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An Introduction to the Intelligent IoT Integrator (I3)

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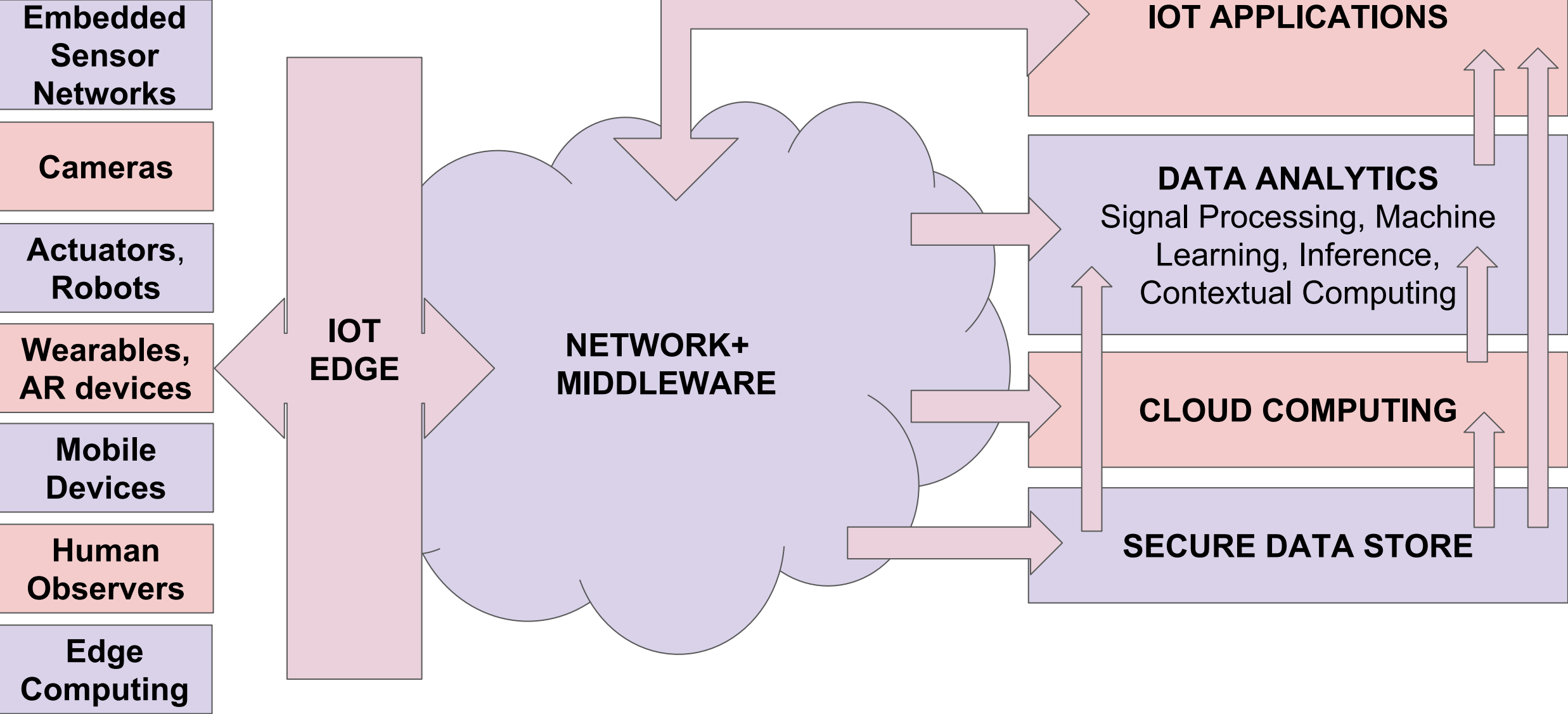
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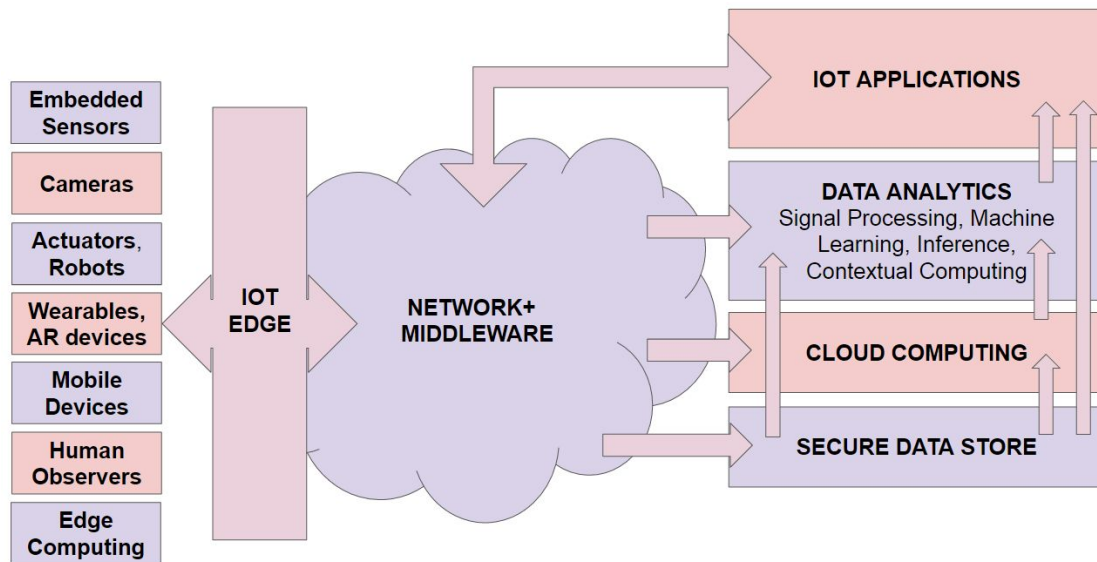
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IoT Architecture



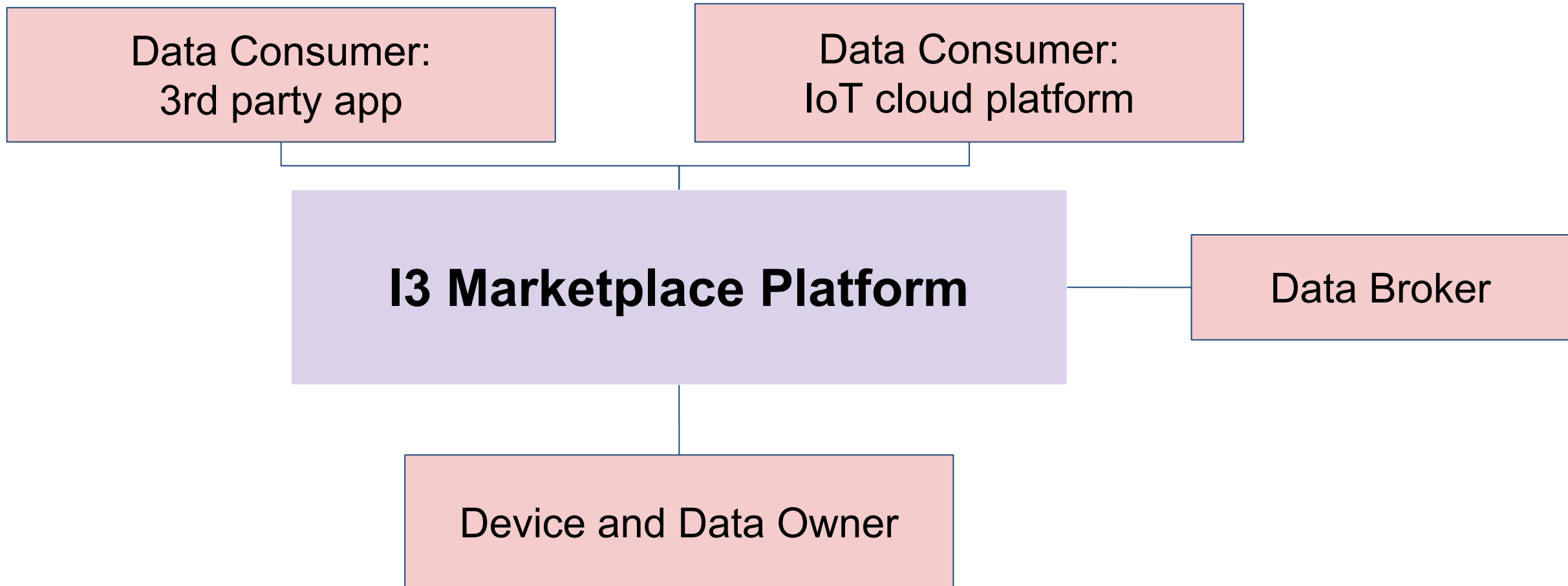
IoT Architectural Challenges



- Traditionally, the same entity owns and manages every block in the architecture from the edge hardware to the cloud and mobile-based application
- Such monolithic, vertically integrated approach limits interoperability
- How can device owners benefit from a larger ecosystem?
- How can application developers access third party-owned devices?
- How to scale geo-spatially?

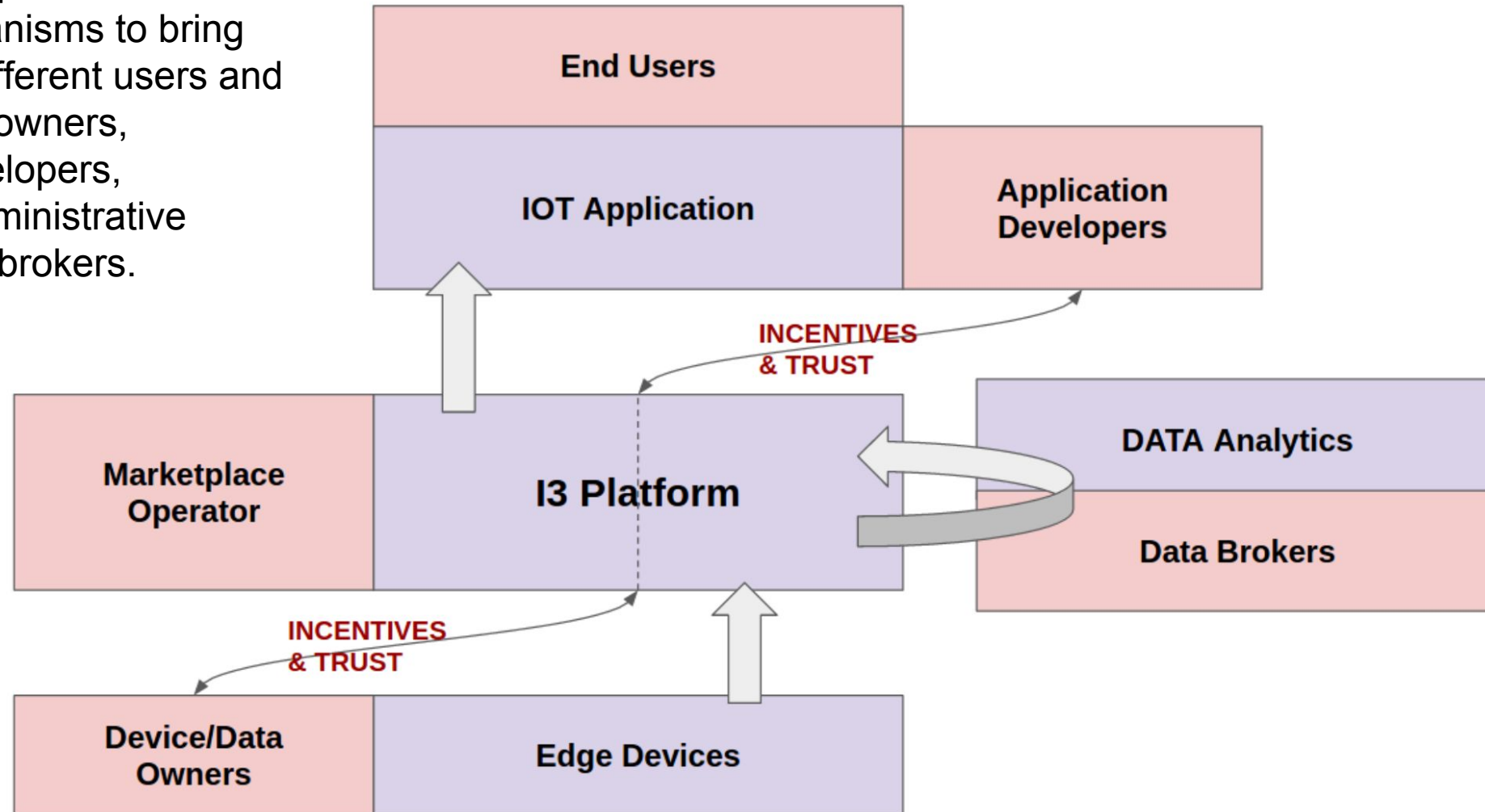
I3 - An IoT Marketplace Platform

We are developing I3, a new IoT Marketplace Platform that enables data owners to provide access to and monetize their data. I3 provides incentives for third-party data brokers to provide services, and enables interoperability.



Creating a unified ecosystem

The I3 platform provides incentive and trust mechanisms to bring together very different users and entities: device owners, application developers, marketplace/administrative operators, data brokers.

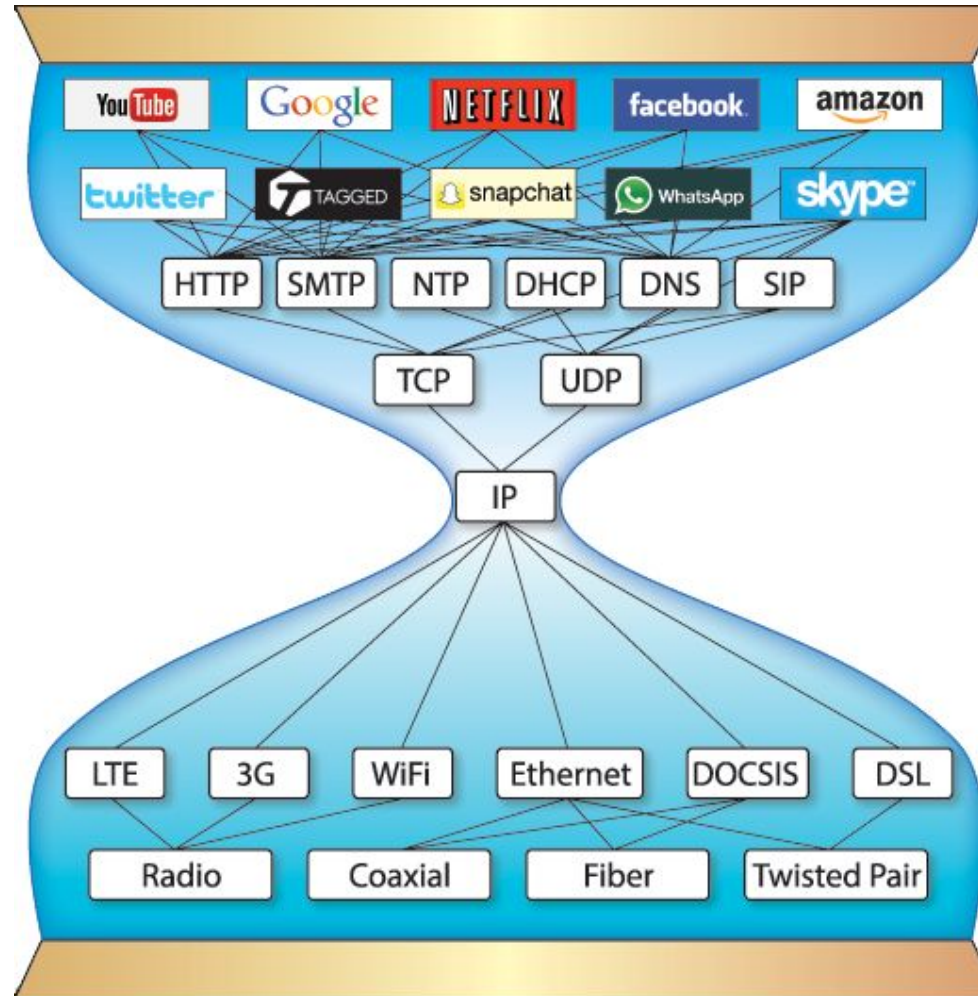


Analogy (1): Narrow Waist

The key architectural element of the traditional Internet that allows for interoperability is that IP provides a narrow waist.

Everything (every transport and application protocol and software) works over IP, and IP works over everything (every type of network / data link / physical layer).

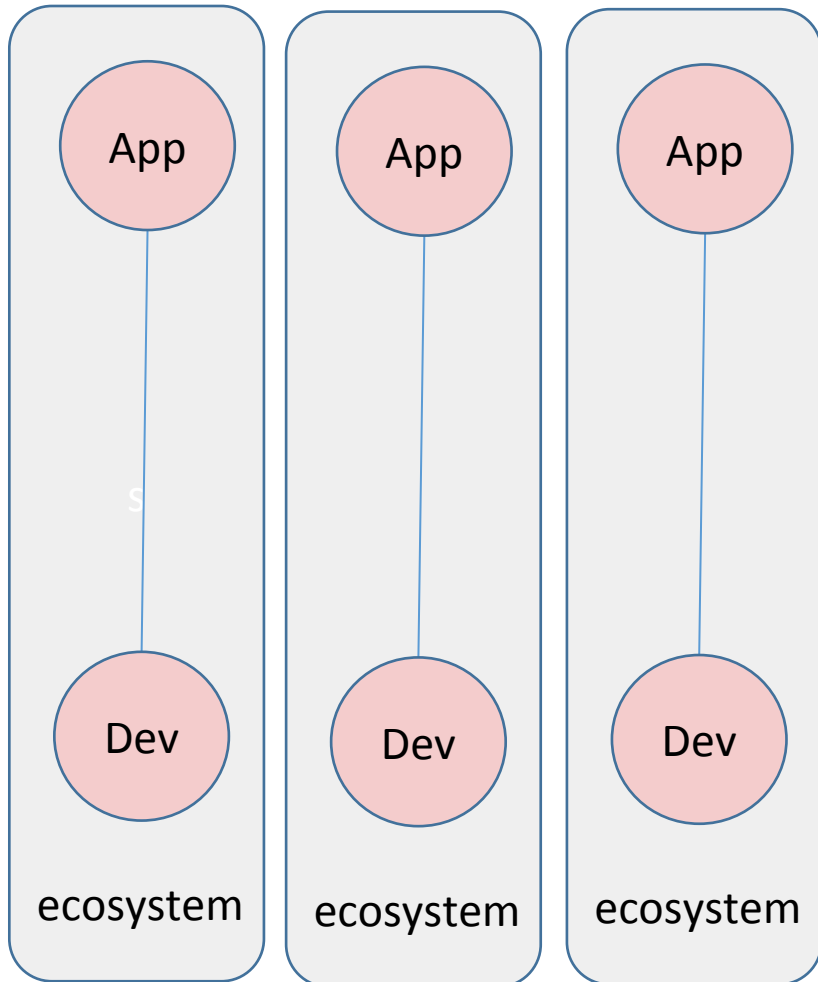
By analogy, I3 too aims to provide interoperability through a narrow waist that separates applications from devices (sensors and actuators).



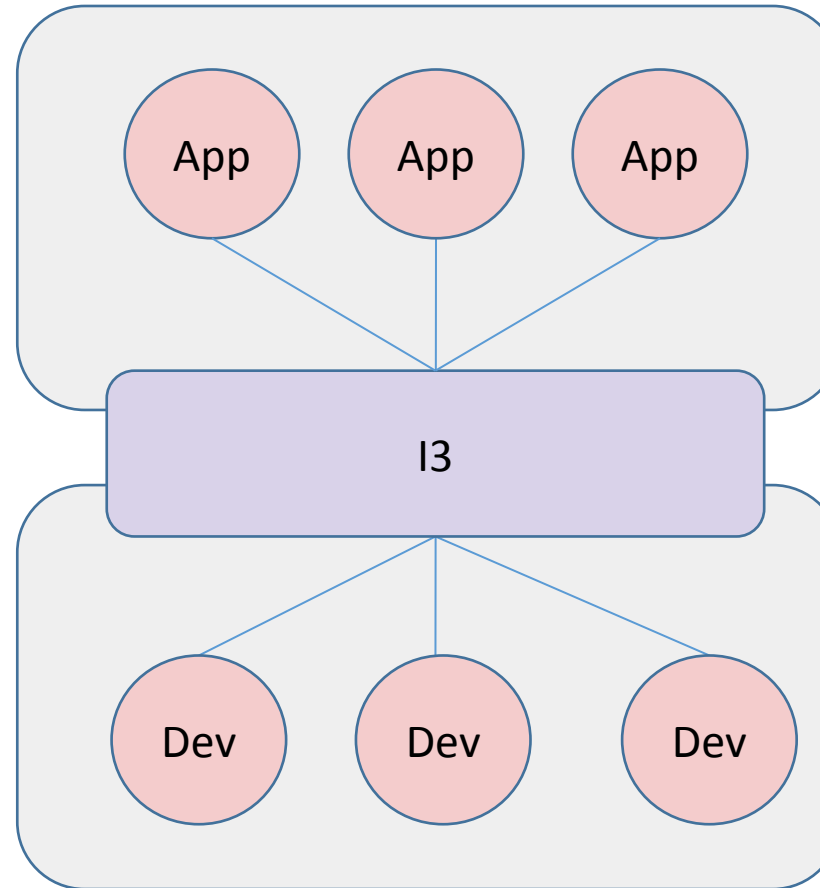
from <http://www.ifwe.co/code/posts/what-title-ii-means-for-tcp/>

I3 as the narrow waist

From:



To:



Apps and devices are no longer siloed and locked in.

Apps do not have to justify themselves to device owners.

IOT data can be accessed by apps as needed and in a shared environment

IOT devices are not tied to apps; migration to new apps can be managed

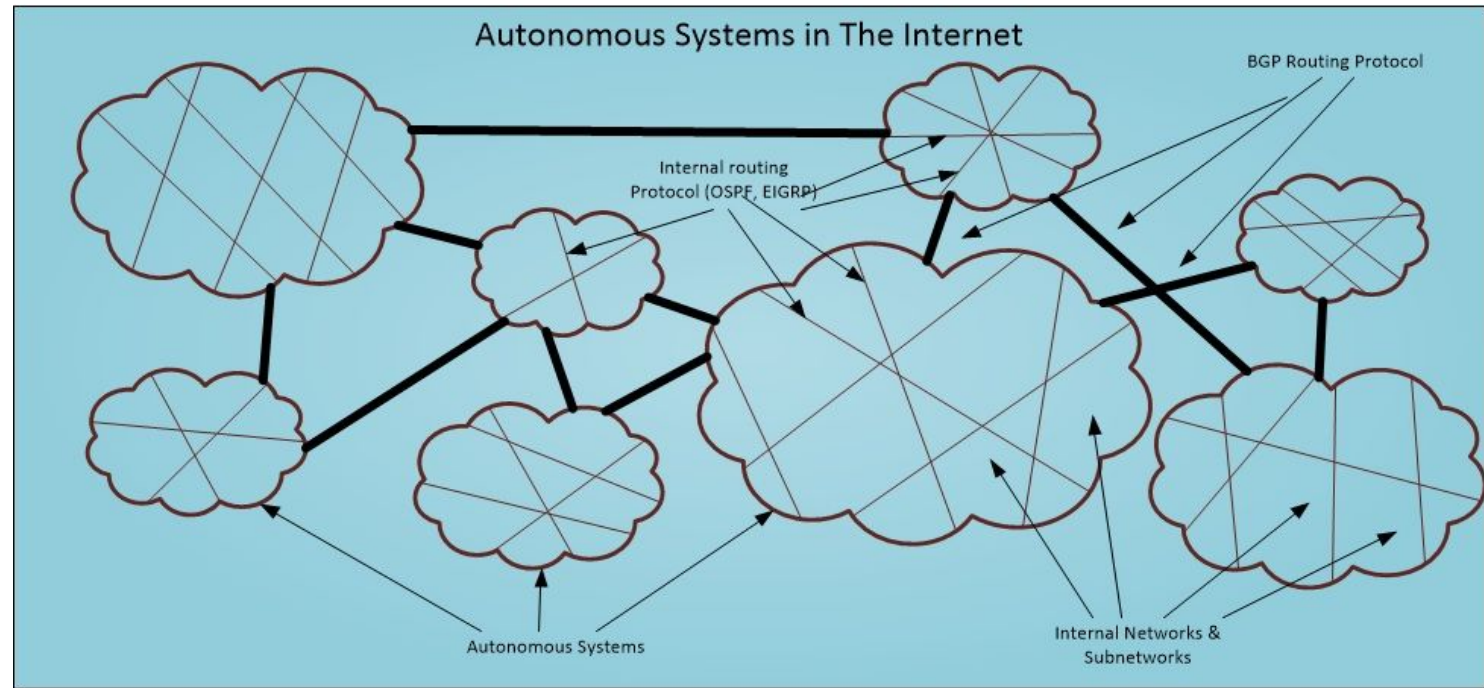
IOT device owners control of data dissemination

Analogy (2) - Network of networks

The key architectural element of the traditional Internet that allows for scalability is that it doesn't provide a homogeneous, flat network, but is rather a hierarchical network of networks.

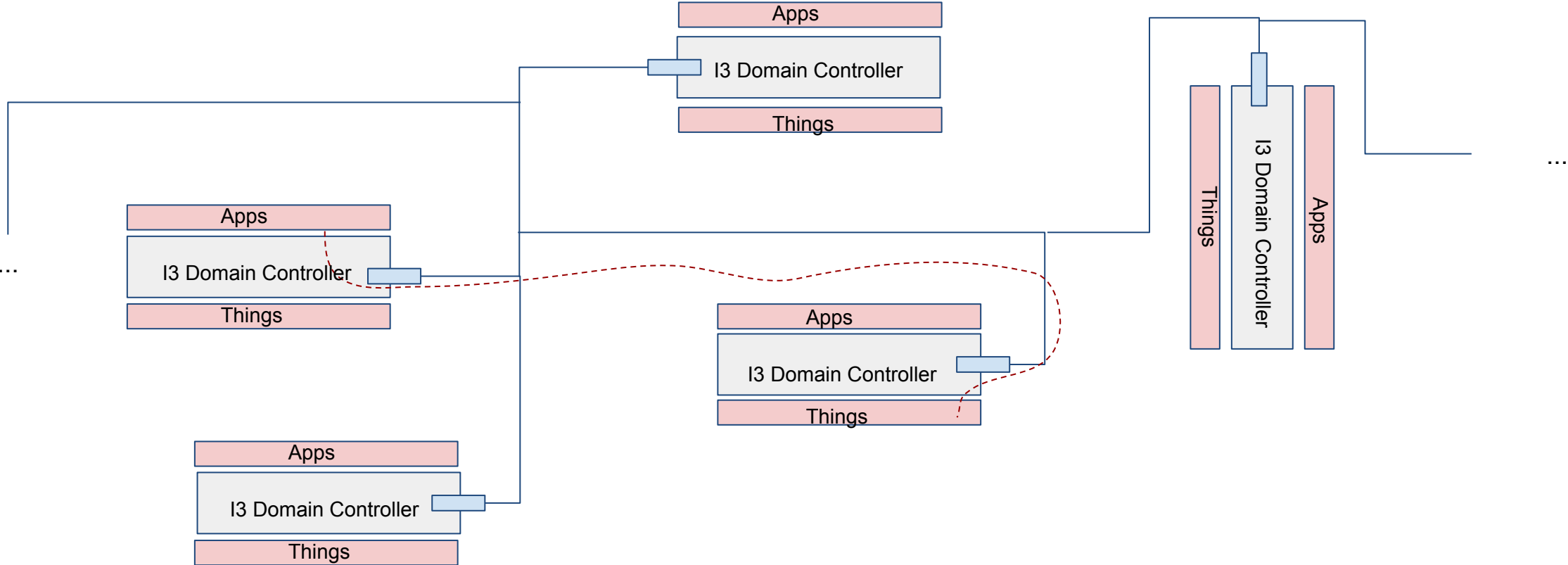
The internet provides for interconnections between different autonomous systems (domains).

Similarly, I3 is intended to be deployed as a series of locally administered domains that link to each other in a peer to peer fashion.

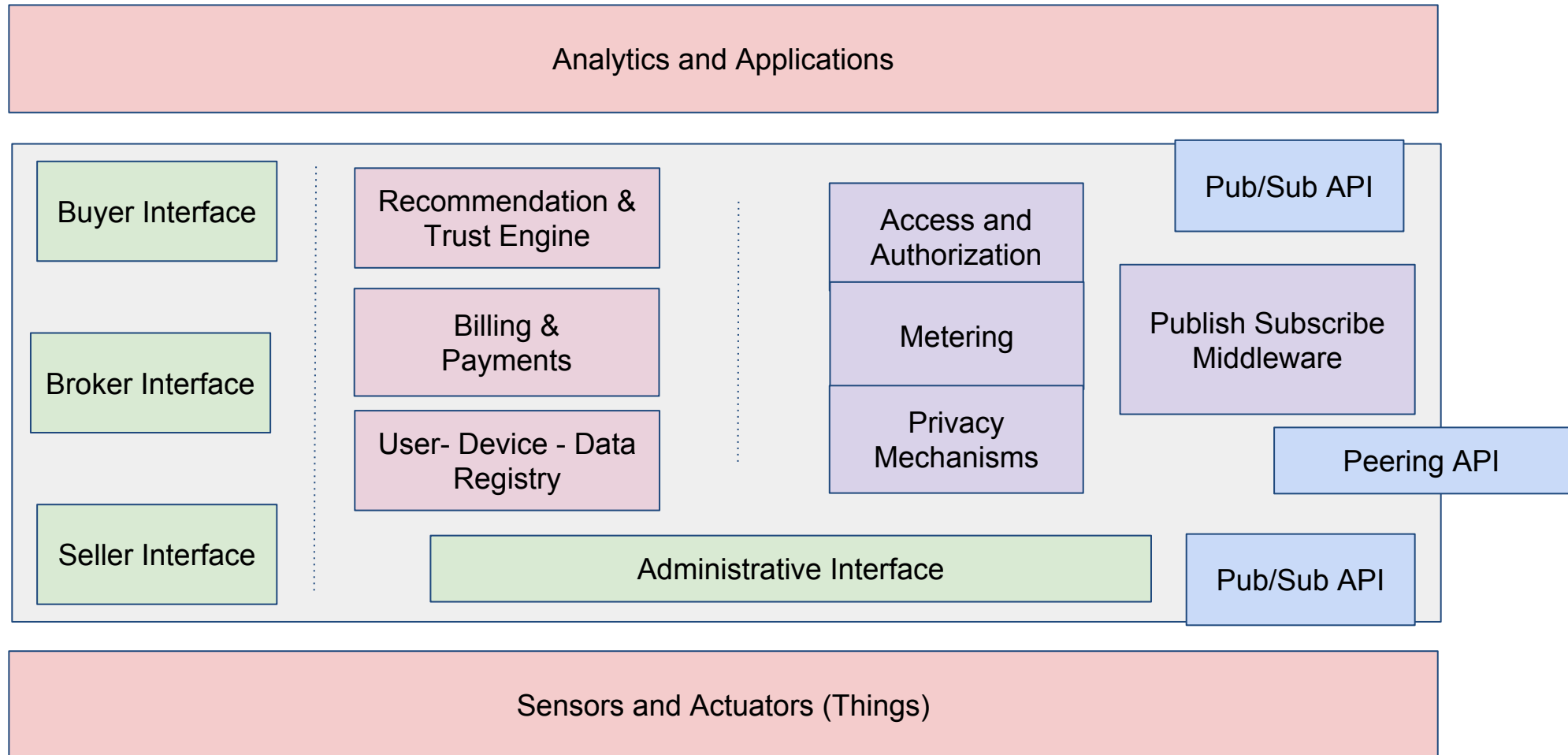


from <http://www.rawbytes.com/>

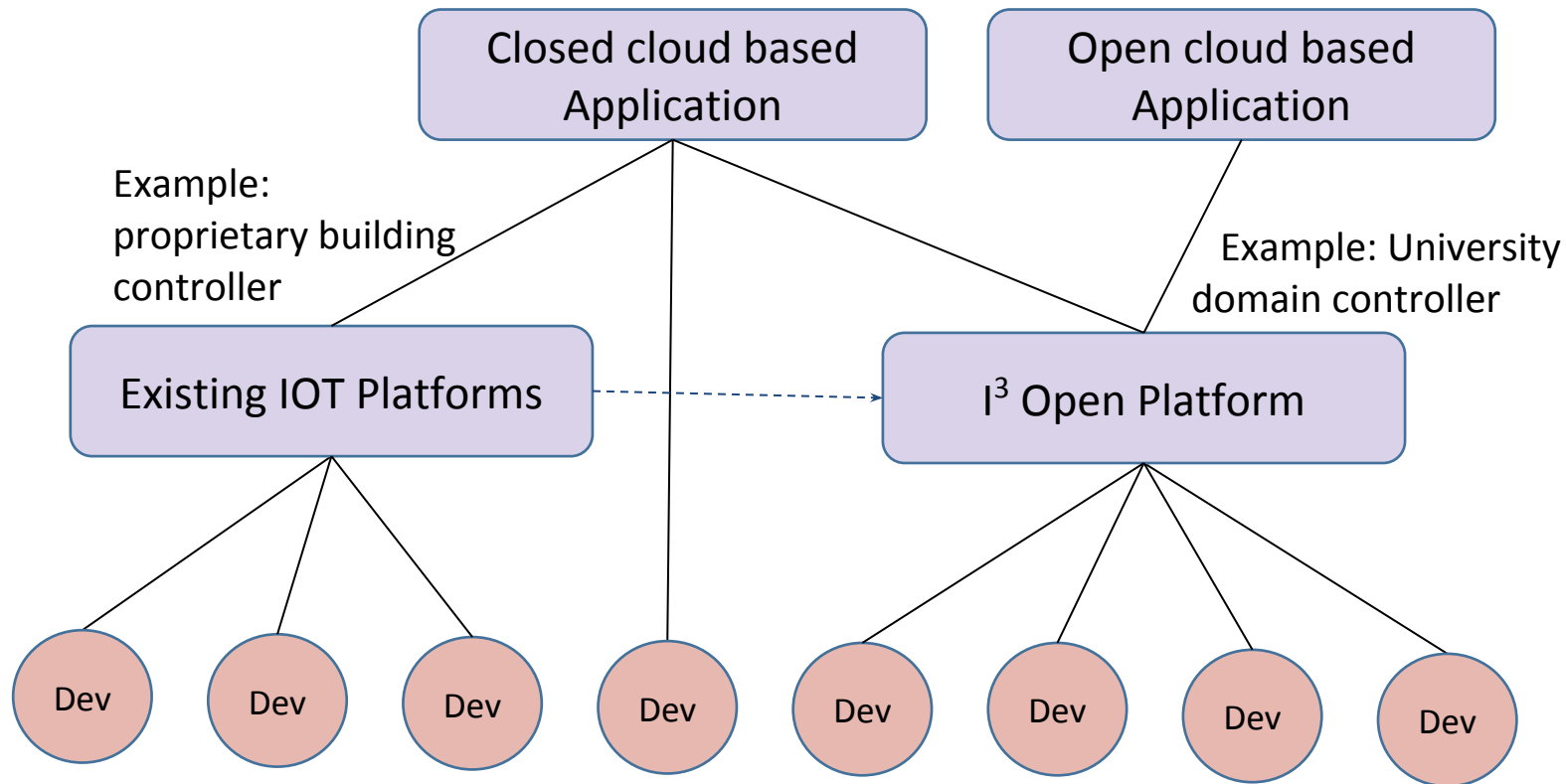
Network of I3's



I3 Domain Controller



Open/Closed Applications



Existing platform manage an IOT domain as a closed entity that can provide and use proprietary data.

The open platform manages an IOT domain as an administration controlled open environment that can feed data to a variety of applications.

Ongoing Efforts

- I3 prototyping
- evaluations on the CCI IoT testbed, with on-campus users
- forming an industry-government-academic consortium to develop I3 as an open platform for smart cities

Thanks!