

Parallelization and Remote Servers

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Objectives

Remote Servers: Why Bother?

The Basics: How Do Computers Work?

- ▶ Computation: CPUs

“Why is my code so slow”

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 - ▶ Each CPU has 1 or more cores

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 - ▶ Each CPU has 1 or more cores
 - ▶ Each core can do 1 computation at a time
 - ▶ Theoretical top speed = all cores active
 - ▶ Reality: cores need to communicate
- ▶ Memory: RAM vs. not-RAM
 - ▶ RAM is volatile, extremely fast, low-volume
 - ▶ Hard drive (ex. SSD) is persistent, fairly slow, high-volume
- ▶ Sidenote: GPUs and CUDA
 - ▶ Each GPU holds 100s or 1000s of “CUDA cores”
 - ▶ Each CUDA core is very small
 - ▶ Very fast for “embarassingly parallel” problems

“Why is my code so slow”

- ▶ The most common cases are:
 - ▶ You’ve run out of RAM
 - ▶ Your computer just has too many operations to do
- ▶ “How do I make it faster”
 - ▶ Run it on a bigger computer with more RAM

How to Access the QERM/SEFS Servers

Some specs

- ▶ 3 servers

Access server

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- ▶ 3 servers
 - ▶ Pilchuk

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- ▶ 3 servers
 - ▶ Pilchuk
 - ▶ Skykomish

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 - ▶ Skykomish
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- ▶ 24 cores

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- ▶ 256 GB RAM

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- ▶ Remote Desktop Connection

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- ▶ Enter computer/connection name
- ▶ Enter your netid and password

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 - ▶ download Husky OnNet from UWare

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 - ▶ Connect

A Basic R Program

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