Leading2Lean Integration Overview and Architecture Diagrams

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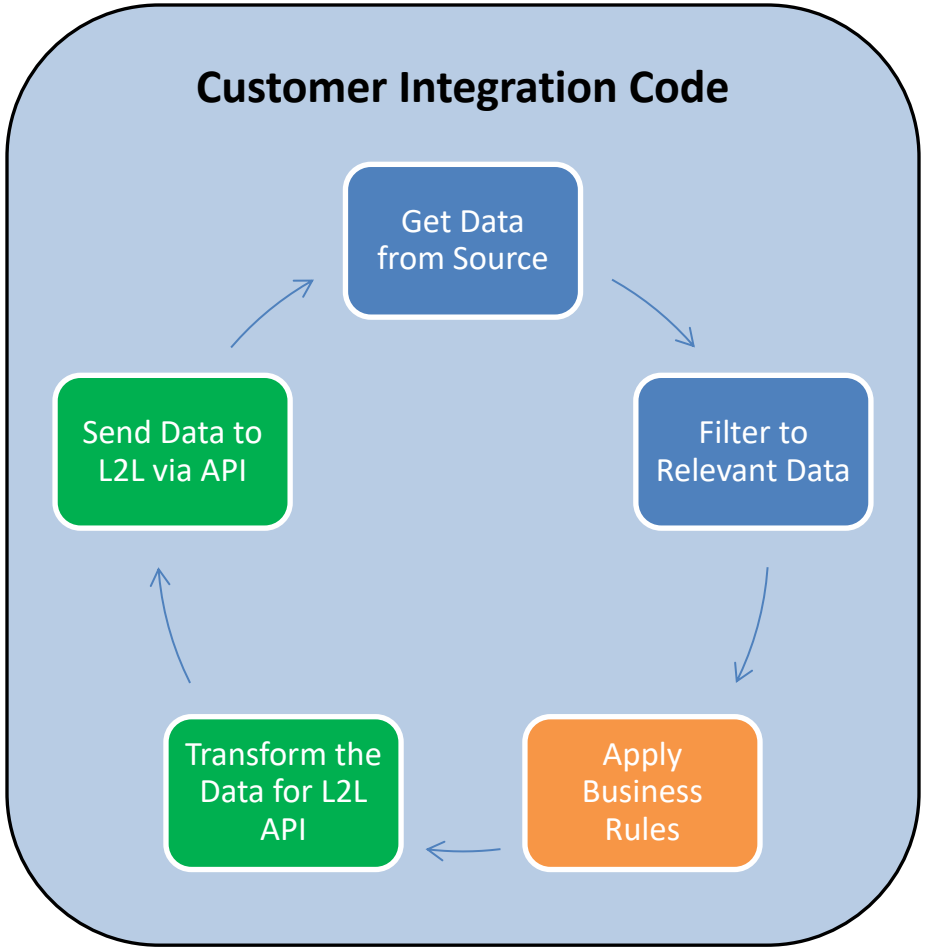
1/12/2021

Integration Options depend on Existing Solutions in Place

- We leverage your existing data collection solutions, we don't replace your machine connectivity
- Let your MES/SCADA/IoT collect the data
- Use an OPC server to connect to the machine to off load the data for integration
- Heterogeneous machine environments may require all the above

Customer Integrations to Major Manufacturing Systems

Integration Application Architecture



- Integration Code is really a simple control loop for processing 3rd party data
- BLUE BOXES: Getting and Filtering the data is typically something local IT / Controls Engineers can help with
- ORANGE BOX: Customer and L2L collaborates on the business rules to achieve the business goals
- GREEN BOXES: L2L has documentation and code samples to guide you

How do we Integrate?
Easy Web Service API

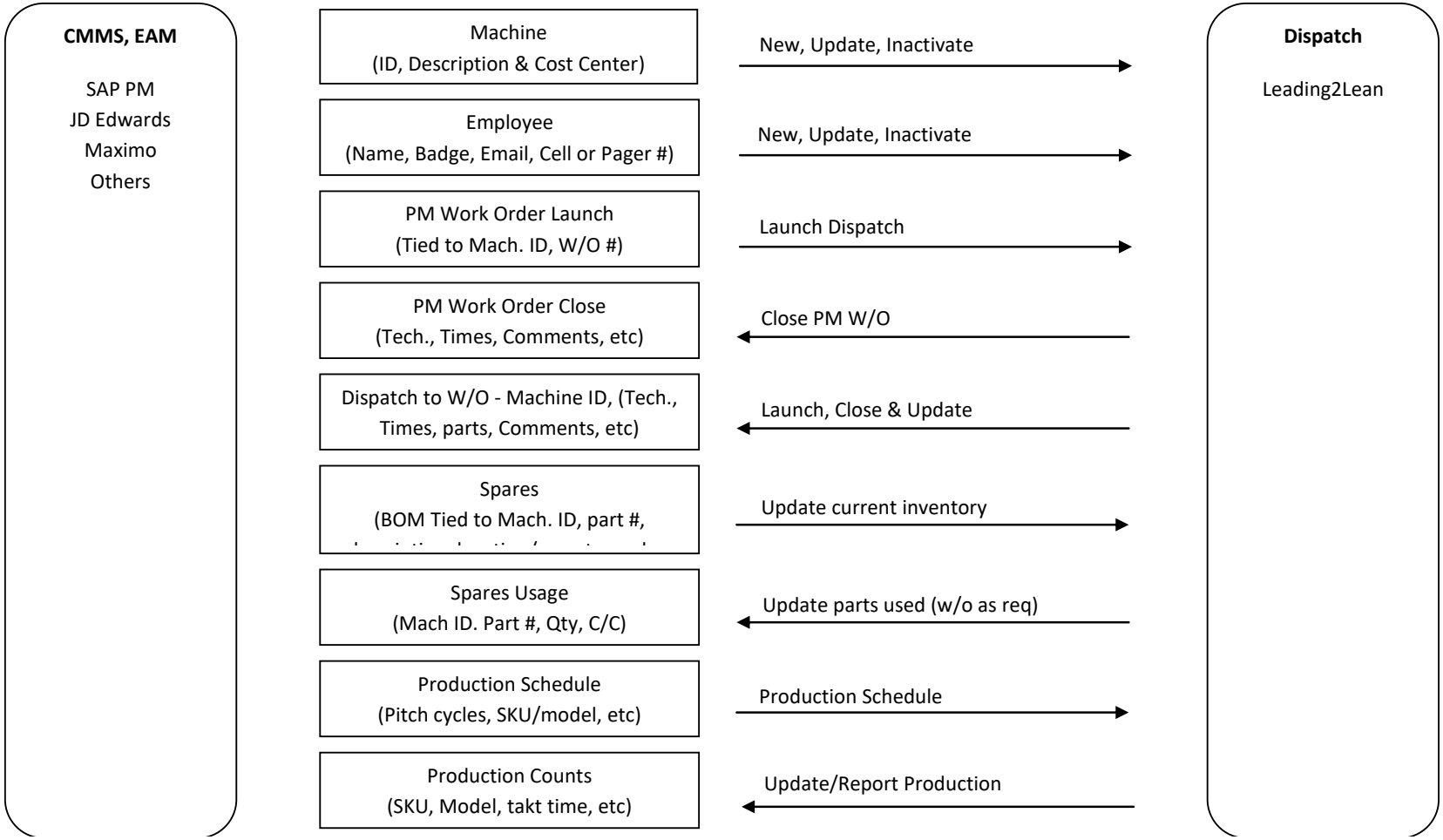
- Fully documented REST based web service API
- Secure / Encrypted (SSL / HTTPS)
- Returns JSON/XML
- Can be integrated with any internet connected system
- Easy to use, integration take hours or days, not months
- Gives IT a toolkit to build solutions on top of the L2L Platform
- No Firewall ports to open - Access to pull or push from L2L from inside your firewall using outbound only connections

{ json:api }

Typical Skillsets / Toolsets Required

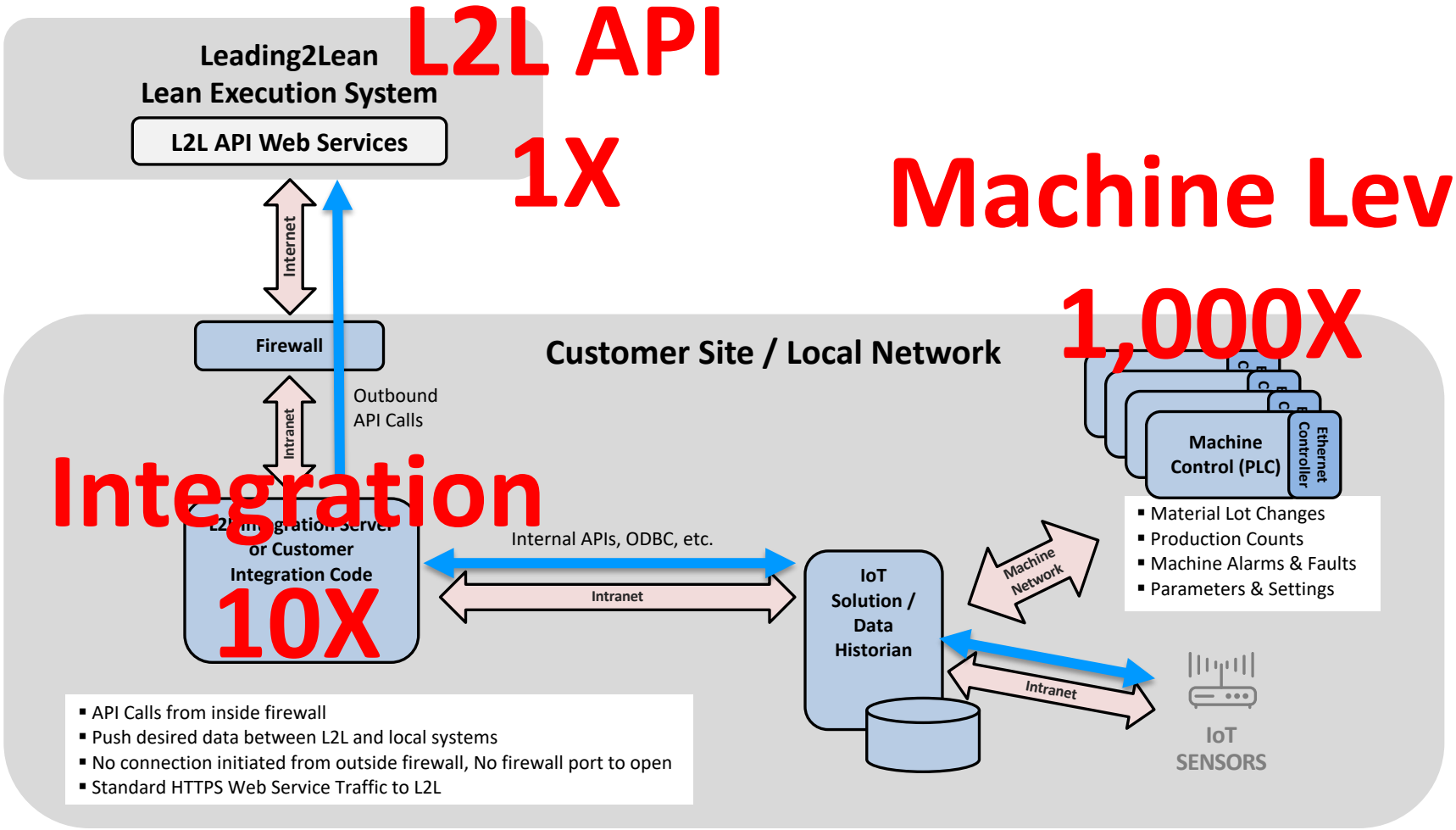
- Customer
  - IT Staff for network, server, and local programming support for ERP / CMMS systems
  - Controls / Automation Engineers to provide Machine connectivity and Machine specific knowledge
  - Machine connectivity via MES, SCADA, OPC Server, etc.
- Leading2Lean
  - Web Development experts with L2L Web Service API experience
  - Manufacturing Experts with Industry Best Practices Knowledge
  - API Documentation
  - API Authentication Keys

Typical ERP / CMMS / EAM Integration Points

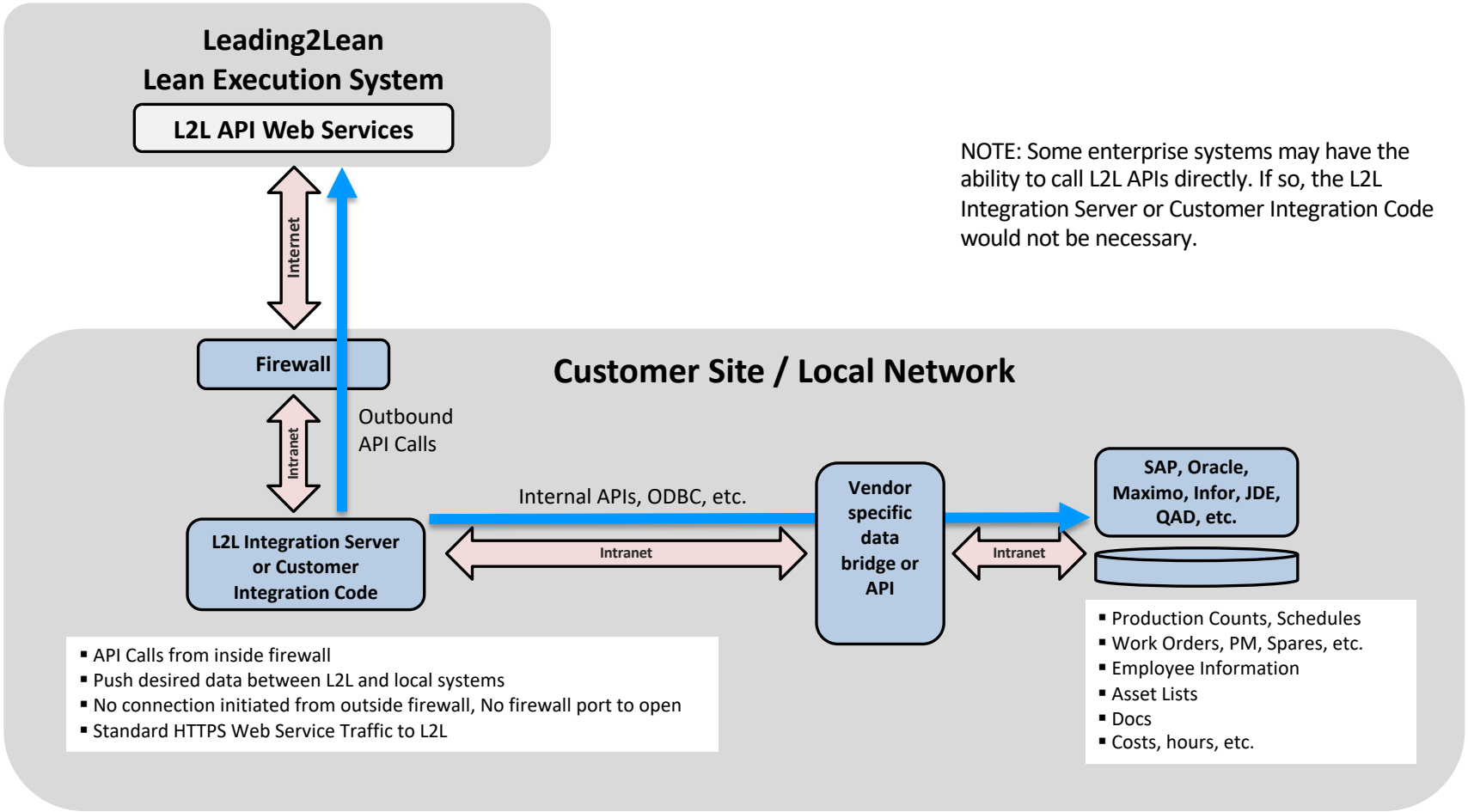


- Evolve or expand to meet capabilities, business needs, systems, etc.
- See Leading2Lean Integration Options and Best Practices whitepaper for more data workflow examples

Amount of Data Required from Typical Integrations



ERP / CMMS / EAM Integration Architecture

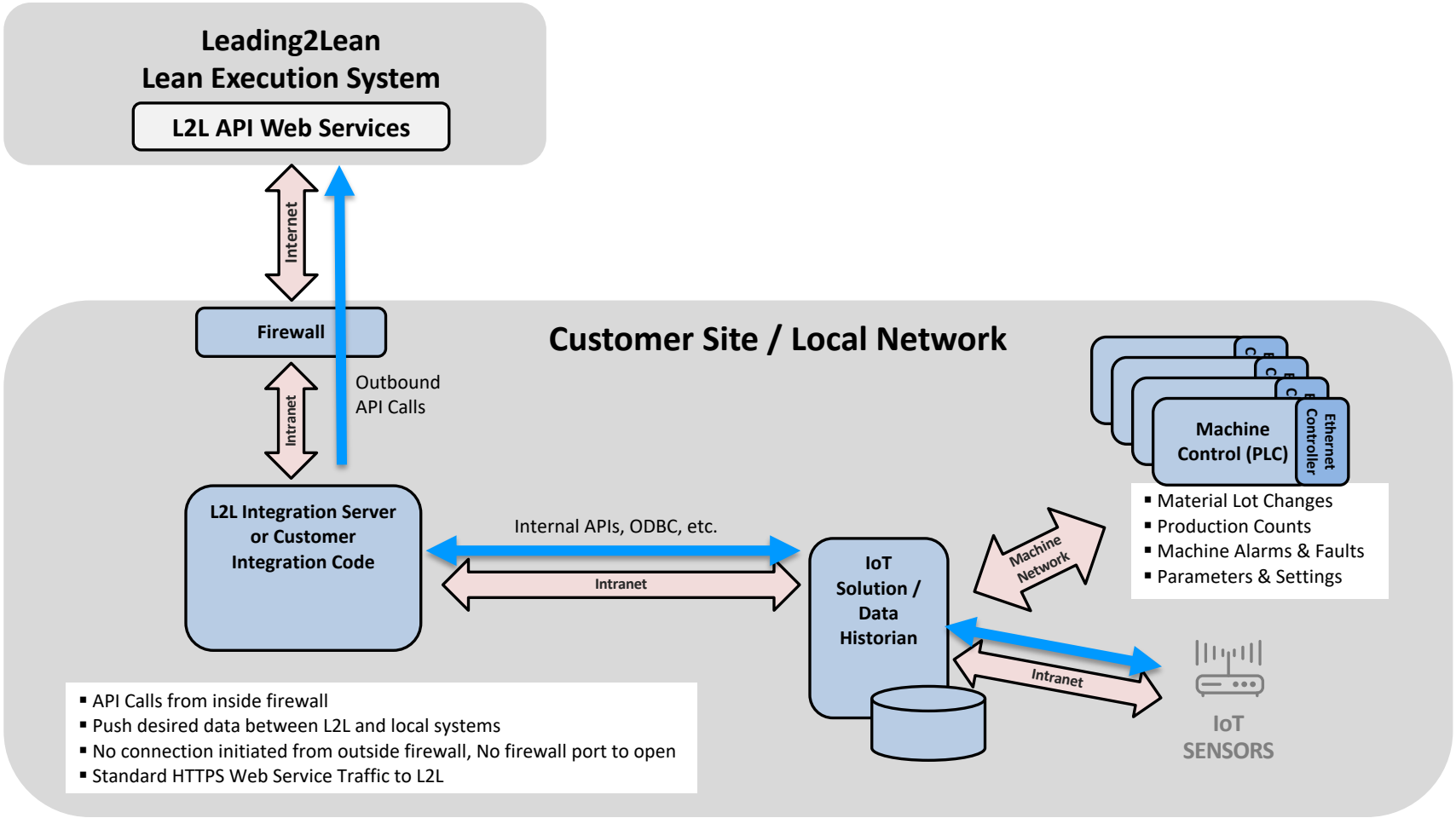


NOTE: Some enterprise systems may have the ability to call L2L APIs directly. If so, the L2L Integration Server or Customer Integration Code would not be necessary.

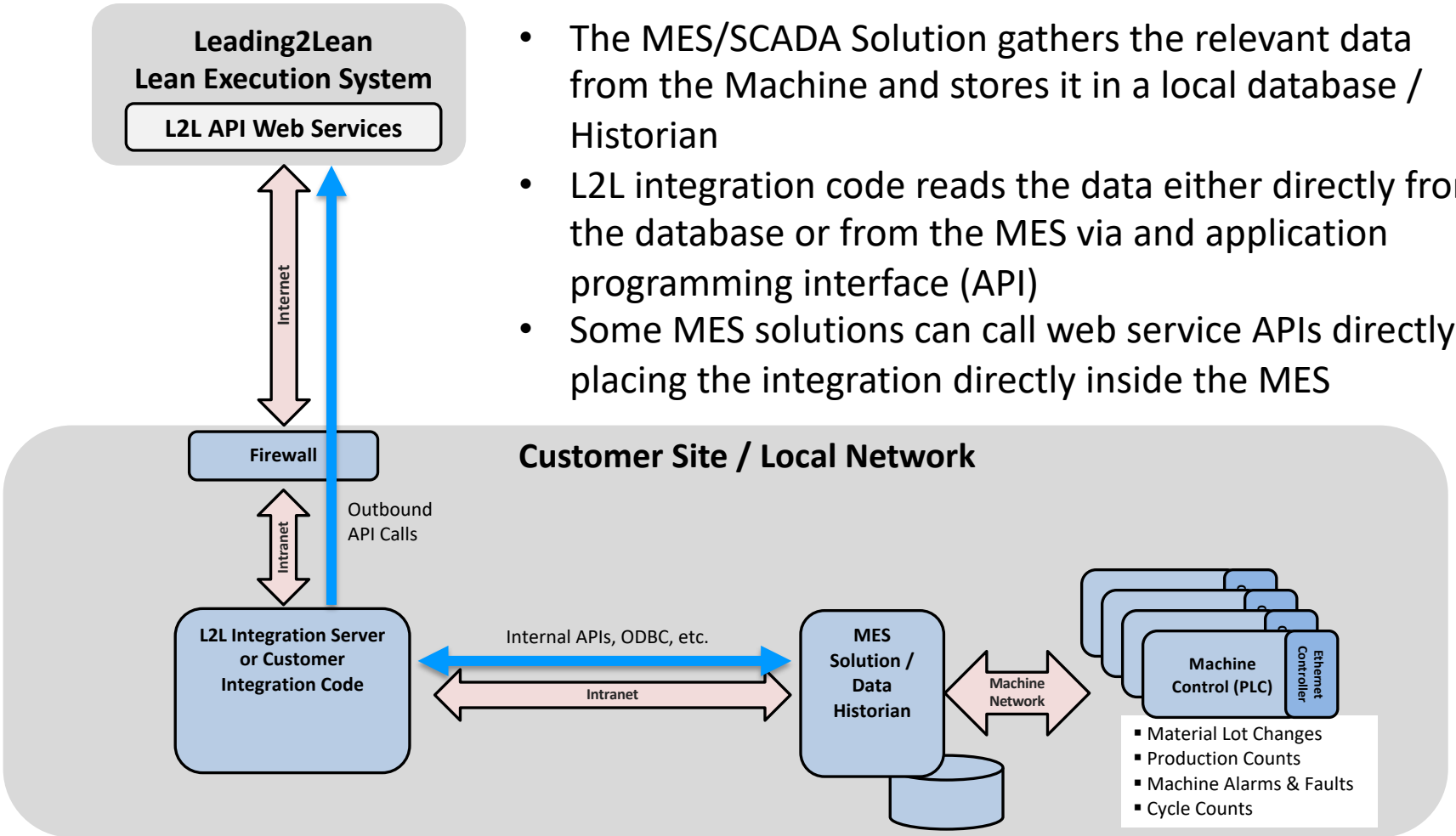
IoT / Machine Integration

- We are an Extension of your IoT Strategy
  - People are core to your IoT Strategy
  - We make IoT data Actionable & Accountable by adding People
  - Use L2L data to direct IoT Investment to solve actual problems
- Common IoT / Machine Integrations
  - Cycle Counts
  - Production Counts
  - New Dispatch Creation based on Sensor or PLC data
  - Trigger Human Interaction / Business Process Automation
  - Track occurrences / Duration of events / Resolution

IoT Integration Architecture Overview



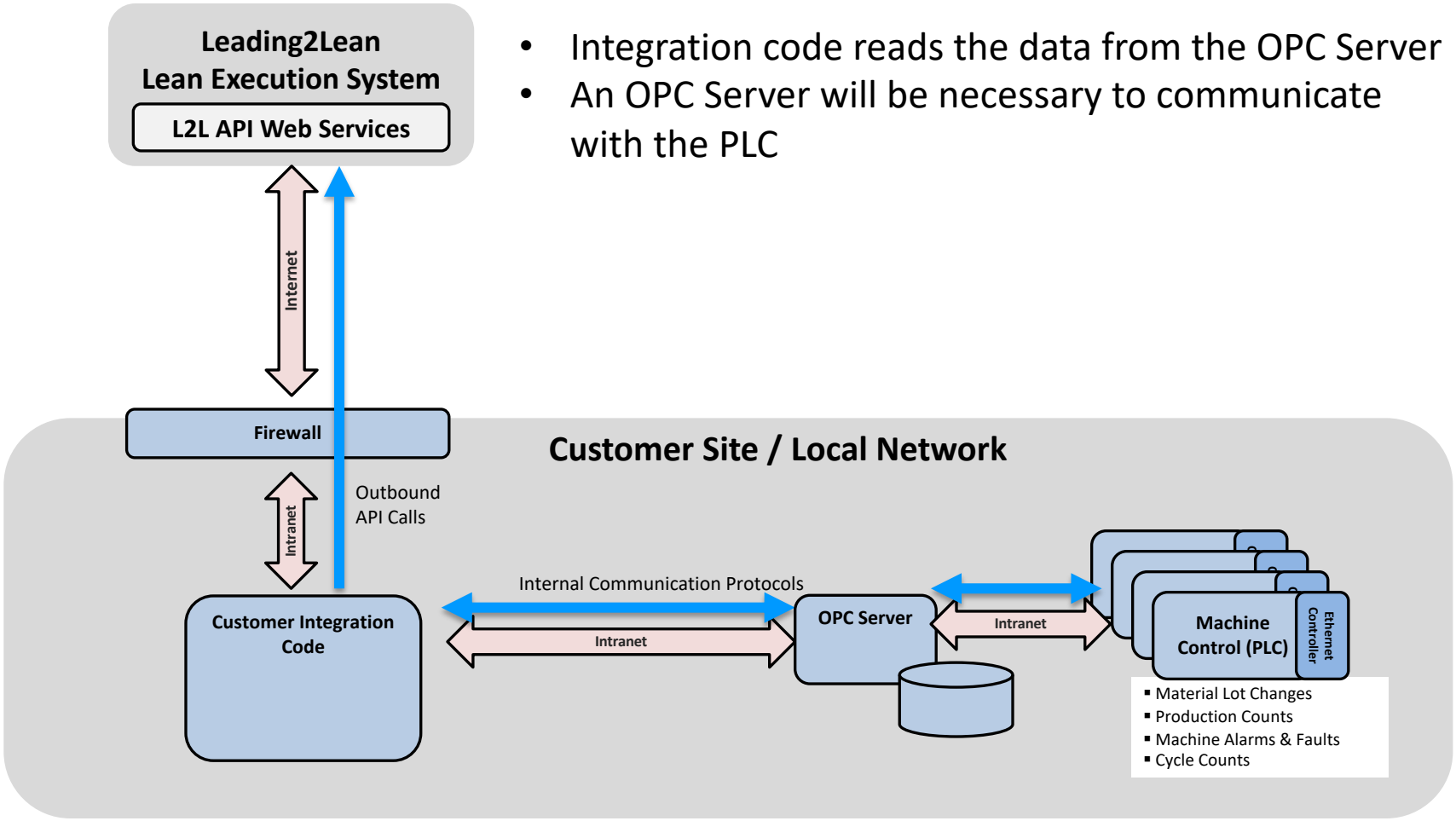
Integration Architecture with an Existing MES/SCADA Solution



- The MES/SCADA Solution gathers the relevant data from the Machine and stores it in a local database / Historian
- L2L integration code reads the data either directly from the database or from the MES via and application programming interface (API)
- Some MES solutions can call web service APIs directly placing the integration directly inside the MES

Integration Architecture directly with a OPC Server

- Integration code reads the data from the OPC Server
- An OPC Server will be necessary to communicate with the PLC



How to Get Started with the API

- Request an API Key from support
- API Documentation found under the support menu:
  - https://<customer>.leading2lean/api/1.0/
- Github Repository for Sample Code
  - http://www.github.com/leading2lean/
- Microsoft .NET
  - Dispatch Integration example code