

Preparing for Exercises today

Part 1 (Lab 1)

- ☐ Connect to the room WiFi Network
- ☐ Signup for a free M2X account!
 1. Go to m2x.att.com
 2. Create account using your email address
 - Make sure you can access this email account here

SSID:
Password:

Part 2 (Labs 2-5)

- ☐ Install the LaunchPad drivers and Energia IDE (*Page 23-24*)
 - ☐ Mac users: install Energia *.pkg from USB stick
 - ☐ Windows users: install *xds110_drivers* and copy folder “*energia-0101E0017*” to your PC.
- ☐ Signup for IFTTT account





IoT Workshop on AT&T M2X Data Service and AT&T Flow Designer APIs

In Room Wi-Fi Connection

SSID: ----

Password: ----

Build A Production-Ready IoT Project Using The AT&T M2X Data Service



Jan Koryčan

Product Development Manager
AT&T - Technology Service Realization



AT&T M2X Data Service

Overview of the AT&T M2X Data Service

Signup for a free account @ m2x.att.com

Labs

- Create account
- Exercise 1 - Creating and Using a Device and a Data Stream
- Exercise 2 – Configure a device to send data to M2X
- Exercise 3 - Add triggers and notifications

Get your free M2X account, and connect your devices!

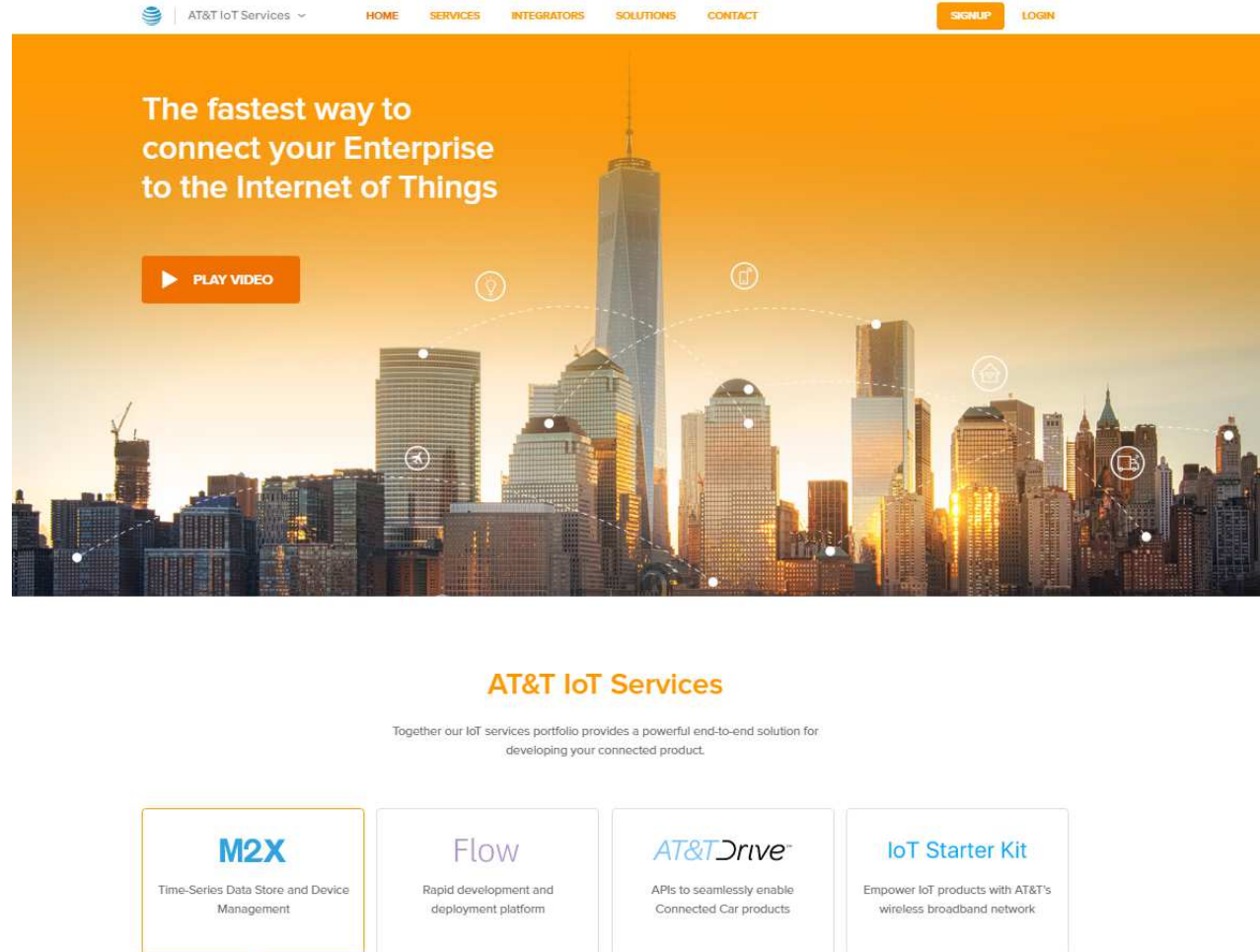
Q&A



The M2X Data Service combined with Flow Designer helps create IoT Services that enable M2M/IoT solutions

- **Build:** enables drag and drop development and custom code creation to build M2M solutions.
- **Deploy:** Run-Time environment provides an elastic, on demand platform as a service tailored the internet of things.
- **Store:** The M2X Data Service provides client access libraries & data storage / access

Services are designed in a *loosely coupled* fashion, allowing them to be used independently and in combination, with other AT&T services and with third party services



The screenshot shows the AT&T IoT Services website. The header includes the AT&T logo, "AT&T IoT Services", and navigation links: HOME, SERVICES, INTEGRATORS, SOLUTIONS, CONTACT. There are also "SIGN UP" and "LOGIN" buttons. The main banner features a city skyline at sunset with the text "The fastest way to connect your Enterprise to the Internet of Things" and a "PLAY VIDEO" button. Below the banner, the "AT&T IoT Services" title is followed by a tagline: "Together our IoT services portfolio provides a powerful end-to-end solution for developing your connected product." Four service tiles are displayed: M2X (Time-Series Data Store and Device Management), Flow (Rapid development and deployment platform), AT&T Drive (APIs to seamlessly enable Connected Car products), and IoT Starter Kit (Empower IoT products with AT&T's wireless broadband network).



IoT Services = M2X Data Service + Flow Designer

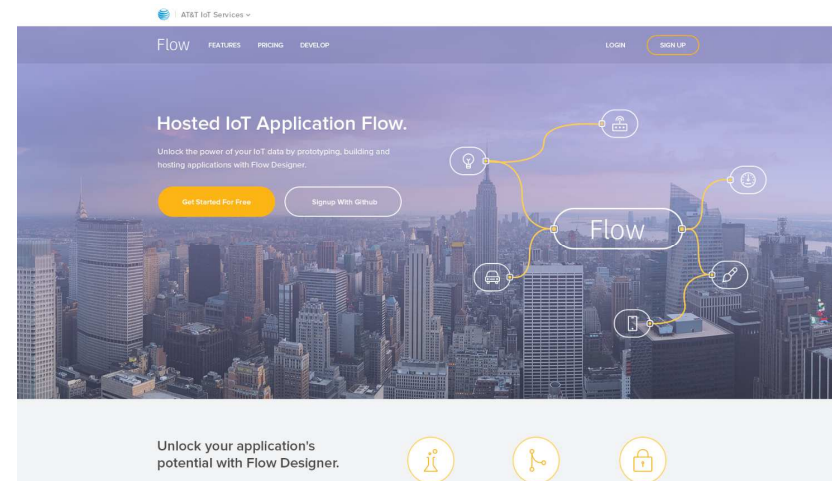


M2X — Built for Industrial Grade IoT

Designed from the ground up to handle the rigorous demands of large scale industrial applications.

AT&T M2X Data Service is a cloud based, multi-tenant, time-series data storage service for network connected IoT devices.

- Storage for IoT device data via APIs
- Enabling direct collection of data from devices, various data sources, and integrated services into AT&T Cloud
- Customer centric tools for developers such as client libraries, sample code, developer forums and help center that speed integration with applications, services and business systems.



Flow Designer is a cloud based, multi-tenant development and execution service for network connected IoT devices.

- Support for common IoT protocols
- Create custom business logic
- Integrate with external services such as analytics, visualization and other services.
- Pre-built libraries and flows from AT&T and the community
- One-click automated deployment
- Foundry Innovation Project





AT&T IoT Services ▾

M2X

✓ M2X

Time series data storage for IoT.

Flow Designer

Flow design and compute service.

PRICING

DEVELOP ▾

SIGN UP

LOGIN

Build Intelligent, Enterprise Grade Connected Device Solutions

AT&T M2X provides time-series **data storage**, **device management**, **message brokering**, **event triggering**, **alarms**, and **data visualization** for your industrial Internet of Things (IIoT) products and services.

GET STARTED FOR FREE

SIGNUP VIA HEROKU

M2X



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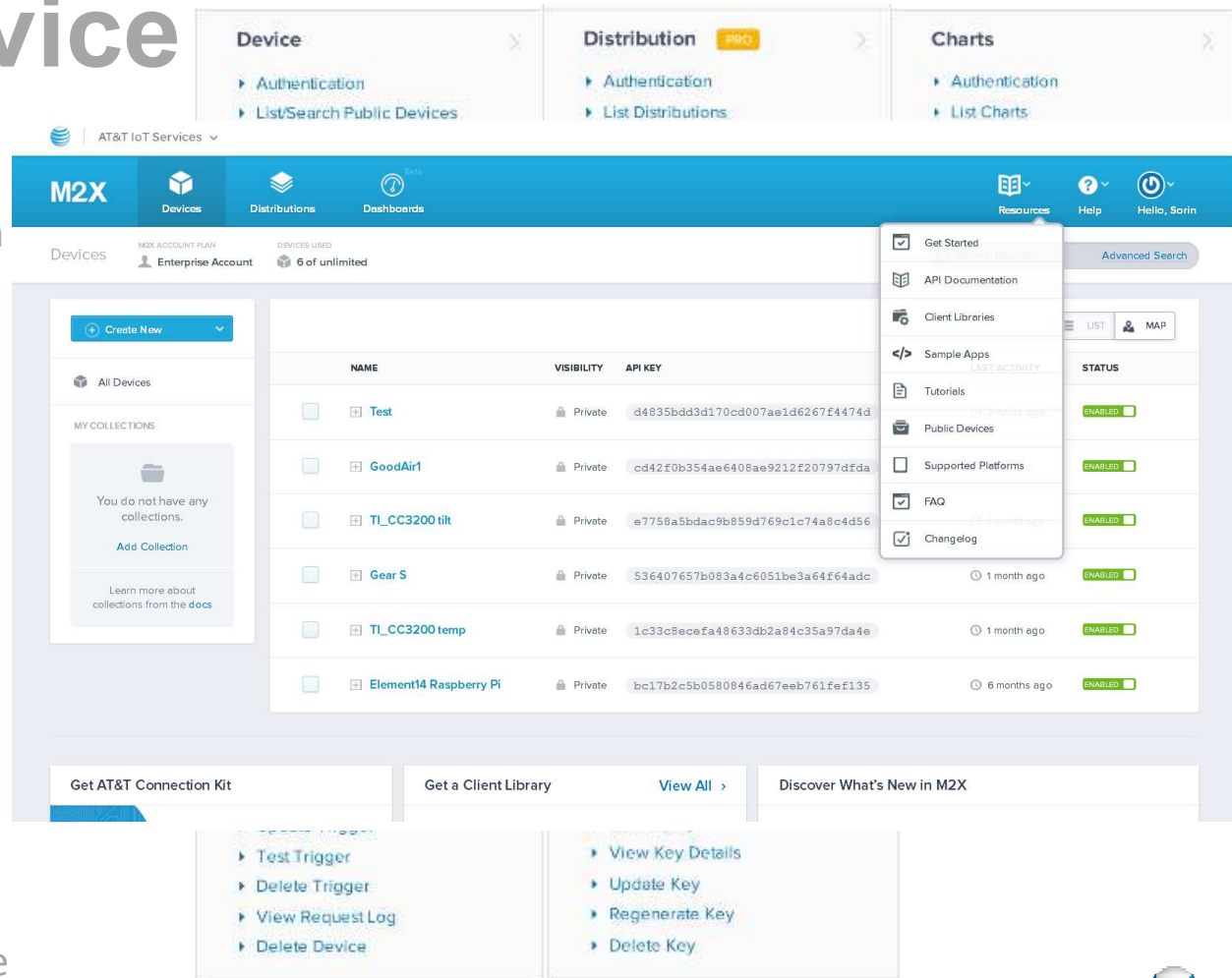


M2X Data Service

 **Developer Portal**
Manage all of your devices and data from the M2X Developer Portal – from prototype to product launch.

 **Flexible, Powerful, Scalable APIs**
The AT&T M2X service API works with all current technologies and is flexible enough to support new emerging technologies.

 **Event Management & Notifications**
Define and manage conditions for data Streams. When a condition is met, a Trigger monitoring a Stream in real-time can create an Event which is logged in the Data Feed.



The screenshot displays the M2X Developer Portal interface. At the top, there are tabs for 'Device', 'Distribution', and 'Charts'. Below these, a navigation bar includes 'M2X', 'Devices', 'Distributions', and 'Dashboards'. The 'Devices' tab is active, showing a table of devices with columns for NAME, VISIBILITY, and API KEY. A sidebar on the left contains a 'Create New' button and a 'MY COLLECTIONS' section. A dropdown menu is open, showing options like 'Get Started', 'API Documentation', 'Client Libraries', 'Sample Apps', 'Tutorials', 'Public Devices', 'Supported Platforms', 'FAQ', and 'Changelog'. At the bottom, there are links for 'Get AT&T Connection Kit', 'Get a Client Library', and 'Discover What's New in M2X'.

NAME	VISIBILITY	API KEY
Test	Private	d4835bdd3d170cd007ae1d6267f4474d
GoodAir1	Private	cd42f0b354ae6408ae9212f20797dfda
TL_CC3200 tilt	Private	e7758a5bdac9b859d769c1c74a8c4d56
Gear S	Private	536407657b083a4c6051be3a64f64adc
TL_CC3200 temp	Private	1c33c8ecef48633db2a84c35a97da4e
Element14 Raspberry Pi	Private	bc17b2c5b0580846ad67eeb761fef135



M2X Data Service



Data Security

Industry standard data security helps to safeguard your data.



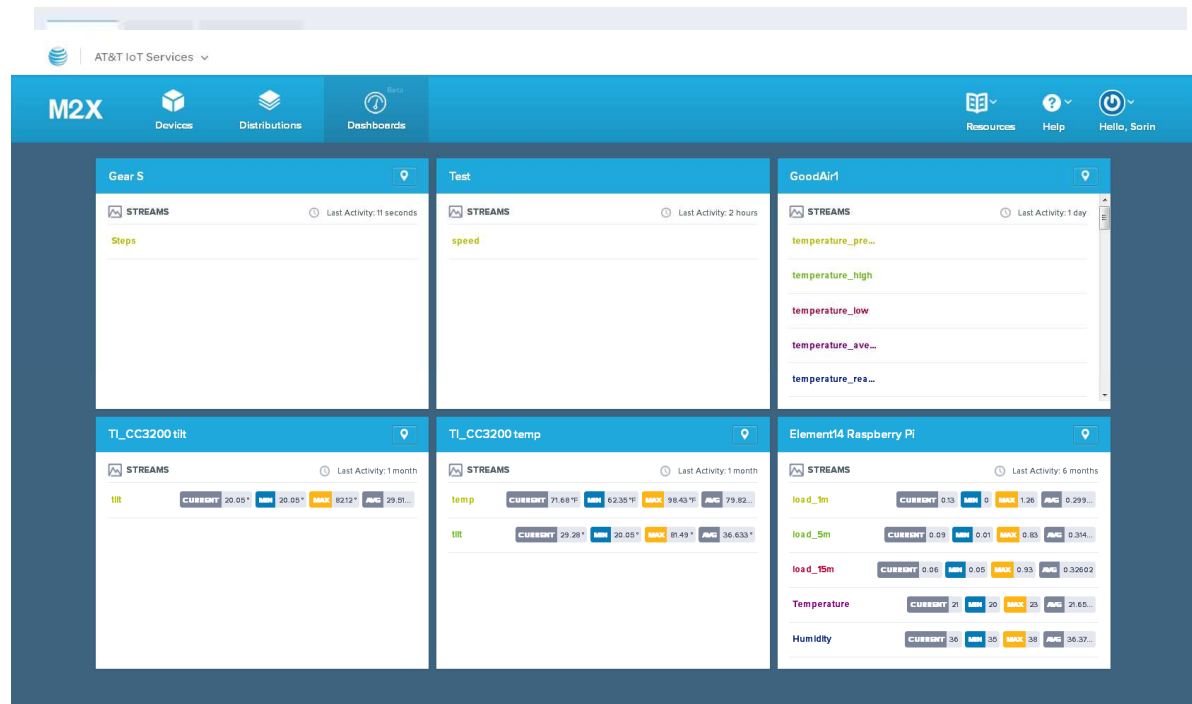
Store and Distribute your Data

Development and product devices data is automatically logged and monitored, and flows into Data Streams categorized by data type (ie. Temperature, humidity). Each Device or Data Source is identified by an API Master Key.



Real-time Analytics

Extract real-time data from your connected devices to enable your business to make important decisions quickly.



M2X Data Service

Advanced Search



Distributions

A group of devices that inherit the characteristics (streams, triggers) of the original device that the distribution was based on.



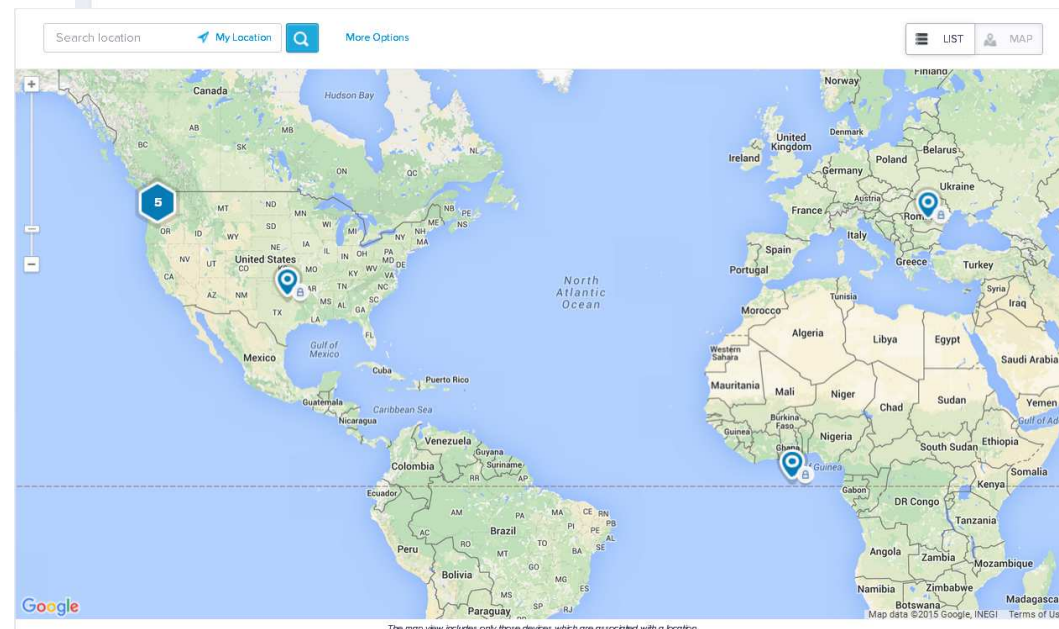
Advanced Search

Search for devices based on practically anything: name, status, ID, serial, tag, location, polygonal, stream ID, condition, etc.




Export Stream Data


One stream, all streams, less data, all data

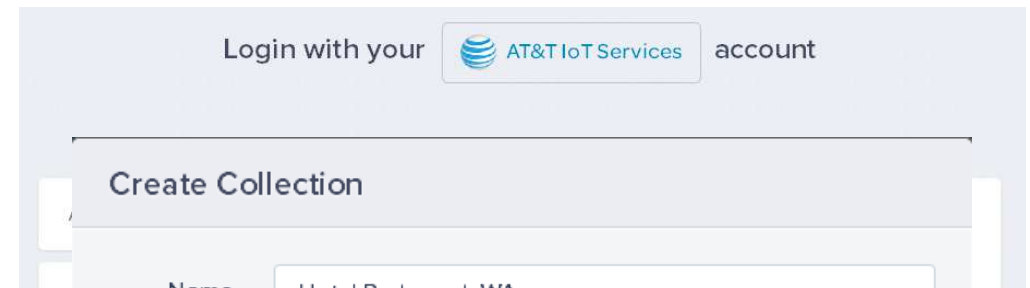


M2X Data Service

 **Single Sign-on**
One username and password across all AT&T IoT Services.

 **Collections**
Organize your devices hierarchically using Collections, and control access to Collections of Devices using Collection API Keys. Categorize devices using Tags, which can be used when searching for devices of a certain type.

 **Commands APIs**
Manage device permissions via Device API keys and system level permissions via API Master Keys.



Commands API

Commands are used to communicate with one or more specific devices. Commands will be delivered directly to target devices that are connected via [MQTT](#), or devices may check periodically for outstanding commands via HTTP.

The Commands API allows you to send custom user-defined commands to devices and allows devices to issue their responses. The Commands API can also be used to view and audit the history of recently sent commands, along with the device responses.

Authentication

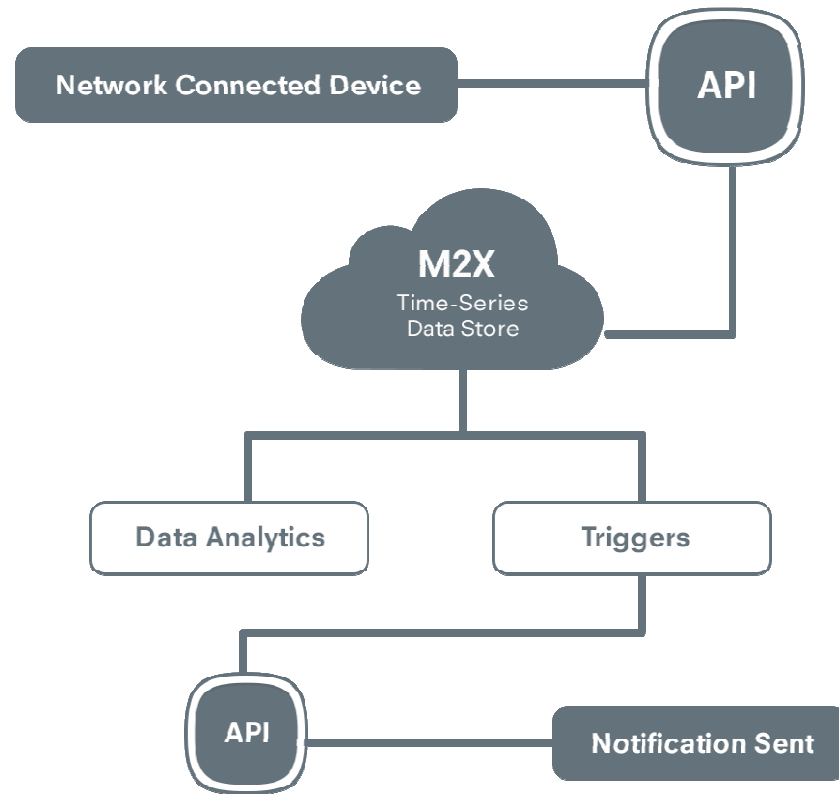
The Commands API endpoints for sending commands and viewing sent commands require a Master API key in the `X-M2X-KEY` header. The endpoints for acknowledging commands and viewing received commands require a Primary Device API key (or Master API key) in the `X-M2X-KEY` header. Any attempt to use the incorrect key to access these endpoints would result in a `403 Forbidden` response. [Learn more about API Keys.](#)



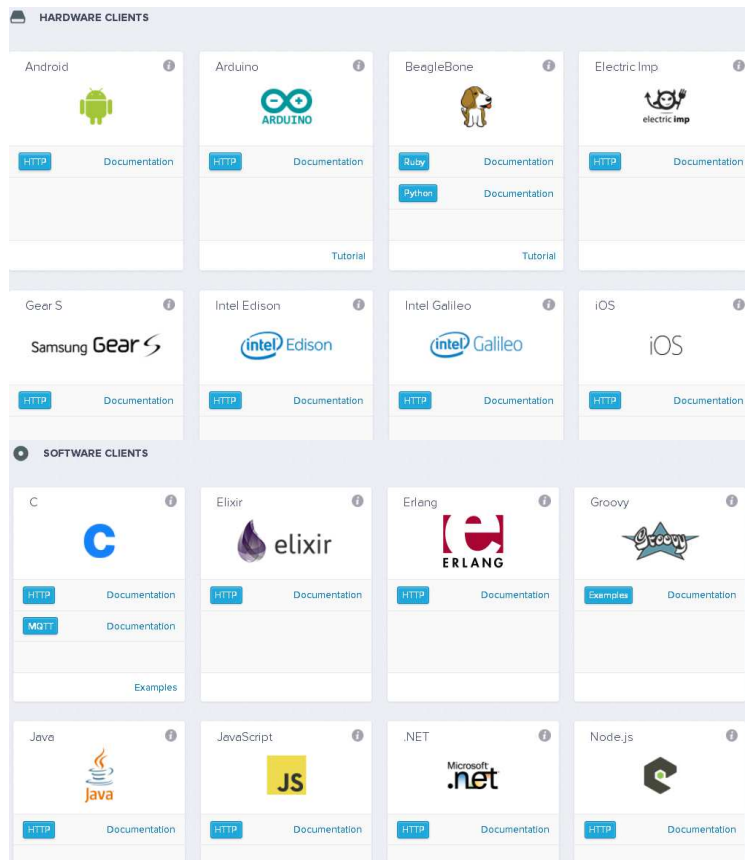
AT&T M2X Data Service

Core Terms & Concepts

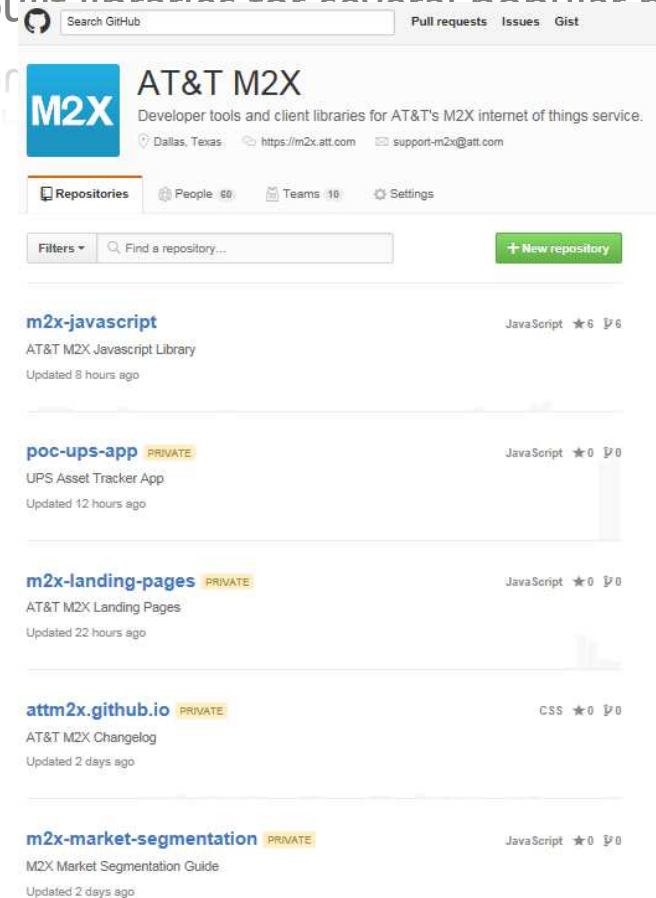
- Devices
- Streams
- Triggers
- Distributions
- Master API Key
- Device API Key



M2X Data Service



AT&T M2X APIs are available from any Internet connected device, server or application. To help you get started, we pre-built libraries for several popular platforms.



AT&T M2X Data Service

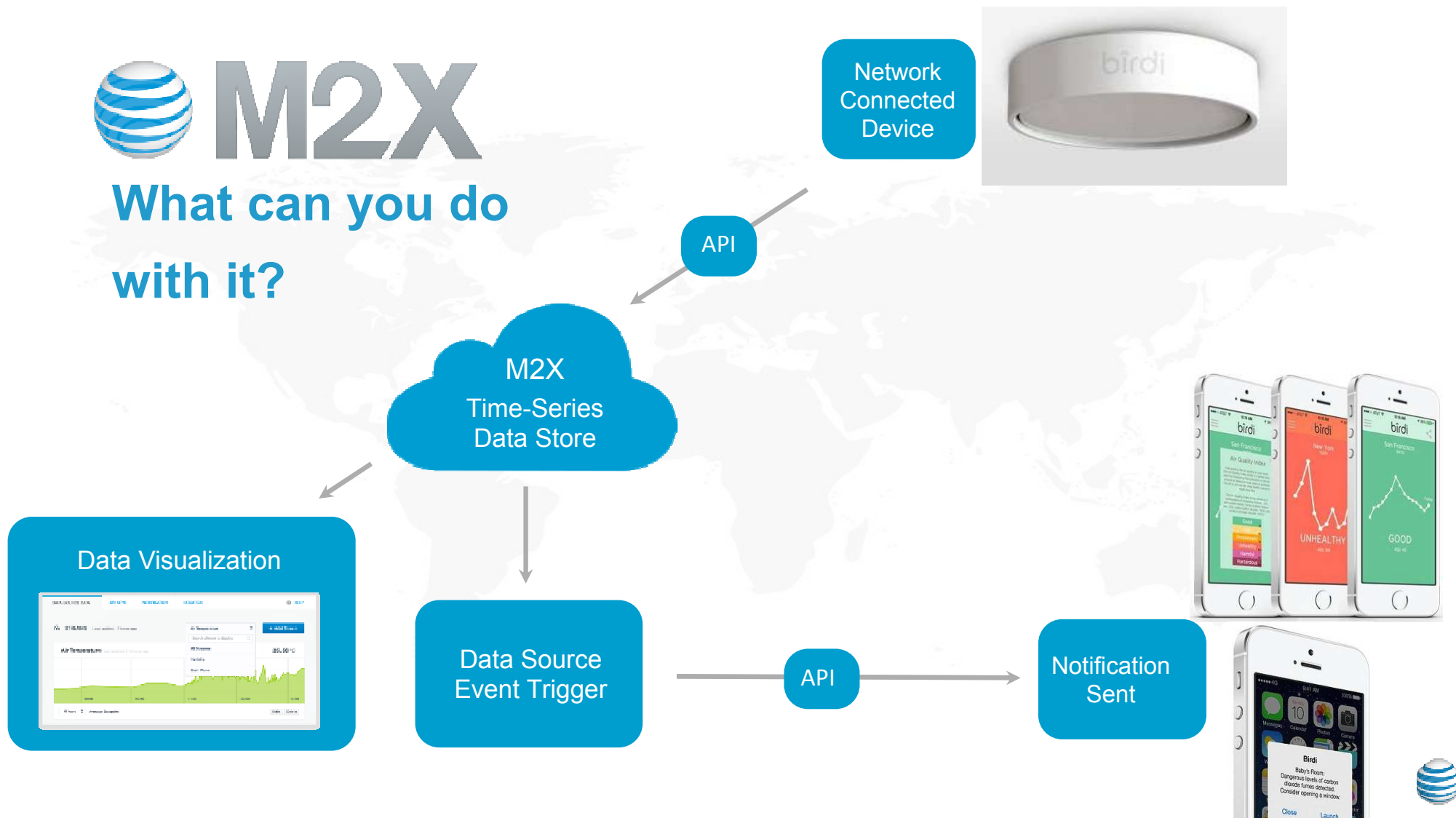
Works with virtually any IP-capable device or application!

RESTful and MQTT interfaces





What can you do
with it?



AT&T M2X Data Service

Online access to **tutorials**, **API documentation** and community support **forums** ensure you have access to the information you need to develop your product.

Signup:

m2x.att.com/signup

Get Started:

m2x.att.com/developer/get-started

M2X GitHub Repos

github.com/attm2x

API Documentation

m2x.att.com/developer/documentation/overview

AT&T Developer Program

developer.att.com



Hosted IoT Application Flow.

Unlock the power of your IoT data by prototyping, building and hosting applications with Flow Designer.

Get Started For Free

Signup With Github

Flow

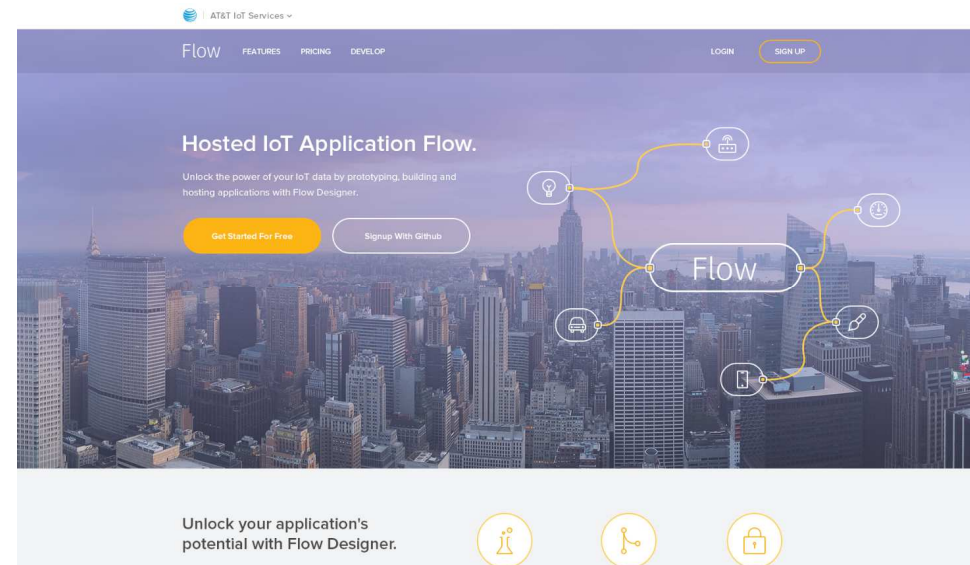
Unlock your application's
potential with Flow Designer.



AT&T Flow Designer

Flow Designer is a cloud based, multi-tenant development and execution service for network connected IoT devices.

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Connect and Integrate Devices, API's and Data

Devices

Support for IoT Protocols

- UDP
- TCP
- MQTT
- MQ
- COAP
- HTTP
- Websockets

Expanding Library of Supported Devices

- 18 Hardware Platforms
- 12 Software Platforms
- Prebuilt protocols e.g. Xirgo
- Create, reuse and share

API's

Connect to Applications/API's

- Simple Integration
- Connect devices to business systems
 - Ticketing
 - Supply Chain
 - CRM
 - More...

Mashup API's

- Simply integration by creating API's that expose complex workflows

Create micro-services

Data

Transform Data

Route Data

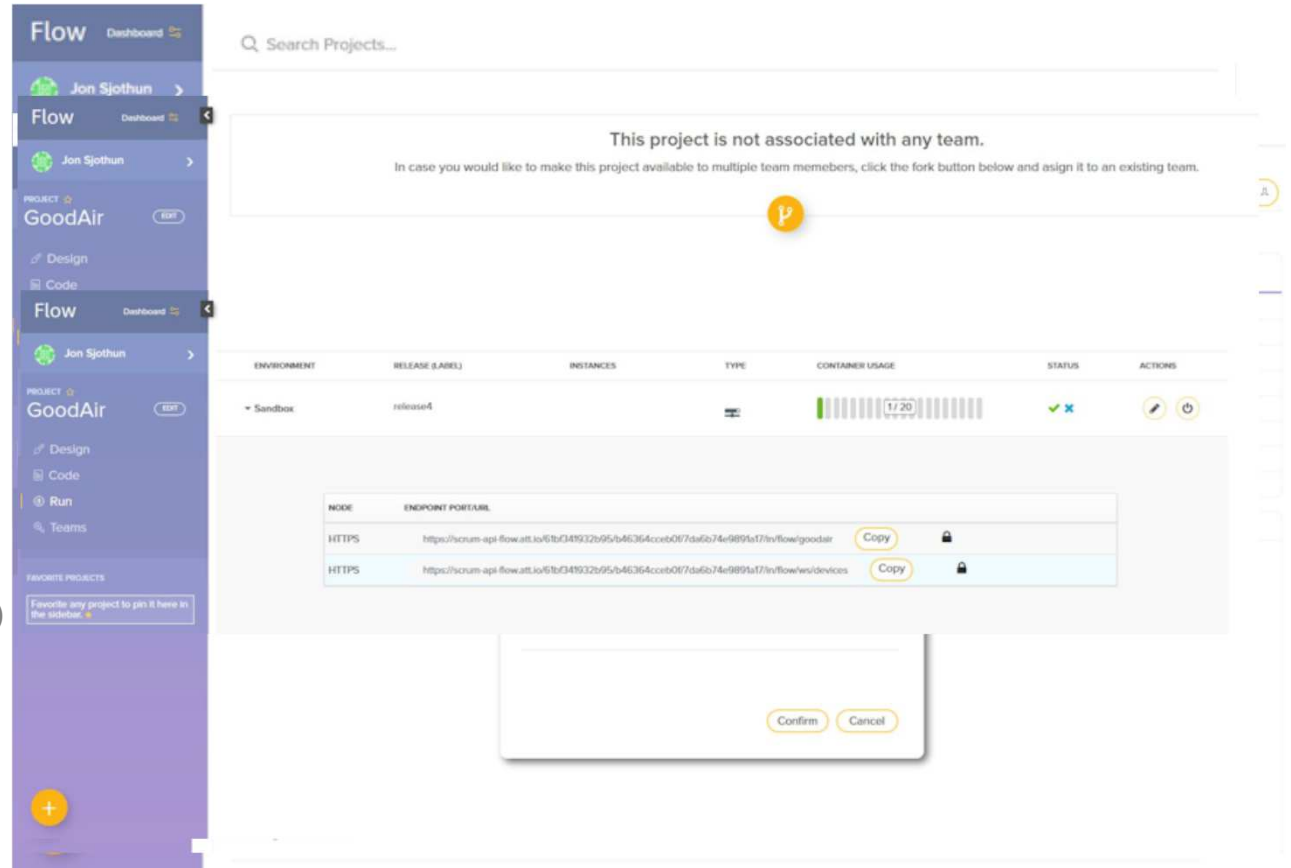
Protocol Transformation

Connect to Data Stores

- M2X
- Flume
- Kafka
- Cassandra
- Elastic Search
- Redis

Flow Designer – Beyond Node-Red

- Multi-tenant cloud hosted
- Source Code Control
 - Version Management
 - Code Sharing/Collaboration
- Cloud Execution
 - Multiple Environments
 - Capacity Management
 - Geo-Redundancy
- Integrations
 - AT&T (M2X, Dev Program, etc.)
 - Devices
 - Protocols
- Monitoring & Management



FD Nodes – Input/Output



- Input and output nodes represent services and clients respectively
- All services are exposed via the load balancer
- Basic protocols – TCP/UDP/HTTP
- Error handling – Catch node
- Hadoop support via Kafka
- HTTP server is created by default as part of node instance
- Active RabbitMQ, MQTT and Kafka(Hadoop) nodes cause a service to be instantiated in a docker.
- HTTP and HTTP response must be instantiated in pairs.



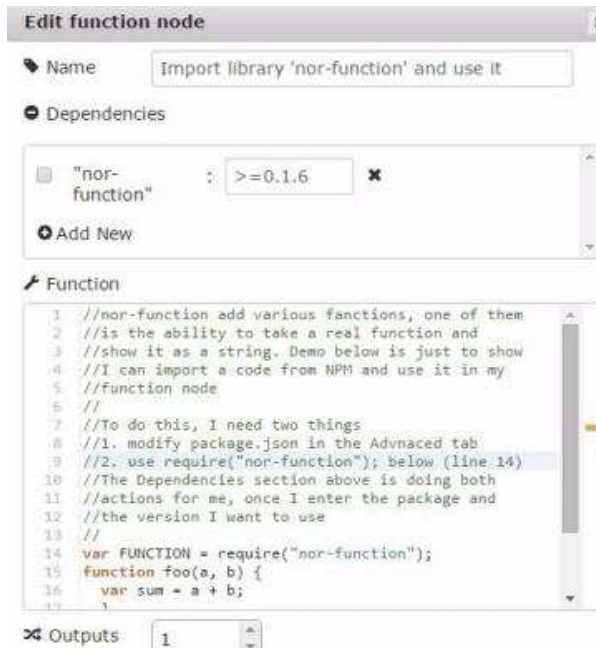
FD Nodes - Functions



- Function nodes perform actions on messages passing through a flow
- Control nodes
- Subflows
- Formatting - CSV, XML, etc.
- Contigo – Java interface to Contigo mapping tool. Instantiates a java runtime in the docker.
- Helpers/Requestors for clients
 - Coap
 - SOAP
 - TCP
 - UDP
- Generic function node allows arbitrary JavaScript.



FD Nodes - Functions



- Editor enables creation of arbitrary JavaScript
- JavaScript dependencies can be specified by their npm package name and version
- Flow designer will automatically download the dependency and install into the docker images
- There are over 170K packages in the community
- Private npm repositories are possible

npm is the package manager for **javascript**.



FD Nodes – Storage



- FD does not support database instances in its current iteration.
- Nodes are client interfaces to popular key/value stores.
- File storage is ephemeral and should not be used for persistent data
- M2X node
 - Supports all API functions
 - Can be used as an endpoint to accept HTTP calls from an M2X client library



FD Nodes – Social and Advanced



Social

- Interfaces to popular user communications
- Twilio supports multi-carrier SMS

Advanced

- Watch a folder
- FTP Client
- RSS Feed Client
- Execute a system command via exec or spawn



FD Nodes – AT&T



Black Flag (Dev Program)

- Supports Oauth
- Auth node can be triggered at startup
- AT&T SMS for AT&T customers only

Smart City

- Socket.io client
- Pub/Sub for data streams

Jasper

- Access device specific usage data
- Manage device rate plan associations
- Manage SIM status
- Send SMS
- Inbound SMS from Jasper
- Event based Push Notifications from Jasper



AT&T M2X Data Service

Thank you!

m2x.att.com

In Room Wi-Fi Connection

SSID: ---

Password: ---





THANK YOU