Jumpstart your Production OpenStack Deployment with FlexPod

Dave Cain
Wednesday April 27th, 2016 11:50am-12:30pm CST
About me

- **Dave Cain**
  - 12+ years working on IT in datacenters
  - B.S. Computer Science @ NC State University
  - Reference Architect & Technical Marketing Engineer
    - Converged Infrastructure Engineering
  - Cisco Champion 2015/2016

- **Twitter:**  
  ![Twitter](thedavecain)
Agenda

1. Enterprise challenges
2. Why NetApp and FlexPod for OpenStack
3. Announcement
4. Infrastructure and integration proof points
Key Challenges with OpenStack

• Operational
  - Complex to deploy
  - 6 month release cadence hard to keep up with
  - Potential risks of implementing, operating and supporting an OpenStack environment
  - Rapid provisioning

• Design
  - Efficient and scalable cloud resource utilization
  - Scalable infrastructure
  - Predictable performance
  - High availability and enterprise readiness
Why Converged Infrastructure?

**FlexPod**

- Prevalidated, flexible, unified platform
  - Reduces risk
  - Reduces TCO
  - Increases efficiency
  - Increases speed and ease of deployment

- **FlexPod core architecture**
  - Cisco Nexus Family switches
  - NetApp® FAS storage with Data ONTAP
  - and/or NetApp E-Series storage
  - Cisco® UCS B or C server
  - Cisco Fabric Interconnect, Cisco UCS Manager
OpenStack on FlexPod

Targeting Production workloads

• Developer benefits
  – Private cloud infrastructure as a service faster
  – Block, File, Object ready to be utilized in the resulting deployment
  – Concentrate on developing applications

• Operator benefits
  – Complete datacenter in a single rack
  – FlexPod robustness provided with OpenStack HA hardening
  – Hybrid cloud ready on Day 1
Why NetApp and FlexPod for OpenStack
NetApp and OpenStack

- **OpenStack Foundation:**
  - Charter Gold Member
  - Elected board representation

- **1st and leading storage provider**
- **Production deployments and deployer**
- **Community project leadership**
## OpenStack Provider Landscape

<table>
<thead>
<tr>
<th>Feature</th>
<th>DIY OpenStack</th>
<th>OpenStack on FlexPod</th>
</tr>
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<tbody>
<tr>
<td>Product roadmap w/upgrades</td>
<td>None</td>
<td>Integrated Relationship</td>
</tr>
<tr>
<td>Lifecycle</td>
<td>6 months</td>
<td>3 years</td>
</tr>
<tr>
<td>Support</td>
<td>None</td>
<td>Yes- Collaborative Support</td>
</tr>
<tr>
<td>Production timeline</td>
<td>Unpredictable</td>
<td>Accelerated</td>
</tr>
<tr>
<td>OpenStack skill sets required</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Operational complexity</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Integrated Infra platform</td>
<td>No</td>
<td>Yes-Validated</td>
</tr>
</tbody>
</table>
FlexPod Integration with Red Hat OpenStack Platform

Nova: Compute
- Rapid cloning of Instances with FAS
Glance: Image Repository Service
- Storage efficiency with FAS
Swift: Object Storage Service
- Dynamic Disk Pool efficiencies with E-Series

Manila: File Share Service
- Shared file systems as a service
Neutron: Network
- Nexus 1000v
Cinder: Block Storage Service
- Storage service catalog
### FlexPod Cooperative Support

Purpose-built for a best-in-class solution

<table>
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<tr>
<th>Direct Access</th>
<th>Coordinated Support</th>
<th>FlexPod Expertise</th>
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<tbody>
<tr>
<td>No barrier between you and the experts you need, whenever you need them.</td>
<td>Formal communications, training and escalation processes across vendors and partners.</td>
<td>A multivendor cooperative support lab to simulate and pretest support solutions.</td>
</tr>
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</table>
Infrastructure and integration matters
Announcement
New NetApp Technical Report

- Red Hat OpenStack Platform 8 on FlexPod
- Validated deployment and architectural diagrams
- Ease of installation with custom Heat templates
  - Cinder, Swift, Manila enablement with NetApp storage
- Common operations demonstrated post-deployment via Horizon
- Load testing and comparison with Rally
Deployment
Red Hat OpenStack Platform 8 on FlexPod

1. Configure physical infrastructure

2. Deploy Red Hat OpenStack Platform director
Deployment
Red Hat OpenStack Platform 8 on FlexPod

3. Download and customize Heat templates

4. Deploy the overcloud
   - 35 minutes

5. Launch post-deployment scripts
   - Manila

6. Deployed automatically for you
   - Cinder using NFS backed by NetApp FAS
   - Swift using iSCSI backed by NetApp E-Series
   - Manila using NFS backed by NetApp FAS
Define your block and file marketplace

- Assemble diverse capabilities across platforms
- Define a catalog through Cinder and Manila
- Deliver unique NetApp® features directly to serve workload requirements
Deliver your block and file marketplace

- Match storage capabilities to application requirements on the dimensions of:
  - Availability
  - Protection
  - Performance
  - Cost
Rapid, efficient, persistent instances

- Create instances instantly that:
  - Are persistent by default, but optionally ephemeral
  - Live-migration ready
  - Storage efficient
  - Enable stateless hypervisors

90%+ deduplication rates commonly reported
Proof points

Volume creation and disk space consumed
Creating 2000 persistent Instances

- 35 concurrency
- Fedora Core 23 Instances
  - 1 vCPU
  - 256Mb RAM
  - 60Gb disk space
- Generic NFS Cinder = 68 minutes
- NetApp NFS Cinder = 20 minutes
  - 71% faster

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Disk space consumed by 2000 booted Instances

- Generic NFS Cinder = 1209GB
- NetApp NFS Cinder = 42.9GB
  - 99.97% less physical space
Create bootable Volume from large Image

- 1 concurrency
- Fedora Core 23 Instance with 35GB of randomized data inserted
  - Still 60Gb disk size
- Generic NFS Cinder = 12 minutes
- NetApp NFS Cinder = 32 seconds
  - 95.57% faster
Disk space consumed by 100 large volumes

- 100 times
- Generic NFS Cinder = 6000GB
- NetApp NFS Cinder = 87 GB
  - 98.55% less physical space

What was the point?
Key Takeaways

- FlexPod is the ideal converged infrastructure platform for deploying Red Hat OpenStack Platform in production environments: easier than do-it-yourself deployments
- Spend more time developing applications and less time designing and deploying infrastructure for OpenStack
- FlexPod Cooperative Support provides peace-of-mind with an infrastructure you can count on – all the way from the physical hardware to the virtual instances
Resources
OpenStack on FlexPod

- CVD Deployment: http://bit.ly/1Q7b3Qb
- Solution Brief (4 page): http://nt-ap.com/1qF6B4L

Upcoming sessions at the Austin Summit

- Shared Filesystems Management (Manila)
  - SuSE and NetApp
  - Wednesday 5:20pm – 6:00pm, Level 4 MR 12 A/B
- Open Container Initiative, the OpenStack Mangum & Kuryr projects, the CNCF, and you!
  - IBM and NetApp
  - Thursday 9:50am – 10:30am, Level 1 Ballroom C
- Big Data Rapid Prototyping using Mangum with Cinder and Manila
  - NetApp
  - Thursday 11:00am – 11:40am, Level 4 Ballroom F

NetApp and SolidFire booth A38