THWARTING EVIL MAID ATTACKS: PHYSICALLY UNCLONABLE FUNCTIONS FOR HARDWARE TAMPER DETECTION

HACK IN THE BOX – MALAYSIA – OCTOBER 2013

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RYAN LACKEY RYAN@CRYPTOSEAL.COM

WHO: ERIC MICHAUD

- Co/Founder of TOOOL.US/HacDC/PS:One/Rift Recon
- Self-taught engineer/machinist/hacker/CEO
- Breaker of systems w/ a physical component and organizations
- Broke many high security locking systems and a voting machine
- Director of hardware curation @ ExploitHub.com
- Previously of Argonne National Laboratory – Vulnerability Assessment Team
- Brought Locksport to Malaysia – Hopefully Serbia?

WHO: RYAN LACKEY

- Co-Founder of HavenCo, world's first offshore datahaven, in 2000.
- Worked on several anonymous blinded ecash systems
- Security consultant in payments, HW key management, and other clients
- Founded and ran a satellite/wireless networking startup in Iraq/Afghanistan
- Operated US military medical imaging communications in Iraq/Afghanistan
- Co-founder of CryptoSeal, a Trusted computing startup in Silicon Valley

THE PROBLEM:
PHYSICAL ATTACKS SUBVERT HIGHER LAYERS

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HOW IT WORKED BEFORE PERVASIVE COMPUTING

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WHAT CHANGED?

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THREAT MODEL

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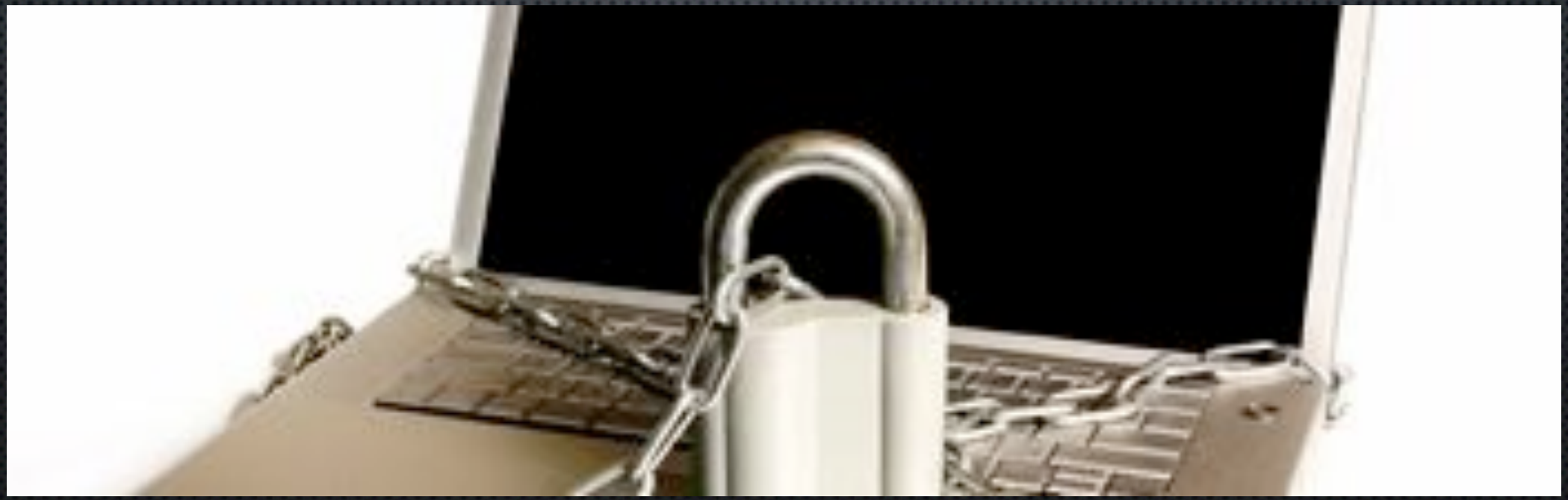
BEST PRACTICE: FULL DISK ENCRYPTION



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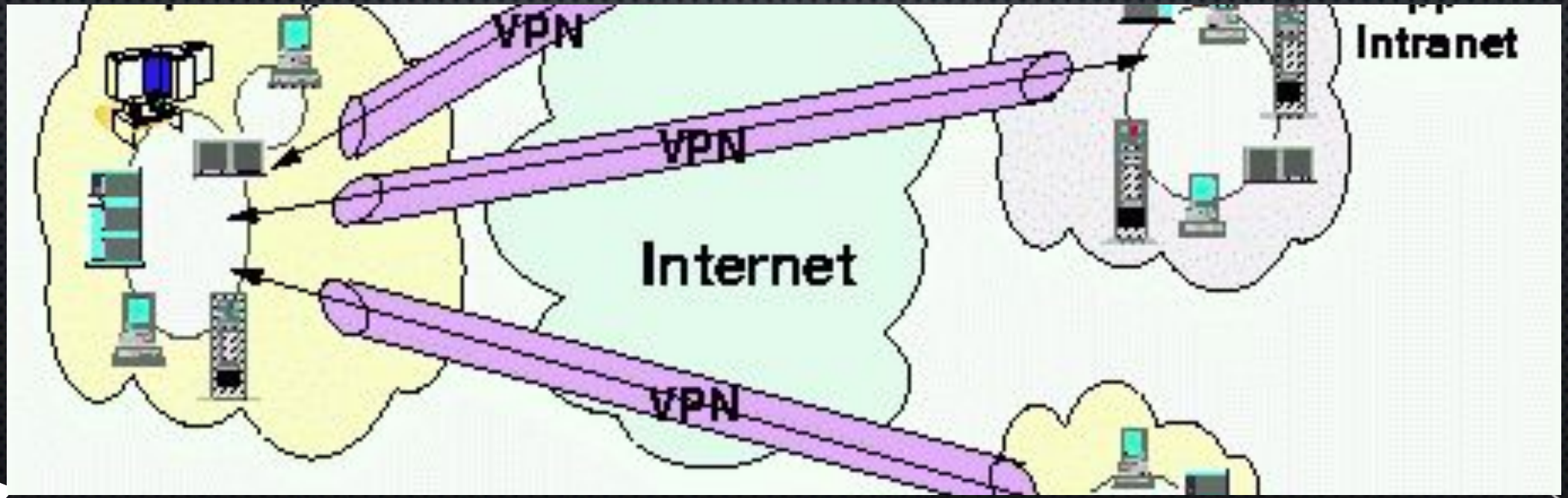
BEST PRACTICE: VPN AND MDM



BEST PRACTICE: TRAVEL CLEAN

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BEST PRACTICE: DEDICATED TRAVEL POOL

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BEST PRACTICE: SEALS

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BEST PRACTICE: FORENSIC TEARDOWN

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A STATIC SOLUTION:
USE-TIME REMOTE-VERIFIED PHYSICAL SEALS

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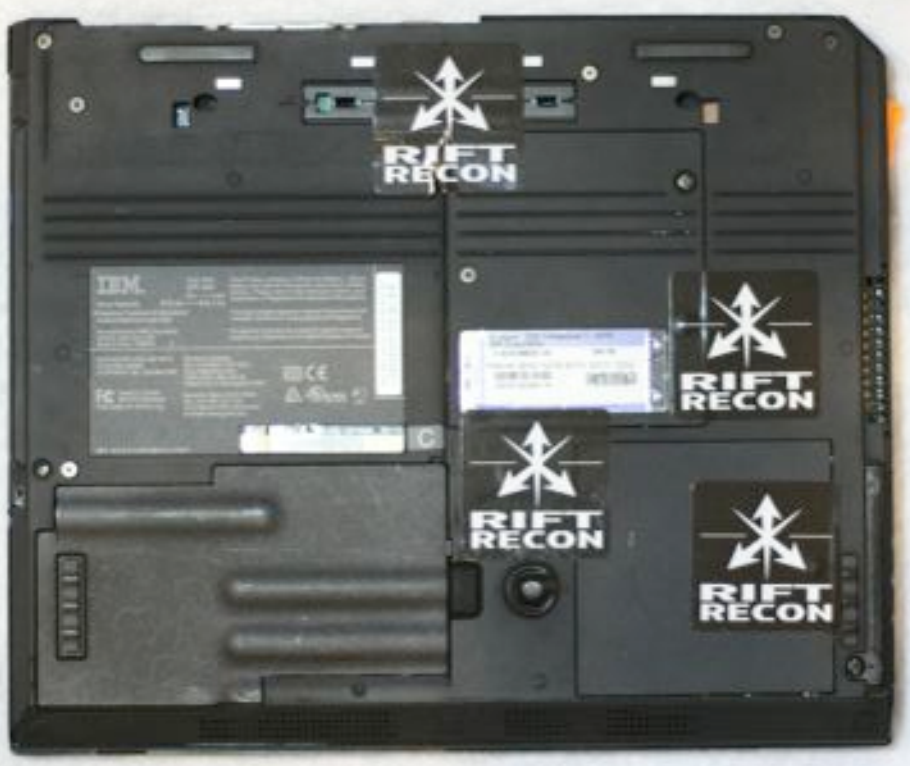
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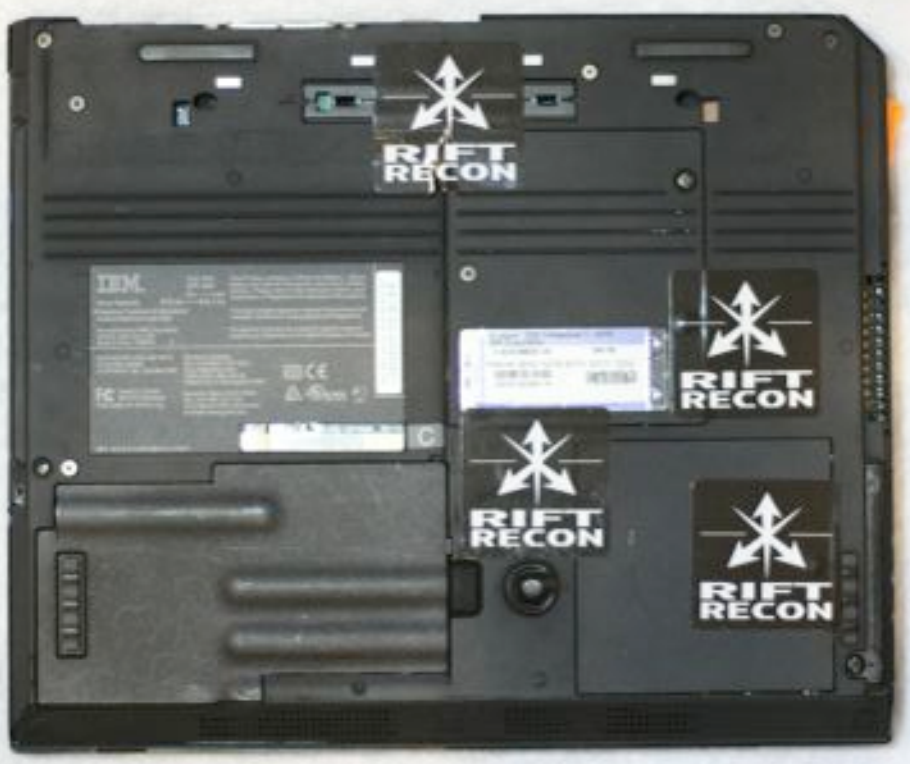

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THREATS TO USE-TIME STATIC SEALS

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THREATS TO USE-TIME STATIC SEALS

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NEWEST IMPROVEMENT: DYNAMIC SEALS

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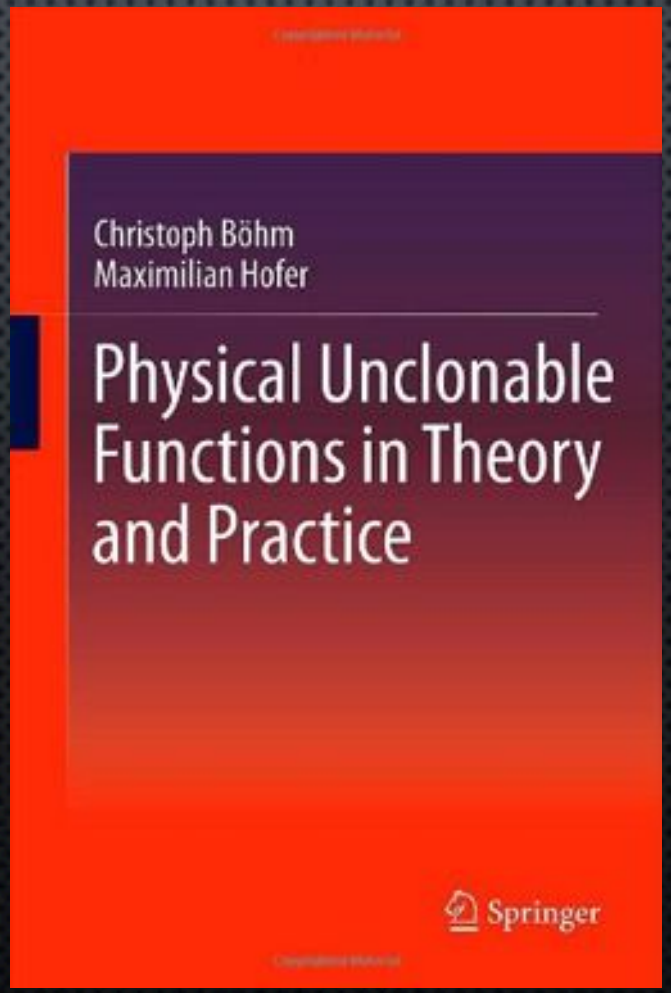
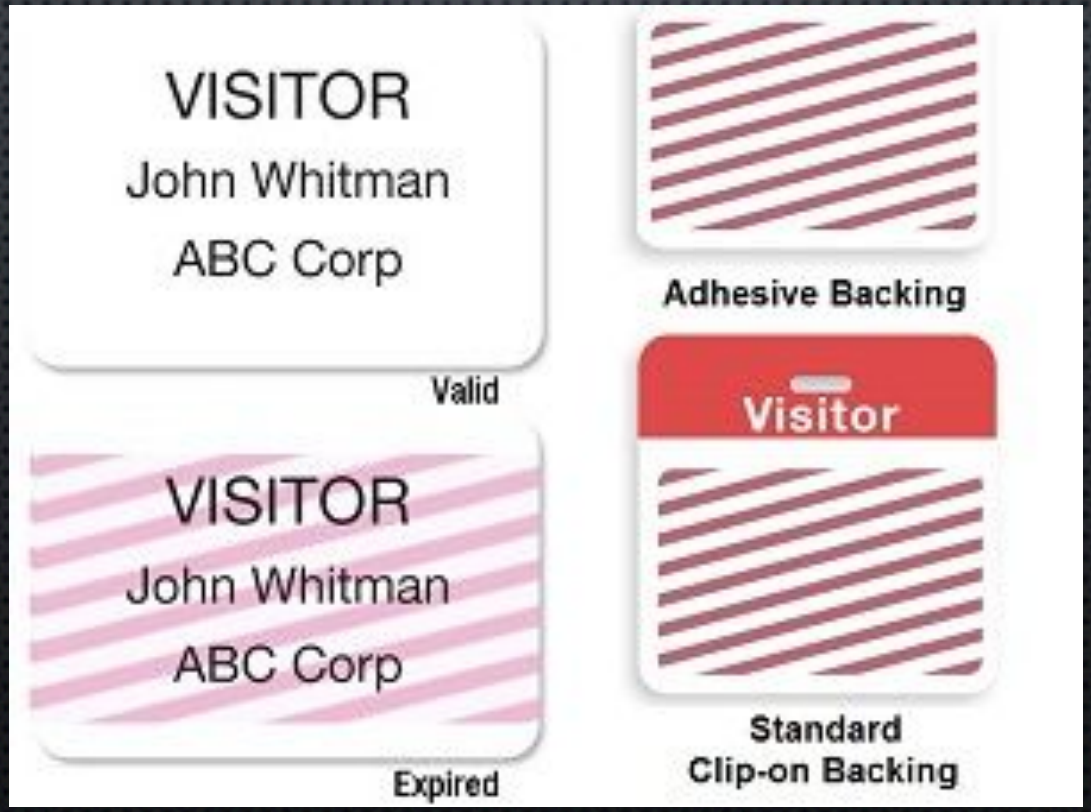
PHYSICALLY UNCLONABLE FUNCTIONS



DYNAMIC SEALS: TIME



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DYNAMIC SEALS: POSITION

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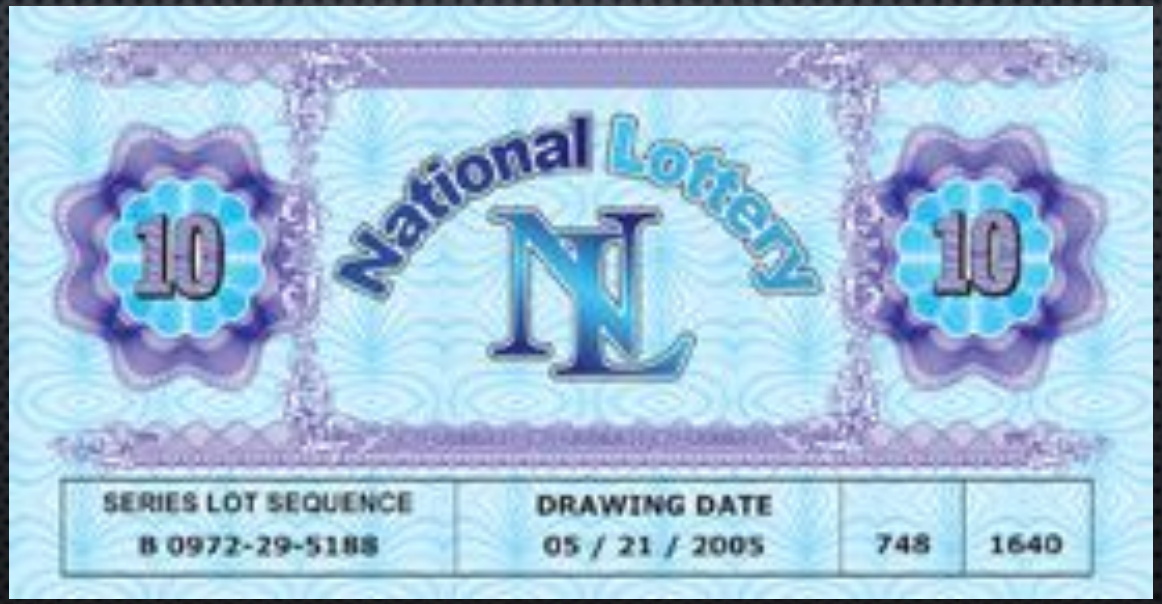
DYNAMIC SEALS: LAYERS



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DYNAMIC SEALS: VERIFIER APPLICATION

Work in progress:
https://github.com/cryptoseal/verifier

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OPEN QUESTIONS

CONCLUSION/SUMMARY

- INCREASING NEED
- COOL NEW TECHNOLOGY
- OPEN SOURCE IS THE BEST MODEL

CONTACT US

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