

arm

How arm can help You
get started with Thread

100 bn

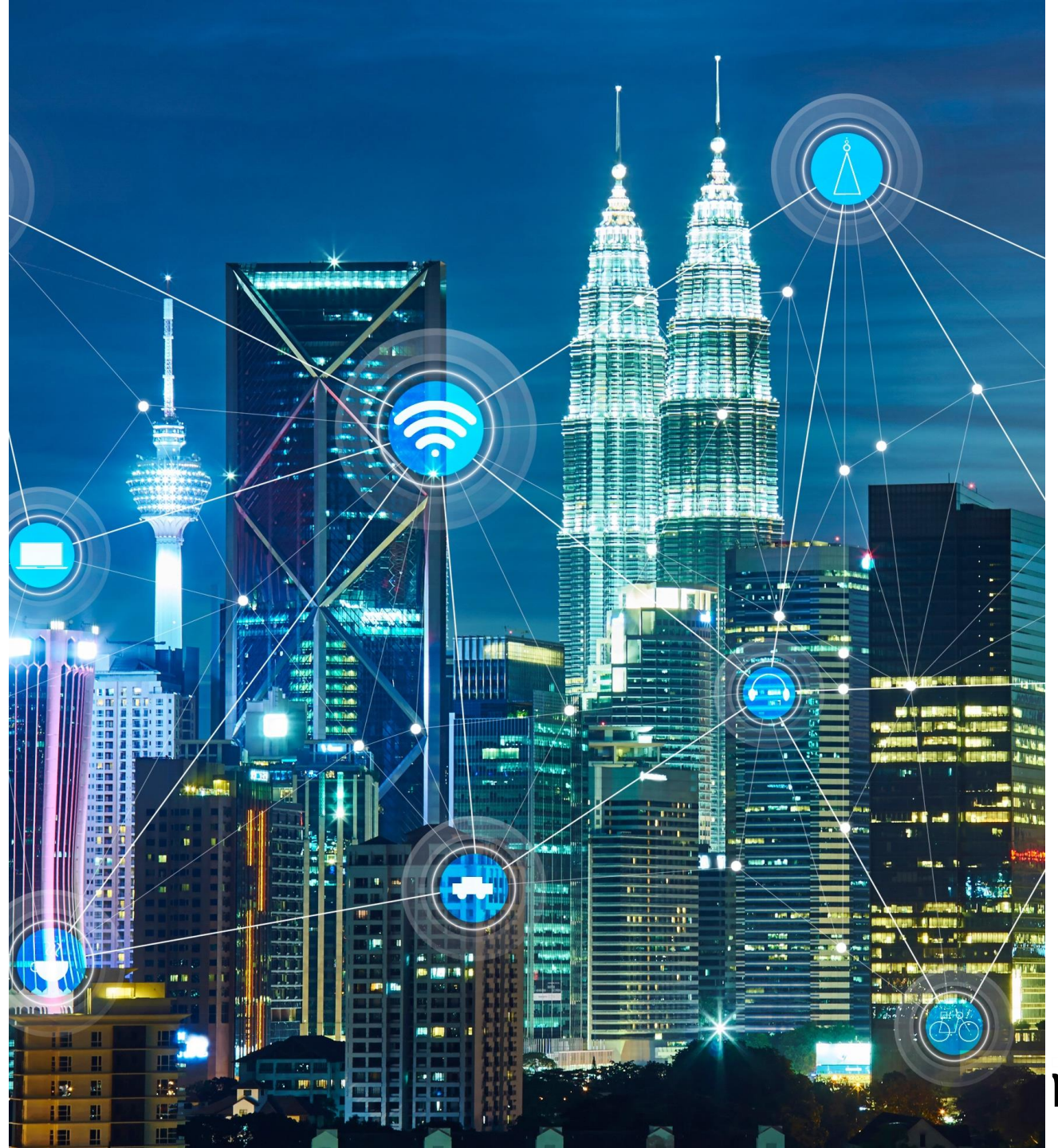
arm-based chips
shipped since 1991

Hallmark of energy-efficient
computing

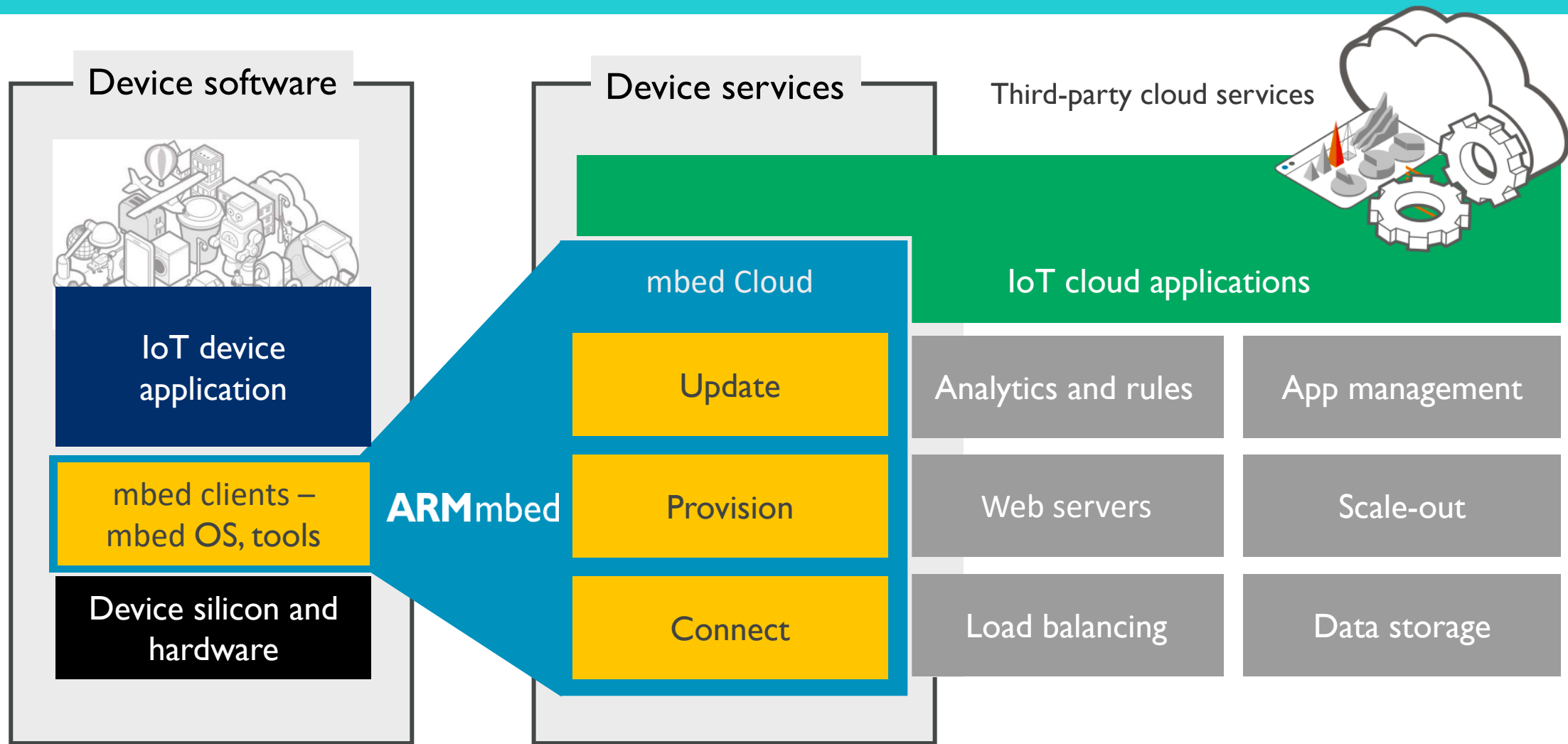
1000+

partner ecosystem

Creation of shared value
to achieve scale



ARM IoT: Easy connection from chip to cloud



Thread is in mbed OS 5

IoT brings a disruptive jump in complexity for embedded software, requiring a platform OS. mbed OS is built to address these challenges in devices built for IoT.

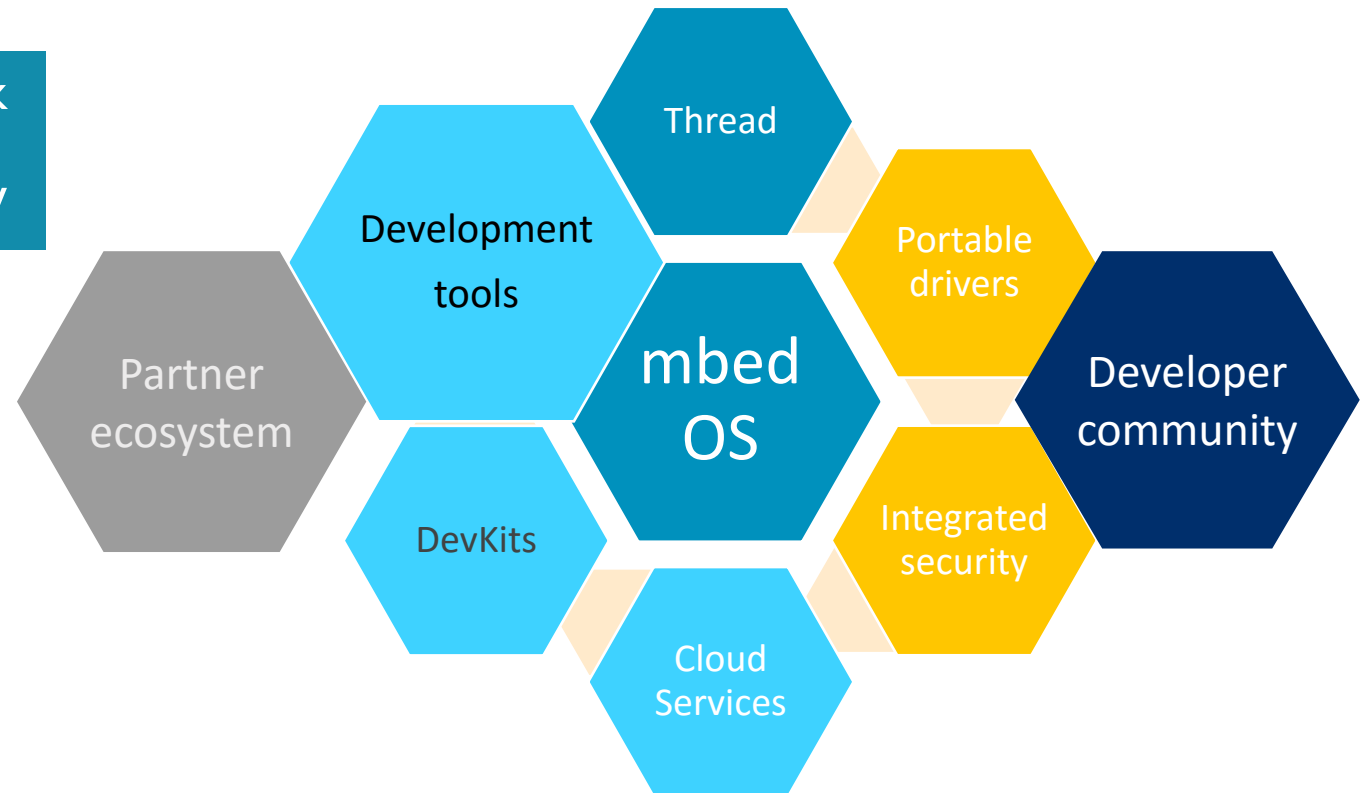
Example application, integrated radio and stack

Reference Border Router SW

Over 52 silicon partners available for
developers today

DevKits – MCUs with ready mbedOS ports

Development Tools



What is Thread

- ✓ No single point of failure
- ✓ Self-healing
- ✓ Interference robustness
- ✓ Self-extending
- ✓ Reliable enough for critical infrastructure

Requirements:

New wireless home network

- ✓ Low power
- ✓ Resilient (mesh)
- ✓ IP-based
- ✓ Open protocol
- ✓ Secure and user friendly
- ✓ Fast time to market
- ✓ Existing radio silicon



ARM's commitment to Thread

July 2014: ARM is one of seven founding members for Thread

November 2016: Conformant Thread stacks announced by **ARM, NXP, Silicon Labs**

February 2017 Certified interoperable Thread Stacks announced by ARM, NXP, Silicon Labs and Nest

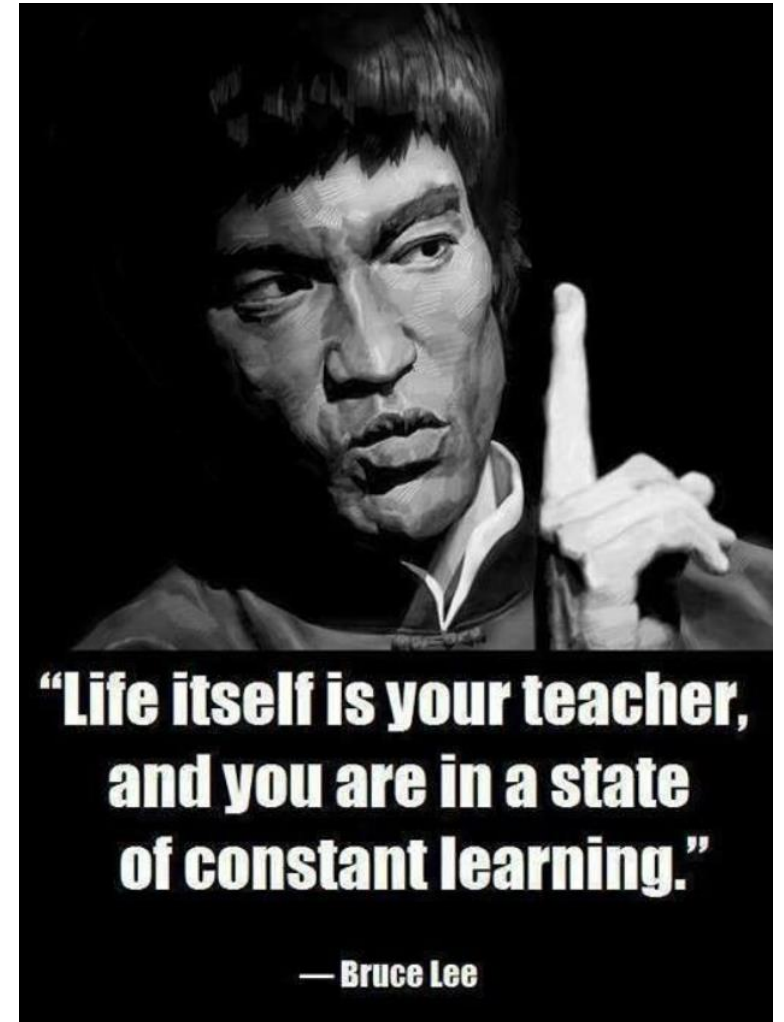


Why we are committed to Thread

Customers demand multivendor solutions. Internet standards (including security) are the only path to industry-wide interoperability.

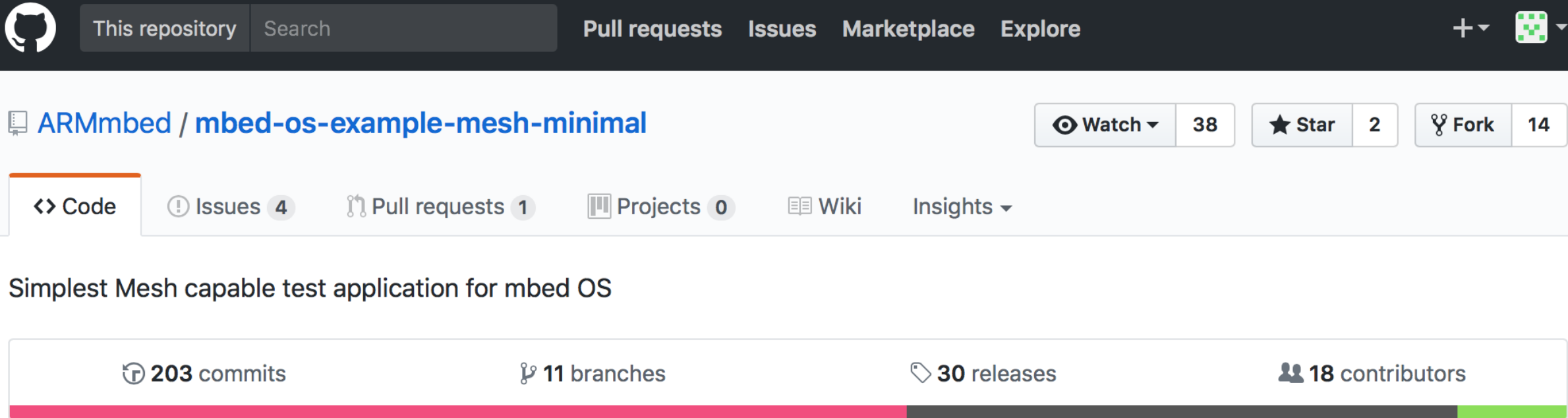
We pioneered open, standards-based, low power mesh networking - 6LoWPAN, CoAP, DTLS... **BUT** there is too much flexibility in the IETF specification -- **interoperability** can not be ensured, especially for **security**.

Thread fills the gaps and ensures interoperability.



Example code dive

The mbed OS and examples are free to download – and use



The screenshot shows the GitHub interface for the repository `ARMmbed / mbed-os-example-mesh-minimal`. At the top, there's a navigation bar with links for 'This repository', 'Search', 'Pull requests', 'Issues', 'Marketplace', and 'Explore'. Below this, the repository name is displayed, followed by buttons for 'Watch' (38), 'Star' (2), and 'Fork' (14). A secondary navigation bar includes links for 'Code', 'Issues' (4), 'Pull requests' (1), 'Projects' (0), 'Wiki', and 'Insights'. The repository description is 'Simplest Mesh capable test application for mbed OS'. At the bottom of the repository header, statistics are shown: '203 commits', '11 branches', '30 releases', and '18 contributors'.

ARMmbed / `mbed-os-example-mesh-minimal`

Watch 38 Star 2 Fork 14

Code Issues 4 Pull requests 1 Projects 0 Wiki Insights

Simplest Mesh capable test application for mbed OS

203 commits 11 branches 30 releases 18 contributors



ARM mbed OS (NXP FRDM-K64F + Atmel ATZB-RF-233)

ARM mbed OS is an open source embedded operating system designed specifically to facilitate the creation and deployment of commercial, standards-based IoT solutions at scale. mbed OS features full support for Thread to simplify development of secure IoT applications in the home and to ease Thread product certification. [Product Link](#)

The “Example”

```
1 ThreadInterface mesh;
2 int main()
3 {
4     printf("\n\nConnecting...\n");
5     mesh.initialize(&rf_phy);
6     int error = mesh.connect();
7     if (error) {
8         printf("Connection failed! %d\n", error);
9         return error;
10    }
11    while (NULL == mesh.get_ip_address())
12        Thread::wait(500);
13    printf("connected. IP = %s\n", mesh.get_ip_address());
14    my_socket = new UDPSocket(mesh);
15    my_socket->set_blocking(false);
16    my_socket->bind(UDP_PORT);
17    my_socket->setsockopt(SOCKET_IPPROTO_IPV6, SOCKET_IPV6_MULTICAST_HOPS,
18        • &multicast_hops, sizeof(multicast_hops));
19    SocketAddress send_sockAddr(multi_cast_addr, NSAPI_IPv6, UDP_PORT);
20    my_socket->sendto(send_sockAddr, message, sizeof(message));
21 }
```

Initialize network interface

Wait... mesh forming can take time

Normal socket usage from here on...

