



ACCELERATING THE ADOPTION OF HARDWARE ACCELERATORS IN K8S

Software defined Data Centre solutions Group
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AGENDA

Device Plugin Overview
Intel® QuickAssist Technology Device Plugin
Flow of QuickAssist Device Plugin enablement in k8s
Demo

DEVICE PLUGINS OVERVIEW

CHALLENGES

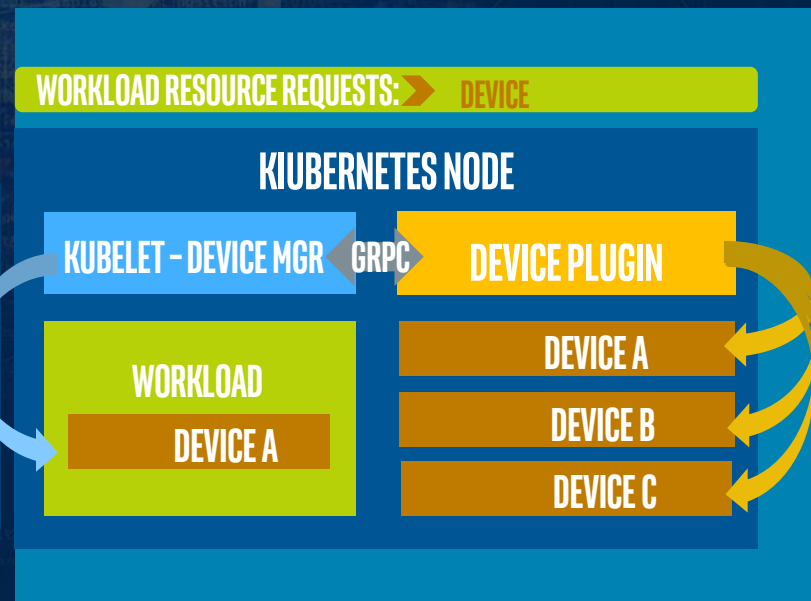
- Device vendors have to write custom Kubernetes code in order to integrate their device with the ecosystem
- Results in multiple vendors maintaining custom code making it difficult for a customer to consume

RESOLUTION

- Device plugin framework provides a vendor independent solution for discovery, advertisement, allocation and health check of external devices
- Registers with kubelet via Registration gRPC service
- A plugin is a simple gRPC server that implements RPCs
- Plugins can be easily deployed (manually/ as a Daemon set)
- Device requests are made via extended resource requests in the Pod

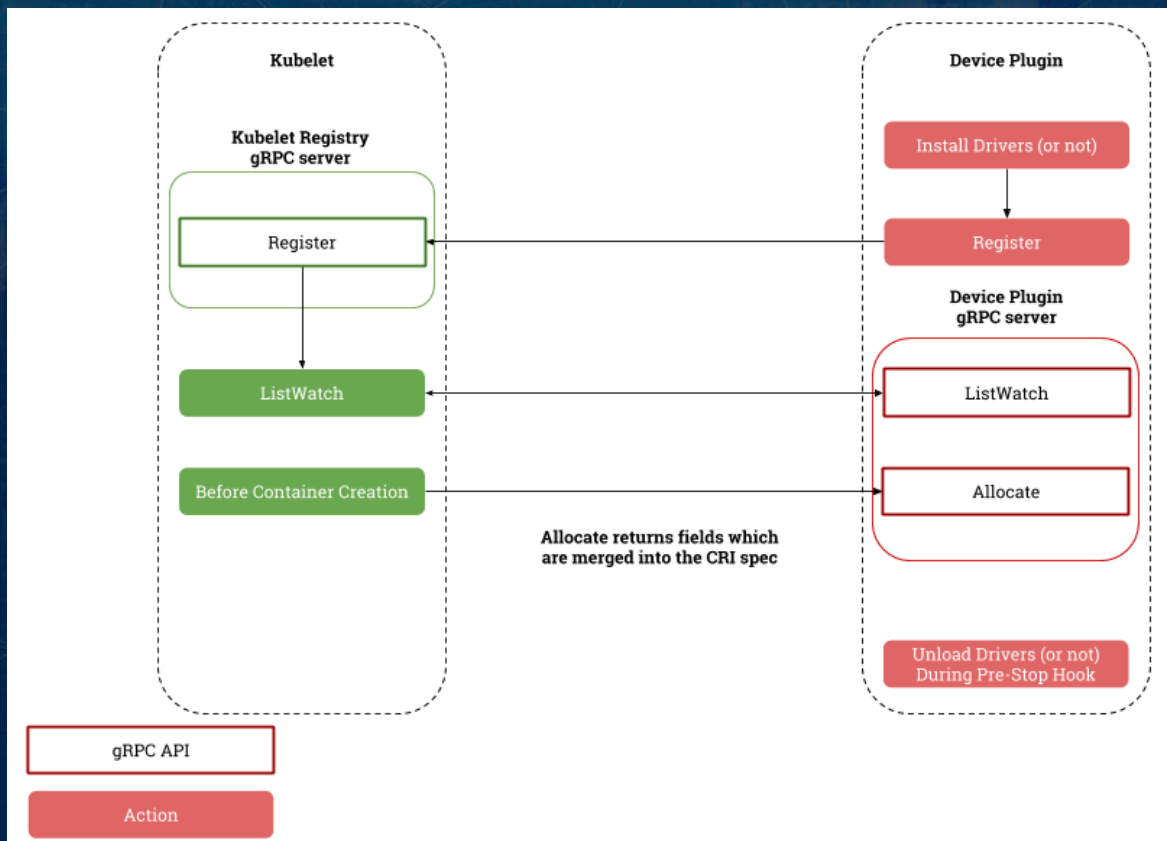
BENEFITS

- A consistent, general and portable framework for users to consume hardware devices across k8s clusters.



REFERENCE: <https://kubernetes.io/docs/concepts/cluster-administration/device-plugins/>

K8S DEVICE PLUGIN IMPLEMENTATION



REFERENCE: <https://github.com/kubernetes/community/blob/master/contributors/design-proposals/resource-management/device-plugin.md>

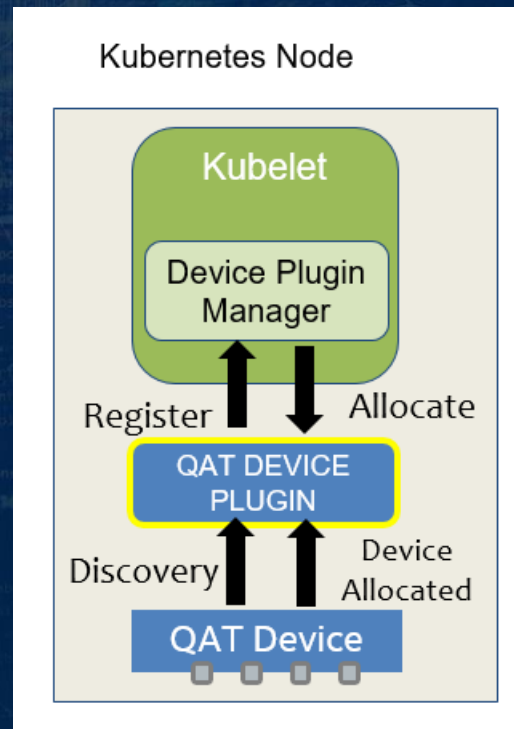
INTEL® QUICKASSIST TECHNOLOGY DEVICE PLUGIN- SUPPORT IN K8S

Intel® QuickAssist Technology

- Intel® QAT is an acceleration technology for cryptography and compression
- It benefits applications in Cloud, Networking, Big data and Storage

Intel® QAT support in K8s

- QAT support enabled through Device plugin framework
- QAT Device Plugin discovers QAT support on a node and the number of VFs configured, advertises this to the node and allocates VFs based on workload resource requests

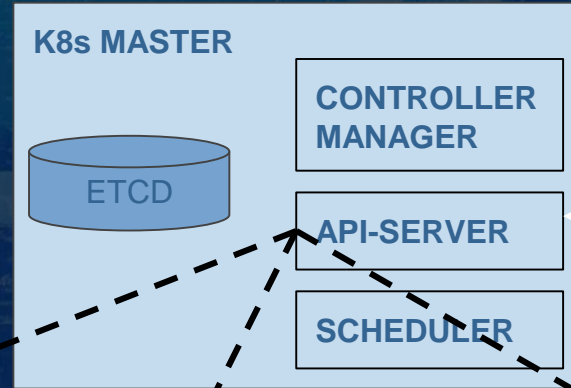


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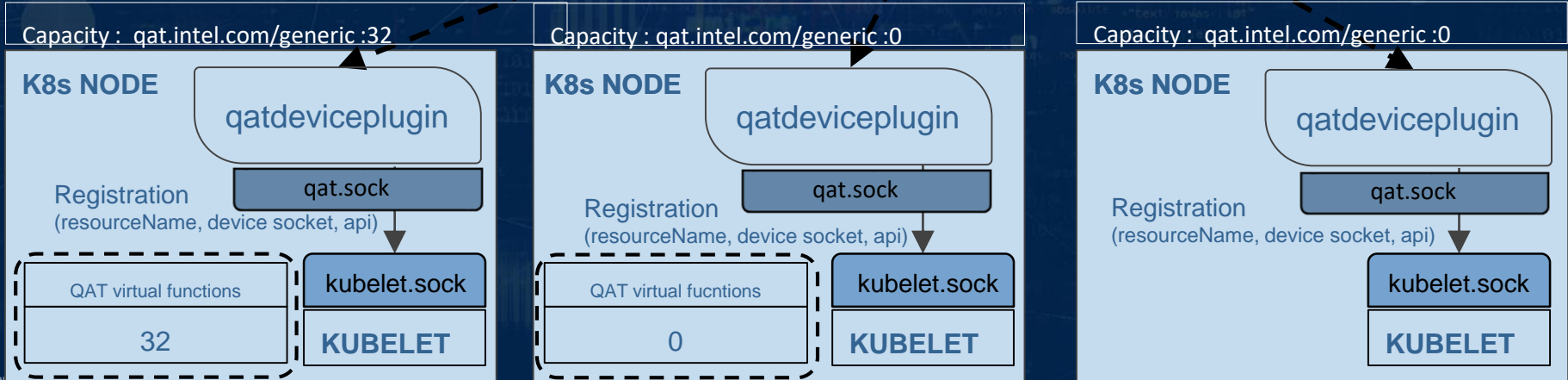
<https://www.intel.com/content/www/us/en/architecture-and-technology/intel-quick-assist-technology-overview.html>

FLOW OF QAT DEVICE ENABLEMENT IN K8S

- Device Plugin gRPC Server Creation
- Device Plugin Registration
- Discovery QAT Devices
- Device binding/unbinding
- Advertisement of devices, Capacity Updated
- Workload requesting QAT device



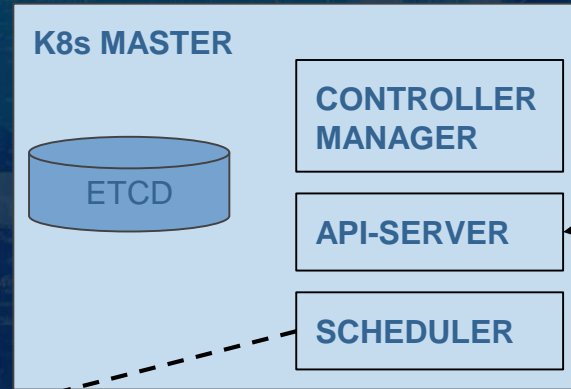
```
kind: Pod
Spec:
  Container
  requests:
    qat.intel.com/generic : 1
```



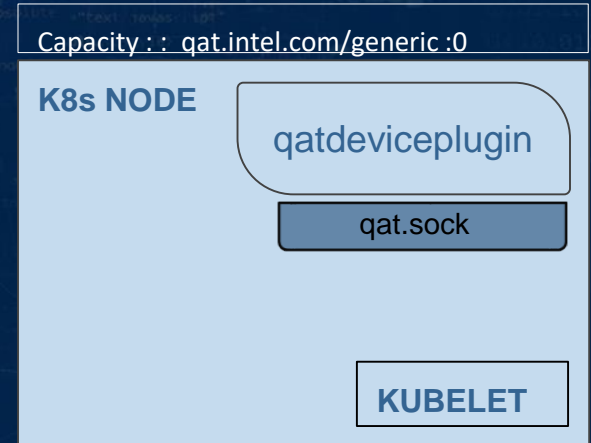
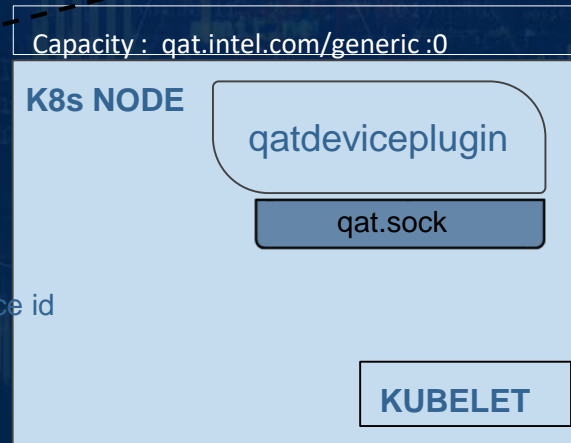
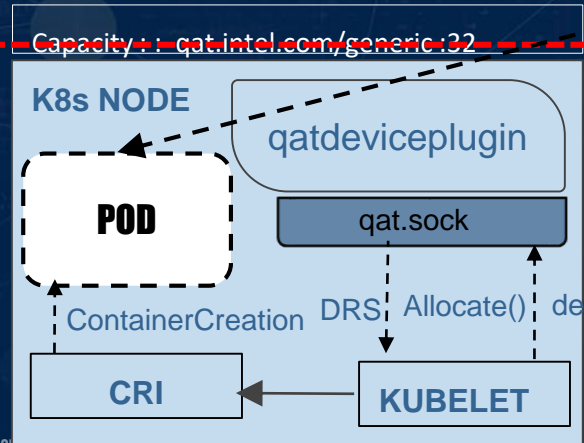
*Other names and brands may be claimed as the property of others.

FLOW OF QAT DEVICE ENABLEMENT IN K8S

- Device Plugin gRPC Server Creation
- Device Plugin Registration
- Discovery of QAT Devices
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- Device Allocation



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Spec:
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DEMO



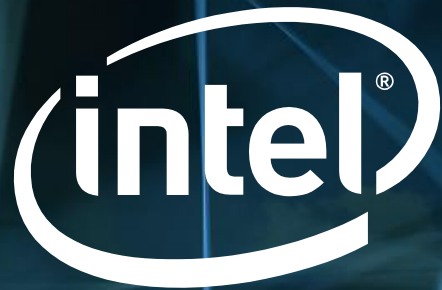
CONCLUSION

For the code and more information please refer to the repository
<https://github.com/intel/intel-device-plugins-for-kubernetes.git>

Talk to us about your applications



THANK YOU



experience
what's inside™