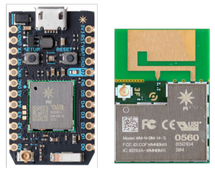
Particle

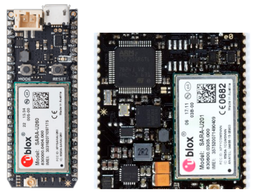
OPENTHREAD 技术研讨会

PARTICLE IS A FULL-STACK IOT DEVICE PLATFORM

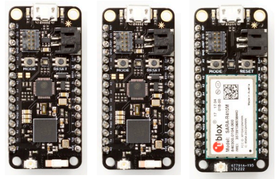
IoT Hardware



Wi-Fi



Cellular



Mesh NEW

Device OS

Connectivity

2G/3G/LTE SIM Cards NEW

Cellular MVNO

Mesh networking NEW

IoT Device Cloud

Developer Tools

Fully managed connectivity

Device management

OTA Firmware Updates

IoT Apps

Integrations

SDKs

WE HAVE GROWN THE WORLD'S LARGEST IOT DEVELOPER COMMUNITY

2018

PARTICLE BY THE NUMBERS

160,000

~~140,000~~ developers

Developers love Particle. We have the largest IoT developer community in the industry

170 countries

Our customers' devices are deployed all over the world, from Argentina to Antarctica

8,500 companies building with Particle

According to IDC, we have the highest customer satisfaction rating of any IoT platform

500,000 devices

We manage hundreds of thousands of devices sending billions of messages per month

CHALLENGES

HIGH COST OF CONNECTIVITY via Wi-Fi and cellular

LARGE NUMBER OF NODES overwhelmed traditional networking solutions

CHALLENGING ENVIRONMENTS that require flexible network and power solutions

INADEQUATE TOOLS for building prototypes and solutions at scale

THE PERFECT SOLUTION WOULD ENABLE

ROBUST local (device to device) communications

LOW COST incremental hardware connectivity

WIRELESS or battery-powered nodes

FLEXIBLE systems architecture

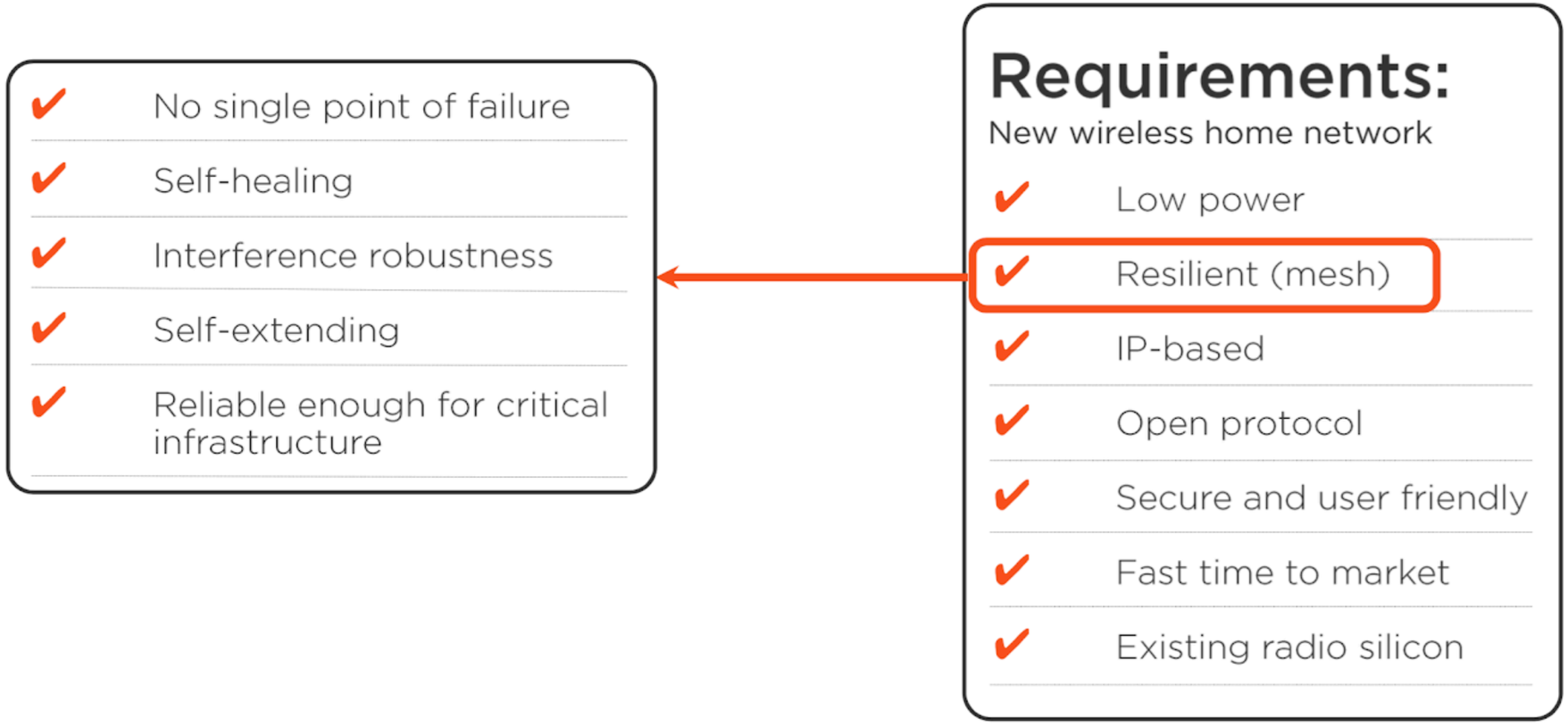
- Wired/wireless
- Cellular / Wi-Fi / Ethernet backhauls
- Support for small and large deployments

WE STARTED TO EXPLORE MESH NETWORKING

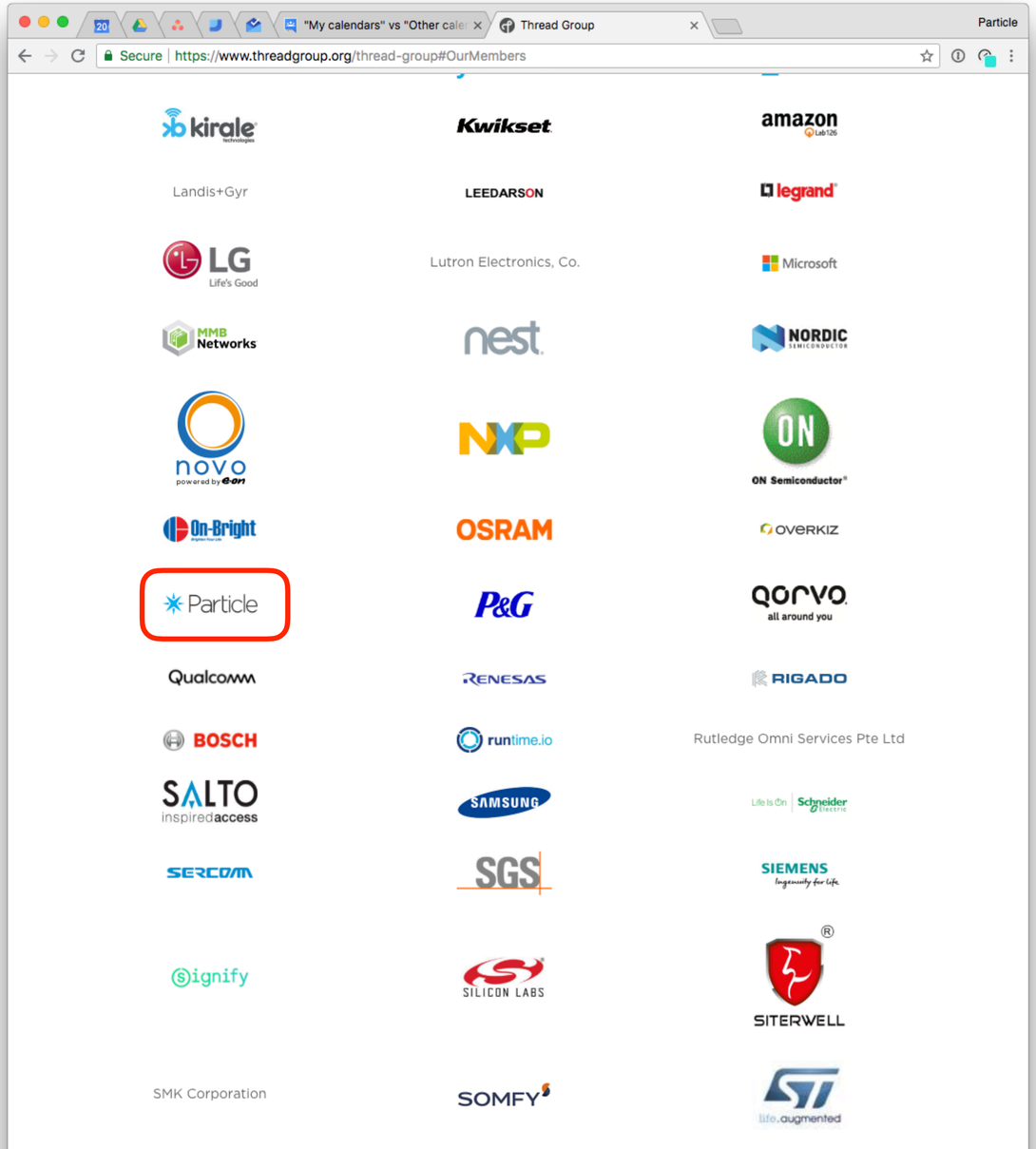
	LOW COST	LOW POWER	HIGHLY RELIABLE
WI-FI	$5 to $10 per module	150-300mA	Single point of failure
CELLULAR	$10 to $20 per module	200-2000mA	Managed infrastructure
MESH	$3 to $5 per module	50mA	Self-healing network

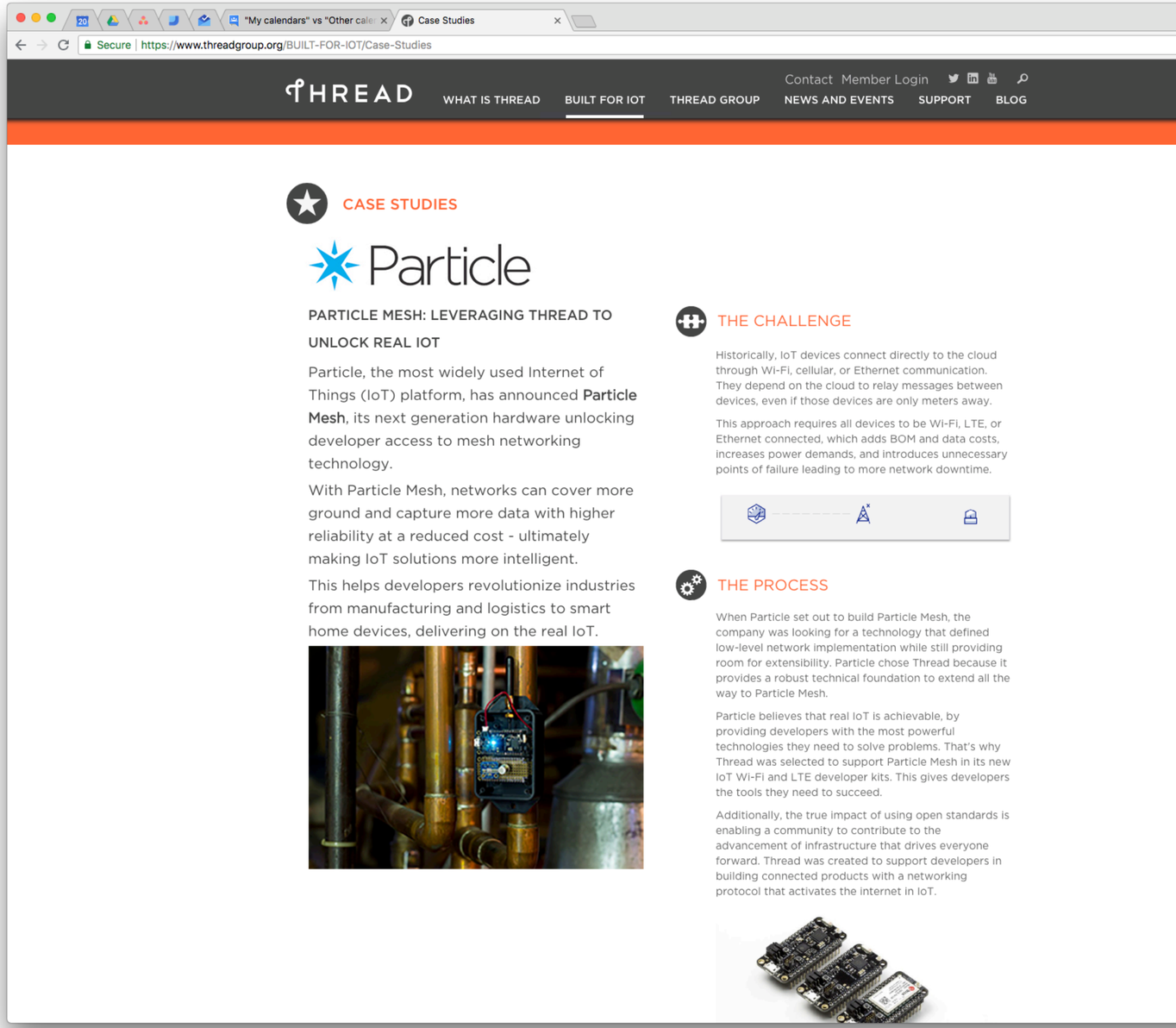
AND THREAD WAS THE CLEAR WINNER

THREAD GROUP | Requirements



PARTICLE IS A NEW MEMBER OF THE THREAD GROUP



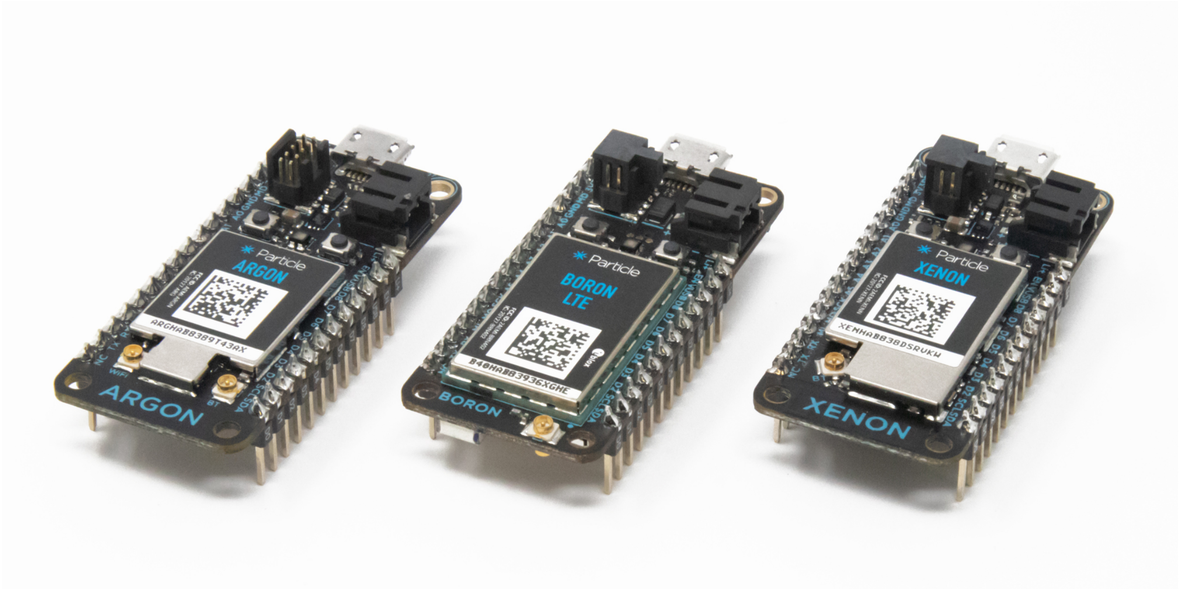


GOOD DEVELOPMENT TOOLS WILL HELP THREAD FIND ITS KILLER APPS BEYOND THE HOME

in February we introduced

PARTICLE MESH

Make your IoT devices even more intelligent



Argon

- Wi-Fi + BLE +Mesh
- Wi-Fi endpoint or mesh gateway
- Starts at $25

Boron

- LTE-M1 or 2G/3G + BLE + Mesh
- Cellular endpoint or mesh gateway
- Starts at $49

Xenon

- BLE + Mesh
- Mesh endpoint
- Starts at $15

Mesh enabled, next generation

- Adafruit Feather form factor
- OpenThread-based Mesh
- Low cost
- Low power
- Highly reliable

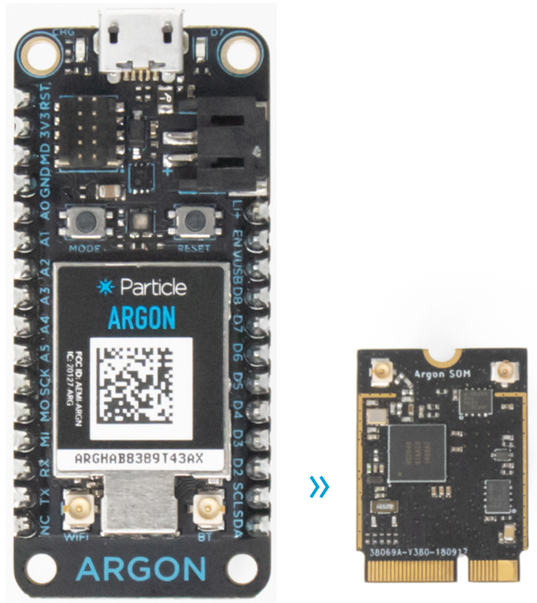
INITIAL FEEDBACK WAS EXTREMELY POSITIVE

5,800 customers preordered **35,000** devices

shipment started in October

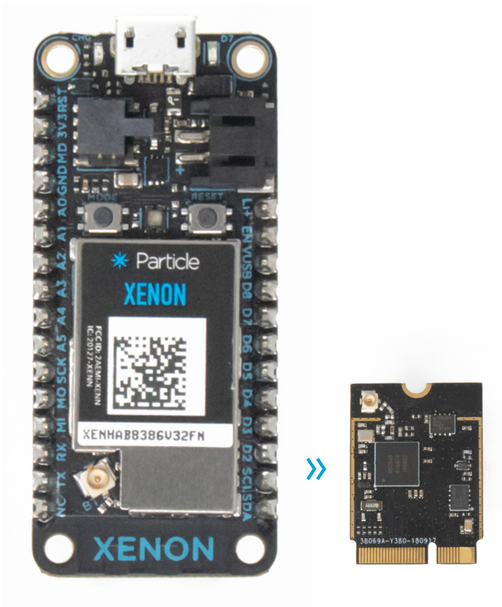
MESH BENEFITS FROM ALL THE EXISTING FEATURES OF THE PARTICLE ECOSYSTEM

1. MASS PRODUCTION HARDWARE FOR APPLICATIONS AT SCALE



Wi-Fi

Cellular (2G/3G/LTE)

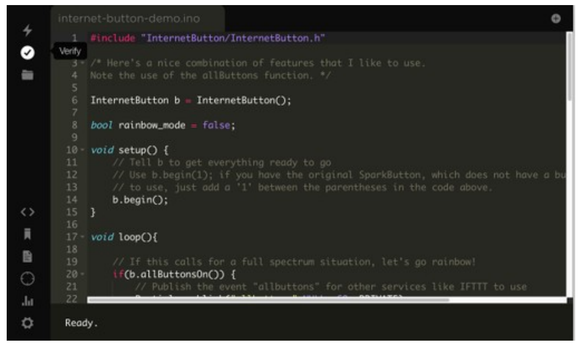


Mesh

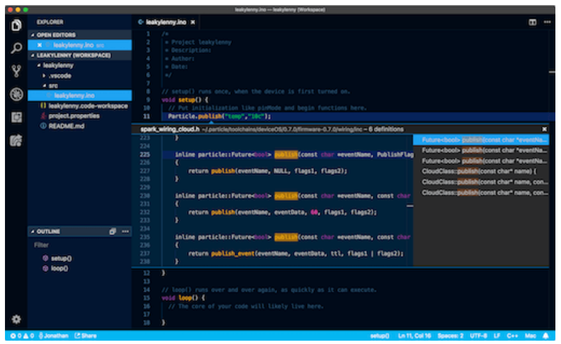
2. PRE-CONFIGURED TOOLS THAT ACCELERATE PRODUCT DEVELOPMENT

INTEGRATED DEVELOPMENT TOOLS

WEB IDE



DESKTOP ENVIRONMENT



BUILT IN OTA UPDATES

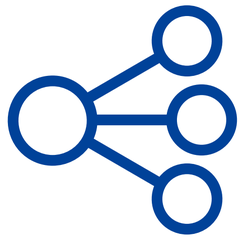
3,000+ FIRMWARE LIBRARIES

C/C++ OR ARDUINO (WIRING)

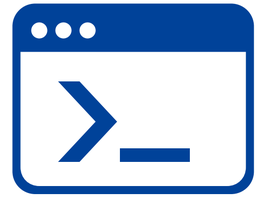
SECURE BY DEFAULT

API / SDKS / CLI

REST API



CLI FOR AUTOMATION



WEB/MOBILE SDKs

3. SOFTWARE STACK THAT IS OPEN, FLEXIBLE, AND FREE TO USE

OPENTHREAD
released by Nest

BUILT ON OPENTHREAD

FREE TO USE

Google Cloud Platform

Microsoft Azure

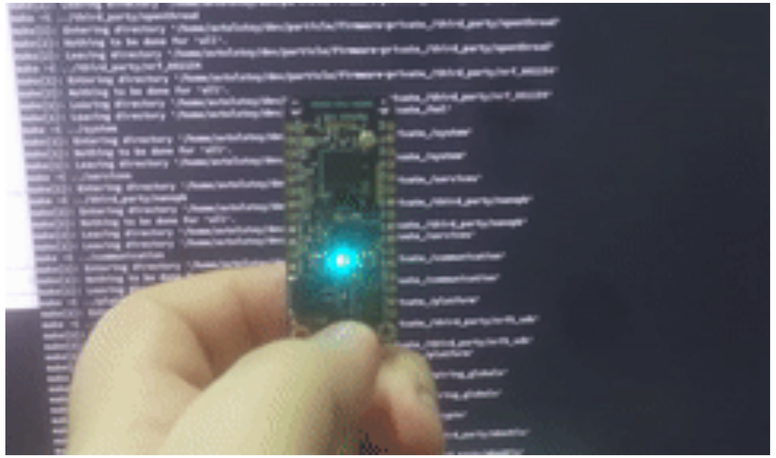
salesforce

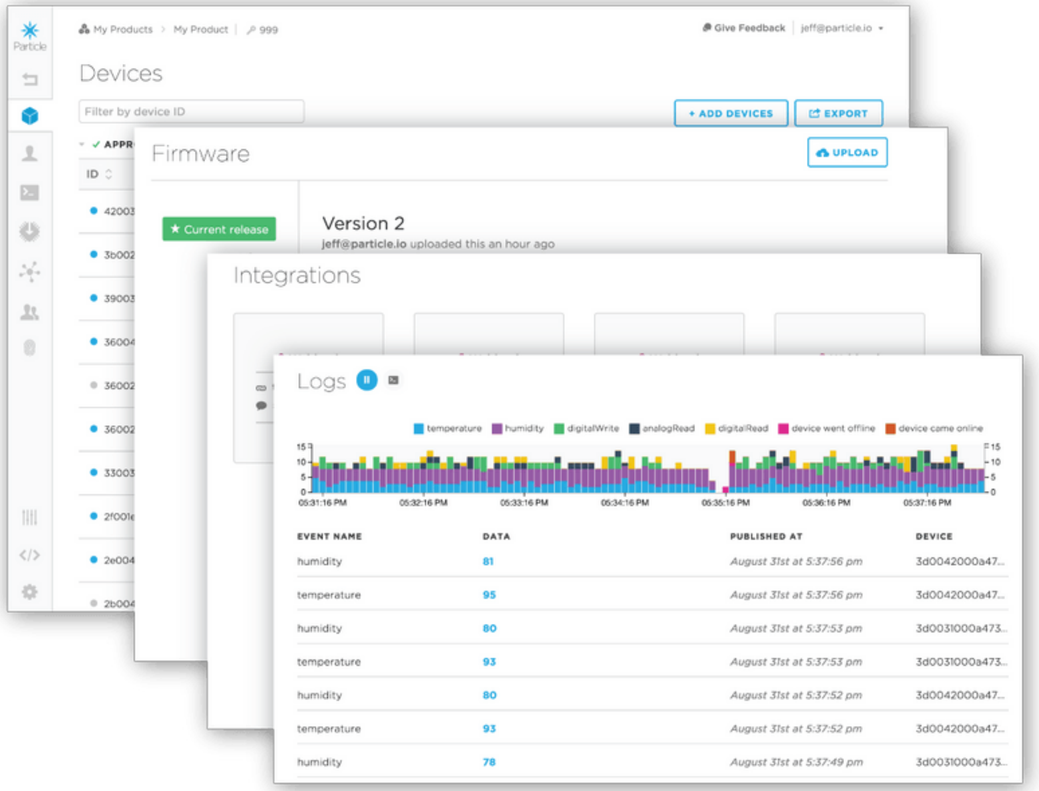
Your business already relies on dozen of services to operate effectively. Device Cloud supports integrations so you can seamlessly connect device data with the tools your business relies on, saving you time and money.

DEVICE CLOUD INTEGRATIONS

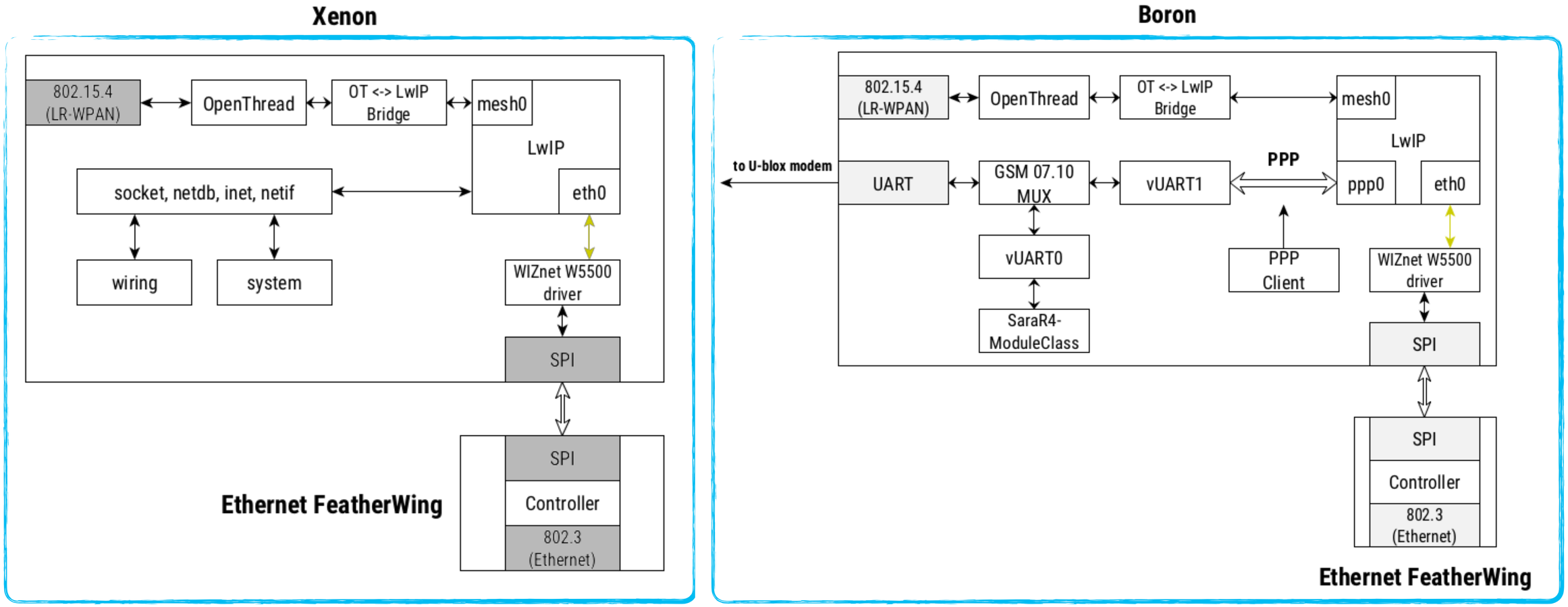
WE ALSO ADDED KEY FEATURES TO SUPPORT THREAD DEVELOPMENT

TURNKEY CLOUD THAT WORKS WITH THREAD

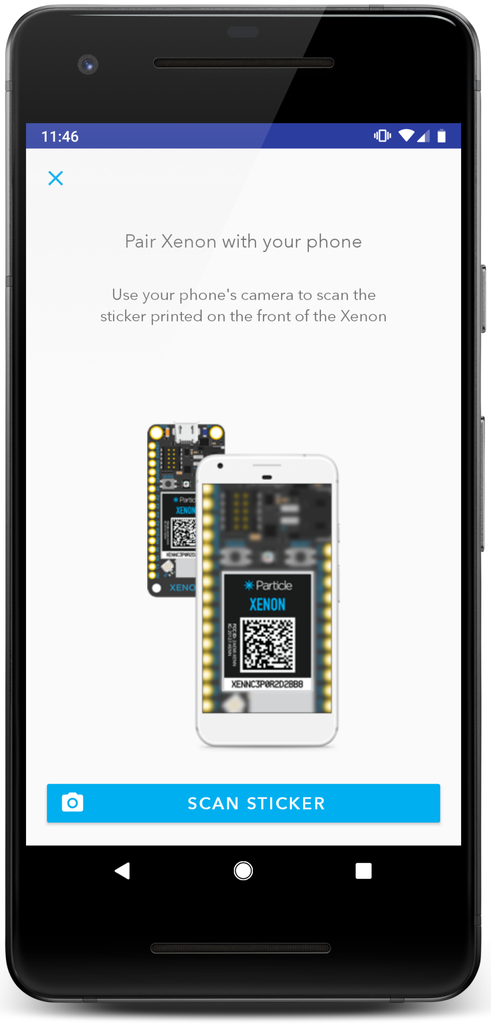


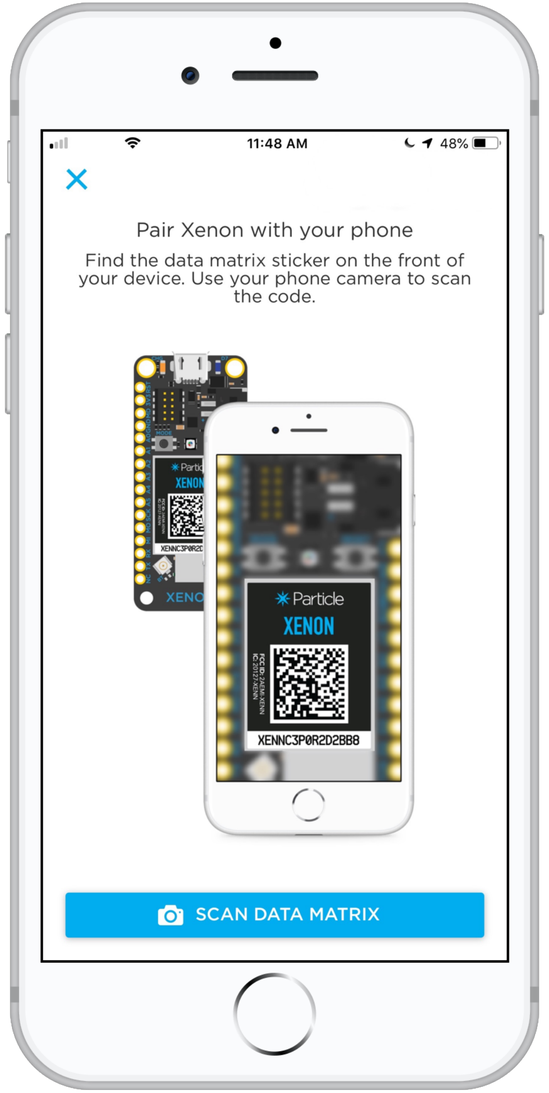


MCU BORDER ROUTERS SUPPORTING WI-FI, CELLULAR (2G/3G/LTE M1/NB1) OR ETHERNET



BLUETOOTH SETUP, INSTALLATION AND DIAGNOSTICS





SIMPLIFIED LOCAL COMMUNICATION

Cloud Functions

Particle.variable()

Expose a *variable* through the Cloud so that it can be called with `GET /v1/devices/{DEVICE_ID}/{VARIABLE}`. Returns a success value - `true` when the variable was registered.

Up to 20 cloud variables may be registered and each variable name is limited to a maximum of 12 characters.

Note: Only use letters, numbers, underscores and dashes in variable names. Spaces and special characters may be escaped by different tools and libraries causing unexpected results.

It is fine to call this function when the cloud is disconnected - the variable will be registered next time the cloud is connected.

Prior to 0.4.7 firmware, variables were defined with an additional 3rd parameter to specify the data type of the variable. From 0.4.7 onward, the system can infer the type from the actual variable. Additionally, the variable address

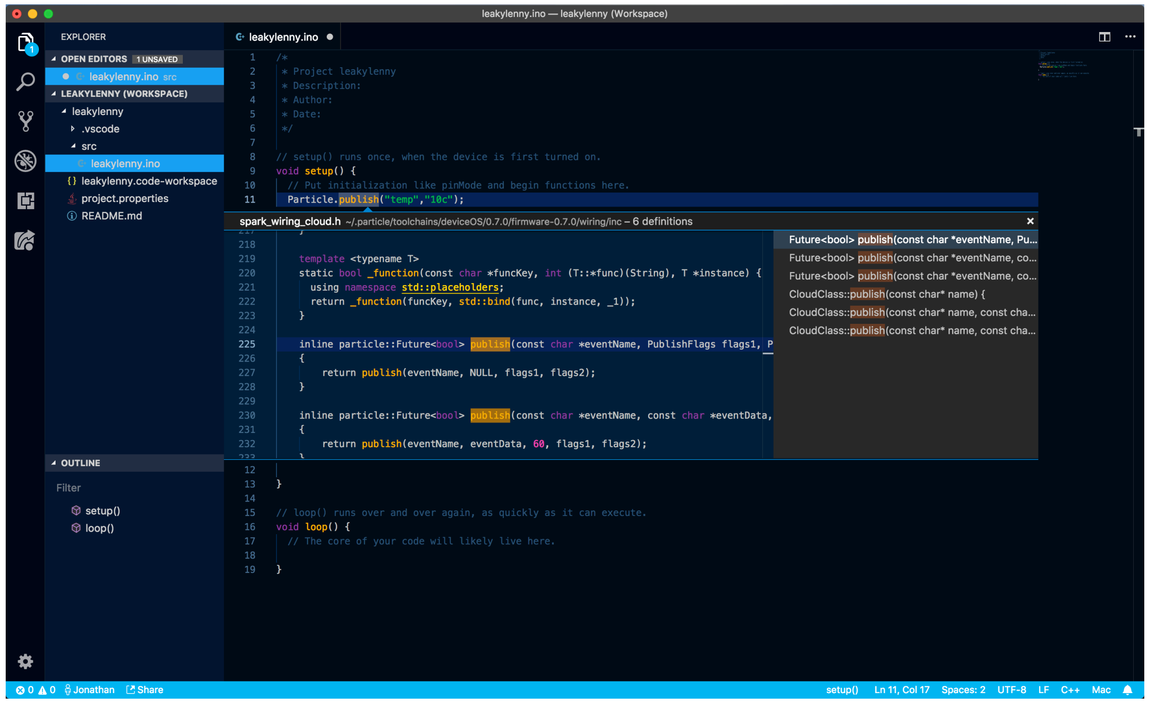
```
// EXAMPLE USAGE

int analogvalue = 0;
double tempC = 0;
char *message = "my name is particle";
String aString;

void setup()
{
  // variable name max length is 12 characters long
  Particle.variable("analogvalue", analogvalue);
  Particle.variable("temp", tempC);
  if (Particle.variable("mess", message)==false)
  {
      // variable not registered!
  }
  Particle.variable("mess2", aString);

  pinMode(A0, INPUT);
}
```

PARTICLE WORKBENCH



Designed for IoT, optimized for Particle

- Local compilation
- Full integration with Visual Studio Code
- Managed toolchain and OTA
- Autocomplete with IntelliSense
- 3,000+ official Particle libraries
- 8,000+ Visual Studio Marketplace extensions
- Advanced debugging

Sign up to access the developer preview

www.particle.io/workbench

OPEN SOURCING

Device OS, development tools

& the hardware designs of our Dev Kits are all are open source

DEMO

GETTING STARTED

PARTICLE DOCS

https://docs.particle.io

Particle Mesh Workshop

https://part.cl/workshop

getting more hardware

Particle online store or SeeedStudio

CAT M1 & NB-IOT SUPPORT

China - China Mobile (NB-IoT)

Hong Kong - 3HK (NB-IoT)

Singapore - Singtel (CAT M1 & NB-IoT)

USA - AT&T (CAT M1)

China Unicom - start testing soon

China Telecom - must operator own server + services

OUR GOAL

Help make Thread the premier mesh networking technology for IoT use cases beyond the connected home

Particle

THANK YOU!