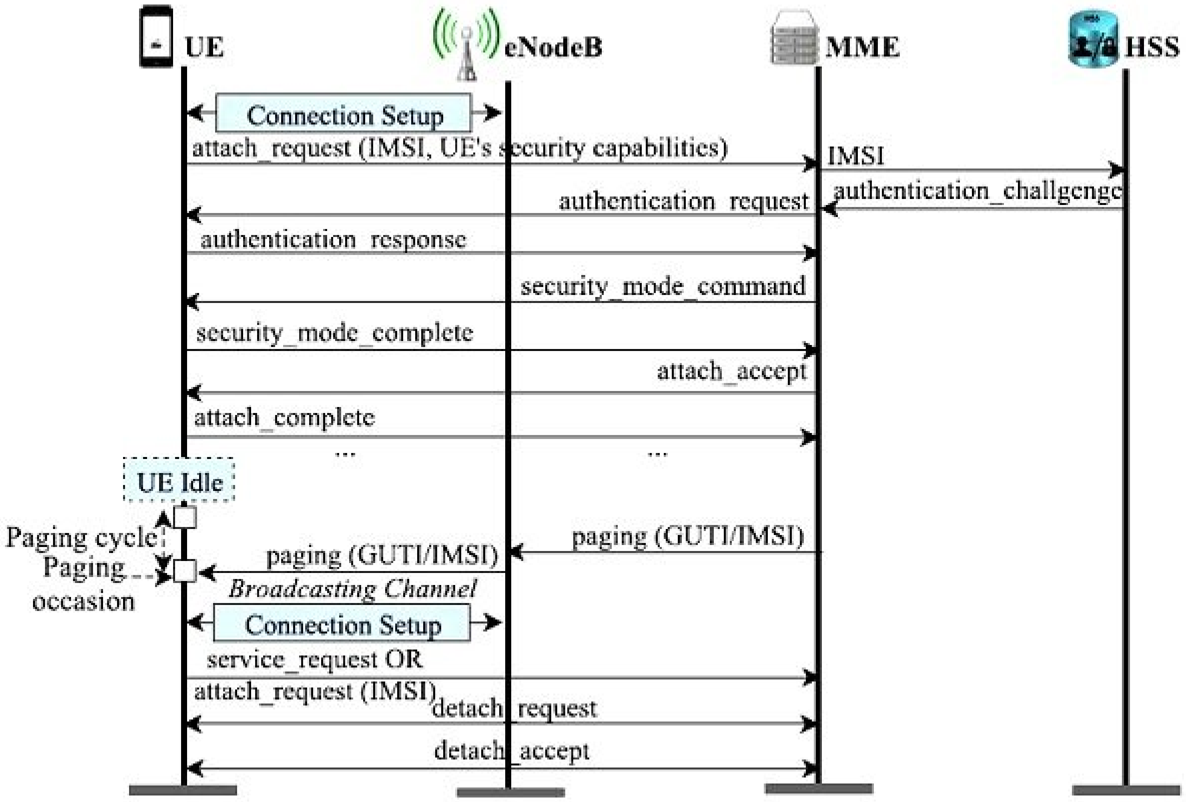
[illegible]

[illegible] 4G [illegible] 5G [illegible]

[illegible] LTE [illegible] LTE [illegible]

[illegible] 4G LTE

[illegible] 4G LTE [illegible] Purdue [illegible] Lowa [illegible] 10 [illegible] 4G LTE [illegible] (attach) [illegible] (detach) [illegible] (paging) [illegible] attach [illegible] detach [illegible] paging [illegible] 1 [illegible]

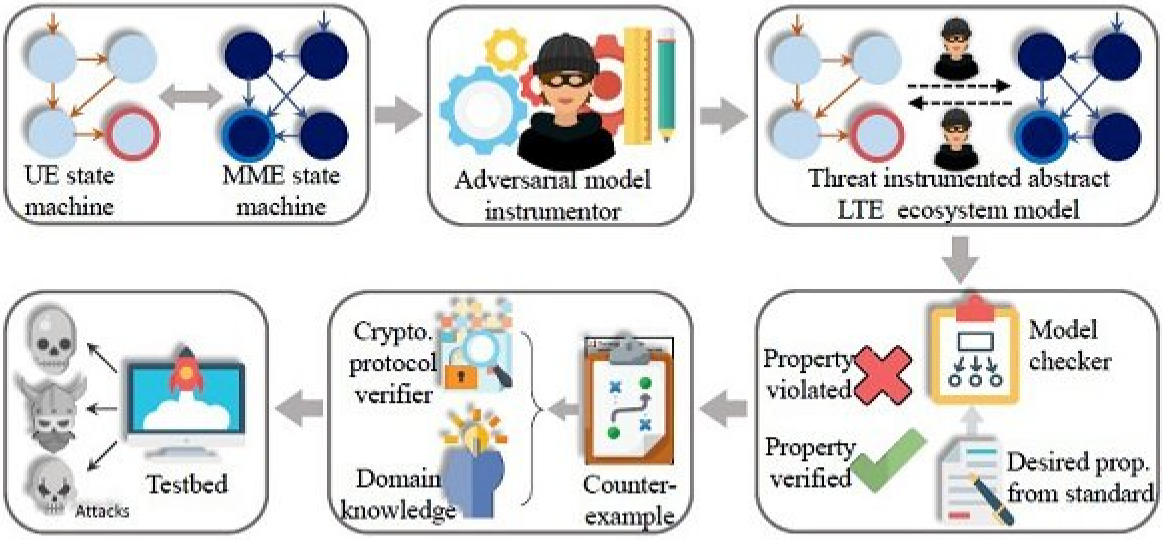


[illegible] -1 [illegible] detach [illegible] attach [illegible] paging

UE [illegible] eNodB [illegible]. MME ([illegible] Mobility Management Entity) [illegible]. HSS ([illegible] Home Subscriber Server) [illegible].

[illegible].

[illegible] LTEInspector [illegible] 8 [illegible] 10 [illegible] ([illegible]) [illegible]. LTEInspector [illegible] 2 [illegible]. LTE [illegible] MME [illegible] UE [illegible].


UE state machine
MME state machine
Adversarial model instrumentor
Threat instrumented abstract LTE ecosystem model
Model checker
Property violated
Property verified
Desired prop. from standard
Crypto. protocol verifier
Domain knowledge
Counter-example
Testbed
Attacks

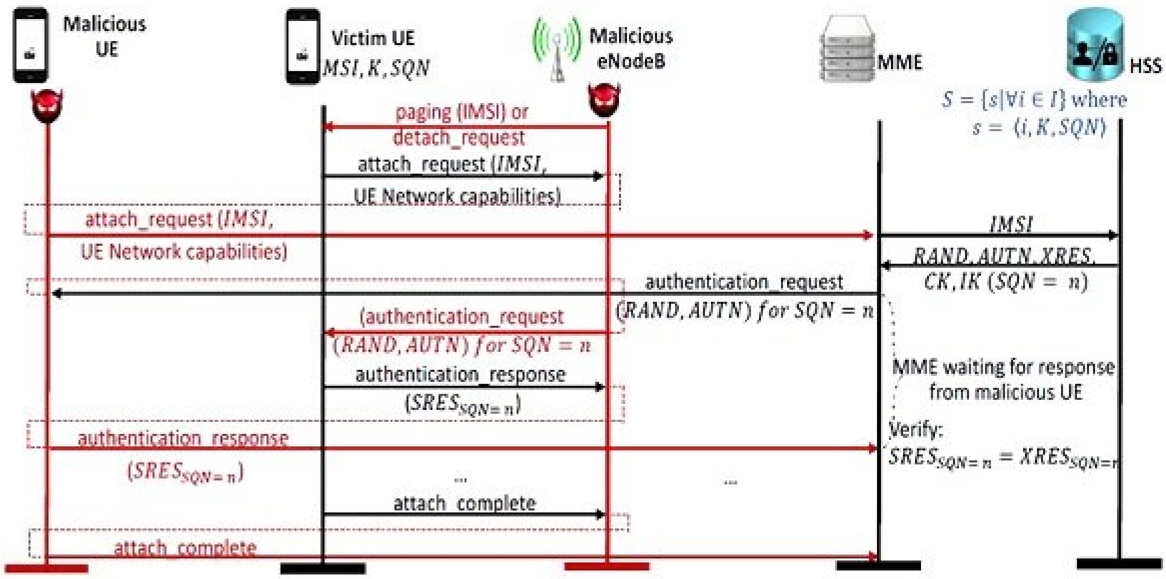
[illegible] -2 [illegible] LTEInspecture

[illegible]

[illegible]. [illegible] LTE [illegible]:

1.[illegible]
Authentication Synchronization Failure))
2.[illegible] Traceability))
3.[illegible] Numb))
4.[illegible] Authentication Relay))
5.[illegible] /[illegible] Detach/Downgrade))
6.[illegible] Paging Channel Hijacking))
7.[illegible] Stealthy Kicking-off))
8.[illegible] Panic
9.[illegible] Energy Depletion))
10. [illegible] (linkability)

[illegible] LTE [illegible]. [illegible] 3 [illegible]. [illegible].



[illegible] 3- [illegible]

[illegible] linkability [illegible]. [illegible] panic [illegible]. [illegible] detach [illegible] DoS [illegible]. [illegible]:«[illegible] LTEInspector [illegible] paging [illegible] (...[illegible]) [illegible].» [illegible] 1300 [illegible] 3900 [illegible].
4G [illegible] 5G [illegible] [illegible] [illegible].
[illegible] Positive Technologies [illegible] 4G [illegible] EPC(Evolved Packet Core) [illegible] (voice) [illegible]. [illegible] DoS [illegible].
[illegible].
Positive Technologies [illegible]

[illegible].

[illegible] GTP. [illegible] GTP [illegible] IP [illegible] GPRS [illegible]. [illegible] 4G LTE [illegible] EPC [illegible] GTP [illegible]. [illegible] IP [illegible] GPRS [illegible] «[illegible]» [illegible]. [illegible].

[illegible] GTP [illegible]. [illegible]. [illegible]. [illegible] 4G LTE [illegible] 4G [illegible] IP [illegible].

[illegible] Telecom Security [illegible]: «[illegible]. [illegible]. [illegible].»

[illegible] (IIoT) [illegible] IoT [illegible]. [illegible] Errricson [illegible] 2022 [illegible] 1.5 [illegible]. [illegible].

[illegible]. [illegible] LTE [illegible] DoS [illegible]. [illegible]. [illegible]. [illegible] (Brute-force) [illegible]. [illegible] Brute-force [illegible].

[illegible] Positive Technologies [illegible] (encryption) [illegible]. [illegible] TSL [illegible] HTTPS [illegible]. [illegible]. [illegible]. [illegible] 4G [illegible] 5G [illegible].

[illegible]

[illegible] 4G LTE [illegible]. [illegible]. [illegible] 5G [illegible]

[illegible].

[illegible]:

[illegible]

[illegible]:

[illegible]: LTEInspector: A Systematic Approach for Adversarial Testing of 4G LTE

theregister

tecore

[illegible]:

[illegible]

[illegible]

[illegible]:

11:05 - 09/07/1397

[illegible]:

4G [illegible] - 5G[illegible] - 4G [illegible] - UE [illegible] - 4G LTE - 5G - GTP [illegible] - [illegible] - 5G [illegible] - 4G LTE

[illegible]

[illegible]: https://www.shabakeh-mag.com/security/13072/%D9%86%D9%82%D8%B5%E2%80%8C%D9%87%D8%A7%DB%8C-%D8%A7%D9%85%D9%86%DB%8C%D8%AA%DB%8C-%D8%B4%D8%A8%DA%A9%D9%87%E2%80%8C%D9%87%D8%A7%DB%8C-4g-%D9%88-5g-%D9%88-%D9%85%D8%B4%DA%A9%D9%84%D8%A7%D8%AA-%D9%86%D8%A7%D8%B4%DB%8C-%D8%A7%D8%B2-%D8%A2%D9%86%E2%80%8C%D9%87%D8%A7