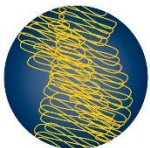


What is a server?



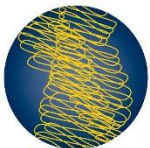
Genomics for
Social Scientists
NATIONAL INSTITUTE ON AGING



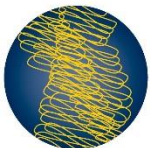
What are servers/server clusters?

- A **server cluster** is a collection of servers, called nodes that communicate with each other to make a set of services highly available to clients.

- Data storage
- Computation



Server versus everyday computers

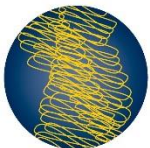


Why do we use them?

- A single byte (or 8 bits) can represent 4 DNA base pairs. In order to represent the entire diploid human genome in terms of bytes, we can perform the following calculations:

$$6 \times 10^9 \text{ base pairs/diploid genome} \times 1 \text{ byte}/4 \text{ base pairs} = 1.5 \times 10^9 \text{ bytes or 1.5 Gigabytes (per person!)}$$

- Single file of **COMPRESSED** genotyped-only variants (2.5×10^5) for 19,000 Health and Retirement Study participants is 10.5GB



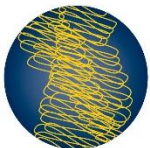
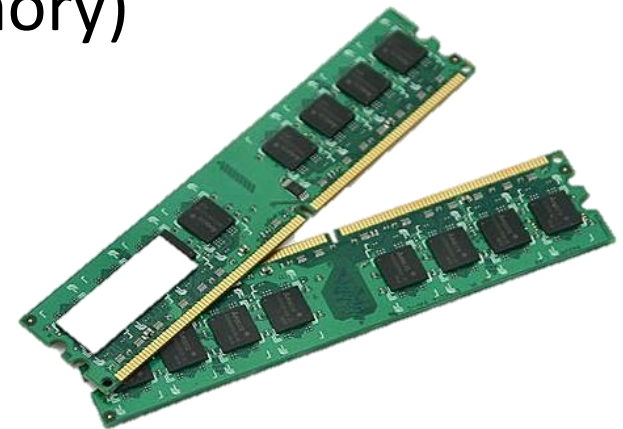
Should I use a server?

• Data & analysis considerations:

• Memory

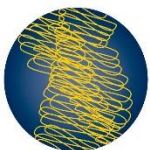
- Storage (hard disk, CD/DVD, Floppy, Flash Drive, Memory card, Tape)
- RAM (Random Access Memory)

• Security



Summary

- Servers are just computers that are optimized to talk to other computers
- Whether or not you use them depends on your data, computation, and security needs
- You should consider memory (storage and processing power) and whether a personal computer would be powerful enough



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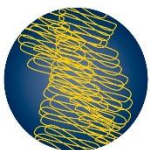
MiCDA

Michigan Center on the
Demography of Aging



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