### **DPWS in Schneider Electric**

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Web Services values for industrial automation: Customers want ...



I. Introduction

#### 1- Customer Values: Analyst Reports

 "Customers rate solutions and integration capability above all other attributes"

 "Customers want Plug & Play integration and open system architectures"

Source: Morgan Stanley Study "Customers want customized solutions and interoperability. In particular. They also want to work with suppliers that can satisfy global needs"

## Example of Web services addressed customer values : Plug and Play

- Dynamically add new devices, functions, machines.
- Duplicate machines or manufacturing lines (by "copy and paste" in the design tool)
- Automatically build the application by assembling mechatronic devices (e.g. conveyors)
- Full Plug and Play at the application level (including "FDR" network PnP)
- Detect and manage manufactured pieces of equipment



Manufactured pieces of equipment

#### Web Services basic brick: DPWS



Devices Profile for Web Services (DPWS) protocol stack



DPWS software component available as Open Source

# Web Services public industrial fair demonstration

MACH fair – UK – April 24-25, 2008

Fully distributed Web Services demonstration with Schneider devices, linked to SAP system and Loughborough tools













# Web Services public industrial fair demonstration



- Distributed control application
- Using Web Services (DPWS)
- In real Schneider industrial devices (4 FTBs)
- Linked to SAP business applications
- Designed with Loughborough engineering tools
- On a test rig provided by our FORD customer
- Developed under the SODA and SOCRADES projects



### A test rig provided by FORD, now implementing a fully Web Services distributed control

**Before:** Standard (SE Unity) PLC system with remote IO

**Now:** Fully distributed, plug and play, linked to SAP and engineering tools, flexible and easily reconfigurable





## The test rig control architecture, linked to SAP and Loughborough applications



#### **DPWS device: required resources**

- Schneider major achievement is to provide a complete DPWS device solution with a single 5 \$ existing chip:
  - ARM9 processor
  - 96 Kbytes of RAM memory
  - 512 Kbytes of Flash memory:
    - 200 KB open source C implementation of DPWS
    - •100 KB TCP-UDP/IP stack and RTOS
    - •200 KB available for device application

### **DPWS** deployment inside Schneider

#### • Large deployment through all business units:

- Industrial automation
- Electrical Power distribution
- Building automation
- Home automation

#### • Device development kits under development

# DPWS important values and potential issues

- Simple and lightweight for integration in low cost devices
- Asynchronous event driven communication
- Compatibility with IT systems through Basic Profile 1.1 or 2.0?
- And see detailed comments dd spec issues.docx