

# SER 321 B Session

**SI Session**

**Monday, April 15th 2024**

*7:00 pm - 8:00 pm MST*

# Agenda



Consensus

Why We Care

Types & Goals

Peer To Peer Communication

RAFT

# SI Session Expectations

Thanks for coming to the **SER 321** SI session. We have a packed agenda and we are going to try to get through as many of our planned example problems as possible. This session will be recorded and shared with others.

- If after this you want to see additional examples, please visit the drop-in tutoring center.
- We will post the link in the chat now and at the end of the session.
  - [tutoring.asu.edu](https://tutoring.asu.edu)
- Please keep in mind we are recording this session and it will be made available for you to review 24-48 hours after this session concludes.
- Finally, please be respectful to each other during the session.

# Interact with us:

## Zoom Features

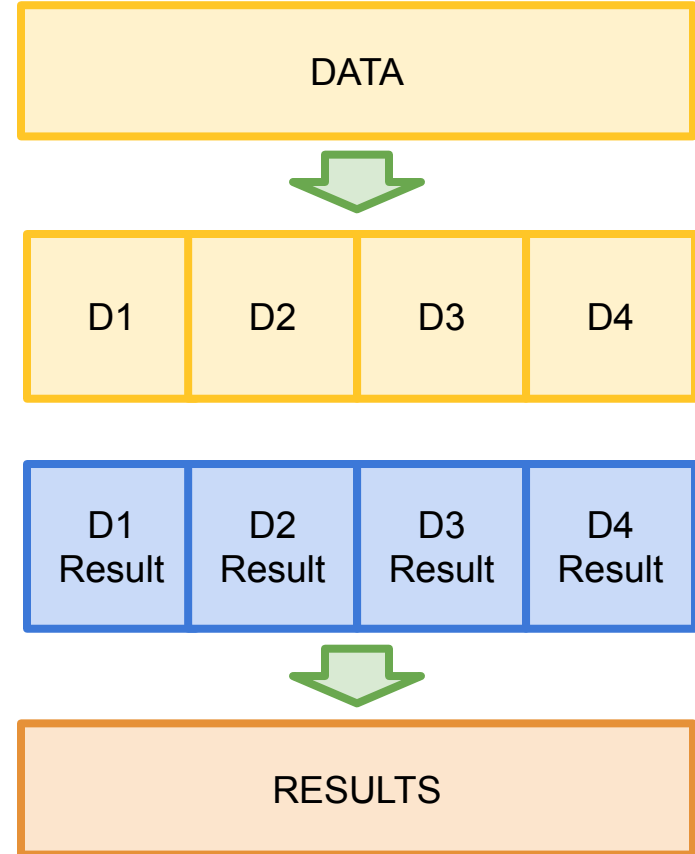
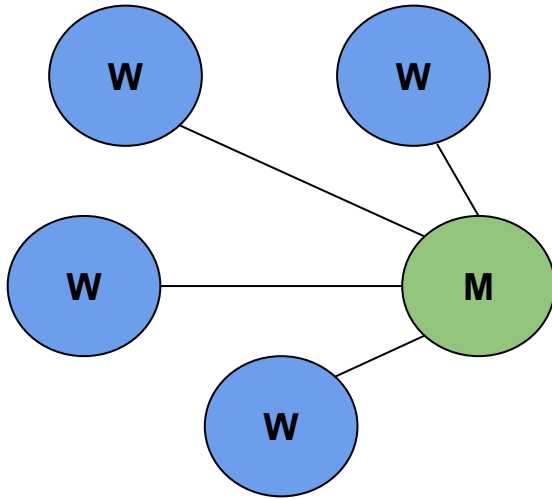


### Zoom Chat

- Use the chat feature to interact with the presenter and respond to presenter's questions.
- Annotations are encouraged

# SER 321

## Distributed Systems



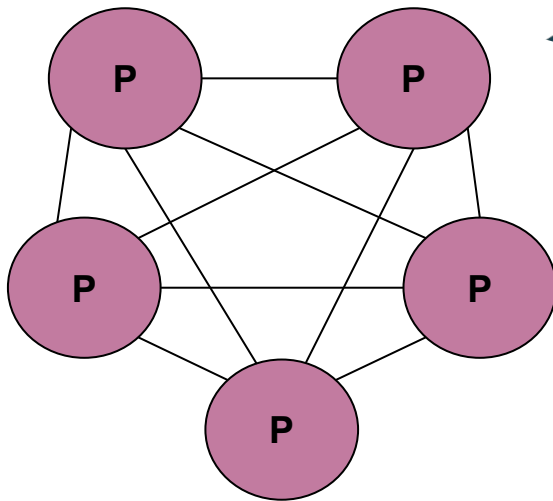
**SER 321**

**Distributed Systems**

What about Peer to Peer?

We want  
someone to  
wear the  
conductor  
hat!

A **LEADER**



How do we choose a leader?

DATA



D1

D2

D3

D4

D1  
Result

D2  
Result

D3  
Result

D4  
Result



RESULTS

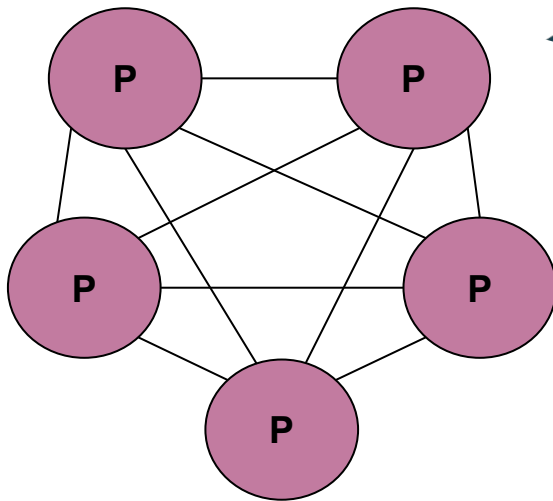
**SER 321**

**Distributed Systems**

What about Peer to Peer?

We want  
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hat!

A *LEADER*



Leader Election!

DATA



D1

D2

D3

D4

D1  
Result

D2  
Result

D3  
Result

D4  
Result



RESULTS

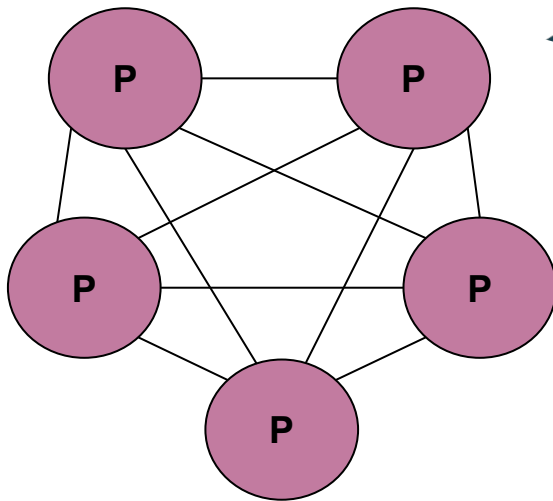
**SER 321**

**Distributed Systems**

What about Peer to Peer?

We want  
someone to  
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hat!

A **LEADER**



Leader Election!

Type of  
**CONSENSUS**

What's  
consensus?



“General agreement or  
trust amongst a group”



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## Consensus

“General agreement or trust amongst a group”

Thoughts on usage?

Leader Election



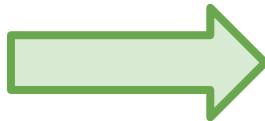
Who's in charge or keeping the beat

Verify Results



Check your work with a neighbor

Synchronize Data



Verify and maintain my copy of the data

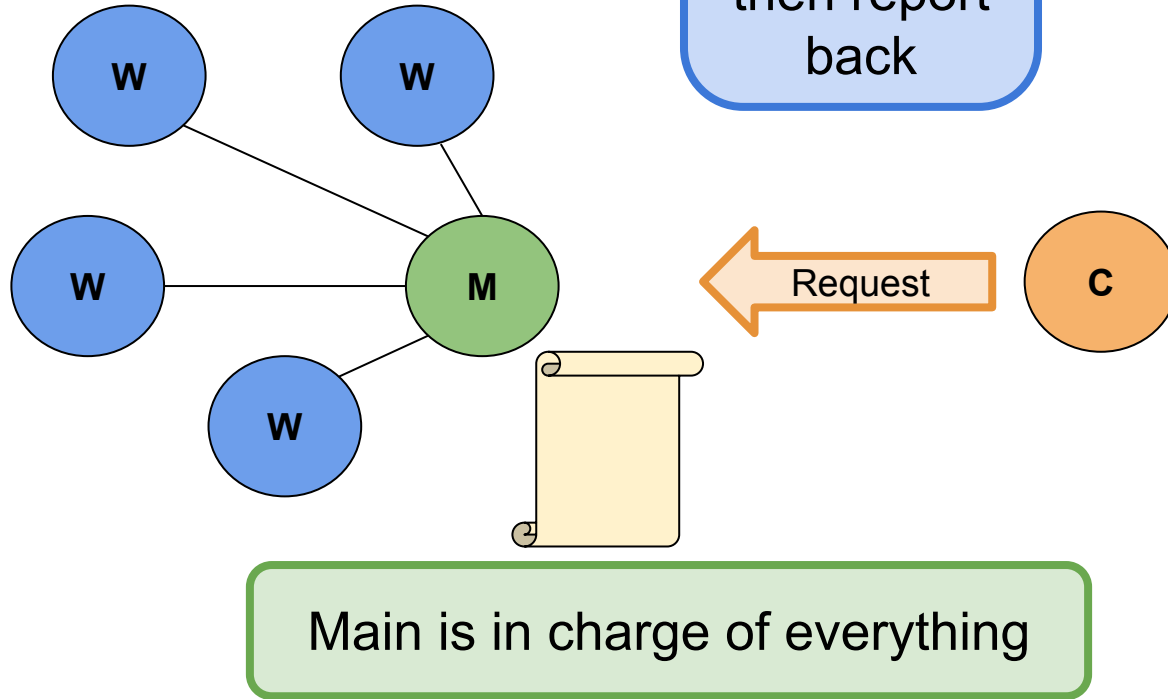
Validate Nodes



Do I want to let you into my network

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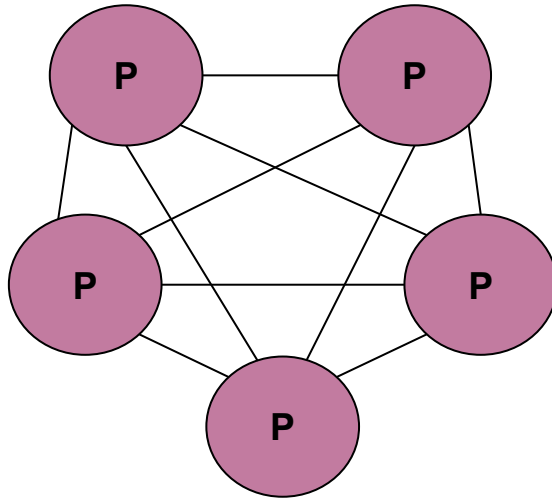
## Communication



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## Communication

How do we handle the client in a Peer to Peer system?



Request is sent to the  
*current leader*

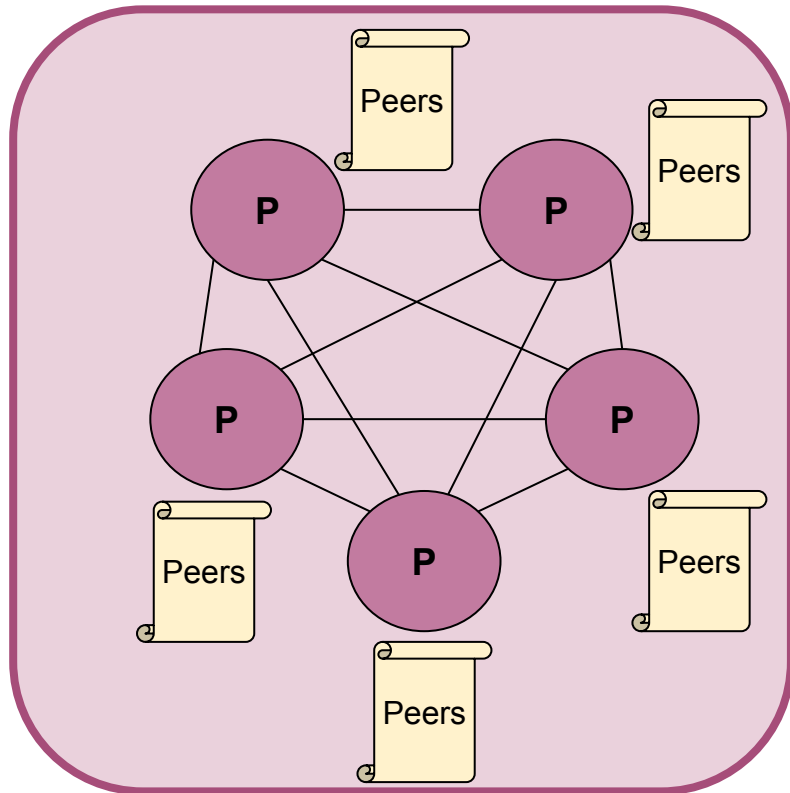
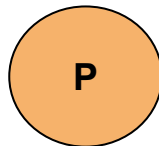
or

Peer that received the  
request *acts as the leader*

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**Communication**

What about *adding* a Peer to the Cluster?



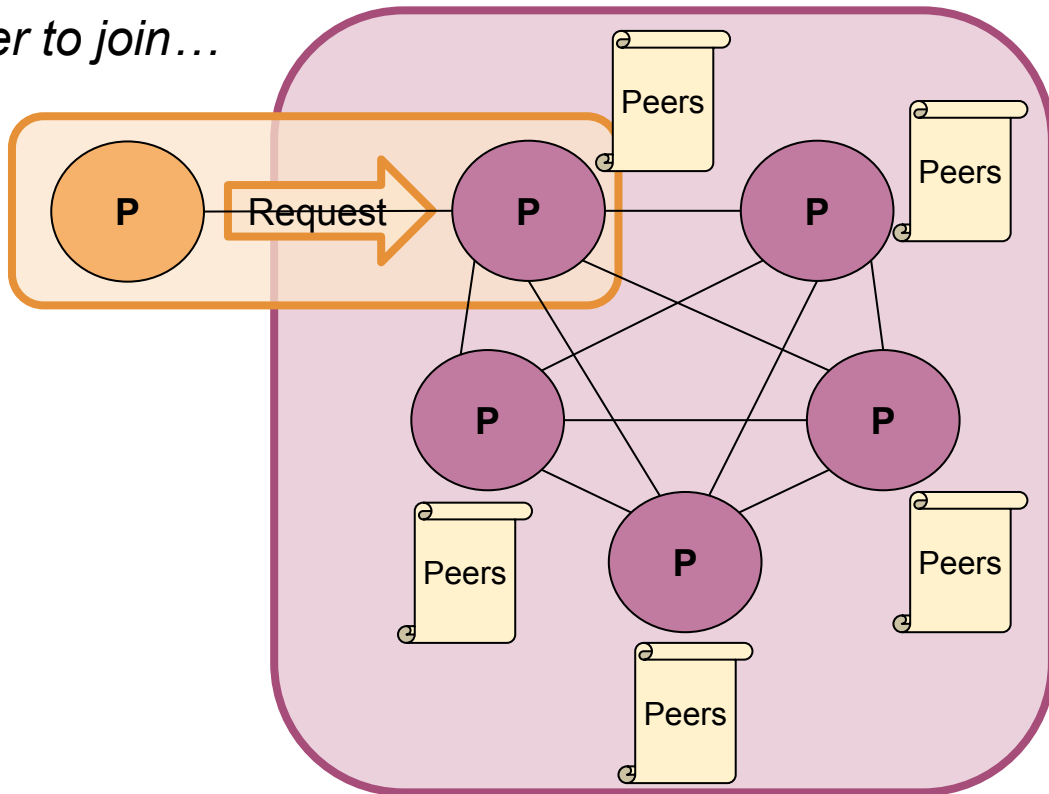
# SER 321

## Communication

What about **adding** a Peer to the Cluster?

*Assuming we want to allow the peer to join...*

Is that all?



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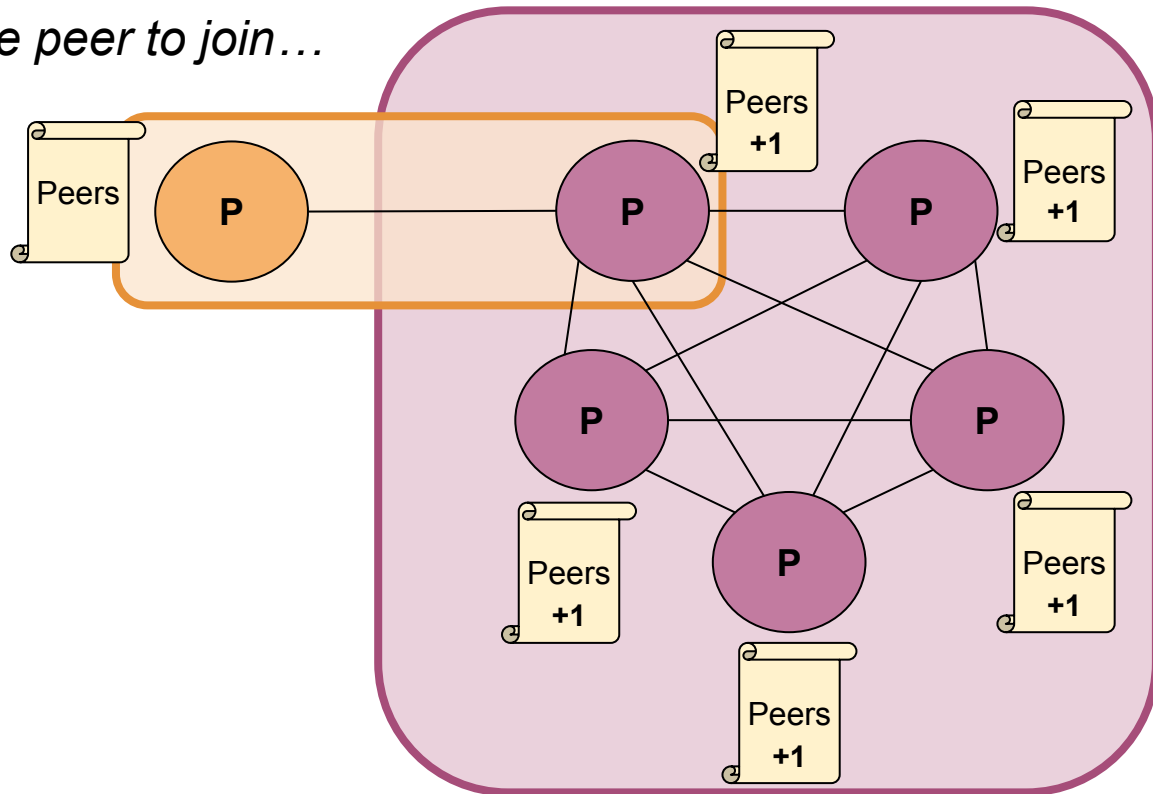
## Communication

What about **adding** a Peer to the Cluster?

*Assuming we want to allow the peer to join...*

Three Additional Steps:

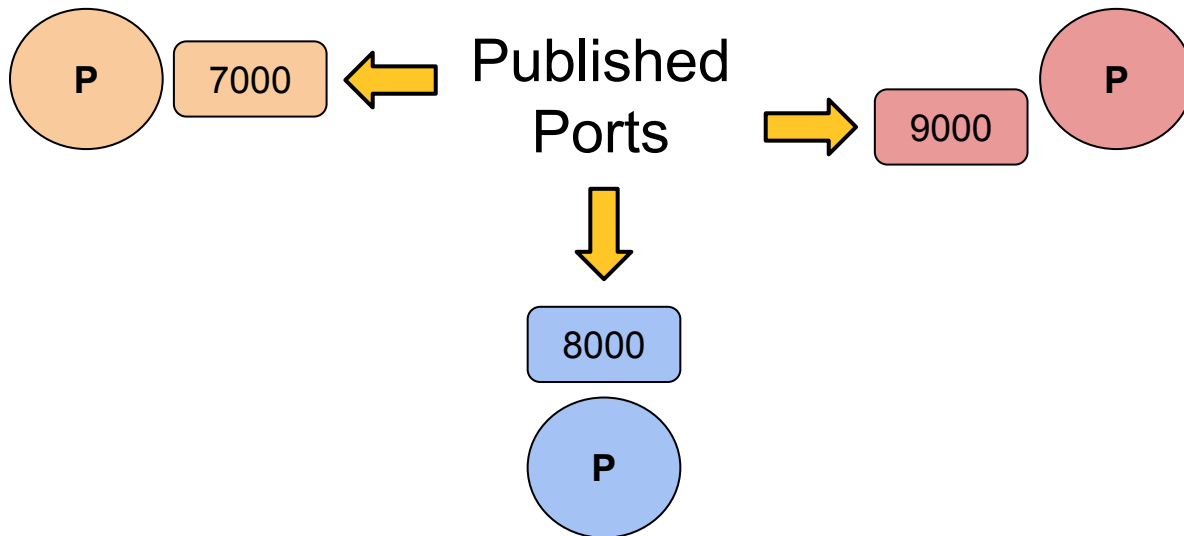
- 1.
- 2.
- 3.



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## Communication

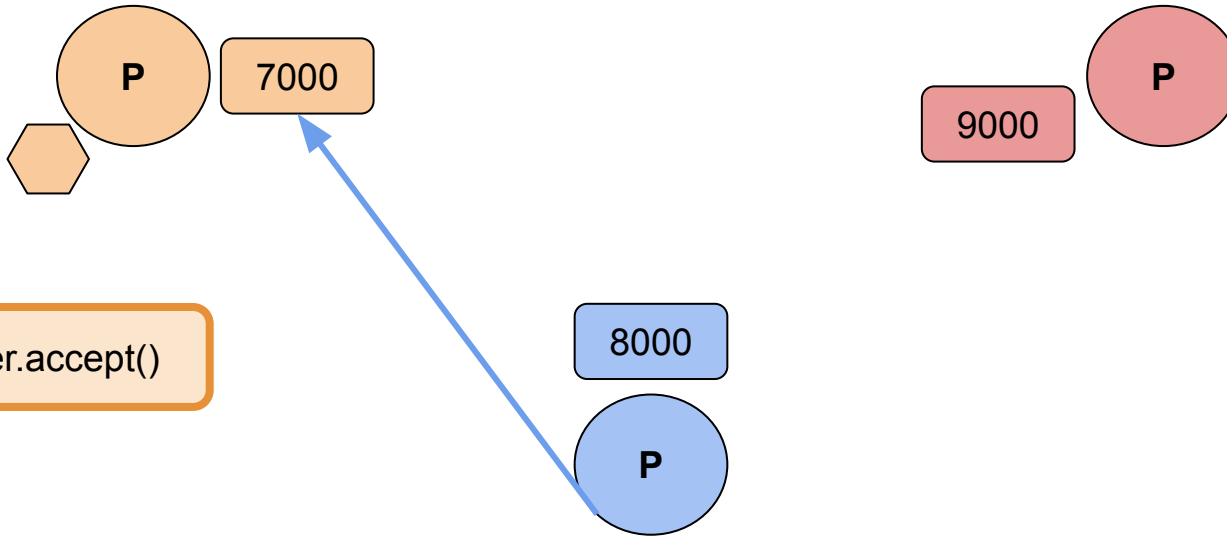
Remember that the OS allocates a new port for the client socket!



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## Communication

Remember that the OS allocates a new port for the client socket!



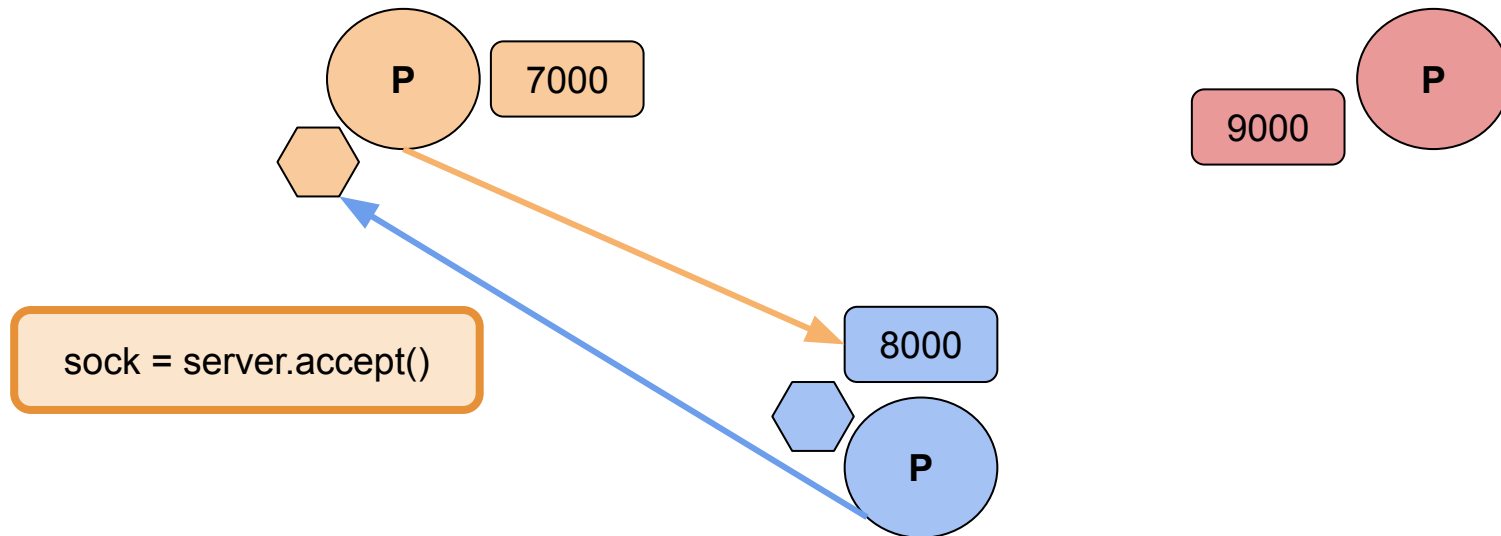
```
sock = server.accept()
```



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## Communication

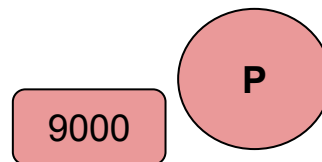
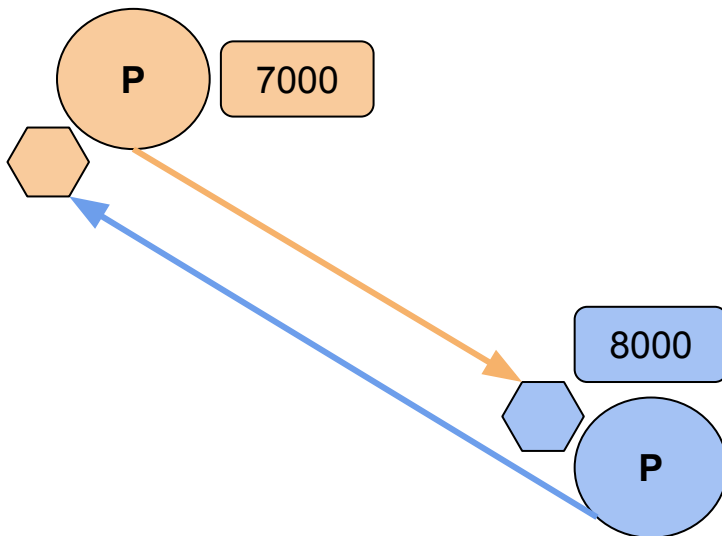
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**Communication**

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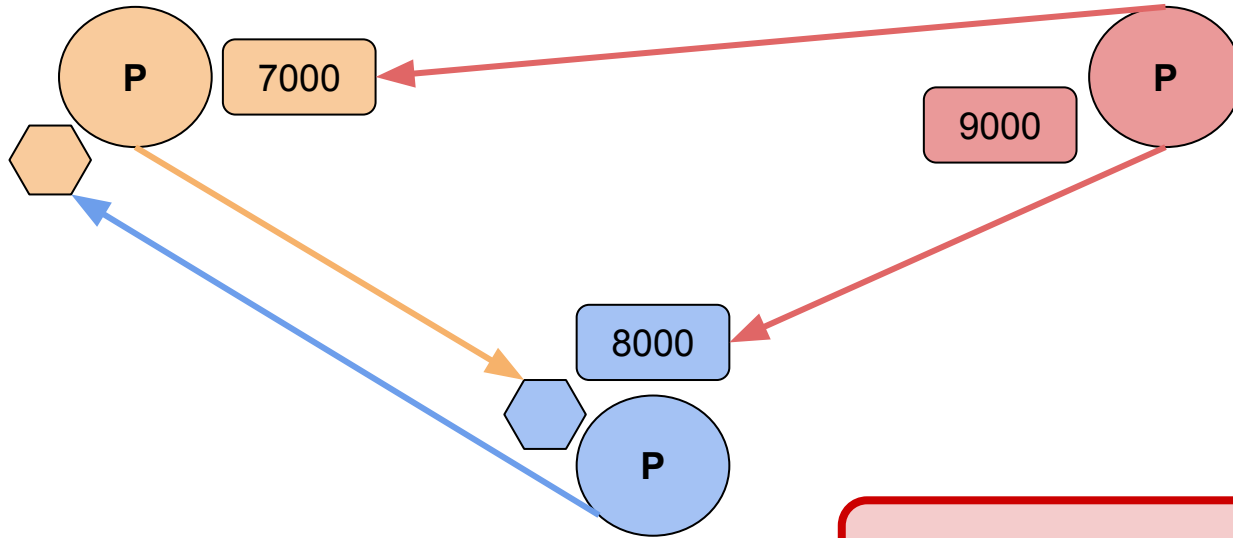


What about Peer 9000?

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## Communication

Remember that the OS allocates a new port for the client socket!

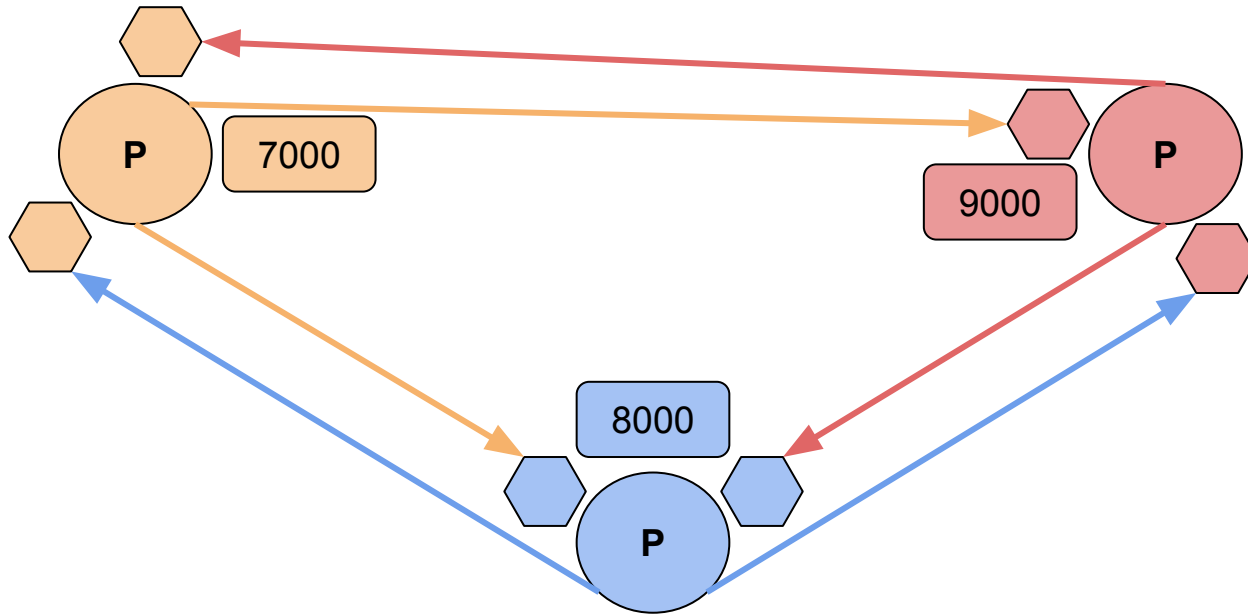


What about Peer 9000?

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## Communication

Remember that the OS allocates a new port for the client socket!



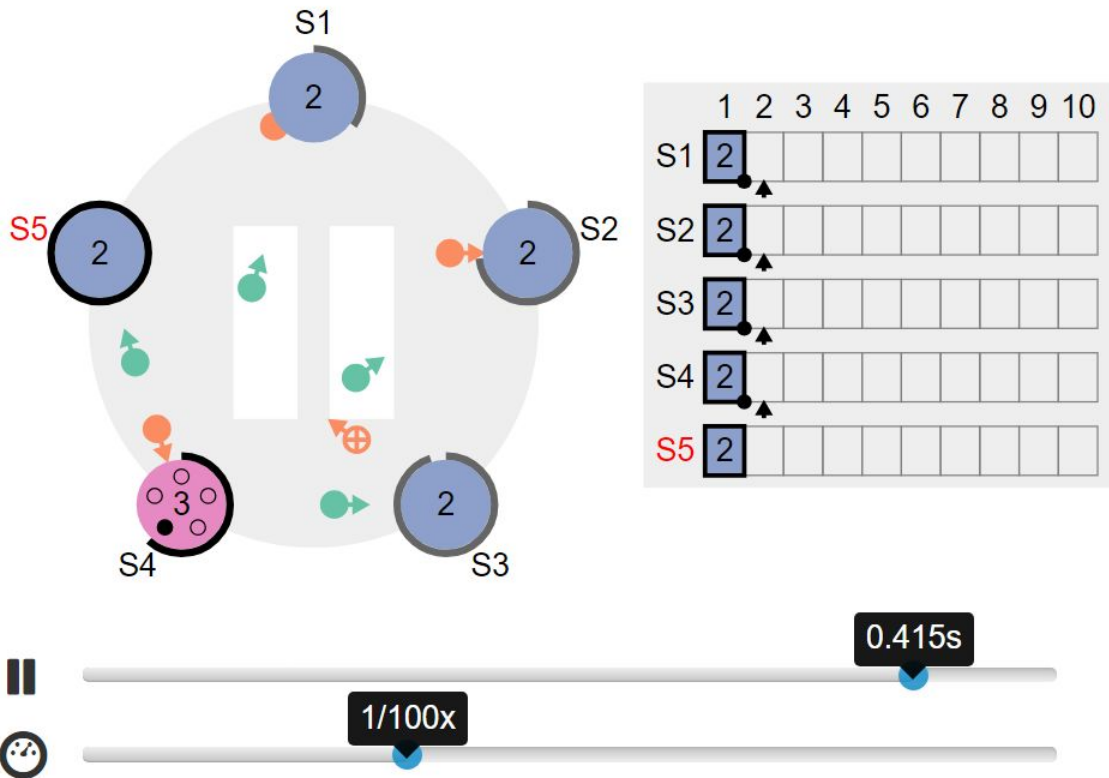
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## RAFT

RAFT is a  
great  
consensus  
example!

Leader Election

Log Replication



[The Secret Lives of Data](#) is a different visualization of Raft. It's more guided and less interactive, so it may be a gentler starting point.

# SER 321

Scratch Space

# Questions?

## Survey:

<http://bit.ly/ASN2324>



## Upcoming Events

### SI Sessions:

- Thursday, April 18th at 7:00 pm MST
- Sunday, April 21st at 7:00 pm MST - **REVIEW SESSION**
- Monday, April 22nd at 7:00 pm MST - **Q&A SESSION**
- ~~Thursday, April 25th at 7:00 pm MST - **CANCELLED**~~

### Review Sessions:

- Sunday, April 21st at 7:00 pm MST
- **Thursday, April 25th Session is *cancelled***



# More Questions?

Check out our other resources!

tutoring.asu.edu



## Academic Support

Academic Support Network (ASN) provides a variety of free services in-person and online to help currently enrolled ASU students succeed academically.

### Services



#### Subject Area Tutoring

Need in-person or online help with math, science, business, or engineering courses? Just hop into our Zoom room or drop into a center for small group tutoring. We'll take it from there.

[Need help using Zoom?](#)

[View the tutoring schedule](#)

[View digital resources](#)

Go to Zoom



#### Writing Tutoring

Need help with undergraduate or graduate writing assignments? Schedule an in-person or online appointment, access your appointment link, or wait in our drop-in queue.

[Access your appointment link](#)

[Access the drop-in queue](#)

Schedule Appointment



#### Online Study Hub

Join our online peer communities to connect with your fellow Sun Devils. Engage with our tools to search our bank of resources, videos, and previously asked questions. Or, ask our Tutorbot questions.

Now supporting courses in Math, Science, Business, Engineering, and Writing.

Online Study Hub

1-

Go to Zoom

2-

[Need help using Zoom?](#)

[View the tutoring schedule](#)

[View digital resources](#)






1. Click on 'Go to Zoom' to log onto our Online Tutoring Center.
2. Click on 'View the tutoring schedule' to see when tutors are available for specific courses.

# More Questions?

## Check out our other resources!

[tutoring.asu.edu/online-study-hub](https://tutoring.asu.edu/online-study-hub)

 **Academic Support Network**

 [Services](#)  [Faculty and Staff Resources](#) [About Us](#) 

[University College](#)

## Online Study Hub

Online peer communities for students and tutors, YouTube channels, and Tutorbots.



### What are online peer communities?

Individual courses have an online peer community that allows you to connect with your peers to post and answer questions and to develop study groups.



### How can tutoring center videos help?

Videos can help supplement the learning you're doing in and outside of class and include step-by-step methods for how to understand concepts.



### How does the Tutorbot work?

You can ask the Tutorbot questions about course concepts and the Tutorbot will recommend additional resources and examples to help address your questions.

Select a subject

- Any -

[Apply](#)



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Select a subject

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Business


### ACC 231

Uses of Accounting Info I

 [Peer Community](#)

### ACC 241

Uses of Accounting Info II

 [Peer Community](#)

### CIS 105

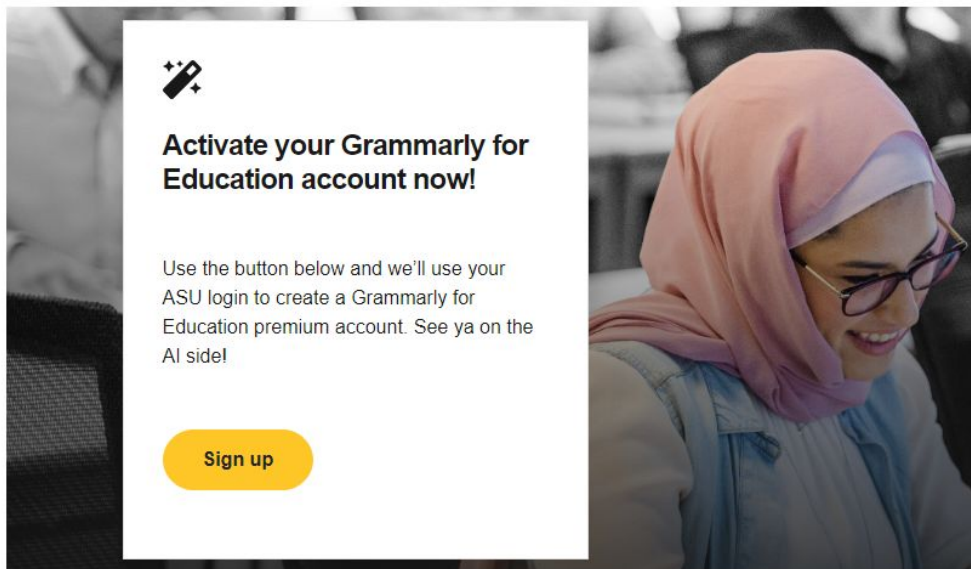
Computer Applications and Information Technology

 [Peer Community](#)

Don't forget to check out the Online Study Hub for additional resources!

# Expanded Writing Support Available

Including Grammarly for Education, at no cost!



[tutoring.asu.edu/expanded-writing-support](https://tutoring.asu.edu/expanded-writing-support)

\*Available slots for this pilot are limited

## Additional Resources

- [Course Repo](#)
- [Gradle Documentation](#)
- [GitHub SSH Help](#)
- [Linux Man Pages](#)
- [OSI Interactive](#)
- [MDN HTTP Docs](#)
  - [Requests](#)
  - [Responses](#)
- [JSON Guide](#)
- [org.json Docs](#)
- [javax.swing package API](#)
- [Swing Tutorials](#)
- [Dining Philosophers Interactive](#)
- [Austin G Walters Traffic Comparison](#)
- [RAFT](#)