EdgeX System Management – the last frontier
EdgeX System Management - Delhi

- System Management Agent – new micro service to centralize EdgeX control plane data and actuation
- System Management API (micro service management – MSM) – functionality built into each service that communicates with SMA
  - Could also be used by other 3rd party management systems
System Management Agent (Delhi)

• Start, stop, restart all EdgeX micro services
• Get the configuration settings (aka properties) for an EdgeX micro service
• Get the memory usage for EdgeX micro services
• Provide a public REST API for 3rd parties to use to manage EdgeX
  • For this release, the API and data provided by this API is dictated by EdgeX
Micro Service Management API (Delhi)

- Stop the EdgeX micro service
- Provide the configuration settings (aka properties) for the service
- Provide the memory usage for the service
- REST API for each service will be consistent across all services
- The API of each service could be exposed to the world, but its real use is to be utilized by the SMA
System Management - Edinburgh

• April 2019
• Add metrics (not all of these would be in Edinburgh – TBD)
  • #Objects detected, inferences per second, time per inference (@ analytics level/AI)
  • Some metrics would be service specific (like above) some would be generic (ex: memory, CPU)
  • Need, potentially, to think about resolution of metric data (but don’t want to impact service performance itself)
  • Data flow metrics: events per second, readings per second ideas
  • Other metrics: I/O per second (probably using other tool)
  • Tracing
  • We may need to split metrics by those collected by the micro service and those collected external to the micro service
• Storing metrics collected locally
  • Push / pull historical data/metrics to other systems
• SMA Translation layer (to talk LWM2M, OMADM, Redfish, etc.)
  • Protocols to support and which reference implementations are offered to be determined
Management - Edinburgh

- SMA DB
- SMA
- SMA Translation
- LWM2M
- Redfish
- EdgeX REST
- 3rd Party Central Control System
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- 3rd party system
System Management - Fuji

• Oct 2019
• Setting configuration
  • Today, configuration is read only
  • In conjunction – EdgeX config work to define read only vs. writable property
• Callback (alerts on changes config/metrics)
  • Allow clients to register for change in EdgeX
• Add actuation based on metric change
  • Control plane level rules engine/analytics
  • Ex: Stop or restart a service if we see CPU rise to a certain level
  • Anomaly detection at system level
Management - Fuji

EdgeX Micro Service
Micro service management (MSM)

SMA DB

Management Analytics
Alerts

SMA
SMA Translation

Registered Client

LWM2M
Redfish

3rd Party Central Control System

3rd Party Central Control System

3rd Party Central Control System

EdgeX REST

3rd party system
EdgeX vs. Platform/Gateway Management

• Ongoing discussion to identify what ultimately goes into EdgeX
  • What management is needed from the platform
  • What provides the functionality and gap analysis

• Work with consortia/standards bodies to come up with interoperable solutions/standards

• Ability to deploy the containers – an installation process/orchestration tool
  • Perhaps sys management agent would be independent of other containers and pull down EdgeX to box

• Gateway or platform management
  • Networking setup/configuration (ex: setup Wi-Fi, ports, etc.)
  • Store of secrets (certificates, keys, etc.)
  • Configuration of certificates for use externally (like with connectivity with AWS)
  • Software deployments and updates
  • BIOS/firmware updates
  • Onboarding of gateway or other compute nodes (securely)
  • Onboarding of sensors/devices (securely)
  • A common schema (choice or creation) for communications??
Edge Management

Centralized Management System
Single point of oversight
Insures IoT infrastructure is secure & reliable
Lifecycle Management

UI

End Device
Gateway
Compute Node

Sensing Actuation
Device
SW
HW
Microservices for data acquisition & simple analytics
Microservices for big data processing, analytics & AI

Auto Discovery Service (OOB)
Managed Object
Management Agent
SW & FWR updates

IP communication
Non IP