

RFID Device Management Profile (RDMP)

SG1 Presentation

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Introduction

- 2nd meeting for Microsoft in SG1
 - SME in Toronto
 - US TAG delegate now
- Device Management proposal submitted 30 days prior to today
- This presentation at request of SG1 chair and secretary

Proposal

- Standardization of RFID Device Management using Web Services
- Includes Discovery, Configuration, Initialization and Monitoring
- Above is comprehensively captured in RFID Device Management Profile (RDMP)
- Based on DPWS - Device Profile for Web Services

DPWS Adoption

37 Vendors, 120 Implementations worldwide

- Microsoft (WSDAPI)
 - Vista, Windows CE, .NET Micro Framework
- SOA4D
 - Sponsored by Schneider, developed by ODONATA, France
- gSOAP
- Levitate
- Peerless
- eSOL
- DotVision
- DPWS4J (Java Web Services stack)

Embedded Implementations

- Printers
 - Canon, HP, Xerox, Epson, Lexmark, Brother, Konica-Minolta, Fuji-Xerox, others
- Projectors
 - Epson, NEC, Toshiba
 - Several others coming in 2008 and 2009
- Industrial and home control
 - Schneider, Hager, LeGrand, Beckhoff, Vantage
 - Exceptional Innovation
 - Audio, Video, home control, hotel control
 - Over 1000 deployments in USA
 - Disney Home of Tomorrow
 - Thousands of devices, 50K visitors in first week

Web Services Primer

- Clients and Server communication using XML and SOAP
- Machine readable description of operations (WSDL)
 - Messaging contract between client & server
 - Services are discoverable
- Suite of standard protocols
 - Security, Events, Metadata, Messaging, etc

Why Web Services on devices?

- Leverage widely deployed web services software and protocol stack
- Layered, expert specifications
- Rich toolset availability for varied platforms
 - Enables developer to focus on core business logic
- Many embedded implementations today
 - Printers, scanners, projectors
- XML-based protocols better debuggable
- Integration with enterprise management software

RDMP

- Discovery Service
- Firmware Update Service
- Configuration Service
- Monitoring Service

WS-Discovery

WS-Discovery provides bootstrapping for ad hoc, peer-to-peer service communications

- Announce device availability
 - Device multicast Hello
 - Device multicast Bye
- Respond to queries by type and/or scope
 - Client multicast Probe → Devices unicast Probe Match
- Resolve service address to transport address
 - Client multicast Resolve → Service unicast Resolve Match
- Scales from ad hoc to managed networks
 - Centralized directory suppresses multicast traffic
- RDMP defines extensions for RFID Devices to participate

DISCOVERY

DEMO

Firmware Update Service

- Upload, commit states
- Pull model
 - Device given a HTTP(S) URL
 - Uses range headers to download sections
- Device may control rate of download
 - Download at device idle times
- Resume interrupted downloads
- Schedule commit time
- Progress Events
- Firmware applicability is determined by management software

DEVELOPMENT EXPERIENCE & FIRMWARE UPDATE

DEMO

Configuration Service

- Enables Auto provisioning
- Apply Property Profile
 - Includes RF configuration

Monitoring Service

- Events and Counters
- Standard events defined in RDMP
 - Ex: BatteryLow, FailedRead, MemoryLow, LabelJam, LabelOut, etc.,
- Standard Counters
 - Ex:FailedReadCount, FailedPrintedCount, FailedKillCount etc.,
- Support for custom events
- Consumable by standard monitoring tools

Industry Support for RDMP

- Intermec
- Motorola
- Sirit
 - My name is Dave Missimer and I am the Director of Engineering for Sirit Technologies. Sirit supplies RFID technology to a variety of marketplaces worldwide. Our deployment experience spans a vast range of applications such as supply chain management, logistics, cashless payment, access control, vehicle identification, inventory control and management, asset tracking, product authentication, and near field communications. Our customers range in size from some of the largest companies in the world to small sole proprietor operations. I have recently become aware that Microsoft is intending to propose their Web services approach for RFID Device Management to the ISO SG1 Workgroup. Although Sirit is not participating in this ISO working group, as a representative of Sirit, I would like to express support for this initiative from Microsoft. Sirit feels that this approach provides a number of important benefits to the RFID community such as:
 - leverages widely deployed web services software and protocol stack technology,
 - availability of a variety of toolsets to utilize this technology,
 - minimal adoption effort for both device and host platforms,
 - broad support on a multitude of computing platforms,
 - technology approach can be shared between other device functional interfaces outside of device management,
 - minimal implementation burden on RFID devices
 - high level, easy to understand interface abstractions
 - proven approach in use today by many different types of network appliances
- Impinj
 - Impinj backs the RDMP initiative. We realize that the proposal is in a prelim draft stage, however, we feel the Web Services approach best addresses our customer's long term needs and is the best path forward to an industry standard. We recommend SG1 to move forward on RDMP – Dan Bowman, Senior Product Manager.
- ...MORE...

Next Steps

- Find best path forward for RDMP in SG1
- Work with industry leaders to define RDMP

APPENDIX

Devices Profile Subset of WS-* Framework

Not Used

Published

Member Sub

Submitted

Standard

WS-Federation

WS-Management

**Devices
Profile**

*Infrastructure
and Profiles*

Metadata

WS-Discovery

WS-Secure
Conversation

Assurances

UDDI

WS-Trust

WS-Atomic
Transaction

**WS-Metadata
Exchange**

WS-Security

WS-Reliable
Messaging

WS-Coordination

WS-Policy

WS-Transfer

WS-Enumeration

WS-Eventing

Messaging

WSDL

SOAP

WS-Addressing

MTOM

XML Schema

XML Infoset

SOAP / UDP

Foundation

XML 1.0

**XML
Namespaces**

MIME

SOAP / HTTP

OASIS TC Timeline

- OASIS Web Services Discovery and Web Services Devices Profile (WS-DD) Technical Committee
 - http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=ws-dd
 - Co-proposed by CA, Canon, Lexmark, Microsoft, Nortel, Novell, Progress Software, Red Hat, Ricoh, Schneider Electric, Software AG, and WSO2
- DPWS, WS-Discovery, and SOAP-over-UDP
 - Not any specific device classes
- Call for Participation issued July 28
- First Meeting September 16-18 in Redmond
- Quarterly face-to-face meetings, weekly calls
- Goal of completion by 2nd quarter 2009