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#KubeCon #CloudNativeCon

Run Kubernetes pods on a Slurm-based HPC center

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From pods to Slurm/batch jobs



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```
apiVersion: v1
kind: Pod
metadata:
  name: nginx
spec:
  containers:
  - name: nginx
    image: nginx:1.14.2
    ports:
    - containerPort: 80
```

```
#!/bin/bash
```

```
#Slurm job options (name, count)
#SBATCH --job-name=proj_1
#SBATCH --time=0:01:0
#SBATCH --exclusive
#SBATCH --nodes=1
#SBATCH --ntasks=1
#SBATCH --tasks-per-node=1
#SBATCH --cpus-per-task=1
```




slurm
workload manager

How can your k8s run pods on external batch clusters?



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Schema credits to Nobuyuki Tamaoki - virtualtech.jp

It does that **seamlessly** thanks to [interLink CNCF Sandbox project](#)

- No CRDs
- No root/administrative network privileges

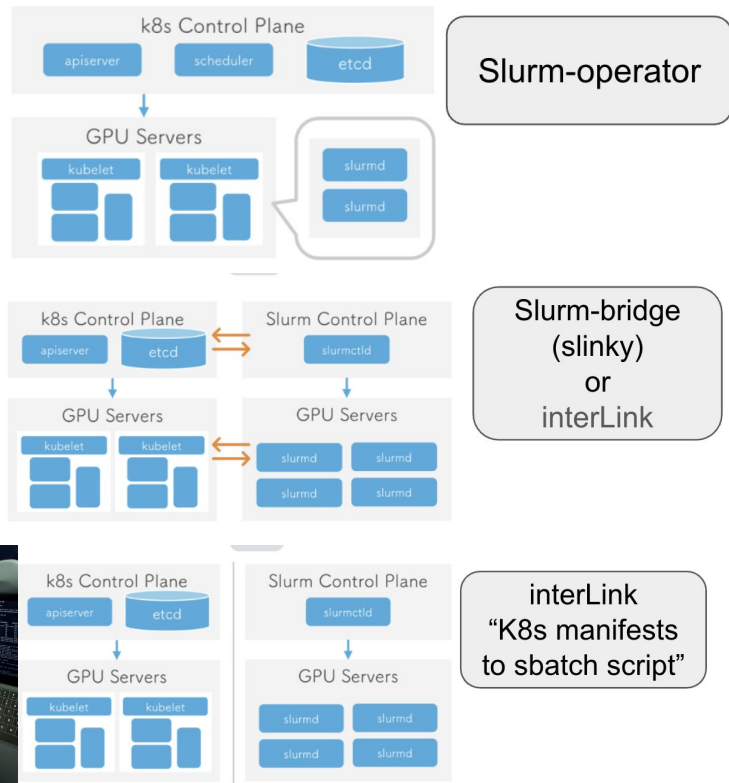


Note that here we **DO NOT** mean Slurm:

- Under K8s
- Nor Side-by-side: “adjacent” resources
 - It can also work though!

We **really mean REMOTE** → k8s nodes do not know about Slurm nodes (they could not connect, unless you use interLink :))

It can be “closely” remote (within a same center) or distant...
... like this distant



Requirements



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Kubernetes:

- 1.34+ (probably even less recent, never tested though)
- Ingress with Wildcard DNS (optional, only for network overlay)
 - Or any equivalent approach

SLURM:

- Container runtime on the nodes → apptainer/enroot/...
- Job SharedFS accessible from edge/login node
- “unshare --net” permitted (optional, only for network overlay)

2(+1) components



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Virtual Kubelet provider on your **k8s cluster**
+
interLink server on the remote HPC **edge/login node**
+
network plugin (optional)

1. Install interLink on edge/login node
2. Install kubernetes interlink virtual kubelet provider
3. Configure your kubernetes Pod (any pod, wheter is created by you or by any fw like KubeFlow) to **target the just-created virtual node**
4. (optional) enable userlevel overlay network to get seamless connectivity with internal pod network



Today demo runs here!

Meet Leonardo!

The italian HPC@CINECA

Here we go!

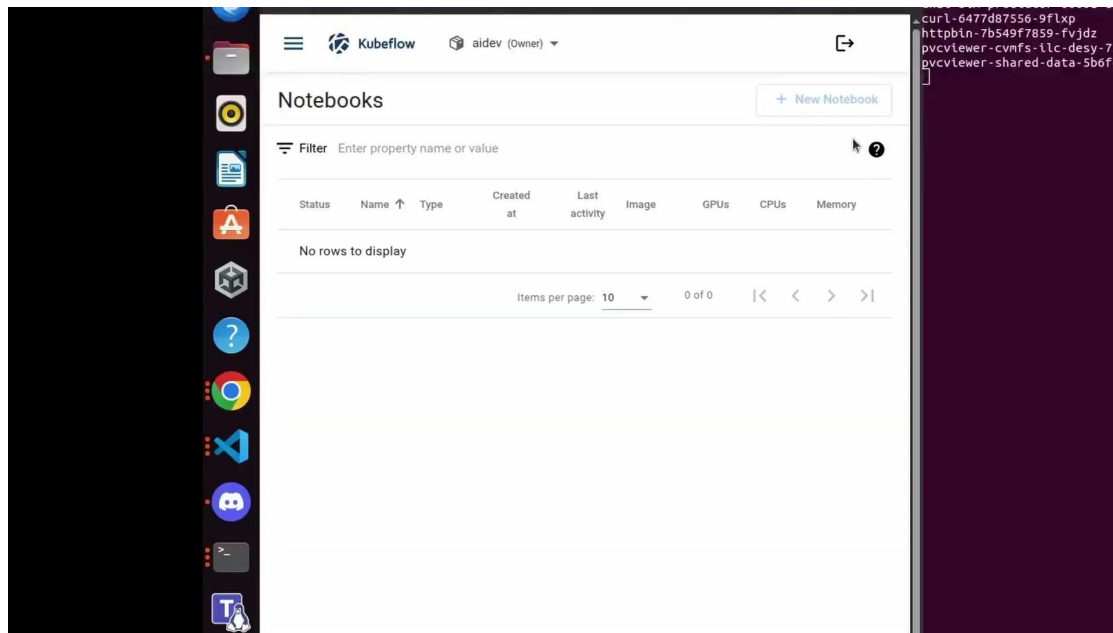
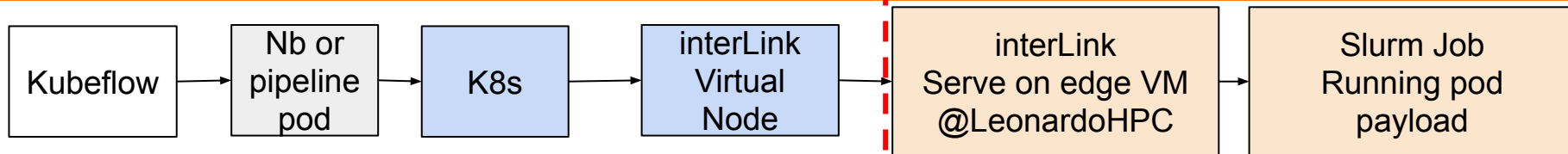


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← Credits to
Giulio Bianchini maintainer



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**Wanna have
some more
live hacking?**

**Wednesday 10:00-13:30
Kiosk P-24A - Hall 5**

You can see how this can work even from your laptop!

Website



... or reach out on slack!