

EDGE X FOUNDRY™

TSC Meeting

April 17, 2019



LF Antitrust Policy Notice

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.

Meeting Logistics

Time: April 17, 2019 7am PDT – 8am PDT

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)

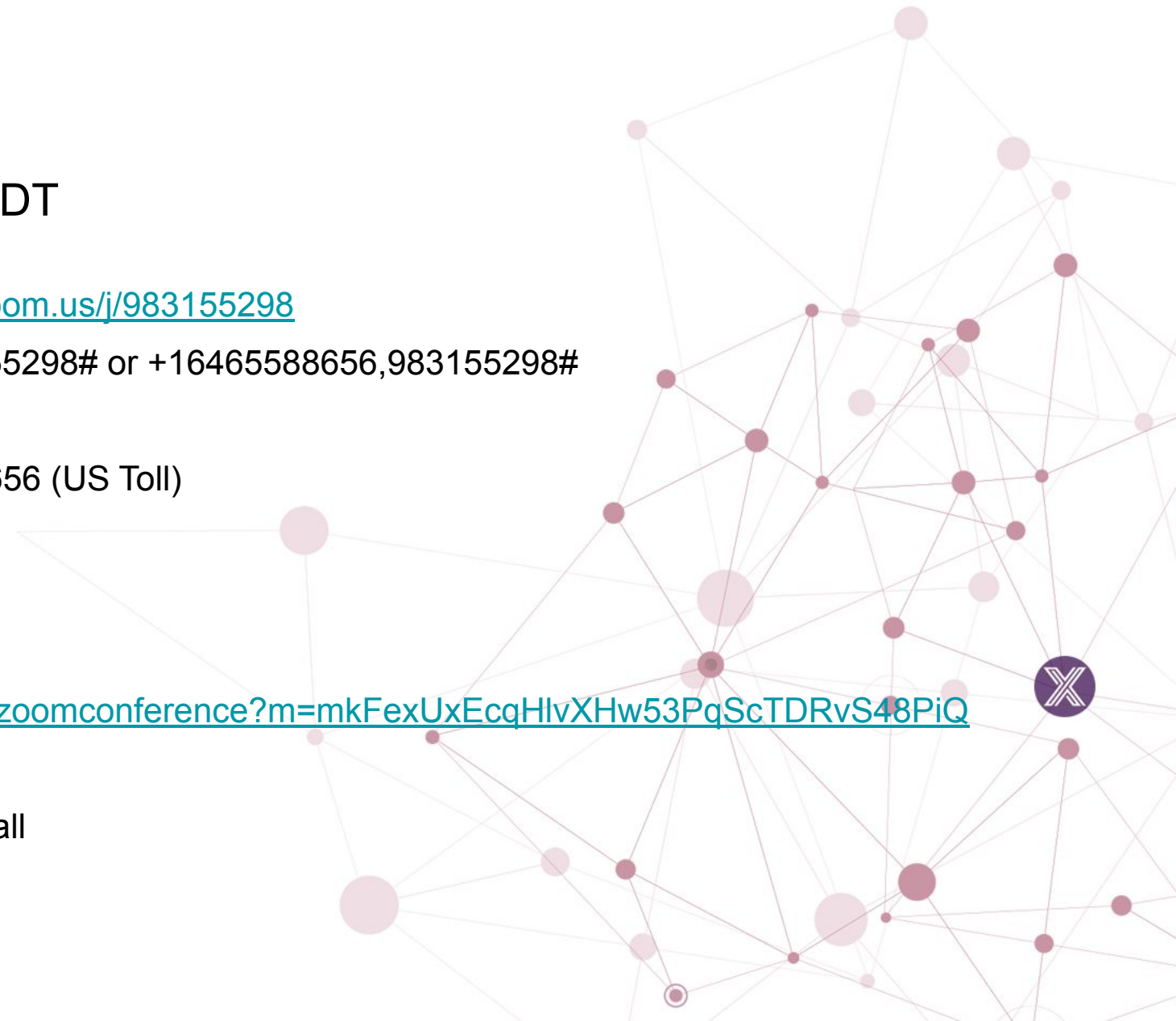
+1 855 880 1246 (US Toll Free)

+1 877 369 0926 (US Toll Free)

Meeting ID: 983 155 298

International numbers available: <https://zoom.us/join?j=983155298>

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



TSC – Members Present Today

<u>Company</u>	<u>Name</u>	<u>Email</u>
IOTech	Andy Foster	andy@iotechsys.com
Mainflux	Drasko Draskovic	drasko@mainflux.com
Intel	James Gregg	james.r.gregg@intel.com
Mainflux	Janko Isidorovic	janko@mainflux.com
Dell	Jim White (TSC Vice Chair)	james.white2@dell.com
IOTech	Keith Steele (TSC Chair)	keith@iotechsys.com
Samsung	Moonki Hong	moonki1.hong@samsung.com
Dell	Randy Thompson	Randy.T@dell.com
IOTech	Steve Osselton	steve@iotechsys.com
Canonical	Tony Espy	espy@canonical.com
Dell	Trevor Conn	Trevor.Conn@dell.com

Current quorum = 6 members

Note: Quorum for TSC meetings requires at least fifty percent of all voting members of the TSC to be present. The TSC may continue to meet if quorum is not met, but will be prevented from making any decisions at the meeting. Except as provided in Section 7.c. and 8.a, decisions by vote at a meeting require a majority vote of those in attendance, provided quorum is met. Decisions made by electronic vote without a meeting require a majority vote of all voting members of the TSC.

Today's Agenda

- Strike Team updates
- WG Updates
- Business Update
- Fuji F2F Meeting Planning and Release Scoping
- Upcoming Events
- AOB



EDGE X FOUNDRY™

Strike Team Updates

Strike Team leads

- Freeze: May 28 (Tue after Memorial Day)
- Release date: June 20

Strike team Updates

- CBOR/binary support - **Toby** on point with Trevor and Janko to assist with core, supporting and export services changes
 - Strike team to determine best WG to use to review design and work issues
- Redis implementations of DB services - **Andre & Trevor**
- Initial performance (and load) testing infrastructure and results - **Andy**
 - LF support for TIG stack
- Certification Program - **Randy** and Jim
- SDK Unit testing (to the point short of any major refactoring) - **Steve**
- SIGL Static Analysis - **James** (with LF support)
- Kong Upgrade - **Tingyu**
- Device services (Edinburgh public availability of Modbus, MQTT, BACNet, BLE, Virtual Device, SNMP) - **Steve**
 - Dell to provide SNMP DS
- Security storing service secrets in Vault and protecting the master token - **Jim** and Tingyu with Intel resource assistance
- Documentation clean up - **Michael** with WG leads to nominate areas of need first and complete doc updates by deadline
- UI updates
 - IoTech UI - **Keith**
 - VMWare UI - **Jim** to check with Huaqiao
 - UIs not able to be updated will be archived to the Delhi release



EDGE X FOUNDRY™

Work Group Updates

Chairs

Working Group Chair Updates

- Around the horn
 - Core/Supporting - Trevor
 - Applications - Janko
 - Device Services - Steve
 - Test/QA - Andy
 - DevOps - James
 - Security - Jim
 - System Management - Jim
 - Certification - Randy
 - Vertical Solutions - Moonki
 - Developer Outreach - Michael

Core Working Group (17-Apr-19)

- Redis
 - PR for notifications support needs review (#1247)
- CBOR
 - core-data (#1216) -- assigned to Anthony Bonafide, in progress
 - export-distro (#1217) -- not yet assigned
- Core-contracts Model Validation
 - Discussed during Core WG calls and via email
 - Work in core-contracts module is dev complete, PR expected today
- Other efforts
 - Removal of DeviceProfile from Device struct (core-contracts issue #27)
 - Core-command - correct PUT operations setting AdminState / OperatingState of a given device (Kanban: <https://github.com/edgexfoundry/edgex-go/projects/9>)

Applications WG Update (10-Apr-19)

Work on the Application Function SDK is progressing according to plan.

Features planned for Edinburgh release are developed:

- FilterByDeviceID
- FilterByValueDescriptor
- TransformToXML()
- TransformToJSON()
- HTTPPost()
- MQTTPublish()
- Application Functions SDK is integrated with SMA and message bus is connected.

Work in progress

- Documentation

To do:

- CBOR for existing Export Services

Device Services WG Update (15-4-19)

- Go SDK
 - PR for Auto Event support
 - PR for CBOR support
- C SDK
 - Tracking core contracts
 - Auto Event support being added
 - CBOR support TBD
 - Dynamic config TBD
 - Correlation ID TBD

Test/QA WG Update (04-10-19)

- Fixed issue #201
- Merged PR #202
- Implemented additional performance Test case
 - Core Metadata - create 50 devices concurrently with same device profile - once / per 5 secs continuously around 1 hour
- Automating the performance test
 - PR [#9](#) (Integrated with Jenkins pipeline) on edgexfoundry-holding is under review and PR [#338](#) on edgexfoundry/ci-management is under review.
 - Trying to build Jenkins Jobs for performance test on Jenkins Sandbox - encountered permission/security issues (now resolved)
 - Tests now working intermittently - connection Got error "Client.Timeout exceeded while awaiting headers" while Telegraf sent request to influxD
- Edinburgh objectives
 - Better visualization/dashboarding (Allure) of test results (complete)
 - Automated capture of resource metrics to monitor performance - LF has completed deployment of TIG stack, currently working Jenkins Job setup
 - Security test automation - tests running on x86, requires Kong docker image for ARM (work by Security team in progress)
 - Code contributors will now be required to supply additional or updated blackbox tests (complete)
- Next QA/Test meeting Thursday 18th April, 4pm PDT

DevOps WG Update (04-17-19)

Several User Stories currently being worked in current sprint.

- Continued work on Jenkins Pipelines for go module semantic version tagging (git-semver)
 - Dockerize Iftools now that sigul enhancements completed
 - Testing the sigul signing process for git repo tags and Docker images
 - Identified security risk with use of Jenkins Pipelines - resolving via whitelist based on RBAC and modification of JJB templates to restrict access to AUTHORIZED (trusted) committers
 - Root cause analysis identified for broken arm builds related to “no manifest” issues
 - Debug and Assisting IoTech with Performance Tests on Sandbox
 - **Risk:** New Device services will require build automation (device-opcua-c, device-bacnet)
 - Starting configuration work to integrate codecov.io to edgex-go repo (LF resource dependencies)
 - Working to build base build images which can be built and managed locally within LF infrastructure
 - Optimize builds so that Jenkins can build using a common build “image” with Jenkins Pipelines vs treating build nodes like “pets”
 - Images stored locally in Nexus vs. remote Docker Hub (speed up the image acquisition)
 - Optimize Jenkins to leverage commonly used build images via local cache
- VOTE NEEDED TO MOVE CI-BUILD-IMAGES OUT OF HOLDING**
- includes KONG (ARM64) which is needed by security blackbox testing

System Management WG Update (4-17-19)

- Now working....
 - Documentation
- Working on the unified base of metrics keys
- Fuji and Beyond (some sys mgmt and cross functional design issues)
 - Roadmapping and Fuji scoping for F2F

Security WG Update (4-17-19)

- Working...
 - Architecture for securing service secrets (DB username/password) - document circulating
 - Addressing security issues (CVE style processes & planning) - document circulating
- Implementing...
 - Vault initialization program (to store db secrets)
 - Mongo init script (to use db secrets)
 - Go Vault Client Module (to extract secrets for future use)
- Kong / ARM issue in dev ops court
- Roadmapping and Fuji Scoping
 - Thanks Bryon

Certification WG Update (4-8-19)

- Developed a list of work items to support certification
 - Starting work on the roadmap of execution phases
 - Draft plan prior to TSC F2F
-
- Meetings are on Mon at 7am PDT
 - Link to plan doc, minutes, and recording available on wiki

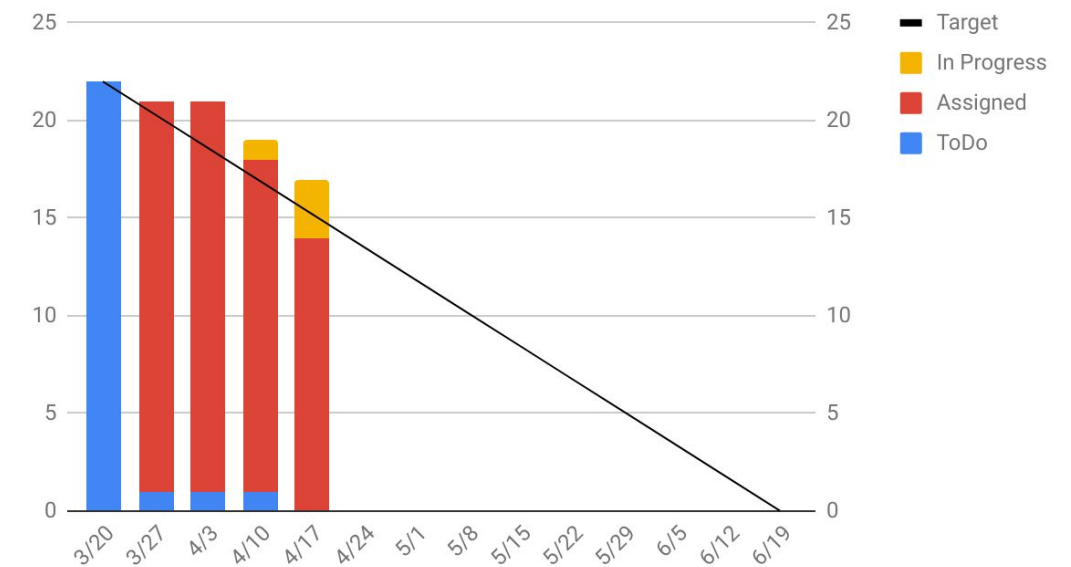
Vertical Solutions WG Update (4-9-19)

- Reviewed potential connection with OMG Retail Standards
- Upcoming Commerce Project call : Apr. 24th 4pm in PST
 - Zoom Meeting : <https://zoom.us/j/975881686>
 - Mobile
 - +1 669 900 6833 (San Jose)
 - +1 646 558 8656 (New York)
 - +1 855 880 1246 (US Toll-free)
 - +1 877 369 0926 (US Toll-free)
 - Meeting ID : 975 881 686
 - Find your local number : <https://zoom.us/u/aA4GBJBi8>

Developer Outreach (04-17-19)

- 2019 EdgeX Foundry Awards voting **ends** today
- Documentation updates:
 - Updated [Getting Started - Developers](#)
 - Added [Systems Management Agent endpoints](#) docs
 - Added [Application Functions overview](#) docs
 - Deferred device-bluetooth guide to post-Edinburgh
 - Work on cleaning up old Java references
- Added [second example](#) to Device-RPi

Edinburgh Documentation Progress





EDGE X FOUNDRY™

Business Update

Business Update

- We need to establish our working relationship with LF Edge with regards to 3 important topics:
- Edge V1 Launch
- Certification Process
- Funding Opportunities - carry over eg. IOT meetups, speaker slots, seminars etc



EDGE X FOUNDRY™

Fuji F2F Planning and Scoping

Planning and Scoping

- Deck started for the F2F Meeting
 - [Fuji Deck](#)
 - **Day 1 Work Group topics to deep dive** on - Send Jim your needs
 - **Day 2 Business and Training topics** - Send Jim your ideas or wants
 - **Architectural issues** to discuss? - Send them to Jim
 - Teed up on day 1, covered in detail on day 2 (tech debt and new features/needs)
 - WG Chairs please **review and start to fill in your Fuji scope slides**
- Slack Channel for posting suggestions, topics, needs, etc.
 - <https://edgexfoundry.slack.com/messages/CHG5F4HS9>

Architect's Day Topics (April 29th)

9am - Core and General (Conn)

- High Availability
 - Application of 12 factor principles
 - Service orchestration
 - For non-HA scenarios
 - Instrumentation
- Database persistence
 - Decoupling from specific providers
 - Long v short term storage (e.g. core-metadata v. core-data)
 - Migration when models change
- General Topics
 - Refactoring needs
 - Store & Forward

Leads – send out your invitations

11am – Application Services v2 (Johanson & Goodell)

- Next functions
- Rules Engine integration
- Command support
- Vault integration
- Binary data support
- Retiring Export Services
- How to support all the cloud systems
- Language bindings (C, C++, Node, Python)

1pm - Security (White)

- Hardware security module & abstraction
- Service to service communications

3pm – **STILL OPEN**

Training and Business Topics Day (April 30th)

Open to all

9am - EdgeX Introductory Tutorial (Hall)

- Basics - What and why of EdgeX
- Getting EdgeX
- Get it running
- Quick exploration of services & their purpose

10:45am – Getting started as an EdgeX developer (Conn)

- Getting EdgeX setup in GoLand
- Running EdgeX in development/debug environments
- Setting up and running blackbox tests

1pm – Building Application Services using the SDK (Johanson & Goodell)

- Getting the SDK
- Using the SDK to create an application service
- How/where to extend the SDK and the services
- Roadmap and the future of the application services

2:45pm – Building Device Services using the SDK (TBD)

- Getting the Go SDK
- Using the SDK to create a simple DS
- High level overview of the functions
- Where/how to extend the SDK or DS

9am – EdgeX v1 (Steele)

- Marketing approach
- Referenceable clients

11am – Commerce Project (Corrion)

4pm – The business of Certification (Thompson)

- Who pays for certification
- Who manages certification (internal vs. 3rd party)

Some time slots still open to other training or business discussions

DS training still tentative

Afternoon of second room open for other training or business discussions

Fuji F2F Meeting (May 1-2)

- Agenda
 - Day 1 – Planning & Scoping Day
 - 9am Welcome and intro by Host and Chairman
 - 10am Architecture issues tee-up
 - Review and explanation of upcoming items of discussion for day 2
 - 11:30am Edinburgh Wrap Up Planning
 - 1pm Project Cadence Check
 - I Release Naming
 - 1:30pm Fuji Planning – what's in/out
 - Scope definition
 - Work Group Kanban Creation
 - 4pm Future Release Roadmaps - Geneva and beyond
 - Long range scoping and roadmap review
 - Day 2 – Architecture issues day
 - 9am Developer Advocate Perspective
 - 10am Architecture discussion and decisions
 - 3pm Action item Review
 - 3:30pm Lessons Learned and Chandler Meeting Changes



Tech Debt Issues (May 2)

- More unit & integration tests
 - Identify the real short comings
- Release manager – we have a process, now what?
- Mongo & Redis – what should be our reference implementation database(s)
- Traceability – we have a correlation id. What's next?
- Rules Engine replacement (the last of the Java)
- Environment support
 - Windows development & 0MQ (any change??)
 - ARM 32 support (any change??)
- Carry over topics from Chair WG day

Other Arch topics for the General Session? Send them in by April 24

New features, tools, processes, etc. Issues (May 2)

- Certification support
- Documentation versioning
 - Semantic versioning
- If not Plugins, what? Or are Modules good enough?
- Kubernetes (K8s and K3s) support
- SMA's responsibilities (and non-responsibilities) & design
 - Versus registry/config, other services or outside systems
- Carry over topics from Chair WG day
- LF Edge
 - What are the projects and what is the potential impact

Fuji – General (cross area)

In

- Move to Go 2.0
- Upgrade to Mongo 4.0
 - If Mongo is still a reference implementation
- Apply “12 Factor Apps” to all services
- Services can live on any platform
- Services can have multiple instances
- Watchers/callbacks for config or data changes
- Swagger (in addition to RAML) API documentation
- Sponsor some hackathons

Out

- ARM 32 support
- Windows development support
 - OMQ issue

WG Scoping (May 1)

I need each WG lead to provide me there slides by April 24

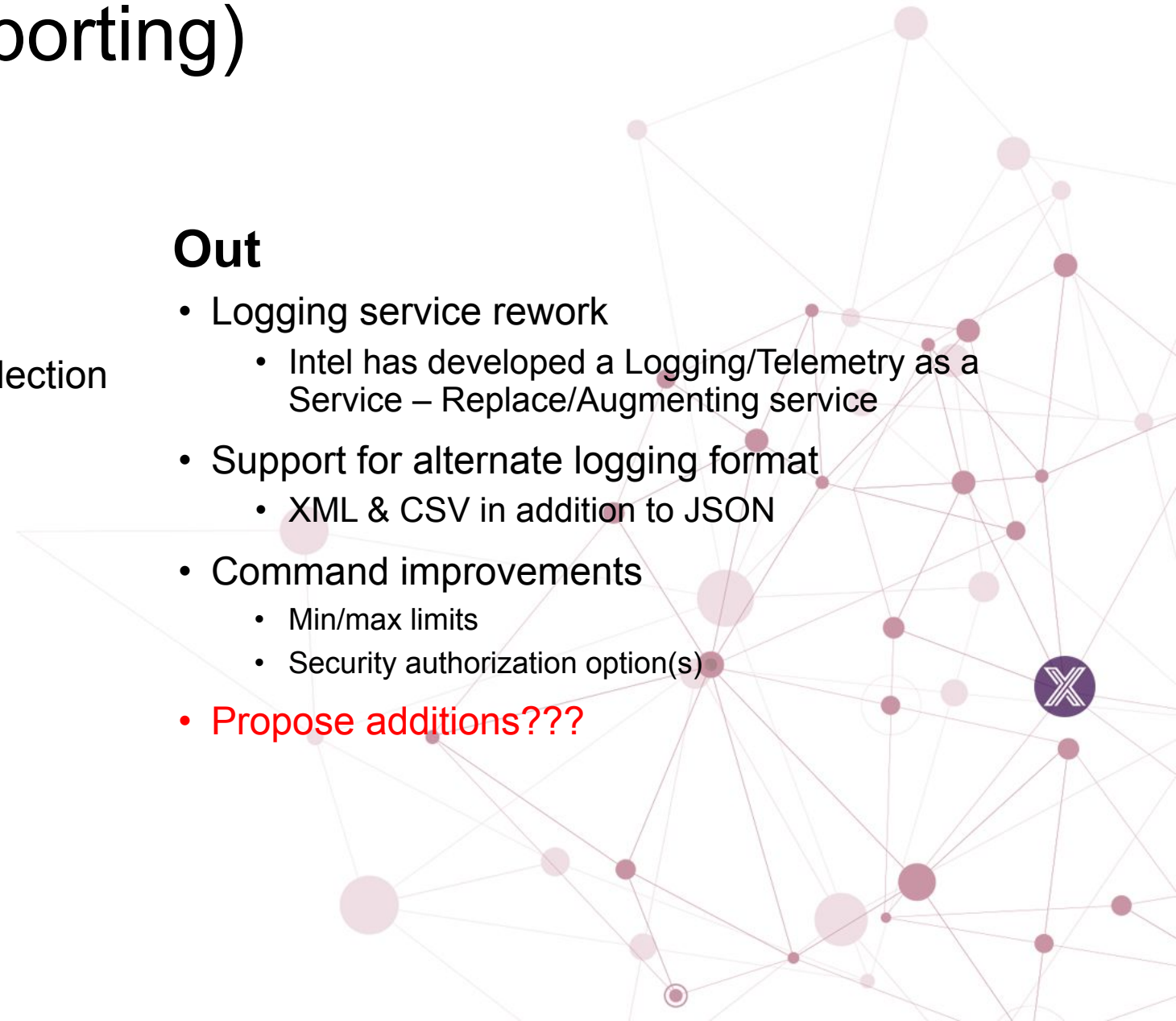
Fuji – Core (and Supporting)

In

- Consul 1.4
- Reference Implementation Database Selection
- Blacklist/whitelist of devices
- Store and Forward ability
 - When north side connectivity is lost
- Data Filter between DS and Core Data
- Add SMS to notifications
- **Propose additions???**

Out

- Logging service rework
 - Intel has developed a Logging/Telemetry as a Service – Replace/Augmenting service
- Support for alternate logging format
 - XML & CSV in addition to JSON
- Command improvements
 - Min/max limits
 - Security authorization option(s)
- **Propose additions???**



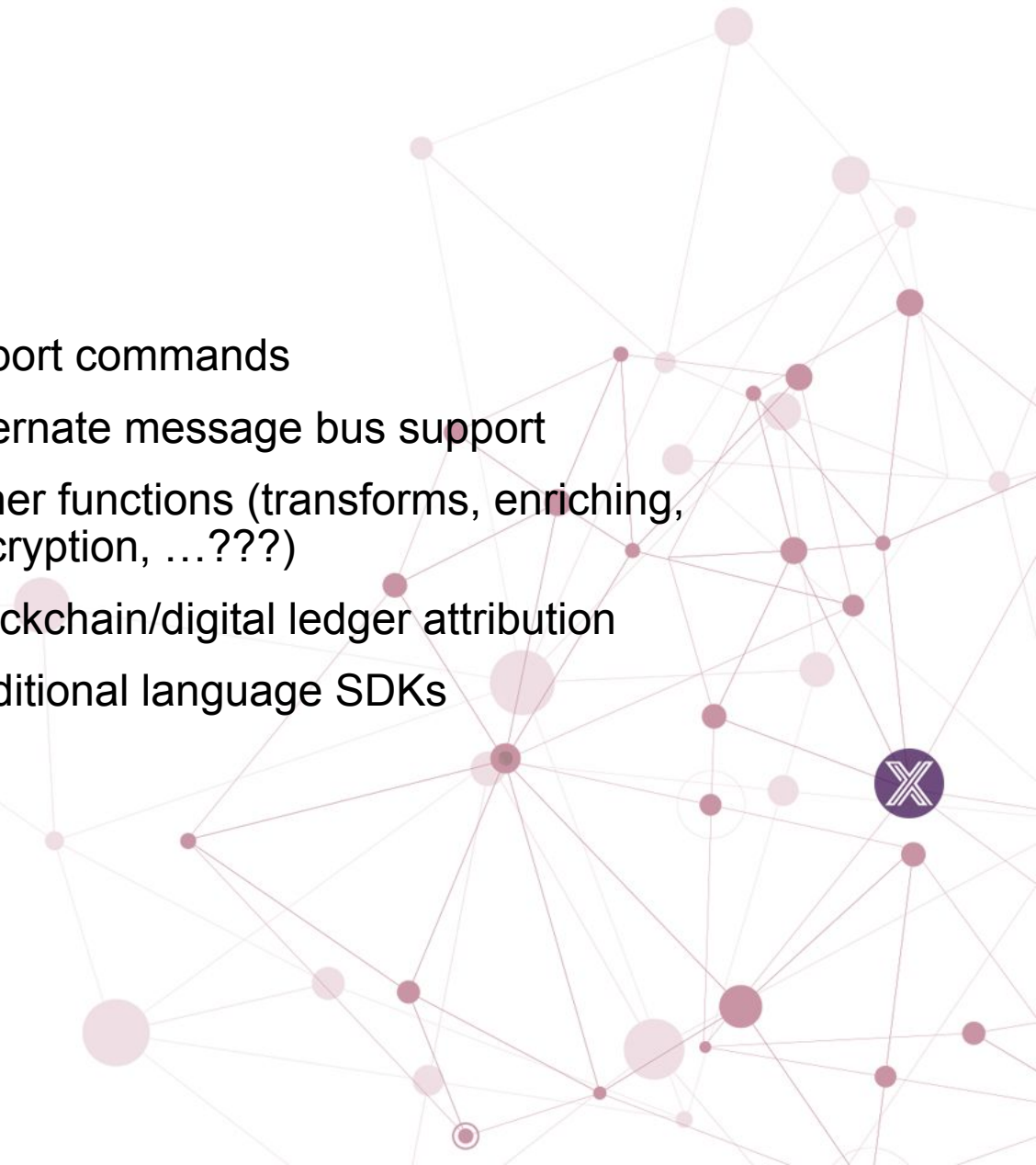
Fuji – Application WG

In

- Rules Engine Replacement
 - Rules engine to trigger notifications
- Next iteration of Application Services and App Functions SDK
 - App Service to send data to Rules Engine
 - Message envelop changes
 - Added functions
 - Filters: for value ranges, ???
 - Compression
 - Signing
 - Additional endpoints (HTTPS/MQTTS)
 - More dynamic topic configuration / addressing

Out

- Export commands
- Alternate message bus support
- Other functions (transforms, enriching, encryption, ...???)
- Blockchain/digital ledger attribution
- Additional language SDKs



Fuji – DS & SDK

In

- Additional DS ???
- Improvements to the SDK
 - Cache of readings
- Intel Camera device integration
 - Camera Discovery Components (SAF Bus)
- Intel RFID device services
- Propose additions???

Out

- Support for mesh network protocols
- Support device hierarchy
- Tooling for SDK (CLI, JetBrains, or Eclipse plugins, etc.)
- Tooling for Device Profile creation
- Downsampling – DS throttle back on readings if nothing is changing
- Additional language SDKs
- Propose additions???

Fuji – System Management

In

- Implementation of SMA as lightweight registry provider (when Consul not there)
 - Know what services are available when registry not there
- Start/stop/restart all done by the executor to include stop/restart of SMA
 - Executor tracks completion and returns results
- Executor for metrics collection
- Setting configuration
- SMA Translation layer (stretch)
 - Pick one protocol to start (LWM2M)

Out

- Storing metrics collected locally
- Callbacks (alert on changes to config/metric) –
- SMA translations to other protocols
 - Redfish
 - OMADM
- Actuation based on metric change
 - “rules engine” for control plane data
- Consider use of QoS and blockchain to prioritize resource usage by certain services.
- SMA to store configuration – lightweight configuration store
 - In replacement of Consul or whatever provider we have for reg/config).
 - Discussed at recent sys mgmt. WG meeting. Bigger question is do we still want Consul.

Fuji - Security

In

- Secure Storage abstraction layer
 - Includes a sample that talks to TPM simulator
- Service to Service AuthN/AuthZ requirements and design
- Renew/refresh threat assessment
- **Propose additions???**

Out

- How to securely provision new devices/sensor
- Hyperledger/blockchain/digital ledger integration
- Protect data at rest
 - In DB like Mongo
 - In log files
- Privacy concerns (HIP-A, GDPR, ...)
- **Propose additions???**

Fuji – Test/QA/Documentation

In

- More unit tests everywhere (better coverage)
- More black box tests
- Automated system level latency and throughput testing (e.g. device read to export or device read to analytics to device actuation)
- Automated Device Service testing (functional and performance for each Device Service e.g. Modbus DS)
- Propose additions???

Out

- Configuration testing
 - Existing testing uses a single static configuration
 - Need to identify and add additional testing configurations to automated blackbox testing
- Tracing
 - During testing, configuration
 - Candidate tools/technology based on OpenTracing standard: Zipkin, Jaeger
- Propose additions???

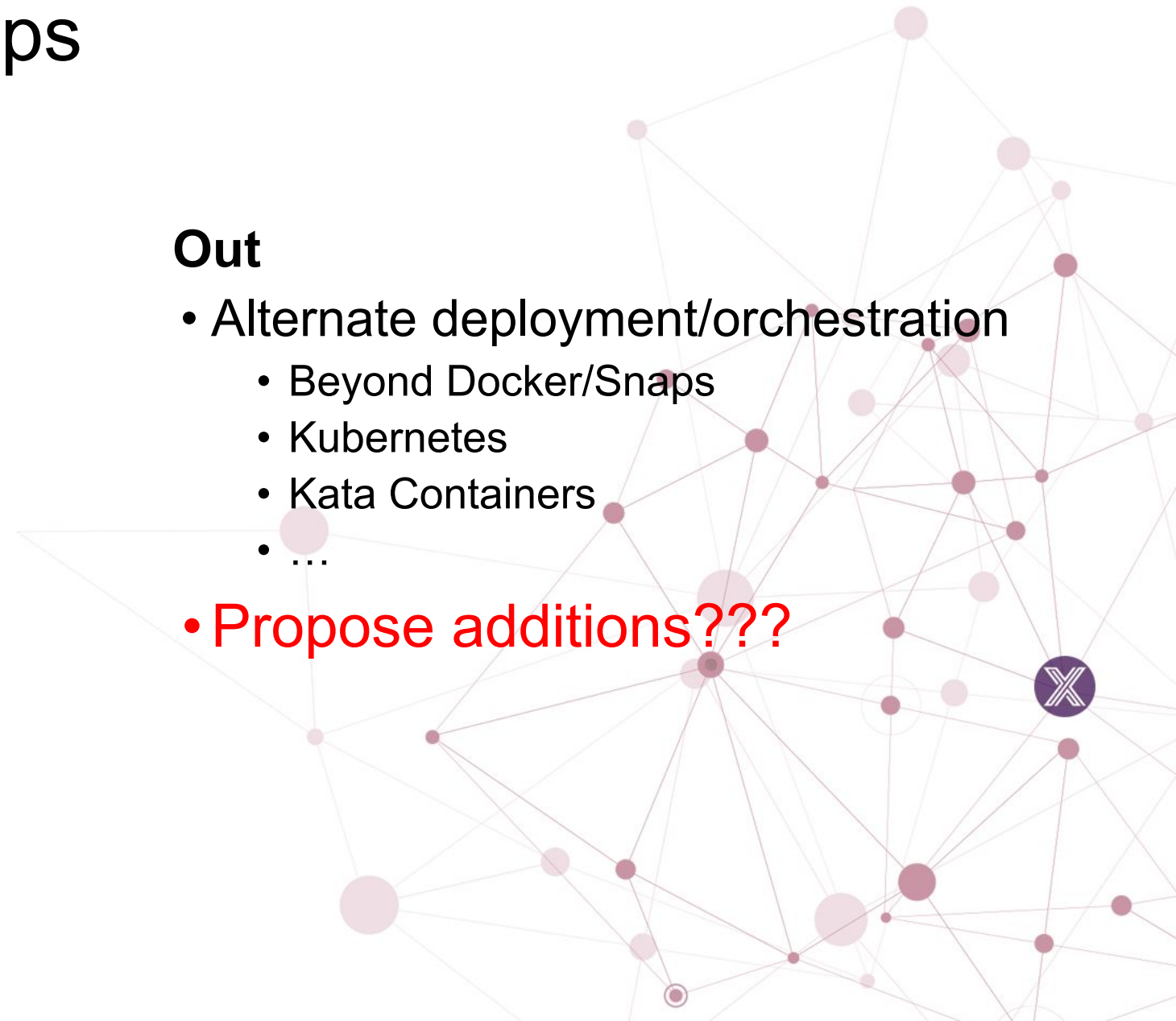
Fuji Planning – DevOps

In

- Static code analysis
- Code and artifact signing
- Go Code formatting check
- **Propose additions???**

Out

- **Alternate deployment/orchestration**
 - Beyond Docker/Snaps
 - Kubernetes
 - Kata Containers
 - ...
- **Propose additions???**



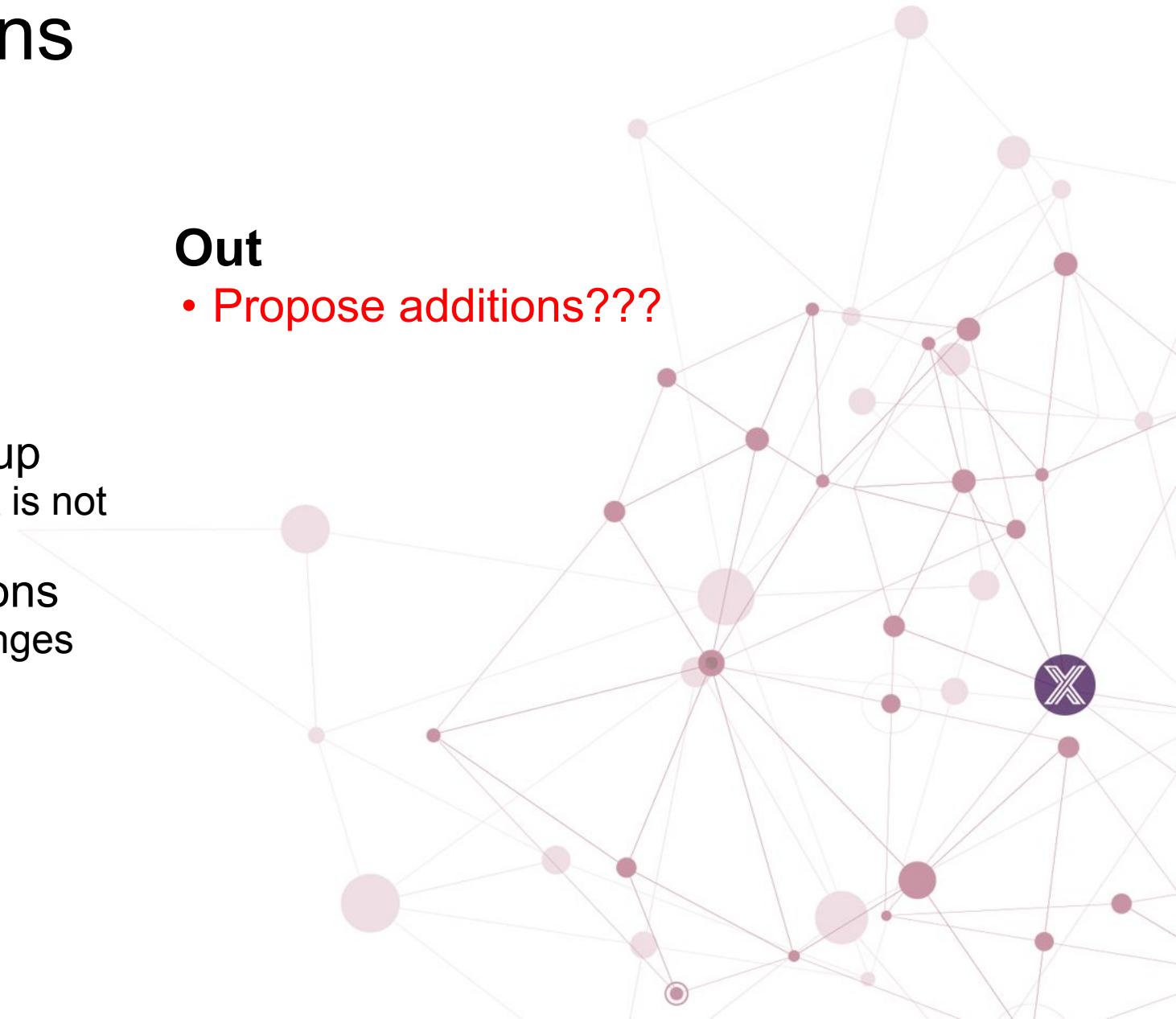
Fuji – Vertical Solutions

In

- Additional project groups
 - Oil/Gas
 - Smart Factory
- Gap analysis by each project group
 - What is needed by the vertical that is not provided by EdgeX today?
- Proposed EdgeX roadmap additions
 - High level architectural needs/changes
 - High level designs
 - Technological suggestions/input
- **Propose additions???**

Out

- **Propose additions???**



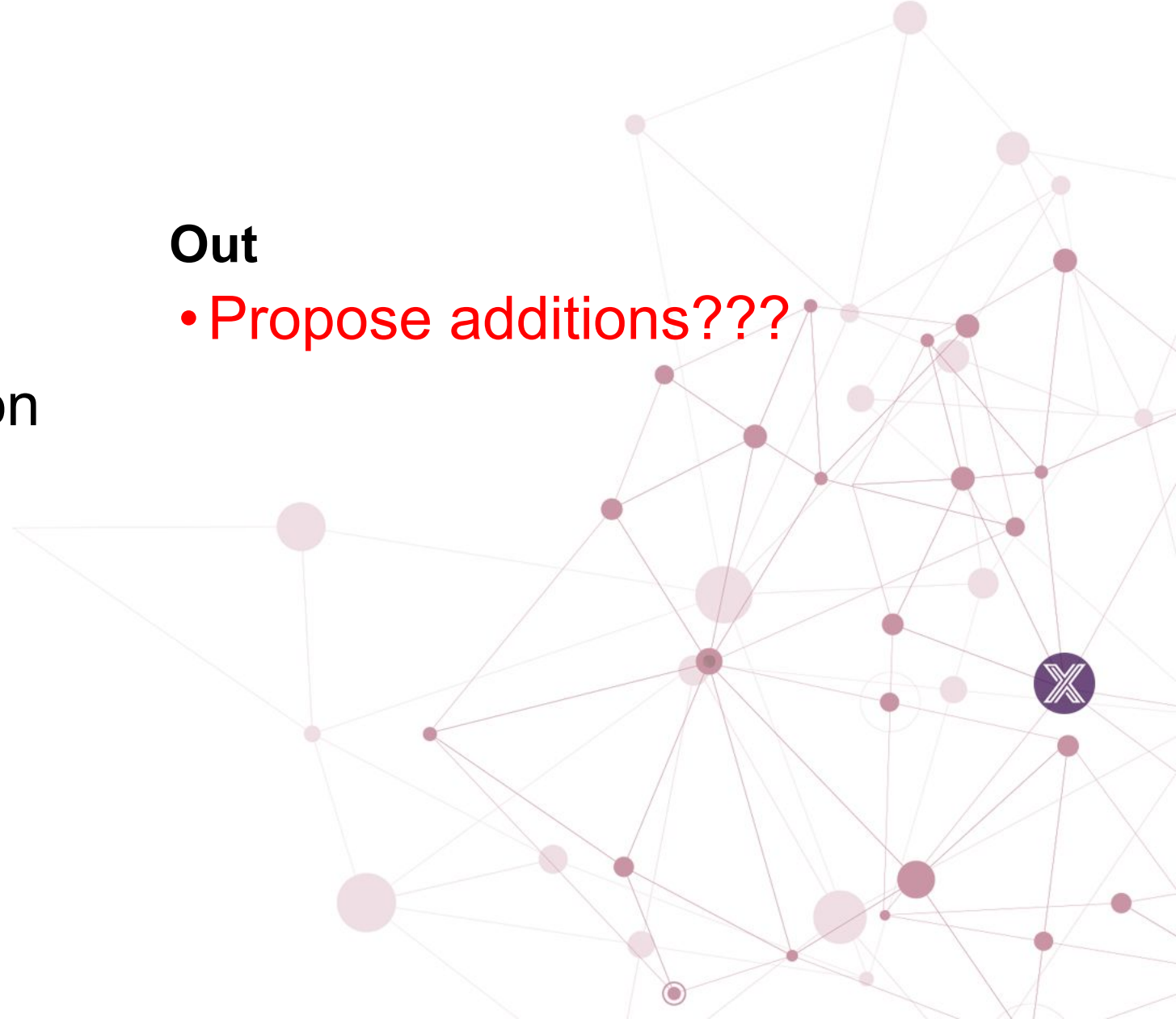
Fuji - Certification

In

- Self Assessment process
- Device Service Certification
- **Propose additions???**

Out

- **Propose additions???**



State of the Development Community

- What's the current community of developers look like?
 - Stats and information on contributors, reviewers, etc.
- What's the current community of users look like?
- What are the common questions
- What are the common needs

Areas of Improvement

- How do we onboard new developers better?
- How do we provide better help to the community of developers?
- How do we provide better help to the community of users?



EDGE X FOUNDRY™

EdgeX TSC F2F Meetings

EdgeX TSC F2F Meeting(s)

- **29 April - 2 May, 2019** -- Location Seoul, South Korea -- [Wiki page](#)
 - Latest agenda available on the [Wiki](#)
- **RSVP at <https://goo.gl/forms/oMptkNU90RRxhK5g1>**
 - **RSVP by EOD April 12**
 - Current registration count: 38 in-person; 4 dial-in
- Hotel/Travel: Recommended hotels listed on [Wiki](#)
 - Recommended Hotel is Sheraton Seoul Palace Gangnam (11 out of 12 respondents are staying at)
 -
- **[NOTICE] Registration is required for the security identification in the venue, and we need additional information from the potential attendees in-person from RSVP or email to (moonki1.hong@samsung.com), for completing it.**
 - **Birthday (DD/MM/YY), Corporate Position, Nationality**
 - **Asset Information : Type (e.g. Macbook Pro, Samsung Notebook 9, etc.), Serial Number, EA**
 - ** Any USB stick (electronic devices), demokit and/or items should be registered.**
- **4 November - 8 November, 2019** -- Location Chandler, Arizona (USA) -- [Wiki page](#)



EDGE X FOUNDRY™

Upcoming Events

Full list of LF events available at
<https://events.linuxfoundation.org/>

Additional LF Edge events available at
<https://www.lfedge.org/events/>

Upcoming Events

- [Internet of Things World, May 13-16, 2019](#) | Santa Clara, CA
 - LF Edge will have a 20x20 booth
 - 4 booth demos confirmed:
 - Akraino Blueprints
 - EdgeX Building Automation (Community Demo)
 - Beechwoods EdgeX Demo
 - Project EVE
 - Need volunteers to help staff the booth -- Please email pr@lfedge.org if available

Discussions around upcoming events occur in the LF Edge Outreach Committee.

Members may subscribe at: <https://lists.lfedge.org/g/outreach-committee>

Additional Events & Speaking Opps

Full list of LF events available at
<https://events.linuxfoundation.org/>

Additional LF Edge events available at
<https://www.lfedge.org/events/>

- [IoT Tech Expo Global](#), April 25-26, 2019 | London
 - EdgeX is the media sponsor for the event and is providing a 20% off discount code “EDGEX20”
- [IoT Tech Expo Europe](#), June 19-20, 2019 | RAI, Amsterdam
 - Janko Isidorovic from Mainflux will give a presentation on EdgeX Foundry & participate in an IoT panel.
 - EdgeX is the media sponsor for the event and is providing a 20% off discount code “EDGEX20”
- [Open Source Summit China](#), June 24-26, 2019 | Shanghai
 - Arpit giving a keynote on LF Edge
- [Embedded Linux Conference \(ELC\)](#), August 21-23, 2019 | San Diego
 - Tingyu and Trevor (Dell) have applied for talks (Notifications May 13)
- [Open Source Summit](#) / [Embedded Linux Conference Europe](#), October 28-30, 2019 | Lyon
 - CFP due July 1
- [IoT Solutions World Congress](#), October 29-31, 2019 | Barcelona
 - [Call for Testbeds](#) is Open
 - January 7 - April 30: Submission
 - May 1 - June 20: Review
 - June 20 - June 30: Notification
 - July 5: Publication



EDGE X FOUNDRY™

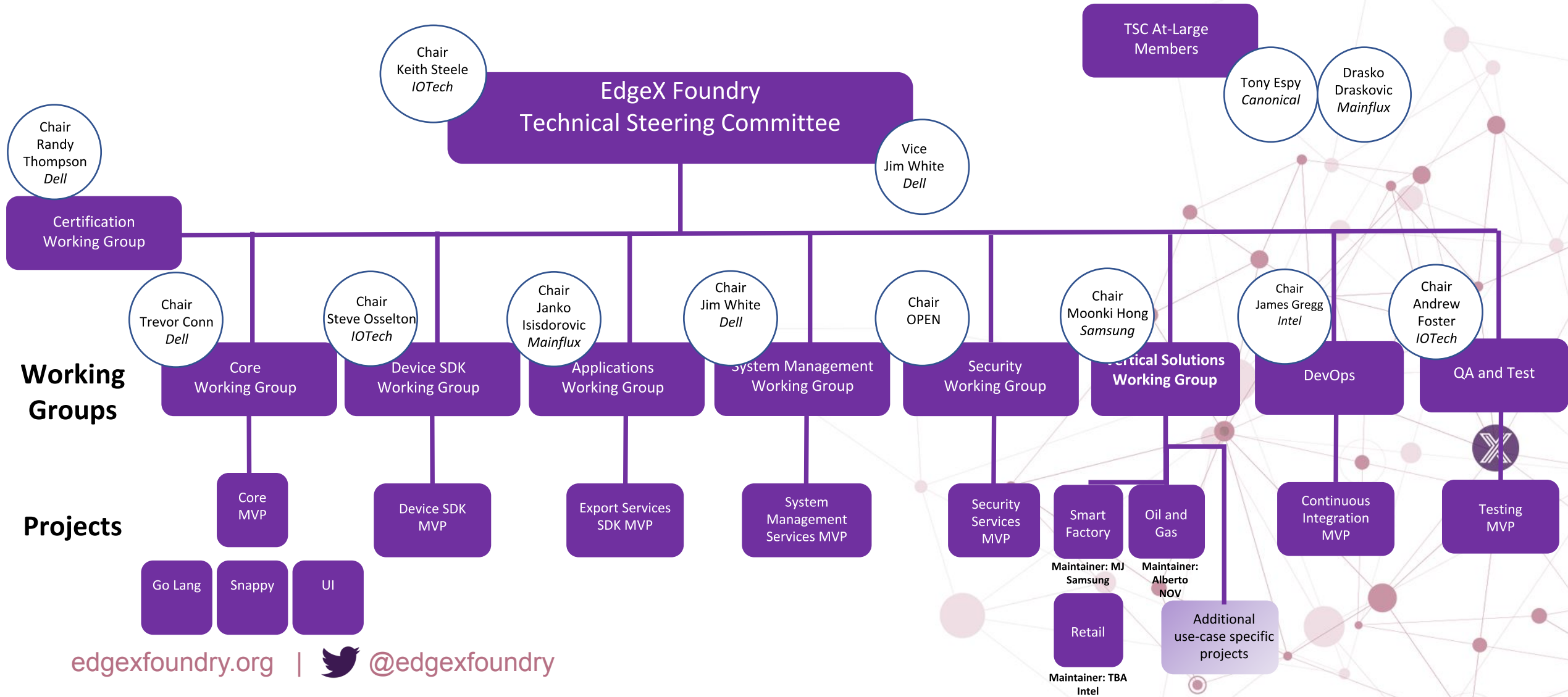
AOB / Reminders

AOB/Cadence

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

- **Next Meeting: April 24, 2019**

EdgeX Project Organization



Marketing

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

EdgeX in Market

- Page showcases momentum in the project, including solutions already available
- <https://www.edgexfoundry.org/edgex-in-market/>
- Email info@edgexfoundry.org if you have any additions

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 Mike Woster at LF (mwoster@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

Project Resources

Quick links to most commonly used Community Resources

- Code: <https://github.com/edgexfoundry>
- Documentation: <https://wiki.edgexfoundry.org/>
- Discussion: <https://slack.edgexfoundry.org/>
- Mail Lists: <https://lists.edgexfoundry.org/mailman/listinfo>
- Twitter: <https://twitter.com/EdgeXFoundry>
- LinkedIn: <https://www.linkedin.com/company/22298339/>
- YouTube: <https://www.youtube.com/c/EdgeXFoundry>

EdgeX - Where to learn more

- EdgeX Foundry Wiki

<https://wiki.edgexfoundry.org/display/FA/EdgeX+Foundry+Project+Wiki>

- EdgeX Foundry Slack

<https://slack.edgexfoundry.org/>

- [Weekly EXF Technical Spin up calls](#)

30 minute deep-dive topics followed by 30 minute open Q&A

Call recordings are available on the [Wiki](#)

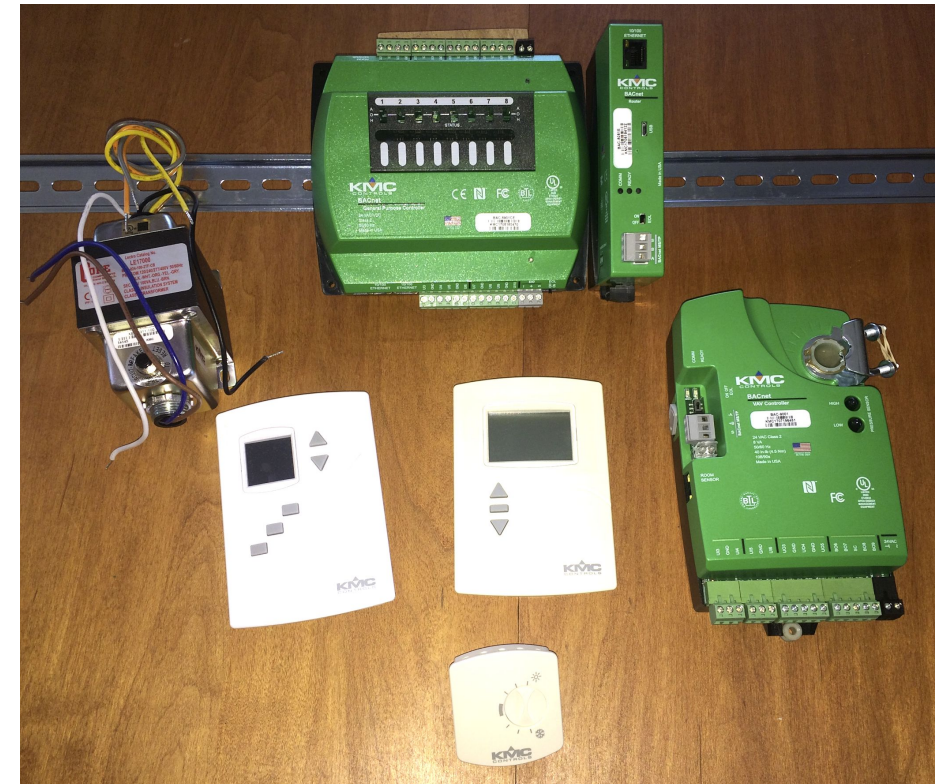
What is the Device Exchange?

- 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>



Special thanks to [Dave Bohlman](#) and [KMC Controls](#) for making this awesome kit and how-to guide available to members!!



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

Related topics

New Technology Open Source Interoperability Smart Home Internet of Things

Open Standards Mobile Development Internet of Everything EdgeX

EdgeX ▾

Find out what's happening in EdgeX Meetup groups around the world and start meeting up with the ones near you.

Related topics:



Meetups: Reimbursement Program

- <https://wiki.edgexfoundry.org/pages/viewpage.action?pageId=7602724>
- Wiki page built for the community to leverage
- Encourage community to begin introducing EdgeX in your local Meetup groups
- EdgeX Foundry will fund/sponsor the talk in which EdgeX is scheduled to be presented
 - Up to \$250 for F&B, once per Meetup group, per quarter
- Let us help drive traffic to your event! Email pr@lfedge.org once Meetup has been scheduled
- Post-event, please consider doing a blog about the event

Hackathons: How can you help?

- <https://wiki.edgexfoundry.org/display/FA/Hackathons>
- 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



EDGE X FOUNDRY™

Thank You