Device-Level Security Implementation to SSD by Controller (Hiroshi Watanabe)

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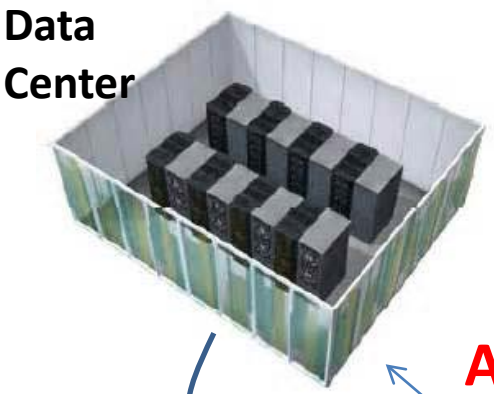
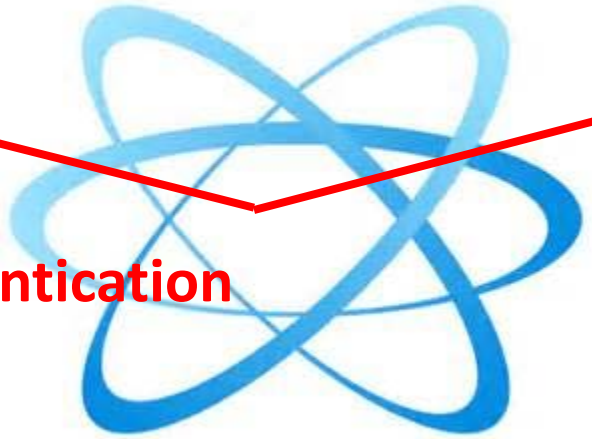
Who will manage CA?

In bootstrapping, authenticate information is exposed to network.





Authentication Information

stolen

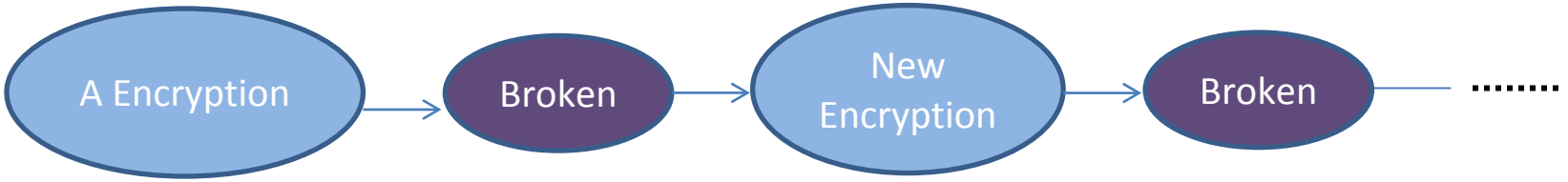
Authentication Information

Certificate Authentication (CA)

Authentication Information

Not distinguish

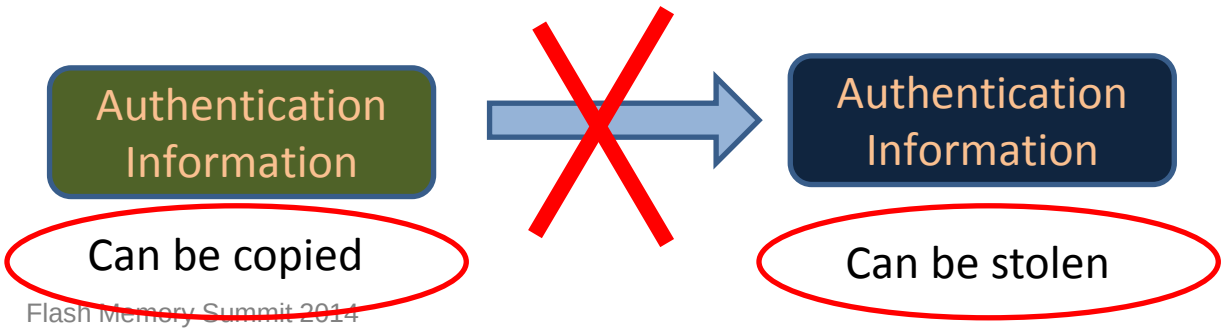
Why will Device-level Security be demanded?



Limitless Spiral

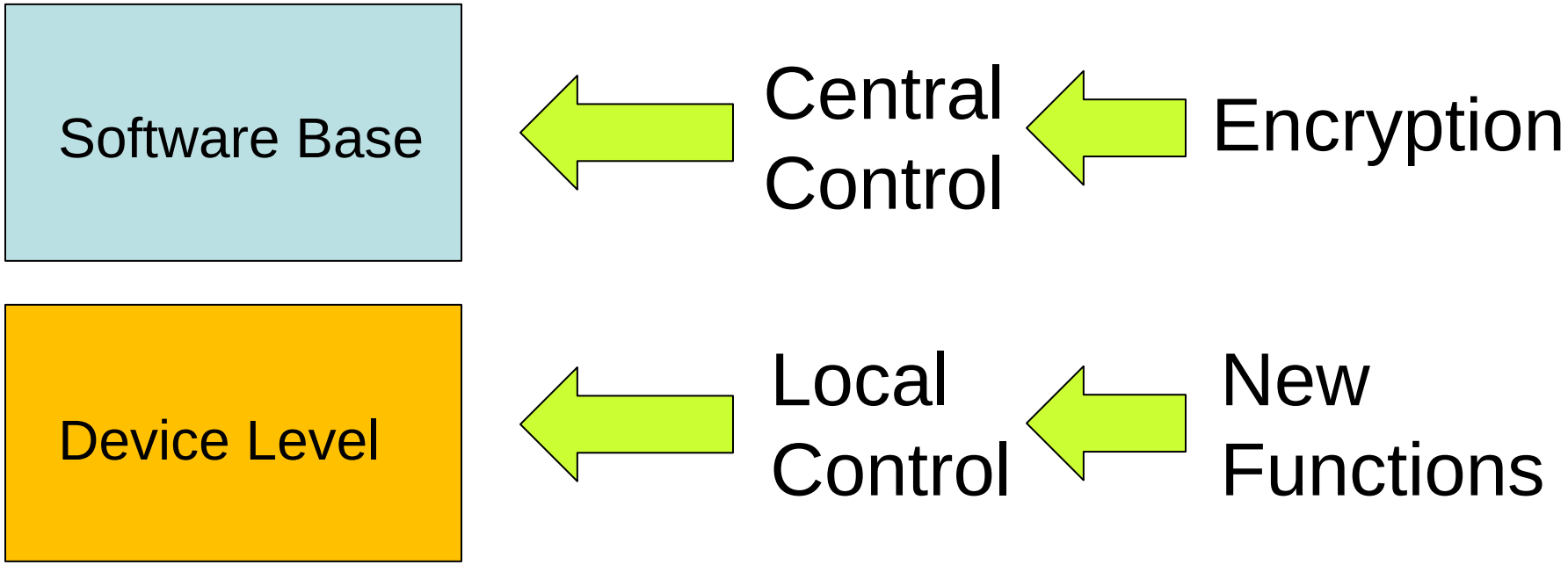
Encryption

Copy Protect



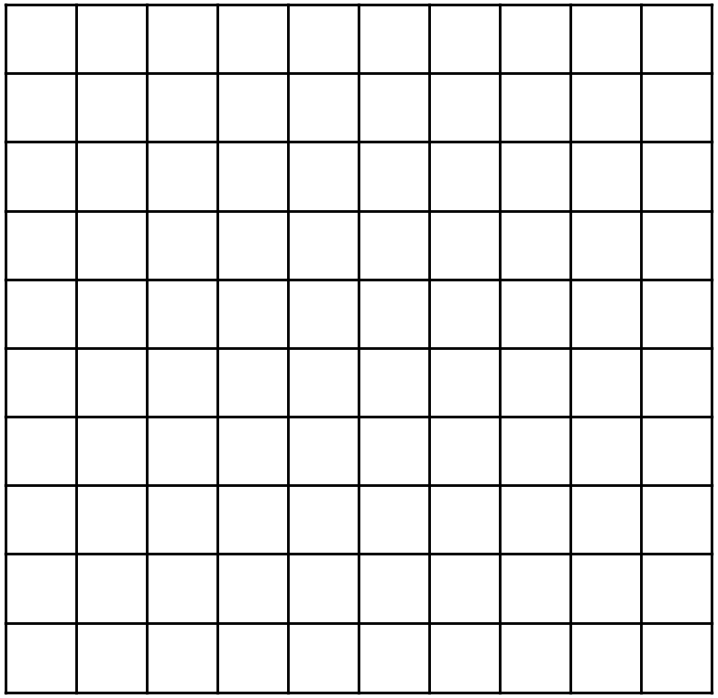
Security Classification

1. **Memory chip is a smallest unit connected in network.**
2. **How many memory chips are used all over the world?**

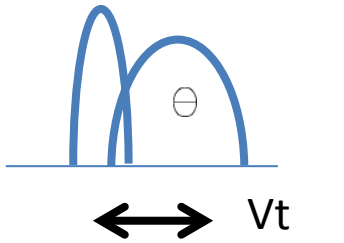


Chip QR Code

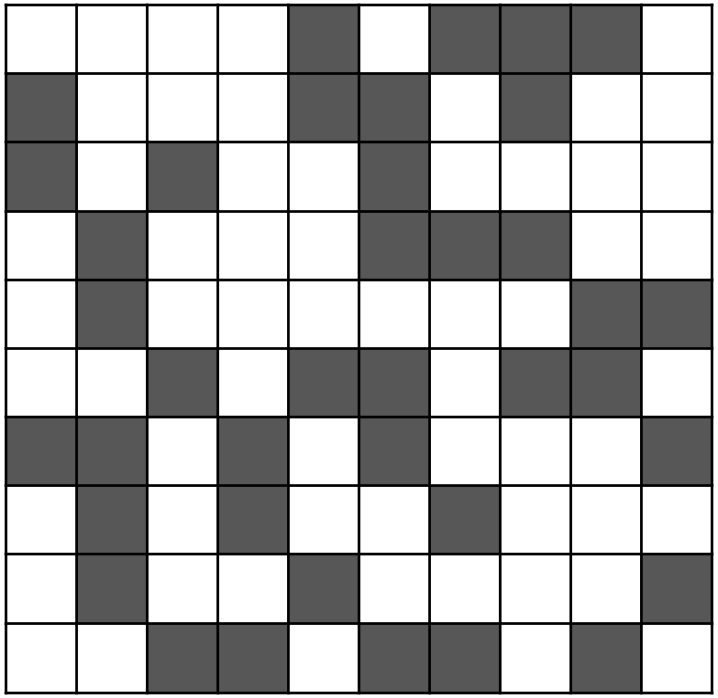
Cell Array



Enhanced RDF



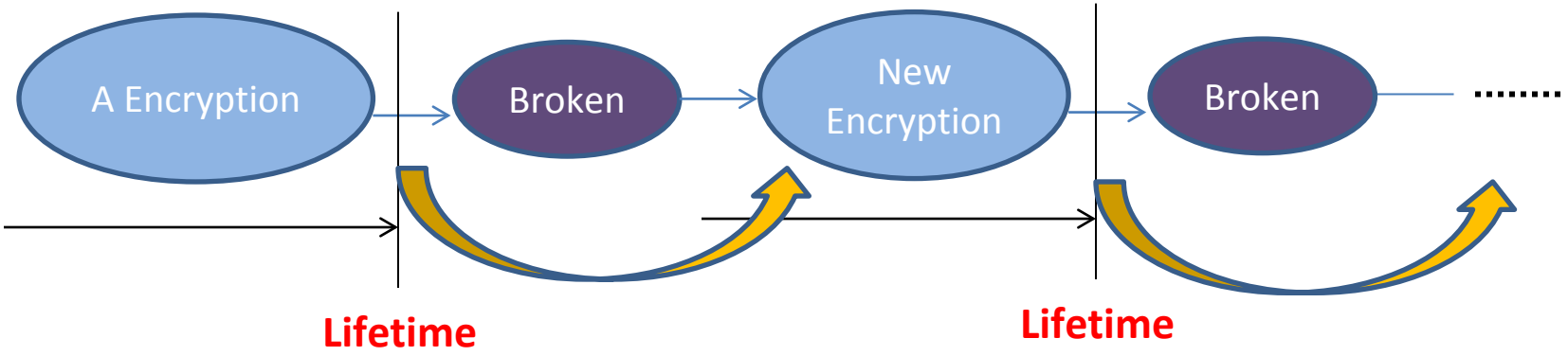
Vt fluctuation mapping



RDF = Random Dopant Fluctuation

H. Watanabe, USP14,038,772, (Date: 9/27/2013)

Lifetime Controller



1. **CMOS Compatible**
2. **Can be embedded to memory controller**
3. **Demonstrated as Integrated Battery-Less Electronic Timer in experiment**

H. Watanabe, et al., IEEE TED vol. 58, No. 3, 792 (2011)