VOYAGE2007

OLE DB Goes Enterprise the PI System Data Provider

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Agenda

- Unified Data Access
- MiddleWare Standards
- PI OLEDB
- Application Integration Trends
- Demo 1+2
- Limitations
- New Goals
- PI DAS

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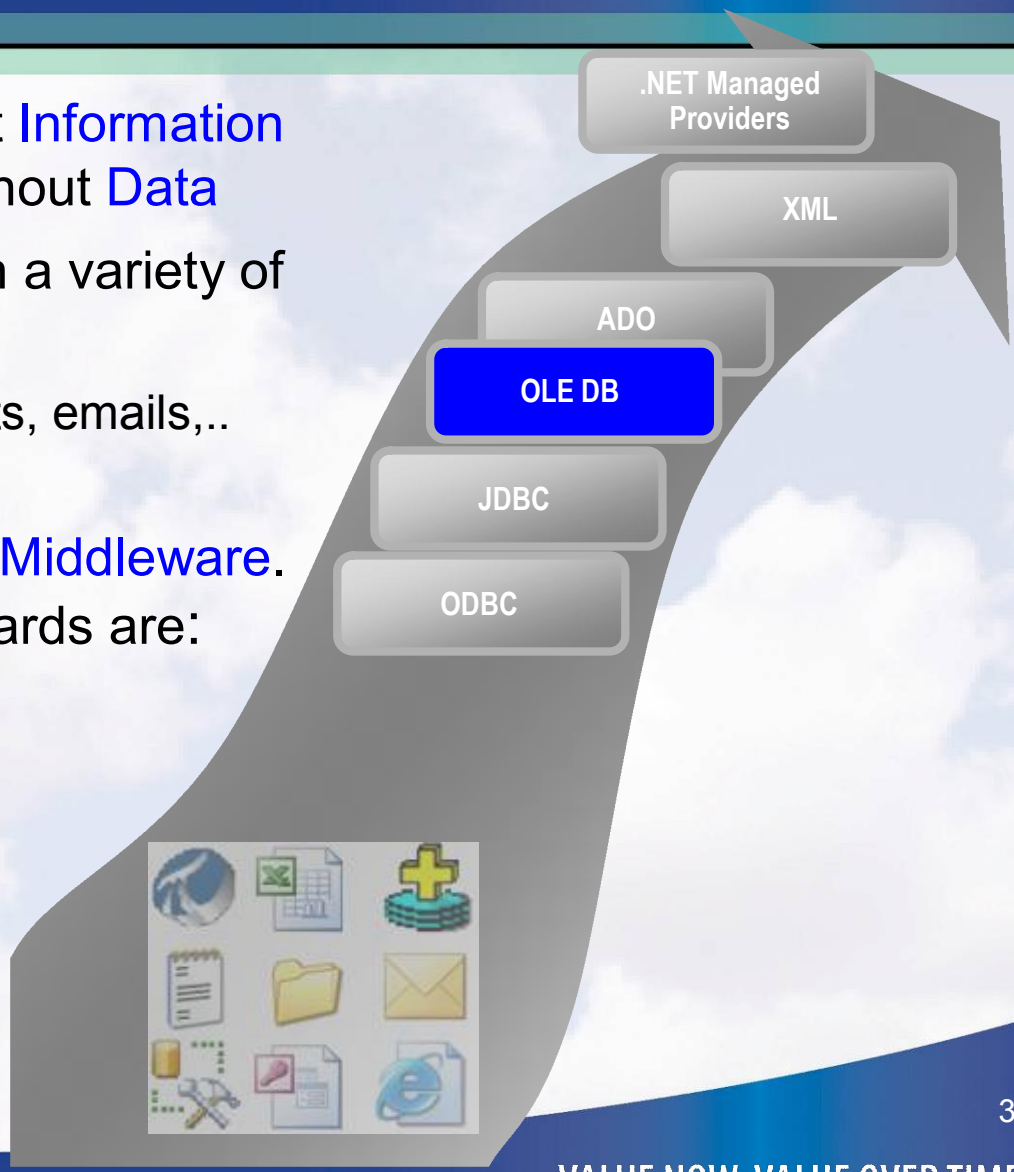
Unified Data Access

- There is no Knowledge without Information and there is no Information without Data
- Today, data is usually stored in a variety of sources:
  - Databases, files, spreadsheets, emails,..
- Unified Data Access aims at transparent access to data via Middleware. Well known data access standards are:
  - ODBC
  - JDBC
  - OLE DB
  - ADO.NET



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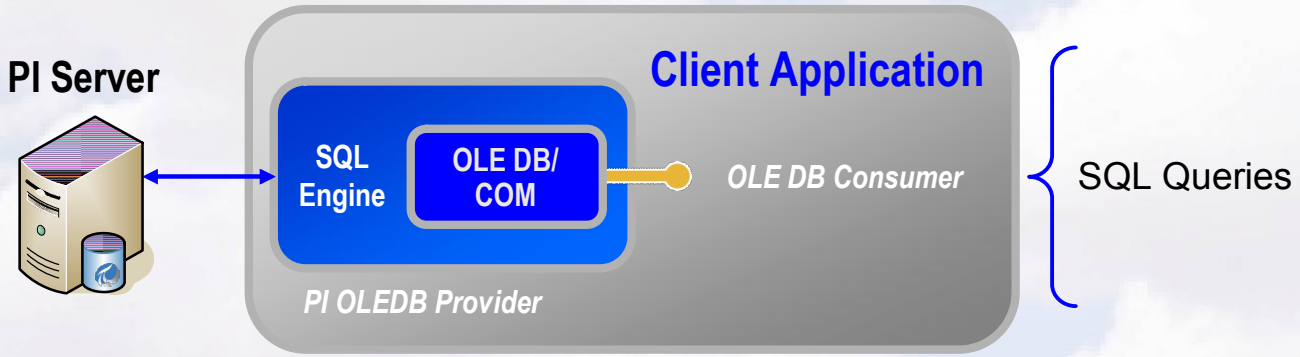
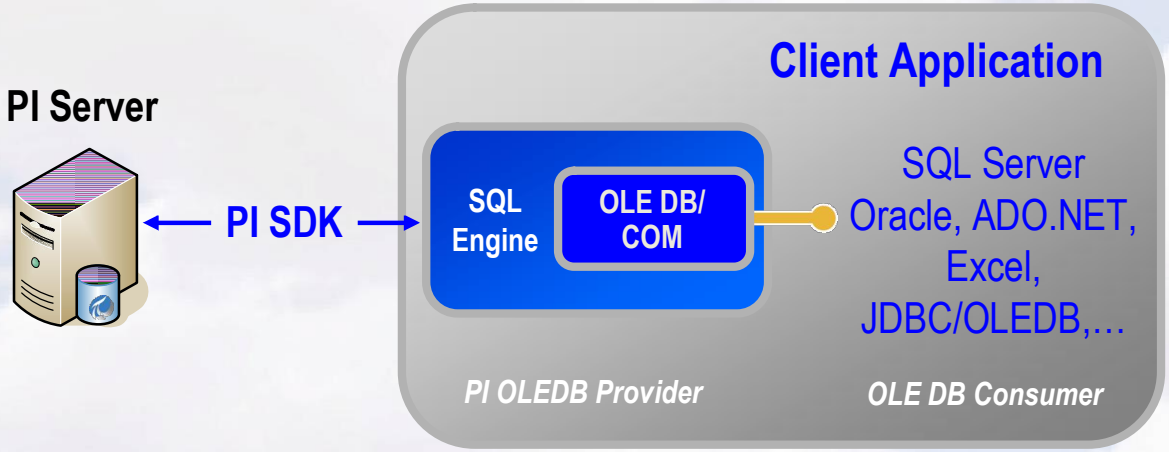
OLE DB / PI OLEDB

- OLE DB Object Linking and Embedding Database provides and organizes COM objects for efficient, unified data access
- OLE DB, much like OPC, standardizes the data access; however, the big advantage OLE DB spec. offers is the implementation of a powerful script language - SQL
- PI OLEDB provider allows applications (OLE DB consumers) working with PI data through SQL queries:



PI OLEDB

- PI OLEDB uses PI SDK for accessing the PI data. It's SQL Engine implementation, currently built in the provider, thus translates SQL queries to appropriate PI SDK calls.
- Many popular client apps. - OLE DB consumers, can thus "script" PI data, or have "built in" support for configuring OLE DB interfaces, e.g. MS Visual Studio.



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Application Integration Trends

- Middleware data access standards:
  - ODBC, JDBC drivers – procedural approach
    OLE DB providers – COM interfaces
    .NET providers – managed data providers for the .NET environment
- Products that benefit from MiddleWare standards:
  - Microsoft SQL Server Integration Services (SSIS)
    Oracle Fusion
    OPC Universal Architecture
- In Service Oriented Architecture (SOA), data is accessed via a limited set of entry points (services). A MiddleWare component that reduces the number of such entry points thus perfectly fits SOA requirements.

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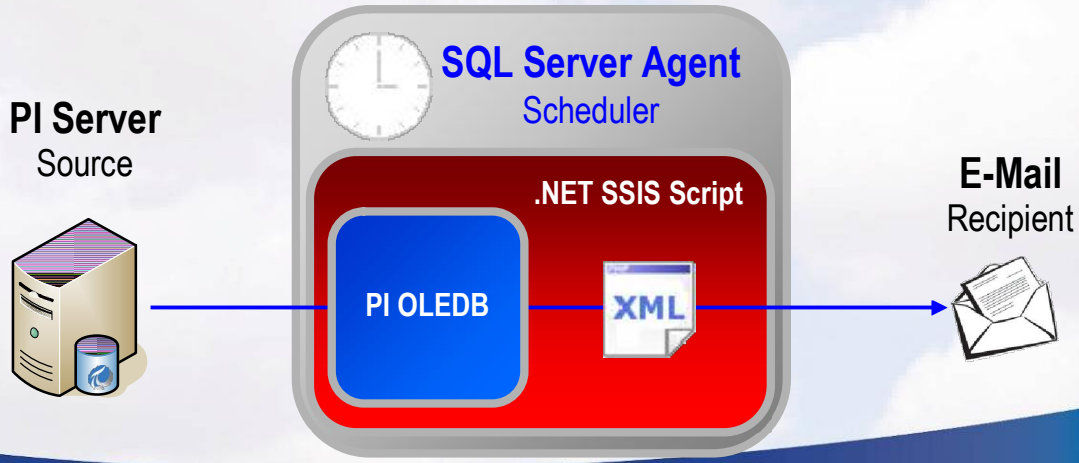
Demo 1 - PI OLEDB and SSIS

- Example 1 will show the configuration steps needed to Extract PI data, Transform it to XML, attach to an e-mail and send (Load) to a given recipient. This ETL package, created in SSIS, will finally be automated; that is, executed on a periodical basis.

  → *Utilizing MS SQL Server Tools (DTS and SSIS) for Data Exchange between PI and RDBMS, White Paper*

- The example will utilize:
  - SSIS (SQL Server Integration Services) and Visual Studio 2005
  - PI OLEDB provider



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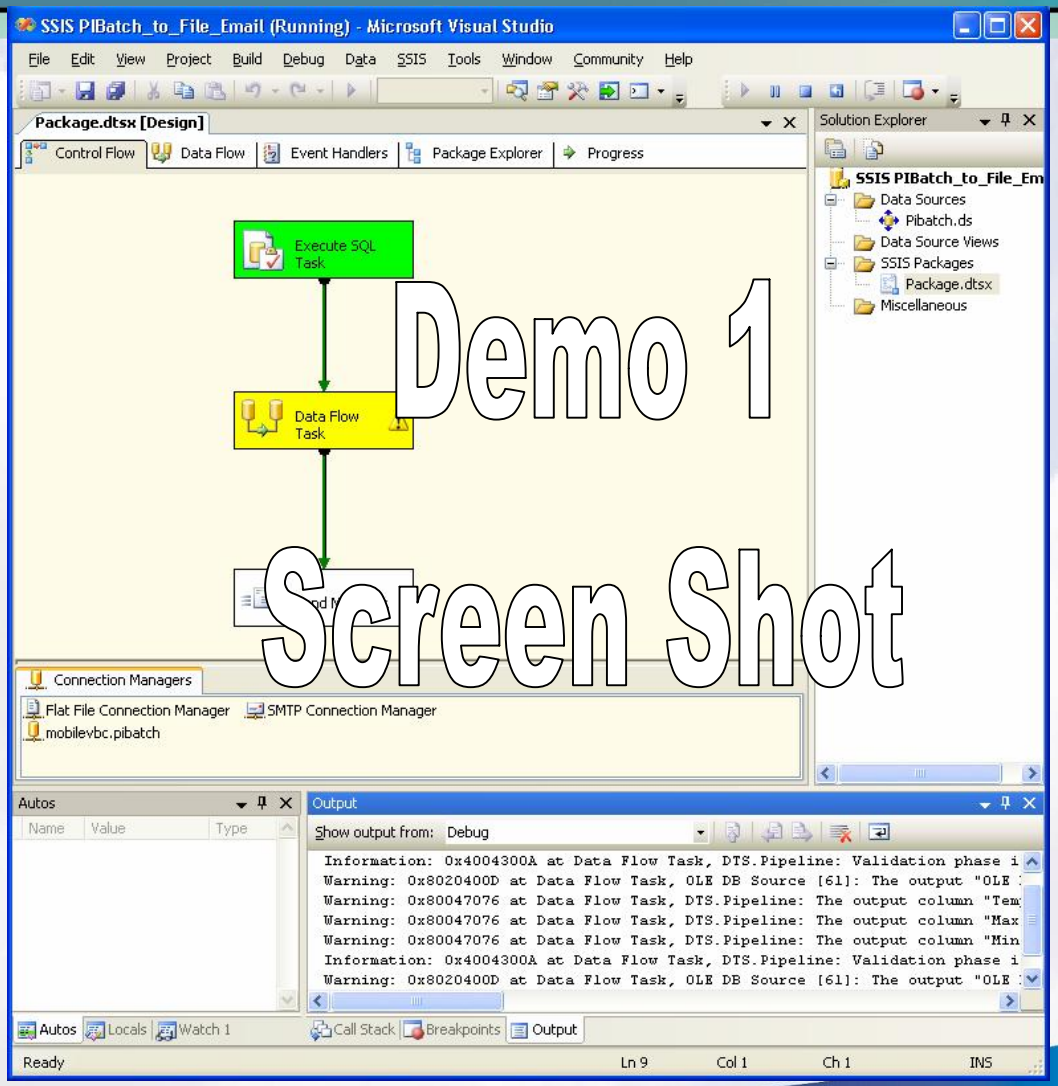
Demo 1 - PI OLEDB and SSIS



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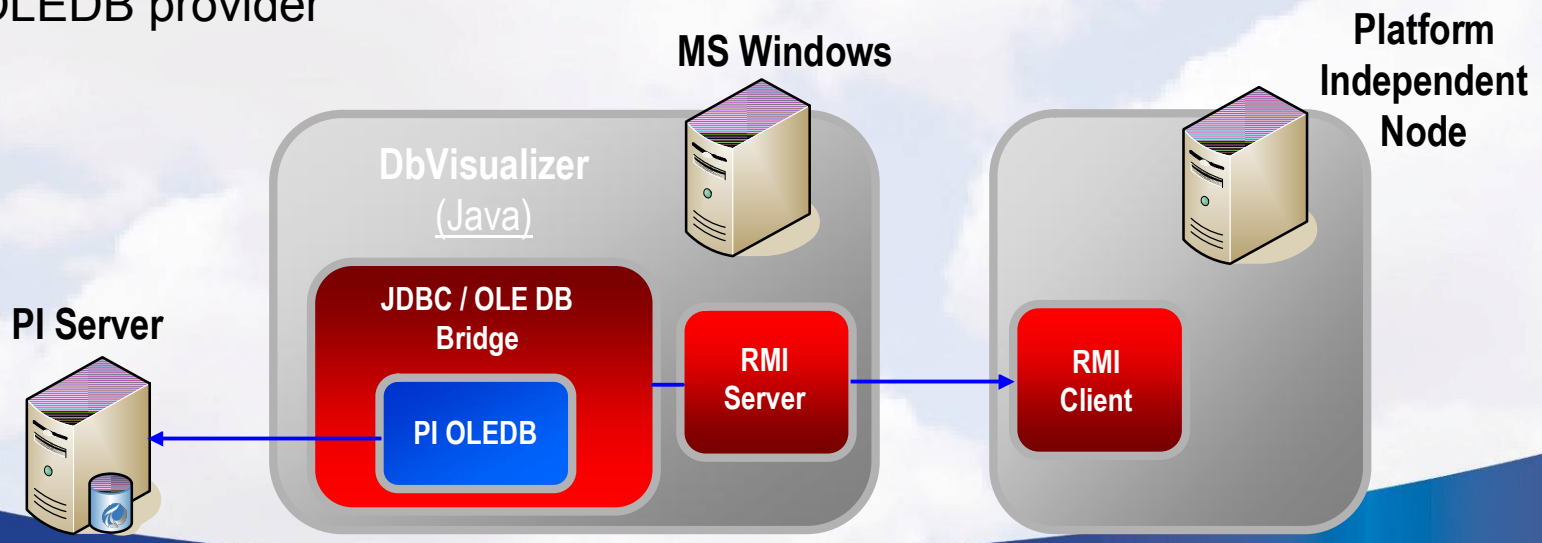
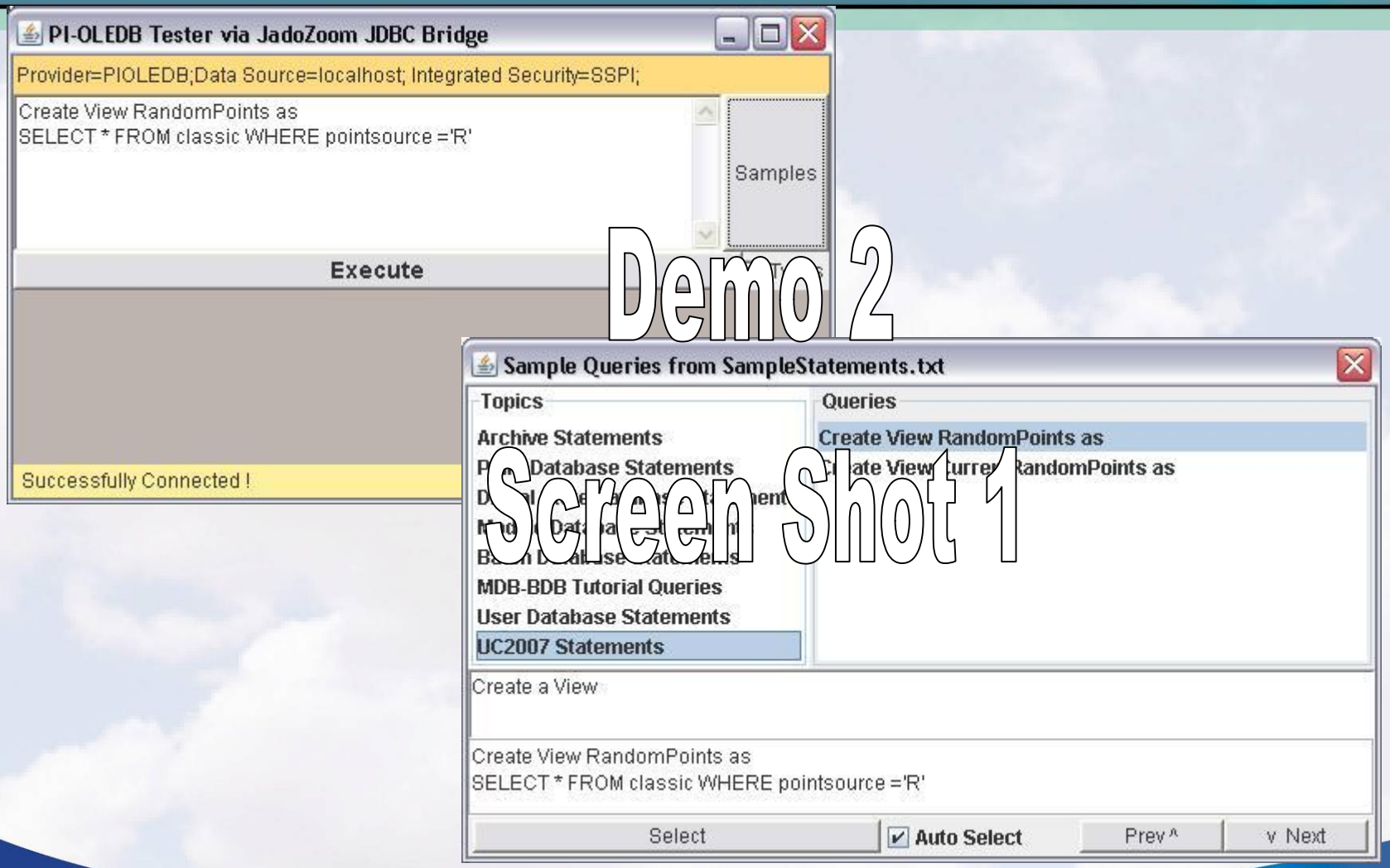
Demo 2 – Views / JDBC bridge

- Demo 2 shows creating a View from a Java application and accessing PI data from a JDBC based client tool - the DbVisualizer.
  As there is no native PI JDBC driver today, a third party JDBC / OLE DB bridge is used.
  → *JDBC to PI OLEDB using 3rd party bridges, White Paper*
- The example utilizes:
  - DbVisualizer from Onseven Software AB
  - JadoZoom JDBC / OLE DB bridge from infoZoom
  - PI OLEDB provider



Demo 2 – Views / JDBC bridge



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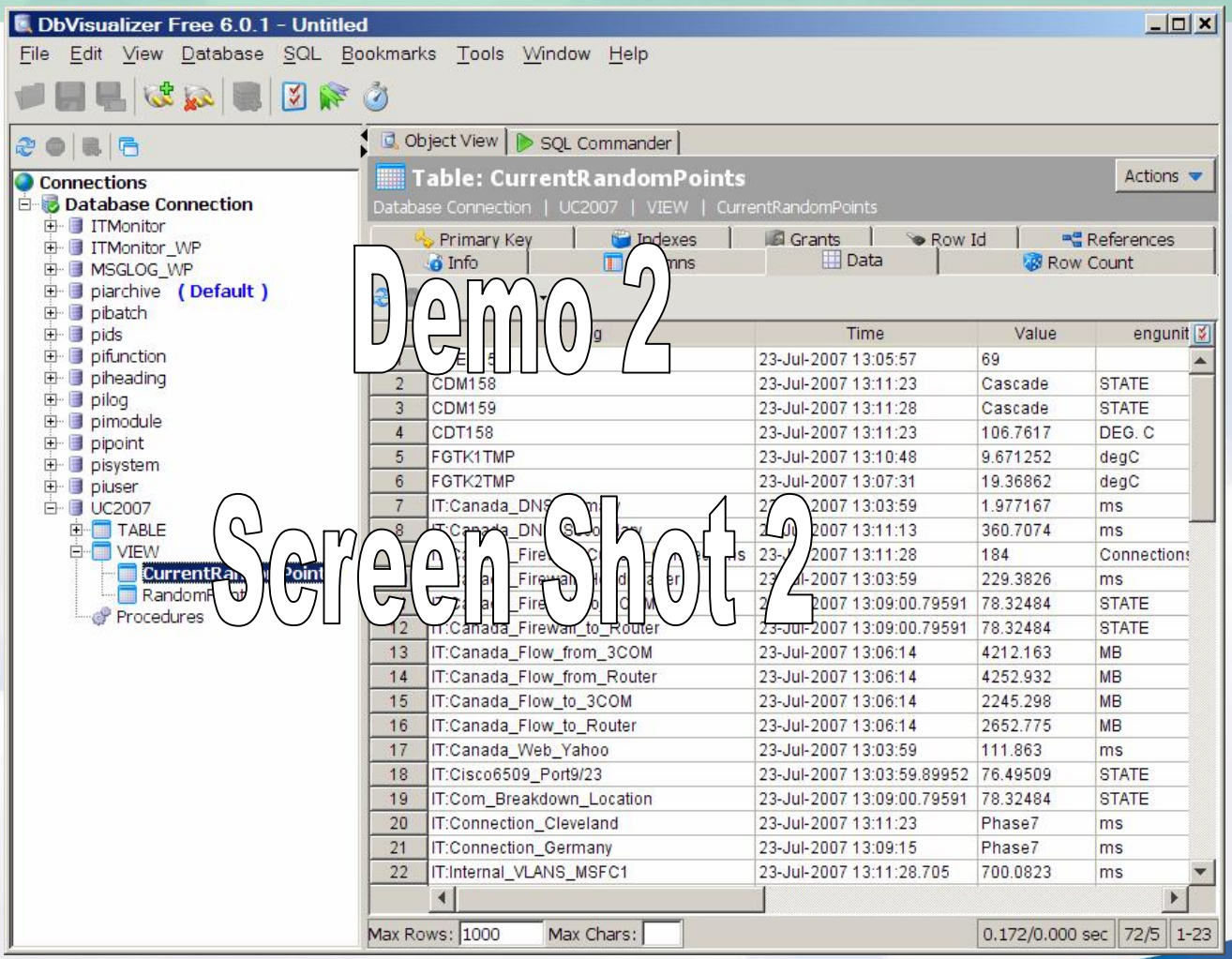
Demo 2 – Views / JDBC bridge



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Current Limitations

- PI Server centric
- Performance
  - RPC‘s not granular enough, SDK overhead
- SQL Engine on client side
  - Performance problems on WAN
- Mix of threading models
  - Although multithreaded, needs to serialize into apartment threaded SDK
- No events
- No UNICODE
- No custom functions
  - Except Views
  - E.g. Functions that can interpret binary structures
- No execution plan exposed
  - Is a problem when trying to find best query strategy

Goals

- Access to the PI System, not just the PI Server
  - JOIN AF Server + multiple PI Servers
- Go beyond OLE DB standard
- Suitable as low level data access mechanism
  - Application development
  - Middle ware
- Support multiple SQL based data access standards
  - e.g. JDBC, ADO.NET
- High Performance infrastructure
  - New RPCs with improved granularity and compression
  - Special pass through mechanism in AF SDK for massive data requests
- 32 bit and 64 bit versions
- Scalable infrastructure
  - Server side or client side deployment

PI Data Access Server
Three Tier Architecture

- Multiple data access standards
- Multiplatform
- Application development

PI DAS Clients

- Access to PI System not just PI Server
- Distributed Query Engine
- High performing, scalable infrastructure
- Events

PI DAS

Back Ends

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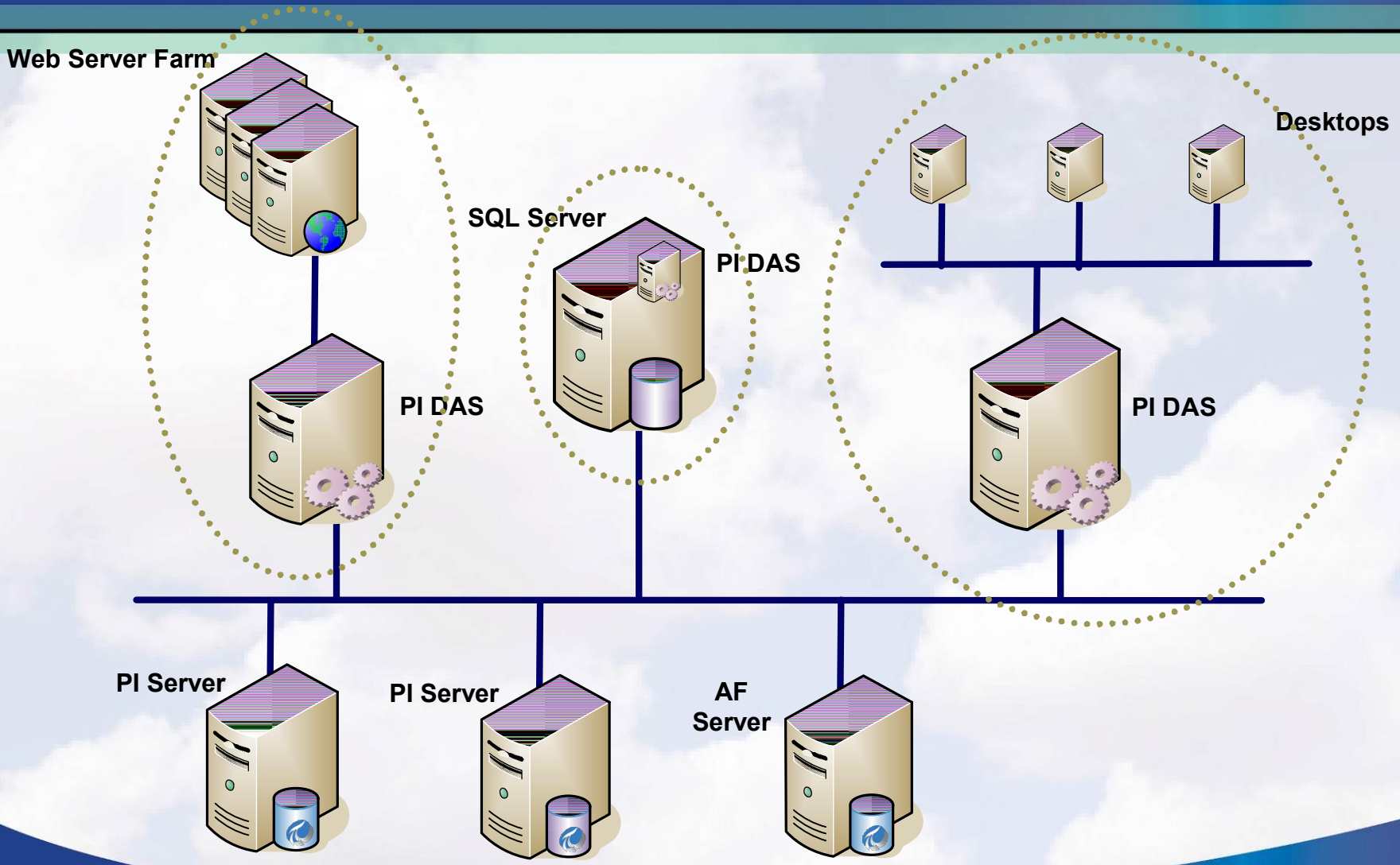
Deployment Options



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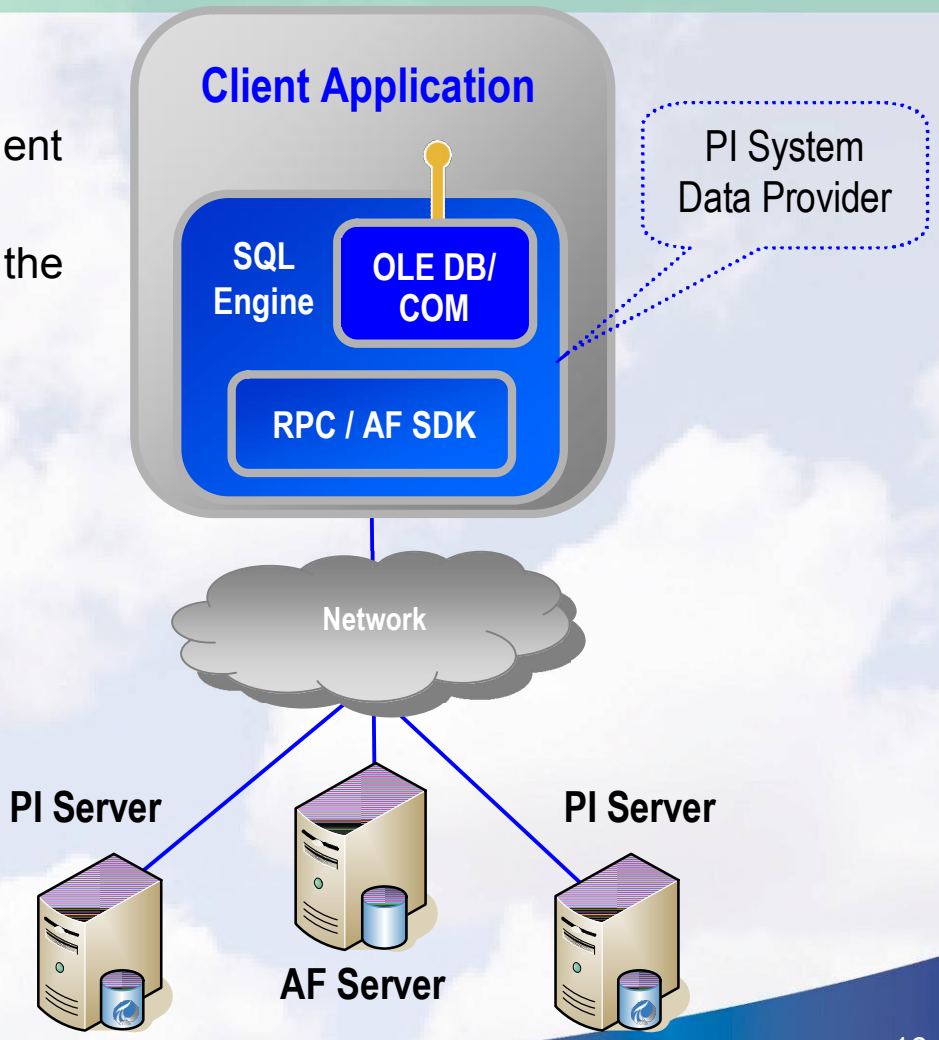
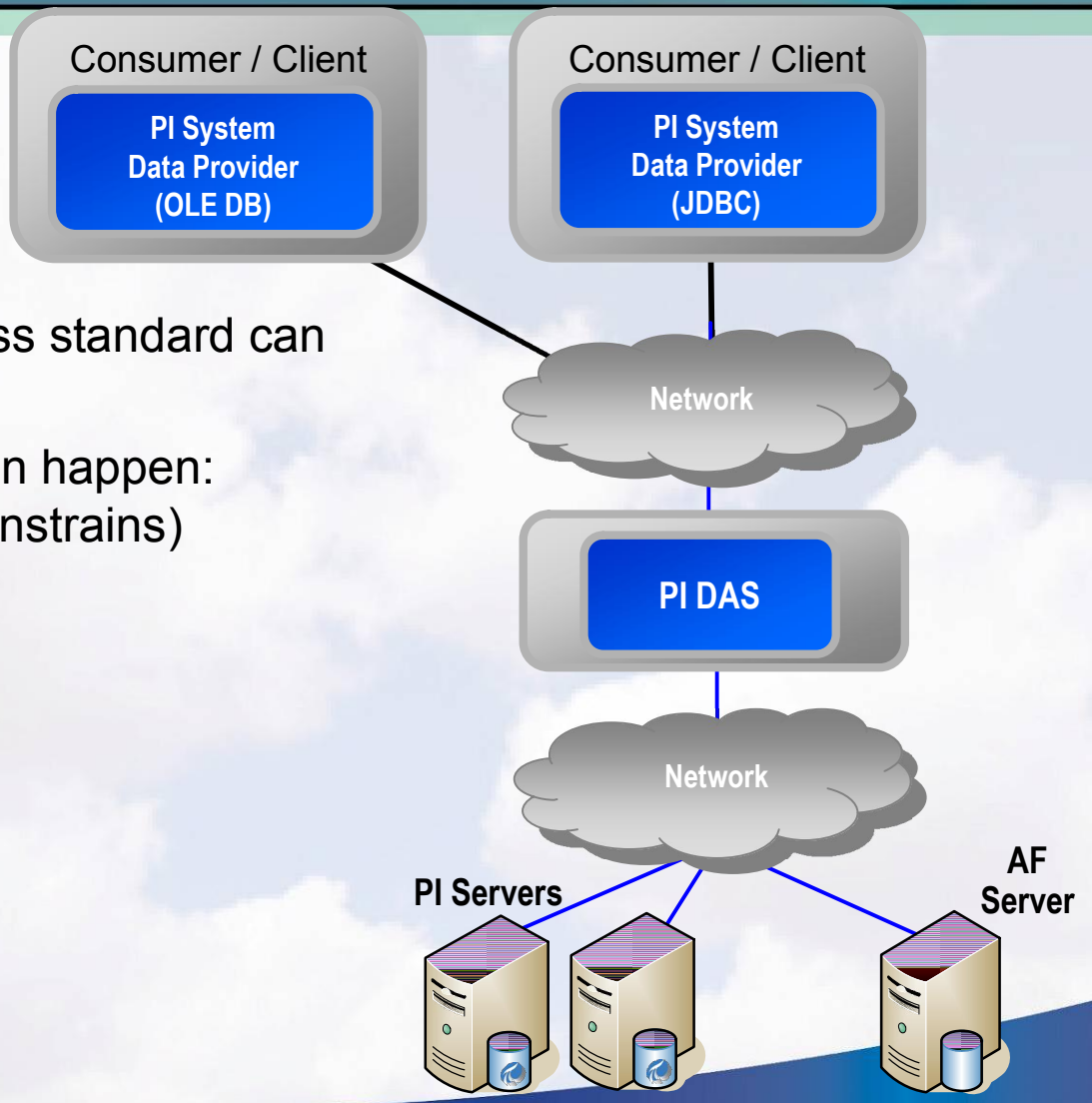
PI Data Access Server
Phase 1

- **Phase 1: client side component**
- The PI System Data Provider will implement the OLE DB data access standard
- In Phase 1, the data provider will embed the SQL Engine logic
- Support for events



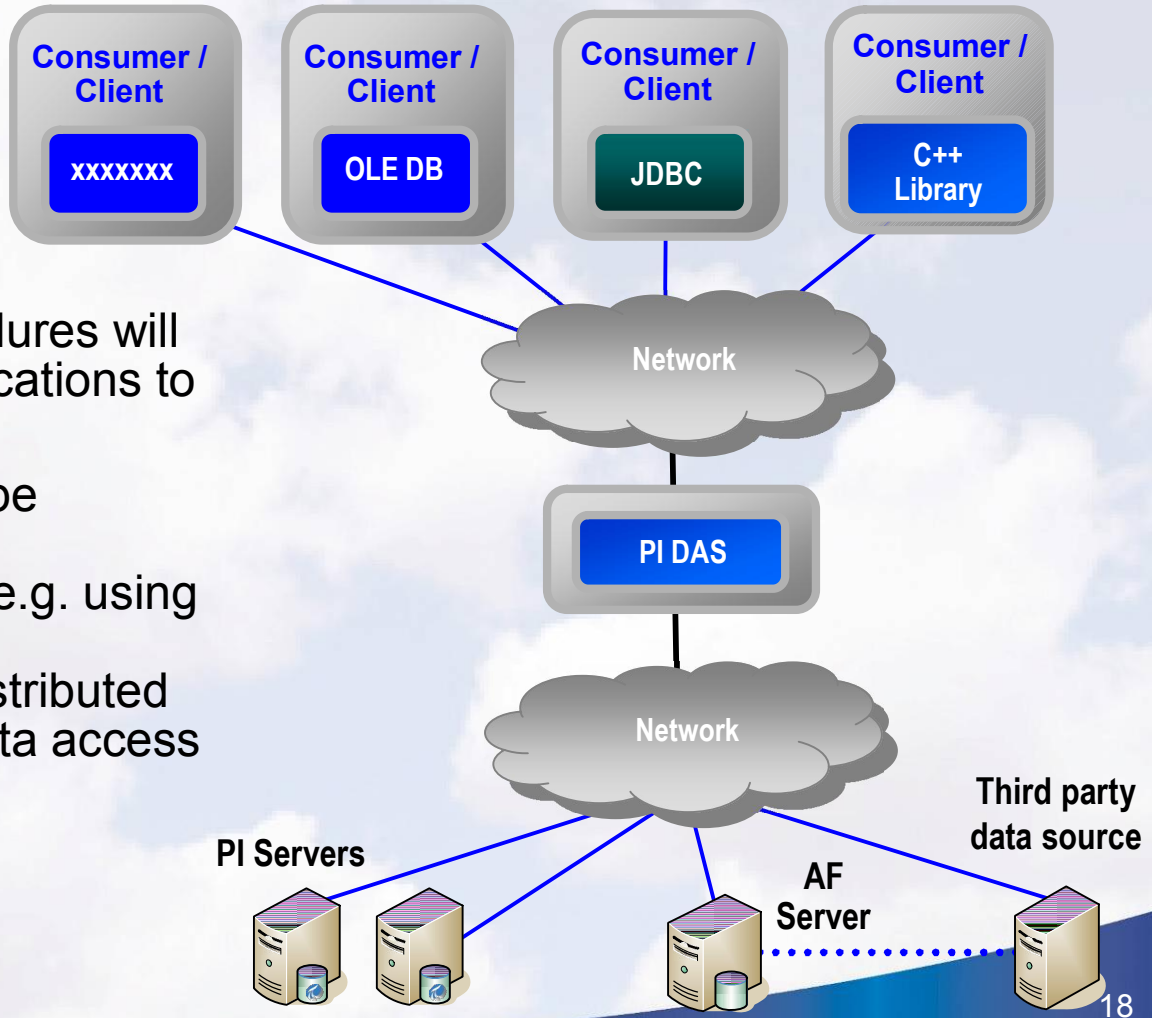
PI Data Access Server
Phase 2

- **Phase 2: the data provider will be a light weight, client-side component**
- More than one data access standard can be implemented
- Data filtering/reduction can happen:
  1. On back-end (query constrains)
  2. On PI DAS (JOINS)



PI Data Access Server
Phase 3

- **Phase 3: implementation of other data access standards, scripting extensions, stored procedures**
- Pre-compiled stored procedures will allow non-SQL based applications to connect to PI DAS
- External data sources can be integrated (JOINed) via AF Data References or direct, e.g. using OLE DB;
  PI DAS will operate as a distributed query engine for several data access standards.



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Need to Know

- PI OLEDB and PI System Data Provider will coexist
- New Table structure
- No MDB but AF tables
- Development effort spans multiple years

Questions ?