

Computer Networks 2021 Exercises - Unit 1

FAN: li2065

NOTE: Each student's work unit is unique. You *must* use the work that has been generated for your FAN. If you do not, then you will fail this work unit.

NOTE: You must record your answers in the answer file EXACTLY as required, and commit and make sure your changes have been pushed to the github server, as they will otherwise not be counted.

NOTE: The topic coordinator will periodically run the automatic marking script, which will cause a file called unit1-results.pdf to be updated in your repository. You should check this file to make sure that your answers have been correctly counted. That file will contain the time and date that the marking script was last run, so that you can work out if it has been run since you last changed your answers. You are free to update your answers as often as you wish, until the deadline for the particular work unit.

1 Specify the OSI Layer to which best matches each statement

For each question, you must record your answer in the `unit1-answers.txt` file in your git repository. For example, if you believed that the following question best matched the Network Layer, which is layer 3, you would put the digit 3 at the end of the `rj=` line in the file `unit1-answers.txt`.

Question#	Description
rj	Responsible for inter-networking

The entry in `unit1-answers.txt` would thus look like:

```
# Question 'rj': Which layer best fits this statement: Responsible for inter-networking
rj=3
```

Templates for each answer are provided in `unit1-answers.txt` for your convenience.

Which network layer best matches the following descriptions?

Question#	Description
ab	Interprets the address in the header to determine which receiver on a local network segment should receive it.

Question#	Description
ac	Responsible for the forwarding of messages or packets

Question#	Description
ad	Is used to abstract the network for user-oriented programmes

Question#	Description
ae	Detects and reacts to congestion on network path between distant nodes

Question#	Description
af	Responsible for bit and symbol synchronisation

Question#	Description
ag	Corrects errors that occur at the physical layer

Question#	Description
ah	Provides galvanic isolation between nodes on a network

Question#	Description
ai	Responsible for multiplexing multiple connections to a given node on the network

Question#	Description
aj	The layer where virtual circuits can be established

Question#	Description
ak	Responsible for establishing sessions

Question#	Description
a1	Defines the physical specifications of a data connection
Question#	Description
am	Responsible for selecting the best path between nodes
Question#	Description
an	Converts electrical signals into data
Question#	Description
ao	Allows for the recovery of a lost connection
Question#	Description
ap	De-duplicates received packets
Question#	Description
aq	The primary layer responsible for reliable delivery of data

2 Specify the OSI Layer in which correspond to the following network protocols

For each question, you will need to research the protocol, and judge to which OSI network layer it corresponds. *For each question, you must record your answer in the unit1-answers.txt file in your git repository. For example, if you believed that the following question best matched the Physical Layer, which is layer 1, you would put the digit 1 at the end of the fq= line in the file unit1-answers.txt.*

Question#	Protocol
fq	RFC1149

The entry in unit1-answers.txt would thus look like:

```
# Question 'fq': To which layer does this protocol correspond? : RFC1149
fq=1
```

Templates for each answer are provided in unit1-answers.txt for your convenience.

To which OSI network layer do the following protocols correspond?

Question#	Protocol
ar	International Telecommunication Union (ITU)
Question#	Protocol
as	Network address translation (NAT)
Question#	Protocol
at	Digital subscriber line (DSL)
Question#	Protocol
au	Internet Protocol
Question#	Protocol
av	Token Ring
Question#	Protocol
aw	Infrared
Question#	Protocol
ax	Short Message Peer-to-Peer (SMPP)
Question#	Protocol
ay	Frame Relay
Question#	Protocol
az	Telephone User Part (TUP)

Question#	Protocol
ba	1000BASE-SX
Question#	Protocol
bb	Link Layer Discovery Protocol (LLDP)
Question#	Protocol
bc	Virtual Extended Network (VEN)
Question#	Protocol
bd	Spanning Tree Protocol (STP)
Question#	Protocol
be	DECnet
Question#	Protocol
bf	1000BASE-T
Question#	Protocol
bg	RS-232

3

For each question, you are presented with a fictional network topology and layered network protocol stack(s). You must answer questions about these networks. *For each question, you must record your answer in the `unit1-answers.txt` file in your git repository. For example, if you believed that the answer to the following question was 42, you would write 42 at the end of the `x1=` line in the file `unit1-answers.txt`.*

Question#	How large would the indicated Protocol Data Unit be? (in bytes)
x1	C.3

The entry in `unit1-answers.txt` would thus look like:

```
# Question 'x1': How large would the indicated Protocol Data Unit be? (in bytes)
x1=42
```

Templates for each answer are provided in `unit1-answers.txt` for your convenience.

Answer the following questions about the fictional network topologies shown

Fictional Network Topology 1

Network Stack 1: 'ausgefahrung'

OSI Layer #	Name	PDU Header Size (bytes)
7	zerkaeskeit	59
6	einkaeste	84
5	zersetzt	36
4	auftritten	18
3	angestehst	95
2	angewitztest	95

Network Stack 2: 'auskatzes'

OSI Layer #	Name	PDU Header Size (bytes)
7	einkatzete	15
6	aufgerabartheit	18
5	angerenntest	14
4	zerhaltung	16
3	zersprache	54
2	angewarfse	38

Network Stack 3: ‘aufschmecktete’

OSI Layer #	Name	PDU Header Size (bytes)
7	ensetztest	36
6	verspracher	65
5	einsprachen	7
4	enrennen	42
3	aufgewitzung	81
2	ausgehaltkeit	81

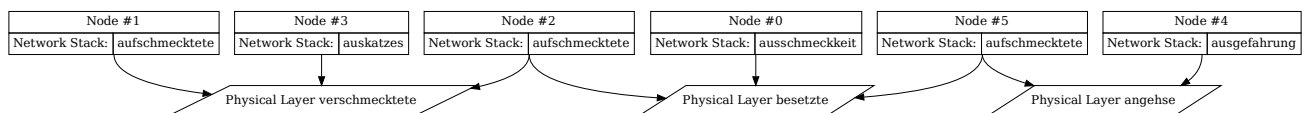
Network Stack 4: ‘ausschmeckkeit’

OSI Layer #	Name	PDU Header Size (bytes)
7	anrenner	46
6	einlaufen	10
5	gesprachte	43
4	angefahrheit	53
3	angerabarbs	32
2	angesprachung	24

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
verschmecktete	87	3826	72
ausgegehs	83	7825	3
besetztete	99	7757	81
angehse	39	4464	907

Network Diagram



Question#	Question
bh	Could applications on nodes 1 and 4 communicate with one another? i.e., are they using compatible network stacks, and is there a compatible path through the network between them? <i>Answer Y or N. Any other answer will be marked incorrect.</i>
bi	If an application on node 5 sends 956 bytes of data, how large would the PDU be at layer 7? <i>Provide the exact number of bytes as your answer.</i>
bj	What is the data rate that is possible between nodes 5 and 4? <i>Provide the exact number of kilo-bits per second as your answer.</i>
bk	How many milli-seconds would it take node 5 to send 5540 bytes of data to node 4? <i>Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.</i>

Fictional Network Topology 2

Network Stack 1: ‘angegehtete’

OSI Layer #	Name	PDU Header Size (bytes)
7	auffahrer	29
6	auftraust	65
5	betraus	30
4	ensinnheit	57
3	geschmeckung	14
2	verpflumung	47

Network Stack 2: ‘angetraukeit’

OSI Layer #	Name	PDU Header Size (bytes)
7	vergehte	73
6	ensprachs	19
5	zersetzkeit	95
4	ausgekrauer	45
3	aufgefahrer	49
2	aufkaestest	51

Network Stack 3: ‘enspricht’

OSI Layer #	Name	PDU Header Size (bytes)
7	anhundt	94
6	zersinnen	20
5	besinner	40
4	angesetztete	68
3	einsetzte	48
2	ansetzse	73

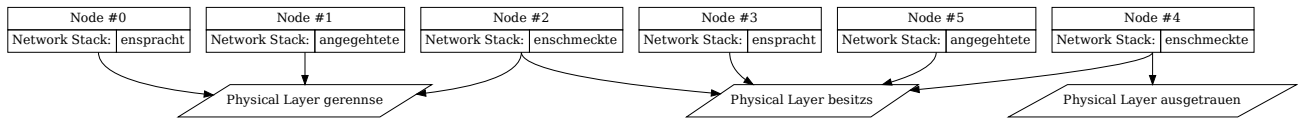
Network Stack 4: ‘enschmeckte’

OSI Layer #	Name	PDU Header Size (bytes)
7	angesitztest	56
6	einklettung	51
5	ausgehalten	29
4	ankaestete	71
3	aufgesitztete	55
2	enfahrheit	49

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
gerennse	21	1860	149
geklettkeit	25	4351	643
besitzs	5	6230	989
ausgetrauen	10	4032	178

Network Diagram



Question#	Question
b1	Could applications on nodes 4 and 0 communicate with one another? i.e., are they using compatible network stacks, and is there a compatible path through the network between them? <i>Answer Y or N. Any other answer will be marked incorrect.</i>
bm	If an application on node 0 sends 532 bytes of data, how large would the PDU be at layer 3? <i>Provide the exact number of bytes as your answer.</i>
bn	What is the data rate that is possible between nodes 0 and 0? <i>Provide the exact number of kilo-bits per second as your answer.</i>
bo	How many milli-seconds would it take node 0 to send 2494 bytes of data to node 0? <i>Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.</i>

Fictional Network Topology 3

Network Stack 1: 'einhalten'

OSI Layer #	Name	PDU Header Size (bytes)
7	anlaufkeit	65
6	angeraucher	47
5	angehalt	8
4	ausgekrautest	36
3	angekraukheit	61
2	aufgesinner	58

Network Stack 2: 'ausstehkeit'

OSI Layer #	Name	PDU Header Size (bytes)
7	engehtete	49
6	angerennung	43
5	einsinnheit	34
4	ausgetraung	38
3	einrenns	4
2	ausgeht	56

Network Stack 3: 'angelaufen'

OSI Layer #	Name	PDU Header Size (bytes)
7	verkaest	38
6	anwarfst	50
5	enrauchtete	47
4	angepflumkeit	17
3	ausgerenns	69
2	einhardtete	1

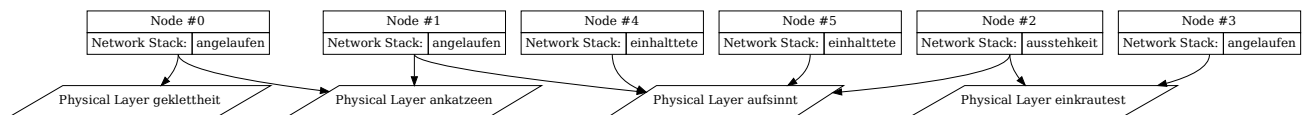
Network Stack 4: 'einrabarbkkeit'

OSI Layer #	Name	PDU Header Size (bytes)
7	aufgetraust	44
6	angehundte	43
5	verhaltkeit	22
4	austraus	88
3	verstehse	4
2	verrennt	60

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
ankatzeen	35	2776	387
aufsinnt	84	4778	871
einkrautest	84	9711	98
geklettheit	22	9463	894

Network Diagram



Question#	Question
bp	Could applications on nodes 0 and 2 communicate with one another? i.e., are they using compatible network stacks, and is there a compatible path through the network between them? <i>Answer Y or N. Any other answer will be marked incorrect.</i>
bq	If an application on node 4 sends 14 bytes of data, how large would the PDU be at layer 2? <i>Provide the exact number of bytes as your answer.</i>
br	What is the data rate that is possible between nodes 4 and 2? <i>Provide the exact number of kilo-bits per second as your answer.</i>
bs	How many milli-seconds would it take node 4 to send 362 bytes of data to node 2? <i>Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.</i>

Fictional Network Topology 4

Network Stack 1: 'zerfahrse'

OSI Layer #	Name	PDU Header Size (bytes)
7	aufsetztest	49
6	einwarfst	12
5	aufsinnen	11
4	angesitzst	49
3	engehtest	85
2	zerwitzer	58

Network Stack 2: ‘ausgewitztete’

OSI Layer #	Name	PDU Header Size (bytes)
7	ausklettete	75
6	einsinnst	64
5	gestehs	62
4	zerklettete	78
3	aufgerabarbs	55
2	verwarfheit	14

Network Stack 3: ‘enhaltete’

OSI Layer #	Name	PDU Header Size (bytes)
7	gegehse	79
6	auslaufse	40
5	vertritten	55
4	aufgesitzse	27
3	besinnen	55
2	ankatzest	43

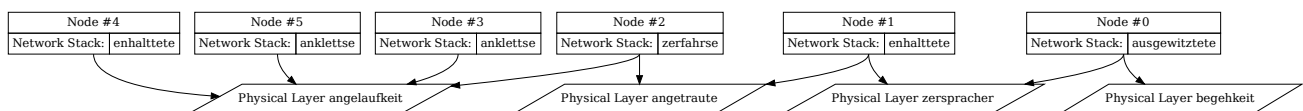
Network Stack 4: ‘anklettse’

OSI Layer #	Name	PDU Header Size (bytes)
7	ankletter	5
6	eintraute	28
5	angekrauer	3
4	angetraute	78
3	angepflumen	26
2	berauchs	43

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
angelaufkeit	41	1155	291
zerspracher	38	8381	161
begehkeit	25	7576	995
angetraute	65	5947	301

Network Diagram



Question#	Question
bt	Could applications on nodes 0 and 2 communicate with one another? i.e., are they using compatible network stacks, and is there a compatible path through the network between them? <i>Answer Y or N. Any other answer will be marked incorrect.</i>
bu	If an application on node 5 sends 977 bytes of data, how large would the PDU be at layer 7? <i>Provide the exact number of bytes as your answer.</i>
bv	What is the data rate that is possible between nodes 5 and 2? <i>Provide the exact number of kilo-bits per second as your answer.</i>
bw	How many milli-seconds would it take node 5 to send 1467 bytes of data to node 2? <i>Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.</i>

Fictional Network Topology 5

Network Stack 1: ‘zertrautete’

OSI Layer #	Name	PDU Header Size (bytes)
7	aufstehte	22
6	ensetzzeit	78
5	austritten	69
4	besetzzeit	99
3	verkatzese	93
2	angekaestest	12

Network Stack 2: ‘ausgefaherte’

OSI Layer #	Name	PDU Header Size (bytes)
7	aufgepflums	88
6	bekaest	81
5	auftrauung	80
4	ausgesetztest	88
3	angerabarbte	91
2	angerabarbst	72

Network Stack 3: ‘gesprachse’

OSI Layer #	Name	PDU Header Size (bytes)
7	angerabarbse	10
6	angesetzt	25
5	aufschmecks	37
4	gesitztest	64
3	ausgegehtheit	14
2	zertrittse	80

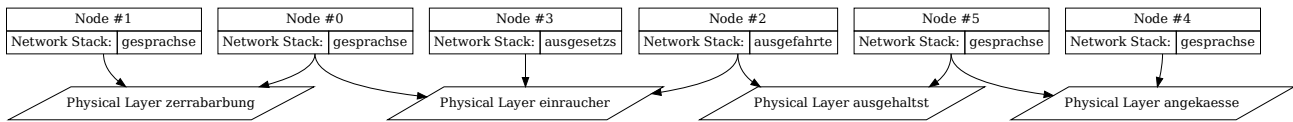
Network Stack 4: ‘ausgesetzts’

OSI Layer #	Name	PDU Header Size (bytes)
7	zersitzzeit	59
6	aushundte	28
5	anrabarbte	30
4	aufgegeht	60
3	angefahrt	67
2	einsitzs	75

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milliseconds)
einraucher	62	7661	836
zerrababung	61	6772	330
ausgehaltst	87	6485	125
angekaesse	29	6874	204

Network Diagram



Question#	Question
bx	Could applications on nodes 0 and 4 communicate with one another? i.e., are they using compatible network stacks, and is there a compatible path through the network between them? <i>Answer Y or N. Any other answer will be marked incorrect.</i>
by	If an application on node 2 sends 498 bytes of data, how large would the PDU be at layer 6? <i>Provide the exact number of bytes as your answer.</i>
bz	What is the data rate that is possible between nodes 2 and 4? <i>Provide the exact number of kilo-bits per second as your answer.</i>
ca	How many milli-seconds would it take node 2 to send 7484 bytes of data to node 4? <i>Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.</i>

Fictional Network Topology 6

Network Stack 1: 'verlaufer'

OSI Layer #	Name	PDU Header Size (bytes)
7	verlauftete	27
6	besprachheit	59
5	aufgewarftest	58
4	einlaufheit	37
3	ausgehalts	24
2	gelauftete	84

Network Stack 2: 'behalts'

OSI Layer #	Name	PDU Header Size (bytes)
7	versinner	9
6	einkaesung	91
5	einsinnse	21
4	antrause	51
3	angekatzes	92
2	gerabarbte	66

Network Stack 3: 'angeschmeckst'

OSI Layer #	Name	PDU Header Size (bytes)
7	gerennkeit	96
6	enklettung	62
5	ankraukeit	91
4	ansinnse	58
3	ensetztete	59
2	aufgesinnung	89

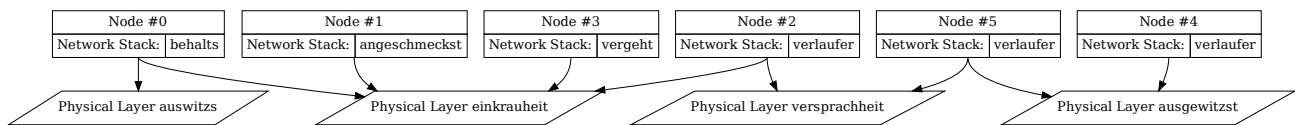
Network Stack 4: ‘vergeht’

OSI Layer #	Name	PDU Header Size (bytes)
7	betritttete	42
6	aushaltte	76
5	auskletttest	42
4	ausgehaltte	98
3	verwitztest	41
2	zerschmecken	69

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
auswitzs	40	3054	559
einkrauheit	3	7224	153
versprachheit	23	3830	534
ausgewitzst	41	4845	317

Network Diagram



Question#	Question
cb	Could applications on nodes 2 and 3 communicate with one another? i.e., are they using compatible network stacks, and is there a compatible path through the network between them? <i>Answer Y or N. Any other answer will be marked incorrect.</i>
cc	If an application on node 2 sends 638 bytes of data, how large would the PDU be at layer 6? <i>Provide the exact number of bytes as your answer.</i>
cd	What is the data rate that is possible between nodes 2 and 3? <i>Provide the exact number of kilo-bits per second as your answer.</i>
ce	How many milli-seconds would it take node 2 to send 8391 bytes of data to node 3? <i>Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.</i>

Fictional Network Topology 7

Network Stack 1: ‘aufwarfkeit’

OSI Layer #	Name	PDU Header Size (bytes)
7	anpflumst	13
6	ankletts	7
5	einpflumtest	40
4	aufgetrittung	56
3	verschmeckte	47
2	ausgehung	57

Network Stack 2: ‘zerschmeckung’

OSI Layer #	Name	PDU Header Size (bytes)
7	aufgerabarbtest	73
6	verfahrers	31
5	auffahrung	98
4	angewarfse	66
3	enfahrung	98
2	verpflumkeit	29

Network Stack 3: ‘besitzst’

OSI Layer #	Name	PDU Header Size (bytes)
7	aufrabarbarkeit	84
6	angetraust	32
5	aufgeschmeckt	19
4	aufsinnung	4
3	ausrabarbarkeit	62
2	aufgewitztete	30

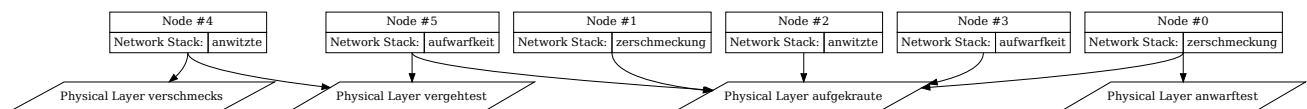
Network Stack 4: ‘anwitzte’

OSI Layer #	Name	PDU Header Size (bytes)
7	beschmeckte	71
6	angespracher	53
5	ensetzen	70
4	verhaltung	45
3	angegeht	92
2	ausgegeht	57

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
verschmecks	20	2552	785
anwarftest	9	6829	73
aufgekraute	73	6027	531
vergehtest	78	6124	976

Network Diagram



Question#	Question
cf	Could applications on nodes 1 and 0 communicate with one another? i.e., are they using compatible network stacks, and is there a compatible path through the network between them? <i>Answer Y or N. Any other answer will be marked incorrect.</i>
cg	If an application on node 5 sends 752 bytes of data, how large would the PDU be at layer 5? <i>Provide the exact number of bytes as your answer.</i>
ch	What is the data rate that is possible between nodes 5 and 0? <i>Provide the exact number of kilo-bits per second as your answer.</i>
ci	How many milli-seconds would it take node 5 to send 39 bytes of data to node 0? <i>Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.</i>

Fictional Network Topology 8

Network Stack 1: ‘angerauchst’

OSI Layer #	Name	PDU Header Size (bytes)
7	auskaesse	67
6	ansitzen	87
5	einkrauer	33
4	einsitzte	17
3	verrabarbs	53
2	verwitzkeit	92

Network Stack 2: ‘aushalten’

OSI Layer #	Name	PDU Header Size (bytes)
7	aufsitzheit	80
6	aufgerabarbte	2
5	zertraus	74
4	zerwitzte	15
3	auffahrt	86
2	geklettung	1

Network Stack 3: ‘gekatzetete’

OSI Layer #	Name	PDU Header Size (bytes)
7	ensprachung	74
6	aufsetzst	58
5	angeschmecker	19
4	auswarftest	97
3	ausfahrttest	38
2	einschmecken	78

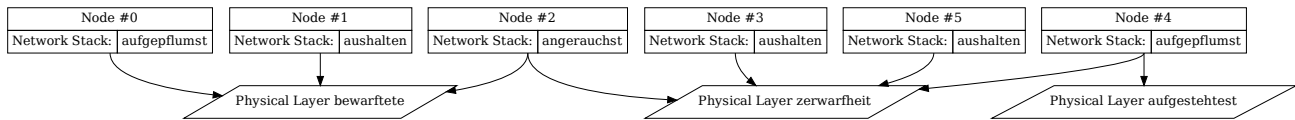
Network Stack 4: ‘aufgepflumst’

OSI Layer #	Name	PDU Header Size (bytes)
7	angetrittheit	36
6	einspracher	8
5	anpflumtest	26
4	einfahrt	94
3	bewarfte	5
2	begehst	46

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milliseconds)
zerwarftheit	60	1747	549
bewarftete	96	9406	654
enkraukeit	39	4950	874
aufgestehetest	63	1606	282

Network Diagram



Question#	Question
cj	Could applications on nodes 4 and 0 communicate with one another? i.e., are they using compatible network stacks, and is there a compatible path through the network between them? <i>Answer Y or N. Any other answer will be marked incorrect.</i>
ck	If an application on node 3 sends 689 bytes of data, how large would the PDU be at layer 3? <i>Provide the exact number of bytes as your answer.</i>
cl	What is the data rate that is possible between nodes 3 and 0? <i>Provide the exact number of kilo-bits per second as your answer.</i>
cm	How many milli-seconds would it take node 3 to send 7503 bytes of data to node 0? <i>Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.</i>

Fictional Network Topology 9

Network Stack 1: 'bewitzt'

OSI Layer #	Name	PDU Header Size (bytes)
7	ausgetraus	73
6	aufsetzs	31
5	anhunder	54
4	angewarft	27
3	angekatzetete	6
2	enkaesung	76

Network Stack 2: 'entrause'

OSI Layer #	Name	PDU Header Size (bytes)
7	gehalttest	77
6	befahrse	19
5	angesetzs	44
4	gegehheit	73
3	betrittte	89
2	ausschmecks	30

Network Stack 3: 'ausrennen'

OSI Layer #	Name	PDU Header Size (bytes)
7	gekraut	71
6	einfahrs	95
5	ankatzese	24
4	ausgerennse	2
3	gesetzs	27
2	einpflumer	87

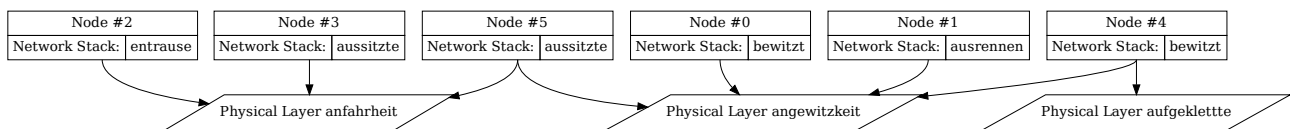
Network Stack 4: ‘aussitzte’

OSI Layer #	Name	PDU Header Size (bytes)
7	behalte	33
6	gelaufkeit	25
5	ausgewarfst	97
4	versetzse	63
3	aussteher	19
2	ansetztete	97

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
anfahrtheit	78	4864	848
aufgeklettete	26	7621	393
angekaeste	62	4436	19
angewitzkeit	90	7641	901

Network Diagram



Question#	Question
cn	Could applications on nodes 1 and 0 communicate with one another? i.e., are they using compatible network stacks, and is there a compatible path through the network between them? <i>Answer Y or N. Any other answer will be marked incorrect.</i>
co	If an application on node 4 sends 230 bytes of data, how large would the PDU be at layer 5? <i>Provide the exact number of bytes as your answer.</i>
cp	What is the data rate that is possible between nodes 4 and 0? <i>Provide the exact number of kilo-bits per second as your answer.</i>
cq	How many milli-seconds would it take node 4 to send 6211 bytes of data to node 0? <i>Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.</i>

Fictional Network Topology 10

Network Stack 1: ‘ausgeschmeckkeit’

OSI Layer #	Name	PDU Header Size (bytes)
7	einkatzest	11
6	gestehheit	85
5	behundheit	90
4	betritung	70
3	enschmeckst	17
2	gehundst	20

Network Stack 2: ‘eingetest’

OSI Layer #	Name	PDU Header Size (bytes)
7	zerlaufst	84
6	belauftest	43
5	besinnt	48
4	aussitzzeit	91
3	ausgerauchen	2
2	angewarfen	56

Network Stack 3: ‘aussetzer’

OSI Layer #	Name	PDU Header Size (bytes)
7	ausgelaufst	12
6	angesinntest	97
5	aussprachte	12
4	angestehte	8
3	ausfahrse	89
2	einrauchkeit	13

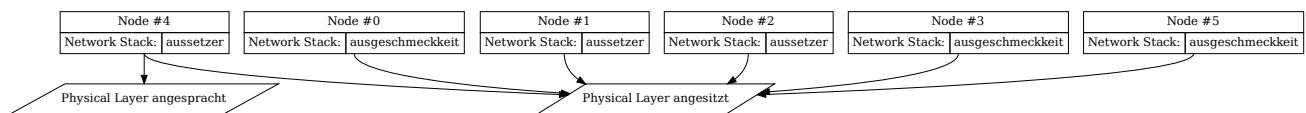
Network Stack 4: ‘auswarftete’

OSI Layer #	Name	PDU Header Size (bytes)
7	zersprachung	31
6	auslauft	97
5	einhundkeit	25
4	angewarfs	92
3	angegehung	53
2	gesprachen	72

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
ankrauen	27	4088	663
angespracht	50	6144	753
angesitzt	4	3737	335
verfahrte	20	7566	804

Network Diagram



Question#	Question
cr	Could applications on nodes 5 and 2 communicate with one another? i.e., are they using compatible network stacks, and is there a compatible path through the network between them? <i>Answer Y or N. Any other answer will be marked incorrect.</i>
cs	If an application on node 2 sends 251 bytes of data, how large would the PDU be at layer 5? <i>Provide the exact number of bytes as your answer.</i>
ct	What is the data rate that is possible between nodes 2 and 2? <i>Provide the exact number of kilo-bits per second as your answer.</i>
cu	How many milli-seconds would it take node 2 to send 931 bytes of data to node 2? <i>Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.</i>

4 Name and describe five reliability challenges for computer networks, referring to the network layers at which these challenges either arise, or are solved.

For each of the five challenges, you must record your answer in the `unit1-answers.txt` file in your git repository.

Question#	Description
cv	Reliability Challenge #1
cw	Reliability Challenge #2
cx	Reliability Challenge #3
cy	Reliability Challenge #4
cz	Reliability Challenge #5

The following question forms part of the DN/HD vs lower grade diagnosis for this work unit. Your answer will be used to assess if you are demonstrating the depth of understanding commensurate with a DN or HD grade. The pedagogical diagnosis is made based on the guidance from: <https://www.flinders.edu.au/content/dam/documents/staff/policies/academic-students/grading-scheme.pdf>.

Specifically, in this item, the DN gate will be:

- *iii. produced work which shows a developing capacity for original, critical and creative thinking over and above the essential requirements of the learning outcomes*

and the HD gate will be:

- *iii. consistently demonstrated knowledge skills and application at the highest level expected of a student at a given topic level*

You must write your answer in the `unit1-answers.txt` text file in your github repository between the lines `BEGIN:da` and `END:da`.

Question#	Description
da	What are the differences and similarities between congestion and packet loss in computer networks. The Transmission Control Protocol is known to confusing these two situations. Describe the implications of this confusion, its cause and/or how it can be mitigated.

Open Answer Question

The following question forms part of the DN/HD vs lower grade diagnosis for this work unit. Your answer will be used to assess if you are demonstrating the depth of understanding commensurate with a DN or HD grade. The pedagogical diagnosis is made based on the guidance from: <https://www.flinders.edu.au/content/dam/documents/staff/policies/academic-students/grading-scheme.pdf>.

Specifically, in this item, the DN gate will be:

- *iii. produced work which shows a developing capacity for original, critical and creative thinking over and above the essential requirements of the learning outcomes*

and the HD gate will be:

- *v. demonstrated an ability to combine knowledge of the subject matter of the topic with original, critical and creative thinking relevant to the discipline,*

You must write your answer in the `unit1-answers.txt` text file in your github repository between the lines `BEGIN:db` and `END:db`.

Question#	Description
db	Identify and describe five security challenges for computer networks, where your description is oriented around the various layers of a computer network. These challenges must not all relate to the same network layer. Have these problems all been solved, or are there open problems? If they have not all been solved, name and describe one such open problem, again, in terms of the various layers of a computer network.