Path Validation Side Meeting

IETF 118

James bond is making a phone call from overseas
He really wants a secured line.

Is this line secure enough?

I have a top secret to tell you, but someone might be listening. I would prefer a dedicated line!

Voice over IP network

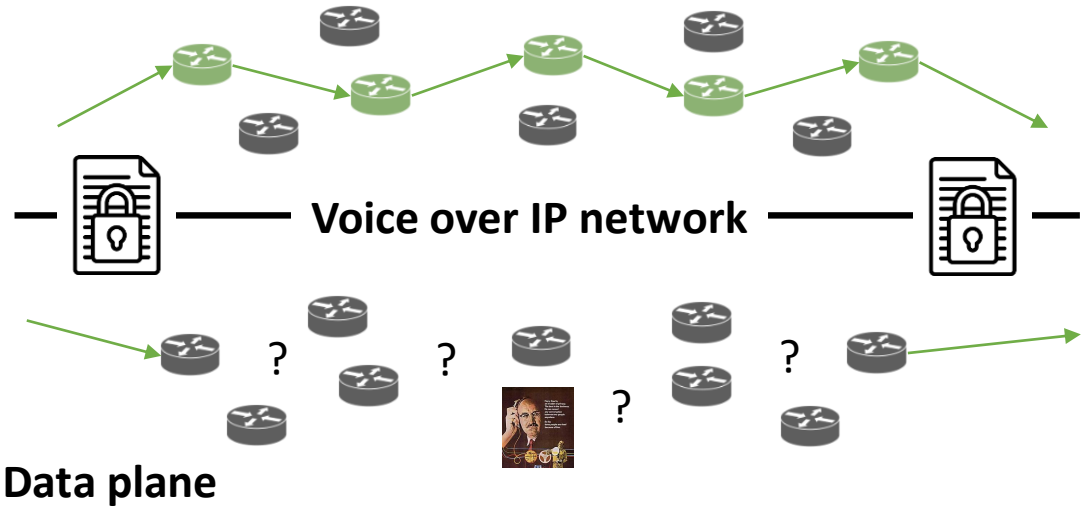
I can do some cryptanalysis...

Don't worry bond, all your traffic are *encrypted.*

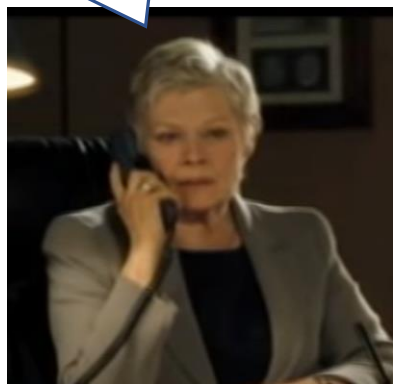
James bond is making a phone call from overseas
He really wants a secured line.

Great… But what do you mean ***should***?

- You need to validate your path, just like validating your claim.
- I heard there's a side meeting in IETF 118 discussing about it…



- Here, I prepared a dedicated line for you
- Your connection ***should*** only transit on top of these trusted routers only.



- It means ***I can only plan these path*** in the control plane.
- But I don't know whether or not the planned path ***was actually taken*** in the data plane!

Before Started

- Can we agree on goals for this meeting?
  - Understand and disambiguate “path validation”.
  - Understand the history, use cases and gaps for path validation
  - Achieve consensus on path validation basic goal, scope and claims.
- Can we agree on non-goals for this meeting?
  - No *deep* dives to a specific protocol or mechanism– only general introduction, comparison and analysis
  - We don’t design anything new
- Trivia
  - IETF Note Well
  - We are being recorded– if you object, please volunteer to take minutes!
  - Minutes link is in our github repo, findable in IETF side meeting page.

Agenda

- Technology introduction, history, disambiguation (5 minutes)
  - Path Validation **Use Cases and Past Experiences**: Telefonica (10 min)
  - Path Validation **Motivation, Use Cases and Solutions**: SCION (15 min)
  - Path Validation **Use Cases**: China Mobile (10 min)
    - The above use cases were compiled in the use case document we hand out.
  - Path Validation **Gap Analysis**: Huawei (15 min)

- QA and Discussions (30 min)
- Wrap up, and next steps (5 min)

Clearing out the terms relates to “path”

- A Vocabulary of Path Properties [RFC9473], a product of panrg

- **Node:** An on-path **physical device** or **virtual function** that processes packets.
- **Link:** A medium or communication facility that connects two or more nodes with each other.
- **Path:** A sequence of adjacent node or link over which a packet can be transmitted, starting and ending with a node.
- **Path Selection:** Node selects a path out of multiple paths to sends flows according to different metrics like performance or security.

Clarifying Concepts

- Path Validation
  - **Interpretation A (Main)**: Validating the planned path is a trusted, authorized path (control plane path, before forwarding).
    - Mostly used in BGP context, referring to BGPSEC and RPKI.
  - **Interpretation B (Minor)**: Validating the packet traversed the planned path in the correct order (data plane path, after forwarding).
    - Which later disambiguates into **Proof-of-Transit.**

- Different IETF drafts interpret Path Validation as **A** only, or **B** only, or both.
- Some academic papers interprets path validation as **B** only.

- We believe **Path Validation = A + B** is the correct understanding.

Intro ends here