Pulling 32-bit `time_t` Asbestos Out of the Open Source Ecosystem

Room: H.3242

Time: 15:00–15:55

Group Facilitator: Trey Darley

But We Were Doing Asbestos We Could Back Then...

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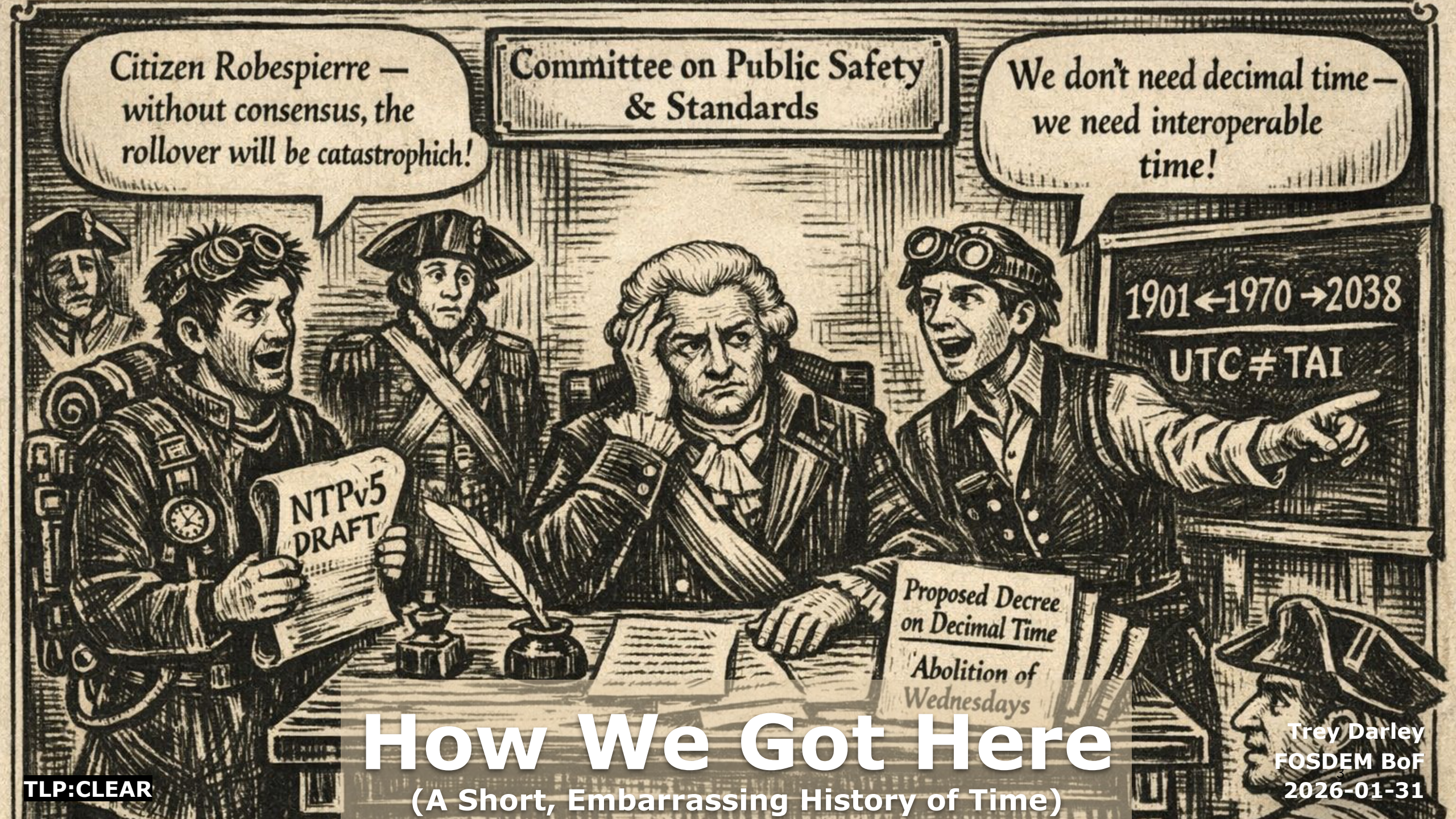

How We Got Here

(A Short, Embarrassing History of Time)

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The Contamination Frame

- Not legacy — still shipping
- `time_t` assumptions baked into: libc, protocols, serialization formats, firmware, toolchains
- You can't grep your way out
- Asbestos in the walls of the open source ecosystem

A Very Brief History of Internet Time

1970s–1980s: Unix time

32-bit signed seconds since 1970

→ 19 JAN 2038

1980s: Network Time Protocol (NTP)

32-bit unsigned seconds since 1900

→ rollover: 7 Feb 2036

Today

Both still drive production systems!

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What Testing Actually Shows

- **Forward-time testing on x86_64:** dozens of failures
- Only one would be improved by a glibc change → **the rest live in application logic, protocols, and build systems**†
- **Real bugs already surfaced:** MariaDB, memcached, libarchive, libzypp, FreePascal

Special thanks to Bernhard M. Wiedemann, openSUSE

†Alpine/musl succeeded because they had no legacy binary ABI constraints.

When Testing Becomes the Problem

- **Forward-time testing breaks TLS by design**
- Certificates expire before deeper failures surface
- **“Just disable TLS” is not a realistic test strategy**
- **We lack a scalable, trusted way to test the future†**

†We need a broader testing discussion with ICANN.

Let's Talk About Vibe Coding!

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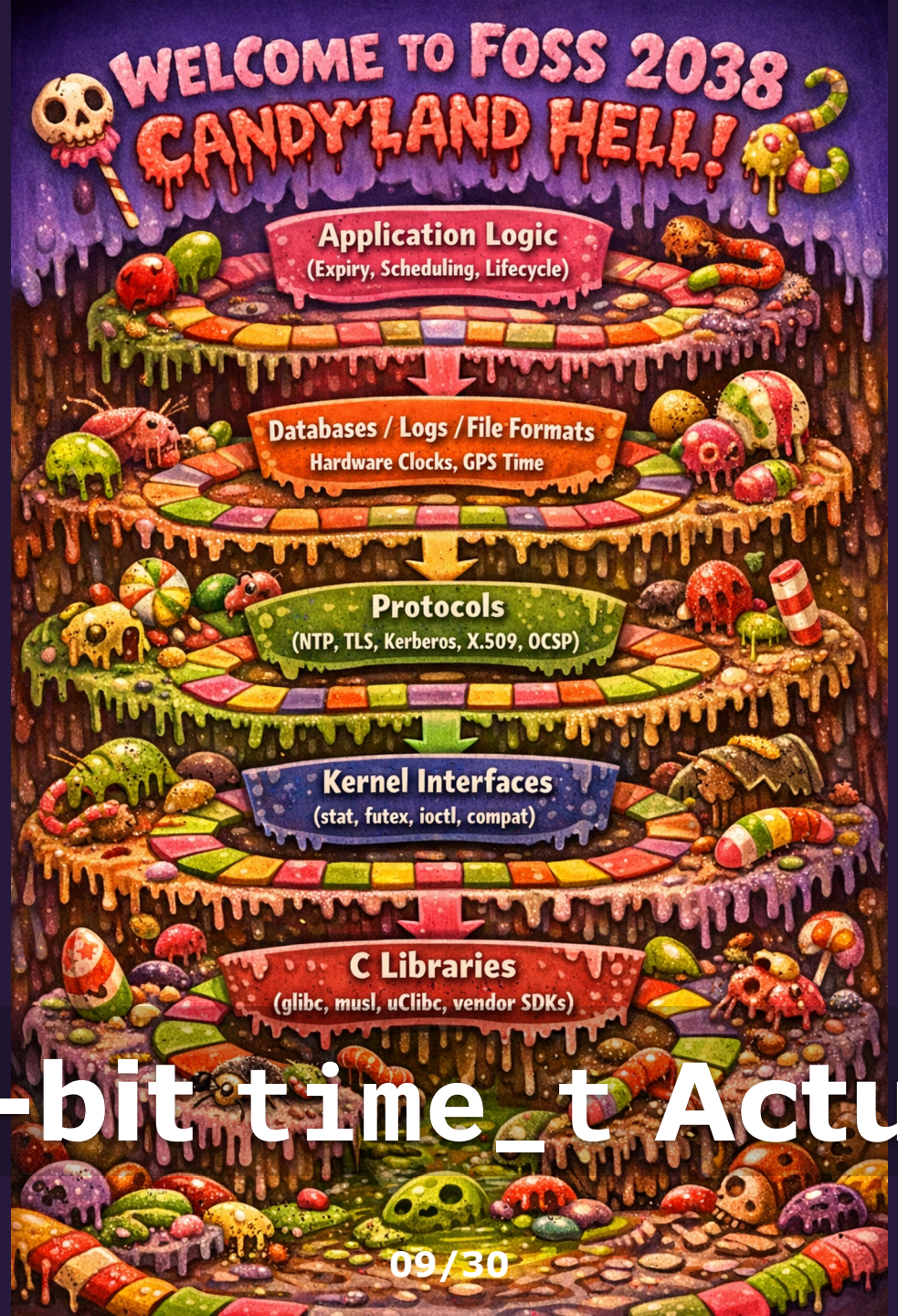

Where 32-bit time_t Actually Lives

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The 12-Week Scenario

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BoF Working Norms

- One mic
- No solutions without concrete examples
- Step up / step back
- I may park threads to protect time

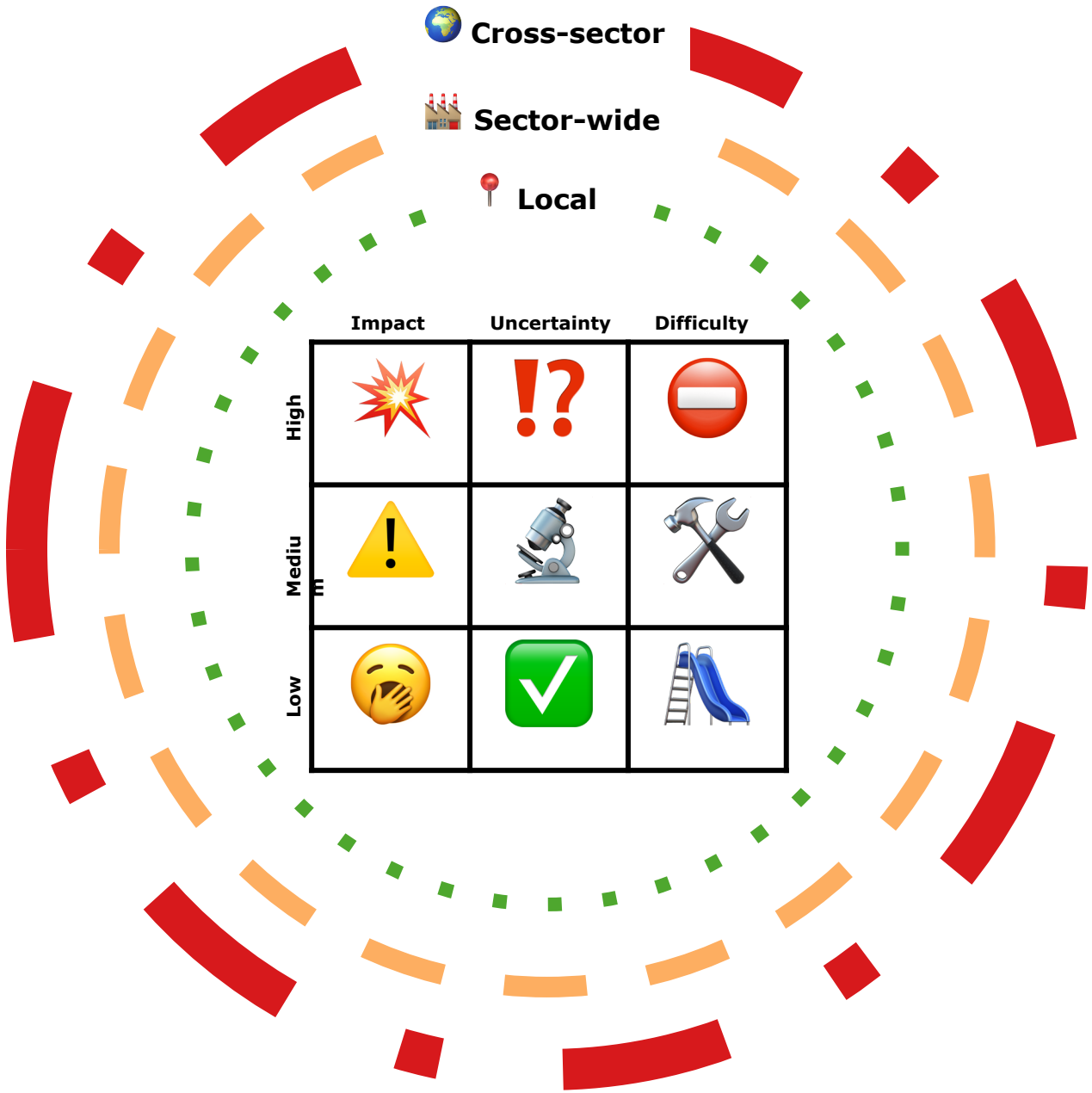
Seed Questions

- Where do you actually start on Monday morning?
- Who has tried to enumerate `time_t` exposure — and what surprised you?
- Pick one system you know well. Where would you start? What helps with testing? What's missing?

Follow-Up Prompts

- **Discussion stuck too deep** → How far down the dependency tree?
- **Discussion stuck too shallow** → Where does time leak into protocols?
- **Discussion stuck in code** → What about 20-year embedded lifetimes?
- **Discussion stuck in theory** → Where do you hit walls?
- **Discussion stuck in pessimism** → What tooling exists? What doesn't?
- **Discussion stuck in closure** → What would you need to know to be confident in that answer?
- **One voice dominating** → Anyone from a different context — embedded, distro, infrastructure?
- **Energy flagging** → Let's make it concrete: pick one system. Where would you start Monday morning?

The 2038-Class Risk Exposure Matrix



GitHub Badge Format

High Impact /
High Uncertainty /
High Difficulty /
Cross-sector Blast Radius

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Let's Talk About Kerberos!

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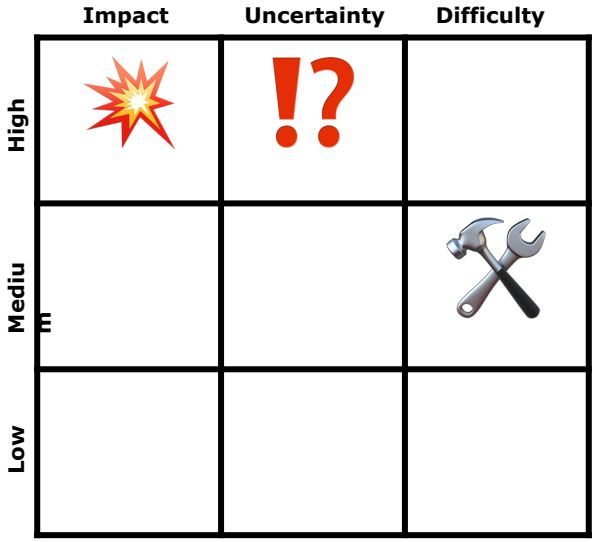
Kerberos Assessment

🌍 Cross-sector

One possible assessment…



GitHub Badge Format

💥⁉️🛠️🌍

High Impact /
High Uncertainty /
Medium Difficulty /
Cross-sector Blast Radius

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Let's Talk About glibc!

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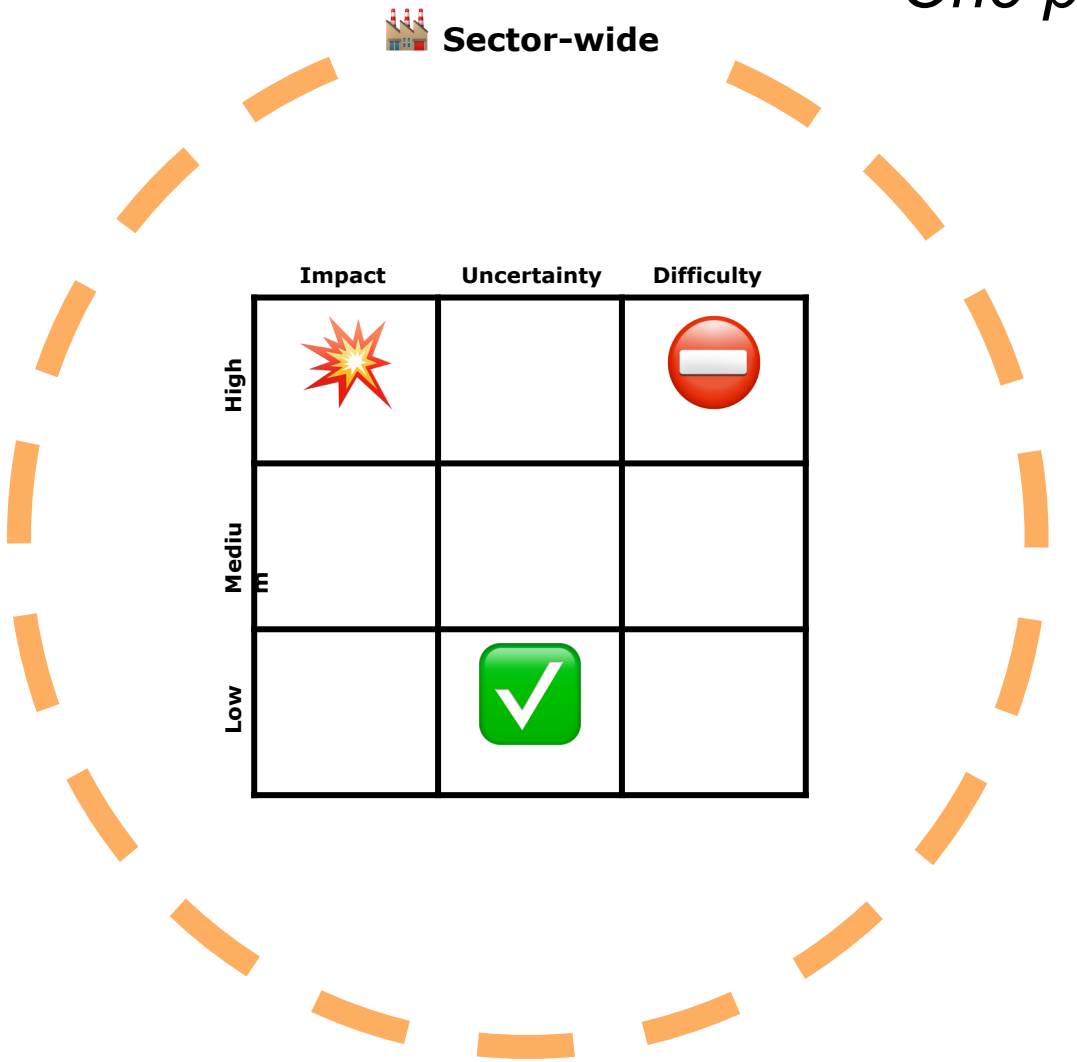
glibc Assessment

One possible assessment…



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High Impact /
Low Uncertainty /
High Difficulty /
Sector-wide Blast Radius

Let's Talk About Satellites!

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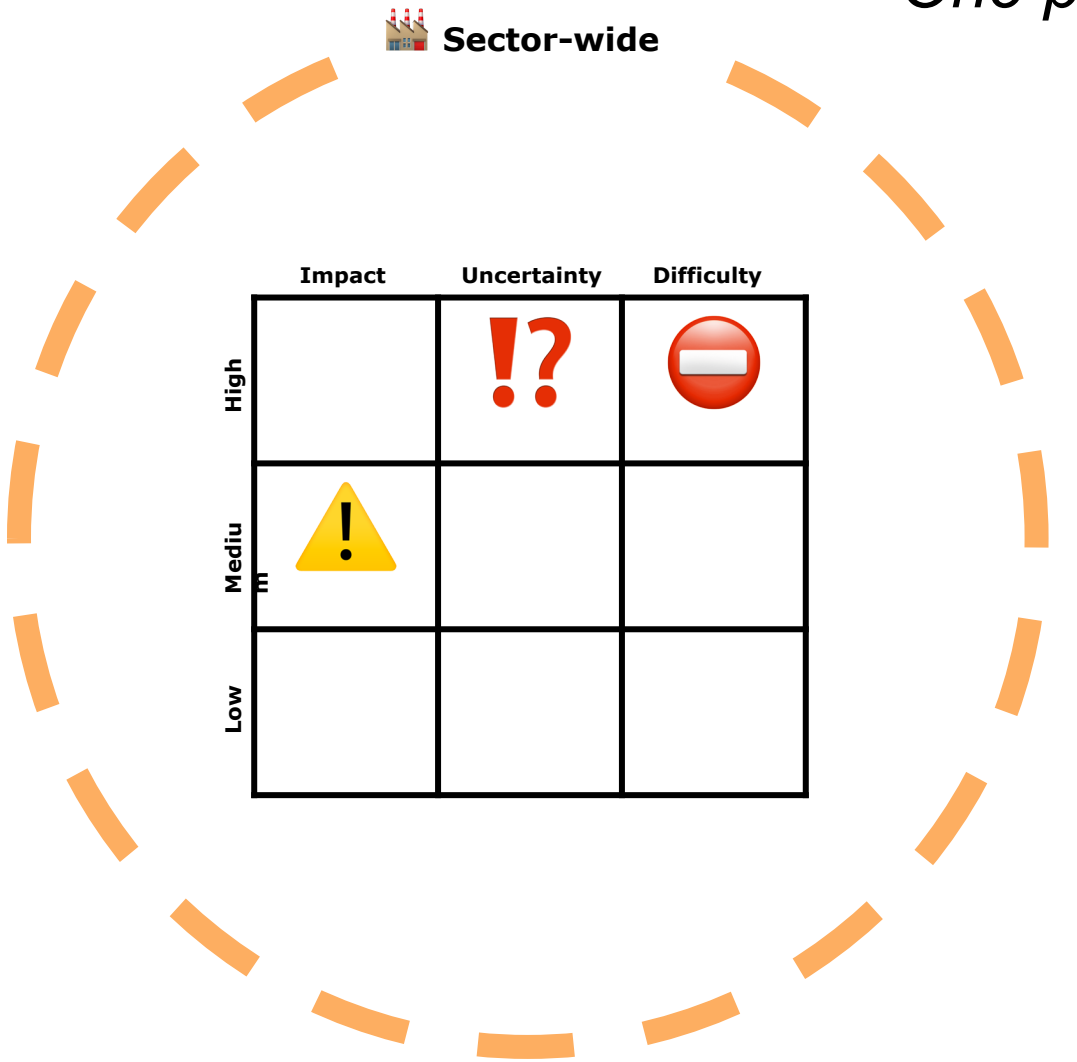
Satellite Assessment

One possible assessment…



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High Impact /
High Uncertainty /
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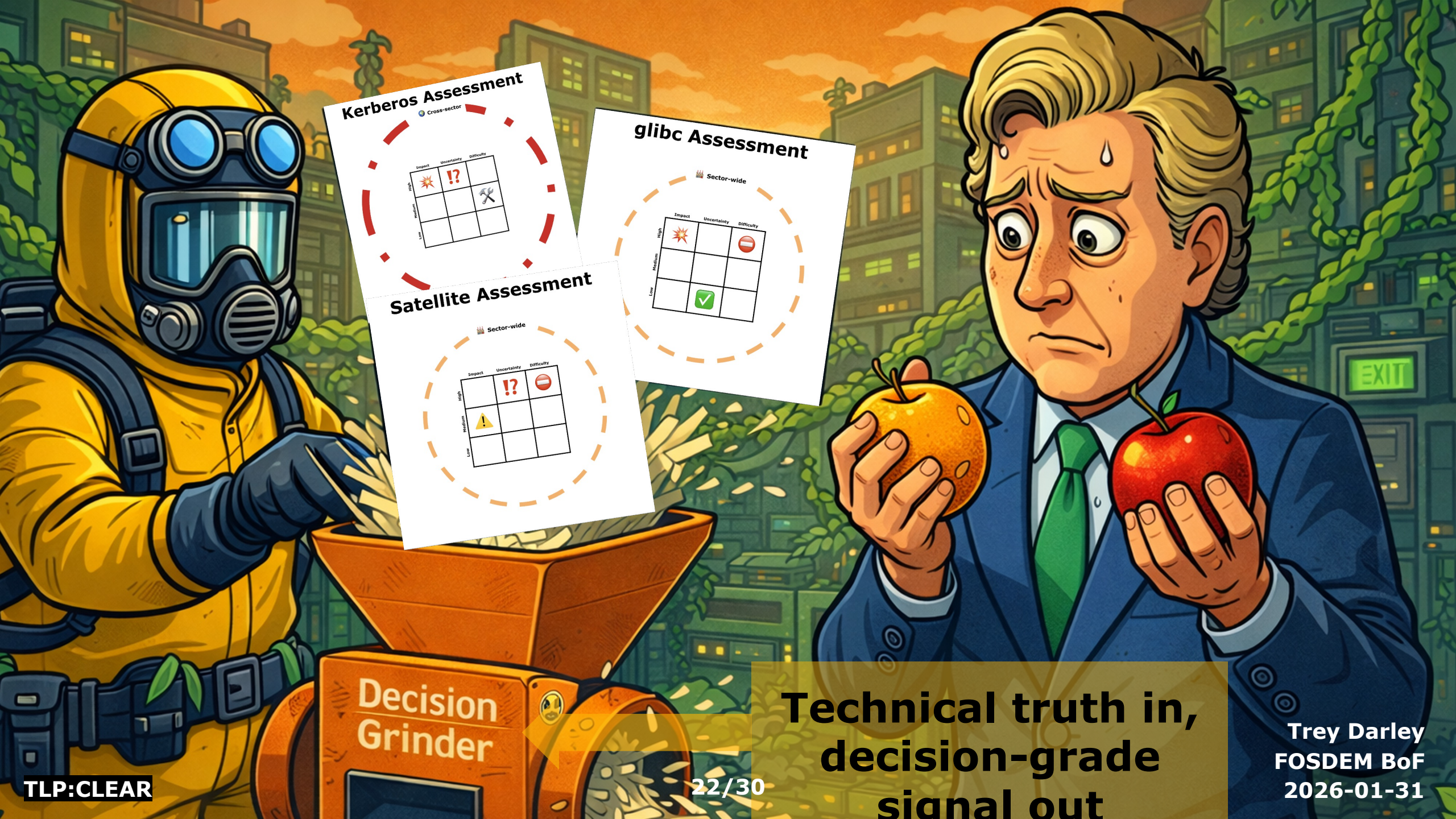
The Ascent


Mind the Gap
DEBUG JUICE
ACTEMP FIX
CAUTION
LOOSE WIRES
EXIT



Technical truth in, decision-grade signal out

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What Can a Minister Actually Do?

Sufficient levers that preserve civil liberties

	Proportionate Levers	What This Is NOT
Transparency	📋 Disclosure Requirements	❌ Mass surveillance
	🏷️ Consumer Labeling	❌ Codebase inspection
Market shaping	🛒 Public Procurement standards	❌ Backdoors
	🛡️ Liability Safe Harbors	❌ Criminal penalties for devs
Stewardship	💰 Funding the Commons	❌ Telling citizens what to run
	🤝 Standards & Coordination	
	🏗️ Code & Build Escrow for Publicly-Funded Systems	

Minister's Five Key Questions

Complexity collapses upward into five questions:

1. Does this stay in my portfolio — or escalate? **Who else needs to know?**
2. **How much time** do I really have?
3. What's the cost of **action** vs **inaction**?
4. Can we fix this **alone?** Or is **coordination required?**
5. What do we tell **the public?**

The key is how to answer these — responsibly

How Do We Roll This Up?

- How do you aggregate across systems?
- What do you do with low-confidence findings?
- How do you meaningfully communicate blast radius to non-technical decision-makers?
- What information do you still need that you can't get alone?
- What would make your current posture defensible?

Follow-Up Prompts

- **Stuck on aggregation** → *Do you count red-zone items? Report worst case? Build a heat map?*
- **Stuck on uncertainty** → *Do low-confidence findings go in the report or not? How do you flag them?*
- **Too technical** → *How do you explain blast radius to someone who doesn't think in dependency graphs?*
- **Too abstract** → *Give me a concrete example — what would you actually write in that one-pager?*
- **Missing coordination** → *What information do you need that you can't get from your own organization?*
- **Premature closure** → *What would make that answer defensible if a journalist called tomorrow?*
- **One voice dominating** → *Who's seeing this differently?*
- **Energy flagging** → *"Let's make it concrete: you've got 60 seconds with the minister in an elevator. What do you say?"*

What Did We Surface?

- **Tooling gaps**
- **Coordination gaps**
- **Hot zones**
- **Open questions**
- ***What did I miss?***

The Coordination Question

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This Is A Long-Horizon Problem...

Let's Keep This Going.

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-  **Email me: hello@propertools.be**
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