Survey Introduction

The Eclipse IoT Working Group solicited feedback for the IoT Developer Survey. The intent of the survey is to better understand the trends and attitudes toward developing IoT solutions.

The survey was opened for input on February 9, 2015 and closed March 26, 2015. A total of 394 individuals responded to the survey but 38 were disqualified due to lack of experience in IoT. The survey was promoted through a variety of channels, including Eclipse Foundation social media and web sites, Eclipse IoT WG member promotions to their communities, various IoT Meetups, and other IoT organizations (OMA, OASIS, IIC).

The results of this survey have inherit biases due to the sample communities involved. The results should be viewed as one data point and snapshot of the IoT developer community.
Key Findings

- Developers are engaged with IoT: 33% of respondents are building IoT solutions today. Over 50% are in learning and discover mode.

- Top 3 Influencers of IoT Technology: 1) Hardware vendors, 2) Semiconductor manufacturers and 3) Cloud Providers

- IoT Leaders: Intel, Google, Cisco, IBM, and Bosch

- Important IoT Consortiums: Eclipse IoT, IEEE, IETF
Key Findings

- Top 3 IoT Concerns: Security, Interoperability and Hardware Integration
- Open Source Is Pervasive in IoT: 81% claim open source is used for IoT solutions
- Key IoT Technology: HTTP and MQTT for messaging, Linux for OS
- Top 3 IoT languages: Java, C, JavaScript
Who responded to the survey?
Role

WHAT IS YOUR JOB TITLE?

- Developer: 46%
- Architect: 6%
- Tester: 6%
- Development Manager: 6%
- Product Manager: 9%
- Role in sales and/or business development: 8%
- Executive: 6%
- Student: 5%
- Researcher: 5%
- Other (please specify): 12%

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Organization Size

HOW MANY EMPLOYEES ARE THE ORGANIZATION YOU WORK FOR?

- 1-49 employees: 35%
- 50-500: 19%
- 501-5000: 21%
- Greater than 5000: 13%
- Student: 6%
- Independent Consultant: 6%
Current Technology Focus

What is your current technology focus within your organization? (Pick top 2)
Individual Experience with IoT

WHAT IS YOUR EXPERIENCE BUILDING IOT SOLUTIONS?

- 33%: I participate in the development of IoT solutions for my company
- 22%: I am researching the IoT industry and technology for my company
- 14%: I develop IoT solutions in my personal time
- 9%: I am learning about IoT technology in my personal time
- 7%: No experience
- 15%: Other (please specify)
IoT Experience
Organization Plans for IoT

WHAT IS YOUR COMPANY’S PLAN FOR IOT SOLUTIONS?

- 45% My company develops and deploys IoT solutions today
- 14% My company plans to develop and deploy IoT solutions in the next 6 months
- 13% My company plans to develop and deploy IoT solutions in the next 6-18 months
- 11% My company has no plans to develop IoT solutions
- 17% Don’t know

If respondent has a Embedded Software focus, deploys IoT solution today jumps to 53%, Enterprise Software (35%) and Web Dev (31%)

If respondent has Enterprise Software focus, no plans to develop IoT solutions jumps to 32%
Solution Area

- Home Automation: 43.8%
- Industrial Automation: 35.4%
- Energy Management: 32.3%
- Building Automation: 25.3%
- Connected Cities: 25.0%
- Automotive: 20.5%
- Utilities: 19.8%
- Healthcare: 18.4%
- Transportation: 17.7%
- Public Utilities: 15.6%
- Wearables: 14.9%
- Retail: 13.2%
- Agriculture: 11.8%
- Security / Public safety: 10.4%
- Fitness: 8.0%
- Vending: 6.6%
- Other (please specify): 6.3%
- Security / Defense: 6.3%
Key Concerns for IoT

What are the top 2 concerns for developing IoT solutions? (Pick 2)

- Security: 43.7%
- Interoperability: 30.7%
- Integration with Hardware: 22.9%
- Connectivity: 18.1%
- Complexity: 14.7%
- Privacy: 14.3%
- Cost: 14.0%
- Performance: 10.9%
- Data Analytics: 8.5%
- Maintenance: 7.8%
- Certification/Conformance: 6.5%
- Other (please specify): 3.8%
- Don’t Know: 3.1%

If respondent has Enterprise Software focus, Interoperability more of a concern (39%), vs Embedded (27%) and Web (21%)

If respondent has Embedded Software focus, Connectivity more important (26%)

If company deploys IoT solution today, Connectivity becomes more of a concern (25%)

Security more of a concern for companies planning to deploy in 6-18 months (60.5%)
Technology Influencers

What type of vendors will have the most influence in selecting IoT technology? (Pick 2)

- Hardware vendors (ex. Eurotech, Sierra Wireless, etc) 31.1%
- Semi-conductor manufacturers (ex. ARM, Intel, Qualcomm, etc) 24.2%
- Cloud providers (ex. Amazon, Google, etc.) 24.2%
- Mobile device manufacturers (ex. Apple, Google, Samsung) 18.4%
- Industry solution providers 17.7%
- All technology decisions are made in-house 16.0%
- Enterprise software vendors (ex. IBM, SAP, Oracle, etc.) 11.3%
- System Integrators (ex. Accenture, IBM, etc.) 10.6%
- Network operators (ex. AT&T, Deutsche Telekom, Vodafone, etc) 9.9%
- Don’t know 9.2%
- Other (please specify) 3.8%

Semi-conductor influence depends on technology focus:
- Embedded Software: 35%
- Enterprise Software: 13%
- Web Development: 14%

Solution providers more influential with Enterprise Software focus (25%)

Semi-conductor influence depends on deployment stage:
- Deploy today: 21.5%
- Plan in 6 months: 27.5%
- Plan in 8-18 months: 39.5%
Open Source Policy

What is your company’s policy about using open source technology in IoT solutions?

- Open source is used, and we have developers who work on open source projects: 32.5%
- Open source is used, but we do not participate or contribute to open source projects: 26.8%
- Open source is used, and we contribute bug fixes to open source projects: 21.7%
- Don’t know: 11.5%
- Other (please specify): 2.7%
- Open source is not allowed on the device, but allowed on the server-side: 2.4%
- Open source is not allowed in any part of our IoT solution: 2.4%

Open source is used and developer work on project depends on company deployment stage:
- Deployed today: 50%
- In 6 months: 27.5%
- In 6-18 months: 10.5%
Technology Used
Programming Languages

For Embedded Software developers C is #1 language (64%) and then Java (58%)
What general messaging protocols do you use in your IoT solution?

- HTTP: 63.1%
- MQTT: 53.0%
- CoAP: 21.5%
- In-house: 18.6%
- XMPP: 11.5%
- AMQP: 11.1%
- Proprietary vendor protocol or other not listed (please specify): 8.2%
- Don’t know: 6.8%
- DDS: 5.4%
- None: 1.1%
Which industrial protocols do you use in your IoT solution?

- None: 24.2%
- Modbus: 23.8%
- Don't Know: 23.0%
- Common Industrial Protocol (EtherNet/IP, ControlNet, DeviceNet): 21.9%
- CAN: 20.0%
- KNX: 7.5%
- Other (please specify): 6.8%
- OPC-UA (IEC 62541): 5.7%
- Profibus, Profinet: 5.3%
- EtherCat: 3.8%
- BACNet: 3.4%
- DNP3: 2.6%
- IEC 60870, 61850: 2.3%
- Serco: 1.1%
- FOUNDATION fieldbus: 0.8%
What connectivity protocol(s) do you use in your IoT solution?

- Wi-Fi: 71.0%
- TCP/IP: 65.2%
- Ethernet: 57.0%
- Bluetooth / Bluetooth Smart: 35.8%
- Cellular: 33.0%
- Zigbee: 28.3%
- Serial RS-232/RS-485: 23.7%
- 6LowPAN: 12.9%
- UPnP: 7.9%
- Other (please specify): 6.1%
- Don’t know: 4.3%
- Satellite: 2.2%
- Thread: 1.8%
Operating System

Which operating systems do you use for your IoT devices?

- Linux: 78.2%
- No OS / Bare-metal: 20.0%
- Other (please specify): 11.4%
- Windows Embedded: 11.4%
- FreeRTOS: 11.4%
- Contiki: 7.5%
- Don't know: 7.1%
- mbed: 6.8%
- TinyOS: 6.1%
- RIOT: 2.1%
HAVE YOU EVER USED ANY ACCESSIBLE HARDWARE PLATFORMS LIKE RASPBERRY PI, ARDUINO, BEAGLEBONE, ETC.? 

- Yes, my company deploys IoT solution using an accessible hardware platform.
- Yes, my company prototypes IoT solutions using an accessible hardware platform.
- Yes, I have experimented with accessible hardware in my spare time
- No, but I intent to experiment with accessible hardware in the next 6 months.
- Never used open hardware.
# IoT Consortiums

How would you rank your organization’s perceived importance of the following IoT Consortiums to your IoT solutions?

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<tr>
<th>Consortium</th>
<th>Very Important</th>
<th>Important</th>
<th>Neutral</th>
<th>Not Applicable</th>
<th>Never heard of them</th>
<th>Rating Average</th>
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<td>AllSeen Alliance</td>
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</table>
Do you participate in any IoT partner program sponsored by a vendor? If so which ones? (ex. Work at Nest, Intel IoT Solutions Alliance, Apple Homekit)

- Yes. Please specify the programs: 8%
- Don't know: 15%
- No: 77%
Top 5 IoT Corporate Leaders

What company or companies do you see as being leaders in IoT?
Questions

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