



EDGE X FOUNDRY™

Delhi TSC F2F Working Agenda and Deck

Palo Alto, CA
June 5-6

Delhi F2F Meeting

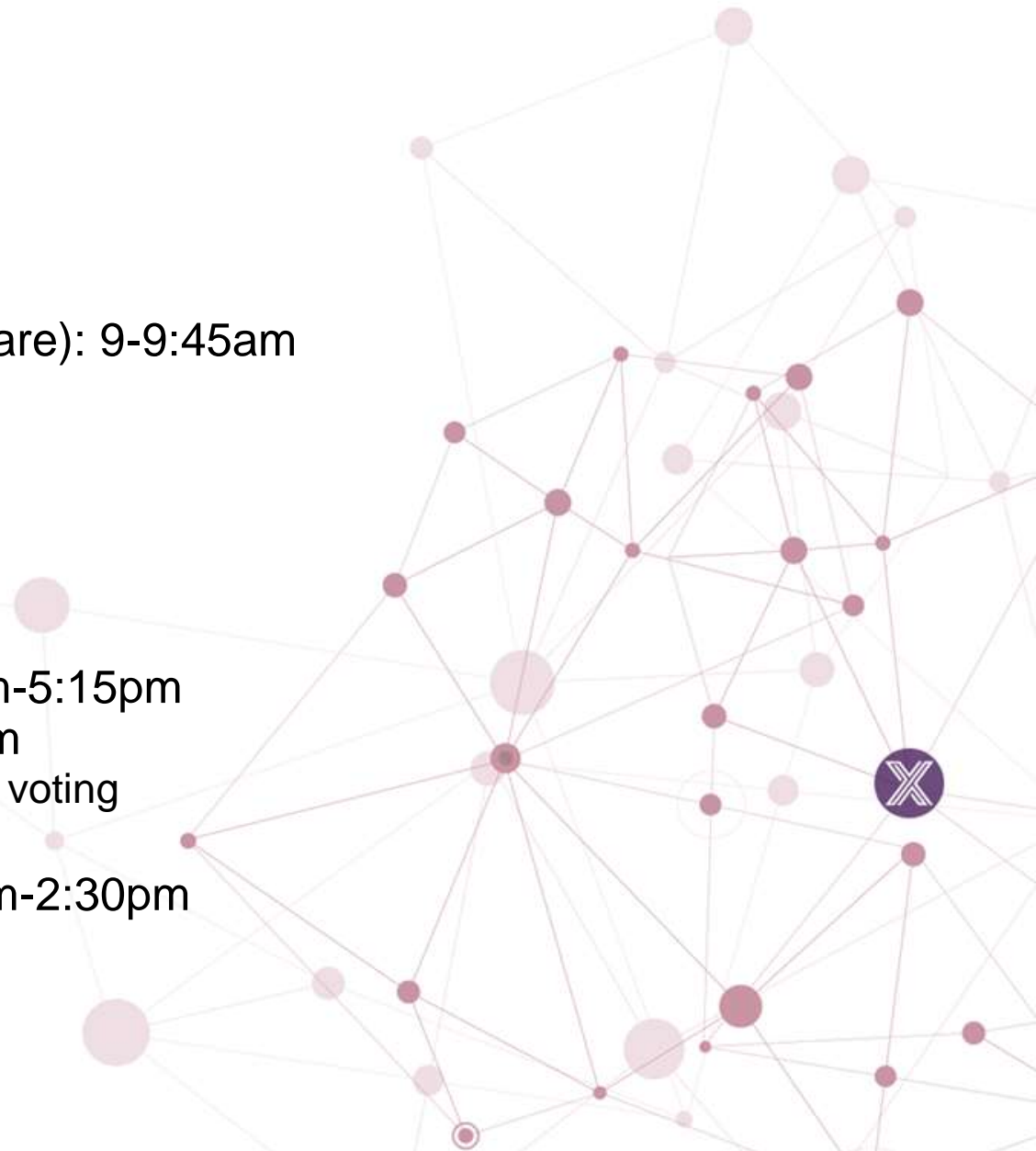
- Agenda

- Day 1 – Delhi planning day

- Welcome and intro by Mike McDonough (VMWare): 9-9:45am
 - Architecture day tee-up: 10-noon
 - Review and explanation of upcoming items
 - Delhi Planning – what's in/out: 1-3:30pm
 - Scope definition
 - Testbed and organization liaising: 3:30-4:30pm
 - IIC Testbeds, IIC coordination, etc.
 - Vertical Solution Group update/actions: 4:30pm-5:15pm
 - TSC & WG chair upcoming voting: 5:15-5:30pm
 - LF review of rules and procedures for upcoming voting

- Day 2 – Architecture issues day

- TBD architecture discussion and decisions: 9am-2:30pm
 - Business Issues/Discussion: 2:30-3:30pm
 - Wrap up and action items: 3:30-4:30pm

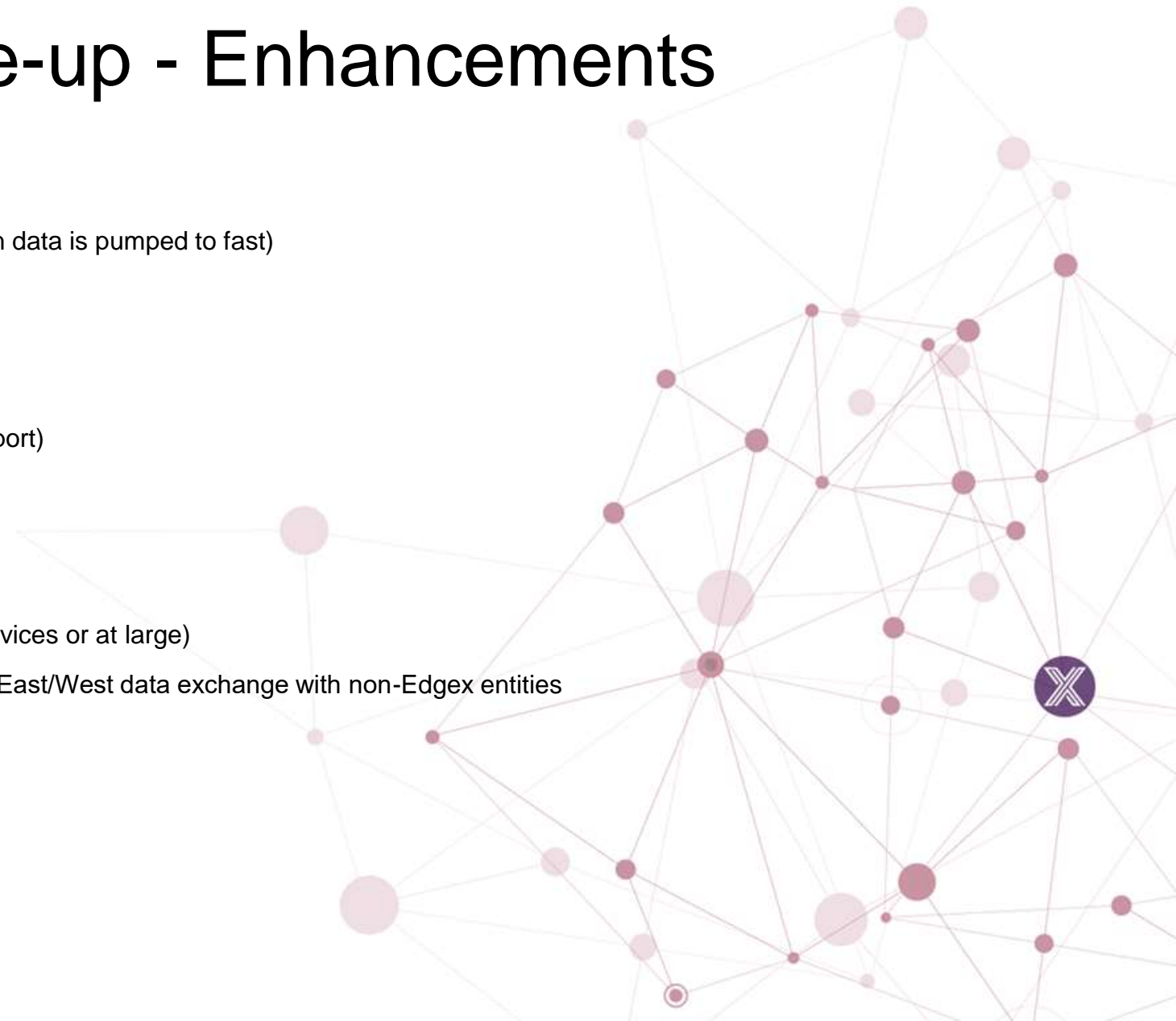


Architecture Issues Tee-up – Technical Debt

- Technical Debt (things that need fixed)
 - Rearchitect Go Export Distro – Move to Application Services concept(s)
 - Protecting micro service secrets with Vault (export distro, others?)
 - Upgrade Consul & master/slave configuration
 - Automate API documentation (move to alternate format?)
 - Search for Mongo replacements/alternatives (offer for Edinburg)
 - Steps toward truly distributed EdgeX (multiple machines, reverse proxy impact, commands across hosts, etc.)
 - Device discovery, onboarding and removal
 - Renew threat modeling

Architecture Issues Tee-up - Enhancements

- ARM 32 support
- Device services that downsample (scale back readings sent when data is pumped to fast)
- Min/Max limit on accepting command
- Data transformation and/or filtering at DS level
- Additional DS connectivity (ex: CANBus, Profinet, ...)
- Alternate deployment / orchestration (ex: adding Kubernetes support)
- User Interface (review/adopt for Delhi)
- How to deal with device security
- Load balancing of requests to multiple service instances
- Support for an alternate message bus (Point to point between services or at large)
- Introduce new category for microservices: “Sharing Services” for East/West data exchange with non-Edgex entities
- Protobuf or lighter weight messaging (Hitachi submission)
- Address data privacy concerns (GDPR, HIP-A, ...)
- Additional export connectors (ex: Greengrass, ...)
- Scheduling – service or library approach?



Cadence Check

- April & Oct remain target release months
 - California release an aberration due need to get Go code
- F2F planning around time of completion of each release
 - Edinburgh – Oct 2018
 - Korea – April 2019
- Conferences
 - At least 2 x large marketing/promotional events (Hannover Messe, IoT SWC)
 - At least 1 x developer focused event

Delhi Scope

- Lot of desires for Delhi
 - Too many potential work items
 - Must be realistic
- Delivery schedule is only 3-4 months out
 - Summer vacations
 - IoT SWC target in October (16-18th)
- Must sharpen the focus and make hard choices
- Suggest 4 main implementation targets
 - Initial System Management APIs and agent
 - DS SDKs (Go/C) & some replacement DSs
 - Next wave of security features
 - Suggest ACL, secure non-HTTP comms
 - Improve testing
 - Better/more unit, complete black box and performance



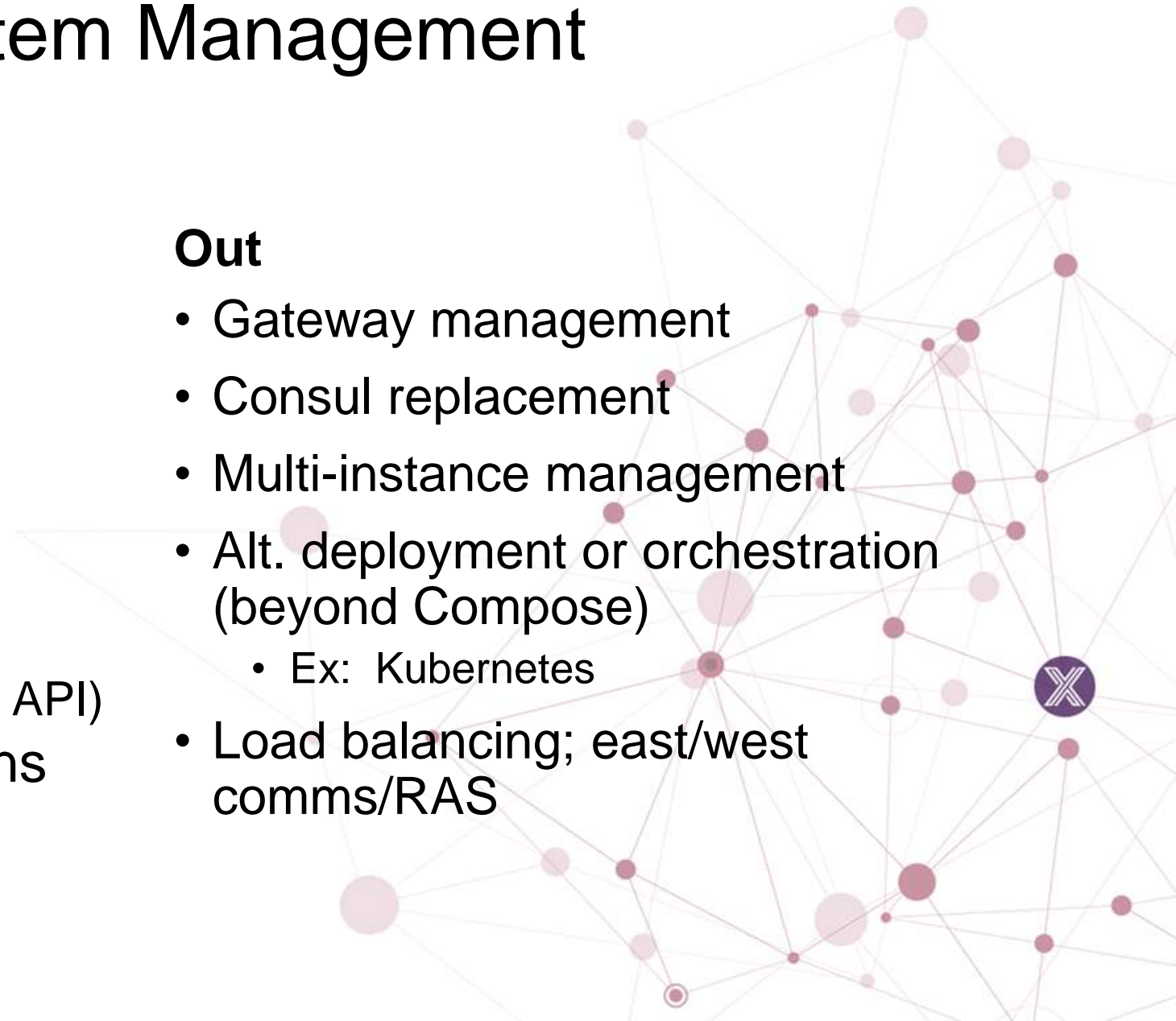
Delhi Planning – System Management

In

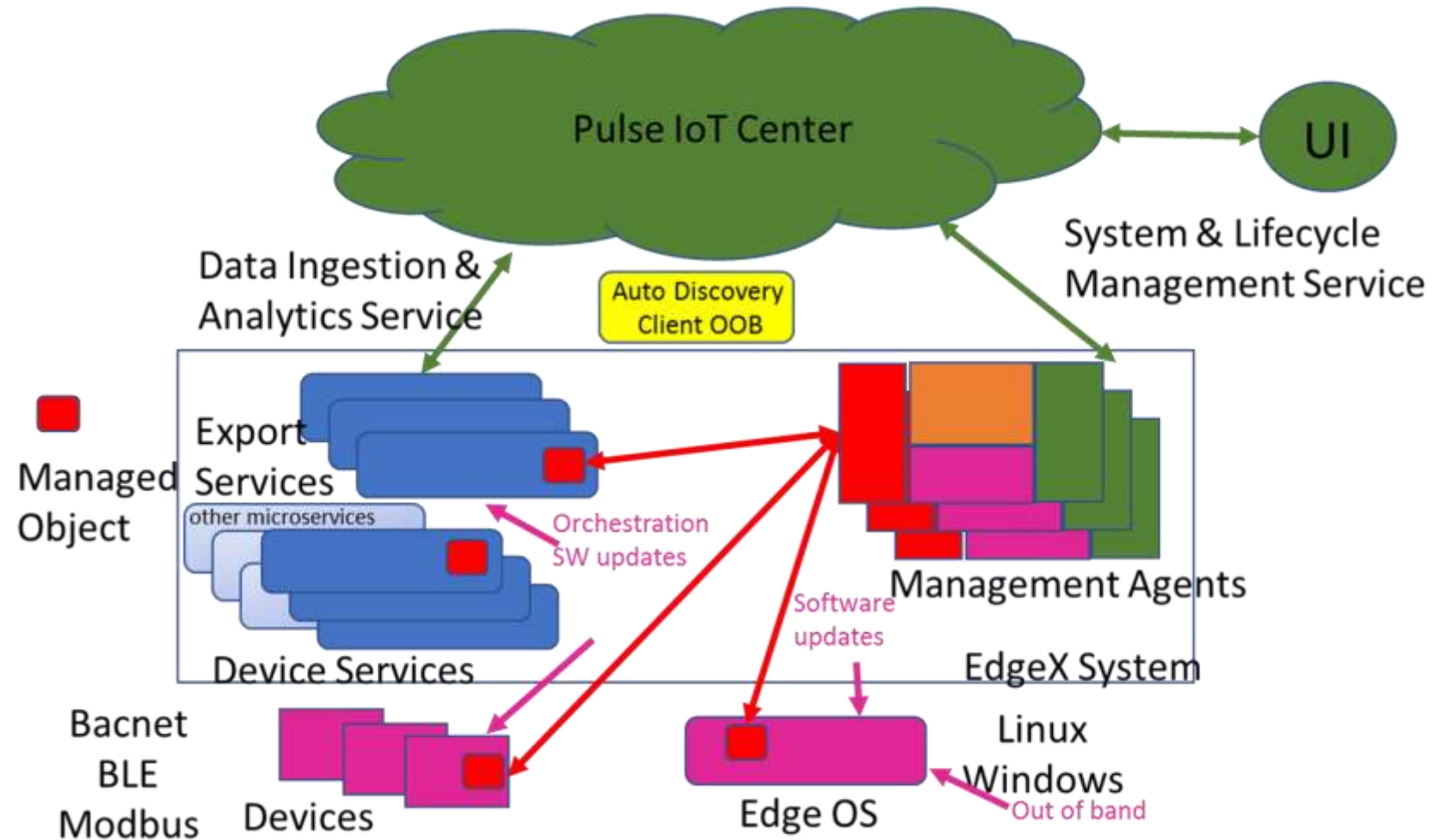
- System management API
- Sys mgmt agent
- Base service (started with refactor)
 - Service naming
 - Availability
 - Common config/reg
 - Service tracing (OpenTracing API)
- Service outage & notifications
 - Resiliency in face of non-availability of services

Out

- Gateway management
- Consul replacement
- Multi-instance management
- Alt. deployment or orchestration (beyond Compose)
 - Ex: Kubernetes
- Load balancing; east/west comms/RAS



System Management Roadmap for reference



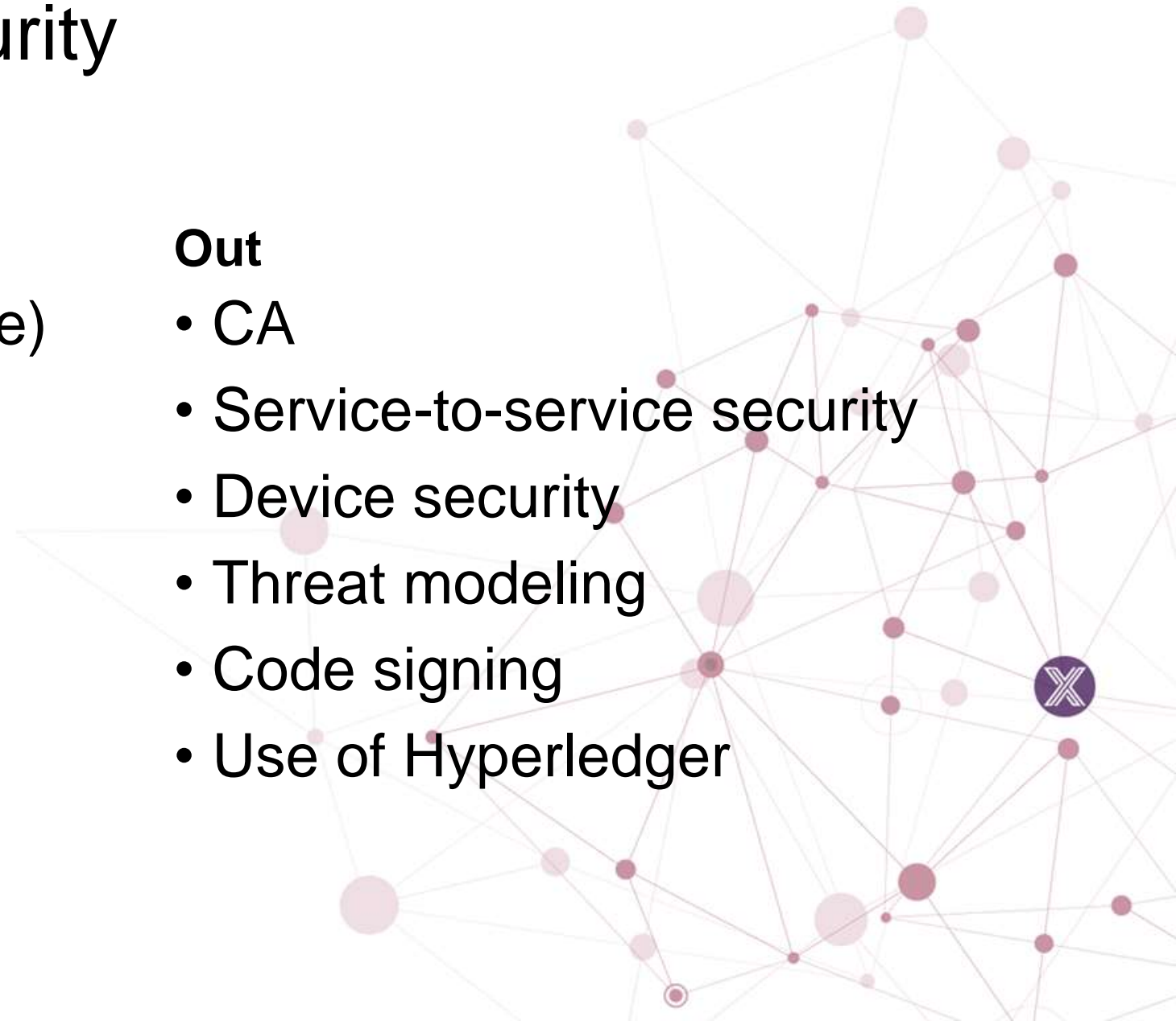
Delhi Planning - Security

In

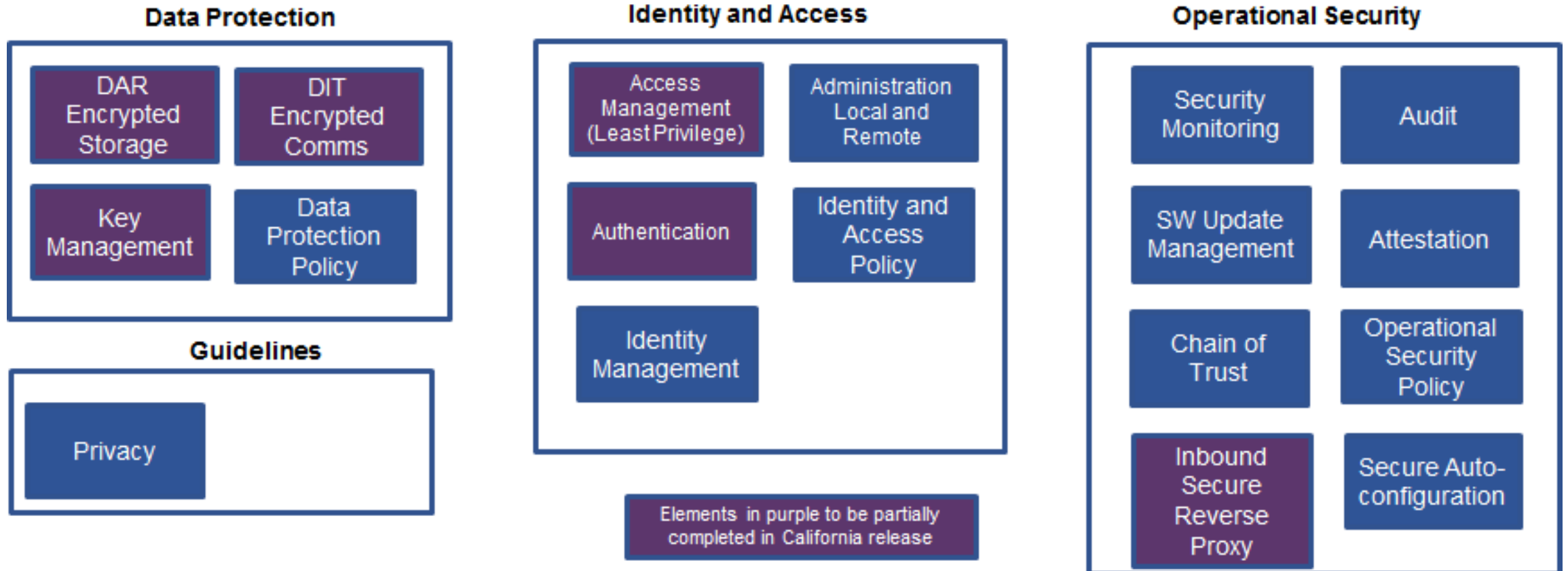
- ACL (for reverse proxy use)
- Secure non-Http comms
 - MQTT outbound/inbound
 - OMQ outbound

Out

- CA
- Service-to-service security
- Device security
- Threat modeling
- Code signing
- Use of Hyperledger



Security Roadmap for reference



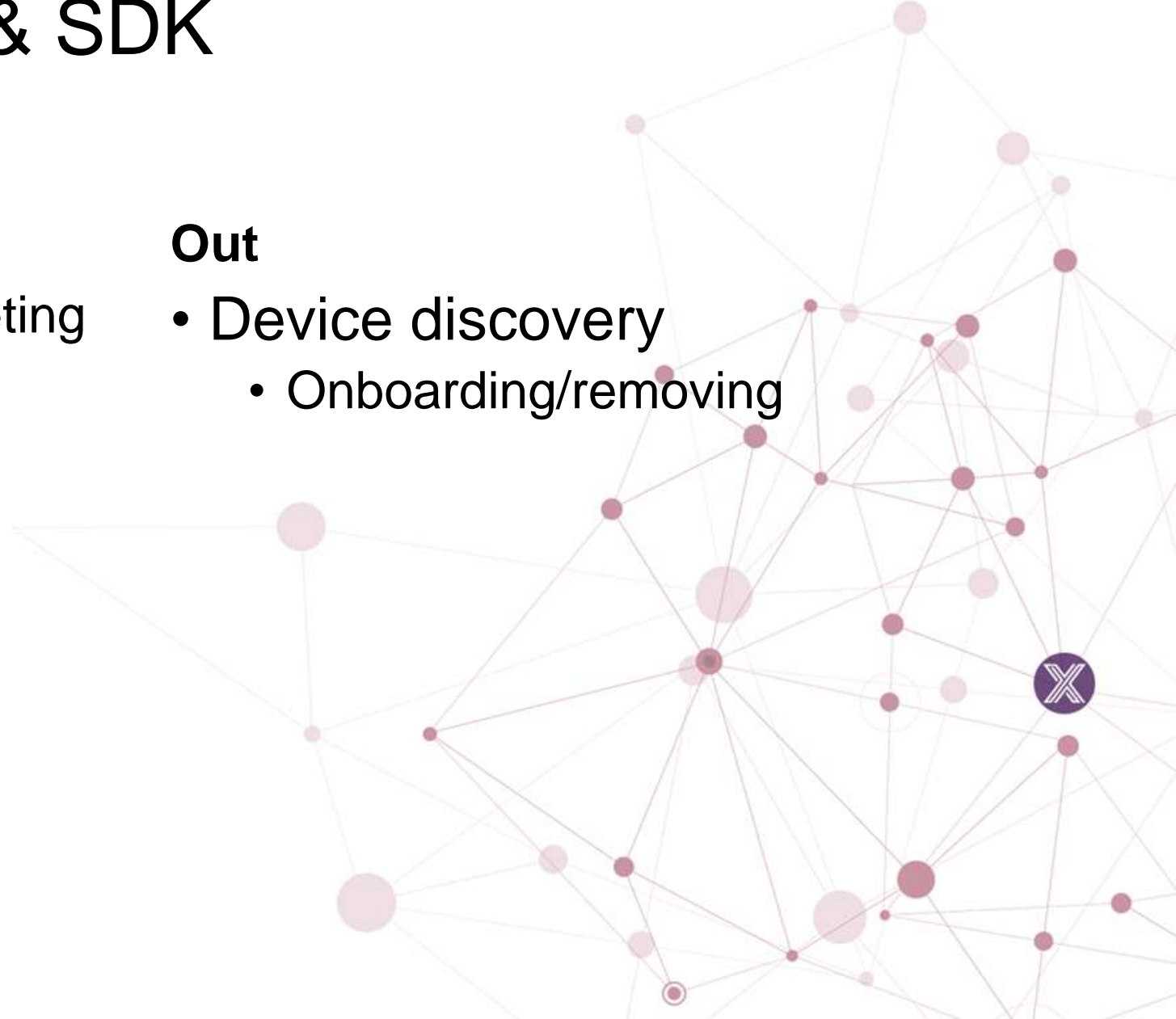
Delhi Planning – DS & SDK

In

- Results/Actions of June 4 meeting
- Complete the initial SDKs
 - Go & C
- Complete new virtual device service
- Refactor some existing DS
 - Modbus
 - BACNet
 - MQTT

Out

- Device discovery
 - Onboarding/removing



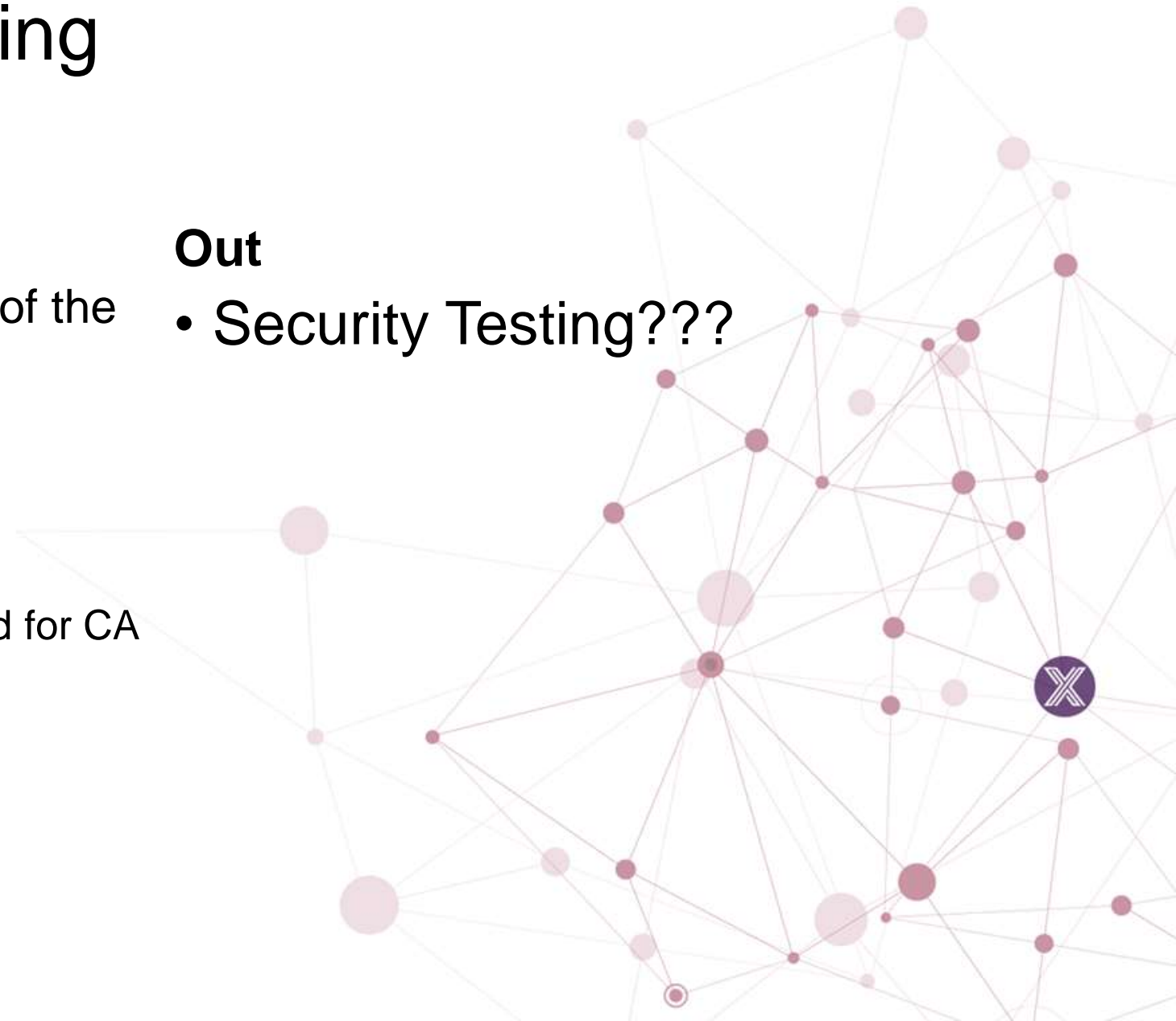
Delhi Planning – Testing

In

- Unit tests coverage of a majority of the code
 - Core/support service refactors as examples
- Blackbox testing for all services
 - Integrate in CI
 - Reporting on failed tests
 - Remaining services not completed for CA
 - DS/SDK
- Performance Tests
 - Meeting RP3 targets?
 - RP3 targets realistic?

Out

- Security Testing???



Delhi Planning - Misc

In

- Replace any remaining Java services
 - Scheduler (review/cleanup contribution)
 - Rules Engine
- Refactor per DT work
 - Better interfacing/loose coupling/isolation
 - Better organization
 - Better testing
- Configuration categorized/grouped
 - Settings/configuration standardization
- Begin work on Application Services
 - Eventual replacement for Export Services
 - Target Edinburgh release?
- Review and incorporate all the outstanding code contributions
 - UI
 - Scheduler
 - Samsung code
 - EdgeX-UI

Out

- Additional OS Support
 - Arm 32?
 - Windows
- DB replacement
- Monitor config changes and apply dynamically
 - Persist settings on clean shutdown
- Services respond to native init process
 - Ex: systemd
- Commands / exported northside

Vertical Solutions Group

- 3 features from Smart Factory Project, might be also along with the existing Core architectures.
- OPC UA Device Service (Java, C) : Also validation completed from OPC UA CTT, discussion with TSC Chair
- ezMQ (realtime messaging framework) : Brokerless transmission
- Pharos (System management) : We have a video clip to demonstrate how it works)

Architecture – Tech Debt/Readdress

- Rearchitect Go Export Distro – Move to Application Services concept(s)
 - More modular/SDK like
 - More scalable solution
- Protecting micro service secrets with Vault (export distro, others?)
- Upgrade Consul &/or move to master/slave configuration
 - Based on conversation with HashiCorp
- Automate API documentation
 - Replace or augment RAML with Swagger, TOML, etc.
- Search for Mongo replacements/alternatives (offer for Edinburgh)
 - Errors and warnings on startup
 - Mongo replacement/alternates (no Arm32 support, MongoDB light, etc.)
 - Use of DB Ids in objects

Discuss as potentially part of Delhi

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- Steps toward truly distributed EdgeX
 - Services running on different host machines
 - Security impact with re: reverse proxy
 - Command calling across hosts
 - Device discovery, onboarding and removal
 - Renew threat modeling

Discussed time permitting and proposed for Edinburgh or beyond

Architecture – Desired Enhancements

- ARM 32 support
 - Device services that downsample (scale back readings sent when data is pumped to fast)
 - Min/Max limit on accepting command
 - Data transformation and/or filtering at DS level
 - Additional DS connectivity
 - CANBus
 - Profinet
 - Alternate deployment / orchestration
 - Kubernetes vs Compose or Snaps
 - User Interface
 - Review/accept VMWare donation as EdgeX UI
 - Preview by end of summer
- Discuss as potentially part of Delhi
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Architecture – Desired Enhancements (Cont.)

- How to deal with device security
- Load balancing of requests to multiple service instances
- Support for an alternate message bus
 - Point to point between services or at large
- Introduce new category for microservices: “Sharing Services” for East/West data exchange with non-Edgex entities
- Protobuf or lighter weight messaging (Hitachi submission)
- Address data privacy concerns
 - EU laws and affirmation about data use/storage/etc.
 - HIP-A
- Additional export connectors (depends on Export Service refactor)
 - AWS Greengrass
- Scheduling – service or library approach?
 - Make it consistent across services

Discussed time permitting and proposed for Edinburgh or beyond

Business Issues

- Marketplace for value-add microservices and its implications (will we need a new EdgeX microservice acting as license server?)
- Certification process
 - When do we start to outline?
 - Levels
 - What does it incorporate?
 - What gets certified? Micro services, EdgeX extensions (ex: real time?)
 - Security certification
- Samsung is about to extend EdgeX related project from the internal manufacturing infrastructure (as Smart Factory) to consumer electronics and mobiles.