
REAL-TIME PERFORMANCE MANAGEMENT FOR THE ENTERPRISE
RtPM
SAN FRANCISCO PHILADELPHIA HOUSTON FRANKFURT
OSISOFT USER CONFERENCES 2005
REAL-TIME PERFORMANCE MANAGEMENT FOR THE ENTERPRISE
RtPM

Unifying Transactional and Production Data for Effective Reporting

Christian Luckock

Agenda

- PI Data Manipulation using SQL
  - New features in PI OLEDB version 3
- Unifying Data
  - Linked Database Concept (PI ⇔ RDBMS)
  - Data Transformation Services
- Reporting and Data Mining
  - Reporting Services
  - OLAP

PI OLEDB version 3

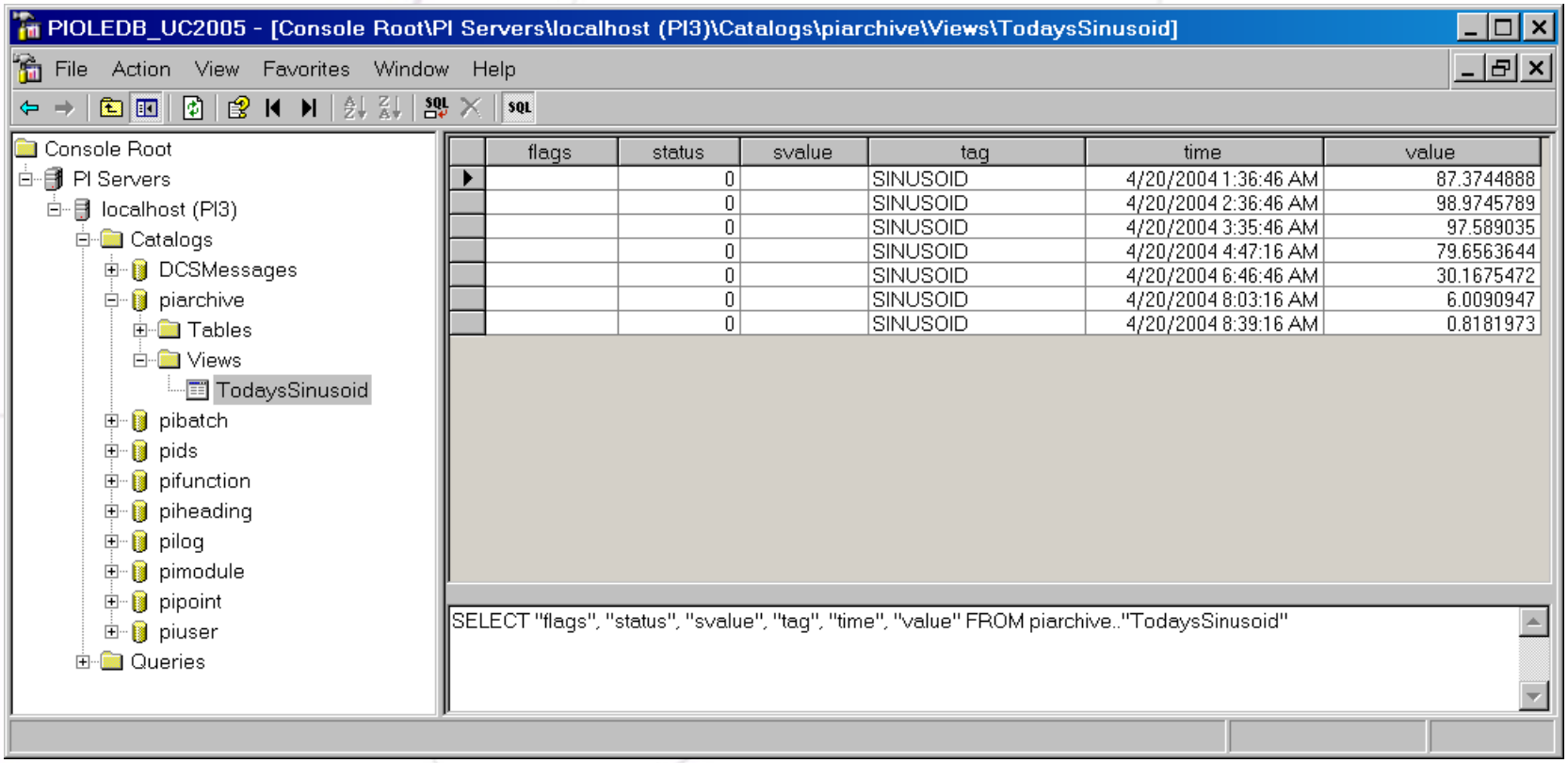
- Improved support for MS SQL Server Linked Server
- Direct support for Data Transformation Services NEW
- Direct support for Reporting Services NEW
- Direct support for Analysis Services NEW
- Direct support for Web Services NEW
- Oracle OLE DB Generic Connectivity

PI SQL Enhancements

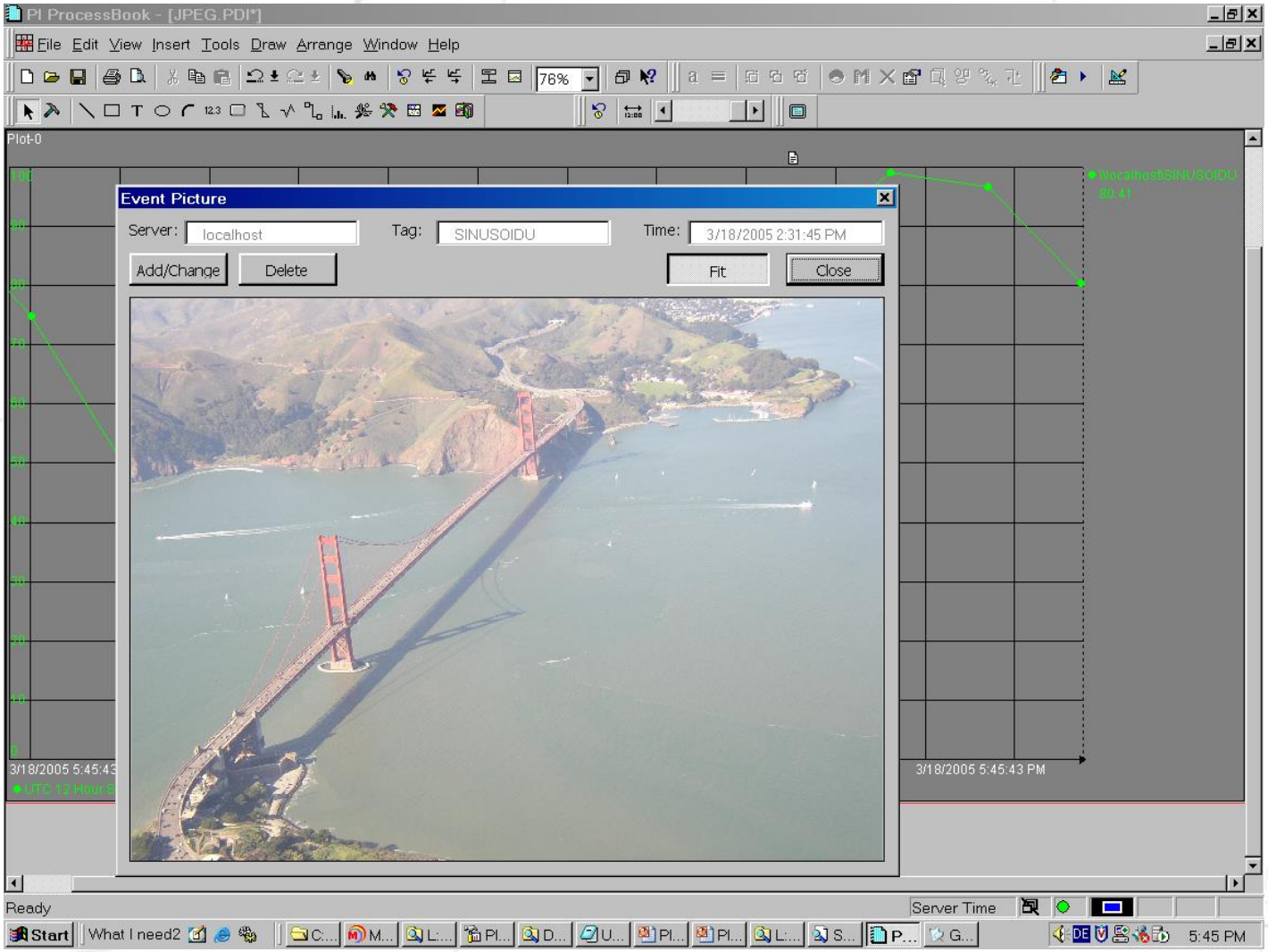
- New SQL Engine
  SQLSS not used anymore, very scalable
- Multithreaded
  Thats why it now supports the many Middleware scenarios
- Support for new Databases
  Appear as Catalog
- Support for Views
  Stored in Module Database
- New Tables
  pisnapshot, picomp2, piinterp2, pipoint2, pifunction

  → Discover using MMC Snap-In

Discover using MMC Snap-In



Add Binary Annotation



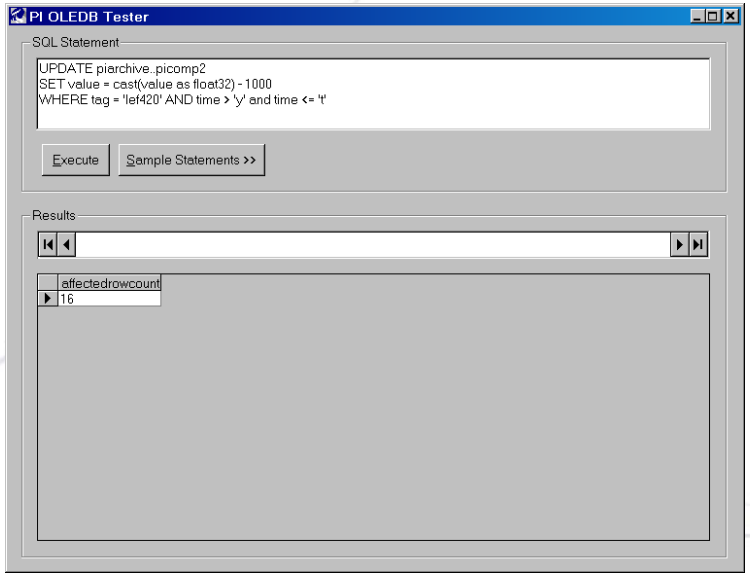
Annotation Column is VARIANT

```
Open strPath For Binary As iFile
  ReDim bytes(FileLen(strPath))

  ' read the file into "bytes"
  Get iFile, , bytes
  Close #1

  ' form an update command
  Dim strQuery As String
  strQuery = "UPDATE picomp2 SET annotations = ? WHERE tag = '" & strTag & "' AND time = '" & strTime
      & "'"

  Dim cmd As New ADODB.Command
  Set cmd.ActiveConnection = con

  cmd.CommandText = strQuery

  ' set the annotations parameter
  cmd.Prepared = True
  cmd.Parameters.Item(0).Value = bytes
```

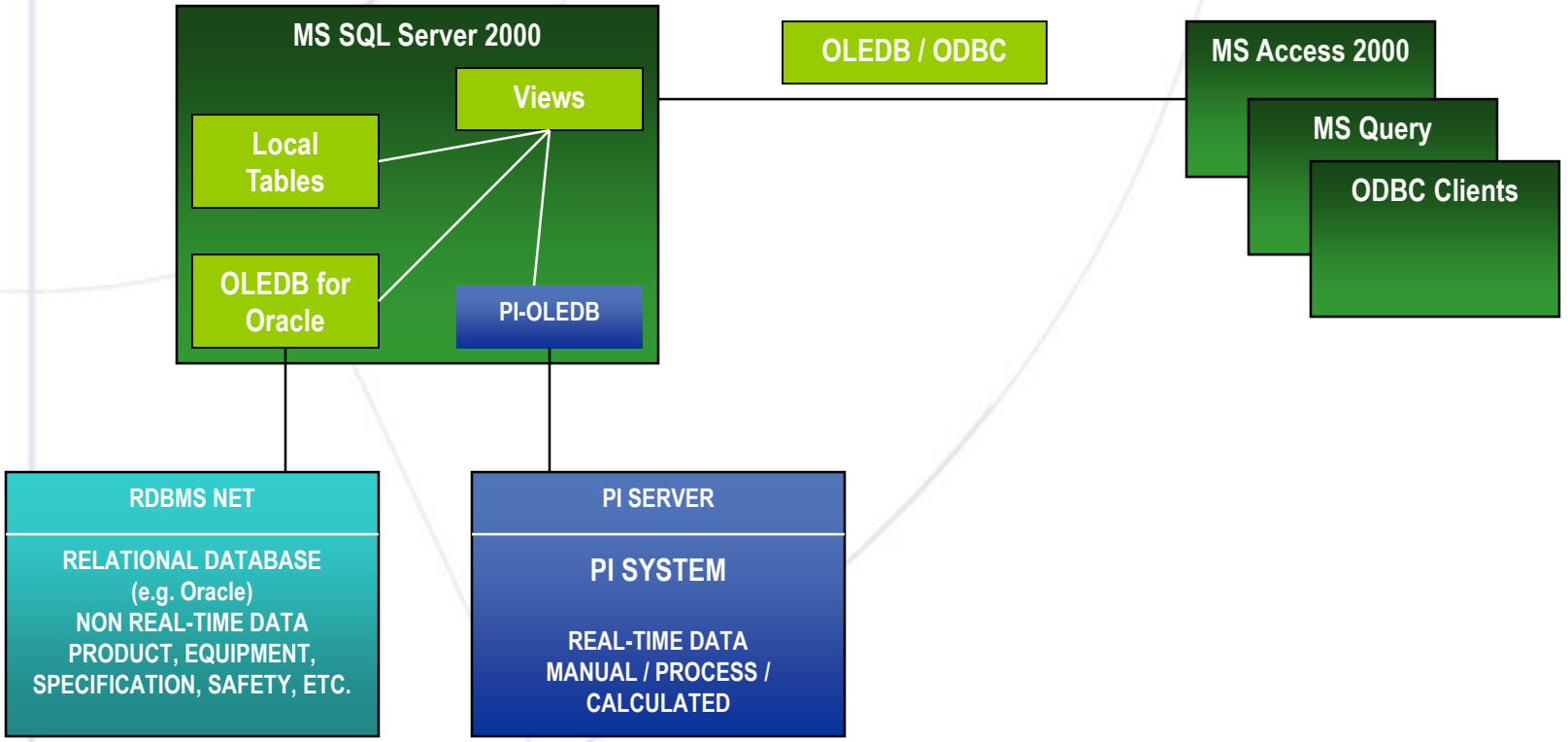
picomp2 table fully updatable

- Decrease all archive events of a tag for a certain time range by value of 1000

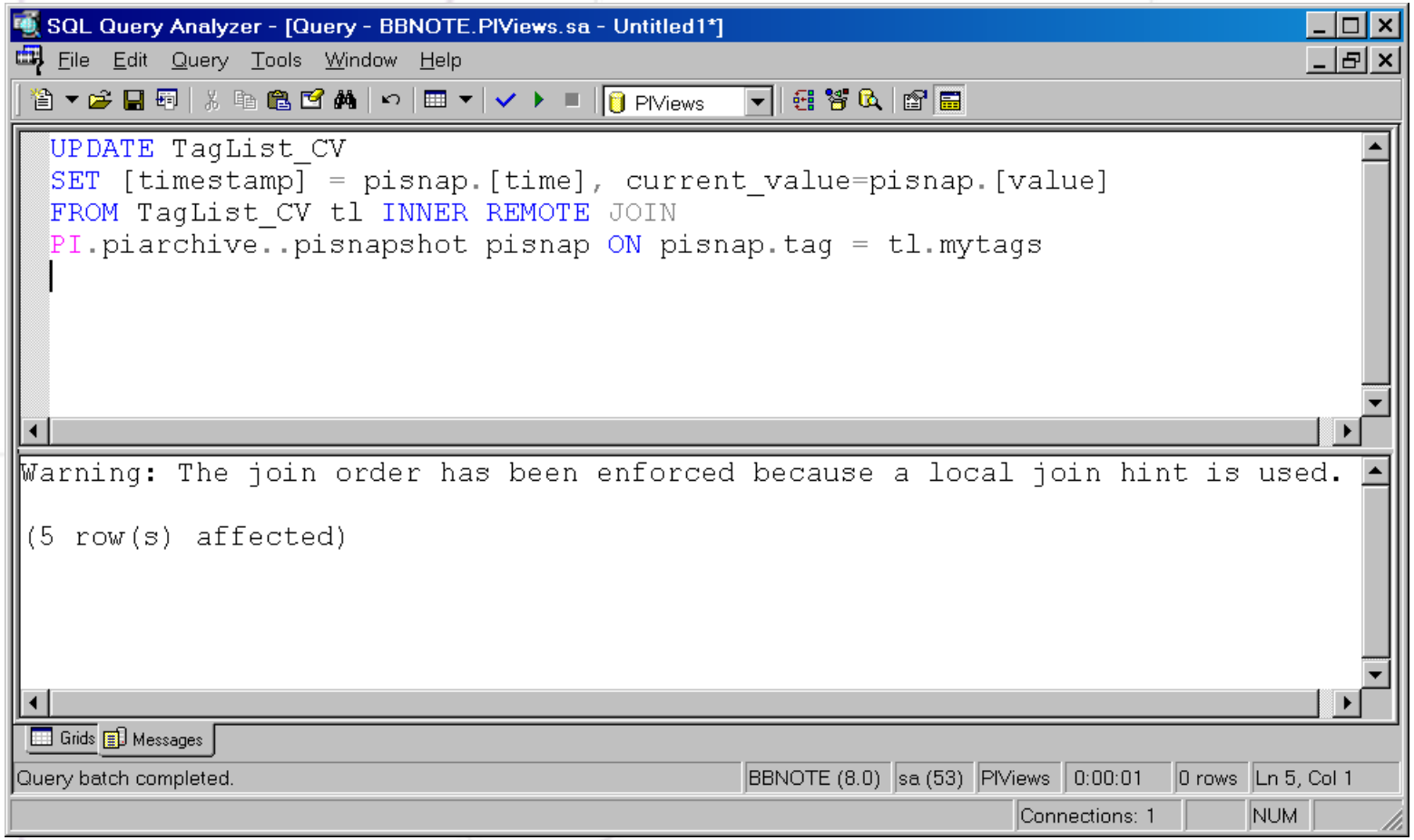
```
UPDATE piarchive..picomp2
SET value = cast(value as float32) - 1000
WHERE tag = 'lef420' AND time > 'y' and time <= 't'
```



Linked Database Concept
MS SQL Server Linked Server



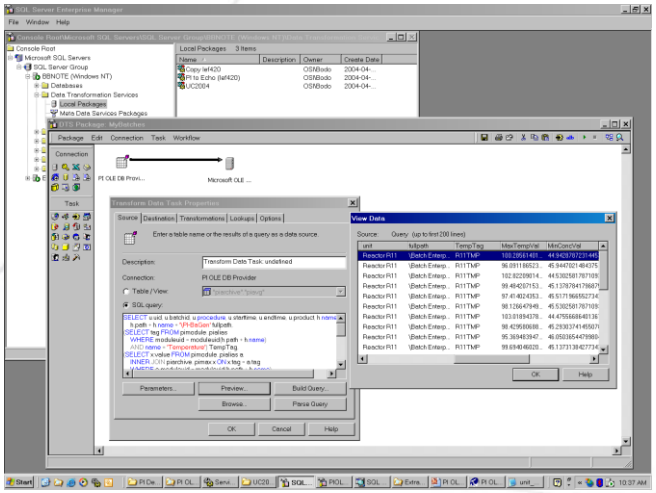
A Heterogeneous Query



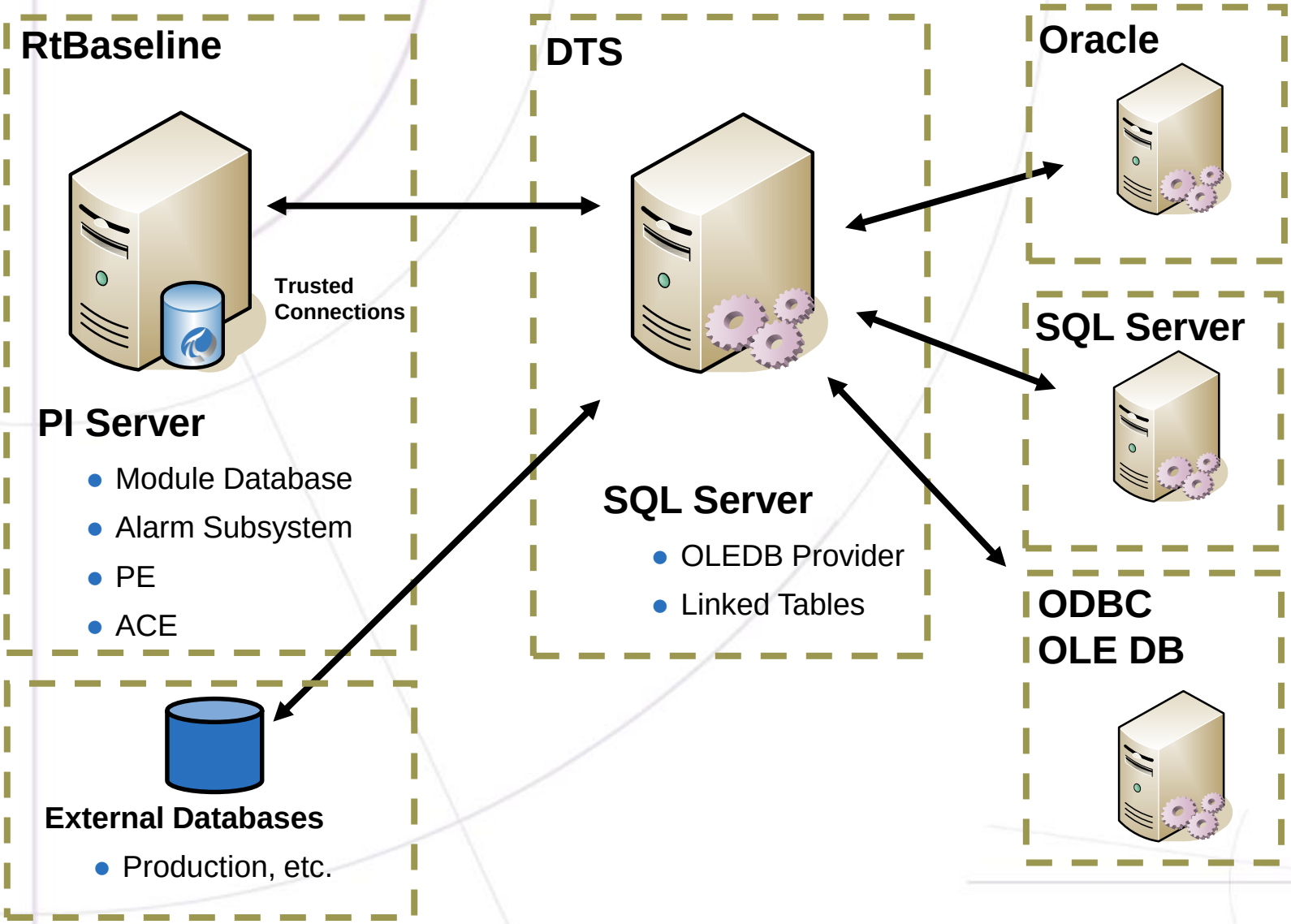
The above query updates a SQL Server table having a list of tags in column „mytags“ with related snapshots from PI.

Data Transformation Services (DTS)

- Data transfer between SQL based data sources
- Extract, transform and consolidate
- Build custom data movement solutions
- Directly connects to PI OLEDB
- Alternative to RDBMS Interface especially for aggregated data

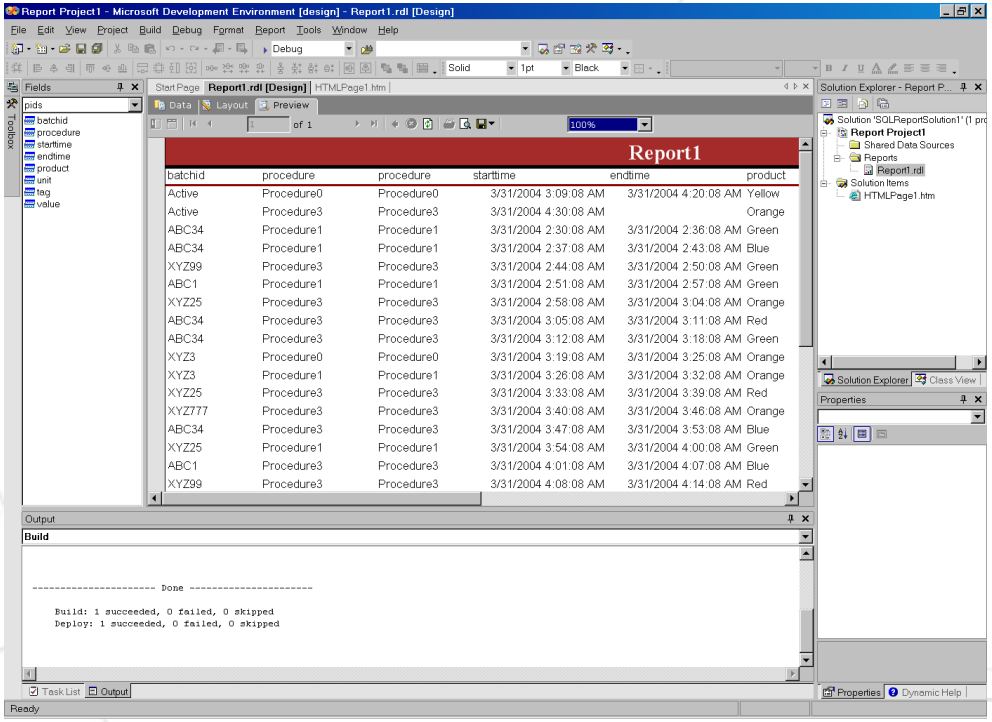


Architecture: Data Transformation

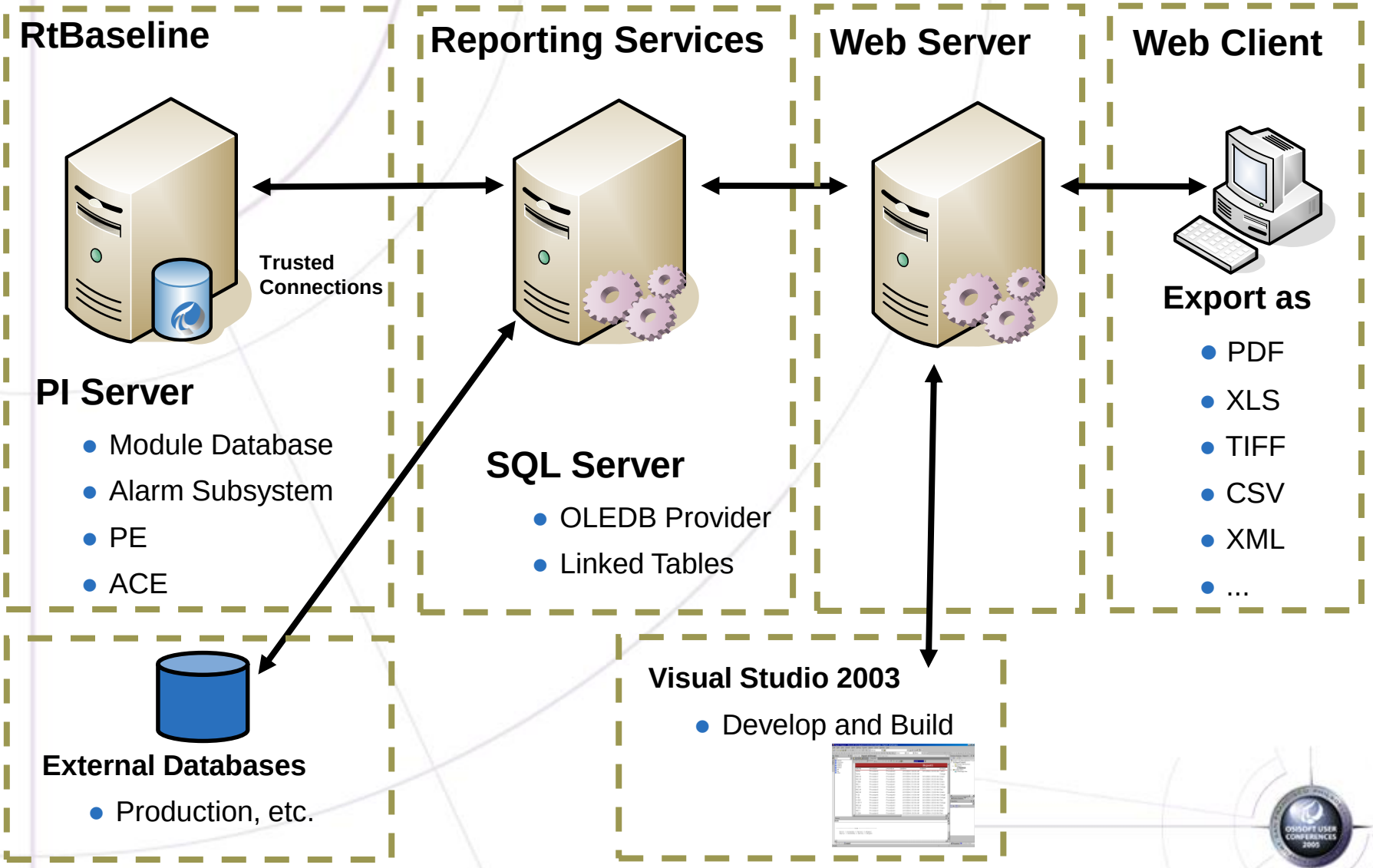


Reporting Services

- Automatically generate Reports and publish on Web Server
- Access data from various data sources
- Can directly connect to PI OLEDB

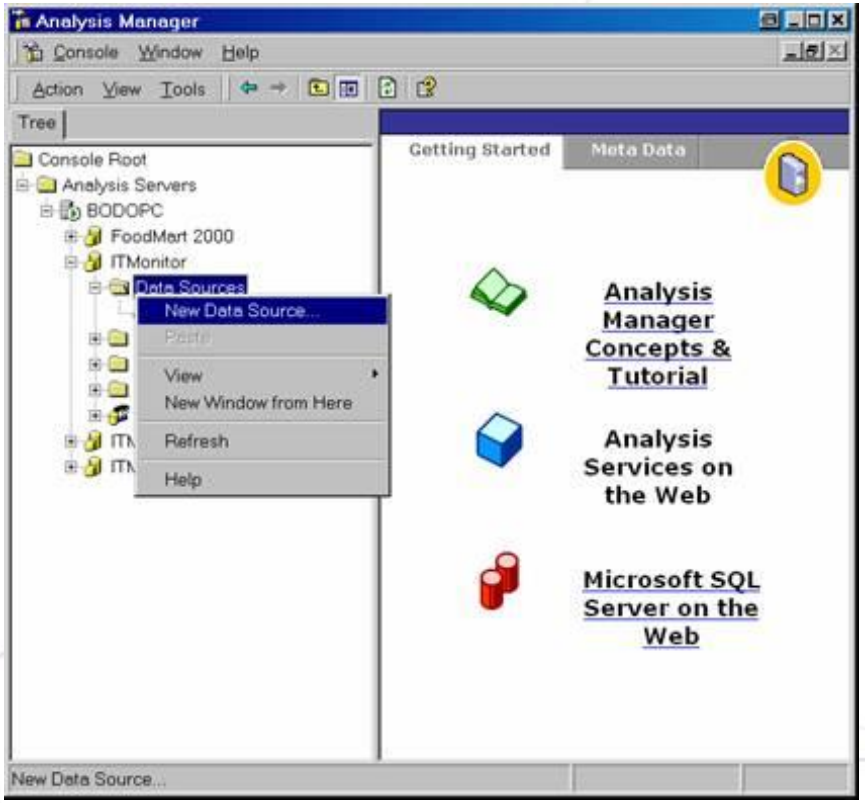


Architecture: Reporting



OLAP

- Data Mining and Multidimensional Data Analysis
- Support for MS Data Analysis Services
- Can directly connect to PI OLEDB



Example:
Operating Conditions Rollup

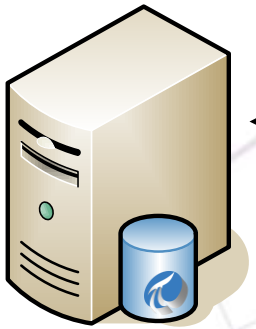
- Need a way to measure operating performance against expectations
- Need to summarize this based upon equipment hierarchy
- Need to analyze the problems to determine root-cause
- Need a way to mine this data for questions like:
  - ✓ "Are there more work orders issued when I run a different grade raw material?"
  - ✓ "What does it cost me in terms of maintenance to meet rush orders?"
  - ✓ "Why do I have to service a piece of equipment after we use a shipment of raw materials from one supplier vs. another?"

Solution:
Operating Conditions Rollup

- PI system to collect data
- Alarm subsystem to generate alarms
- One mechanism to rollup alarms
  - ACE (sophisticated)
  - PE (simple)
- PIOLEDB provider to read the information
- Microsoft Analysis Services (OLAP) to analyze data

Architecture: Operating Conditions Rollup

RtBaseline

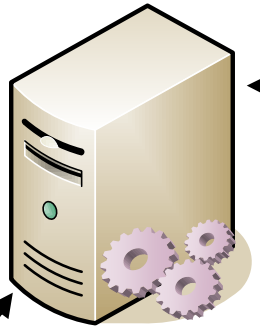


Trusted Connections

PI Server

- Module Database
- Alarm Subsystem
- PE
- ACE

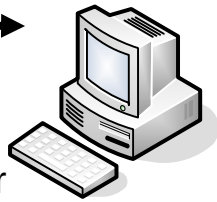
Analysis Server



SQL Server

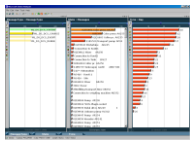
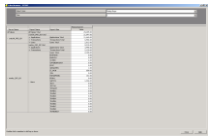
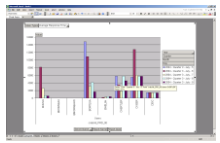
- OLEDB Provider
- Linked Tables

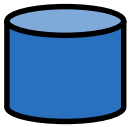
OLAP Client



OLAP Analysis

- Cube Browser
- Excel Pivot Tables
- Office Web Parts
- SQL Reports
- What-If Scenarios

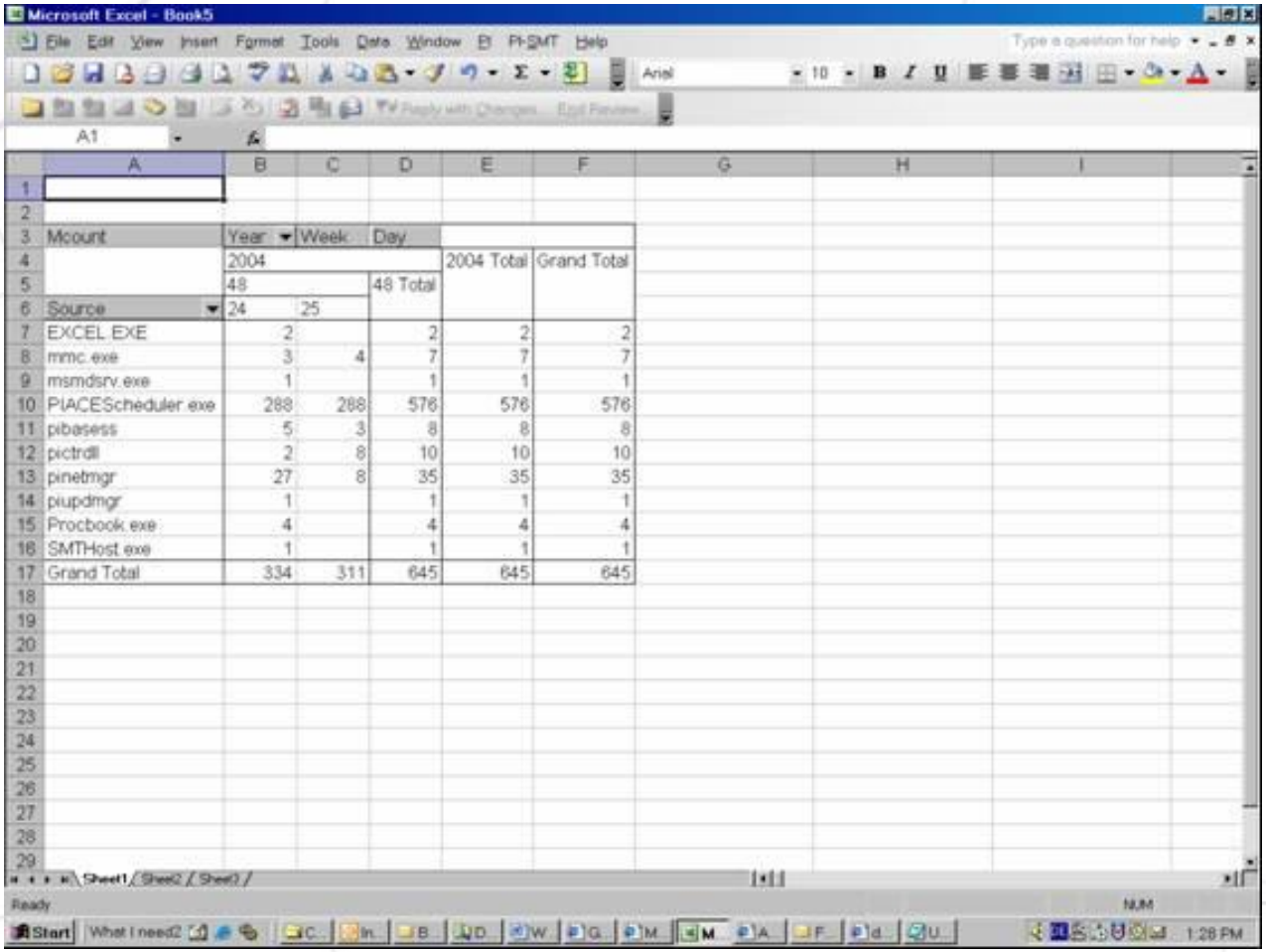


External Databases

- Production, etc.

OLAP White Paper

- http://techsupport.osisoft.com
  →Downloadcenter→White Papers



Mcount	Year	Week	Day		
	2004			2004 Total	Grand Total
	48		48 Total		
Source	24	25			
EXCEL.EXE	2		2	2	2
mmc.exe	3	4	7	7	7
msmdsrv.exe	1		1	1	1
PIACEScheduler.exe	288	288	576	576	576
pibasess	5	3	8	8	8
pictrdll	2	8	10	10	10
pinetmgr	27	8	35	35	35
piupdmgr	1		1	1	1
Procbook.exe	4		4	4	4
SMTHost.exe	1		1	1	1
Grand Total	334	311	645	645	645

Summary

- PI has a rich SQL interface
  - IT departments love it
  - Beginners discover capabilities using MMC Snap_in
- Simple configuration to bring process data and transactional data together
  - Because OLE DB is a standard
- 3rd party reporting and data mining tools plug and play

Contact

Christian Luckock

christian@osisoft.com

(602) 896-3946