EDGE X FOUNDRY™

TSC Meeting

January 16, 2019

edgexfoundry.org | @edgexfoundry

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: January 16, 2019 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

TSC – Members Present Today

Company	Name	Email
IOTech	Andy Foster	andy@iotechsys.com
ForgeRock	David Ferriera	david.ferriera@forgerock.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
IOTech	Steve Osselton	steve@iotechsys.com
Canonical	Tony Espy	espy@canonical.com
Dell	Trevor Conn	Trevor.Conn@dell.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. Decisions by vote at a meeting require a majority vote, provided quorum is met.*

Today's Agenda

- WG Updates
- EdgeX Certification - Randy Thompson
- Misc Work Stream Items
    - Use of plugins
    - Release, version, patches policy (TSC Vote)
    - Work ongoing
        - EdgeX Long/Short Term Support
- Next TSC F2F
- Upcoming Events
- AOB

Work Group Updates

Chairs

edgexfoundry.org | @edgexfoundry

Working Group Chair Updates

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

Core Working Group (16-Jan-19)

- Configuration Changes Complete
  - Per proposal circulated before end of year
- Mongo model decoupling nearly finished
  - export-client PR going through review
  - Remaining metadata endpoints
    - /device (Issue 880)
    - /provisionwatcher (Issue 883)
- New version of Scheduler (PR 965 / 1009) merged
  - Moves responsibility for schedules out of metadata and puts that functionality in a more appropriate place
  - Need decision on timing to remove metadata/schedule code
- Core WG Call Tomorrow (Primary Agenda Item == Plugins part deux)

Applications WG Update (08-Jan-19)

- After comparing OpenFaaS and Nuclio, team came to conclusion that the deployment and performance are not designed for the Edge, however we really like the features.
- Over the next weeks we will examine if it is reasonable to develop the EdgeX Application framework which will enable us to have functionality similar to Serverless but on the Edge.
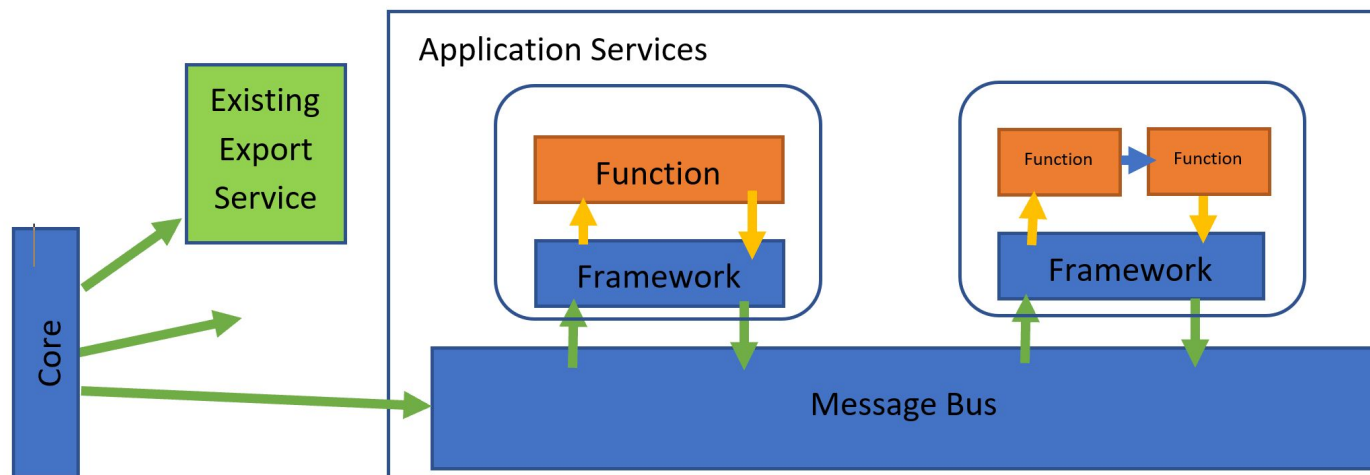
- Application WG face to face meeting is scheduled for January 24 and 25 2019, Boston MA
- Location: Dell EMC office (255 Main St) in Cambridge (https://www.google.com/search?client=firefox-b-1&q=255+main+street+cambridge+ma#)
- Contact me or Jim White if you want to attend.

Device Services WG Update (16-1-19)

- C SDK
  - Action to add cmake file template
- Device Services
  - Minor updates/fixes
- General
  - Reviewing SDK updates for Edinburgh release
  - Discussing floating point encoding options
  - Next WG Intel presenting IP Camera device service

Test/QA WG Update (01-16-19)

- Creating document describing steps by which EdgeX developers can setup the performance test environment and develop new test scripts

- Investigating failed blackbox test cases of

- Opened PR #13 to add more unit test for device-modbus

DevOps WG Update (01-16-19)

Several User Stories currently being worked in current sprint.

- **device-sdk-c** (WIP)
  Jenkins job template created and passing all Verify checks
  Missing dependencies on Jenkins build servers
  Working through the build issues with Jeremy's help behind the scenes

- **device-grove-c** (Pending Approval by Release Engineer - PR#268)
- Explore kicked off related to new tooling that supports code coverage / testing as well as TIG stack
  Looking at Codecov.io and SonarQube
  TIG stack requires dedicated LF infrastructure to host Grafana
- Sprint 31 planning today (Intel)
  Plan to start work on integration of the Allure reporting

Security WG Update (01-16-19)

- Documentation work:
  - Secret store near completion
- Finalize HW Secure Storage design document today
  - Coding can begin next.
- Automated testing design has begun

System Management WG Update (1-16-19)

- Start/stop/restart in progress
  - POC and PR to be completed by next meeting
  - Final API for review at next meeting
- Next tasks
  - Go & C SDK (and device services) incorporation work to be done
  - Add CPU usage metrics (in addition to memory usage metrics)
  - Add health/status check of the services to the SMA
  - Stretch goal – provide a translation layer (with abstraction) to offer SMA API via other protocol (like LWM2M, SNMP, etc.)

Developer Outreach (01-16-19)

- Friday Tech Talk: EdgeX Snap Package

- Discourse <-> Slack integration & Guidelines

Certification Program

Randy Thompson

randy_thompson@dell.com

Introduction Certification Work

- Randy Thompson - Dell Technologies, IoT Solution Division
  - IoT Solution Planner
  - Is a member of Jason Shepherd's team
  - Director of IoT product at places such as BSquare and WindRiver
- Randy has put together a proposal for the EdgeX certification program that you are going to hear about today
  - It contains a great deal of thought and detail (not all of which will be discuss or debated today)

Goals of Today's Certification Presentation

- Introduce everyone to Randy and his work
- Confirm the long standing goal of the community that EdgeX certification is something we want to do
  - It's been on the Roadmap since California release - with Edinburgh as target for the first visible signs of the program
- Approve the concept that a new Work Group be established
  - Jim and Randy to have a draft Charter for review @ the next TSC call
  - Randy being nominated by Keith & Jim to lead that WG
  - Vote at the next TSC to ...
    - approve the WG formation
    - review (& potentially accept) the charter
    - Vote on accepting Randy as the Certification WG chair

Terms

Validation:

The assurance that a product, service, or system meets the needs of the customer and other identified stakeholders.

- Is the project designed to meet the desired objectives/success criteria?

Verification:

Evaluation of whether or not a product, service, or system complies with a regulation, requirement, specification, or imposed condition.

- Is the software in compliance with a defined set of requirements?
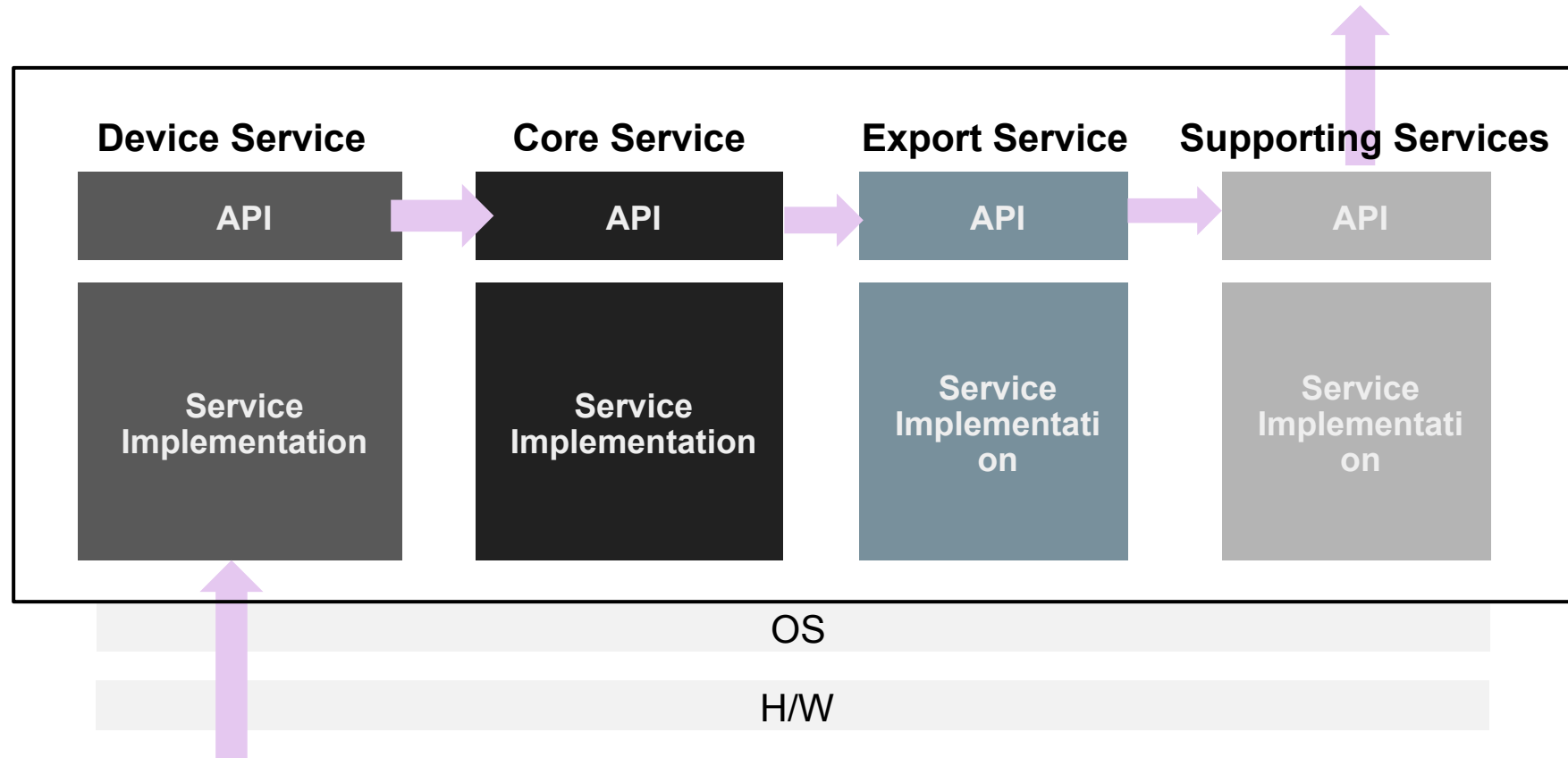
Certification:

Verification based on a pre-defined scope by a recognized certification body.

Why is Certification needed?

- EdgeX is based on loosely-coupled microservices bound by common APIs

- Entire subsections can be replaced, combined, etc. with proprietary, differentiated "EdgeX-compliant" offerings, even Core Services

- The community and users need assurance that EdgeX components from LF and third parties will work together

- Goal: To ensure that the services provided by EdgeX ecosystem are
    - API compliant
    - Interoperable
    - Reliable
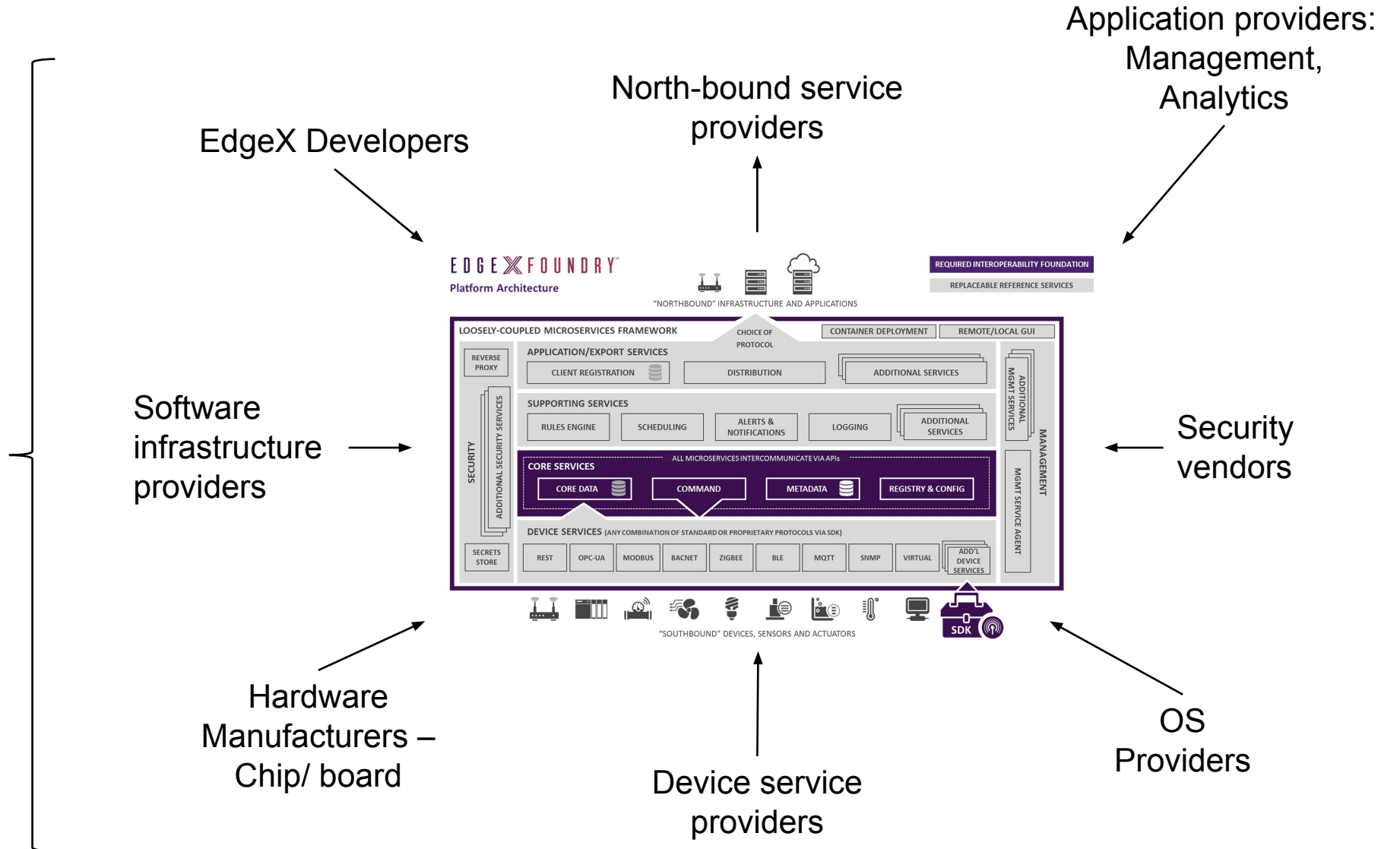   - Secure
    - Portable
    - Performant

Certification is critical for multi-vendor ecosystem

By ensuring the services can be easily and reliably integrated to drive an outcome, users have greater choice and confidence

Device Service	**Core Service**	**Export Service**	**Supporting Services**
API	API	API	API
Service Implementation	Service Implementation	Service Implementation	Service Implementation

OS

H/W

Certification Stakeholders

Application providers:
Management,
Analytics

North-bound service
providers

EdgeX Developers

Users:
Enterprises
OEMs
SI
VAR

Software
infrastructure
providers

Security
vendors

Hardware
Manufacturers –
Chip/ board

Device service
providers

OS
Providers

Benefits of Certification

EdgeX Developer Community	EdgeX Partners	EdgeX Users
• Defined test and quality standard • Accelerated market adoption • Demonstrated commitment to APIs	• Commercial opportunities to leverage EdgeX community • Proof of compliance for greater acceptance • Reduced support issues	• Confirmed interoperability • Faster implementation • Reduced integration risks • Higher reliability

What is EdgeX certification?

The certification framework defines a comprehensive set of rules, technical requirements, standards and procedures to drive consistency

The framework is used by the EdgeX Foundation or trusted third party to verify the software conforms to specified characteristics
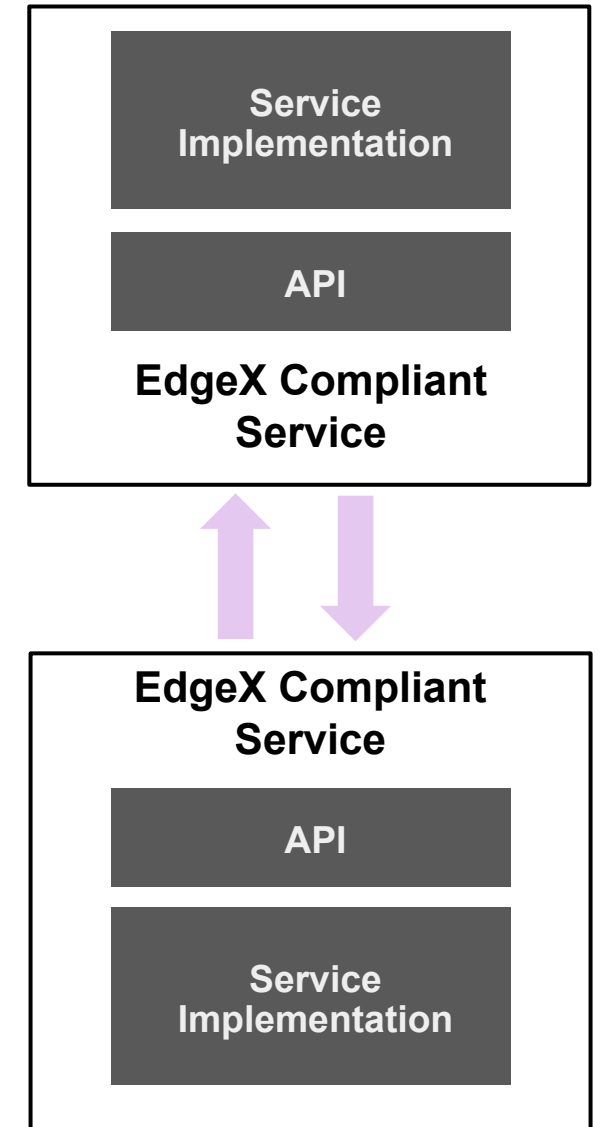
- Certified components must
  - Be compliant with the EdgeX APIs
  - Be interoperable with EdgeX Foundation code
  - Support EdgeX management service (system management agent)

- Certified components should be
  - Robust, reliable and able to recover from faults, e.g., lost communications, etc.
  - Efficient in managing resources
  - Follow accepted engineering best-practices

- Components achieving certification will be able to promote compliance
  - Certificate, Logo
  - Press release

Conformance Properties

- *Consistency*: do the different (parts of) software artifacts conform to each other?

- *Functional*: does input to the system produce the expected output?

- *Behavioral*: does the system meet general safety and progress properties like absence of deadlocks or are constraints on the specific states of the system met?

- *Quality*: do the artifacts fulfill nonfunctional requirements in the areas of for example performance, security, and usability?

- *Compliance*: do the artifacts conform to standards, guidelines, or legislation?

Source: https://link.springer.com/article/10.1007/s11219-009-9080-0

Elements of certification

API	● Compliant with EdgeX Community approved APIs.
Dependencies	● Services should be conforming to EdgeX approved infrastructure.
Security	● Services should conform to EdgeX approved security model for invocation, API access, data storage, and any future network and identify services
Quality	● Coding quality of services have been reviewed to meet industry best practices ● Services were tested in an EdgeX approved test bed with other services
Performance	● Key performance characteristics under expected use are published (compute, memory use, storage, latency, etc) and verified during certification testing ● Service does not block or reduce performance of other services
Version Control	● Services are version compliant. If there API changes, services must be recertified with the newly published APIs
Documentation	● Service details and interactions are published ● Services should provide code samples with documentation

Validation	● Services are tested in recommended/known environments, including, but not limited to:
	  ○ At least one Linux variant of the OS (Recommended by EdgeX community)
	  ○ Hardware (64 bit). Preferably the devkit

Lifecycle	Support App lifecycle ● Services code can be downloaded from a central repository/ Docker Hub/ or some kind of hub that is public ● Service should be deployed to edge as part of other services and can be included in manifest ● Services should support the system management agent ● Services can be upgraded. Process for upgraded Services to replace existing services.
Additional Comments	● EdgeX is orchestration agnostic. Services should be designed that way and should not make any assumption about orchestration/ QoS

EdgeX Compliant Service

Service Implementation

API

EdgeX Compliant Service

API

Service Implementation

Performance Standards - TBD

- Start-up time until service registered and running within EdgeX

- Does not block other services when running

- Memory
  - To load
  - When running

- CPU utilization

- Overall file size

- Response time to requests

- Supports EdgeX management service (system management agent)

Placeholders

Certification Authority

- Conducts the certification process and testing
  - Receive and review request for certification
  - Execute testing/evaluation process
  - Issue certification or report issues back to requestor

- Follows certification procedures as defined by the EdgeX community

- Phase 1 – EdgeX Community

- Future? – Outsource to trusted third party

Process

- Developer follows documented process for certification prep
  - Self test
  - Prepare documentation, sample code, and certification request

- Certification authority receives request
  - Review for completeness and assign to schedule
  - Process purchase order for payment

- Execute certification testing
  - Receive service code (source, executable, container) and any dependency code
  - Configure according to documentation

- Completion
  - Pass – issue certification
  - Fail – reply with notes, wait for resubmission

Commercial Aspects

- Cost of certification based on service type or time/effort required
  - Core service $$$
  - Device service $$
  - Supporting/Other services $
  - No charge for some organization types?

- Certification valid for 2 years, linked to version used for testing

- Renewal process requires going through certification process using current EdgeX release
  - xx% discount from original certification?

- Organization must be member of EdgeX Foundation to request certification

- Certified service allowed to use logo and claim "EdgeX Certified"

- Marketing support
  - List of compliant services on EF web site

- Conditions for reviewing/revoking certification
  - Errors discovered in compliance testing
  - Code changed after certification
  - Complaints about functionality or quality from EdgeX user community

Levels of Engagement

Self assessment

- Developer conducts own tests against provided test tools
- Intended for certification prep – not recognized by EdgeX Foundation

Certification

- Code submitted to EF certification process
- Cost $$$
- Permits use of Certification mark/logo

Self Assessment

- Define a standard EdgeX software test platform that users can download and use to conduct their own certification readiness assessment

- Requesting organization must report assessment results as part of their certification request

- Benefits
  - Promotes a baseline public standard for validation of EdgeX APIs
  - Insures requestor has done their homework and cleared basic issues before entering certification process
  - Demonstrates EdgeX community commitment to standards around certification

- Challenges
  - Need to create and document the test platform
  - Make available for download along with each release
  - Exercise APIs for
    - Device services
    - Replacing core/support services
    - New application/export services

Phased Implementation

- Phase 1 – Basic compatibility
    - Documentation
    - Runs in EdgeX environment
    - API compatibility

Minimal requirements for new service or service replacement

- Phase 2 – Operation and Performance
    - All of phase 1
    - Does service operate as documented
    - Test performance of service, impact on other services

Service does what it says and doesn't negatively impact overall system

- Phase 3 – Security
    - All of phase 2
    - Security code review
    - Security testing

Service does not introduce security risks

For Discussion

- Should certification of a Device Service include testing the device connection? Or only service API and integration into EdgeX environment?
  - Recommendation: Certification <u>not</u> include testing the interaction with the actual device. Cost, time, and liability concerns.

- Does a service remain compliant if the EdgeX APIs in a new release change?
  - Assumption: REST APIs will be backward compatible
  - Certification will specify the version tested as a way to inform users there may not be support for newer APIs or capabilities

- Should a Device Service that leverages hardware, e.g. TPM, include testing of the hardware interactions as part of the certification?

  - Recommendation: Anything that is related to security deserves a higher level of validation, but without assuming liability.

- Should submitter be required to submit source code for certification testing?

  - Assumption: Some submitters will have proprietary services and do not want to share source

Next steps?

Agreement on the framework

- TSC agreement and commitment on principles and priorities
- Establish a WG to define and document
- Commercial aspects

Process for Validation / Certification

- Who will certify – EF or third party?
- Develop certification process and test fixtures

Marketing / Promotion

- Communication strategy to community, users

Execution

- Certification process in action
- Certified products listed on web site

Start
January 2019

First Certified Product
Q3 2019?

EdgeX Process & Misc Items

EdgeX Process & Misc Items

- Look for more on the Go **plugins** discussion next week
- Releases, versions, patches definitions & policies - Final dock
  - TSC approval vote needed
  - See https://wiki.edgexfoundry.org/pages/viewpage.action?pageId=21823969
- Work still on going (see Wiki for current drafts)
  - LTS/STS still being reviewed & worked

EDGEXFOUNDRY™

EdgeX TSC F2F Meetings

EdgeX TSC F2F Meeting(s)

- **22 - 25 April, 2019** -- Location Seoul, South Korea -- Wiki page
  - Technical Business Discussions + EdgeX 101 on Monday, April 22
  - Architect's Day / WG Breakout Sessions + Social Event on Tuesday, April 23
  - Technical F2F - Day 1 + Dinner Reception on Wednesday, April 24
  - Technical F2F - Day 2 on Thursday, April 25
- **RSVP at https://goo.gl/forms/oMptkNU90RRxhK5g1**
  - RSVP by EOD April 5
  - Current registration count: 5 in-person; 0 dial-in
- Hotel/Travel: Information coming soon

Discussion: Does the TSC want to move the F2F meeting up by a week (April 15) or back a week (April 29)?

- Easter Sunday is April 21, which would be a travel day for most
- Good Friday is April 19, which could impact some folks the week of April 15
- April 29 - May 2 is Dell World
- Other April events include Hannover (April 1-5), IOTBuild (April 9-10), Global IoT Expo (April 25-26)

- **October, 2019** -- Location Chandler, Arizona (USA) @ hosted by Intel

edgexfoundry.org | @edgexfoundry

Upcoming Events

Upcoming Events

- [Emerging Computing Technology Conference](), January 29-30, 2019, Houston
  - Akram Ahmad (Dell) - January 29 at 4:15 pm

- [IoT Evolution Expo](), January 29 - February 1, Fort Lauderdale
  - Jim White (Dell) - TBD - Edge Computing: Remotely acting on mission-critical decisions in the field

Upcoming CFPs

CFP Upcoming Deadlines:

- Open Source Leadership Summit , March 12-14, 2019, Half Moon Bay, CA
  - CFP Status: Closes January 28, 2019
  - https://events.linuxfoundation.org/events/open-source-leadership-summit-2019/program/cfp/

- Open Source Summit China, June 24-25, 2019 | Shanghai, China
  - CFP Status: Opens December 1, 2018 – March 10, 2019

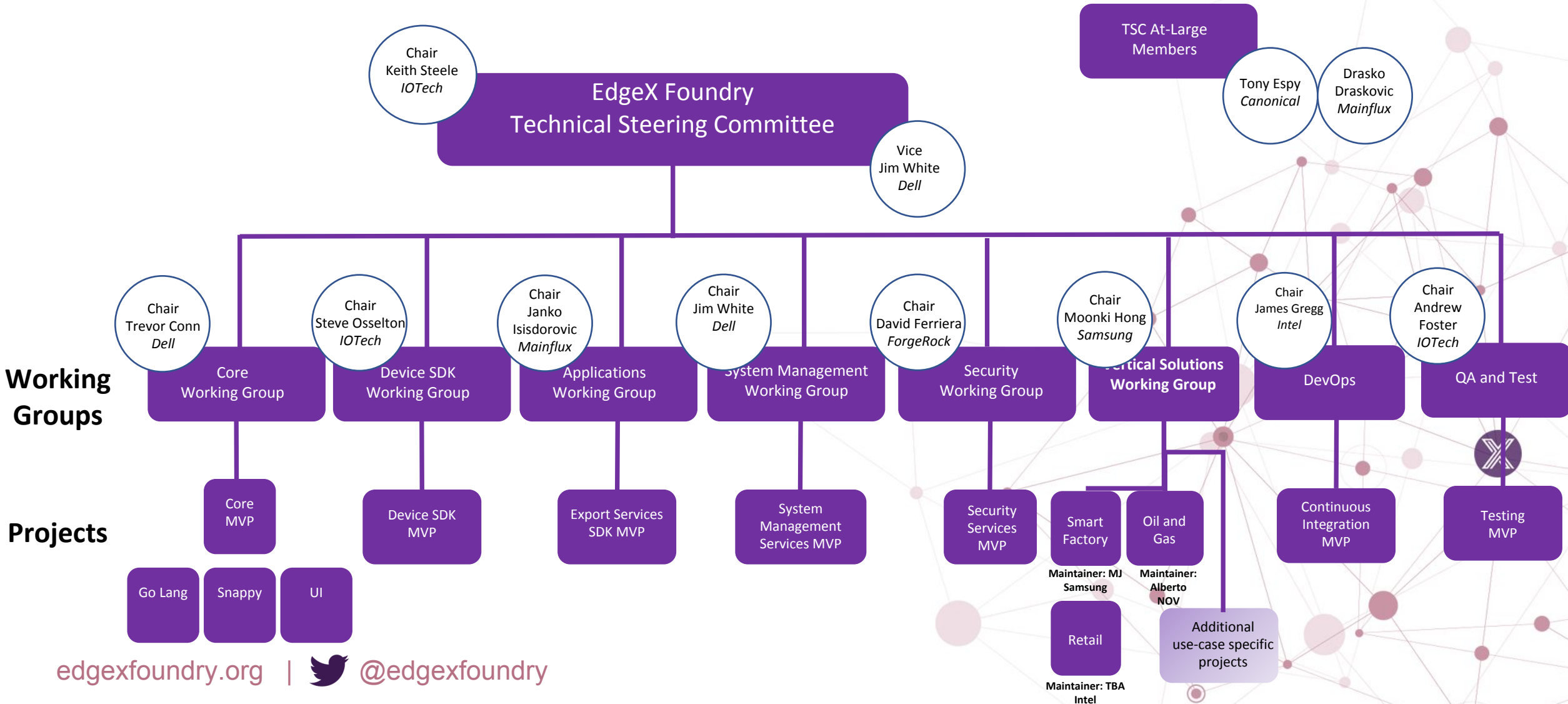- Members interested in joining the EdgeX Speakers Bureau, please email pr@edgexfoundry.org

AOB / Reminders

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: January 23, 2019**

EdgeX Project Organization

Marketing

- **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

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 Brett Preston at LF (bpreston@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://chat.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 Rocket Chat

    https://chat.edgexfoundry.org/home

- Weekly EXF Technical Spin up calls

    30 minute deep-dive topics followed by 30 minute open Q&A
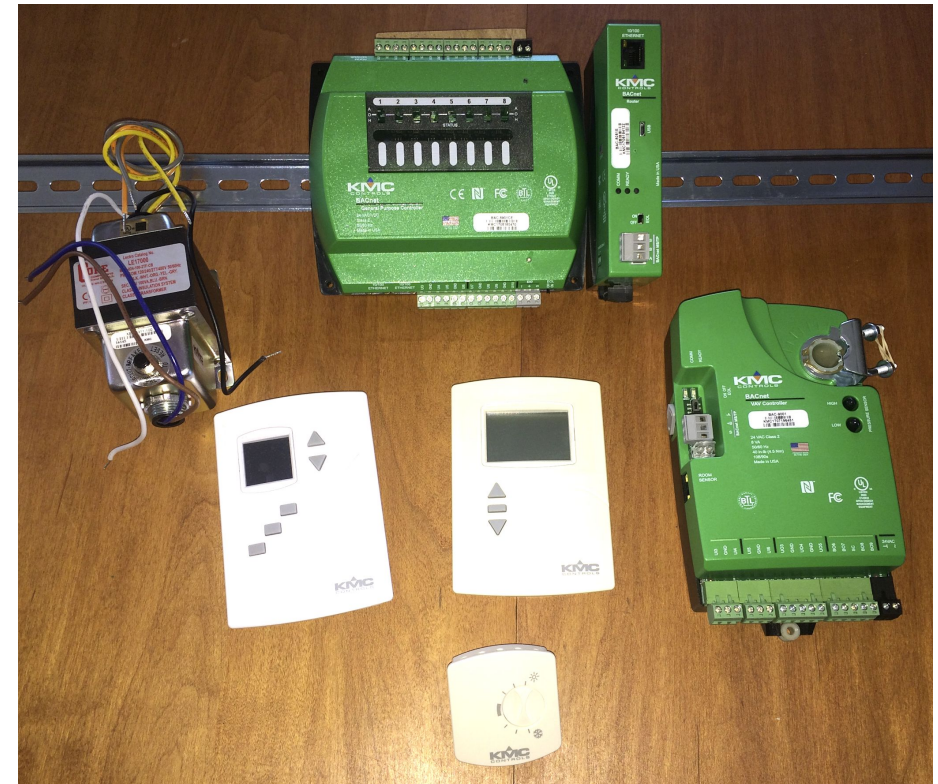
    Call recordings are available on the Wiki

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

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@edgexfoundry.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

Thank You