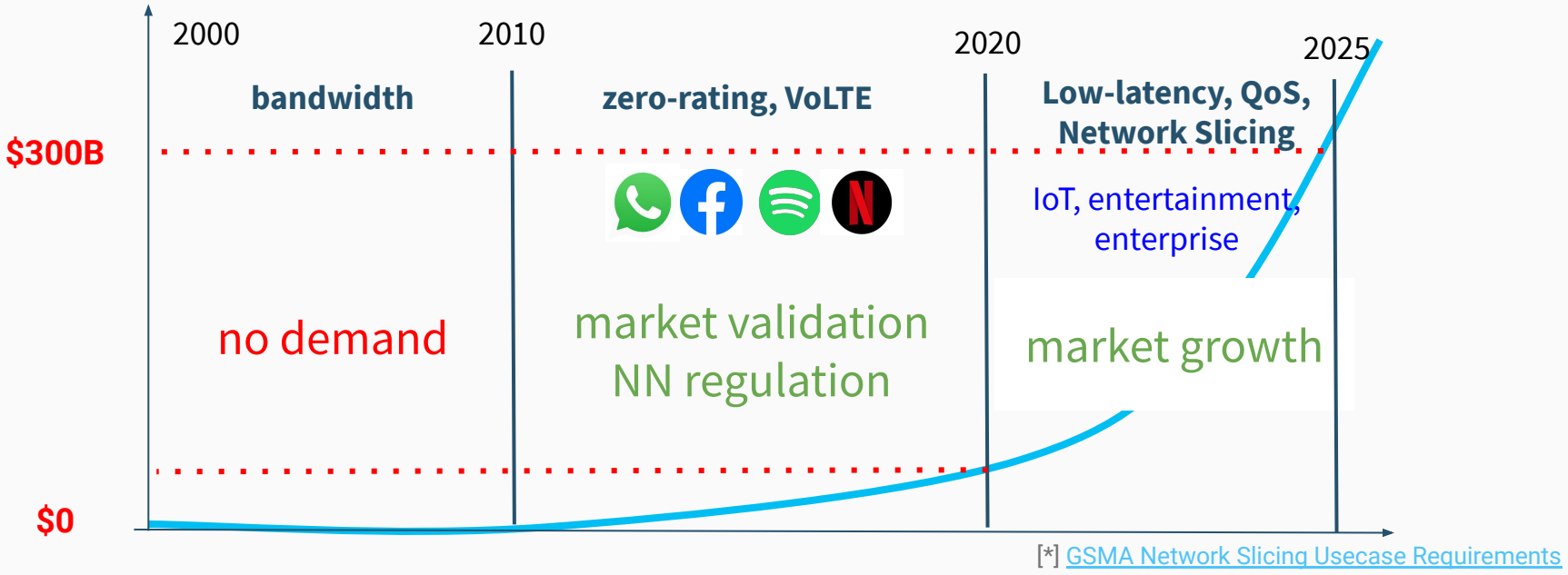
Network Tokens: expose and access network traffic differentiation in compliance with NN and privacy

BEREC Workshop on Traffic Identification, Nov 12 2020
Yiannis Yiakoumis, PhD
Co-Founder & CEO, Selfie Networks
Work with Nick McKeown (Stanford), Frode Sorensen (NKOM), Tom Herbert (Intel)

https://networktokens.org | yiannis@selfienetworks.com

We are at a tipping point as a community: for the very first time, we have market validation, a NN framework that allows traffic differentiation & network SLAs, and multiple use cases and end users that can benefit from it.



[*] GSMA Network Slicing Usecase Requirements

Traffic identification is where end-users, CAPs, operators, and regulators meet.

User-centric

Category-based & inclusive to eligible apps

high-performance

application-agnostic

Easy to deploy

auditable

Low operational overhead

user-consent

privacy

Secure

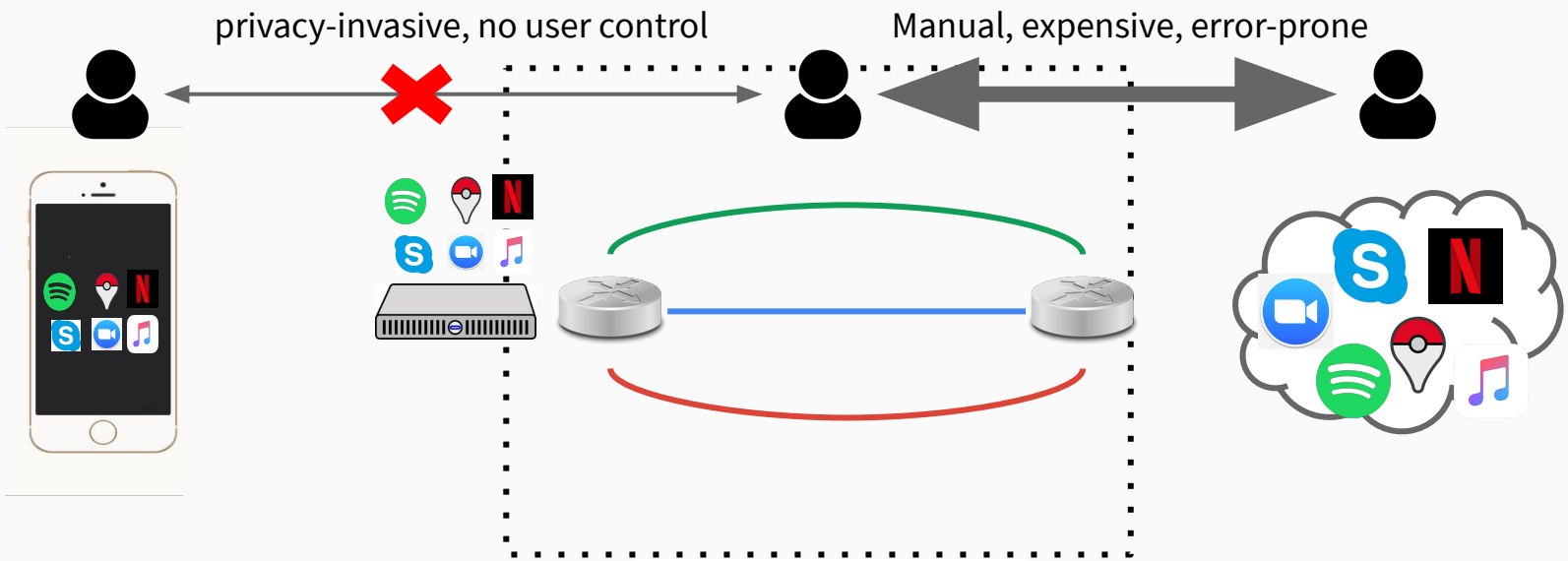
easy onboarding & low barrier to entry

encryption

Traffic identification is where end-users, CAPs, operators, and regulators meet.

But existing mechanisms (“traffic classification” and “low-level insecure mechanisms”) don’t meet these needs

Traffic Classification Detour: why existing mechanisms don't work



100+
integrations

15%
success rate
on integration

9+ months
onboarding
time

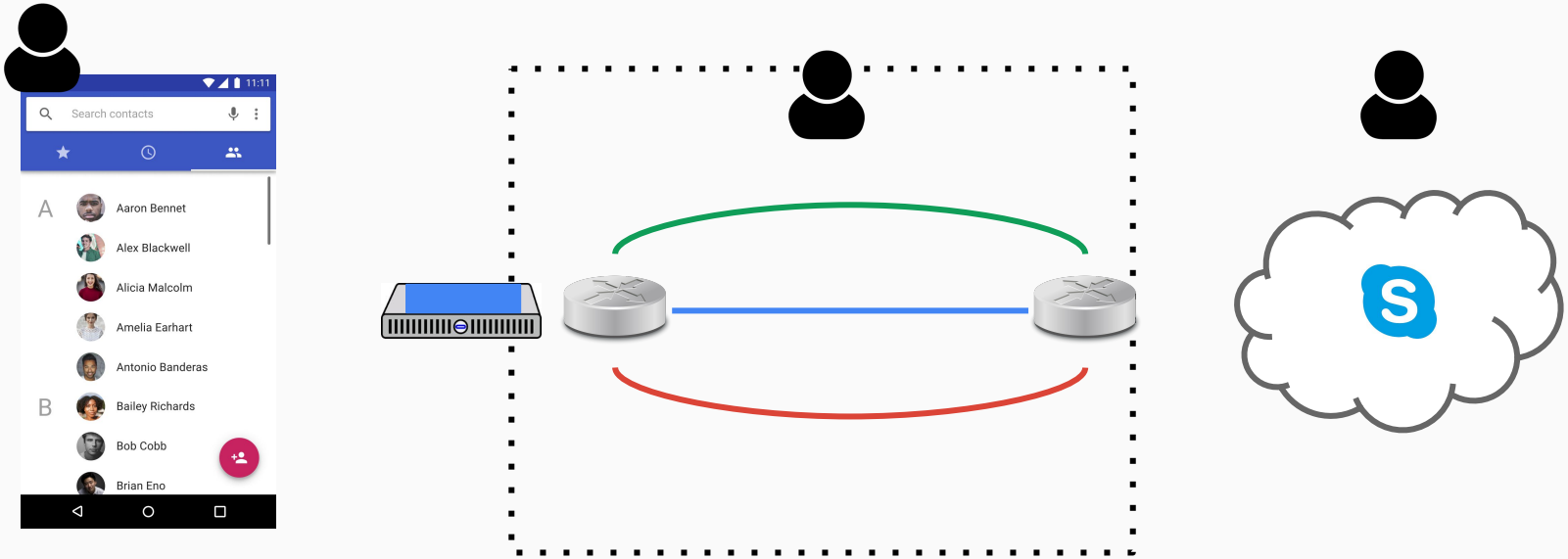
How can we expose and access traffic differentiation services in a way that ...

1. is easy for operators to deploy and operate
2. is easy for end-users and app providers to access
3. respects user privacy and user choice
4. works with encryption and modern infrastructure (ESNI, multi-cloud, 3rd-party APIs)

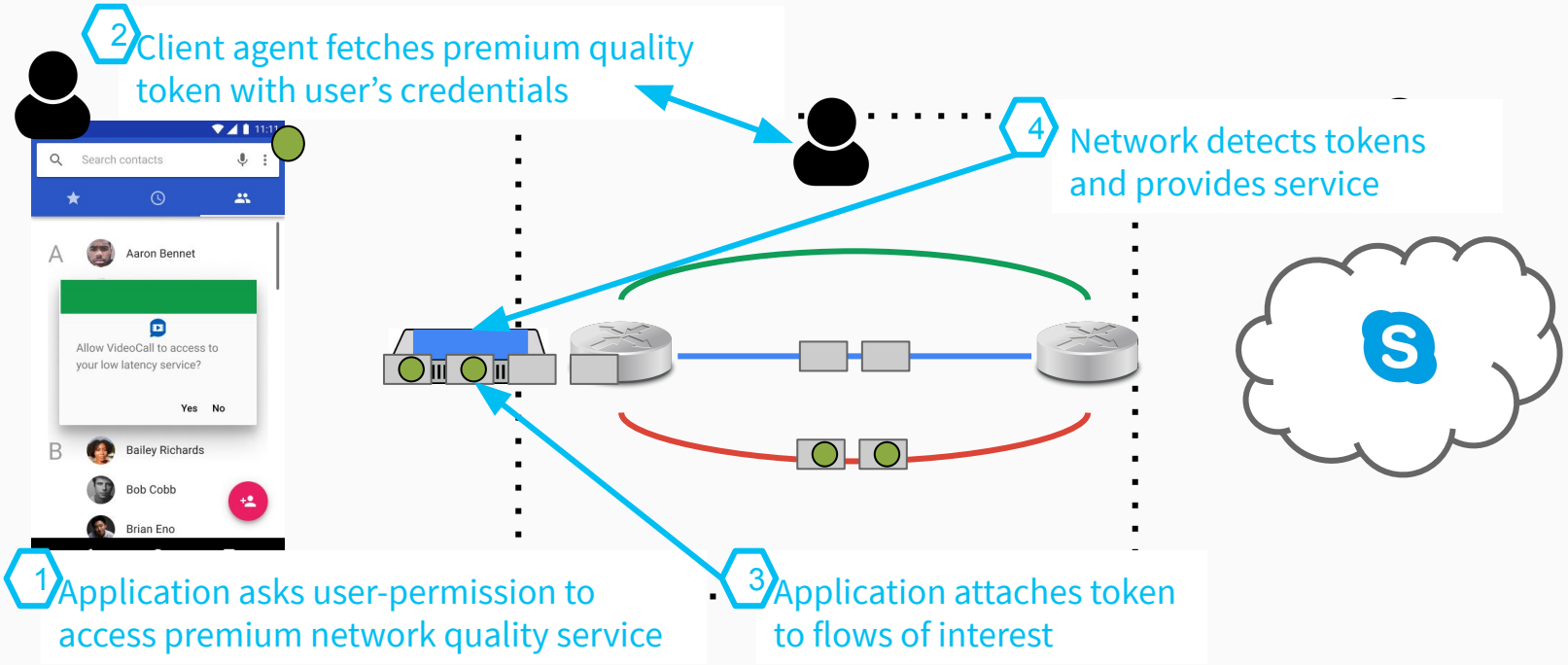
Network Tokens: **an open and secure method for end users and application providers to explicitly coordinate with the network about how their traffic is treated (e.g., to access a 5G slice, a low-latency path, or a zero-rating service).**

- Tokens carry simple claims (e.g., *“I am Skype”*, *“I need low latency”*)
- Encrypted and/or signed based on trust relationships and requirements
- Secure and revocable
- Inserted as extensions/attributes in existing protocols (e.g. IPv6, TLS, STUN)
- Policy agnostic: **Policy dictated by token distribution, crypto functions, E2E workflows**
- **User-centric tokens (e.g. for QoS), app-specific tokens (e.g., for zero-rating)**

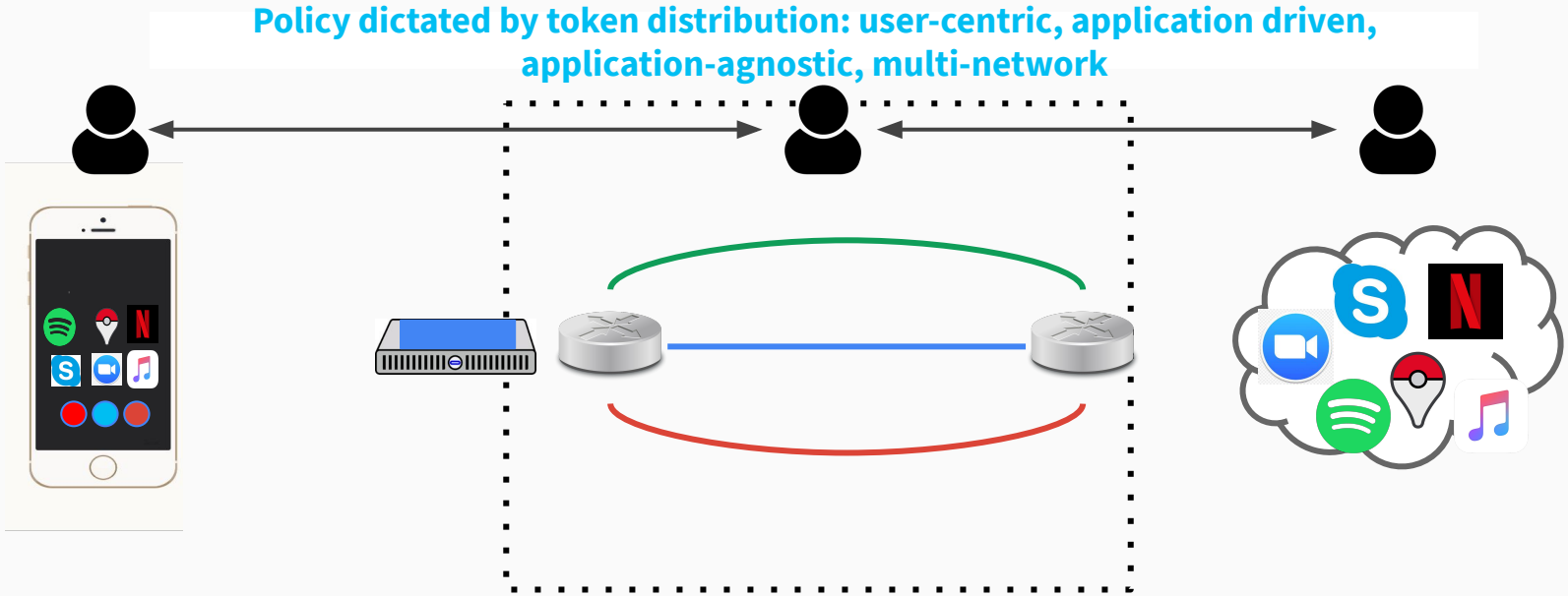
How network tokens work



How network tokens work

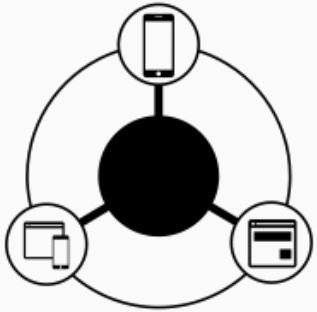


How network tokens work

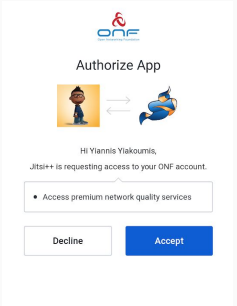


Status & Traction

Open Specs, and IETF I-D for Network Tokens & Workflows



Engagements with operators, app providers, network & OS vendors



OVVO-5G: Premium Network Quality for Video Calls

https://networktokens.org

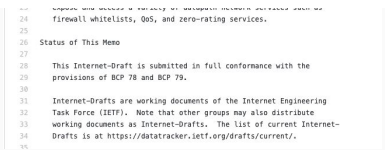
OVVO-5G

A blueprint reference implementation for a premium quality service tailored for voice and video communications

TBD
Internet-Draft
Intended status: Standards Track
Expires: November 8, 2020

Y. Yiakoumis
Selfie Networks, Inc
N. McKeown
Stanford University
May 07, 2020

Network Tokens
draft-yiakoumis-network-tokens-00



firewall whitelists, QoS, and zero-rating services.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at https://datatracker.ietf.org/drafts/current/.

Working Group

Operators
Voice/Video Providers
Vendors
Regulators

Network Token & Standards Compliance (IETF, 3GPP)

Open reference implementation with operator industry consortia (ONF, TIP)

Get involved!

- Join the discussion at network-tokens@ietf.org
- Check the code at https://github.com/networktokens
- Read and contribute to spec and use cases
- Try it in your network

Learn more at https://networktokens.org

Summary

- Traffic identification is where end-users, CAPs, operators and regulators meet
- Existing mechanisms are not sufficient and can’t support expected growth
- **Network Tokens** is a new technology that puts privacy, security, and net neutrality compliance as top-design priorities
  - Available as a standards track internet-draft presented within the IETF community
  - Running open-source code implementation within operator industry consortia

Thank you

yiannis@selfienetworks.com / LinkedIn / @gyiakoumis / https://networktokens.org