IOT SOLUTIONS IN MICROSOFTS AZURE IOT SUITE pdf

1: Getting Started with IoT Solutions on Microsoft Azure â€“ Niall's Blog

Microsoft Azure Stack is an extension of Azureâ€”bringing the agility and innovation of cloud computing to your on-premises environment and enabling the only hybrid cloud that allows you to build and deploy hybrid applications anywhere.

By all accounts we are only touching the tip of the iceberg. There are many reports that estimate how many devices are today connected to the internet and how many will be in the future. But why is this happening? If you are one of those businesses looking to innovate with IoT then all of this presents some challenges: How do we connect a plethora of different devices that run different operating systems. How do we ingest all of this data? As the number of devices grow and we find more and more uses for IoT we need the bandwidth and technology that can stream this data easily and efficiently and not clog up our devices. How do we analyse data on the way in, to look for anomalies or triggers for alerts or other business processes. Think tsunami, fire or flood alerts systems. How do we decide what data to store and then store it in an efficient way so that it can be analysed easily. With so much data can we analyse it efficiently and gain insight quickly. Can we use the data to define predictive models and then integrate those models into our business processes. This is where Cloud technologies come in, or more specifically Hyper-scale clouds. Cloud technology has made overcoming these challenges really simple, and not just for those with a big budget, but those that want to start small and grow. Microsoft Azure solves these challenges by offering a suite of managed services that each solve a specific challenge but integrate into a complete end to end IoT solution that will scale as you need it to, keep your data safe and secure as well as remove the need for you to manage the underlying infrastructure, allowing you focus on deriving business value. You can get more information on the suite as well as some of the customers using it , but below is a simple step by step process to get you started: Getting Started with Azure IoT I am the first to admit that getting started with Azure can be a challenge, considering the number of services available and how quickly they are changing. Even with in IoT now there are many services and features to understand, so here are the steps I would suggest you take to get started quickly: Training Check out this Microsoft Virtual Academy course. This is a free online training course that covers all aspects of our IoT platform. Check out the IoT Suite. This is a site that will allow you create a demo solution very quickly. Behind the scenes the suite creates all of the Azure components that the solution needs and will provide a web based dashboard to manage your solution. It even provides all of the code in a GitHub repository so you can customise it for your own solution. Devices on the Edge If you want to build and connect devices check out the starter kits here http: To dive deeper into connecting your own devices, check out the IoT Hub developer site. If you need to deploy gateways or are working with legacy gateways the IoT Gateway SDK can help with edge analytics, minimising latency, conserving network bandwidth and aggregating and securing data from multiple edge devices. If you plan to use MQTT then check out the protocol gateway developer page. Business Intelligence, Analytics and Machine Learning The above steps will show you how to use Azure Stream Analytics to analyse data as it is being ingested. Check out this tutorial to see how Power BI can be used to visualise this real-time data. Check out the machine learning portal. Here you can import data and create predictive models from it. The portal has a graphical interface for developing models but you can also import your existing R code. Once your model has been trained and tested it can simply be exposed as an API for integration with other systems or business processes. Demos and Opensource Code Check out the Clapometer demo based on the Sound Monitoring solution developed with Croke Park Check out my Smart HVAC demo that demonstrates an end to end solution from data ingestion to machine learning and real time analysis of data using the prediction algorithm developed in machine learning portal.

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2: Microsoft IT Showcase/Bringing digital transformation to the supply chain with Azure IoT Suite

Microsoft's Azure IoT Suite is a cloud-based platform that is ideal for collecting data from connected devices. You'll learn in this book about data acquisition and analysis, including real-time analysis.

Such a complex structure can make you reluctant to start IoT development. Subsequently, the image brightness will be calculated on the IoT device and then streamed to the cloud, where it will be stored, processed and displayed see Figure 1. Furthermore, the end user will not only be able to see the information acquired with the remote device, but also remotely control that device. You can find the complete source code supporting this discussion at msdn. Moreover, LaVigne mentioned in his article that IoT can be used to program and control remote cameras. Here, I develop this thought and explicitly show how to turn the Raspberry Pi into such a device. I use this API version to enable binding to methods, which allows me to directly wire methods of the view model with events fired by visual controls: There are two tabs: Camera capture and Cloud. The first contains controls for starting and stopping camera preview, displaying the video stream and presenting image brightness a label and a progress bar. The second tab contains two buttons, which you can use to connect a device to the cloud and to register a device with the IoT portal. The Cloud tab also has a checkbox that lets you enable streaming telemetry data. This class, apart from implementing a few properties that are bound to the UI, handles the video acquisition, image processing and cloud interaction. Those sub-functionalities are implemented in separate classes: Camera Capture Camera capture see CameraCapture. MediaCapture class and Windows. The former is used to acquire video, while the latter displays the acquired video stream. I acquire video with a webcam, so I have to declare the corresponding device capability in the Package. To initialize the MediaCapture class, you invoke the InitializeAsync method. Eventually, you can pass to that method an instance of the MediaCaptureInitializationSettings class, which lets you specify capture options. You can choose between streaming video or audio and select the capture hardware. Here, I acquire only video from the default webcam see Figure 2. I also invoke helper method GetVideoProperties, which reads and then stores the size of a video frame. I use this information later to get the preview frame for processing. In the CameraCapture I wrapped those methods with additional logic, verifying initialization and the preview state: Note that the RemoteCamera app is universal, so it can be deployed without any changes to your development PC, a smartphone, a tablet or to the Raspberry Pi. If you test the RemoteCamera app with your Windows 10 PC, you need to ensure that apps are allowed to use your camera. Once you connect your webcam to the Rasbperry Pi, it will appear under the Devices tab of the Device Portal. Image Processor The ImageProcessor class calculates the brightness of the current frame in the background. To perform the background operation, I create a thread with the task-based asynchronous pattern, as shown in Figure 3. This event is fed with an instance of the ImageProcessorEventArgs class, which has only one public property, Brightness. The processing runs until the task receives a cancellation signal. The key element of the image processing is the GetBrightness method, shown in Figure 4. There are two versions of GetPreviewFrameAsync. The first, a parameterless method, returns an instance of the VideoFrame class. In this case, you can get the actual pixel data by reading the Direct3DSurface property. If the input bitmap has a different pixel format, I perform an appropriate conversion. Next, I copy pixel data to the byte array, whose size is determined by image height multiplied by image stride bit. Given the byte array with pixel data, all I need to do is calculate the mean value of all the pixels. So, I iterate over the pixel buffer see Figure 6. This event is handled in the MainPage class MainPage. Note that ProcessingDone is raised from the background thread. Brightness through the UI thread using Dispatcher class, as shown in Figure 7.

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3: IoT Solution Accelerators | Microsoft Azure

To learn more about microservice architectures, www.enganchecubano.com Application Architecture and Microservices: An application revolution powered by the cloud.. Deployment options. You can deploy the solution accelerators from the Microsoft Azure IoT Solution Accelerators site or using the command line.

The Azure IoT suite makes it simpler for enterprises to get started with IoT implementations through pre-configured solutions in order to derive business value easily. It facilitates analysis and visualization of huge quantities of data to support real-time and predictive analytics. Hence, the Azure IoT Suite helps in giving a quick start to end to end IoT implementation by orchestrating the required Azure services. Utility teams and consumers can now remotely monitor ,00 smart meters and derive insights from the meter data, to prevent over-consumption and leakage or wastage of water. The solution is helping them in optimizing water consumption and to successfully manage the supply and demand needs in order to conserve water. It primarily serves as a cloud gateway that connects all the smart meters with the Cloud and establishes communication between them. It can scale to connect millions of meters and can process huge volumes of data. It is also responsible for per-device authentication, thus playing a major role in security aspects. Event Hub Event Hub handles millions of events every second to stream them into various applications. Variable load profiles like connected cars, mobile apps, application performance counters generate telemetry data every second. Event Hub consumes these events to accommodate numerous load profiles and process massive amounts of data. For instance, in this smart metering solution, the Event Hub triggers the meter data to Event processor host for real-time visibility. Stream Analytics This is a real-time analytics service, which can help in the detection of anomalies and retrieval of archived data from smart meters. It allows to write stream processing logic in a language similar to SQL from the data derived from the connected devices. Table Storage Table Storage is a different storage services that Azure offers. It stores large meter data and supports flexible data format to derive insights. It follows a semi-structured model to easily combine various device types that have differing data schemes. It offers limitless scalability, availability and unmatched security. In the solution, it is used to generate powerful insights for real-time and predictive analytics. Similarly, every enterprise can take advantage of the Azure IoT suite to quickly deploy solutions to address the common IoT scenarios. With growing business needs, the implementation may advance complexly, however, Azure IoT suite makes it simpler to reconfigure, modify, and build as required. In addition, Azure consultants can assist them in leveraging the power of Azure IoT suite to deploy IoT solutions, thus enabling enterprises to realize better productivity gains. Know how enterprises are accelerating their business growth through connected IoT based data-driven solutions by leveraging Microsoft Azure IoT and Analytics services. Read the blog here Blog.

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4: IoT Solutions in Microsoft's Azure IoT Suite: Data Acquisition and Analysis in t | eBay

IoT begins with your things. Build with your things, from adding sensors to creating smart devices, to start your IoT solution. Find the products, services, and solutions you need to make the most of IoT business opportunities across devices, cloud, analytical capabilities, and business systems. Get.

To stay competitive in the marketplace, prevent costly delays, and avoid errors, it is critical to understand and respond quickly to end-to-end operations of production lines, factory, and the entire supply chain. In fact, in fiscal year , it was more than an 8-billion-dollar business. We are on a three-phase transformational journey to bring the benefits of digital transformation to our supply chain factories. Overall, we want to achieve three broad goals: We make decisions based on current, trusted, interactive data. Decreased time to root cause, and drive continuous improvement. We quickly detect process-related issues and anomalies to change how the supply chain is managed. Envisioning a better supply chain process We currently manufacture over 42, different products that end up as more than 77 million units manufactured each year, shipped to 30, locations in different countries. Our systems generate 1 terabyte of supply chain data each day. Microsoft Supply Chain MSC manages the global supply chain for Microsoft, including supply chain management, new product introduction, strategic sourcing and business planning as it relates to the manufacturing process. MSC also manages safety, compliance, and sustainability in all of our production facilities and customer care. Microsoft Supply Chain Assessing supply chain efficiency Our supply chain faces challenges every day. Our products live in competitive marketplaces and we want to have the best products and customer service possible. Our most common challenges include: Pricing pressure and thin margins. Manufacturing and supply chains are required to aggressively manage sourcing, production, fulfillment, and after-sales support costs to put products in a position to compete in a crowded marketplace. Increasing customer service expectations. The era of free shipping, same day delivery, white-glove service, and liberal returns policies conflicts with margin pressure. Shipping consumer electronics products poses significant risks for issues that occur over the product lifetime. There is a clear need for the supply chain to mitigate these risks by proactively identifying and fixing issues before shipping to our customers. Precise global launch windows require intricate orchestrationâ€”getting it wrong brings a higher risk of write-offs, write-downs, and missed sales. The three phases each take us one step closer to an intelligent supply chain process that enables digital transformation. Phase 3, which will finish the journey, is in our sights for the immediate future. Phase 1 Get connected Our first phase was about connecting the data from any data system and surfacing the combined data to help operators, factory managers, executives, and others to spot trends and issues. Azure Connected Factory has allowed us to closely align to our vision of: Performing remote monitoring and predictive maintenance. Ingesting events from sensors in real time. Providing a data analysis and visualization framework, and incorporating real-time, streaming analytics. Microsoft Supply Chain Services in Azure With Azure Connected Factory, we can pull telemetry data from our entire supply chain, from machines on the factory floor, to supplier information. The first part of connecting our supply chain processes to Azure is data contracts. We currently have three different contracts: There is flexibility built into these contracts to allow for all kinds of special attributes to suit a particular data source. These data contracts are implemented at all incoming data points to the Azure Connected Factory. Azure IoT Hub and Event Hubs together give us the ability to ingest massive amounts of data using these data contracts. One of the biggest benefits of the connected phase is the ease of setup for our engineers. Before using Azure IoT Suite, we had program managers and teams of developers writing code and backend queries to bring a new data source into the process, which could take days, weeks, or even months of work. With Azure IoT Suite, it takes one person about 15 minutes to attach a new data source to the solution. In our factories, we use Softing to communicate with our factory equipment to gather data. PowerBI provides the interface between our users and the data collected and processed by Azure Connected Factory. We also set up a large array of Power BI screens in a control room layout as well as in bullpens on the factory floor, which allows operators to drill into the details. Today, team members simply walk into the room and see the reports displayed, interact with the data, and derive insights from the results. In addition, they can see reports anytime

from their office or phone. This allows us to see connections between process steps as they happen, without relying on testing and data. Azure Connected Factory enables us to process this data much more rapidly than before. Before, we captured approximately 1 billion data points per day, but we were only able to analyze about 1 percent of that data. Our access to data has gone from hours and days to minutes and seconds, and our grasp of the supply chain process is far superior to what we had. With this increase in processing capability, we have much more data at our fingertips. Using Western Electric rules and internal data grading techniques for statistical process control, we can get actionable data that correlates directly to what is important to our supply chain business. Our data sources are streaming, and the way that we process and react to that data has become a real-time, streaming process as well, both with the raw data at the back-end and with the processed data in PowerBI. Data capture and analysis with Azure Linking our supply chain is also an important part of Phase 2. This way, suppliers can see incoming material and quality. And, if we detect issues in the field, individual component manufacturers can see if their component is problematic. This saves our engineers time in accurately diagnosing an issue and drilling down to the critical data they need to fix the issue. It also allows stakeholders at every level of our business to quickly access accurate, efficient information that helps them to make agile, informed business decisions. Alerts identify measurements that indicate many types of factory issues, giving our engineers a feedback loop with stats and relevant info in PowerBI. Users can subscribe to cards in PowerBI bots that generate intelligent and actionable messages based on data conditions. We set up screens displaying Power BI in conference rooms in around six weeks. For the first dataset we worked on, there was a savings of 15 to 20 hours a week because teams did not have to curate data. Instead, they just looked at Power BI on a large screen in the conference room. We are saving costs in several areas. Our engineers no longer have to spend an hour preparing a report or waste time gathering data from different sources to fix a supply chain issue that could cost millions of dollars. More holistic and unbiased data view. We collect data from all of our suppliers and have a trusted data view, regardless of manufacturer or supplierâ€”no more datasets with disparate messages. More productivity; fewer meetings. Executives look at the reports at any time. Quick, easy insights with data that tells a story. We see interactions, for example, between yields and returns. No programming knowledge is needed to see inventory levels, process efficiency, costs, machine usage, factory production flow, and material. We detect and intercept anomalies quickly, which prevents issues later. We create views that are most relevant for different teams. Also, Power BI is developer-friendly and extensible. Third parties can contribute and create features, graphs, and charts. In the past, we had to extract data from our internal tools and then integrate the data to see factory production flow. Now, Power BI integrates it for us. Data analytics in Power BI itself. These analytics reveal areas for machine learning for future scenarios. Phase 3 Cognitive Our third and final phase of digital transformation integrates machine learning and predictive maintenance into our supply chain process. Phase 3 enables us to realize benefits of the IoT Connected Factory and other Azure components along the entire supply chain process. Below are a couple examples of how this will look in our environment. We have completed one pattern exercise that improved yield by 30 percent across the manufacturing process. Predictive return insights Predictive return insights means using big data from production processes to examine aspects of the product return process. This helps us improve the precision when we apply changes to supplier, factory, and supplier processes, which in turn allows us to more effectively anticipate and manage the product return cycle. Realizing the benefits of a complete solution Our new solution for MSC has already provided benefits to our supply chain processes such as easy initial setup, customizability, quick access to data insights, significant time savings, cost savings, and increased productivity. We only expect these benefits to increase as we move further toward completing our Azure IoT Suite solution.

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5: Internet of Things - Use Azure IoT Suite to Boost IoT Development

Microsoft has built a portfolio that supports the needs of all customers, enabling everyone to access the benefits of digital transformation. The Azure IoT product portfolio is an overview of the available PaaS/SaaS technologies and solutions. It presents the two paths that are available for.

To accelerate development of a custom IoT solution that needs maximum flexibility. Access to underlying PaaS services You have access to the underlying Azure services to manage them, or replace them as needed. The code for the microservices is open source and you can modify it in any way you see fit. Additionally, you can customize the deployment infrastructure. You can use the built-in browser-based user experience to customize the solution model and aspects of the UI. The infrastructure is not customizable because the different components are not exposed. You need Java or. NET skills to customize the solution back end. You need JavaScript skills to customize the visualization. You need modeling skills to customize the solution. No coding skills are required. Get started experience Solution accelerators implement common IoT scenarios. Can be deployed in minutes. Application templates and device templates provide pre-built models. Pricing You can fine-tune the services to control the cost. Simple, predictable pricing structure. The decision of which product to use to build your IoT solution is ultimately determined by: Establish bi-directional communications with billions of IoT devices and manage your IoT devices at scale. All devices are platform-agnostic and tested to connect seamlessly to IoT Hub. The SDKs support multiple operating systems, such as Linux, Windows, and real-time operating systems, as well as multiple programming languages, such as C , Node. NET , and Python. IoT Azure IoT Hub is a fully managed service that enables reliable and secure bidirectional communications between millions of IoT devices and a solution back end. The Azure IoT Hub Device Provisioning Service is a helper service for IoT Hub that enables zero-touch, just-in-time provisioning to the right IoT hub without requiring human intervention, enabling customers to provision millions of devices in a secure and scalable manner. This service is meant for customers who want to analyze data on devices, a. Spatial Intelligence Azure Digital Twins is an IoT service that enables you to create a model of a physical environment. It provides a spatial intelligence graph to model the relationships between people, spaces, and devices. By corelating data across the digital and physical world you can create contextually aware solutions. Visualization and integration Microsoft Azure offers a complete cloud solution, one that combines a constantly growing collection of integrated cloud services with an industry-leading commitment to the protection and privacy of your data. Find out more about Microsoft Azure. Or for a more in-depth hands-on experience, try one of the IoT Edge Tutorials.

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6: Build your Internet of Things Solution with Azure IoT Suite

Today during Microsoft Convergence in Atlanta, Microsoft CEO Satya Nadella announced the Azure IoT Suite.. More and more, we're seeing the Internet of Things (IoT) become part of the fabric of business, helping converge an organization's assets, data and processes with people and business systems.

What are Azure IoT solution accelerators? The scenarios include remote monitoring, connected factory, predictive maintenance, and device simulation. When you deploy a solution accelerator, the deployment includes all the required cloud-based services along with any required application code. The solution accelerators are starting points for your own IoT solutions. The source code for all the solution accelerators is open source and is available in GitHub. You can also use the solution accelerators as learning tools before building a custom IoT solution from scratch. The solution accelerators implement proven practices for cloud-based IoT solutions for you to follow. The application code in each solution accelerator includes a web app that lets you manage the solution accelerator. Supported IoT scenarios Currently, there are four solution accelerators available for you to deploy: Remote Monitoring Use this solution accelerator to collect telemetry from remote devices and to control them. You can use the remote monitoring dashboard to view the telemetry from your connected devices, provision new devices, or upgrade the firmware on your connected devices: Connected Factory Use this solution accelerator to collect telemetry from industrial assets with an OPC Unified Architecture interface and to control them. Industrial assets might include assembly and test stations on a factory production line. You can use the connected factory dashboard to monitor and manage your industrial devices: Predictive Maintenance Use this solution accelerator to predict when a remote device is expected to fail so you can carry out maintenance before the predicted failure happens. This solution accelerator uses machine learning algorithms to predict failures from device telemetry. Example devices might be airplane engines or elevators. You can use the predictive maintenance dashboard to view predictive maintenance analytics: Device Simulation Use this solution accelerator to run simulated devices that generate realistic telemetry. You can use this solution accelerator to test the behavior of the other solution accelerators or to test your own custom IoT solutions. You can use the device simulation web app to configure and run simulations: Design principles All the solution accelerators follow the same design principles and goals. Scalable, letting you connect and manage millions of connected devices. Extensible, enabling you to customize them to meet your requirements. Modular, letting you swap out services for alternatives. Secure, combining Azure security with built-in connectivity and device security features. Architectures and languages The original solution accelerators were written using. Microsoft is updating the solution accelerators to a new microservices architecture. The following table shows the current status of the solution accelerators with links to the GitHub repositories:

7: Microsoft Azure IoT Device Catalog

Deploy a Microsoft solution accelerator Open source IoT solutions that align with the Azure IoT Reference Architecture. Deploy in minutes using your Azure subscription and customize as needed.

8: Introduction to Azure IoT solution accelerators | Microsoft Docs

Microsoft Azure solves these challenges by offering a suite of managed services that each solve a specific challenge but integrate into a complete end to end IoT solution that will scale as you need it to, keep your data safe and secure as well as remove the need for you to manage the underlying infrastructure, allowing you focus on deriving.

9: Azure IoT Solution Accelerators

Azure IoT Suite solutions come with pre-built sample scenarios that include: Background information on the business

need and objectives Simulated devices and sample data.

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How To Give Buffet Suppers Gary Rhodes New Classics Stacking the stands : the power of the extended Christian family Turn: Dance in your blood Grammar of the modern Spanish language as now written and spoken in the capital of Spain. Flicks in the Late 1990s, or Not-So-Fast Times at Shakespeare Scottish banking during the period of published accounts, 1865-1896 Otis service tool manual Daily steps to renewal Graphic anatomy 2 atelier bow wow Bangla onubad boi Beethoven piano sonata no 2 sheet music Happy Valentines Day, little critter! The official cheerleading manual Lifes Little Instruction Calendar For Business Success 2002 Day-To-Day Calendar Discrete mathematical problems with medical applications ACROSS THE TAMAR/t38 North American Indians Native Americans of the Northeast (North American Indians) Faith Builders from Jesus Going over the wall. The Solar age resource book A flute in Mayferry Street All Nature Is My Bride Certificate of analysis template Social and economic policies under globalisation : 1993-1997 Ap english language practice test national parks The NASCAR encyclopedia V.6. Accessions, 1890-1915, by F. Madan and H. H. E. Craster. Business objects 4.0 architecture Activity 23: Using your body to cope with your feelings Southern Homemade Make money reading books The fallback plan The garden of Canada Questions and Answers for Electricians Examinations Greshams ghost : challenges to written culture A Mummer//s Wife (Large Print Edition) The Worlds Greatest Project Education and credentialing of the forensic nurse The Weather in the Imagination