SLES and Enterprise Apps on the cloud
Azure Product Teams

Alfred Sin, Program Manager – Linux on Azure
Peter Lopez, Principal Program Manager – Azure Dedicated
Introductions

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Program Manager
Azure Compute
Linux on Azure

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SAP on Azure
Agenda

Linux on Azure Ecosystem

SLES & Azure Compute
  · Cloud configuration orchestration – Cloud-Init
  · Image Customization – Image Builder
  · Implementation considerations
  · Troubleshooting – Serial Console and Integrated Support

· SAP on Azure with Enterprise stories
Linux/Open Source at Microsoft in the news...

- Linux at Microsoft in the post-IBM acquisition era
- GitHub, Citus Data Acquisitions
- ACI, AKS and SUSE
- HPC work and SUSE
- Azure Optimized SLES Kernel
Linux/Open Source at Microsoft in the news...

*Linux at Microsoft in the post-IBM acquisition era*

- Our position is the same: Microsoft wants to be the cloud of choice for those looking to use Linux on Azure
- Linux should “just run” on Azure
- We don’t compete with our customers
Linux/Open Source at Microsoft in the news...

GitHub, Citus Data Acquisitions

- Taking open-source leaders to the next level
  - [https://www.citusdata.com/blog/2019/01/24/microsoft-acquires-citus-data/](https://www.citusdata.com/blog/2019/01/24/microsoft-acquires-citus-data/)
Linux/Open Source at Microsoft in the news...

ACI and AKS and SUSE

• Container images available running SLES, and they run on ACI
• SUSE Cloud Application Platform support for AKS
  • [https://www.suse.com/products/cloud-application-platform/](https://www.suse.com/products/cloud-application-platform/)
HPC work and SUSE

- New HPC sizes (HB, HC), with public preview of RDMA over SR IOV
- SLES12 SP4 and SLES15 both supported on these new sizes – so run your HPC SLES workloads on Azure!

Linux/Open Source at Microsoft in the news...

**Azure Optimized SLES Kernel**

- SLES 15's Azure-optimized SLES kernel is the first enterprise Linux kernel optimized for Azure
- Faster boot speeds, decreased memory footprint, and faster access to Azure features
  - RDMA, SRIOV, Write Accelerator
- All SLES15 VMs will run on this kernel when deployed, but switching back via Zypper is easy
Linux on Azure Strategy

- **Choice** - Provide a wide selection of Linux distributions with optimized security, and management user experience for every Linux workload
- **CLI/API tooling** - Enable tools and services that customers are already familiar with to run on Azure seamlessly
- **Hybrid** - Build a unified experience across systems and services leveraging Azure Stack, Azure IaaS, Azure PaaS, Office 365
Customers are moving their Linux workloads to Azure

“We’ve brought Java, Tomcat, Docker containers, Red Hat Enterprise Linux, SUSE Linux, and many other open-source tools into DevTest Labs, and they all work great.”
- Peter Rothlaender, Manager of Cloud Solutions, Daimler AG

“Our plan to move SAP to Azure has allowed us to be more cost competitive while at the same time has improved our ability to be more responsive to new business requirements.”
- Doug Mills: Vice President and Chief Information Officer, The Mosaic Company

Nearly 50% of VM cores are Linux
Comprehensive support for key Linux distros in Azure

- SLES 11 SP4+, 12, and 15
- RHEL 6.7+ and 7.1+
- CentOS 6.3+ and 7.0+
- Ubuntu 12.04+
- openSUSE Leap 42.3+
- OEL 6.4+ and 7.0+
- Debian 7.0+ and 8.2+
- CoreOS 494:4.0+

https://azure.microsoft.com/overview/linux-on-azure/
SUSE on Azure Compute: A migration journey
Linux workloads to Azure – a migration journey

Customer Journey

Migration Configuration → Image Customization → Implementation considerations → Troubleshooting

Azure considerations

Cloud-Init → Image Builder → High Availability Live patching → VM Serial Console
Cloud-Init - Migrating VM Configurations to Azure

- Currently:
  - Azure VMs are provisioned by the Linux Agent or Cloud-Init
  - Cloud-Init configurations currently in progress
Cloud-Init

- Scenario examples
  - Implement cloud configurations with and without extensions
  - Deploy images without the Linux Agent (Preview soon)
  - Additional functionality, such as running scripts every boot etc.

- Enabling cloud-init on Azure and Status

<table>
<thead>
<tr>
<th>Distro / Version</th>
<th>Status</th>
<th>Package Release ETA</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUSE SLES 12 SP5</td>
<td>cloud-init fixes in flight to support SLES</td>
<td>H2 2019</td>
</tr>
<tr>
<td>SUSE SLES 15 SP1</td>
<td>cloud-init fixes in flight to support SLES</td>
<td>H2 2019</td>
</tr>
</tbody>
</table>

- Expect blogs on progress!
Image Customization

Who likes building images?

TRUST ME, I’M AN ARCHITECT
Image Customization

- What does it take to build images?
  - Learning and implementing tooling and pipelines
  - Understanding OSes and hosting platform specifics

- Customers ask:
  - Simplicity
  - Unification
  - Compliance
  - Performance
  - Image management
Azure VM Image Builder

- **Azure VM Image Builder**
  - **Build** corporate golden images to meet security and compliance requirements.
  - **Create** images with applications pre-installed.
  - **Migrate** image customizations and pipeline to Azure.

- **Shared Image Galley**
  - Quick deployment of thousands of VMs from a custom image.
  - Automatic creation of replicas of source images to scale VM and VMSS deployments.
  - Expedited regional expansion, DevOps processes, simplified cross-region HA/DR setup, etc.

Migration Configuration | Image Customization | Implementation considerations | Troubleshooting
Azure VM Image Builder (Private Preview)

Join the community: https://aka.ms/azvmimagebuilder
Azure VM Image Builder

• Demo code is here:
  https://aka.ms/aib-susecon

Join the community at: https://aka.ms/azvmimagebuilder
Live patching with SLES

- Requires standard kernel (not Azure-tuned)
- Requires SLES BYOS image for this feature
Customer questions:

• Does HA work for SLES on Azure?

• I want to deploy SAP on SLES on Azure but I heard some configurations aren’t supported

• Which HA configurations are actually supported on Azure?
High Availability – SLES on Azure

Some HA options:

1. STONITH cluster using fencing agent
   - Slower to fence a failed node – VM kill switch under development
2. Softdog in an SBD cluster (requires shared storage and extra VM)
Troubleshooting: VM Serial Console

- #1 most popular VM support topic: Can’t SSH or RDP to my VM
- On-prem solution: plug in a keyboard
- Cloud problem: need console access to VM
Azure VM Serial Console

- Serial Console allows customers to access their VMs when the network is down or SSH is otherwise unavailable.
- Saves time spent going through support case process.

https://aka.ms/serialconsolefeedback
SLES and Azure stories
## Manufacturing Industry Insights around SAP

### Top 10 Manufacturing Modes
- Discrete Manufacturing
- Process Manufacturing
- Mixed Mode Manufacturing
- Engineer to Order (ETO)
- Make to Order (MTO)
- Repetitive / Make to Stock
- Job Shop / Shop Floor
- Light Assembly (ATO) / Kitting
- Industrial Manufacturing
- Wholesale Manufacturing

### Manufacturing Industries
- Agriculture
- Apparel and Textiles
- Automotive
- Chemical
- Computer and Electronics
- Consumer Package Goods
- Distribution
- Energy
- Food and Beverage
- Health and Medical Devices
- High-tech / Semiconductors
- HVAC
- Industrial Machinery
- Lumber Paper Wood
- Metal Fabrication
- Mining
- Petroleum and Coal
- Pharmaceuticals Biotech
- Plastics and Rubber
- Professional Services
- Ship Building
- Transportation
- Other

With specific SAP Manufacturing modules and the flexibility of Azure, customers can enable solutions for today, with designs for tomorrow.

- SAP ManufacturingOne – Prepacked SAP All-in-one solution
- SAP ManufacturingOne – All-in-one solution Powered by HANA
- SAP ME – SAP Manufacturing Execution
- SAP MII - Manufacturing Integration and Intelligence
- SAP Pco – Plant Connectivity data transfer
- SAP DME - Digital Manufacturing Execution
- SAP DMI - Digital Manufacturing Insights
SAP + SLES + Azure

- Old School, in the new school
  - mechanisms for iptables migration
- HANA N+N with Suse & pacemaker
- Coke (Cona), Daimler, Devon(Compliance), Rio Tinto(Compliance), Stryker medical(Compliance) and Microsoft
- Why wait? Try – Azure Quickstart Templates
SAP on Azure customers

Retail, food, and CPG

Manufacturing, mining, and oil & gas

Utility, pharma, services, and multi-sector
Recent HANA on Azure Customers

- Accenture
- Coca-Cola
- Coats
- AGL
- Costco Wholesale
- Tate & Lyle
- L3 Technologies
- Co-op
- Subsea 7
- Rockwell Automation
- GEA
- Daimler
- City & Guilds
- Canny Goldenfields Inc.
- Microsoft
The most trusted and compliant cloud

**GLOBAL**
- ISO 27001
- ISO 27018
- ISO 27017
- ISO 22301
- SOC 1 Type 2
- SOC 2 Type 2
- SOC 3
- CSA STAR Self-Assessment
- CSA STAR Certification
- CSA STAR Attestation

**US GOV**
- FedRAMP
- FedRAMP
- Moderate JAB P-ATO
- High JAB P-ATO
- DoD DISA SRG Level 2
- DoD DISA SRG Level 4
- SP 800-171
- FIPS 140-2
- Section 508 VPAT
- ITAR
- CJIS
- IRS 1075

**INDUSTRY**
- PCI DSS Level 1
- CDSA
- MPAA
- FACT UK
- Shared Assessments
- FISC Japan
- HIPAA/HITECH Act
- HITRUST
- GxP 21 CFR Part 11
- MARS-E
- IG Toolkit UK
- FERPA
- GLBA
- FFIEC

**REGIONAL**
- Argentina PDPA
- EU Model Clauses
- UK G-Cloud
- China DJCP
- China GB 18030
- China TRUCS
- Singapore MTCS
- Australia IRAP/CCSL
- New Zealand GCIO
- Japan My Number Act
- ENISA IAF
- Japan CS Mark Gold
- Spain ENS
- Spain DPA
- India MeitY
- Canada Privacy Laws
- Privacy Shield
- Germany IT Grundschutz workbook
Case Studies
Coke Cona
Customer Case Studies CONA

• An intensive seven (7) month project whereby Capgemini migrated SAP BI HANA, from on-prem at two (2) outsourced datacenters to Microsoft’s Azure HLI & VLI) facilities. We broke new ground as the size, complexity and scope of this project is unprecedented per Microsoft and SAP. Microsoft and Capgemini designed and migrated what is now the world’s largest HANA landscape in the Azure Cloud. Microsoft, Capgemini, and CONA executed with a small but tightly integrated team.

• It is an Infrastructure as a Service (IaaS) transition which brought performance improvements and $2-3MM of annualized savings.

• CONA consisted of 9 different landscapes
• 32 HANA Large Instances (VLi’s & HLI’s)
  24 x s384 4TB nodes & 8 x s192 2TB nodes
• Production consisted of a 8+1 HANA scale out figuration (1 master node, 7 worker nodes, plus 1 standby node)
• D/R is a 100% match of production
• Production HANA Database is 17+TB
• Multi-Tier HANA System Replication was executed. Site A to B to C.
• Prod “Site A” replicates to D/R “Site B”. Then “Site B” replicates via HSR to Azure site “C”.

“The CONA project has changed many of Microsoft’s Azure Standard procedure to improve on the Provisioning of Storage, Compute, D/R communication, Network Design and Capacity Planning. In other words, the CONA implementation has changed the way Azure does business.” - Corey Sanders Corporate Vice President for Azure Compute Microsoft
Technical Architecture Overview

Hosting DC 1
S,D,Q,T,R,P
Las Vegas

Hosting DC 2
L/DR
San Francisco

Internet

Azure US EAST 2
S VMs  M VMs  D VMs

Azure US EAST
L VMs  R VMs  Q VMs  T VMs  P VMs

Azure US WEST
D/R

HANA Nodes

ASR Replication

Atlas

Azure Express Route

LSR Replication

Citrix

SDC L,Q,T,S

ETC M,R,P

Bottlers
AO

AT&T

L3

Citrix

Coke One Services LLC
Technical Architectures and Planning

• Having an image of the As-Is and the To-Be is critical.

• Understanding the delta’s and what that will mean to the business.

• Understanding the delta’s and what that means to the technology/migration process is just as critical.
Taking the usual inventory lists and transforming into a visual landscapes
Microsoft Booth @ Expo Floor 305

Come visit us at Microsoft Booth #305 If you have any further questions!

And we’ve got swag for you :D

Visit Azure.com/Linux Azure.com/SUSE for more details