Adopter Series Requirements
Adopter Series Presentations

• Accenture, AIP+ - Jun 30
• Thundersoft, TurboX – Jul 14
• Jiangxing Intelligence, Edge Box – Jul 28
• Tibco, Project Air – Aug 25
• See
  https://wiki.edgexfoundry.org/display/FA/Vertical+Solutions+Working+Group#VerticalSolutionsWorkingGroup-UpcomingEvents
Why EdgeX – the Rationale

• **Accenture**
  • Hardware/OS agnostic
  • Cloud agnostic (with multiple cloud connectivity options already available)
  • Rich variety of protocol connectors
  • Flexible micro service architecture (easy to integrate to Accenture IP)
  • Download and execute dockerized images
  • “generate value for our customers without needing to worry about the underlying gateway technology or connectivity”

• **Thundersoft**
  • Micro service based
  • Cloud support

• **J.I.**
  • Interoperability/plug-play components
  • Hardware/OS agnostic
  • Flexibility/micro service architecture

• **Tibco**
  • Open and unifying
  • Interoperable
  • Collaboration with other LF Edge projects
  • Community support
  • Application SDK
Requirements

• This deck includes potentially requirements collected from the EdgeX Adopter Series from the summer of 2020
  • Requirements already built into EdgeX are not covered
• Requirements are categorized as
  • **Explicit** requests for new features, changes, etc.
  • **Implicit**
    • Based on description of their use cases/solutions
    • Extensions they have built
    • Changes they made to EdgeX
Accenture

• Implicit
  • Low code/no code pipeline configuration
  • Deal with a wide range of device protocols
  • Filter data at the edge
  • Use data at the edge
  • Offer Digital Twin
  • Long lived solutions (“obsolescence’s factor”)
  • Autonomous operation requires high reliability
  • High operational availability means weeks of planning on patches/upgrades to avoid outages
  • Device registration from top down
  • Device data simulator
Accenture

• Explicit Asks
  • Tooling to support remote IOT device deployment, configuration, monitoring & administration (included remote login and debugging)
    • Diagnosing network issues/faults (network congestion)
    • Losing data from battery powered devices as they wakeup and report only so often
    • Device failure
    • Incorrect configuration
  • Support for “Intelligent connected IOT devices”
    • Cameras
    • Semi-autonomous devices
    • Distributed analytics pipelines
  • Recommend and integrate with frameworks
    • Video analytics and robotics
  • Certification schemes
    • These devices are “guaranteed to work with EdgeX”
  • Better real time/deterministic support
Accenture – other notes

- Used to use Kura
- Focused on industrial use cases
- Trialing video analytics for smart city
  - Pot hole detection on garbage truck
- Concern for how expensive the gateway (hardware/software) is
  - A limiting factor (process and memory power)
  - Moore’s law will take this problem away
- Use hardware acceleration at the edge
  - GPU and CPU execution in parallel for analytics
- “Engineers put too much debug and lose performance”
  - They have a tunable metrics collection capability
  - Use Grafana for metrics display and tip to potential problems
  - Operator commands additional information when there appears to be a problem
- “Accenture solution creation teams value this solution more than clients.”
  - Clients view it as a black box – they want an implementation that is cost effective and reliable
ThunderSoft

• Implicit
  • Enhanced multimedia support
  • Enabled Robot Operating System (ROS)
  • ONVIF support
  • Additional sensor/protocol support (many Chinese hardware)
  • Data caching on the edge
  • Device virtualization
  • Android support
  • EdgeStream – like gstreamer
ThunderSoft

- Explicit
  - More sensor / protocol support
    - More hardware specific devices
    - Commercial protocols – like those from Siemens
  - ROS support
  - ONVIF support
  - Video processing
    - Multimedia framework support
  - Extended Cloud support
    - Greengrass, MS Azure IOT, Ali Yun linkvision
  - Data caching on the edge
  - Qualcomm support
  - EdgeX “Plus”
    - Ready made solutions on RP3, Intel and Qualcomm with dev kits and sensors per use case (like smart factor, etc.)
ThunderSoft – other notes

- Smart city, industrial, automotive, robotics are leading verticals
  - Smart home, smart office, healthcare trailing
- Standardization accelerating
  - Alliance of Industrial Internet with EdgeCross
- End to end solutions are must-have
- Customers don’t ask for EdgeX, they ask for a solution
- Using Greengrass to do data buffering to cloud (AWS)
- Some cloud vendors are doing more in IOT (like Ali Yun)
  - Cloud vendors are not doing a good job with devices
- Using Tensor Flow and Tensor Flow light for AI engine
Jiangxing Intelligence

- Implicit
  - Time series database (Influx)
  - MCU/FPGA support
  - AI inference integration
  - Caching QoS (messaging)
  - Container optimization
    - Reducing the size of containers
    - Reduce transmission time and storage of containers
  - Application management
  - UI
  - Connectivity to Alibaba Cloud, Tencent Cloud, Baidu Cloud
  - Robotic devices integration
  - Kubernetes integration
    - Docker Swarm for ARM and smaller resource systems
Jiangxing Intelligence

• Explicit
  • More help for C/C++
  • More conveniences around deployment
  • AI notification interface (AI results to actuate)
    • Data in/out of AI engines (not necessarily model upgrades/updates, etc)
  • New resource management
    • How many times is a function (like AI function) is called
  • Video streaming & analytics
    • Detect objects
  • Energy saving strategy
    • Take advantage of low resource (power) devices
    • Use MCU based strategy
    • Turn on/off things “smartly”
  • Lower performance overhead (high priority need – because of industrial use cases and existing hardware there and ARM chips)
    • Writing and reading actions have high overhead (especially for ARM)
  • Device registration optimization (device unique ID required per instance of Edge Box)
  • Move to HA services / solutions
  • More convenient UI
  • Compatibility with more frameworks like NV DeepStream
Jiangxing Intelligence – other notes

- Created pre-packaged solutions
  - Water affairs
  - Power grid monitoring
  - Smart Substation
  - Etc.
- Number of instances of Edge Box running currently: ~1000
Tibco

- Implicit
  - Stream processing
  - Use of device profile over value descriptor to understand data
  - Integration of Flogo Rules over Kuiper
  - Custom app services over configurable due to dynamic nature of user needs
    - Add/remove filters, rules, etc.
Tibco

- Explicit
  - Deployment (dynamically)
    - Project Eve integration
  - Sensor / protocol support
    - Integration with Fledge for low level connectors
    - Manufacturing protocols/devices in particular
Tibco – other notes

• “Connect, Unify, Predict” – project orientation
• Performance optimization – race car data
• Horizontally focused
  • Tibco verticals come to Tibco Labs for horizontal solutions that can be applied vertically
• Integrates with Tibco Flogo Runtime @ the gateway
• Project Air is open source – driving backend Tibco solutions
  • Facilitate edge to enterprise integration
• No customer deployments in production yet