LASER Workshop 2020

Compliance Cautions

Investigating Security Issues Associated with U.S. Digital-Security Standards

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Compliance Standards

- What are they?
- Why use them?
- How are they enforced?
- What's the problem?

Even if you had perfect compliance, what else could go wrong?

First empirical evaluation of compliance standards for

security issues that exist within perfect compliance

Standards we examined

Study Methods

1 **Audit**

Six researchers conducting line-by-line audit of three standards

2 **Expert evaluations**

Four compliance experts evaluate researchers’ findings

3 **Disclosure**

Various approaches to responsibly disclose findings to organizations

1 **Audit**

Six researchers conducting line-by-line audit of three standards

Real-world experience

Exploitation in the wild

Unanimous agreement

		Probability				
		Unlikely	Seldom	Occasional	Likely	Frequent
Severity	Catastrophic	M	H	H	E	E
	Critical	L	M	H	H	E
	Moderate	L	L	M	M	H
	Negligible	L	L	L	L	M

E - Extremely High H - High M - Moderate L - Low

1 **Audit**

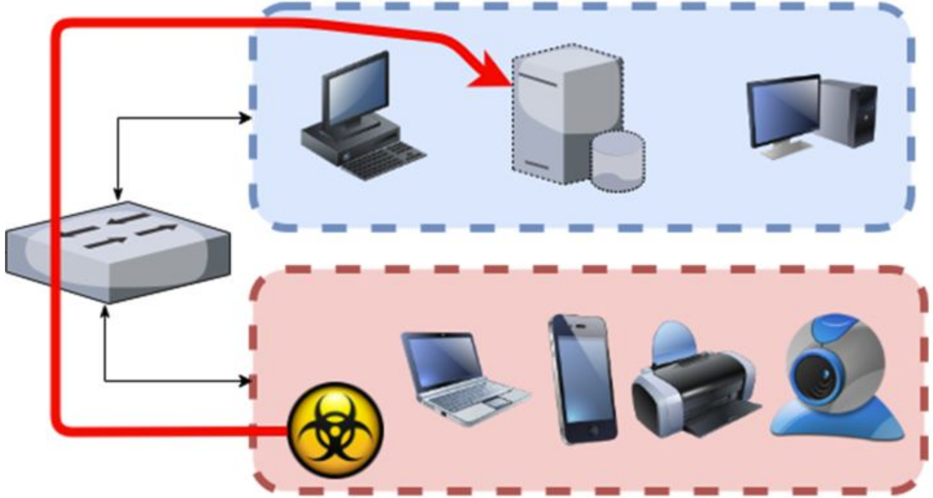
Six researchers conducting line-by-line audit of three standards

In total, **148 issues** ranging from low to **extremely high** risk

Data vulnerability

1 Audit

Six researchers conducting line-by-line audit of three standards



Data vulnerability

1 Audit

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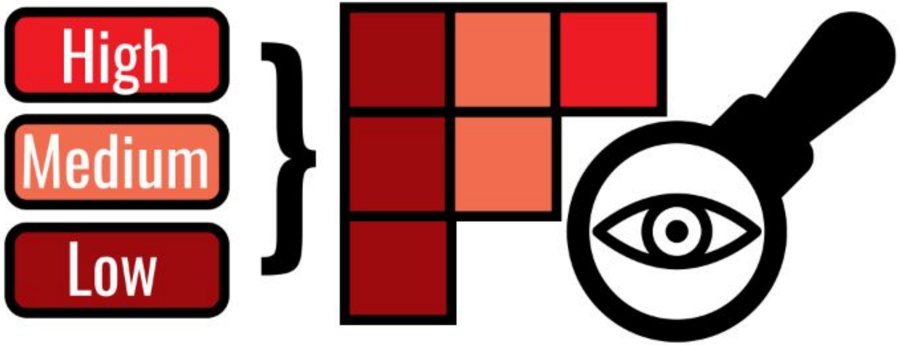
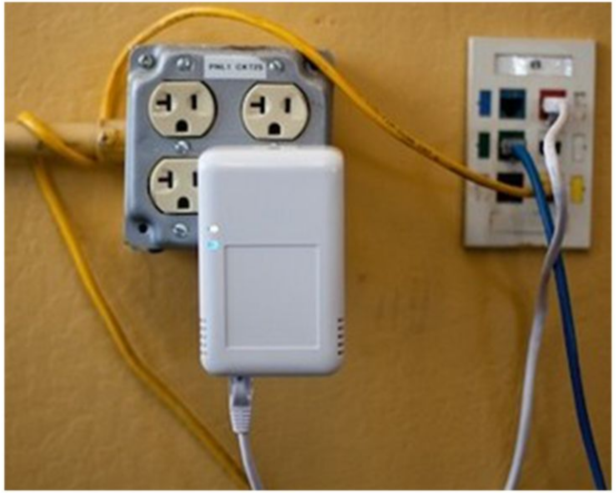


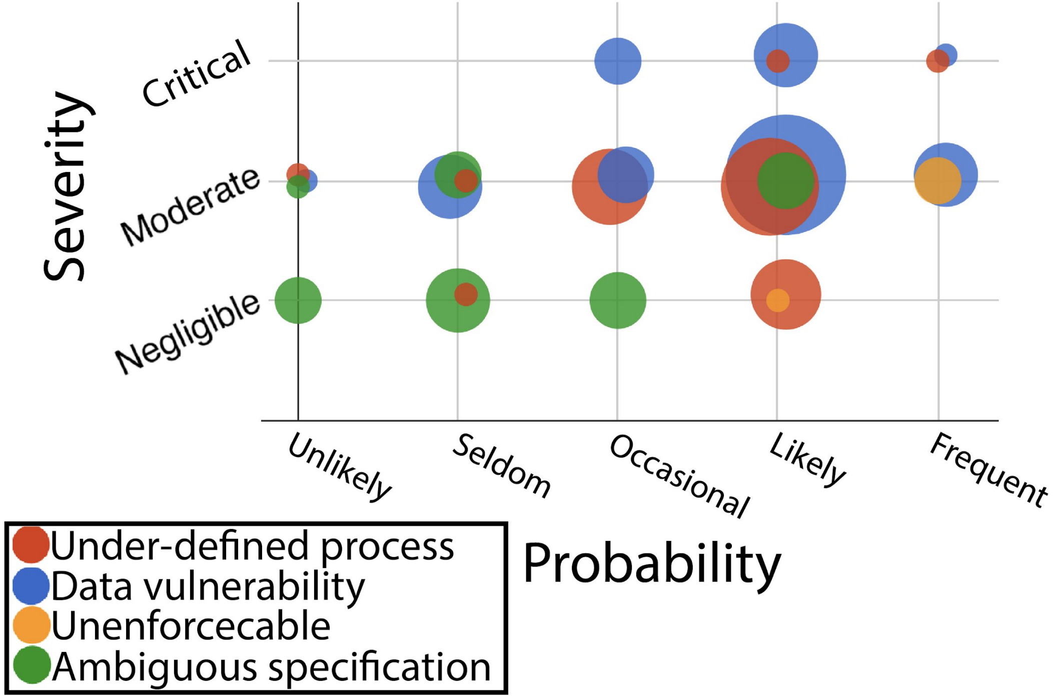
Under-defined process

1 Audit

Six researchers conducting line-by-line audit of three standards



Risk Estimates for IRS Compliance Standard

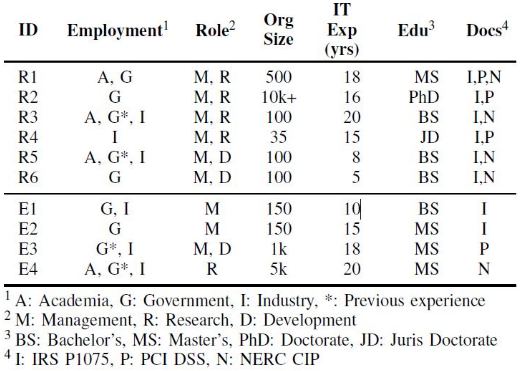


LASER Talking Points, Pt 1

- Cold calling the experts!
    - **Friends/past contacts**
    - **Industry experts met a previous conferences**
- Interrater reliability
- Codebook development

LASER Talking Points

- Interrater reliability
  - **How to get results when people are in 4 different time zones, and everyone has a full-time job??**
  - **Calculated with Krippendorff's alpha**
- Codebook development



ID	Employment[1]	Role[2]	Org Size	IT Exp (yrs)	Edu[3]	Docs[4]
R1	A, G	M, R	500	18	MS	I,P,N
R2	G	M, R	10k+	16	PhD	I,P
R3	A, G*, I	M, R	100	20	BS	I,N
R4	I	M, R	35	15	JD	I,P
R5	A, G*, I	M, D	100	8	BS	I,N
R6	G	M, D	100	5	BS	I,N
E1	G, I	M	150	10	BS	I
E2	G	M	150	15	MS	I
E3	G*, I	M, D	1k	18	MS	P
E4	A, G*, I	R	5k	20	MS	N

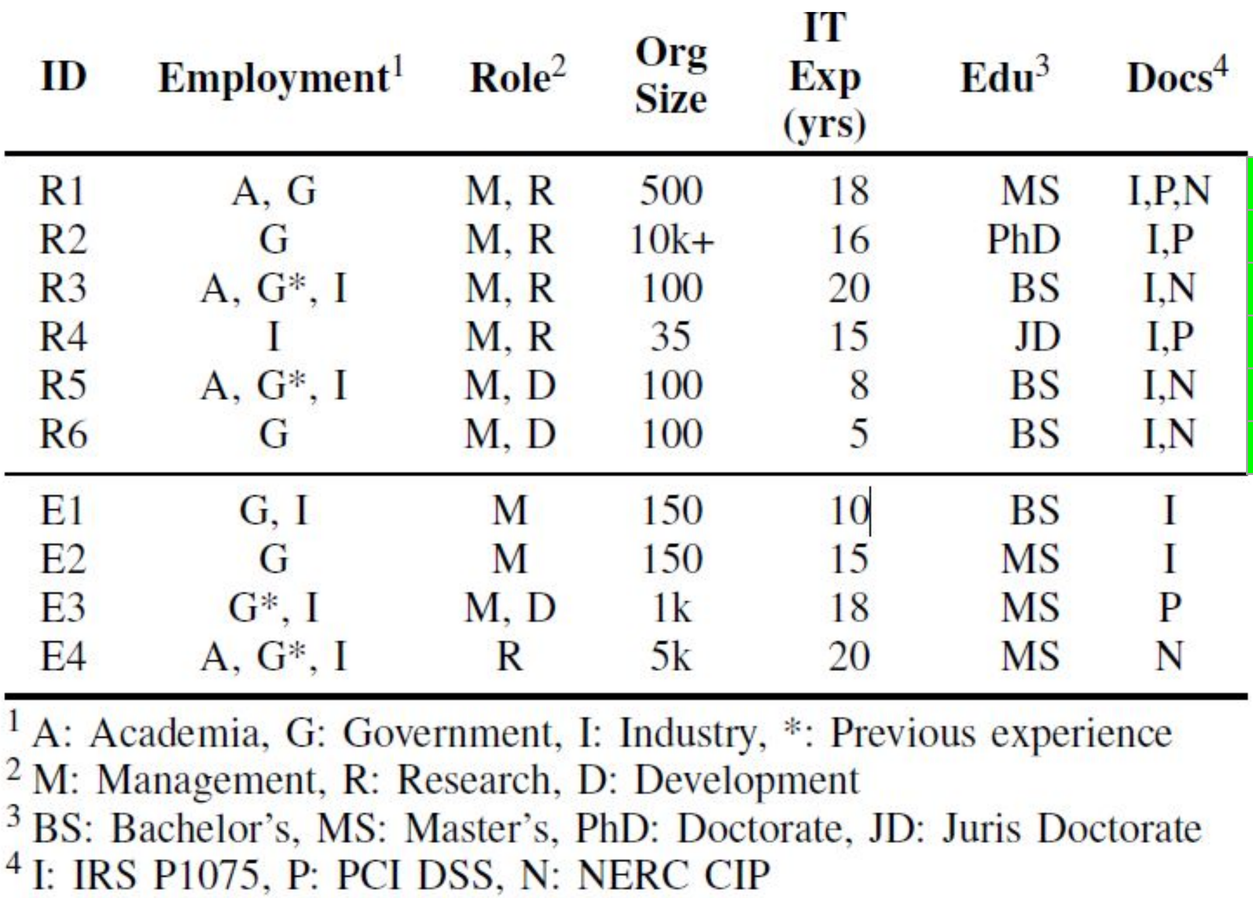
[1] A: Academia, G: Government, I: Industry, *: Previous experience

[2] M: Management, R: Research, D: Development

[3] BS: Bachelor's, MS: Master's, PhD: Doctorate, JD: Juris Doctorate

[4] I: IRS P1075, P: PCI DSS, N: NERC CIP

LASER Talking Points



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R5	A, G*, I	M, D	100	8	BS	I,N	🟩		🟪
R6	G	M, D	100	5	BS	I,N	🟩		🟪
E1	G, I	M	150	10	BS	I			
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LASER Talking Points

- Codebook development
  - **Determine root cause**
  - **Do it iteratively until you have agreement**
  - **Define terms upfront!!!**

2 **Expert evaluations**

Four compliance experts evaluate researchers’ findings

CISOs and authors

Challenge assumptions

Validate findings

Provide context

LASER Talking Points, Pt 2

2 **Expert evaluations**

Four compliance experts evaluate researchers' findings

- **Confirmed real-world misuse of compliance standards**
- **“White box” pentest**

3 Disclosure

Various approaches to responsibly disclose findings to organizations

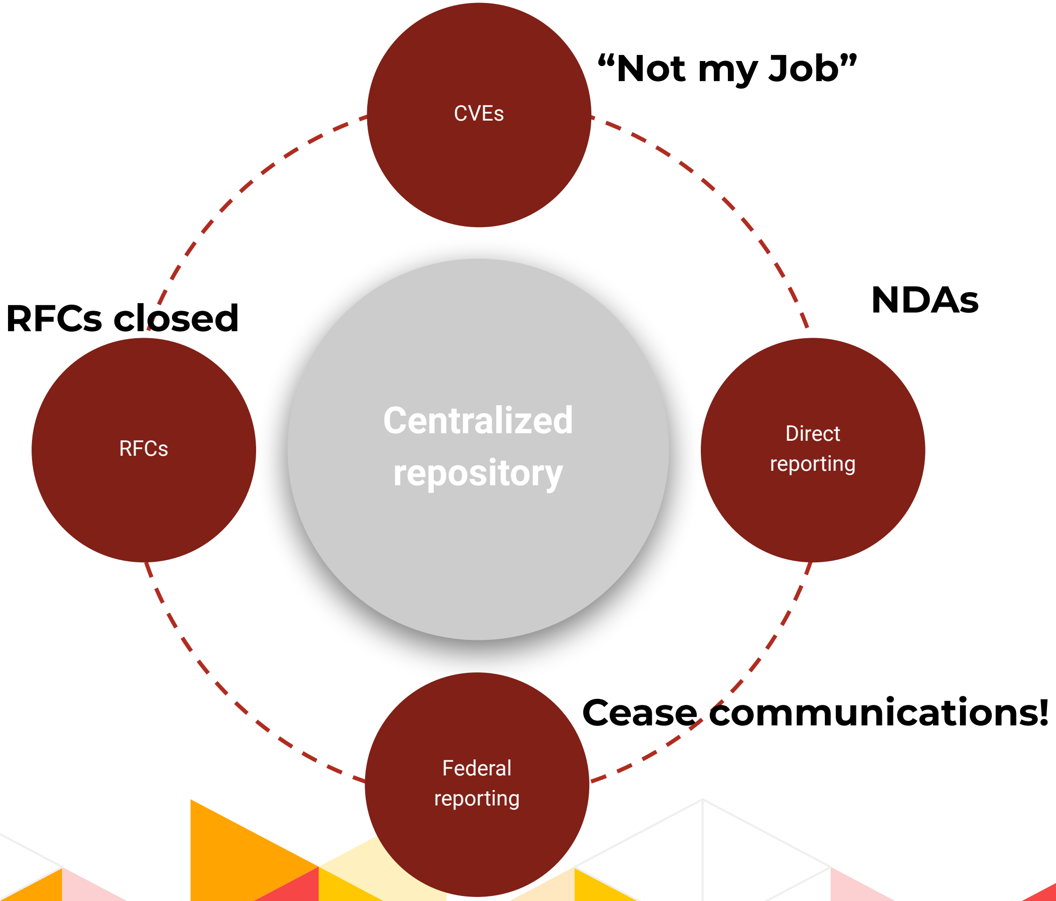
Enforcers

Creators

Aggregators

3 **Disclosure**

Various approaches to responsibly disclose findings to organizations



What did you try that did not succeed before getting to the results you presented?

8 months to finish first part,

8 months of NDA negotiations, and

Several follow-on interviews to clarify survey data

Wrap-up

- Wrap up discussion
- Next steps?
- Plans for post-workshop paper?

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