Controlling a Container Wildfire

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Who are we?

- Founded in 2009
- Headquartered in Boston, MA, USA
- 500+ employees
- CNCF Silver Member
- Platinum Sponsor for KubeCon EU 2019

Founded on the idea that software should manage IT resources, not people.
Container Adoption is Accelerating

Containers are transforming the way we architect applications, enabling a faster, more scalable way to bring ideas to market. Given this kind of impact on the business, it should come as no surprise how quickly they are being adopted.

Expect 165% growth in the next 18 months

Over 60% of respondents are on their journey to containers/cloud native. We can expect that as lines of business experience the benefits of continuous delivery on highly elastic platforms, demand for these platforms will grow faster than we've ever seen before.

https://turbonomic.com/state-of-multicloud/
Containerization - WHY

- Docker is cool? --- NO
- Container is light weight? --- NO
- Container is cost efficient? --- NO

It’s all about application
- Scalability, Portability, Elasticity
- Making Application Cloud Ready

What does Container do here?
- Packaging and Distribution…
Portability, Scalability, Elasticity  <->  Complexity
Wildfire #1 - Application Performance

Slow Response Time? It’s just a symptom…

• Lack of instances?
• CPU/Mem Limit too low?
• Noisy Neighbor?
• Dependencies?
• Underlying Infrastructure Congestion?
• …

• Or, All of the above…

How about thousands of Micro-Service based Application?
Wildfire #2 - Compliance

- Affinity and Anti Affinity
- High availability
- Licensing
- Security
- Cluster Boundaries
- Shirt Sizes
- Ratios
- Budget

- HA
- Scaling
- Intent

- Utilization Intent
- Tiering
- Affinity anti affinity

- SLA/SLO Compliance
- Vertical vs Horizontal Scaling
- Vertical vs Horizontal Scaling
- Licensing

- Request

- Label and Selector
- Taints and tolerations
- Affinity and Anti Affinity
- Resource Quota
- Cluster

- Scaling Policy SLO
- Cost

- Autoscaling Consistency
- GDPR Placement
- RI Coverage
- Budget
## Wildfire #3 - Operation between teams

<table>
<thead>
<tr>
<th>Role</th>
<th>Responsibility</th>
<th>Challenges</th>
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| IaaS Platform Administrator   | Installation and Management of the OpenShift Platform | Manage size infrastructure size  
                               | Monitor everything                                                        |
| CaaS Platform Administrator   | Managing Tenant Provisioning, Isolation, and Capacity | Assign namespace quotas (t-shirt size?)  
                               | Manual process for request/limit management (per node, per name, per cluster - over a period of time) |
| Application Operations Engineer/Site Reliability Engineer | Monitoring and Managing Application Operational Behavior | Size their containers  
                               | Size their persistent volumes  
                               | Number of replicas (or autoscale with range)  
                               | Request namespace quota increase |
Wildfire #4 - Choose the right technology
Abstraction: The Supply Chain Market

1. Everything in the data center is abstracted into a supply chain market.

2. Services entities shop for the best overall price for every commodity (resource) they need to perform.

The Business

- App
- Container
- VM
- vPod

Service Entity

- App, Container, VM, Physical Machine, Fabric, etc.

Commodity

- CPU, Memory, Flow, IO, Storage, IOps, etc.

Within 1 hr. you see these relationships and metrics in Turbonomic
Continuous Optimization
Real-time actions drive continuous health:
- Placement
- Sizing
- Provisioning
- Start
- Stop
- Match RI
- Purchase RI
- ...

Capacity Management
Quickly & accurately model what-if scenarios:
- Workload growth
- Add/remove hardware
- Migrate to Cloud
- Alleviate Pressure
- Merge Cluster
- ...

Automation: Real-time Action
The Container End Game

Here is my application, run it for me, when and where I want it, securely. That's the end game.

– Kelsey Hightower

How do we get there?

Don’t just get software to do what you tell it, get software to make decisions.