

A close-up photograph of a woman with dark hair, wearing a white lab coat, looking off to the side with a focused expression. The background is a bright, slightly blurred laboratory setting with white equipment.

Microsoft Azure

The cloud platform for
Academic and Research
Institutions

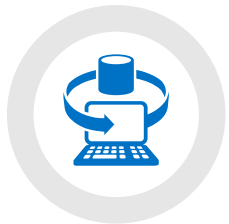
Outline

- ① Cloud Computing for Academia
- ② Connecting Computing Resources
- ③ Microsoft Azure Offer
- ④ Importance of Research
- ⑤ Azure Services for IT and Researchers
- ⑥ Value-Added Services
- ⑦ Next Steps

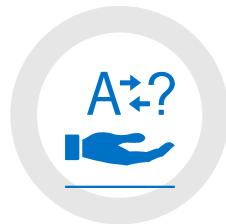
Why Cloud Computing for Academia



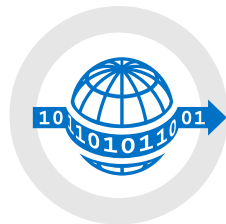
**Enable Distributed
Multidisciplinary
Collaboration**



**Collect and Store Massive
Amount of Data**



**Set Up and Perform
Computations**



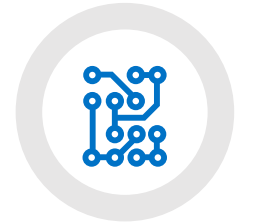
**Leverage Multiple
Data Services**



**Support and
Conduct Research**



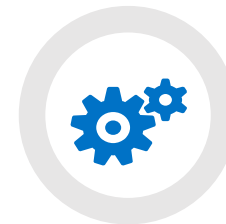
Faculty | Researchers | Graduate Students



**Power and Connect
Devices and IoT**



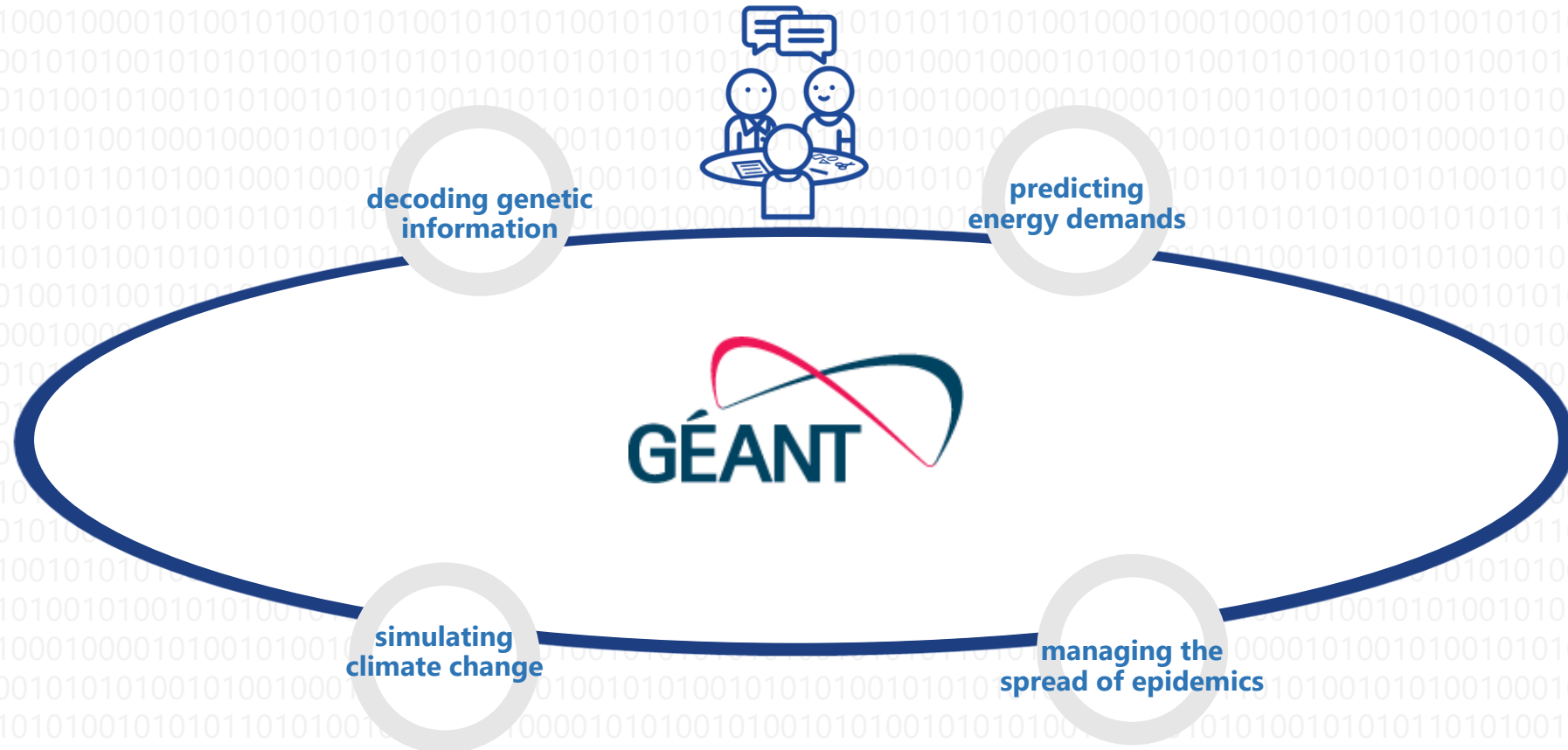
**Share Information on
Websites and Portals**



**Optimize Security,
Resources and Time**

GÉANT provide network connectivity and federated identity solutions
delivers data connections to Member Institutions:

Enabling Researchers to focus on Research



Microsoft has partnered with GEANT, Europe's leading collaboration on e-infrastructure and services for research and education, for a deal on Azure. Special pricing is available through the GEANT framework including:

- Discounts on metered SKUs
- Annual Consumption credits
- Waivers for data flowing out of Azure (egress)
- Discounts on unlimited ExpressRoute connections
- Access to lowest cost compute when pre-purchased



Azure Free Trial

We offer a **one-month free trial** for any new customer and provide **credits of €170 of Azure at no charge.**

Use them on any Azure service based on your needs including, *Virtual Machines, Websites, Cloud Services, Mobile Services, Storage, SQL Database, Content Delivery Network, HDInsight, Media Services, and many more.*

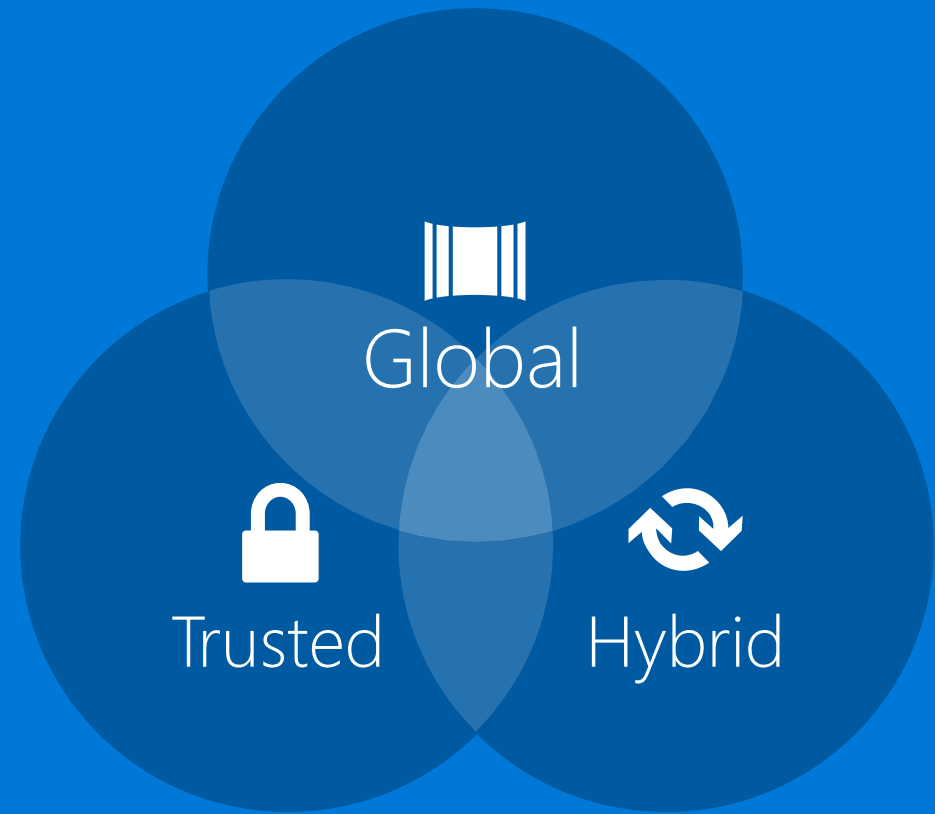
[Learn more about the Azure Free Trial →](#)

A photograph of two men in a server room. They are standing in a long aisle between rows of black server racks. The man on the left is wearing a maroon sweater and khaki pants, and is holding a laptop. The man on the right is wearing a light-colored striped shirt and dark pants, and is pointing at the laptop screen. The room is lit with blue light, and the floor is made of light-colored tiles. The text "What is Azure?" is overlaid on the left side of the image.

What is Azure?

Azure

Infrastructure-as-a-Service (IaaS)



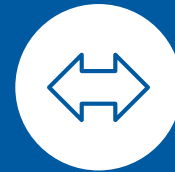
Performance
& Scale



Security
& Compliance



Resiliency



Flexibility



Cost
Optimization

Security & Management

- Security Center
- Portal
- Azure Active Directory
- Azure AD B2C
- Multi-Factor Authentication
- Automation
- Scheduler
- Key Vault
- Store/Marketplace
- VM Image Gallery & VM Depot

Platform Services

Media & CDN

- Media Services
- Media Analytics
- Content Delivery Network

Integration

- API Management
- BizTalk Services
- Logic Apps
- Service Bus

Compute Services

- Container Service
- VM Scale Sets
- Batch
- RemoteApp
- Dev/Test Lab

Application Platform

- Web Apps
- Mobile Apps
- API Apps
- Cloud Services
- Service Fabric
- Notification Hubs
- Functions

Developer Services

- Visual Studio
- Mobile Engagement
- VS Team Services
- Xamarin
- Application Insights
- HockeyApp

Data

- SQL Database
- SQL Data Warehouse
- DocumentDB
- SQL Server Stretch Database
- Redis Cache
- Storage Tables
- Azure Search

Intelligence

- Cognitive Services
- Bot Framework
- Cortana

Analytics & IoT

- HDInsight
- Machine Learning
- Stream Analytics
- Data Catalog
- Data Lake Analytics Service
- Data Lake Store
- IoT Hub
- Event Hubs
- Data Factory
- Power BI Embedded

Hybrid Cloud

- Azure AD Health Monitoring
- AD Privileged Identity Management
- Domain Services
- Backup
- Operational Analytics
- Import/Export
- Azure Site Recovery
- StorSimple

Infrastructure Services

Compute

- Virtual Machines
- Containers

Storage

- Blob
- Queues
- Files
- Disks

Networking

- Virtual Network
- Load Balancer
- DNS
- Express Route
- Traffic Manager
- VPN Gateway
- App Gateway

Datacenter Infrastructure (32 Regions, 24 Online)



A photograph of two men in a server room. They are standing in a long aisle between rows of black server racks. The man on the left is wearing a maroon sweater and khaki pants, and is holding a laptop. The man on the right is wearing a light-colored striped shirt and dark pants, and is pointing at the laptop screen. The room is lit with blue light, and the floor is made of light-colored tiles. The text "Why Azure?" is overlaid on the left side of the image.

Why Azure?

Microsoft Azure Momentum

120,000

New Azure customer subscriptions/month



100 Trillion

Objects in Azure Storage



>85%

of Fortune 500 use Microsoft Cloud



1 in 3

Virtual Machines run Linux



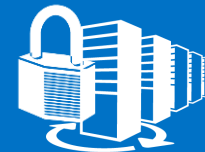
Connectivity

ExpressRoute Partners on every continent except Antarctica!



Security

Physical: Racks are locked, Rooms are secure, datacenter grounds are protected
Cybersecurity: enterprise grade data security



Microsoft Azure



Application innovation

Accelerate innovation with the cloud



Data and intelligence

Power decisions & apps with insights



Openness and flexibility

Build freely, deploy anywhere



Trust

Protect your business

Application innovation

Accelerate innovation with the cloud



Build apps faster and easier

Manage applications proactively

Deliver native mobile apps seamlessly

Build apps faster and easier



Build on PaaS



Existing frameworks



Web and mobile

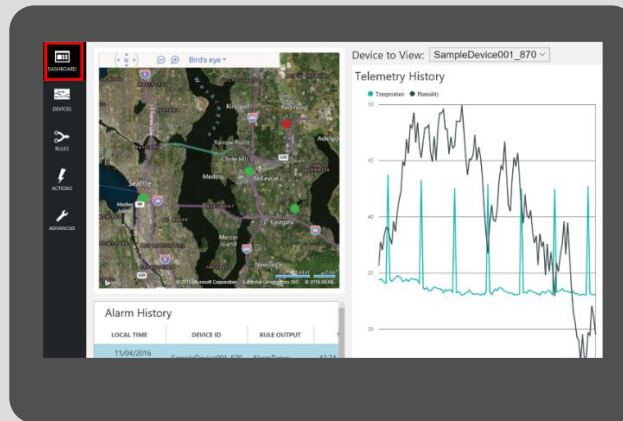


Microservices

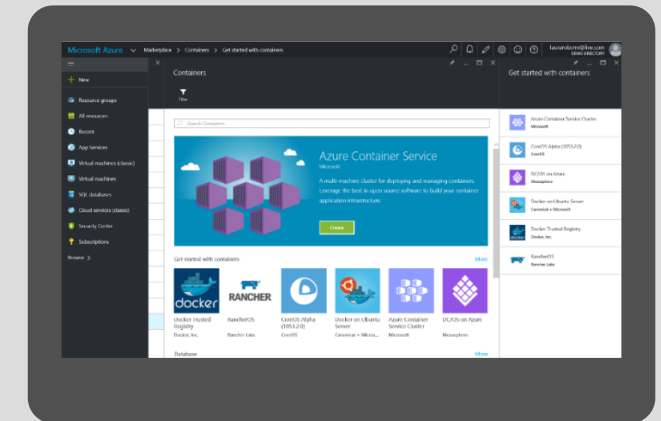


Serverless Compute

Azure Internet of Things



Azure Marketplace



Build on IaaS



Storage



Virtual machines

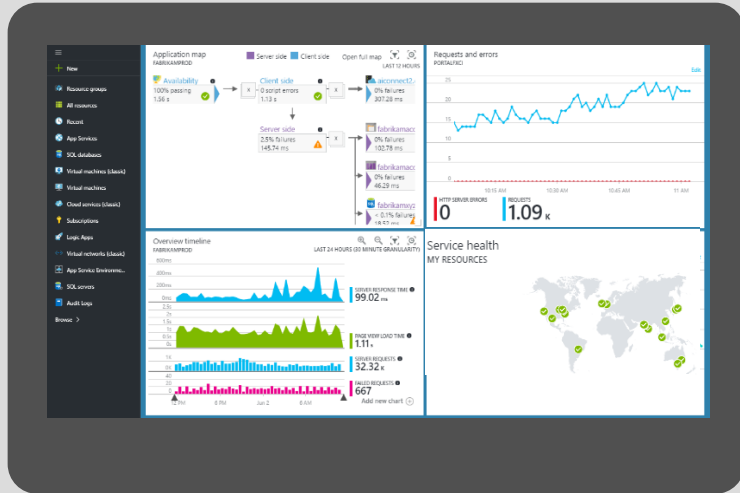


Networking

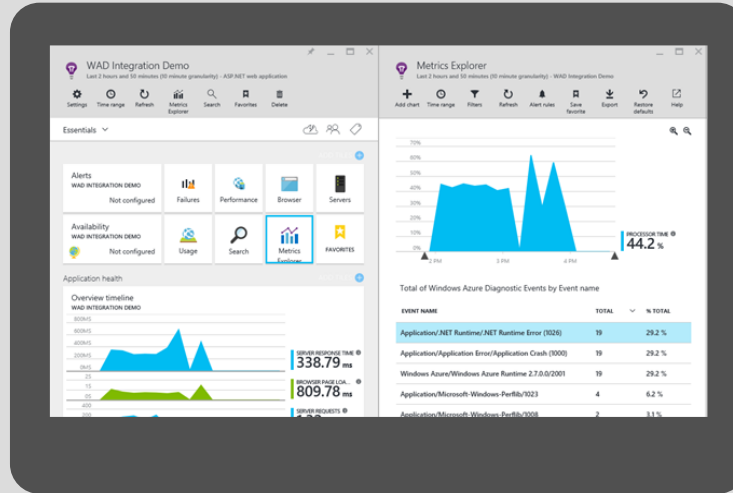
Manage applications proactively



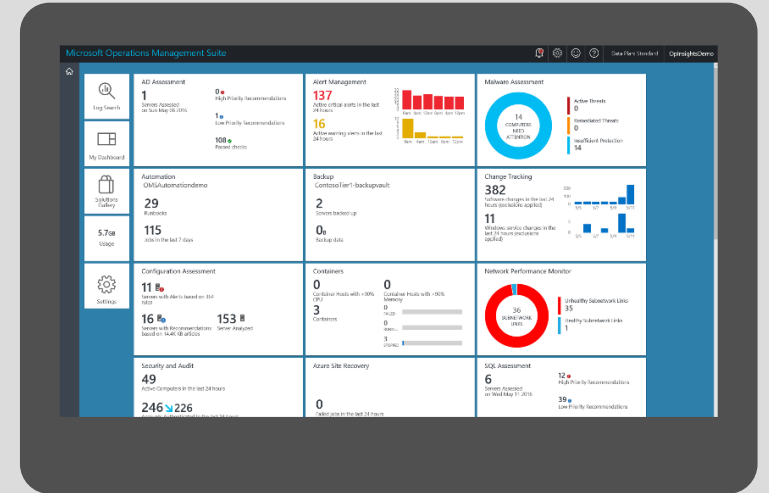
Azure Portal



Application Insights



Operations Management Suite

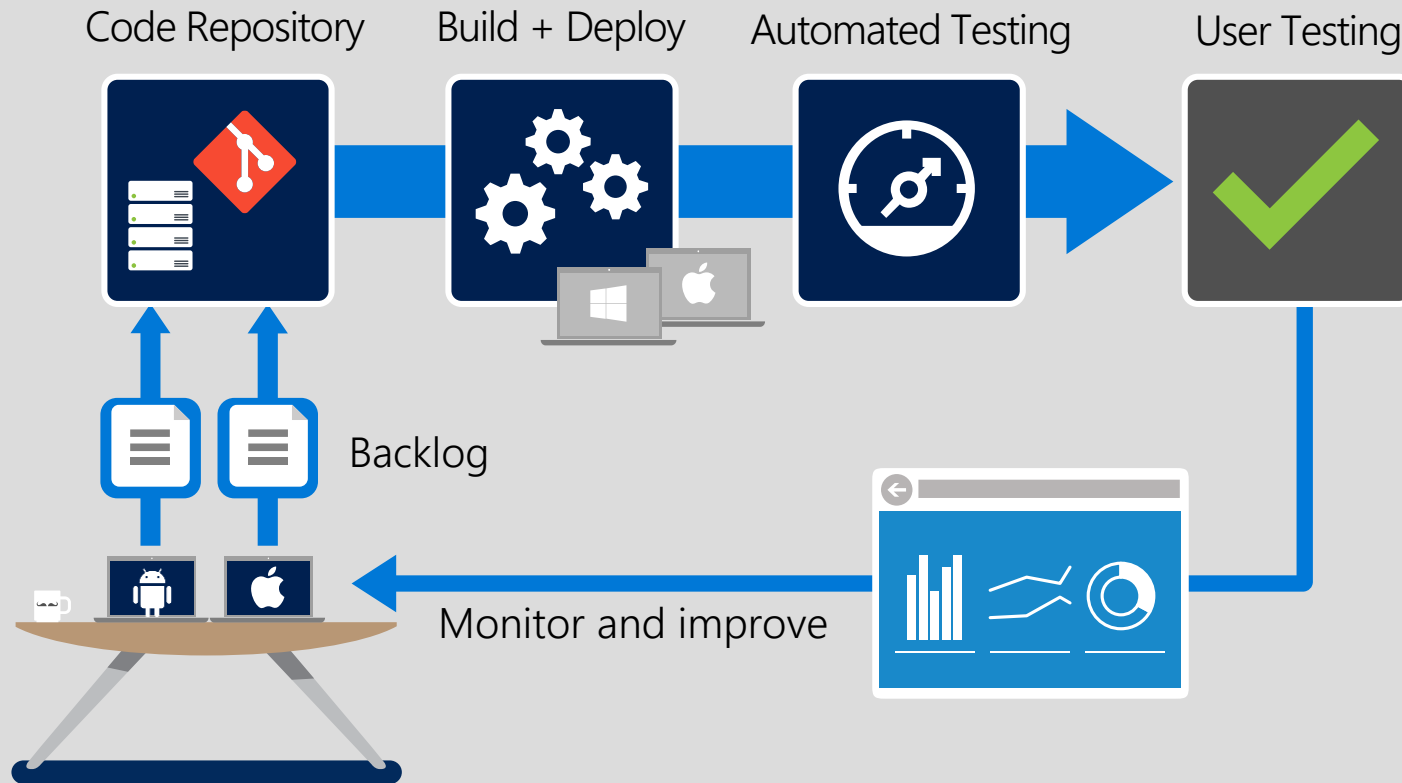


Deliver native mobile apps seamlessly



Mobile DevOps

Mobile Back-end Services



Cloud and
Offline Data

User
Authentication

Push
Notifications

Microsoft Azure



Application innovation

Accelerate innovation with the cloud



Data and intelligence

Power decisions & apps with insights



Openness and flexibility

Build freely, deploy anywhere



Trust

Protect your business

Data and intelligence

Power decisions & apps with insights



Support institutional strategy with powerful analytics

Predict and respond proactively

Learn and engage with artificial intelligence

Support research with powerful analytics



Back-end power

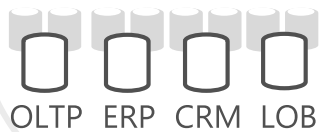
Big data



Web data



Traditional data



Front-end insights



Predict and respond proactively



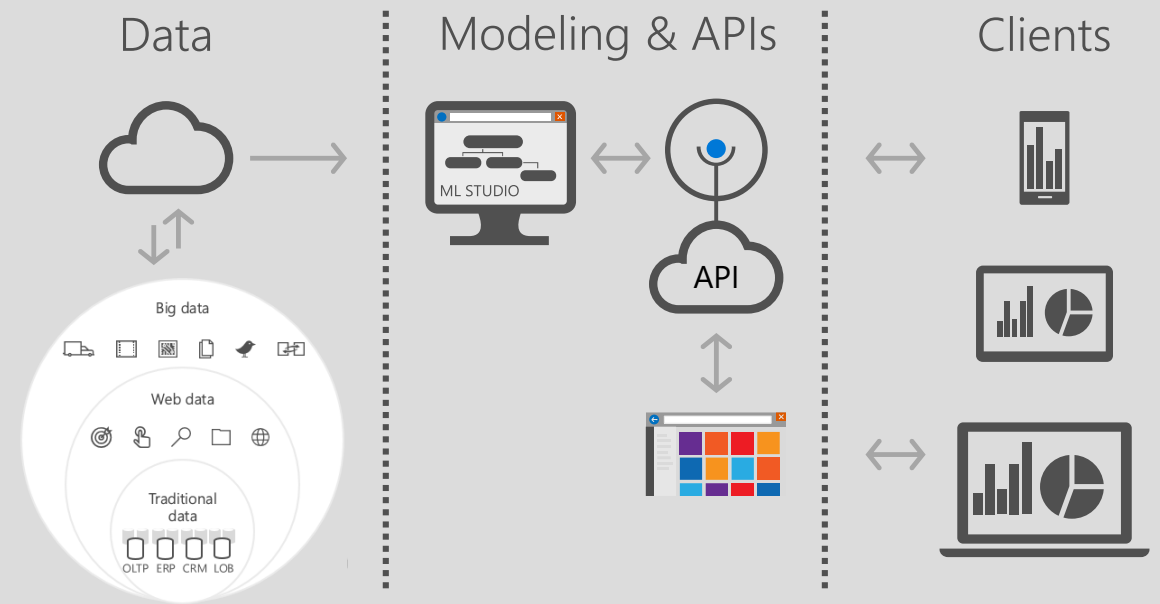
Azure Machine Learning Studio and Templates

 Demand forecasting

 Predictive maintenance

 Vehicle telemetry

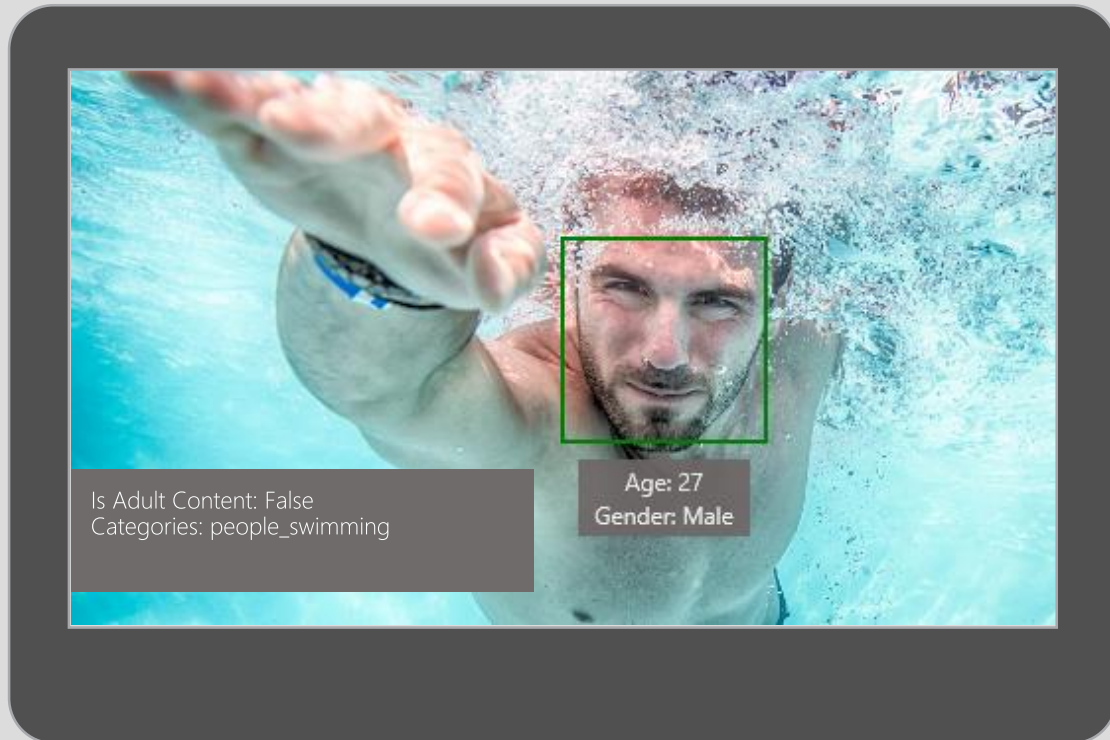
Azure Machine Learning service



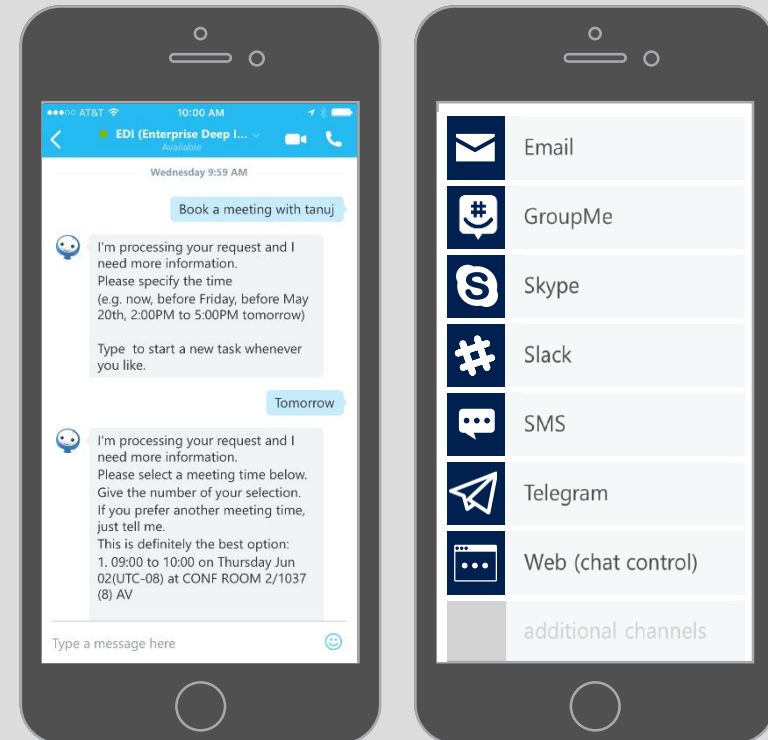
Learn and engage with artificial intelligence



Cognitive services



Bot framework



Microsoft Azure



Application innovation

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Trust

Protect your business

Openness and flexibility

Build freely, deploy anywhere



Build and run open source solutions

Extend on-premises data and apps

Use same management tools to manage workloads on premise and in the cloud

Deploy the cloud on-premises and freely move workloads back-and-forth

Build and run open source solutions



Any tool, application, framework

Applications



DevOps



Frameworks



Databases & middleware



Containers



Infrastructure



Extend on-premises data and apps



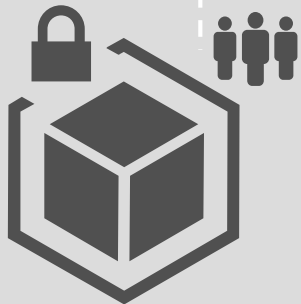
Hybrid Use Cases

Application Availability



Bottomless Storage

Identity Management

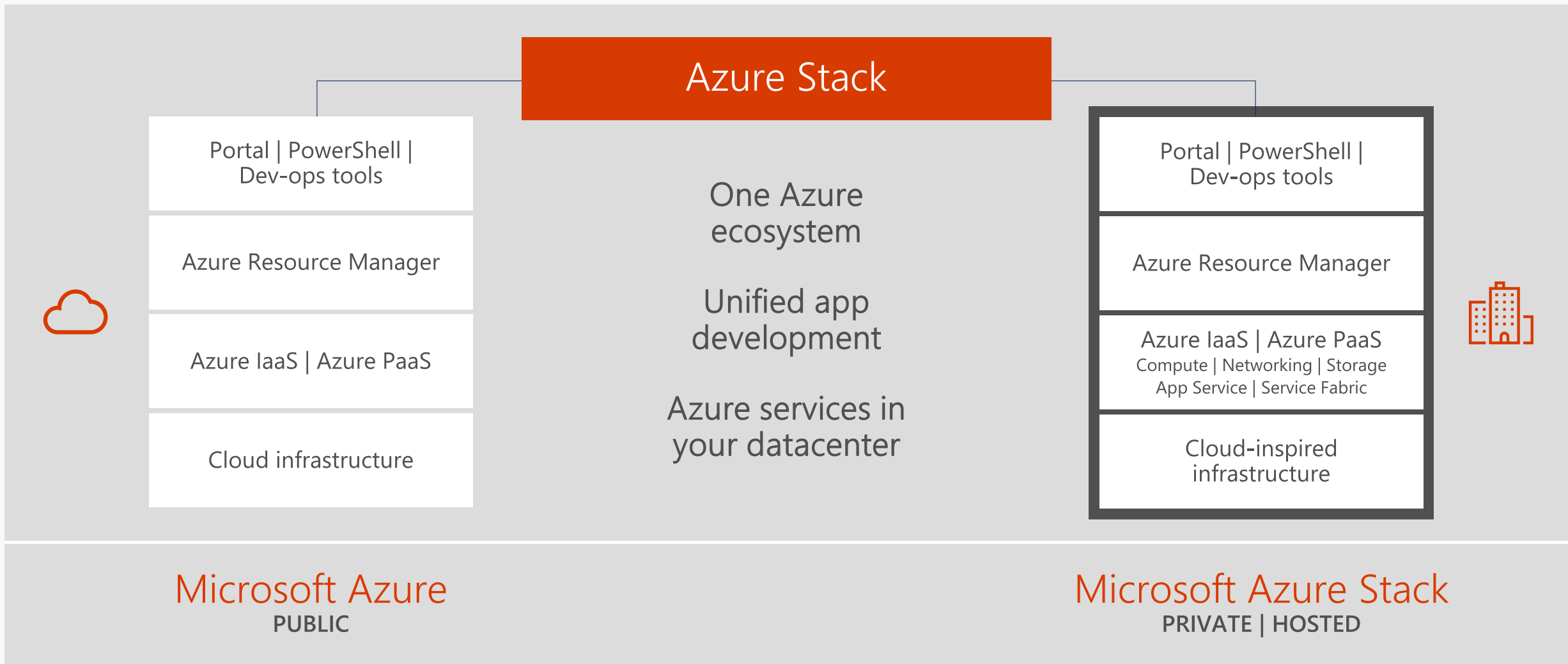


Full hybrid applications

Seamless & secure across:

INFRASTRUCTURE	Azure Backup
	Azure Site Recovery
DATA	Azure StorSimple
	SQL Server Stretch DB
USERS	Azure Active Directory
APPS	App Service Web Mobile Logic Apps API Apps
MANAGEMENT	Operations Management Suite

Deploy the cloud on-premises



Microsoft Azure



Application innovation

Accelerate innovation with the cloud



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Trust

Protect your business

Trust

Protect your business



Detect and mitigate threats

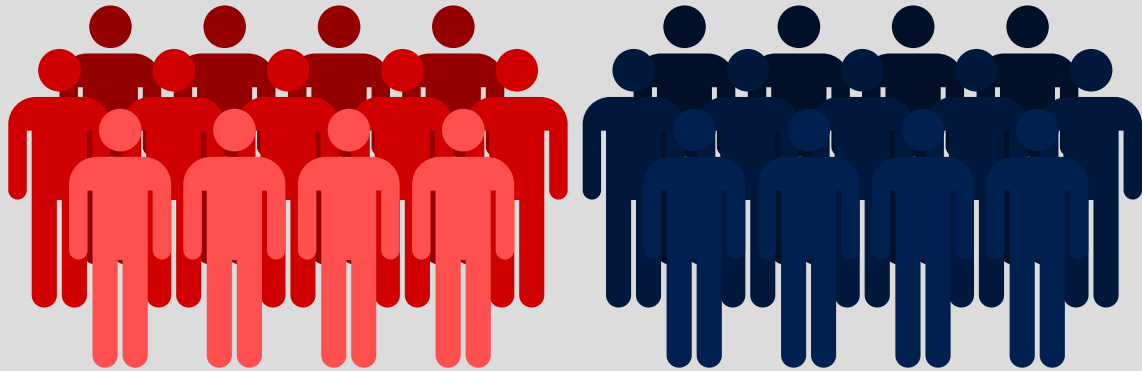
Achieve global scale, in local regions

Benefit from relentless business commitment

Detect and mitigate threats



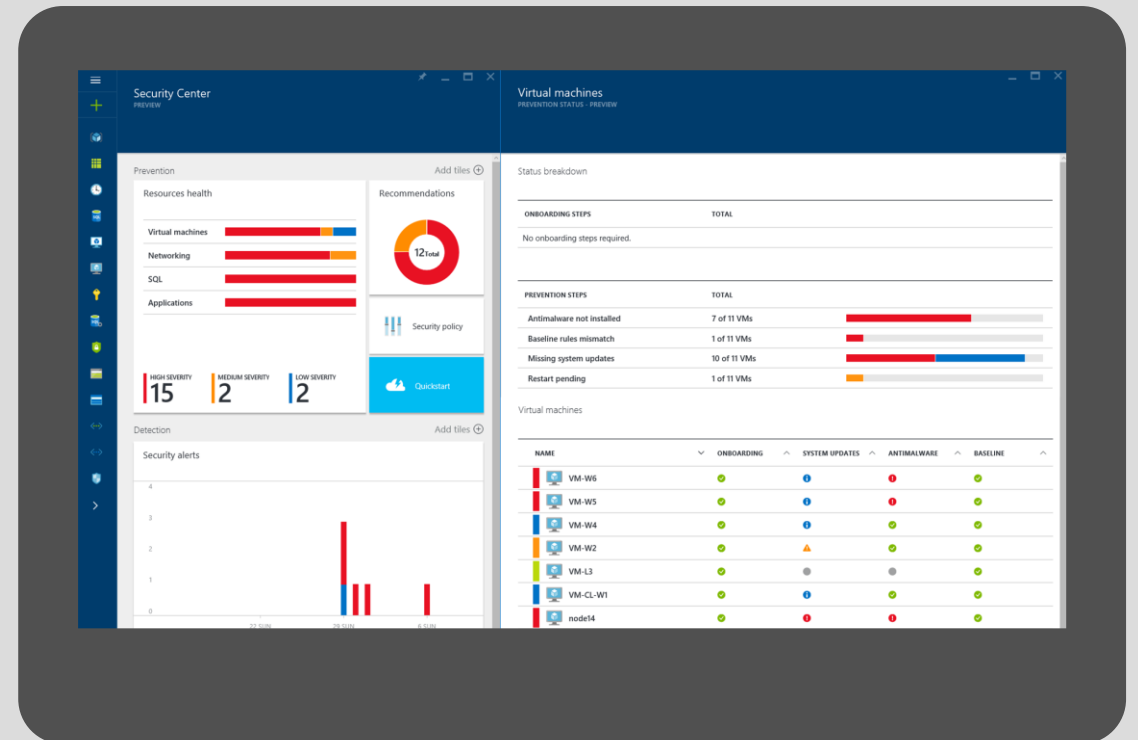
Securing the platform



RED TEAM

BLUE TEAM

Empowering your teams



Achieve global scale, in local regions



34

regions

Benefit from relentless business commitment



ISO 27001



SOC 1 Type 2



SOC 2 Type 2



PCI DSS Level 1



Cloud Controls Matrix



ISO 27018



Content Delivery and Security Association



Shared Assessments



FedRAMP
JAB P-ATO



HIPAA/
HITECH



FIPS 140-2



21 CFR
Part 11



FERPA



DISA Level 2



CJIS



IRS 1075



ITAR-ready



Section
508 VPAT



European
Union Model
Clauses



EU Safe
Harbor



United Kingdom
G-Cloud



China Multi
Layer Protection
Scheme



China
GB 18030



China
CCCPFF



Singapore
MTCS Level 3



Australia
Signals
Directorate



New
Zealand
GCIO



Japan
Financial
Services



ENISA
IAF



Azure Services for Researchers



Academic research is among one of the most important endeavors in today's changing world. It's at the core of every leading learning institution.

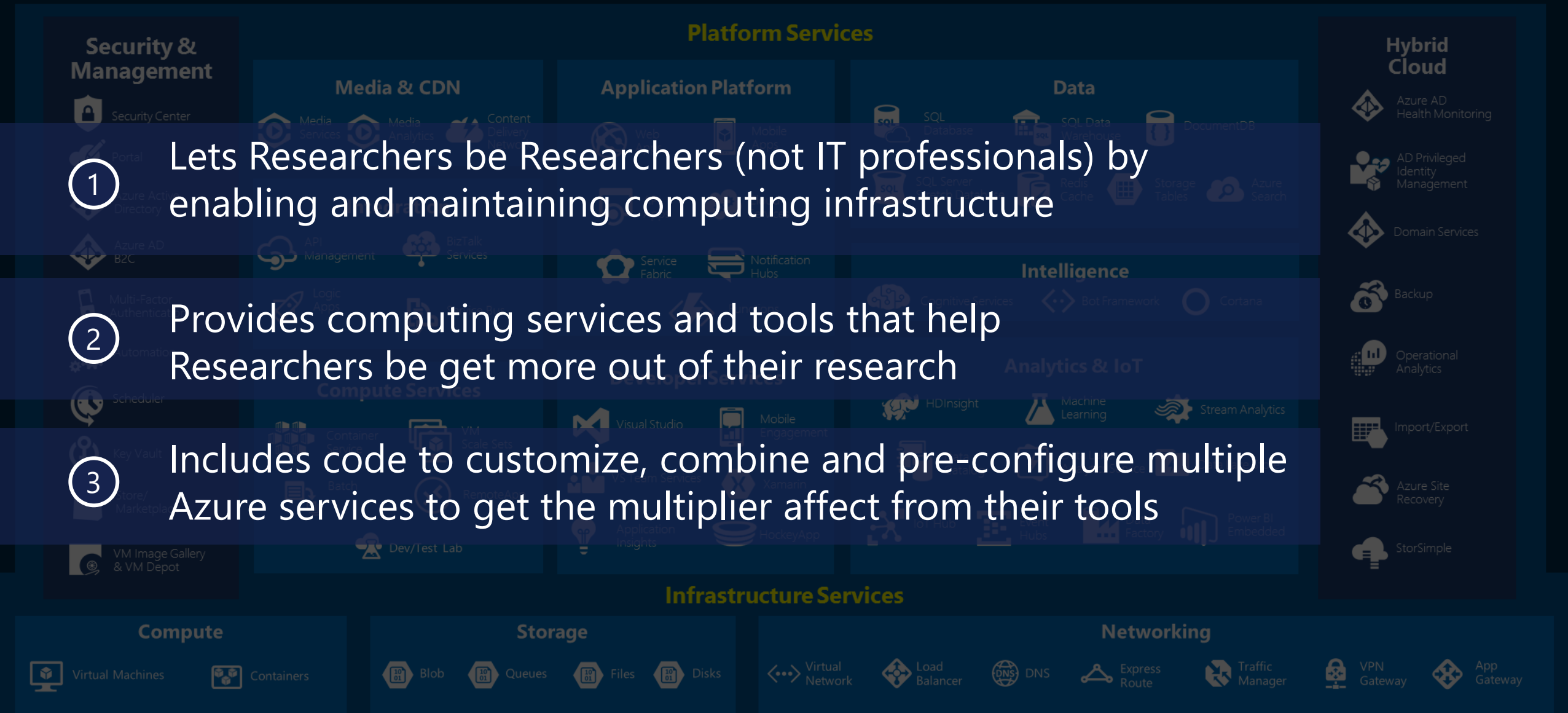
Research today is advancing at a tremendous rate in all disciplines, including computer science, engineering, life sciences, environment science, social sciences, and more.

Applicability of Azure Services in Research

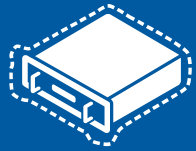
① Lets Researchers be Researchers (not IT professionals) by enabling and maintaining computing infrastructure

② Provides computing services and tools that help Researchers be get more out of their research

③ Includes code to customize, combine and pre-configure multiple Azure services to get the multiplier affect from their tools



Azure Services for Education Highlights



Virtual Machines



Storage



Network Connectivity



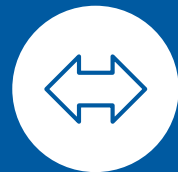
Website and WebApp
Hosting



Data Sharing



Backup and
Disaster Recovery



Cortana
Intelligence Suite



IoT Suite



Security



Privacy and Compliance

Virtual Machines

Research process requires:

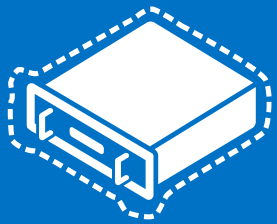
- Access to fast and flexible computing environments, fast
- High Performance Computing, often with multiple computing environments
- Development and Testing sandbox to allow in house creations of custom applications
- Remote data collection, analysis, modeling and sharing



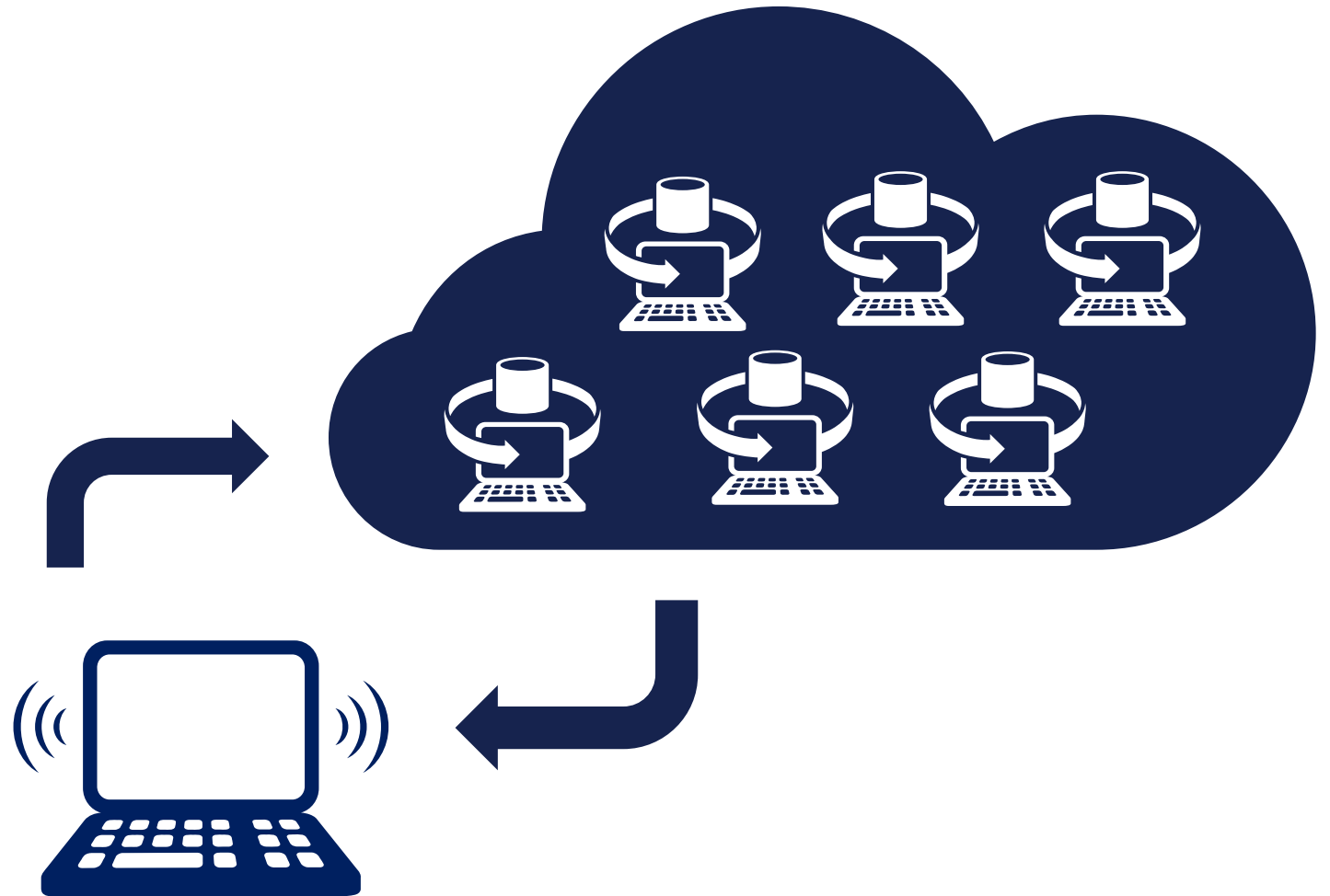
[University Hits £1 Million Savings Goal with Virtualised Network and Management Tools](#)

Virtual Machines

Access to powerful computing environments, fast



- We make it easy to swap workloads from on premise to the cloud
- Avoid limitations or failure of older hardware and connectivity
- Don't worry about storage and backup
- Multiple varieties of Linux supported
- Pay only for what you use



Storage

Research process requires:

- Storage of research information - including massive amounts of research data, graphics, art and computer science projects, accessible on web and mobile
- Back up of key research data
- Record-keeping of educational data per applicable regulations
- Storage of virtual machine configurations to speed up deployment



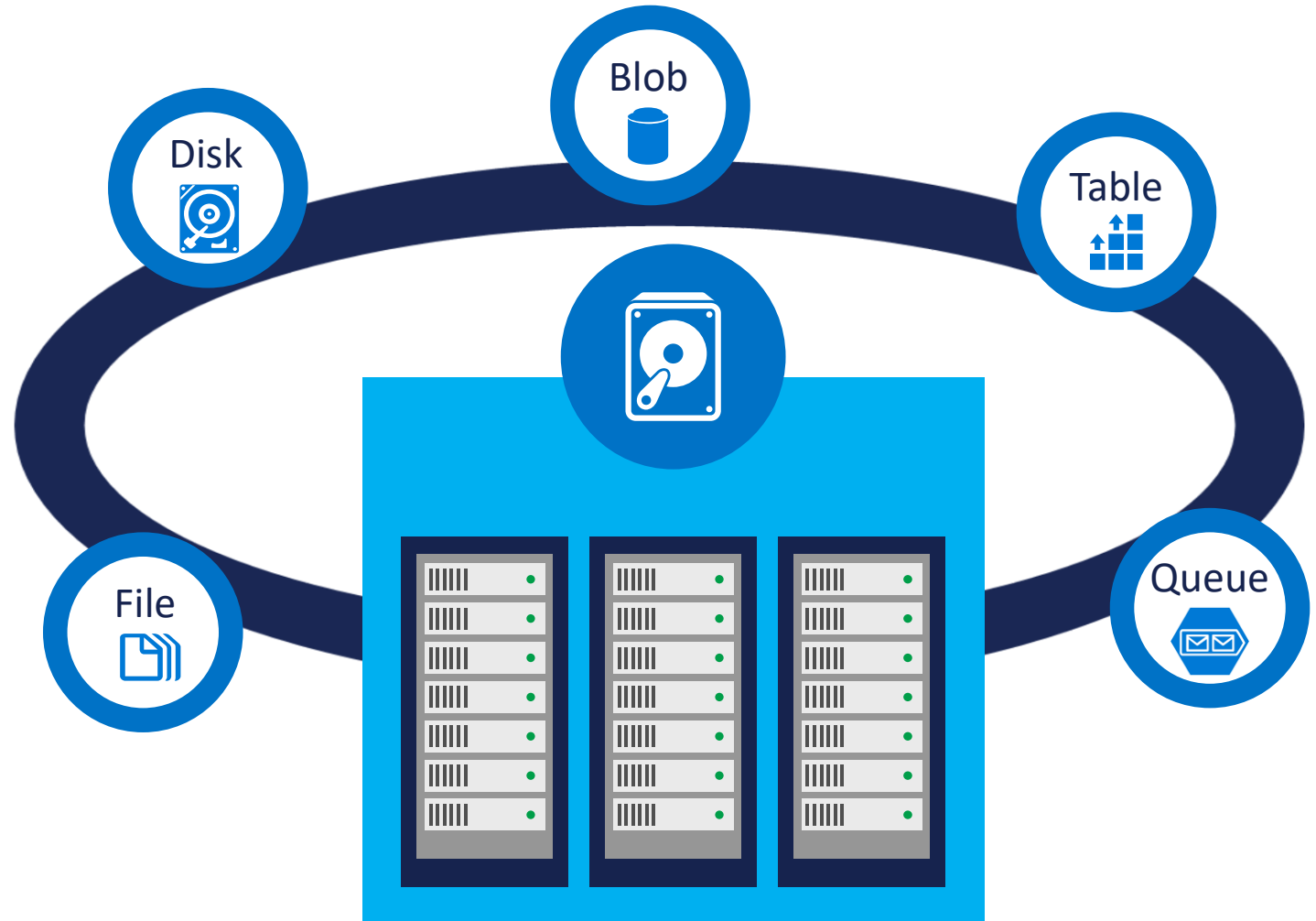
[Scientists from University of Washington are predicting ocean chemistry using Microsoft Azure](#)

Storage

Durable, highly available and massively scalable cloud storage for your research data



- Optimize storage for different data types
- Hyperscale repository for big data analytics workloads
- Premium Storage Disks option: SSD-based, high IOPs, low latency
- StorSimple – hybrid cloud storage reduces costs, optimizes access times and improves data security



Network Connectivity

Research process requires:

- Extensive connections between various tools, research participants, objects and partners to one another
- Direct peering between databases and GEANT backbone enables streamlined connections
- Connections (VPN) must be highly available, easy to manage, secure and reliable
- Networking must be predictable and high-throughput



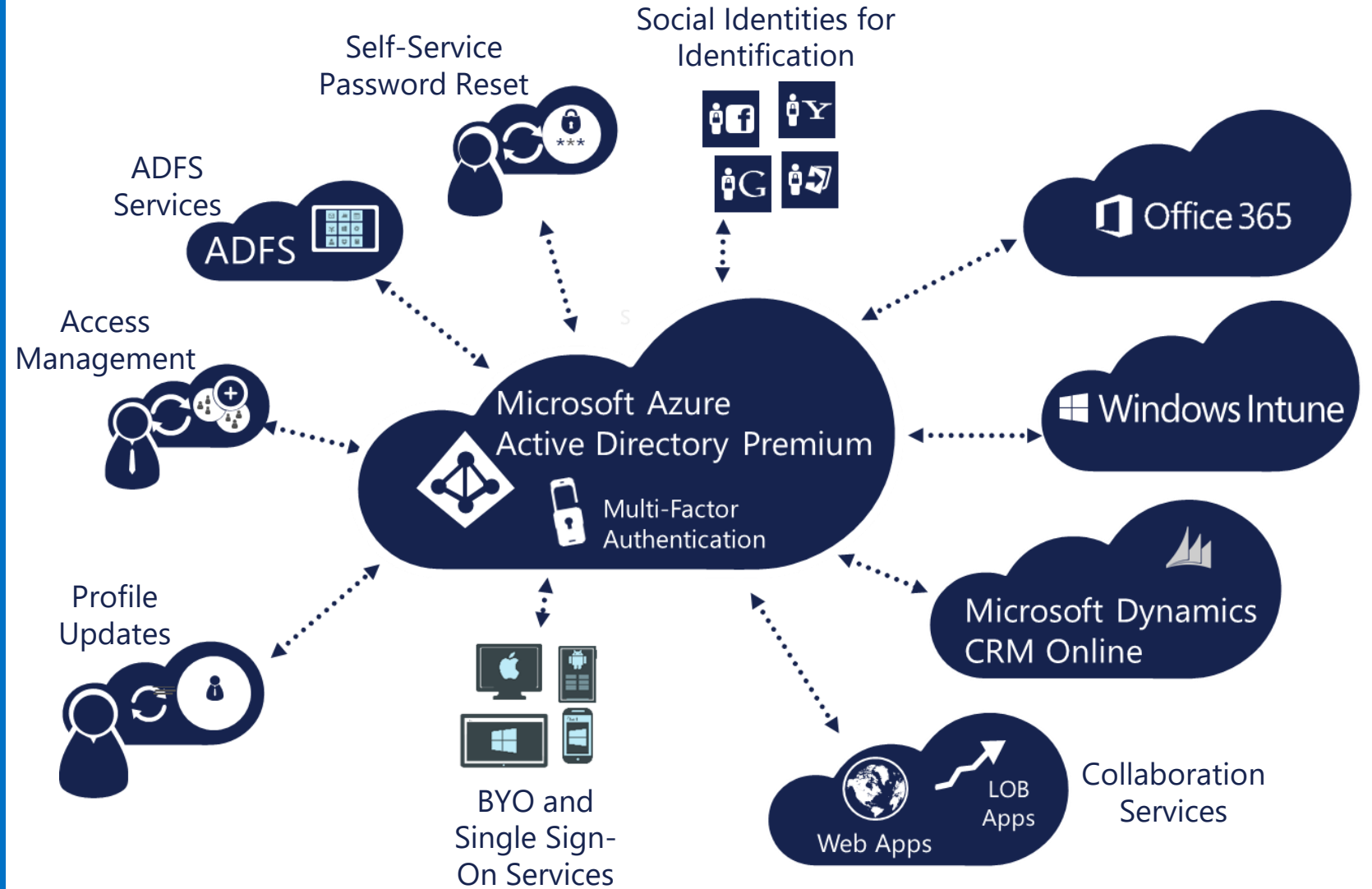
[Major Jordanian University Uses Hybrid Cloud Infrastructure For Flexible IT](#)

Network Connectivity

Expanding existing data center with Microsoft Cloud and simpler management



- Azure AD provides a comprehensive identity and access management cloud solution in the public cloud
- Enables streamlined sign-in capabilities to all of institution's domains and thousands of partner applications with a single ID and password
- Self-service Password Reset saves a LOT of time and costs
- Multi-Factor Authentication increases security for critical workloads



Website and WebApp Hosting

Research process requires:

- Hosting of university, departmental or projects websites, accessible on web and mobile
- Collaborative environments or services that all participants and research stakeholders can have access to in order to exchange data
- Web apps or portals that showcase research findings
- Hosting class information or assignments online



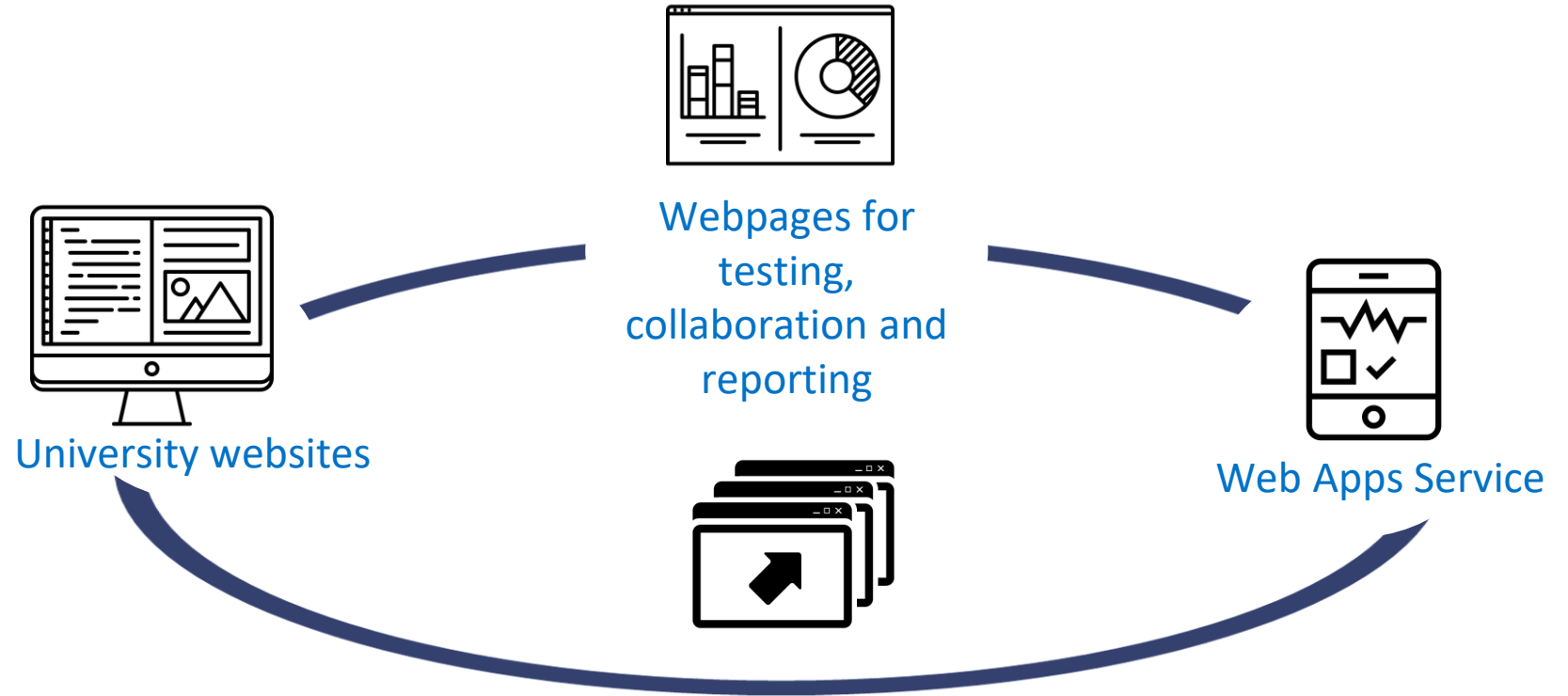
[University of the Aegean in Greece developed Fire App to help fights wildfires with data](#)

Website and WebApp Hosting

Build, deploy and maintain Websites and Apps



- Save Money by Auto-Scaling up and down
- Ensure Website Availability and maintain performance
- Cross-Platform capabilities - support favorite publishing tools and languages



Data Sharing Across Institutions

Research process requires:

- Sharing of the entire data set with the public for publicly funded projects
- Collaboration with other institutions
- Co-authoring of academic papers on collaborative projects



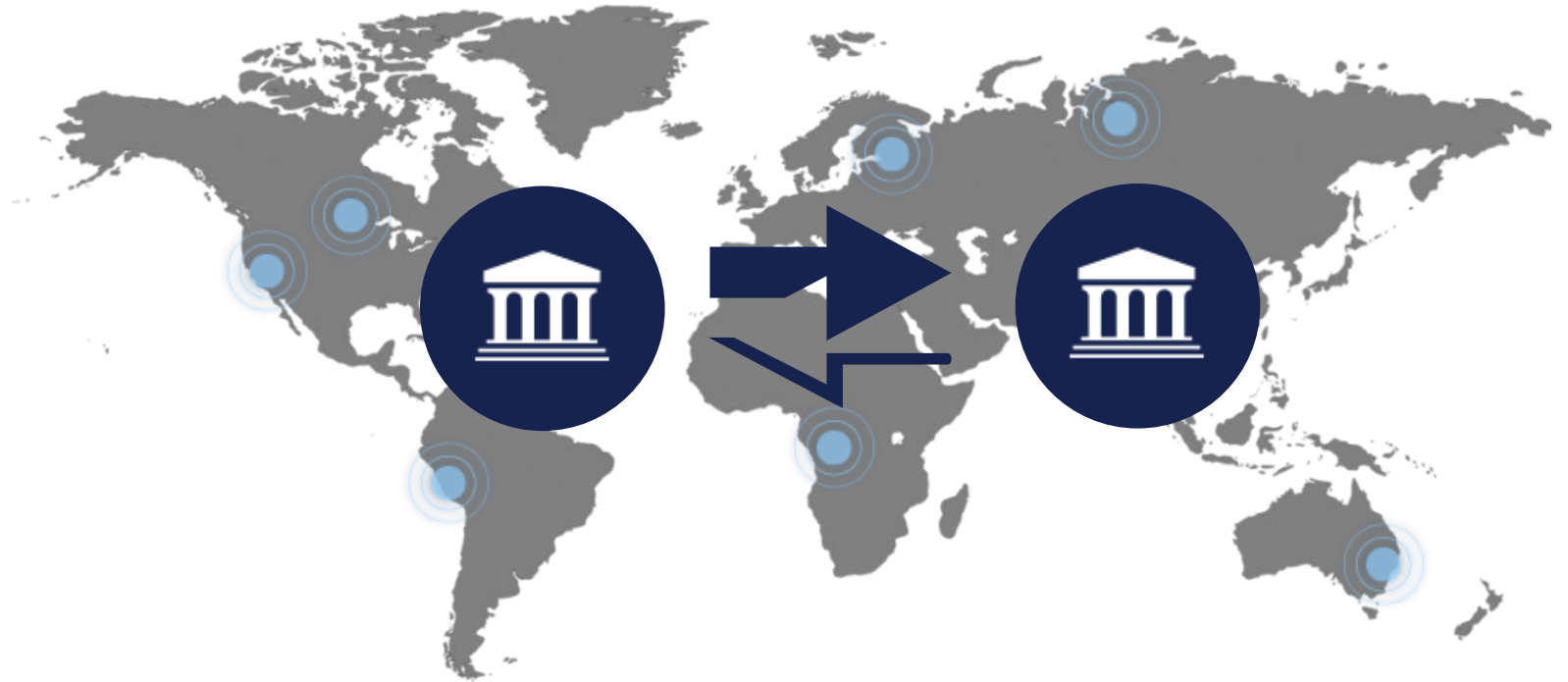
[Microsoft Research has joined forces with the Federal University of Minas Gerais to help researchers predict traffic jams](#)

Data Sharing Across Institutions

Collaborate, build communities
around research results and
accelerate the speed of discovery



- Easy to set up
- Post data publicly for external consumption
- Federated authorization
- Massive amounts of data can be processed
- Comply with publicly posted data requirements



Backup and Disaster Recovery

Research process requires:

- Data backup to ensure business and research continuity
- Data backup per institutional policy requirements
- Website and institutional information recovery



[University Gains Cost-Effective Disaster Recovery Solution with Software Upgrade](#)

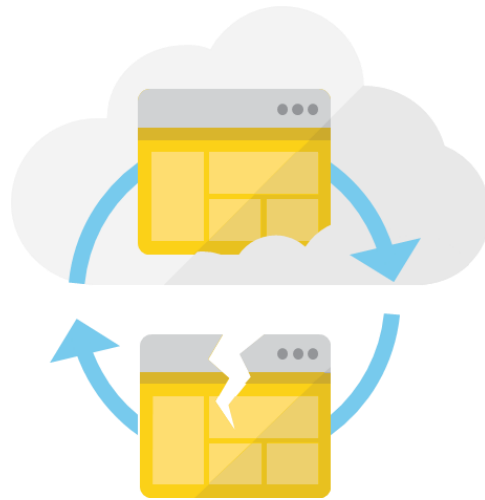
Backup and Disaster Recovery

Ensure work continuity without the expense of secondary infrastructure

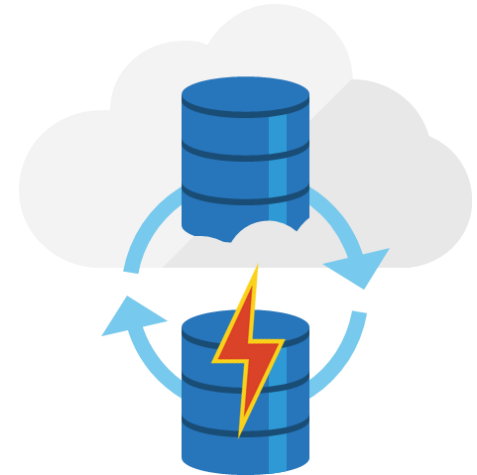


- Compressed to minimize impact on bandwidth
- Backed up in off-peak hours not to take up bandwidth
- No backup hardware or compute costs
- Only backs up the difference for efficiency

Azure Backup



Azure Disaster Recovery



Cortana Intelligence Suite

Research process requires:

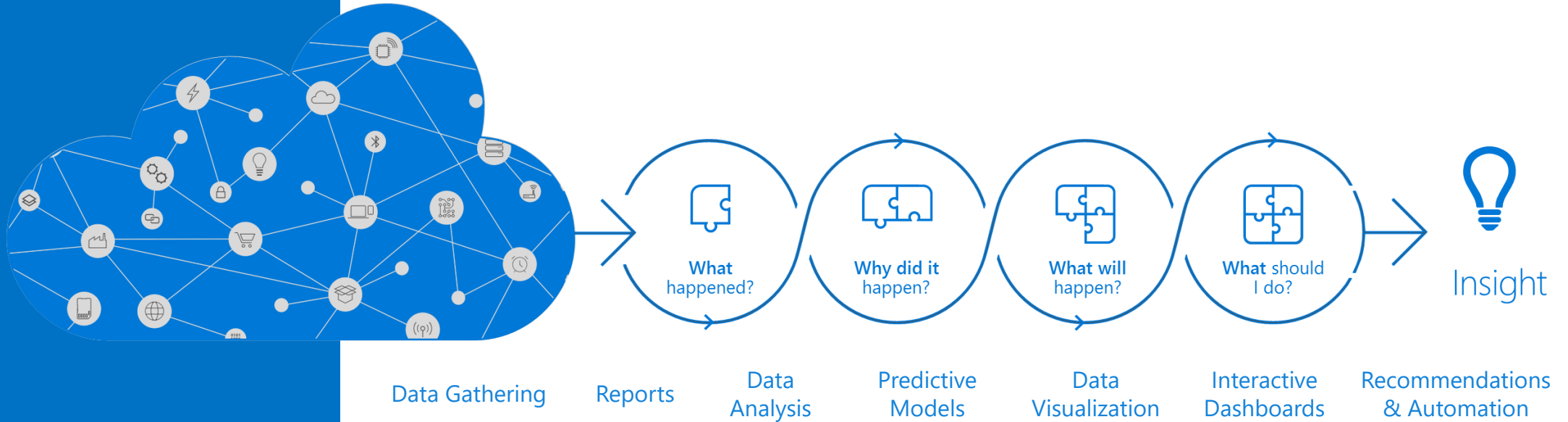
- Building advanced models to increase accuracy and predict anticipated scenarios and outcomes
- Using advanced computing capabilities to understand and fit to a model
- Ability to adjust different factors and variables quickly
- Utilizing Machine Learning capabilities to assist with research efficiency



[University of Texas at Austin preventing flood disasters with Cortana Intelligence Suite](#)

Cortana Intelligence Suite

Turn Research data into Insights



- Utilize the latest in Machine Learning platform
- Leverage and Analyze Data with SQL, HDInsight (Hadoop) and Power BI
- Leverage Cognitive Services (Computer vision, speech recognition, hearing)

IoT Suite

Research process requires:

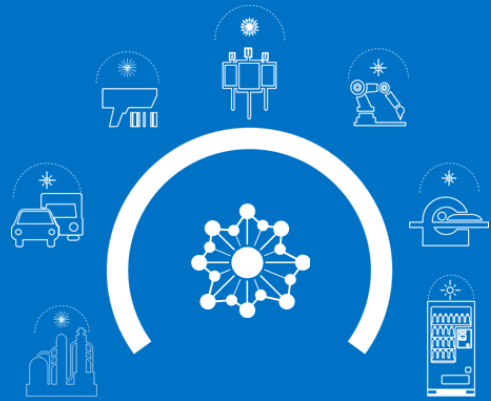
- Remote data collection
- Deployment of new class of specialized and connected devices and sensors used for research data gathering
- Advanced and sophisticated data collection processes, methods and techniques
- Utilizing innovative data analysis and visualizations to assist with research outcomes



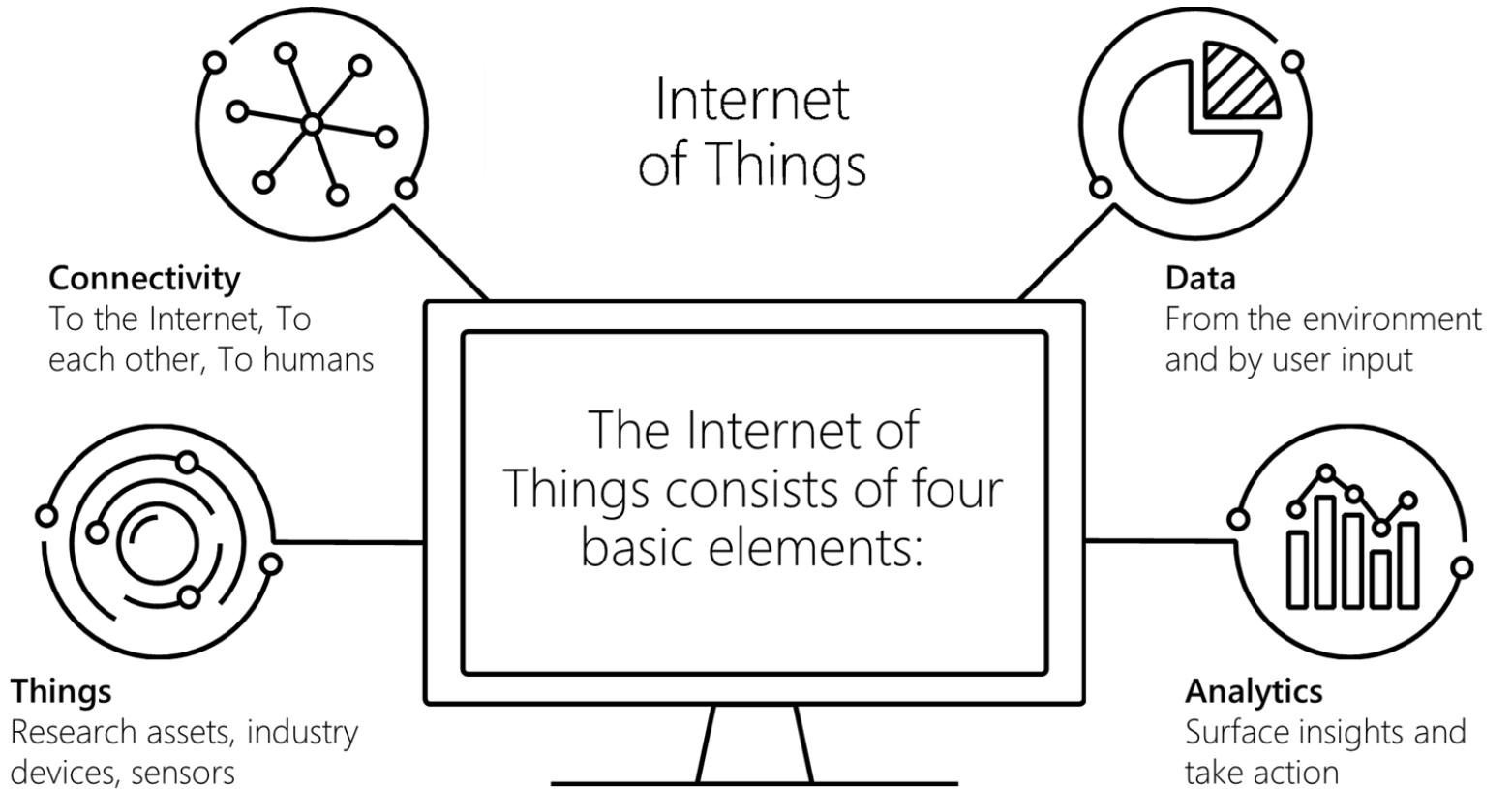
[Brazilian scientist use Azure to Understand Cloud Forests through the Power of Cloud Computing](#)

IoT Suite

Fully realize benefits of a connected world



- Build on the infrastructure you already have
- Collect data from widely separated devices and sensors
- Get more from your data with analysis, modeling and sharing
- Secure your devices and data



Security

Research process requires:

- Protection of sensitive research data from unauthorized access
- Prevention of unauthorized access to educational and student data
- Safeguarding of physical assets



[University Transforms Life Sciences Research with Big Data Solution in the Cloud](#)

Security

20 years of experience and expertise



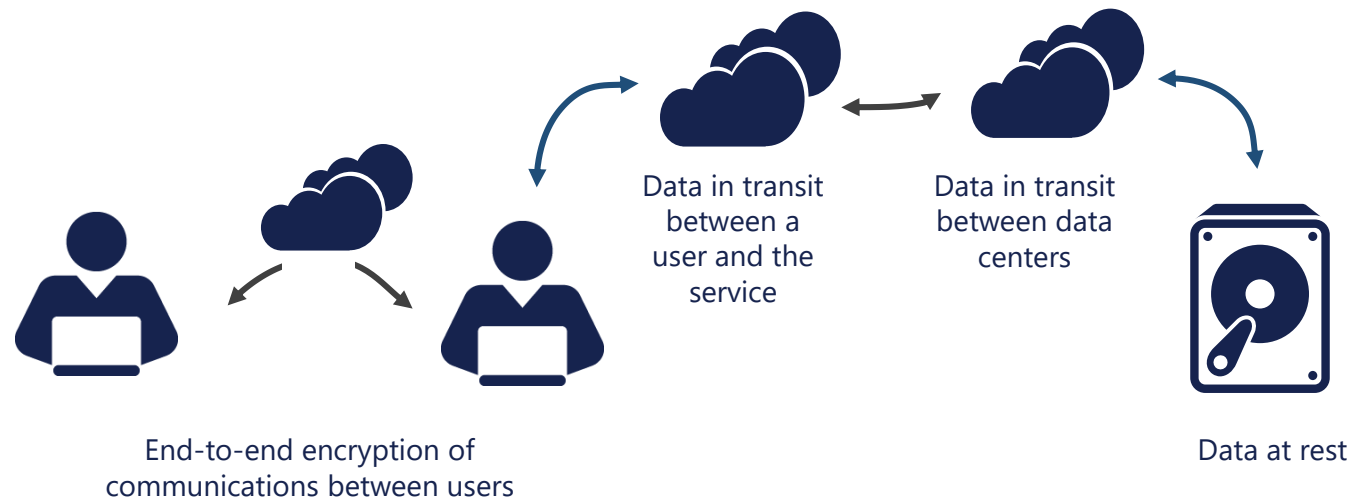
- Azure Trust Center (azure.microsoft.com/en-us/support/trust-center)
- A lot of data centers, in particular in sensitive locations - largest global footprint in the industry
- Security – the server farms have 3 layers of physical security
- Institutions get their encryption key so Microsoft does not keep it

Azure Backup

The confidentiality, integrity, and availability of your data is secured

Azure Disaster Recovery

More certification than any other cloud provider, backed by third-party audits



Privacy and Compliance

Research process requires:

- Continual monitoring and testing of research equipment
- Maintaining compliance with local security and data privacy laws
- Ensuring technical certifications for research equipment and technology



[Senior research assistant at the University of Stirling in Scotland is helping to untangling airports using open source tools on Microsoft Azure](#)

Privacy and Compliance

The largest compliance portfolio in the industry



- Security goals set in context of business and industry requirements
- Security analytics & best practices deployed to detect and respond to threats
- Benchmarked to a high bar of certifications and accreditations to ensure compliance
- Continual monitoring, test and audit
- Ongoing update of certifications for new services
- 24 regions available and 8 announced
- 38 compliance certifications



ISO 27001



SOC 1 Type 2



SOC 2 Type 2



PCI DSS Level 1



Cloud Controls Matrix



ISO 27018



Content Delivery and Security Association



Shared Assessments



FedRAMP JAB P-ATO



HIPAA / HITECH



FIPS 140-2



21 CFR Part 11



FERPA



DISA Level 2



CJIS



IRS 1075



ITAR-ready



Section 508 VPAT



European Union Model Clauses



EU Safe Harbor



United Kingdom G-Cloud



China Multi Layer Protection Scheme



China GB 18030



China CCCPP



Singapore MTCS Level 3



Australian Signals Directorate



New Zealand GCIO



Japan Financial Services



ENISA IAF



[Understanding Cloud Forests Through the Power of Cloud Computing](#)



UNIVERSITY of
ROCHESTER

[Cloud computing changes the way we practice public speaking](#)



[Major Jordanian University Uses Hybrid Cloud Infrastructure for Flexible IT](#)



[Academic partnership for research on weather forecast in Azure](#)



[All that RaaS: saving lives and transforming healthcare economics](#)

[Predicting ocean chemistry using Microsoft Azure](#)



[University Transforms Life Sciences Research with Big Data Solution in the Cloud](#)



University of Venda

[South African university transforms education through move to cloud and tablet](#)



[Microsoft Azure helps researchers predict traffic jams](#)

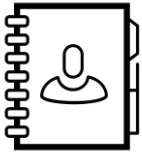
Azure in Research (and Education) Case References



Resources for Research

Public website	https://www.microsoft.com/en-us/research/academic-program/microsoft-azure-for-research/?wt.mc_id=AID616592_QSG_EBK_155736
Azure for Research blog	http://aka.ms/a4rblog
Cloud computing guide for researchers	https://blogs.msdn.microsoft.com/azure_4_research/tag/guide/?wt.mc_id=AID616592_QSG_EBK_155737
Azure for Research training content	https://github.com/MSRConnections/Azure-training-course?wt.mc_id=AID616592_QSG_EBK_155738
Azure for Research videos - YouTube playlist	https://www.youtube.com/playlist?list=PLD7HFcN7LXRdpL-fIDjHy0Vs61XsdosO-&wt.mc_id=AID616592_QSG_EBK_155739
Linked in group	Microsoft Azure for Research
Twitter	@azure4research
Data Science VM forum	https://social.microsoft.com/Forums/en-US/home?forum=dsvm
Microsoft GitHub	https://github.com/Microsoft





Ploutarchos Rigas,
Industry Sector Lead in Education



plrigas@microsoft.com

Where to Learn More?



How To Buy

Empowering every
person and
organisation on the
planet to achieve
more

Thank you

