The challenge to transform secure hardware into secure products

Presented by: Jean-Philippe Fassino
Schneider Electric / Technology / IOT & Digitization
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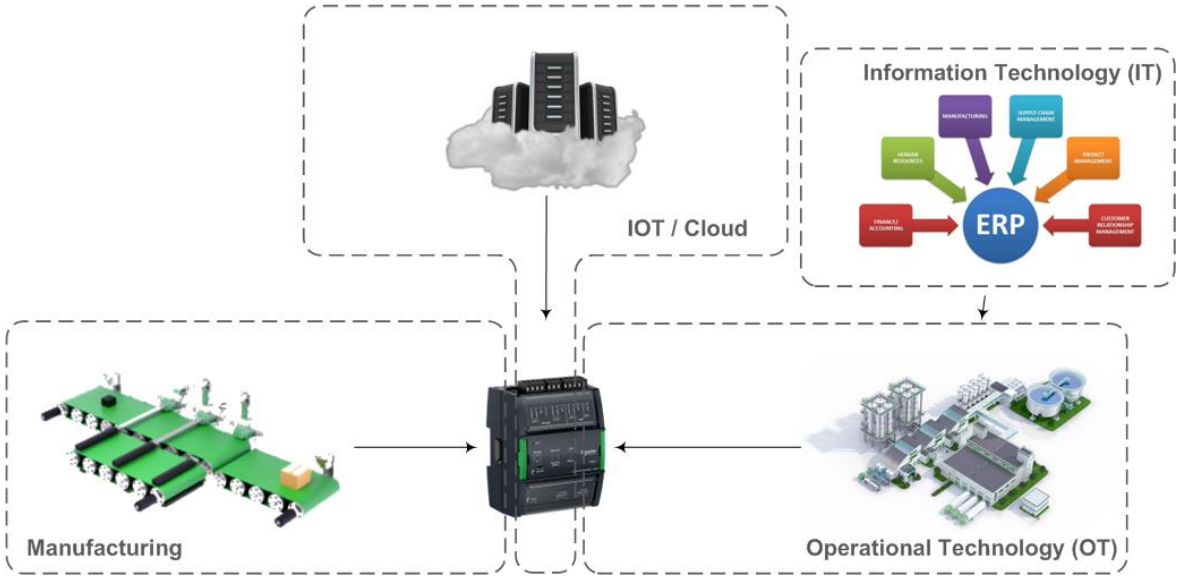
Industrie
Agroalimentaire, métaux, eau, machines…

Datacenters, salles serveurs…

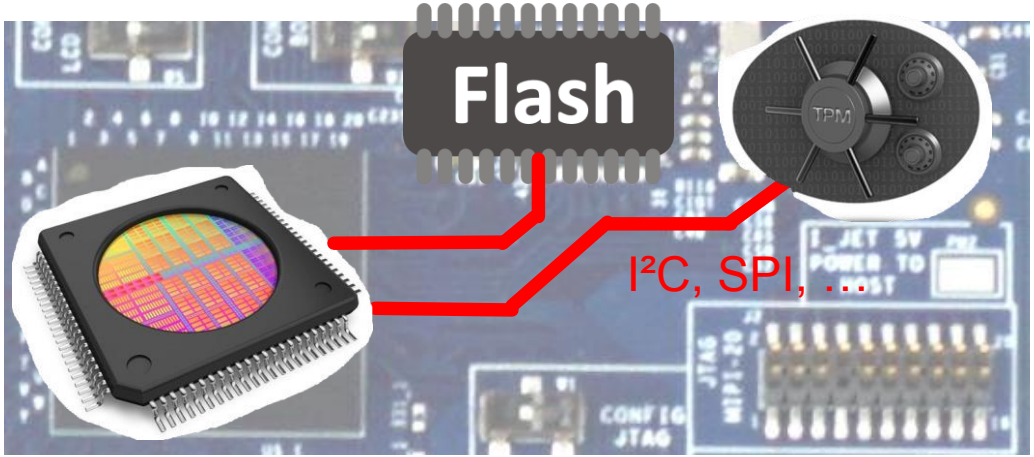
Energie
Production, répartition, distribution
Sécurisation de l'industrie électro-intensive

Cyber-Security challenge in Schneider Electric Eco-System



- Critical Infrastructure
- Connect & unconnected offers
- Several stakeholders in security
- Long product lifetime
- Long history and legacy
- Availability
- Safety
- Counterfeiting

Is the Secure Element sufficient?



Threat	Likelihood	Impact
Software vulnerabilities	Remote & reproducible	From low to high
CPU spoofing	Feasible hardware attack	Leakage of data: • Customer data • High value algorithm
Eaves-dropping on the communication link		
Attack on Secure Element	Very complex hardware attack	Compromising of cryptographic keys

Mitigating Secure Element threats

Software vulnerabilities

- Secure Development Lifecycle to improve software quality
- Trusted execution environment to process secure services

CPU spoofing & eaves-dropping

- Secure channel between processor & secure element
  - This lead to obfuscate a secret key in the processor which is not what we want
- Secure Element integrated within System-on-Chip should be a good solution
  - Removing the connection avoid these threats

To guarantee the security of the equipment, the security of the manufacturing line must be addressed

Advanced security features require specific operations during manufacturing

- Key injections for firmware digital signature & confidentiality, secure storage, …
- Certificate Signing Request for device genuineness, asset identity, …
- Locking some keys to avoid depersonalization while allowing late provisioning on customer site (dual security world)

While keeping manufacturing line constraints

- Short production time per product
- No network connection to avoid unplanned stop of the production
- Involvement of many third parties

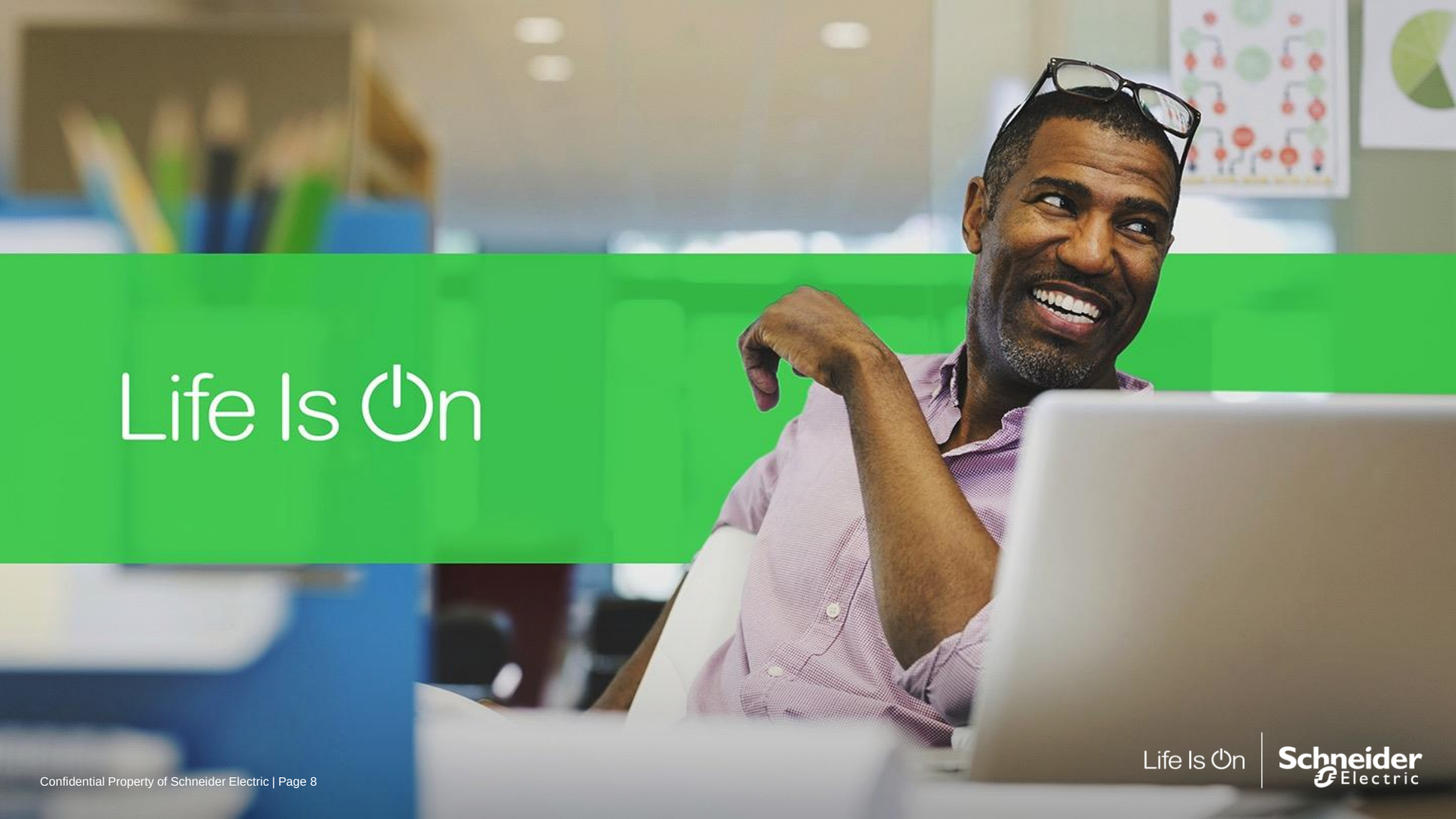
Conclusion

Silicon vendors should **evaluate the cost of attacks** to compromise their Secure Element

- It’s mandatory to choose adequate solution and characterize the resilience of the final product

Secure Element integrated within System-on-Chip should be a good solution

Impact on manufacturing line of adding security features must be correctly anticipated if we want to transform successfully secure hardware into secure products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