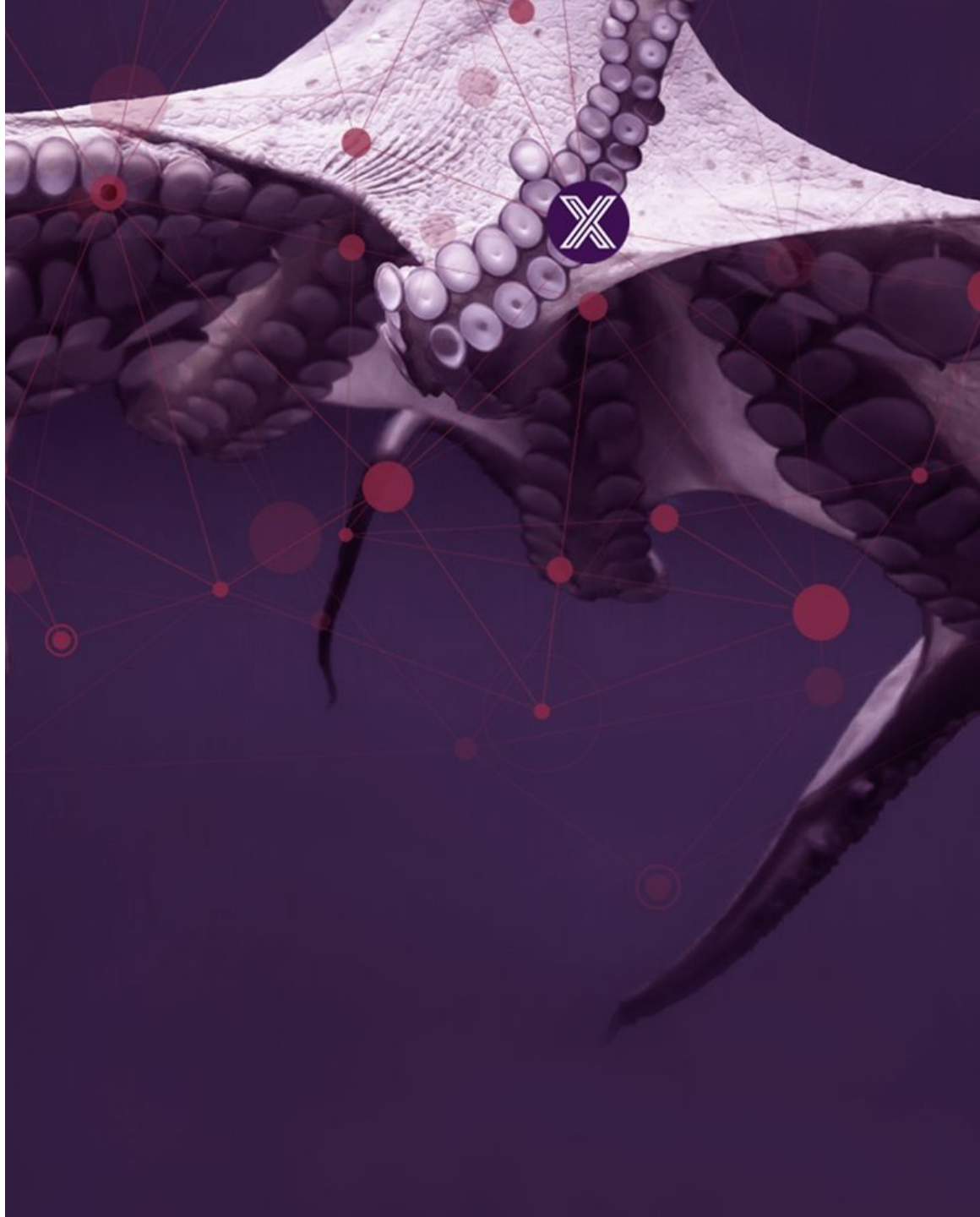
EDGE X FOUNDRY™

TSC Meeting

November 8, 2017



Meeting Logistics

Time: November 8, 2017 7am PST – 8am PST

Join from PC, Mac, Linux, iOS or Android: https://zoom.us/j/983155298

Or iPhone one-tap (US Toll): +14086380968,983155298# or +16465588656,983155298#

Or Telephone:

Dial: +1 408 638 0968 (US Toll) or +1 646 558 8656 (US Toll)

+1 855 880 1246 (US Toll Free)

+1 877 369 0926 (US Toll Free)

Meeting ID: 983 155 298

International numbers available: https://zoom.us/zoomconference?m=mkFexUxEcqHlvXHw53PqScTDRvS48PiQ

** TSC calls are recorded and added to Wiki post-call

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EdgeX Foundry meetings involve participation by industry competitors, and it is the intention of the Linux Foundation to conduct all of its activities in accordance with applicable antitrust and competition laws. It is therefore extremely important that attendees adhere to meeting agendas, and be aware of, and not participate in, any activities that are prohibited under applicable US state, federal or foreign antitrust and competition laws.

Examples of types of actions that are prohibited at EdgeX Foundry meetings and in connection with Linux Foundation activities are described in the Linux Foundation Antitrust Policy available at http://www.linuxfoundation.org/antitrust-policy. If you have questions about these matters, please contact your company counsel, or if you are a member of the Linux Foundation, feel free to contact Andrew Updegrove of the firm of Gesmer Updegrove LLP, which provides legal counsel to the Linux Foundation.

TSC – Members Present Today

Company	Name	Email
IOTech	Andy Foster	andy@iotechsys.com
Analog Devices	Doug Gardner	doug.gardner@analog.com
Mainflux	**Janko Isidorovic**	janko@mainflux.com
Dell	**Jason Shepherd**	Jason.A.Shepherd@dell.com
The Linux Foundation	**Jeremy Phelps**	jphelps@linuxfoundation.org
Dell	Jim White	james.white2@dell.com
IOTech	Keith Steele	keith@iotechsys.com
Samsung	MJ Jeong	myeong.jeong@samsung.com
VMware	**Salim AbiEzzi**	salim@vmware.com
Canonical	**Tony Espy**	espy@canonical.com
Samsung	**Uze Choi**	uzchoi@samsung.com

Current quorum = 8 members

*Note: TSC meetings shall require a **quorum of two-thirds of the TSC total members to take a vote or make a decision.** If a TSC meeting fails to meet the quorum requirement, discussions may proceed, however there shall be no voting or decisions.*

Today's Agenda

- Barcelona Release Update
- Dev Ops Latest
- TSC F2F Meeting (January) Logistics
- New Project Proposal: Oil & Gas
- California Preview Release
- California Release Planning
- Systems Management Update
- Security Working Group Update
- IIC/EdgeX Edge Symposium Update
- AOB

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Barcelona Release Update

Keith Steele

Barcelona Update

- Barcelona Release now available for download!
- We are in the process of a point release for Barcelona now.

Barcelona Release Highlights

- Released Oct 20th (see https://wiki.edgexfoundry.org/display/FA/Barcelona)
- API review and 60+ company onboarding
- Code hardening and increased tests (more than doubled the tests)
- Bug fixes and unused code clean up
- Google IoT Core export service connector (provided by Schlumberger)
- MQTTS export service connector (provided by Beechwood)
- 6 new device services (BACNet, Modbus, BLE, MQTT, SNMP, serial)
- Blackbox testing (provided by IoTech)
- CI and release processes and facilities
  - Checkstyles in place
- Additional elements that were not officially part of the MVP
  - first Go micro service & performance numbers (provided by Dell)
  - ARM builds (provided by Cavium)

Core Metadata in Go (first full Go microservice)

Initial performance numbers and footprint

Measure	***Go***	***Java***
Executable/JAR Footprint	11.7 MB	42.4 MB
Container Footprint	**16.2 MB**	**165 MB**
Memory Usage (On Startup)	**4.3 MB**	**221 MB**
Memory Usage (Under Load)	**9.2 MB**	**230 MB**
CPU Usage (Steady State)	0.15%	0.30%
CPU Usage (Under Load)	5.0% - 15.0%	6.0% - 15.0% **(spiked at 90% for heavy load)**
Startup Speed	**0.14 Seconds**	**12.55 Seconds**
Response Speed (Ping)	0.0011 Seconds	0.0022 Seconds
Response Speed (Post)	0.0091 Seconds	0.0137 Seconds
Response Speed (Get)	0.0038 Seconds	0.0062 Seconds

Dev Ops Latest

Jeremy Phelps

DevOps Update

First point release to Barcelona coming. I've created barcelona branches in all the projects from tag 0.2.0 and have created "barcelona" Jenkins jobs.

TODO:

1. Get Black Box testing integrated with CI process for Java artifacts.
2. Cross compilation of artifacts on LF CI env.
3. Go ARM testing via QEMU/Linaro Cloud.
4. Go ARM docker containers
5. Black box testing ARM artifacts in Linaro/Cavium
6. Daily dev release of docker containers to docker hub
7. **AI:** Discuss GO Repo in next GO meeting, then call for TSC approval

In Short: A busy month

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TSC F2F Meeting

Brett Preston / Keith Steele

January 16-18, 2018 - Orlando, FL

- Wiki page: https://wiki.edgexfoundry.org/display/FA/16-18+January+2018%3A+Orlando+Technical+Meeting
- Venue secured:
  - HYATT REGENCY ORLANDO INTERNATIONAL AIRPORT
- RSVP by emailing info@edgexfoundry.org
  - Note if you plan to attend in-person or by dial-in
  - Current RSVP Counts: 4 in-person / 0 dial-in

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Oil & Gas Project Proposal

New Project Proposal: Oil & Gas Project

- Wiki page: https://wiki.edgexfoundry.org/pages/viewpage.action?pageId=7602309
- Project Information: https://wiki.edgexfoundry.org/download/attachments/7602309/EdgeX-Foundry-Oil%26Gas-v2.pdf?version=1&modificationDate=1508685451000&api=v2
- Discussion
  - Initial contribution tied to use case; no code contribution yet
  - Goal being to drive toward code contribution
  - **AI:** Discuss over the Vertical Solutions mail list
  - **AI:** Define what constitutes a “Project”

Future Project Ideas

- Project with Hyperledger - Data getting into Hyperledger
  - **AI:** Mainflux will explore a cloud connector in the Applications WG
- CIP Project - Want to make sure industries have long-term support for linux kernel. Look to have EdgeX certified to run on that kernel
  - **AI:** Philip is already in discussions and will send info, provided by CIP, to TSC mail list

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California Preview Release

Potential EdgeX Development Plan Summary

Targeting 3 major releases - Jun 2018 through Jun 2019

- Jun 2018 ("California")
  - Multi-hardware/OS support
  - Near real-time capable and small footprint
  - Security services and APIs
  - Additional north and south side connectors
- Oct 2018 ("Delhi")
  - EdgeX system management APIs and connectivity to cloud based control system
  - Microservice OTW/OTA upgrades
  - Multiple language device service SDKs
  - North-side services framework for customizing north side data exfiltration and device actuation
- April 2019 ("Tokyo")
  - Certification program, processes and testing tools
  - Include user interfaces and data visualization
  - Start of east/west EdgeX communications (failover and device activation)

California Preview Release

- Delivery - Jan 2018
- Focus: Go Service replacements/performance demonstration
  - Core Data, Metadata, Command (Dell)
  - Export Client (Mainflux)
  - SDK elements (Canonical)
  - Potentially Config/Registry (Samsung)
  - Potentially Export Distro (Cavium)

California Preview Release (continued)

- Java SDK refactor/simplification
- Improvements of Test Framework
  - Full Blackbox testing (all APIs)
  - Go services be “certified” as drop in replacements by our test framework(s)
  - Integration of Blackbox testing to CI process
- Potentially documentation additions/changes
- Complete/refine CI/Release processes and systems (ex: dev release containers)
  - ARM build process and ARM versions of services
- Firm up Azure IoT Hub connector - as stretch goal
- C based Device SDK
- Web oriented demos
- Strategy doc for Security and System Management API’s
- California Release Target Functionality List

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California Release

California Release June 2018

- EdgeX security services and APIs
  - Authentication/authorization protocols surrounding all APIs
  - Protecting data at rest and motion
  - Security testing framework
  - Code signing
- Reduced footprint – EdgeX's 10 major microservices collectively running in under 1GB or memory
- Near real-time EdgeX microservices – capable of data collection and actuation at the edge in under 250ms
- EdgeX running and available on Intel and Arm-based architectures
- EdgeX running (and tested) on Windows 10/7, Windows 10 IoT, MacOS, Red Hat Enterprise Linux v7, CentOS v7.3, Unbuntu Desktop 16, and Debian v8.
- EdgeX out-of-the-box exports to Azure IoT Hub, Google IoT Cloud, AWS IoT and IBM Watson IoT
- EdgeX device services that support use of Modbus, BACnet, BLE, SNMP, MQTT, OPC-UA, CANbus, and Zigbee devices/sensors with EdgeX.

California Release Security & System Management

- Planned Security Features
  - API Manager
  - Key Management
  - Secure micro service-to-micro service communications

- System Management Features
  - Base Micro service APIs to support (start, stop, restart)
  - Expose bootstrapping Configuration/Registry service
  - Device management

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Systems Management Update

Salim AbiEzzi

Agenda from 20171106 WG Call

- Introductions
- Adopt (e.g., LwM2M) vs. define
- Proposed model of management agent and managed objects
- Determining functions of the different MOs
- Refining REST interfaces
- Implementation
- Volunteers to divide and conquer

Summary

- Light attendance
- Possibility to change call from 8am to 1pm Pacific, better for Asia
- Revisited “adopt existing” versus “design custom” solution
- Discussion and comments on OOB secure auto-config
- Priority is the interface to Microservices MO, targets CA release

OOB Secure Auto-Config

- Requires WAN connectivity, should have a LAN solution
- Multiple steps of ownership before that of deploying customer
- Privacy (who owns which device) protection
- Intel's EPID
  - Intel owns key server
  - requires WAN connectivity
- Hence, LAN auto-discovery approach
  - select a mature standard
  - discovery client on EdgeX gateway
  - discovery server on configuration server

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Security Work Group Update

Riaz Zolfonoon

Security WG

Key Management - Requirements

- Keys
  - Create, Read, Update (attributes), Delete
  - Store (external keys) and support policy-based key export
- CA
  - Simple Out-of-the-box self-signed CA
  - Support external CAs
  - Certificate status queries (OCSP)
- Data Protection
  - Encrypt/Decrypt
  - Sign/Verify
  - MAC

Security WG

Key Management - Next Steps

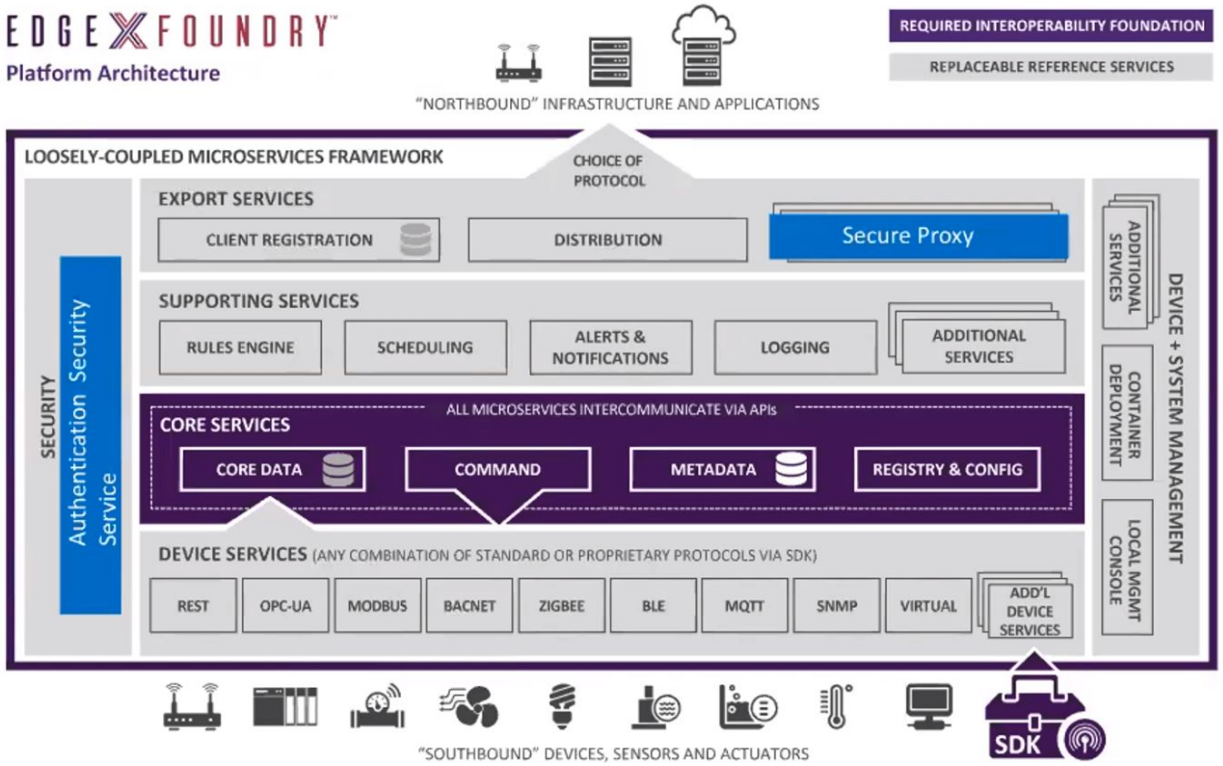
- Evaluate available options
  - Hashicorp Vault
  - KeyWhiz
  - Confidant
  - Kubernetes
- Resolve Requirements/Licensing/etc
- Timeline
  - Proposal to WG by Nov 30th
  - Review completed by Dec 31st
  - Proposal to TSC (@f2f)

Security WG

API Manager - Requirements

- Inbound Secure Reverse Proxy for HTTP(s)

- Requirements
  - Boundary Protection
  - Namespace/Port aggregation
  - Deployment flexibility
  - Local or centralized authentication
  - URL only versioning - allow multiple versions concurrently



Security WG

API Manager - Next Steps

- Evaluate available options
  - Tinyproxy
  - lighttpd
  - Apache - mod proxy
  - nginx
- Resolve Requirements/Licensing/etc
- Timeline
  - Proposal to WG by Nov 30th
  - Review completed by Dec 31st
  - Proposal to TSC (@f2f)

Security Work Group Meeting Today post this call

11:00 am EST

Meeting Time

- Security Working Group meetings are open to the public, and are held weekly.
- Security Working Group meetings are held on Wednesday's at 8am PDT (find your local time here)
- To be added directly to the meeting invitation, please email info@edgexfoundry.org
-
- ---
-
- Dial-In Info:
- Join from PC, Mac, Linux, iOS or Android: https://zoom.us/j/576218946
- Or iPhone one-tap (US Toll): +14086380968,,576218946# or +16465588656,,576218946#
- Or Telephone:
- Dial: +1 408 638 0968 (US Toll) or +1 646 558 8656 (US Toll)
- +1 855 880 1246 (US Toll Free)
- +1 877 369 0926 (US Toll Free)
- Meeting ID: 576 218 946
- International numbers available: https://zoom.us/zoomconference?m=t6UX5OTIE0SFrIk-9MMnBPbFjE3dZ_xx

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EdgeX/Industrial Internet Consortium (IIC) Edge Symposium

Jim Clardy

EdgeX/IIC Edge Symposium

IIC/EdgeX Joint Workshop Coordination **[Owner: Keith]**

- Joint call held with OMG earlier this week
- IIC Chair Richard Soley wants to increase activity in IIC Edge track
- Agreed we will hold joint Edge Symposium either a one day or half day event
- Targeting Reston IIC Meeting in February 2018 for 1st meeting with follow on meeting in Europe (May IIC meeting)
- Targeting Single track meeting room 75-100 attendees
- Current EdgeX organising committee Jim Clardy, Jason Shepherd, Keith Steele, Salim, Riaz, Jeremy
- Possible areas for collaboration/Workshop: Vertical Domain Edge Testbeds, Quantifying IIOT ROI, Security collaboration, Edge Platform variants, Leveraging Open Source, standardization/certification etc
- Actions: EdgeX to provide IIC Liaison WG with written request for event, outlining agenda/themes, intent for split and scheduling of speakers, possible alternate dates/venues, 2018 on-going plans
- Actions: Salim to get in touch with edge working group at IIC (testbed in IIC vertical domain)

EdgeX/IIC Edge Symposium

- Latest update: EdgeX to summarize request in writing, incl. topics/themes, LF ability to source speakers, expected quid-pro-quo on # of speakers from IIC, point contact for logistics, possibly alternate venues/times throughout 2018

AOB / Reminders

Project Resources

Quick links to most commonly used Community Resources

- Code: https://github.com/edgexfoundry
- Documentation: https://wiki.edgexfoundry.org/
- Discussion: https://chat.edgexfoundry.org/
- Mail Lists: https://lists.edgexfoundry.org/mailman/listinfo
- Twitter: https://twitter.com/EdgeXFoundry
- LinkedIn: https://www.linkedin.com/company-beta/22298339/
- YouTube: https://www.youtube.com/channel/UC30DbbsoqbkGJYJ5omJJsng

Project Contributions Welcome!

- Our objective is to make EdgeX use & deployment pervasive!
- EdgeX success is 100% dependent on the vibrancy of a proactive community
- Getting Involved
  - Project membership growing - want to join contact Philip DesAutels at LF (pdesautels@linuxfoundation.org)
  - First Priority is the MVP - potential contributors please contact keith@iotechsys.com (people, equipment, technology)
  - If interested in adding new projects please contact the relevant working group chair

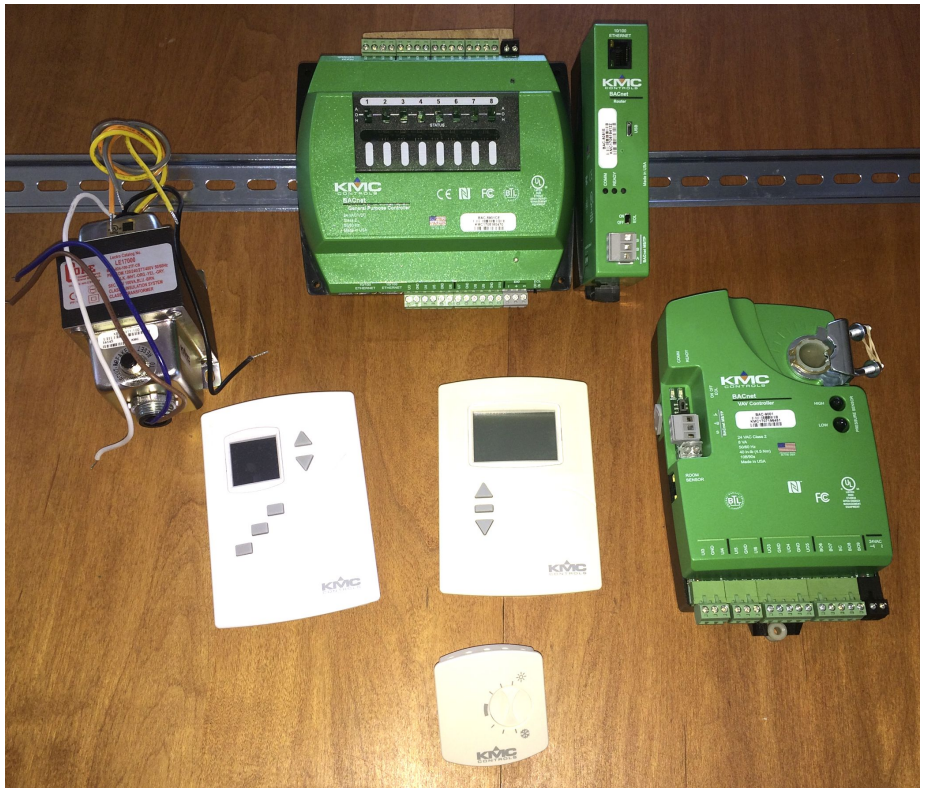
EdgeX - Where to learn more

- EdgeX Foundry Wiki
  https://wiki.edgexfoundry.org/display/FA/EdgeX+Foundry+Project+Wiki
- EdgeX Foundry Rocket Chat
  https://chat.edgexfoundry.org/home
- Weekly EXF Technical Spin up calls by Jim White, Dell (james_white2@dell.com)
  30 minute deep-dive topics followed by 30 minute open Q&A
  Thursdays @ alternating times (6pm & 9am EST)
    Calls resuming post-Barcelona release
  Email info@edgexfoundry.org to request to be added directly to meeting invite
  Previous call recordings are available on the Wiki

What is the Device Exchange?

- A great way to put your products in the hands of other members so they can help build a better EdgeX!
  - https://wiki.edgexfoundry.org/display/FA/Device+Exchange

KMC CONTROLS



Special thanks to Dave Bohlman and KMC Controls for making this awesome kit and how-to guide available to members!!

Hackathon Events

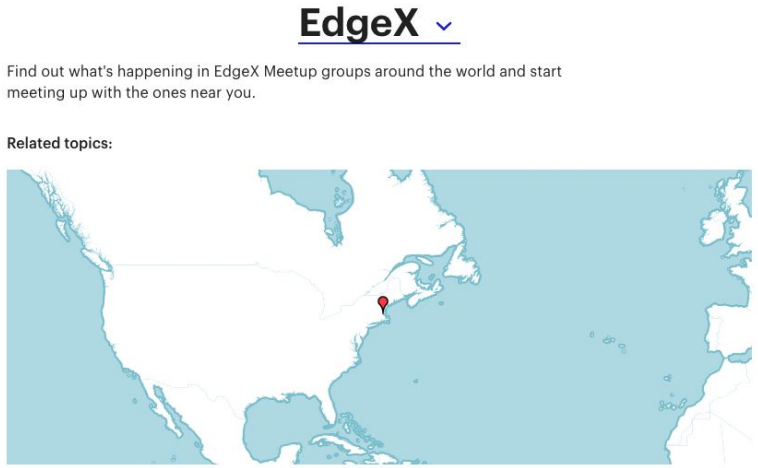
- Nov 17th, University of Helsinki, called Edge Hackathon (http://ceacs.eu/Hackathon.html). 60+ people
- Dec 1st, regional Startups and Entrepreneurs summit in Cairo.
- Jim White and Tyler Cox putting together hackathon starter kit.
- More coming

Hackathons: How can you help?

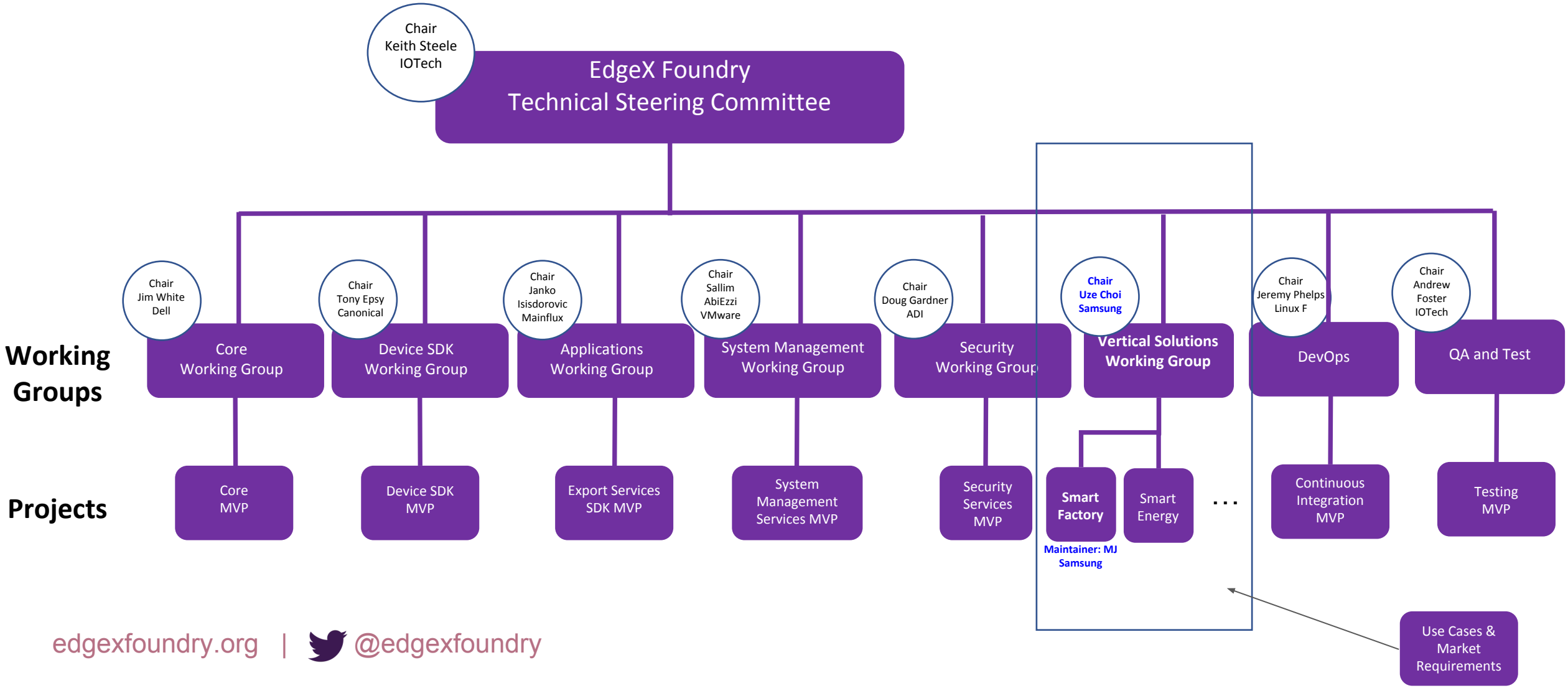
- Provide any local volunteers onsite to help with technical work, potentially help judge, etc. (see list below of known hackathons coming up and locations)
- Sponsor breakfast/lunch/dinner for the participants (usually things like donuts/coffee, pizza lunch or cater sandwiches)
- Sponsor $ rewards (incentives) for teams that successfully implement projects (these could even be projects that particular sponsors want to see accomplished - we just need them scoped appropriately so as to be something that can be accomplished in a 2 day period)
- Help provide or resource hackathon winner prizes
- Sponsor or provide any swag (t-shirts, mugs, etc.)
- Provide marketing assistance

Meetups

- Help us grow awareness!
- Present, and Tag, EdgeX in your local IoT Meetups
- https://www.meetup.com/topics/edgex/
- Email info@edgexfoundry.org for assistance



TSC Organization



Marketing

- **CTA:** If your company will be demoing technologies that utilize the EdgeX framework, please email events@edgexfoundry.org so that we can add to https://www.edgexfoundry.org/events/

- **CTA:** If your company will be presenting EdgeX at an upcoming event/webinar/other, please email pr@edgexfoundry.org so that we can help promote

AOB/Cadence

- Meeting Cadence Reminder
  - Currently held weekly at 7am PST on Wednesday's
  - Calls without TSC quorum will still be used to review issues

- **Next Meeting: November 15, 2017**

Thank You