Akraino Technical Meetings Spring

IEC Type 4 AR/VR Blueprint

Link：https://wiki.akraino.org/pages/viewpage.action?pageId=6129521

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Overview

IEC Type 4 focuses on AR VR applications running on edge. In general, the architecture consists of three layers: Iaas(IEC), PaaS(Tars), SaaS(AR/VR Application).

Use Cases

There are multiple use cases for AR VR itemized below. For Release 4, we focus on building the infrastructure and virtual classroom application (Highlighted).

| Use Cases	Value Proposition
Operation Guidance	Predict the next step for the operations (like assembling Lego blocks, cooking sandwiches, etc) and help people to achieve a goal.
Virtual Classroom	Simulating a virtual classroom, which improves online education experiences for the teachers and students.
Sports Live	Augment and simulate the sports live, which gives the audiences an amazing immersive watching experience.
Gaming	Augment and simulate the game scenario, let players enjoy an immersive game world.

Use case: Virtual Classroom

Virtual Classroom is a basic app that allows you to live a virtual reality experience simulating a classroom with teachers and students.

- In Teacher mode
  - You will see the classroom as a teacher's view.
  - You can see some students are in the classroom and are listening to your presentation.

- In Student mode
  - you will see the classroom as a student's view.
  - You can see the teacher and other students on the remote side.

Overall Architecture of IEC Type 4 AR/VR

The whole architecture, shown below, consists of three nodes: Jenkins Master, Tars Master, and Tars Agent with AR/VR BP and CVB.
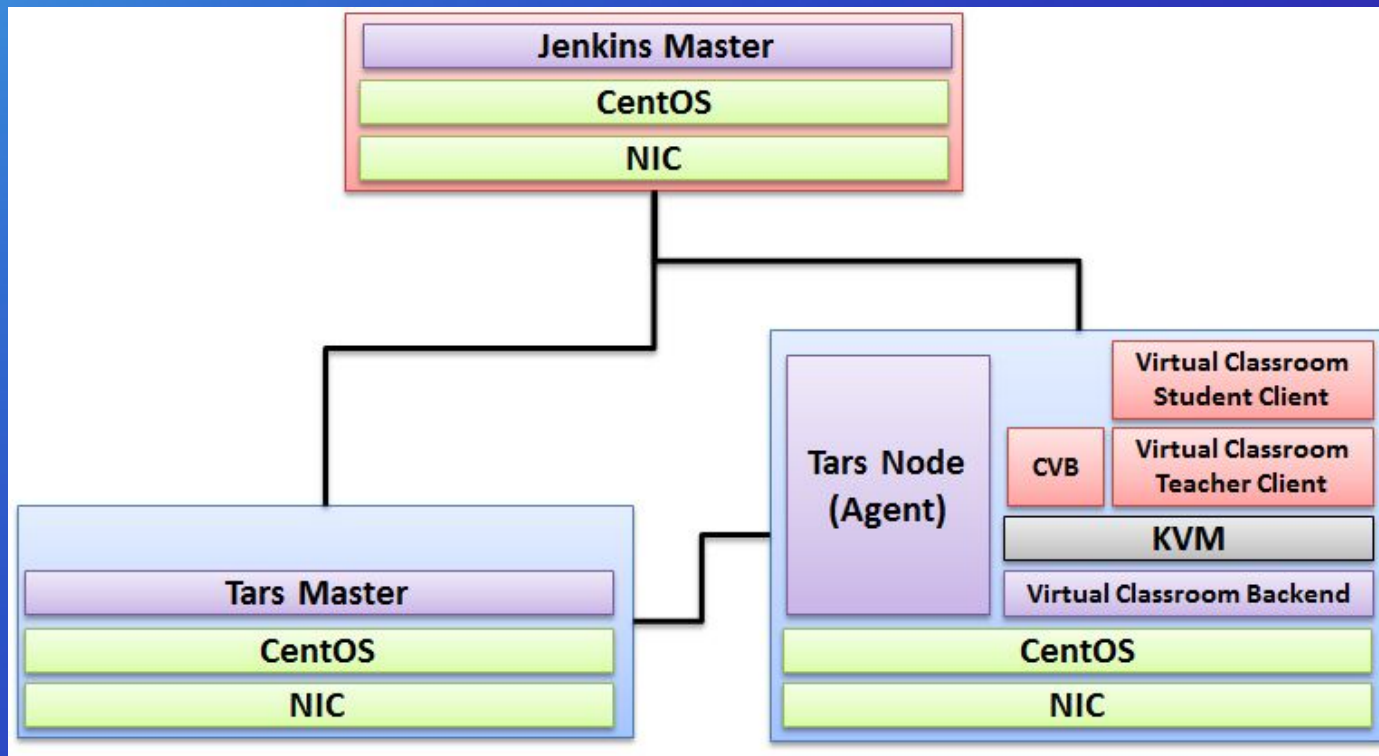
- For the Jenkins Master, we deploy a Jenkins Master for our private lab for testing

- For the Tars Master, we deploy a Tars Platform for serverless use case integration

- For the Tars agent, we deploy the Virtual Classroom backend on this node and two front end client as Virtual Classroom teacher and student on KVM.

Software Platform Architecture

TARS is a high-performance microservice framework based on name service and Tars protocol, also integrated administration platform, and implemented hosting-service via flexible schedule. TARS adds support for ARM and multiple platforms, including macOS, Linux and Windows.
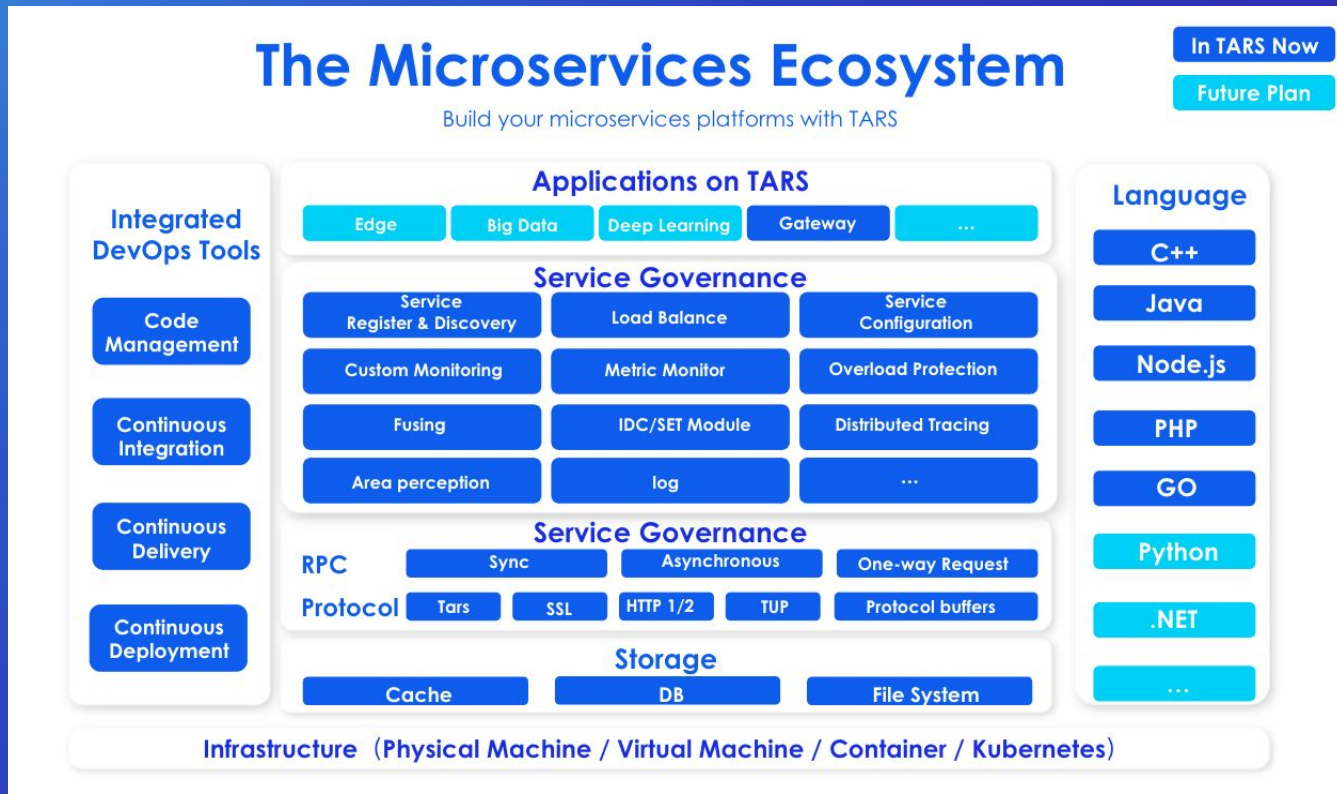
- For release 4, we update TARS to version 2.4.13 which supports multiple new features, such as API Gateway named TarsGateway that support to transfer HTTP protocol to TARS protocol.

- We provided a serial of TARS API to the Akraino API map. Including application management APIs and service management APIs.

Summary of IEC Type 4 AR/VR Release 4

- Focus on building the infrastructure and virtual classroom application.

- Deploy in Parserlabs.

- Use Jenkins to make CI/CD available.

- Update TARS to the version 2.4.13 which supports multiple new features

- Pass the security check and the validation lab check.
  - Lynis log : https://nexus.akraino.org/content/sites/logs/parserlabs/r4/jobs/iec-type4/lynis.log
  - Vuls log : https://nexus.akraino.org/content/sites/logs/parserlabs/r4/jobs/iec-type4/vuls.log

Planning for Release 5

- Deploy IEC Type 4 AR/VR on Kubernetes

- K8STARS is a convenient solution to run TARS services in kubernetes.
  - Maintain the native development capability of TARS.
  - Automatic registration and configuration deletion of name service for TARS.
  - Support smooth migration of original TARS services to K8S and other container platforms.
  - Non intrusive design, no coupling relationship with operating environment.

  - Service can be run as easy as one command like:
    - kubectl apply -f simpleserver.yaml

Thanks and Welcome to Join Akraino!