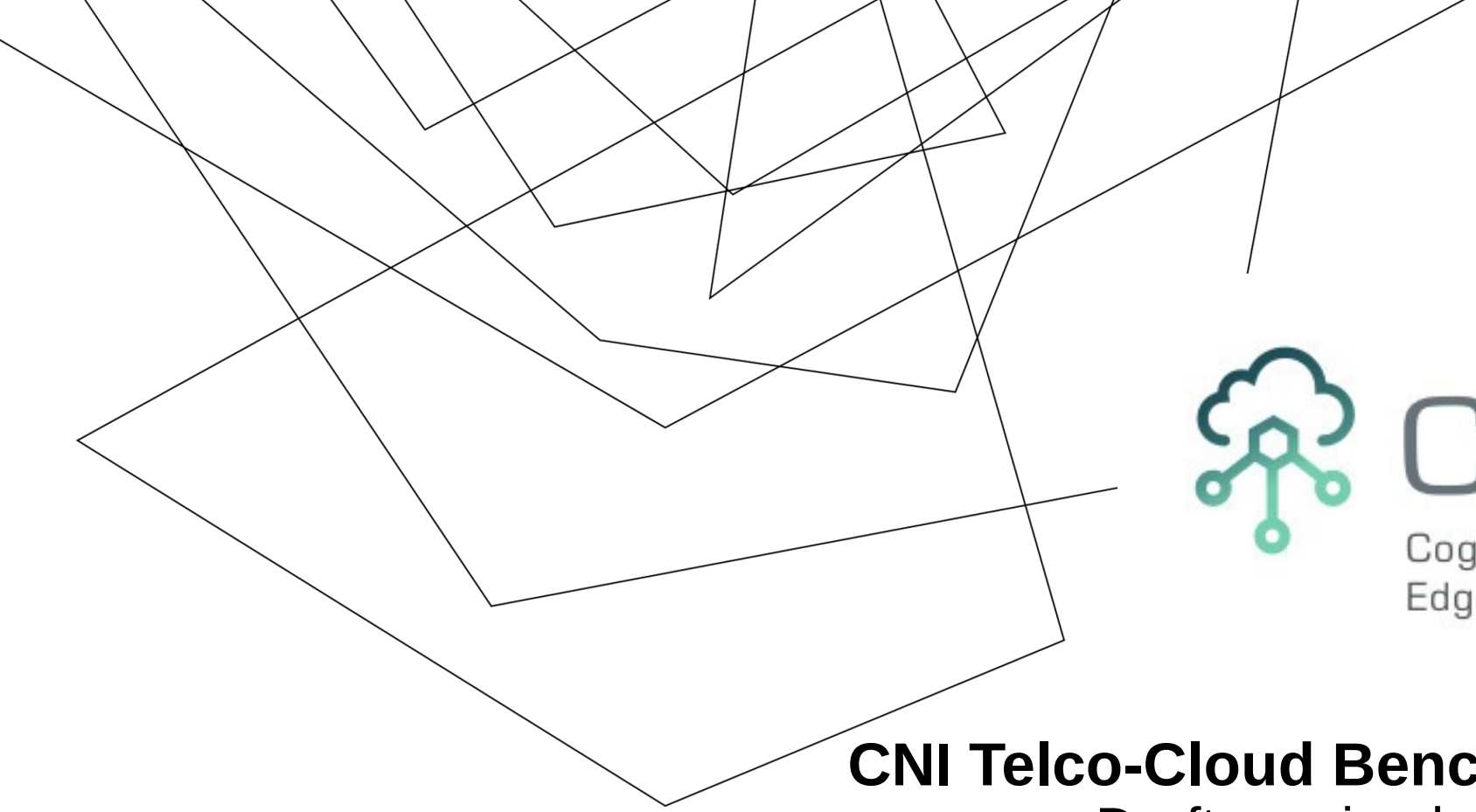

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CODECO
Cognitive Decentralised
Edge Cloud Orchestration

CNI Telco-Cloud Benchmarking Considerations

Draft-samizadeh-bmwg-cni-benchmarking-00

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INTRODUCTION

- **Scope introduction**

This document investigates a standardized, reproducible benchmarking methodology for evaluating Kubernetes CNI plugins' performance and scalability across diverse telco-cloud and edge-cloud environments.

Objective

The following objectives can be served: ensuring consistent, transparent, and reproducible benchmarking of Kubernetes CNIs to evaluate their performance, scalability, resource efficiency, and suitability for telco-cloud and edge-cloud deployments.

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Kubernetes CNI Benchmarking Telco-Cloud Methodology

Sec	Focus Area	Key Points	Tools / Notes	Related to
8.1	Controlled Test Environments	- Use bare-metal or dedicated VMs - Disable CPU scaling, pin cores - Sync clocks (NTP/PTP)		
8.2	Standardized Test Configurations	- Document Kubernetes & CNI versions - Kernel & system tunables - Hardware specs (CPU, NIC, MTU)		
8.3	Repeatability & Statistical Significance	- Run each test ≥5 times - Report min, median, max, 90th & 95th percentiles - Use automation	CODEF, Ansible	
8.4	Traffic Generators & Load Profiles	- Use iperf3, netperf, sockperf - Test TCP_RR, TCP_CRR, UDP_RR - Include short TCP, streaming, UDP bursts, concurrent flows		
8.5	Workload Simulation & Stress Testing	- Simulate pod churn, network/node failures, policy enforcement - Align with real-world telco stresses	kube-burner, chaos-mesh, tc-netem are **RECOMMENDED** to orchestrate these scenarios, aligning with stress test guidance in [RFC8239].	RFC8239
8.6	Observability & Instrumentation	- Capture CPU/memory per pod - NIC stats, CNI internal metrics (policy hits, drops) - Node and pod granularity	Prometheus, Cilium Hubble, Calico logs. Resource metrics **MUST** be collected at both node-level and pod-level granularity.	
8.7	Result Reporting & Output Format	- Use machine-readable formats (JSON, YAML, YANG) - Include configs, logs, versions - Common result schema for comparability	**SHOULD** be in line with goals in [RFC6815].	RFC6815

NEXT STEPS

- Extending this draft and prepare a new version for IETF124 .
- Your comments and input are more than welcome.

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Thank you

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