THE USERS SHOULD BE ASSURED THAT THEIR DATA ARE ROUTED EFFICIENTLY IN TERMS OF QOS THROUGH A TRUSTED COMMUNICATION PATH.
IN-NETWORK CONTROL FOR TRUSTED FLOW STEERING

NETWORK ELEMENT TRUST LEVEL

- TRUSTED?
- NEVER UPDATED
- WHO?
IN-NETWORK CONTROL FOR TRUSTED FLOW STEERING

NETWORK ELEMENT TRUST LEVEL

- Interactions with the other network entities
- Location
- Firmware version
- Level of hardware hardening
- Etc.
IN-NETWORK CONTROL FOR TRUSTED FLOW STEERING

PATH TRUST LEVEL

PATH TRUST LEVEL = 5

5
3
4
IN-NETWORK CONTROL FOR TRUSTED FLOW STEERING

PATH TRUST LEVEL
IN-NETWORK CONTROL FOR TRUSTED FLOW STEERING

PATH TRUST LEVEL

PATH TRUST LEVEL = 3

LOWEST = 3
IN-NETWORK CONTROL FOR TRUSTED FLOW STEERING

IN-BAND NETWORK TELEMETRY

- **Packet Header**
  - INT Header
  - Metadata-1
- **Data**
  - Insert INT Header and Metadata-1

- **Packet Header**
  - INT Header
  - Metadata-1
  - Metadata-2
- **Data**
  - Insert Metadata-2

- **Packet Header**
  - INT Header
  - Metadata-1
  - Metadata-2
  - Metadata-3
- **Data**
  - Insert Metadata-3 and extract INT message

- **INT Source Node**
- **INT Transit Hop**
- **INT Sink Node**
- **Telemetry Server**

- **User-1**
- **User-2**

- **Business Packet**
- **Packet Header**
  - Data
IN-NETWORK CONTROL FOR TRUSTED FLOW STEERING

DEMO TOPOLOGY
IN-NETWORK CONTROL FOR TRUSTED FLOW STEERING

DEMO TOPOLOGY

- 6 × P4 Software Switches
- 1 × Optical Connection

Telemetry Collector

6 × P4 Software Switches

1 × Optical Connection
IN-NETWORK CONTROL FOR TRUSTED FLOW STEERING

TELEMETRY COLLECTOR

Telemetry Collector

Telemetry Server

P4 Collector
IN-NETWORK CONTROL FOR TRUSTED FLOW STEERING

DEMONSTRATION

[Diagram of network control for trusted flow steering, showing Host 1 connected to s1, s2, and s5 via P4 switches, P4 Collector, Telemetry Server, P4 Collector, s3, s4, s6, and Host 2 with an optical fiber connection between s5 and s6.]
CONCLUSION

- Significantly reduces the reaction time by the infrastructure elements
- Improves the accuracy
- Promotes Transparency and Accountability