

Design Round-Table – Internet of Things Platform Design

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InterConnect 2017



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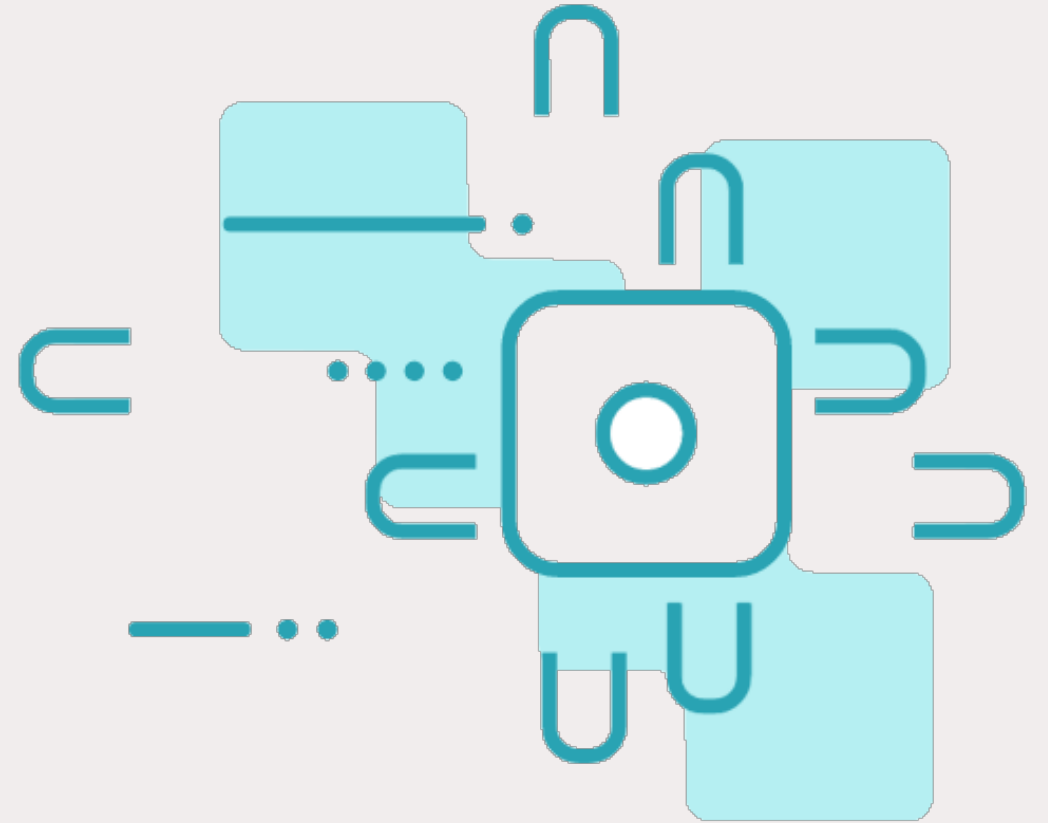
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Abstract

The IBM Watson Internet of Things design team is continuously researching usage patterns, use-cases and experiences with the Watson IoT Platform.

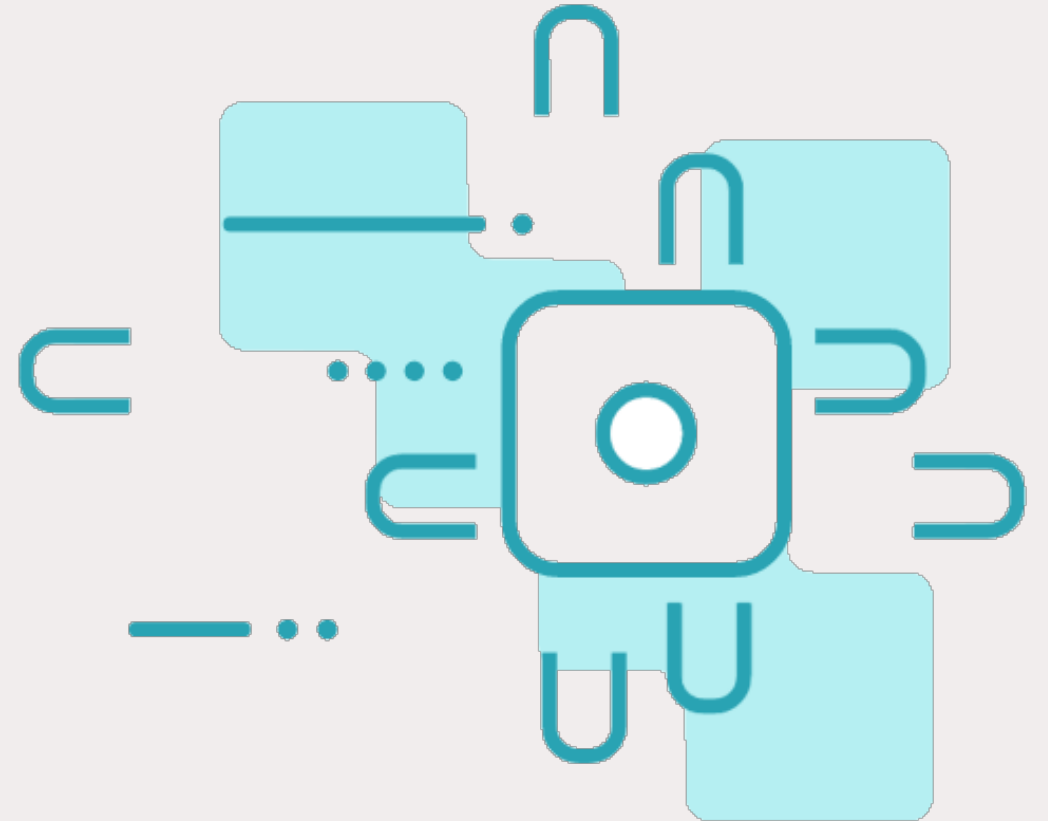
This round table session will present and discuss the IoT Platform capabilities and the design roadmap for 2017.

Attendees will share their feedback and experiences with the IoT platform and discuss needs and requests for design enhancements.



Agenda

- Introductions
- Discussion topics
 - Your IoT solution (Monday March 20th)
 - Your use of the Watson IoT Platform (Wednesday March 22th)
- Summary and conclusions
- How to engage with Watson IoT Platform Design



Introduktions

– “Hi, I’m Mats, Design Lead for the IBM Watson IoT Platform”

Who are you?

- Your name
- Your company
- Your role



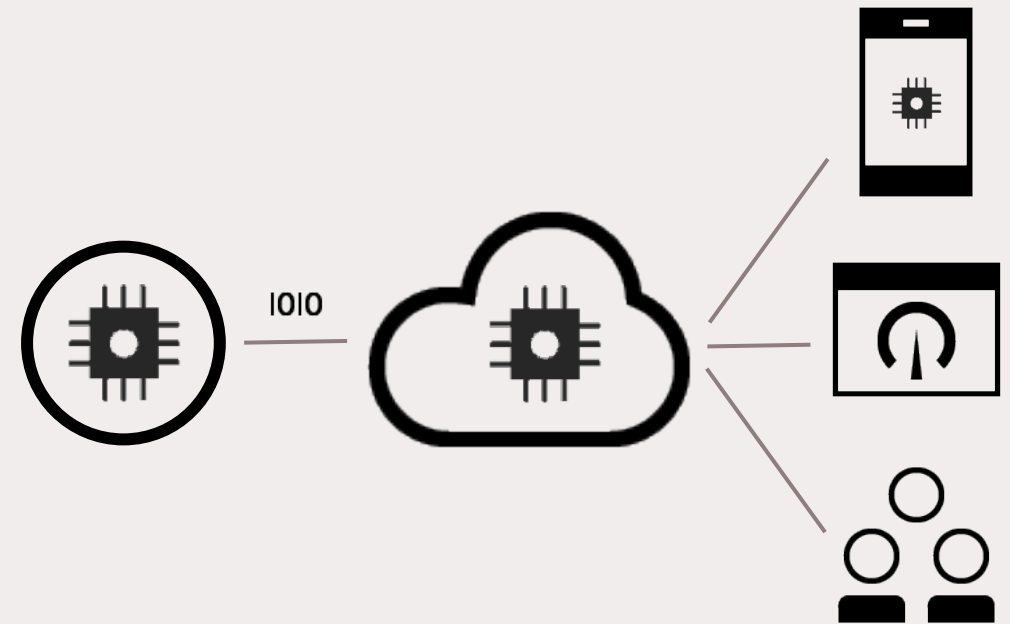
Your IoT Solution

What is Watson IoT Platform?

The IBM Watson Internet of Things Platform is a fully managed, cloud-hosted service available in IBM Bluemix.

Devices get connected and start sending data securely to the IBM Watson IoT Platform service using the MQTT messaging protocol.

From there, devices are managed using your online dashboard or secure APIs, so that apps can access real-time and historical data.



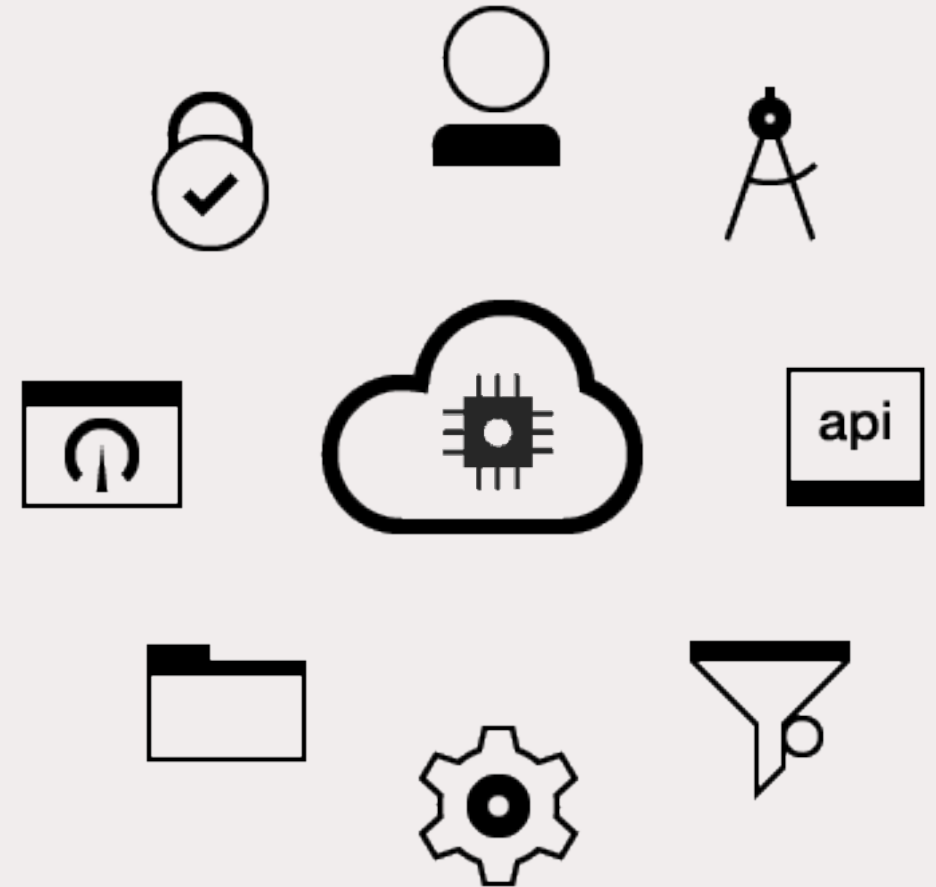
What is Watson IoT Platform?

IoT Platform Connect connects devices from chips to intelligent appliances to your applications and industry solutions and performs device management functions

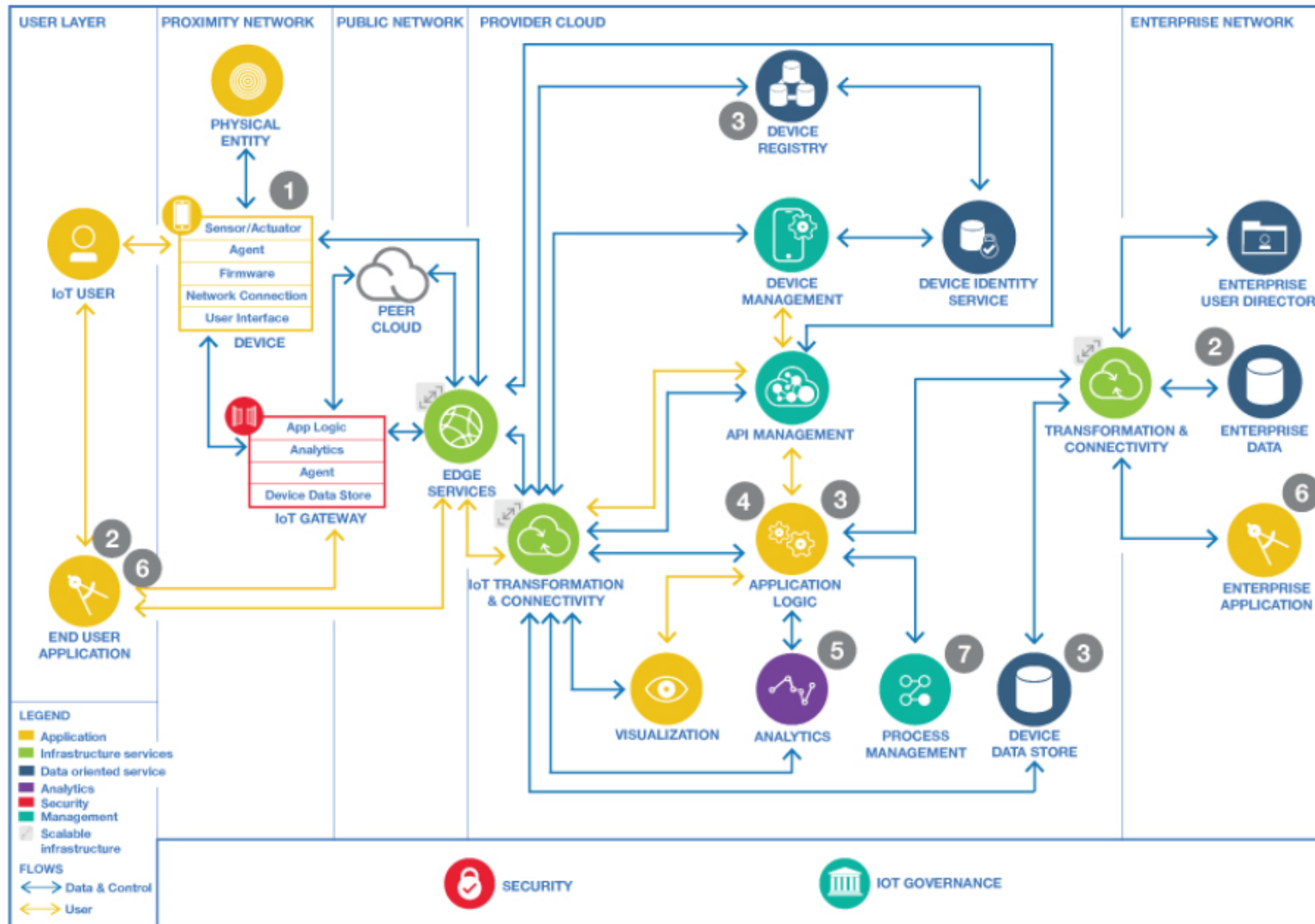
IoT Platform Information Management ingest, transform and aggregate data from your IoT devices, diverse data sources and platforms into asset-based data structures. Exploit a variety of cloud-based storage services as your IoT data historian

IoT Platform Risk and Security Management to manage risk and gather insights across your entire IoT landscape using dashboards and sophisticated alerts.

IoT Platform Analytics automate insights to data w/ Real-Time analytics



Internet of Things architecture overview



Discussion – Your IoT solution

- What IoT solutions are you building today?
- How are you using Watson IoT Platform in these solutions?
- What have you found to be the most useful / valuable about the IoT Platform in your IoT solution?



Discussion – Your IoT solution

- What roles in your organization is using the Watson IoT Platform?
- How are they using the IoT Platform?
- What are the most important User Interface and API use-cases for the IoT Platform?



Discussion – Watson IoT Platform Roadmap

- What capabilities, most important to your IoT solution, would you like to see in the Watson IoT Platform Roadmap?



Discussion – Watson IoT Platform Roadmap

- What capabilities in the IoT Platform Roadmap are the most important to your organization?
- What capabilities are you missing in the IoT Platform Roadmap?



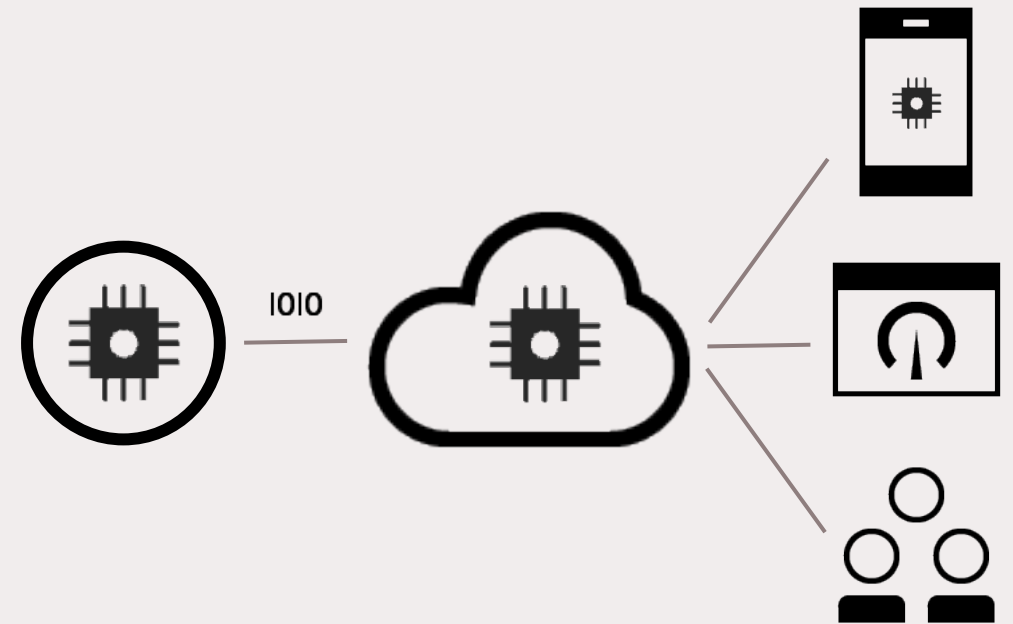
Your use of the Watson IoT Platform

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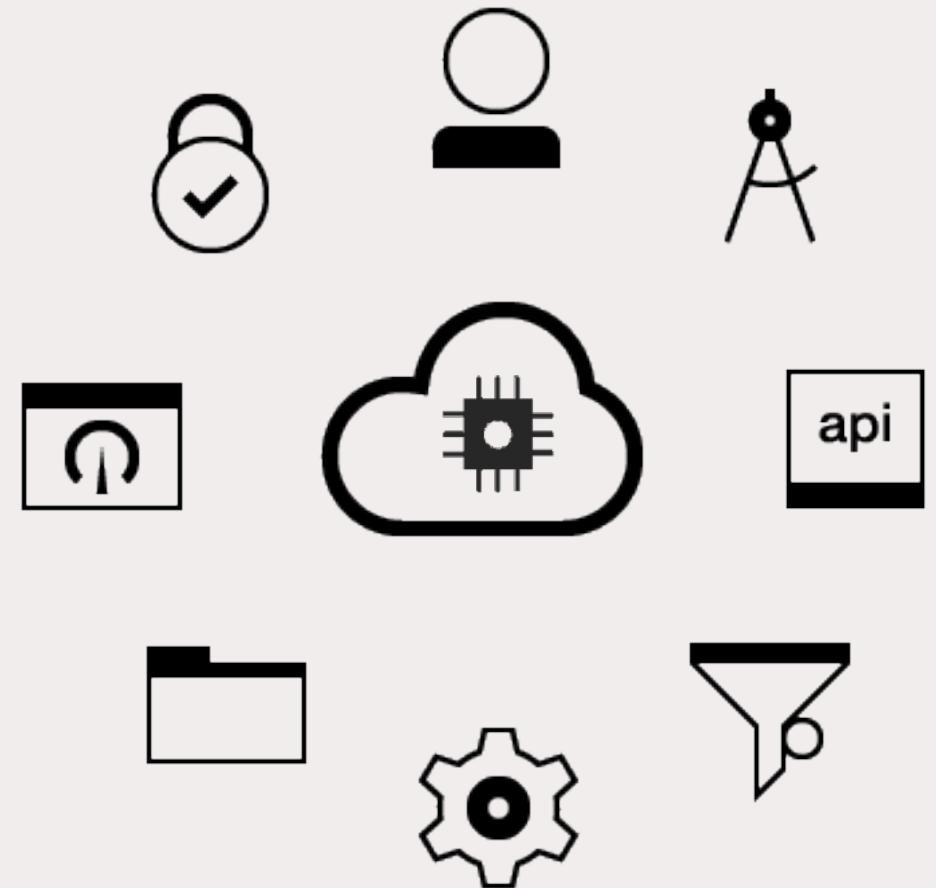
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IoT Platform Risk and Security Management to manage risk and gather insights across your entire IoT landscape using dashboards and sophisticated alerts.

IoT Platform Analytics automate insights to data w/ Real-Time analytics, Language Processing, Machine Learning, Natural Language, Image, Video and Text analytics. Machine Learning.



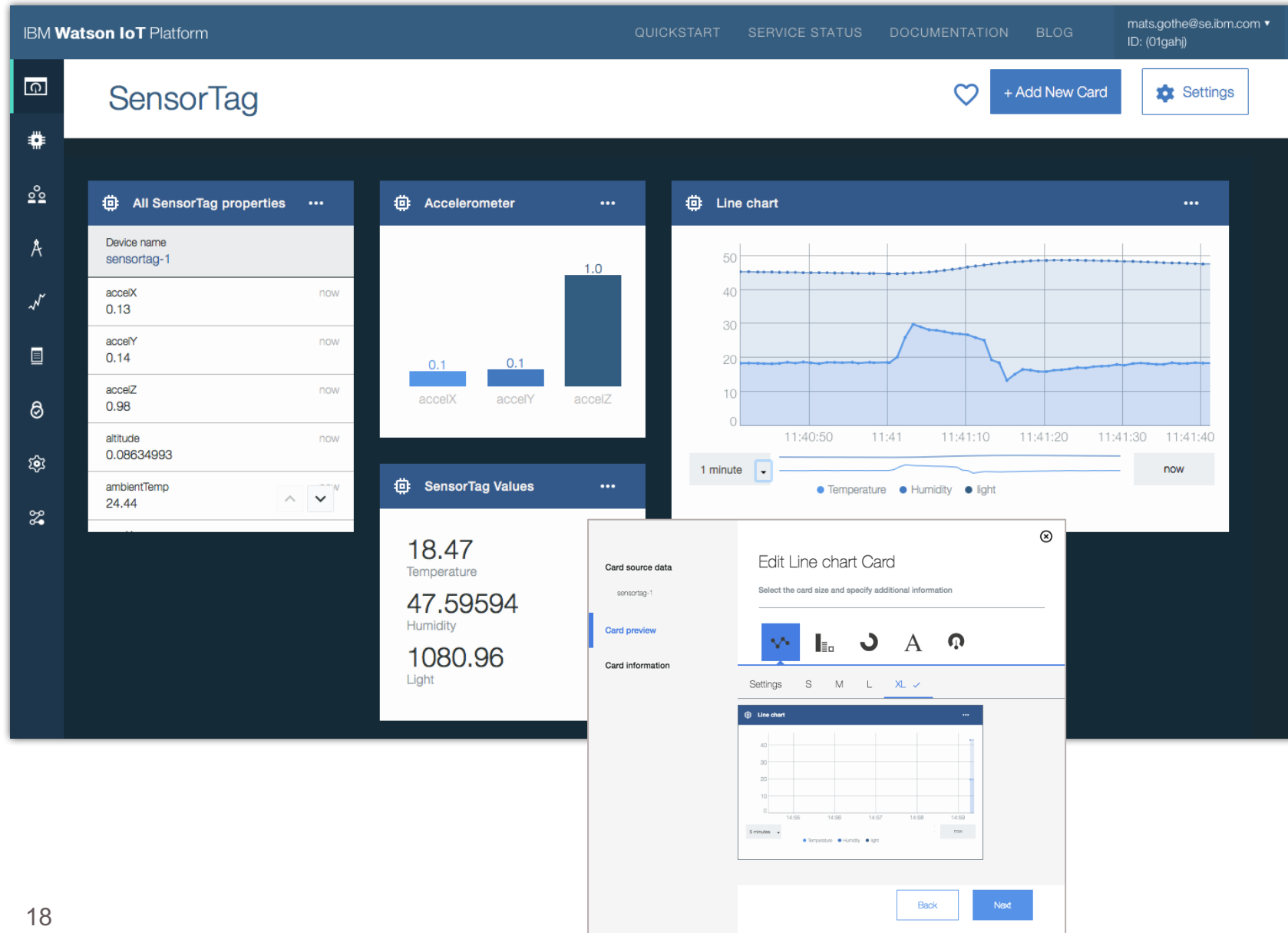
IoT Platform Designs in 2016

In 2016 we added significant new capabilities to the Watson IoT Platform user experience

- IoT Platform Dashboards
- Access Control - Predefined and Custom Roles
- Analytics - Real-Time Analytics and Schemas in Watson IoT Platform
- Analytics – Edge Analytics
- Connect - Custom Device Management Packages
- Risk and Security Management Policies
- Extensions - Configure SSO service
- Extensions - Configure Email service
- Extensions - Configure External Historian service
- Extensions – Configure Blockchain service
- Extensions – IoT Platform Integrations Jasper, Orange, AT&T and ARM
- New IoT Platform design (experimental feature)



IoT Platform Dashboards



IoT Platform Dashboards
/w Boards and Cards

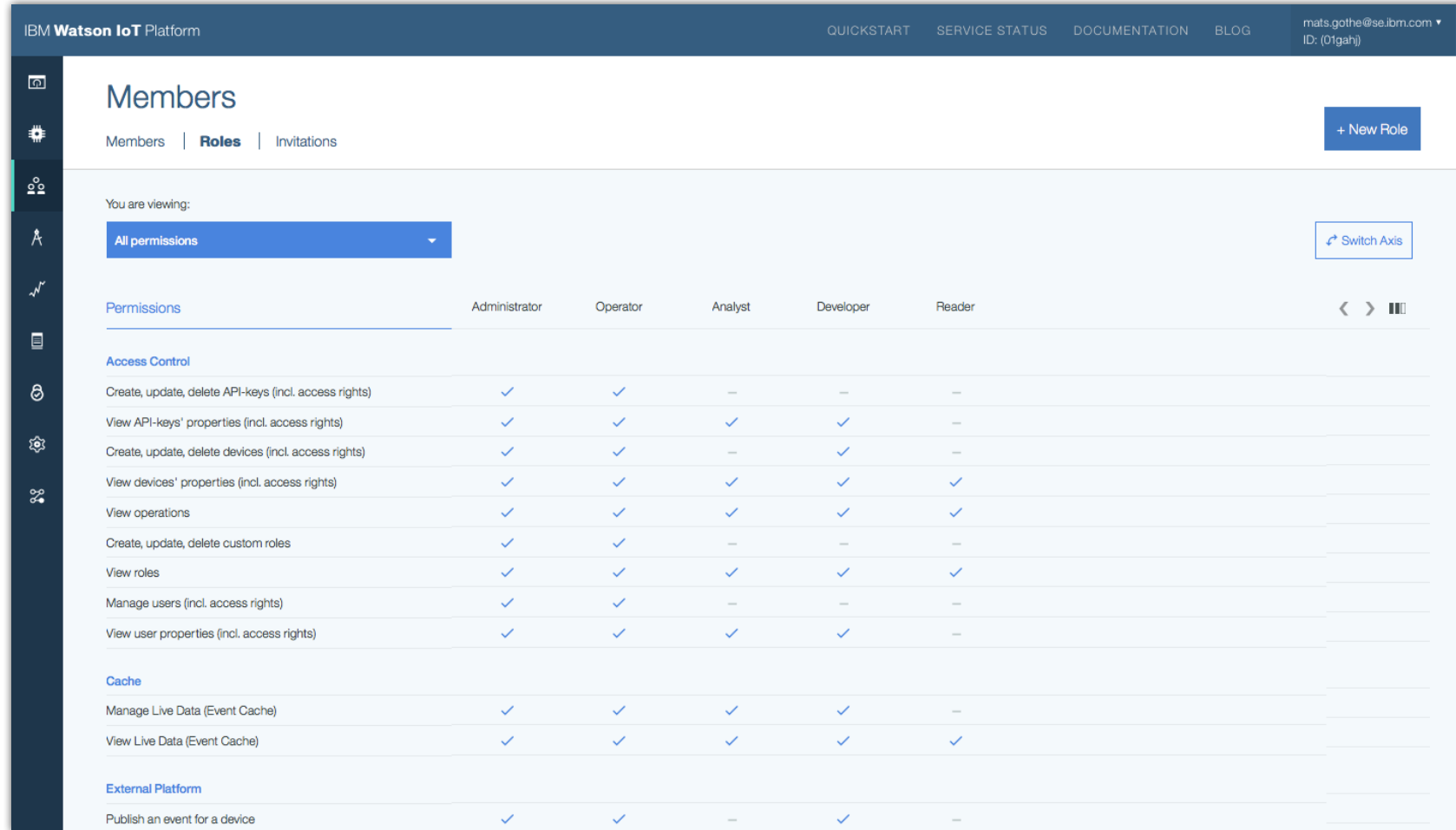
Personal and Shared
boards

Predefined cards for

- Usage Overview
- Device and Rule centric
Real-Time Analytics
- Risk Management

Custom card server

IoT Platform Roles and Permissions



The screenshot shows the 'Members' page in the IBM Watson IoT Platform. The page has a dark blue header with the logo and navigation links. A sidebar on the left contains icons for different sections. The main content area is titled 'Members' and includes tabs for 'Members', 'Roles', and 'Invitations'. A '+ New Role' button is in the top right. Below the tabs, there's a 'You are viewing:' section with a dropdown menu set to 'All permissions' and a 'Switch Axis' button. The main part of the page is a table with columns for 'Permissions' and five roles: 'Administrator', 'Operator', 'Analyst', 'Developer', and 'Reader'. The table is organized into sections: 'Access Control', 'Cache', and 'External Platform'. Each row represents a specific permission, and the table uses checkmarks to indicate which roles have access to that permission.

Permissions	Administrator	Operator	Analyst	Developer	Reader
Access Control					
Create, update, delete API-keys (incl. access rights)	✓	✓	—	—	—
View API-keys' properties (incl. access rights)	✓	✓	✓	✓	—
Create, update, delete devices (incl. access rights)	✓	✓	—	✓	—
View devices' properties (incl. access rights)	✓	✓	✓	✓	✓
View operations	✓	✓	✓	✓	✓
Create, update, delete custom roles	✓	✓	—	—	—
View roles	✓	✓	✓	✓	✓
Manage users (incl. access rights)	✓	✓	—	—	—
View user properties (incl. access rights)	✓	✓	✓	✓	—
Cache					
Manage Live Data (Event Cache)	✓	✓	✓	✓	—
View Live Data (Event Cache)	✓	✓	✓	✓	✓
External Platform					
Publish an event for a device	✓	✓	—	✓	—

New predefined
and custom roles

Permissions to
'view' vs 'manage'

Bases for resource
level access control

IoT Platform Roles and Permissions

The screenshot shows the 'Temperature Alert' configuration interface. At the top, there are navigation links: QUICKSTART, SERVICE STATUS, DOCUMENTATION, and BLOG. The user's email 'mats.gothel@se.ibm.com' and ID '(01gah)' are displayed. The main area has tabs for 'Browse' and 'Actions'. The 'Temperature Alert' form includes a title field, a description field, and a dropdown for 'Applies to: sensortag'. An 'Alert priority' dropdown is set to 'Low'. Below these are two sections: 'IF: Add one or more conditions.' and 'THEN: Add or select one or more actions.' The 'IF' section shows a condition 'objectTemp >= 25' with an 'AND' operator. The 'THEN' section has a 'New action' button with a 'Click to edit' link. At the bottom right, there are 'Close', 'Save', and 'Deactivate' buttons.

IBM Watson IoT Platform

QUICKSTART

SERVICE STATUS

DOCUMENTATION

BLOG

mats.gothel@se.ibm.com

ID: (01gah)

Rule-Centric Analytics

+ Add New Card

Settings

Rules with Alerts

0 Critical 0 High 0 Medium 1 Low

Last 24 hours

Temperature Alert
Low alert at 14:41 on 16/03/2017
3 Alerts

Rule Alerts

0 Critical 0 High 0 Medium 3 Low

Last 24 hours

Temperature Alert
Low alert at 14:41:13 on 16/03/2017

Temperature Alert
Low alert at 14:40:42 on 16/03/2017

Temperature Alert
Low alert at 14:40:23 on 16/03/2017

Rule Alert Info

Rule name
Temperature Alert

Description
n/a

Device ID
sensortag-1

Device type
sensortag

Severity
Low

Time
14:41 16/03/2017

Conditions
sensortag.d.objectTemp>=25

Message
d.objectTemp
25.31

d.pressure

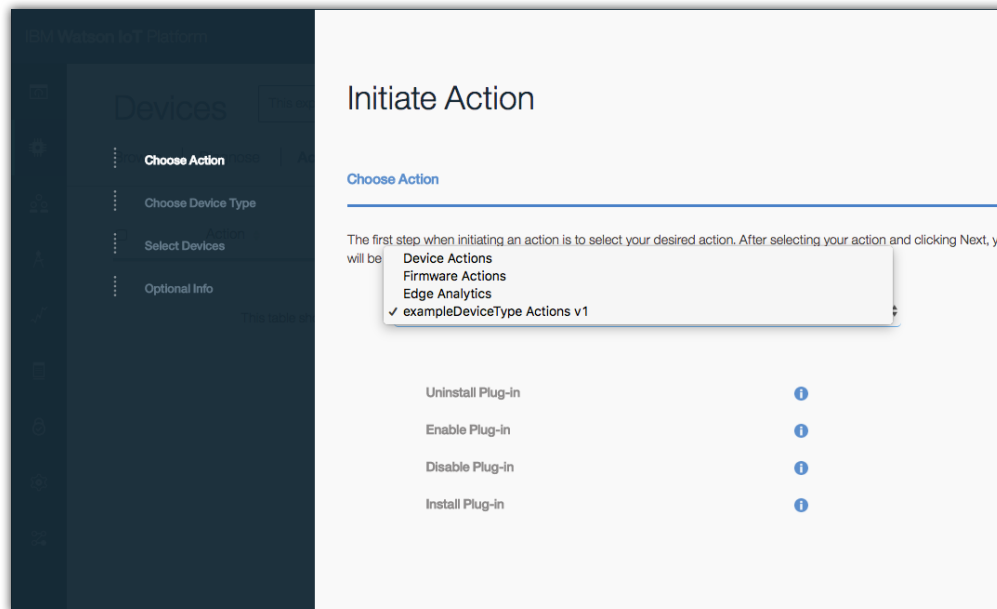
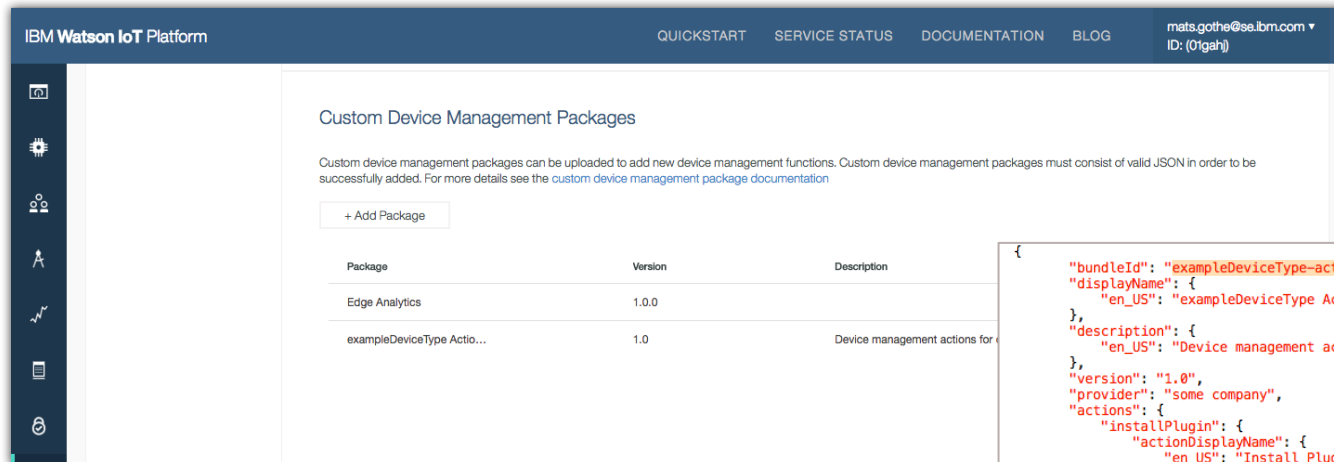
Real-Time Analytics
and Schemas migrated
to Watson IoT Platform

Consistent with IoT
Platform design

Integrated with IoT
Platform dashboard

Cloud and Edge rules

• Custom Device Management Packages



```
{
  "bundleId": "exampleDeviceType-actions-v1",
  "displayName": {
    "en_US": "exampleDeviceType Actions v1"
  },
  "description": {
    "en_US": "Device management actions for exampleDeviceType devices"
  },
  "version": "1.0",
  "provider": "some company",
  "actions": {
    "installPlugin": {
      "actionDisplayName": {
        "en_US": "Install Plug-in"
      },
      "description": {
        "en_US": "Install a new plug-in on the device"
      },
      "parameters": [
        {
          "name": "pluginId",
          "value": "\\w+",
          "required": true
        },
        {
          "name": "pluginURI",
          "value": "({http:\\\\|https:\\\\|ftp:\\\\|sftp:\\\\|.*\\.com\\.com})",
          "required": true
        }
      ]
    },
    "enablePlugin": {
      "actionDisplayName": {
        "en_US": "Enable Plug-in"
      },
      "description": {
        "en_US": "Enables a plug-in on the device"
      },
      "parameters": [
        {
          "name": "pluginId",
          "value": "\\w+",
          "required": true
        }
      ]
    }
  }
}
```

Custom Device Management Packages

Custom MQTT Commands w/ Parameters integrated with IoT Platform Device Management

Download and install JSON formatted package provided by 3rd parties

IoT Platform Extensions

IBM Watson IoT Platform

QUICKSTART SERVICE STATUS DOCUMENTATION BLOG mats.gothel@sa.ibm.com ID: (01gah)

+ Add Extension

Extensions

Extensions are optional service integrations which can be added to your Watson IoT Platform to provide additional functions or integrate with third-party services.

Single Sign On
The Single Sign On (SSO) extension allows additional authentication options to be enabled.
Status: Not Configured
[Setup](#)

Email
The email extension configures options for the SendGrid and SMTP user invitation methods.
Status: Not Configured
[Setup](#)

ARM mbed Connector
This integration enables ARM mbed Connector devices to integrate with IBM's Watson IoT Platform and exchange messages bi-directionally.
Status: Configured

Historical Data Storage
The historical data storage extension finds and configures compatible services that can be used to store your IoT device data. You must be logged in to Bluemix in order to complete this operation.
Status: Not Configured
[Setup](#)

Blockchain
The blockchain extension provides an interface to add and manage IBM Blockchain and Hyperledger fabric connections.
Status: Disconnected
[Setup](#)

IoT Platform Extensions

- Configure SSO
- Configure Email
- Configure external historian
- Configure Blockchain

IoT Platform Extensions

IBM Watson IoT Platform

QUICKSTART SERVICE STATUS DOCUMENTATION BLOG mats.gothel@se.ibm.com ID: (01gahj)

Browse Diagnose Action Device Types Manage Schemas + Add Device

Browse Devices

This table lists all added devices. You can filter, organize, and search among the devices using various criteria. Get started by adding a device using the Add Device button, or use the API to bulk add devices.

Device ID	Device Type	Class ID	Date Added	Location
arduino-2	arduino	Device	10 Feb, 2017 3:06:34 PM	
intel-galileo-4	intel-galileo	Device	10 Feb, 2017 3:06:34 PM	

Connection Info Device Info Recent Events Sensor Info Actions Logs See All Info →

Device ID	intel-galileo-4
Device Type	intel-galileo
Date Added	2017-02-10T14:06:34.000Z
Added By	a-01gahj-skdlhtsrj

809646_EUI64-0080E103...	relativeHumidity	Device	14 Mar, 2017 3:36:30 PM
arduino-3	arduino	Device	10 Feb, 2017 3:06:34 PM
arduino-1	arduino	Device	10 Feb, 2017 3:06:34 PM
intel-galileo-2	intel-galileo	Device	10 Feb, 2017 3:06:34 PM
arduino-4	arduino	Device	10 Feb, 2017 3:06:34 PM

New IoT Platform design

- New resource creation
- New in-place view / edit
- Vertical tab'ed sections
- (In Experimental mode)

Discussion – IoT Platform Designs in 2016

- Do you agree or disagree with the usefulness of these additions to the Watson IoT Platform User Experience design?
- What tasks work particularly well / are easy to use versus tasks that frustrate / confuse?
- What improvements do you request in IoT Platform User Experience design?



Discussion – Watson IoT Platform Roadmap

- What capabilities, most important to your IoT solution, would you like to see in the Watson IoT Platform Roadmap?



Discussion – Watson IoT Platform Roadmap

- What capabilities in the IoT Platform Roadmap are the most important to your organization?
- What capabilities are you missing in the IoT Platform Roadmap?



Summary and Conclusions

Learn more about Watson IoT Platform

- Are you visiting the Watson IoT Platform Blog to receive notifications on platform updates?
<https://developer.ibm.com/iotplatform/blog/>
- Are you enabling Experimental Features to try new platform capabilities?
- Are you participating in the IoT Platform beta programs?



Learn more about Watson IoT Platform

Learn more about IBM's point of view on the
Internet of Things

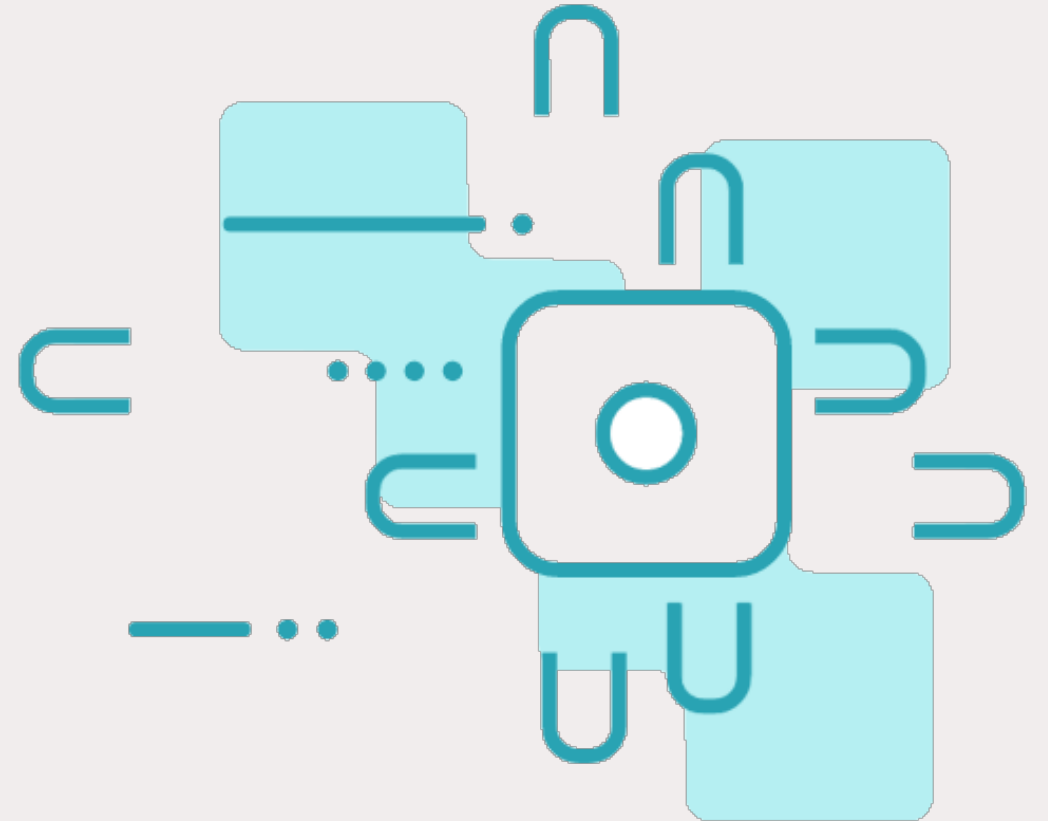
ibm.com/iot

Try out our Internet of Things platform

ibm.biz/try_iot
[Bluemix.net](https://bluemix.net)

Join us in our IoT conversations

[@IBMIoT](https://twitter.com/IBMIoT)



Become a Design Sponsor

Join the Design Partner Program

The Watson IoT Platform Design Partner Program (DPP) is a group of selected clients and partners that are building, integrating and deploying IoT solutions using the Watson IoT Platform.

The members of the DPP are meeting monthly with IoT Platform offering management, design and development to learn about new IoT Platform capabilities in the roadmap and to provide their feedback and guidance on priorities.

Join the IoT Platform Design Partner Program



Mail us at
IOTDPP@us.ibm.com



Sign up at
<https://ibm.biz/Bds5dt>

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