

Introduction to Azure Percept

Accelerated AI on the
IoT-Edge

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4THECOMMUNITY

ANDREAS ERBEN (CTO, CEO Americas)

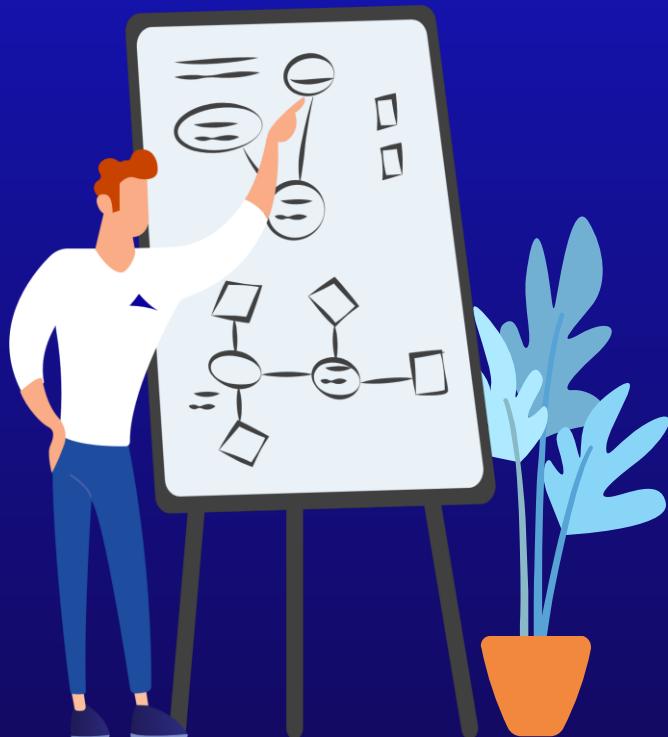


- Over 25 years of experience
- Exposed to VR in the mid 1990s
- Worked with all sizes and most types of companies
- Extensive enterprise background
- Loves geeky technology
- Cloud, Mixed Reality, Applied AI, IoT, MetaVerse



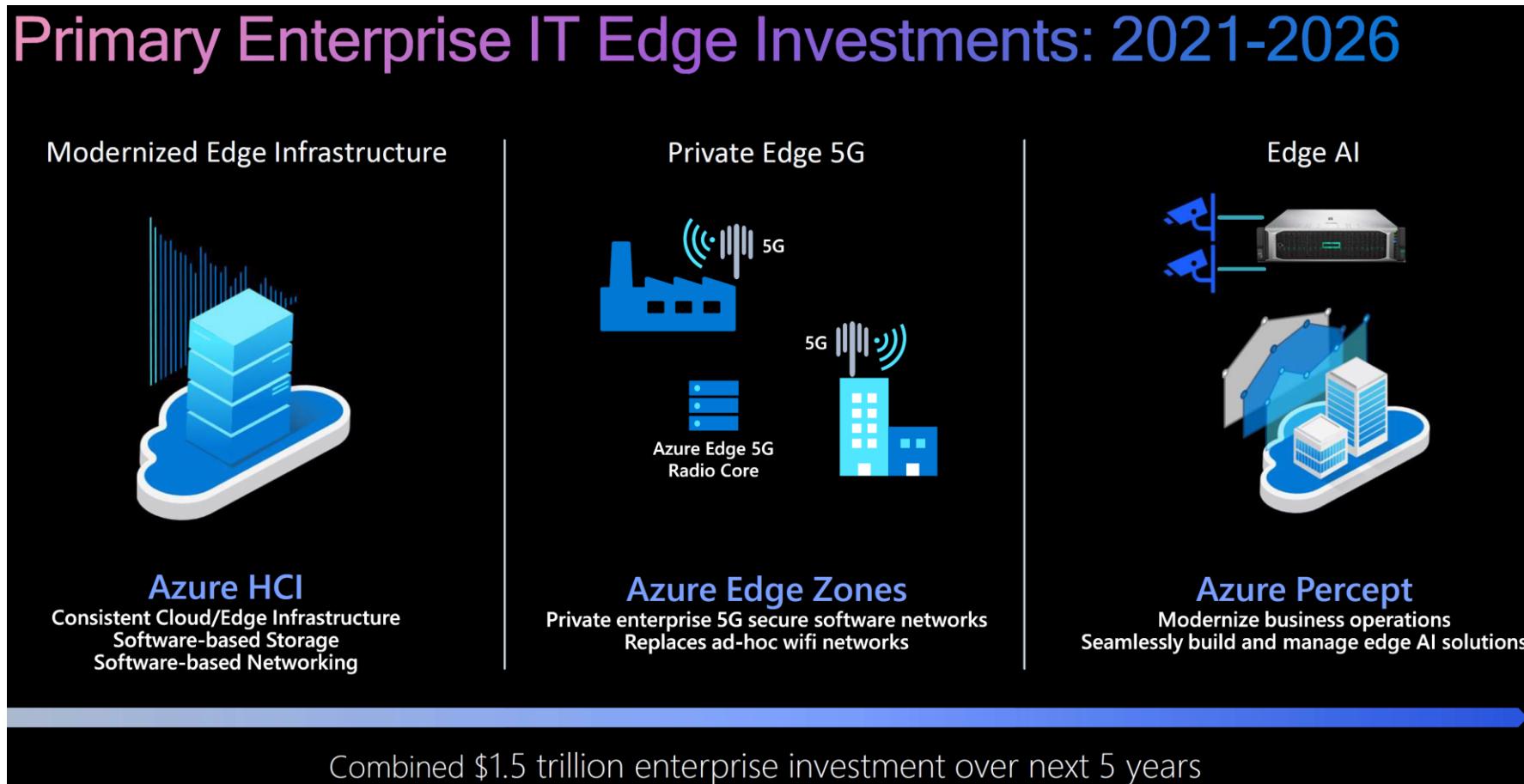
Andreas.Erben@daenet.com

Agenda



- 1 – Overview and Motivation
- 2 – Hardware and Percept Studio
- 3 – Architecture of Percept type solutions
- 4 – Setup Experience and AI Models
- 5 – Deploying solutions, demos and experiments

Intro – the projected business



Intro – many use cases

The future of edge computing....use cases

Manufacturing

- Predictive maintenance
- Field service
- Worker safety & loss prevention
- Factory automation & defect detection
- Incident response
- Automated supply chain & assembly

Smart City/ Buildings

- Security & surveillance
- Access control via custom command
- Energy management
- Transportation & traffic management
- Utilities management
- Monitoring & workplace safety

Automotive / Transportation

- Factory automation
- Cabin intelligence
- Driver distraction
- Passenger detection
- Conversational AI
- Command & control
- Sensor data efficiency

Retail

- Space & assortment
- Traffic patterns
- Personalization
- Inventory management
- Shrinkage reduction
- Optimal product placement

Healthcare

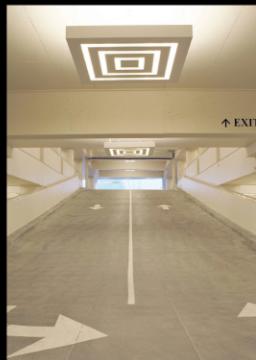
- Patient recognition & monitoring
- Supply chain & operational efficiency
- Identification of patient issues
- Waiting room prioritization
- Scheduling & reminders

Intro – focus use cases today



Modern Retail

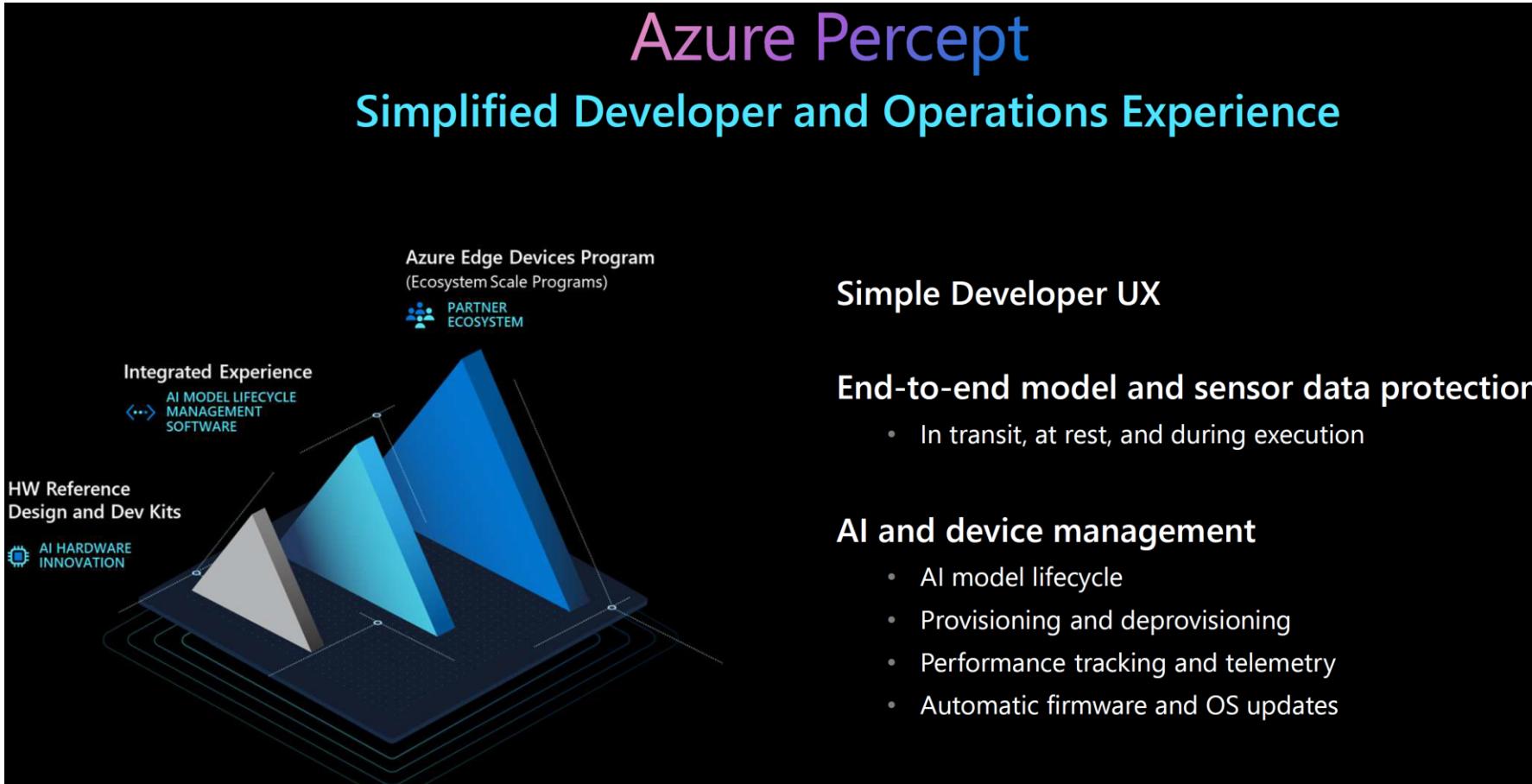
- ✓ **Consumer Behavior** – Understand consumer traffic and behavior patterns within retail stores and drive-through
- ✓ **Shelf Analytics** – Advanced product analytics through automated stockout analytics, planogram compliance and end cap management
- ✓ **Store Safety** – Recognize store utilization through visualizations like heatmaps, occupancy tracking, space utilization, social distancing
- ✓ **Buy Online, Pickup In Store** – Automated vehicle detection to speed order pickup



Modern Safety

- ✓ **Worker Safety** – Dangerous zone detection (machinery, trench), worker slip and fall
- ✓ **Tailgating** – Detect two or more people entering a secure door behind a legitimate entry.
- ✓ **Transportation Screening** – Security-lane management at screening checkpoint through automated threat detection (concealed weapons, narcotics, and/or illegal goods).
- ✓ **On-Site Guard** – Automated space monitoring for access control, intrusion detection and suspicious activities (loitering, etc.)

Azure Percept ecosystem



Azure Percept DK Overview



Azure Percept Studio

Azure Percept Studio

Seamlessly build and manage edge AI solutions

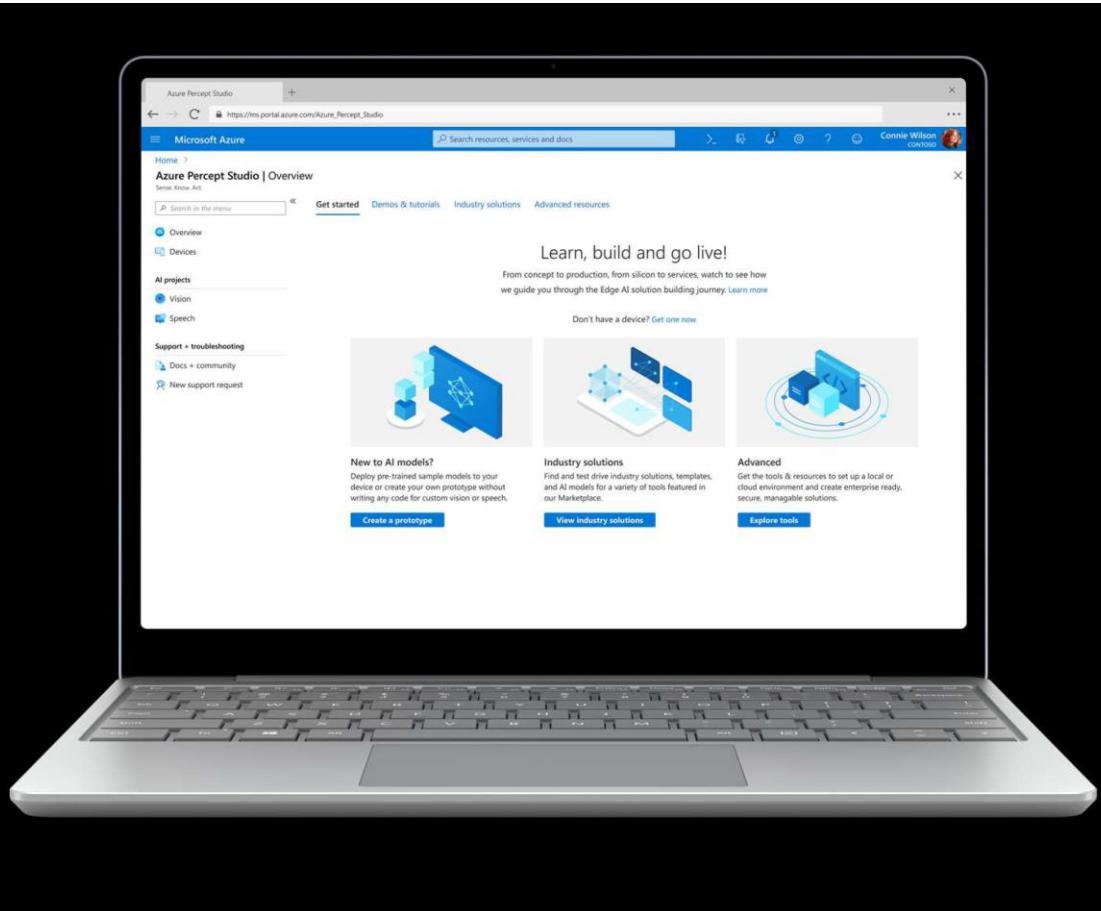
Delightful onboarding

Integrated experiences

No code flow

Advanced flow

Prototype and deploy



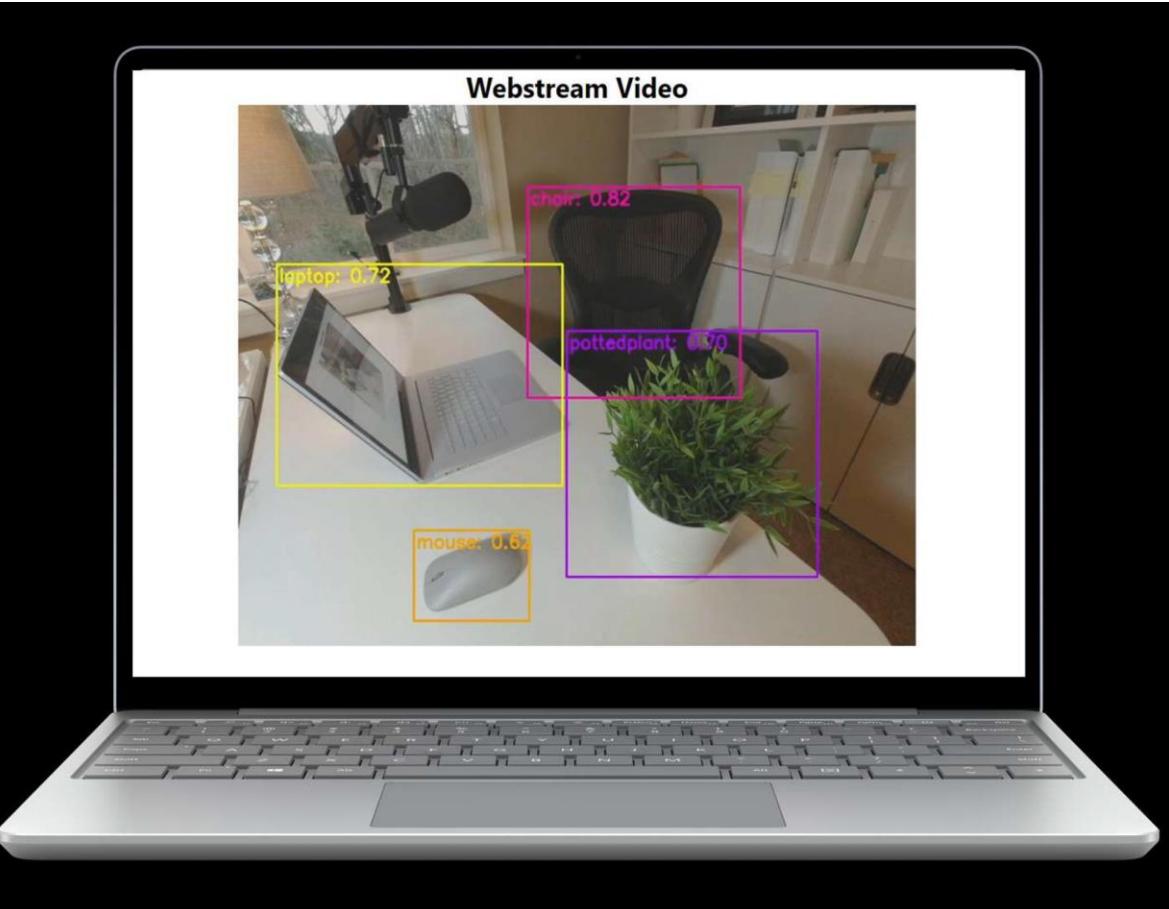
The screenshot shows the Microsoft Azure portal with the Azure Percept Studio overview page open. The page features a navigation bar with 'Get started', 'Demos & tutorials', 'Industry solutions', and 'Advanced resources'. Below the navigation is a section titled 'Learn, build and go live!' with a sub-section for 'New to AI models' showing a 'Create a prototype' button. Another section for 'Industry solutions' shows a 'View Industry solutions' button. A third section for 'Advanced' shows a 'Explore tools' button. On the left side of the screen, there's a sidebar with links for 'Overview', 'Devices', 'AI projects' (with 'Vision' and 'Speech' selected), and 'Support + troubleshooting'. The main content area also includes a 'Don't have a device? Get one now' callout.

Azure Percept Studio

Azure Percept Studio

Seamlessly build and manage edge AI solutions

Out-of-the-box AI recognition
of common objects. No code
required.



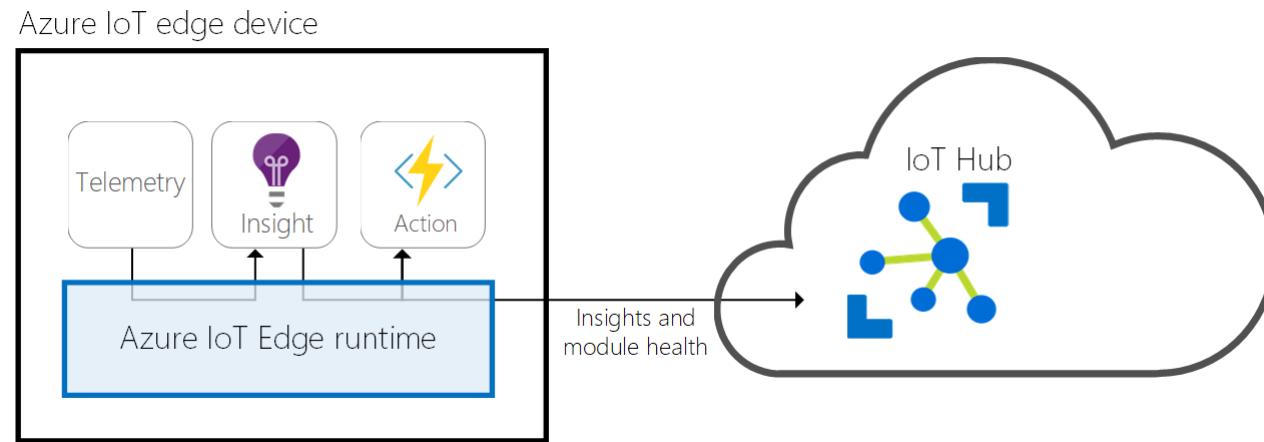
Azure Percept Studio

- <https://portal.azure.com/#blade/AzureEdgeDevices/Main/overview>

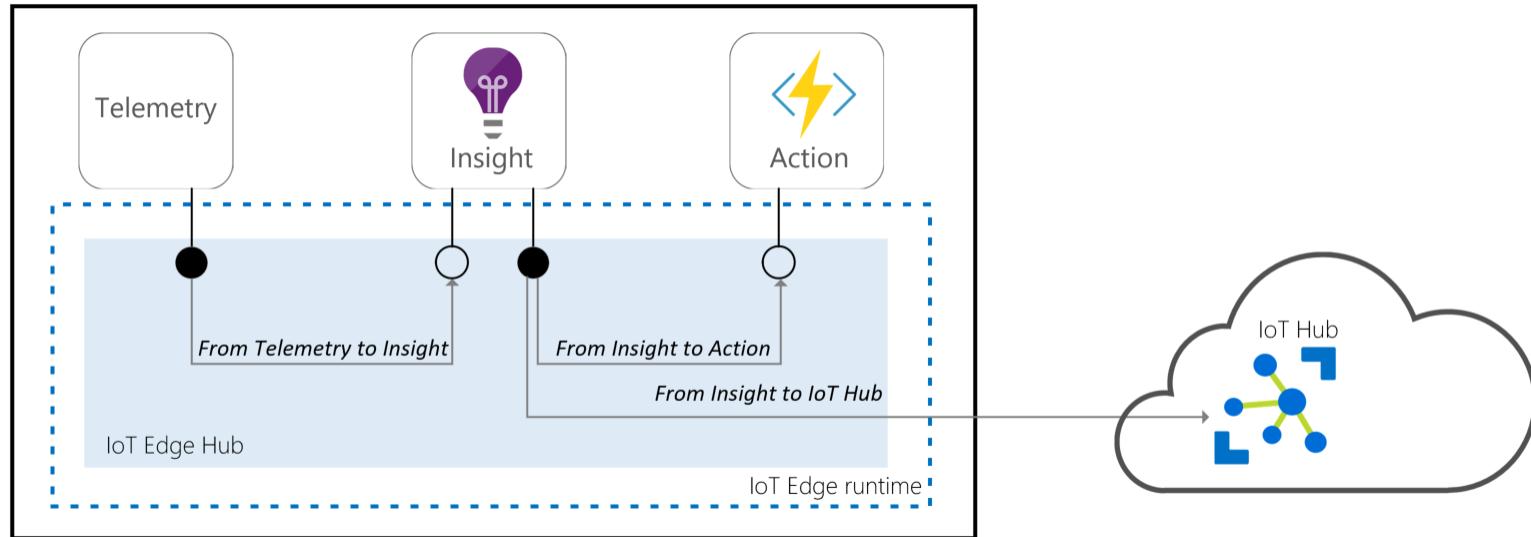


DEMO Azure Percept Studio

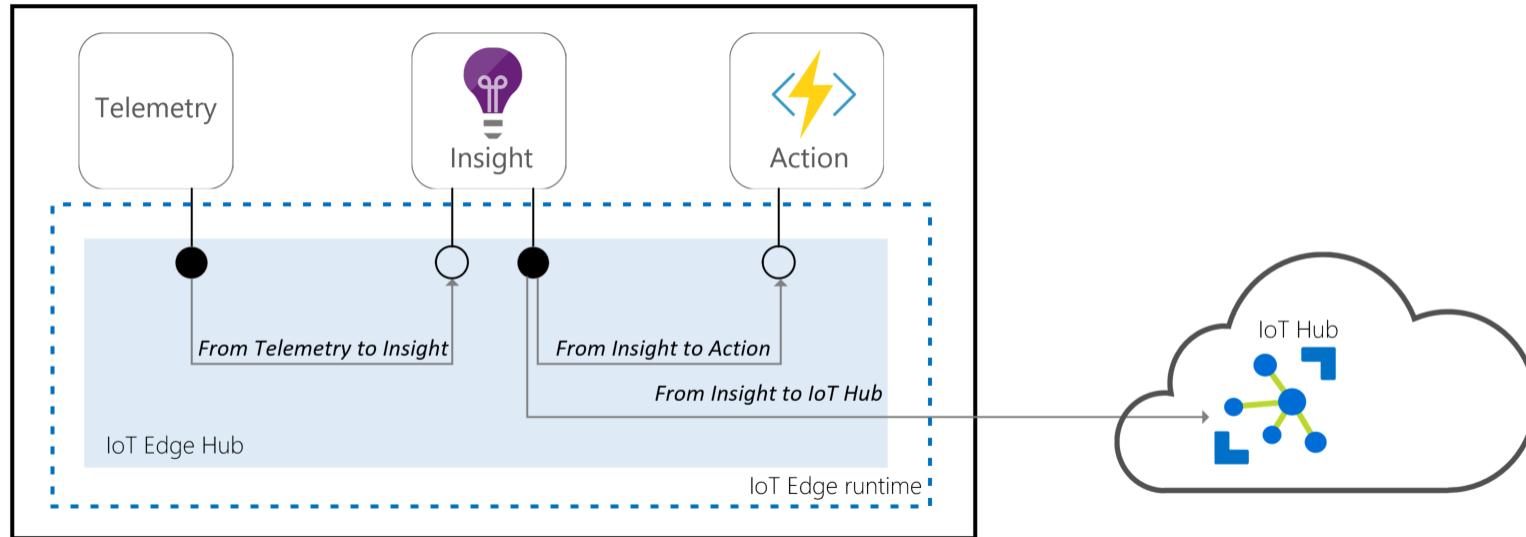
IoT Edge architecture

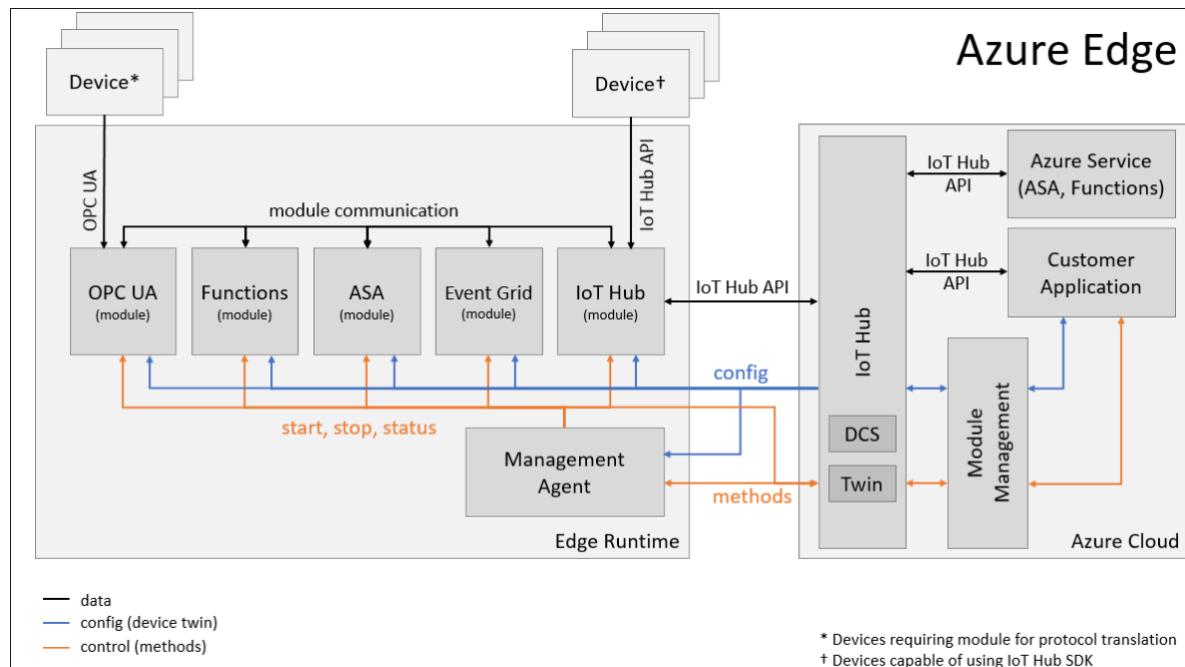


IoT Edge architecture

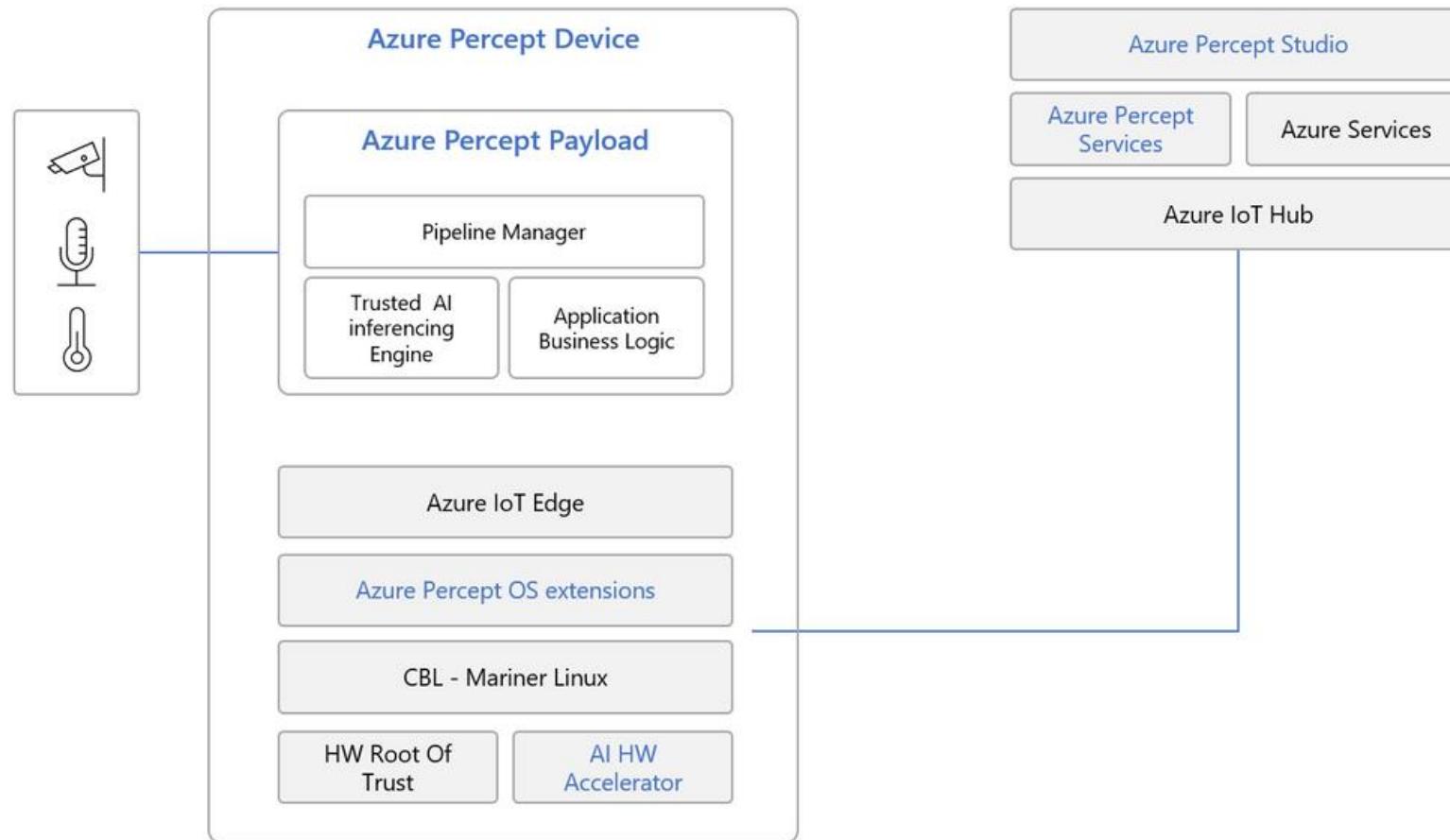


IoT Edge architecture AMQP (out of scope here)

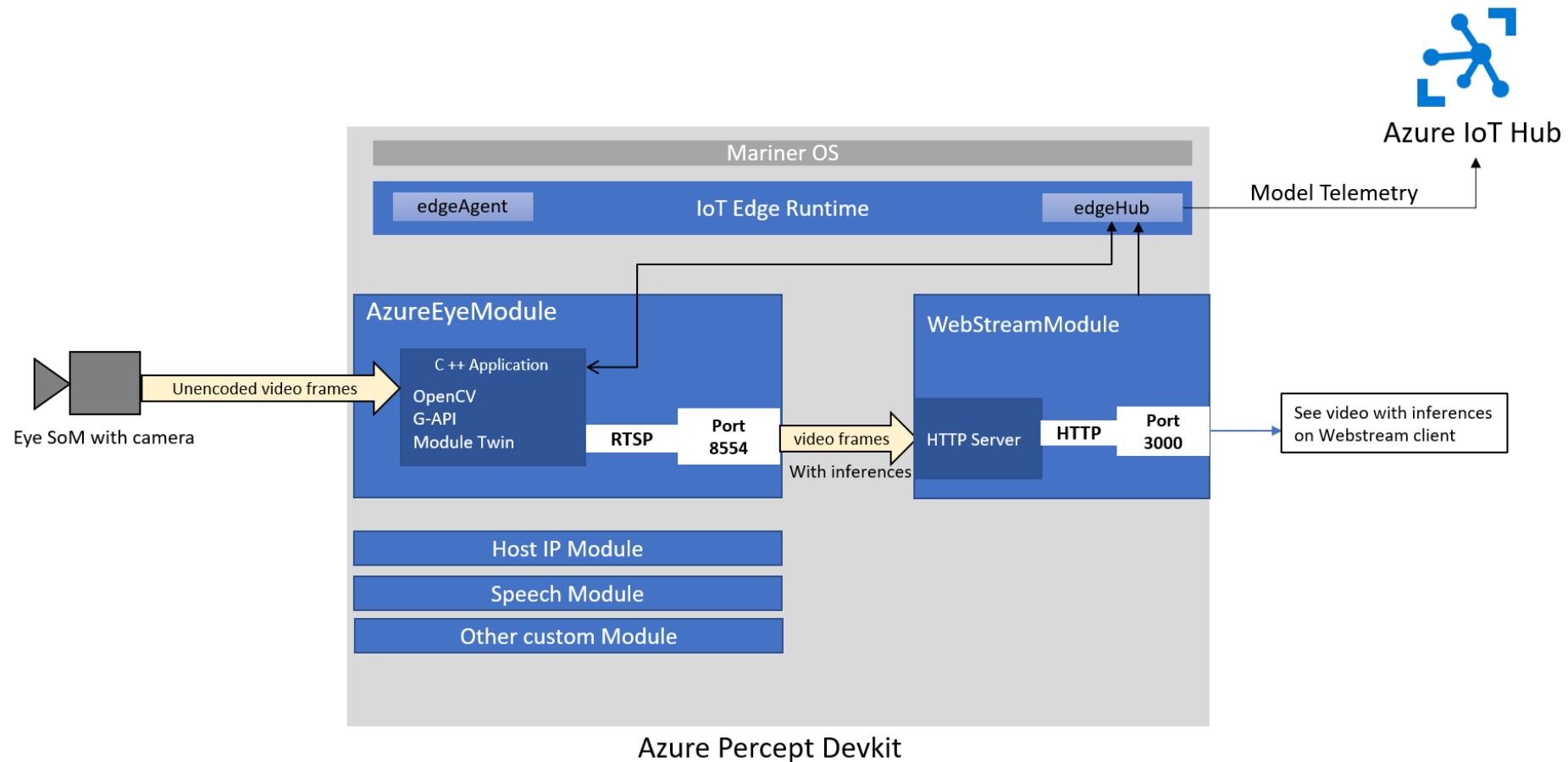




Azure Percept Architecture



DevKit Architecture overview

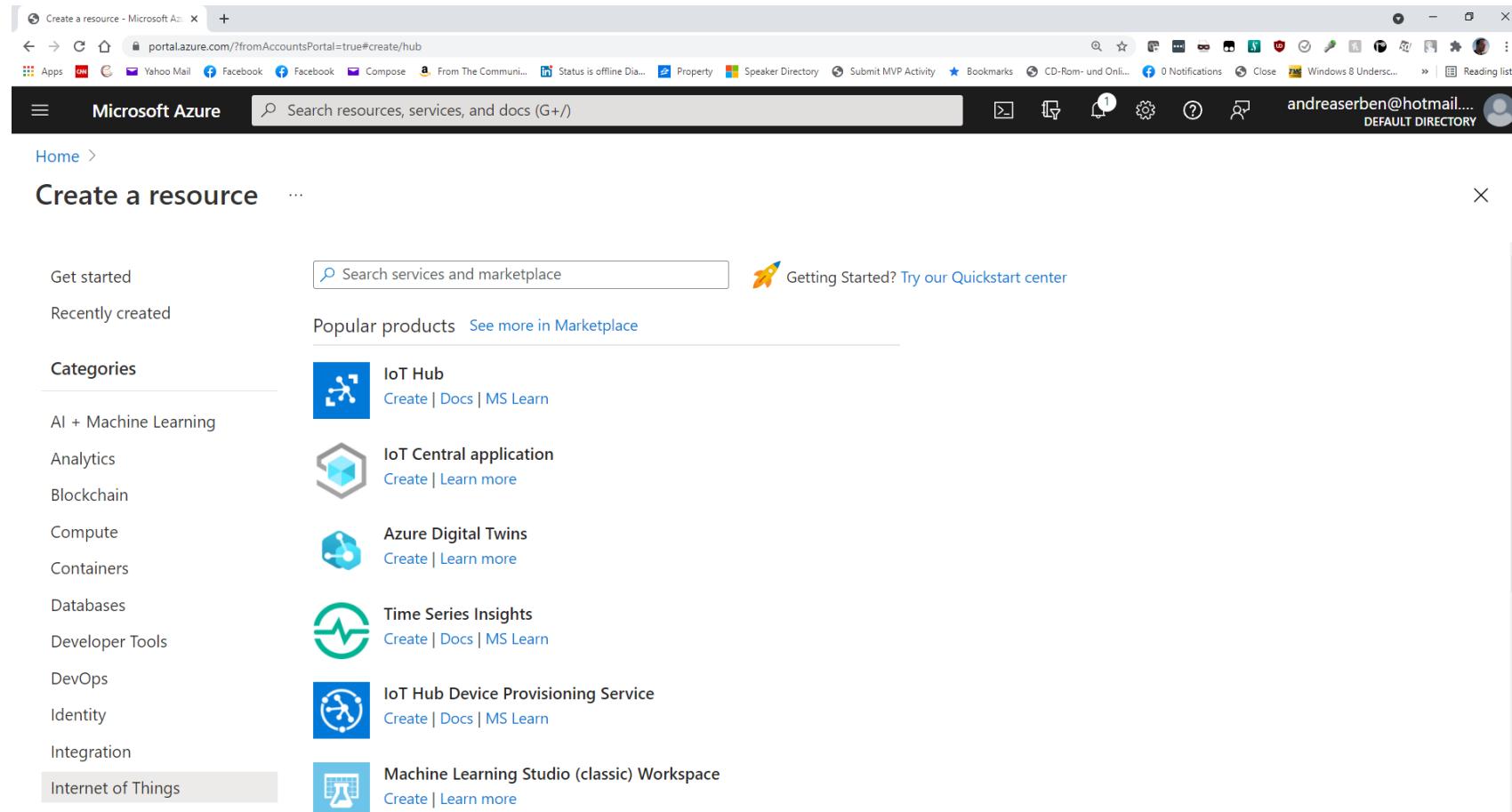


Setup Experience

- Preparations: Create IoT Hub
- Connect to Device
- Connect Device to IoT Hub
- Update device (USB and IoT Hub)



Create IoT Hub 1/13



The screenshot shows the Microsoft Azure 'Create a resource' interface. The left sidebar has a 'Categories' section with various service icons and names. The 'Internet of Things' category is currently selected, indicated by a grey background. The main area displays a search bar, a 'Popular products' section, and a 'Getting Started' message. Below these are cards for IoT Hub, IoT Central application, Azure Digital Twins, Time Series Insights, IoT Hub Device Provisioning Service, and Machine Learning Studio (classic) Workspace, each with 'Create' and 'Learn more' links.

Get started

Recently created

Categories

- AI + Machine Learning
- Analytics
- Blockchain
- Compute
- Containers
- Databases
- Developer Tools
- DevOps
- Identity
- Integration
- Internet of Things

Search services and marketplace

Popular products See more in Marketplace

Getting Started? Try our Quickstart center

IoT Hub
Create | Docs | MS Learn

IoT Central application
Create | Learn more

Azure Digital Twins
Create | Learn more

Time Series Insights
Create | Docs | MS Learn

IoT Hub Device Provisioning Service
Create | Docs | MS Learn

Machine Learning Studio (classic) Workspace
Create | Learn more

Create IoT Hub 2/13

The screenshot shows the Microsoft Azure portal interface for creating an IoT hub. The title bar indicates the page is 'IoT hub - Microsoft Azure' at 'portal.azure.com/?fromAccountsPortal=true#create/Microsoft.IotHub'. The main content area is titled 'IoT hub' under 'Microsoft'.

The 'Basics' tab is selected in the navigation bar. Below it, a sub-header reads: 'Create an IoT hub to help you connect, monitor, and manage billions of your IoT assets.' A 'Learn more' link is present.

Project details:
A note says: 'Choose the subscription you'll use to manage deployments and costs. Use resource groups like folders to help you organize and manage resources.'

Subscription: Microsoft Azure Sponsorship

Resource group: (New) IoTPercept_RG
Create new

Instance details:
IoT hub name: IoTHubAzurePercept
Region: East US

At the bottom, there are three buttons: 'Review + create' (highlighted in blue), '< Previous', and 'Next: Networking >'.

Create IoT Hub 3/13

IoT hub - Microsoft Azure

portal.azure.com/?fromAccountsPortal=true#create/Microsoft.IotHub

Microsoft Azure

Search resources, services, and docs (G+)

andreas@erben@hotmail... DEFAULT DIRECTORY

Home > Create a resource >

IoT hub

Microsoft

X

Basics Networking Management Tags Review + create

You can connect to your IoT hub either publicly via its public hostname or privately using a private endpoint.

[Learn more](#)

Connectivity configuration *

Public access

Private access (Recommended)

[You can change this or configure another connectivity method after this resource has been created.](#)
[Learn more](#)

Review + create < Previous: Basics Next: Management >

Create IoT Hub 4/13

IoT hub - Microsoft Azure

portal.azure.com/?fromAccountsPortal=true#create/Microsoft.IotHub

Microsoft Azure Search resources, services, and docs (G+)

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Home > Create a resource >

IoT hub

Microsoft

Basics Networking Management Management Tags Review + create

Each IoT hub is provisioned with a certain number of units in a specific tier. The tier and number of units determine the maximum daily quota of messages that you can send. [Learn more](#)

Scale tier and units

Pricing and scale tier * ⓘ F1: Free tier ⓘ [Learn how to choose the right IoT hub tier for your solution](#)

Number of F1 IoT hub units ⓘ 1 ⓘ Determines how your IoT hub can scale. You can change this later if your needs increase.

Defender for IoT Off [Turn on Defender for IoT and add an extra layer of threat protection to IoT Hub, IoT Edge, and your devices. \[Learn more\]\(#\)](#)

Pricing and scale tier ⓘ	F1	Device-to-cloud-messages ⓘ	Enabled
--------------------------	----	----------------------------	---------

[Review + create](#) [< Previous: Networking](#) [Next: Tags >](#)

Create IoT Hub 5/13

The screenshot shows the Microsoft Azure portal interface for creating an IoT hub. The URL in the address bar is `portal.azure.com/#create/Microsoft.IoTHub`. The top navigation bar includes links for Welcome!, Sign in to your account, IoT hub - Microsoft Azure, Upgrade Azure IoT Hub | Microsoft, cannot upgrade from free to standard, Unable to upgrade Azure IoT Hub, and Azure IoT hub blocked for two days. The main header says "Microsoft Azure" and has a search bar for "Search resources, services, and docs (G+)". The user's email, `andreasreben@hotmail.com`, is shown in the top right.

The page title is "IoT hub" under the "Microsoft" category. The navigation menu at the top includes Home, IoT Hub, and IoT hub. Below the title, there are tabs for Basics, Networking, **Management**, Tags, and Review + create. The Management tab is currently selected.

The main content area starts with a note: "Each IoT hub is provisioned with a certain number of units in a specific tier. The tier and number of units determine the maximum daily quota of messages that you can send. [Learn more](#)".

Scale tier and units

Pricing and scale tier * ⓘ: A dropdown menu is open, showing "S1: Standard tier" as the selected option. Below it is a link: "Learn how to choose the right IoT hub tier for your solution".

Number of S1 IoT hub units ⓘ: A slider with a value of 1 is shown. A tooltip below the slider states: "Determines how your IoT hub can scale. You can change this later if your needs increase."

Defender for IoT: A toggle switch is turned On. A tooltip below it says: "Turn on Defender for IoT and add an extra layer of threat protection to IoT Hub, IoT Edge, and your devices. [Learn more](#)".

A summary table at the bottom shows the configuration:

Pricing and scale tier ⓘ	S1	Device-to-cloud-messages ⓘ	Enabled
--------------------------	----	----------------------------	---------

At the bottom of the page are three buttons: "Review + create" (highlighted in blue), "< Previous: Networking", and "Next: Tags >".

Create IoT Hub 6/13

IoT hub - Microsoft Azure

portal.azure.com/?fromAccountsPortal=true#create/Microsoft.IotHub

Microsoft Azure

Search resources, services, and docs (G+)

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Home > Create a resource >

IoT hub ...

Microsoft

Messages per day ⓘ	8,000	Message routing ⓘ	Enabled
Cost per month	0.00 USD	Cloud-to-device commands ⓘ	Enabled
Defender for IoT ⓘ	Disabled	IoT Edge ⓘ	Enabled
		Device management ⓘ	Enabled

Role-based access control

Change the permission model to Azure role-based access control (RBAC) only, or to a combination of shared access policies and RBAC. [Learn more](#)

RBAC only

Shared access policy + RBAC

To manage the elements within an instance, a user needs access to IoT Hub data APIs. Select the suggested role below to grant yourself full access to the APIs. You can also use Access Control (IAM) to choose appropriate roles later.

[Learn more](#)

Review + create < Previous: Networking Next: Tags >

Create IoT Hub 7/13

The screenshot shows the Microsoft Azure portal interface for creating an IoT hub. The title bar reads "IoT hub - Microsoft Azure". The URL in the address bar is "portal.azure.com/?fromAccountsPortal=true#create/Microsoft.IotHub". The main content area is titled "IoT hub" and shows configuration options under the "Microsoft" provider. A radio button for "Shared access policy + RBAC" is selected. Below this, a note states: "To manage the elements within an instance, a user needs access to IoT Hub data APIs. Select the suggested role below to grant yourself full access to the APIs. You can also use Access Control (IAM) to choose appropriate roles later." A link "Learn more" is provided. There is a checkbox "Assign me to the IoT Hub Data Contributor role" followed by a help icon. Under "Advanced settings", there is a "Scale" section with a slider for "Device-to-cloud partitions" set to 2. Below that is a "Transport Layer Security (TLS)" section with a "Minimum TLS Version" dropdown set to 1.0. At the bottom, there are three buttons: "Review + create" (highlighted in blue), "< Previous: Networking", and "Next: Tags >".

Create IoT Hub 8/13

The screenshot shows a Microsoft Azure portal window with multiple tabs open at the top. The main content area displays a confirmation dialog for deleting an IoT Hub named 'IoTHubAzurePercept'. The dialog includes a warning message, a confirmation input field, and a table of existing IoT Hubs. At the bottom, there is a prominent blue 'Delete' button.

Are you sure you want to permanently delete IoTHubAzurePercept?

Warning! Deleting the IoT Hub 'IoTHubAzurePercept' is irreversible and cannot be undone. Going further will delete it and all the devices in it permanently.

Type the name of your IoT Hub to confirm *

 ✓

Name	Devices
IoTHubAzurePercept	0

Delete

Create IoT Hub 9/13

IoT hub - Microsoft Azure

portal.azure.com/?fromAccountsPortal=true#create/Microsoft.IoTHub

Microsoft Azure

Search resources, services, and docs (G+)

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DEFAULT DIRECTORY

Home > Create a resource >

IoT hub

Microsoft

Basics Networking Management Tags Review + create

Tags are name/value pairs. To categorize resources and consolidate billing, apply the same tag to multiple resources and resource groups. Your tags will update automatically if you change your resources. [Learn more](#)

Name ⓘ	Value ⓘ	Resource
Conference	Live360	IoT Hub
		IoT Hub

Review + create < Previous: Management Next: Review + create >

Create IoT Hub 10/13

IoT hub - Microsoft Azure

portal.azure.com/?fromAccountsPortal=true#create/Microsoft.IotHub

Microsoft Azure

Search resources, services, and docs (G+)

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Home > Create a resource >

IoT hub

Microsoft

Validation passed.

Basics Networking Management Tags Review + create

Subscription: Microsoft Azure Sponsorship

Resource group: IoTPercept_RG

Region: East US

IoT hub name: IoTHubAzurePercept

Networking

Connectivity configuration: Public access

Private endpoint connections: None

Allow public network access: Enabled

Create < Previous: Tags Next > Automation options

Create IoT Hub 11/13

The screenshot shows the Microsoft Azure portal interface. The title bar indicates the current page is 'IoTHubAzurePercept-1019172815 | Overview'. The left sidebar lists navigation options: Home, Overview (which is selected and highlighted in grey), Inputs, Outputs, and Template. The main content area displays a message 'Deployment is in progress' with deployment details: Deployment name: IoTHubAzurePercept-1019172815, Subscription: Microsoft Azure Sponsorship, Resource group: IoTPercept_RG. It also shows the start time: 10/19/2021, 5:28:16 PM and Correlation ID: f9910bd4-8fca-4a8d-816e-1823ff8515f3. Below this, there is a section titled 'Deployment details' with a download link. A table is present with columns: Resource, Type, Status, and Operation details. The table body contains the text 'No results.'.

Resource	Type	Status	Operation details
No results.			

Create IoT Hub 12/13

The screenshot shows the Microsoft Azure IoT Hub Overview page for the deployment "IoTHubAzurePercept-1019161954". The deployment status is marked as "complete". Key details include:

- Deployment name: IoTHubAzurePercept-1019161954
- Subscription: Microsoft Azure Sponsorship
- Resource group: IoTPercept_RG
- Start time: 10/19/2021, 4:19:55 PM
- Correlation ID: c05756fa-dd1a-4af5-91c5-06b4be46...

Below the summary, there are sections for "Deployment details" (with a download link) and "Next steps" (links to "Add and configure IoT Devices" and "Configure routing rules for device messaging"). A prominent blue "Go to resource" button is at the bottom.

The right sidebar contains links to "Security Center", "Free Microsoft tutorials" (including links to message routing, device identity registry, and quotas), and "Work with an expert".

Create IoT Hub 13/13

The screenshot shows the Microsoft Azure portal interface for managing an IoT Hub. The main title is "IoTHubAzurePercept" under the "IoT Hub" category. The left sidebar contains navigation links for Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Events, Settings (Shared access policies, Identity, Pricing and scale, Networking, Certificates, Built-in endpoints), and Usage (Get started). The central pane displays the "Essentials" section with the following details:

Setting	Value
Resource group (Move)	IoTPercept_RG
Status	Active
Current location	East US
Subscription (Move)	Microsoft Azure Sponsorship
Subscription ID	972feafb-390b-4d95-82ec-c5221f0485c5
Tags (Edit)	Conference : Live360
Hostname	IoTHubAzurePercept.azure-devices.net
Pricing and scale tier	S1 - Standard
Number of IoT Hub units	1
Minimum TLS Version	1.0

At the bottom, there is a "Usage" section with a "Get started" button and a "Show data for last:" dropdown menu containing options: 1 Hour, 6 Hours, 12 Hours, 1 Day (which is selected), 7 Days, and 30 Days.

Add IoT Device

Create a device - Microsoft Azure

portal.azure.com/?fromAccountsPortal=true#@andreasben@hotmail.onmicrosoft.com/resource/subscriptions/972feafb-390b-4d95-82ec-c5221f0485c5/resourcegroups/IoTPercept_RG/provi... Apps | Yahoo Mail | Facebook | Compose | From The Community | Status is offline Dia... | Property | Speaker Directory | Submit MVP Activity | Bookmarks | CD-Rom- und Online... | 0 Notifications | Close | Windows 8 Under... | Reading list

Microsoft Azure Search resources, services, and docs (G+)

andreasben@hotmail.... DEFAULT DIRECTORY

Home > IoTHubAzurePercept-1019161954 > IoT devices >

Create a device

Find Certified for Azure IoT devices in the Device Catalog

Device ID * ⓘ
The ID of the new device

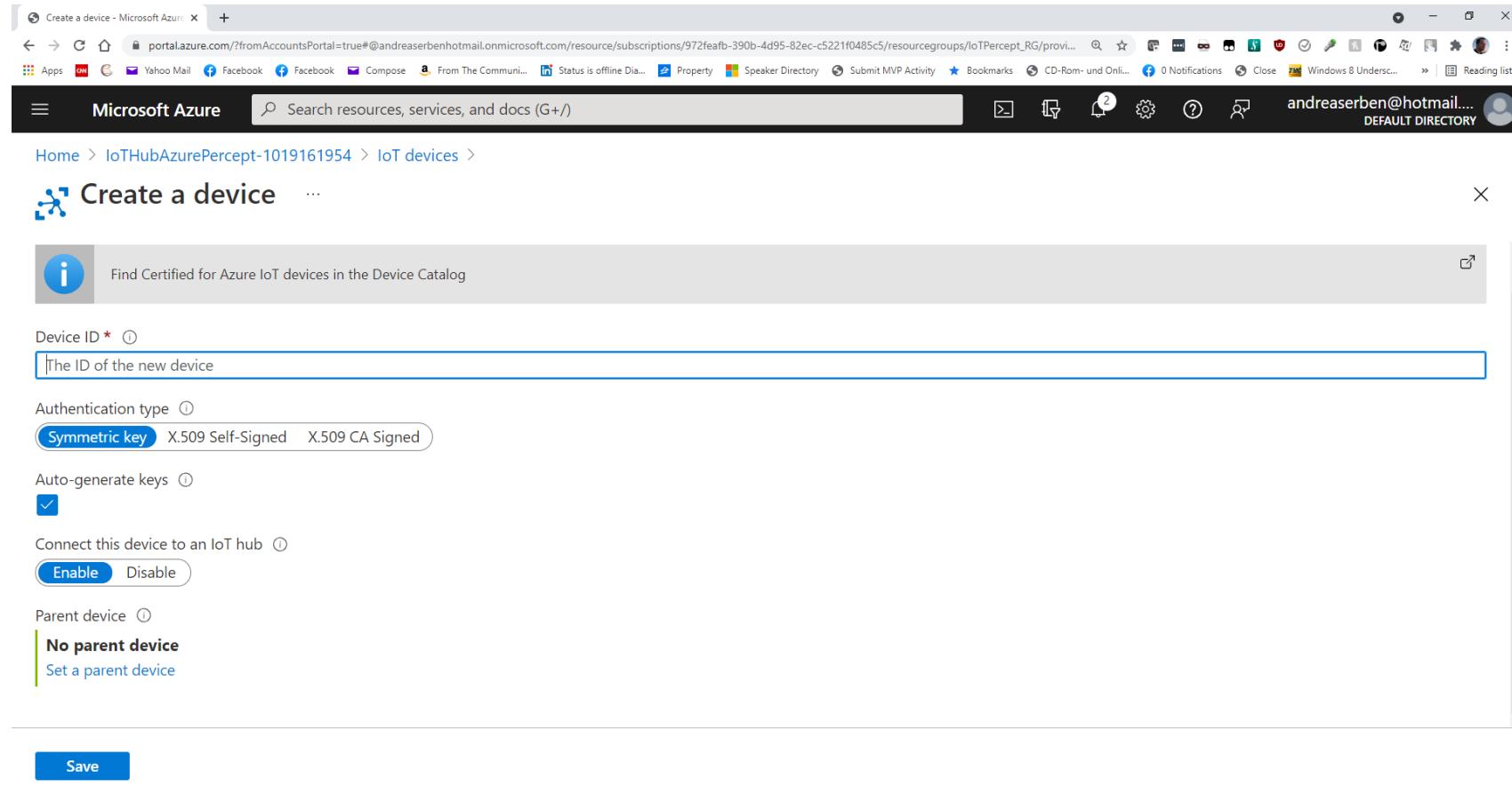
Authentication type ⓘ
 Symmetric key X.509 Self-Signed X.509 CA Signed

Auto-generate keys ⓘ

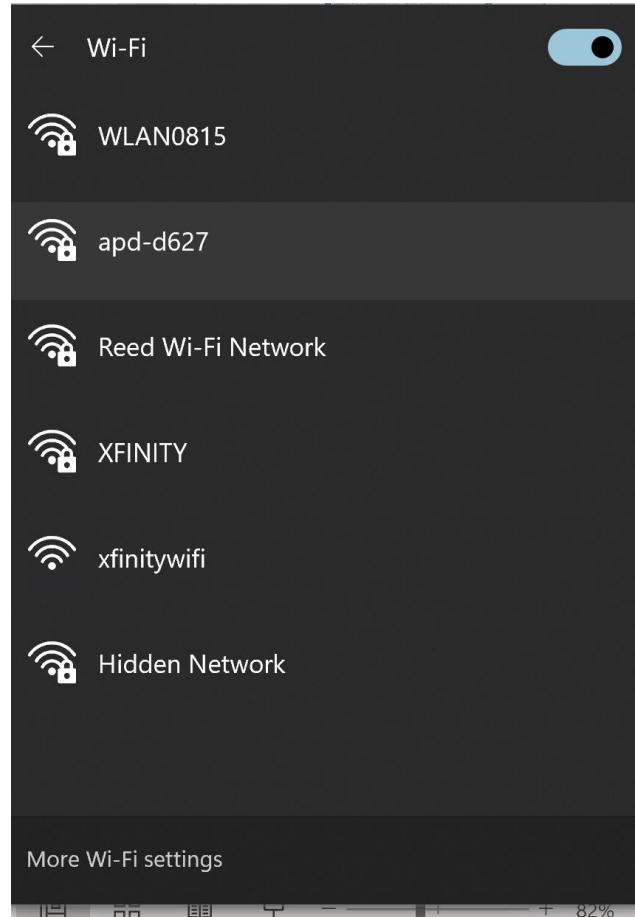
Connect this device to an IoT hub ⓘ
 Enable Disable

Parent device ⓘ
No parent device
Set a parent device

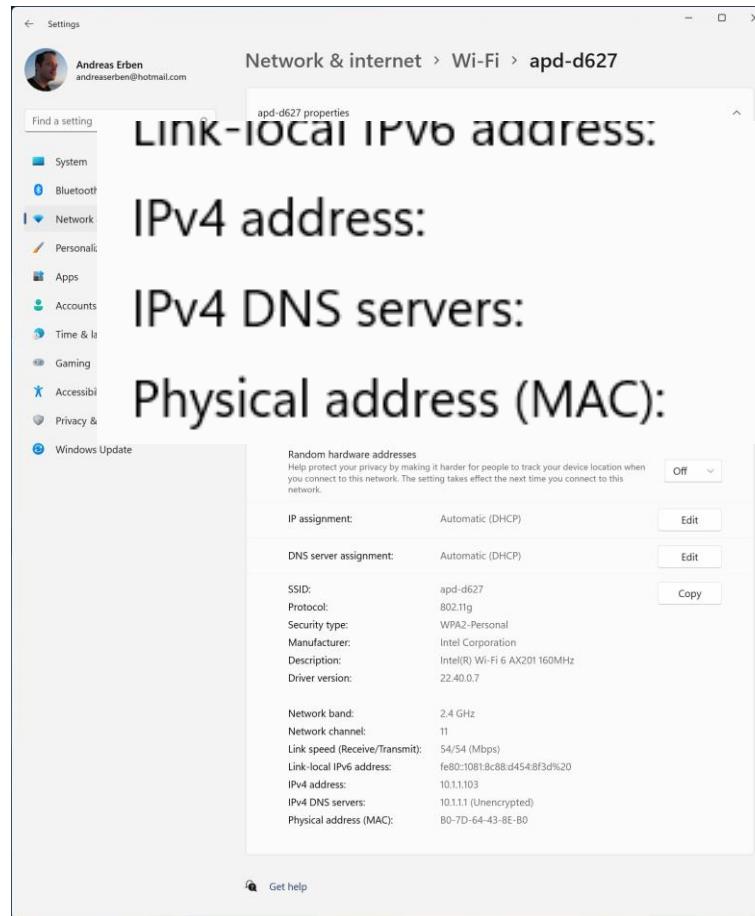
Save



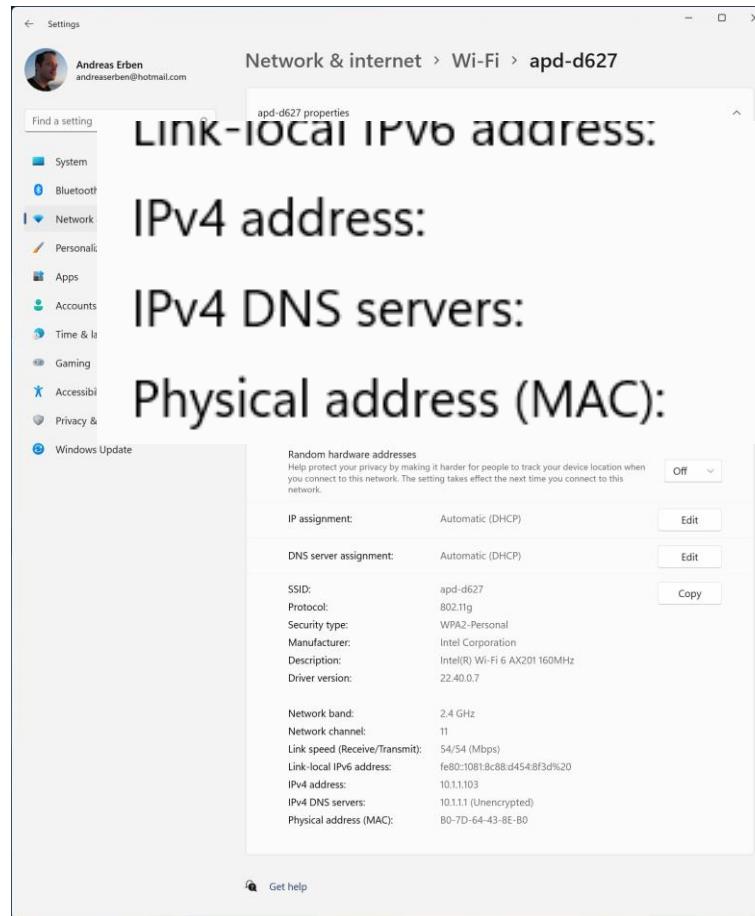
Connect to Azure Percept



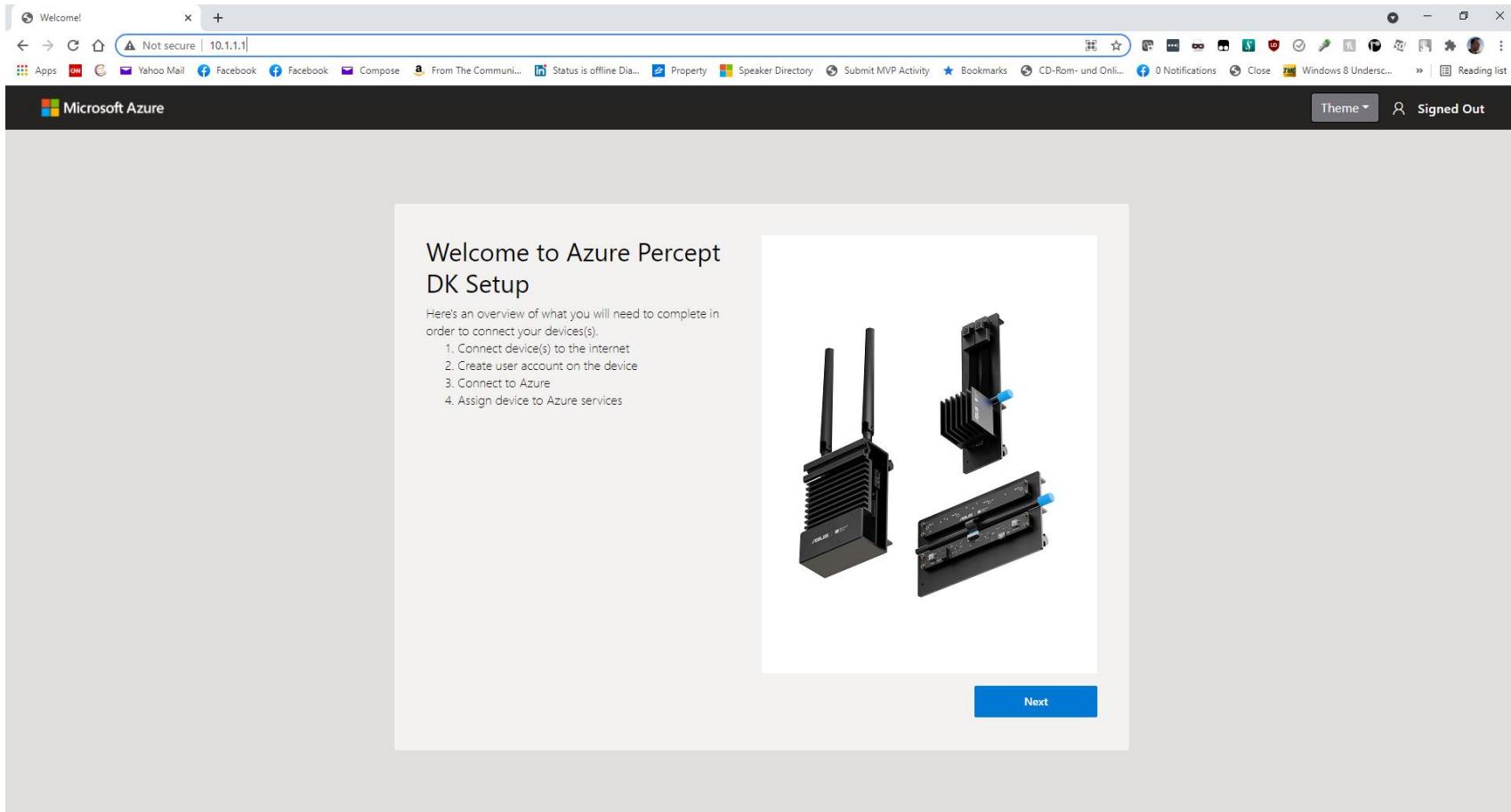
Connect to Azure Percept



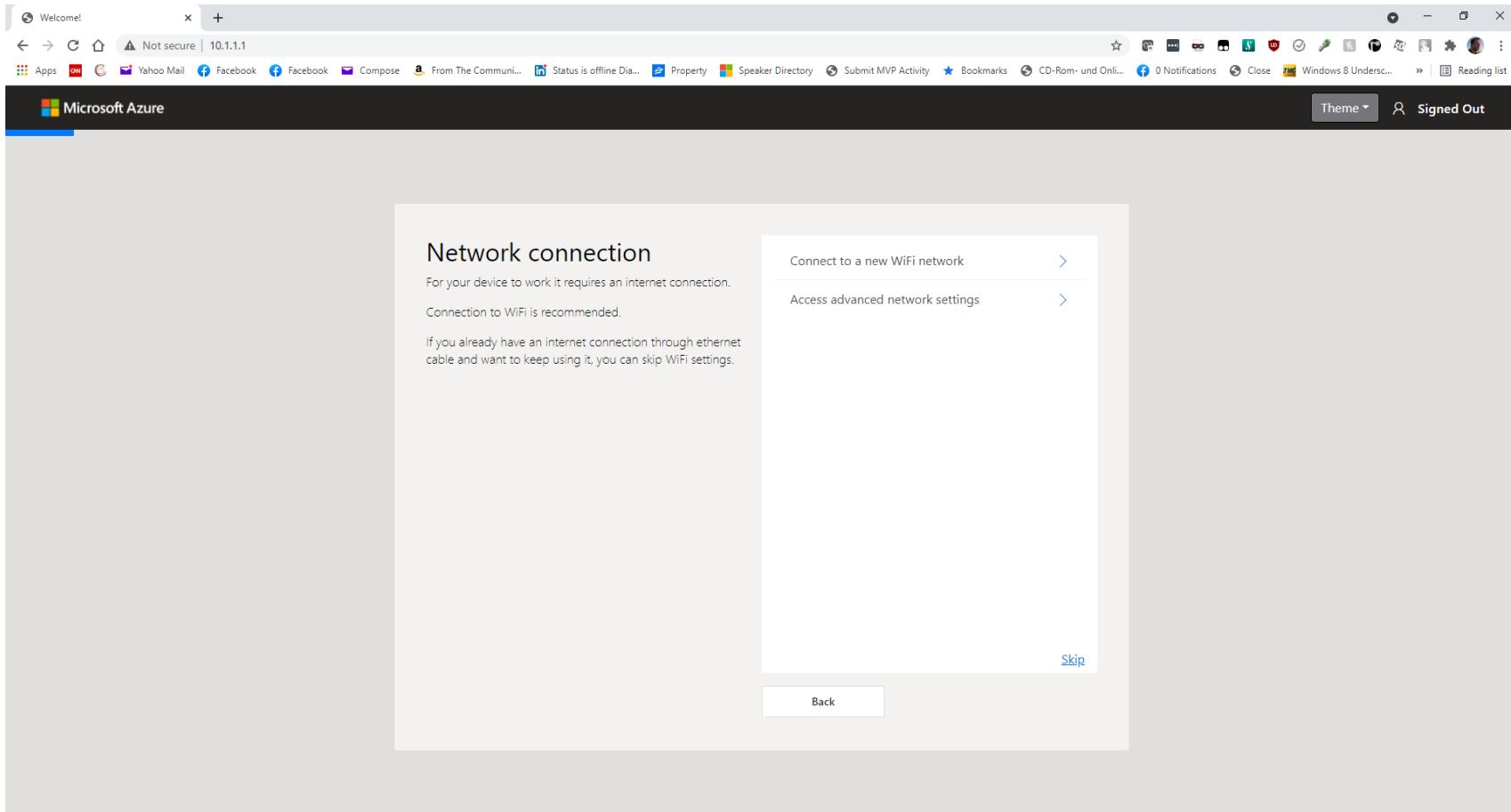
Connect to Azure Percept



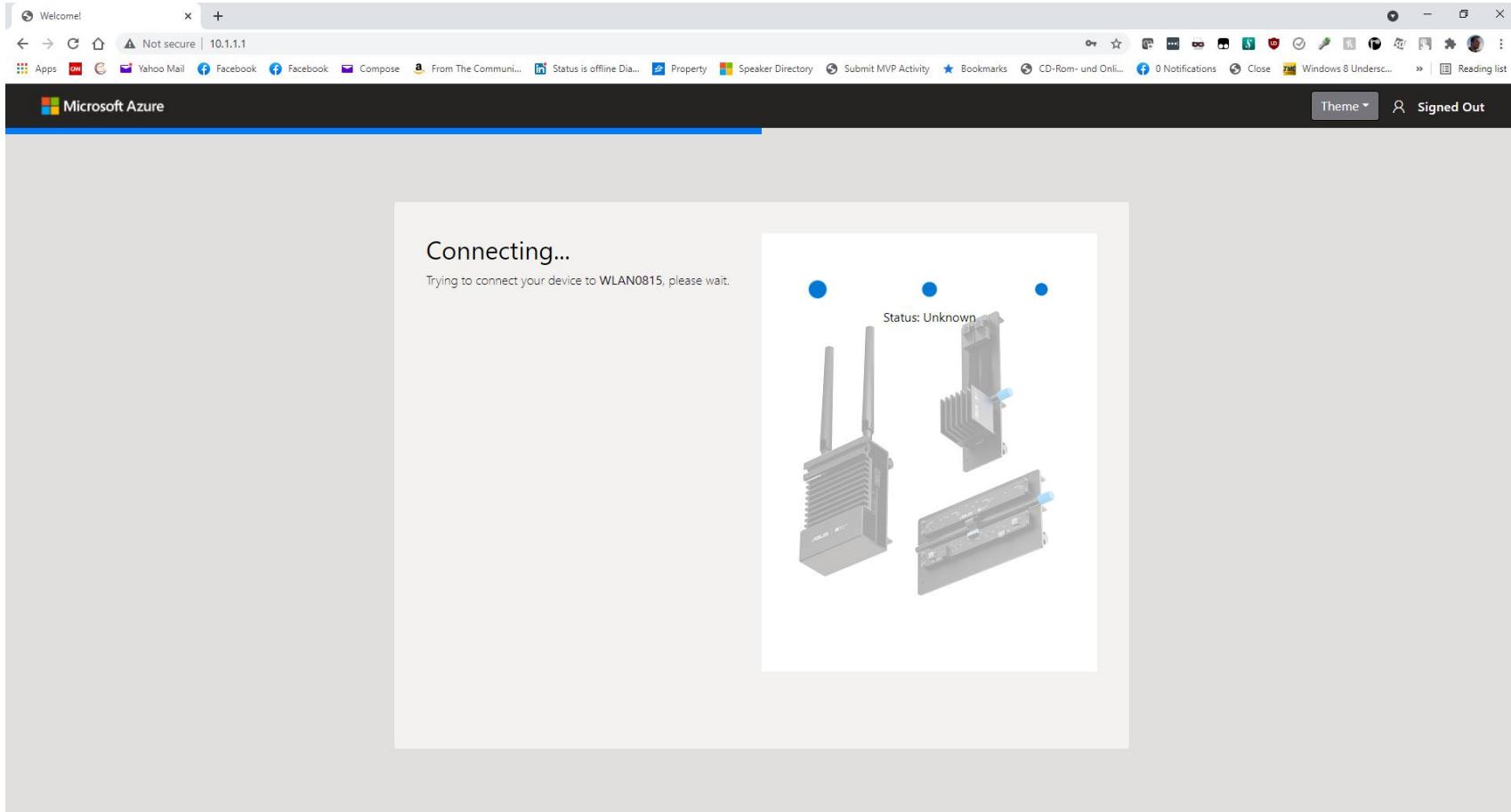
Connect to Azure Percept



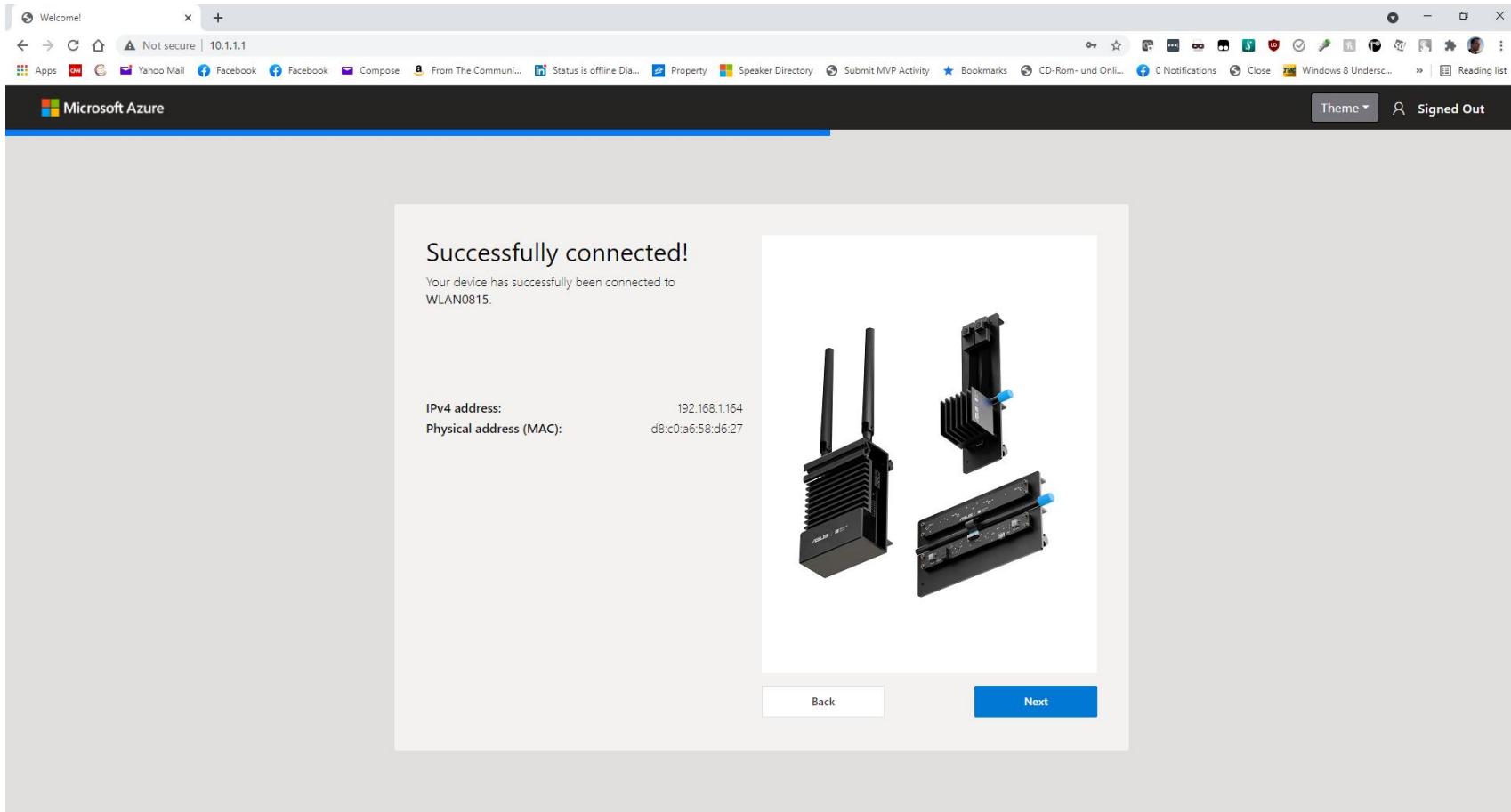
Connect to Azure Percept



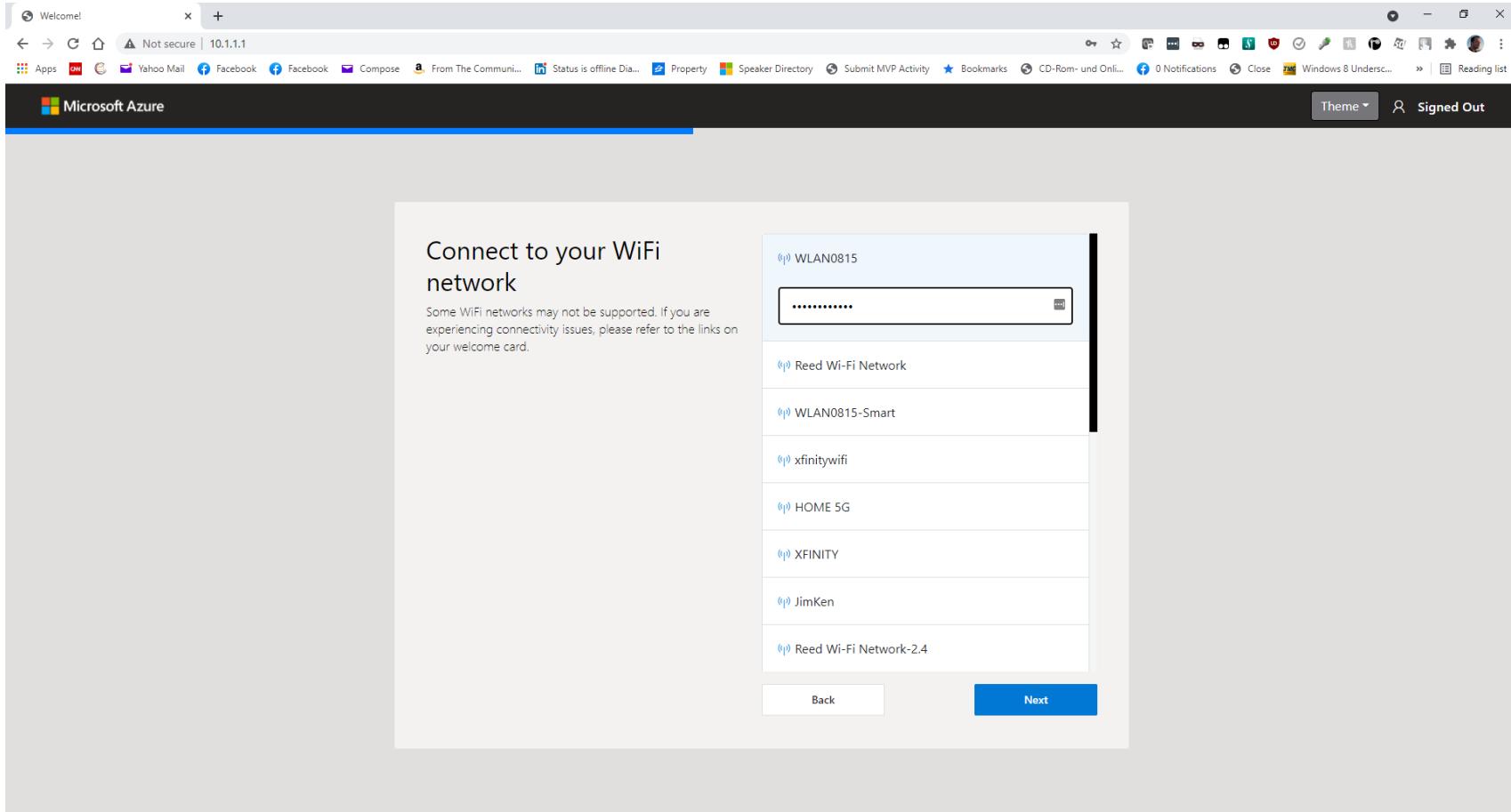
Connect to Azure Percept



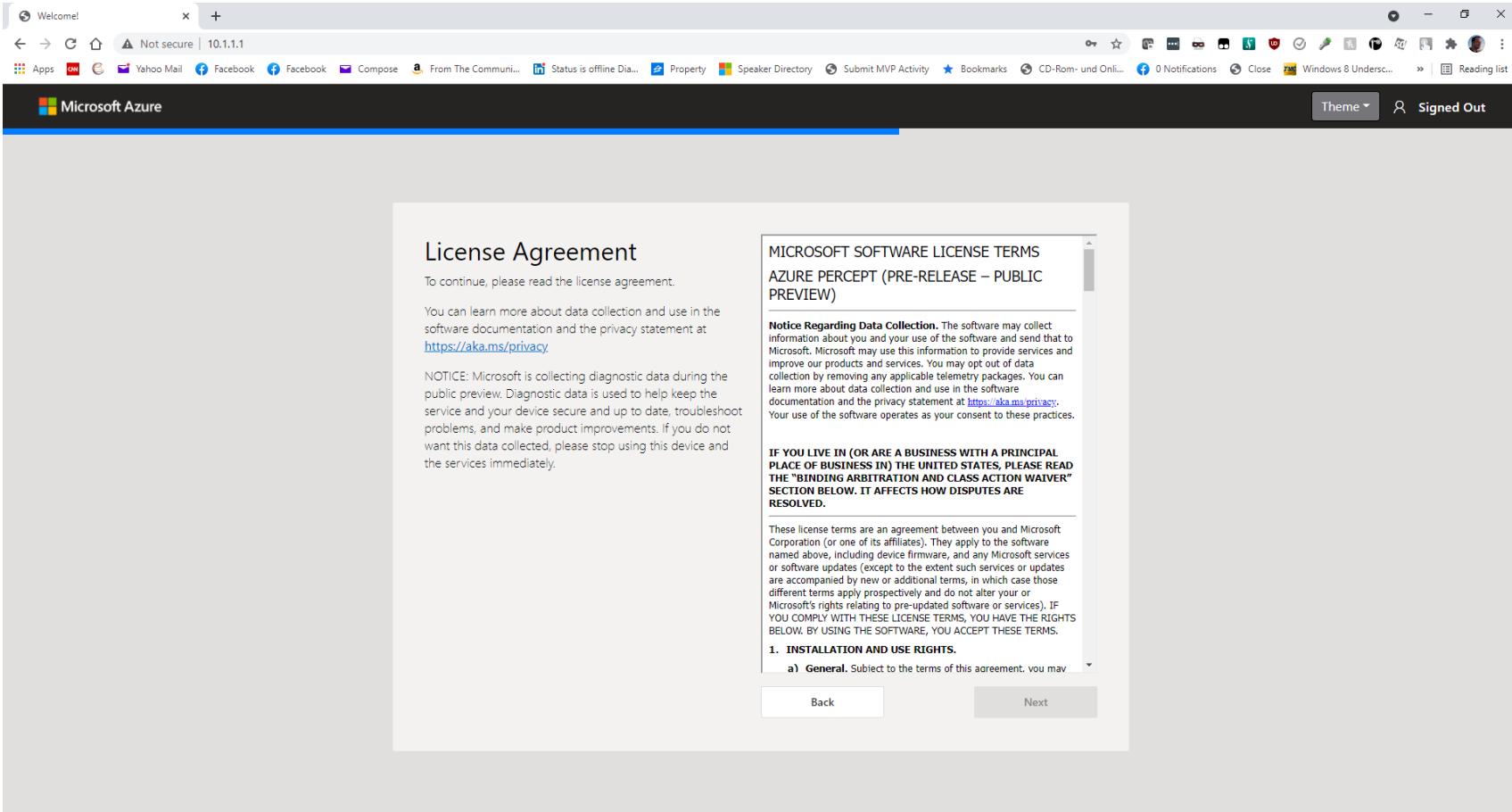
Connect to Azure Percept



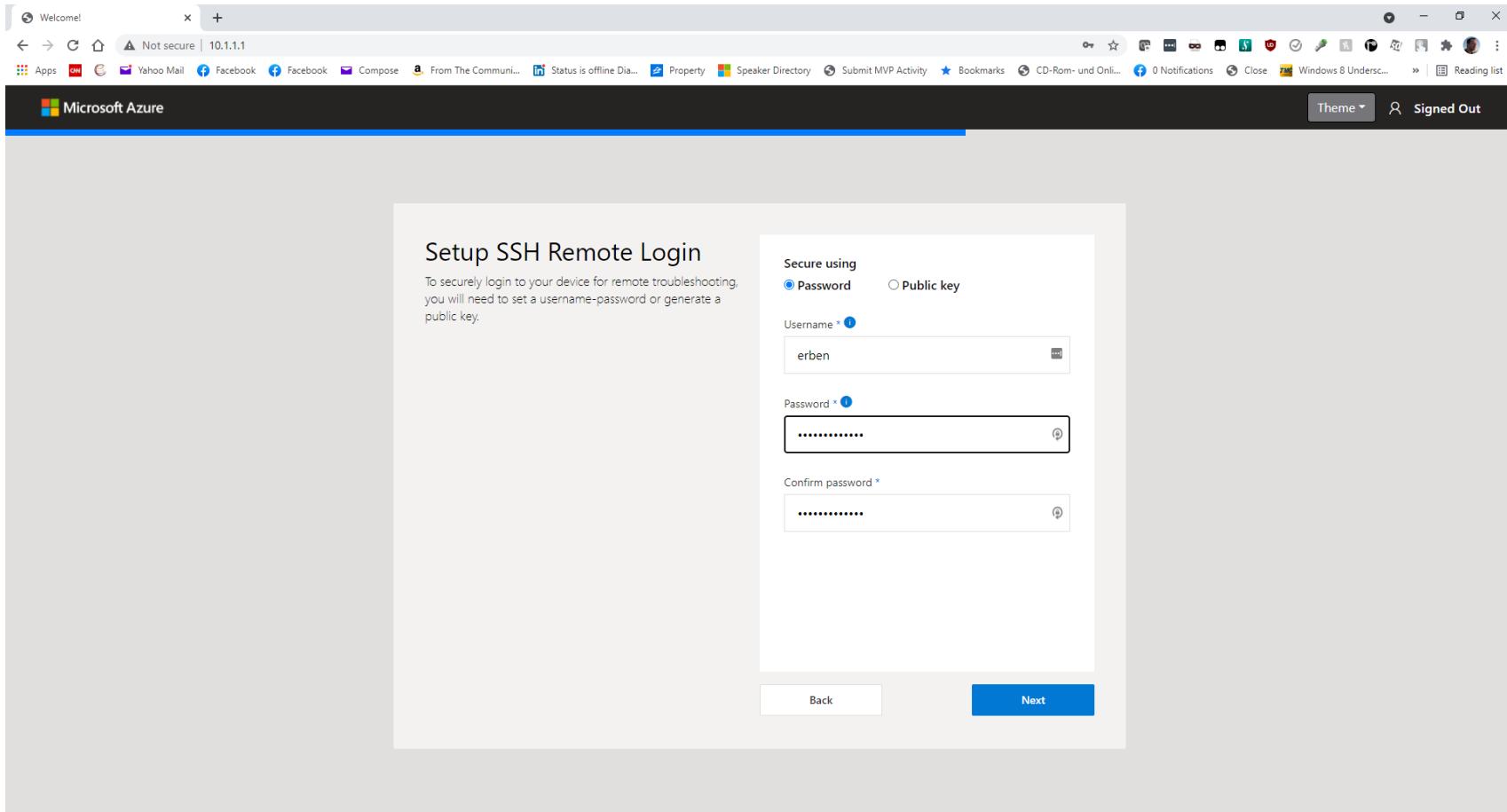
Connect to Azure Percept



Connect to Azure Percept



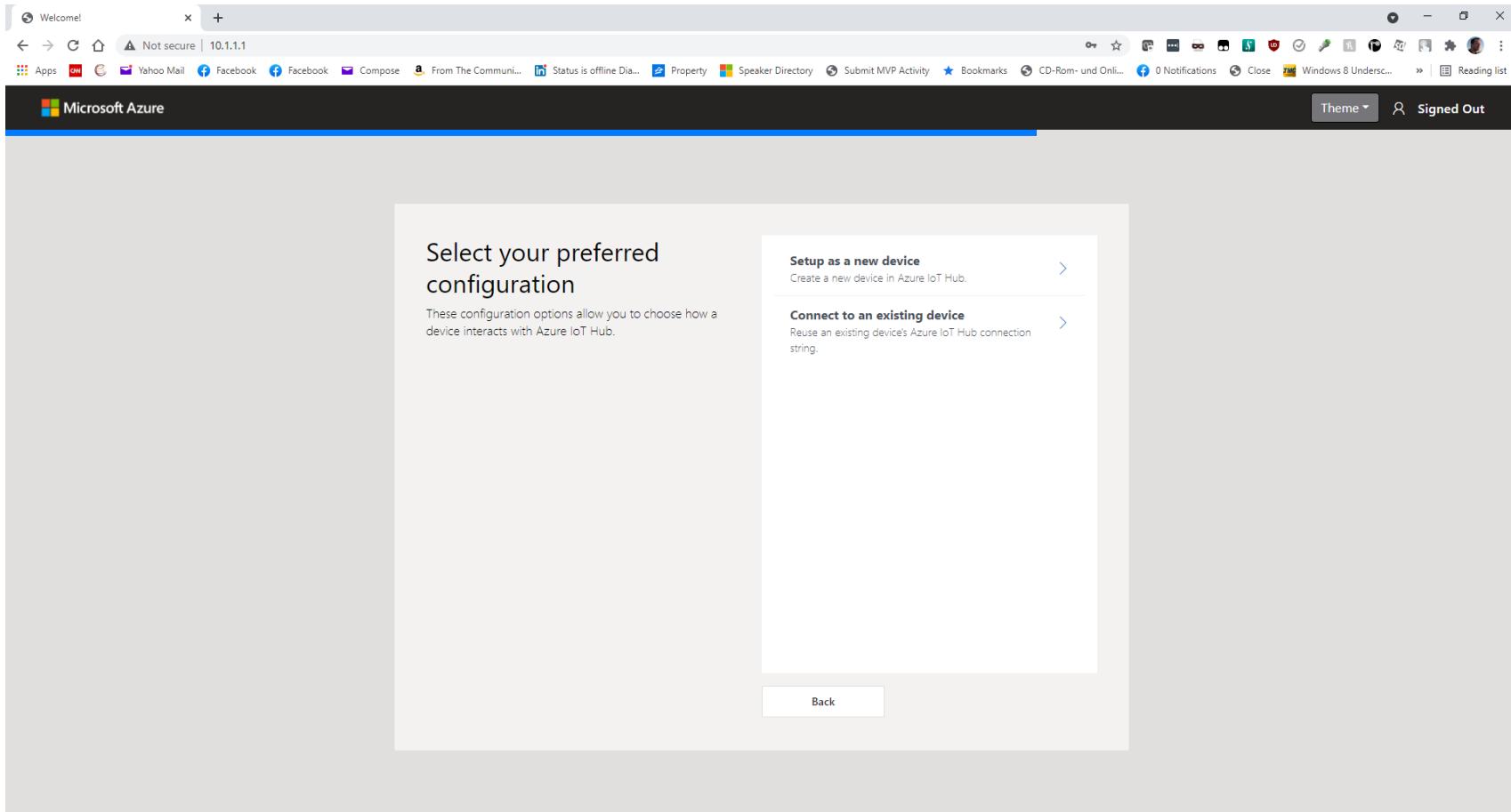
Connect to Azure Percept



Painfully long password here... 😊



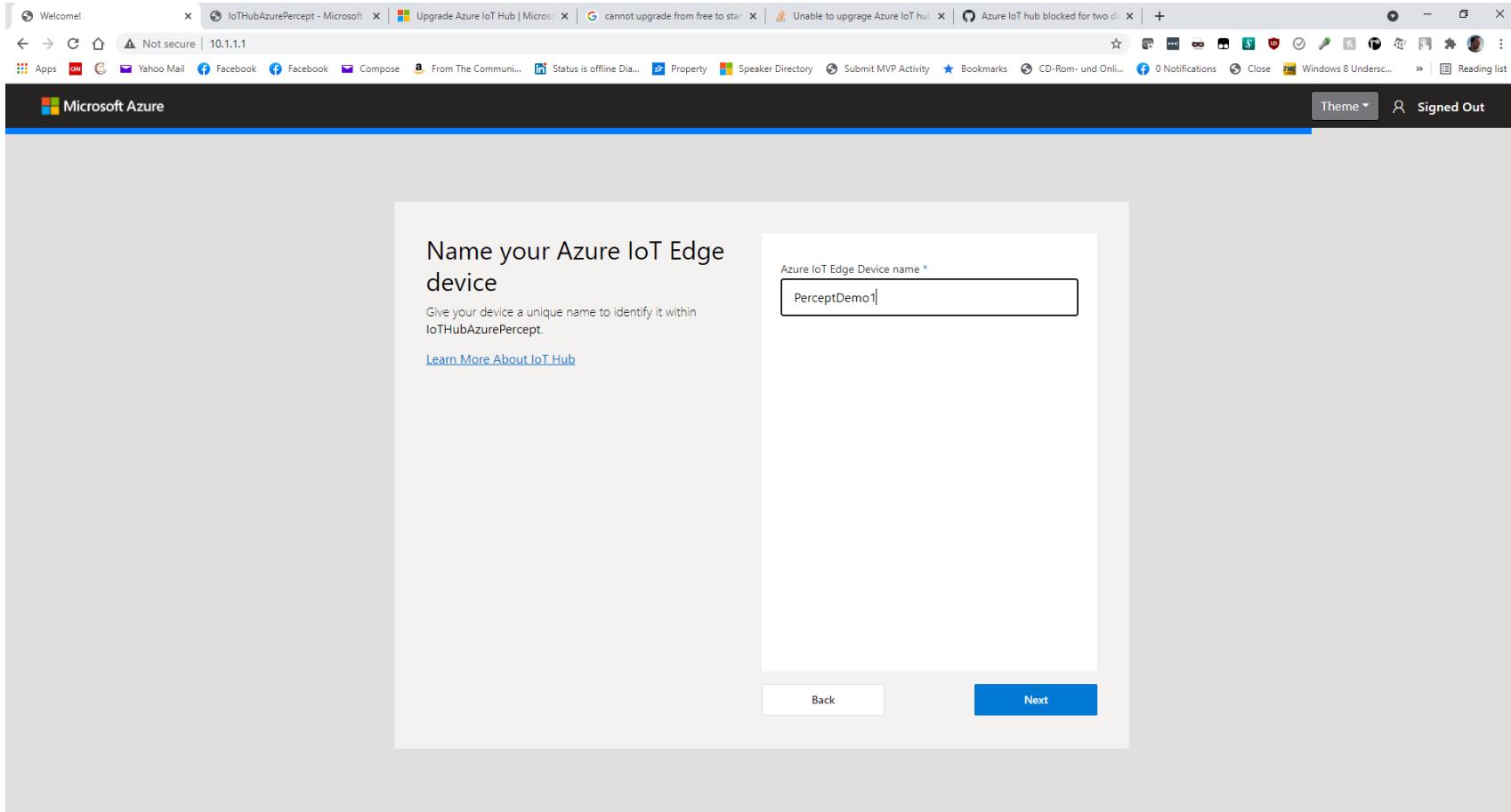
Connect to Azure Percept



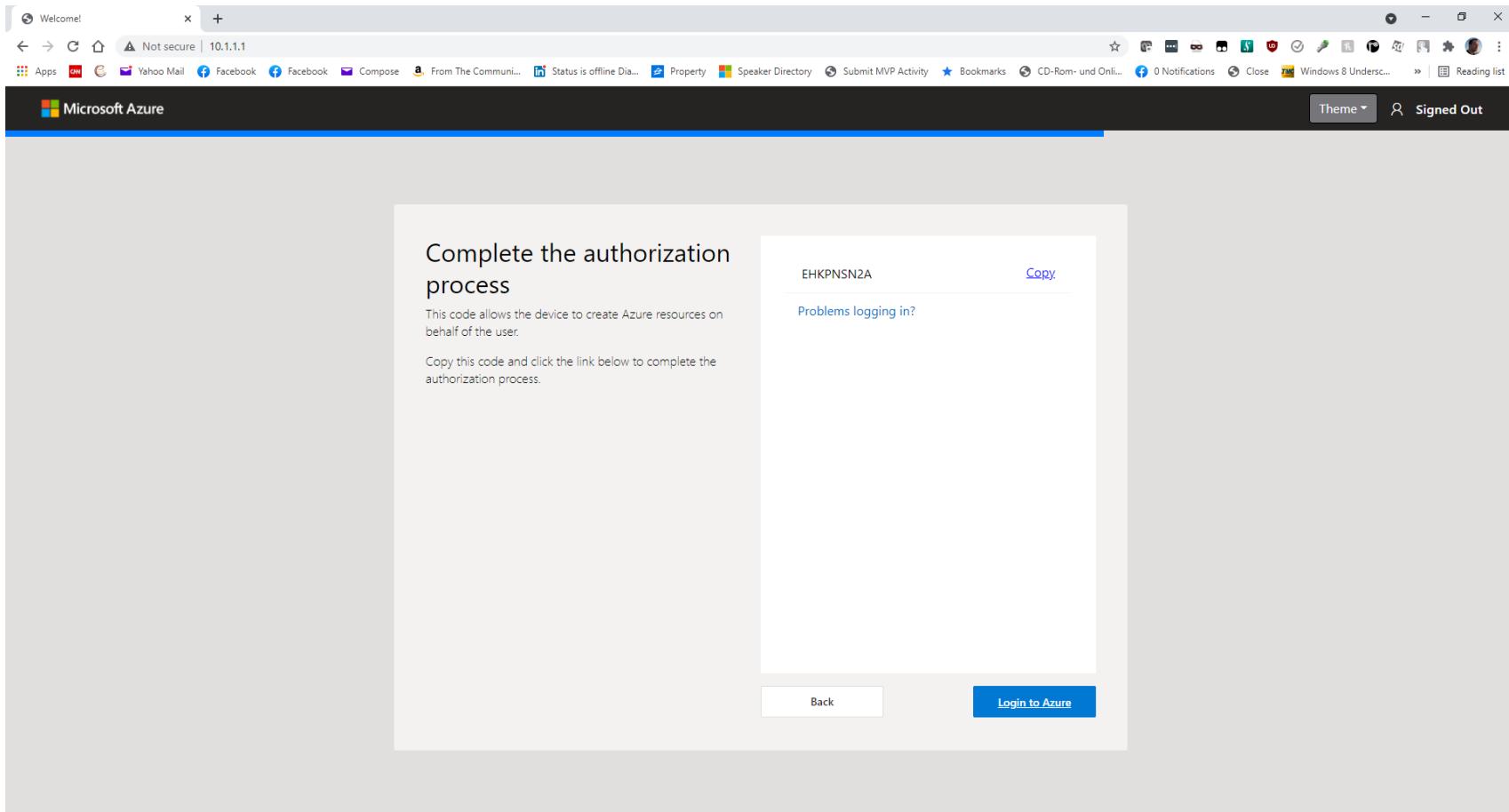
Painfully long password here... 😊



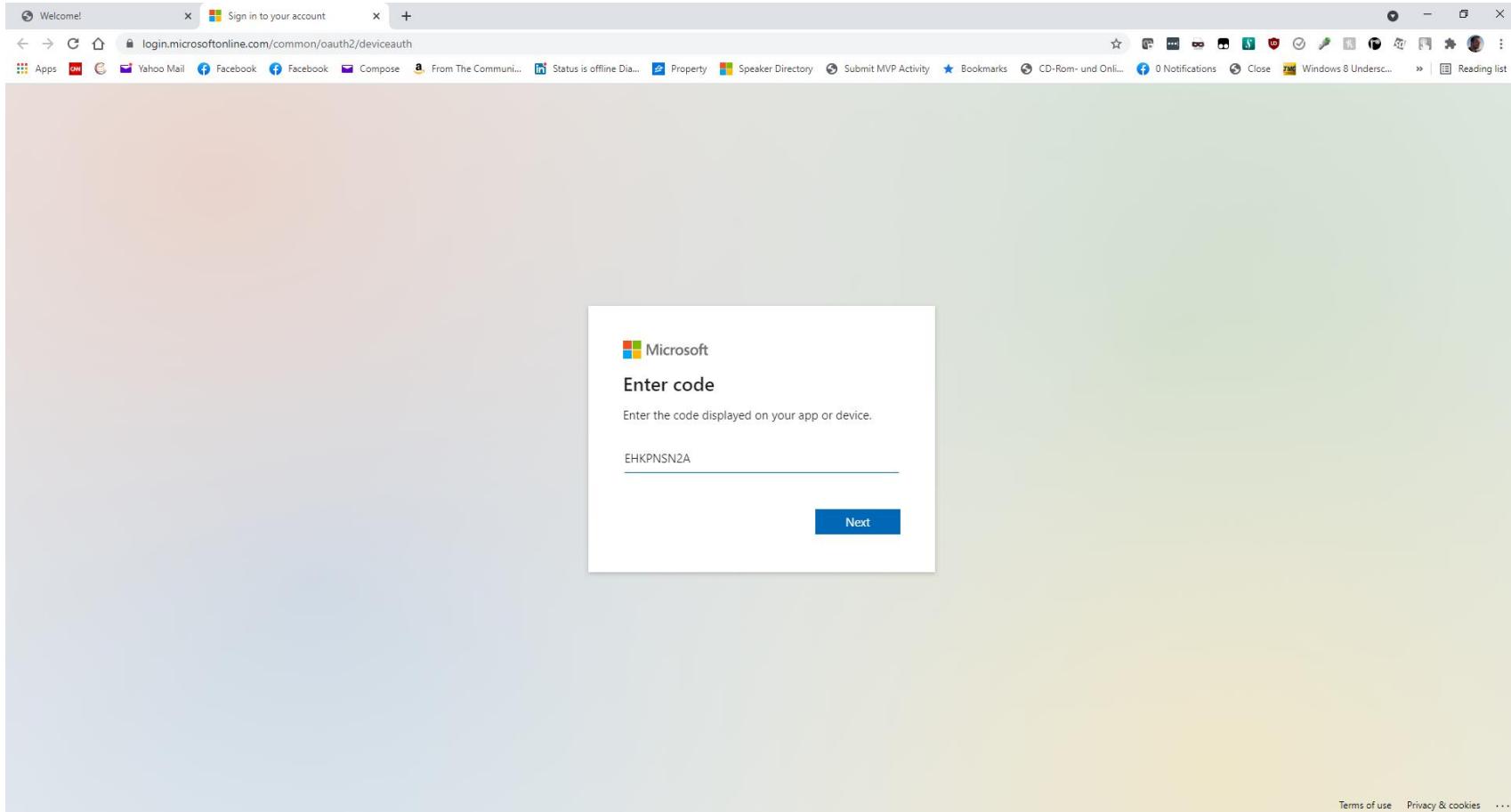
Connect to Azure Percept



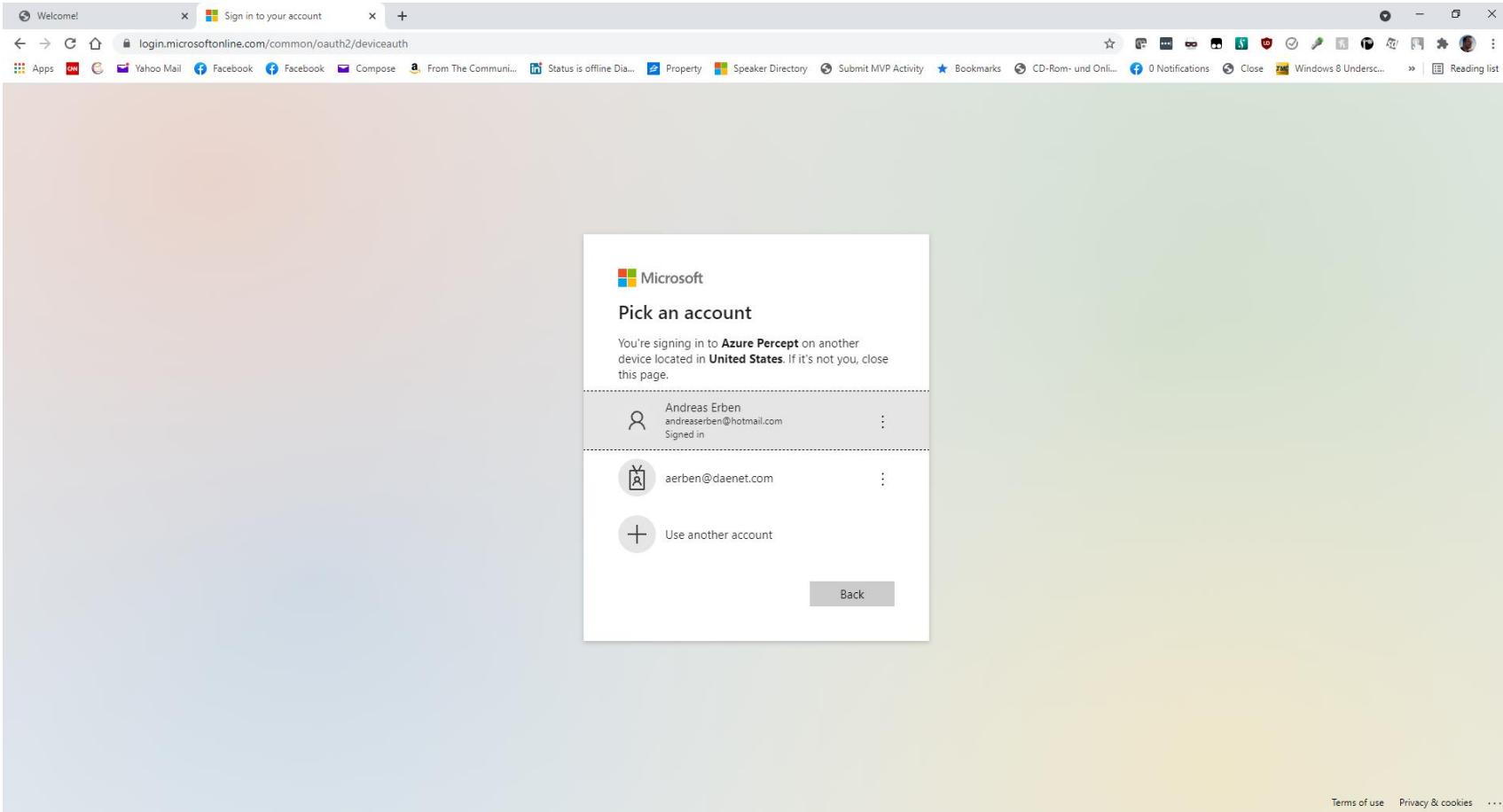
Connect to Azure Percept



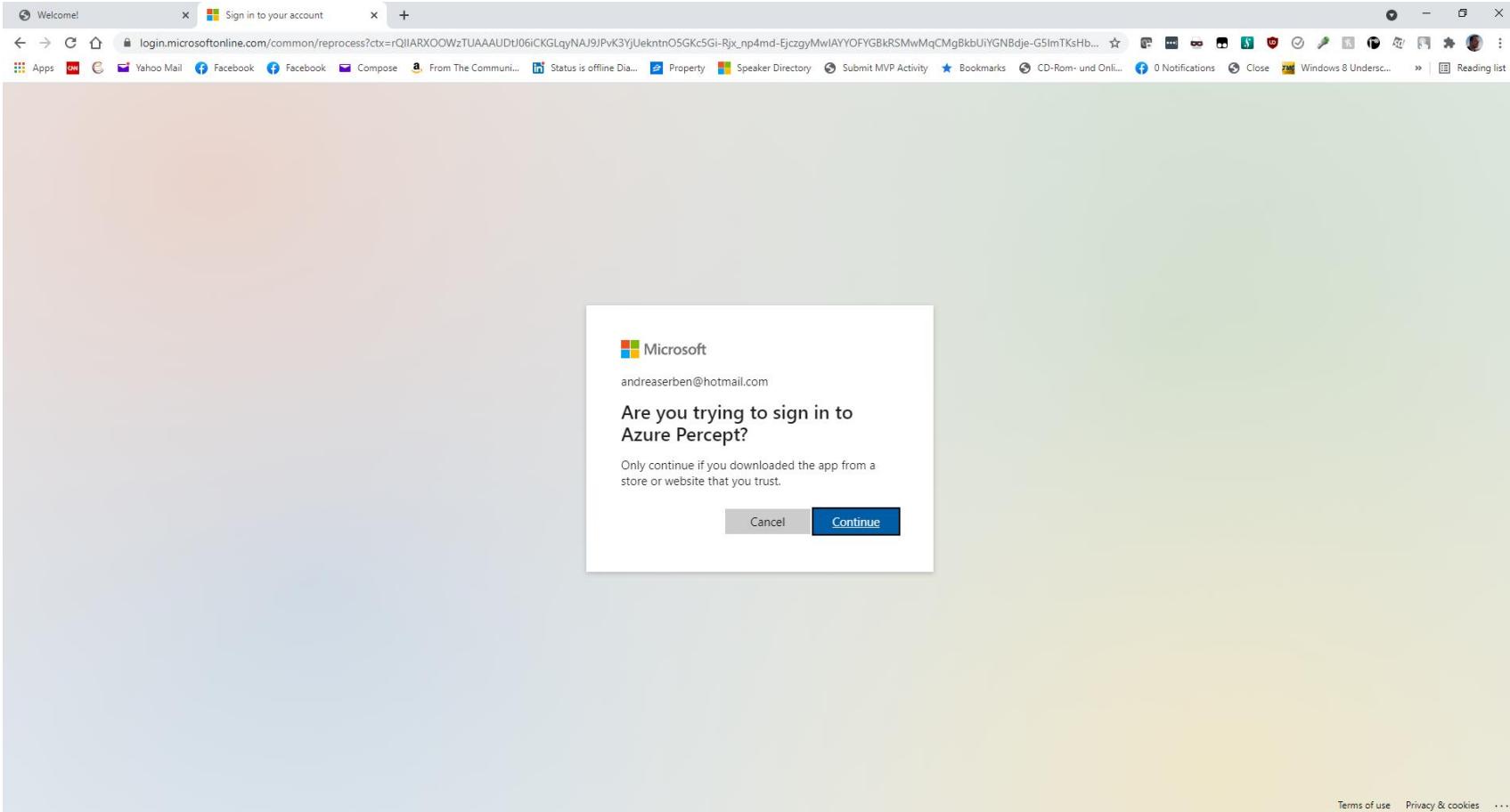
Connect to Azure Percept



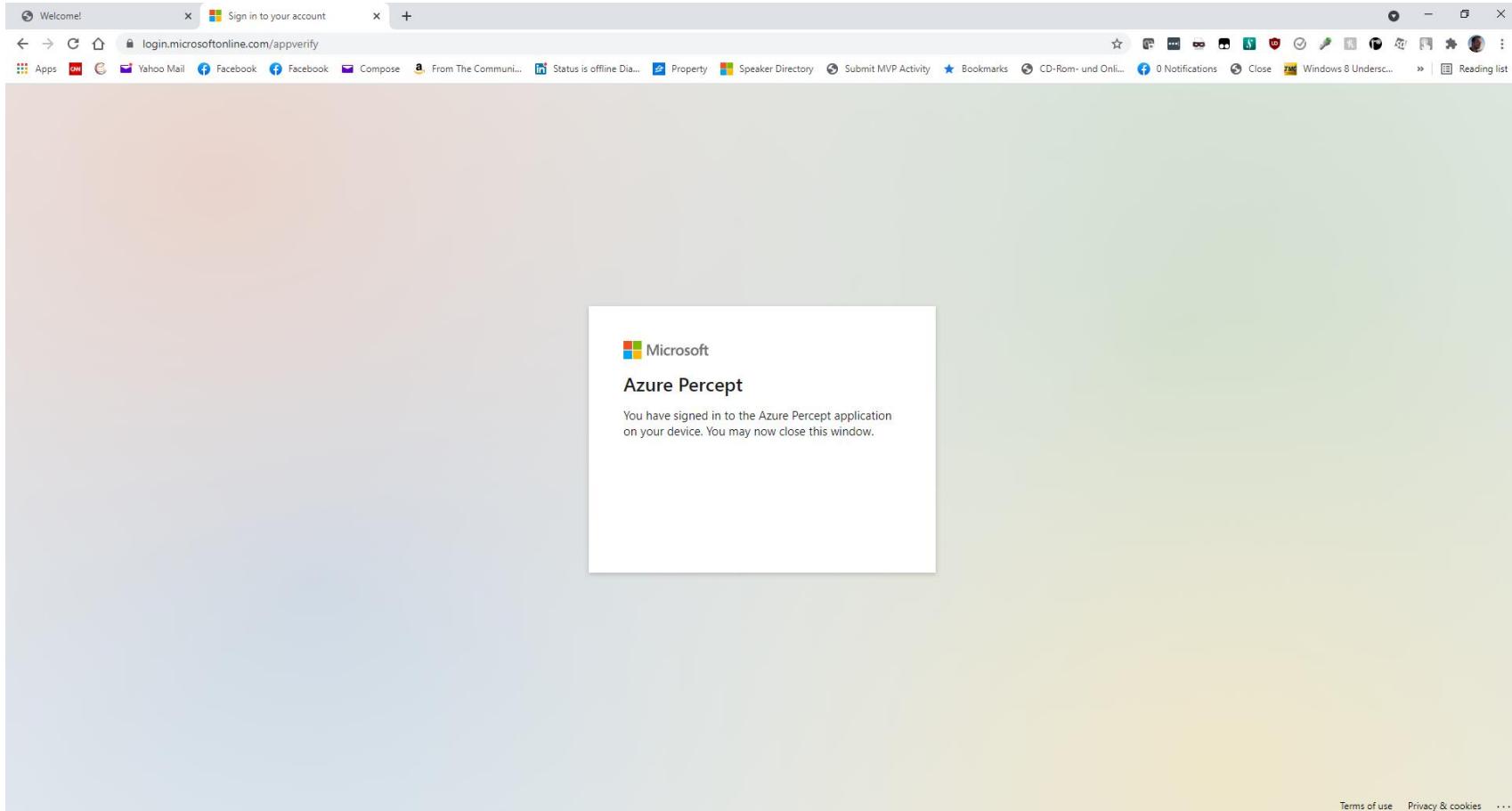
Connect to Azure Percept



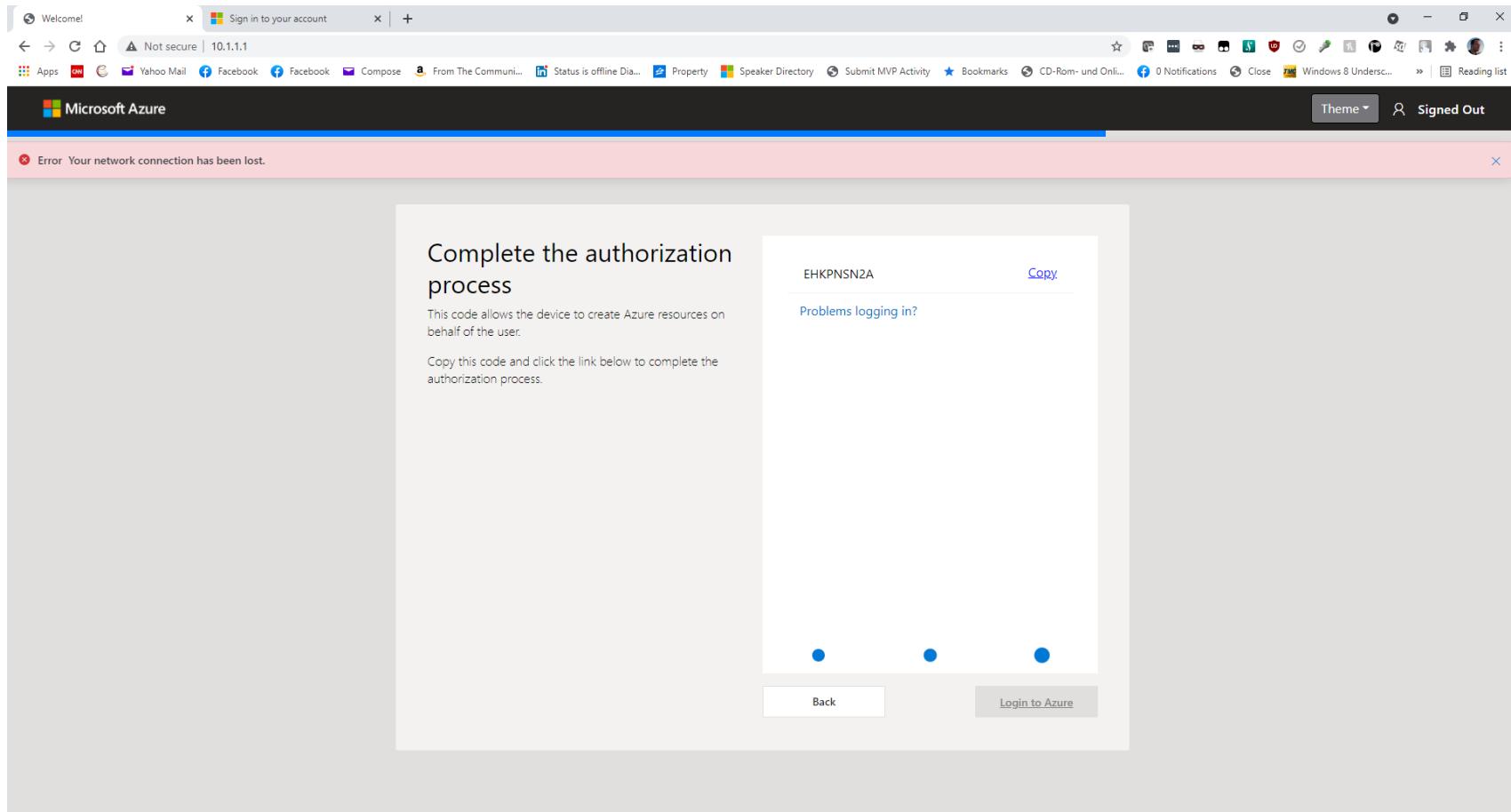
Connect to Azure Percept



Connect to Azure Percept



Connect to Azure Percept



Connect to Azure Percept

The screenshot shows a Microsoft Azure browser-based interface. At the top, there's a navigation bar with various links like 'Welcome!', 'IoTHubAzurePercept - Microsoft', 'Upgrade Azure IoT Hub | Microsoft', 'cannot upgrade from free to standard...', 'Unable to upgrade Azure IoT hub...', and 'Azure IoT hub blocked for two days...'. Below the bar, the main content area has a green success message: 'Success Your network connection has been restored.' The central part of the screen displays a card titled 'Assign your device to your Azure IoT Hub'. It contains the following text:

Select the Azure IoT Hub you would like to onboard your device to. If none are listed, select "Create a new Azure IoT Hub".

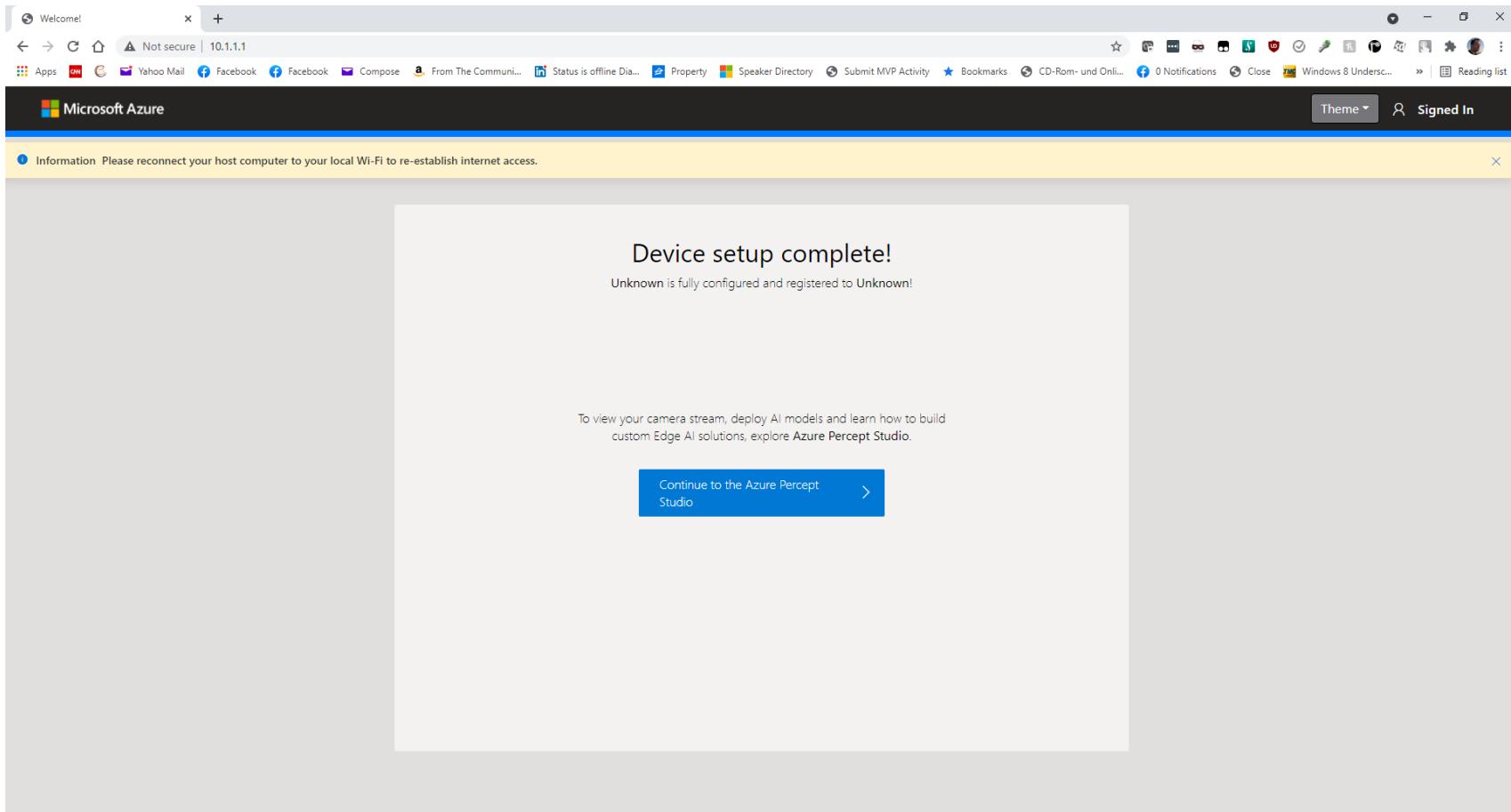
This Azure IoT Hub is linked to a Device Provisioning Service instance, allowing you to enroll using the TPM.

[Learn more about Azure IoT Hub](#)

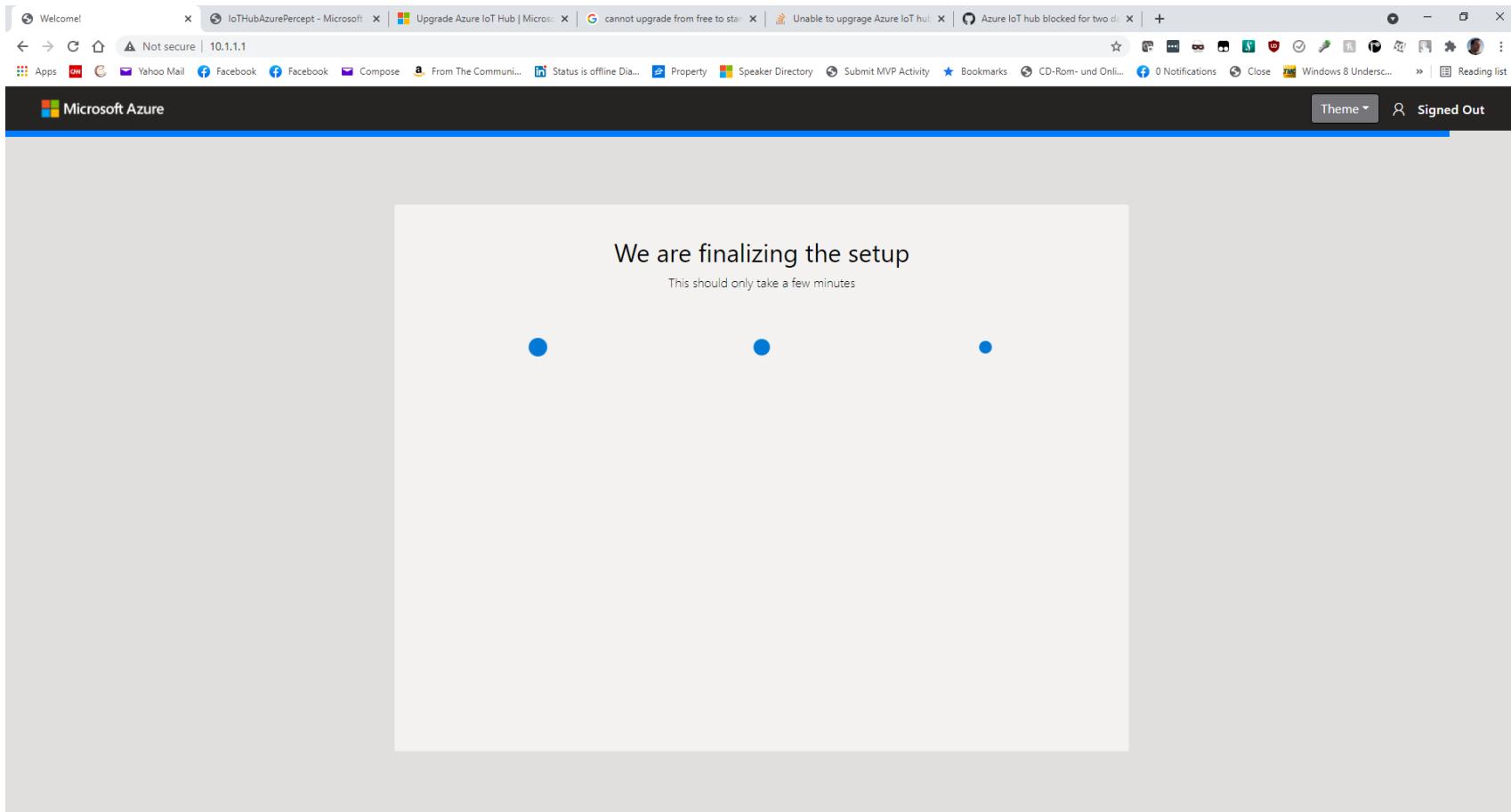
[Learn more about Azure Pricing](#)

On the right side of the card, there are two options: 'IoTHubAzurePercept' (Tier: Standard) and 'Create a new Azure IoT Hub'. Below the card is a 'Refresh' button. At the bottom of the page is a 'Back' button.

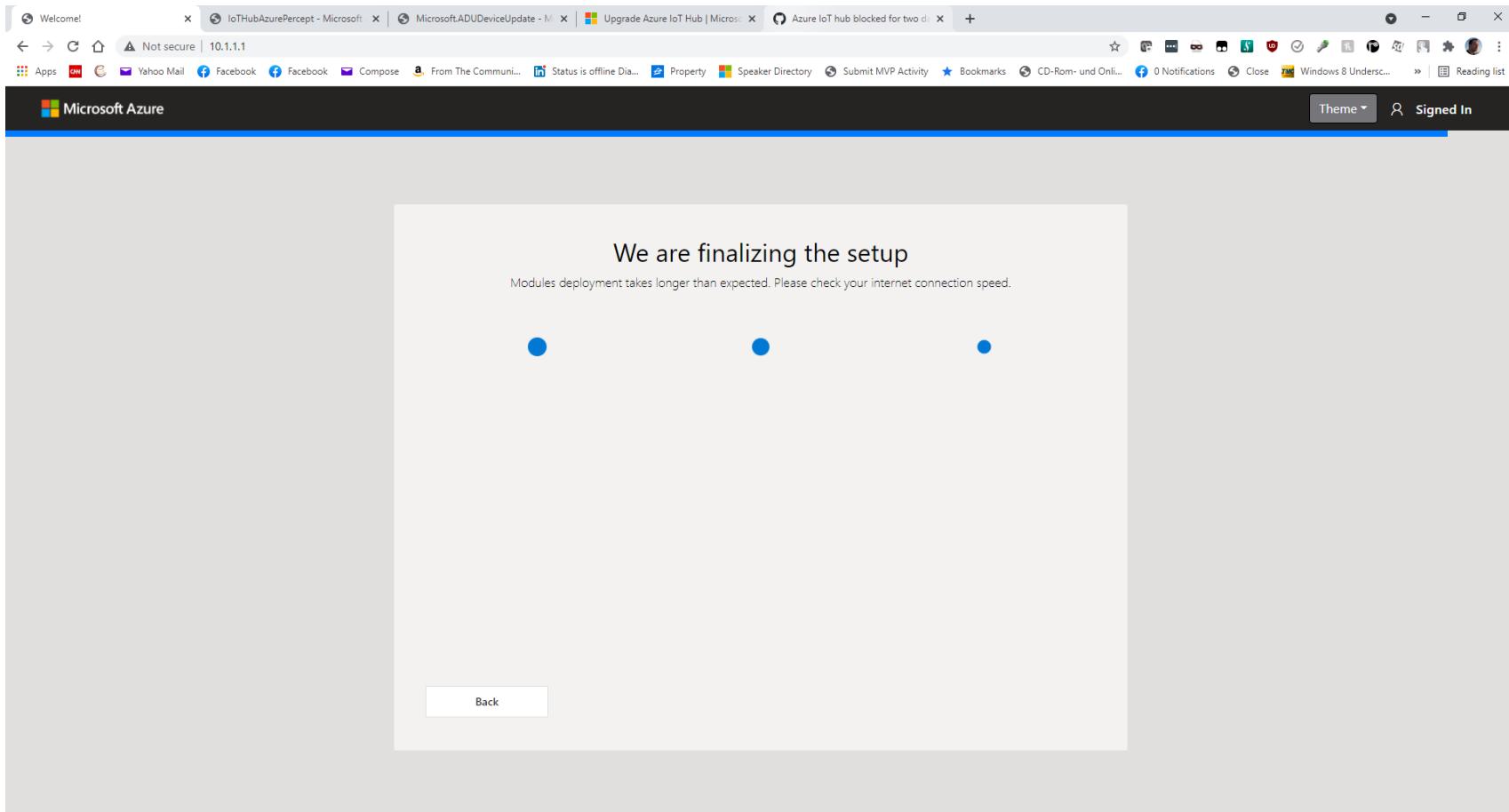
Connect to Azure Percept



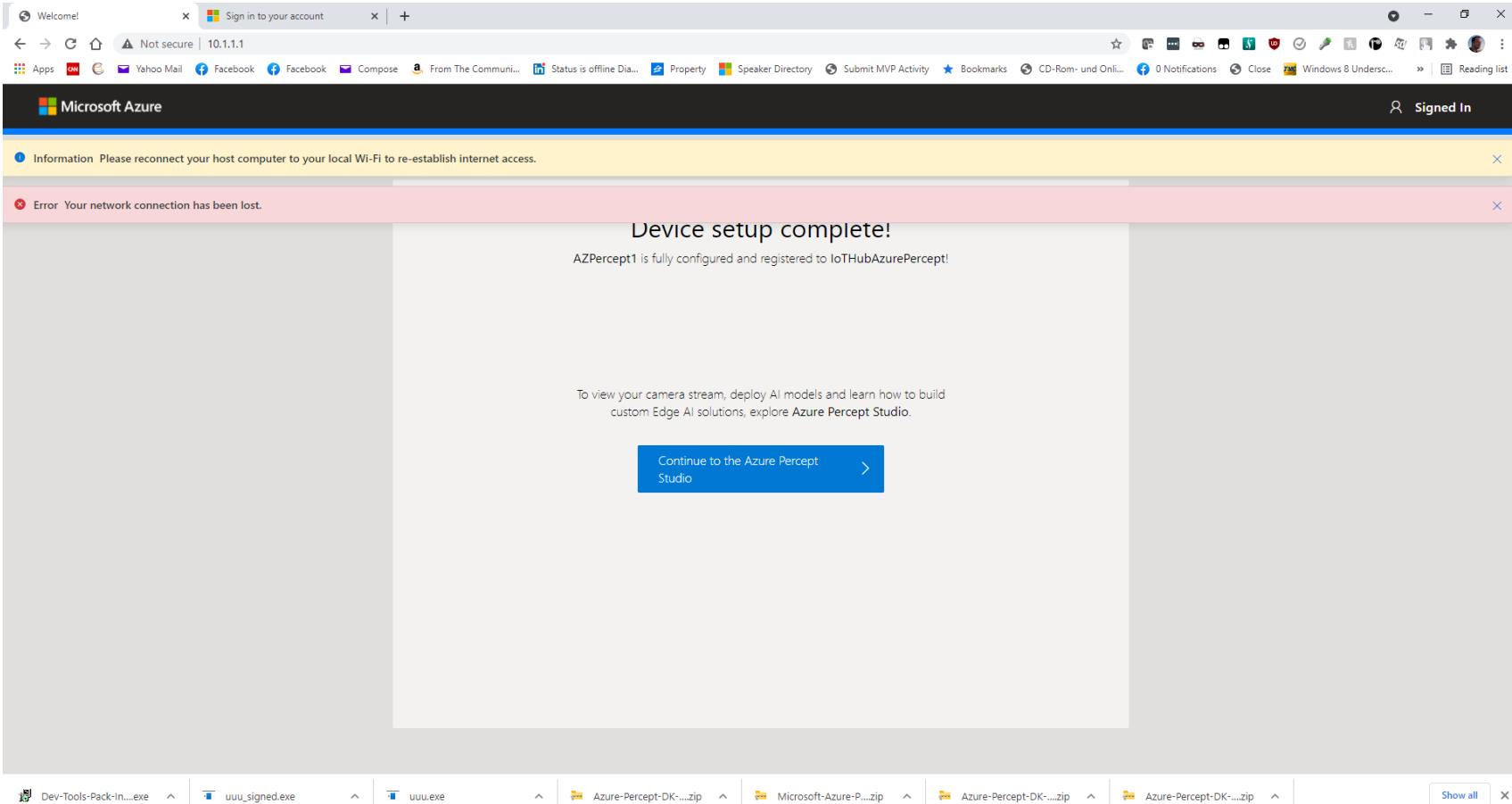
Connect to Azure Percept



Connect to Azure Percept



Connect to Azure Percept



Azure Percept Studio landing page

The screenshot shows the Azure Percept Studio landing page within a Microsoft Edge browser window. The URL in the address bar is portal.azure.com/#blade/AzureEdgeDevices/Main/overview. The browser's top navigation bar includes various links like Apps, Facebook, and Speaker Directory, along with account information for 'andreaserben@hotmail...'.

The main content area features a large heading 'Azure Percept Studio | Overview' with a subtitle 'Manage your Azure Percept devices'. Below this are several navigation links: 'Get started' (underlined), 'Demos & tutorials', 'Sample applications', and 'Advanced tools'. A search bar is also present.

On the left side, there are sections for 'AI Projects' (Vision, Speech) and 'Support + troubleshooting' (Docs + community, New support request). A prominent call-to-action section in the center-right says 'Learn, build and go live!' with subtext 'From silicon to services, watch to see how we guide you through the Edge AI solution building journey.' and a link 'Learn more'.

Two small images below this section show 'How to AI model' (a monitor displaying a neural network diagram next to some blocks) and 'Sample applications' (a smartphone connected to a network of nodes).

A notification bubble in the top right corner informs the user '\$150.00 credit remaining' for their 'Visual Studio Enterprise' subscription.

Azure Percept Studio

The screenshot shows the Azure Percept Studio Overview page. The browser title bar reads "Welcome! > Azure Percept Studio - Microsoft > Sign in to your account". The main content area has a header "Azure Percept Studio | Overview" with a subtitle "Manage your Azure Percept devices". A navigation bar below the header includes a search bar, "Get started" (which is underlined), "Demos & tutorials", "Sample applications", and "Advanced tools". On the left, there's a sidebar with sections for "AI Projects" (Vision, Speech) and "Support + troubleshooting" (Docs + community, New support request). The central content features a large heading "Learn, build and go live!" followed by text about the Edge AI solution building journey and a link to "Get your device here". Below this are two images: one showing a computer monitor displaying a neural network diagram next to some 3D blocks, and another showing a mobile device connected to a cloud-like network of nodes.

Azure Percept Studio

The screenshot shows the Azure Percept Studio interface for the device **AZPercept1**. The device is listed under the **Azure Percept DK** category. The **General** tab is selected, displaying the following details:

Information	Value
Manufacturer	ASUS
Model	APDK-101
OS Name	Linux
SW Version	2021.107.129.116
Processor Architecture	aarch64
Processor Manufacturer	ARM

Below the device information, there is a note about an update being available: **Update available**.

At the bottom of the page, a file navigation bar shows several files and folders:

- Dev-Tools-Pack-in.exe
- uuu_signed.exe
- uuu.exe
- Azure-Percept-DK-.zip
- Microsoft-Azure-P-.zip
- Azure-Percept-DK-.zip
- Azure-Percept-DK-.zip

Update Firmware via USB

1) download uuu for

2) download firmware

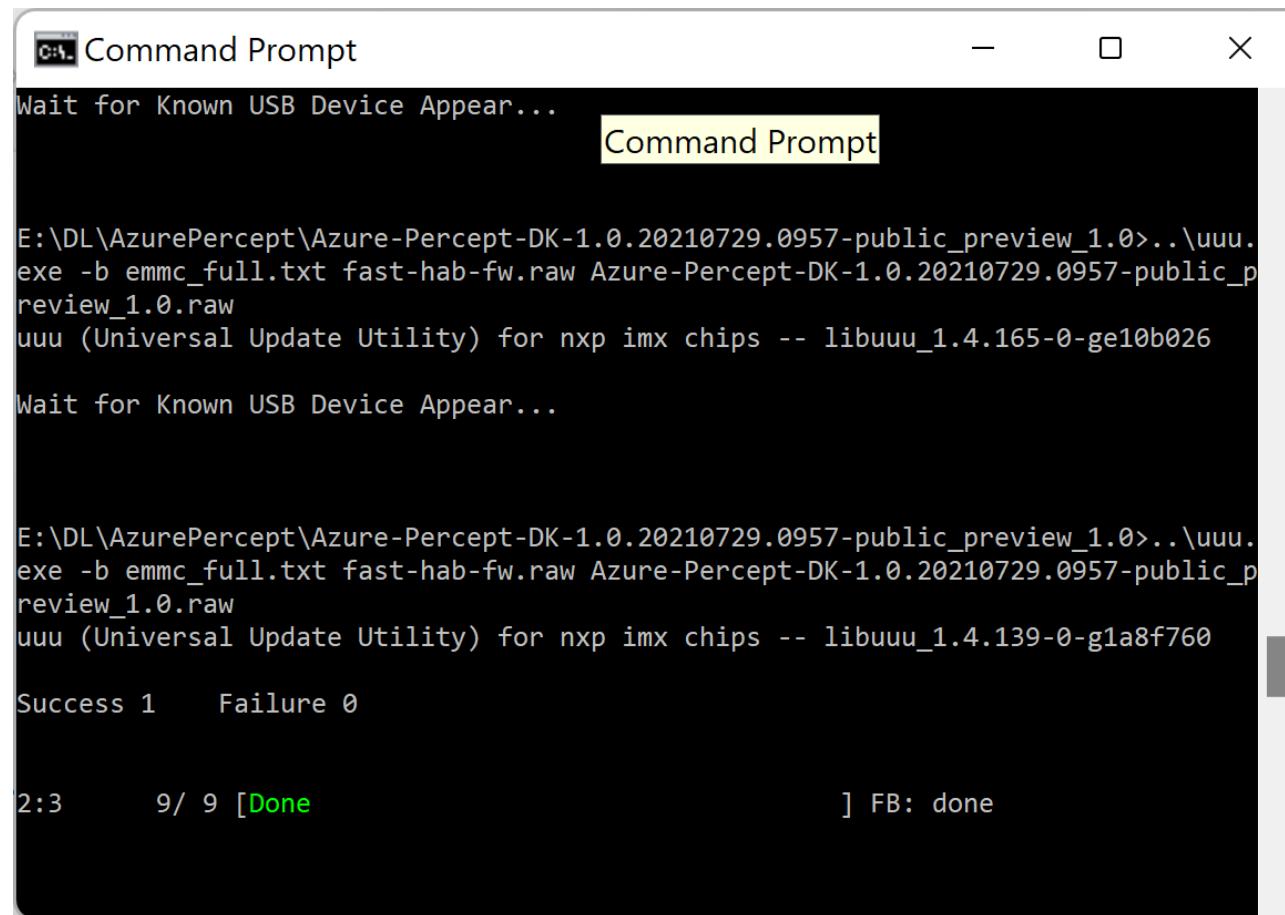
3) sudo
flagutil –wBfRequest

4) sudo reboot -f

The screenshot shows a Command Prompt window titled "Command Prompt - ..\uuu.exe -b emmc_full.txt fast-h...". The title bar also displays "uuu (Universal Update Utility) for nxp imx chips -- Command Prompt - ..\uuu.exe -b emmc_full.txt fast-hab-fw.raw Azure-Percept-DK-1.0.20210729.0957-public_preview_1.0.raw". The main window content includes:

- Text: "Wait for Known USB Device Appear..."
- Text: "E:\DL\AzurePercept\Azure-Percept-DK-1.0.20210729.0957-public_preview_1.0>..\uuu.exe -b emmc_full.txt fast-hab-fw.raw Azure-Percept-DK-1.0.20210729.0957-public_preview_1.0.raw"
- Text: "uuu (Universal Update Utility) for nxp imx chips -- libuuu_1.4.165-0-ge10b026"
- Text: "Wait for Known USB Device Appear..."
- Text: "E:\DL\AzurePercept\Azure-Percept-DK-1.0.20210729.0957-public_preview_1.0>..\uuu.exe -b emmc_full.txt fast-hab-fw.raw Azure-Percept-DK-1.0.20210729.0957-public_preview_1.0.raw"
- Text: "uuu (Universal Update Utility) for nxp imx chips -- libuuu_1.4.139-0-g1a8f760"
- Text: "Success 0 Failure 0"
- Text: "2:3 6/ 9 [=====66%====>] FB: flash -raw2sparse all"

Update Firmware success USB



The screenshot shows a Windows Command Prompt window titled "Command Prompt". The window has a black background and white text. It displays the following output:

```
Wait for Known USB Device Appear...
Command Prompt

E:\DL\AzurePercept\Azure-Percept-DK-1.0.20210729.0957-public_preview_1.0>..\uuu.exe -b emmc_full.txt fast-hab-fw.raw Azure-Percept-DK-1.0.20210729.0957-public_p
review_1.0.raw
uuu (Universal Update Utility) for nxp imx chips -- libuuu_1.4.165-0-ge10b026

Wait for Known USB Device Appear...

E:\DL\AzurePercept\Azure-Percept-DK-1.0.20210729.0957-public_preview_1.0>..\uuu.exe -b emmc_full.txt fast-hab-fw.raw Azure-Percept-DK-1.0.20210729.0957-public_p
review_1.0.raw
uuu (Universal Update Utility) for nxp imx chips -- libuuu_1.4.139-0-g1a8f760

Success 1    Failure 0

2:3      9/ 9 [Done] ] FB: done
```

Device Update for IoT Hub

The screenshot shows the Microsoft Azure Device Update for IoT Hub interface. The browser window has three tabs open: "Welcome!", "IoTHubAzurePercept - Microsoft", and "Upgrade Azure IoT Hub | Microsoft". The main content area displays the "IoTHubAzurePercept | Device updates" page for an IoT Hub. The left sidebar includes sections for "Updates", "Groups", "Deployments", and "Get started" (which is currently selected). Other sections like "Built-in endpoints", "Failover", "Properties", and "Locks" are also listed. Below the sidebar, there are sections for "Explorers" (Query explorer, IoT devices), "Automatic Device Management" (IoT Edge, IoT device configuration, Device updates, which is highlighted), and "Messaging" (File upload). The main content area features a "Get started with Device Update for IoT Hub" section with a "Sign up for Device Update for IoT Hub" button and a list of four steps: Import and manage updates, Create group of devices for deploying updates, Deploy update and view progress, and Welcome to Device Update for IoT Hub. A "How to get started:" section at the bottom provides instructions for getting started.

Welcome! IoTHubAzurePercept - Microsoft Upgrade Azure IoT Hub | Microsoft Azure IoT hub blocked for two d...

portal.azure.com/#@andreasben@hotmail.onmicrosoft.com/resource/subscriptions/972feafb-390b-4d95-82ec-c5221f0485c5/resourcegroups/IoTPercept_RG/providers/Microsoft.Devices/iot...

Microsoft Azure Search resources, services, and docs (G+)

andreasben@hotmail.... DEFAULT DIRECTORY

Home > IoTHubAzurePercept-1019172815 > IoTHubAzurePercept

IoTHubAzurePercept | Device updates

Io Hub

Search (Ctrl+ /) Updates Groups Deployments Get started

Built-in endpoints

Failover

Properties

Locks

Explorers

Query explorer

IoT devices

Automatic Device Management

IoT Edge

IoT device configuration

Device updates

Messaging

File upload

Get started with Device Update for IoT Hub

Device Update for IoT Hub enables you to securely, easily, and reliably update your IoT Hub devices.

Sign up for Device Update for IoT Hub

Import and manage updates

Create group of devices for deploying updates

Deploy update and view progress

Welcome to Device Update for IoT Hub

How to get started:

To get started, there are a few steps below that need to be completed. The process will take approximately 5 minutes. [Learn more.](#)

Device Update for IoT Hub

The screenshot shows the 'Create Device Update' wizard in the Microsoft Azure portal. The user is on the second step, 'Create Device Update'. The form includes fields for Subscription (set to 'Microsoft Azure Sponsorship'), Resource group (set to 'IoTPercept_RG'), Account Details (Name set to 'IoTUpdateAccount', Location set to 'West US 2'), and a 'Grant access to resource' section where the 'Assign Device Update Administrator role' checkbox is checked. Navigation buttons at the bottom include 'Review + create' (highlighted in blue), 'Previous', and 'Next: Review + create >'.

Welcome! | IoTHubAzurePercept - Microsoft | Create Device Update - Microsoft | Upgrade Azure IoT Hub | Microsoft | Azure IoT hub blocked for two days | +

portal.azure.com/#create/Microsoft.ADUDeviceUpdate

Microsoft Azure | Search resources, services, and docs (G+)

andreasraben@hotmail.com | DEFAULT DIRECTORY

Home >

Create Device Update

Azure Device Update
manage all your resources.

Subscription * Microsoft Azure Sponsorship

Resource group * IoTPercept_RG

Create new

Account Details

Name * IoTUpdateAccount

Location * West US 2

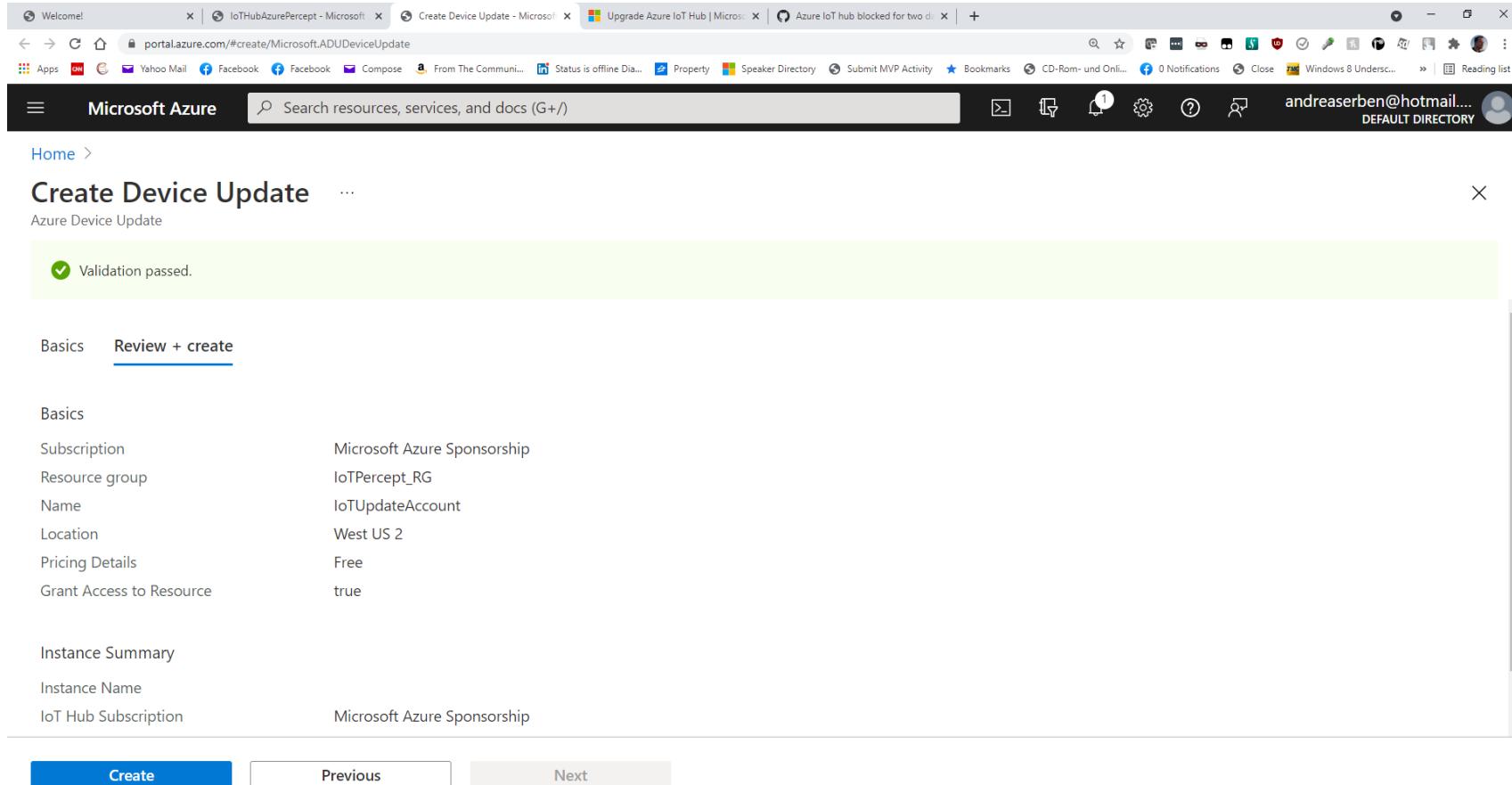
Grant access to resource

In order for other users and applications to have access to Device Update, users or applications must be granted access to this resource. Select the suggested role below to give yourself access to all Device Update resources. You can also use Access Control (IAM) to provide a combination of roles for the right level of access. [Learn more](#)

Assign Device Update Administrator role. ⓘ

Review + create | Previous | Next: Review + create >

Device Update for IoT Hub



The screenshot shows a Microsoft Azure browser-based interface for creating a Device Update service. The title bar includes tabs for 'Welcome!', 'IoTHubAzurePercept - Microsoft Edge', 'Create Device Update - Microsoft Edge', 'Upgrade Azure IoT Hub | Microsoft Edge', and 'Azure IoT hub blocked for two days'. The main navigation bar has links for 'Apps', 'Yahoo Mail', 'Facebook', 'Compose', 'From The Community', 'Status is offline Dialog', 'Property', 'Speaker Directory', 'Submit MVP Activity', 'Bookmarks', 'CD-Rom- und Online...', '0 Notifications', 'Close', 'Windows 8 Underscr...', and 'Reading list'. The user's email, 'andreaserben@hotmail.com', is shown in the top right.

The page title is 'Create Device Update' under 'Azure Device Update'. A green success message box displays 'Validation passed.' with a checkmark icon. Below it, there are two tabs: 'Basics' and 'Review + create', with 'Review + create' being the active tab.

Basics

Subscription	Microsoft Azure Sponsorship
Resource group	IoTPercept_RG
Name	IoTUpdateAccount
Location	West US 2
Pricing Details	Free
Grant Access to Resource	true

Instance Summary

Instance Name	IoT Hub Subscription
	Microsoft Azure Sponsorship

At the bottom are three buttons: 'Create' (highlighted in blue), 'Previous', and 'Next'.

Device Update for IoT Hub

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes links for Welcome!, IoTHubAzurePercept - Microsoft, Microsoft.ADUDeviceUpdate - Microsoft, Upgrade Azure IoT Hub | Microsoft, and Azure IoT hub blocked for two days. The main title is "Microsoft.ADUDeviceUpdate | Overview". On the left, there's a sidebar with "Overview" selected, along with "Inputs", "Outputs", and "Template". Below the sidebar, a message says "We'd love your feedback! →". The main content area displays a large message "Deployment is in progress" with a sub-section "Deployment details (Download)". It shows deployment information: Deployment name: Microsoft.ADUDeviceUpdate, Subscription: Microsoft Azure Sponsorship, Resource group: IoTPercept_RG. It also lists deployment details: Start time: 10/19/2021, 5:49:56 PM, Correlation ID: 3347eec6-dae1-4b2a-ab72-d679db3f5f36. A status bar at the bottom indicates "No results.".

Deployment in progress...

Deployment to resource group 'IoTPercept_RG' is in progress.

Deployment name: Microsoft.ADUDeviceUpdate
Subscription: Microsoft Azure Sponsorship
Resource group: IoTPercept_RG

Start time: 10/19/2021, 5:49:56 PM
Correlation ID: 3347eec6-dae1-4b2a-ab72-d679db3f5f36

No results.

Device Update for IoT Hub

The screenshot shows the Microsoft Azure portal interface. On the left, there's a sidebar with navigation links: Home >, Microsoft.ADUDeviceUpdate | Overview, Overview (selected), Inputs, Outputs, and Template. The main content area displays a deployment status: "Deployment is in progress". Below this, it shows deployment details: Deployment name: Microsoft.ADUDeviceUpdate, Subscription: Microsoft Azure Sponsorship, Resource group: IoTPercept_RG. A table lists a single resource: IoTUpdateAccount (Type: Microsoft.DeviceUpdate). To the right, a "Provide feedback" dialog is open. It asks: "How easy or difficult was it to use the creation wizard to setup your Azure service?". Below this are seven radio buttons labeled from "Very difficult" to "Very easy". Another section asks: "How valuable did you find the creation wizard?". This has eleven radio buttons numbered 0 to 10, with "Not valuable" at 0 and "Very valuable" at 10. There's also a large optional text area for comments. At the bottom of the dialog are checkboxes for "Microsoft can email you about your feedback" and a "Privacy Statement" link, followed by a "Submit feedback" button.

Microsoft.ADUDeviceUpdate | Overview

Deployment

Search (Ctrl+ /)

Delete Cancel Redeploy Refresh

We'd love your feedback! →

Deployment is in progress

Deployment name: Microsoft.ADUDeviceUpdate
Subscription: Microsoft Azure Sponsorship
Resource group: IoTPercept_RG

Deployment details (Download)

Resource	Type
IoTUpdateAccount	Microsoft.DeviceUpdate

Provide feedback

How easy or difficult was it to use the creation wizard to setup your Azure service?

Very difficult Moderately difficult Slightly difficult Not difficult or easy Slightly easy Moderately easy Very easy

How valuable did you find the creation wizard?

0 1 2 3 4 5 6 7 8 9 10

Not valuable Very valuable

Tell us more about your experience

Optional

Microsoft can email you about your feedback

[Privacy Statement](#)

[Submit feedback](#)

Device Update for IoT Hub

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes links for Welcome!, IoTHubAzurePercept - Microsoft, Microsoft.ADUDeviceUpdate - Microsoft, Upgrade Azure IoT Hub - Microsoft, and Azure IoT hub blocked for two days. The main header says "Microsoft Azure" and has a search bar for "Search resources, services, and docs (G+)". The user is logged in as "andreasrben@hotmail.com" under "DEFAULT DIRECTORY".

The main content area displays the "Microsoft.ADUDeviceUpdate | Overview" page. On the left, there's a sidebar with "Overview" selected, along with "Inputs", "Outputs", and "Template" options. A feedback message "We'd love your feedback! →" is visible.

The central part of the screen shows a green checkmark icon and the message "Your deployment is complete". Below this, deployment details are listed: Deployment name: Microsoft.ADUDeviceUpd..., Start time: 10/19/2021, 5:49:56 PM; Subscription: Microsoft Azure Sponsorship; Correlation ID: 3347eec6-dae1-4b2a-ab72-d679db3f5...; Resource group: IoTPercept_RG. There are also links for "Deployment details (Download)" and "Next steps". A blue "Go to resource" button is at the bottom of this section.

On the right side of the screen, there are several promotional links: "Security Center" (with a shield icon), "Free Microsoft tutorials" (with a link to "Start learning today >"), and "Work with an expert" (with a link to "Find an Azure expert >").

Supported Vision AI models

- BinaryUnetModel
- ClassificationModel
- FasterRCNNModel
- OCRModel
- OpenPoseModel
- S1Model
- SSDModel
- YOLOModel



Model Zip

```
config.json:  
{  
    "DomainType": "openpose",  
    "ModelFileName": "human-pose-estimation-  
0001.blob"  
}
```

IoT Edge Hub Route filtering

- Example:

```
where $body.NEURAL_NETWORK[0].label='person' INTO $upstream
```

The fun stuff - demos

Resources

- <https://azure.microsoft.com/en-us/services/azure-percept/>
- Buy:
 - <https://www.microsoft.com/en-us/d/azure-percept-dk/8mn84wxz7xww/7q83>
 - <https://www.rutronik24.com/search-result/qs:PE101%252FDKSC-101>
- Ignite 2021 (Spring and Fall) session:
 - <https://docs.microsoft.com/en-us/events/ignite-mar-2021/azure/featured-sessions/fs179/>
 - <https://docs.microsoft.com/en-us/events/ignite-nov-2021/azure/breakouts;brk226/>
- <https://azure.microsoft.com/en-us/blog/azure-percept-edge-intelligence-from-silicon-to-service/>