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Anuket: Kubernetes Architecture RA2 Pieman Release

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- Delivering a comprehensive set of specifications for a **Kubernetes-based Telco Cloud Platform (CaaS)**
- An **open-source blueprint** for CaaS, accessible to any Operator, NEP, etc.
- Addressing Anuket **Reference Model requirements** through **Kubernetes** based specifications
- Supporting Telco **Containerised Network Functions (CNFs)** and other applications, such as 5G Core, RAN CU/DU, Voice Core, BNG, etc.
- Providing a comprehensive design of a CaaS platform to support Telco Applications, expanding vanilla Kubernetes with **Telco-specific** requirements and features
 - *E.g. multiplexing, load balancing, multi-tenancy, acceleration, NUMA alignment, etc.*

RA2 releases & scope

v.	Date	Name
1.0-alpha	10 th Jan 2020	Snezka
3.0	15 th May 2020	Baldy
4.0	25 th Sep 2020	Baraque
5.0	29 th Jan 2021	Elbrus
6.0	30 th Jun 2021	Kali
7.0	7 th Dec 2021	Lakelse
8.0	14 th June 2022	Moselle
9.0	13 th Dec 2022	Nile
10.0	27 th June 2023	Orinoco
11.0	23 rd April 2024	Pieman

Anuket – Orinoco: **GSMA NG.139**

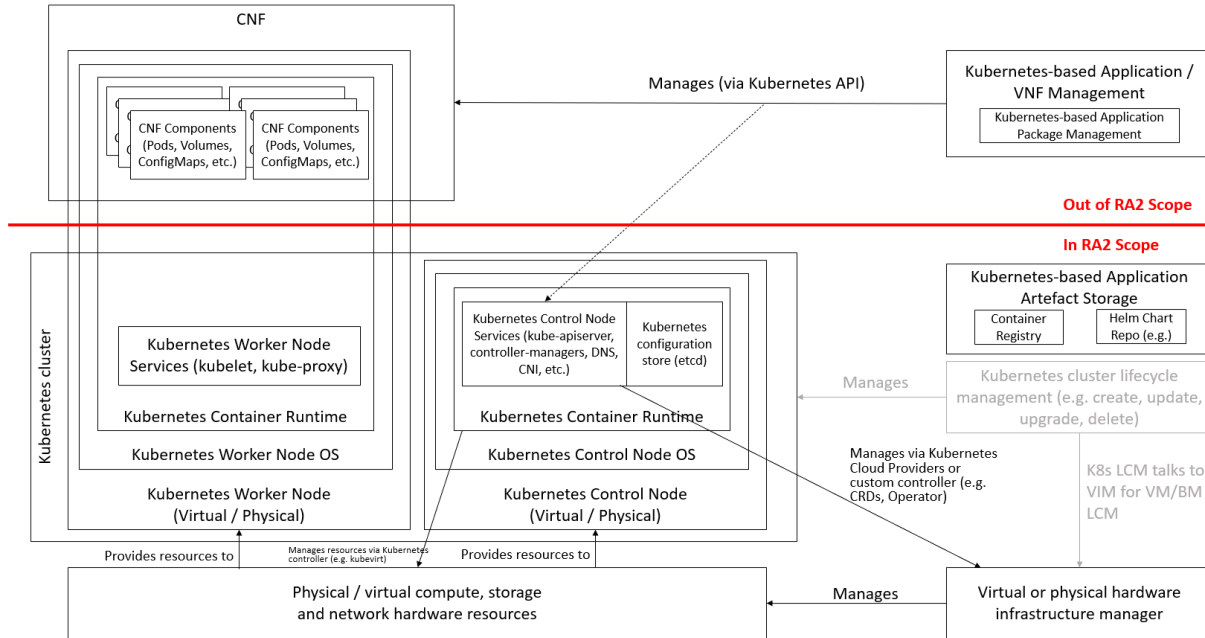
Anuket – Pieman

- M0 Start – 17th Oct 23
- M1 Release definition – 31st Oct 23
- M2 Scope Freeze – 7th Nov 23
- M4 Content Freeze – 19th Mar 24
- M4S Proofreading – 26th Mar 24
- M5 Release – 23rd Apr 24

RA2 Bogometer

Chapter	Status	Notes
Chapter 01 - Overview	Complete	
Chapter 02 - Architecture Requirements	Lots of SME feedback	Requirements – from RM
Chapter 03 - L2: High Level Architecture	Dickering over the fine points	CaaS building blocks
Chapter 04 - L3: Component Level Architecture	Lots of SME feedback	Specs for clusters: Nodes, sizing, K8s control plane, Networking & plugins, storage, workload reqs.
Chapter 05 - Security Guidance	Lots of SME feedback	Security policies for CaaS
Chapter 06 - Special Interest Group level requirements	Dickering over the fine points	Maps specs to K8s SIG features tested by Functest
Chapter 07 - Gaps, Innovation, and Development	Lots of SME feedback	What's missing from the ecosystem
Appendix A - Guidance For workload isolation (multitenancy) with Kubernetes	Lots of SME feedback	Multitenancy guidance

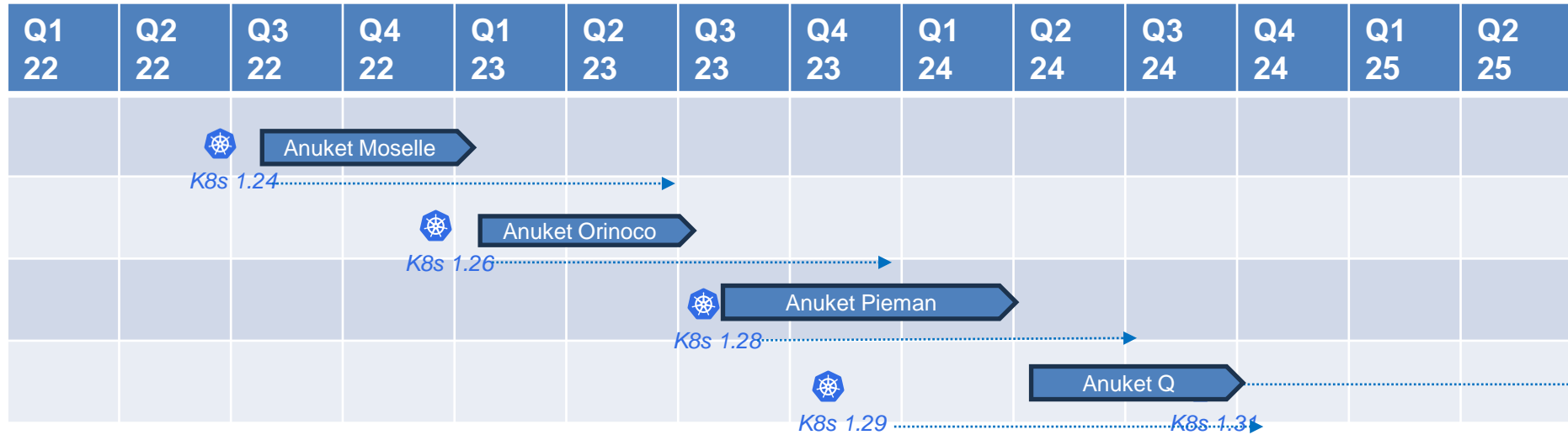
RA2 scope & Nile review



Specifications mandate certain features & configurations in order to deploy a common Telco Cloud CaaS platform:

- Usage of Kubernetes 1.26
 - Compromise between supportability (see lifecycle)
 - and Operator adoption (lengthy upgrade and re-certification)
- Acceleration: CPU/NUMA aware scheduling, AF-XDP, real time Kernels, etc.
- Networking: Multiplexing, Load balancing, SCTP support...
- Multitenancy: Hard (multicluster) vs Soft (namespaces)

RA2 lifecycle



Release lifecycle and support timelines:

- **Kubernetes:** 3 releases/year (ie every 4 months)
Community support for 12m
- **Anuket:** 2 releases/year – every 1 or 2 Kubernetes releases

Document authoring & build process

- **Document source:** Anuket RA2 – open source specification
 - **Tasks** tracked as [Issues](#) (with labels, milestones, target releases...)
 - **Contributions** deltas tracked as [Pull Requests](#) (with reviews, approvals, comments...) – [weekly meetings](#)
 - **Project lifecycle:** milestones (*scope, content, proofreading, build*), regular releases (Orinoco is the **15th** release of Anuket), collaboration open to whole community (*Operators, Cloud&HW Vendors, NEPs, Users...*)
- **Build:** Once the RA2 content is frozen as part of the Anuket release, the output documents are **automatically** generated with [pipelines](#):
 - RST (ReStructured Text) source, published as HTML, and ported to docx.
 - NG.139 publication via GSMA

RA2 Orinoco release

The RA2 project addressed **20 issues** in the Orinoco release, featuring:

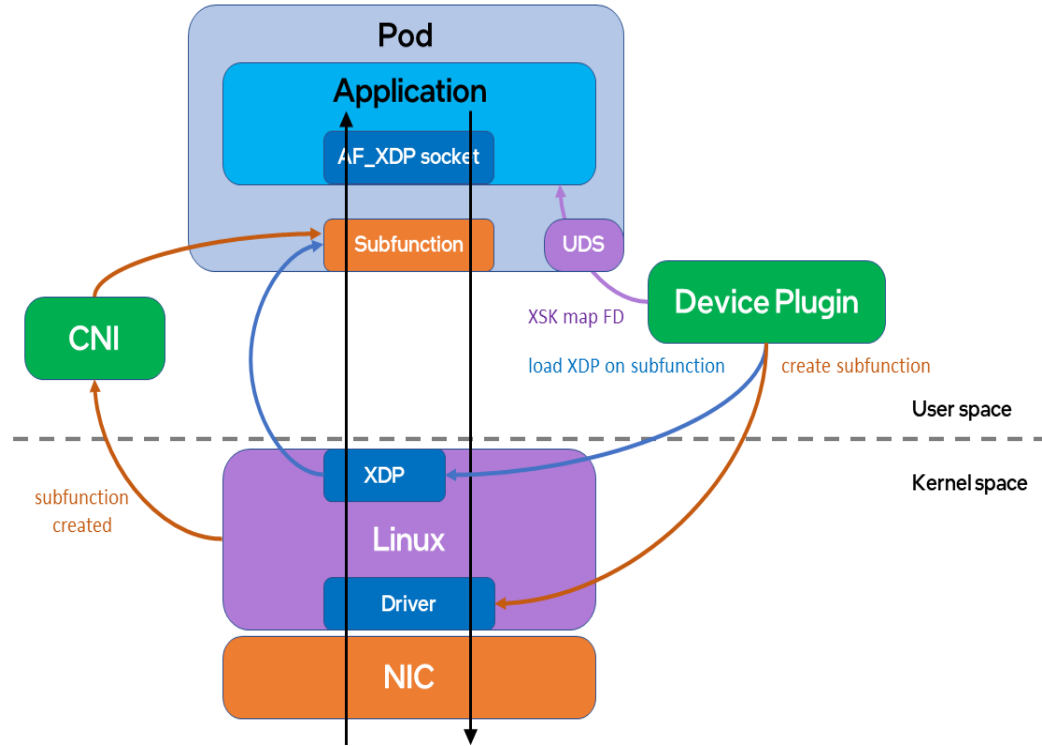
- Update to **K8s 1.26**
- **Kernel** requirements
- **AF_XDP** architecture
- **GSMA** doc output
- External **BibTEX** bibliography
- Finalised conversion MD to **RST**
- Various Updates & Fixes

Address Family for XDP (AF_XDP)

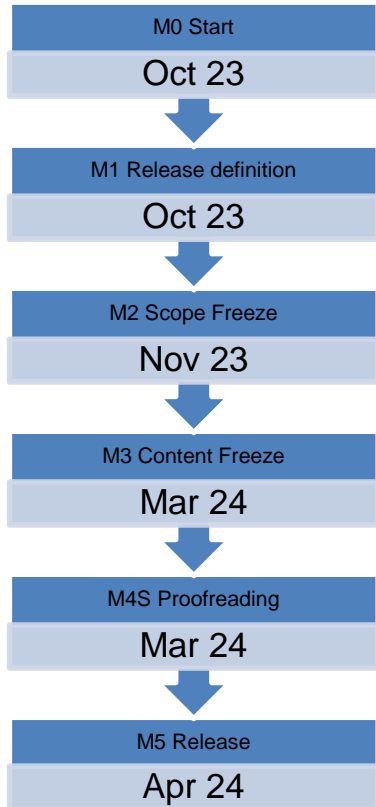
Added text with diagrams to [RM Ch3](#), 4 and 10, and [RA2 Ch3](#), explaining:

- Applications written for AF_XDP, with DPDK, or with VPP
- Bare metal or virtualized
- Device Plugin and CNI

Still to come: RA2 spec



RA2 Pieman – what's coming



- Update Kubernetes version
 - 1.28>1.29 (Dec23-Dec24)
- Add requirements
 - PaaS Services
- Add features
 - Load Balancer
 - Dynamic Resource Allocation
 - AF_XDP
 - Edge Nodes specs
 - Storage requirements
 - Service Mesh
 - Cert-manager
- Node Labelling
- CaaS Manager
 - specs for caas manager interface
- Functest sync
 - Align testing tables - add new tests
- Fixes
 - clarify gaps, security requirements
- *Anything else?*

Join us!

We aim to accelerate the adoption of telco cloud using open standards and architectures.

We welcome contributors from any background. Feel free to join our meetings, mail us or check the repository.

Weekly meetings – Monday @ 1000 UTC:

<https://wiki.anuket.io/display/HOME/Anuket+Meetings>

Mailing list: <https://lists.anuket.io/g/ra2>

Wiki: <https://wiki.anuket.io/x/ QgB>

Docs: https://cnnt.readthedocs.io/en/latest/ref_arch/kubernetes/

GitHub project: <https://github.com/anuket-project/anuket-specifications/projects/10>

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