# CREASE

## **C**ausal **RE**asoning and **A**ttestation for **S**cientific **E**xperimentation

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KNIT9 – Sep 24, 2024

**CNS-2346499**

# CREASE

- Relevance to FABRIC:
  **debuggability**,
  **diagnosticability** and
  **reproducibility** of Software-Defined Networking (SDN) experiments.

- You can already use it on FABRIC!
  This talk will provide you with more information.

# CREASE

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Why especially needed?
Software ~= Bugs

# Kernighan's Lever

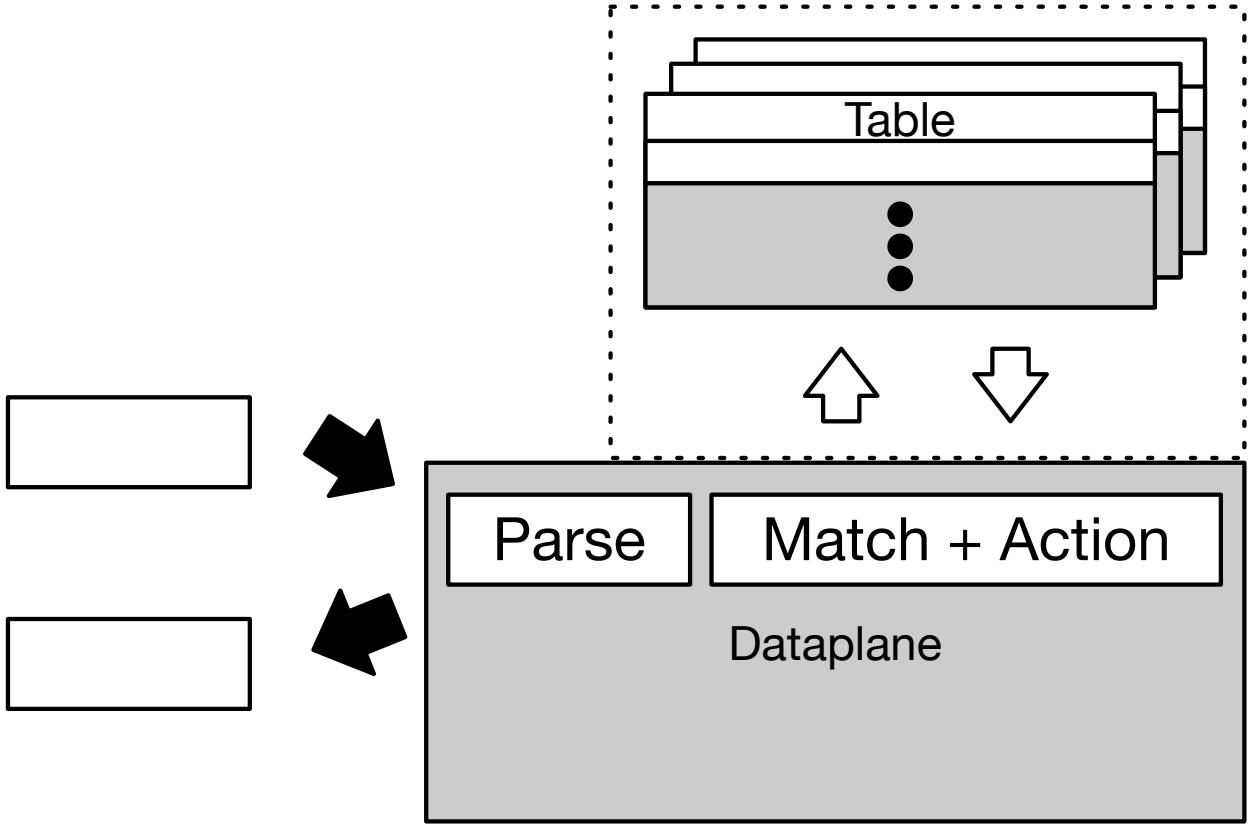
"Everyone knows that debugging is twice as hard as writing a program in the first place.

So if you're as clever as you can be when you write it, how will you ever debug it?"

# Lamport's Spooky Action at a Distance:

"A distributed system is one in which the failure of a computer you didn't even know existed can render your own computer unusable."

# How CREASE works



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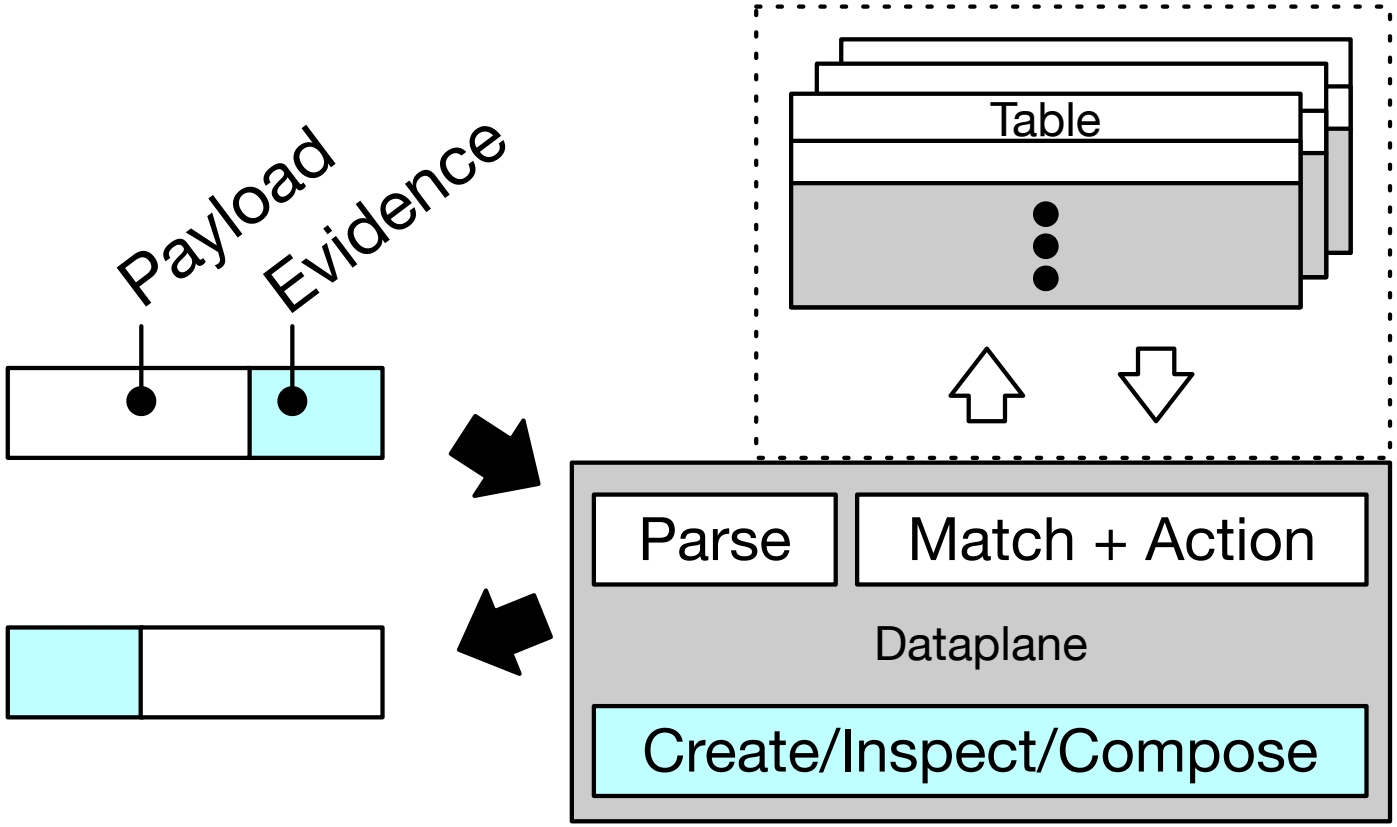

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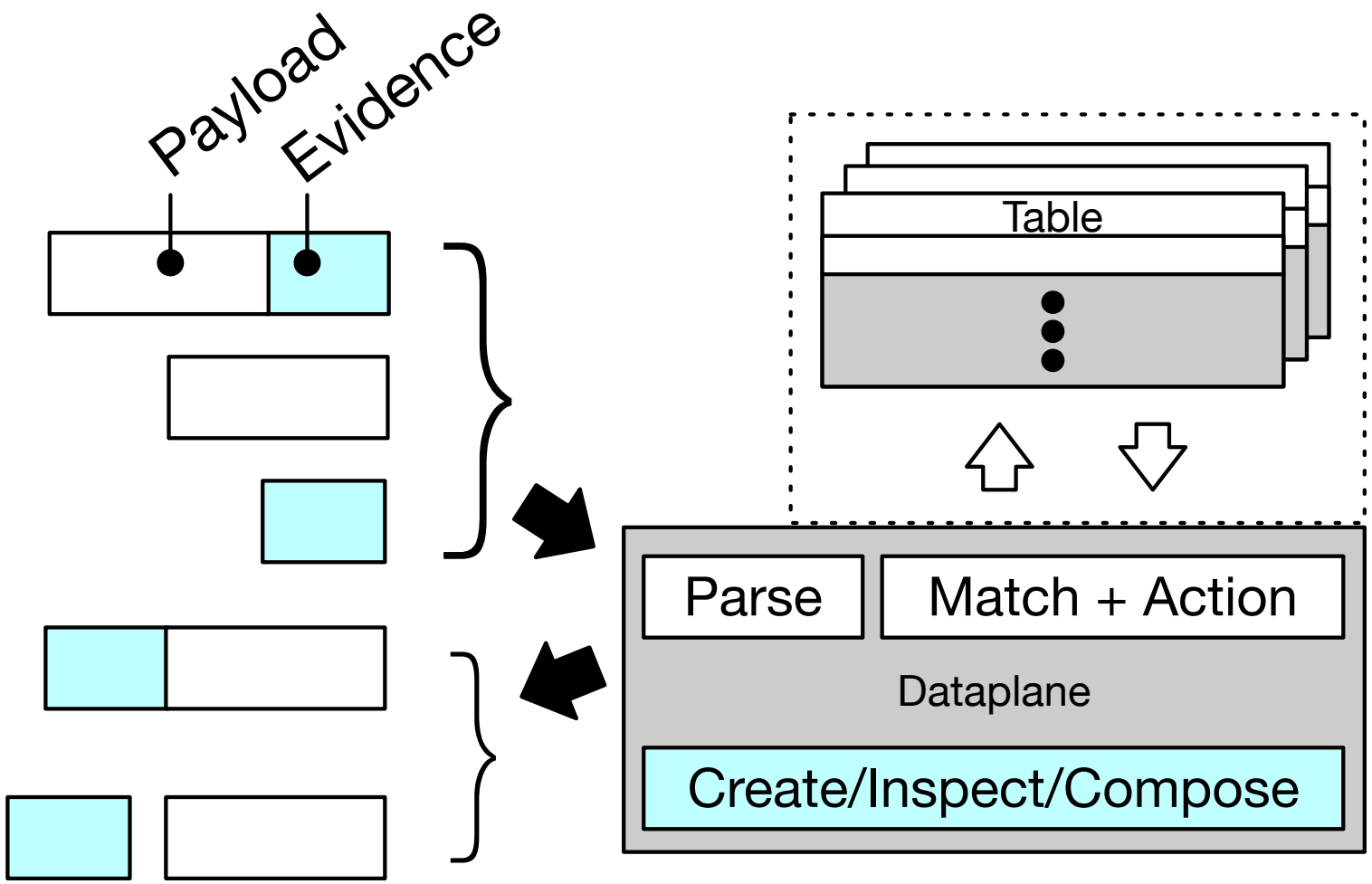
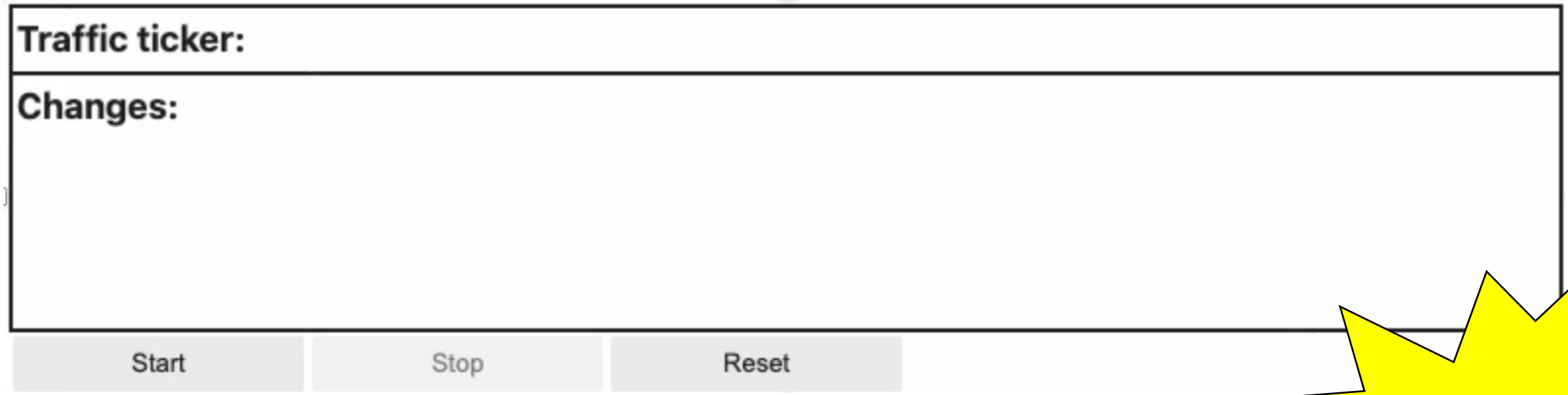


# CREASE Background

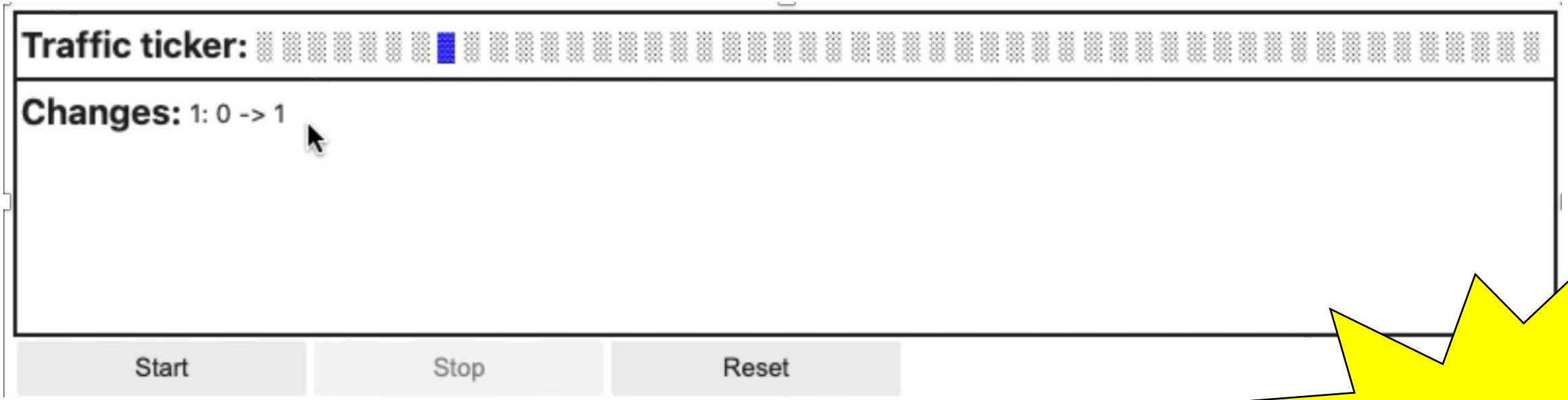
- Origins in security
- Remote Attestation and Provenance
- Motivations:
  Transparency and
  Accountability
- How to adapt these ideas in CREASE?

# See the full Webinar!




Webinar materials released!

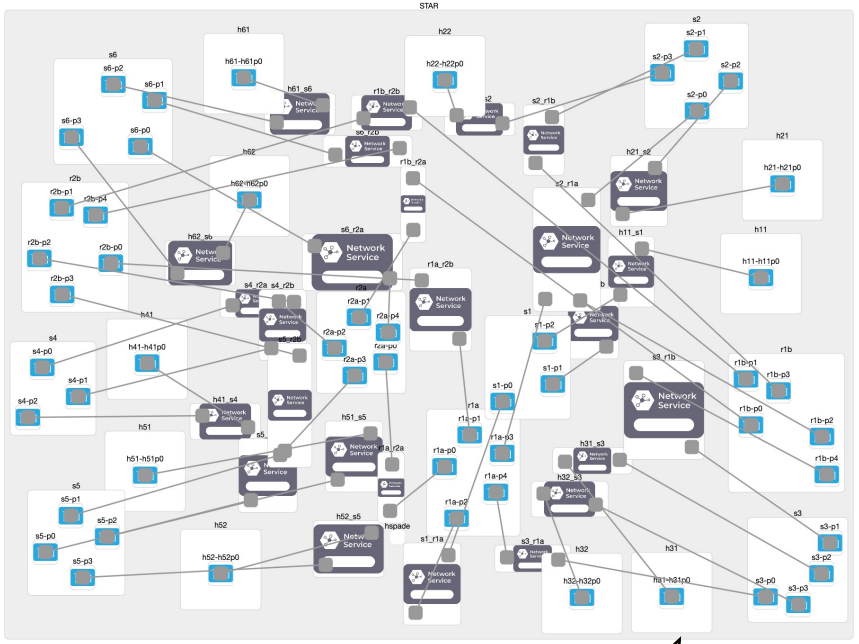
# See the full Webinar!



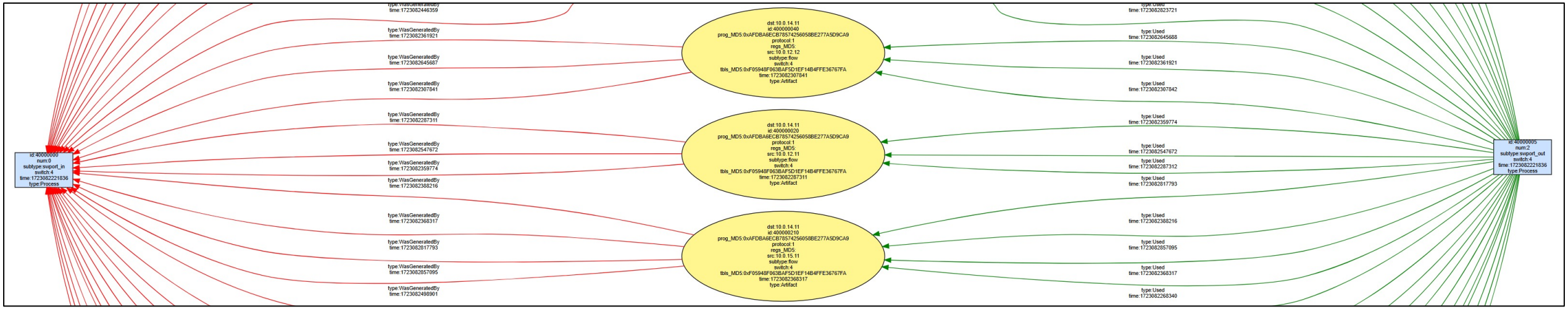

Webinar materials released!

# What's ahead?

- Provenance tracking (see **Alexander's demo**)
- Measurements of Overhead (see **Bjoern's demo**) (Thanks to MFlib)
- Single-node vs Multi-node behavior
- Usage examples!
- Extended research outputs
- Interoperation with Patchwork (see **Nishanth's talk**) Element <-> Dataplane visibility



# Provenance tracking (Alexander's demo)

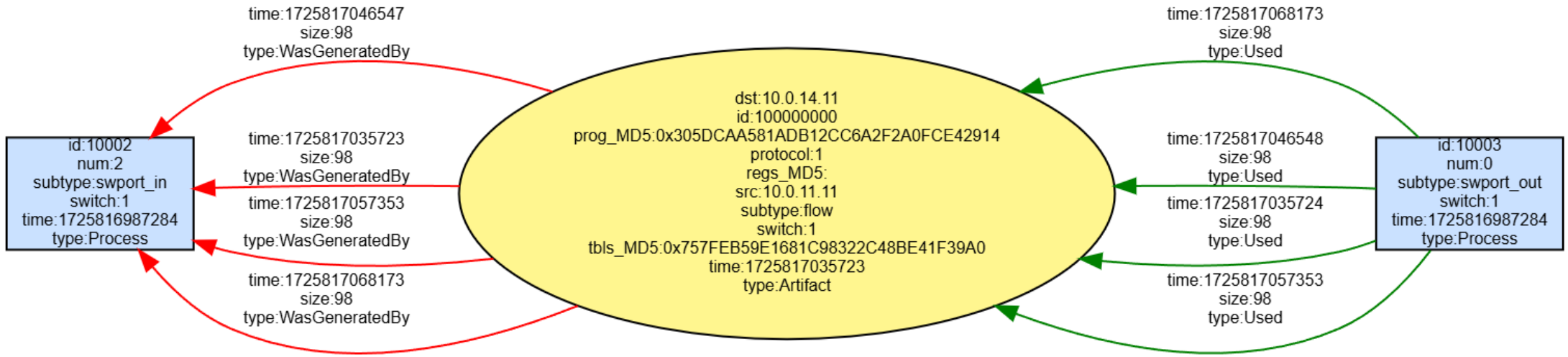



Dhiraj Saharia
(Georgetown)

Ben Ujcich
(Georgetown)

Ashish Gehani
(SRI Intl)

Vinod Yegneswaran
(SRI Intl)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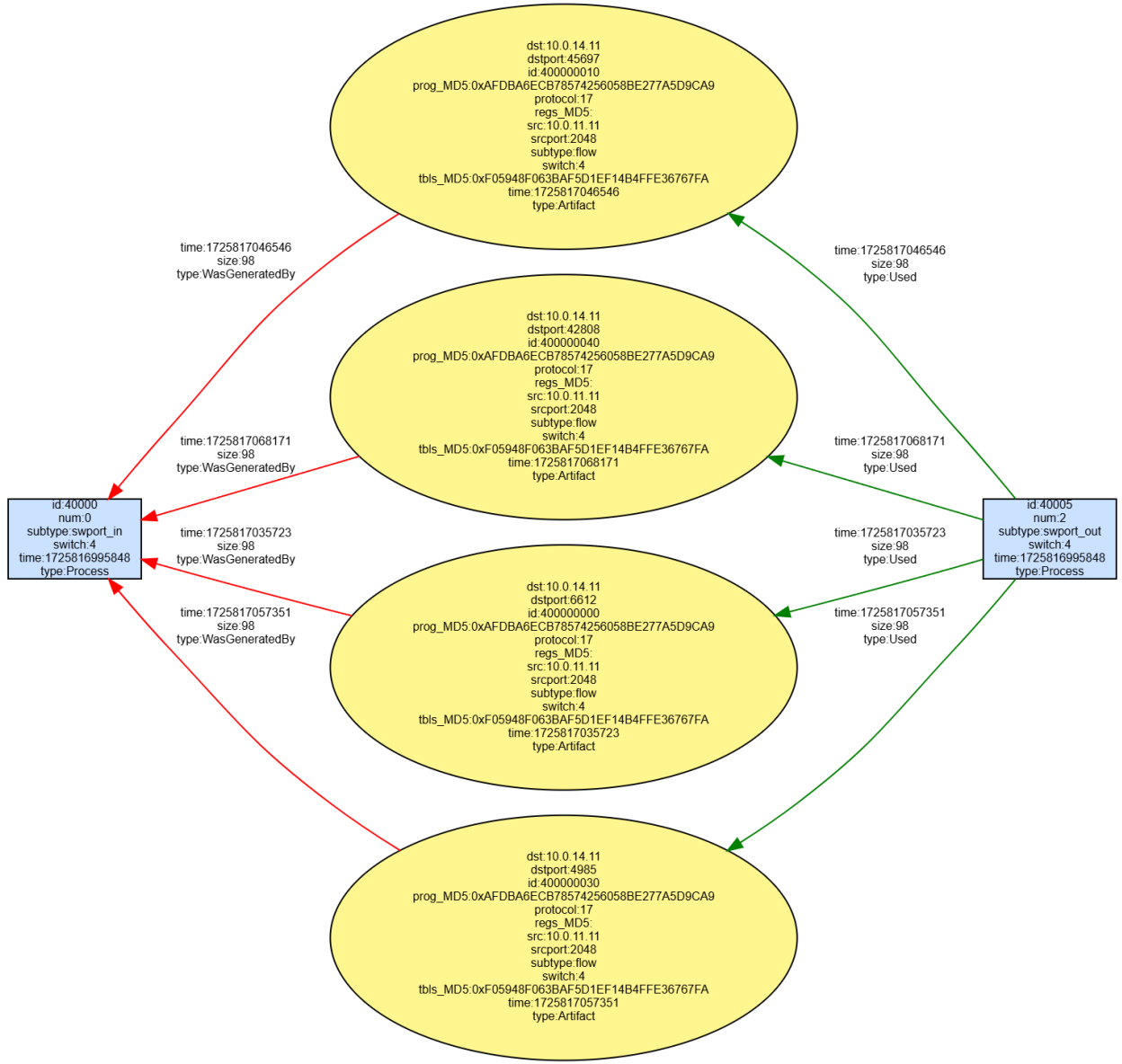
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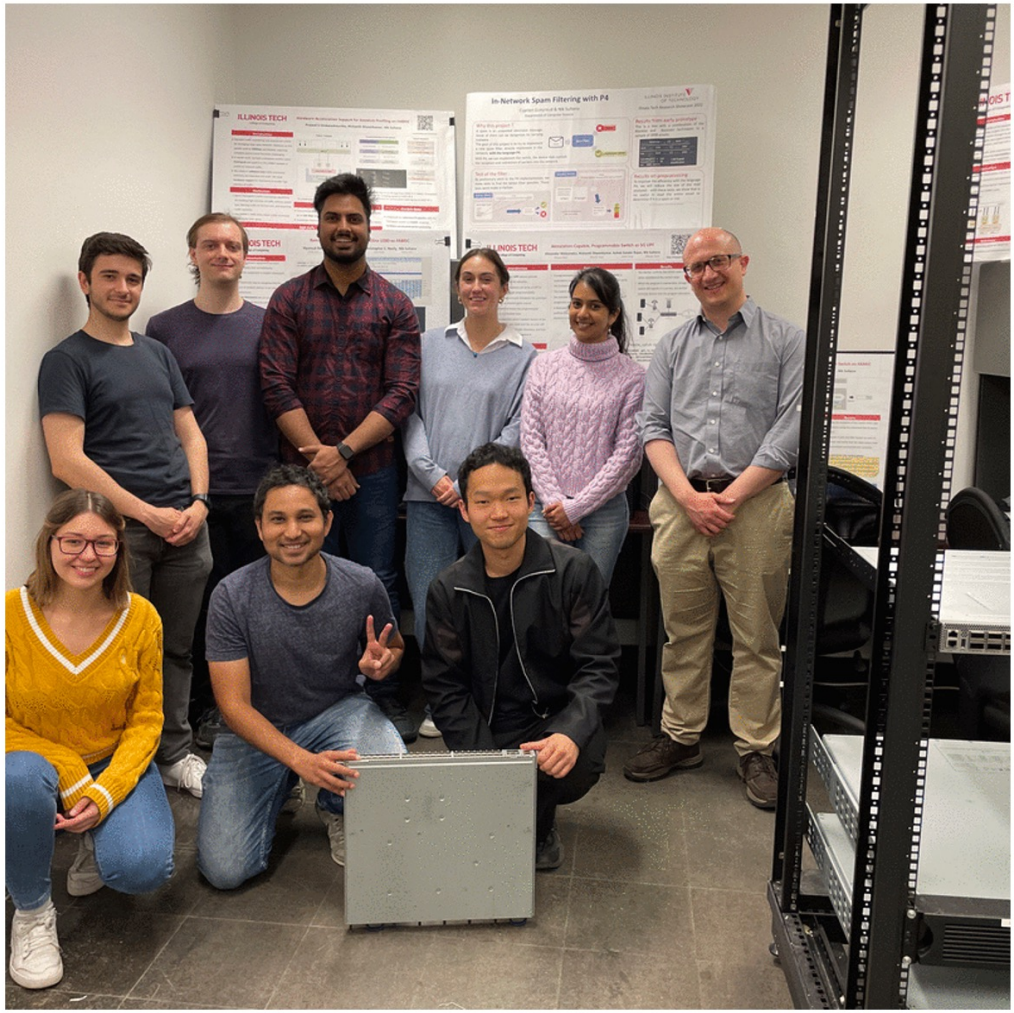
# Thank you


- Researchers building CREASE + Remote Attestation at **Illinois Tech** (Hyunsuk Bang, Bjoern Sagstad, Nishanth Shyamkumar, Alexander Wolosewicz) at **Georgetown** (Dhiraj Saharia and Ben Ujcich) and **SRI** (Ashish Gehani, Vinod Yegneswaran).
- Komal Thareja, Yongwook Song, Charles Carpenter, Mert Cevik, and many others at in the **FABRIC community**!
- Collaborators including Deborah Shands (SRI), Yatish Kumar (ESnet), Chris Neely (AMD), Ashok Sunder Rajan (Intel) and many others at ESnet, CILogon, and in the P4 community!
- NSF: CNS-2346499.

# CREASE

- Website: http://crease.cs.iit.edu
  First beta released – feedback welcome!
  **See demos from our team.**
- Join our mailing list to stay updated – see the CREASE website.
- Take our survey!
  Reach out to me if you use/research SDN (and P4) on FABRIC.
- Want to help build this? PhD topics in this area.