

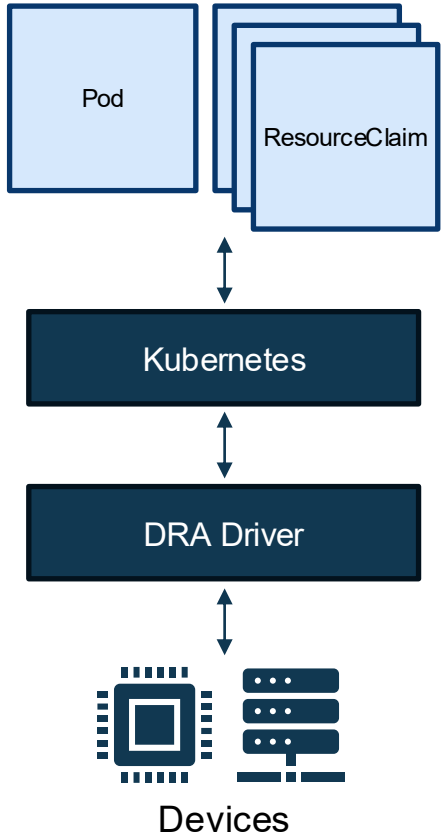
All Things DRA in One Place: DRA Example Driver Deep Dive

Jon Huhn, Microsoft



Dynamic Resource Allocation (DRA) in a Nutshell

- Allow Kubernetes workloads to use specialized hardware
  - Schedule Pods on Nodes where devices are available
  - Connect devices to containers
- DRA drivers provide vendor-specific details



DRA Drivers

KubeCon CloudNativeCon North America 2026

kubernetes-sigs/**dra-driver-nvidia-gpu**

DRA Driver for NVIDIA GPUs

72 Contributors · 126 Issues · 16 Discussions · 729 Stars · 216 Forks

ROCm/**k8s-gpu-dra-driver**

K8s DRA driver for AMD GPUs

15 Contributors · 18 Issues · 30 Stars · 26 Forks

intel/**intel-resource-drivers-for-kubernetes**

16 Contributors · 6 Issues · 43 Stars · 24 Forks

kubernetes-sigs/**dra-driver-google-tpu**

Kubernetes DRA Driver for Google TPUs

9 Contributors · 1 Issue · 17 Stars · 8 Forks

kubernetes-sigs/**dra-driver-cpu**

Kubernetes DRA driver for exclusive, topology-aware CPU allocation for high-performance workloads

22 Contributors · 45 Issues · 69 Stars · 34 Forks

kubernetes-sigs/**dranet**

DRANET is a Kubernetes Network Driver that uses Dynamic Resource Allocation (DRA) to deliver high-performance networking for demanding applications in...

39 Contributors · 24 Issues · 167 Stars · 73 Forks

kubernetes-sigs/**dra-example-driver**

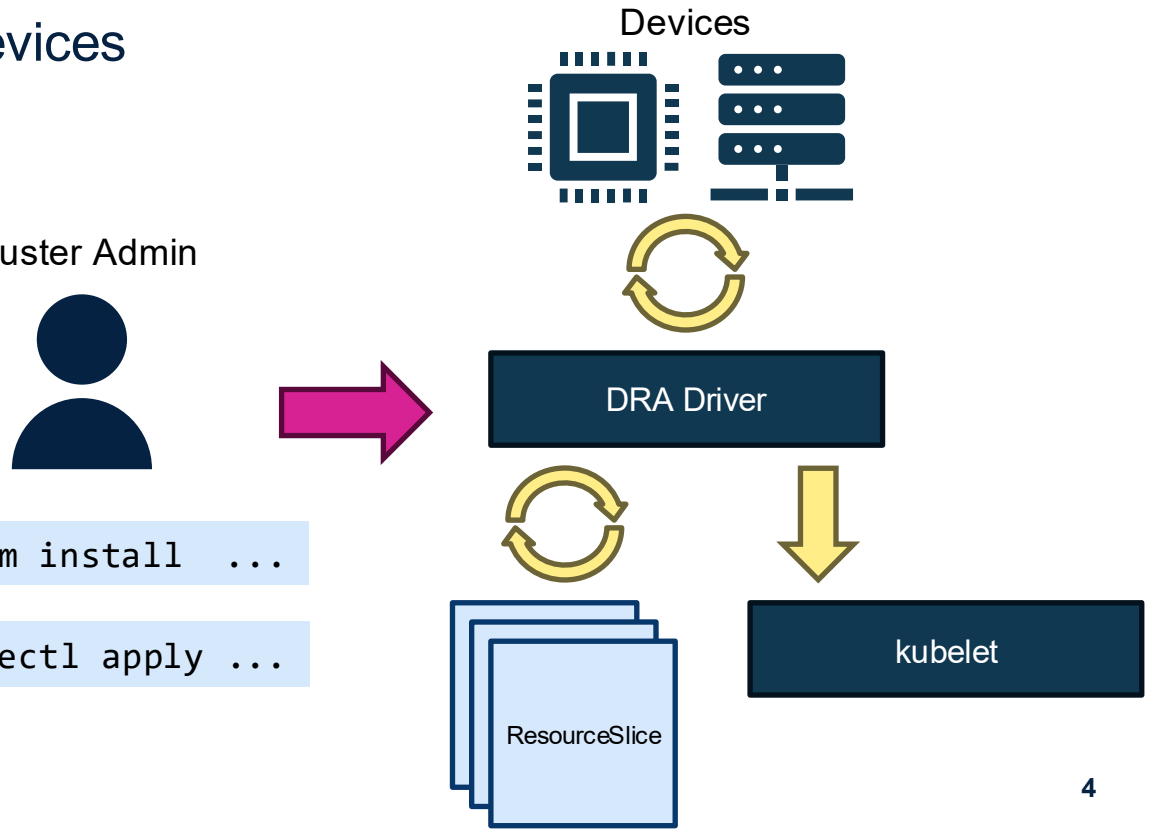
Example DRA driver that developers can fork and modify to get them started writing their own.

36 Contributors · 9 Issues · 150 Stars · 127 Forks

The Role of a DRA Driver: Cluster Setup

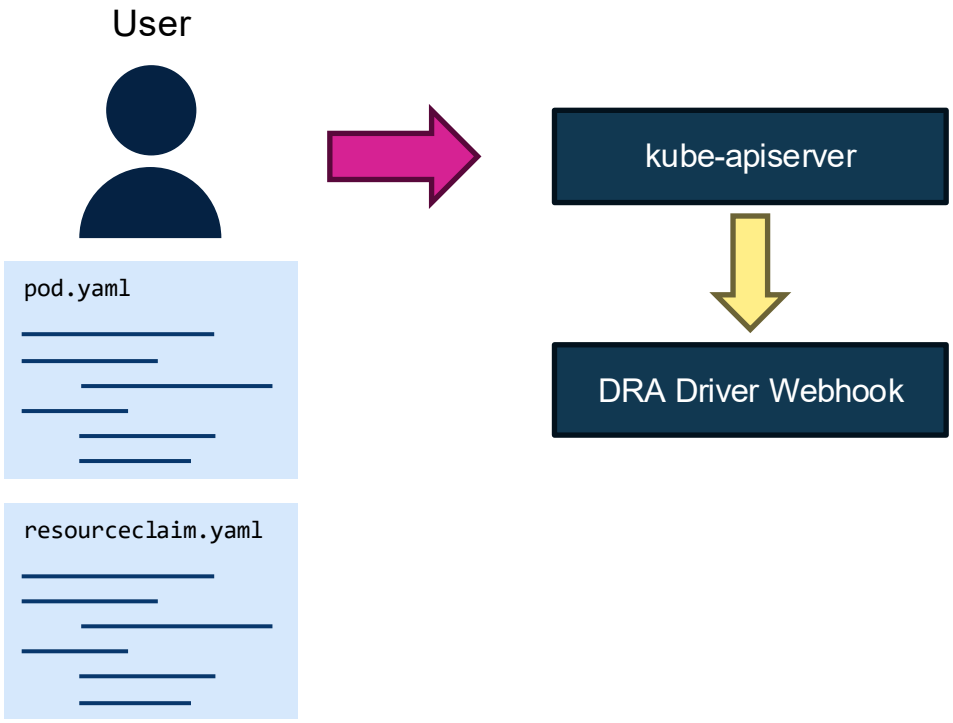
- Discover and advertise devices
- Monitor device health

- Example Driver
  - Device profiles
  - Simulated health



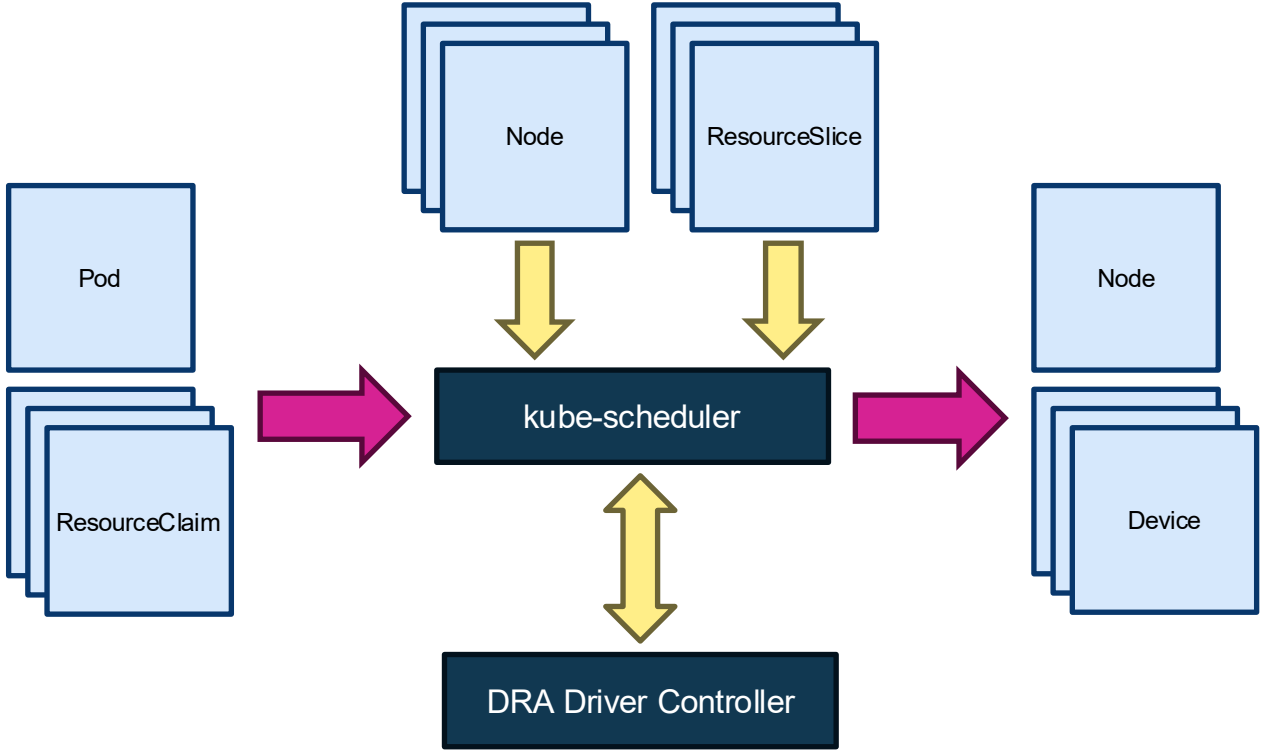
The Role of a DRA Driver: Creating Workloads

- Webhook validates ResourceClaim device config
- Example Driver
  - GpuConfig validation



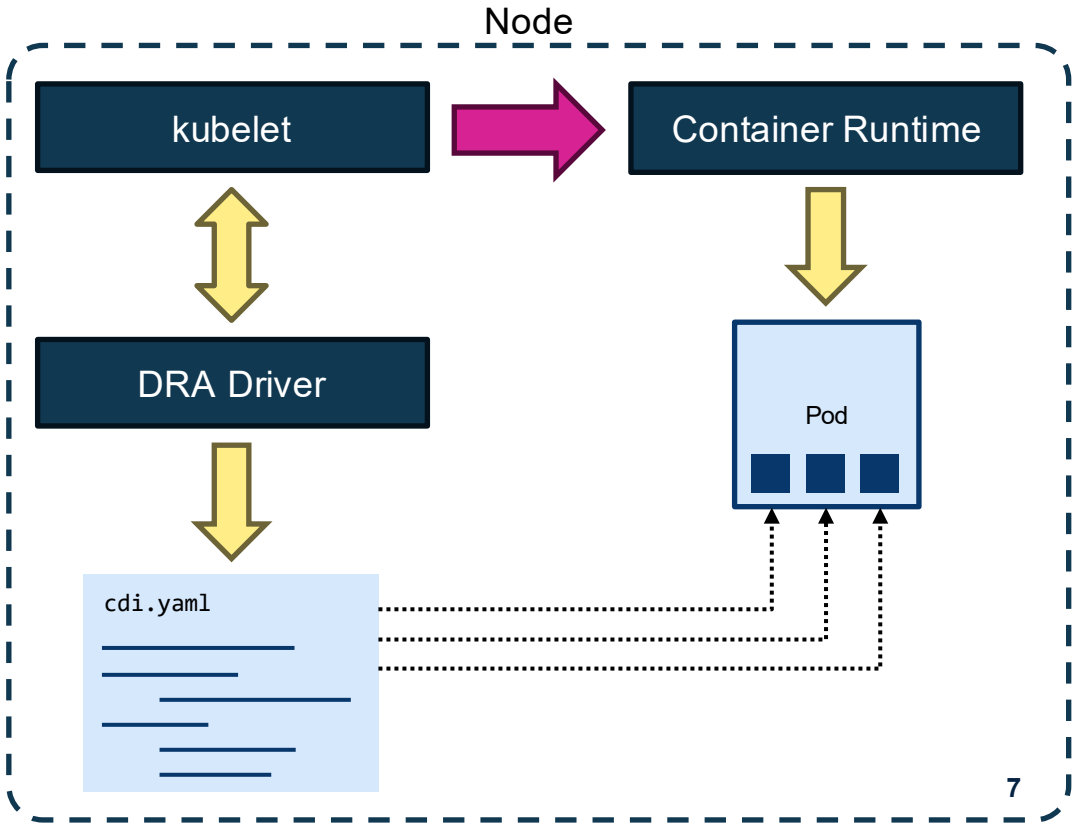
The Role of a DRA Driver: Scheduling

- Signal devices ready to bind
- Example Driver
  - Adds binding conditions



The Role of a DRA Driver: Pod Startup

- Write Container Device Interface (CDI) configuration
- Example Driver
  - Configures environment variables

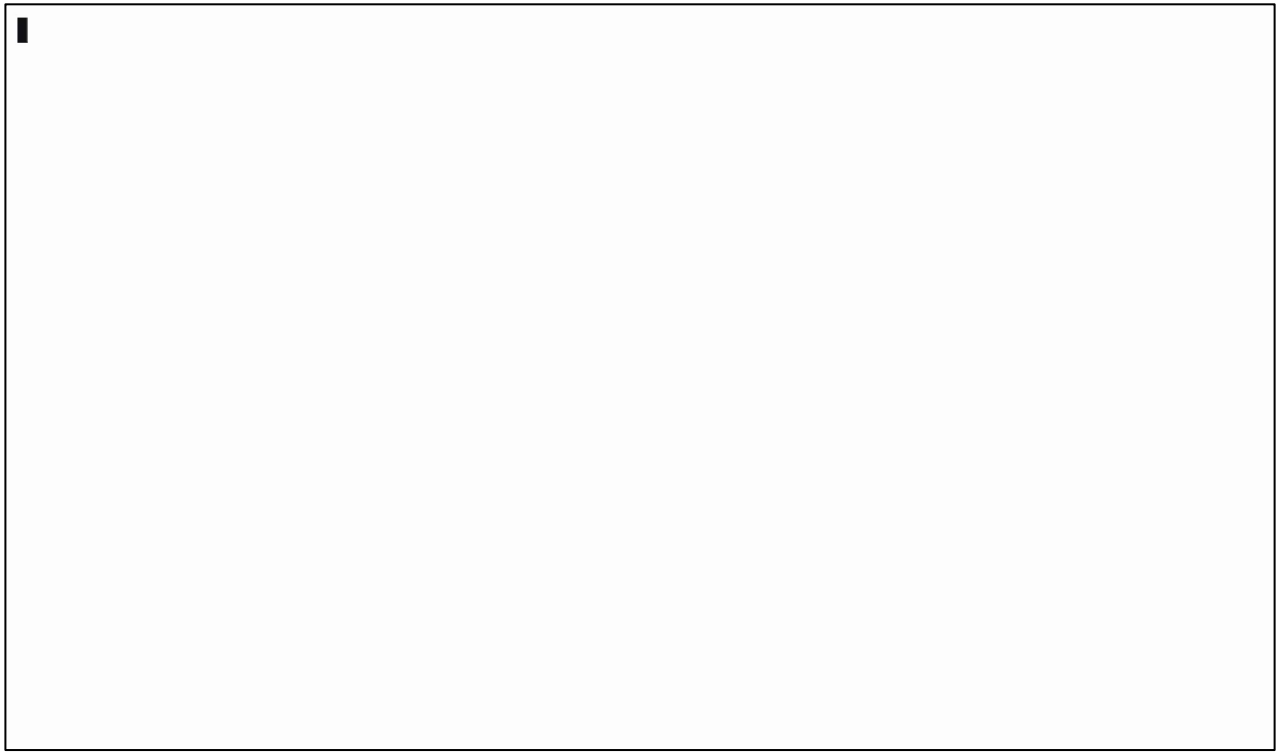


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Demos!

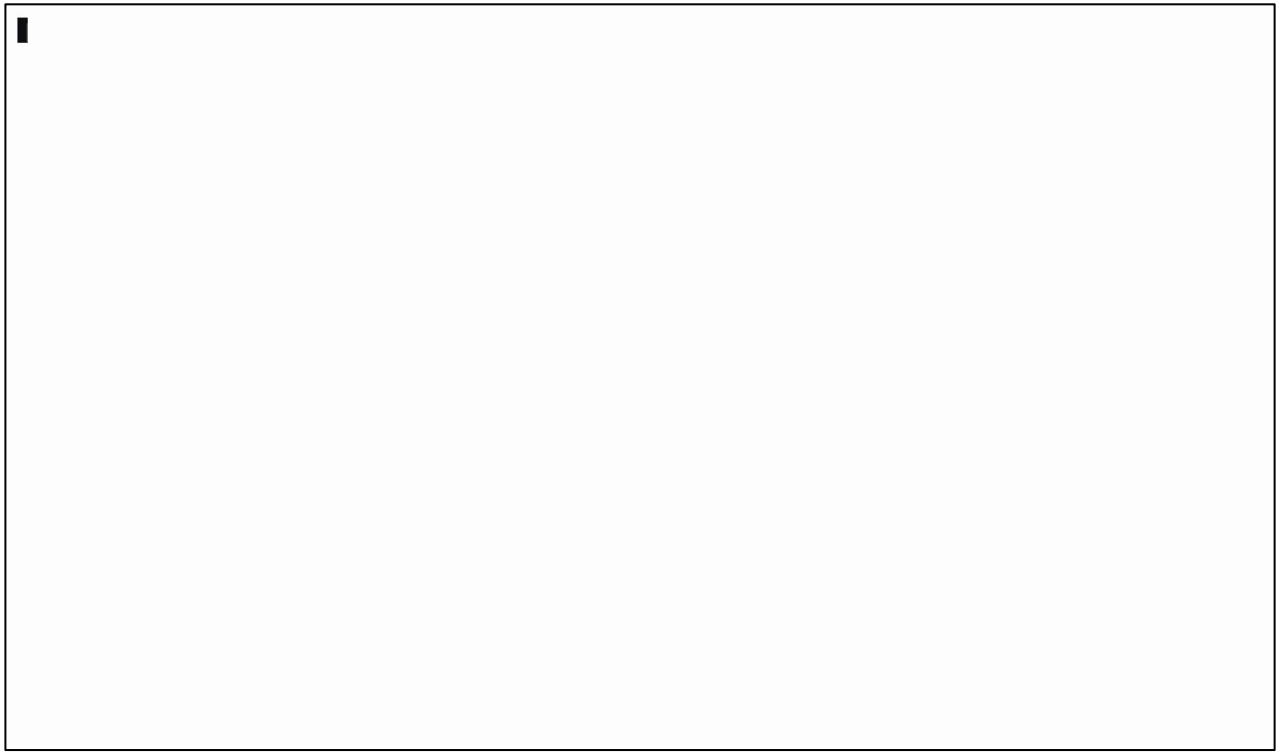


Demo: Getting Started



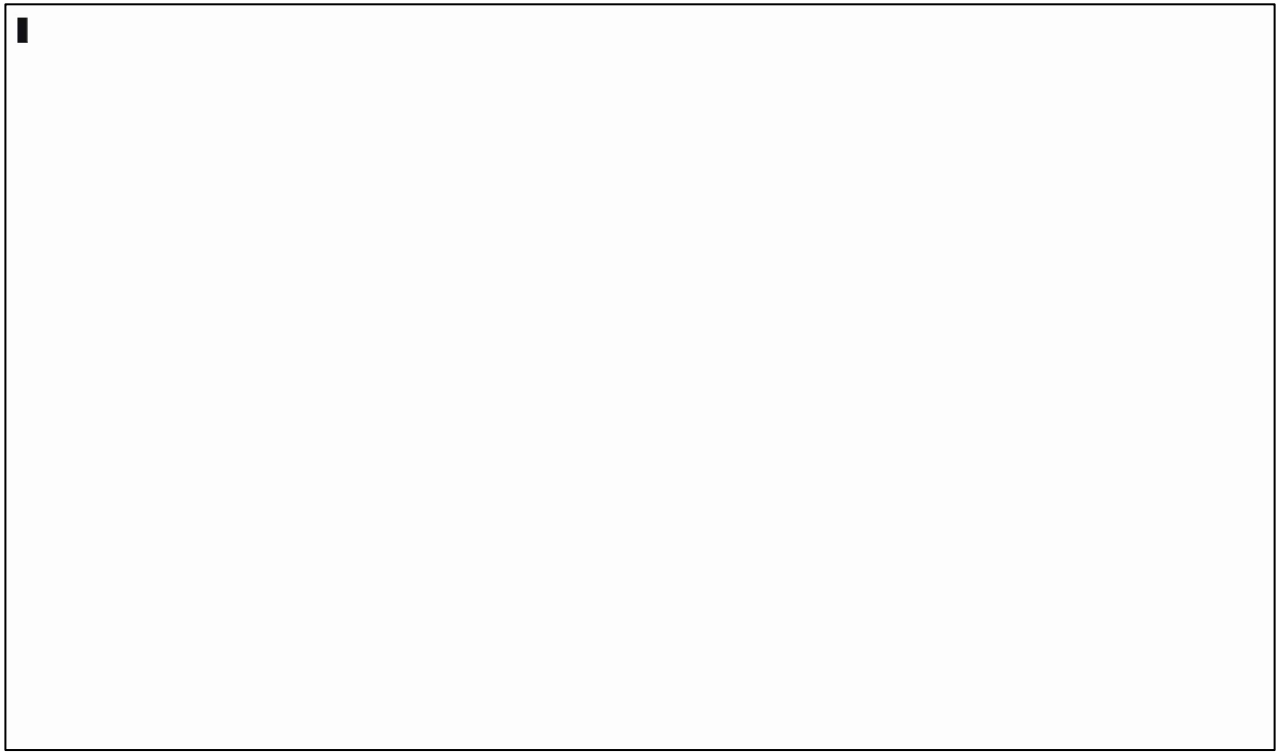
Text version

Demo: Config Validation



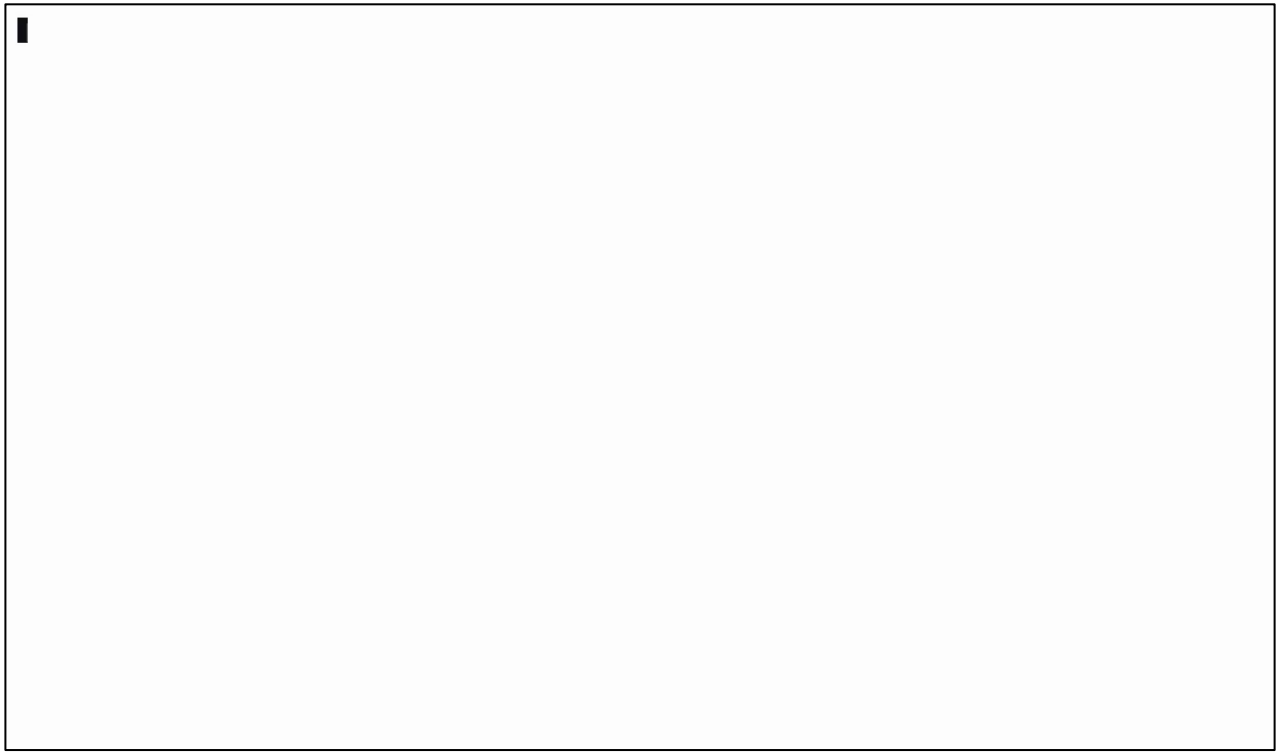
Text version

Demo: Device Health Reporting



Text version

Demo: Aligned GPU+NIC



Text version

“What is my purpose?”

Learn how to use DRA

Developing DRA drivers

Verify DRA integrations

Developing DRA Drivers

- Create a new driver from scratch
- Implement new DRA features
- Best practices

Learn How to Use DRA

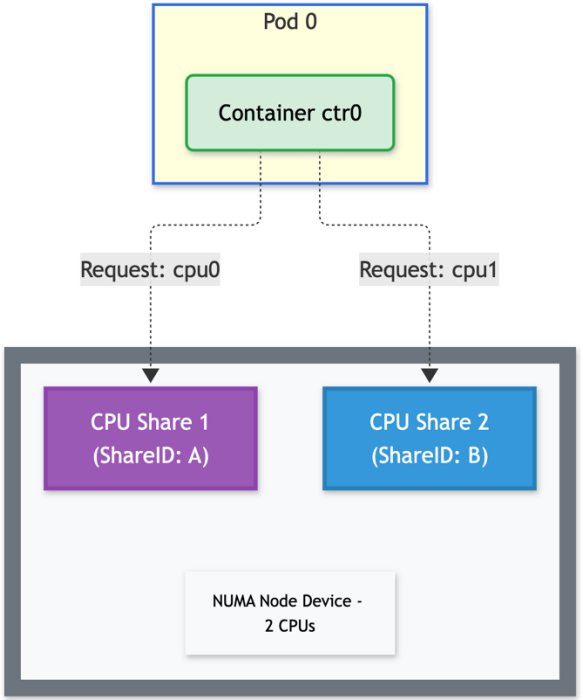
- admin-access
- basic-multiple-requests
- basic-resourceclaim-opaque-config
- basic-resourceclaimtemplate
- basic-shared-claim-across-containers
- basic-shared-claim-across-pods
- binding-conditions
- cel-selector
- device-taints-tolerations
- extended-resource-request
- gpu-allow-multiple-allocations-partitionable
- gpu-allow-multiple-allocations
- health-reporting
- initcontainer-shared-gpu
- native-resource-request
- net-consumable-capacity
- partitionable-devices
- podgroup-resourceclaimtemplate
- podresources-api
- prioritized-alternatives

Outline

Filter headings

Native Resource Request Example

- Overview
- CPU Allocation
- Requirements
  - Driver Requirements
  - Cluster Requirements
- How to Run
  - 1. Install the Driver with CPU Profile
  - 2. Apply the Example
  - 3. Verify the Pod is Running
  - 4. Check Resource Allocation
- Expected Output
- Cleanup



DRA Integrations



Kubeflow



KUBERMATIC



kubernetes



KubeVirt



Kueue



slurm



VOLCANO

...and more!

Example Driver DRA Feature Status

Implemented ✅

- DynamicResourceAllocation
- DRAAdminAccess
- DRAConsumableCapacity
- DRADeviceBindingConditions
- DRADeviceTaintRules
- DRADeviceTaints
- DRAExtendedResource
- DRANodeAllocatableResources
- DRAPartitionableDevices
- DRAPrioritizedList
- DRAResourceClaimDeviceStatus
- DRAResourceClaimGranularStatusAuthorization
- DRAWorkloadResourceClaims
- ResourceHealthStatus
- ResourceHealthStatusMessage

Not (yet) Implemented ❌

- DRADerivedAttributes
- DRADeviceCompatibilityGroups
- DRAFractionalCapacityRange
- DRAListTypeAttributes
- DRAOptionalNodeOperations
- DRAPartitionableDevicesType
- DRAResourcePoolStatus

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Thank you to all contributors!

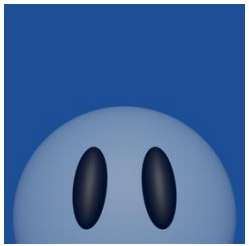


Get Involved!

KubeCon CloudNativeCon North America 2026

GitHub repo

K8s Slack:
#wg-device-management



GitHub: @nojnhuh
K8s Slack: @nojnhuh