

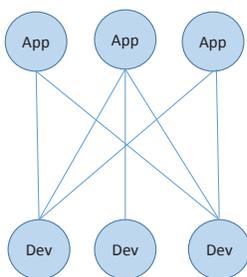


## I<sup>3</sup> Overview

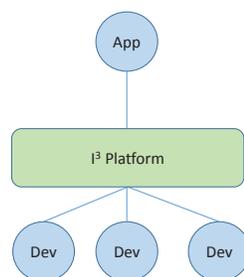
There are a numerous IOT forecasts from different prognosticators and while the numbers vary widely, everyone agrees that the market potential is enormous and this technology will change the way we live and work. However, IOT applications have no value until the devices they depend on are deployed in the network and the device owners have little incentive to aid these companies in disclosing their personal data. Until this chicken-and-egg problem is solved, IOT application developers will struggle to fulfill the promise that IOT represents.

A team of Viterbi and Marshall researchers have developed a concept that seeks to break free of these market inhibitors. The vision is that properly motivated, individuals will contribute their IOT data to a managed and trusted IOT marketplace. USC's Intelligent IOT Integrator (I<sup>3</sup>) is a new class of IOT domain controllers intended to provide such an environment. The marketplace makes IOT data available to the application community who compensates the users based on the value of the data.

From:



To:



Under this vision:

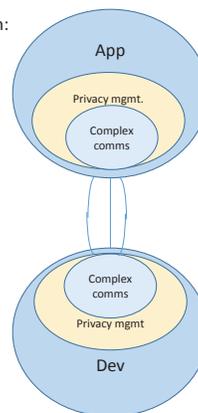
- The IOT application community no longer has to worry about deployment of IOT devices but instead can make use of a large community of networked IOT devices on a pay-as-you-go basis.
- The IOT device owners receive an incentive to grant IOT application access to the data

generated by their devices. Applications petition for access to data based on their data policy and incentives ensuring the device owners are an active part of the data ecosystem and in control over the distribution of the data their devices generate.

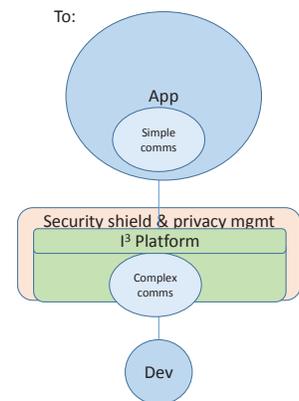
Creation of such a marketplace is complicated and faces many technical, research, and business issues. Success depends on the platform developing and maintaining a trusted position among its supported IOT device owners. This requires attention to privacy issues and requires operational plans that involve the user should a breach occur.

Economics are a significant concern for any large scale IOT network. The complicated and dynamic nature of a modern network precludes integration of complex functions in every IOT device and the availability of an open IOT domain controller provides the means to reduce costs while increasing security.

From:



To:



The I<sup>3</sup> system is designed to run lights-out (no manual intervention is required for normal operation) by a series of franchised by independent service operators. This allows operational costs to manageable while the system scales to support a larger number of IOT devices. The marketplace concept incorporates



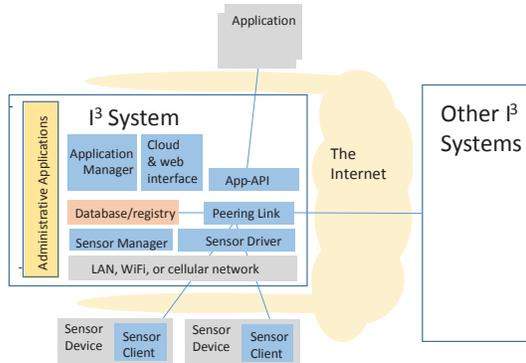
the needed mechanisms needed to ensure sustainable nodal operations.

Unlike many opensource projects where the opensource license focuses on software distribution, the I<sup>3</sup> system license requires that operational entities meet defined operational requirements in an effort to ensure operational compatibility between different I<sup>3</sup> operators.

Part of the I<sup>3</sup> systems concept includes a data curation system. When new sensors or applications are detected, notice of their existence is sent to the registered user community. There is also browsable directory and a recommendation engine that further simplify the process of connecting IOT data sources to the applications that need their data.

A load-sharing reliability system has also been envisioned to allow continued application operations in the face of a dynamic access environment.

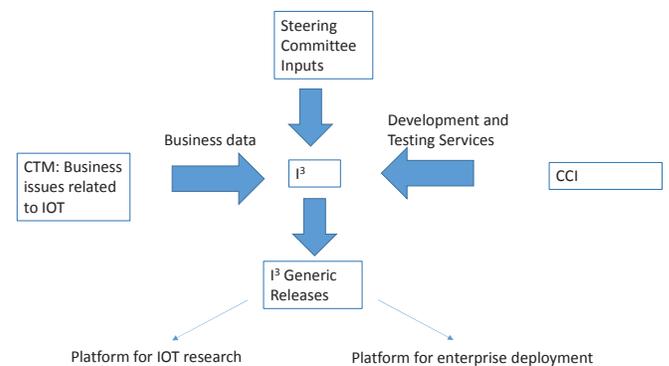
A device agnostic approach to IOT devices allows the system to support a wide variety of device types and this in turn allows applications to consider many different kinds of data as these applications assist in automating our complicated lives. Devices can report structured or unstructured data, provide status or control features, and provide simple or complex system level coverage.



The design is modularly, scalable, and to support distributed environments allowing it to

support university operations, a smart-city, or a distributed group of factories spread over a large geographic area. A single system can provide coverage for a community, a non-profit, a business, government, or educational institution.

The I<sup>3</sup> group is turning this vision into a reality. We have completed development of the initial requirements, completed proof-of-concept test systems, and have begun R1.0 software design efforts. We are seeking corporate partners who understand the value of accelerating IOT market adoption and want to move the I<sup>3</sup> concept into the opensource community. We are also in the process of seeking grants and other forms of support that will allow us to further accelerate our research efforts.



As development proceeds we know we will uncover technical challenges, support issues, and marketing hurdles which will need to be overcome. We are motivated by the knowledge that a democratized and fully realized IOT environment will create economic opportunity, improve our understanding of the world, and form the basis of the next industrial revolution.

We encourage all those interested in leading the IOT revolution, those who believe the future of IOT requires active participation, to join us by sending an email of inquiry to :

[manager@i3-IOT.ORG](mailto:manager@i3-IOT.ORG)