Security Analysis of Automotive Architectures using Probabilistic Model Checking

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Examples for Automotive Security

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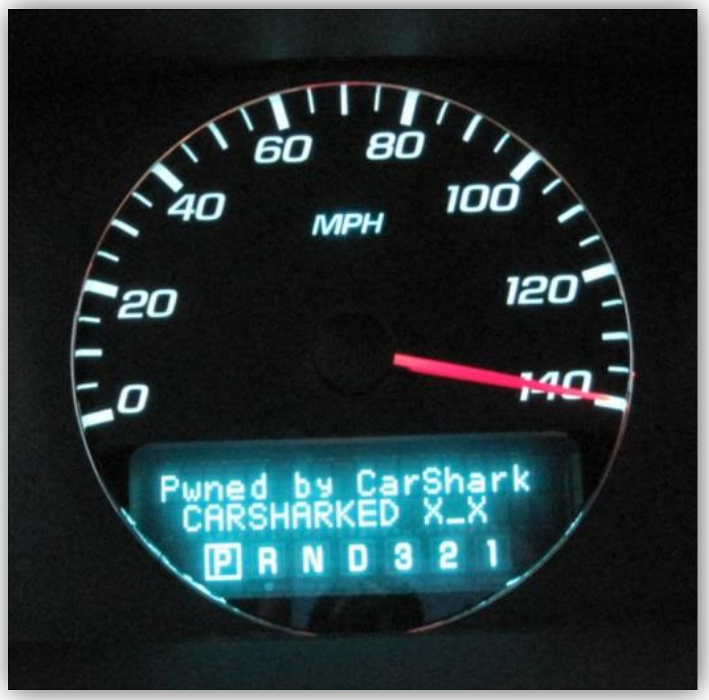

[1]

[1] K. Koscher, et.al. Experimental security analysis of a modern automobile. In Proc. of the 31st IEEE Symposium on Security and Privacy (SP), 2010.
[2] https://www.progressive.com/auto/snapshot/

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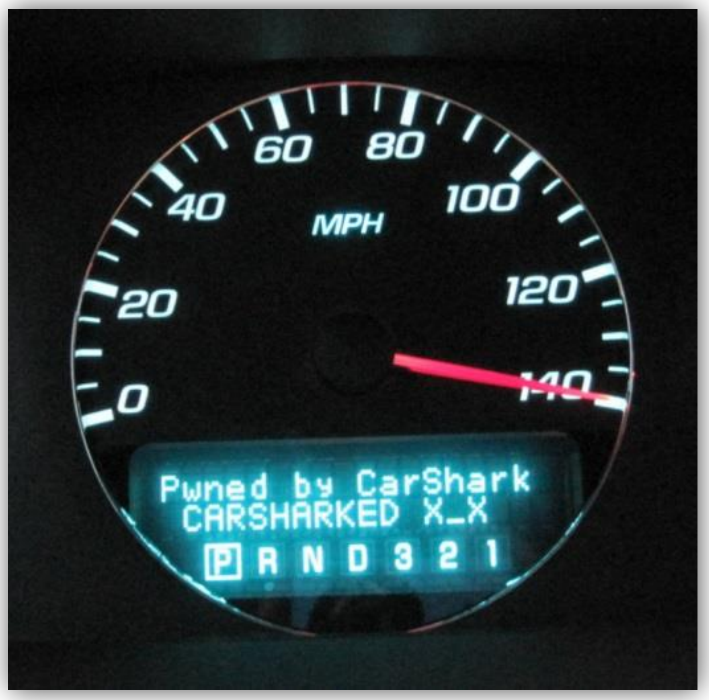

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Motivation

- **What** influence do component vulnerabilities have on the security of a specific function?

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- **How much** effort should be invested in the consideration of security during implementation of specific components?

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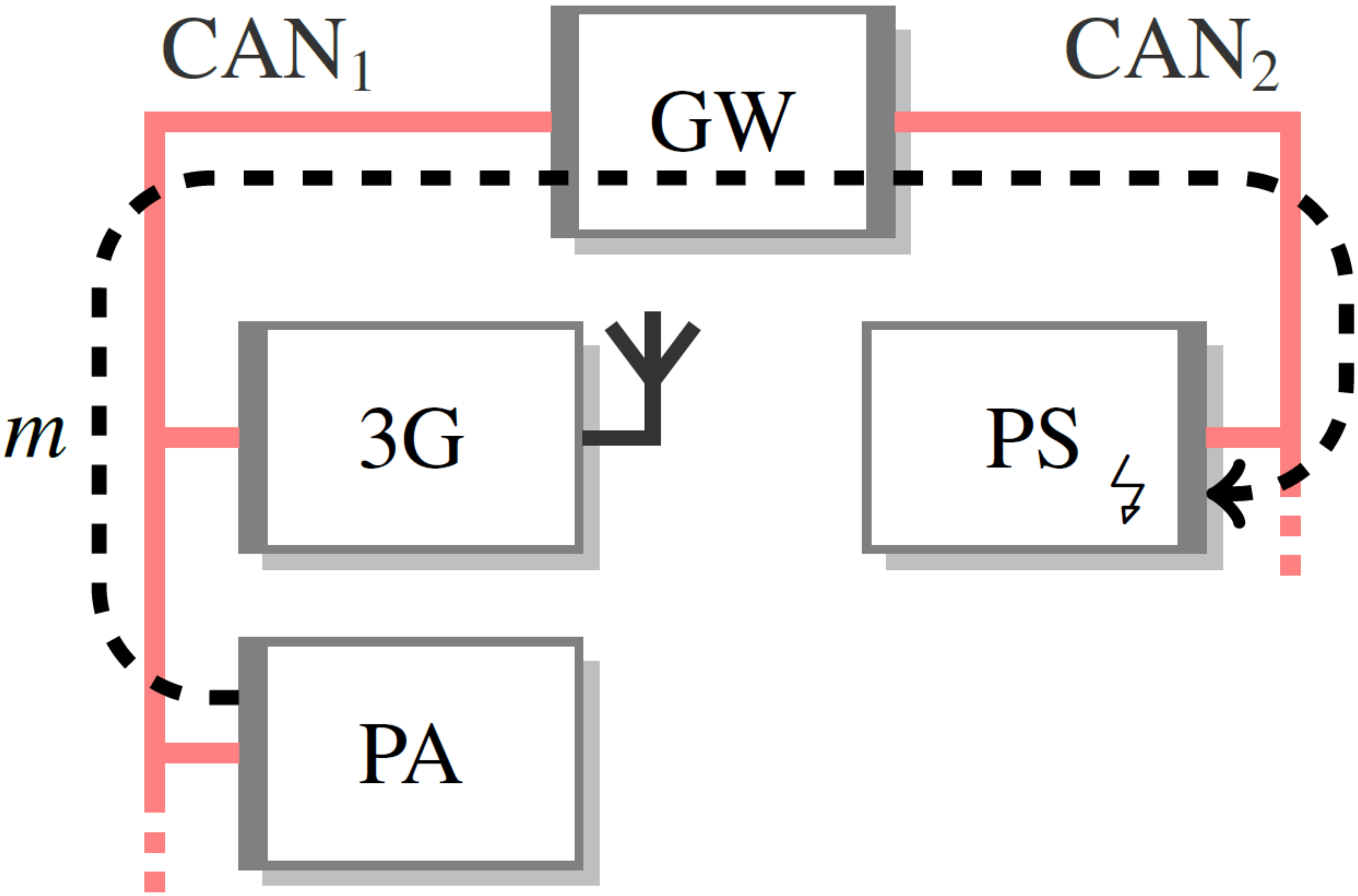

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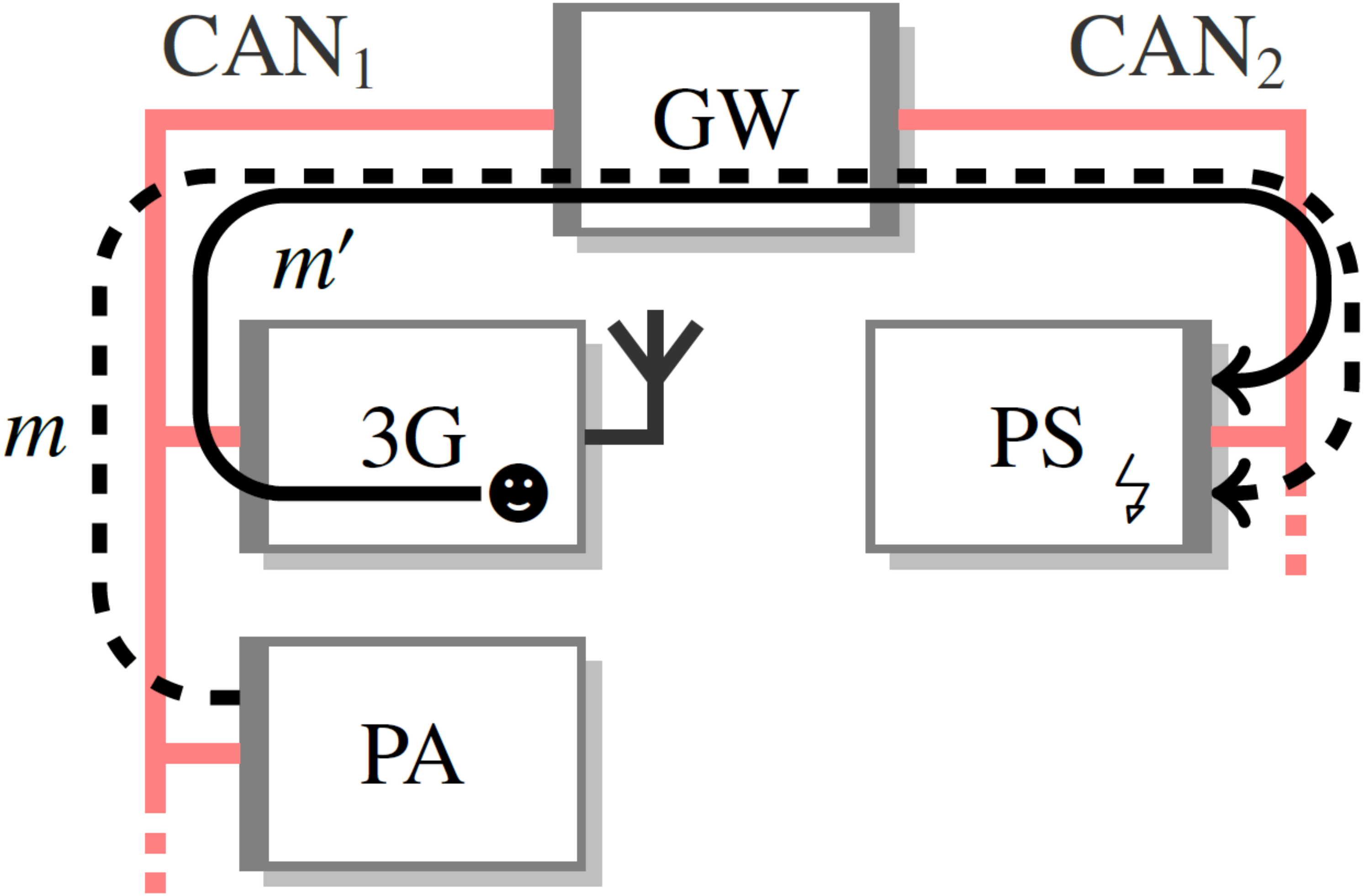

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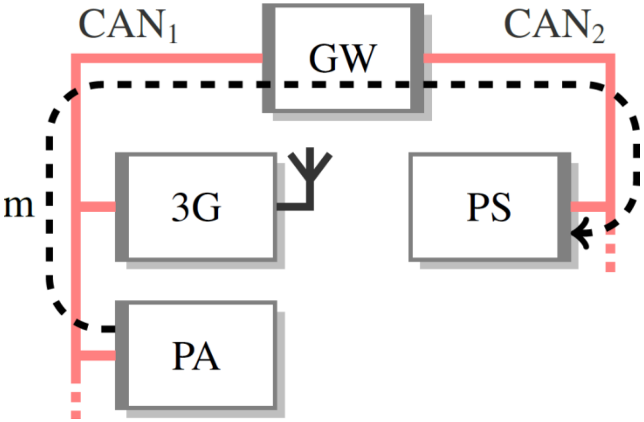

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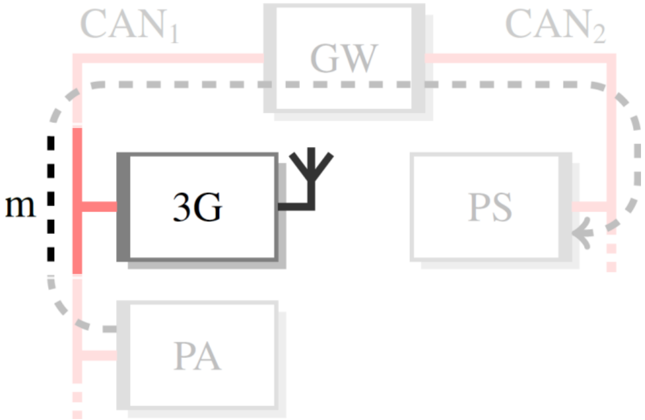

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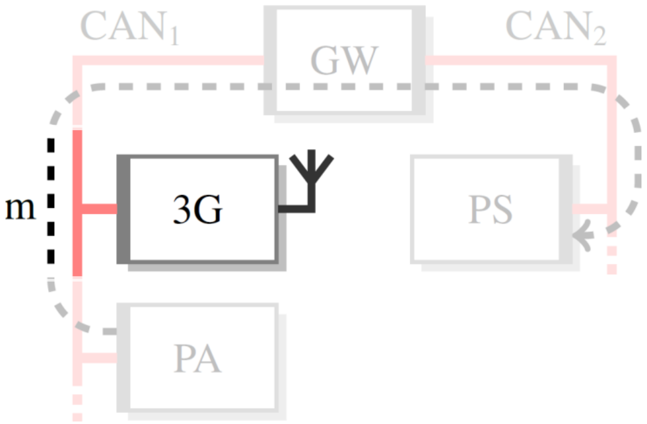

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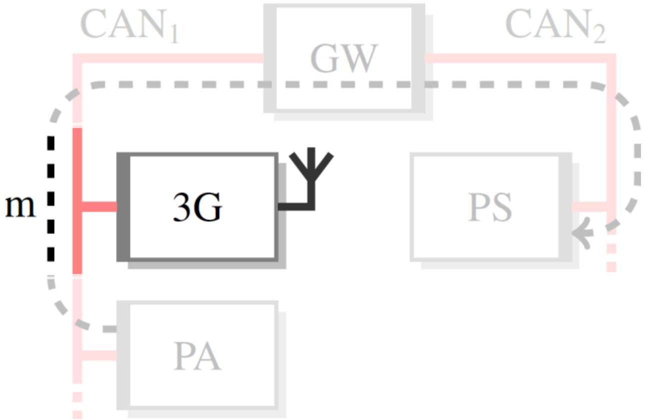

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secure

3G exploitable

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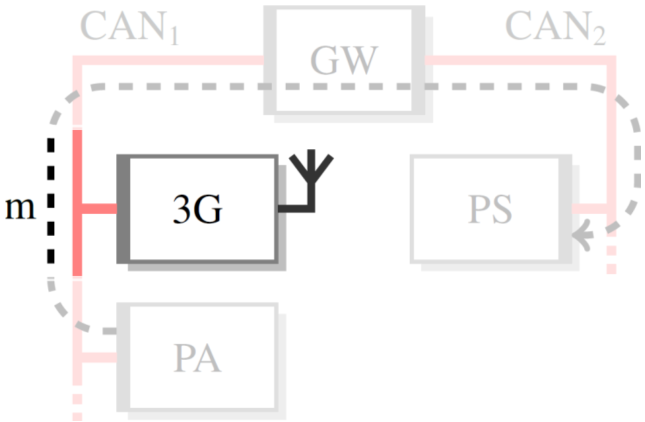

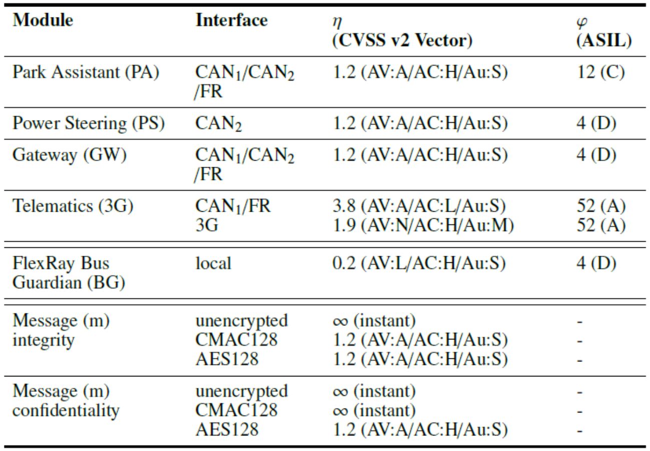

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Park Assistant (PA)	CAN$_1$/CAN$_2$ /FR	1.2 (AV:A/AC:H/Au:S)	12 (C)
Power Steering (PS)	CAN$_2$	1.2 (AV:A/AC:H/Au:S)	4 (D)
Gateway (GW)	CAN$_1$/CAN$_2$ /FR	1.2 (AV:A/AC:H/Au:S)	4 (D)
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FlexRay Bus Guardian (BG)	local	0.2 (AV:L/AC:H/Au:S)	4 (D)
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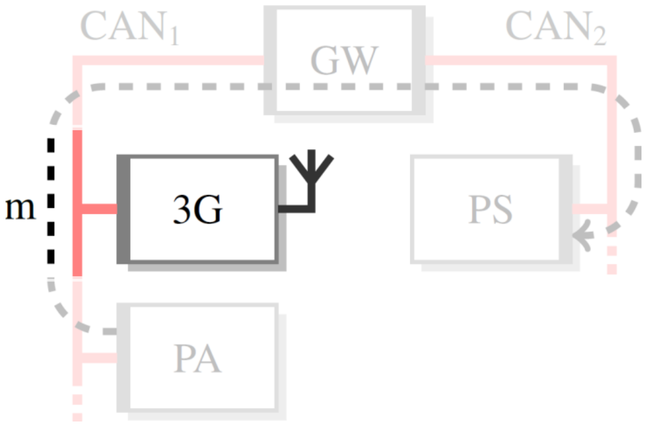

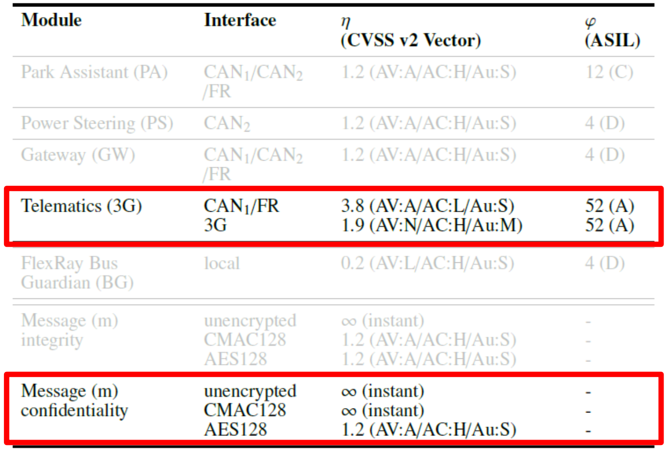

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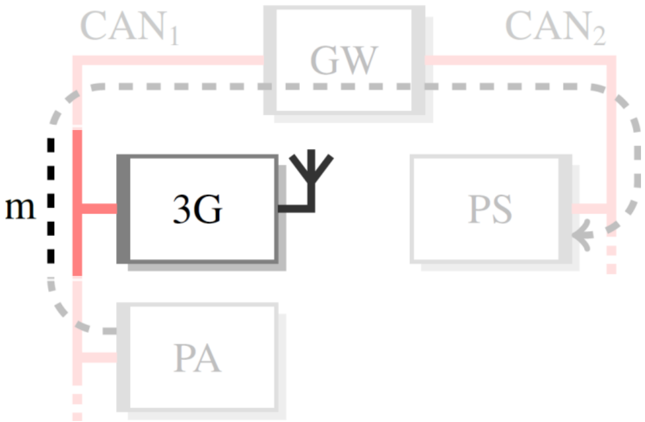

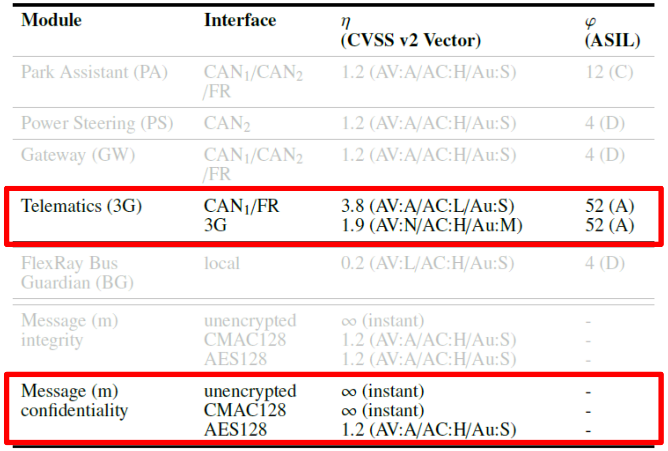

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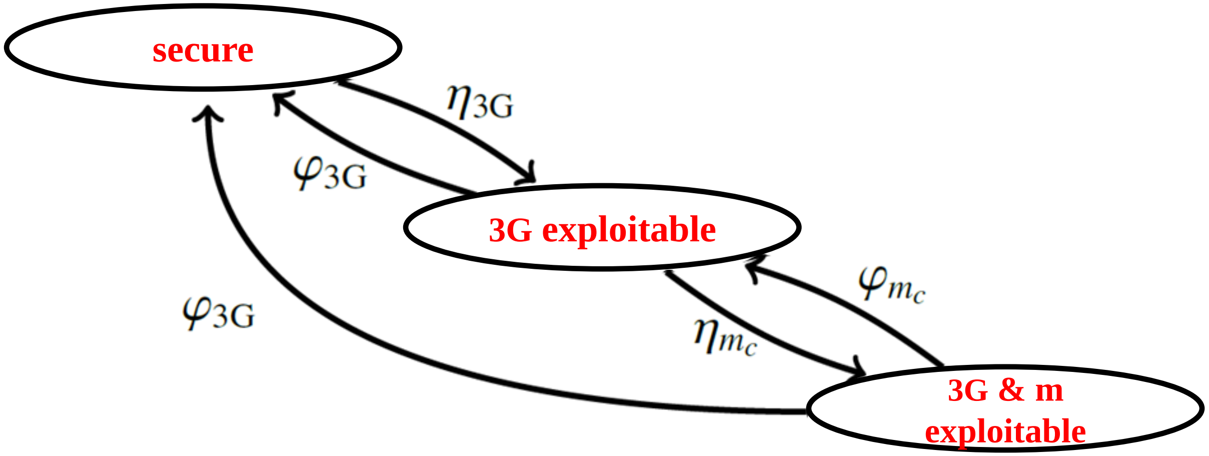

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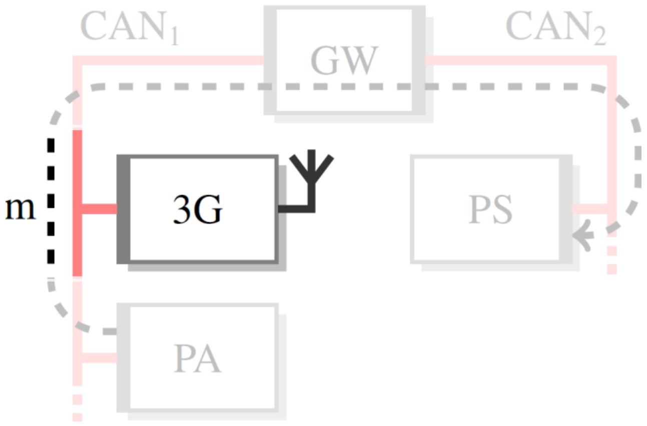

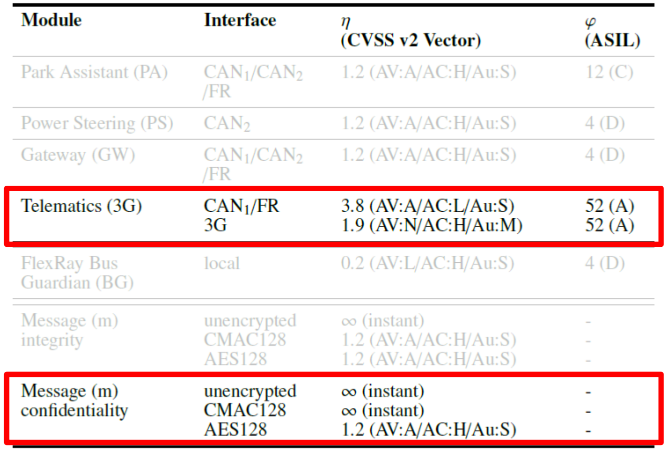

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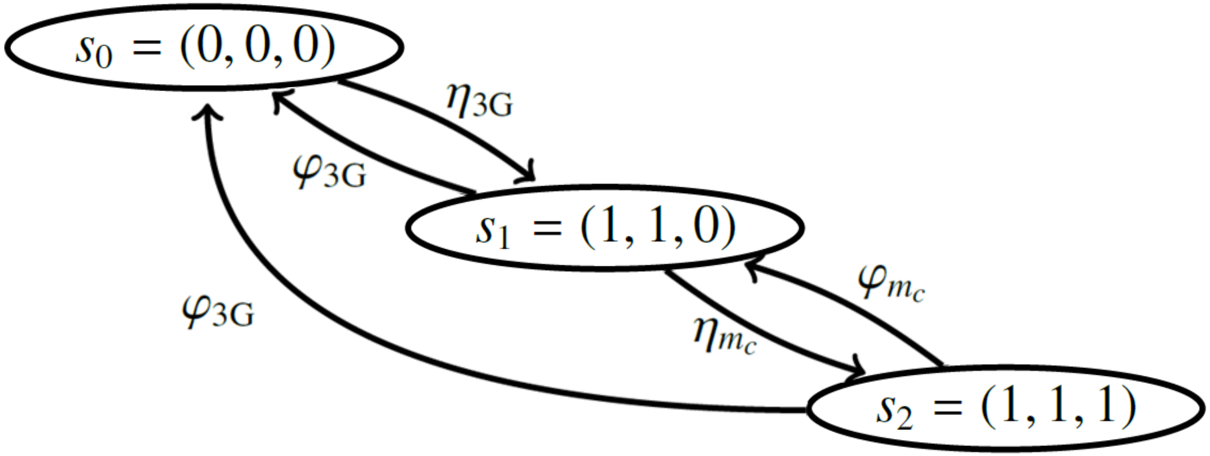

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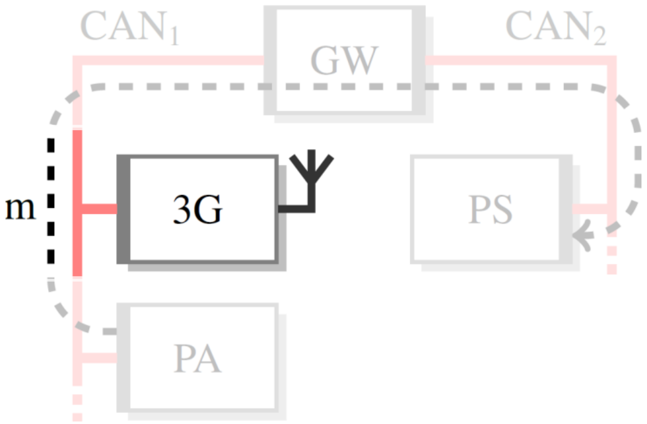

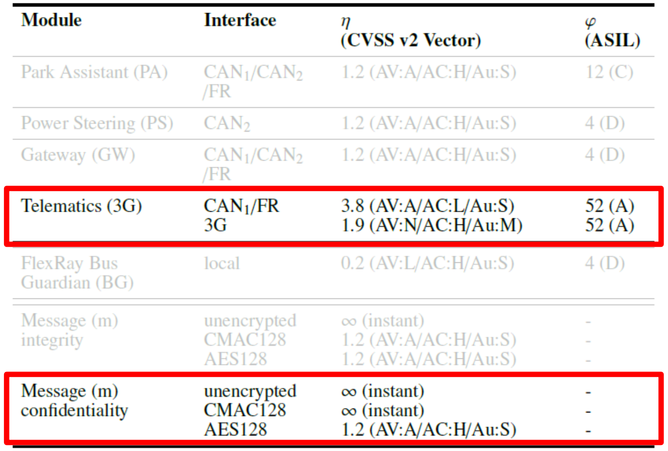

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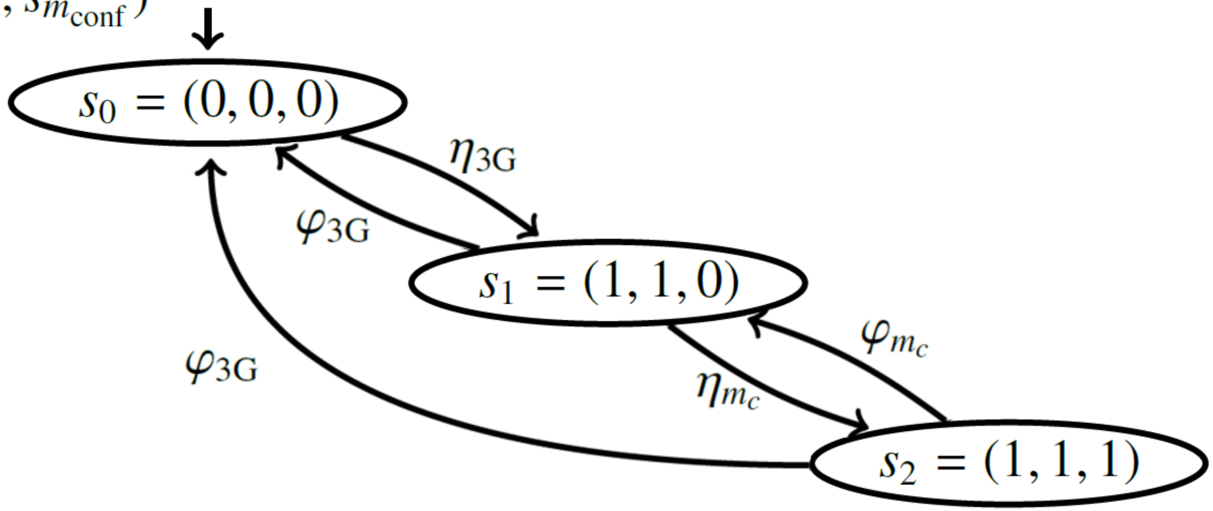

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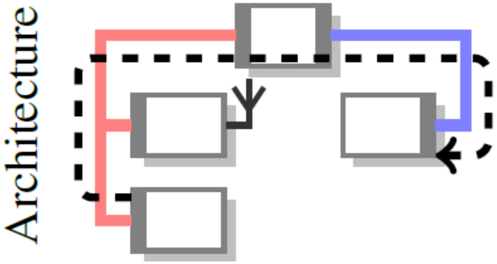

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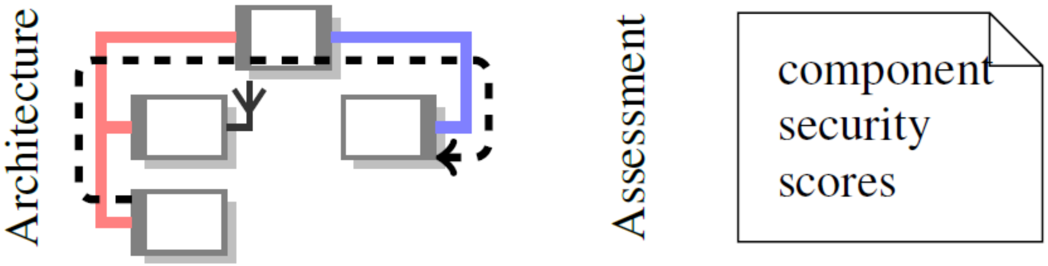
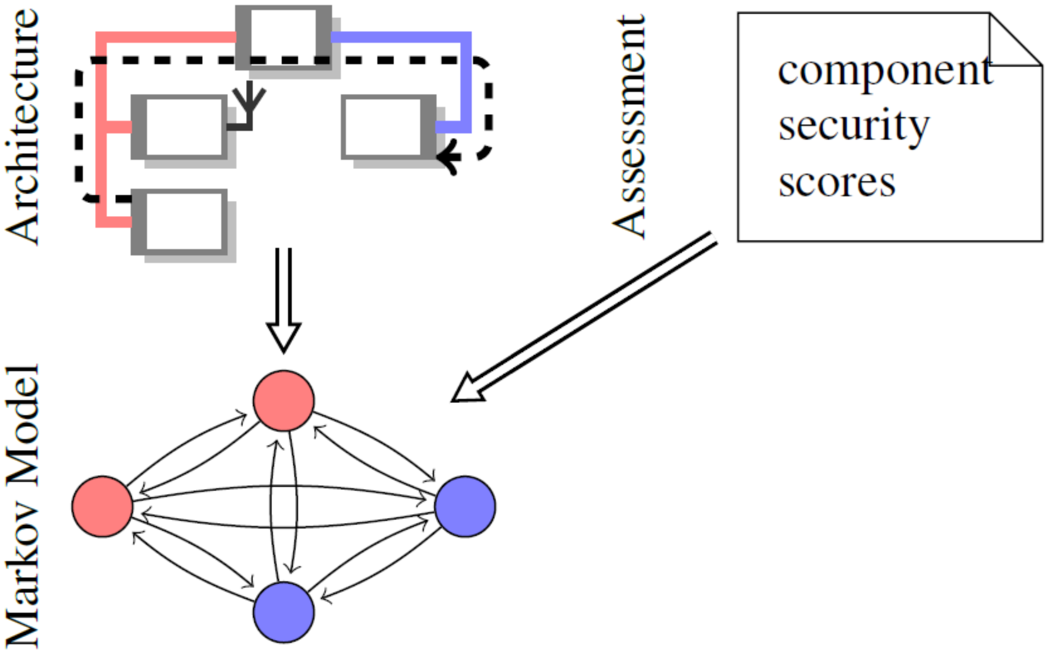


Architecture

Assessment

component
security
scores

Process



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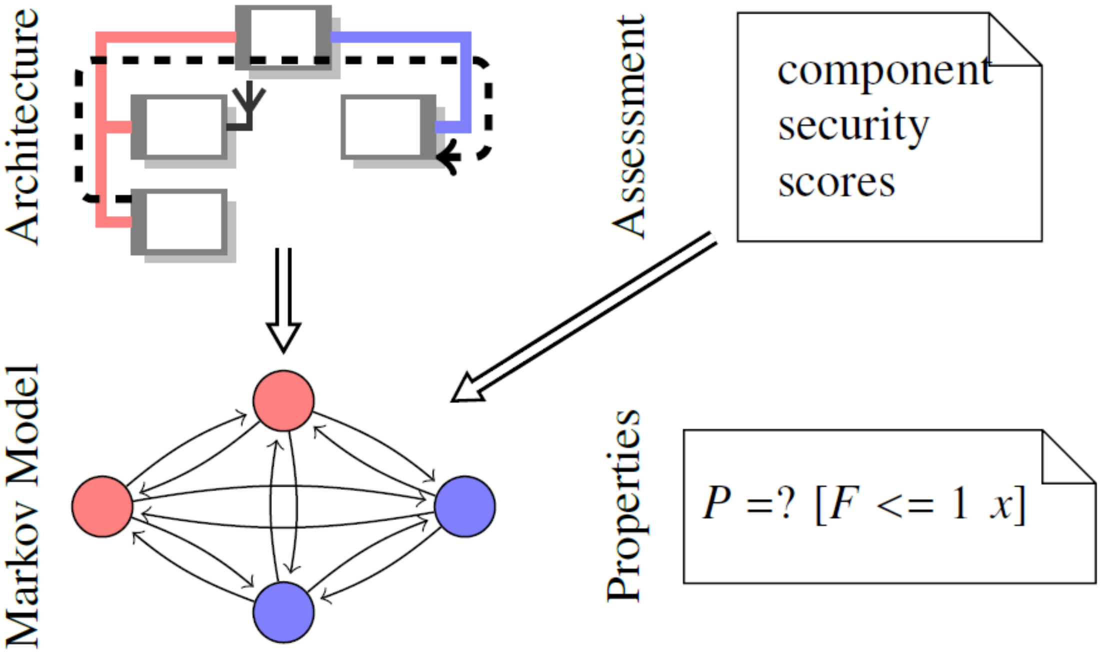

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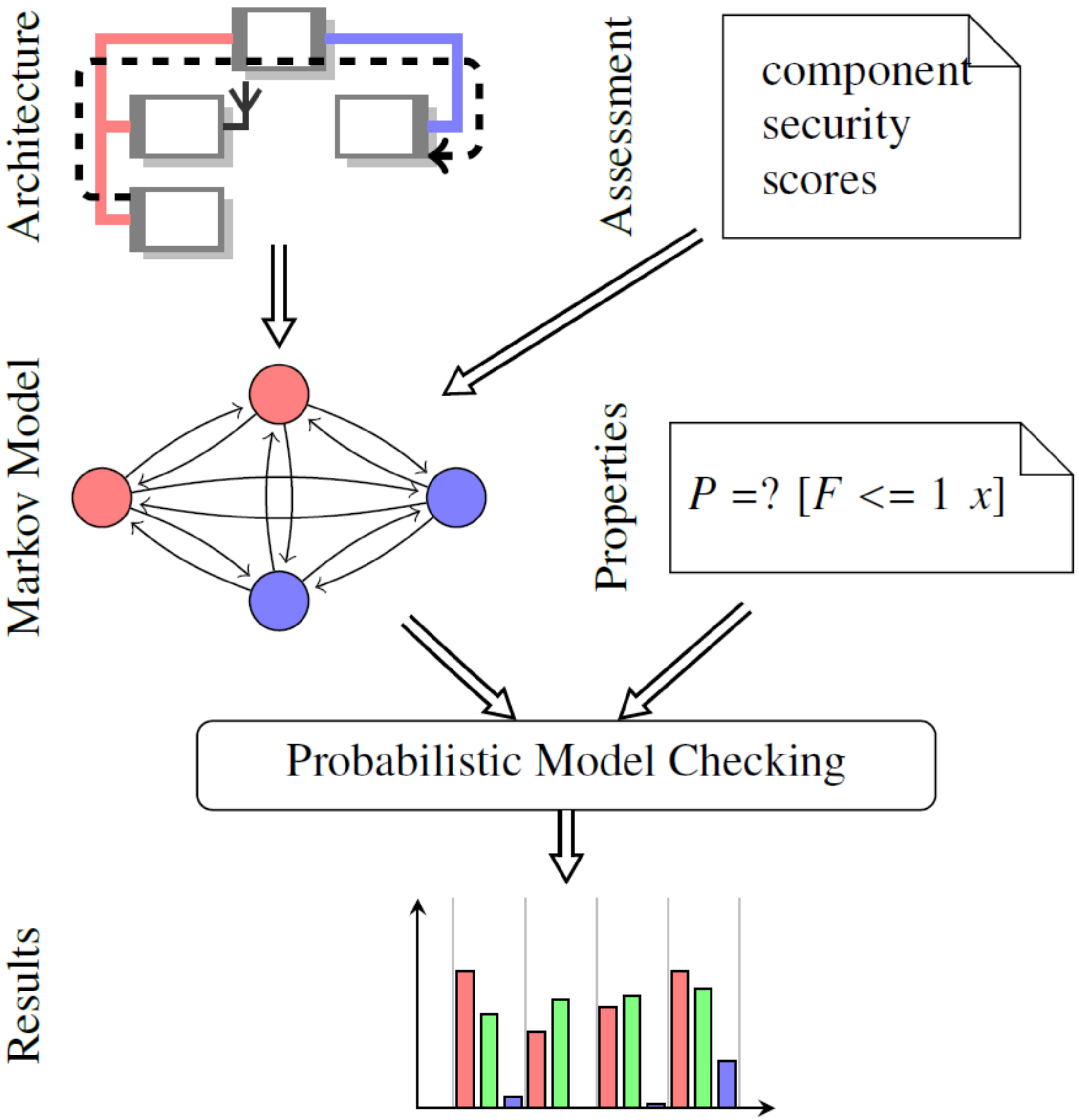

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Properties

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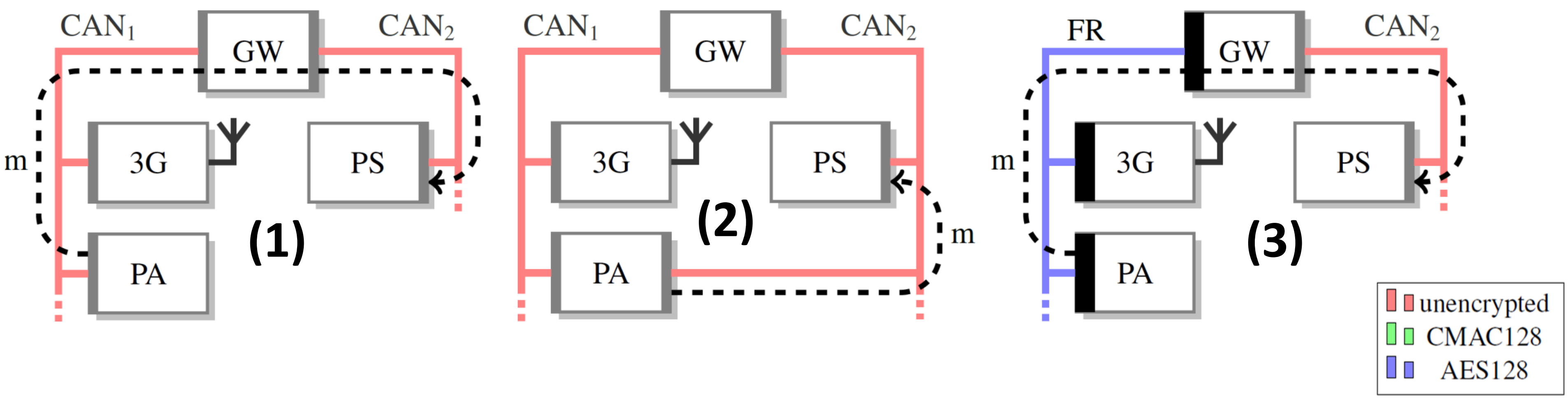
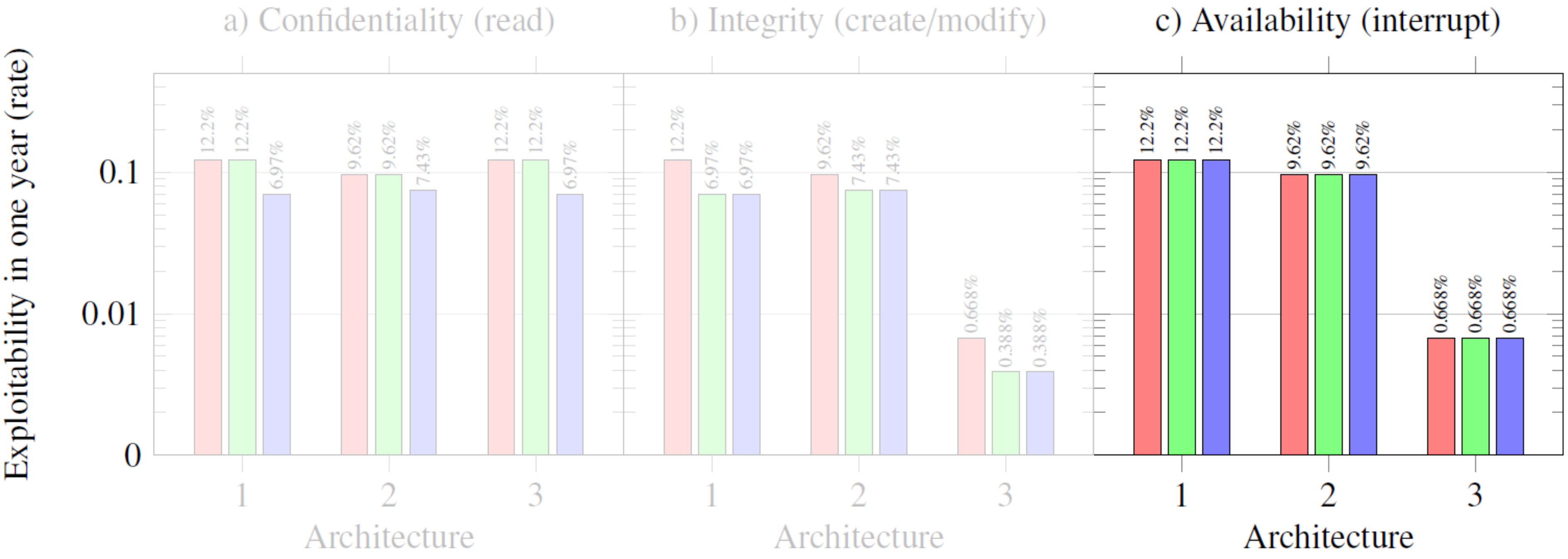
Probabilistic Model Checking

Results

Architecture Security Analysis





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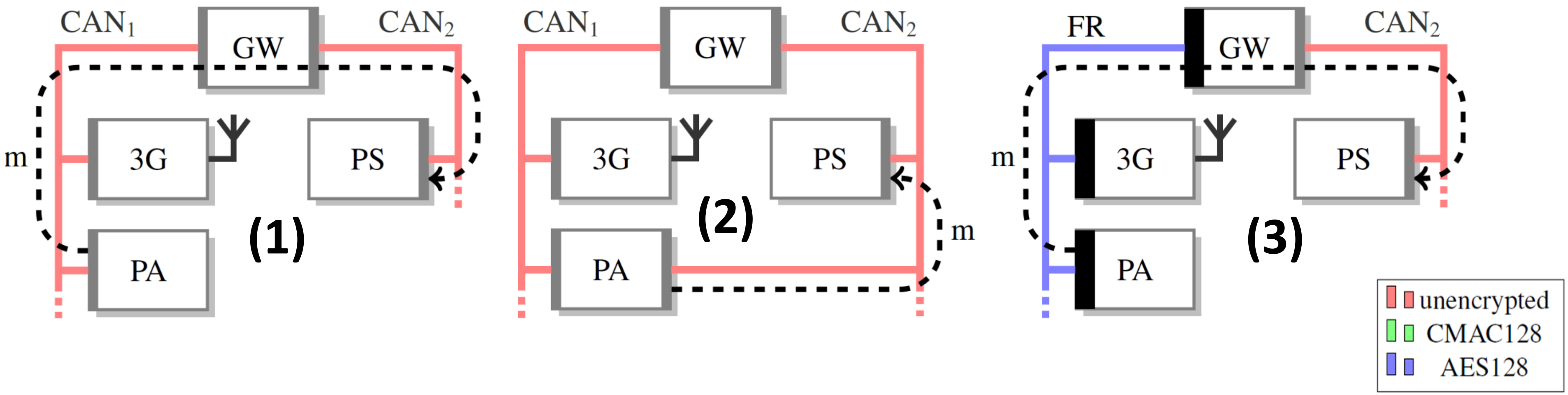

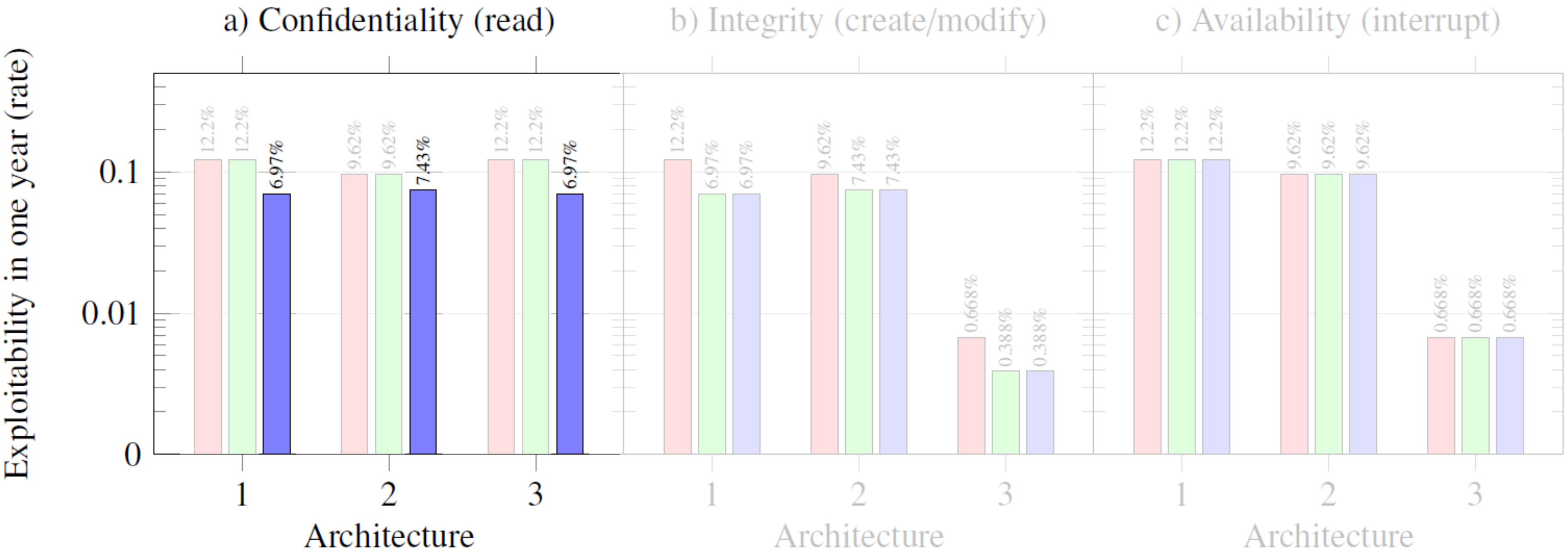

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For more Information:

www.mundhenk.org