Computer Networks 2021 Exercises - Unit 1

FAN: hang0013

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`	Provides support for common services

Question#	Description
`ac`	Responsible for electromagnetic spectrum allocation

Question#	Description
`ad`	Can provide transparent conversion between different file types

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

Question#	Description
`af`	Responsible for human-computer interaction

Question#	Description
`ag`	Responsible for the forwarding or messages or packets

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

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

Question#	Description
`aj`	Allows for the recovery of a lost connection

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

Question#	Description
al	Responsible for closing a connection, especially where it involves multiple resources

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

Question#	Description
an	Responsible for electromagnetic compatibility

Question#	Description
ao	Responsible for logical link control

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

Question#	Description
aq	Defines the electrical specifications of a data connection

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	Datagram Congestion Control Protocol (DCCP)

Question#	Protocol
as	TFTP

Question#	Protocol
at	HTTPS

Question#	Protocol
au	CLNP

Question#	Protocol
av	NetBIOS

Question#	Protocol
aw	IEEE 802.16

Question#	Protocol
ax	ARCnet

Question#	Protocol
ay	Message Transfer Part (Q.710)

Question#	Protocol
az	Fibre Channel Protocol (FCP)

Question#	Protocol
ba	Fiber distributed data interface (FDDI)

Question#	Protocol
bb	Distributed Multi-Link Trunking

Question#	Protocol
bc	Multiprotocol Label Switching (MPLS)

Question#	Protocol
bd	NetBEUI

Question#	Protocol
be	Transaction Capabilities Application Part (TCAP)

Question#	Protocol
bf	Simple Object Access Protocol (SOAP)

Question#	Protocol
bg	100BASE-FX

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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: 'gerauchst'

OSI Layer #	Name	PDU Header Size (bytes)
7	bewitzkeit	69
6	auflaufkeit	83
5	einhunds	45
4	enklettt	51
3	angesitzst	44
2	angehundse	55

Network Stack 2: 'berennkeit'

OSI Layer #	Name	PDU Header Size (bytes)
7	ensinnkeit	41
6	aufgesitztete	92
5	aufgeschmeckheit	57
4	angesinner	37
3	zertrittt	89
2	aufpflumheit	24

Network Stack 3: 'enhundung'

OSI Layer #	Name	PDU Header Size (bytes)
7	gerennst	98
6	entrauen	29
5	ausgetrauen	99
4	berauchheit	41
3	anhaltung	97
2	angeschmeckung	39

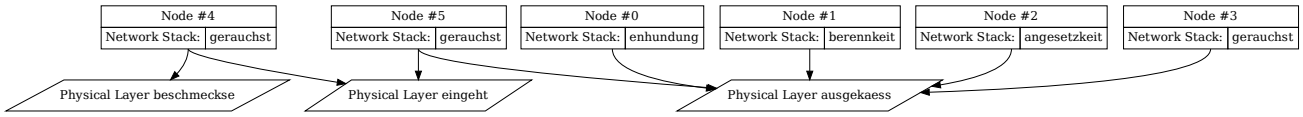
Network Stack 4: 'angesetzkeit'

OSI Layer #	Name	PDU Header Size (bytes)
7	ausgeklettheit	95
6	einklettt	27
5	einrabarben	82
4	ausstehung	34
3	ausgesprachs	39
2	anwarfer	51

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
beschmeckse	98	4394	67
einwitzkeit	58	5661	465
eingeht	37	4922	194
ausgekaess	66	9091	11

Network Diagram



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 402 bytes of data, how large would the PDU be at layer 2? *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 94 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: 'einkaeskeit'

OSI Layer #	Name	PDU Header Size (bytes)
7	ausgerennkeit	59
6	gespracher	87
5	anschmeckung	19
4	ausgeschmecken	90
3	ankraust	72
2	enhunder	67

Network Stack 2: 'begehtest'

OSI Layer #	Name	PDU Header Size (bytes)
7	anschmeckkeit	68
6	angerennkeit	61
5	ausstehse	84
4	aufkrautest	78
3	enhaltkeit	27
2	angerennheit	37

Network Stack 3: 'zerlaufheit'

OSI Layer #	Name	PDU Header Size (bytes)
7	getritts	70
6	ausgehalttest	9
5	einhundst	43
4	berenntest	37
3	ankraukeit	13
2	aufwarfung	59

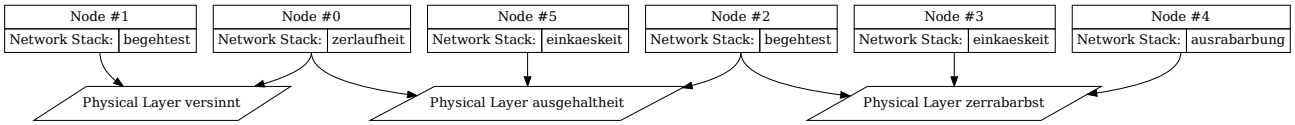
Network Stack 4: 'ausrabarbung'

OSI Layer #	Name	PDU Header Size (bytes)
7	austrittte	59
6	angefahrtest	4
5	auswitzse	30
4	ausgefahrs	82
3	aussitzkeit	43
2	aufgewitztete	53

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
`behundtete`	47	7168	596
`versinnt`	24	3778	808
`zerrabarbst`	95	8037	755
`ausgehaltheit`	46	5766	214

Network Diagram



Question#	Question
bl	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.*
bm	If an application on node 1 sends 685 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 1 and 1? *Provide the exact number of kilo-bits per second as your answer.*
bo	How many milli-seconds would it take node 1 to send 9338 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 3

Network Stack 1: 'angelaufheit'

OSI Layer #	Name	PDU Header Size (bytes)
7	betrittte	59
6	einrenntest	60
5	anrennung	3
4	ausgehaltst	32
3	zerrabarbheit	3
2	angekaeste	84

Network Stack 2: 'aufgerennse'

OSI Layer #	Name	PDU Header Size (bytes)
7	aufgehalten	24
6	ausgepflumst	5
5	aussprachheit	19
4	versprachtest	39
3	ausgehheit	63
2	besitzst	17

Network Stack 3: 'angesinntest'

OSI Layer #	Name	PDU Header Size (bytes)
7	gekatzest	26
6	einlaufung	16
5	ausraucht	83
4	ensetzung	94
3	angewitzst	3
2	aufgesinnung	33

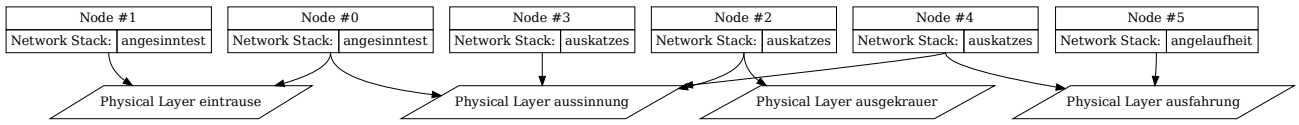
Network Stack 4: 'auskatzes'

OSI Layer #	Name	PDU Header Size (bytes)
7	aufpflumt	50
6	enwarfung	7
5	angerennkeit	61
4	gelaufer	58
3	ausgegehheit	65
2	angetritten	66

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
eintrause	98	7407	447
ausgekrauer	83	6363	918
aussinnung	31	9916	539
ausfahrung	69	656	801

Network Diagram



Question#	Question
bp	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? *Answer Y or N. Any other answer will be marked incorrect.*
bq	If an application on node 2 sends 498 bytes of data, how large would the PDU be at layer 3? *Provide the exact number of bytes as your answer.*
br	What is the data rate that is possible between nodes 2 and 4? *Provide the exact number of kilo-bits per second as your answer.*
bs	How many milli-seconds would it take node 2 to send 686 bytes of data to node 4? *Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.*

Fictional Network Topology 4

Network Stack 1: 'bekrause'

OSI Layer #	Name	PDU Header Size (bytes)
7	aufkrauung	6
6	ausgekatzet	16
5	gewarfen	58
4	zerrennst	27
3	aufgesteher	88
2	anhaltkeit	78

Network Stack 2: ‘gehaltt’

OSI Layer #	Name	PDU Header Size (bytes)
7	gesetzte	37
6	ankaesheit	20
5	gerabarben	33
4	aufgeklettung	15
3	auslauftete	17
2	zerschmeckst	99

Network Stack 3: ‘angespracht’

OSI Layer #	Name	PDU Header Size (bytes)
7	bewitztete	21
6	besitzung	63
5	betrittse	50
4	angekatzet	93
3	zerkraukeit	50
2	zerwarftete	100

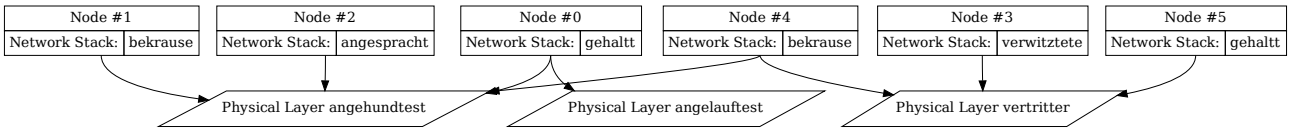
Network Stack 4: ‘verwitztete’

OSI Layer #	Name	PDU Header Size (bytes)
7	vergehtest	58
6	engehtest	26
5	aufsetzse	45
4	zersetztest	56
3	angelaufs	99
2	bewitzen	95

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
`angehundtest`	7	9446	393
`angelauftest`	34	763	547
`angewitzkeit`	20	4408	531
`vertritter`	85	4305	550

Network Diagram



Question#	Question
bt	Could applications on nodes 1 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.*
bu	If an application on node 3 sends 126 bytes of data, how large would the PDU be at layer 5? *Provide the exact number of bytes as your answer.*
bv	What is the data rate that is possible between nodes 3 and 2? *Provide the exact number of kilo-bits per second as your answer.*
bw	How many milli-seconds would it take node 3 to send 5514 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 5

Network Stack 1: 'verpflumer'

OSI Layer #	Name	PDU Header Size (bytes)
7	zerkaesheit	66
6	ausschmeckte	73
5	geschmeckse	13
4	anlauftete	63
3	aufwitzung	21
2	gekaesheit	21

Network Stack 2: 'einwarftest'

OSI Layer #	Name	PDU Header Size (bytes)
7	gefahrte	41
6	ausgesetzt	98
5	aufgesetzt	43
4	ausgeht	43
3	aufsprachtete	26
2	gerauchte	69

Network Stack 3: 'verklettst'

OSI Layer #	Name	PDU Header Size (bytes)
7	verklettse	26
6	verstehte	98
5	bekletten	74
4	vertritts	80
3	ausgefahrst	95
2	angetraus	63

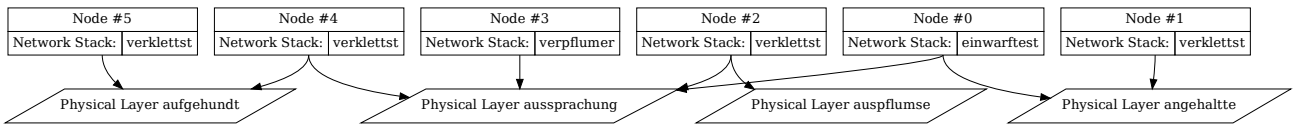
Network Stack 4: 'zerschmeckkeit'

OSI Layer #	Name	PDU Header Size (bytes)
7	gepflumtest	19
6	ausgetrittt	42
5	ausgerauchtest	62
4	enkrause	31
3	ausgerennse	89
2	angerauchung	68

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
aufgehundt	79	2411	318
aussprachung	37	6446	498
auspflumse	77	8426	404
angehaltte	68	3541	330

Network Diagram



Question#	Question
bx	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? *Answer Y or N. Any other answer will be marked incorrect.*
by	If an application on node 2 sends 102 bytes of data, how large would the PDU be at layer 3? *Provide the exact number of bytes as your answer.*
bz	What is the data rate that is possible between nodes 2 and 3? *Provide the exact number of kilo-bits per second as your answer.*
ca	How many milli-seconds would it take node 2 to send 8182 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: 'angerennse'

OSI Layer #	Name	PDU Header Size (bytes)
7	zerpflumen	97
6	angesprachtest	36
5	enrabarbtest	57
4	zerfahrst	81
3	angeraucht	73
2	anrabarbkeit	69

Network Stack 2: 'aufkletttest'

OSI Layer #	Name	PDU Header Size (bytes)
7	aufgerabarbst	55
6	zerklettt	99
5	angewitzst	2
4	zersitzst	3
3	ausgesetzkeit	96
2	auskatzekeit	21

Network Stack 3: 'ausgegeher'

OSI Layer #	Name	PDU Header Size (bytes)
7	angetraukeit	73
6	einkaesung	68
5	angewarfkeit	63
4	gewarfkeit	58
3	bewarfte	77
2	ausgefahrung	55

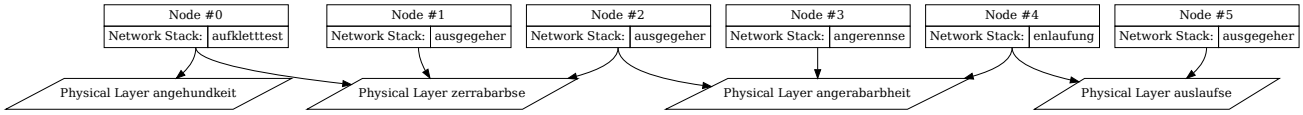
Network Stack 4: 'enlaufung'

OSI Layer #	Name	PDU Header Size (bytes)
7	aufgerenntete	2
6	ausgepflumheit	41
5	ansetzheit	96
4	verraucht	91
3	ausgesprachse	63
2	einwitzs	77

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
`angehundkeit`	93	1089	885
`zerrabarbse`	59	5317	766
`auslaufse`	21	1794	962
`angerabarbheit`	78	3782	493

Network Diagram



Question#	Question
cb	Could applications on nodes 4 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.*
cc	If an application on node 3 sends 636 bytes of data, how large would the PDU be at layer 5? *Provide the exact number of bytes as your answer.*
cd	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.*
ce	How many milli-seconds would it take node 3 to send 4760 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 7

Network Stack 1: 'verkaesse'

OSI Layer #	Name	PDU Header Size (bytes)
7	eingehen	75
6	aufgerennung	94
5	angestehs	34
4	enrennte	53
3	verraucher	90
2	angefahrkeit	74

Network Stack 2: 'angekatzeer'

OSI Layer #	Name	PDU Header Size (bytes)
7	engehkeit	72
6	enfahrkeit	81
5	angesinnheit	38
4	getraute	45
3	angestehs	98
2	angerauchse	88

Network Stack 3: 'ausschmeckt'

OSI Layer #	Name	PDU Header Size (bytes)
7	ausgelaufkeit	29
6	geraucht	78
5	aufgestehte	15
4	einsprachung	33
3	einkletttete	80
2	aufpflumst	35

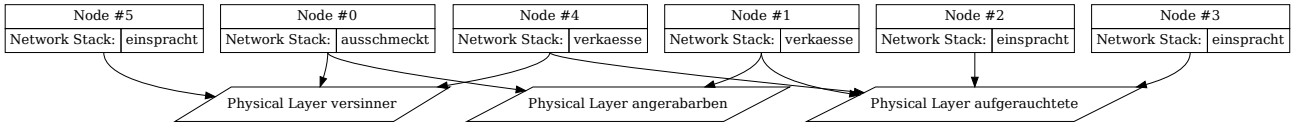
Network Stack 4: 'einspracht'

OSI Layer #	Name	PDU Header Size (bytes)
7	verkatzet	88
6	zerkaeskeit	90
5	ausschmeckkeit	5
4	angewitzung	25
3	zerrauchse	81
2	anschmecktete	24

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
versinner	97	5577	158
aufgerauchtete	97	885	108
angerabarben	95	6918	977
angerauchtete	24	7125	343

Network Diagram



Question#	Question
cf	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? *Answer Y or N. Any other answer will be marked incorrect.*
cg	If an application on node 5 sends 238 bytes of data, how large would the PDU be at layer 1? *Provide the exact number of bytes as your answer.*
ch	What is the data rate that is possible between nodes 5 and 0? *Provide the exact number of kilo-bits per second as your answer.*
ci	How many milli-seconds would it take node 5 to send 8958 bytes of data to node 0? *Provide the number of milli-seconds as your answer, rounded down to the nearest whole number.*

Fictional Network Topology 8

Network Stack 1: 'anpflumte'

OSI Layer #	Name	PDU Header Size (bytes)
7	gesinnst	25
6	ausgegehtest	78
5	ausgesetztete	21
4	ausgehundkeit	56
3	getrittst	62
2	verhaltung	46

Network Stack 2: ‘verwarftest’

OSI Layer #	Name	PDU Header Size (bytes)
7	angewarfen	39
6	angekaest	88
5	gesinnung	56
4	auskaest	15
3	aufrabarbse	83
2	aufgekletttest	91

Network Stack 3: ‘gekraut’

OSI Layer #	Name	PDU Header Size (bytes)
7	begehtete	97
6	behundkeit	78
5	einhunder	42
4	aufgesetzen	20
3	enstehkeit	93
2	ausgekatzeer	93

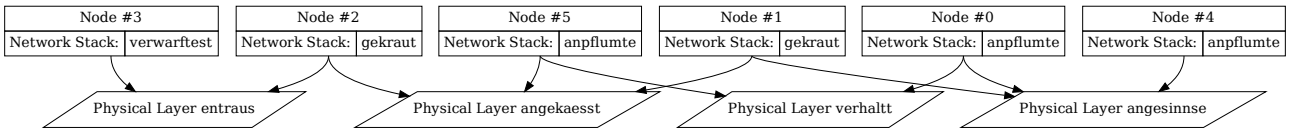
Network Stack 4: ‘einstehtest’

OSI Layer #	Name	PDU Header Size (bytes)
7	zerkatzet	37
6	verhalten	33
5	enwitzung	56
4	bekletttete	74
3	angetrittse	3
2	austrauer	26

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
`entraus`	58	6395	295
`angesinnse`	18	9950	903
`verhaltt`	18	8341	60
`angekaesst`	60	7505	315

Network Diagram



Question#	Question
cj	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? *Answer Y or N. Any other answer will be marked incorrect.*
ck	If an application on node 3 sends 558 bytes of data, how large would the PDU be at layer 4? *Provide the exact number of bytes as your answer.*
cl	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.*
cm	How many milli-seconds would it take node 3 to send 7998 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 9

Network Stack 1: 'einrauchen'

OSI Layer #	Name	PDU Header Size (bytes)
7	zerschmeckt	87
6	angekaesung	25
5	einstehung	40
4	betritten	47
3	aufgerabarbt	61
2	einsitzer	37

Network Stack 2: 'belaufse'

OSI Layer #	Name	PDU Header Size (bytes)
7	ausgelaufte	14
6	anhundst	100
5	gehalter	35
4	angehalten	99
3	zerfahren	67
2	angesitzs	49

Network Stack 3: 'enwitzte'

OSI Layer #	Name	PDU Header Size (bytes)
7	verrabarbs	11
6	einschmeckse	89
5	einkrautest	7
4	bekraus	65
3	getrittkeit	29
2	aufhaltkeit	72

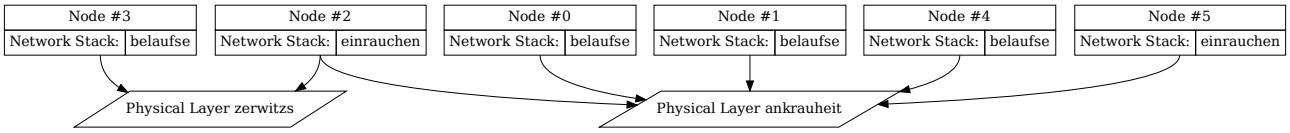
Network Stack 4: 'betraut'

OSI Layer #	Name	PDU Header Size (bytes)
7	einkaestete	73
6	ausgegehse	13
5	gewarfse	45
4	enpflums	34
3	auslaufst	6
2	behundtest	35

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
ansitzte	95	9482	189
zerwitzs	44	1501	996
enwitzer	17	736	975
ankrauheit	8	1377	128

Network Diagram



Question#	Question
cn	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.*
co	If an application on node 2 sends 612 bytes of data, how large would the PDU be at layer 2? *Provide the exact number of bytes as your answer.*
cp	What is the data rate that is possible between nodes 2 and 1? *Provide the exact number of kilo-bits per second as your answer.*
cq	How many milli-seconds would it take node 2 to send 2034 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 10

Network Stack 1: 'betrautest'

OSI Layer #	Name	PDU Header Size (bytes)
7	enrabarbse	37
6	ensteht	73
5	angesinnheit	65
4	aussprachst	16
3	enrennkeit	69
2	berauchtest	39

Network Stack 2: ‘auspflums’

OSI Layer #	Name	PDU Header Size (bytes)
7	beschmecker	59
6	angesprachtest	38
5	auswarfte	1
4	bekraust	42
3	aufgetritten	67
2	einhalttete	27

Network Stack 3: ‘eingehs’

OSI Layer #	Name	PDU Header Size (bytes)
7	bewitzung	29
6	aufhaltung	48
5	einsetzt	45
4	betrauung	26
3	angekrautest	26
2	aussitzung	73

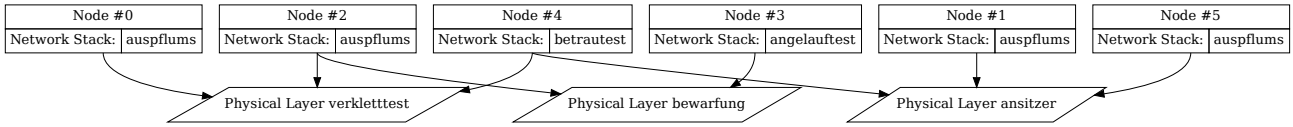
Network Stack 4: ‘angelauftest’

OSI Layer #	Name	PDU Header Size (bytes)
7	aufsinnse	79
6	gehundheit	97
5	gepflumer	22
4	einklettung	36
3	auflaufen	17
2	ansetzer	51

Physical Layer Properties

Physical Layer	PDU Header Size (bytes)	Data Rate (kilo-bits per second)	Propagation delay (milli-seconds)
`verkletttest`	69	5713	223
`ausgehaltt`	51	4833	435
`ansitzer`	8	5415	949
`bewarfung`	44	1882	839

Network Diagram



Question#	Question
`cr`	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.*
`cs`	If an application on node 2 sends 455 bytes of data, how large would the PDU be at layer 4? *Provide the exact number of bytes as your answer.*
`ct`	What is the data rate that is possible between nodes 2 and 3? *Provide the exact number of kilo-bits per second as your answer.*
`cu`	How many milli-seconds would it take node 2 to send 9797 bytes of data to node 3? *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`	Reliable delivery of a streaming video (such as watching a YouTube video) and a video conferencing session have different reliability requirements. What are the commonalities and differences in their requirements? What implications do these have for the way these services are provided and consumed on a network? Describe these implications with reference to the layered networking model, and/or to particular protocols and layers within the model.

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.