From n-gate.com:

Some academics arrive to tell us that (once again) they have Fixed The Internet, and (once again) it runs on top of the current actually-working internet, and (once again) if you sign up you can communicate with as many as twelve other computers.
$ whoami

Mateusz Kowalski

- I deploy stuff that actually works
- The bigger it is, the better it works
- I am not an academic

Kamila Součková

- I identify problems in systems before they eat your time, your product, and your family dog
- I know a bit about a lot of things
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1. **Designing a new Internet**
   - What is wrong with the Internet today?
   - SCION: A clean-slate redesign

2. **How can you use it today?**
   - Deployment
   - Source code and API
   - Anapaya production network, SCIONLab research network
1. Designing a new Internet
THE INFRASTRUCTURE MESS CAUSING COUNTLESS INTERNET OUTAGES
“Throw and Pray” vs Smart End Host
“Throw and Pray” vs Smart End Host
route control, failure isolation, and explicit trust information for end-to-end communication
Path control in SCION

- end host selects path (from given options: != source routing)
- routers just follow the instructions
- ISP policies enforced (user cannot “invent” paths)
Isolation Domains (ISDs)

- an ISD is connected, but **sovereign**
- ISD independently chooses policies
- trust + routing in an ISD are independent
SCION goodies

• Scalability
  ○ routers are stateless
  ○ hierarchical routing

• Native multipath

• Fault tolerance
  ○ control plane: the usual
  ○ + "DIY": if a path stops working, just switch to another one ⇒ instant
I TESTED MY DEMO
JUST BEFORE PRESENTATION
2. Join the hype train
Anapaya Production Network

join at
www.anapaya.net
SCIONLab Research Network

join at www.scionlab.org
“How can I run it?”

- reference SCION implementation can run on any server
- SCION-IP Gateway enables IP-based applications to transparently use SCION
- SCION over IP enables mixed networks
```
import scion

scion.init()
paths = scion.get_paths(my_destination)
print(f'Got {len(paths)} paths')
my_path = my_choose_path(paths)  # implement whatever you need
with scion.connect(my_destination, my_path) as s:
    s.write(b'Hello SCION!')
```

* Python API not final yet; contact us to get an early version
What can you do with it?

We can’t wait to see:

● interesting use-cases for path control
● efficient use of multipath
● using path awareness for better network utilisation
● implications for security
● ISP issues: traffic engineering, path policies...
● ...
DEMO
www.scionlab.org
Resources

- https://www.scion-architecture.net
- https://www.scionlab.org
- https://www.anapaya.net
- https://github.com/scionproto/scion
- https://github.com/netsec-ethz/scion-apps
Say hi!

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