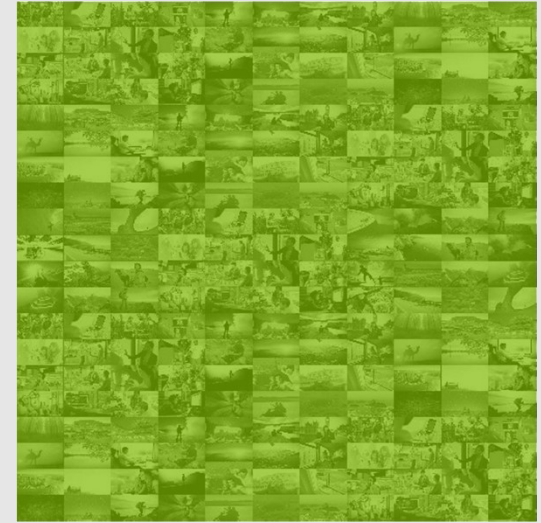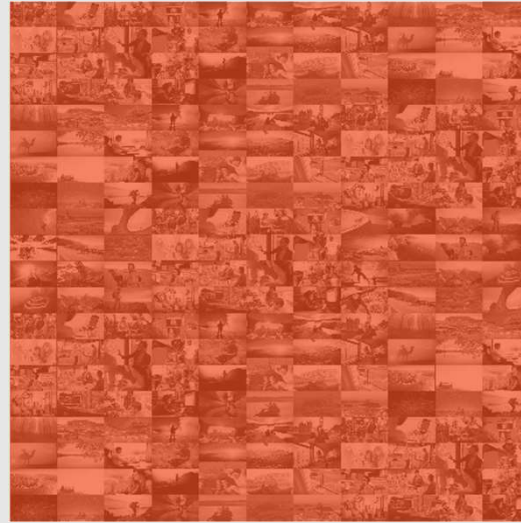# Docentendag ICT
6 December 2018
SPL

Mathieu Rietman, Stéphanie Straub
Cloud Solution Architect

Microsoft

Microsoft mission

Empower every person and every organization on the planet to achieve more

1 million/hour
new devices coming
online by 2020

12 years average
age of S&P 500
corporations by 2020

60% computing
in the public cloud
by 2025

Empowering the students of today
to create the world of tomorrow.

The future of learning will be profoundly social, personalized, and supported by teachers and technology

Moving from know-it-all to learn-it-all

Technology creates opportunity

Personalized, inclusive, and immersive learning experiences fostered by technology create **opportunities to develop emotional and cognitive skills in conjunction with academic learning.**

up to **30%** more time

Impact on time:
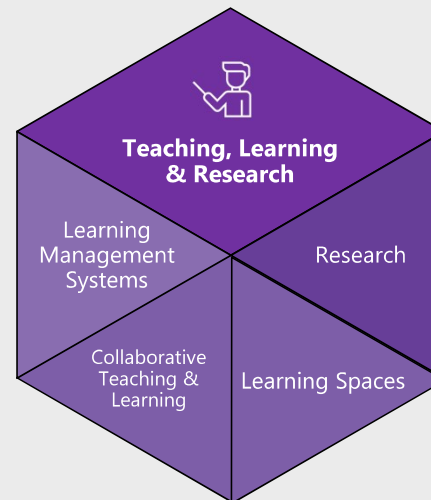
Teachers get up to **30% more time back** with the right technology
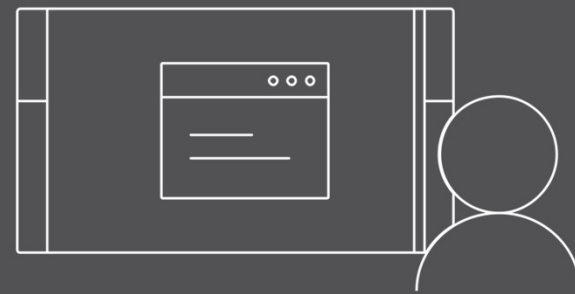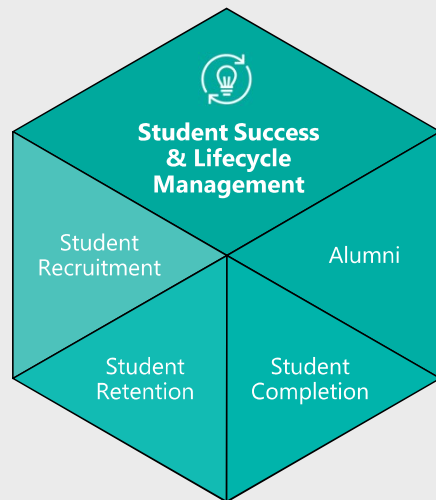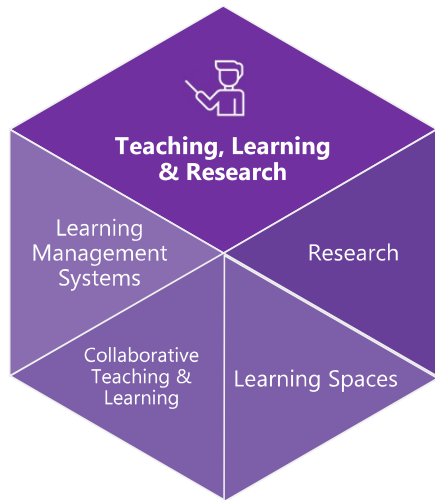
Education Transformation Framework

Vision

For education transformation to be effective, an institution must carefully analyze, design, develop, implement and evaluate their plan for change. Carefully crafting a vision is the first step toward a successful, holistic education transformation.

Student Success & Lifecycle Management

- Student Recruitment
- Alumni
- Student Retention
- Student Completion

Teaching, Learning & Research

- Learning Management Systems
- Research
- Collaborative Teaching & Learning
- Learning Spaces

Connected Campus

- Security Management
- Data Sharing
- Facilities Management
- Institutional Operations
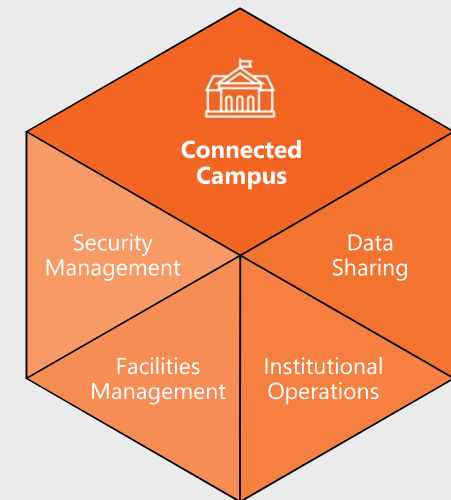
Transformative Outcomes

Gebruiksscenario's Azure in de klas

Specifiek gebruiksscenario:

- Digitale tentaminering / examinering / authentiek toetsen
- Digitaal leerplatform (Virtual Labs, Hackathon)
- Cloud curriculum (lesmateriaal, MOOCs)
- Azure in de klas
  - Voor beheerders
  - Voor ontwikkelaars
- Bring your own device
- Flexibele en persoonlijke digitale leeromgeving. (API Management)

Ontwikkelingen in educatie

Developments

- Steeds meer SaaS
  - En daardoor krimpende omvang datacenters
- Continue verandering in samenwerkingsverbanden
- Complexiteit en risico beheeraanbestedingen
- 'Klassieke' outsourcing van ICT onvoldoende flexibel
- Steeds geraffineerdere cyberattacks
- Aanbieden gedifferentieerd onderwijs
  - Hoger laptopgebruik door leerlingen

Azure

- Geen hardware desinvestering
- Door aparte 'subscriptions' relatief eenvoudig meebewegen
- Azure via SURF/SLB: dienstverlening eenvoudiger in te kopen
- Instelling blijft 'eigenaar' van Azure DC en houdt rechten op omgeving
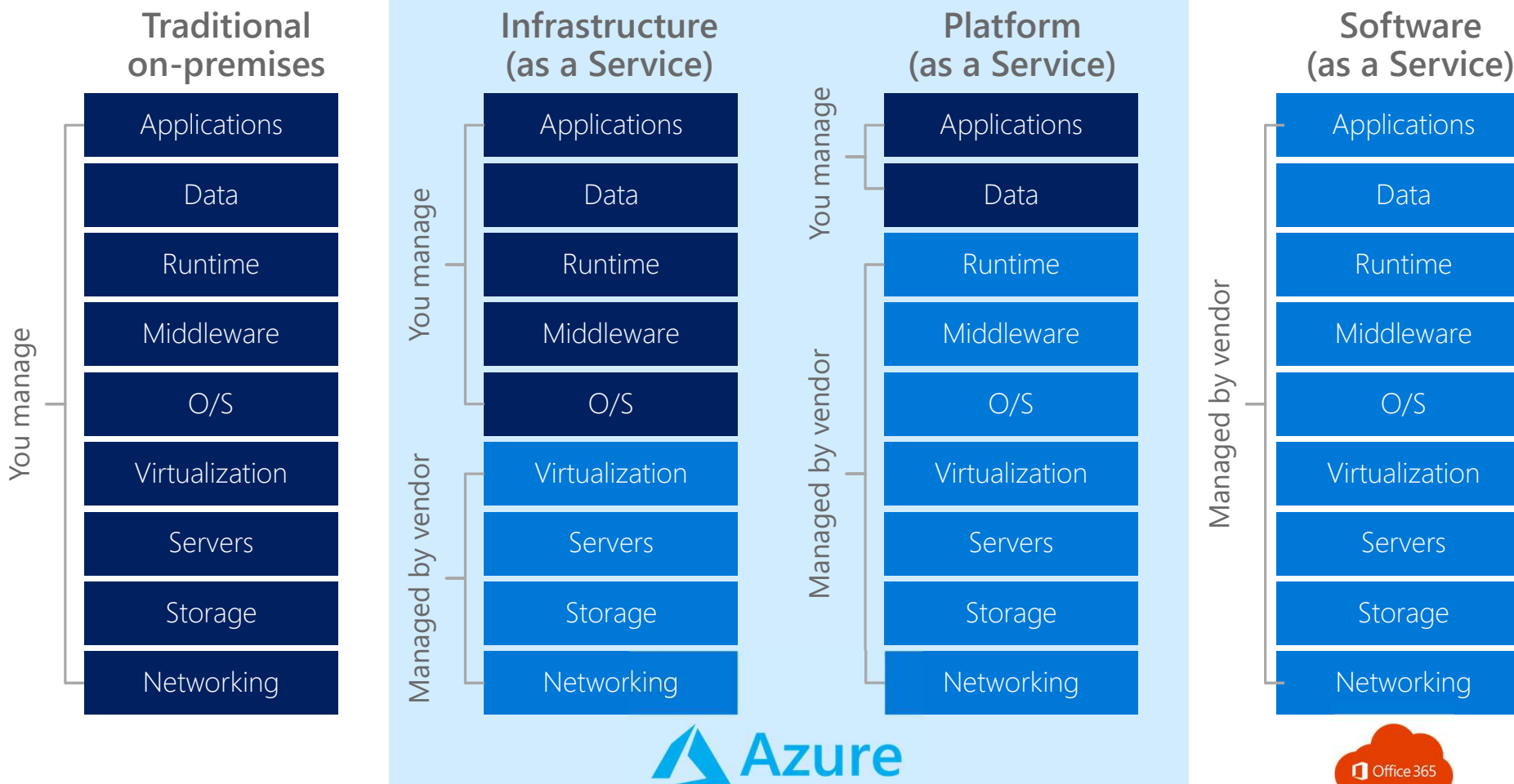- Security Microsoft inzetten
- SBC omgeving in Azure

Algemene cloud strategie

Why going to the cloud?

- Reduce risk, improve continuity, availability and security
- As a service
  - Focus on core IT, not on DC/Infrastructure
  - Get commodity as a service managed by experts, IT simplification, standardization
- Flexibility & costs
  - Scale up and down (compute as well as costs). Faster time-to-market (delivery)
  - Make use of (optimized) cloud results to lower costs
- Access to capabilities not available on-premise
  - Available enterprise class cloud services with low costs and setup in one click
- Adapt new methods, innovate
  - Application development, IT management, data management, DevOps, automation, release pipeline, self service, Big Data
  - Cloud is Infrastructure as code

Cloud service models

Traditional on-premises	Infrastructure (as a Service)	Platform (as a Service)	Software (as a Service)
Applications	Applications	Applications	Applications
Data	Data	Data	Data
Runtime	Runtime	Runtime	Runtime
Middleware	Middleware	Middleware	Middleware
O/S	O/S	O/S	O/S
Virtualization	Virtualization	Virtualization	Virtualization
Servers	Servers	Servers	Servers
Storage	Storage	Storage	Storage
Networking	Networking	Networking	Networking

Traditional on-premises: You manage

Infrastructure (as a Service): You manage (Applications, Data, Runtime, Middleware, O/S); Managed by vendor (Virtualization, Servers, Storage, Networking)

Platform (as a Service): You manage (Applications, Data); Managed by vendor (Runtime, Middleware, O/S, Virtualization, Servers, Storage, Networking)

Software (as a Service): Managed by vendor

Azure

Office 365

Azure platform

Platform Services

Security & Management

Media & CDN

Application Platform

Data

Integration

Intelligence

Compute Services

Developer Services

Analytics & IoT

Hybrid Cloud

Infrastructure Services

Compute

Storage

Networking

Datacenter Infrastructure (54 Regions Announced)

Azure platform

Platform Services

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

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
- CosmosDB
- 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 (54 Regions Announced)

2014

2017 (3 years later)

Azure Open Source support

DevOps									
Management									
Applications									
App frameworks & tools									
Databases & middleware									
Infrastructure									

... And many others

Azure: The trusted 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

| Moderate JAB P-ATO | High JAB P-ATO | DoD DISA SRG Level 2 | DoD DISA SRG Level 4 | DoD DISA SRG Level 5 | 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 |
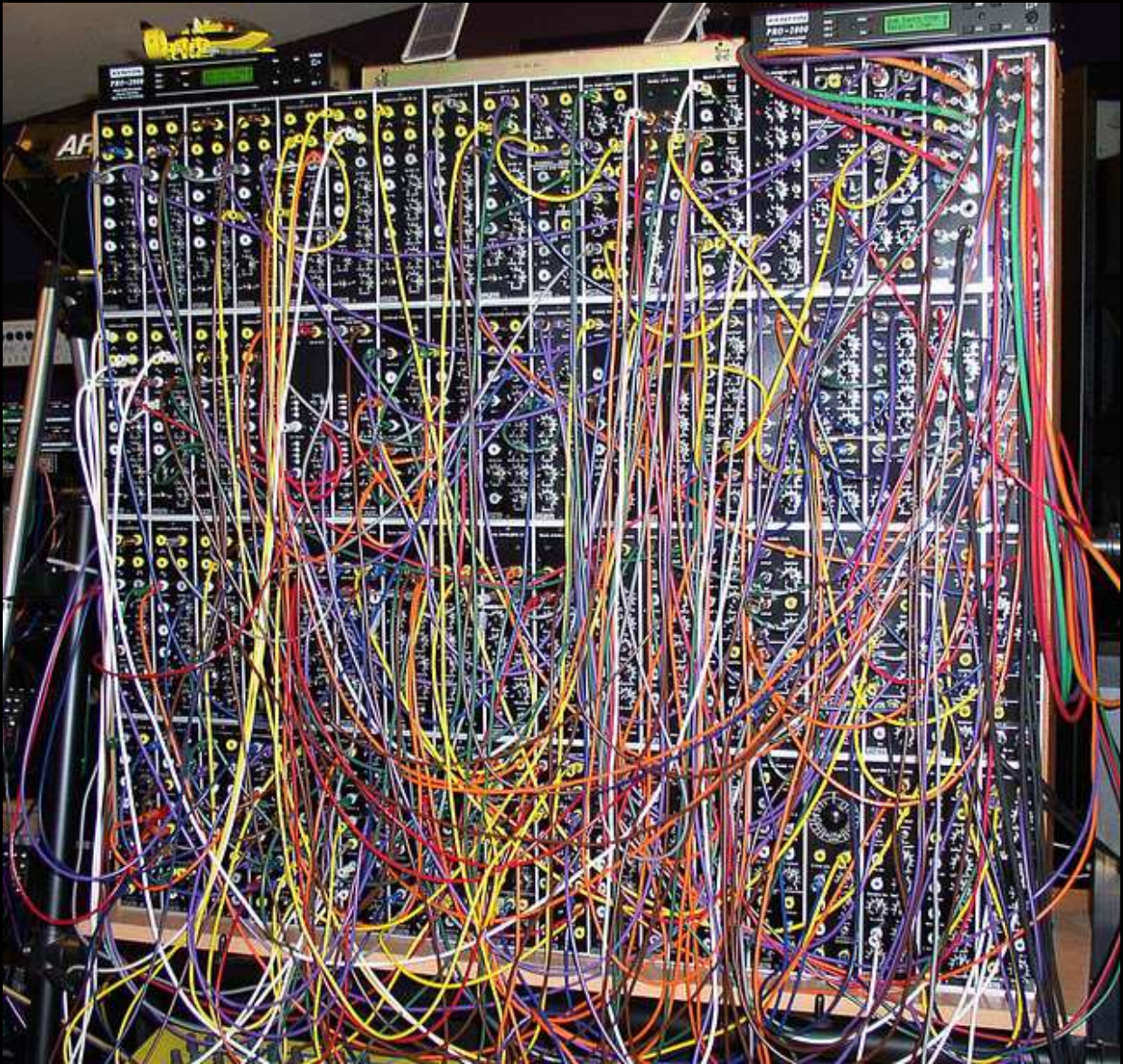
Computer lab in the cloud
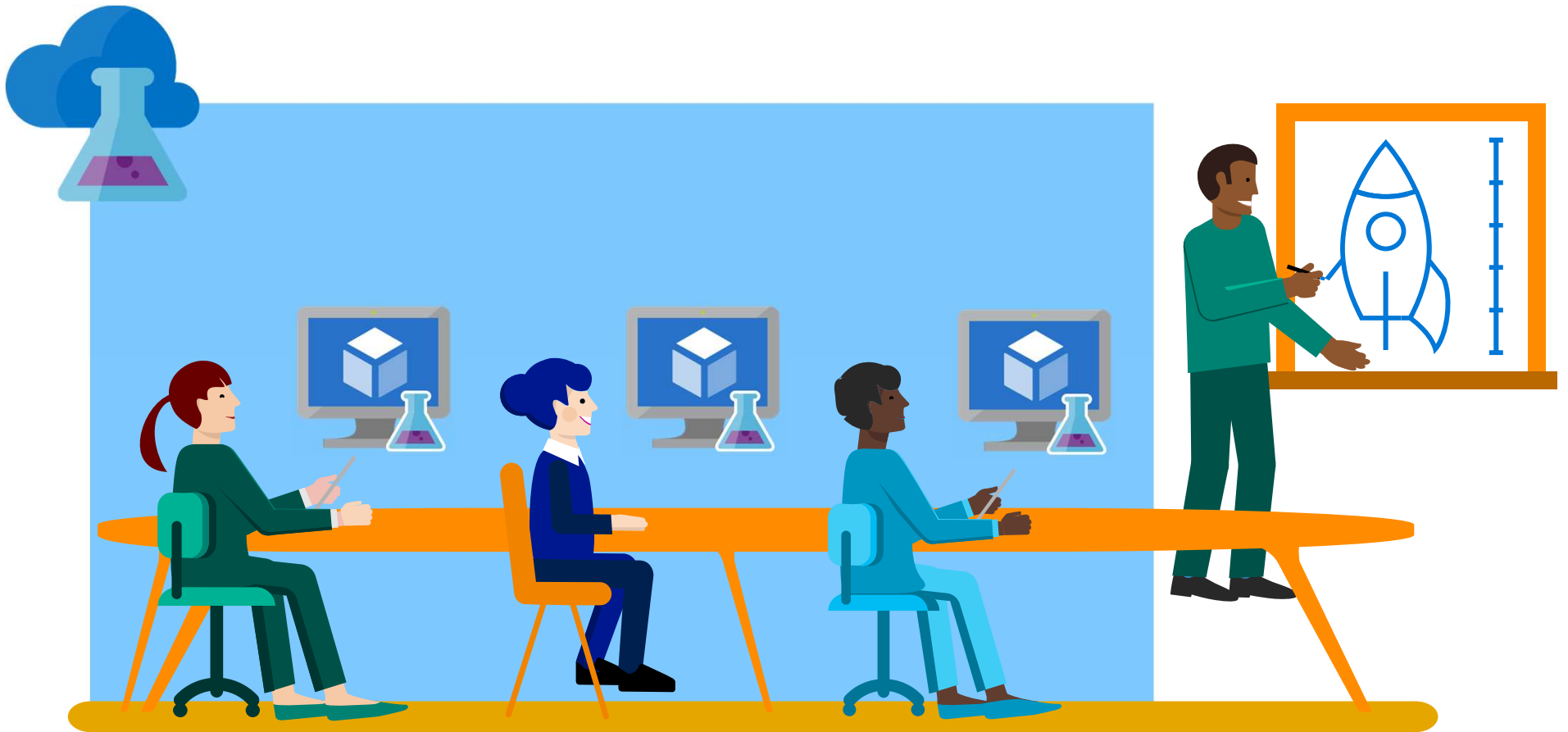
Azure Lab Services

Fast, easy and lean dev-test and managed (preview) environments in Azure

DevTest Lab User / Student

Azure

Easy create 100 VM for your students

IT Admin / Teacher
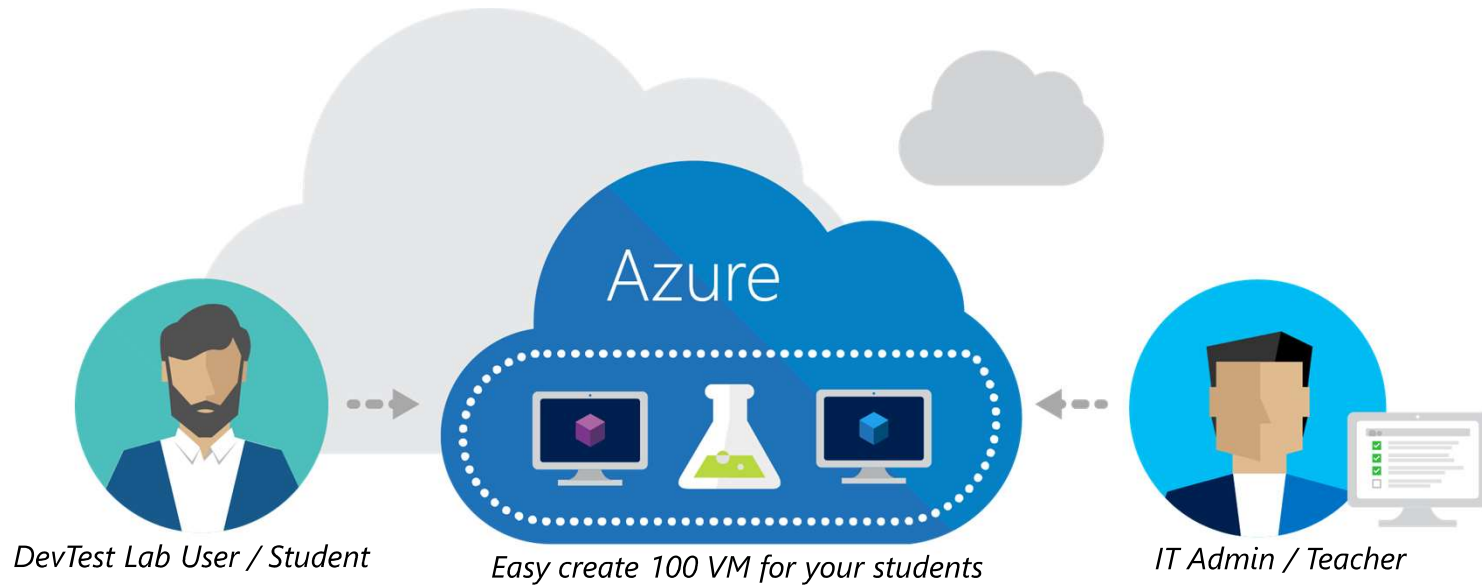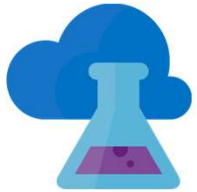
Integrate with your existing toolchain

▶ **Leverage premade plug-ins or API**

▶ **Dev-test from preferred CI tool**

▶ **Use command line tool**

Innovative solutions for curriculum

Microsoft Cognitive Services

Give your apps a human side
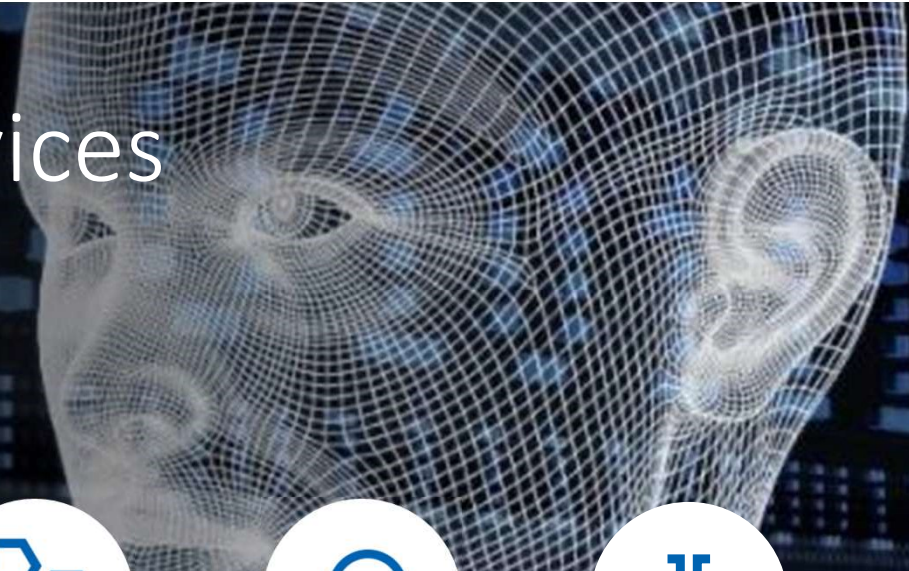
Vision
From faces to feelings, allow your apps to understand images and video

Speech
Hear and speak to your users by filtering noise, identifying speakers, and understanding intent

Language
Process text and learn how to recognize what users want

Knowledge
Map complex information and data in order to solve specific tasks

Search
Access billions of web pages, images, videos, and news with the power of Bing

Labs
An early look at emerging Cognitive Services technologies: discover, try, and give feedback on new technologies before general availability

Emotion

Face detection

"faceRectangle": {"width": 193,
                  "height": 193,
                  "left": 326,
                  "top": 204} …

Emotion scores

"scores": { "anger": 5.182241e-8,
            "contempt": 0.0000242813,
            "disgust": 5.621025e-7,
            "fear": 0.00115027453,
            "happiness": 1.06114619e-8,
            "neutral": 0.003540177,
            "sadness": 9.30888746e-7,
            "surprise": 0.9952837}

What is a Bot?

TYPE

TAP

TALK

Cortana

Facebook Messenger

Custom – Direct Line   Skype

Bing

Channels

Connected Services

Intelligent tools
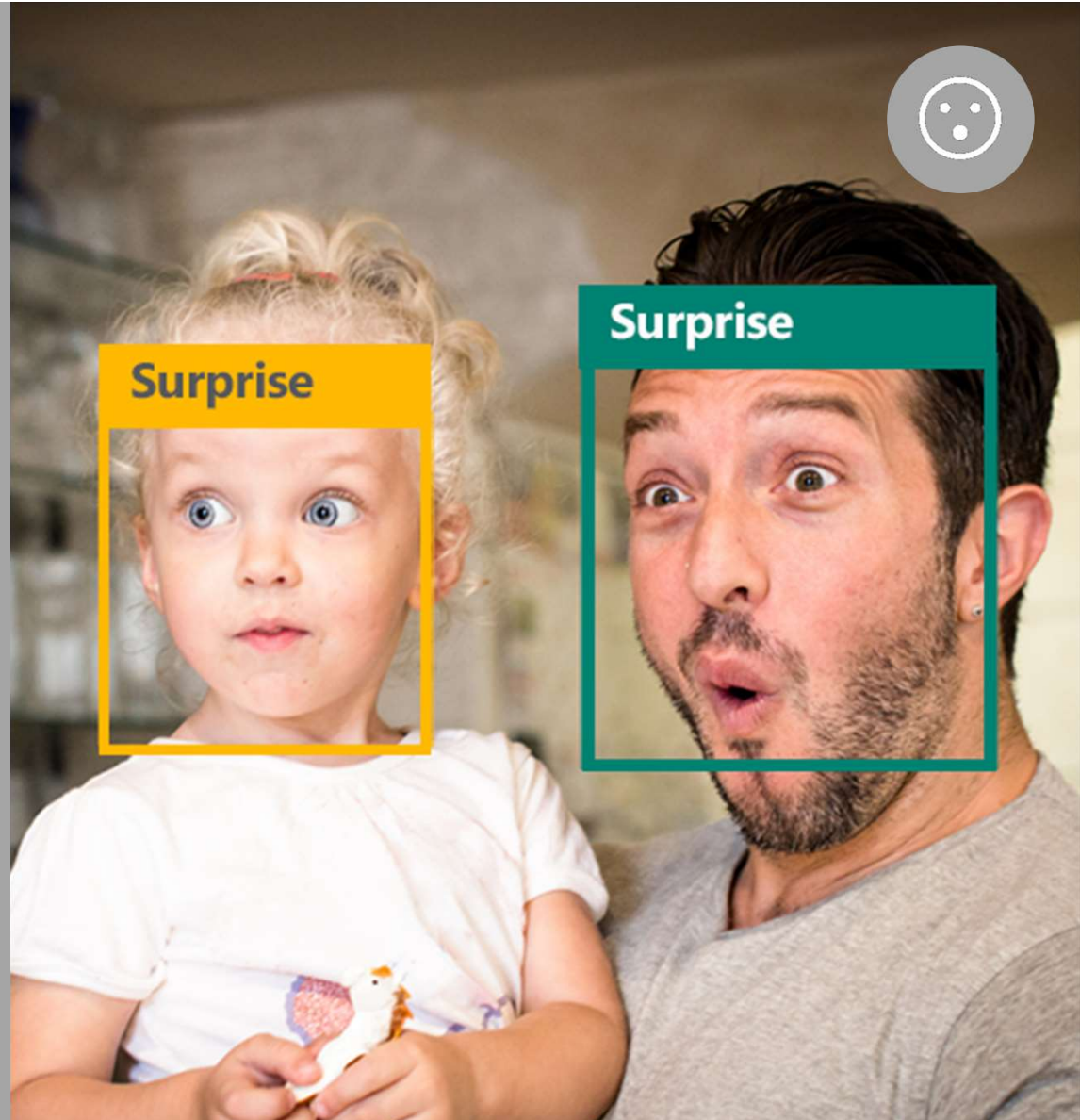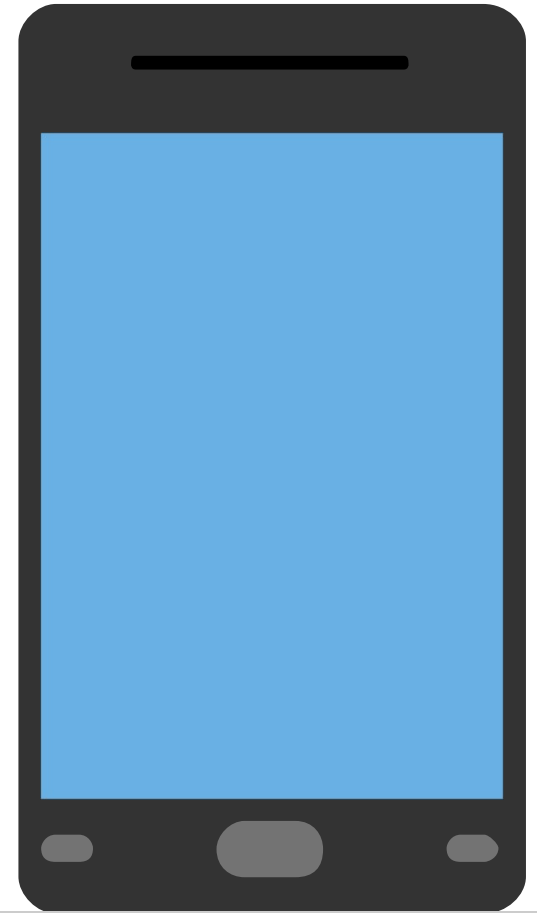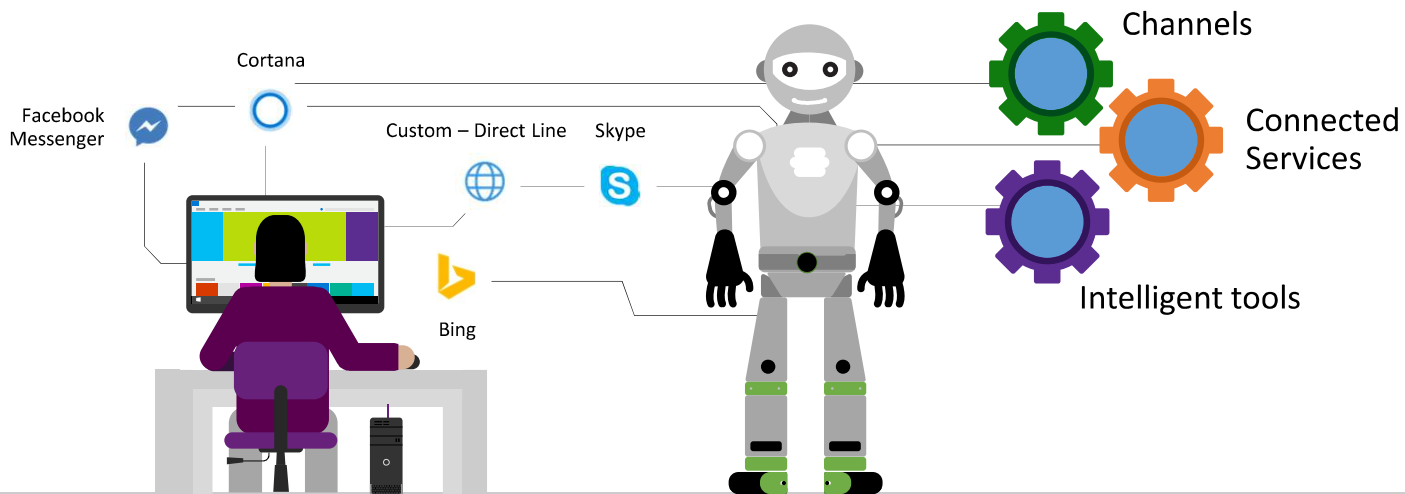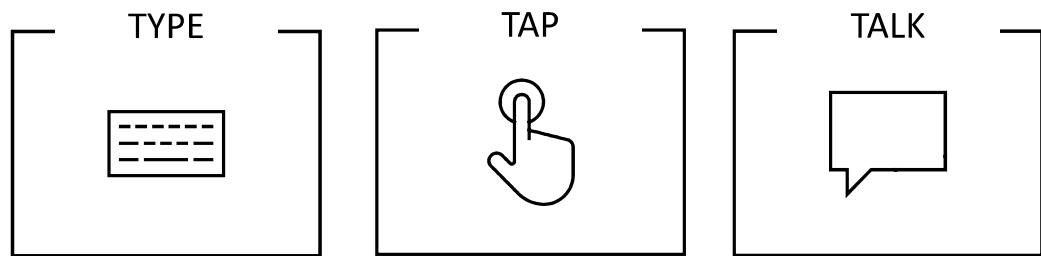
Demo Lab Services

Azure in Education

Quick reference

Educators
Students
Researcher
IT Professional

PROGRAMME	RECOMMENDED FOR	REQUIREMENTS
Microsoft Imagine		Student status verification required
Visual Studio Dev Essentials		Credit card and phone number required for verification
Microsoft Azure for Research		Application required
Azure Notebooks		No credit card required
Azure Machine Learning		No credit card required
Free Azure account		Credit card and phone number required for verification
Web Apps feature of Azure App Service		No credit card required
Free Azure training		No credit card required
Microsoft IT Pro Career Center		No credit card required

Azure in Education
❑ https://azure.microsoft.com/en-in/community/education/
Azure for Research
❑ https://a4ronline.azurewebsites.net/

Azure for Students

Azure for Students

Azure credits, free services and learning (upcoming) for Higher Education students

No credit card needed

Simply verify your student status through your school email address, and you're ready to go.

+

25+ free products

Explore virtual machines, artificial intelligence (AI), databases, and more.

Learn more >

+

$100 in free credit

Use your credits with any Azure product to build a class project or a hackathon.

Windows Virtual Machine COMPUTE	Linux Virtual Machine COMPUTE	Azure Managed Disks STORAGE	Azure Blob Storage STORAGE
750 hours	750 hours	64 GB x 2	5 GB
B1S	B1S		LRS hot block
Create Windows virtual machines with on-demand capacity in seconds. Learn more	Create Linux virtual machines with on-demand capacity in seconds. Learn more	Get premium, secured disk storage for Azure Virtual Machines with simplified management. Learn more	Use massively-scalable object storage for any type of unstructured data. Learn more
Create	Create		Create

Azure File Storage STORAGE	SQL Database DATABASES	Azure Cosmos DB DATABASES	Bandwidth (Data Transfer) NETWORKING
5 GB	250 GB	5 GB	15 GB
LRS File Storage		400 request units	outbound
Migrate to simple, distributed, cross-platform file storage without changing code. Learn more	Create an Azure SQL Database that delivers intelligence built-in. Learn more	Build and scale your application with a globally distributed multi-model database service. Learn more	Transfer data inbound and outbound through our robust network of global data centers. Learn more

Azure for students
❑ https://azure.microsoft.com/en-us/free/students/?v=18.45
Overview available Azure Services (new services added CY19)
❑ https://azure.microsoft.com/en-us/free/students/?v=18.45#free-products-section

Visual Studio Azure Credits

Visual Studio subscribers receive Monthly Azure credits for dev/test scenarios

$50	$100	$150
Visual Studio Professional (standard subscription and annual cloud subscription)	MSDN Platforms	Visual Studio Enterprise (standard subscription and annual cloud subscription)
Visual Studio Test Professional		Visual Studio Enterprise (BizSpark)
		Visual Studio Enterprise (MPN)

Visual Studio Azure Activation
❑ https://azure.microsoft.com/en-us/pricing/member-offers/credit-for-visual-studio-subscribers/

Wat zijn de kosten

Estimate costs up front or during deployment

- Use Azure pricing calculator to do budget cost predictions
- Review costs in Azure Portal when deploying
- Example:
  - A B1S Burstable VM with 1 core and 2 GB memory cost EUR 0.32 per student per 32 hours
  - Storage is billed separately depending on how long the machine must be available priced per hour provisioned EUR 0.085 per day per VM
- Check other Educational possibilities via SURF / SLB Diensten

Azure Pricing Calculator
❑ https://azure.microsoft.com/en-us/pricing/calculator/

Future-Ready Skills

Flexible, on-demand learning paths and credentials	Emerging and relevant content and experiences	Access to Industry-leading developer tools
Microsoft Imagine Academy Learning paths in Computer Science, Data Science, Productivity, and IT	**in LEARNING** Business and technical courses for the modern workforce	**Microsoft Imagine X** Tools and experiences for student developers
Microsoft Certifications Industry-recognized and sought by employers around the world	**OPENedX** Open-source platform with courses and credentials in AI, Data Science, and more	**Azure for Students** Build, deploy, and manage with free cloud services

Microsoft Learn

Career learning paths and training for specific roles

Certifications

Jump-start your career and demonstrate your achievements through industry-recognized Microsoft certifications.

Explore all >

Hands-on Labs

Practice what you learned with free interactive hands-on labs. Apply and validate your learning in a live Azure environment

See all Hands-on Labs >

Pluralsight

Gain the know-how and confidence your job demands through these free online courses in partnership with Pluralsight.

See All Free Online Courses >

Instructor-led training

Sharpen your technology skills with in-depth, on-demand training in virtual classrooms led by Microsoft Certified Trainers.

Select a course >

Microsoft Learn
❑ https://docs.microsoft.com/en-us/learn/

Azure
Developer

Azure
Solutions Architect
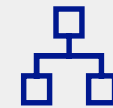
Azure
Administrator

Learning path for Azure Administrator role

Courses Prep for Certification　　　　**Exams**　　**Certification**

Manage Subscriptions

Implement and Manage Storage

Deploy and Manage VM

Configure and Manage VNets

Manage Identities

AZ-100: Microsoft Azure Infrastructure and Deployment Exam

Available as online courses and instructor-led training

Migrate Servers To Azure5

Implementing and Managing Application Services

Implement Advanced Virtual Networks7

Secure Identities8

AZ-101: Microsoft Azure Integration and Security Exam

Microsoft Certified: Azure Administrator Associate

CERTIFIED

Learning path for Azure Developer role

Courses Prep for Certification   **Exams**   **Certification**

Cloud
Technology Selection

Cloud Storage

PaaS Solution

Secure
Cloud Solutions

AZ-200: Microsoft
Azure Developer Core
Solutions Exam

*Available as online courses and
instructor-led training*

Develop Azure
Cloud Model

Cloud
Integration Services

Develop AI,
ML, IOT

AZ-201: Microsoft Azure
Developer Advanced
Solutions Exam

CERTIFIED

Microsoft Certified:
Azure Developer Associate
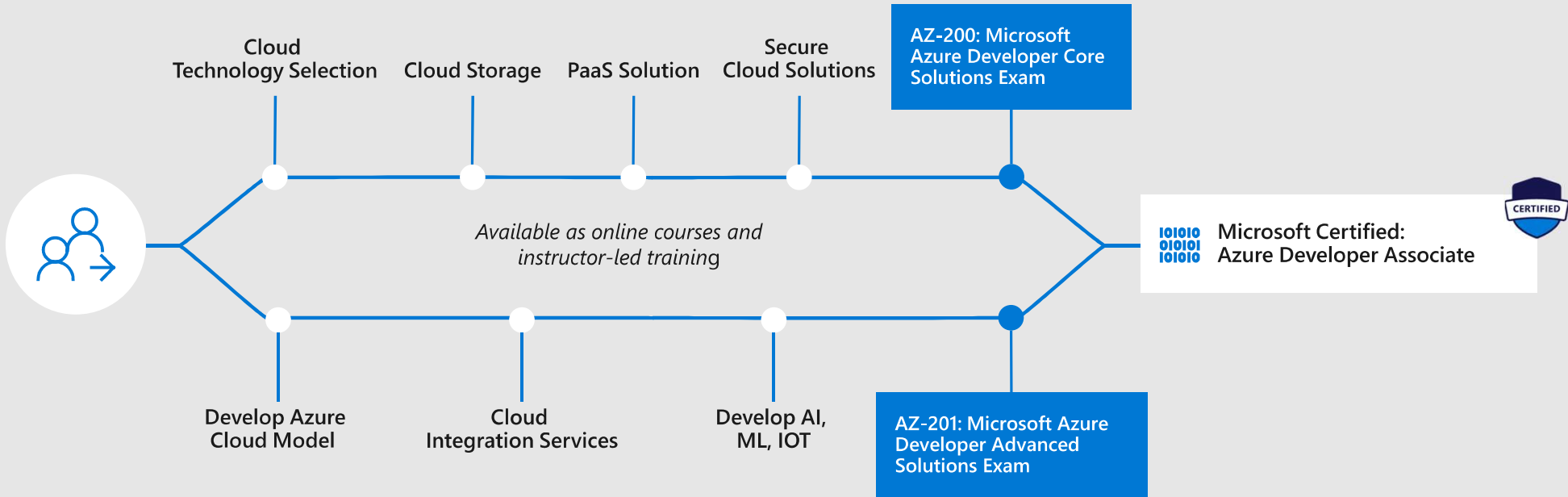
Microsoft Github Repo

Open Source Education Repository with technical resources for learning and teaching Azure

Lab Categories	Description
AI and Machine Learning	Build bots and apps backed by AI and ML using Azure and Azure Cognitive Services and popular open-source libraries such as Keras and TensorFlow.
Azure Services	Deploy serverless code with Azure Functions, run Docker containers, use Azure to build Blockchain networks and more.
Big Data and Analytics	Spin up Apache Spark Clusters, Use Hadoop to extract information from big datasets or use Power BI to explore and visualize data.
Deep Learning	These labs build on each other to introduce tools and libraries for AI. They're labeled 200-400 level to indicate level of technical detail.
Internet-of-Things	Use Azure to collect and stream IoT data securely and in real time.
Web Development	Quickly create a scalable web apps using Node, PHP, MySQL on easy-to-use tools like Visual Studio Code and GitHub.

Github Computer Science
❑ https://github.com/Microsoft/computerscience

"The pathway to new technologies requires a parallel investment in skills development – making sure people have the requisite skills to participate in an increasingly digital society."

-- Satya Nadella, CEO, author
Hit Refresh, 2017

Microsoft Certifications

Microsoft certifications and exams by technology

UPDATED	UPDATED	UPDATED
Azure exams	**Data exams**	**Microsoft 365 exams**

Windows 10 exams	Windows Server 2016 exams

AZURE ADMINISTRATOR   AZURE DEVELOPER   AZURE SOLUTION ARCHITECT
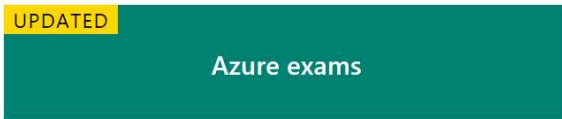
[Overview certifications](#) (certification possibilities via SURF/SPL/SLB Diensten)
❑ https://www.microsoft.com/en-us/learning/exam-list.aspx

Cloud adoption is a journey

Maturity stages of organizational readiness

FA

Foundational Adopters
Organizations with little to no cloud experience. These organizations are still envisioning cloud and require end-to-end guidance for cloud adoption.

IA

Intermediate Adopters
Organizations with foundational cloud experience. At this stage, organizations have an understanding of cloud technologies, and are either evaluating or have migrated non-priority workloads to the cloud.

AA

Advanced Adopters
Organizations with advanced cloud experience. These organizations are in the process of cloud adoption and want to optimize workloads on the cloud.

Microsoft

SPL & MSFT
Masterclasses 2019

Voorjaar 2019 : Masterclasses "Azure in de klas"

- Eenvoudig cloudtechnologie toevoegen aan het curriculum en inspiratie opdoen om het curriculum te innoveren
- Trends, best practices en hoe te starten

De masterclass is een hele dag en bestaat uit theorie, do-it-yourself en interactie met de community.

Schrijf je in via Stichting Praktijkleren

Thank You

Microsoft