

IEC Type 5 is an Akraino approved blueprint and part of Akraino Edge Stack. The project is focused on SmartNIC,which could accelerate network performance and provide more management convenience. In general, the architecture consists of two layers:  Iaas(IEC), SmartNIC layer. But in R3, we have two simple layers: Host Layer, SmartNIC Layer.

**Akraino Blueprint:** IEC Type 5 SmartNIC Blueprint



**Overview**

IEC Type 5 is focused on SmartNIC Datacenter Services across all clouds.

**Use Case**

For Release 3, we focus on implementation of OVS-DPDK offload into SmartNIC, which architecture is described as the diagram below.



The R3 release evaluates the throughput and packet forwarding performance of the Mellanox BlueField SmartNIC card. A DPDK based Open vSwitch (OVS-DPDK) is used as the virtual switch, and the network traffic is virtualized with the VXLAN encapsulation.

Since the community version OVS-DPDK is considered experimental and not mature enough, which only supports “partial offload” and lacks of utilization of the full performance advantage of Mellanox NICs. Thus the OVS-DPDK we used is a fork of the community Open vSwitch. We develop our own offload code which enables the full hardware offload with DPDK rte\_flow APIs.

To Deploy the Test architecture, we use a private Jenkins and an Intel server equipped with a BlueField v1 SmartNIC and Ansible to automatically setup the filesystem image and install the OVS-DPDK in the SmartNICs. The test architecture is shown as below.



* The File Server is a simple Nginx based web server where stores the BF drivers, FS image.
* The Git repo is our own git repo where hosts OVS-DPDK and DPDK code.
* The Jenkins will use ansible plugin to download BF drivers and FS image in the test server and setup the environment according to the ansible playbook.

The testbed setup is shown in the below diagram. (DUT: Device Under Test)



|  |  |
| --- | --- |
| **Type** ​ | **Description**​ |
| SmartNICs | BlueField v1, 25Gbps |
| vSwitch | OVS-DPDK 2.12 with VXLAN DECAP/ENCAP offload enabled. |
| DPDK | version 19.11 |

**Key features in R3:**

* Host layer
* SmartNIC layer
* OVS-DPDK offload in SmartNIC

For more information:

[https://wiki.akraino.org/display/AK/Release+3+Documentation+for+IEC+Type+5%3A+SmartNIC+for+Integrated+Edge+Cloud+%28IEC%29+Blueprint+Family?src=contextnavpagetreemode](https://wiki.akraino.org/display/AK/Release%2B3%2BDocumentation%2Bfor%2BIEC%2BType%2B5%3A%2BSmartNIC%2Bfor%2BIntegrated%2BEdge%2BCloud%2B%28IEC%29%2BBlueprint%2BFamily?src=contextnavpagetreemode)

Akraino R3 is now available! More details available here:

[https://wiki.akraino.org/display/AK/Release+3+Planning](https://wiki.akraino.org/display/AK/Release%2B3%2BPlanning)

[BACK]



Akraino Edge Stack, an open source project under the LF Edge umbrella that aims to create 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 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/>.

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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.

**[Insert Logos for**: Akraino, EdgeX Foundry, Glossary of Edge Computing Home Edge, Project EVE]

[www.lfedge.org](http://www.lfedge.org)