KubeCon | CloudNativeCon

North America 2017

Kubernetes in the Public Cloud

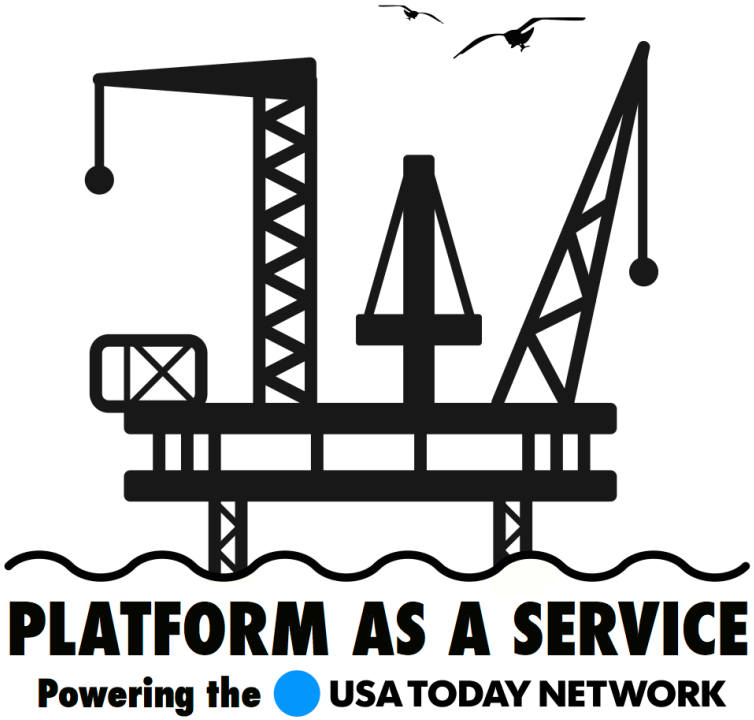
Ron Lipke, Senior Engineer – PaaS

Gannett

GANNETT?

- National News and Media Company
- National brand is USA TODAY
- USA TODAY Network comprised of 131 media companies in 33 states
- 125 MILLION unique visitors per month

USA TODAY
D&C
TT
PC
app
C-T
Marshfield NH
The Desert Sun
BB
BCE
press connects
KS
FLORIDA TODAY
T-F
PO
COURIER POST
MILWAUKEE JOURNAL SENTINEL
news-star
DR
C.
The Detroit News
sg
DT
FDL REPORTER
C
NA
N-M
GFT
pg
PDN
THE EVENING SUN
dnj
DW
ON
TAR
HA
G
Press Citizen
ij
C-T
KNS
JC online
the advertiser
E-G
azc
T
RS
LSJ
LDN
TS
pnj
htr
NJ
Star
P-I
WDH
SJ
C
SP
AL
myCJ
SPJ
DJ
TCP
WDH
LD
WI RAPIDS DT
YORK
RGJ
delmarva now
N-L
SC Times
lohud
TRN
O&E
THE NEWS JOURNAL
VENTURA COUNTY STAR
ydr
TR
NH
VR STORIES



Teams:

- Integration
- API
- Success
- Optimization
- Test Automation

OUR CONTAINER JOURNEY

The Largest Night of Traffic in USA Today History...

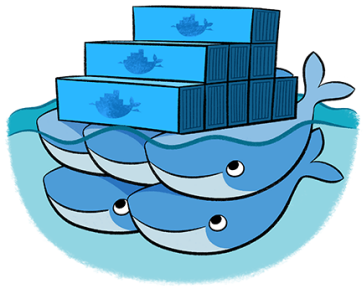
...Why not Make that Our First Container App!?

REQUIREMENTS

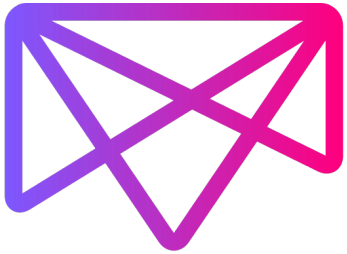
- Integration with legacy resources in existing networks
- Bootstrapping and orchestration compatible with our existing platform tooling and APIs
- Autoscaling (nodes and containers)
- Self service provisioning
- Maintain cost boundaries and charge back insight
- Quickly iterate with new features

CONTAINER ORCHESTRATION OPTIONS

AWS ECS



docker



MESOSPHERE

HashiCorp
Nomad

kubernetes

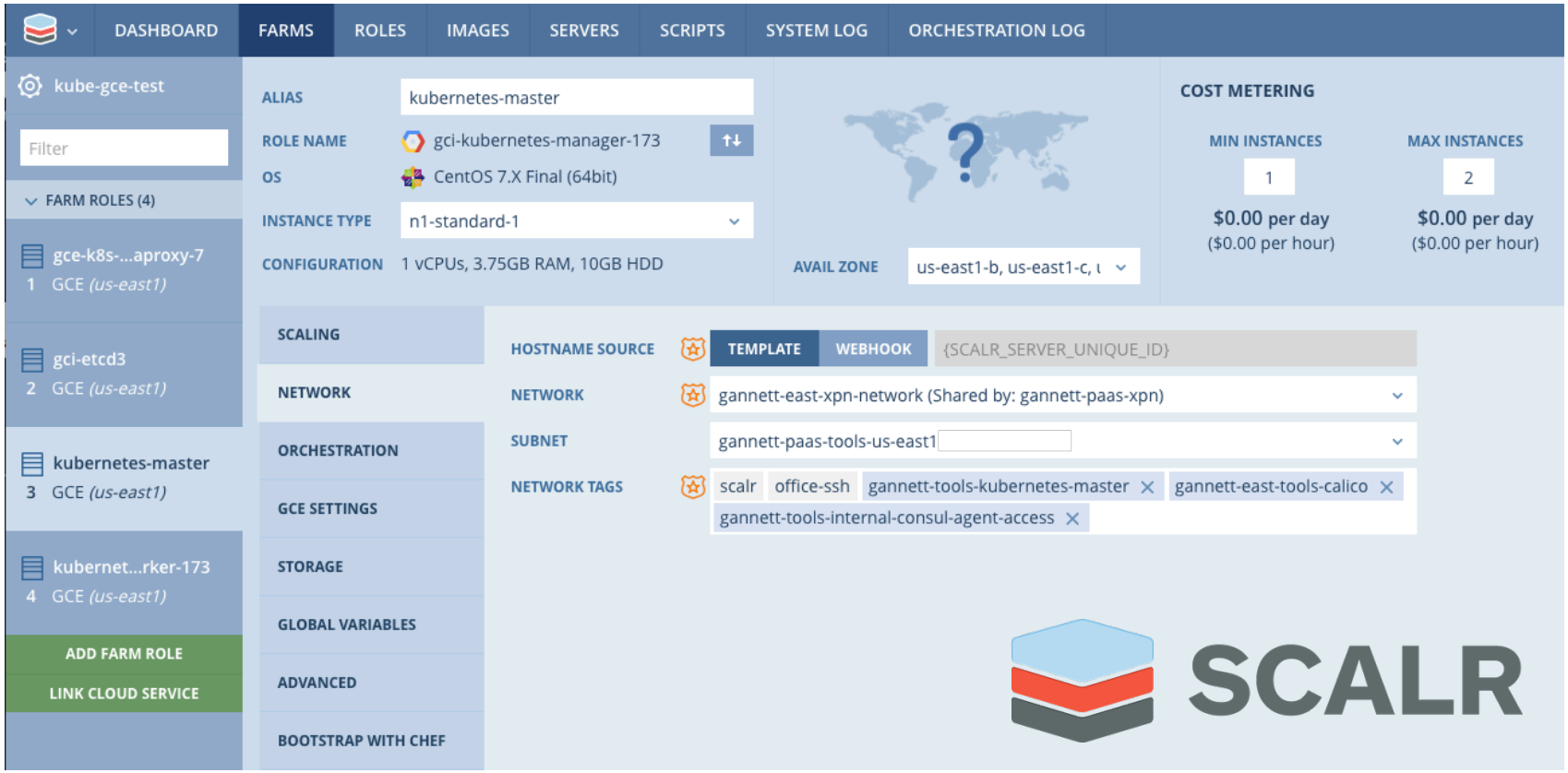
AND THE WINNER IS...

kubernetes

NETWORKING

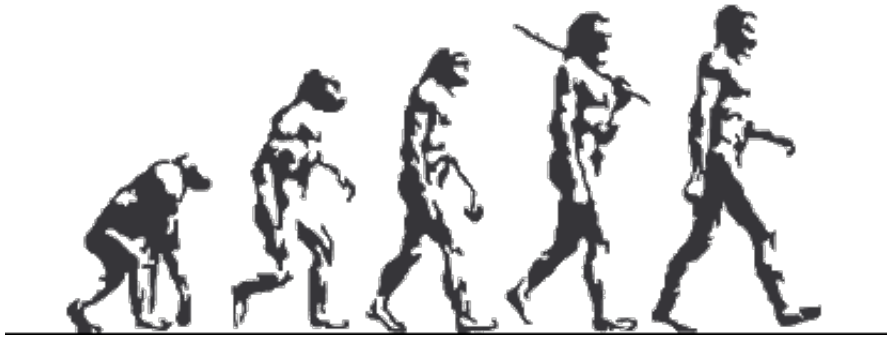
- Project Calico
- Policy driven
- Lightweight IP to IP encapsulation
- Usable in existing VPC or Shared VPN

CLOUD MANAGEMENT PORTAL (CMP)



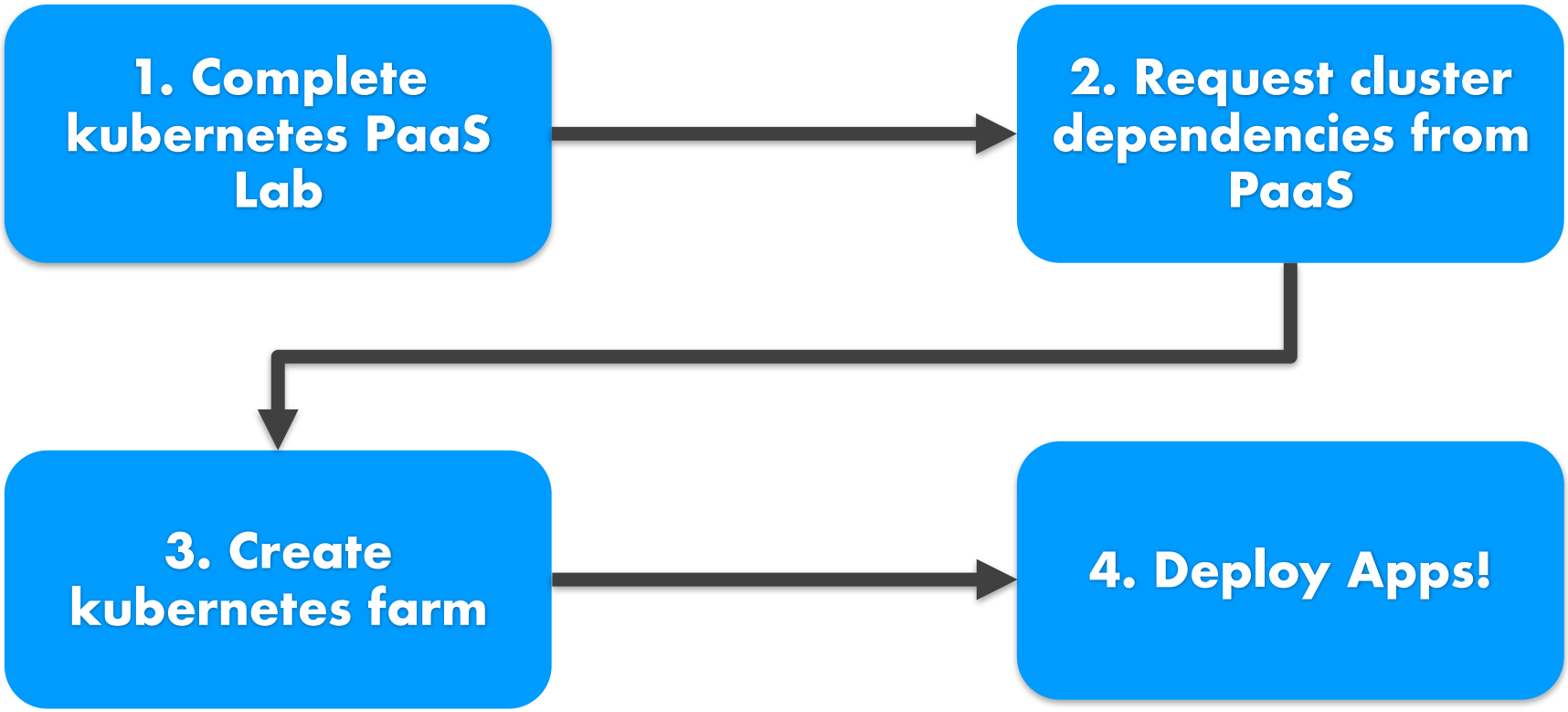
ORGANIZATIONAL CHALLENGES

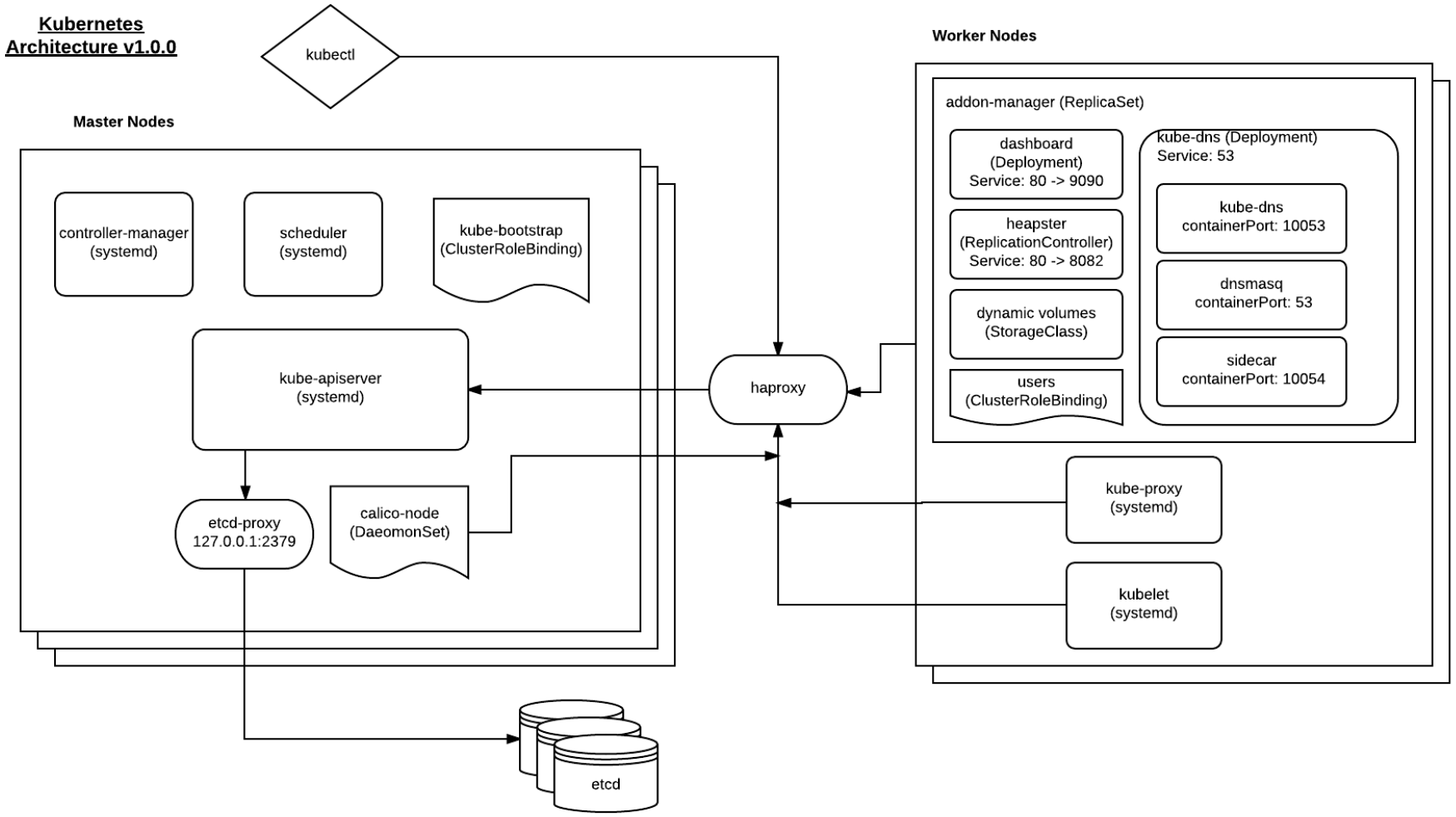
- Cluster ownership – single tenancy, self-service
- Cost boundaries/charge back
- First time ops-ing



CURRENT KUBERNETES

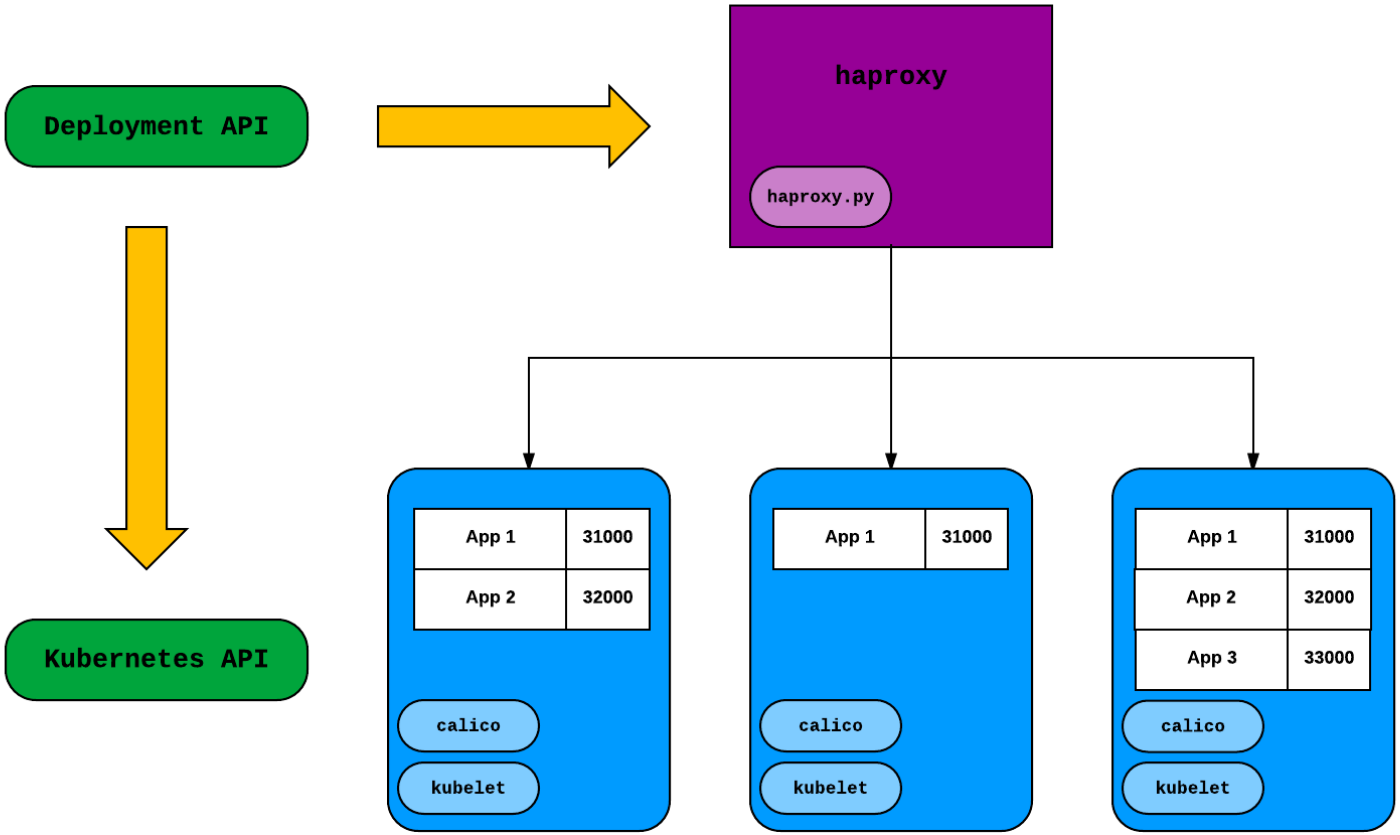
PROVISIONING AND BOOTSTRAPPING





USA TODAY NETWORK

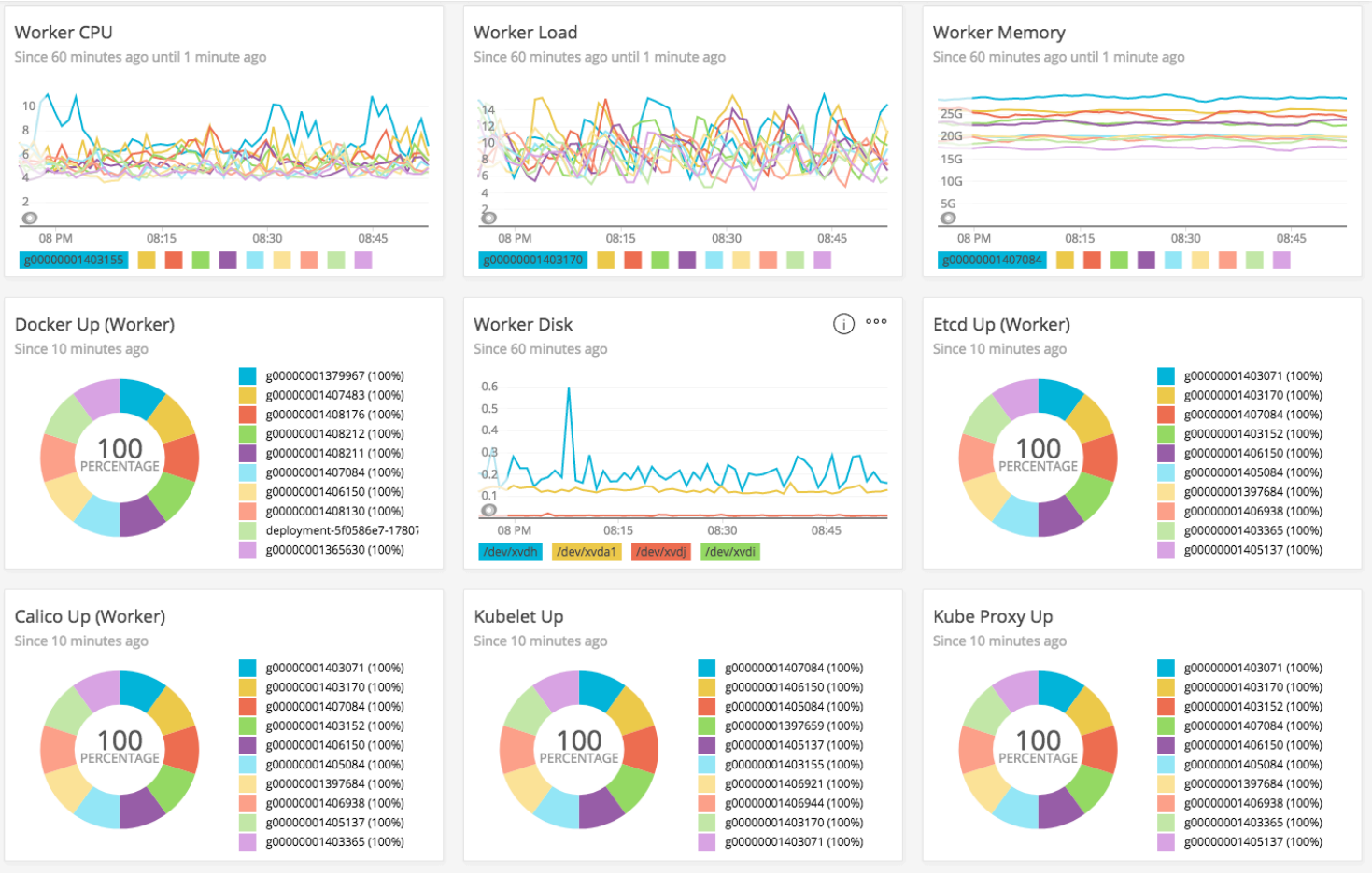
DEPLOYMENT API



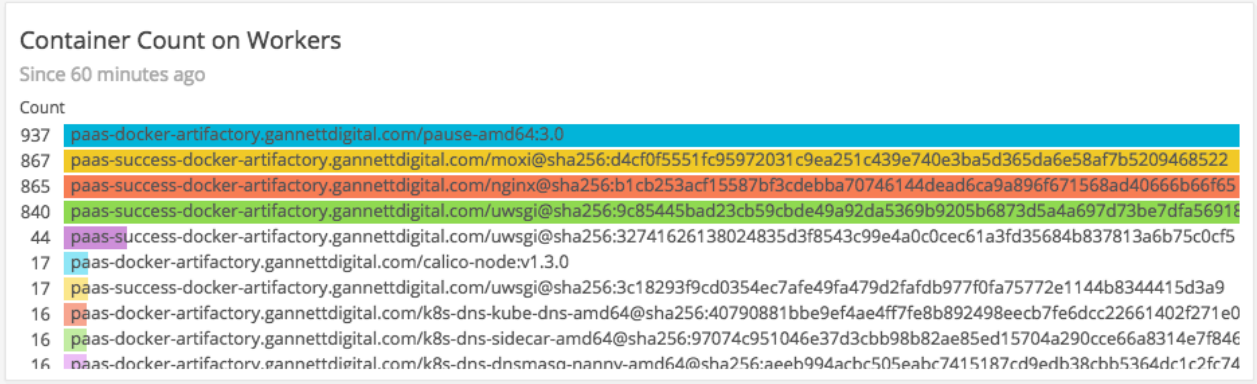
TESTING AND TROUBLESHOOTING

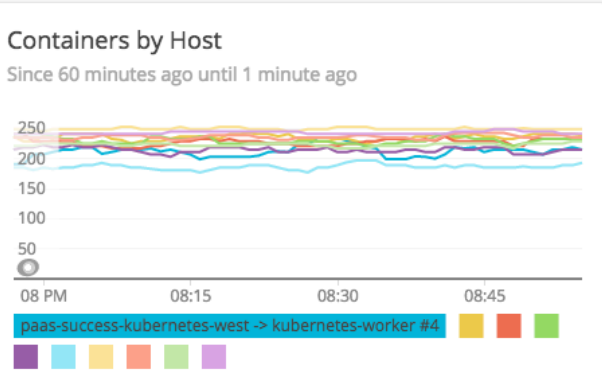
- Serverspec
- Canary clusters
- Runbooks
- Log Aggregation
- Monitoring/tracing

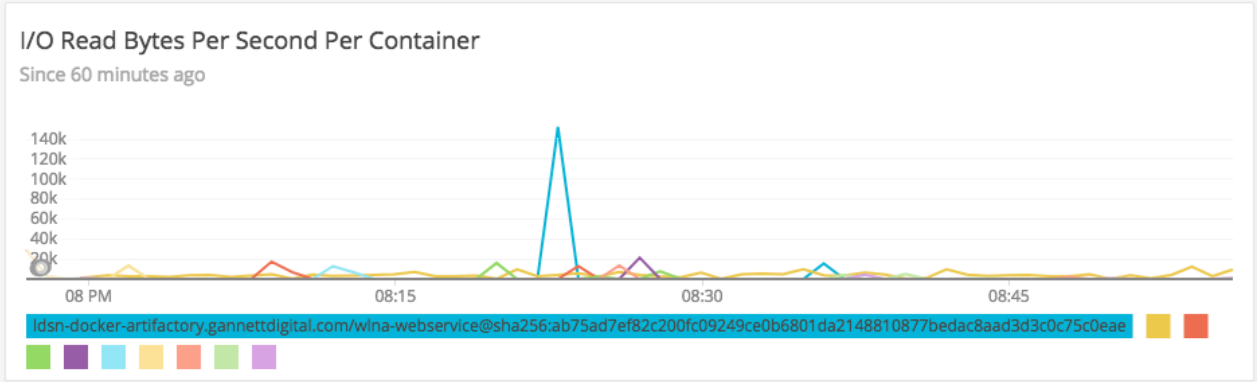
MONITORING KUBERNETES CLUSTERS

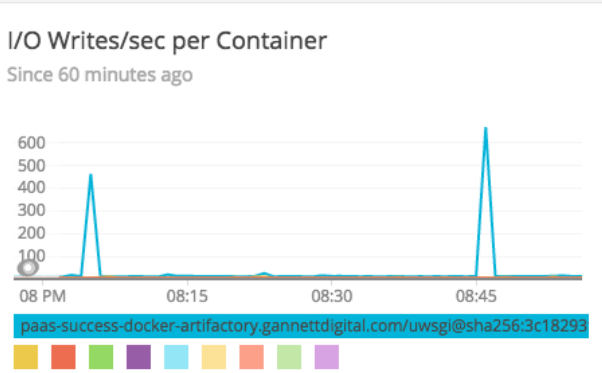


MONITORING KUBERNETES CLUSTERS









CHALLENGES

- Terminating nodes

KUBE WORKER REMOVAL

```
#!/bin/bash
# coding:utf-8

# This script requires kube-apiserver to utilize TLS, and expects calicoctl >= 1.0.0

PATH=$PATH:/usr/local/bin

if hash kubectl 2>/dev/null; then
  NODENAME=`curl -Gs http://localhost:10255/stats/summary | grep -o '"nodeName": "[^"]*"' | head -n 1 | cut -c 13- |
sed -e 's/^"//' -e 's/"$//'`

  echo "==> Draining worker"
  kubectl drain -s https://$KUBE_MASTER:443 $NODENAME --grace-period=120 --force --delete-local-data --kubeconfig
/etc/kubernetes/kubeconfig-bootstrap

  echo "==> Deleting worker"
  kubectl delete node -s https://$KUBE_MASTER:443 $NODENAME --kubeconfig /etc/kubernetes/kubeconfig-bootstrap

else
  echo "kubectl not found on this worker"
fi

systemctl stop calico-node

sleep 5

# Remove node from Calico
calicoctl delete node $HOSTNAME
```

CHALLENGES

- Terminating nodes
- Autoscaling worker nodes
- Conntrack limits
- Cloud Parity
- Keeping pace with releases

SO...HOW DID WE DO?

ELECTIONS 2016

USAT Web Traffic

Since 7 days ago

83.4 M ↑1,042.86%

Page Views

'Elections 2016' Page Traffic

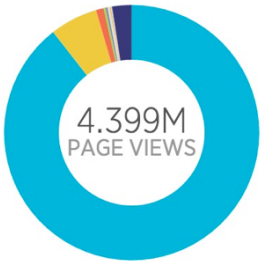
Since 7 days ago

3.93 M ↓0.01%

Sessions

Gannett's Most Popular Elections 2016 Pages

Since 7 days ago



- http://www.usatoday.com/section/global/elections-2016/ (89.4%)
- http://www.usatoday.com/elections-2016/ (6.05%)
- http://www.freep.com/elections-2016/ (0.980%)
- http://www.desmoinesregister.com/elections-2016/ (0.284%)
- http://www.cincinnati.com/elections-2016/ (0.181%)
- http://www.delawareonline.com/section/elections-2016/ (0.143%)
- http://www.courier-journal.com/elections-2016/ (0.140%)
- http://www.indystar.com/elections-2016/ (0.137%)
- http://www.azcentral.com/elections-2016/ (0.131%)
- http://www.democratandchronicle.com/news/elections-2016/ (0.0554%)

PAAS SUCCESS KUBERNETES MIGRATION

Cost Reduction

Daily operating costs cut by **several hundred dollars**.

Deployment Times

A full deployment of all 140 sites took over 2 hours, now down to **25 minutes**.

Deployment Frequency

During Hurricanes Harvey and Irma, over **1500 successful deployments** with no pay wall.

WHAT'S NEXT?

CLUSTER IMPROVEMENTS

- ETCD v3
- Kubernetes 1.9
- kubeadm
- Vault Integration
- Service Mesh
- Ingress Overhaul

THANK YOU

Ron Lipke – Senior Engineer, PAAS