

SER 321 A Session

SI Session

Thursday, February 13th 2025

7:00 pm - 8:00 pm MST

Agenda



Protobuf Examination

Distributed Systems Overview

Parallel vs. Distributed Processing

Distributed Structures

Consensus

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



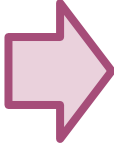
Zoom Chat

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

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Protobuf Examination

Operation Protocol for
ProtocolBuffers in
the example repo



Protobuf Lecture & Walkthrough

```
1 syntax = "proto2";
2
3 package operation;
4
5 option java_package = "buffers";
6 option java_outer_classname = "OperationProtos";
7
8 message Operation {
9     optional string val1 = 1;
10    optional string val2 = 2;
11    optional int32 base = 3;
12    enum OperationType {
13        ADD = 0;
14        SUB = 1;
15        MUL = 2;
16        DIV = 3;
17    }
18    enum ResponseType {
19        JSON = 0;
20        STRING = 1;
21    }
22    optional OperationType operationType = 4 [default = ADD];
23    optional ResponseType responseType = 5 [default = JSON];
24
25 }
```

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Protobuf Examination

What **CLASS** would you use for this?

What **FIELDS** do you add for use?

Can you change the Protobufs for the Assignments?

Protobuf Lecture & Walkthrough

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```

Check out the recording for the solution!

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Protobuf Examination

Let's request "7 x 8" in Base 10:

Solution

Protobuf Lecture & Walkthrough

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```

Check out the recording for the solution!

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Protobuf Examination

As the Server, how would you determine the requested operation type?

Operation request =
Operation.parseDelimitedFrom(in);

Solution

Protobuf Lecture & Walkthrough

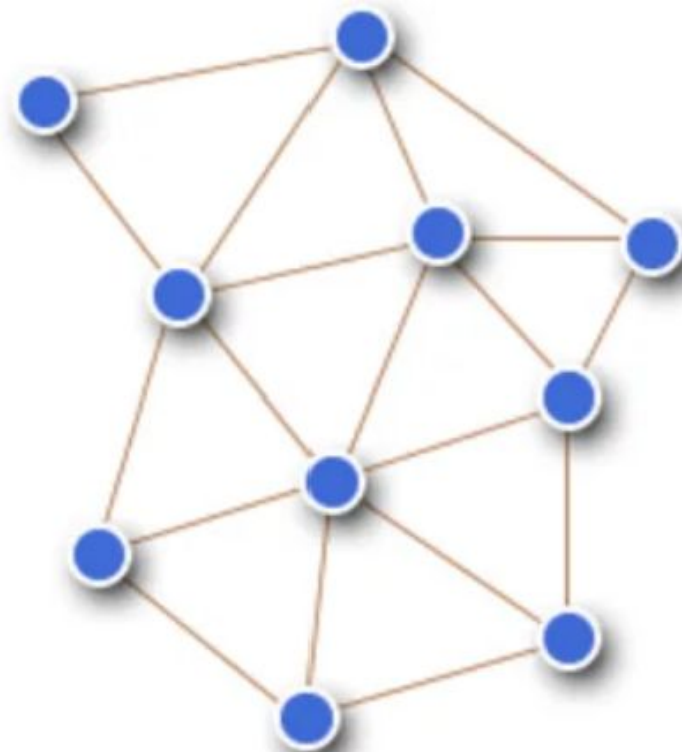
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Check out the recording for the solution!

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Distributed Systems

What do we mean by
“Distributed Systems”
or
“Distributed Algorithms”?



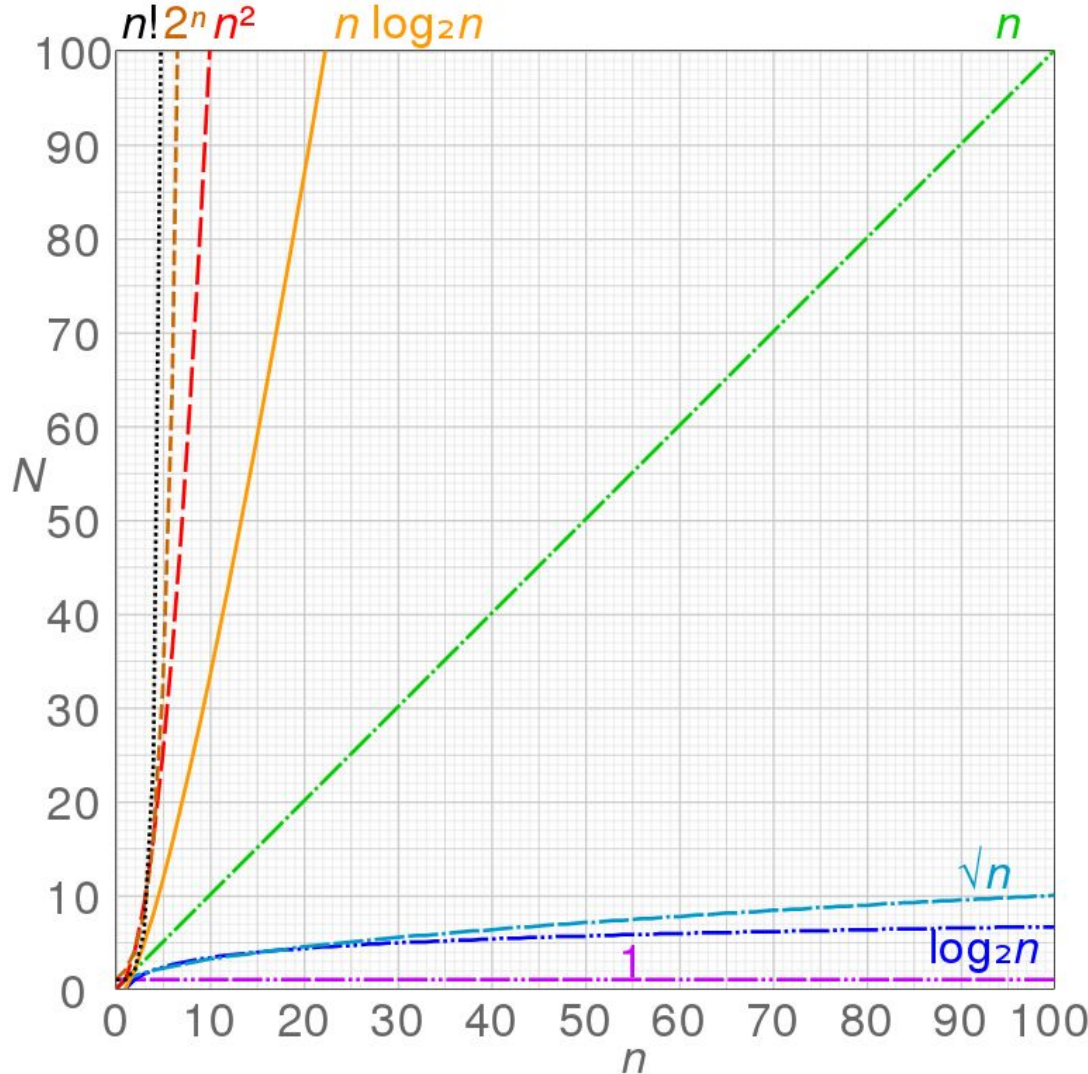
Check out the recording for the discussion!

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Distributed Systems

When should
we *consider*
distributing?

***Check out the recording
for the discussion!***

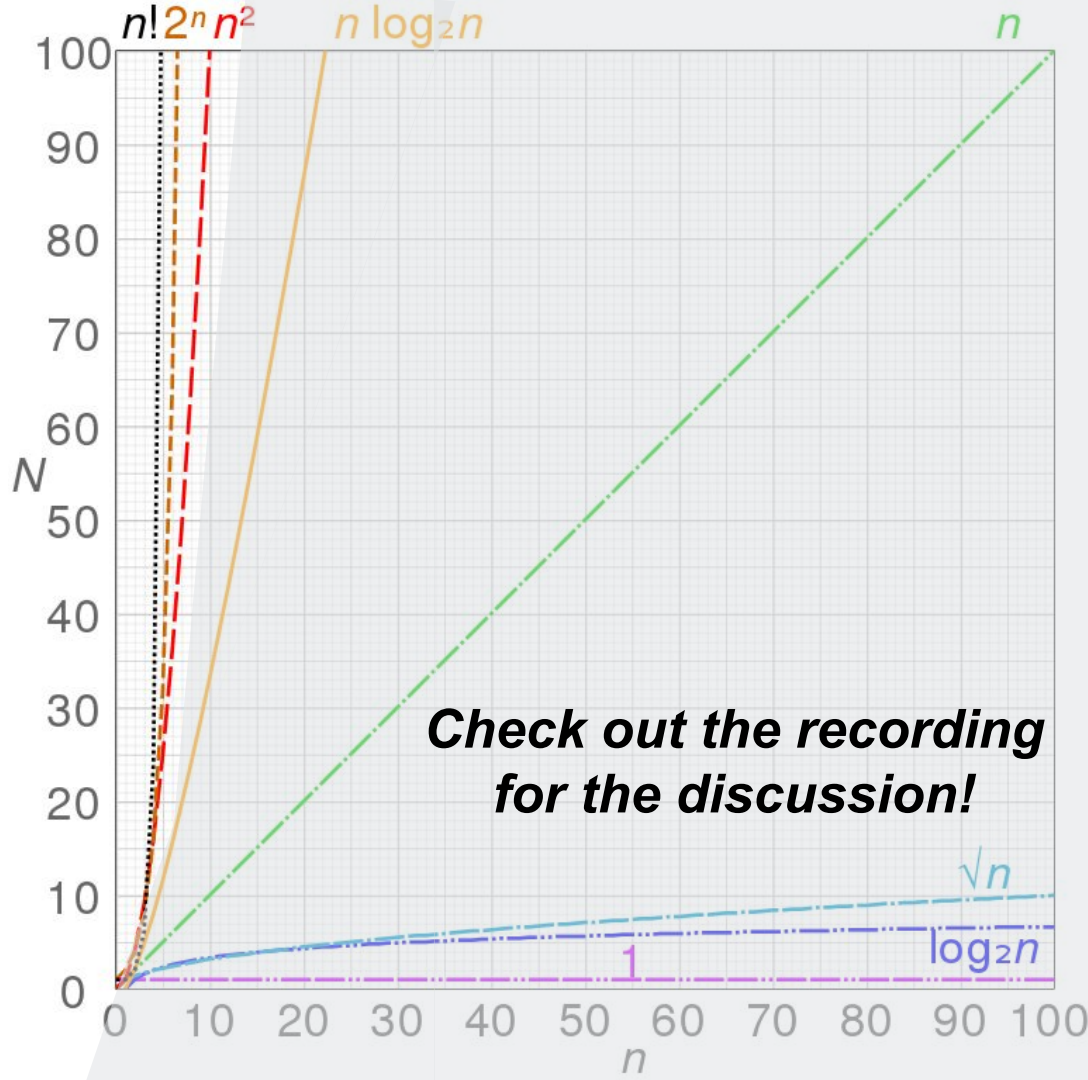


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Distributed Systems

When should
we *consider*
distributing?

Super Duper Extra Extra
Large Orders of Magnitude!



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Systems

Parallel

Distributed

Check out the recording for the discussion!



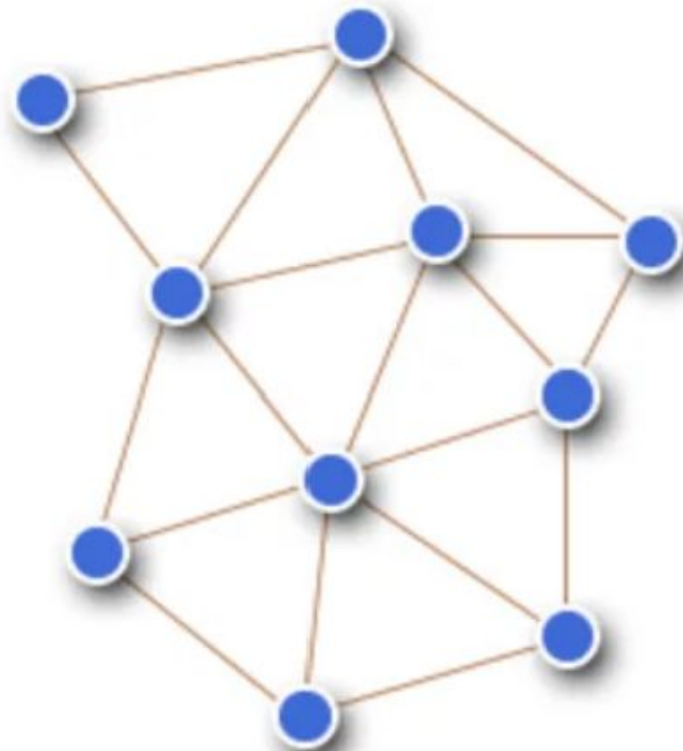
A Venn diagram with two overlapping circles. The left circle is light blue with a blue outline and is labeled 'Parallel'. The right circle is light red with a red outline and is labeled 'Distributed'. The intersection of the two circles is shaded with a mix of blue and red. In the center of the intersection, the text 'Check out the recording for the discussion!' is written in bold, italicized black font.

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Distributed Systems

Remember that we are operating in *reality*

- No global clock
- Nodes *will* fail
- Web of nodes *will constantly* change
- Network is not *always* reliable
- Latency is *always present*
- The path traversed *changes*
- Some resources *must be shared*
- You need to prevent the pitfalls!
 - No deadlocks
 - No starvation
 - No error states

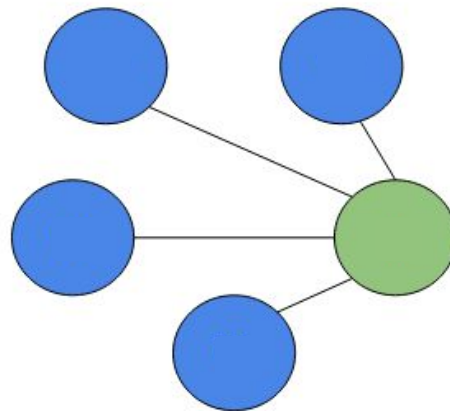
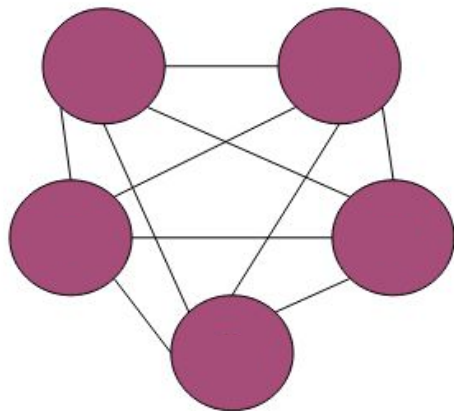


Check out the recording for the discussion!

Main and Worker

Peer to Peer

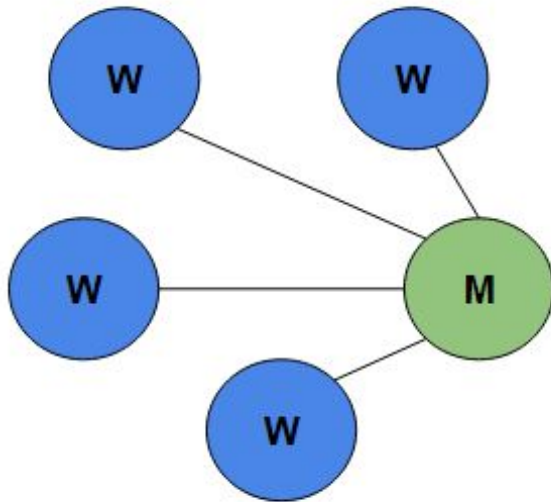
Which is which?



Check out the recording for the solution!

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Distributed Systems



Pros and Cons

Check out the recording for the discussion!

Pros:

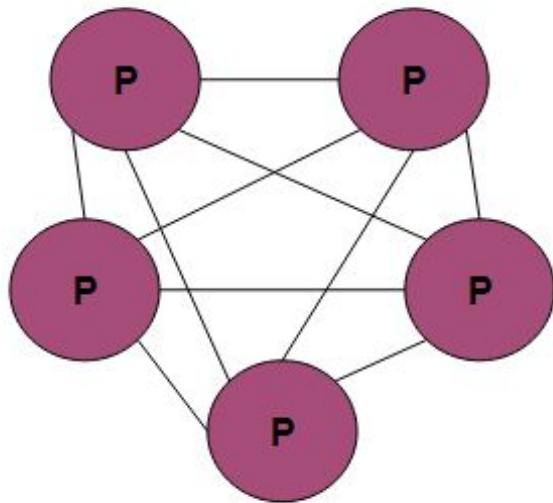
- Straightforward setup
- Logic is centralized
- Communication is linear

Cons:

- Single point of failure

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Distributed Systems



Pros and Cons

Check out the recording for the discussion!

Pros:

- Peers can join or leave as needed
- Robust - no single point of failure

Cons:

- Communication is more *complex*
- Setup is not as straightforward
- Client connections are handled *differently*

We will cover this in a moment!

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Scratch Space

Upcoming Events

SI Sessions:

- Sunday, February 16th at 7:00 pm MST
- Tuesday, February 18th at 11:00 am MST
- Thursday, February 20th at 7:00 pm MST

Review Sessions:

- Tuesday, February 25th at 11:00 am MST - **Q&A Session**
- Thursday, February 27th at 7:00 pm MST - **Exam Review Session (2hrs)**

Questions?

Survey:

<https://asuasn.info/ASNSurvey>



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.

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[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

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2-

[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

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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.

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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

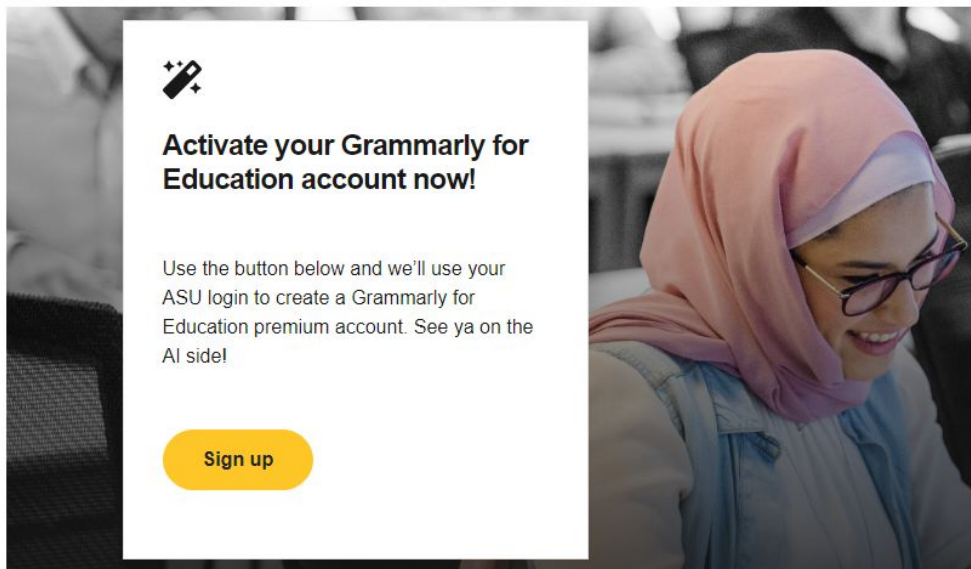
Computer Applications and Information Technology

 [Peer Community](#)

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

Expanded Writing Support Available

Including Grammarly for Education, at no cost!



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](#)