CERIAS

Embedded Sensors Project (ESP)

"The Operating System *is* the Intrusion Detection System"

Benefits

Difficult to circumvent

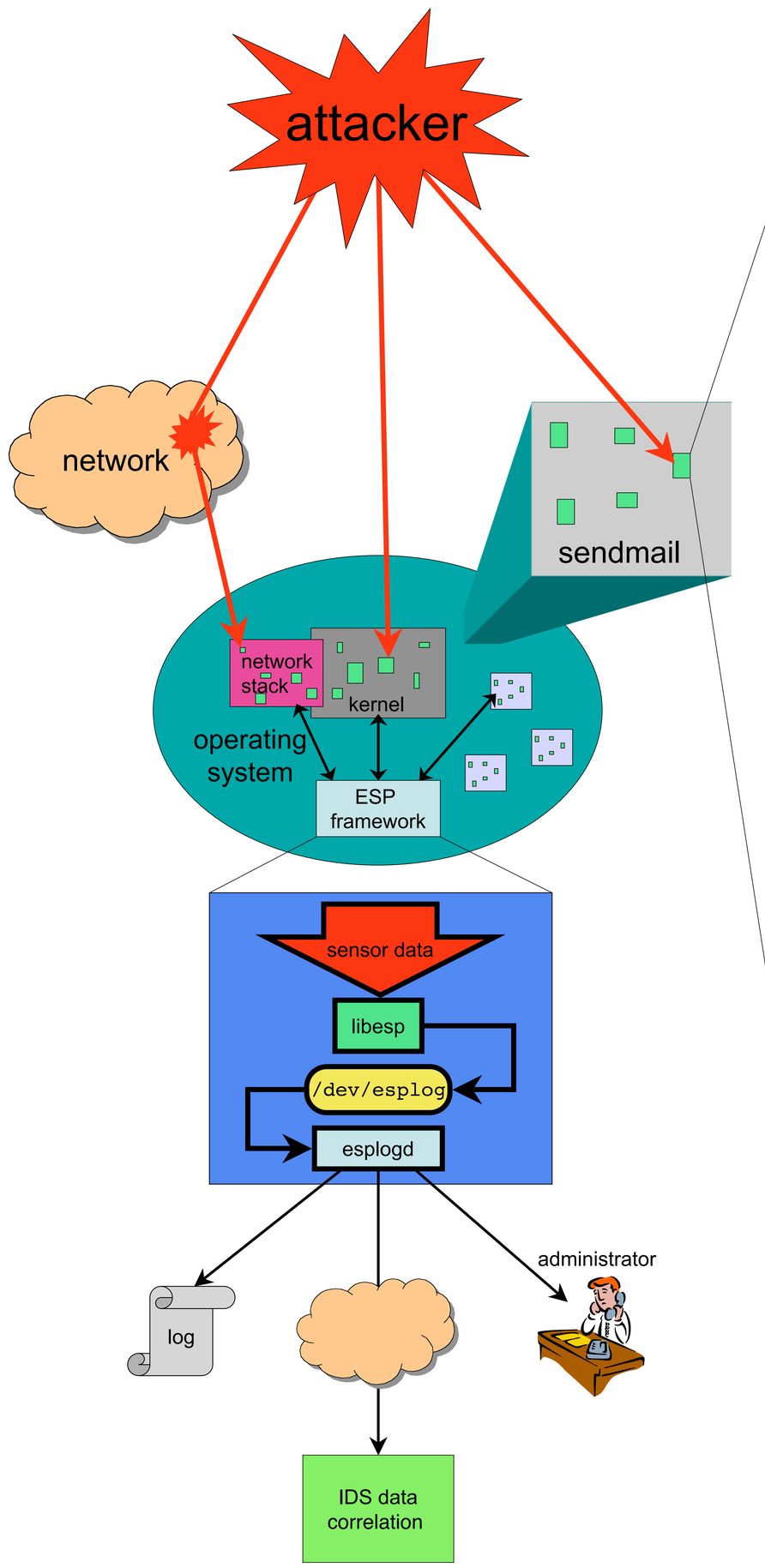
Tamper-resistant

Host and network attack detection

Low resource overhead

Real-time detection

Almost no false negatives



What is a Sensor?

Small amount of code inserted into OS and application

Monitors system and program behavior directly

Placed at critical points in code

Detects an attack at the point of vulnerability

Minimal amount of code changed/added

```
#ifdef ESP_CVE_1999_245
  if(strlen(home_env)>255)
    esplog("CVE_1999_245");
#endif
```

Future Research

ESP-enabled OS

Portable Sensor Support Framework

Modular Response System

Meta-detector design

Large scale sensor deployment

http://www.cerias.purdue.edu/homes/esp/

References

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- F. Kerschbaum, E.H. Spafford, D. Zamboni, Using Internal Sensors and Embedded Detectors for Intrusion Detection. Journal of Computer Security, Volume 10 Issues 1/2 (2002), 23-70.
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- J. Early, An Embedded Sensor For Monitoring File Integrity. CERIAS Technical Report 2001-41 (2001), Purdue University, West Lafayette, IN.

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