NDS V&V

Overview of GitLab project - Phase I

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OECD/NEA/DB/NDS

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Motivation and Scope of NDS work

- Modernize the way we handle and distribute ND files and libraries through the use of version control (Git) **repositories** and **releases**
- Implement well-defined, systematic quality checks that are automatically triggered upon any modification of the files (**CI/CD pipelines**)
- Provide a durable DB framework *as a service*
  - Ensure by-design reproducibility of the QA processes
  - Ensure overall maintainability of the platform
- Use of modern programming languages, Python, R, and docker containers

Vision

Different Roles

- DB/NDS develops the architecture to implement **best V&V practices** for evaluated files
- NEA/IT monitors and ensures robustness, security, maintenance and accessibility of the GitLab platform
- JEFF Evaluators upload candidate evaluated files for testing, retrieve final outcome

Scalability

- Within this framework, pipelines are scalable to address revising practices and new formats (e.g. foreseen GNDS)
- Modularity is ensured by design (easy to add a stage/job in a pipeline)

GitLab Workflow

Technical design choices

- All codes used in the pipelines are run using Docker containers
- All corresponding Docker images are built with Dockerfiles
- Dockerfiles are themselves version-controlled under a GitLab repository

Security constrains

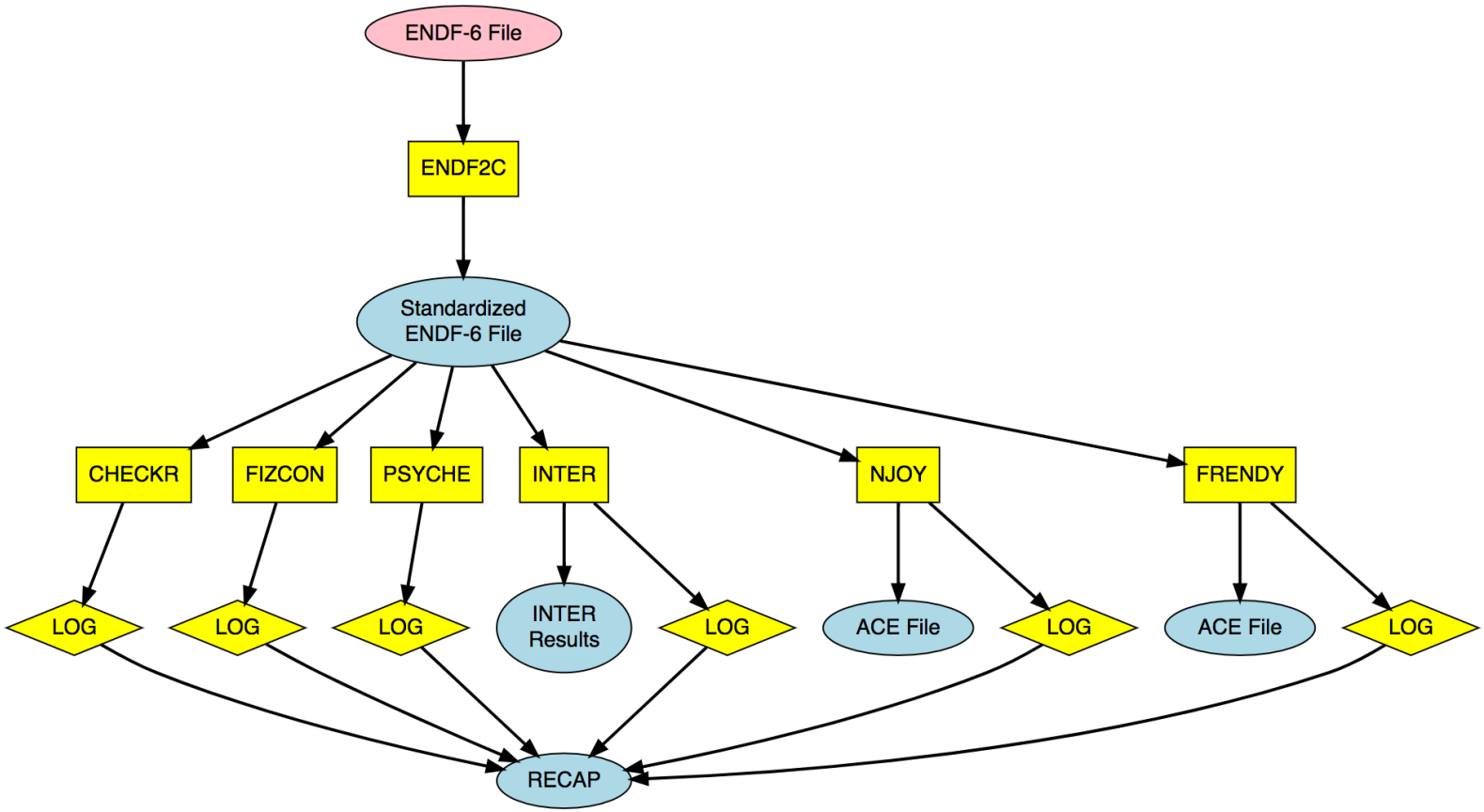
- Local docker registry enabled in local GitLab
- Local Gitlab cannot 'pull' from external world (security choice)
- Base images first checked and installed by NEA/IT (e.g. ubuntu, alpine, debian...)

Phase 1 : Isotopic pipeline

Objective of Phase 1 :

- Clearance of individual (isotopic) evaluations of minimal QA criteria
  - format compliance
  - actual processability
  - actual usability in transport codes (e.g. MCNP / SERPENT)
- "Fail fast" approach : if something is really wrong, we want to know asap
- If file passes :
  - elligible for benchmarking (Phase II)
  - elligible for selection in JEFF test libraries and releases

Phase 1 : Isotopic pipeline



Example of (one) Phase 1 workflow logic

General scheme of the GitLab project

IT

NEA Runner

- ubuntu
- debian
- ...

NEA

Verification

- verif.

- checkr.f
- fizcon.f
- psyche.f
- Dockerfile
- .gitlab-ci.yml

Processing

- njoy

- njoy src
- Makefile
- Dockerfile
- .gitlab-ci.yml

Validation

- serpent

- serpent src
- Makefile
- Dockerfile
- .gitlab-ci.yml

USERS

Processing

- scripts
- .gitlab-ci.yml

Isotope 1

- endf
- .gitlab-ci.yml

artifacts

Isotope 2

- endf
- .gitlab-ci.yml

artifacts

× 1000

Materials

JEFF

- table.csv
- .gitlab-ci.yml

artifacts

Criticality Benchmarks

- sources
- .gitlab-ci.yml

artifacts

Shielding Benchmarks

- sources
- .gitlab-ci.yml

artifacts

Legend

Project

Gitlab Container Registry

Gitlab Repository

Artifacts

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READY

IN PROGRESS

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JEFF

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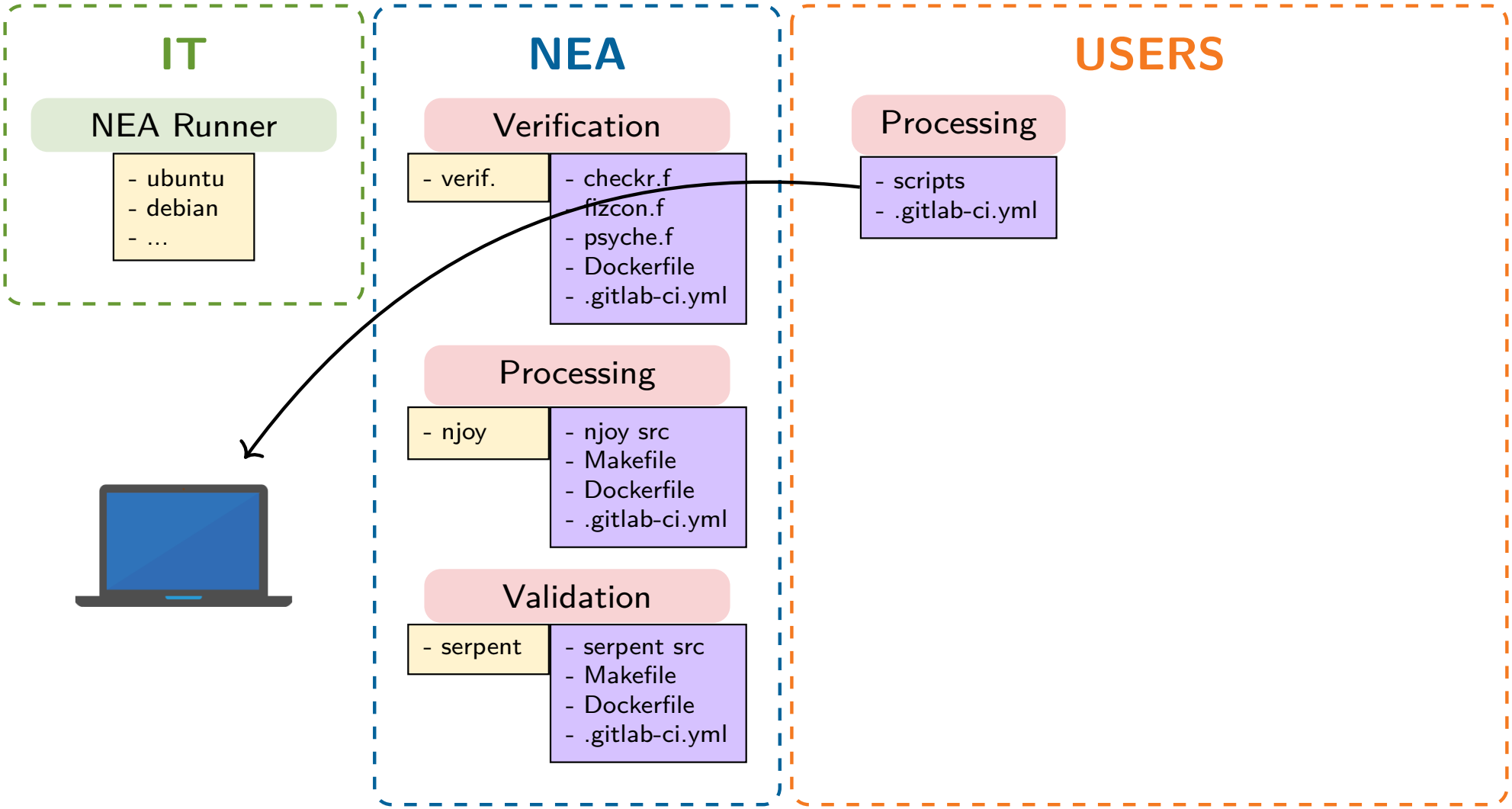
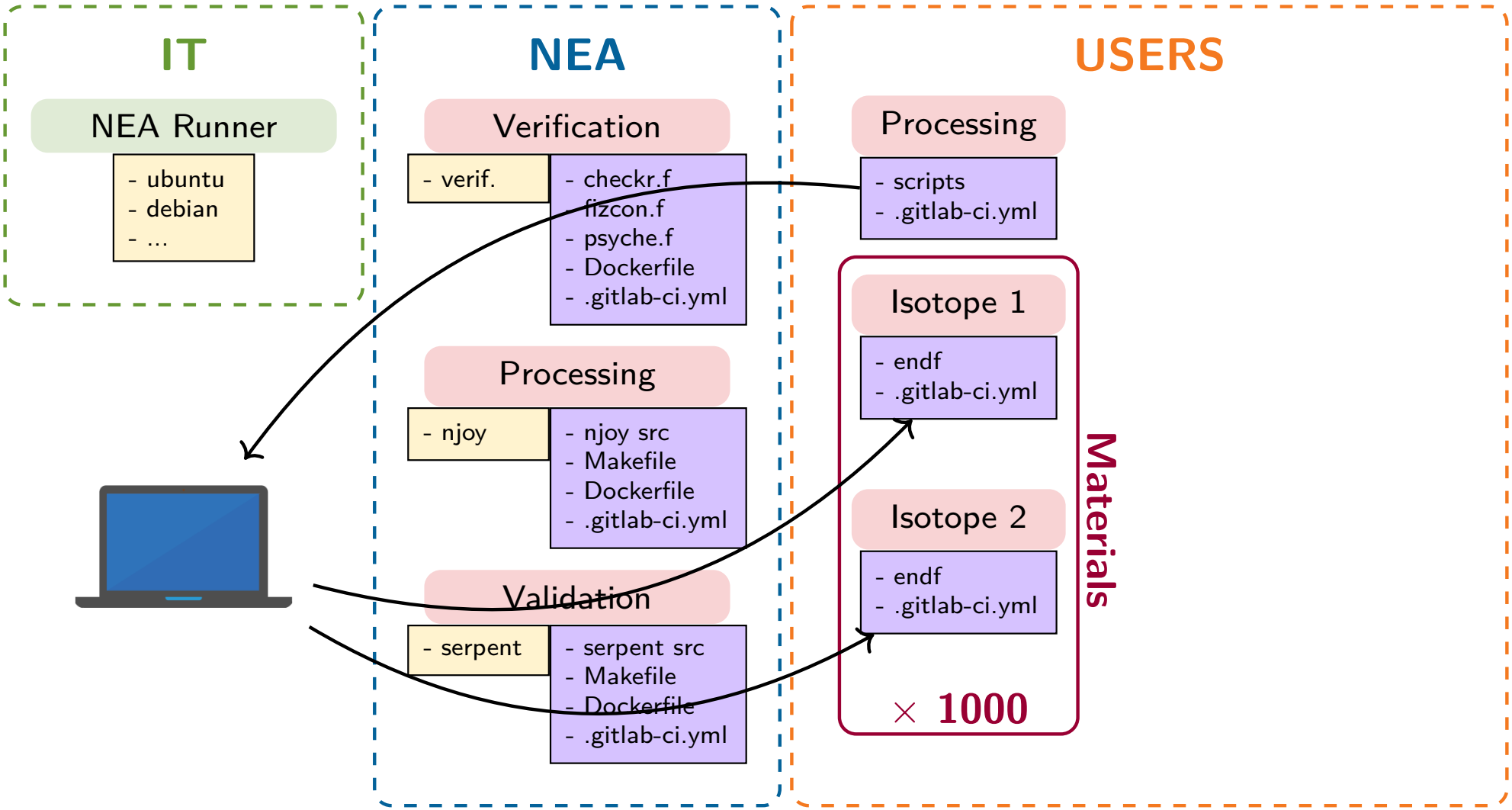


General scheme of the GitLab project



General scheme of the GitLab project

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The .yml file of the particular project points towart the general .yml file of the project Tools

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The general .yml file triggers the pipeline

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pipeline

c – f – p – n

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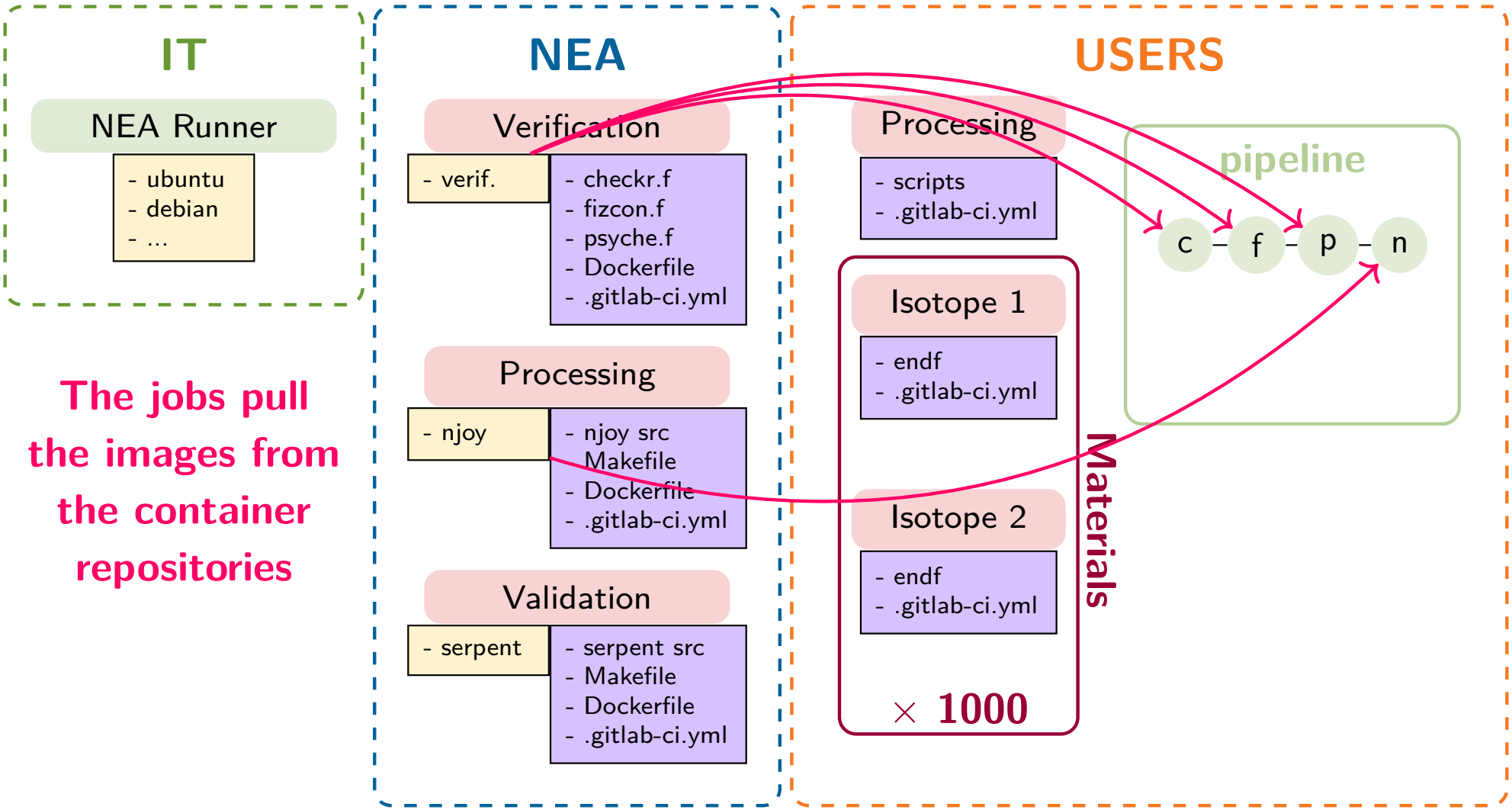
Materials

General scheme of the GitLab project



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The artifacts are collected and stored in the project's artifact repository

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