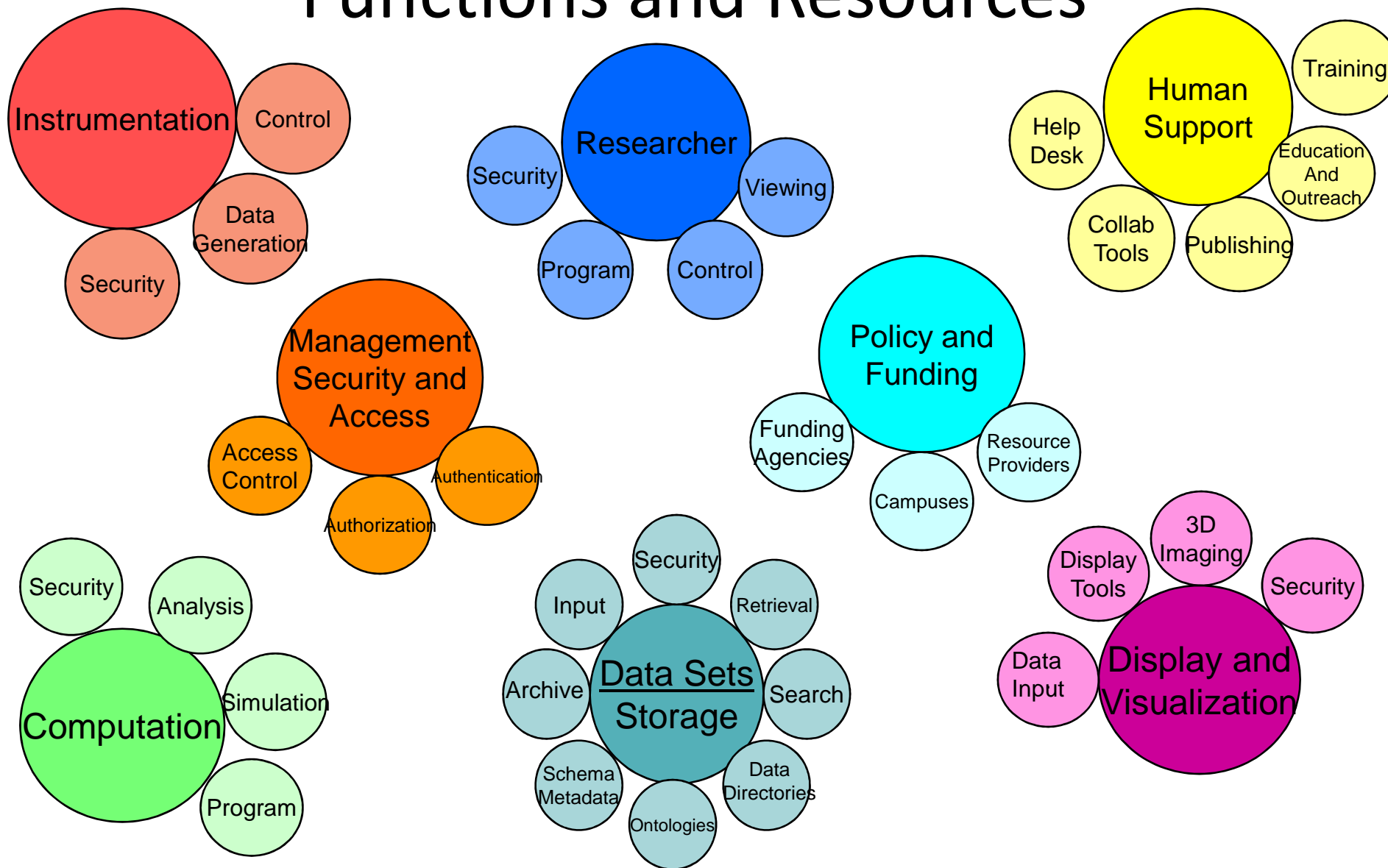


Jane goes after new grant

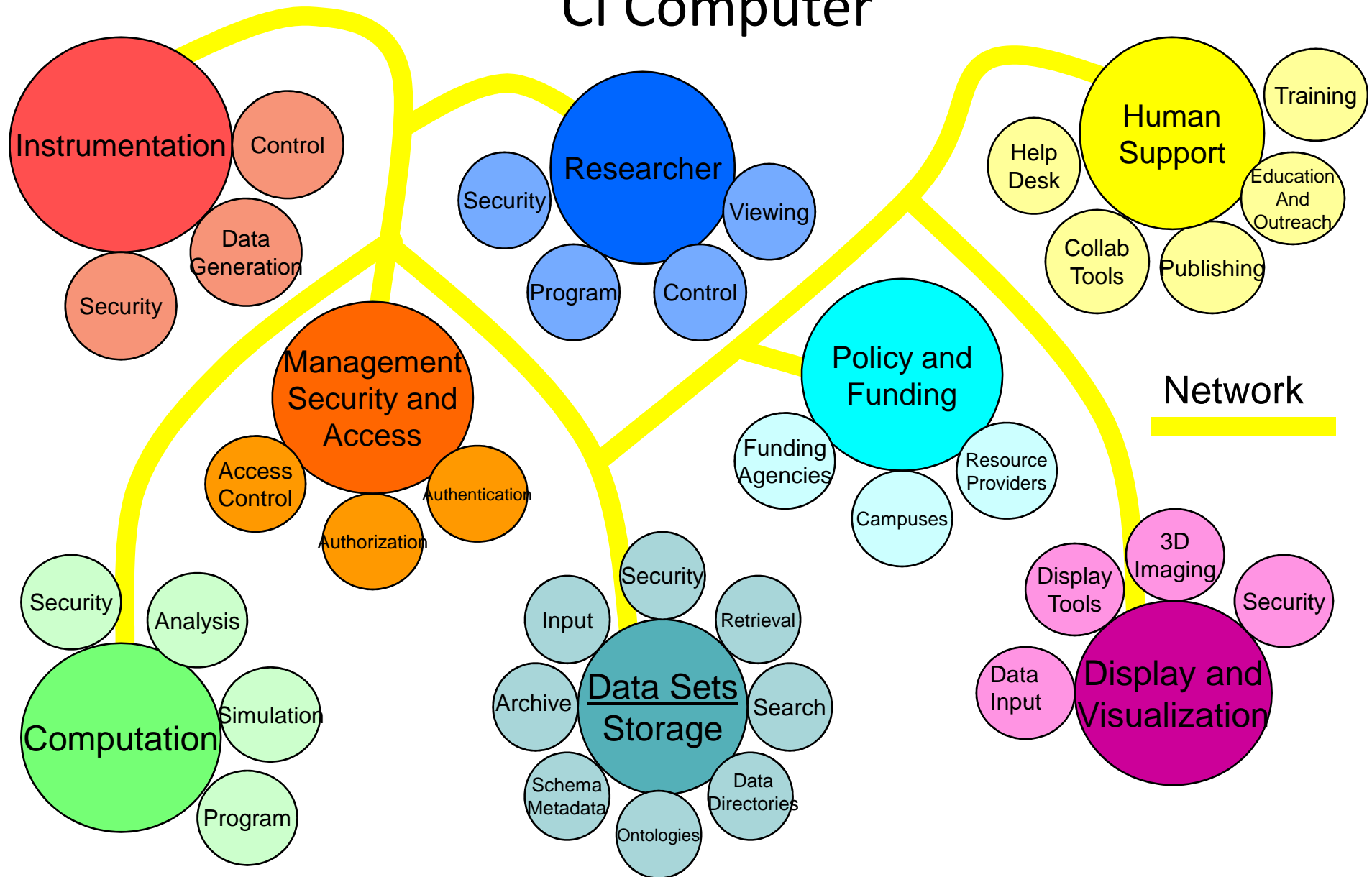


Cyberinfrastructure

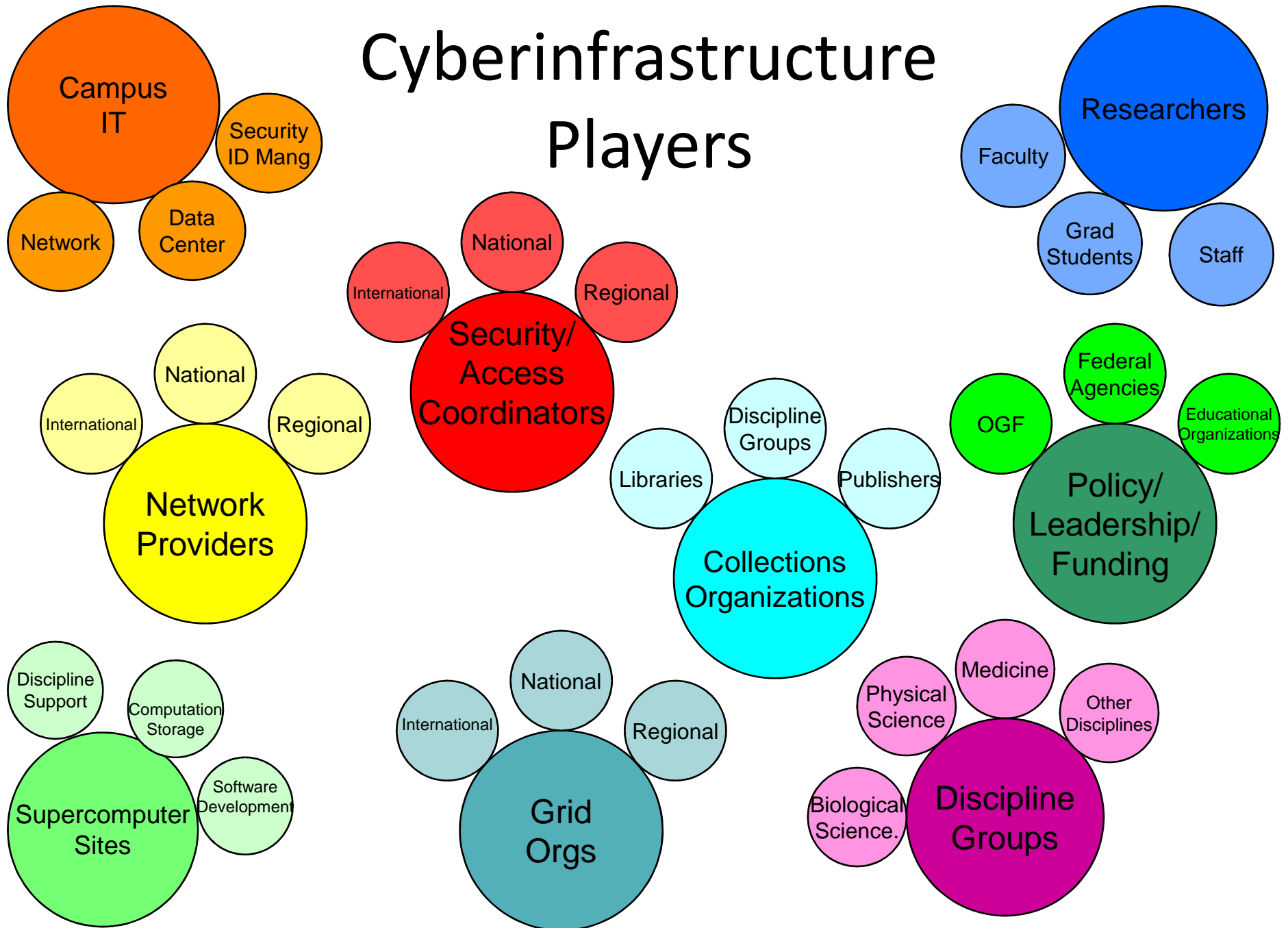
Functions and Resources



The Network is the Backplane for the Distributed CI Computer



Cyberinfrastructure Players



Traditional Grid Computing

- Built by Supercomputer Sites or in Researcher's Labs
- Support internal to discipline
- Campus IT generally not involved
- There have been problems with facilities in researcher's labs (power, HVAC, network)

Moving into CI

- Disciplines new to CI are doing their planning, but expect others to provide it.
- Campus IT organizations starting to get more involved
- Supporting organizations are figuring out how to work together.

CI is not just for Researchers

The current focus on CI is its use by Researchers. However this is an emerging technology that will be used by all, just as the individual computer and the Internet has become a regular work tool.

CI Direction

Cyberinfrastructure is moving toward including all aspects of Information Technology as a coordinated system. The “coordinated” part still needs a lot of work.

NSF has provided a vision. Next steps are needed to define an architecture and develop an implementation plan.

Users need to define the “what”. IT staff need to define the “how”.

CI Days Workshops

TeraGrid, Open Science Grid, NLR, Internet2, EDUCAUSE, and the IRNC have come together to try to help better understand the CI picture, and to better coordinate functions and roles in the creation of this infrastructure.

One activity started by this group is “CI Days” held for campuses to assist in their CI planning. This workshop brings together players from the campus, region and nation to share information and plan how to provide CI functions for the campus. The national and regional groups will also learn the campus needs to help better direct the evolution of the services.

CI Days

- Campus Based
 - Involve the whole campus. It's local so they will come
 - Discover the needs and driving factors
 - Get everyone on the same page
 - Launch the campus CI planning and implementation
- Regional Based
 - Serve as a way to scale CI Days
 - Representatives from campuses can go home and expand the experience for their campus environment

Other Activities

- Presentations and Workshops
- CI Days Web/Wiki
 - www.cidays.org
- Collect Campus CI Plans
 - Let campuses share their plans with others on the CI Days Wiki

Russ' CI Vision

Set of tools and resources that allow:

- Computation and Storage to easily allow transition from the desktop, to the campus resource, to the regional center, to national super centers using the same software.
- Data repositories in formats and locations to allow ease of sharing among all interested disciplines (the real digital library!)
- Tools to allow people to easily construct systems to analyze, visualize and simulate their research subjects.
- Collaboration tools that allow people to work together like they are in the same room, even if they aren't.

More Info

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