

5GCN Tester



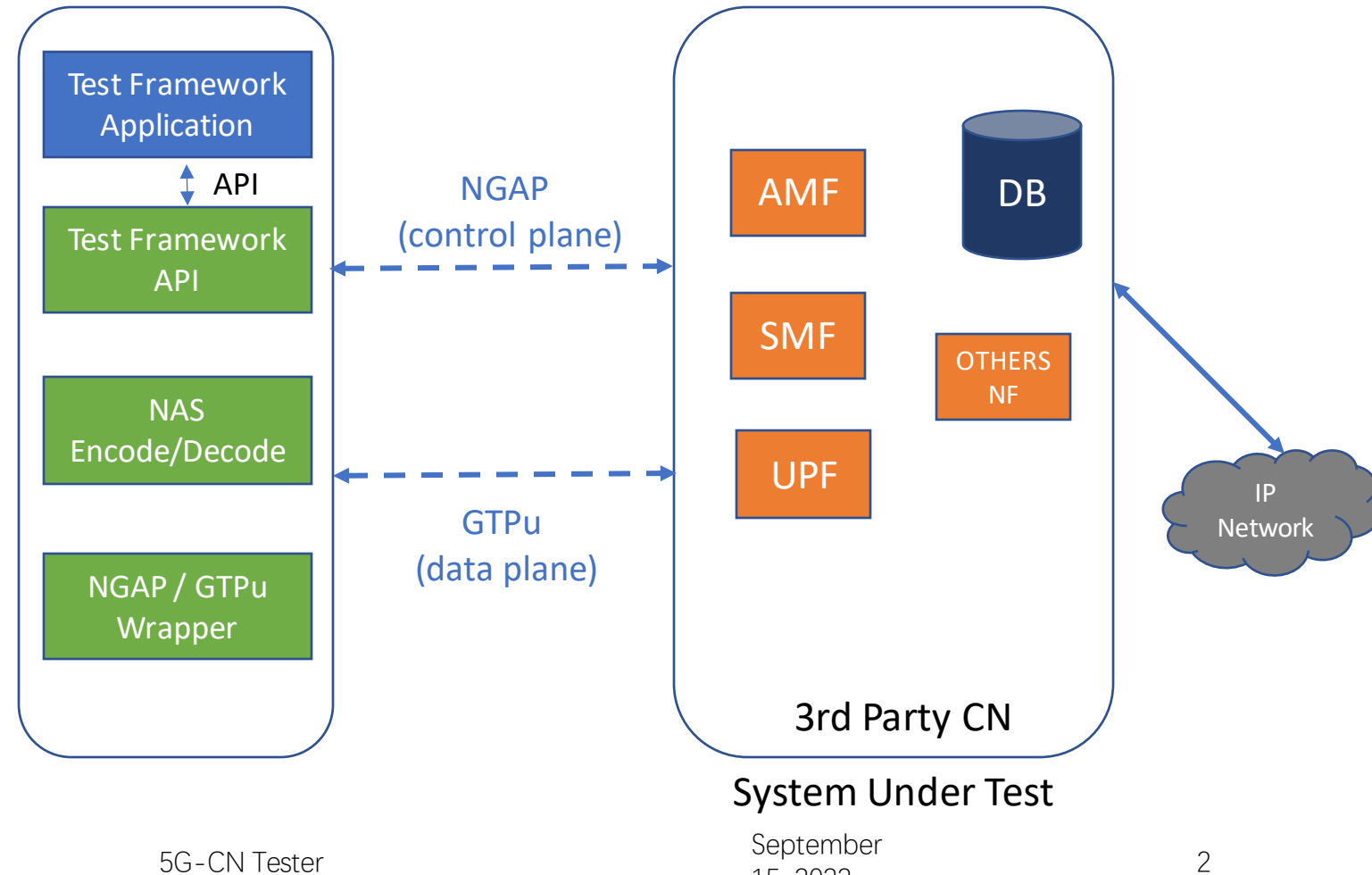
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September
15, 2022

Objectives of the 5G-CN Tester

- ❑ Validate a 5G Core Network
 - ❑ MAGMA
 - ❑ OAI-5G-CN
- ❑ Be platform independent
- ❑ Be properly isolated



Where to Start

- ❑ We evaluated whether
 - ❑ We write a 5G RAN emulator from scratch
 - ❑ Or we fork an existing 5G open-source RAN emulator and build on top
- ❑ Given the timeline, we could only do w/ option #2

- ❑ We then evaluated several Open-Source Projects:
 - ❑ gnbnsim (no longer public)
 - ❑ ueransim
 - ❑ OAI Stack
 - ❑ My5G-RANtester
 - ❑ Omec-gnbnsim

Currently Best Candidate: omec-gnbsim

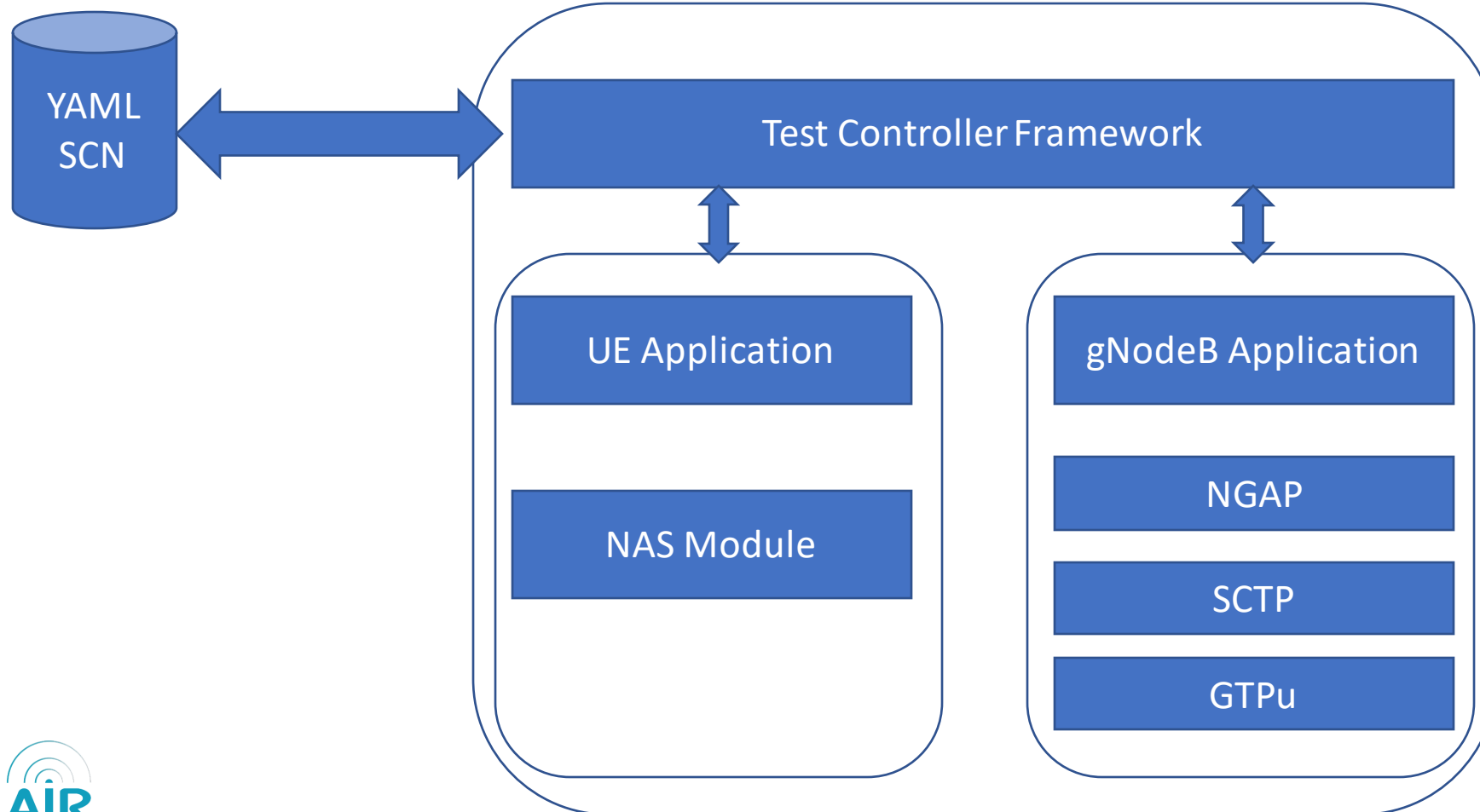
□ Reasons:

- Most advanced and still very active
 - Better coverage on NGAP and NAS messages
- Independent source (since we could test against OAI stack)
- Golang programming language looks like a plus to some of us
 - More people could contribute to maintenance
- Internal Structures look to allow us to implement complex procedures
 - Like Handovers

Full Compatibility w/ S1AP Tester?

- Scenario Format?
 - We will start with full compatibility
 - We would like to go with a YAML based-scenario description (if time OK)
- Traffic Generator
 - It will certainly be included inside the tester
- Of course we want to support "procedure"-based tests
 - Like "register" / "deregister"
- But also "packet" testing and analysis
 - Should be explicit for developer to understand why test is failing
- Communication with Orchestrator required?

5G-CN Tester Architecture



Development Environment

- ❑ 5G-CN Tester will have its own dedicated repository
 - ❑ Like <https://github.com/magma/S1APTester>
 - ❑ Initially it may be private for early development
- ❑ It will need its own CI workflow
 - ❑ GitHub actions vs Jenkins?
 - ❑ Check contributions for:
 - ❑ Formatting (Code Linting, PR semantics, Commit messages,...)
 - ❑ Builds
 - ❑ Sanity Checks and more tests later on.

Repository Structure (2 choices)

Monolithic Repository

- We mirror the gnbsim repository
- Pros
 - Easier to maintain
- Cons
 - Own history
 - We have to keep the Apache 2.0 License

Sub-module repository

- We still mirror the gnbsim repo
 - But create one above and gnbsim is a git sub-module
- Pros
 - Easier to resync with gnbsim development. They are quite active
 - Top repo under 3-Clause BSD
 - Mainly the scenario database and test-framework will be here
- Cons
 - Developers/CI have to manage 2 commits

Why we want to keep a clean mirror of gnbsim?

- ❑ 2 main reasons:
 - ❑ Easier to resync with their current development
 - ❑ We will be able to cherry-pick new commits
 - ❑ Easier to later upstream some of our modifications
- ❑ Once we got a working prototype, the question is
 - ❑ Could we also upstream our test-framework directly on the OMEC-gnbsim repository?
 - ❑ They might be interested for complex scenarios

Timelines

Public milestones for the MAGMA Community

5G Basic : January 15th 2023

P0 Tests in Magma CI

5G Extended: April 30th 2023

P1 Tests in Magma CI

5G Federation: July 31th 2023

P2 Tests in Magma CI

Internal milestones for development phase #0

Setup new repository

Initial Skeleton

Setup own CI

Locally testing P0 Tests

Switch to public and make release of tool

Include tool and scenarios into MAGMA main repository (CI and doc)