Ford Motor Company

Go Further

Ford Invests in Making Customer Experience as Strong as Its Vehicles with FordPass
Introductions

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Customer Experience
Ford, Microsoft and Pivotal working together
Making people’s lives better

Transforming Ford’s Customer Experience Is Core To Our Strategy
FordPass

Clear Brand Representation On A Consumers Mobile Device
FordPass – Main Components

**FORD MARKETPLACE**
Members easily buy, sell, share and service mobility products and solutions

**FORD GUIDES**
Locally savvy Ford advisors, shifting from selling to solving

**FORD APPRECIATION**
Ford currency is earned, exchanged and applied to drivers/riders and marketplace activity

**FORD HUBS**
Leaner, engaging retail environments connected to the marketplace and community

Ford Pass Is The Experience Platform deployed on PCF To Deliver Mobility Products And Services To A Broader Base Of Mobility Users
FordPass

• Mobile Cloud-Native Application (Video)
Transformations to reach our Goal

Plan, Build and Operate
Clash of the Cultures

• Ford is an automotive company and has a rich and extensive history
  – (and therefore lots of process)
• Traditional company
• Fail never vs. fail fast.
• Static vs. Dynamic.
Transformation – Plan & Build Model

• Technology
  – Shift from Build and Deploy to Buy and Consume

• Processes
  – Change from Long lead times and multiple hand-offs to Consumption Ready and Self Service Provisioning

• People
  – Move from Fragmented to an Agile DevOps Model
Transformation – Operational Model

• Migration to Cloud-Native Application Architecture
  – Old: Highly process driven using the Plan, Build, Operate Model.
  – New: Fail fast/ Fail often. Failure at an automotive company is disastrous.

• Breaking the Norm
  – Maintenance Windows
  – Change Controls
  – Moving to IT Advisory model
Transformation – Operational Model

- Monitoring & Alerting
- Jump-Servers
- Incident and Problem Management
- Supporting Global Launch
What to Deploy?

Good Question!
CF + Services?

- PCF 1.5 (based on CF 208.20)
- RabbitMQ
- MySQL
- Spring Cloud Services (Netflix OSS)
- GemFire PCF tile
- Ops Metrics (JMX)
Which Load Balancer to use?

• F5?
• Azure
  – Traffic Manager?
  – Application Gateway?
  – Azure Load Balancer?
• HA Proxy?
...Azure Load Balancer & HAProxy
That topology question

- Single deployment or dual deployment.
- Vehicle SDN
- Latency requirements
Active-Active

Client

Azure Load Balancer

Traffic Manager

Azure Load Balancer

PCF

HA Proxy

HA Proxy

West US

PCF

HA Proxy

HA Proxy

East US

Gemfire

Gemfire
Active-Active

- Allows for maintenance / troubleshooting to be done while eliminating traffic.
- Downtime does happen
Cloud Foundry on Azure

A quick primer of some of the important considerations when deploying to Azure
CF on Azure Primer

- Availability Sets (Not AZs)
- TCP Keepalive
- Latest CPI
- Storage Accounts
Azure Availability Set

- Perpendicular to an Availability Zone / Fault Domain
- Automatically spans fault and update domains.
- Azure Treats VMs in an AS differently to singleton VMs
- Defined in the resource pools section
Azure Availability Set

as-cf-nats

FD1

Nats VM

FD2

Nats VM

FD3

Nats VM
resource_pools:
  - name: nats
    stemcell:
      name: bosh-azure-hyperv-ubuntu-trusty-go_agent
      version: '3215'
    network: default
    cloud_properties:
      instance_type: Standard_DS1
      availability_set: as-cf-nats
      storage_account_name: prem-store-cf
      storage_access_key: idontthinksotim
TCP Keepalive

- Bosh release that sets Kernel Param
- bosh update runtime-config
- Required for bosh deployed vms that connect through the Azure Load Balancer ie any system or apps domain.
TCP Keepalive

- Requires Bosh Director (version 255.4+)
- create a new YAML file (`./runtime.yml`) for runtime config
- Example:
- **bosh update runtime-config ./runtime.yml**
  - Bosh deploy to update each VM
  - Since tcp_keepalive job is configured as an addon, it will be placed on every VM bosh deploys
Azure CPI

- Responsive / Reactive development
- Edge Case Removal
Azure Storage Accounts

- 20,000 IOPS
- 40VM max
- Defined in the cloud_properties (resource_pools) section
Defining a Storage Account

resource_pools:
- name: nats
  stemcell:
    name: bosh-azure-hyperv-ubuntu-trusty-go_agent
    version: '3215'
  network: default
  cloud_properties:
    instance_type: Standard_DS1
    availability_set: as-cf-nats
    storage_account_name: prem-store-cf
    storage_access_key: idontthinksotim
Azure Premium Storage

- 25%-100% real world speed increase (Observed)
- Lower Fault Rate
- Migration methodology
  - Change storage account in manifests
  - Bump disk space
  - Cycle stemcells
  - Delete old storage accounts
Engineering Challenges

Design, Development and Deployment
Challenges

• Compute, Storage & Network
• Security (wild card SSLs, DNS)
• Open Source components - Licensing revisions and reviews
• Lack of robust toolset in Azure Space
• Documentation
Challenges

• Logging
• Monitoring
• Gemfire
• Scalability
• ADFS
• High Maintenance
Rapid Iteration
Ford, Microsoft and Pivotal working together
Iteration

- Continuous Infrastructure Deployments

PCF Releases

Bosh + CPI
Stemcells
CF Services

Deploy
Test
KEEP CALM AND CF PUSH
Thank you & Q/A