SC21 Network Research Exhibition: Demonstration Abstract

Kubernetes with International P4 Experimental Networks for The Global Research Platform and Other Research Platforms

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Abstract

Recent successes of implemented "research platforms" has been demonstrated. These platforms are based on architecture consisting of different orchestration techniques (e.g., Kubernetes), low management overhead, and tenant-oriented applications. This approach has focused services for research science communities, especially for data intensive science. For most research platforms usage scenarios, isolation between different research services and other multi-tenant support functions has not been a high priority concern. However, for research testbeds such as the International P4 Experimental Networks testbed, isolation between different tenant projects is important for majority of its P4 research projects.

Goals

This demonstration will illustrate the challenges to enabling Kubernetes integration with P4 Experimental Network Services over the Global Research Platform (GRP). This SC21 NRE demonstration will also showcase solutions to those challenges:

(1) P4 software only Experimental Network Services in a container/Kubernetes environment with a cluster in the Global Research Platform.

(2) P4 hardware only Experimental Network Services in a Container/Kubernetes environment with a dedicated cluster in the Global Research Platform.

(3) P4 integrated hardware and software as Experimental Network Services in a Container/Kubernetes for the Global Research Platform.

(4) Prototype Kubernetes L2 and L3 network integration with P4 Experimental Network Services for Global Research Platform.

Resources

(1) Selected US and international iP4EN sites will participate in these demonstrations.

(2) With support from SC21 SCinet team, vlans will be implemented from StarLight over a 100G path to show floor and public L3 route from StarLight booth to PRP/TNRP/GRP sites and other partner booths at SC21.

Involved Parties

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The current International P4 Experimental Networks and testbeds configuration is shown below:

GRP Service: International P4 Experimental Networks (iP4EN)