



# SLICES-SC

## Post-5G Blueprint

CNR, EURECOM/OAI, Inria, SU, UTH

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# post5G Experimentation in SLICES

- SLICES first 4-5 years: evolve beyond 5G using **open** 5G technologies on large-scale end-to-end platforms
- Focus on technologies targeting integration of disaggregated post5G RAN and Core with cloud-native deployment framework
- Integration of new applications on experimental post5G infrastructure (SNS C/D)



# Open, large scale, reproducible

- Reuse and contribute to open-source initiatives (OAI, ONF, LF)
- Complex deployments:
  - Multi cell-site
  - Multi-region
  - Multi tenancy
  - Multi-management
- Documented blueprint, common software/hardware base, **fine-grain automatic control**

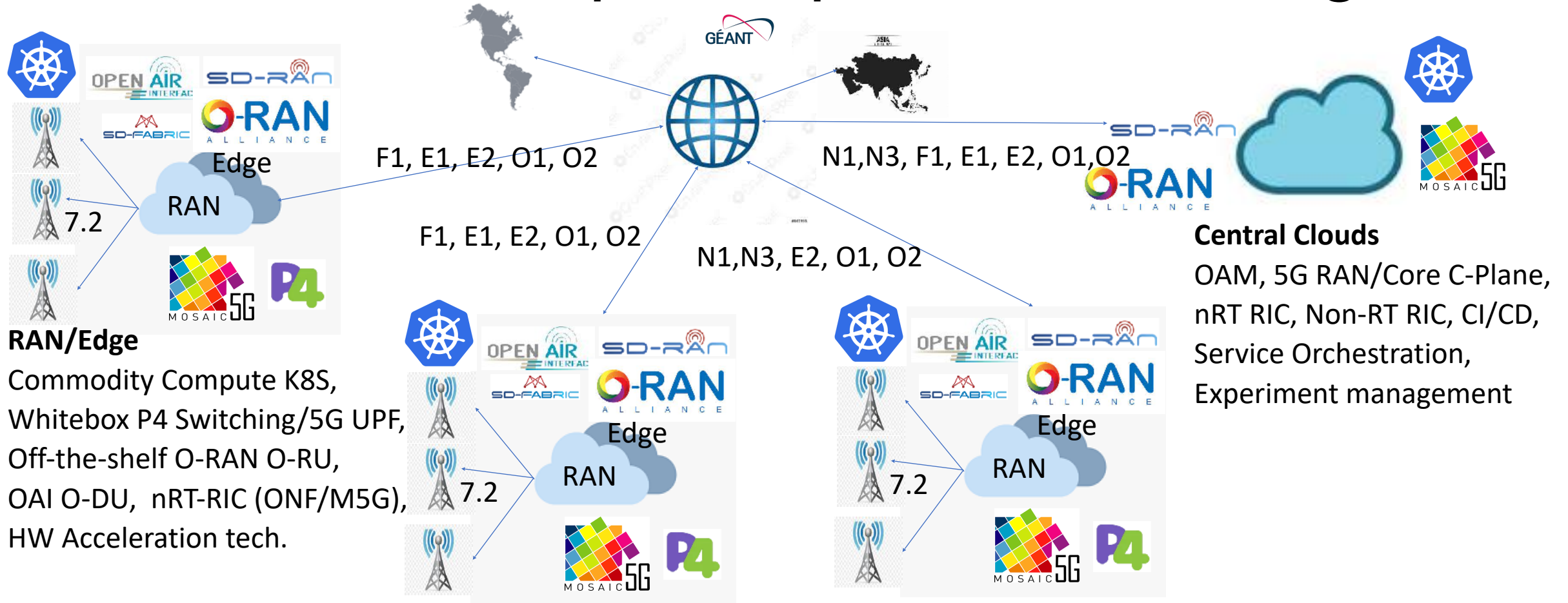
# The Blueprint (Bottom-up PoC)

NOW

- Recommendations and deployment scripts for RAN/Edge
  - Servers/OS Configurations for RAN/Edge
  - Radio sub-system deployment
  - Switching (High-performance)
  - Multi-nodes k8s clusters, Helm deployment for core and RAN/Edge
- Ansible playbooks for deploying cloud services in support of post-5G networks
  - 5G core network control plane (OAI 5GC now)
  - Disaggregated RAN control plane (CU-CP), O-RAN controllers, orchestration and management
  - VPN based inter-connection setup
  - For baremetal, SLICES-RI Cloud infrastructure, or Google Cloud Platform, integrated with TUM reproducibility testbed
- Generate requirements for SLICES-RI API
  - Experiment management
  - Network management and orchestration
- Measurement collection
- Dedicated interconnection network
- Cloud-based experiment development services (CI/CD)
- CD for Open-Source Communities (e.g., OAI, O-RAN OSC)



# SLICES PoC Blueprint – post5G Cloud-Edge



# Roadmap (2023/24)

- Initial PoC for 06/2023
  - Spring 2023 OAI hands-on workshop
  - IEEE HPSR Tutorial (USA)
  - EUCNC demo
  - SLICES-SC Summer School tutorial
- 06/23-12/23
  - Buildup of initial SLICES-RI post-5G sites (5 funded in France, Greece, Italy), Blueprint will provide input for planning new sites
  - Alignment with O-RAN NGRG platform activities and SNS Streams C/D
  - Alignment with other International activities (OpenRANGym, 6G hubs in Germany, Japan)
- Early 2024 – SLICES-RI Pre-operation
  - Development of required interfaces for SLICES-RI (portal, central cloud services, contribution to API development)

# Time to work!

<http://doc.slices-sc.eu/blueprint/>

The screenshot shows the SLICES Blueprint documentation website on the left and a code editor on the right. The website has a search bar and a sidebar with navigation links. The main content area is titled "SLICES Blueprint" and contains introductory text and an "Architecture" section. The code editor shows a file tree with folders like "devcontainer", "Automation", "SONIC", "docs", "edge-core", "intel\_connectivity\_research\_pr...", "k8s", "oai5g", "sopnode", "DHCP", and "esliver". The "ansible" folder is expanded, showing files like "5g.yaml", "5g\_test.yaml", "Dockerfile", "README.md", "container.yaml", "dummy.yaml", and "fabric-switch.yaml".

Search docs

SLICES Blueprint

Architecture

Deployment setup

Bill of Materials (BOM)

Switches

Servers

Cabling and Mech

RU

UEs

Contact and Support

Docs / SLICES Blueprint

### SLICES Blueprint

This documentation describes the SLICES blueprint. Historically blueprints were used to produce unlimited numbers of accurate copies of plans. For SLICES, the concept is taken to allow each site to reproduce software and hardware architectures on the SLICES sites and nodes. The SLICES blueprint targets testbed owners and operators, it is not intended to be used by experimenters or testbed users. The blueprint is an way to eventually reach a unified architecture between sites and nodes composing SLICES and easily onboard members to fields of research that may not be their core business and so learn about the needs and best practices to make SLICES a success.

With the blueprint, sites are able to deploy and operate partial or full 5G networks, with simulated and/or hardware components.

The blueprint is designed in a modular way such that one can either deploy it fully or only partially. For example, people only interested in 5G can only deploy the core and use a simulated RAN while people interested only by the RAN can just deploy a RAN, assuming they have access to a core (e.g., via the SLICES central node or another partner). Advanced users may even deploy a core and connect it with multiple RANs.

### Architecture

In this blueprint, the core and RAN deployed in Kubernetes clusters th

Code Issues 14 Pull requests 1 Actions Projects Wiki Security Insights

Code

main

Go to file

- devcontainer
- Automation
- SONIC
- docs
- edge-core
- intel\_connectivity\_research\_pr...
- k8s
- oai5g
- sopnode
- DHCP
- esliver
- ansible
  - collections
  - files/chassis\_config
  - inventories
  - misc/ssh
  - roles
  - 5g.yaml
  - 5g\_test.yaml
  - Dockerfile
  - README.md
  - container.yaml
  - dummy.yaml
  - fabric-switch.yaml

SLICES / sopnode / ansible /

dsauzeu ramdisk optional

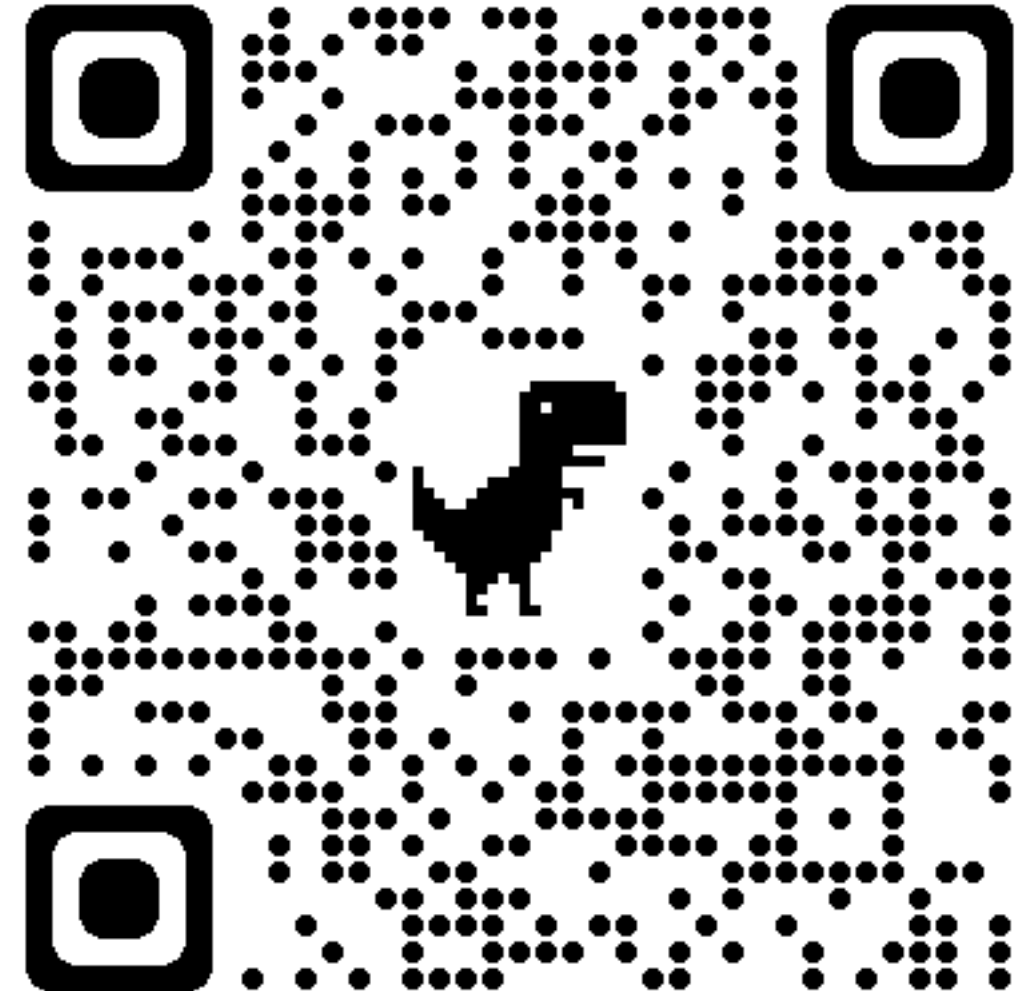
Name	Last
..	
collections	ansib
files/chassis_config	sopr
inventories	Conf
misc/ssh	slow
roles	ramc
5g.yaml	supp
5g_test.yaml	5g U
Dockerfile	shor
README.md	apis
container.yaml	supp
dummy.yaml	read
fabric-switch.yaml	disti
fabric.yaml	temp
k8s-master.yaml	parti
k8s-node.yaml	parti
k8s-ready.yaml	clust
network.yaml	netw

BCM.core.custom\_files and BCM.core configurations looks as follows:

```
---
# 5G config
GCN:
  namespace: blueprint
  core:
    present: true
    custom_files: blueprint/
    custom_values: blueprint
```

Assuming this file is called `params.5g.yaml`

```
ansible-playbook -i inventories
```



# Demo

<https://youtu.be/u8qZn8IK9dU>





