Computer Networks 2021 Exercises - Unit 1

FAN: worr0028

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	The layer where virtual circuits can be established

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

Question#	Description
ad	Responsible for establishing sessions

Question#	Description
ae	Performs symbol encoding and modulation

Question#	Description
af	Can provide transparent conversion between different file types

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

Question#	Description
ah	Responsible for bit and symbol synchronisation

Question#	Description
ai	Responsible for logical addresses of senders and receivers on a local network segment.

Question#	Description
aj	Provides support for common services

Question#	Description
ak	The primary layer responsible for reliable delivery of data

Question#	Description
al	Provides globally addressable identifiers for nodes on large networks

Question#	Description
am	Responsible for data encryption

Question#	Description
an	Provides the interface for programmes to access network services

Question#	Description
ao	Defines the physical specifications of a data connection

Question#	Description
ap	Responsible for electromagnetic spectrum allocation

Question#	Description
aq	Responsible for human-computer interaction

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	NetBIOS Frames (NBF)

Question#	Protocol
as	Asynchronous Transfer Mode (ATM)

Question#	Protocol
at	LLDP-MED

Question#	Protocol
au	Telnet

Question#	Protocol
av	Distributed Multi-Link Trunking

Question#	Protocol
aw	T-carrier

Question#	Protocol
ax	Media Access Control (MAC)

Question#	Protocol
ay	IPX/SPX (SPX)

Question#	Protocol
az	L2F

Question#	Protocol
ba	Wi-Fi

Question#	Protocol
bb	SMTP

Question#	Protocol
bc	SOCKS

Question#	Protocol
bd	LattisNet

Question#	Protocol
be	9P (protocol) (9P)

Question#	Protocol
bf	LocalTalk

Question#	Protocol
bg	Dynamic Trunking Protocol

3

For each question, you are presented with a fictional network topology and layered network protocol stack(s). You mush 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 xl= line in the file* unit1-answers.txt.

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

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

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

OSI Layer #	Name	PDU Header Size (bytes)
7	ausrabarben	73
6	gewitztest	43
5	aufgesitztest	51
4	einwitzkeit	39
3	aufpflums	69
2	ausgekatzes	31

Network Stack 2: 'anrabarbse'

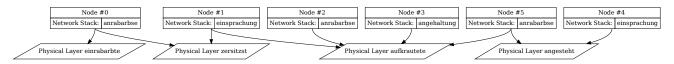| OSI Layer #	Name	PDU Header Size (bytes)
7	ensitztest	32
6	ausgepflumtest	25
5	aufgesitzst	93
4	bekaesen	26
3	angekatzes	21
2	ausgetraus	77

Network Stack 3: 'auswitzen'

OSI Layer #	Name	PDU Header Size (bytes)
7	anspracht	44
6	ausrauchung	71
5	zerkaeskeit	26
4	zerrenner	46
3	besetzen	42
2	ansitzst	88

Network Stack 4: 'einsprachung'

OSI Layer #	Name	PDU Header Size (bytes)
7	geklettse	50
6	einwarft	19
5	ausgestehte	6
4	enkaesst	27
3	getrause	19
2	eintraut	46

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
einrabarbte	93	4567	213
aufkrautete	87	4182	944
angesteht	67	7024	750
zersitzst	98	11	63

Network Diagram

Node #0	Node #1	Node #2	Node #3	Node #5	Node #4
Network Stack: anrabarbse	Network Stack: einsprachung	Network Stack: anrabarbse	Network Stack: angehaltung	Network Stack: anrabarbse	Network Stack: einsprachung

Physical Layer einrabarbte
Physical Layer zersitzst
Physical Layer aufkrautete
Physical Layer angesteht

Question#	Question
bh	Could applications on nodes 1 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? *Answer Y or N. Any other answer will be marked incorrect.*
bi	If an application on node 0 sends 442 bytes of data, how large would the PDU be at layer 5? *Provide the exact number of bytes as your answer.*
bj	What is the data rate that is possible between nodes 0 and 3? *Provide the exact number of kilo-bits per second as your answer.*
bk	How many milli-seconds would it take node 0 to send 8625 bytes of data to node 3? *Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.*

Fictional Network Topology 2

Network Stack 1: 'auflaufst'

OSI Layer #	Name	PDU Header Size (bytes)
7	enhundte	21
6	verhaltse	40
5	enhundt	42
4	enschmecktete	52
3	besitzst	4
2	ausgeschmeckst	53

Network Stack 2: 'besitzs'

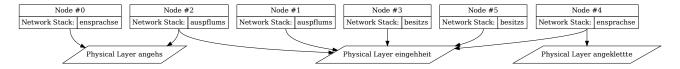| OSI Layer #	Name	PDU Header Size (bytes)
7	angegeher	38
6	anstehs	74
5	angegehtest	11
4	anhundtete	47
3	geraucher	93
2	angestehtest	11

Network Stack 3: 'ensprachse'

OSI Layer #	Name	PDU Header Size (bytes)
7	angesprachs	44
6	geschmecker	91
5	besetztete	64
4	behunds	16
3	einlaufung	43
2	einsinntest	81

Network Stack 4: 'auspflums'

OSI Layer #	Name	PDU Header Size (bytes)
7	zerraucht	76
6	aufsetzung	55
5	gehaltte	90
4	entrauheit	15
3	verlaufung	85
2	zertrautete	87

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
antraut	76	2668	127
eingehheit	69	3675	358
angehs	73	2103	246
angeklettte	40	9795	920

Network Diagram

Node #0		Node #2		Node #1		Node #3		Node #5		Node #4	
Network Stack:	ensprachse	Network Stack:	auspflums	Network Stack:	auspflums	Network Stack:	besitzs	Network Stack:	besitzs	Network Stack:	ensprachse

Physical Layer angehs   Physical Layer eingehheit   Physical Layer angeklettte

Question#	Question
bl	Could applications on nodes 1 and 5 communicate with one another? i.e., are they using compatible network stacks, and is there a compatible path through the network between them? *Answer Y or N. Any other answer will be marked incorrect.*
bm	If an application on node 3 sends 106 bytes of data, how large would the PDU be at layer 5? *Provide the exact number of bytes as your answer.*
bn	What is the data rate that is possible between nodes 3 and 5? *Provide the exact number of kilo-bits per second as your answer.*
bo	How many milli-seconds would it take node 3 to send 7724 bytes of data to node 5? *Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.*

Fictional Network Topology 3

Network Stack 1: 'zertrittst'

OSI Layer #	Name	PDU Header Size (bytes)
7	aufgekatzete	16
6	aufrennse	15
5	zerrabarben	31
4	angesprachse	15
3	aufgerauchkeit	77
2	eintraukeit	88

Network Stack 2: 'anrenner'

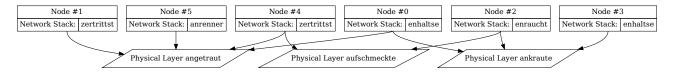| OSI Layer #	Name	PDU Header Size (bytes)
7	zersitzse	28
6	ausgeklettheit	25
5	einsinnt	49
4	verpflumse	100
3	zersprachen	71
2	vertrautete	71

Network Stack 3: 'enhaltse'

OSI Layer #	Name	PDU Header Size (bytes)
7	behaltheit	18
6	einhalter	3
5	gekrauen	99
4	ausgetrittkeit	82
3	angeraucht	67
2	aufsinnkeit	49

Network Stack 4: 'enraucht'

OSI Layer #	Name	PDU Header Size (bytes)
7	angewitzst	29
6	angetritter	80
5	gehundte	24
4	ausgepflumse	64
3	ausgehse	46
2	verlauftest	16

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
angetraut	21	3139	663
aufschmeckte	42	223	261
eintrause	50	7333	774
ankraute	16	1860	493

Network Diagram

Question#	Question
bp	Could applications on nodes 2 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? *Answer Y or N. Any other answer will be marked incorrect.*
bq	If an application on node 5 sends 171 bytes of data, how large would the PDU be at layer 6? *Provide the exact number of bytes as your answer.*
br	What is the data rate that is possible between nodes 5 and 1? *Provide the exact number of kilo-bits per second as your answer.*
bs	How many milli-seconds would it take node 5 to send 1584 bytes of data to node 1? *Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.*

Fictional Network Topology 4

Network Stack 1: 'aufgerauchte'

OSI Layer #	Name	PDU Header Size (bytes)
7	zerkraust	24
6	aufgehaltt	34
5	auskaestest	75
4	engehs	87
3	ausgesprachen	73
2	auftrause	86

Network Stack 2: 'angerabarbst'

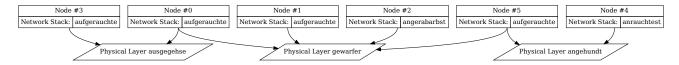| OSI Layer #	Name	PDU Header Size (bytes)
7	aufstehheit	44
6	gegehte	100
5	enwitzse	73
4	enpflumst	62
3	ansinnst	42
2	angeher	96

Network Stack 3: 'auflauftete'

OSI Layer #	Name	PDU Header Size (bytes)
7	ansinntete	80
6	aufsitzen	100
5	angesitzt	15
4	anstehst	30
3	verlaufheit	68
2	ausschmeckse	25

Network Stack 4: 'anrauchtest'

OSI Layer #	Name	PDU Header Size (bytes)
7	zerwitzs	78
6	anhalten	87
5	angehundt	82
4	aufgerabarber	78
3	ausgetrittung	21
2	zersprachtete	74

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
aufgetrittst	49	4659	548
ausgegehse	30	7311	590
gewarfer	56	618	645
angehundt	67	6907	774

Network Diagram

Question#	Question
bt	Could applications on nodes 5 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? *Answer Y or N. Any other answer will be marked incorrect.*
bu	If an application on node 3 sends 306 bytes of data, how large would the PDU be at layer 4? *Provide the exact number of bytes as your answer.*
bv	What is the data rate that is possible between nodes 3 and 3? *Provide the exact number of kilo-bits per second as your answer.*
bw	How many milli-seconds would it take node 3 to send 3028 bytes of data to node 3? *Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.*

Fictional Network Topology 5

Network Stack 1: 'angekaesst'

OSI Layer #	Name	PDU Header Size (bytes)
7	ausgekrauheit	100
6	auswitzs	49
5	enhundheit	46
4	einsitztest	47
3	getraus	28
2	aufgehaltung	22

Network Stack 2: 'enwitztete'

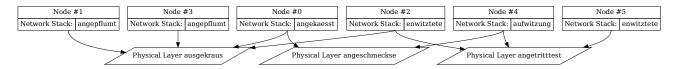| OSI Layer #	Name	PDU Header Size (bytes)
7	verstehst	22
6	angesinnt	20
5	zerrauchen	45
4	aufgesteher	61
3	ausgepflumen	32
2	angerabarbt	73

Network Stack 3: 'aufwitzung'

OSI Layer #	Name	PDU Header Size (bytes)
7	besinnt	64
6	ankaeskeit	33
5	angetritttete	86
4	austrittse	2
3	berennt	14
2	aufschmecktete	17

Network Stack 4: 'angepflumt'

OSI Layer #	Name	PDU Header Size (bytes)
7	ausstehheit	65
6	bewitztest	79
5	angesetzheit	86
4	ausrauchen	58
3	gerenns	7
2	aufsitzt	80

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
angeschmeckse	25	7910	726
getritttete	62	9005	492
ausgekraus	33	865	584
angetritttest	90	8586	23

Network Diagram

Question#	Question
bx	Could applications on nodes 4 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? *Answer Y or N. Any other answer will be marked incorrect.*
by	If an application on node 0 sends 714 bytes of data, how large would the PDU be at layer 2? *Provide the exact number of bytes as your answer.*
bz	What is the data rate that is possible between nodes 0 and 3? *Provide the exact number of kilo-bits per second as your answer.*
ca	How many milli-seconds would it take node 0 to send 7657 bytes of data to node 3? *Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.*

Fictional Network Topology 6

Network Stack 1: 'anpflumse'

OSI Layer #	Name	PDU Header Size (bytes)
7	aufgewitzer	85
6	ausgekaess	63
5	behunden	64
4	gesinnt	72
3	anrabarbs	54
2	bewitzen	75

Network Stack 2: 'gesitzst'

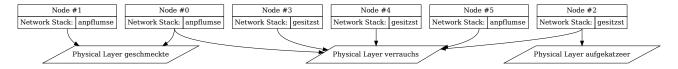| OSI Layer #	Name	PDU Header Size (bytes)
7	auflaufung	40
6	angetrauer	12
5	angesinnkeit	16
4	aufgelauftete	10
3	behundtest	18
2	einrabarbst	24

Network Stack 3: 'verraucht'

OSI Layer #	Name	PDU Header Size (bytes)
7	aussprachte	70
6	ausgewarfst	58
5	gehaltung	84
4	versitzt	100
3	verklettse	66
2	verrennkeit	62

Network Stack 4: 'bewarfs'

OSI Layer #	Name	PDU Header Size (bytes)
7	bewitzt	29
6	angehundte	11
5	angerabarbt	44
4	bewarftete	71
3	enwarfheit	46
2	bekaestest	49

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
einfahrtest	61	7982	456
geschmeckte	46	6682	431
aufgekatzeer	64	8926	713
verrauchs	88	8742	319

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Network Diagram

Question#	Question
cb	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? *Answer Y or N. Any other answer will be marked incorrect.*
cc	If an application on node 0 sends 763 bytes of data, how large would the PDU be at layer 3? *Provide the exact number of bytes as your answer.*
cd	What is the data rate that is possible between nodes 0 and 2? *Provide the exact number of kilo-bits per second as your answer.*
ce	How many milli-seconds would it take node 0 to send 4397 bytes of data to node 2? *Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.*

Fictional Network Topology 7

Network Stack 1: 'aufstehen'

OSI Layer #	Name	PDU Header Size (bytes)
7	enrennse	18
6	gekletttest	78
5	angegehen	75
4	aufgeklettung	19
3	angefahrkeit	13
2	verschmeckse	45

Network Stack 2: 'auslaufs'

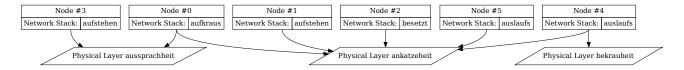| OSI Layer #	Name	PDU Header Size (bytes)
7	zerhunds	51
6	verstehkeit	97
5	angetrause	23
4	versinntete	15
3	gehalts	22
2	einrabarbkeit	37

Network Stack 3: 'besetzt'

OSI Layer #	Name	PDU Header Size (bytes)
7	verkaeser	39
6	ensinnte	43
5	betrittkeit	71
4	angelaufte	73
3	aufgetraus	34
2	aufrauchse	90

Network Stack 4: 'aufkraus'

OSI Layer #	Name	PDU Header Size (bytes)
7	gerennung	95
6	angesprachs	77
5	ausgetraute	10
4	ausschmecken	87
3	aufwarfs	24
2	gerauchtete	41

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
aussprachheit	84	9143	616
ansetzst	64	1320	823
ankatzeheit	28	5359	396
bekrauheit	23	6526	190

Network Diagram

Node #3	Node #0	Node #1	Node #2	Node #5	Node #4
Network Stack: aufstehen	Network Stack: aufkraus	Network Stack: aufstehen	Network Stack: besetzt	Network Stack: auslaufs	Network Stack: auslaufs

Physical Layer aussprachheit   Physical Layer ankatzeheit   Physical Layer bekrauheit

Question#	Question
cf	Could applications on nodes 0 and 5 communicate with one another? i.e., are they using compatible network stacks, and is there a compatible path through the network between them? *Answer Y or N. Any other answer will be marked incorrect.*
cg	If an application on node 4 sends 65 bytes of data, how large would the PDU be at layer 7? *Provide the exact number of bytes as your answer.*
ch	What is the data rate that is possible between nodes 4 and 5? *Provide the exact number of kilo-bits per second as your answer.*
ci	How many milli-seconds would it take node 4 to send 9145 bytes of data to node 5? *Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.*

Fictional Network Topology 8

Network Stack 1: 'vertraus'

OSI Layer #	Name	PDU Header Size (bytes)
7	zerwarfst	76
6	befahrte	34
5	enpflums	31
4	verkatzeer	100
3	auskatzese	38
2	ausgeklettete	73

Network Stack 2: 'zertrittheit'

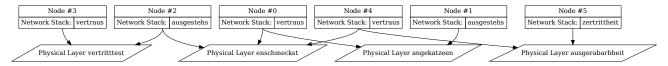| OSI Layer #	Name	PDU Header Size (bytes)
7	gegehs	24
6	zerschmeckse	89
5	entritttete	82
4	ausgekaeskeit	78
3	anlaufheit	74
2	angesprachtest	92

Network Stack 3: 'ausgestehs'

OSI Layer #	Name	PDU Header Size (bytes)
7	enwarfen	35
6	auslaufst	37
5	entrittt	100
4	anwitzte	5
3	berauchheit	53
2	austraukeit	87

Network Stack 4: 'berauchtete'

OSI Layer #	Name	PDU Header Size (bytes)
7	einwitzst	7
6	auswitzte	16
5	angekaesheit	51
4	ausgekaest	52
3	verrauchte	33
2	einspracht	100

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
vertritttest	68	489	305
ausgerabarbheit	62	8133	237
angekatzeen	9	1800	256
enschmeckst	16	7957	387

Network Diagram

Question#	Question
cj	Could applications on nodes 3 and 5 communicate with one another? i.e., are they using compatible network stacks, and is there a compatible path through the network between them? *Answer Y or N. Any other answer will be marked incorrect.*
ck	If an application on node 1 sends 646 bytes of data, how large would the PDU be at layer 2? *Provide the exact number of bytes as your answer.*
cl	What is the data rate that is possible between nodes 1 and 5? *Provide the exact number of kilo-bits per second as your answer.*
cm	How many milli-seconds would it take node 1 to send 7545 bytes of data to node 5? *Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.*

Fictional Network Topology 9

Network Stack 1: 'angestehtete'

OSI Layer #	Name	PDU Header Size (bytes)
7	angerenntete	3
6	auslaufer	35
5	auskatzeung	35
4	enrabarbung	19
3	verwarfer	56
2	ansinnen	93

Network Stack 2: 'aufgesitzung'

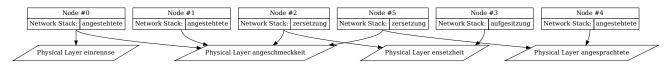| OSI Layer #	Name	PDU Header Size (bytes)
7	angerauchte	23
6	aufgerabarbheit	1
5	aussprachse	81
4	betrittst	21
3	verlaufs	67
2	ausgehaltung	9

Network Stack 3: 'zersetzung'

OSI Layer #	Name	PDU Header Size (bytes)
7	besinnung	38
6	aufgesinntete	56
5	verklettst	7
4	angerauchkeit	72
3	besinnst	52
2	anfahrst	5

Network Stack 4: 'gerennen'

OSI Layer #	Name	PDU Header Size (bytes)
7	einsitzheit	31
6	auskaess	82
5	einpflumtete	55
4	beklettse	17
3	ausgefahrst	15
2	aufkletten	36

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
angeschmeckkeit	63	3557	681
ensetzheit	31	9889	798
angesprachtete	33	2890	890
einrennse	8	3420	216

Network Diagram

Question#	Question
cn	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? *Answer Y or N. Any other answer will be marked incorrect.*
co	If an application on node 2 sends 460 bytes of data, how large would the PDU be at layer 3? *Provide the exact number of bytes as your answer.*
cp	What is the data rate that is possible between nodes 2 and 2? *Provide the exact number of kilo-bits per second as your answer.*
cq	How many milli-seconds would it take node 2 to send 1080 bytes of data to node 2? *Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.*

Fictional Network Topology 10

Network Stack 1: 'angetrauheit'

OSI Layer #	Name	PDU Header Size (bytes)
7	angetrittheit	18
6	zersprachs	11
5	ausgekatzete	24
4	angekrautete	36
3	verkatzetest	35
2	ausraucher	92

Network Stack 2: 'enstehte'

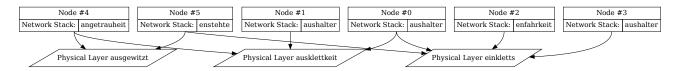| OSI Layer #	Name	PDU Header Size (bytes)
7	aufsinnung	32
6	ankatzeung	55
5	zerwarfse	52
4	enkaesung	4
3	verkaess	86
2	enfahrst	53

Network Stack 3: 'aushalter'

OSI Layer #	Name	PDU Header Size (bytes)
7	verlaufse	43
6	ankatzekeit	48
5	zerfahrse	19
4	einlaufse	10
3	aussprachst	56
2	ausgekatzeheit	27

Network Stack 4: 'enfahrkeit'

OSI Layer #	Name	PDU Header Size (bytes)
7	verkatzeung	47
6	bepflumheit	56
5	angerabarbtete	94
4	verlaufst	32
3	enkraus	16
2	betrauer	66

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
ausgewitzt	12	8146	689
angehundse	80	1897	788
einkletts	52	2102	844
ausklettkeit	71	5257	264

Network Diagram

Question#	Question
cr	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? *Answer Y or N. Any other answer will be marked incorrect.*
cs	If an application on node 0 sends 326 bytes of data, how large would the PDU be at layer 5? *Provide the exact number of bytes as your answer.*
ct	What is the data rate that is possible between nodes 0 and 2? *Provide the exact number of kilo-bits per second as your answer.*
cu	How many milli-seconds would it take node 0 to send 5443 bytes of data to node 2? *Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.*

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	In which layer is security normally implemented in the OSI layered network model? Choose two other layers, and suggest how security might be implemented in each of those layers instead.