

Structure:

1	<i>Historic development of Cryptographic Chips: From Enigma to Ecolex and AroFlex</i>	13
2	<i>Transformation of Cryptography influences Secure Embedded Systems in a Network</i>	15
3	<i>The Echo Protocol: Networking Encrypting Devices</i>	21
4	<i>Hardware Architecture</i>	27
4.1	Cryptographic Conversions on Secure Embedded Systems	30
4.2	Example: NitroKey	32
4.3	Example: Arduino & Raspberry Pi	34
4.4	Defining the architectural Design of Echo on a Chip (EoC)	35
5	<i>Hardware Echo-Chip - Part # I - Encryption and Decryption Processes on a Trusted Execution Environment</i>	41
5.1	Communication Methods Zone: TCP-Disconnected Communication Methods via Protocol-Change, e.g. Bluetooth or UDP	42
5.2	McEliece Key & Algorithm Zone	43
5.3	Public Key Infrastructure Zone for Decryption & Encryption	48

5.4	Cascading / Multi-Encryption	48
5.5	Local Private Application Interfaces	49
6	<i>Hardware Echo-Chip - Part # II - Meshing the Flood: Implementing Routing and Graph Theory into Hardware</i>	52
6.1	Congestion Control Zone	52
6.2	Local Broadcast Manager & Listener Broadcasting Zone	53
6.3	Neighbors Zone	54
7	<i>Hardware Echo-Chip - Part # III - Key Servers & Ozone Postbox Functionalities</i>	55
7.1	Congestion Control Zone	55
7.2	Database or Memory Containers Zone	55
7.3	Neighbors Zone	56
7.4	Discovery via Cryptography	56
7.5	Ozone Address / PostBox Zone	57
7.6	Private Public-Key Server & Private Servers Zone	58
8	<i>Conclusions for contextual risk cases with research and development requirements</i>	61
8.1	Risk Case: From ToTok to TikTok	61
8.2	Risk Case: Android @ Huawei	65
8.3	Risk Case: Virus-Scanner Kaspersky et al.	67
8.4	Risk Case: BIOS Firmware	72
8.5	Risk Case: 5G Telecommunication-Chips	76
8.6	Risk Case: Closed Source Operating System Windows	80
8.7	Risk Case: Closed Internet Networks like #RUNET	83

9	<i>The Secure Architecture Model (SAM) extends and integrates the OSI-Model</i>	85
10	<i>Literature</i>	97
11	<i>Didactical Questions</i>	108