Open Source 5G Core Decision Matrix

Attribute	ONAP	free5GC	SD-Core (Aether)	Magma	OAI Mosaic5G & 5G CN
Available Download	Yes	Yes	Yes	Yes, partner with Wavelabs	Must be a Eurecom partner/subscriber (free for research)
OS	Linux	Ubuntu	Ubuntu	MacOS (or Ubuntu/Debian)	Ubuntu
4G Compatibility	No	5G NSA Option	Simultaneously run 4G core (optional?)	Yes, meant to control existing EPC 5G NSA available	No, but planned for future development
5G Compatibility	Yes	5G SA and full 5G Core options	Simultaneously run 5G core (SA and NSA options)	Private 5G must be deployed with 3rd party help (Wavelabs)	Yes, not all 3GPP components deployed
Organization/ Contributors	Linux Foundation	National Chiao Tung University	ONF, 5G core built from free5GC	Linux Foundation	Open Air Interface, Eurecom
Members	AT&T, Samsung, Nokia, Ericsson, Intel, IBM, and more	ONF, Fujitsu, Chungwa Telecom, WNC, Intel and more	ARM, AT&T, Dell, Google, Intel, Nokia, and many universities and companies across the globe	ARM, Meta, Qualcomm, Wavelabs, OAI, free5GC, and more	NSF, Qualcomm, Meta, Nokia, and many international universities
Hardware Requirements	• RAM: 224GB • HD: 160GB • vCores: 112 • Ports: 0.0.0.0/0 (all open) • most likely can scale down	• CPU: Intel i7 processor • RAM: 8GB • HD: 160GB • NIC: Any 10Gbps Ethernet card supported in the Linux kernel	• 18 CPU Cores (1-2 cores per SD-C Component) (just for 5G) • 4Gi for AMF, SMF, and MongoDB, 1Gi for other components	• 2+ physical Ethernet interfaces • AMD64 dual-core processor (2GHz clock or faster) • 4GB RAM • ≥32GB SSD storage • ≥2GB USB stick • Peripherals	Unlisted
Software Requirements	• Kubernetes 1.19.9 • Helm 3.5.2 • Kubectl 1.19.9 • Docker 19.03.x (for most recent release)	• Ubuntu 18.04 • gcc 7.3.0 • Go 1.14.4 Linux/amd64 • Kernel version 5.0.0-23-generic	• Ubuntu 18.04 • Kernel 4.15 or later • Haswell CPU or newer • Helm and/or REST Interface/SimApp	• Docker • VirtualBox • Vagrant • Go 1.13 • Pyenv 3.8.10 • Kubectl • Helm • Terraform • AWS, or Kubernetes	• Ubuntu 18 • Some components can be installed with Docker • Otherwise, unlisted
RAN and UE Compatibility	• SDN-R component creates portal to see what UEs are connected • Looks like you can register PNFs?	• Register RAN thru config and UE thru WebConsole	• WebConsole facilitates communication with NFs • Federation Gateway uses standard 3GPP interfaces • 3GPP Compliance	• Compatible with TR-069 eNBs • NSA network is 3GPP Release 15 compliant	• Flexible RAN Intelligent Controller (FlexRIC) made to control (only?) OAI's pre-existing RAN project
Simulated UE/RAN	RAN-Sim	UERANSIM and use for testing	NG40 RAN emulator gNB Simulator	In-house simulated eNB and UE test	UERANSIM
UE/RAN Use Cases	• Old 5G RAN Use case • Plug and Play Use case • Network Slicing using RAN-Sim	• Tested with Samsung S21 5G and other UE • Tested with Nokia gNB and others	• Used with SD-RAN • T&W running Radisys 5G-SA RAN stack	• Shown to connect with commercial gNBs and UEs with Genxcomm • Baicells, T&W • Planned: Sunwave, OAI/ORAN	Use case with OAI O-RAN shows some slicing
Training	Free training course on the ONAP basics, and a $299 course on how to use and customize	~$16,670 is the lowest annual membership fee to gain access to workshops and trainings	Some webinars, otherwise none	Free, online training course	No training available
Help	Documentation, use cases, and examples, sometimes hard to navigate	Up-to-Date documentation, YouTube videos, and a forum for questions. Technical support included in membership	Decent documentation and installation/config guides	Good documentation and FAQ section Wavelabs has a dedicated Slack channel for deployment help	Decent documentation for installation
Control Portal	Portal allows interface with most components	WebConsole for client connections, otherwise CLI	WebConsole for client connections, Helm or REST API	Orch8r portal controls components and client connections	Trirematics not yet operational
Network Slicing	Yes	No, partial implementation	Yes	No, planned for next 18 months	Some with FlexRIC
Closed-Loop Control	Yes	No	Yes	No	No
Edge Computing	Yes (?)	No	Yes, and flexible deployment	No	No

Information compiled by Zoe Snead for ANL, for more details see the full notes page