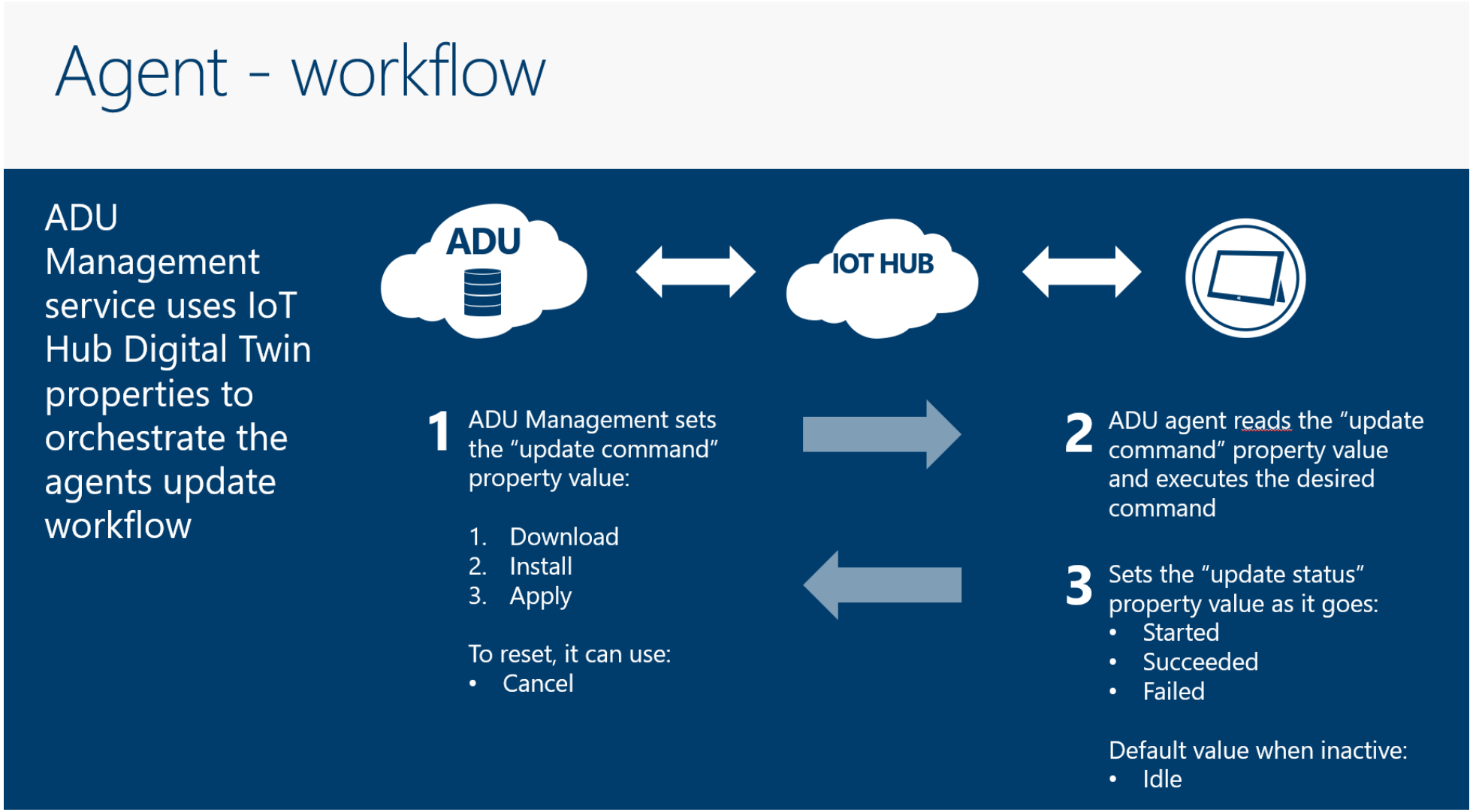
Device Update

Hands on Lab with Device Update for IoT Hub on Ubuntu

Overview of Device Update

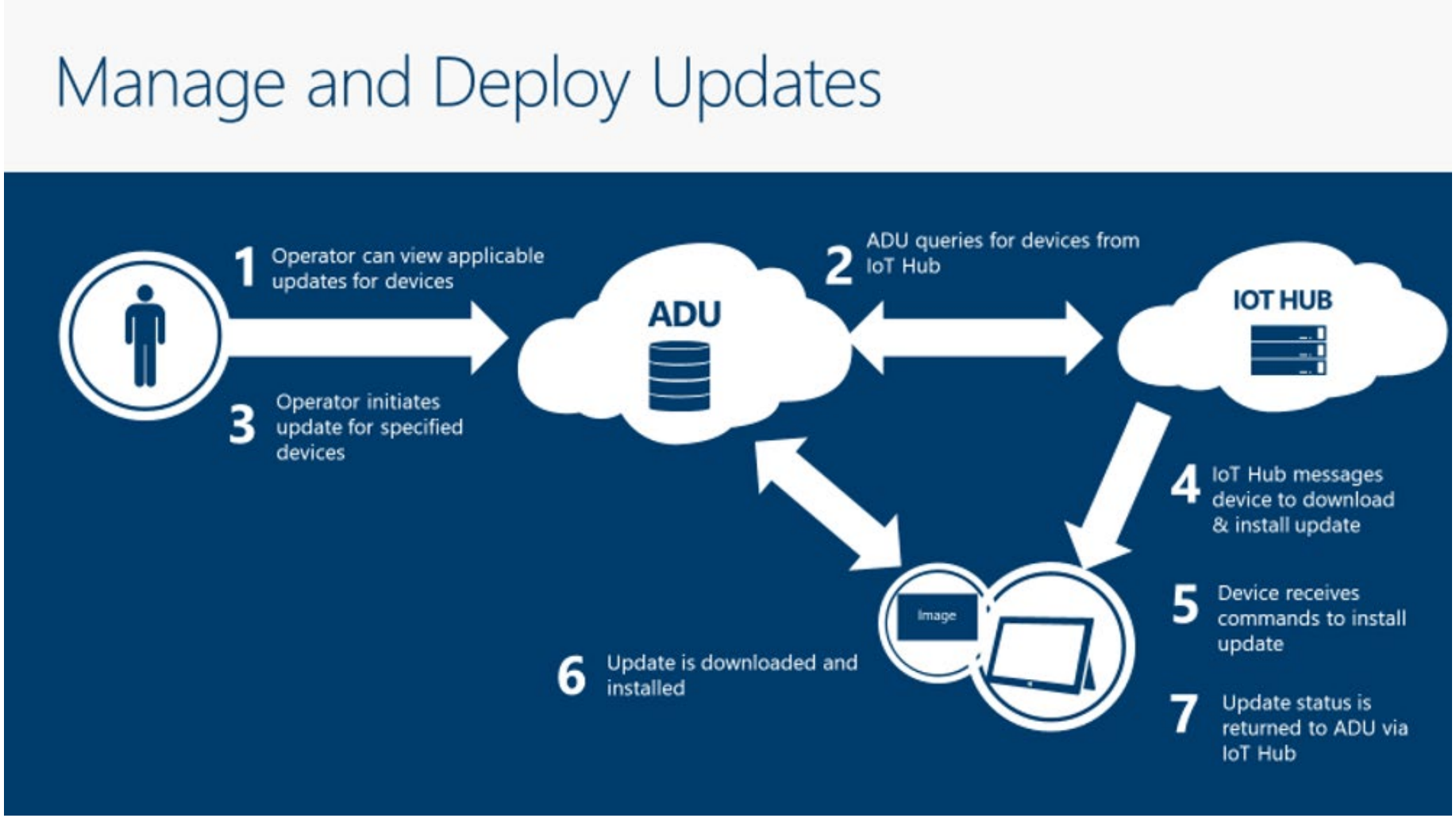
- A secure and flexible way to keep devices up to date using IoT Hub
- Allows importing, scheduling and reporting on updates
- Integrates with IoT Hub and can have a 1 to many [IoT Hub] deployment
- Leverages existing [and requires] Content Delivery Network – like Windows Update
- Based on an Open-Source Agent written in C and expected to be modified
- Sample Agents: Linux [with or without IoT Edge], Yocto and RTOS
- Device Updates can be package (think apt install xxx) or image based
- Leverages Azure IoT Plug and Play
- https://docs.microsoft.com/en-us/azure/iot-hub-device-update/device-update-agent-overview

How it works



https://docs.microsoft.com/en-us/azure/iot-hub-device-update/understand-device-update

How it works



https://docs.microsoft.com/en-us/azure/iot-hub-device-update/understand-device-update#grouping-and-deployment

How updates are defined - manifests


```
{
    "manifestVersion": "1",
    "updateId": {
        "provider": "DuTest",
        "name": "DuTestUser",
        "version": "2020.611.534.16"
    },
    "updateType": "microsoft/swupdate:1",
    "installedCriteria": "1.0",
    "files": {
        "00000": {
            "fileName": "image.swu",
            "sizeInBytes": 256000,
            "hashes": {
                "sha256": "IhIIxBJpLfazQOk/PVi6SzR7BM0jf4HDqw+6gdZ3vp8="
            }
        }
    },
    "createdDateTime": "2020-06-12T00:38:13.9350278"
}
```


https://docs.microsoft.com/en-us/previous-versions/azure/iot-hub-device-update/update-manifest

The device side agent is open source

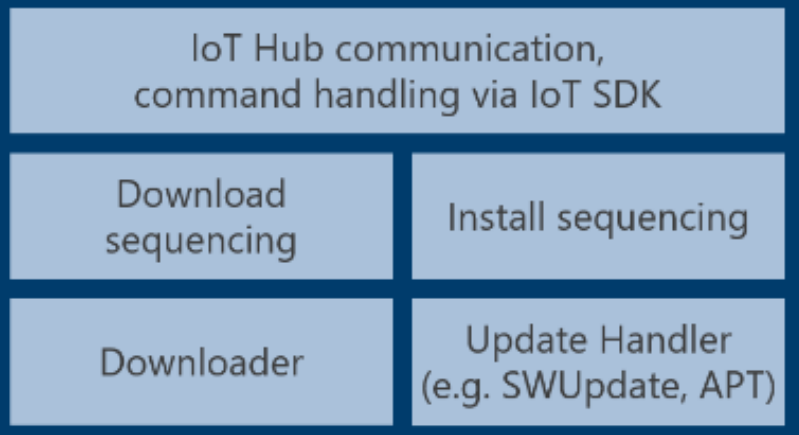
Device Update for IoT Hub Agent

Open-source Agent
- Uses Azure IoT device SDK for C
- Integrates with Delivery Optimization SDK for download

IoT Hub Digital Twin to orchestrate the update

Image Update
1. Linux
   - Reference OS built with Yocto 2.7 (Poky Warrior OS)
   - Validated on Raspberry Pi 3
   - Integrates with SWUpdate for A/B type install
2. RTOS
   - Azure RTOS and Device Update samples to be created

Package Update
1. Validated updating IoT Edge Runtime
2. Integrates with Apt for package updating

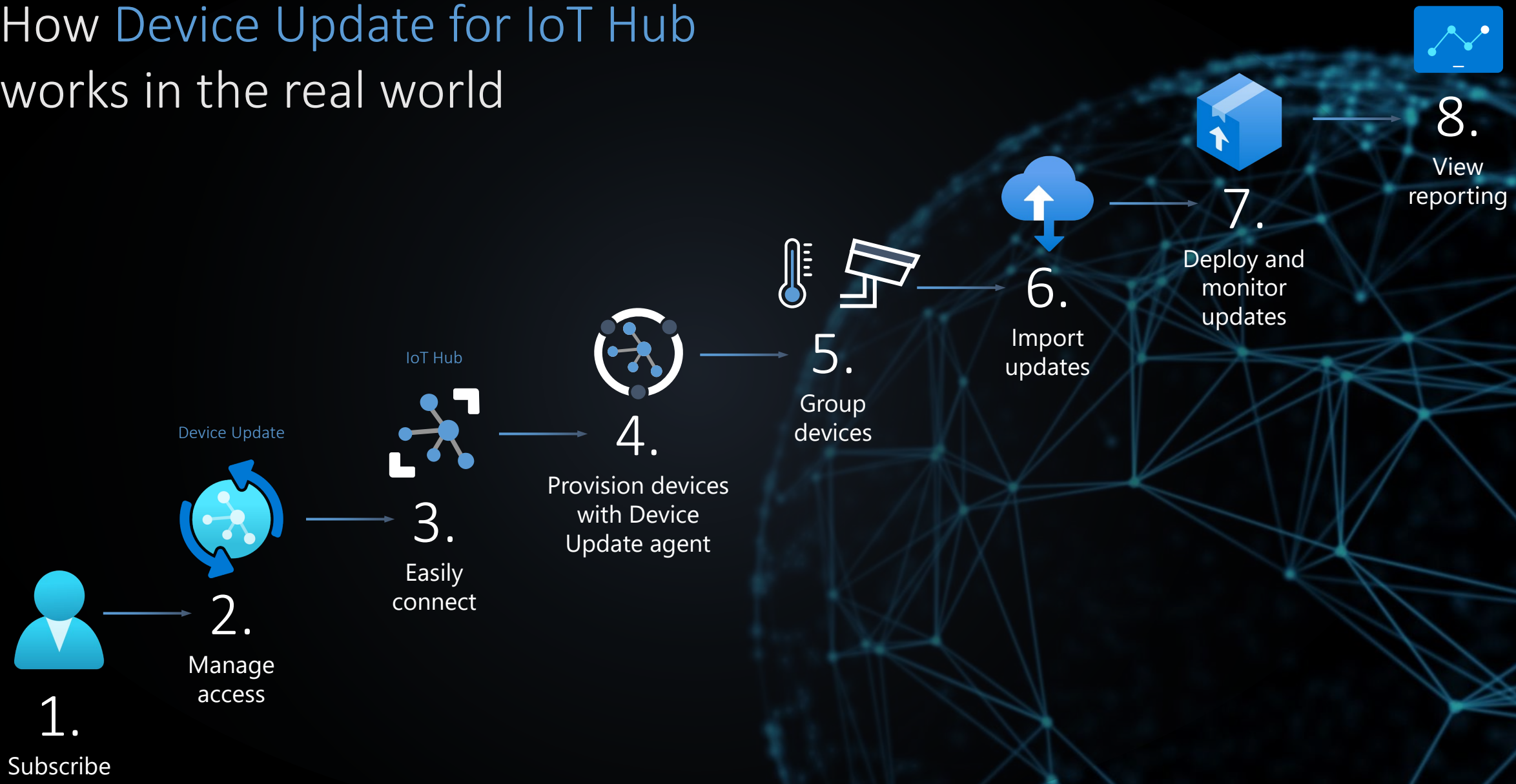


https://docs.microsoft.com/en-us/previous-versions/azure/iot-hub-device-update/update-manifest

Several Versions for Azure Device Update

- Public Preview
  - 0.6.0
  - 0.7.0
- Public Preview Refresh - 0.8.0
  - Recently released
  - Adds important new features

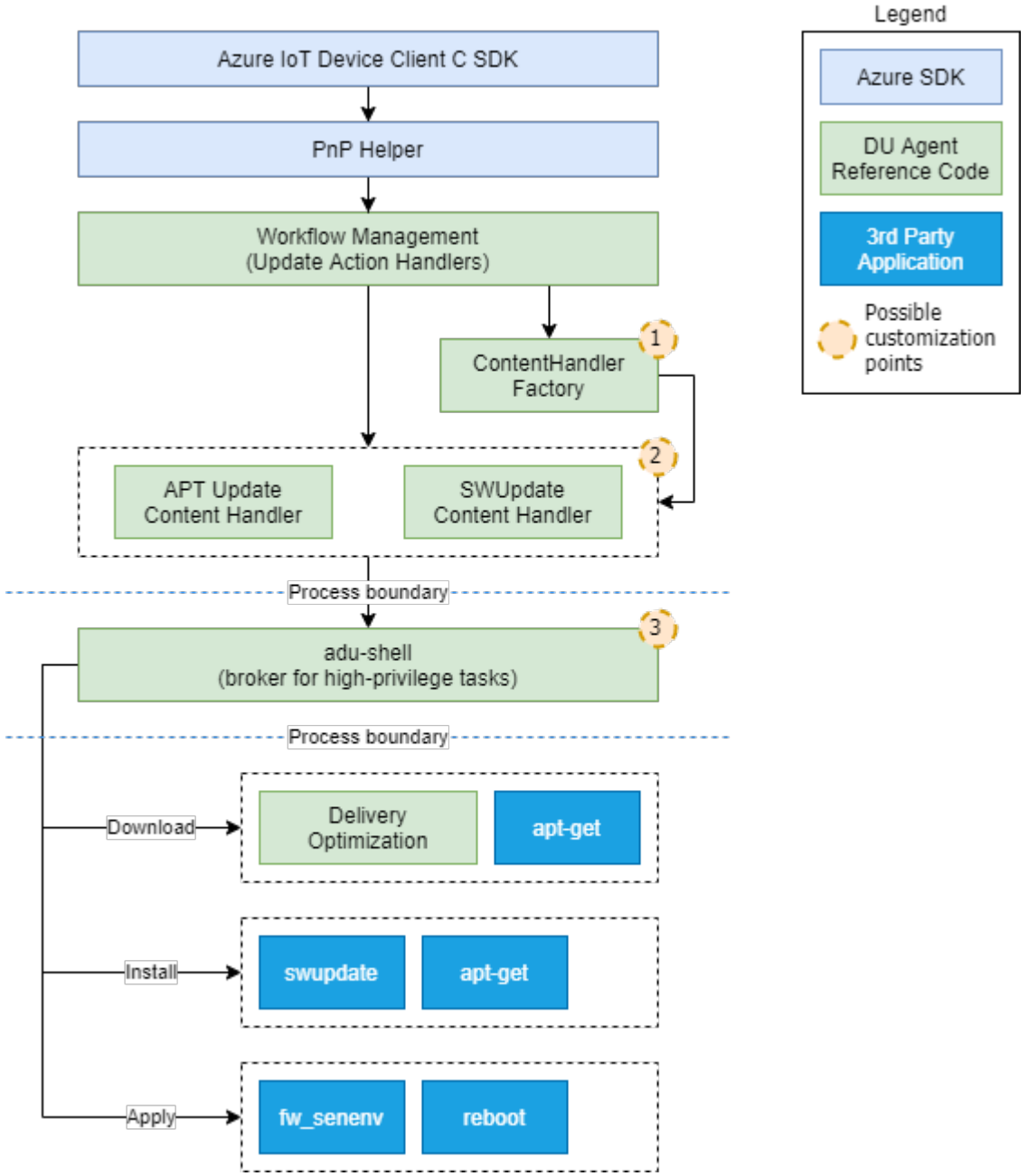
How Device Update for IoT Hub works in the real world



Agent Architecture

- https://github.com/Azure/iot-hub-device-update
- APT or Image Handler
  - APT leverages existing package repositories
  - Image delivered via included CDN
  - BASH Scripts
- Delivery Optimization
  - Uses port 80 and can be proxied
- IoT Hub Protocol and supports Nested Edge
- Uses module of device identity in IoT Hub and twin properties
- On Linux, uses the Identity Service

```
apt install aziot-identity-service
apt install deviceupdate-agent
apt install deliveryoptimization-plugin-apt
```



Update Manifest Version 4

- Enables the following features:
  - Multi Step Ordered Execution (MSOE)
  - Multi Component Updating
  - Goal State Deployment
  - Detached Update Manifest
- https://github.com/Azure/iot-hub-device-update/blob/main/docs/agent-reference/update-manifest-v4-schema.md

Multicomponent Updating - Proxy Updates

- Targeting specific update files to different apps/components on the device
- Targeting specific update files to sensors connected to IoT devices over a network protocol (e.g., USB, CANbus etc.).
- https://github.com/Azure/iot-hub-device-update/blob/main/docs/agent-reference/multi-component-updating.md

Multi-Step Ordered Execution (MSOE) Support

- Multi-Step Ordered Execution (MSOE) Support
- Parent and child updates
- Pre and post install steps
- https://github.com/Azure/iot-hub-device-update/blob/main/docs/agent-reference/update-manifest-v4-schema.md

Update Types

- Built in UpdateTypes
  - microsoft/apt:1
  - microsoft/swupdate:1
- Update Content Handler extension and custom UpdateTypes
- https://github.com/Azure/iot-hub-device-update/blob/main/docs/agent-reference/update-manifest-v4-schema.md

Further Reference

- https://github.com/Azure/iot-hub-device-update/tree/main/docs/agent-reference
- https://github.com/Azure/iot-hub-device-update/blob/main/docs/agent-reference/whats-new.md
- https://github.com/Azure/iot-hub-device-update/blob/main/docs/agent-reference/how-to-build-agent-code.md
- https://docs.microsoft.com/en-us/azure/iot-hub-device-update/understand-device-update