

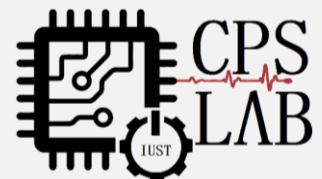


PATRIIoT: Powerful Accelerator Tool for Retrieving Information in IoT Platforms

Presenter:

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Overview

- Introduction
- What is IoT?
- Big data concerns in IoT
- Why we need IoT platform?
- PATRIIoT
- Industrial roadmap
- Research roadmap
- Conclusion



History of IoT

- 1982 - Students invent a connected Coke machine
- 1989 - The World Wide Web is invented
- 1990-1993 - World's first IoT device invented (John Romkey)
- 1998 - Mark Weiser creates a connected water fountain
- 1999 - The term "Internet of Things" was used by Kevin Ashton during his work at P&G which became widely accepted.
- 2004 - The term was mentioned in famous publications like the Guardian, Boston Globe, and Scientific American



The
Boston
Globe
The
Guardian

History of IoT

- 2005 - UN's International Telecommunications Union (ITU) published its first report on this topic.
- 2008 - The Internet of Things was born!
- 2011 - Gartner, the market research company, include "The Internet of Things" technology in their research
- 2013-2014 - IoT devices start using sensors
- 2014 - The first "smart city" is created
- 2018 - IoT enters the healthcare and health insurance industries
- 2020 - IoT steps up in response to the COVID-19 crisis
- 2021 - FIA creates IoT forum



Gartner®



What is IoT?

- The Internet of things (IoT) is a system of **interrelated** computing devices mechanical and digital machines, objects, animals or people that are
 - Provided with **unique identifiers** (**UIDs**)
 - Has the ability to **transfer data** over a network
 - Does not **require** human-to-human or human-to-computer interaction



What is IoT?

- A thing in the IoT can be
 - A person with a heart monitor implant
 - A farm animal with a biochip transponder
 - An automobile that has built-in sensors to alert the driver when tire pressure is low
 - Any other **natural** or **man-made** object that can be assigned an **IP address** and is able to **transfer data** over a network.



What is Big Data?

- Big Data refers to a **massive** set of data that **no conventional data management tool** can handle. It has three main features
 - The **speed** at which information is processed
 - The **variety** of information stored
 - In the form of processed or unprocessed data from a variety of sources
 - The **volume** of information listed
- Big Data is therefore a concept that allows access to **gigantic** databases in **real-time**.

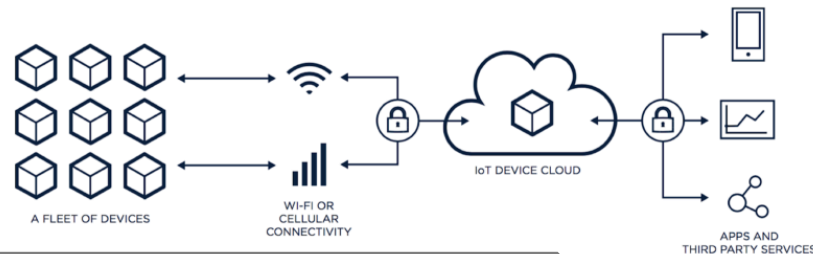
Relationship between Big Data and IoT

- Big Data should enable **real-time** analysis of the data generated by IoT and thus **optimize** the use of this technology. To do this, Big Data proceeds in four steps
 - **Collecting** data generated by IoT by following the three primary principles of Big Data: speed, volume and variety
 - **Storing** data in files within the Big Data database
 - Data **analysis** by complex and efficient analytical systems, such as Spark or Hadoop
 - The implementation of the **report** of the analyzed data



What is IoT Platform?

- Fundamentally, an IoT platform is a **fully-integrated** service that offers everything you need to **connect** and **manage** IoT devices at scale.
- An IoT platform needs to be capable of supporting millions of **simultaneous device connections** and easily allow you to **configure** your devices for machine-to-machine communication.
 - In other words, like a lot of tools, an IoT platform **takes care** of the **complex** IoT infrastructure and allows you to focus on your **product** and **business**.



Why Do We Need An IoT Platform?

- **Facilitation** of development processes
 - Enables benevolent functioning of **data visualization** and other **linking management** to sponsor an **automated** environment.
- Strategic **marketing** weapon
 - Service providers and producers in business can **collect** more data **remotely** about their potential **buyers**.
- **Unification** of data
 - Data becomes **equally accessible** and easier for the customers to obtain information

Why Do We Need An IoT Platform?

- **Safety** and **security** of IoT
 - **Keeping track** of the functioning of devices, **blocks** third-party advent by enabling **end-to-end encryption**, automatic updating and protects against computer viruses
- **Cost** reduction
 - **Abating** the extra cost in an industry by saving the additional **labor expenses**

The different types of IoT platforms

- Edge-to-cloud platforms
 - Tightly **integrate all the infrastructural** components you need to power your IoT product into a single service ([Particle](#))
- Connectivity management platforms
 - Provide all the connectivity technologies you need to **connect your devices to the Internet** over Wi-Fi or cellular ([Mulesoft](#), [Hologram](#), [Sigfox](#))



Edge-to-cloud
platforms



IoT
Connectivity



Cloud
Management



Data
analytics



Artificial
intelligence

The different types of IoT platforms

- IoT cloud platforms
 - Provide all the building blocks you need to **service value** from **your device data** ([Google Cloud IoT](#), [Salesforce Cloud IoT](#)). They typically focus on providing you
 - **Storage**
 - **Data-routing**
 - **Data analysis**
 - **Seamless integrations**



Edge-to-cloud
platforms



IoT
Connectivity



Cloud
Management



Data
analytics



Artificial
intelligence

The different types of IoT platforms

- Data platforms
 - Provide tools that allow you to **gain more insights** from your devices ([Mulesoft](#), [Sigfox](#))
- AIoT platforms
 - Offer **Artificial Intelligence** as a core part of their offering ([Uptake](#))



Edge-to-cloud
platforms



IoT
Connectivity



Cloud
Management



Data
analytics



Artificial
intelligence

Who are we?

PATRIIoT: Powerful Accelerator Tool for Retrieving Information in IoT Platforms



Team Members:



Dr. Hosseini Monazzah
Board of Directors



Eng. Javadi
CEO



Dr. Safaei
Board of Directors



Eng. Aliazam
Development Manager

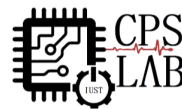


Eng. Naderi
Support Manager



Eng. Janipour
Test Manager

Sponsors:



End-to-end solution Sensor side

- Data is the **most valuable** thing which is produced in **sensors!**
- **Communication ready** APIs
- **Fault tolerant** APIs
- **Power management** APIs
- Many other interesting features!



End-to-end solution Gateway side

- Considered for sensor nodes that **can not access** to internet **directly**
- **Application support** for mobile or PC as gateway
- Support different **communication technologies** (LoRA, NB-IoT, ...)
- Data **labeling**
- Many other interesting features!



End-to-end solution Cloud side

- **Heart** of all communications in PATRIIoT
- Support different **application layer protocols** (MQTT, HTTPS, ...)
- Different **statistical analysis** tools
- Data classification through **ML** algorithm
- **Digital twin** modeling
- Many other interesting features!



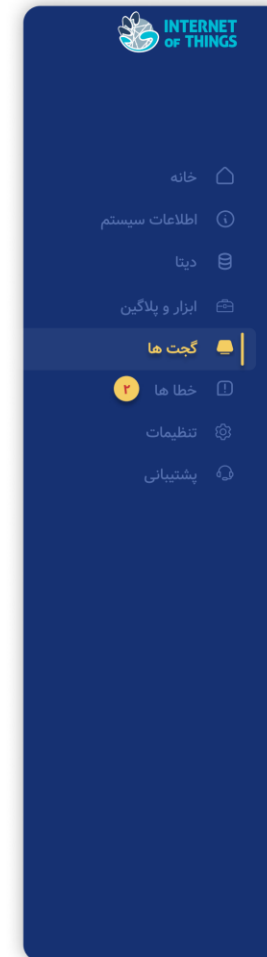
PATRIIoT prototype (TLR-4)

افزودن پروژه | افزودن برجسب | راهنمای افزودن گجت

فیلتر

همه پروژه ها

پروژه	تعداد دیتا های دریافتی	وضعیت	آدرس شبکه	زمان آخرین بسته	زمان اولین بسته	آدرس فیزیکی / نام
ساعت هوشمند	4800 / 5000	فعال	185.165.241.171	01/2/15 12:24	01/2/15 12:24	DC:F7:56:F8:F3:8A
ساعت هوشمند	5000 / 5000	فعال	5.239.217.137	01/2/15 12:24	01/2/15 12:24	علی قاسمی
ساعت هوشمند	100 / 5000	فعال	194.225.229.114	01/2/15 12:24	01/2/15 12:24	ساینا احمدی
بدون پروژه	3250 / 5000	غیرفعال	45.149.77.235	01/2/15 12:24	01/2/15 12:24	B8:27:EB:F0:99:DB
اسپیرومتر دیجیتال	4600 / 5000	غیرفعال	185.165.241.171	01/2/15 12:24	01/2/15 12:24	AC:67:B2:29:C0:E4
ترازو دیجیتال	1200 / 5000	فعال	185.165.241.171	01/2/15 12:24	01/2/15 12:24	1C:C6:3C:70:4E:FC



Internet of THINGS

- خانه
- اطلاعات سیستم
- دیتا
- ابزار و پلاگین
- گجت ها**
- خطا ها
- تنظیمات
- پشتیبانی

PATRIIoT prototype (TLR-4)

ali.Javadi
علی جوادی

پروژه ساعت هوشمند

برچسب	roll	yaw	pitch	زمان	شماره بسته	ادرس فیزیکی و نام
راه رفتن نشسته	2	12	10	1401/02/15 12:24:12	300 /5000	B8:27:EB:F0:99:DB
نشسته	2	12	10	1401/02/15 12:24:12	301 /5000	B8:27:EB:F0:99:DB
راه رفتن آهسته افتادن	2	12	10	1401/02/15 12:24:12	1456 /5000	علی قاسمی
بدون برچسب	2	12	10	1401/02/15 12:24:12	2342 /5000	ساینا احمدی
راه رفتن سریع	2	12	10	1401/02/15 12:24:12	2343 /5000	ساینا احمدی
نشسته	2	12	10	1401/02/15 12:24:12	303 /5000	B8:27:EB:F0:99:DB
نشسته	2	12	10	1401/02/15 12:24:12	304 /5000	B8:27:EB:F0:99:DB
افتادن	2	12	10	1401/02/15 12:24:12	305 /5000	B8:27:EB:F0:99:DB
افتادن	2	12	10	1401/02/15 12:24:12	306 /5000	B8:27:EB:F0:99:DB

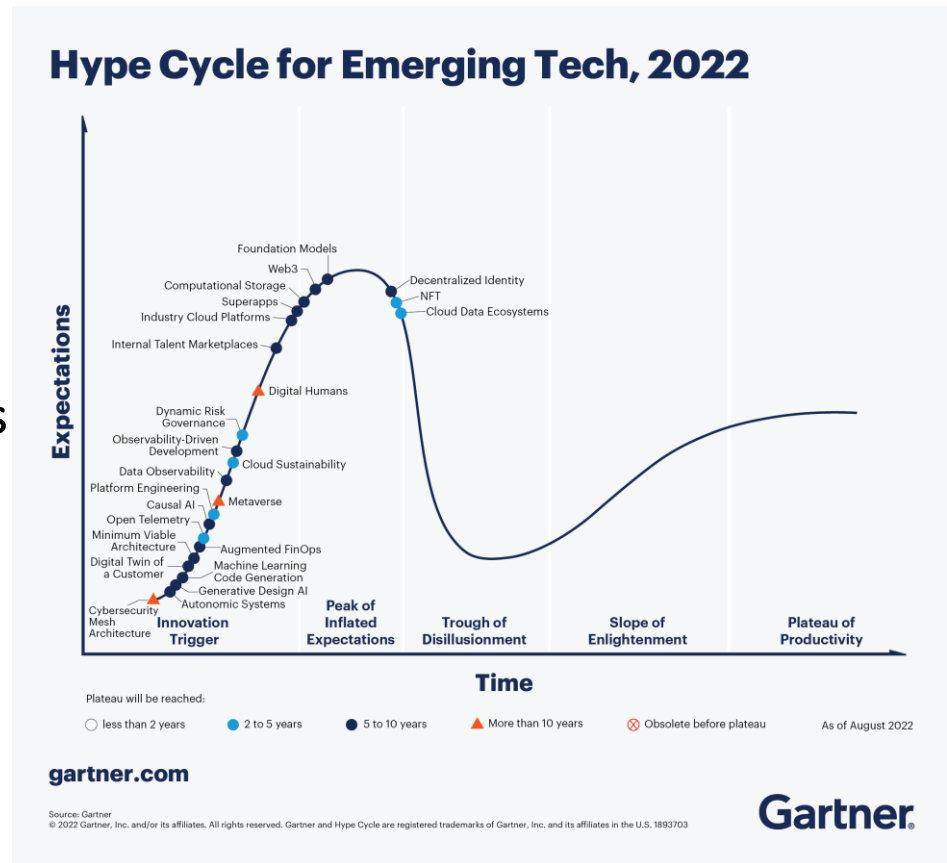
- خانه
- اطلاعات سیستم
- دیتا**
- ابزار و پلاگین
- گجت ها
- خطا ها
- تنظیمات
- پشتیبانی

Possible opportunities

- Industrial market size
 - Healthcare market
 - Was USD **99.80** Bn. in **2021** and is expected to grow by **20.5%** from **2022** to **2026**, reaching nearly USD **253.7** Bn.
 - Automotive market
 - Was USD **79.80** Bn. in **2021** and is expected to grow by **26.7%** from **2022** to **2029**, reaching nearly USD **529.93** Bn.
 - Sensor market
 - Was USD **8.4** Bn. in **2021** and is expected to grow by **26.32%** from **2022** to **2029**, reaching nearly USD **54.46** Bn.

Possible opportunities

- Research trend
 - Digital twin
 - Casual AI
 - Platform engineering
 - Data observability
 - Industry cloud platforms
 - Machine learning



Conclusion

IoT and Big Data

Big Data should enable real-time analysis of the data generated by IoT. IoT generates Big Data!

IoT Platform

It is a fully-integrated service that offers everything you need to connect and manage IoT devices at scale!

PATRIIoT

An edge-to-cloud platform, it tightly integrates all the infrastructural components you need to power your IoT product into a single service!

Industry and research opportunities

IoT is an always-win game (at least for the next 7 years!). IoT platforms like PATRIIoT provide real infrastructures to study most innovation trigger topics introduced by Gartner!





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THANK YOU

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