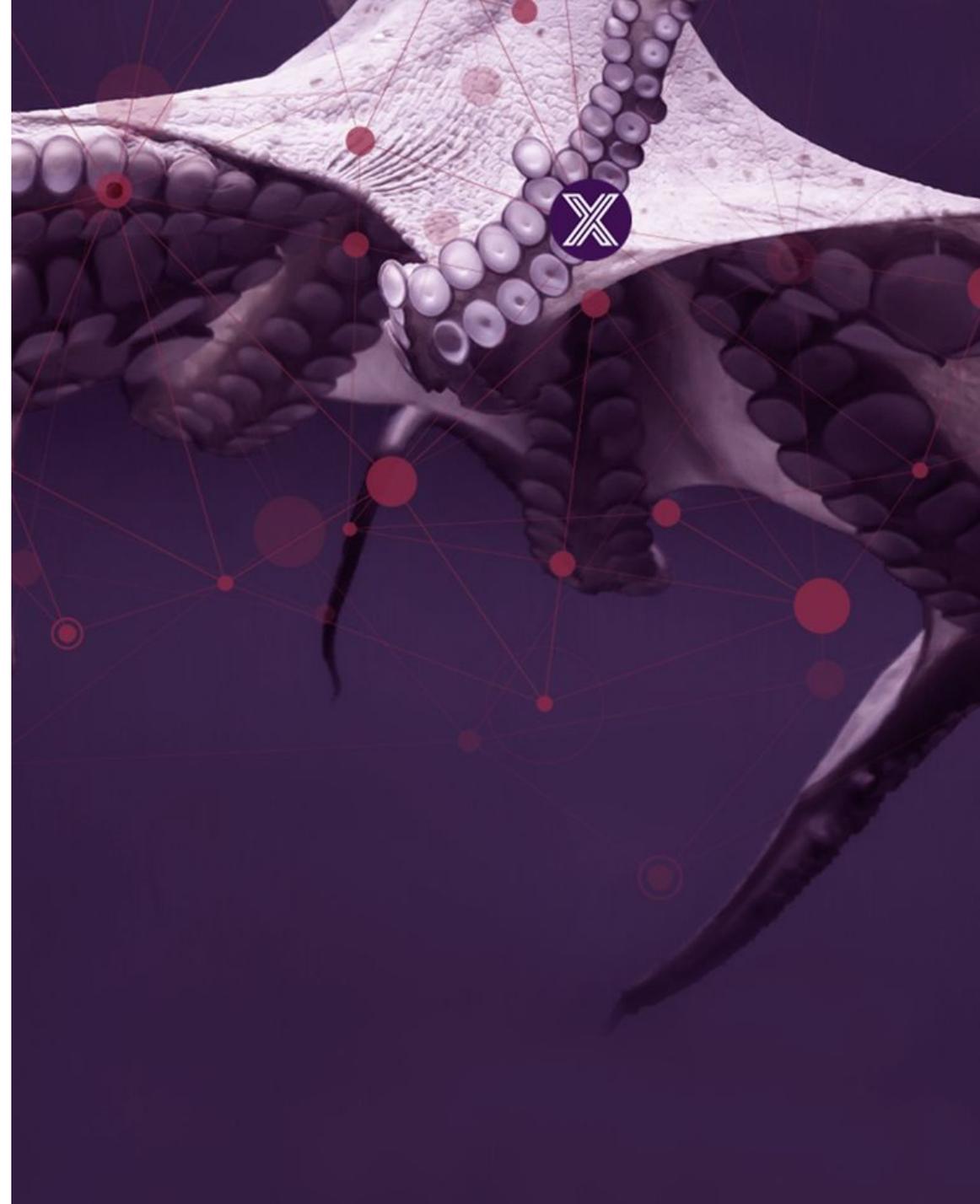


EDGE X FOUNDRY™

TSC Meeting

September 26, 2018



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: September 26, 2018 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/zoomconference?m=mkFexUxEcqHlvXHw53PqScTDRvS48PiQ>

** 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
ForgeRock	David Ferriera	david.ferriera@forgerock.com
Analog Devices	Doug Gardner	doug.gardner@analog.com
Mainflux	Drasko Draskovic	drasko@mainflux.com
Mainflux	Janko Isidorovic	janko@mainflux.com
The Linux Foundation	Jeremy Phelps	jphelps@linuxfoundation.org
Dell	Jim White (TSC Vice Chair)	james.white2@dell.com
IOTech	Keith Steele (TSC Chair)	keith@iotechsys.com
Samsung	Moonki Hong (suspended)	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.*

Today's Agenda

- WG Updates
- Edinburgh F2F Planning
 - Agenda items and topics
 - Logistics
- EdgeX Community Demo Update
- EdgeX DevKits
- Upcoming Events
- AOB



Delhi Release Work Group Updates

Jim White

Working Group Chair Updates

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

Core Working Group (26-Sep-18)

- Service bootstrap resiliency complete
 - Eliminate sleeps at startup, services can come up in any order.
- Config V2 underway
 - All core services are merged into master
 - Export-client is done (PR 591 -- not yet merged)
 - Support-logging is next
- Tomorrow (27-Sept) Core WG @ 10AM CST
 - Update from Andre Srinivasan on Redis provider for EdgeX

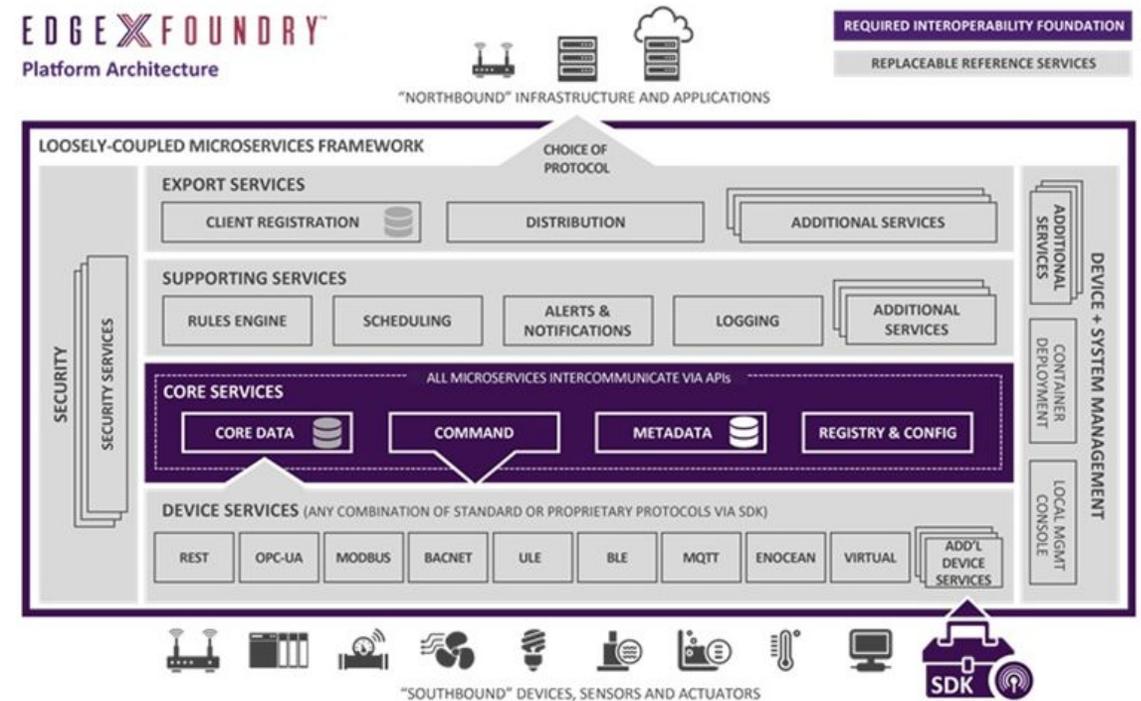
Export Services - Current Status

Existing Features:

- Rules engine
- Export data to Azure IoT Hub, Google IoT, AWS IoT, etc...

Issues:

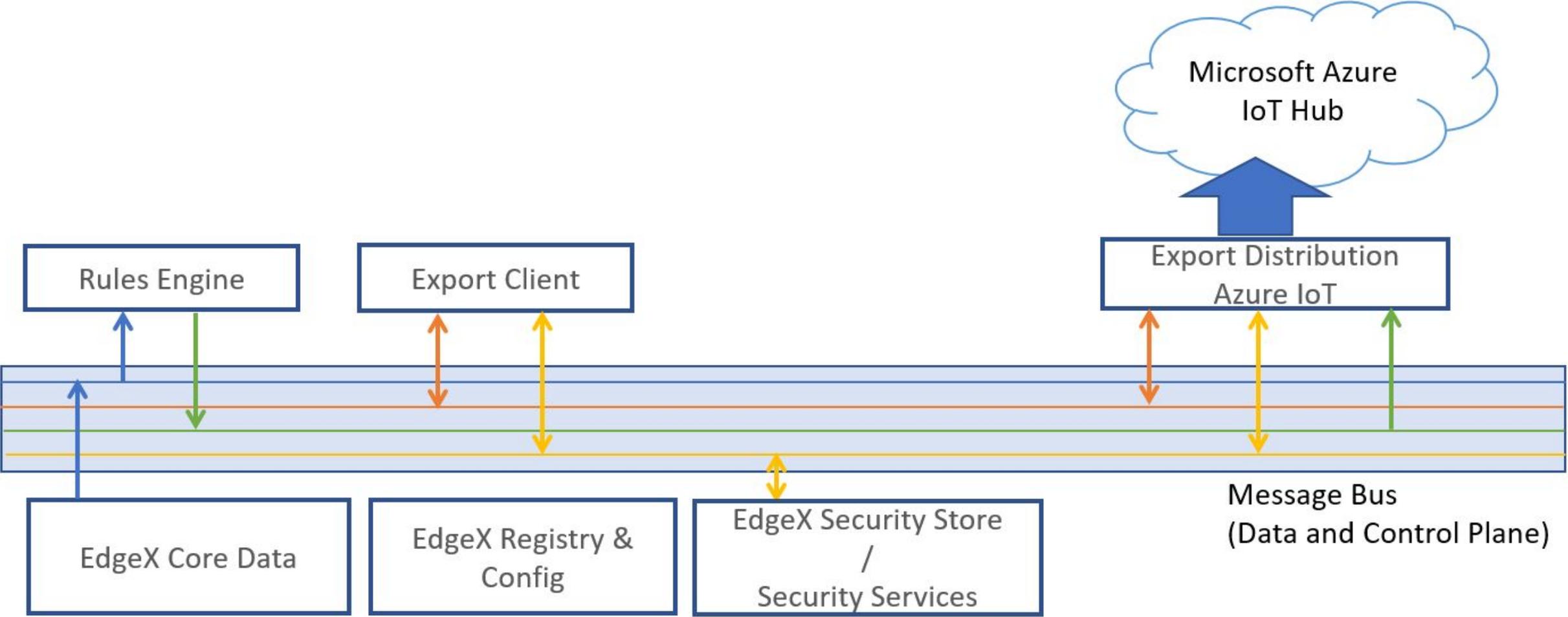
- Not Scaling
- Same services handles all exports
- Can add new export without touching existing exports



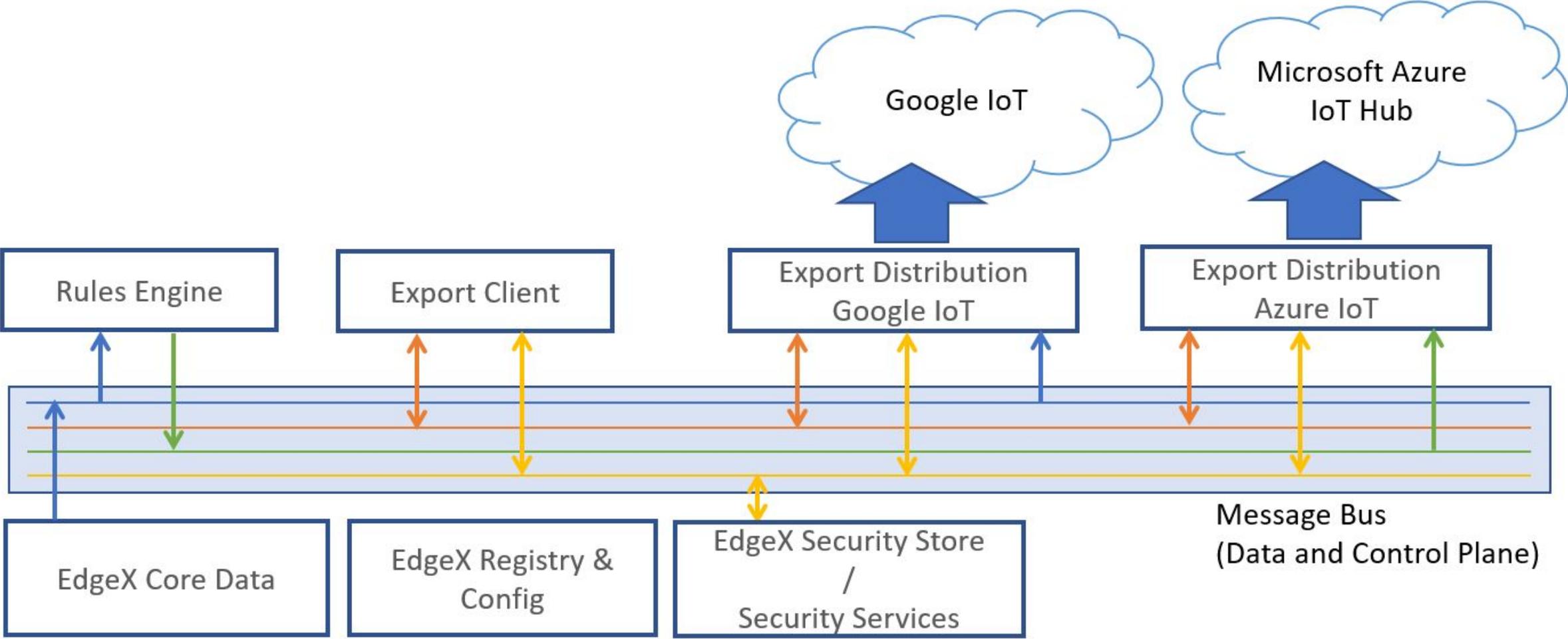
Applications Services General Idea

- Improve Security
- Improve Scaling
- Separate Export Domain from Core Domain
- Make Export Services Modular
- Enable easy addition of microservices
- Enable easy replacement of microservices
- Enable users to spin individual microservices to export data to export target
- Enable users to add different Rules engines (even multiple if required)

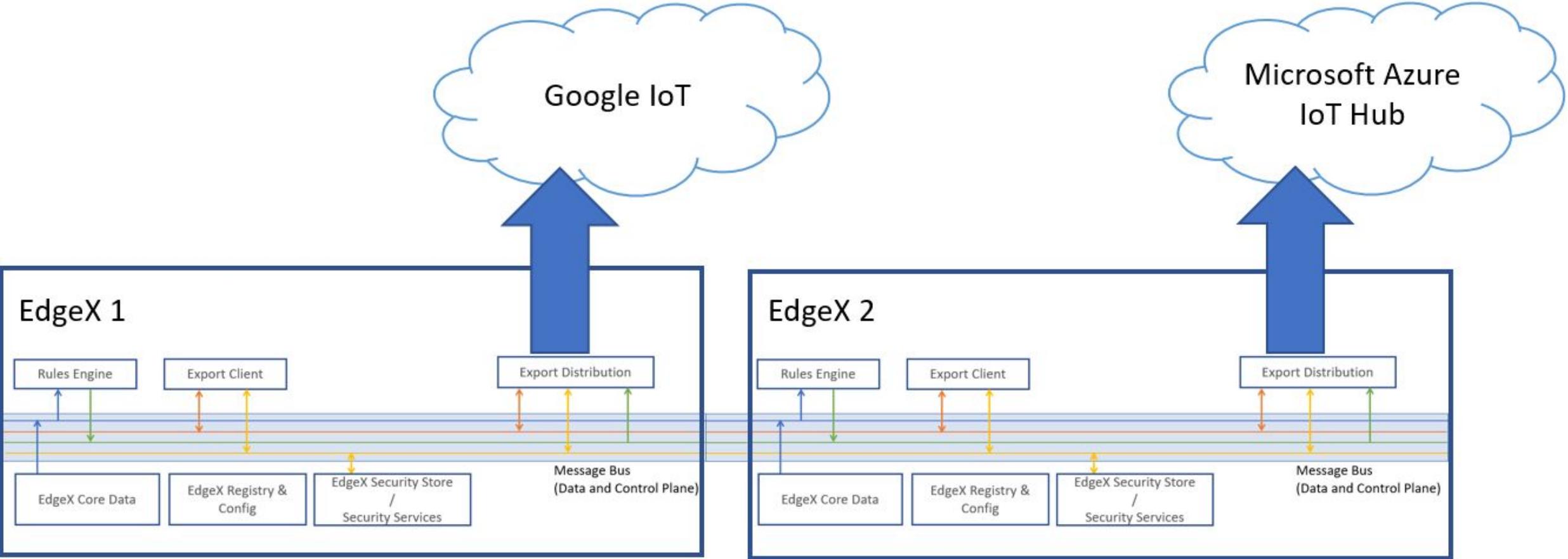
General Architecture High Level Diagram – Single Export Target



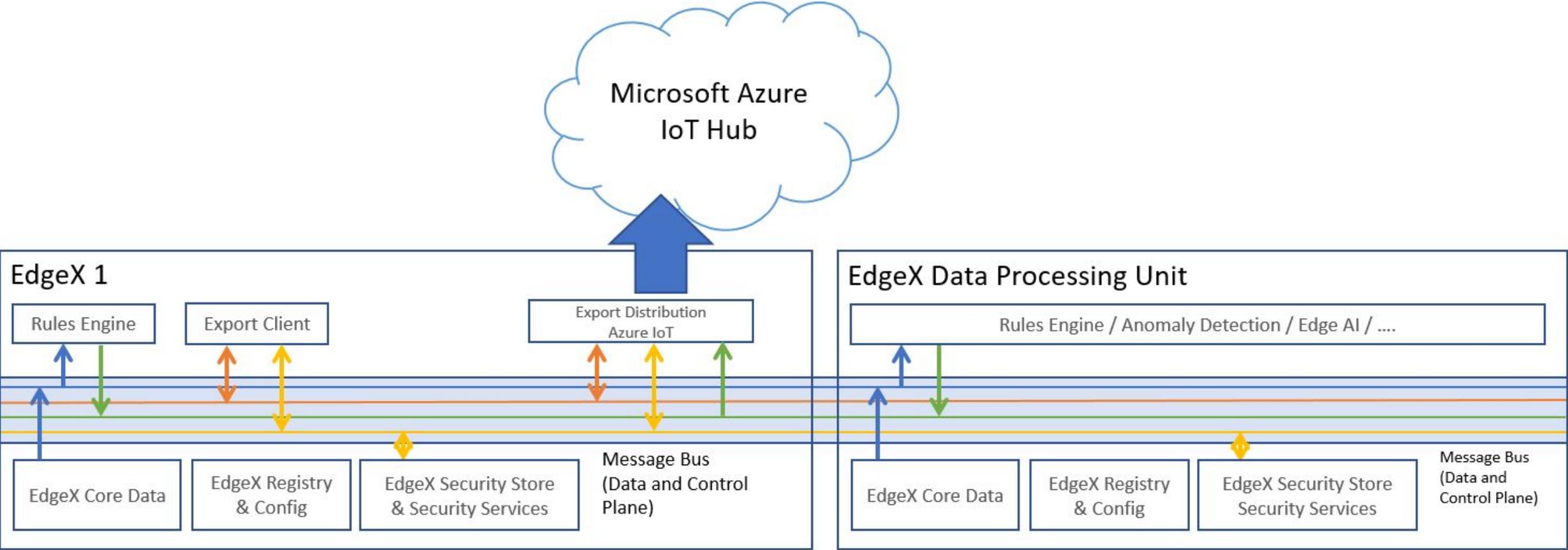
General Architecture Diagram – Multiple Export Targets



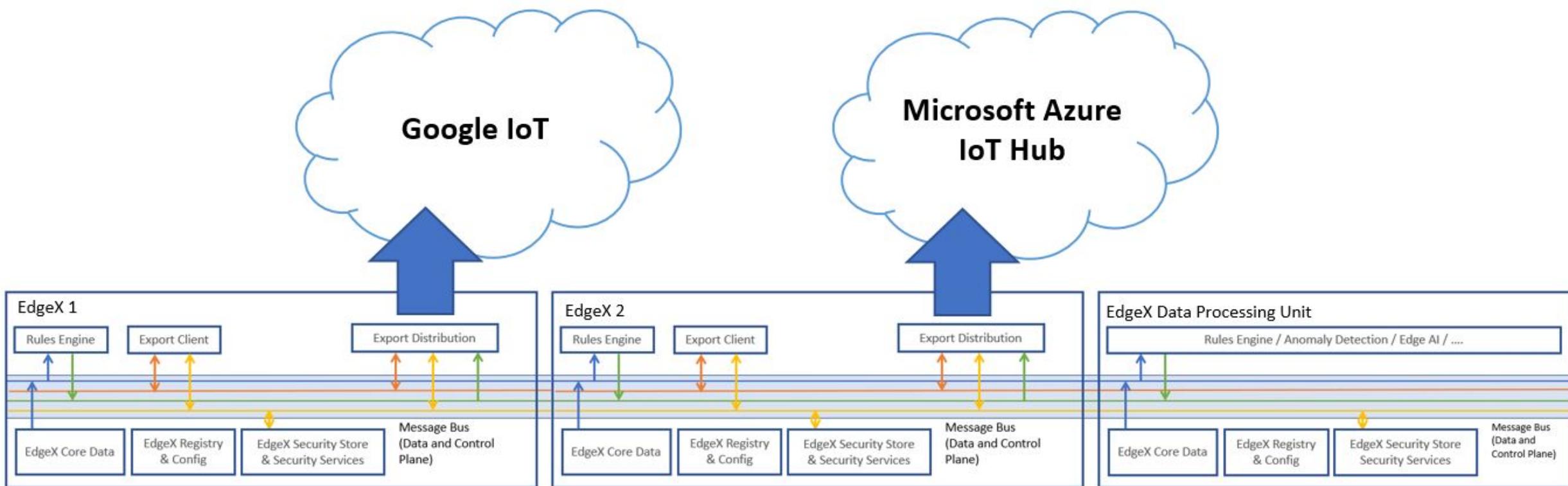
General Architecture Diagram – Horizontal Scaling



General Architecture Diagram – External Data Processing Unit



General Architecture Diagram – Horizontal Scaling and External Data Processing Unit



Application Working Group Meetings

- Agree on schedule - Weekly meetings because there is a lot of work in front of us.
- First meeting for next week - General discussion on this proposal
- Second meeting should be on Message bus
- Third meeting should be on preparing for Edinburgh F2F meeting

AI - Brett: Set up Doodle for first meeting next week

Device Services WG Update (26-SEP-18)

- Go SDK
 - Ongoing contributions from community
 - Need identified to finalise user API
 - Debate over implementation review process
- C SDK
 - GitHub issues being created for remaining tasks
 - Two device services with basic read/write functionality (IOTivity/Grove)
- General
 - Mechanism for scheduling integration resolved
 - Design document still to be finalized

Device Services Priorities? (26-SEP-18)

Ethernet – Industrial and Building Automation:

- Modbus TCP
- BacNet/IP
- OPC DA
- OPC UA
- EtherNet/IP
- EtherCat
- Profinet
- Zigbee
- DALI
- KNX
- IOTivity

Ethernet – General Purpose

- MQTT
- GRPC

Serial Industrial

- Modbus RTU
- BACnet/MSTP
- Profibus
- DNP3
- CAN

QA/Test WG Update (26-SEP-18)

- Device Service SDK blackbox testing
- Reviewing performance testing tools and frameworks
- Develop performance testing strategy to be discussed at Edinburgh F2F
- Assist DevOps to setup better testing scoreboards

DevOps WG (19-SEP-18)

- Working through another issue on arm (ubuntu 1804)
- Tony/Ian, contact at Canonical for running 1604 on arm?
- Brandon at Dell helping out on java service CI
- Found a CI bug in security services (fixed)
- Self release is being worked on
- Need to look at docs verify job failures

Security (26-SEP-18)

- Delhi work continues - Items below all in progress
 - Init script golang replacement - 1 outstanding item before completion
 - Vault non-root tokens and namespace creation
 - Oauth Plugin for Kong
 - ACL Plugin
 - HW Secure storage abstraction design
- Began discussions with WG about Edinburgh deliverables
- **Request:** Present IIC Security presentation at an upcoming TSC call
 - Scheduled for 10-Oct-2018
- No security WG meeting on 03-Oct-2018

System Management WG (26-SEP-18)

- Implementation update
 - Function complete
 - Working on video demo to show (and allow you to play with APIs)
- Next Sys Mngmt WG meeting topics (Oct 2)
 - Management API options (for Edinburgh transformation)
 - Additional metric collection (for Edinburgh)
- Roadmapping slide deck produced (Edinburgh, Fuji)
 - [See the Wiki](#)

Developer Outreach (26-SEP-18)

- Complete
 - [Developer Survey](#)
 - Meetings calendar: <https://www.edgexfoundry.org/calendar/>
 - Get Started, phase 2 (draft)
 - Devkit landing page
- In Progress
 - [Deployment patterns](#) documentation
- Blocked
 - Device Service creation documentation
- Coming up
 - Security Services documentation

New Management GUI

- IOTech Contribution
- Based on Clojure
- IOTech Systems Public Github <https://github.com/IOTechSystems/edgex-ui-clojure>
- Feedback gratefully accepted



EDGE X FOUNDRY™

Edinburgh F2F Planning

Jim W & Brett

Project & Architecture Introduction Options

Thanks to Doug Gardner for the suggestion

Options:

- A. Project Architecture Video Conference
 - a. Zoom conference call between Oct 15-17 (recorded)
 - b. Includes Q&A
- B. Point people to recorded tech talks
- C. Hold a tutorial on Monday, Oct 22 in Edinburgh
- D. Hold a quick 1 hour tutorial at 8am on Tuesday, Oct 23 in Edinburgh
- E. Hold a quick 1 hour tutorial at 8am on Wednesday, Oct 24 in Edinburgh
- F. Some combination of above

In future F2F, we will include room in the schedule

Edinburgh F2F

- Oct 23 - Architect's Day (tentative plan)
 - Morning Half / Half Room discussions
 - Device Services/SDK – device onboarding; DS callbacks; adding device through metadata & what's next in DS
 - Test/QA - performance testing strategy
 - Application Services Design - the export services replacement
 - Afternoon Half / Half Room discussions
 - Security – Hardware root of trust and building out an EdgeX interface to HRofTrust
 - System Management – what is in EdgeX system management long term and what is gateway or other management that may not actually fall into EdgeX. In other words what is our scope long term and how do we handle needs not in our scope.
 - 4:30-5:30pm joint session review & prep for F2F

Edinburgh F2F

- Oct 24-25: TSC meetings
- Planning Deck started
 - [See Wiki for latest](#)
- High level Agenda
 - Architecture teeup
 - Scoping for Edinburgh and Fuji releases
 - DevOps topics
 - Developer Advocate report and topics
 - Architecture Issues

Current Edinburgh F2F Architecture Topics (**tentative**)

- Database replacement/options
- Device services and SDK in mono repo
- Export Services (soon Application Services) – state of rework
- Move to Go 1.11
- Modules / vgo
- Tracing of request through all services to allow better debugging and support
- Performance testing (who, what, how)
- Automated security testing
- HW root of trust (HW storage abstraction) in Security
- Improved resiliency
- What do we need to do next? Services now are more resilient to timing issues
- Support for distribution
- What do we need to do to better support truly distributed EdgeX
- Release management/manager
- Windows developer support (OMQ issue)
- ARM 32 support (are we directly supporting or not??) Support for device hierarchy in metadata (and elsewhere)
- Automate generation of API documentation (RAML)
- Replacement of RAML or alternate to RAML (Swagger)
- Config changes and callback/watcher
- Alternate deployment / orchestration (ex: adding Kubernetes support)
- How to supply command information to the north side systems (ex: how to give Azure IoT the ability to command devices)?
- Code signing Exe/JAR/etc. artifacts, Docker containers
- Downsampling @ device service level
- Min/Max values (or other checks) on command parameters
- Message bus intercommunications between more micro services.
- Configuration versioning

Edinburgh F2F

- Business Topics (covered 3-5pm on Thursday)
 - **Tentative** topics list
 - Demonstrator
 - Dev kits
 - IIC and other liaison efforts
 - Which events we use to show case and announce
 - Certification/Marketplace offerings
 - Marketing and messaging efforts (like those raised by Moonki at the last meeting)
 - Developer Advocate and other role

EdgeX TSC F2F Meeting(s)

- Wednesday & Thursday 24th/25th October -- Location Edinburgh, UK -- [Wiki page](#)
 - Working Group technical meetups on Tuesday, October 23
 - **RSVP at <https://goo.gl/forms/QR3WgP4ybB5KUT3w2>**
 - Current registration count: 33 in-person; 3 dial-in (3 are Tuesday only)
 - Tuesday Working Group Counts
 - Security: 7
 - Systems Mgmt: 3
 - Applications: 5
 - Device: 11
 - QA/Test: 2
 - Hotel/Travel: <https://events.linuxfoundation.org/events/elc-openiot-europe-2018/attend/venue-travel/>
 - For Wednesday night dinner/activity, Scotch whisky tasting!!
 - RSVP is required. RSVP as part of TSC registration above.
 - Current dinner count: 29
-
- April 2019 -- Location Seoul (South Korea) @ Samsung offices

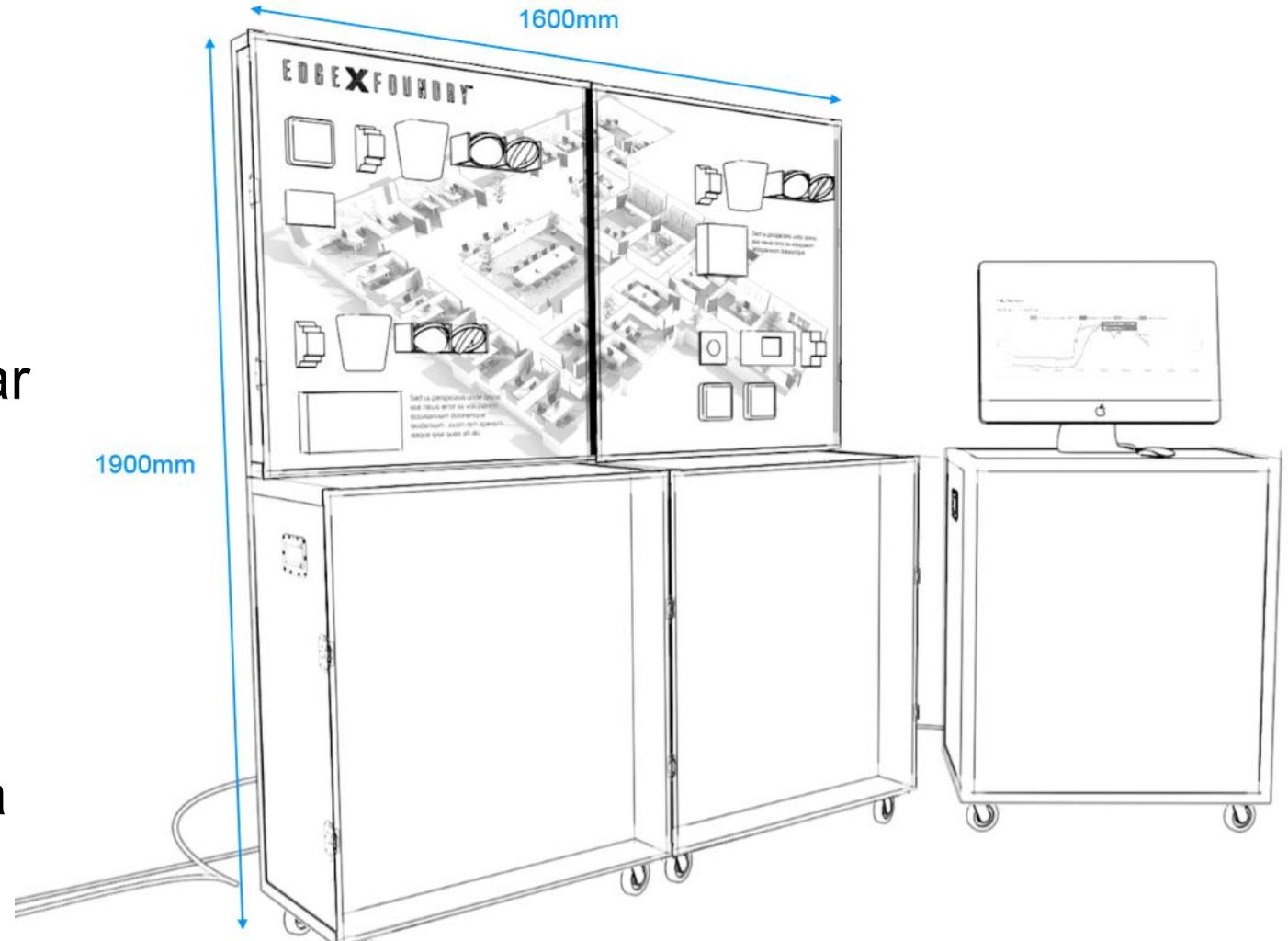


EdgeX Community Demo Update

Andy Foster

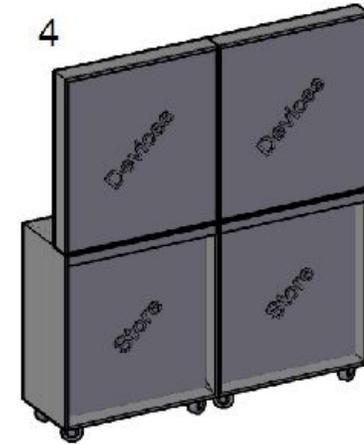
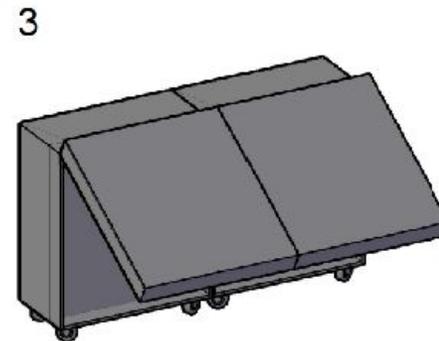
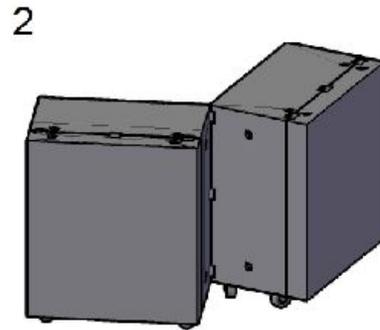
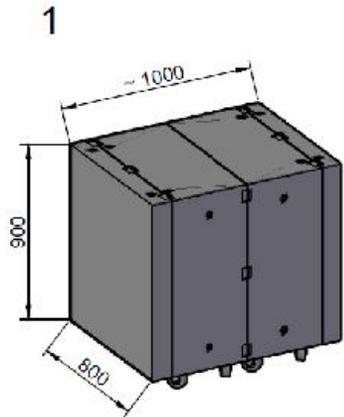
Stand Design

- Demonstrator stand design has been revised based on feedback from TSC
- Single wall design has been replaced with a more modular approach
- Will make transportation and setup much easier and more costs effective
- New design will enable demonstrator to be used at a greater variety of events



"Magic Cube" Demonstrator

- small size
- easy to transport
- easy to assemble/dismantle on site



EdgeX Foundry Demonstrator

Outer Dimensions are fixed.

Inner Dimensions are approximate indications showing minimum or maximum space at position.

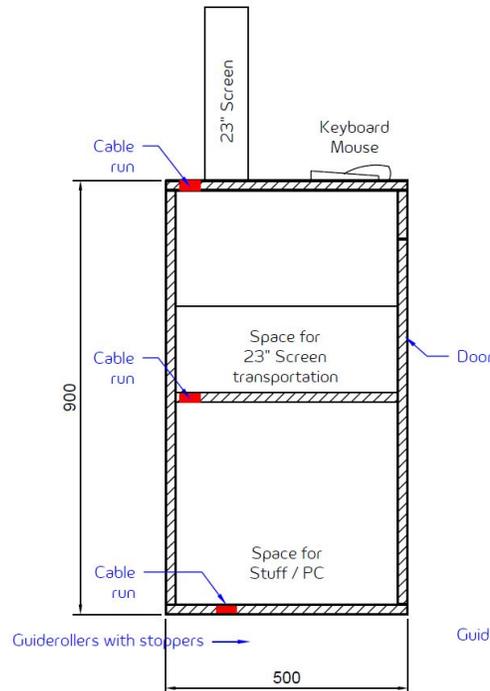
All panels 9mm thick, plain in phenolic brown (ready for self adhesive graphics)

Aluminium profiles 30/30mm all around, fixed by rivets.

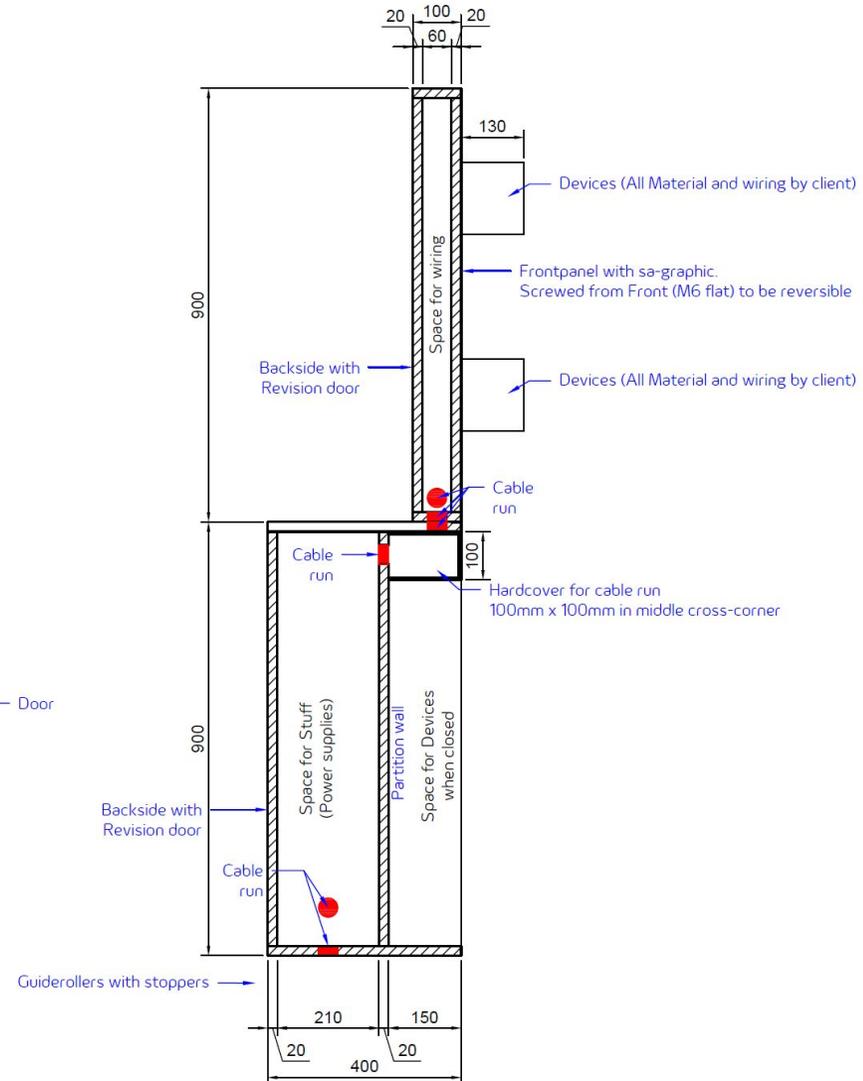
Ballcorners, Guiderollers with stoppers.

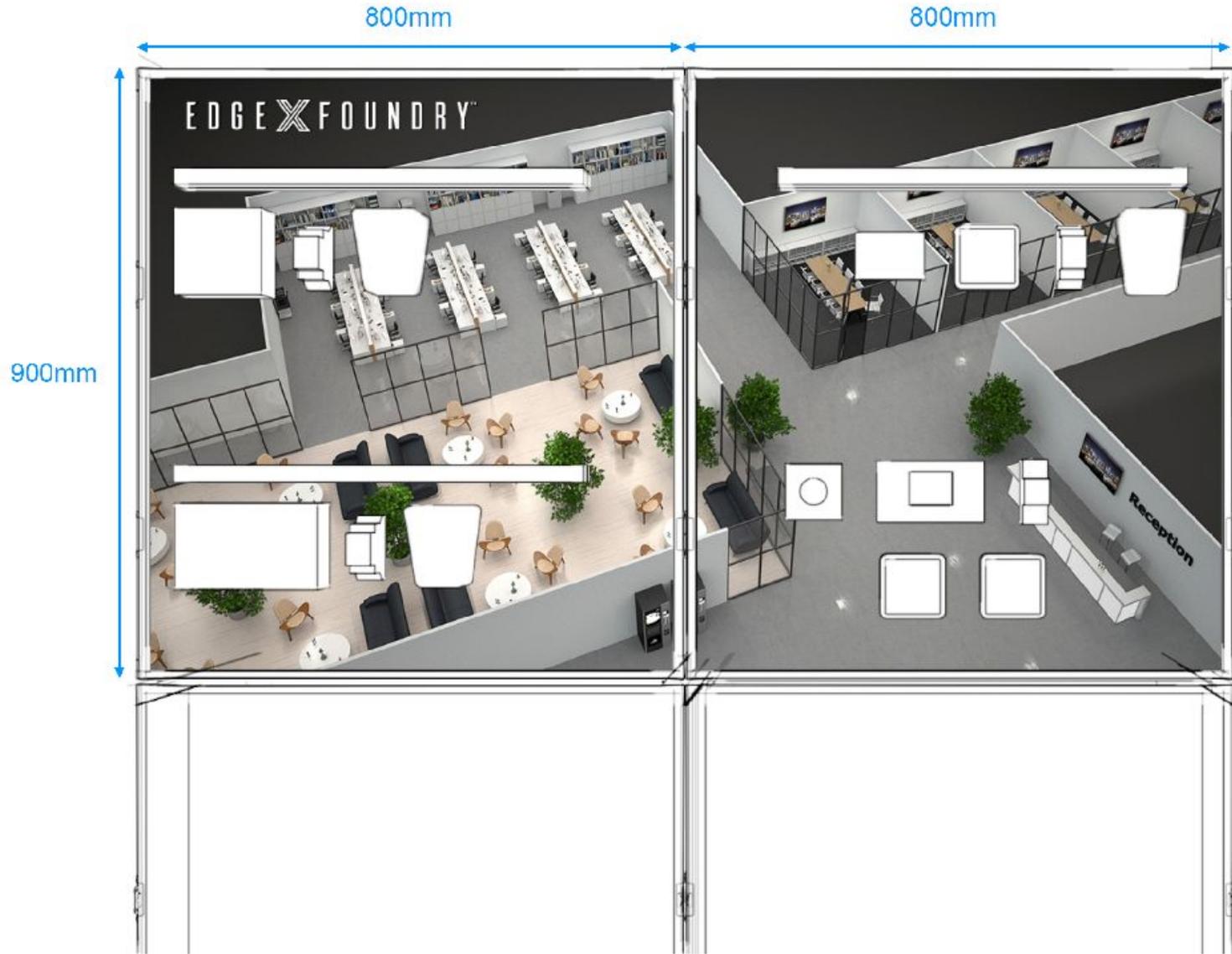
All cable runs ● Ø40mm with protected edges.

Monitor case section view

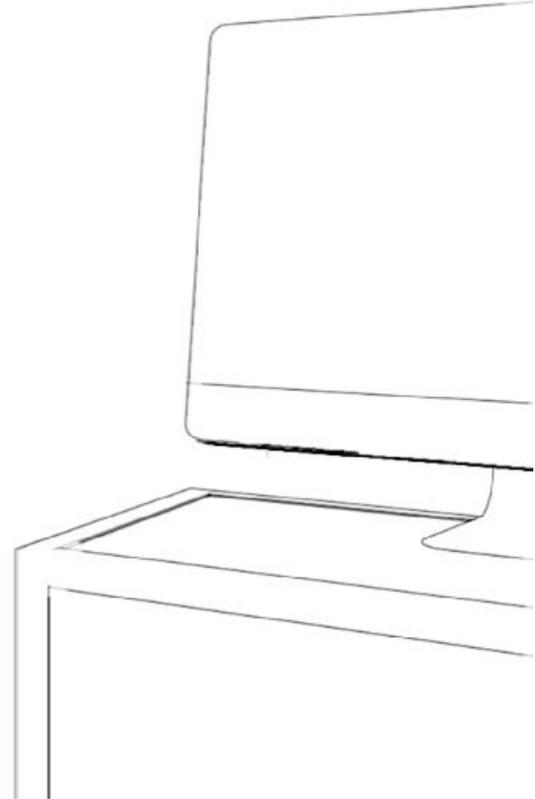


Devise cases (2 pcs) section view

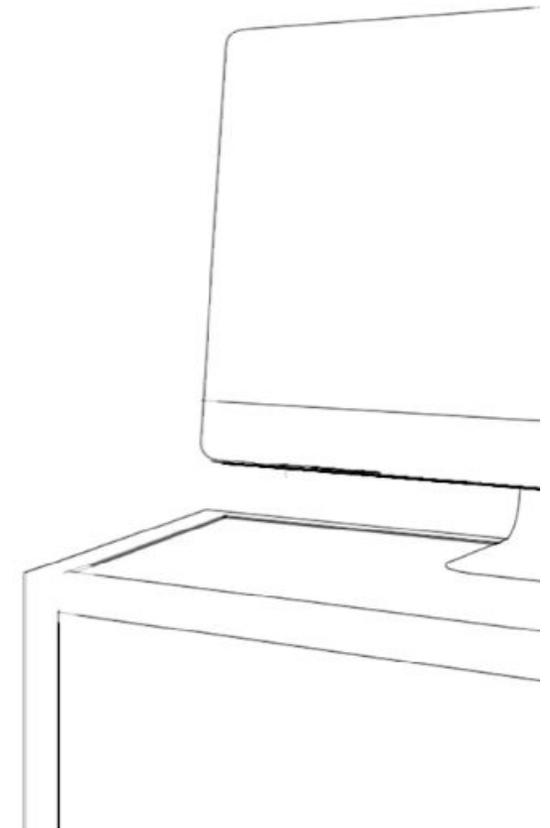
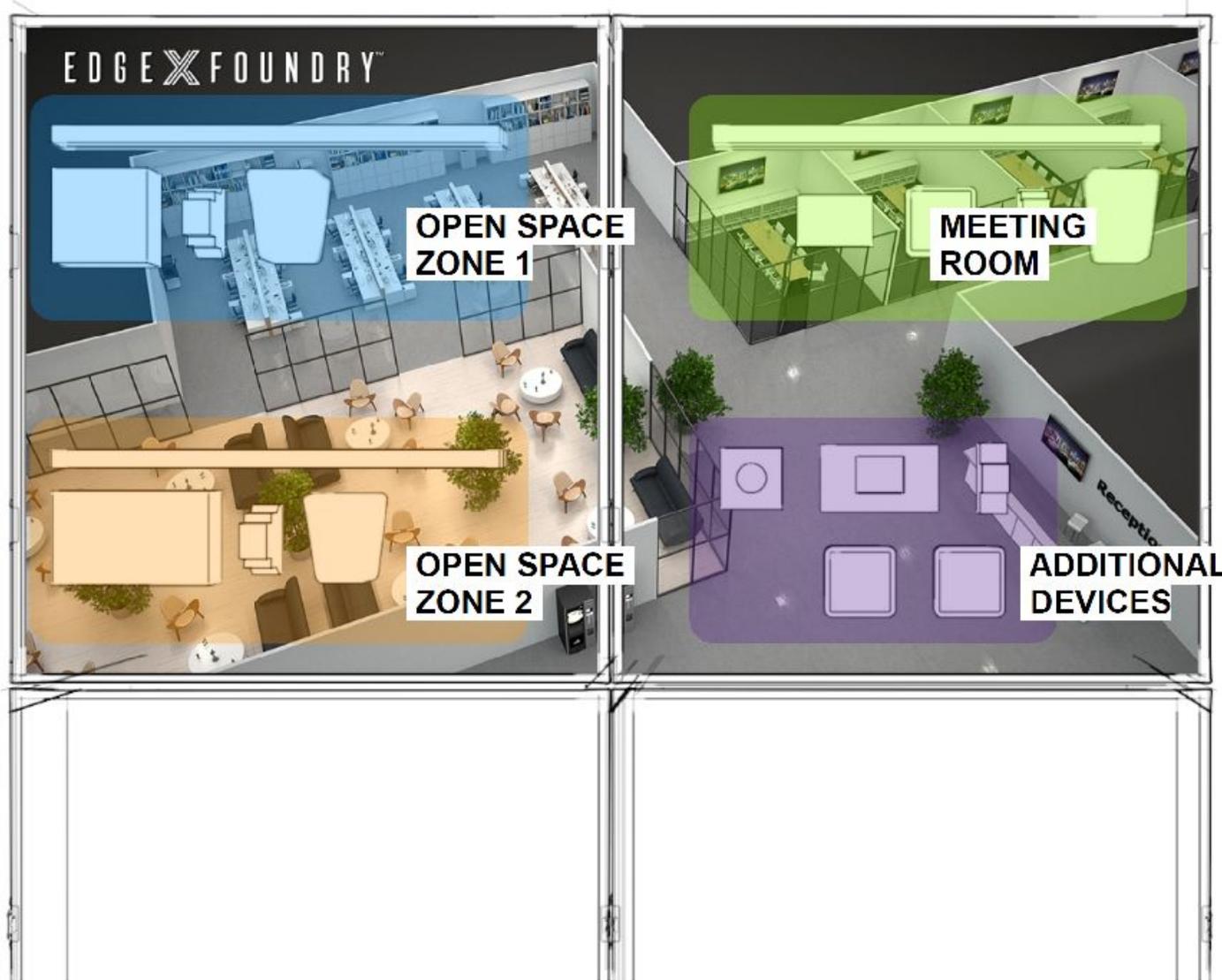




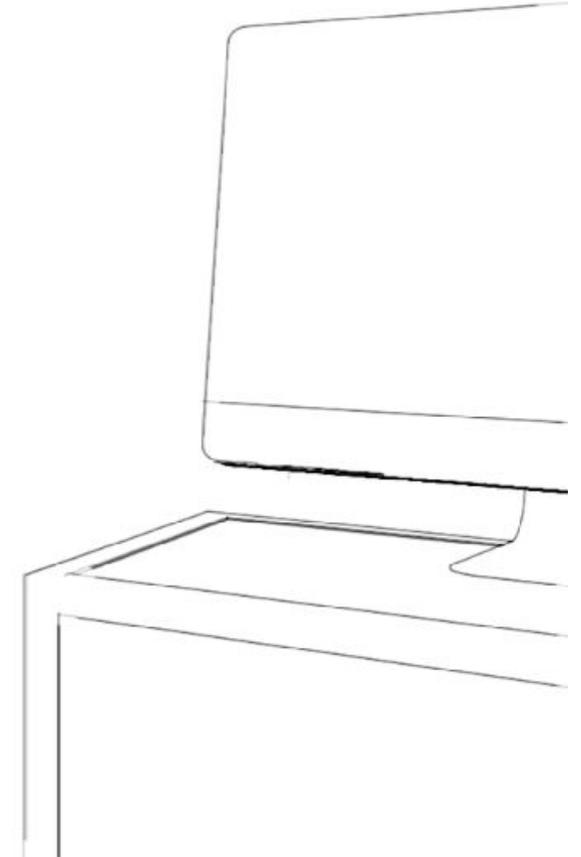
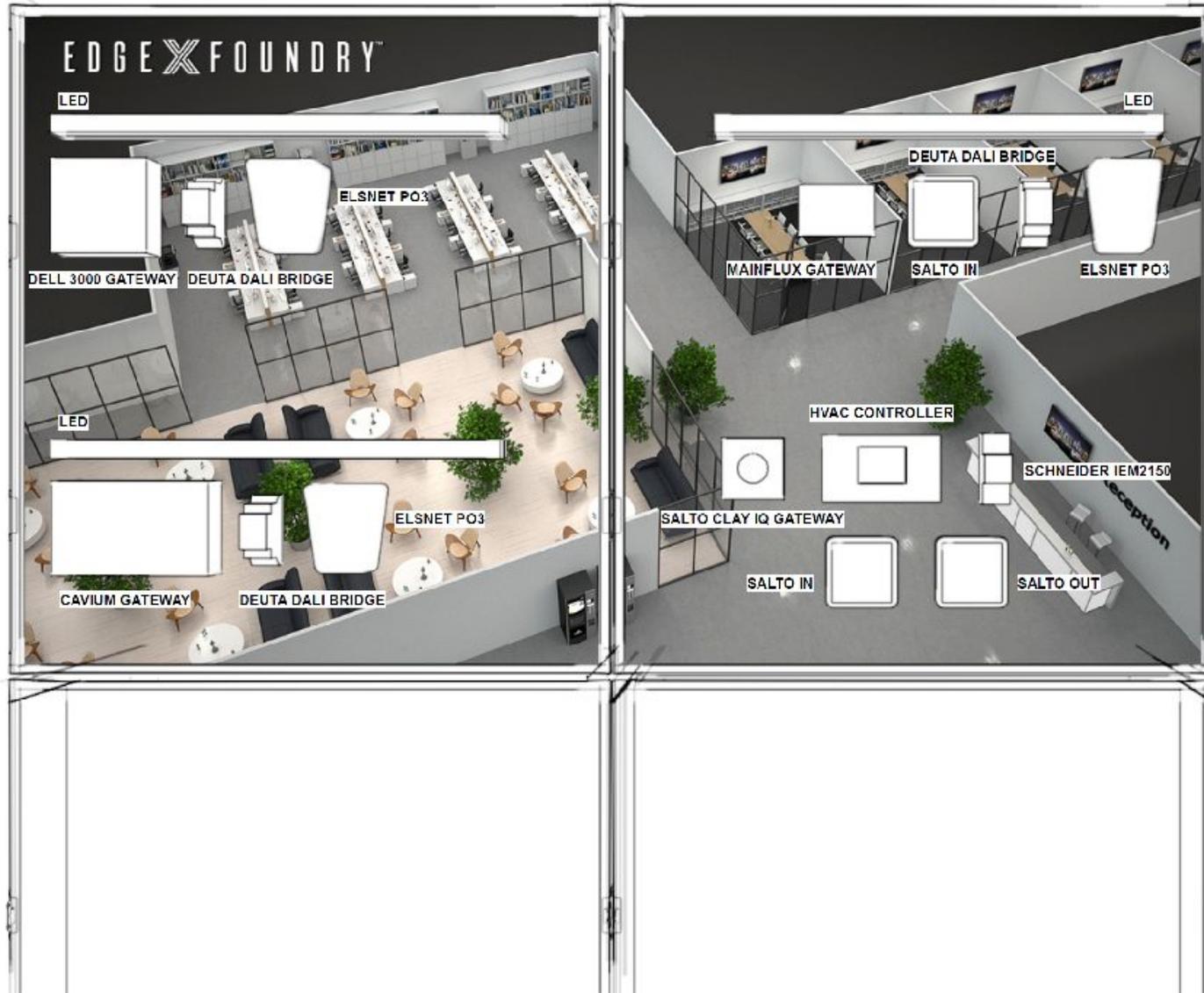
PROPOSAL



PROPOSAL



PROPOSAL





EDGE X FOUNDRY™

EdgeX DevKits

Keith Steele

EdgeX Open Source Developer Kit (19-Sep-18)

- IoT Platform Software (bundled for FREE without support)
 - Edge X (Delhi Release)
 - Linux operating system
 - Core Services (Data, Metadata, Command)
 - OT Connectivity
 - Grove Device Service, MQTT Device Service
 - Edge Analytics
 - Node Red Service
 - Supporting Services (Logging, Notifications, Scheduler)
 - Cloud Connectivity
 - Export Services (REST, AWS, Azure) – cloud subscriptions must be purchased separately
 - Management GUI



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Upcoming Events

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

Additional EdgeX events available at
<https://www.edgexfoundry.org/events/>

Upcoming Events

- [Open Networking Summit Europe](#), September 25 - 27, 2018, Amsterdam, Netherlands
 - Community Partner: Save 15% on Attendee Registration with discount code ONSEU18COM15
- [IoT Scotland Meetup](#), September 27, 2018, Scotland
 - 6:30pm: Keith Steele - EdgeX Foundry overview
- [Redis Labs IoT Meetup](#), October 1, San Francisco
 - Dave Nielson - EdgeX Foundry lightning talk
- [Fog World Congress](#), October 1-3, San Francisco
 - Dr. May Wang - EdgeX Foundry overview (TBD)
 - Rob Schauble - Edge computing panel
 - Salim AbiEzzi - System Management
- [Newcastle IoT Meetup](#) - October 2, Newcastle
 - Keith Steele - EdgeX Foundry overview
- [IOT Solutions World Congress](#), October 16-18, 2018, Barcelona
 - Exhibiting: Booth location - Gran Via, Hall 2, Level 0, Street B, Stand 271
 - Community Demo debut (built by IOTech, Basking Automation)
 - Member kiosks: CloudPlugs, Redis Labs, ZEDEDATA, Community kiosk (RSA, VMware)

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

Additional EdgeX events available at
<https://www.edgexfoundry.org/events/>

Upcoming Events (continued)

- [Open Source Summit Europe / ELC / OpenIoT Summit Europe](#), October 22 - 24, 2018, Edinburgh, UK
 - Community Partner: Save 15% on Attendee Registration with discount code OSSEU18COM15
 - [Schedule announced](#)
 - EdgeX Sessions:
 - [Getting Started with EdgeX Foundry Workshop](#), Sunday October 21 at 1:30-5:15 pm, Jim White, Dell
 - [Extending Cloud-Native Principles to the Edge to Enable Scalable IoT Solutions](#), October 23 at 9-9:40 am, Jason Shepherd, Dell
 - [Building an Open IoT Solution with EdgeX Foundry and the Zephyr Project](#), October 23 at 12:20-1pm, Michael Hall, EdgeX Foundry and Thea Aldrich, Zephyr Project
 - [Getting Lean and Distributed at the Edge](#), October 24 at 5:05-5:45 pm, Jim White, Dell
 - Lunch and Learn, led by Jeroen Mackenbach (Dell), integrating EdgeX
 - Member sessions (for amplification)
 - [Can we Build a Safety Integrity Level System with Linux?](#) October 22 at 11:15-11:55 am, Tiejun Chen, VMware
 - [A Hybrid Solution to Address Real Time Virtualization](#), October 22 at 5:05-5:45 pm, Tiejun Chen, VMware
 - Any other member presentations?
- [EdgeX Edinburgh Technical Meetings](#), October 23 - 25, 2018, Edinburgh, UK
- [Internet of Things Congress](#), October 24, 2018, Nuremberg, Germany
 - 2pm: Matthias Schorer - EdgeX presented in session on how to use microservice approach to IoT edge computing.

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

Additional EdgeX events available at
<https://www.edgexfoundry.org/events/>

Upcoming Events (continued)/CFPs

- [Symposium on Securing the IoT](#), October 29-31, Boston
 - Brad Kemp - EdgeX Foundry Overview (TBD)
 - [Advantech IoT Co-Creation Summit](#), November 1-2, Suzhou, China
 - Jijun Ma - Nov 2: Workshop ““[物联网趋势解读](#)” held by [物聯網智庫彭昭](#)
-

CFP Upcoming Deadlines:

- [Internet of Things World](#), May 13-16, Santa Clara, CA (USA)
 - Deadline - November 16, 2018
 - https://get.knect365.com/iot-world/speaking-submission-2019/?_ga=2.218061782.1372769890.1536769581-2081958547.1534262136
- Members interested in joining the EdgeX [Speakers Bureau](#), please email pr@edgexfoundry.org



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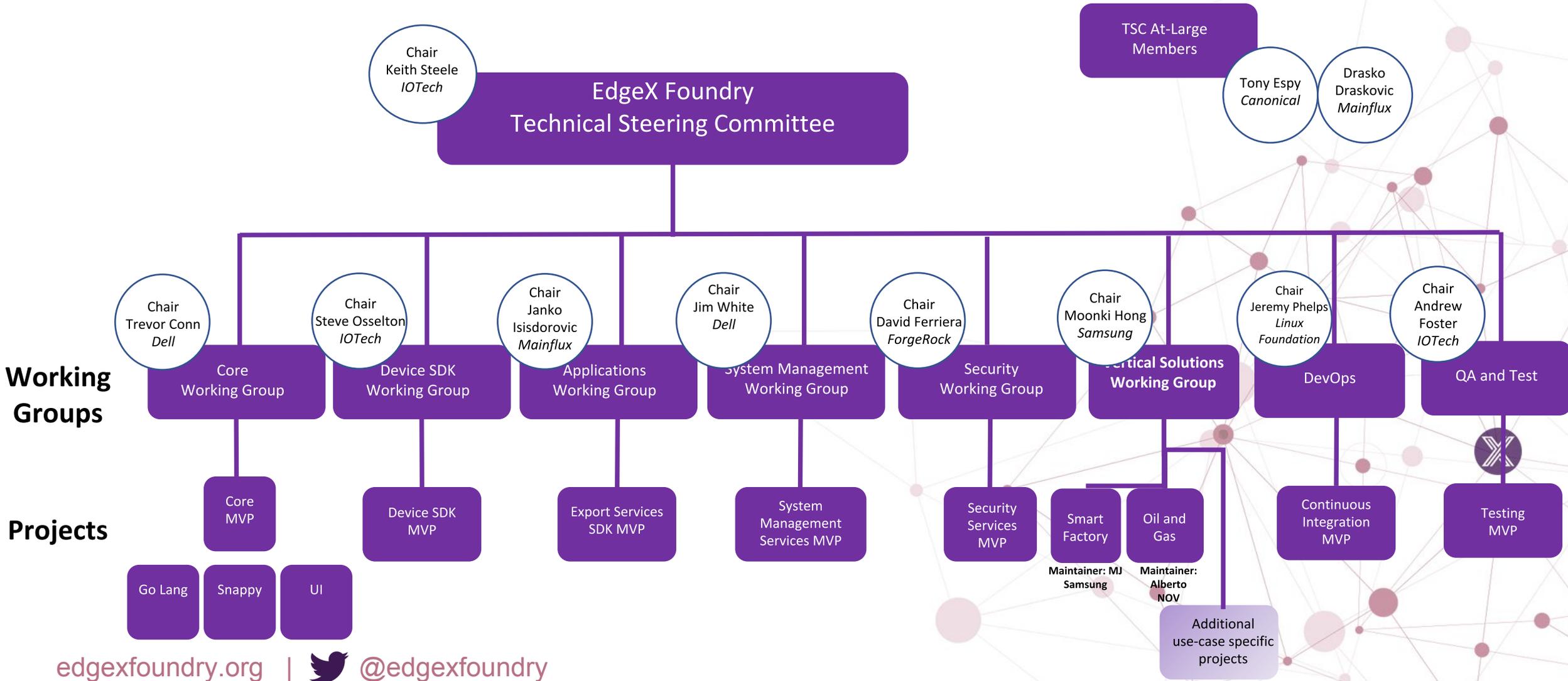
AOB / Reminders

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: October 3, 2018**

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](#)

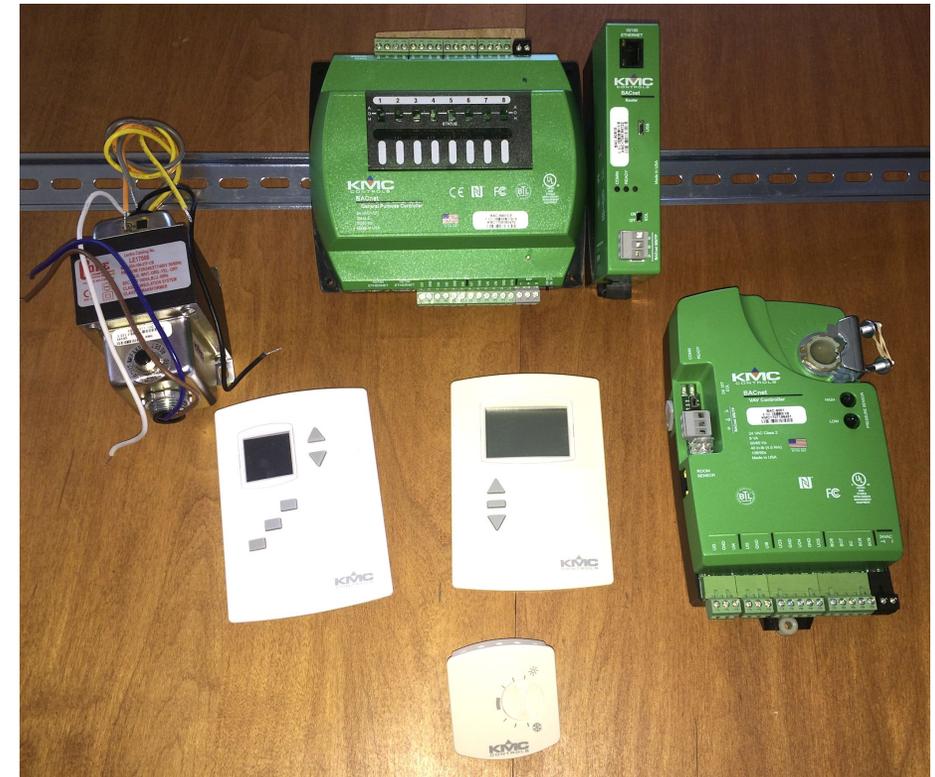
What is the Device Exchange?

- 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



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@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



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Thank You