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CloudNativeCon

Europe 2018

Scaling Distributed Deep Learning with Service Discovery

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Agenda



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- Myself:
 - GitHub: github.com/yongtang
 - Committer: CoreDNS, Docker (Moby), TensorFlow
 - Working on machine learning projects in Infoblox
- My talk
 - DNS security with machine learning in Infoblox
 - Helping distributed deep learning with service discovery (CoreDNS)



CoreDNS

Infoblox The Infoblox logo consists of a green diamond grid pattern.

Machine Learning @ Infoblox

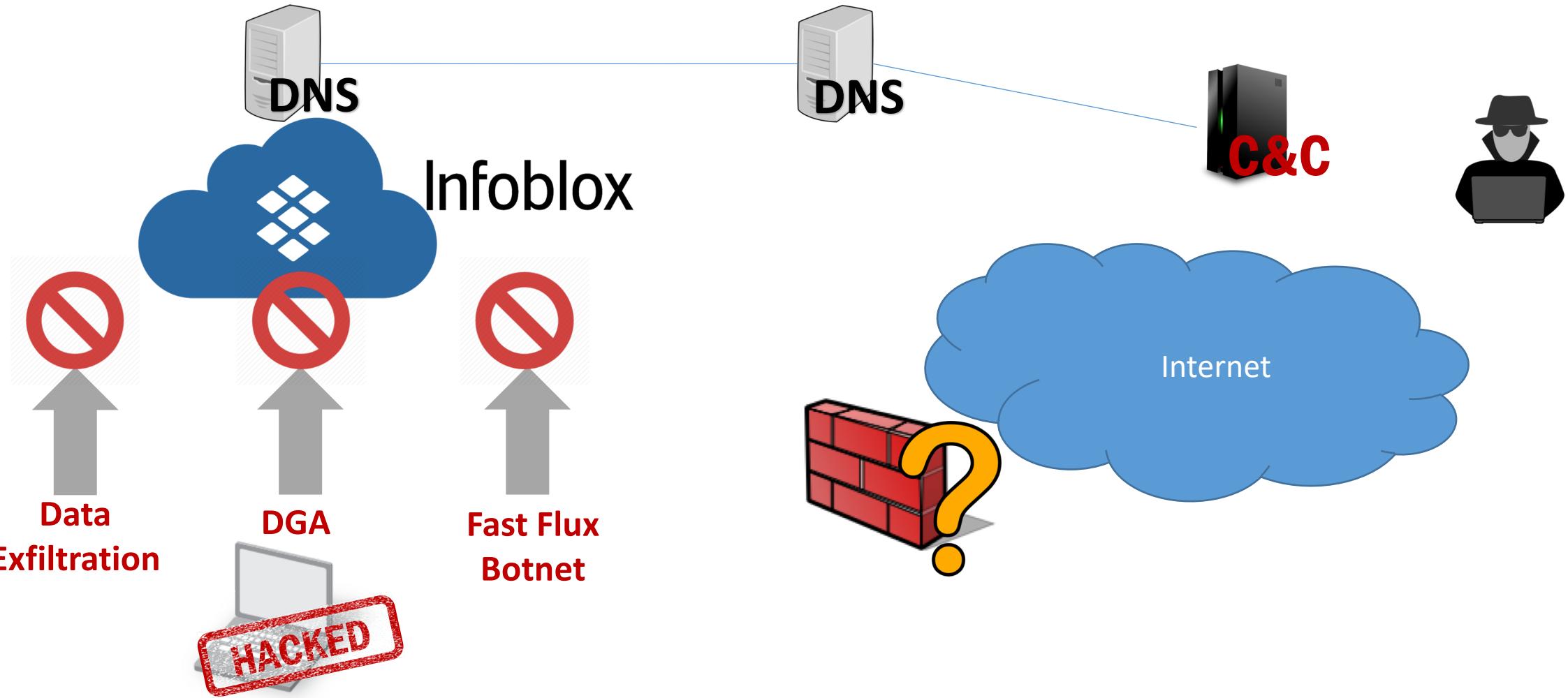


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CoreDNS

Infoblox

Machine Learning Infrastructure



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- Small ML team, no dedicated ML DevOps/Infra team
 - Services provided by cloud vendors (SageMaker, EMR)
- Deploy our own TensorFlow clusters
 - Latest version of TensorFlow
 - User defined ops (e.g., KafkaReader, PR [#14098](#))
- Scope
 - Bring up/down a TensorFlow cluster with one or two commands
 - Use TensorFlow once cluster is up and running
 - No dynamic scaling up/down (unnecessary complexity)



CoreDNS

Infoblox

CoreDNS and Plugins



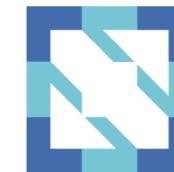
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- DNS server with a focus on service discovery
- A CNCF incubating project, Infoblox is a sponsor
- Integration with k8s, default DNS server for k8s (expected)
- **Plugin-based architecture, easily extended (customized)**



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COMPUTING FOUNDATION

Service Discovery with CoreDNS



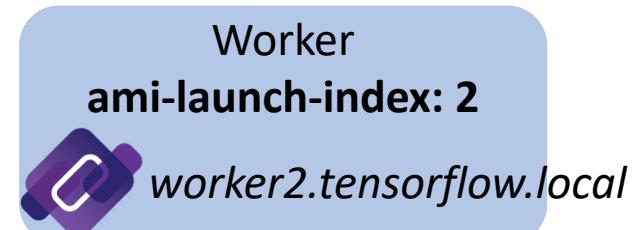
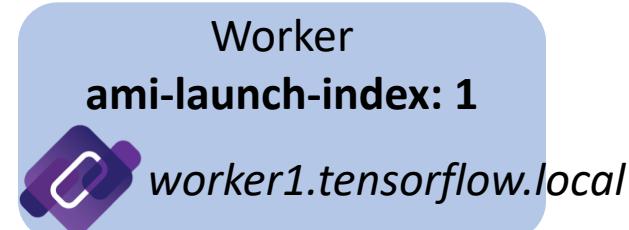
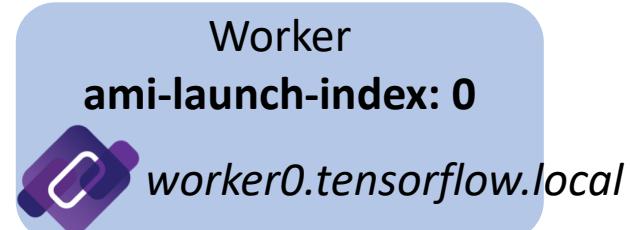
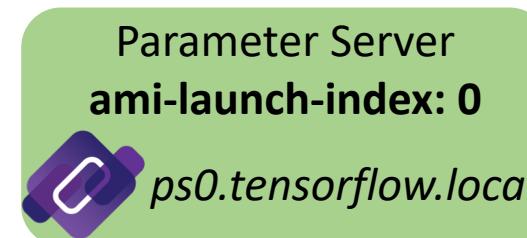
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- Worker: GPU, Parameter Server: CPU
- Whole cluster information for every nodes specified in advance
- Instance Metadata (ami-launch-index) -> DNS record



CoreDNS

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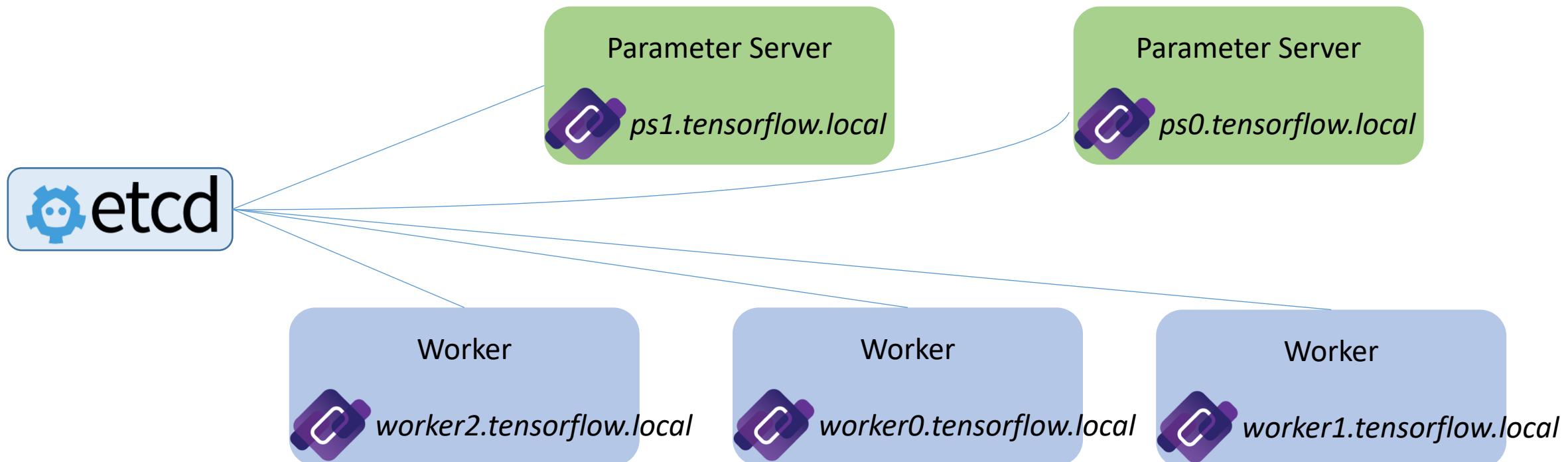
Service Discovery with CoreDNS



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- Distributed K-V store (e.g., etcd/zookeeper)
- Exposed through CoreDNS



Service Discovery with CoreDNS



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- Pack TensorFlow and CoreDNS into Cloud-Init script
- TensorFlow cluster could be deployed with one command
- 80% of a distributed system at a fraction of the cost



CoreDNS



CoreDNS

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Service Discovery with CoreDNS



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THANK YOU



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