

# Understanding Servers

IT4GIS  
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## What is a server?

- Desktop
- Workstation
- Server



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## Functional Roles

- Data Storage
- Application Host
- GeoProcessing
- Spatial Data Management
- Website Host
- E-mail

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## Data Storage

- The role of hardware
  - NAS (network attached storage)
  - SAN (storage area network)
  - DAS (direct attached storage)
  - [other]
- Your role
  - Delete unnecessary data
  - Apply best data type (vector attribute tables and raster file formats)

Grid or GeoTIFF?

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## Data Storage: Fault Tolerance

- RAID=Redundant Array of Inexpensive Disks
- Hardware or software implementation
- Level 0,1,5,10
- Minimum four disks on server
- Hard disk types
  - SCSI, IDE, etc.
  - Hot-swappable

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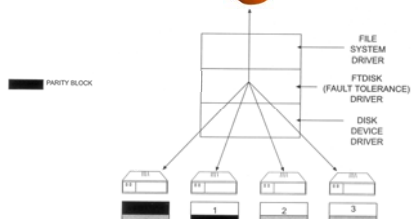
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## Data Storage: The Way Fault Tolerance Works!



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## Data Storage: RAID and RAIS

- Redundant Array of Inexpensive Disks
- Redundant Array of Inexpensive Servers

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## Hints and Tips: The 5-nines

- 99.999% of the time...
- Servers are operational and functioning
- How much down-time does this allow?
  - 5 minutes!
  - No longer even a goal!
  - Why?



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## Application Host

- GIS software-host server (application server)
- GIS software license server



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## GeoProcessing

- ArcGIS for Server software resides on server with GeoProcessing Services running
- Clients have the desktop or workstation application installed
- Large tasks are processed by the server via web interface
  - Can more fully utilize available processors and RAM

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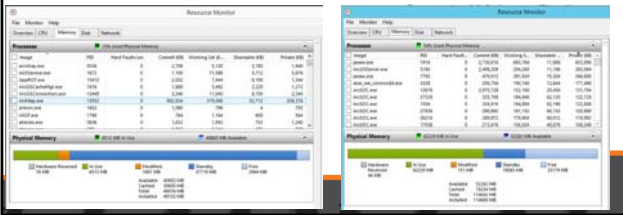
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## Why are Servers Faster?

- More RAM and more CPU cores (yes)
- But more importantly, a different architecture in RAM and CPU usage and allocation




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## Spatial Data Management

- SDE = Spatial Database Engine
- Requires DBMS
- ArcSDE
- Spatial library organized with a RDBMS



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## Web Server

- IIS
  - Overview of structure on host server
  - Client access (<http://giscenter.isu.edu>)
- ArcGIS for Server
  - Serving maps



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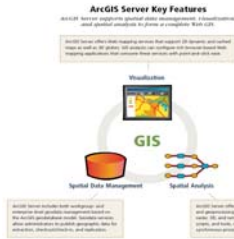
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## ArcGIS for Server



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## Types of Server Hardware

- Glorified desktops
- Standard Rack-based
- Blade
  - Rack based, but not limited to 42 Units
  - Can contain more than CPUs
- ISU's Research Data Center (RDC)

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## Professional Tips

- Data folder for clients
- Data liability policy
- Use of Temp folders
- System Administration:
  - Do not allow write access from remote clients anywhere on your system!
- Security
  - Web access is principal security threat
  - FTP is a primary avenue for intrusion
  - Dynamic IP addressing

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## Applying Security to Your Server

- Reactive:
  - TCP/IP exclusion
- Proactive
  - Service packs
  - Updating anti-virus dictionaries
  - Disabling and uninstalling FTP
  - Firewalls

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## Security (cont'd)

- Backup your data
  - Mission critical
  - Critical
  - Non-critical data

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## Key Concepts

- A server is best defined by its **Functional Role**.
- You should now know several roles for GIS servers.
- Fault tolerance addresses **data integrity**.
- Proactive security measure address **data security**.

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## Questions...Assignment



Get ready for the 2-minute write

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