Smart Manufacturing Architectures, Implementations and the Internet of Things

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IoT Smart Manufacturing Areas of Interest

#1 Simplify Bus Communications from Device to Cloud

#2 Enable new E2E Integrated Hardware Root of Trust Security Models

#3 Convergence of OT/IT Manufacturing Architectures

#4 Enable Software Defined and Scalable Analytics at the Edge and Cloud

E2E IoT Security is a Pre-Cursor and Basic Capability that Drives all other Success!
## IoT Smart Manufacturing Postions Summary

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<tr>
<th>Use Case</th>
<th>Challenge</th>
<th>Benefit</th>
<th>Opportunity</th>
<th>Issues</th>
<th>Standards</th>
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<tr>
<td>Simplify Bus Communications</td>
<td>Device access, state visibility</td>
<td>State awareness of embedded industrial devices.</td>
<td>Define open data access models for embedded devices</td>
<td>Ease\cost of accessing Proprietary networks.</td>
<td>Protocol abstraction or translation for IoT use cases.</td>
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<td>E2E Security Models</td>
<td>HRT linkage</td>
<td>High protection level for critical infrastructure</td>
<td>Lowers barriers for enabling industrial use cases</td>
<td>Expertise, legacy components, engineering expense</td>
<td>Connect one-way to hardware roots of trust at both ends of the wire.</td>
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<td>Convergence of OT/IT Manufacturing Architectures</td>
<td>Network fragmentation; Manageability at scale; Access to RT data.</td>
<td>Simplicity, scalability</td>
<td>Lower maintenance and integration costs</td>
<td>Long timelines likely for system and network migration</td>
<td>Simplify network traversal across MSB and ESB network architectures. Improve co-existence of Near RT and RT network processing</td>
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<td>Enable Software Defined Scalable Analytics</td>
<td>Access at the edge; skilled resource pool</td>
<td>Higher re-use of assets; more scalable manageability;</td>
<td>Drive secure virtualization deeper into embedded domains</td>
<td>Remote connectivity, data normalization, model, interoperability, maintenance models</td>
<td>Improve interoperability and scalable access to analytics at the edge and cloud for E2E systems.</td>
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Abstract complexity of heterogeneous devices with:

**Manufacturing Service Bus**
- High Bandwidth
- Real-time
- Standards-based

**Secure and Trusted Data:**
- Unified Security architecture

**“Plug and Play”**
- Add devices and connect E2E
- Easily Collect/Transfer Data

#1 Simplify Bus Communications E2E
#2 Integrated Hardware Root of Trust Security

1. Secure:
   - Intel Hardware Root-of-Trust + Middleware + Intel Security + Wind River Bundled Solutions

2. Connected: An Open Middleware Component Model Supports
   - Device to Cloud Integration
   - Middleware to ESB Adaptation Integration
   - High QoS Options
   - Migration Path

3. Managed:
   - Intel Security, Wind River, MW Solution Integration
#3 OT/IT Convergence Trends

Increase Access to Highly Actionable Data

A Single View of the Truth: Right Information at Right Time to Right Person = Better Decisions!

Dynamic Real-Time Optimization
Supply Chain Frequencies approaching Factory Frequencies

Cost Reductions
Increased production performance, aligned operational / business goals
Lower maintenance, workforce management

Increased Access to Real-Time Data Translates to $$$
Reference and Related Collateral:

Intel IoT Insights Day:
http://newsroom.intel.com/docs/DOC-6097
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