True Partnerships. Remarkable Outcomes.

Transforming the UK Public Sector
Agenda

• Infrastructure & Security in the cloud

• Use cases & Data Management (e.g. Website Hosting, Back Up, Data Safe Haven)

• Hybrid Cloud options (e.g. Disaster Recovery, Business Continuity, resilience)

• Pricing and Cost Control models

• Questions
Serving the UK Public Sector for over 30 years

Being 100% focused on the UK Public Sector, our mission is to deliver the outcomes that matter to their staff, citizens, patients, tenants and students.

Our customers are drawn from some of the UK’s largest organisations including the NHS, emergency services, housing associations, universities and a number of large local authorities, as well as many smaller organisations such as schools and charities. We work across:

- Schools & Academies
- Colleges
- Universities
- Charities and non-profits
- Housing Associations
- Healthcare and NHS
- Emergency Services
- Local and Regional Government
- Central Government
Capabilities
Microsoft’s Commitment to Data Privacy & Security

1. Microsoft does not provide any government with direct, unfettered access to customers’ data

2. Microsoft does not provide any government with encryption keys or assist their efforts to break our encryption

3. Microsoft does not engineer back doors into our products

4. Microsoft has never provided business or government data in response to a national security order

5. Microsoft will contest any attempt by the US government to disclose customer content stored exclusively overseas
# TRUSTED CLOUD PRINCIPLES

A set of foundational beliefs that guide the way Microsoft does business in the cloud

<table>
<thead>
<tr>
<th>Security</th>
<th>Privacy &amp; Control</th>
<th>Transparency</th>
<th>Compliance</th>
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</thead>
<tbody>
<tr>
<td>The confidentiality, integrity, and availability of your data is protected.</td>
<td>No one is able to use your data in a way that you do not approve.</td>
<td>You have visibility into how your data is being handled and used.</td>
<td>Your content is stored and managed in compliance with applicable laws, regulations and standards.</td>
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Azure compliance

Azure has the deepest and most comprehensive **compliance coverage** in the industry.
Security responsibilities

<table>
<thead>
<tr>
<th>On-Premises</th>
<th>IaaS</th>
<th>PaaS</th>
<th>SaaS</th>
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<tr>
<td>Applications</td>
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<td>Data</td>
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<td>Runtime</td>
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<td>Middleware</td>
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<td>O/S</td>
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<td>Virtualization</td>
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<td>Servers</td>
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<td>Storage</td>
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<td>Networking</td>
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*Green indicates areas of customer responsibility
*Blue areas are the responsibility of Microsoft
Benefits of cloud computing

- Flexible Hyperscale Platform
- Cost Saving Techniques
- Reliable & Sustainable
- Free Up Internal Resources
- 24 x 7 Support
- Refocus Efforts
- Disaster Recovery
## Azure is an Open Cloud

### 3rd Parties are welcome

<table>
<thead>
<tr>
<th>DevOps</th>
<th>Nagios</th>
<th>Vagrant</th>
<th>Grunt</th>
<th>Android</th>
<th>Xamarin</th>
<th>Docker</th>
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<tbody>
<tr>
<td>Management</td>
<td>Chef</td>
<td>Puppet</td>
<td>Ansible</td>
<td>SaltStack</td>
<td>Mist.io</td>
<td>Libcloud</td>
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<tr>
<td>Applications</td>
<td>Wordpress</td>
<td>Joomla!</td>
<td>Drupal</td>
<td>Apprenda</td>
<td>Pivotal</td>
<td>SAP</td>
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<tr>
<td>App frameworks &amp; tools</td>
<td>PHP</td>
<td>nodeJS</td>
<td>Python</td>
<td>JS</td>
<td>Ruby</td>
<td>IJ</td>
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<tr>
<td>Databases &amp; middleware</td>
<td>Redis</td>
<td>Cloudera</td>
<td>MySQL</td>
<td>MongoDB</td>
<td>Couchbase</td>
<td>SQL Server</td>
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<tr>
<td>Infrastructure</td>
<td>Linux</td>
<td>SUSE</td>
<td>redhat</td>
<td>Bitnami</td>
<td>Oracle Linux</td>
<td>FreeBSD</td>
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Certified, pre-configured for Microsoft Azure Solutions in Azure Marketplace

>4000

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<thead>
<tr>
<th>Marketplace</th>
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<tbody>
<tr>
<td>Web + Mobile</td>
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<tr>
<td>Data + Storage</td>
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<td>Data + Analytics</td>
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<td>Internet of Things</td>
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<td>Networking</td>
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<td>Media + CDN</td>
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<td>Hybrid Integration</td>
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<td>Security + Identity</td>
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<td>Developer Services</td>
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<td>Container Apps</td>
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<tr>
<td>Windows Server Microsoft</td>
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<tr>
<td>Chef Server 12, 13, 14, 15, 16, Chef Software, Inc.</td>
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<td>CloudBoost Enterprise CloudBoost.com</td>
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<tr>
<td>Logentries Logentries.com</td>
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<tr>
<td>Microsoft Service Fabric Cluster Microsoft.com</td>
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<td>Yellowfin for Azure (SaaS), Yellowfin.com</td>
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<th>Solution Templates</th>
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<tbody>
<tr>
<td>SharePoint 2013 Non-PA Farm Microsoft</td>
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<tr>
<td>Cisco CSR 1000v Deployment Cisco Systems, Inc.</td>
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<tr>
<td>Deluge Enterprise Cluster Deluge, Inc.</td>
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<tr>
<td>Elasticsearch, Kibana Elastic</td>
</tr>
<tr>
<td>Fortigate NGFW Single VM Fortinet.com</td>
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<tr>
<td>Intel Cloud Edition for Linux Intel.com</td>
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<th>Azure Certified</th>
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<tr>
<td>Dynamics AX 2012 R3 Microsoft</td>
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<tr>
<td>Windows Streaming Engine 4.5 Linux Windows Media Player</td>
</tr>
<tr>
<td>SDD DataKeeper Cluster Edition SDD Technology, Inc.</td>
</tr>
<tr>
<td>IBM MQ V8.11 Microsoft</td>
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<tr>
<td>Check Point Virtual Gateway Check Point</td>
</tr>
<tr>
<td>Veeam Cloud Connect for Veeam</td>
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</tbody>
</table>
Azure Storage Replication Options

**LRS**
- 3 replicas, 1 region
- Protect against disk, node, rack failures
- Write is ack’d when all replicas are committed
- Superior to dual-parity RAID
- 11 9s of durability

**ZRS**
- 3 replicas **across 3 Zones**
- Protect against disk, node, rack and zone failures
- **Synchronous writes** to all 3 zones
- 12 9s of durability
- Available in 8 regions

**GRS**
- 6 replicas, 2 regions (3/region)
- Protects against major regional disasters
- Asynchronous to secondary
- 16 9s of durability

**RA-GRS**
- GRS + Read access to secondary
- Separate secondary endpoint
- RPO delay to secondary can be queried

**Data protection**
Computing options for every workload

VIRTUAL MACHINES

- Entry level
- Burstable
- General Purpose
- Compute intensive
- Memory optimized
- GPU accelerated
- High Performance Computing
- Storage optimized

PURPOSE-BUILT

SAP

CRAY

NetApp
Resiliency in Azure

Azure offers a comprehensive set of native business continuity solutions, providing high availability, disaster recovery, and backup to protect your mission critical applications and data.

What is resiliency?

- **High availability**: Maintaining acceptable continuous performance despite temporary failures in services, hardware, datacenters, or fluctuations in load.
- **Disaster recovery**: Protection against loss of an entire region through asynchronous replication for failover of virtual machines and data using services such as Azure Site Recovery and geo-redundant storage (GRS).
- **Backup**: Replication of virtual machines and data to one or more regions using Azure Backup.

Definitions

- **Blast radius**: The radius of protection for applications and data. For example, Availability Sets protect applications within a datacenter, and Availability Zones protect applications and data in an Azure region.
- **Data residency boundary**: Two regions that share the same regulatory requirements for data replication and storage for the country or region in which they operate.

For more information

- Azure resiliency solutions: [azure.com/resiliency](https://azure.com/resiliency)
- Azure Availability Zones: [aka.ms/AvailabilityZones]
- Azure regions: [aka.ms/AzureRegions]
Regions paired for geo-redundancy

Designed for high data availability, resiliency against regional disasters
Geo-replicated data still within national boundaries for 8 countries

Geo replication

> 300 miles

UK West

UK South
Azure pricing calculator

- Understand cost options (including discounts)
- Generate cost model for entire Azure estate (TCO)
- Plan for future deployments
- Recognise component costs before deploying resources
- Determine region limitations in advance
Cost Management & Billing
Azure Advisor

Microsoft Azure

Home > Advisor recommendations > Shut down or resize your virtual machine

Shut down or resize your virtual machine

Recommendation details

We've analyzed the usage patterns of your virtual machine over the past 14 days and identified virtual machines with low usage. While certain scenarios can result in low utilization by design, you can often save money by managing the size and number of virtual machines. **59,670.29 USD**

**Potential yearly savings**

**Impacted resources**

- Virtual machine:  ShareSloth
  - Resize the virtual machine
  - View Usage Patterns
  - Shut down the virtual machine
  - **Recommended actions:** Resize the virtual machine
  - **Potential savings:** 2,249.86 USD
  - **Subscription:** Azure Customer Success team
  - **Recommendation rule:** Average CPU < 5%
  - **Updated at:** 2/19/2019, 12:24:55 PM
  - **Action:** Postpone / Dismiss

- Virtual machine: testing
  - **Recommended actions:** Resize the virtual machine
  - **Potential savings:** 1,044.58 USD
  - **Subscription:** Azure CIP Community Internal Consumption
  - **Recommendation rule:** Average CPU < 15%
  - **Updated at:** 2/19/2019, 12:26:31 PM
  - **Action:** Postpone / Dismiss

- Virtual machine: testcrm
  - **Recommended actions:** Resize the virtual machine
  - **Potential savings:** 1,678.46 USD
  - **Subscription:** Azure CIP Community Internal Consumption
  - **Recommendation rule:** Average CPU < 15%
  - **Updated at:** 2/19/2019, 12:26:31 PM
  - **Action:** Postpone / Dismiss

- Virtual machine: bhannade-win-vm
  - **Recommended actions:** Resize the virtual machine
  - **Potential savings:** 2,499.84 USD
  - **Subscription:** Azure CIP Community Internal Consumption
  - **Recommendation rule:** Average CPU < 15%
  - **Updated at:** 2/19/2019, 12:26:31 PM
  - **Action:** Postpone / Dismiss
Cost optimisation methods

✓ **Deallocation** of virtual machines when not in use

✓ Consider **autoscaling** based on demand metrics

✓ **Right-size** virtual machine estate / storage

✓ **Consolidate** server roles

✓ Platform **transformation**

✓ Azure **hybrid use** benefit

✓ Azure **reserved instances**
Help organisations understand what Azure is, use cases and assess existing infrastructure

**Strategy Planning Offerings**
- Azure 101
- Data 101
- Ai 101
- Power Platform Workshop

**Assessment**
- Surveyor 360
- Azure Fundamentals
- Azure Security Assessment
- Microsoft Solution Assessments
- Azure Essentials Managed Service

**Managed Service, cost optimisation and Training - enable customers for successful and effective Azure usage**

**Managed Services & Project Services**
- Azure Essentials Managed Service
- Azure Cost Optimisation
- Health Check & Governance Assessment
- Azure Training & Adoption Support
- Data Managed Service

**Migrate organisations to Azure after assessment, strategy defined and innovate with new workloads**

**Project Services**
- Azure Migration (AMP)
- Sentinel
- Windows Virtual Desktop (WVD)
- Azure Stack
- Data Warehousing in Azure
- Ai & IoT Workloads in Azure
- Azure VMWare Solution
- Power Platform Deployment
- Onboarding to Azure Essentials
Questions

James Honnor
Major Account Manager – Education
Mobile: 07769 948086
E-mail: james-honnor@phoenixs.co.uk