Chair of Distributed Systems and Security
School of Computation, Information and Technology
Technical University of Munich

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Compliance to the code of conduct
I hereby assure that I solve and submit this exam myself under my own name by only using the allowed tools listed below.

_____
Signature or full name if no pen input available

Computer Networking and IT Security

Exam:	INHN0012 / Quiz 2	**Date:**	Thursday 23rd January, 2025
Examiner:	Prof. Dr.-Ing. Stephan Günther	**Time:**	14:30 – 14:45

Working instructions

- This exam consists of **4 pages** with a total of **2 problems**.
  Please make sure now that you received a complete copy of the exam.
- The total amount of achievable credits in this exam is 15 credits.
- Detaching pages from the exam is prohibited.
- Allowed resources:
  - **open book**
  - **any teamwork, copy & paste, or AI-based assisstance forbidden**
- **Answers are only accepted if the solution approach is documented.**
- Subproblems marked by * can be solved without results of previous subproblems. Give a reason for each answer unless explicitly stated otherwise in the respective subproblem.
- Do not write with red or green colors nor use pencils.

Problem 1 **Multiple Choice (12 credits)**

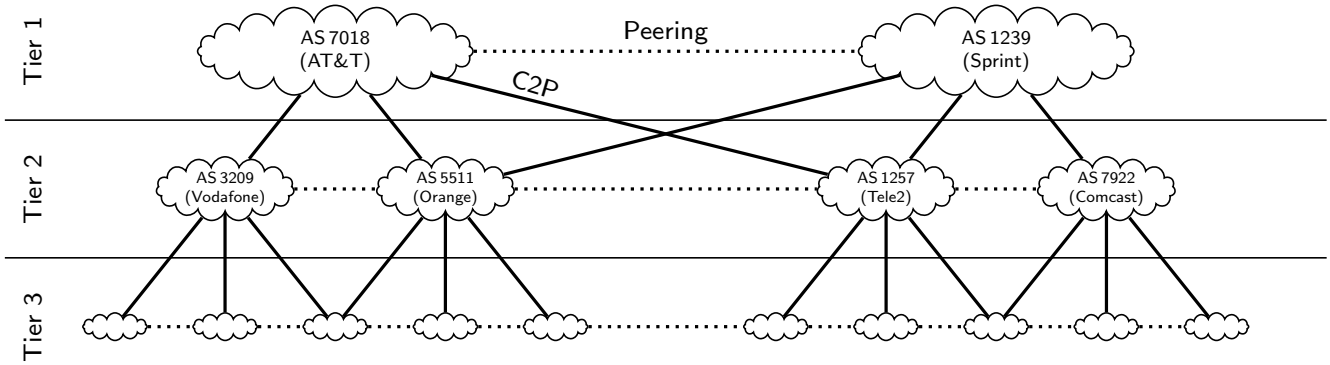
The following subproblems are multiple choice / multiple answer, i. e. at least one answer per subproblem is correct. Subproblems with a single correct answer are graded with 1 credit if correct. Those with more than one correct answers are graded with 1 credit per correct answer and -1 credit per wrong answer. Missing crosses have no influence. The minimal amount of credits per subproblem is 0 credits.

Mark correct answers with a cross ☒
To undo a cross, completely fill out the answer option ■
To re-mark an option, use a human-readable marking ×■

a)* Which of the following protocols are Distance Vector routing protocols?

- ☐ IS-IS
- ☐ AODV
- ☐ HWMP
- ☐ EIGRP
- ☐ IGRP
- ☐ OSPF

b)* Given the example for BGP known from the lecture. Which statements are correct?



- ☐ AT&T is being paid by Tele2.
- ☐ Orange announces own route to Tele2.
- ☐ Orange announces routes from Vodafone to Tele2.
- ☐ AT&T and Sprint do not pay each other when using the peering.

c)* Derive the MAC address belonging to the IPv6 address `FFB2::0BF0:62DD:6677`.

- ☐ 33:33:62:DD:66:77
- ☐ 0B:F0:62:DD:66:77
- ☐ FF:B2:0B:F0:62:DD
- ☐ FF:FF:FF:FF:FF:FF

d)* Which MAC address belongs to the automatically configured IPv6 address `FE80::88B8:7DFF:FEB2:8744`?

- ☐ 33:33:7D:B2:87:44
- ☐ 88:B8:7D:B2:87:44
- ☐ FE:80:88:B8:7D:B2
- ☐ 8A:B8:7D:B2:87:44

e)* Which statements about hubs and switches are correct?

- ☐ Hubs interrupt collision domains
- ☐ Switches make forwarding decisions based on MAC addresses
- ☐ Hubs can regenerate signals on the physical layer
- ☐ Switches interrupt collision domains
- ☐ Hubs make forwarding decisions based on MAC addresses

f)* Why are acknowledgements on Layer 2 not used by Ethernet but WLAN?

- ☐ Collision avoidance mechanisms on wireless links such as RTS/CTS do not work
- ☐ On wireless links, each transmitter may cause a collision at the destination
- ☐ The frame error probability in on wireless links is much higher
- ☐ Wireless links cannot rely on acknowledgements at all

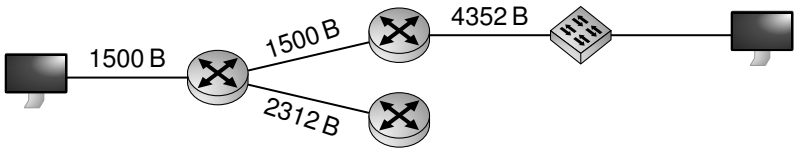
Problem 2 **Short questions (3 credits)**

a)* What is achieved by “bit stuffing”?

0 1

b)* Given the following network, the respective `MTU` for each path segment is shown. Determine the maximum payload that can be transmitted by ICMP over IPv6 between both clients such that no fragmentation is required. You may ignore possible extension header.

0 1 2



Additional space for solutions–clearly mark the (sub)problem your answers are related to and strike out invalid solutions.