

A Webinar on
**Internet of Things:
Application Frameworks in IoT**
30th September 2014



Question and Answers

Q: Are there any middleware platforms/frameworks available for IoT?

Yes there are some frameworks which offers middleware capabilities for IoT.

AURA is a middleware that supports interacting with complex devices (e.g. digital cameras, PDAs, etc.), and their integration. **Hydra** is another middleware framework for IoT-based system.

In cloud space we have ProSyst and OpenIoT. ProSyst provides the open standards based middleware for connecting and managing devices in the cloud. OpenIoT creates an open source middleware for getting information from sensor clouds, without having to worry about what exact sensors are used. It offers utility-based IoT services.

Q: Is there any standardized protocol stack available for IoT?

As per my understanding, various developments are going on this front. Researchers from the OpenWSN team from Berkeley are creating an open-source implementation of protocol stacks based on IoT standards, using a variety of hardware and software platforms.

From a networking perspective, the introduction of the IETF 6LoWPAN protocol family has been instrumental in connecting the low power radios to the Internet.

From an application perspective, the introduction of the IETF CoAP protocol family has been instrumental in ensuring that application layers and applications themselves do not need to be re-engineered to run over low-power embedded networks

Q: Does sensor networks have to be IPv6 ready in near future?

Most of current wireless sensor platforms use IEEE 802.15.4 as a physical and medium access control layer. The diversity of protocols makes it difficult for sensor networks to seamlessly integrate with existing IP networks. The adoption of IP as the Layer-3 protocol to connect wireless sensors has been slow due to a belief that IP is too large to fit on a memory constrained device. Yet, a real Internet of Things requires the large address space of IPv6. Hence severely memory-constrained devices can fulfill the requirements for Ipv6.

Q. Can RFID-powered Sensors play a key Role in the Internet of Things?

A number of applications require a more reliable energy source before they can be implemented in the real world. In some of these cases, Wireless battery-free sensors based on RFID can be a good fit.

A passive RFID sensor has an "on-demand" reliable source of energy. There is no dependency on environment conditions for the sensor to transmit the required data. The disadvantage is that they cannot measure or transmit when there is no nearby RFID reader to send RF power.

Q. Do you have lessons learned from some real implementation, about the interoperability of the devices - ecosystem?

Interoperability is needed at all levels. It includes consistent standardized platform, standardized testing methodologies and well suited testing tools. The standardized platform is needed to obtain consistency. The standardized testing methodologies based on test specifications will specify how to validate devices and services. e.g. Hypercat provides interoperability by creating an online catalog tagged with metadata that can be read by other IoT devices.

Q. Which electronic devices are advised to use?

The electronic devices to be used in IoT completely depends upon the nature of the application. Sensors and sensory nodes form one of the primary building blocks of the IoT. The devices in IoT need to uniquely identify themselves and should be able to collect the device data and able to send the collected data to the server.

Q. Can you compare the security capabilities of the various frameworks?

There are many application frameworks in the current IoT landscape. I would suggest once you zero in on couple of frameworks based on the type of your application then compare the frameworks on the following factors Authentication, Authorization and Encryption. The frameworks tries to overcome following key security challenges in IoT.

- Data confidentiality
- Privacy protection
- Trust and governance
- Fault tolerance

Q. How do you see use Axeda + Thingwox now that PTC bought both companies?

As per my understanding, by buying ThingWorx PTC gained a technology that is used to speed up the creation of IoT applications and provide maintenance and system monitoring. Axeda can bring broader capabilities in terms of device and asset management, secure connectivity agents and data management.

Q. Any comments on Hypercat?

In my opinion, compare to other IoT standards groups the Hypercat is different in terms of it doesn't just aim to create best practices in IoT implementation. The unique factor is, it is designed for exposing information about IoT assets over the web. The aim of HyperCat is to provide an easy way for similar data sets to discover each other on the internet without humans having to write programmes. This will help to break down vertical data integration and provide a foundation for connected products and applications to interoperate.

Q. How to communicate on http with devices?

For communicating information over HTTP, RESTful HTTP can be used. However, HTTP works great for always-on Web servers, which can easily handle the two-way, real time "request and response" style of Web communications.

But not all devices on the IoT will be set up for this kind of inter-machine conversation. Gadgets whose batteries can run down, or which have to deal with weak signals, can't always respond to real-time HTTP-like requests. To overcome this, in IoT most of the devices tend to rely on other protocols like MQTT, CoAP, XMPP etc.

Q. Suppose I have a device with MQTT and want to communicate using generic http from a webserver... possible?

We can communicate to a device from a webserver using generic http such as RESTful HTTP but in this case device need to have implementation for RESTful HTTP. If a device is enabled with MQTT then its goal is to collect device data and transport that data to the server.

One possible way is to have two servers, where device and one server will communicate with each other over MQTT and two servers will communicate with each other over generic http.

Q. What kind of hosting platform do you prefer: AWS, Google, Azure?

There are many cloud providers available today in the market such as AWS, Google, Azure, Rackspace and so on. Following criterias can help while evaluating the cloud provides

1. Can the Provider Run on Multiple Infrastructures and Support Hybrid Options
2. The provider's ability to recover from hardware, software, and network failures, dynamically, and with minimum downtime
3. Can the Platform Deliver a Balance of Automation and Granular Control
4. The extent upto which provider offers customer support

Harbinger Systems

Q. Will you post the recording or presentation slides of this webinar?

Yes, you can view the recording and presentation slides of the webinar by visiting this link:

<http://www.harbinger-systems.com/insights/webinar/Internet-of-Things-Application-frameworks-in-IoT>

If you have any further questions or would like more details about the webinar and our services or would like to get notified about our next webinar, please let us know at:

hsplinfo@harbingergroup.com

We look forward to interacting with you!

Team Harbinger



Follow us on [Twitter](#) | [Facebook](#) | [LinkedIn](#) | Check out our presentations on [SlideShare](#)