KIRA – Scalable Zero-Touch Routing

KIRA: Kademlia-directed ID-based Routing Architecture

Karlsruhe Institute of Technology

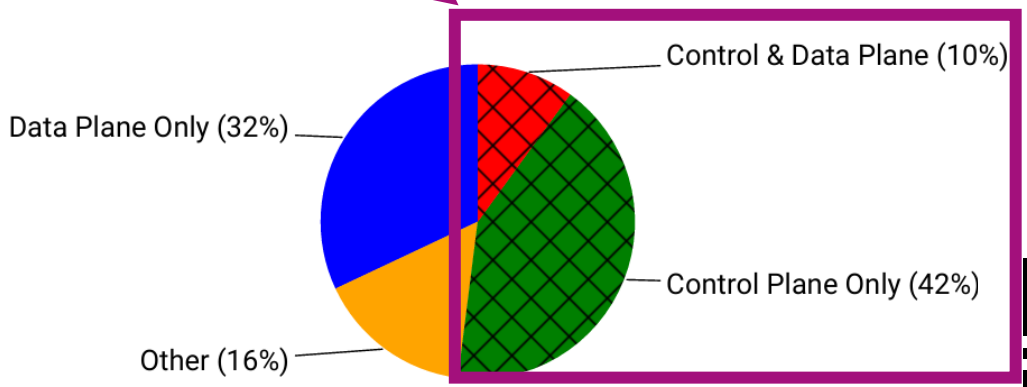
Contact:
bless@kit.edu

- Often overlooked problem: control plane connectivity
- Very prominent example: Facebook outage October 2021
- Control plane was root-cause for 52% of the 41 largest outages over 4 years in Google's B4 WAN

A Decentralized SDN Architecture for the WAN

Alexander Krentsel, Google / UC Berkeley
Nitika Saran*, Cornell
Bikash Koley, Google
Subhasree Mandal, Google
Ashok Narayanan, Google
Sylvia Ratnasamy, Google / UC Berkeley
Ali Al-Shabibi, Google
Anees Shaikh, Google
Rob Shakir, Google
Ankit Singla, Google
Hakim Weatherspoon, Cornell
dsdn-sigcomm@google.com

SIGCOMM 2024



More Info

https://s.kit.edu/KIRA

*"[Major failures] typically involve bugs or errors in multiple components […], that **interact in unanticipated** ways. […] these outages persist, despite our extensive efforts to improve testing, diagnostics, change procedures, and verification"*

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- Objective: Never lose control over your network infrastructure!
- KIRA provides resilient autonomous control plane connectivity
- Features
  - Scalability: 100,000s of nodes (in a single domain)
  - Zero-touch: no configuration required
  - Topological versatility: works well in all scalable topologies
  - Supports mobility (Cellular, MANETs, LEO Satellites), multi-homing, and domain contexts
- Add-on services
  - KeLLy: efficient topology discovery
  - DHT/ Distributed Key-Value Store
    → dynamically register and lookup names/services

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- Need KIRA in every networked device → IETF Standard
- Internet-Draft: https://datatracker.ietf.org/doc/draft-bless-rtgwg-kira/
  - Comments welcome! → rtgwg list
  - Running code provides zero-touch IPv6 connectivity
- Looking for: operators, collaborations & implementers
- Public Side meeting:
  Thursday November 6th, 14.45–15.45h, McGill
  - Overview, Q&A, Collaboration & Next Steps

More Info

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