

SER 321 B Session

SI Session

Thursday, April 3rd 2025

7:00 pm - 8:00 pm MST

Agenda



OSI Model Review

Sockets!

Properties & Steps for Use

Handling the Client

Port Examination

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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Sockets!

Sockets allow our client and server to communicate!

Location

Need to define **3 properties** before usage

Connection
Semantics

Message Format

*Check out the
recording for
the
discussion!*

IP or DNS

142.251.46.206

www.google.com

TCP or UDP

Connection
Oriented

Connectionless

Protocol Specs

Synchronous

Asynchronous

Stateless

Stateful

Binary

Text

Headers

No Headers



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Sockets!

Sockets allow our client and server to communicate!

Person

Conversation
Flow

Conversation
Content

*Check out the
recording for
the
discussion!*

IP or DNS

142.251.46.206

www.google.com

TCP or UDP

Connection
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Protocol Specs

Synchronous

Asynchronous

Stateless

Stateful

Binary

Text

Headers

No Headers

Hello!

Welcome!



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Client Socket

Steps for the **Client Socket**

1.

2.

3.

4.

5.

6.

7.

8.

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

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Server Socket

Steps
for the
**Server
Socket**

1.

2.

3.

4.

5.

6.

7.

8.

9.

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

Assign 3-1 Starter Code

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Server Socket

1. Define Params

2. Create Socket

3-5. Mark Socket to Listen

6. Wait for Connection

7. Handle Client Connection

8. Close Client Connection

9. Continue Listening

1

2 & 3-5

9

6

```
public static void main (String args[]) {
```

```
    if (args.length != 1) {  
        System.out.println("Expected arguments: <port(int)>");  
        System.exit( status: 1);  
    }  
}
```

```
    try {  
        port = Integer.parseInt(args[0]);  
    } catch (NumberFormatException nfe) {  
        System.out.println("[Port|sleepDelay] must be an integer");  
        System.exit( status: 2);  
    }  
}
```

Check out the recording for the discussion and solution!

```
    try {  
        //open socket  
        ServerSocket serv = new ServerSocket(port);  
        System.out.println("Server ready for connections");  
  
        /** Simple loop accepting one client and calling handling one request. */
```

```
        while (true){  
            System.out.println("Server waiting for a connection");  
            sock = serv.accept(); // blocking wait  
            System.out.println("Client connected");
```

1

8

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Server Socket

What needs to be done here?

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

1. Define Params

2. Create Socket

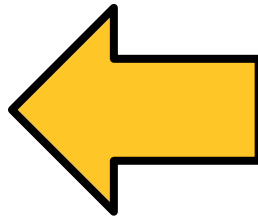
3-5. Mark Socket to Listen

6. Wait for Connection

7. Handle Client Connection

8. Close Client Connection

9. Continue Listening



1

2

3

4

5

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Server Socket

What needs to be done here?

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

Is input
from the client
or
to the client ?

1. Define Params

```
// setup the object reading channel  
in = new ObjectInputStream(sock.getInputStream());
```

```
// get output channel  
OutputStream out = sock.getOutputStream();
```

```
// create an object output writer (Java only)  
os = new DataOutputStream(out);
```

2. Close Client Connection

```
clientSock = sock.accept(); // blocking wait  
PrintWriter out = new PrintWriter(clientSock.getOutputStream(), autoFlush: true);  
InputStream input = clientSock.getInputStream();  
System.out.println("Server connected to client");
```

1

2

3

4

5

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Server Socket

What needs to be done here?

Check out the recording for the discussion and solution!

```
static void overandout() {  
    try {  
        os.close();  
        in.close();  
        sock.close();  
    } catch (Exception e) {e.printStackTrace();}  
}  
  
try {  
    s = (String) in.readObject();  
} catch (Exception e) {  
    System.out.println("Client disconnect");  
    connected = false;  
    continue;  
}
```

1 Create input/output streams

2

3

4

5

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Server Socket

What needs to be done here?

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

```
JSONObject res = isValid(s);

if (res.has(key: "ok")) {
    writeOut(res);
    continue;
}

JSONObject req = new JSONObject(s);

res = testField(req, key: "type");
if (!res.getBoolean(key: "ok")) {
    res = noType(req);
    writeOut(res);
    continue;
}
```

```
public static JSONObject isValid(String json) {
    try {
        static JSONObject testField(JSONObject req, String key){
            JSONObject res = new JSONObject();

            // field does not exist
            if (!req.has(key)){
                res.put("ok", false);
                res.put("message", "Field " + key + " does not exist in request");
                return res;
            }
            return res.put("ok", true);
        }
    }
    return res;
}

return new JSONObject();
}
```

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Server Socket

What needs to be done here?

Check out the recording for the discussion and solution!

```
int numr = input.read(clientInput, off: 0, buflen);  
  
String received = new String(clientInput, offset: 0, numr);  
System.out.println("read from client: " + received);  
out.println(received);  
  
if (req.getString(key: "type").equals("echo")) {  
    res = echo(req);  
} else if (req.getString(key: "type").equals("add")) {  
    res = add(req);  
} else if (req.getString(key: "type").equals("addmany")) {  
    res = addmany(req);  
} else {  
    res = wrongType(req);  
}  
  
writeOut(res);
```

1 Create input/output streams

2 Check for disconnect

3 Check Protocol

4

5

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Server Socket

What needs to be done here?

Check out the recording for the discussion and solution!

1. Define Params

2. Create Socket

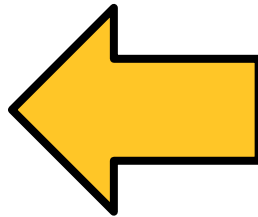
3-5. Mark Socket to Listen

6. Wait for Connection

7. Handle Client Connection

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1 Create input/output streams

2 Check for disconnect

3 Check Protocol

4 Read Headers

5 Handle Accordingly

Check out the recording for the discussion!

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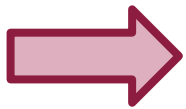
OSI Model

Unit

Layer

What we are *really*
talking about

Data		
Data		
Data		
Segment		
Packet		
Frame		
Bits		



Check out the recording for the discussion!

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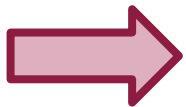
OSI Model

Unit

Layer

What we are *really*
talking about

Data		
Data		
Data		
Segment		
Packet		
Frame		
Bits	Physical	Signal, Binary transmission



Check out the recording for the discussion!

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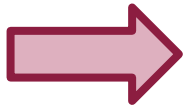
OSI Model

Unit

Layer

What we are *really*
talking about

Data		
Data		
Data		
Segment		
Packet		
Frame	Data Link	LLC, MAC, data transmission in LAN
Bits	Physical	Signal, Binary transmission



Check out the recording for the discussion!

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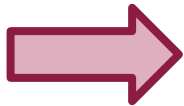
OSI Model

Unit

Layer

What we are *really*
talking about

Data		
Data		
Data		
Segment		
Packet	Network	IP address, routing and delivery
Frame	Data Link	LLC, MAC, data transmission in LAN
Bits	Physical	Signal, Binary transmission



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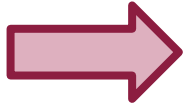
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OSI Model

Unit

Layer

What we are *really*
talking about



Data		
Data		
Data		
Segment	Transport	TCP/UDP
Packet	Network	IP address, routing and delivery
Frame	Data Link	LLC, MAC, data transmission in LAN
Bits	Physical	Signal, Binary transmission

Check out the recording for the discussion!

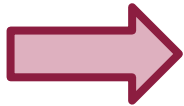
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OSI Model

Unit

Layer

What we are *really*
talking about



Data		
Data		
Data	Session	AuthN, authZ, session mgmt
Segment	Transport	TCP/UDP
Packet	Network	IP address, routing and delivery
Frame	Data Link	LLC, MAC, data transmission in LAN
Bits	Physical	Signal, Binary transmission

Check out the recording for the discussion!

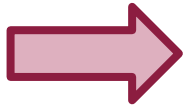
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OSI Model

Unit

Layer

What we are *really*
talking about



Data		
Data	Presentation	Translation, compression, encryption
Data	Session	AuthN, authZ, session mgmt
Segment	Transport	TCP/UDP
Packet	Network	IP address, routing and delivery
Frame	Data Link	LLC, MAC, data transmission in LAN
Bits	Physical	Signal, Binary transmission

Check out the recording for the discussion!

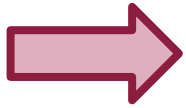
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OSI Model

Unit

Layer

What we are *really*
talking about



Data	Application	HTTP(s), SMTP, FTP, IMAP, POP, etc.
Data	Presentation	Translation, compression, encryption
Data	Session	AuthN, authZ, session mgmt
Segment	Transport	TCP/UDP
Packet	Network	IP address, routing and delivery
Frame	Data Link	LLC, MAC, data transmission in LAN
Bits	Physical	Signal, Binary transmission

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Scratch Space

Upcoming Events

SI Sessions:

- Sunday, April 6th at 7:00 pm MST
- Tuesday, April 8th at 10:00 am MST
- Thursday, April 10th at 7:00 pm MST

Review Sessions:

- Sunday, April 27th at **6:00 pm MST - 2 hour Exam Review Session**
- Tuesday, April 29th, at 10:00 am MST - **Q&A Session**

Questions?

Survey:

<https://asuasn.info/ASNSurvey>



More Questions?

Check out our other resources!

tutoring.asu.edu



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Services



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[Access the drop-in queue](#)

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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.

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Online Study Hub

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2-

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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.

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

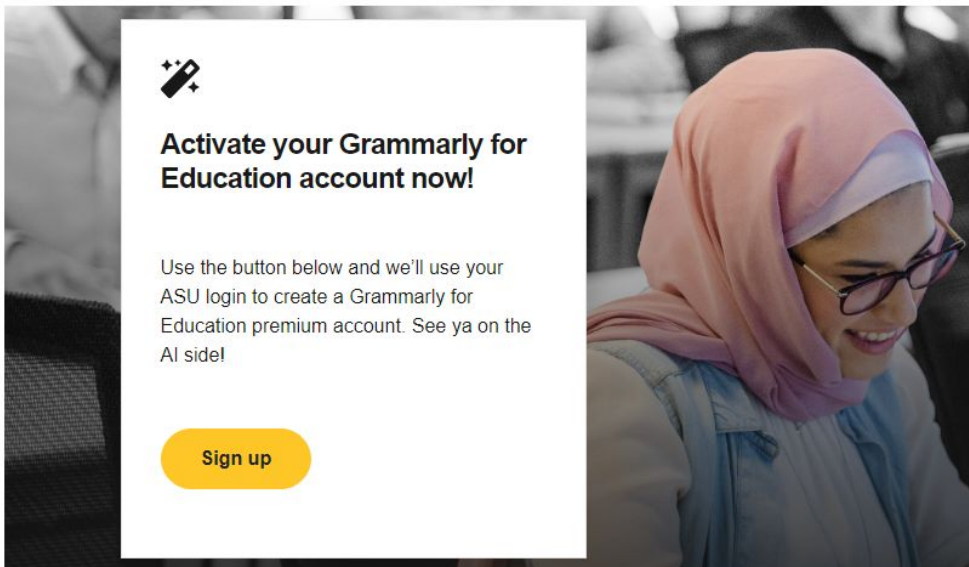
Computer Applications and Information Technology


 [Peer Community](#)

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

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*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](#)
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