“Real-time Enabling” Your Enterprise Business Systems

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Enterprise Integration and PI Data Access

Production  Maintenance  Quality

Compliance  Reporting  Lab  Calibration

ERP and Asset Management  Systems

ISO  XML  OPC  Java

SAP  IBM  ORACLE  INFOR  IFS  MINCOM  Ventyx

CAGOV

OSIsoft
PI Data Access

- PI Web Services 2010
- PI OLEDB Enterprise 2010
- PI JDBC 2010
- PI OPC
- PI Notification - Delivery Channels
- PI SDK, AF SDK, AN SDK

End User Licensing: PI System Access (PSA)
Developer Licensing: vCampus Subscription
Push vs. Pull +
optional Middleware

• PI Data/Events
  – Push vs. Pull

– None
– Microsoft BizTalk
– SAP MII (and PCo)
– IBM Websphere ESB
– Oracle Fusion
– TIBCO
– . . . . . .
Use Cases and Demos

- MMT (Mobile Management Technology)
  - PI SDK (polling now, later migrate to sign-up for update)
- Cognos (Green Sigma initiative)
  - PI JDBC (via Tivoli Agent) to Tivoli Data Warehouse

- Business Objects – Xcelsius
- Carbon Impact (CI)
- SAP ERP (Production PP/PI, Maintenance PM, Quality QM)
  - All Integration using SAP MII
    - Uses XML – you supply or it generates from PI data
IBM MMT Agenda

- MMT Introduction
- PI – MMT Integration
  - MMT Architecture
  - Integrated Modeling Environment
  - PI data feeds
- PI enabled Analytics
  - PI data visualization in MMT
  - Power and Heat Distributions
  - Asset management
- Conclusion
MMT Introduction

**Mobile Measurement Technology**

Optimize data center thermal profile to reduce energy consumption.

![Image of thermal map and mobile measurement equipment]

- Hot spot at long aisle
- Hot air is sucked into cold aisle

Temperature colors:
- 54.5°C
- 33.7°C
- 13.0°C
MMT Introduction

**Data Model Manager** – defines different types and their properties:
Next step – Real-time MMT

Mobile Measurement Technology (MMT 1.0)

Measurement Management Technology (MMT 1.5)

Mass Transport Equation: \( \nabla^2 \varphi = 0 \)

Energy/Thermal Equation:
\[
\rho c_p \nabla T + \nabla \cdot (k \nabla T) + h_{Racks} = 0
\]
Next step – Real-time MMT

- OPC-XML Gateway
- BACnet-XML Gateway
- PI Server
- BACnet / IP
- XML
- HTML
- XML
- XML
- XML
- XML

- Honeywell
- Siemens
- ALC
- Johnson Controls
PI-MMT Integration

**MMT Architecture**
PI data feeds

Configure PI Adapter
PI data feeds

CRAC Points:
- Fan speed
- Return temperature
- Supply temperature

PDU Points:
- Current A, B, C
- Voltage AB, BC, CA
- Total Power
- ... panels and circuits
PI data visualization in MMT
CRAC Zones & Efficiency
Power Distribution Analytics

Real-time Rack
Power ~ 3209 W
Flow Analytics
Heat Distribution Analytics

PI data
Integrated Modeling Environment

A tool/platform to define data models, read real-time data, plug-in analyses and visualization, deploy it to customers.
IBM – MMT - Conclusions
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SAP – Xcelsius integration via MII

Where PI geeks meet...
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Where PI geeks meet...
SAP – Carbon Impact integration via MII
SAP – PM, PP/PI, QM
PI JDBC → Tivoli Data Warehouse → Cognos BI
```java
int recordCount = 0;
String url = "jdbc:postgresql://9.255.255.255:5461/Data Source=PIDataSRC;user=greensigma;password=greensigma ; Integrated Security=SSPI;";
String driver = "com.osisoft.jdbc.Driver";
Statement stmt; ResultSet rs;
Properties plist = new Properties();

plist.put("LogConsole", "True"); // optionally switch on debug info
//plist.put("LogLevel", "3"); // 3=Fine
plist.put("user", "greensigma");
plist.put("password", "greensigma");

try {
    Class.forName(driver).newInstance();
    System.out.println("About to Create Connection");
    con = DriverManager.getConnection(url, plist);
    System.out.println("Creating Statement");
    stmt = con.createStatement(ResultSet.TYPE_SCROLL_INSENSITIVE, ResultSet.CONCUR_READ_ONLY);
    rs = stmt.executeQuery("SELECT tag, value, time FROM picomp2 WHERE tag in " +
    "('E56.27.5317 INFTNK_FIT114', 'E53.60.44.5323 DRW_FLT501', 'B315_CUP_MPW_INFL_FLOW1_5'," +
    "'B315_CUP_MPW_INFL_FLOW2_5', 'C60.57.01.5690WELL_WELL-80 Fi-0101'," +
    "'C60.57.01.5690WELL_WELL-80 Fi-0201'," +
    "'C60.57.01.5690WELL_WELL-84 Fi-0401'," +
    "'C60.57.01.5690WELL_WELL-85 Fi-0501_FILTERED'," +
    "'C60.57.01.5690WELL_WELL-85A Fi-0501_FILTERED'," +
    "'C60.57.01.5690WELL_WELL-06 Fi-0601'," +
    "'C60.57.01.5690WELL_WELL-07 Fi-0701'," +
    "'C60.57.01.5690WELL_WELL-23 Fi-2301'," +
    "'C60.57.01.5690WELL_WELL-25 Fi-2501'," +
    "'C60.57.01.5690WELL_WELL-14 Fi-1401'," +
    "'C60.57.01.5690WELL_WELL-14A Fi-1401_FILTERED'," +
    "'C60.57.01.5690WELL_WELL-16 Fi-1601'," +
    "'C60.57.01.5690WELL_WELL-09 Fi-0901'," +
    "'C60.57.01.5690WELL_WELL-20 Fi-2001_FILTERED'," +
    "'C60.57.01.5690WELL_WELL-20A Fi-2001_FILTERED'," +
    "'C60.57.01.5690WELL_WELL-21 Fi-2101'," +
    "'C60.57.01.5690WELL_WELL-22 Fi-2201'," +
    "'C60.57.01.5690WELL_WELL-10 Fi-1001'," +
    "'C60.57.01.5690WELL_WELL-12 Fi-1201'," +
    "'S317MP17:S317 EFFTNK_FIT127'," +
    "'S317MP17:S317 EFFTNK_FIT127A'," +
    "'E55.01.5325 EQ_TNK T3_FLOW'," +
    "'E55.01.5325 EQ_TNK T4_FLOW'," +
    "'E55.01.5325 FT-9'," +
    "'E55.01.5325 FT-10'" +
    "and time > '2010-08-26 00:00:00' and time < '2010-08-26 01:00:00';" +
    "" +
    "System.out.println(" == START of OUTPUT == ");
```

Thank You!