

# **Modern Blockchains and Next- Generation Internet Architectures: Opportunities and Synergies**

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# A brief history of Mysten Labs and Sui

SEP '21

Founding of  
Mysten Labs

MAY '23

Launch of the  
Sui mainnet

JUL '23

65 million  
transaction blocks  
in a single day

MAY '24

1 year of  
Sui mainnet with  
zero downtime

**Vision:**  
Make Sui the  
foundation of web3

- Scale technology to billions of people
- Enable novel web3 applications

**Why are current  
networking solutions  
insufficient?**



Distributed  
systems  
fundamentally  
depend on  
**reliable global  
connectivity**

Blockchain nodes are globally distributed

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The Internet is insecure and attacks can cause severe damage

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Centralized networking solutions contradict decentralization

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→ **Build on a secure public network infrastructure**

# How we (want to) protect critical communication

## Need

**High availability** required for communication between validators and for client access.

## Existing solutions

Protections include **cryptographic signatures, filtering, and rate-limiting.**

## Ideal setup

Use a networking layer that provides **secure routing** and **availability guarantees.**

**Enter SCION:  
A next-generation Internet  
with built-in security**



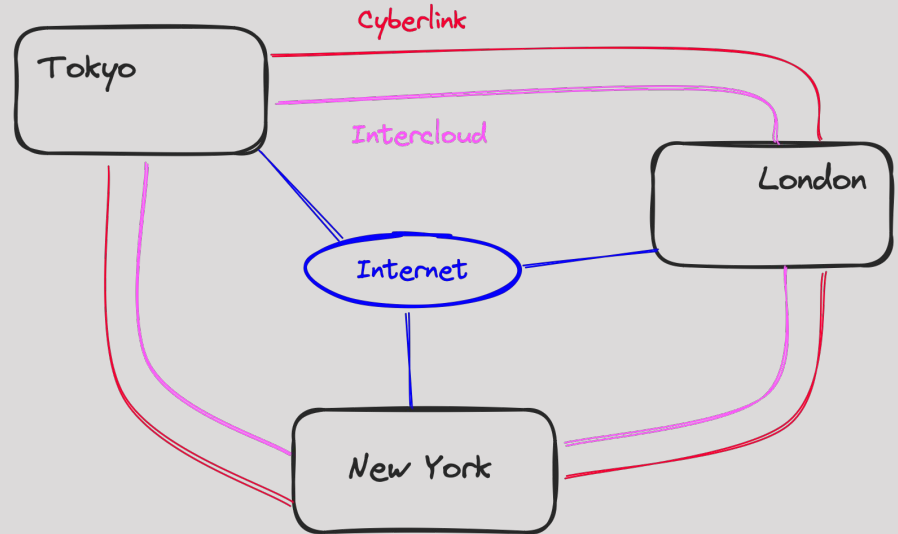
# SCION: A next-generation Internet with built-in security

## Strong security properties and high performance

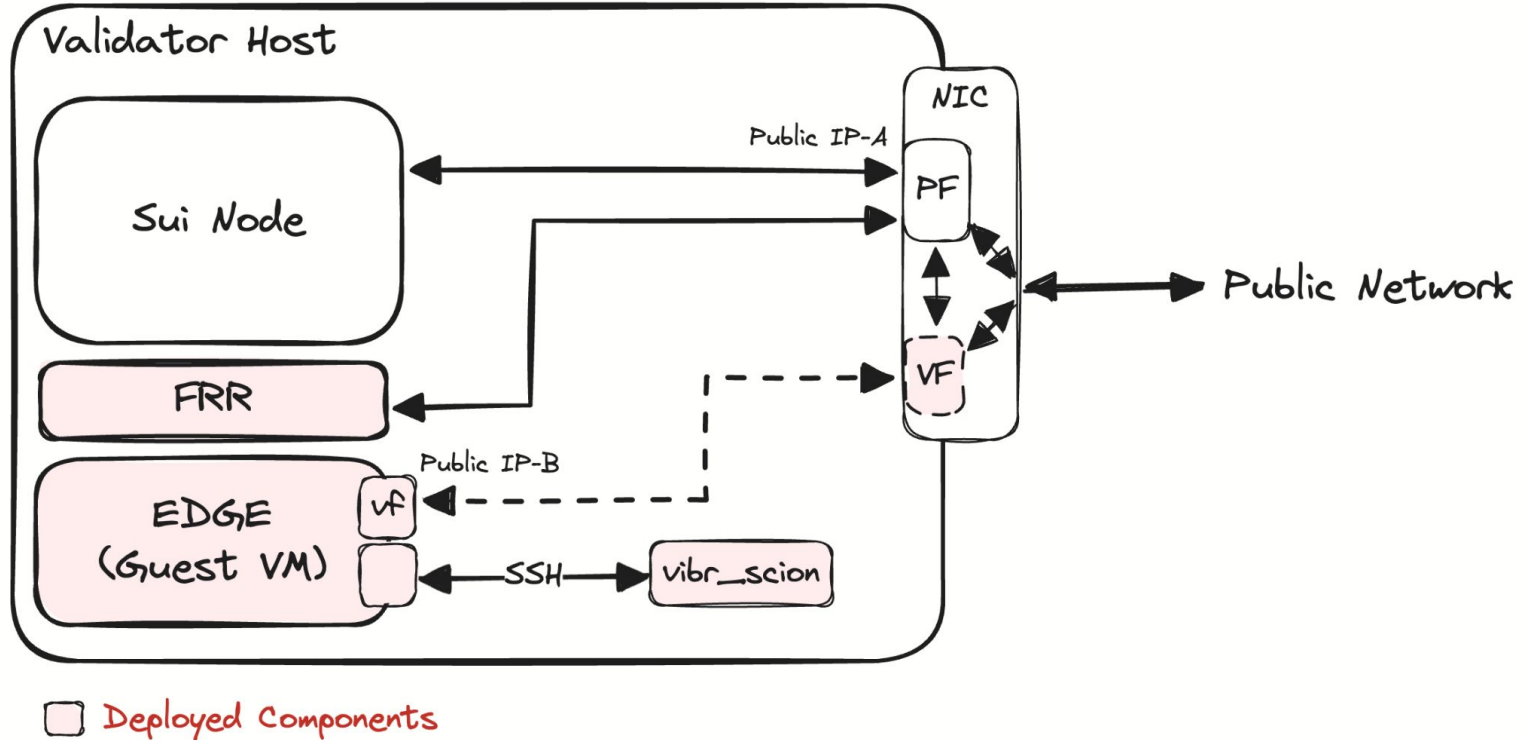
- Replaces BGP (routing) and IP (forwarding)
- **Secure routing** protocol prevents attacks
- Faster recovery after network failures
- Allows hosts to **select from multiple available paths**
- Often provides **lower latency** than the Internet

## Global production deployment

- In production use in Swiss financial, healthcare, and energy sectors
- New **redundant global network** created by Mysten Labs with its partners



# Networking setup with SCION at a Sui validator





**Can SCIION in turn benefit  
from blockchains?**



# Blockchains have come a long way...

	<b>Bitcoin</b>	<b>Sui</b>
<b>Sustainability</b>	<b>Wasteful</b> proof of work 1 tx ~ 1 person flying Zurich–Lisbon	<b>Efficient</b> delegated proof of stake 1 tx ~ traditional financial transaction
<b>Programmability</b>	<b>Limited</b> Bitcoin script	<b>Ergonomic and Turing-complete</b> smart-contract language
<b>Speed</b>	Finality in <b>minutes–hours</b> <b>5–10</b> transactions per second	<b>Sub-second</b> finality <b>&gt; 1000</b> transactions per second
<b>Cost</b>	<b>&gt; 1 USD</b> per transaction	<b>&lt; 0.1 cent</b> per transaction

# Sui could perform control-plane tasks for SCION

## SCION has a **clean separation of control and data plane**

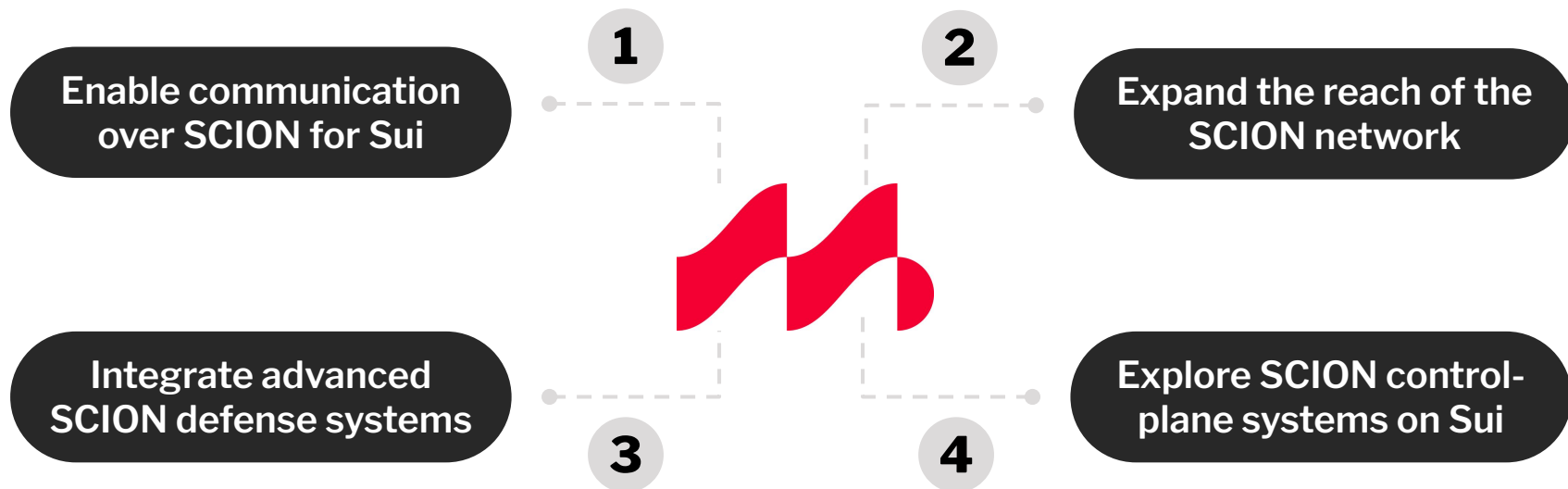
- Packet-carried forwarding state
- Forwarding information can be distributed out-of-band

## Sui enables **digital assets for network resources**

- **Compose, transfer, and coordinate** assets
- Assets for forwarding information, keys, bandwidth reservations
- **Fast and cheap transactions** enable real-time applications
- Directly integrated **financial settlement**
- Challenge: how to connect physical resources to on-chain assets

Hummingbird: A Flexible and Lightweight Inter-Domain Bandwidth-Reservation System. Giuliani et al. 2023. <https://arxiv.org/abs/2308.09959>

# Current efforts, next steps, and further research



# Thank You

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