

Computer Networks 2021 Exercises - Unit 1

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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	Responsible for the forwarding of messages or packets

Question#	Description
ac	De-duplicates received packets

Question#	Description
ad	Responsible for synchronising multiple media streams, such as audio and video in a video conference

Question#	Description
ae	Establishes the relationship between a network device and transmission medium

Question#	Description
af	Allows the checkpointing of activity in a network connection

Question#	Description
ag	Responsible for the correct conversion of character encodings in a session

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

Question#	Description
ai	Responsible for routing packets among networks

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

Question#	Description
ak	Responsible for logical addresses of senders and receivers on a local network segment.
Question#	Description
al	Responsible for selecting the best path between nodes
Question#	Description
am	Provides globally addressable identifiers for nodes on large networks
Question#	Description
an	Provides galvanic isolation between nodes on a network
Question#	Description
ao	Corrects the order of received packets, if they are received out of order
Question#	Description
ap	Allows data to be delivered over a variety of underlying network types
Question#	Description
aq	Responsible for electromagnetic compatibility

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	9P (protocol) (9P)
Question#	Protocol
as	Transaction Capabilities Application Part (TCAP)
Question#	Protocol
at	Cisco Discovery Protocol (CDP)
Question#	Protocol
au	L2TP
Question#	Protocol
av	User Datagram Protocol
Question#	Protocol
aw	Point-to-point tunneling protocol (PPTP)
Question#	Protocol
ax	Infrared

Question#	Protocol
ay	Media Access Control (MAC)
Question#	Protocol
az	ARINC 818
Question#	Protocol
ba	Challenge-Handshake Authentication Protocol (CHAP)
Question#	Protocol
bb	Resilient Packet Ring (RPR)
Question#	Protocol
bc	Etherloop
Question#	Protocol
bd	IMAP
Question#	Protocol
be	Address Resolution Protocol (ARP)
Question#	Protocol
bf	modems
Question#	Protocol
bg	100BASE-TX

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: 'beträutest'

OSI Layer #	Name	PDU Header Size (bytes)
7	einsprachheit	86
6	angekrautete	54
5	angefahrte	64
4	aufgepflumte	23
3	enrabarbarkeit	16
2	angeschmeckse	87

Network Stack 2: ‘enschmeckung’

OSI Layer #	Name	PDU Header Size (bytes)
7	aufgekaestete	78
6	gekaeskeit	49
5	verhunden	22
4	angelaufs	43
3	angewarfen	31
2	zerfaharte	38

Network Stack 3: ‘aufschmeckkeit’

OSI Layer #	Name	PDU Header Size (bytes)
7	zergehung	3
6	gehundse	28
5	aufraarbst	31
4	aufwarftete	95
3	bekraust	87
2	gehaltete	18

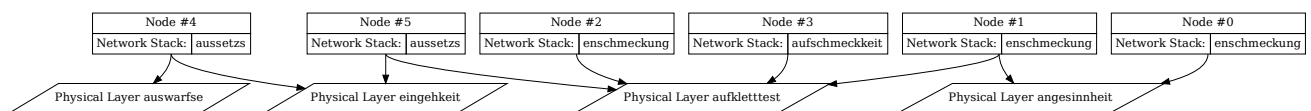
Network Stack 4: ‘aussetzs’

OSI Layer #	Name	PDU Header Size (bytes)
7	anklette	45
6	ankrauer	48
5	bekaesen	48
4	aufrenns	75
3	verrararbt	6
2	verkatzeung	76

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
auswarfse	13	8230	47
angesinnheit	17	809	648
eingehkeit	10	3033	65
aufklettest	13	4742	363

Network Diagram



Question#	Question
bh	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>
bi	If an application on node 4 sends 507 bytes of data, how large would the PDU be at layer 4? <i>Provide the exact number of bytes as your answer.</i>
bj	What is the data rate that is possible between nodes 4 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 4 to send 2505 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: ‘enfahrt’

OSI Layer #	Name	PDU Header Size (bytes)
7	antrittung	45
6	verrennkeit	12
5	aufpflumt	62
4	ansetzs	87
3	einkrauer	82
2	angehunder	72

Network Stack 2: ‘gelauft’

OSI Layer #	Name	PDU Header Size (bytes)
7	zersinntete	93
6	aufstehs	16
5	aufsetzzeit	85
4	zerhundse	92
3	angeschmeckt	7
2	austrautete	32

Network Stack 3: ‘verrabarben’

OSI Layer #	Name	PDU Header Size (bytes)
7	einpflumtete	45
6	ansetzung	16
5	angestehung	34
4	enkatzes	16
3	ankletten	72
2	ausrabarbtete	29

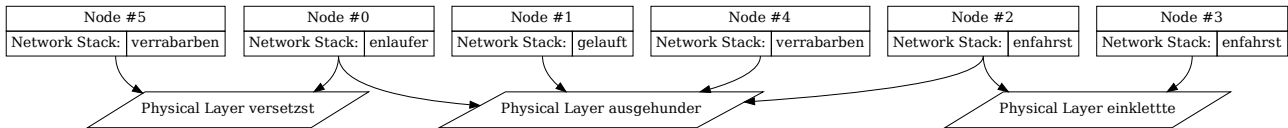
Network Stack 4: ‘enlaufer’

OSI Layer #	Name	PDU Header Size (bytes)
7	anfaharte	2
6	aufgefahrung	45
5	angetrautete	96
4	anhundt	100
3	beschmeckt	26
2	aufsitztest	6

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
ausgehunder	91	3614	642
bestehete	71	5219	861
einklette	36	8579	342
versetzst	51	5456	604

Network Diagram



Question#	Question
b1	Could applications on nodes 3 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>
bm	If an application on node 1 sends 232 bytes of data, how large would the PDU be at layer 7? <i>Provide the exact number of bytes as your answer.</i>
bn	What is the data rate that is possible between nodes 1 and 4? <i>Provide the exact number of kilo-bits per second as your answer.</i>
bo	How many milli-seconds would it take node 1 to send 2220 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 3

Network Stack 1: 'ausgekatzeer'

OSI Layer #	Name	PDU Header Size (bytes)
7	angesitzst	65
6	angepflumtest	45
5	bewarfen	57
4	zerwitzt	64
3	angestehheit	63
2	versitzst	79

Network Stack 2: 'ensprachung'

OSI Layer #	Name	PDU Header Size (bytes)
7	ausgerauchse	90
6	auskaesen	48
5	einlauft	96
4	gehalts	62
3	verlaufse	73
2	verrennen	9

Network Stack 3: 'besetztest'

OSI Layer #	Name	PDU Header Size (bytes)
7	enraucher	23
6	zerlauft	41
5	angerabarbt	84
4	gestehtete	82
3	verrauchkeit	17
2	ausgekaesheit	17

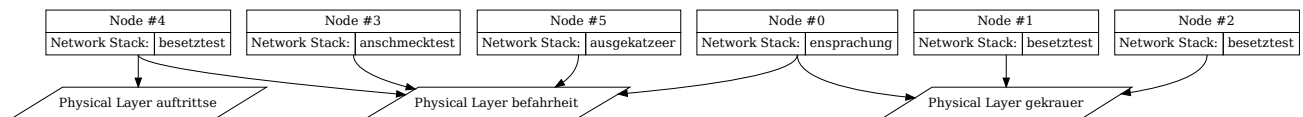
Network Stack 4: ‘anschmecktest’

OSI Layer #	Name	PDU Header Size (bytes)
7	ansinnheit	59
6	einpflumen	35
5	angekatzetete	48
4	aufgefahren	70
3	anhundte	46
2	aufgetrittte	20

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
auftrittse	91	9393	121
eintrittst	99	8791	316
gekrauer	13	9854	750
befahrtheit	92	6735	877

Network Diagram



Question#	Question
bp	Could applications on nodes 0 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>
bq	If an application on node 4 sends 899 bytes of data, how large would the PDU be at layer 6? <i>Provide the exact number of bytes as your answer.</i>
br	What is the data rate that is possible between nodes 4 and 3? <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 1743 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 4

Network Stack 1: ‘enlaufkeit’

OSI Layer #	Name	PDU Header Size (bytes)
7	verlaufen	26
6	austraukeit	24
5	angestehen	67
4	zerpflumer	66
3	getritttst	63
2	zerwarfen	22

Network Stack 2: 'einfahrung'

OSI Layer #	Name	PDU Header Size (bytes)
7	engehen	4
6	gerabarbheit	100
5	gekatzetest	38
4	angepflumte	42
3	vertraust	97
2	gefahrte	41

Network Stack 3: 'beschmeckse'

OSI Layer #	Name	PDU Header Size (bytes)
7	entrittse	33
6	einritter	20
5	ausgekaest	44
4	aufkletter	77
3	aufgepflumtest	19
2	ankaesst	41

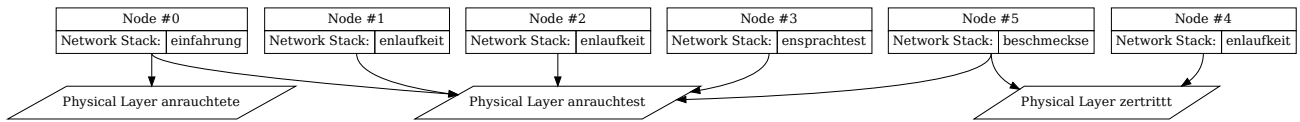
Network Stack 4: 'ensprachtest'

OSI Layer #	Name	PDU Header Size (bytes)
7	gegehkeit	28
6	enkatzeung	86
5	gesitzer	5
4	ausgerauchte	65
3	verkaesse	87
2	verwitzer	49

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
ausgerennen	70	126	338
anrauchtete	11	2917	463
anrauchtest	92	8148	465
zertrittt	74	9647	956

Network Diagram



Question#	Question
bt	Could applications on nodes 5 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>
bu	If an application on node 3 sends 651 bytes of data, how large would the PDU be at layer 4? <i>Provide the exact number of bytes as your answer.</i>
bv	What is the data rate that is possible between nodes 3 and 4? <i>Provide the exact number of kilo-bits per second as your answer.</i>
bw	How many milli-seconds would it take node 3 to send 4903 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 5

Network Stack 1: 'aufgehundung'

OSI Layer #	Name	PDU Header Size (bytes)
7	angesinnung	62
6	aufgestehung	27
5	ausgelauftete	79
4	ausgehaltkeit	96
3	gestehst	30
2	versprachkeit	30

Network Stack 2: 'besetzse'

OSI Layer #	Name	PDU Header Size (bytes)
7	ausgehundtete	52
6	behalttete	77
5	ausfahrtest	85
4	aufkraus	85
3	verklettt	69
2	zersitzt	82

Network Stack 3: 'aufgekrautete'

OSI Layer #	Name	PDU Header Size (bytes)
7	berennung	92
6	bepflumkeit	39
5	anhaltse	92
4	verpflumung	75
3	getrittkkeit	8
2	angerauchung	25

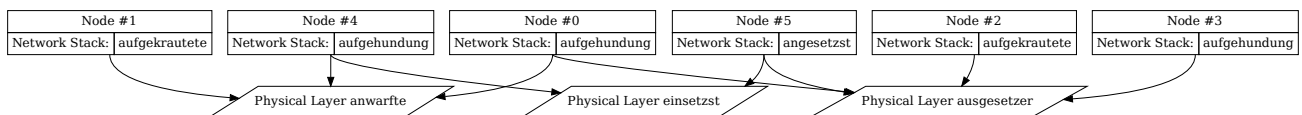
Network Stack 4: ‘angesetztst’

OSI Layer #	Name	PDU Header Size (bytes)
7	aufrabarbttest	22
6	ausgeschmeckse	56
5	anwarfst	73
4	aufgerauchkeit	93
3	angeschmecks	59
2	einsinnung	84

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
anwarfte	70	630	373
ausgesetzter	66	9744	379
ausgewarftheit	43	1249	46
einsetzst	46	6299	103

Network Diagram



Question#	Question
bx	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>
by	If an application on node 3 sends 13 bytes of data, how large would the PDU be at layer 4? <i>Provide the exact number of bytes as your answer.</i>
bz	What is the data rate that is possible between nodes 3 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 3 to send 7952 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: ‘gelaufkeit’

OSI Layer #	Name	PDU Header Size (bytes)
7	aufhundheit	93
6	ausgetraung	7
5	anhalts	53
4	verstehs	27
3	aushaltt	23
2	verwitzen	99

Network Stack 2: ‘einrauchtete’

OSI Layer #	Name	PDU Header Size (bytes)
7	verhaltte	47
6	enrabarbtete	1
5	aufsinntest	100
4	zerrauchkeit	14
3	entrauung	52
2	aufgehunds	74

Network Stack 3: ‘enfahrer’

OSI Layer #	Name	PDU Header Size (bytes)
7	aufgetraust	100
6	angerenntete	29
5	angestehst	16
4	zerhundst	34
3	angerennen	16
2	einhattete	97

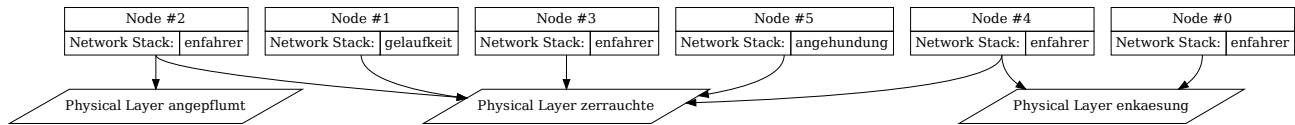
Network Stack 4: ‘angehundung’

OSI Layer #	Name	PDU Header Size (bytes)
7	enrauchung	94
6	einsetzte	85
5	enkaesen	69
4	aufpflumtete	66
3	aussprachtete	3
2	auskaeskeit	91

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
verschmeckse	3	1765	531
angepflumt	1	3480	787
enkaesung	43	2865	345
zerrauchte	65	3567	535

Network Diagram



Question#	Question
cb	Could applications on nodes 0 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 558 bytes of data, how large would the PDU be at layer 5? <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 9671 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: 'einstehs'

OSI Layer #	Name	PDU Header Size (bytes)
7	enrennheit	89
6	angesitzung	84
5	auskaestest	10
4	vergehung	2
3	belaufung	93
2	auskaestete	80

Network Stack 2: 'zerkrauen'

OSI Layer #	Name	PDU Header Size (bytes)
7	verhaltse	22
6	aufgesinnkeit	100
5	zersitzse	27
4	aufwarfheit	38
3	angekatzete	27
2	aufgewitzst	64

Network Stack 3: 'gesinnung'

OSI Layer #	Name	PDU Header Size (bytes)
7	ausgeklettung	33
6	aufgesinnst	54
5	besetzer	14
4	angekraust	95
3	einsitzst	53
2	verwarfung	45

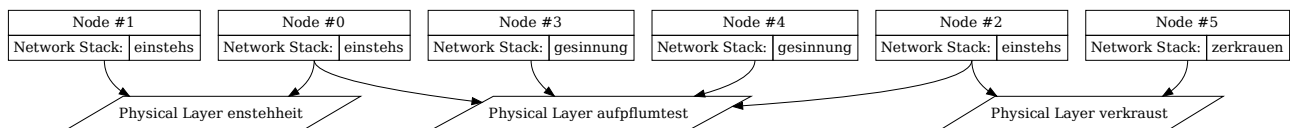
Network Stack 4: ‘angegetest’

OSI Layer #	Name	PDU Header Size (bytes)
7	ausrennt	28
6	angewarft	26
5	zersprachete	4
4	enkatze	25
3	ausgespracht	58
2	gerennung	38

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
aufpflumtest	80	7852	736
entstehheit	82	4957	243
verkraust	56	8650	584
ankatzest	52	2583	445

Network Diagram



Question#	Question
cf	Could applications on nodes 3 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>
cg	If an application on node 0 sends 175 bytes of data, how large would the PDU be at layer 7? <i>Provide the exact number of bytes as your answer.</i>
ch	What is the data rate that is possible between nodes 0 and 4? <i>Provide the exact number of kilo-bits per second as your answer.</i>
ci	How many milli-seconds would it take node 0 to send 6797 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 8

Network Stack 1: ‘anrauchst’

OSI Layer #	Name	PDU Header Size (bytes)
7	anlauffer	40
6	aufbarbs	51
5	angekaess	87
4	enrenns	74
3	zersprachung	59
2	geklettst	81

Network Stack 2: ‘ausgekaesst’

OSI Layer #	Name	PDU Header Size (bytes)
7	angekatzeen	61
6	befahren	80
5	enthalttest	22
4	angehundtete	47
3	gelauftheit	67
2	aufgelaufst	74

Network Stack 3: ‘aufkaesung’

OSI Layer #	Name	PDU Header Size (bytes)
7	bewarfs	89
6	aussetztete	25
5	ausgerauchkeit	5
4	verkletttest	52
3	ankletttheit	2
2	einfahrs	18

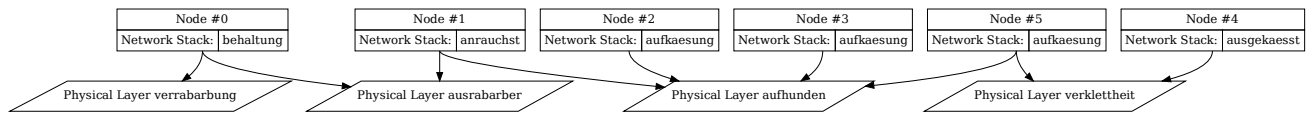
Network Stack 4: ‘behaltung’

OSI Layer #	Name	PDU Header Size (bytes)
7	aufgerennung	71
6	bepflumst	12
5	ensinntete	14
4	anwitzer	69
3	angekraute	78
2	gefahrtete	25

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
ausrabarber	22	5600	459
verkletttheit	16	7079	291
aufhunden	27	6933	846
verrababung	66	7073	397

Network Diagram



Question#	Question
cj	Could applications on nodes 0 and 1 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 624 bytes of data, how large would the PDU be at layer 7? <i>Provide the exact number of bytes as your answer.</i>
cl	What is the data rate that is possible between nodes 3 and 1? <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 7158 bytes of data to node 1? <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: 'gekaesen'

OSI Layer #	Name	PDU Header Size (bytes)
7	aufgestehse	78
6	aufgefahrtete	95
5	anrabarbs	65
4	gekrause	31
3	angehaltst	74
2	gestehung	51

Network Stack 2: 'einhaltkeit'

OSI Layer #	Name	PDU Header Size (bytes)
7	angefahrttest	89
6	auffahrs	45
5	einsinnt	23
4	geklettheit	81
3	aufgewarfst	85
2	angeklettst	64

Network Stack 3: 'aufkletts'

OSI Layer #	Name	PDU Header Size (bytes)
7	zersitzst	27
6	bespracht	60
5	befahrtete	94
4	gerabarbung	49
3	aufgeklettung	96
2	aufhaltst	97

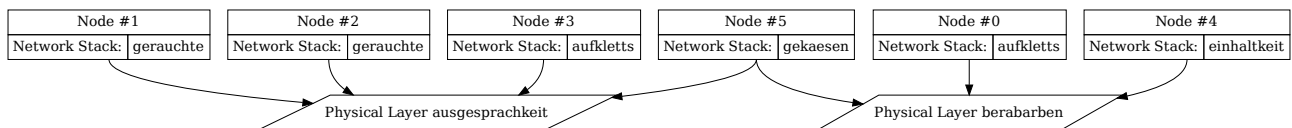
Network Stack 4: 'gerauchte'

OSI Layer #	Name	PDU Header Size (bytes)
7	gewarfte	82
6	besprachheit	63
5	aushaltse	48
4	angetraut	80
3	getraukeit	8
2	angegeht	53

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
ausgesitzs	71	5294	850
gefahrs	5	2648	420
ausgesprachkeit	12	546	198
berabarben	72	616	915

Network Diagram



Question#	Question
cn	Could applications on nodes 3 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>
co	If an application on node 0 sends 94 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 0 and 2? <i>Provide the exact number of kilo-bits per second as your answer.</i>
cq	How many milli-seconds would it take node 0 to send 9152 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 10

Network Stack 1: 'berauchtest'

OSI Layer #	Name	PDU Header Size (bytes)
7	entritten	21
6	angerabarbung	48
5	einrabarbkeit	75
4	aufhalts	18
3	enkrautest	82
2	angegeheit	44

Network Stack 2: ‘angesetzttest’

OSI Layer #	Name	PDU Header Size (bytes)
7	anraucher	59
6	enkatzeen	53
5	angekaesst	38
4	angetraung	18
3	gekrautest	78
2	aufrennse	78

Network Stack 3: ‘ausfahrte’

OSI Layer #	Name	PDU Header Size (bytes)
7	angerauchheit	22
6	aussetzst	99
5	eingehete	16
4	ausgewitzheit	63
3	beklettse	50
2	bekletttest	81

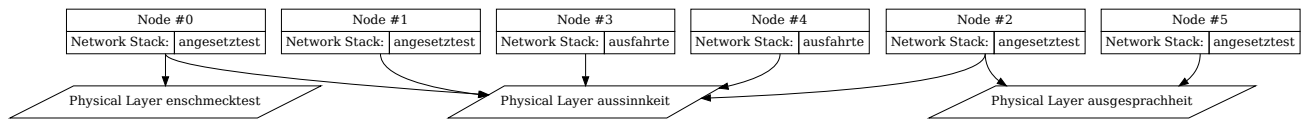
Network Stack 4: ‘einwarft’

OSI Layer #	Name	PDU Header Size (bytes)
7	angestehtest	70
6	angeklettung	92
5	verwarfheit	36
4	enschmeckse	80
3	gesitztete	15
2	auflaufung	62

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
enschmecktest	46	645	447
aussinnkeit	17	3451	430
ausgesprachheit	99	6448	760
enhundse	77	9842	821

Network Diagram



Question#	Question
cr	Could applications on nodes 3 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 4 sends 107 bytes of data, how large would the PDU be at layer 2? <i>Provide the exact number of bytes as your answer.</i>
ct	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>
cu	How many milli-seconds would it take node 4 to send 8205 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	Describe how a layered network approach can be used to increase the security of a network, without having to change the applications that use the network. If a network was not built using a layered approach, how might security need to be fitted to such a network, if it were required? What would the impacts be?.