

SER 321 A Session

SI Session

Wednesday September 20th 2023

6:00 - 7:00 pm MST

Agenda



Parallel vs. Distributed Systems

Distributed Structure Review

Main and Worker

Peer to Peer

Consensus Review

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
- 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

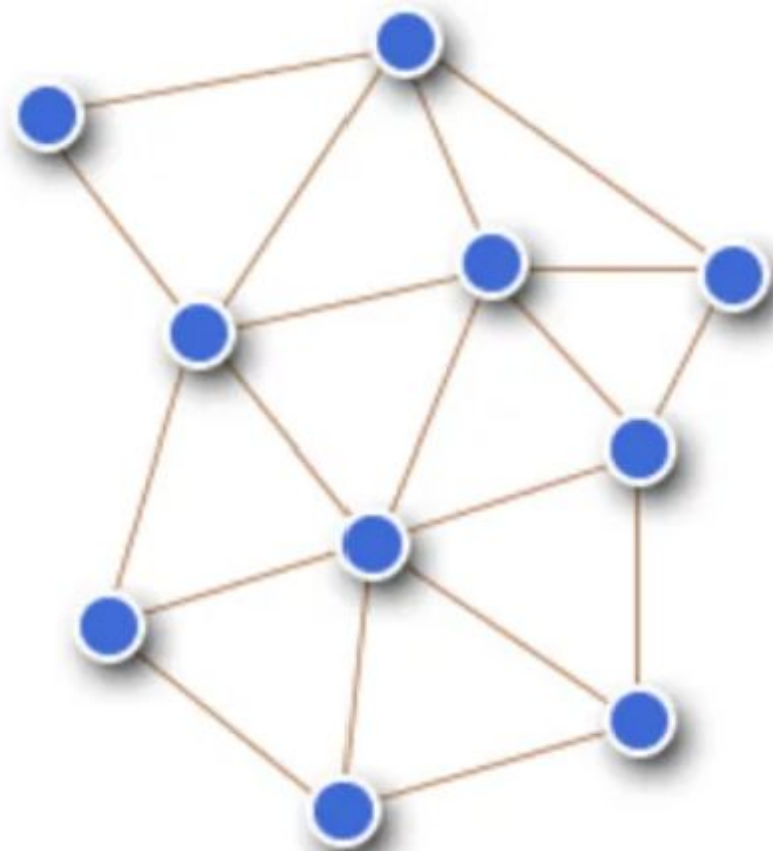
- Use the chat feature to interact with the presenter and respond to presenter's questions.
- Annotations are encouraged

SER 321

Distributed Systems

What do we mean by distributed system again?

- Appears to be a single system from the outside
- Made up of many nodes
- Nodes communicate
- Nodes are independent
- No Global Clock
- Nodes can fail



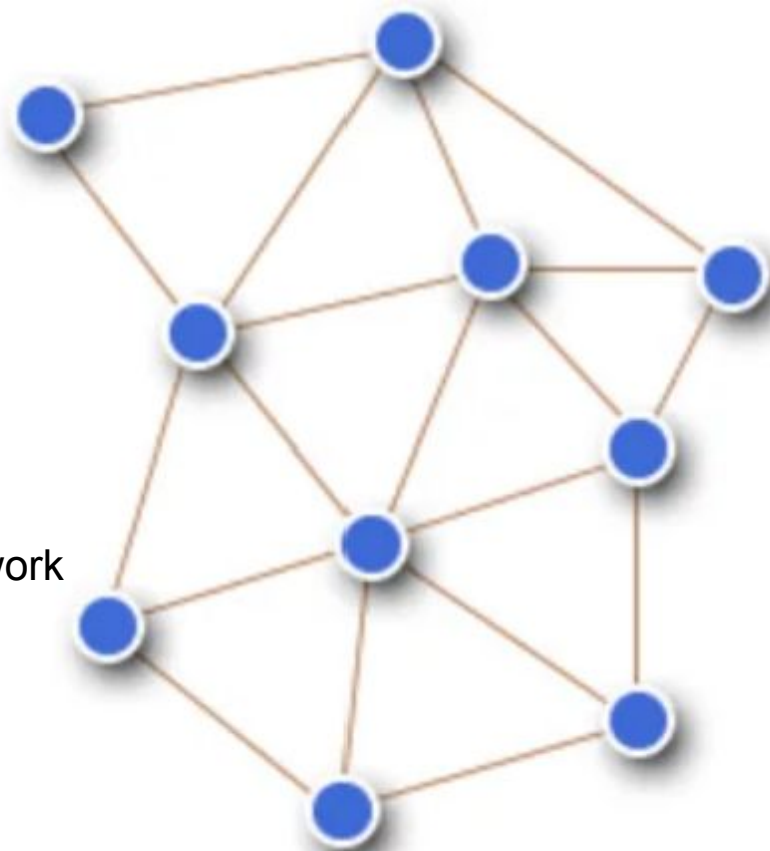
SER 321

Distributed Systems

Then a distributed algorithm would be...

Algorithms using distributed systems!

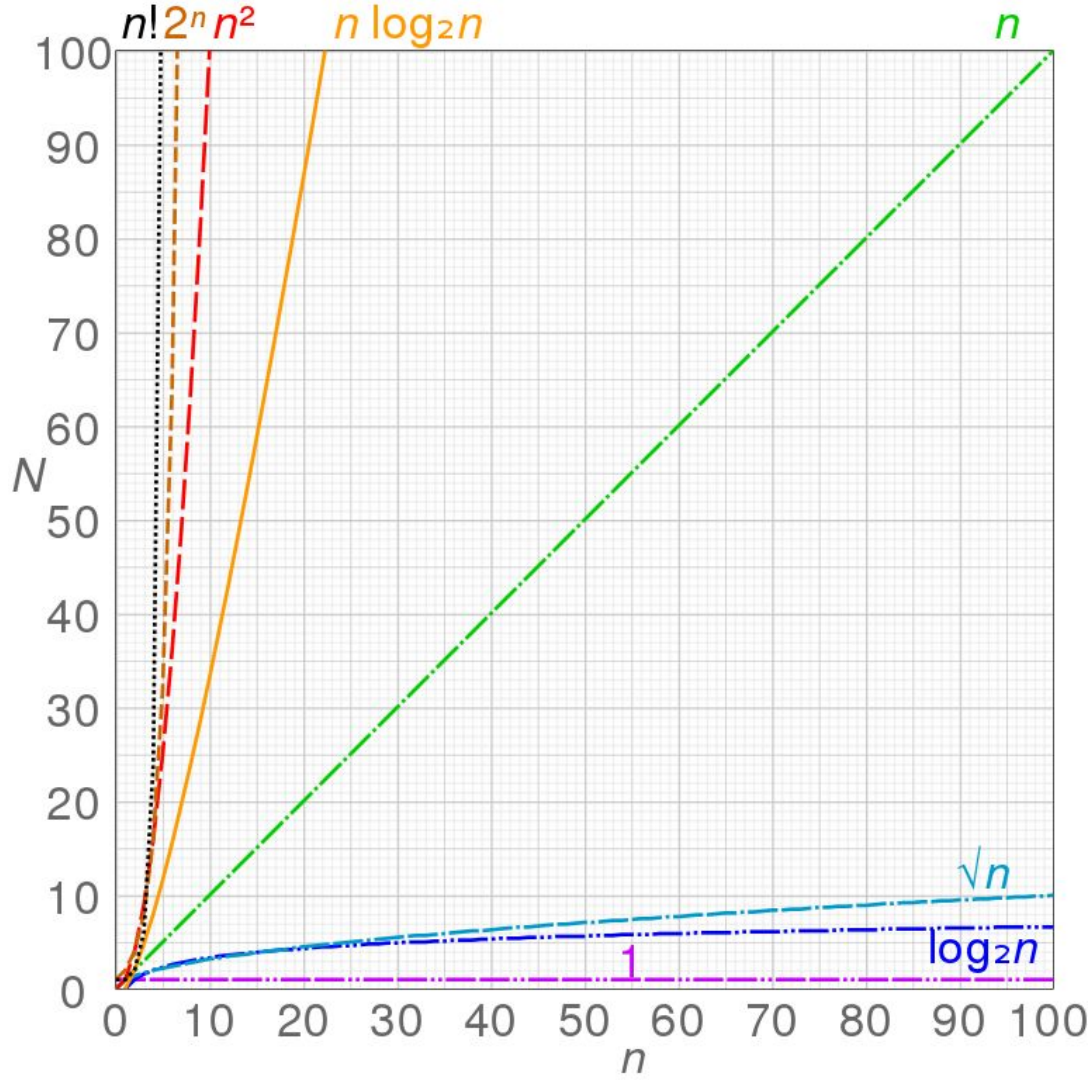
- Each node is going to perform a “share” of the work
- May save memory
- Can be faster
- Can be slower!
 - Do we remember Big-Oh?



SER 321

Distributed Systems

Really only going to be truly “worth it” for excessively large orders.



SER 321

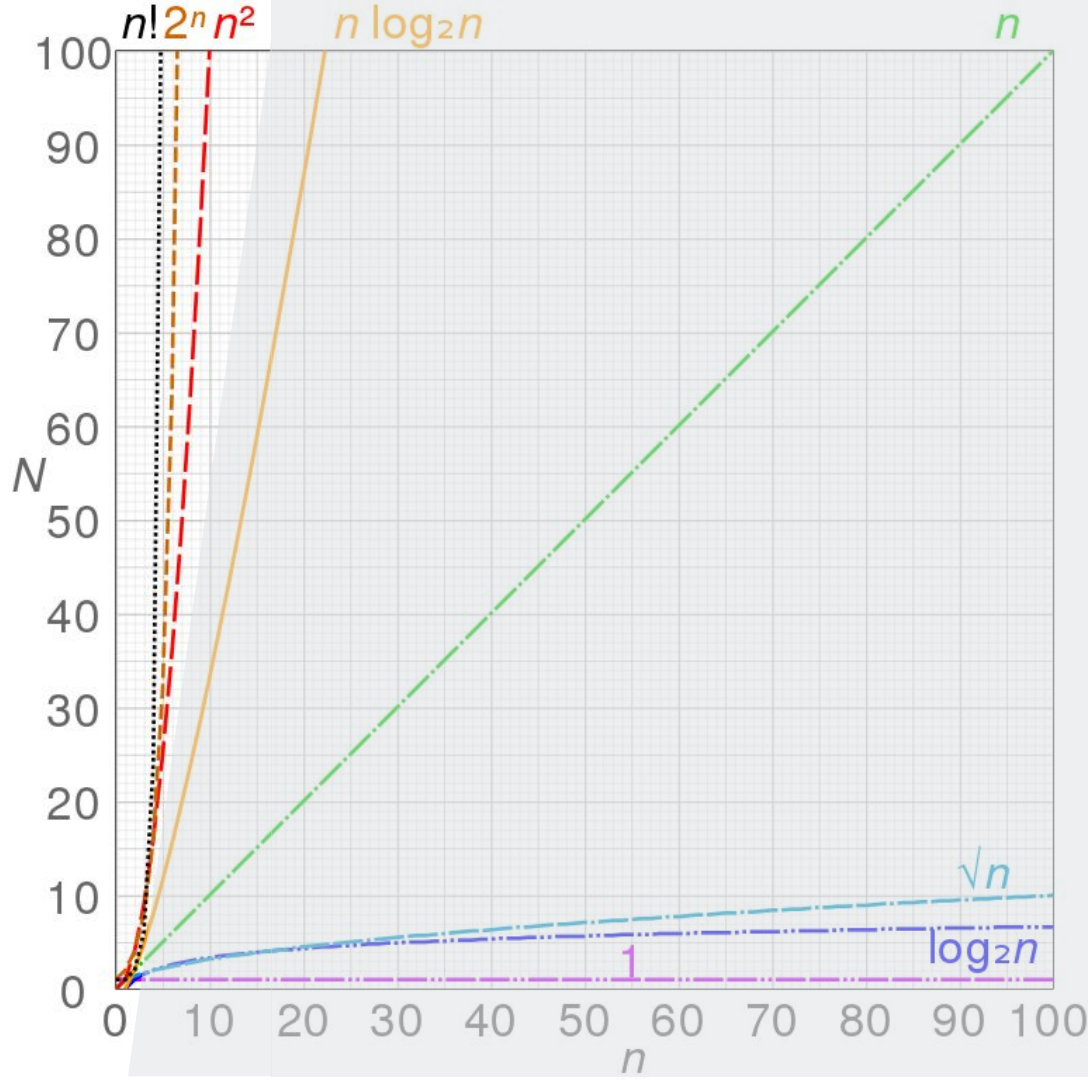
Distributed Systems

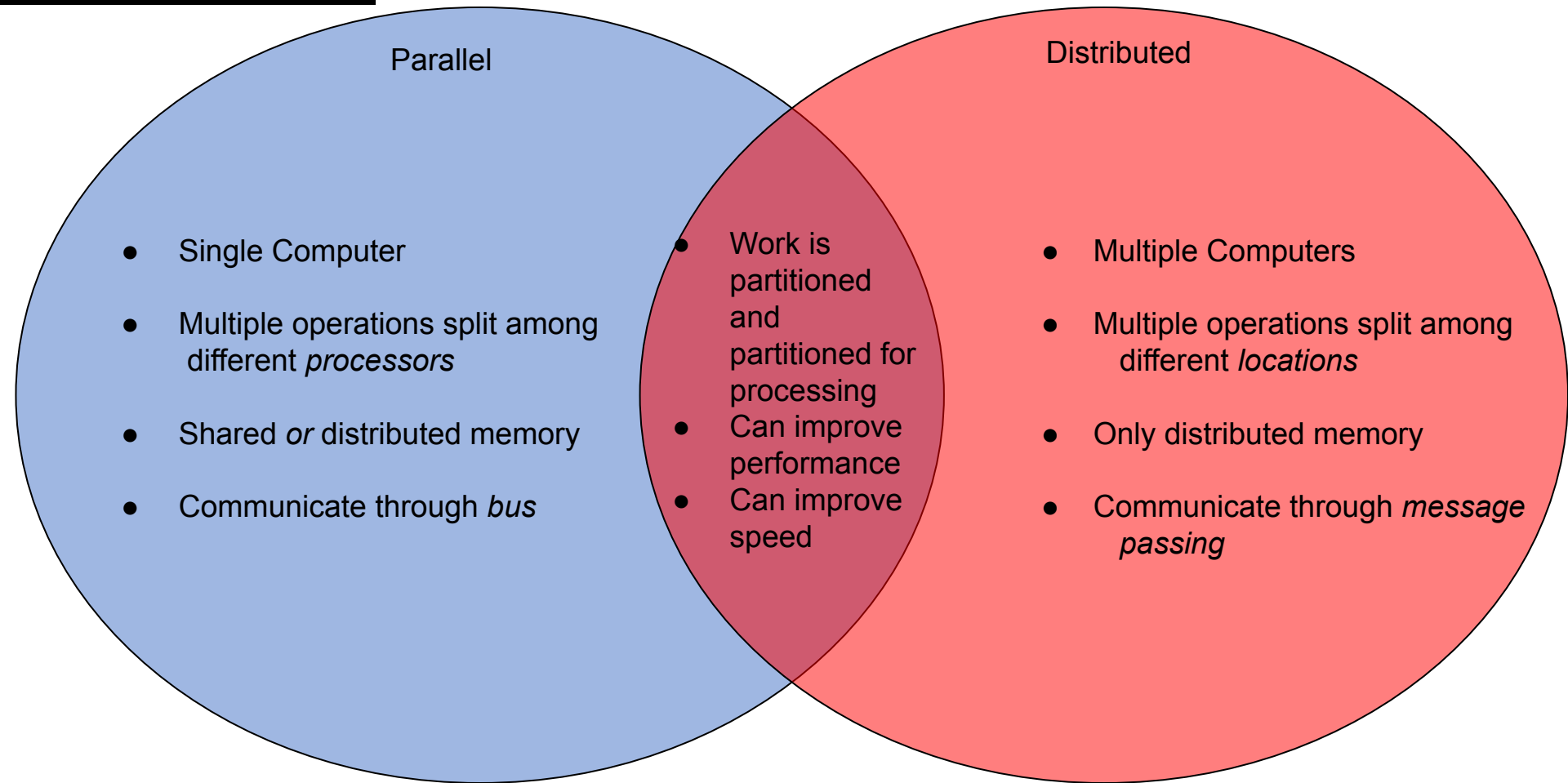
Really only going to be truly “worth it” for excessively large orders.

Think enormous amounts of data with very large orders

One system may not be able to handle it!

Then it makes sense to partition and divvy up the work



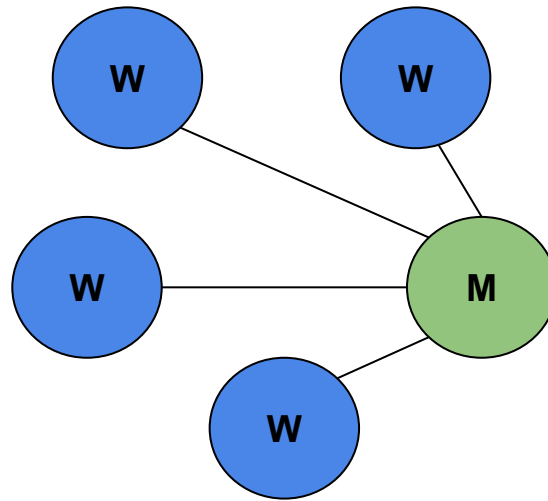


SER 321

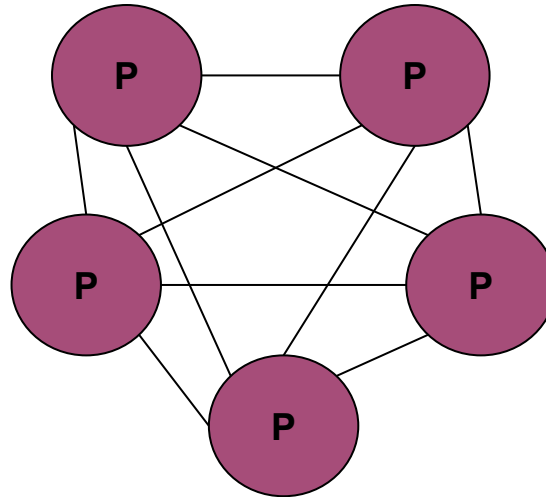
Distributed Structures

Two main forms:

Main and Worker



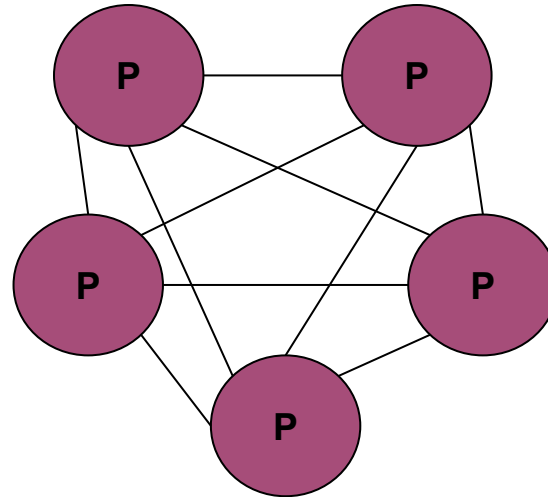
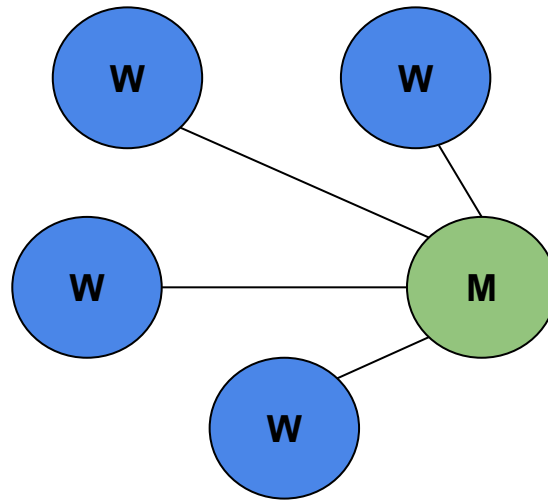
Peer to Peer



SER 321

Distributed Structures

Peer to Peer **may or maynot** have a leader

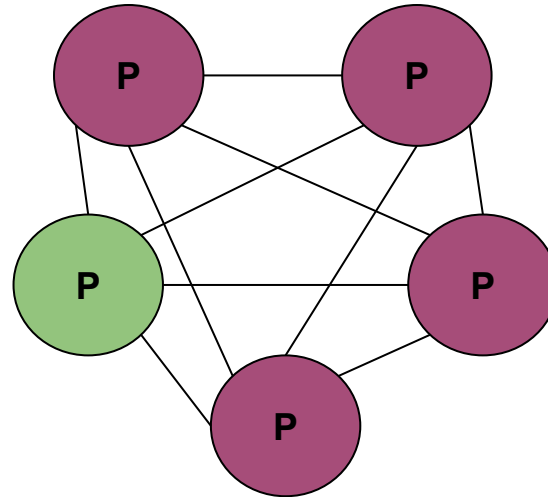
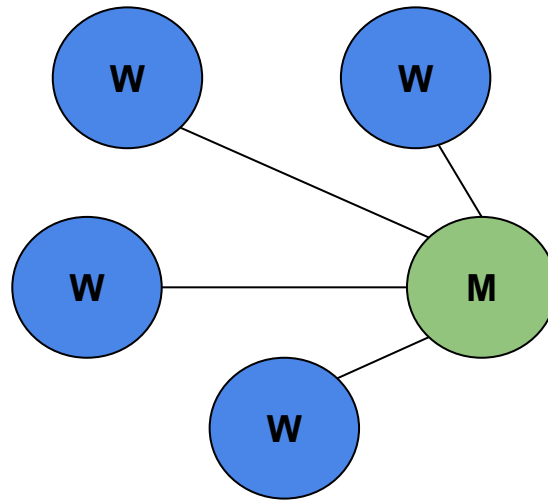


SER 321

Distributed Structures

Peer to Peer **may or maynot** have a leader

What's a leader again?



SER 321

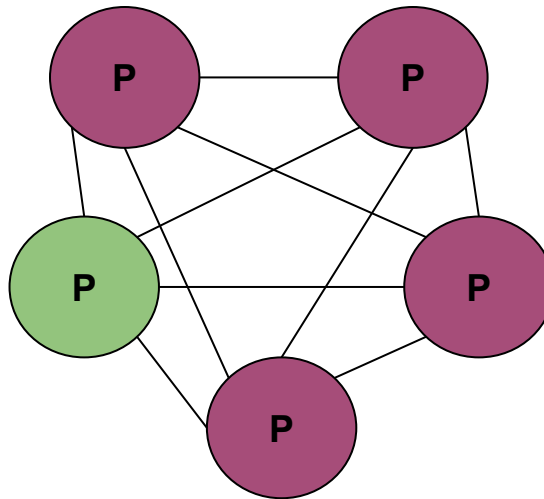
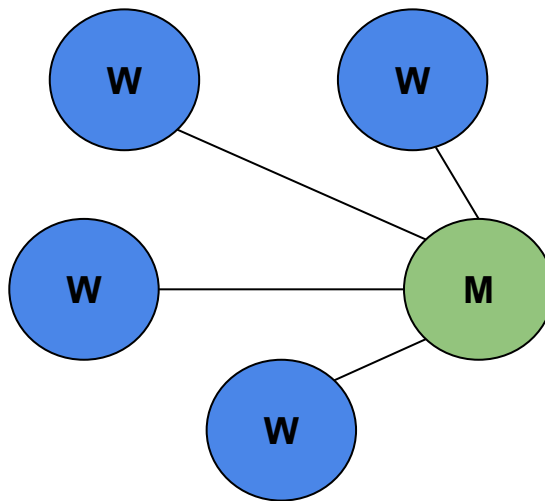
Distributed Structures

Peer to Peer **may or maynot** have a leader

What's a leader again?

A single node in the system that contains all system state and concurrency data

The node with the “true and final” list of data



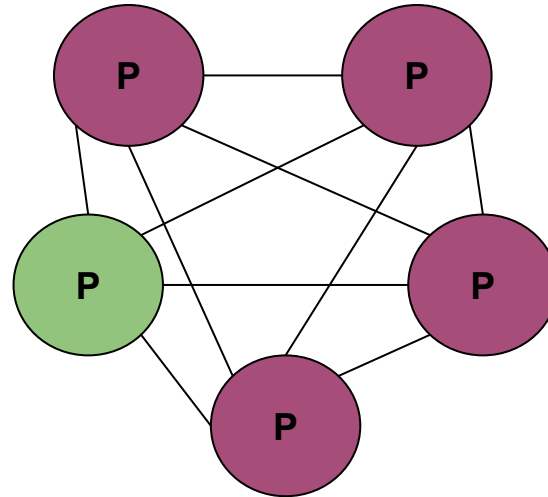
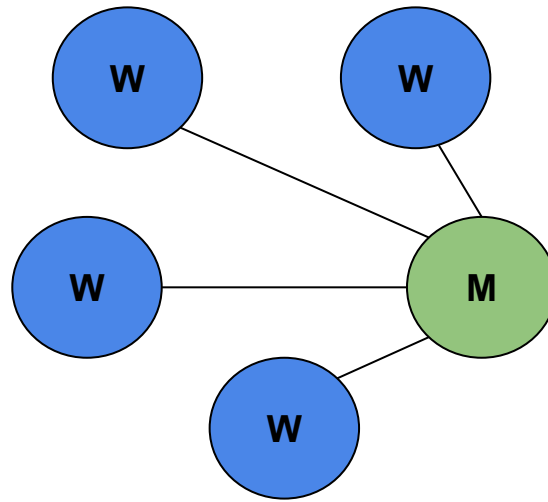
SER 321

Distributed Structures

What's the difference between the main and worker structure and the peer to peer structure with a leader?

Worker nodes do not communicate with other worker nodes

Peer nodes always communicate with *all* peers in the system



A leader is chosen in a Leader Election, a form of consensus, where each node votes for the leader.

SER 321

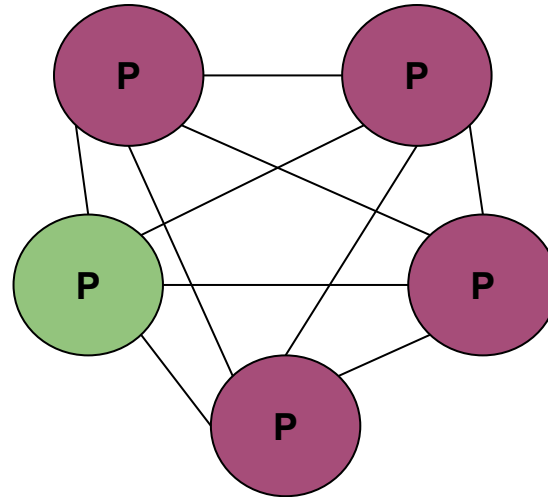
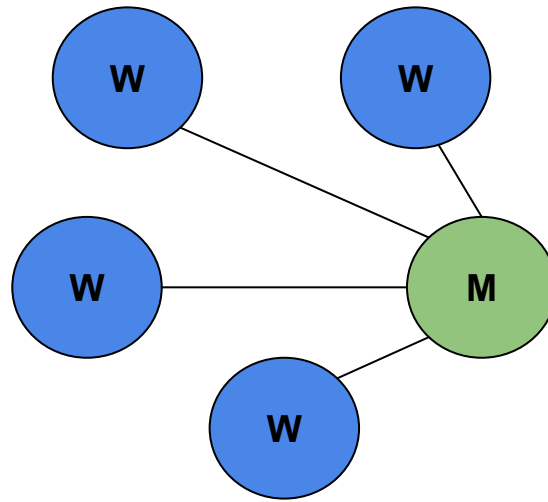
Consensus

One node sends a statement to the other nodes

Every node will agree or disagree with that statement

If the previously defined rule is met, the statement is confirmed

Otherwise, the statement is rejected



SER 321

Consensus

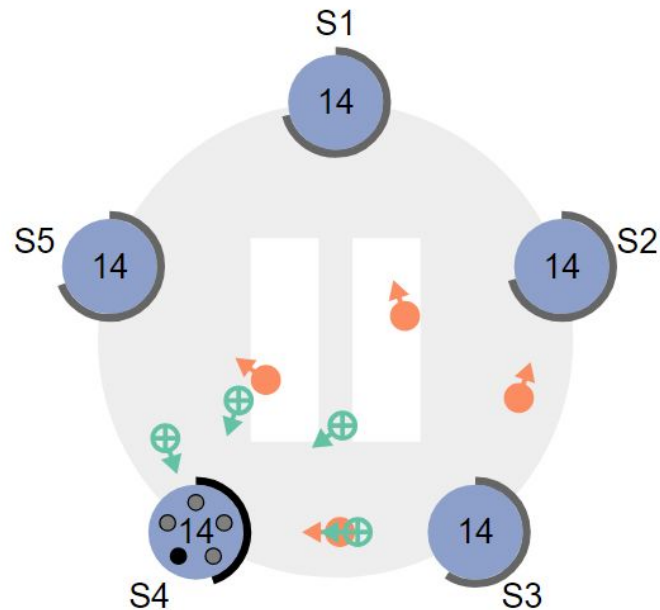
Different forms

All looking to ensure nodes agree
That nodes *trust* each other

Proof of Work

Leader Election

RAFT

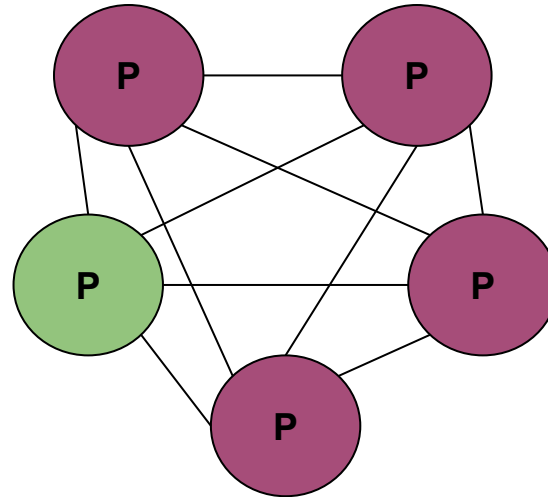
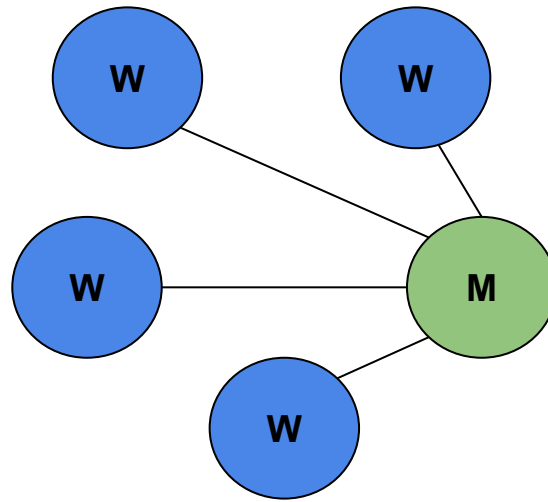


SER 321

Consensus

True or false:

Consensus only exists in Peer to Peer structures.



SER 321

This Assignment

- Think about what protocol you want to use!
- Do you want to start from scratch?
 - Maybe build off a previous assignment?
 - Start with code from the [CoureRepo](#)?
 - [SimplePeerToPeer](#)
 - [PeerToPeer](#)
- Think about the encryption you are going to use
- ***Start slow! Build in small steps***
- ***Commit often***
- Ask questions in the [#module5](#) channel

Questions?

Survey:

https://bit.ly/asn_survey



Upcoming Events

SI Sessions:

- Sunday September 24th 2023 6:00 pm MST

Review Sessions:

- TBD

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

 **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](#)



Academic Support Network



[Services](#) 

[Faculty and Staff Resources](#)

[About Us](#) 

[University College](#)

Select a subject

- Any -

[Apply](#)

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!

Additional Resources

[CourRepo](#)

[Dining Philosophers Interactive](#)

[Raft Interactive](#)