Management Plane in SDV

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SDV compute environment

- Heterogenous, distributed environment
- Various OS
- Various hardware
- Cloud and mobile phones
- Various application formats, capabilities and constraints
- Various communication protocols
- Various safety zones
## Three planes

<table>
<thead>
<tr>
<th>Networking</th>
<th>Cloud</th>
<th>K8s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Plane</td>
<td>Manage and monitor networked devices and their configurations</td>
<td>Manage and monitor cloud resources</td>
</tr>
<tr>
<td>Control Plane</td>
<td>Make routing and forwarding decisions</td>
<td>Orchestrate cloud resources to support various workloads</td>
</tr>
<tr>
<td>Data Plane</td>
<td>Where the actual data flows</td>
<td>Compute and storage resources</td>
</tr>
</tbody>
</table>
Why Kubernetes (or not)?

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Single Node</th>
</tr>
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<tbody>
<tr>
<td>High Availability</td>
<td></td>
</tr>
<tr>
<td>Restart</td>
<td>Yes</td>
</tr>
<tr>
<td>Redundancy</td>
<td>Limited</td>
</tr>
<tr>
<td>Failover</td>
<td>No</td>
</tr>
<tr>
<td>Workload Elasticity</td>
<td>Limited</td>
</tr>
<tr>
<td>Resource load balancing</td>
<td>No</td>
</tr>
</tbody>
</table>
What else is needed?

- Payload formats other than OCI containers
- Non TCP/IP network
- Constrained devices
- Fleet management
- Cloud services
Characteristics

• Technology Neutral
• Adaptive
• Extensible
• Kubernetes native and standalone
• Cloud-connected and autonomous
• End-to-end observability
• Secured and compliant
• Low TCO
Technology-agnostic Abstractions

• Microservices
  • List/graph of components

• State Seeking
  • OS/firmware update
  • Runtime update
  • Payload deployment/management
  • Configuration
  • Policy

• Virtualization
  • Virtualized infrastructure
  • Workload isolation
Modeling challenge
THANK YOU!