



VORTEX* EDGE PMQ

Partner ILT Training

Internet of Things Group

*Other names and brands may be claimed as the property of others.

TABLE OF CONTENTS

1 | Learning Objectives

2 | Introduction

- What is Vortex* Edge PMQ?
- Benefits of Selling Vortex* Edge PMQ
- Market Overview
- Market Opportunity

3 | The Vortex Edge PMQ Solution

- Solution Components
- How it Works
- Solution Value Prop
- Solution Differentiators

4 | Target Customers and Proof Points

- Verticals and Use Cases
- Decision Makers and Pain Points
- Customer Proof Points

5 | Call to Action and Additional Resources

*Other names and brands may be claimed as the property of others.

TRAINING LEARNING OBJECTIVES

1

Where Vortex* Edge PMQ fits into the larger Industrial Internet of Things landscape

2

How Vortex* Edge PMQ addresses customer pain points and adds value to Industrial Internet of Things (IIoT) deployments

3

What next steps you can take to learn more

*Other names and brands may be claimed as the property of others.

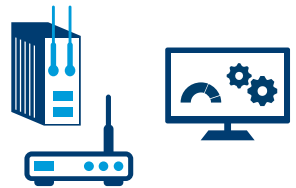
INTRODUCTION

WHAT IS VORTEX* EDGE PMQ?

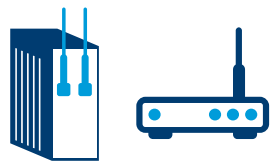
Vortex* Edge PMQ is a Fully-Integrated Hardware, Connectivity, and Predictive Analytics Solution Powering the Next Generation of Smart Industrial Internet of Things Systems.



A high-performance, ruggedized, edge-to-cloud IoT platform for advanced manufacturing, with components from Intel, IBM,* PrismTech* & ADLINK*



Turns data into insights and actions at the edge through the rapid deployment of predictive analytics



Combines pre-validated edge gateways, servers, connectivity and analytics software

*Other names and brands may be claimed as the property of others.

BENEFITS OF SELLING VORTEX* EDGE PMQ



Decrease Time to Value

- Vortex* Edge PMQ is a **pre-integrated, pre-validated solution** already optimized for customers' advanced analytics needs
- Developing on the Vortex platform **reduces solution development cycles** to days, rather than months on Open Source R



Lower Assembly Costs

- **Hardware and software solution components are pre-assembled** on the joint solution from ADLINK,* PrismTech,* Intel, and IBM,* removing the need to perform costly integration of disparate parts



Scale Your Resources

- The PMQ* infrastructure maximizes scarce data science resources, allowing you to **increase efficiency of your assets and ultimately scale your business**
- **ADLINK,* PrismTech,* Intel, and IBM* offer industry innovative product options**, supporting new use cases, integrating to a myriad of different protocols and applying the market's leading analytics engines

*Other names and brands may be claimed as the property of others.

MARKET OVERVIEW

The Internet of Things is Revolutionizing Industrial Scenarios



Industrial Internet of Things (IIoT) Overview

- **IoT sensors, networks and services enable improved productivity** from product, to manufacturing equipment, to factory, to end user
- Connecting people, things, and networks creates **tremendous opportunity for lower costs** and greater revenue



Industry 4.0 is Here

- **IoT industry standards** are enabling industrial deployments to take advantage of **cheaper hardware and software solutions**
- Innovative firms are seeing the value of **edge computing to improve connectivity, enhance security and lower costs**



MARKET OPPORTUNITY



200B

IoT sensors will connect 50 billion devices by 2020¹

56%

Of asset-intensive 'heavy' industries will have implemented IoT by 2017²

30%

Lower TCO with edge analytics solutions vs. cloud-only solutions³

- Unplanned asset downtime
- Maintenance costs
- Warranty claims
- Parts and inventory costs
- Asset longevity
- Production quality
- Production yield vs. waste
- Maintenance scheduling

1. Cisco, 2016.

2. Gartner Survey Shows That 43 Percent of Organizations Are Using or Plan to Implement the Internet of Things in 2016, Gartner Newsroom <http://www.gartner.com/newsroom/id/3236718>

3. © Wikibon IoT Reference Models AWS IoT Service & Pivot3 Server SAN

THE VORTEX* EDGE PMQ SOLUTION

Internet of Things Group

*Other names and brands may be claimed as the property of others.

SOLUTION COMPONENTS

Vortex*



Vortex* Intelligent Data Connectivity Software

- An advanced connectivity and data-management platform software
- Pulls edge and historical data together in industrial settings
- Open and robust standards-based data-sharing infrastructures

Edge



Smart Gateway

- Ruggedized gateway for analytics at the edge
- Quad Core Intel Atom® SoC Processor E3845

Industrial Server

- Ruggedized industrial server serves as a hub for gateway traffic
- Single/Dual Intel® Xeon® Processor E5-2400 v2 series with Intel® C604 Chipset

PMQ



IBM* PMQ

- PMQ = Predictive Maintenance and Quality
- Value-Added Software re-sold by IBM*

*Other names and brands may be claimed as the property of others.

SOLUTION COMPONENTS – VORTEX* INTELLIGENT DATA CONNECTIVITY SOFTWARE

Vortex*



Edge



PMQ



Vortex Intelligent Data Connectivity Software

- Vortex provides **real-time peer-to-peer data connectivity** based on the Data Distribution Services (DDS) standard (the most widely recognized standard in IIoT)
- Enables data from many different sensors and protocols to be **ingested, normalized and distributed in real-time** on the Smart Gateway and Industrial Server
- Ensures **efficiency and security** by cutting down the discovery data that has to be shared across devices, gateways and servers
- Vortex is **pre-integrated** on both the Smart Gateway and Industrial Server
- **Ultra-low latency** coupled with a high level of abstraction
- **High throughput**
- **Simple, fast and scalable configuration** (almost no configuration required)
- **New Load-balancing and fault-tolerance** strategy provided improved scalability and resilience
- New, more **cross-compatible API** and encoding

*Other names and brands may be claimed as the property of others.

SOLUTION COMPONENTS – EDGE GATEWAY AND INDUSTRIAL SERVER ON THE INTEL IOT PLATFORM



Smart Gateway

Enforces asset models from the edge, increasing automated maintenance uptime while reducing bandwidth costs

Specifications:

- Built on the **Intel Atom® SoC quad/dual core E3845/E3826 processors**
- Versatile connectivity for wired & wireless device comms
- Rugged fanless, cable-free operation with wide temperature, shock and vibration tolerance
- Ultra compact form factor and mounting



Industrial Server

- Built on the **Intel® Xeon® Processor E5-2400 v2 Series** with an **onboard Intel® 8920 crypto engine**
- Integrated with key software solutions
- IPMI 2.0 management interface, up to 96GB RAM & swappable SATA storage bays
- Optimized for compatibility with:
 - Dual 10G SFP+ optical ports
 - Dual gigabit ethernet ports
 - Optional optical and copper Bypass options

Vortex*



Edge



PMQ



★ [See appendix](#) for full gateway and server datasheets

*Other names and brands may be claimed as the property of others.

SOLUTION COMPONENTS – PMQ ANALYTICS FROM IBM*



IBM* PMQ Analytics



Vortex*



Edge



PMQ



Functionality

Connect relevant data from production equipment, maintenance logs and supply chain

Integrate data from physical assets, including real-time sensor data from equipment, historical data, and data in EAM systems

Access relevant data sources in real-time to **determine the assets and processes at the greatest risk** of failure

Organize asset data including site overview, process and material quality, real-time and historic performance, quantitative and qualitative KPIs, top failure reasons, and recommendations

Automatically initiate and manage work orders

Benefit

Helps develop predictive models to **enable faster, more informed decisions**

Identifies problems before they occur to reduce reject rates, improve yield and maximize uptime, earlier and more definitely than traditional statistical process control methods

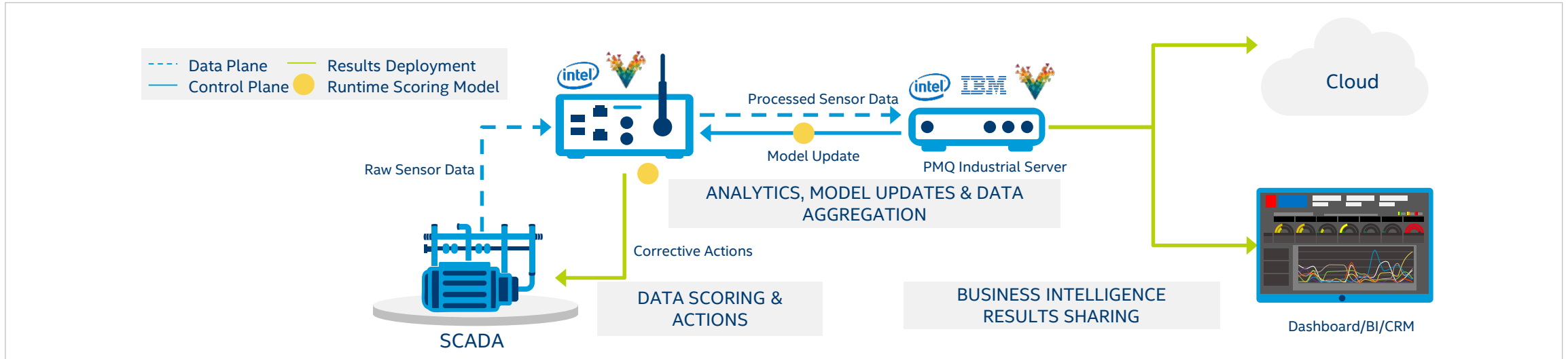
Effectively predicts asset health

Provides decision makers with **configurable dashboards and reports to in real-time**

Makes maintenance recommendations and provides possible repair resources based on asset health

*Other names and brands may be claimed as the property of others.

HOW IT WORKS



1

Collects data from sensors on IIoT assets using PrismTech* Vortex Intelligent Data Connectivity Software and ADLINK* Smart Gateways

2

Vortex* homogenizes protocols and pre-processes data at the edge on the ADLINK* Smart Gateway and Industrial Server

3

IBM's* PMQ Analytics analyzes data to predictively model an asset's optimal function

4

Prompts or recommends real-time corrective actions, including actuator commands and maintenance requests

5

Learns from historical data to build increasingly better predictive models

*Other names and brands may be claimed as the property of others.

SOLUTION VALUE PROP

Vortex* Edge PMQ optimizes asset management by enabling visibility and predictability to:

Reduce Costs



Reduce unplanned downtime by addressing asset problems *before* they fail



Lower maintenance costs through automated corrective actions and early warning maintenance requests



Cut warranty claims by predicting and reducing asset stressors on the fly



Minimize parts and inventory costs by predicting and adjusting miscalibrations to reduce the potential for production errors

Improve Production Quality



Extend asset life by ensuring that assets are constantly adjusted to function at optimal environment settings



Improve product quality with real-time corrective actions that keep assets producing with precision



Increase yield while reducing waste as precisely maintained assets work at optimal speeds and cut error through automated predictive maintenance

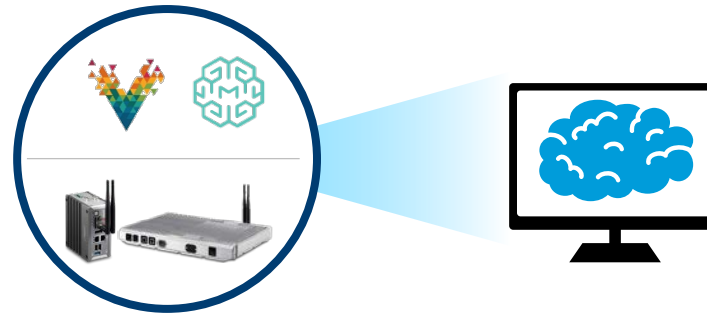


Optimize maintenance schedules by enabling predictive, data-driven asset maintenance evaluation and prioritization

*Other names and brands may be claimed as the property of others.

SOLUTION DIFFERENTIATORS

Vortex* Edge PMQ is a predictive, real-time solution designed for industrial needs



Common limitations of other solutions

Diagnostic-only solutions (condition-based analytics)

- Conditional-only analytics address problems after the fact – asset failure, error or miscalibration has already occurred and impacted productivity

Remote-only solutions

- Often involves modeling assets and enforcing actions from the remote cloud or datacenter, which can create additional costs and delays

Vortex* Edge PMQ delivers real-time, predictive analytics at the edge, going beyond diagnostic and remote solutions

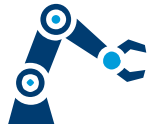
- Delivers *predictive* insights – anticipates and dynamically responds to asset status
 - Enables *proactive* responses – Goes beyond basic diagnostics to help address problems like asset failure, error or miscalibration *before* they impact productivity
- Operates at the *edge* close to the asset itself, which supports *fast decisions and actions* via low-latency predictive analytics

*Other names and brands may be claimed as the property of others.

TARGET CUSTOMERS AND PROOF POINTS

VERTICALS AND USE CASES

Vortex* Edge PMQ is available globally, and scales easily to deliver value in asset-intensive industries



Target Verticals

Primary vertical: Manufacturing
(Industrial, chemical, petroleum, mining)

Additional verticals:

- Automotive, aerospace & defense
- Chemical & petroleum
- Government
- Transportation
- Consumer products
- Electronics
- Energy and utilities
- Travel
- Telecommunication



Target Use Cases

Primary use case:
Automotive/smart factory/industry 4.0

- Manufacturing quality early warning
- Asset Tracking and Optimization
- Factory Analytics

Secondary use cases:

- Underground mine equipment monitoring
- Intelligent wireless tower management
- Central utilities equipment optimization
- Rail equipment performance monitoring
- Transportation fleet management

*Other names and brands may be claimed as the property of others.

DECISION MAKERS AND PAIN POINTS



Target Decision Makers

BDMs with care-about within two use case categories:

Operations optimization

- COO
- VP of operations
- Director of facilities
- Other decision-makers responsible for asset maintenance

Building predictive capabilities with new products and services

- CIO
- VP of product development

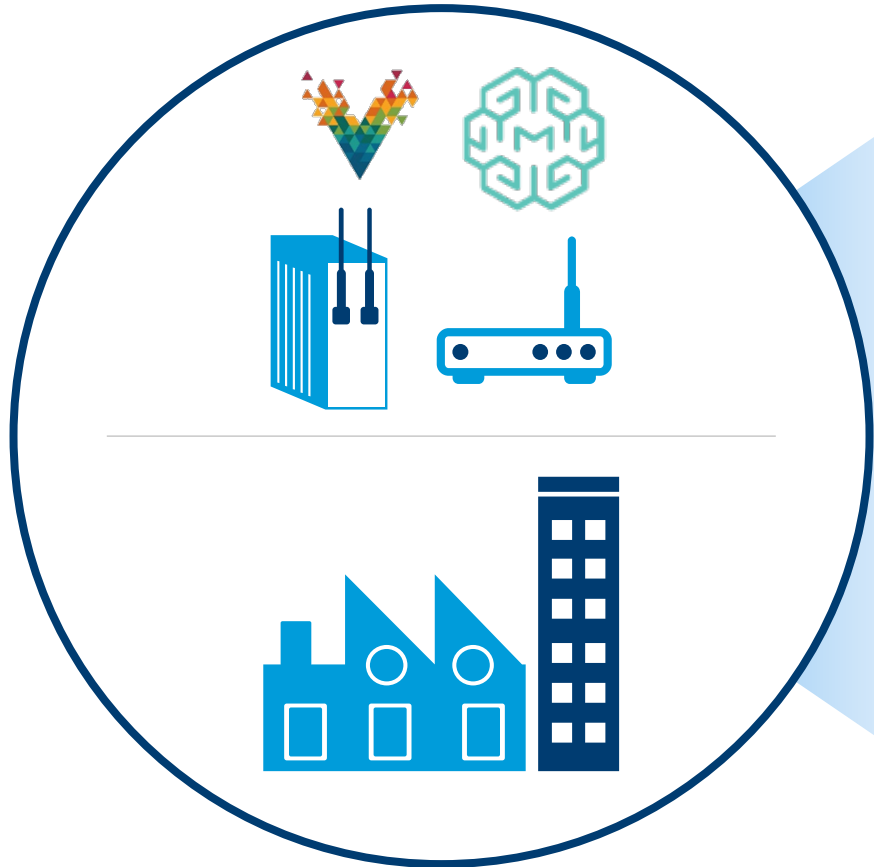


Target BDM Pain Points

- Unplanned downtime
- Maintenance costs
- Warranty claims
- Parts and inventory costs
- Asset longevity
- Production quality
- Production yield vs. waste
- Maintenance scheduling

CUSTOMER PROOF POINTS¹

Industry leaders are already benefiting from PMQ*



BMW*



BMW* light-alloy foundry
Reduced scrap rate by 80% in 12 weeks

IBM*



50-70% of service support (including on-site service) is replaced by machine-to-machine fixes

Pratt & Whitney*



Pratt & Whitney* Jet Engines
\$63 Million in annual savings for a single airline customer

Israel Electric*



20% reduction in costs for power station outage management

Daimler Powertrain*



Reduced defect rate by 50% in 16 weeks, Cylinder heads

1. PrismTech,* Vortex* Edge PMQ Sales Pitch, Sept 2016

*Other names and brands may be claimed as the property of others.

CALL TO ACTION AND ADDITIONAL RESOURCES

CALL TO ACTION AND ADDITIONAL RESOURCES

Solution Pricing Information

Vortex* Edge PMQ is a highly flexible solution that is tailored to the unique hardware, software, and service needs of each customer.



Engage with PrismTech* through the support alias to discuss pricing details based on your customer's unique needs.

Key Contacts

For questions or support regarding hardware, software, data management, comms, specific industries or use cases, or any other Vortex* Edge PMQ-related topics, contact the Vortex Edge PMQ support alias:

pmq-partner-support@prismtech.com



Collateral Available

Customer-facing leave-behinds

- [Vortex Edge PMQ Brochure](#)
- [Smart Gateway Brochure](#)
- [Industrial Server Brochure](#)



*Other names and brands may be claimed as the property of others.

LEGAL DISCLAIMERS

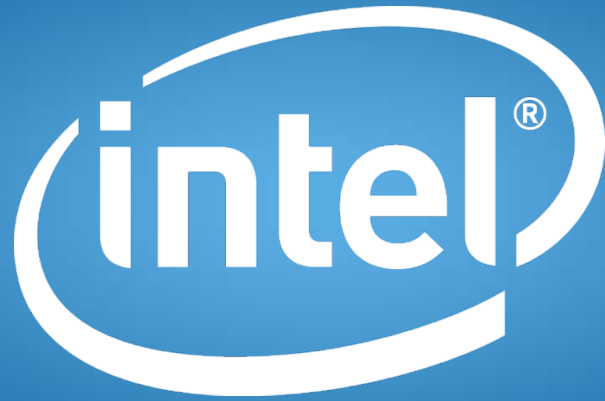
Intel technologies features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [Intel.com](https://www.intel.com).

Cost reduction scenarios described are intended as examples of how a given Intel- based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.

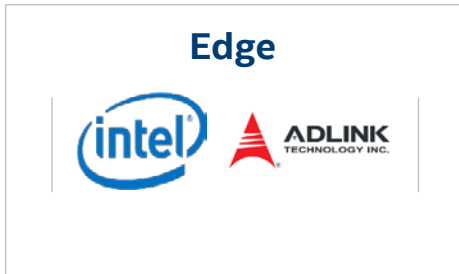
Intel, the Intel logo, Intel Core, Intel Atom, and Intel Xeon are trademarks of Intel Corporation or its subsidiaries in the U.S. and/or other countries.

*Other names and brands may be claimed as the property of others.

© Intel Corporation



SOLUTION COMPONENTS— EDGE GATEWAY AND INDUSTRIAL SERVER DATASHEETS



Gateway Datasheet

Hardware Features

- Quad Core Intel® Atom Soc Processor E3845
- Extremely compact: 120 (W) x 100 (D) x 55 (H) mm
- Intel® IoT Gateway Full Compliant
- 1x HDMI, 2x USB 2.0 + 1x USB 3.0, 2x GbE ports, optional 4 isolated DI/O, 2XmPCIe slots (one supporting mSATA). 1x USIM socket, 1X SDIO
- Aluminum housing, withstanding industrial grade EMI/EMS (EN 61000-6-4EN 61000-6-2)
- Optional DIN-Rail/Wall mounting

Integrated Software

- WindRiver® IDP XT 3.1
- Vortex* OpenSplice
- Vortex* Connect
- Vortex* Fog
- Node Fog
- Node-RED + Freeboard
- IBM* SPSS Scoring Engine
- Certified by Microsoft Azure, IBM Bluemix & SEMA Cloud

Server Datasheet

Hardware Features

- Single/Dual Intel® Xeon® Processor E5-2400 v2 series
- Six memory sockets support VLP RDIMM DDR3-1333/1600 REG/ECC up to 96GB
- Intel® C604 Chipset
- Dual 10G SFP+ ports
- Dual 10/100/1000 BASE-T ports
- IP65 water and dust proof
- Conduction cooled, a aluminum chassis

Hardware Features

- Operating systems
 - Red Hat Enterprise Linux
- Predictive Analytics
 - IBM* WebSphere® Application Server
 - IBM* SPSS® Collaboration and Deployment Services
 - IBM* SPSS Modeler Server
 - IBM* Solution Publisher
 - IBM* SPSS Modeler Server Premium
 - IBM* SPSS Data Access Pack
 - IBM* SPSS Modeler Collaboration and Deployment Services Adapter
 - IBM* SPSS Decision Management
 - IBM* SPSS Statistics Server
 - IBM* SPSS Statistics Collaboration and Deployment Services Adapter
 - IBM* DB2® Client

Business Intelligence

- IBM* WebSphere® Application Server
- IBM* HTTP Server
- IBM* Cognos® Business Intelligence
- IBM* DB2 Client
- **Connectivity and Integration**
 - Vortex* Cloud
 - Vortex* DDS to integration Bus Connector
 - IBM* WebSphere MQ
 - IBM* Integration Bus
 - IBM* Integration Explorer
 - IBM* Integration Bus ODBC Database Extender
 - IBM* DB2 Client
- **Database**
 - IBM* DB2 Enterprise Server Edition