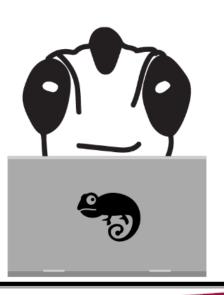


## Hacking an NFC Toy with the ChameleonMini









```
fptrs@vm:~$ python3 ~/git/ChameleonMiniCeres/Software/chamlog.py -f log
Note: If parityBit check failed, '!' is appended to the decoded data and raw data with parity bit is displayed.
                                                         bytes) (02b2048e3c
17200 ms <+17200 ms>:CODEC RX
17447 ms <
            +247 ms>:CODEC RX
                                                    (5
                                                         bytes) [02b2048e3c
17693 ms <
            +246 ms>:CODEC RX
                                                    (5
                                                                [02b2048e3c
                                                         bytes)
                                                         bytes) [02b2048e3c
17696 ms <
              +3 ms>:CODEC RX
                                                    (5
            +247 ms>:CODEC RX
                                                    (5
                                                         bytes)
                                                                [02b2048e3c
17943 ms <
                                                    (5
17969 ms <
             +26 ms>:CODEC RX
                                                         bytes)
                                                                260100T60a
17982 ms <
                                                    (10
                                                                [02b304040480a291d62a]
             +13 ms>:CODEC RX
                                                         bytes)
             +27 ms>:CODEC RX
                                                                [260100f60a
                                                    (5
18009 ms <
                                                         bytes)
18033 ms <
                                                    (13
                                                         bytes)
                                                                [2220523a9610500304e0006150]
             +24 ms>:CODEC RX
18062 ms <
             +29 ms>:CODEC RX
                                                    (13
                                                         bytes) [2220523a9610500304e001e841]
18092 ms <
             +30 ms>:CODEC RX
                                                    (13
                                                         bytes) [2220523a9610500304e0027373]
                                                    (13
18121 ms <
             +29 ms>:CODEC RX
                                                         bytes)
                                                                [2220523a9610500304e003fa62]
18150 ms <
             +29 ms>:CODEC RX
                                                    (13
                                                         bytes)
                                                                [2220523a9610500304e0044516]
18180 ms <
             +30 ms>:CODEC RX
                                                    (13
                                                         bytes)
                                                                [2220523a9610500304e005cc07]
18209 ms <
             +29 ms>:CODEC RX
                                                    (13
                                                         bytes)
                                                                [2220523a9610500304e0065735]
18238 ms <
                                                         bytes)
             +29 ms>:CODEC RX
                                                    (13
                                                                [2220523a9610500304e007de24]
18268 ms <
             +30 ms>:CODEC RX
                                                    (13
                                                         bytes) [22b204523a9610500304e089a6]
18298 ms <
             +30 ms>:CODEC RX
                                                    (17
                                                         bytes) [22ba04523a9610500304e07698d0892806]
                                                    (13
18543 ms <
            +245 ms>:CODEC RX
                                                         bytes)
                                                                [22b204523a9610500304e089a6]
18788 ms <
            +245 ms>:CODEC RX
                                                    (13
                                                         bytes) [22b204523a9610500304e089a6]
19033 ms <
            +245 ms>:CODEC RX
                                                    (13
                                                         bytes)
                                                                [22b204523a9610500304e089a6]
19279 ms <
            +246 ms>:CODEC RX
                                                    (13
                                                         bytes)
                                                                [22b204523a9610500304e089a6]
            +245 ms>:CODEC RX
19524 ms <
                                                    (13
                                                         bytes) [22b204523a9610500304e089a6]
                                                         bytes) [22b204523a9610500304e089a6]
19769 ms <
            +245 ms>:CODEC RX
                                                    (13
                                                                [22b204523a9610500304e089a6]
20014 ms <
            +245 ms>:CODEC RX
                                                    (13
                                                         bytes)
20259 ms <
            +245 ms>:CODEC RX
                                                    (13
                                                         bytes)
                                                                [22b204523a9610500304e089a6]
```

```
fptrs@vm:~$ python3 ~/git/ChameleonMiniCeres/Software/chamlog.py -f log
Note: If parityBit check failed, '!' is appended to the decoded data and raw data with parity bit is displayed.
17200 ms <+17200 ms>:CODEC RX
                                                         bytes) [02b2048e3c
17447 ms <
            +247 ms>:CODEC RX
                                                    (5
                                                         bytes)
                                                                [02b2048e3c
17693 ms <
            +246 ms>:CODEC RX
                                                    (5
                                                         bytes)
                                                                [02b2048e3c
                                                         bytes) [02b2048e3c
17696 ms <
              +3 ms>:CODEC RX
                                                    (5
                                                    (5
            +247 ms>:CODEC RX
                                                         bytes)
                                                                [02b2048e3c
17943 ms <
                                                    (5
17969 ms <
             +26 ms>:CODEC RX
                                                         bytes) [260100f60a
                                                    (10
17982 ms <
             +13 ms>:CODEC RX
                                                         bytes) | 020304040480a291d62a
                                                                [260100f60a
             +27 ms>:CODEC RX
                                                    (5
18009 ms <
                                                         bytes)
18033 ms <
                                                    (13
                                                         bytes)
                                                                [2220523a9610500304e0006150]
             +24 ms>:CODEC RX
18062 ms <
             +29 ms>:CODEC RX
                                                    (13
                                                                [2220523a9610500304e001e841]
                                                         bytes)
18092 ms <
                                                         bytes) [2220523a9610500304e0027373]
             +30 ms>:CODEC RX
                                                    (13
18121 ms <
             +29 ms>:CODEC RX
                                                    (13
                                                         bytes)
                                                                [2220523a9610500304e003fa62]
18150 ms <
             +29 ms>:CODEC RX
                                                    (13
                                                         bytes)
                                                                [2220523a9610500304e0044516]
18180 ms <
             +30 ms>:CODEC RX
                                                    (13
                                                         bytes) [2220523a9610500304e005cc07]
             +29 ms>:CODEC RX
                                                    (13
                                                         bytes) [2220523a9610500304e0065735]
18209 ms <
                                                        bytes)
                                                                [2220523a9610500304e007de24]
18238 ms <
             +29 ms>:CODEC RX
                                                    (13
18268 ms <
             +30 ms>:CODEC RX
                                                    (13
                                                         bytes) [22b204523a9610500304e089a6]
18298 ms <
             +30 ms>:CODEC RX
                                                    (17
                                                         bytes) [22ba04523a9610500304e07698d0892806]
                                                    (13
18543 ms <
            +245 ms>:CODEC RX
                                                         bytes)
                                                                [22b204523a9610500304e089a6]
18788 ms <
                                                         bytes) [22b204523a9610500304e089a6]
                                                    (13
            +245 ms>:CODEC RX
                                                    (13
                                                         bytes) [22b204523a9610500304e089a6]
19033 ms <
            +245 ms>:CODEC RX
19279 ms <
            +246 ms>:CODEC RX
                                                    (13
                                                         bytes)
                                                                [22b204523a9610500304e089a6]
19524 ms <
            +245 ms>:CODEC RX
                                                    (13
                                                         bytes) [22b204523a9610500304e089a6]
                                                         bytes) [22b204523a9610500304e089a6]
19769 ms <
            +245 ms>:CODEC RX
                                                    (13
                                                                [22b204523a9610500304e089a6]
20014 ms <
            +245 ms>:CODEC RX
                                                    (13
                                                         bytes)
20259 ms <
            +245 ms>:CODEC RX
                                                    (13
                                                         bytes)
                                                                [22b204523a9610500304e089a6]
```

```
fptrs@vm:~$ python3 ~/git/ChameleonMiniCeres/Software/chamlog.py -f log
Note: If parityBit check failed, '!' is appended to the decoded data and raw data with parity bit is displayed.
17200 ms <+17200 ms>:CODEC RX
                                                         bytes) [02b2048e3c
17447 ms <
            +247 ms>:CODEC RX
                                                    (5
                                                         bytes)
                                                                [02b2048e3c
17693 ms <
            +246 ms>:CODEC RX
                                                    (5
                                                         bytes)
                                                                [02b2048e3c
                                                                [02b2048e3c
17696 ms <
              +3 ms>:CODEC RX
                                                    (5
                                                         bytes)
            +247 ms>:CODEC RX
                                                    (5
                                                         bytes)
                                                                [02b2048e3c
17943 ms <
                                                    (5
17969 ms <
             +26 ms>:CODEC RX
                                                         bytes)
                                                                [260100f60a
17982 ms <
                                                    (10
                                                                02b304040480a291d62a
             +13 ms>:CODEC RX
                                                         bytes)
             +27 ms>:CODEC RX
                                                                260100f60a
                                                    (5
18009 ms <
                                                         bytes)
18033 ms <
                                                    (13
                                                         bytes)
                                                                [2220523a9610500304e0006150]
             +24 ms>:CODEC RX
18062 ms <
             +29 ms>:CODEC RX
                                                    (13
                                                         bytes) [2220523a9610500304e001e841]
18092 ms <
                                                         bytes) [2220523a9610500304e0027373]
             +30 ms>:CODEC RX
                                                    (13
                                                    (13
18121 ms <
             +29 ms>:CODEC RX
                                                         bytes)
                                                                [2220523a9610500304e003fa62]
18150 ms <
             +29 ms>:CODEC RX
                                                    (13
                                                         bytes)
                                                                [2220523a9610500304e0044516]
18180 ms <
             +30 ms>:CODEC RX
                                                    (13
                                                         bytes) [2220523a9610500304e005cc07]
18209 ms <
             +29 ms>:CODEC RX
                                                    (13
                                                         bytes) [2220523a9610500304e0065735]
                                                        bytes)
18238 ms <
             +29 ms>:CODEC RX
                                                    (13
                                                                [2220523a9610500304e007de24]
18268 ms <
             +30 ms>:CODEC RX
                                                    (13
                                                         bytes) [22b204523a9610500304e089a6]
18298 ms <
             +30 ms>:CODEC RX
                                                    (17
                                                         bytes) [22ba04523a9610500304e07698d0892806]
                                                    (13
18543 ms <
            +245 ms>:CODEC RX
                                                         bytes)
                                                                [22b204523a9610500304e089a6]
18788 ms <
            +245 ms>:CODEC RX
                                                         bytes) [22b204523a9610500304e089a6]
                                                    (13
19033 ms <
            +245 ms>:CODEC RX
                                                    (13
                                                         bytes) [22b204523a9610500304e089a6]
19279 ms <
            +246 ms>:CODEC RX
                                                    (13
                                                         bytes)
                                                                [22b204523a9610500304e089a6]
            +245 ms>:CODEC RX
19524 ms <
                                                    (13
                                                         bytes) [22b204523a9610500304e089a6]
            +245 ms>:CODEC RX
                                                         bytes) [22b204523a9610500304e089a6]
19769 ms <
                                                    (13
                                                                [22b204523a9610500304e089a6]
20014 ms <
            +245 ms>:CODEC RX
                                                    (13
                                                         bytes)
20259 ms <
            +245 ms>:CODEC RX
                                                    (13
                                                         bytes)
                                                                [22b204523a9610500304e089a6]
```

```
fptrs@vm:~$ python3 ~/git/ChameleonMiniCeres/Software/chamlog.py -f log
Note: If parityBit check failed, '!' is appended to the decoded data and raw data with parity bit is displayed.
17200 ms <+17200 ms>:CODEC RX
                                                         bytes) [02b2048e3c
17447 ms <
            +247 ms>:CODEC RX
                                                    (5
                                                         bytes)
                                                                [02b2048e3c
17693 ms <
            +246 ms>:CODEC RX
                                                    (5
                                                         bytes)
                                                                [02b2048e3c
17696 ms <
              +3 ms>:CODEC RX
                                                    (5
                                                         bytes) [02b2048e3c
            +247 ms>:CODEC RX
                                                    (5
                                                         bytes)
                                                                [02b2048e3c
17943 ms <
                                                    (5
17969 ms <
             +26 ms>:CODEC RX
                                                         bytes)
                                                                [260100f60a
17982 ms <
                                                    (10
                                                                [02b304040480a291d62a]
             +13 ms>:CODEC RX
                                                         bytes)
             +27 ms>:CODEC RX
                                                                [260100f60a
                                                    (5
                                                         bytes)
18009 ms <
                                                                [222(523a9610500304e0)06150]
18033 ms <
                                                    (13
                                                         bvtes)
             +24 ms>:CODEC RX
18062 ms <
             +29 ms>:CODEC RX
                                                    (13
                                                        bytes)
                                                               [2220523a9610500304e001e841]
18092 ms <
                                                         bytes) [2220523a9610500304e0027373]
             +30 ms>:CODEC RX
                                                    (13
                                                    (13
18121 ms <
             +29 ms>:CODEC RX
                                                         bytes)
                                                                [2220523a9610500304e003fa62]
18150 ms <
             +29 ms>:CODEC RX
                                                    (13
                                                         bvtes)
                                                               [2220523a9610500304e0044516]
18180 ms <
             +30 ms>:CODEC RX
                                                    (13
                                                         bytes) [2220523a9610500304e005cc07]
18209 ms <
             +29 ms>:CODEC RX
                                                    (13
                                                         bytes) [2220523a9610500304e0065735]
                                                        bytes)
18238 ms <
             +29 ms>:CODEC RX
                                                    (13
                                                                [2220523a9610500304e007de24]
18268 ms <
             +30 ms>:CODEC RX
                                                    (13
                                                         bytes) [22b204523a9610500304e089a6]
18298 ms <
             +30 ms>:CODEC RX
                                                    (17
                                                         bytes) [22ba04523a9610500304e07698d0892806]
                                                    (13
18543 ms <
            +245 ms>:CODEC RX
                                                         bytes) [22b204523a9610500304e089a6]
18788 ms <
            +245 ms>:CODEC RX
                                                    (13
                                                         bytes) [22b204523a9610500304e089a6]
19033 ms <
            +245 ms>:CODEC RX
                                                    (13
                                                         bytes) [22b204523a9610500304e089a6]
19279 ms <
            +246 ms>:CODEC RX
                                                    (13
                                                         bytes)
                                                                [22b204523a9610500304e089a6]
            +245 ms>:CODEC RX
19524 ms <
                                                    (13
                                                         bytes) [22b204523a9610500304e089a6]
                                                         bytes) [22b204523a9610500304e089a6]
19769 ms <
            +245 ms>:CODEC RX
                                                    (13
                                                         bytes) [22b204523a9610500304e089a6]
20014 ms <
            +245 ms>:CODEC RX
                                                    (13
20259 ms <
            +245 ms>:CODEC RX
                                                    (13
                                                         bytes)
                                                                [22b204523a9610500304e089a6]
```



```
Note: If parityBit check failed, '!' is appended to the decoded data and raw data with parity bit is displayed.
                                                         bytes) [ICODE SLI
37513 ms <+37513 ms>:CONFIG SET
                                                    (9
51253 ms <+13740 ms>:UID SET
                                                    (8
                                                         bytes) [e004035010963a52
                                                   (5
                                                         bytes) <u>[02b2048e3c</u>
56018 ms < +4765 ms>:CODEC RX
              +0 ms>:CODEC TX
                                                   (5
                                                         bytes) [000000<u>ccc6</u>
56018 ms <
56045 ms <
             +27 ms>:CODEC RX
                                                    (5
                                                         bytes) 260100f60a
56058 ms <
             +13 ms>:CODEC RX
                                                   (10
                                                        bytes)
                                                                [02b304045b6efd7fcc0a]
56058 ms <
             +0 ms>:CODEC TX
                                                   (3
                                                         bytes)
                                                                [0078f0
             +19 ms>:CODEC RX
56077 ms <
                                                   (5
                                                                [260100f60a
                                                         bytes)
                                                   (12
56077 ms <
             +0 ms>:CODEC TX
                                                                [0000523a9610500304e03738]
                                                        bytes)
56103 ms <
             +26 ms>:CODEC RX
                                                   (13
                                                        bytes) [2220523a9610500304e0006150]
             +0 ms>:CODEC TX
                                                   (7
                                                                [000000000077cf
56103 ms <
                                                         bvtes)
56132 ms <
             +29 ms>:CODEC RX
                                                   (13
                                                                [2220523a9610500304e001e841]
                                                        bytes)
                                                                [000000000077cf
56132 ms <
              +0 ms>:CODEC TX
                                                   (7
                                                         bytes)
56161 ms <
             +29 ms>:CODEC RX
                                                   (13
                                                       bytes) [2220523a9610500304e0027373]
56162 ms <
              +1 ms>:CODEC TX
                                                         bytes)
                                                                [000000000077cf
                                                    (7
             +29 ms>:CODEC RX
                                                   (13
                                                                [2220523a9610500304e003fa62]
56191 ms <
                                                        bytes)
              +0 ms>:CODEC TX
56191 ms <
                                                   (7
                                                         bytes) [000000000077cf
56220 ms <
             +29 ms>:CODEC RX
                                                   (13
                                                        bytes)
                                                                [2220523a9610500304e0044516]
56220 ms <
              +0 ms>:CODEC TX
                                                                [000000000077cf
                                                    (7
                                                         bytes)
             +29 ms>:CODEC RX
                                                   (13
56249 ms <
                                                        bytes)
                                                                [2220523a9610500304e005cc07]
              +1 ms>:CODEC TX
                                                         bytes) [000000000077cf
56250 ms <
                                                   (7
56279 ms <
             +29 ms>:CODEC RX
                                                   (13
                                                        bytes) [2220523a9610500304e0065735]
56279 ms <
              +0 ms>:CODEC TX
                                                                [000000000077cf
                                                   (7
                                                         bytes)
56308 ms <
             +29 ms>:CODEC RX
                                                    (13
                                                                [2220523a9610500304e007de24]
                                                         bytes)
56308 ms <
              +0 ms>:CODEC TX
                                                                [000000000077cf
                                                         bytes)
```

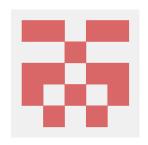
fptrs@vm:~\$ python3 ~/git/ChameleonMiniCeres/Software/chamlog.py -f log

```
fptrs@vm:~$ python3 ~/git/ChameleonMiniCeres/Software/chamlog.py -f log
Note: If parityBit check failed, '!' is appended to the decoded data and raw data with parity bit is displayed.
                                                   (9
                                                        bytes) [ICODE SLI
37513 ms <+37513 ms>:CONFIG SET
51253 ms <+13740 ms>:UID SET
                                                   (8
                                                        bytes)
                                                               [e004035010963a52
                                                   (5
                                                        bytes)
                                                                [02b2048e3c
56018 ms < +4765 ms>:CODEC RX
              +0 ms>:CODEC TX
                                                   (5
                                                               [000000ccc6
56018 ms <
                                                        bytes)
                                                        bytes) [260100f60a
56045 ms <
             +27 ms>:CODEC RX
                                                   (5
                                                        bytes) [02b304045b6efd7fcc0a]
56058 ms <
             +13 ms>:CODEC RX
                                                   (10
56058 ms <
             +0 ms>:CODEC TX
                                                   (3
                                                        bytes) | 0078f0
             +19 ms>:CODEC RX
56077 ms <
                                                   (5
                                                        bytes) [260100f60a
                                                   (12
56077 ms <
             +0 ms>:CODEC TX
                                                        bytes) [0000523a9610500304e03738]
56103 ms <
             +26 ms>:CODEC RX
                                                   (13
                                                        bytes) [2220523a9610500304e0006150]
             +0 ms>:CODEC TX
                                                   (7
                                                               [000000000077cf
56103 ms <
                                                        bytes)
56132 ms <
             +29 ms>:CODEC RX
                                                   (13
                                                                [2220523a9610500304e001e841]
                                                        bytes)
56132 ms <
             +0 ms>:CODEC TX
                                                   (7
                                                        bytes)
                                                                [000000000077cf
56161 ms <
             +29 ms>:CODEC RX
                                                   (13
                                                       bytes) [2220523a9610500304e0027373]
56162 ms <
              +1 ms>:CODEC TX
                                                        bytes)
                                                                [000000000077cf
                                                   (7
             +29 ms>:CODEC RX
                                                   (13
                                                                [2220523a9610500304e003fa62]
56191 ms <
                                                        bytes)
              +0 ms>:CODEC TX
56191 ms <
                                                   (7
                                                        bytes) [000000000077cf
56220 ms <
             +29 ms>:CODEC RX
                                                   (13
                                                        bytes)
                                                                [2220523a9610500304e0044516]
56220 ms <
              +0 ms>:CODEC TX
                                                               [000000000077cf
                                                   (7
                                                        bytes)
             +29 ms>:CODEC RX
                                                   (13
56249 ms <
                                                        bytes)
                                                                [2220523a9610500304e005cc07]
              +1 ms>:CODEC TX
                                                        bytes) [000000000077cf
56250 ms <
                                                   (7
56279 ms <
             +29 ms>:CODEC RX
                                                   (13
                                                        bytes)
                                                               [2220523a9610500304e0065735]
56279 ms <
             +0 ms>:CODEC TX
                                                               [000000000077cf
                                                   (7
                                                        bytes)
56308 ms <
             +29 ms>:CODEC RX
                                                   (13
                                                                [2220523a9610500304e007de24]
                                                        bytes)
56308 ms <
              +0 ms>:CODEC TX
                                                        bytes)
                                                                [000000000077cf
```

```
Note: If parityBit check failed, '!' is appended to the decoded data and raw data with parity bit is displayed.
                                                   (9
                                                        bytes) [ICODE SLI
37513 ms <+37513 ms>:CONFIG SET
51253 ms <+13740 ms>:UID SET
                                                   (8
                                                        bytes)
                                                                [e004035010963a52
                                                   (5
                                                                [02b2048e3c
56018 ms < +4765 ms>:CODEC RX
                                                        bytes)
              +0 ms>:CODEC TX
                                                   (5
                                                                [000000ccc6
56018 ms <
                                                        bytes)
56045 ms <
             +27 ms>:CODEC RX
                                                   (5
                                                        bytes)
                                                                [260100f60a
56058 ms <
             +13 ms>:CODEC RX
                                                   (10
                                                        bytes)
                                                                [02b304045b6efd7fcc0a]
56058 ms <
             +0 ms>:CODEC TX
                                                   (3
                                                        bytes)
                                                                [0078f0
             +19 ms>:CODEC RX
56077 ms <
                                                   (5
                                                                [260100f60a
                                                        bytes)
                                                   (12
56077 ms <
             +0 ms>:CODEC TX
                                                                [0000523a9610500304e03738]
                                                        bytes)
56103 ms <
             +26 ms>:CODEC RX
                                                   (13
                                                        bytes) [2220523a9610500304e0006150]
             +0 ms>:CODEC TX
                                                   (7
                                                                [000000000077cf
56103 ms <
                                                        bvtes)
56132 ms <
             +29 ms>:CODEC RX
                                                   (13
                                                                [2220523a9610500304e001e841]
                                                        bytes)
             +0 ms>:CODEC TX
56132 ms <
                                                   (7
                                                        bytes)
                                                                [000000000077cf
56161 ms <
             +29 ms>:CODEC RX
                                                   (13
                                                       bytes) [2220523a9610500304e0027373]
56162 ms <
              +1 ms>:CODEC TX
                                                        bytes)
                                                                [000000000077cf
                                                   (7
             +29 ms>:CODEC RX
                                                   (13
                                                                [2220523a9610500304e003fa62]
56191 ms <
                                                        bytes)
              +0 ms>:CODEC TX
56191 ms <
                                                   (7
                                                        bytes) [000000000077cf
56220 ms <
             +29 ms>:CODEC RX
                                                   (13
                                                        bytes)
                                                                [2220523a9610500304e0044516]
56220 ms <
              +0 ms>:CODEC TX
                                                                [000000000077cf
                                                   (7
                                                        bytes)
             +29 ms>:CODEC RX
                                                   (13
56249 ms <
                                                        bytes)
                                                                [2220523a9610500304e005cc07]
              +1 ms>:CODEC TX
                                                        bytes) [000000000077cf
56250 ms <
                                                   (7
56279 ms <
             +29 ms>:CODEC RX
                                                   (13
                                                        bytes) [2220523a9610500304e0065735]
56279 ms <
             +0 ms>:CODEC TX
                                                                [000000000077cf
                                                   (7
                                                        bytes)
56308 ms <
             +29 ms>:CODEC RX
                                                   (13
                                                                [2220523a9610500304e007de24]
                                                        bytes)
56308 ms <
              +0 ms>:CODEC TX
                                                        bytes)
                                                                [000000000077cf
```

fptrs@vm:~\$ python3 ~/git/ChameleonMiniCeres/Software/chamlog.py -f log





Fabian Peters – fptrs

Federico Cerutti – ceres-c





https://github.com/emsec/ChameleonMini/