

Introduction

This document provides an overview of the Smart Cities blueprint as well as an overview of key features and implementations of PARSEC in Akraino Release 6.

Overview

Akraino Blueprint: Smart Cities

The purpose of Smart Cities blueprint is to provide edge computing platform base on Arm Soc , Improve deployment flexibility and security in the edge computing. The high-level relationships between the functional domains is shown in the figure below:

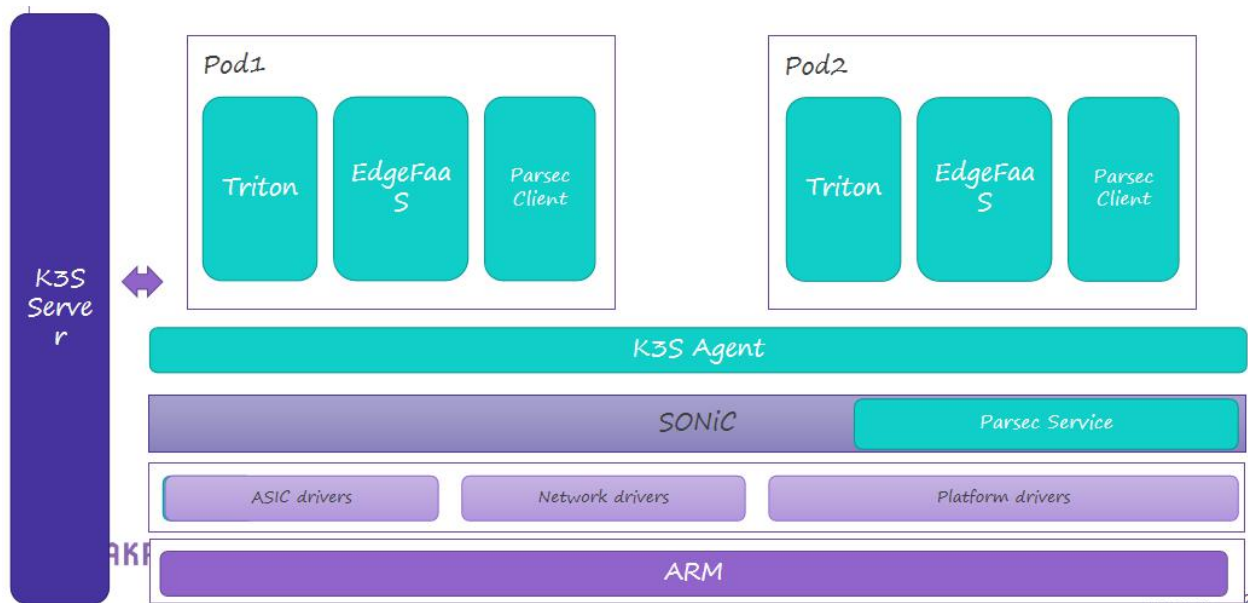


Figure 1. Smart Cities Functional Domains.

For the full description of the Smart Cities Reference Architecture please refer to the [Smart Cities Documents](#).

Smart Cities in Akraino R6

Key features and implementations in Akraino Release 6:

Based on the parsec codebase of release 5, more functions are added in release 6. The basic requirements of smart cities are considered. a lightweight demonstration application is designed and implemented. The demo program integrates K3S, edgefaas, Parsec ,and Triton multiple open source platforms on SONiC gateway device, and completes the ability of network access security verification and computing power registration of heterogeneous computing resource. Its overall structure is as follows:

Demo App Design:

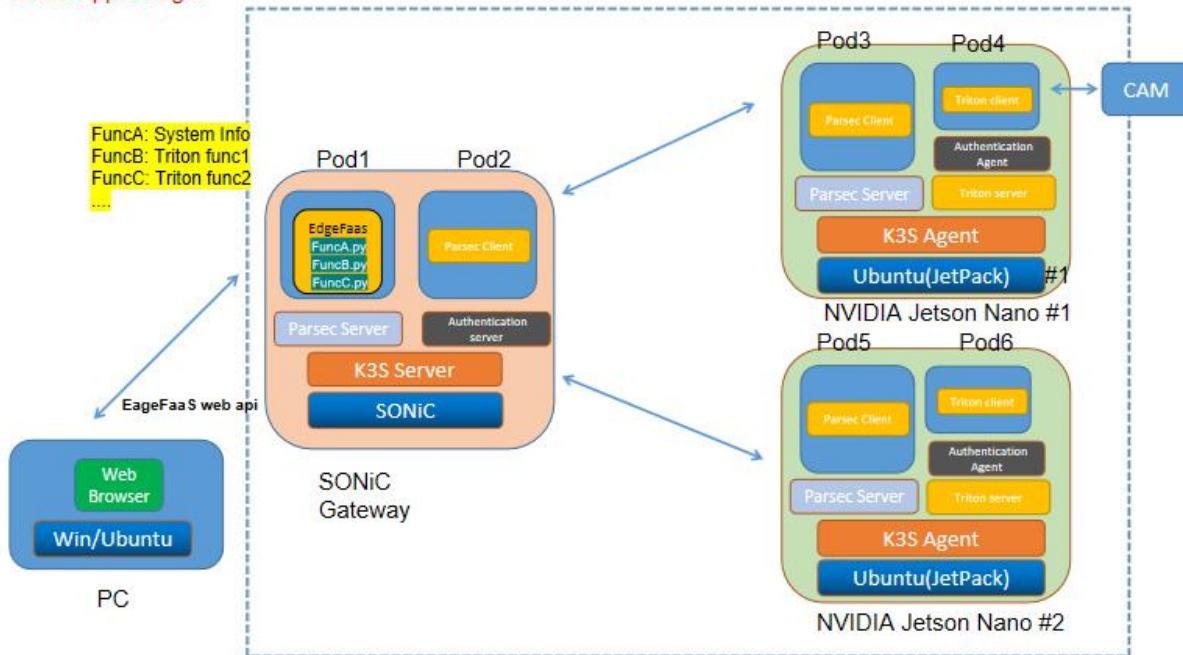


Figure 2. Overall design of demo application on SONiC gateway

Based on this architecture, the following six use cases are implemented:

- Use case1: Device(NVIDIA Jetson Nano #1) join network. In this use case, parsec is used for authentication and encryption to realize the security authentication of devices newly joined to the network.
- Use case2: Get cluster system info by EdgeFaaS from SONiC gateway.
- Use case3: Image recognition by Triton on device(NVIDIA Jetson Nano #1).
- Use case4: Get camera image by device(NVIDIA Jetson Nano #1) and provide to PC user.
- Use case5: Update new Func on SONiC gateway by EdgeFaaS.
- Use case6: PC get Api list by EdgeFaaS on SONiC gateway.

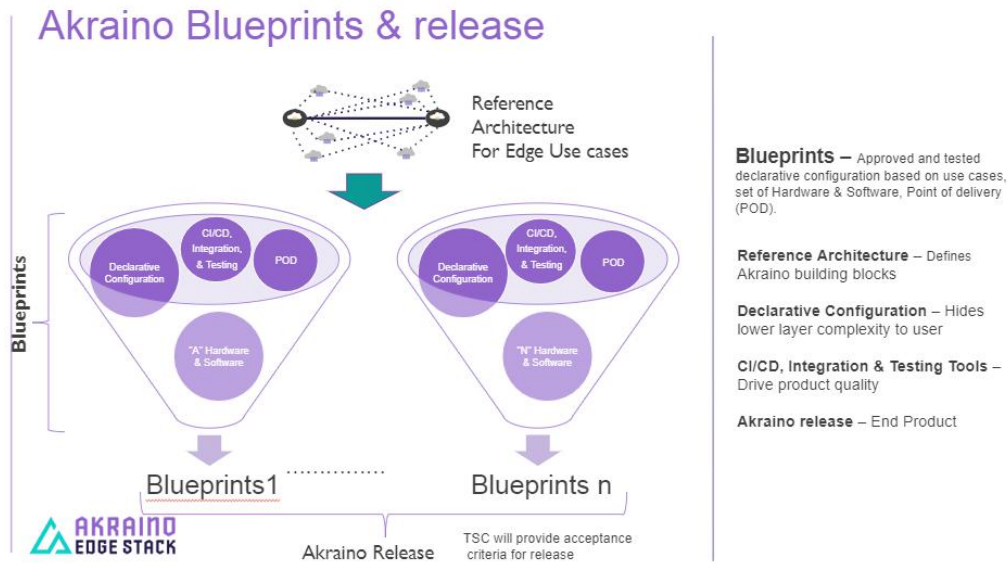
For more information of Smart Cities blueprint:

<https://wiki.akraino.org/display/AK/Smart+Cities>



Akraino Edge Stack is an open source project under the LF Edge umbrella that creates edge software stacks that supports high-availability cloud services optimized for edge computing systems and applications. It offers users new levels of flexibility to scale edge cloud services quickly, to maximize the applications and functions supported at the edge, and to help ensure

the reliability of systems that must be up at all times. The Akraino Edge Stack platform integrates multiple open source projects to supply a holistic Edge Platform, Edge Application, and Developer APIs ecosystem.



Akraino uses the “blueprint” concept to address specific Edge use cases to support an end-to-end solution.

A blueprint is a declarative configuration of the entire stack-- i.e., edge platform that can support edge workloads and edge APIs.

To address specific use cases, a blueprint architecture is developed by the community and a declarative configuration is used to define all the components used within that architecture such as hardware, software, tools to manage the entire stack, and method of deployment (Blueprints are maintained using full CI/CD integration and testing by the community for ready download and install).

For more information: <https://www.lfedge.org/projects/akraino/> or <https://wiki.akraino.org/>.



Akraino is part of the LF Edge umbrella organization that establishes an open, interoperable framework for edge computing independent of hardware, silicon, cloud, or operating system. By bringing together industry leaders, LF Edge creates a common framework for hardware and software standards and best practices critical to sustaining current and future generations of IoT and edge devices.

LF Edge Projects address the challenge of industry fragmentation, and collaborates with end users, vendors, and developers to transform all aspects of the edge and accelerate open source developments.

www.lfedge.org