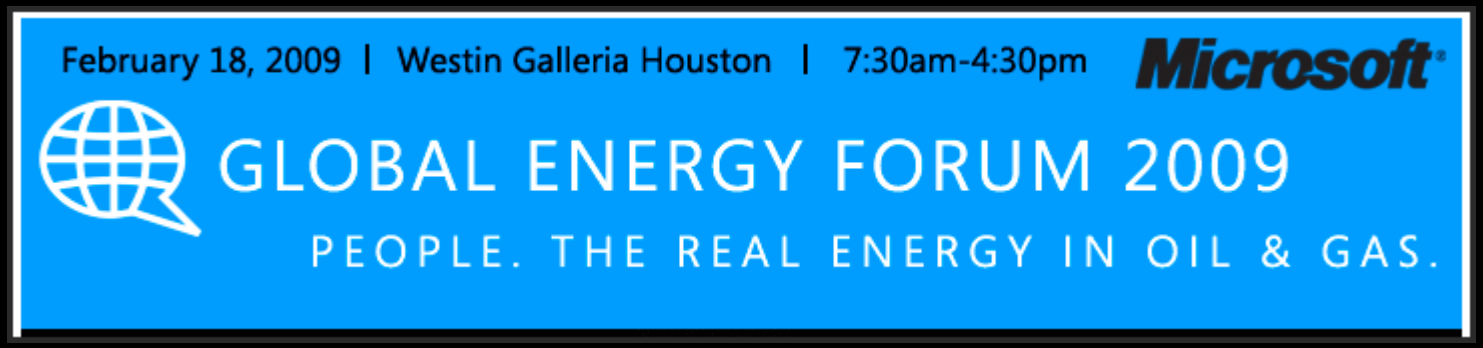


Proof of Concept Solution

PRODML™-BASED REAL-TIME PRODUCTION SURVEILLANCE

Participants

	Sponsor of the pilot Founding member of PRODML
	Weatherford is a global oilfield services company providing drilling, evaluation, completion, production and intervention in over 100 countries. A leader in fibre optic sensors such as Distributed Temperature and Pressure sensors featured in this pilot, Weatherford has been an active member of PRODML since its inception.
	OSIsoft delivers the PI System, the industry standard in enterprise infrastructure, for management of time series data and events. The PI System safeguards data and delivers enterprise-wide visibility into operational and business data in order to manage assets, mitigate risks, improve processes, drive innovation and make business decisions in real time.
	As an active member of the PRODML Workgroup since 2007, Infosys has worked on the Biztalk orchestration and SharePoint presentation parts of the POC. Infosys is a worldwide leader in Systems Integration services, with over 100,000 employees around the world. Infosys' Energy practice specializes in technology-led solutions for Oil & Gas through the entire value chain.
	Energistics(tm) is a global, energy industry consortium that facilitates user communities for the development, deployment and maintenance of collaborative technologies using open data exchange and web services standards. Major current initiatives include WITSML(tm) Standards (drilling, completions & interventions), PRODML(tm) Standards (production optimization &reporting), and RESQML (tm) (earth & reservoir models).
	Together with our partners, Microsoft delivers enterprise-class solutions that amplify the impact of people and help companies meet Oil and Gas industry challenges. With the right tools in their hands, oil and gas workers can efficiently analyze volumes of data, and they can communicate and collaborate with colleagues, vendors, and partners around the world to make better decisions faster.
	PDS is Shell's Center of Expertise for Petrotechnical Software Technology. The CoE is working with Shell's Smart Fields team to develop pilot ProdML applications on a .NET platform. PDS is a long term sustaining member of Energistics, and in particular the ProdML Workgroup, and furthermore is developing ProdML/.NET technology for the market.

<PRODML/>™

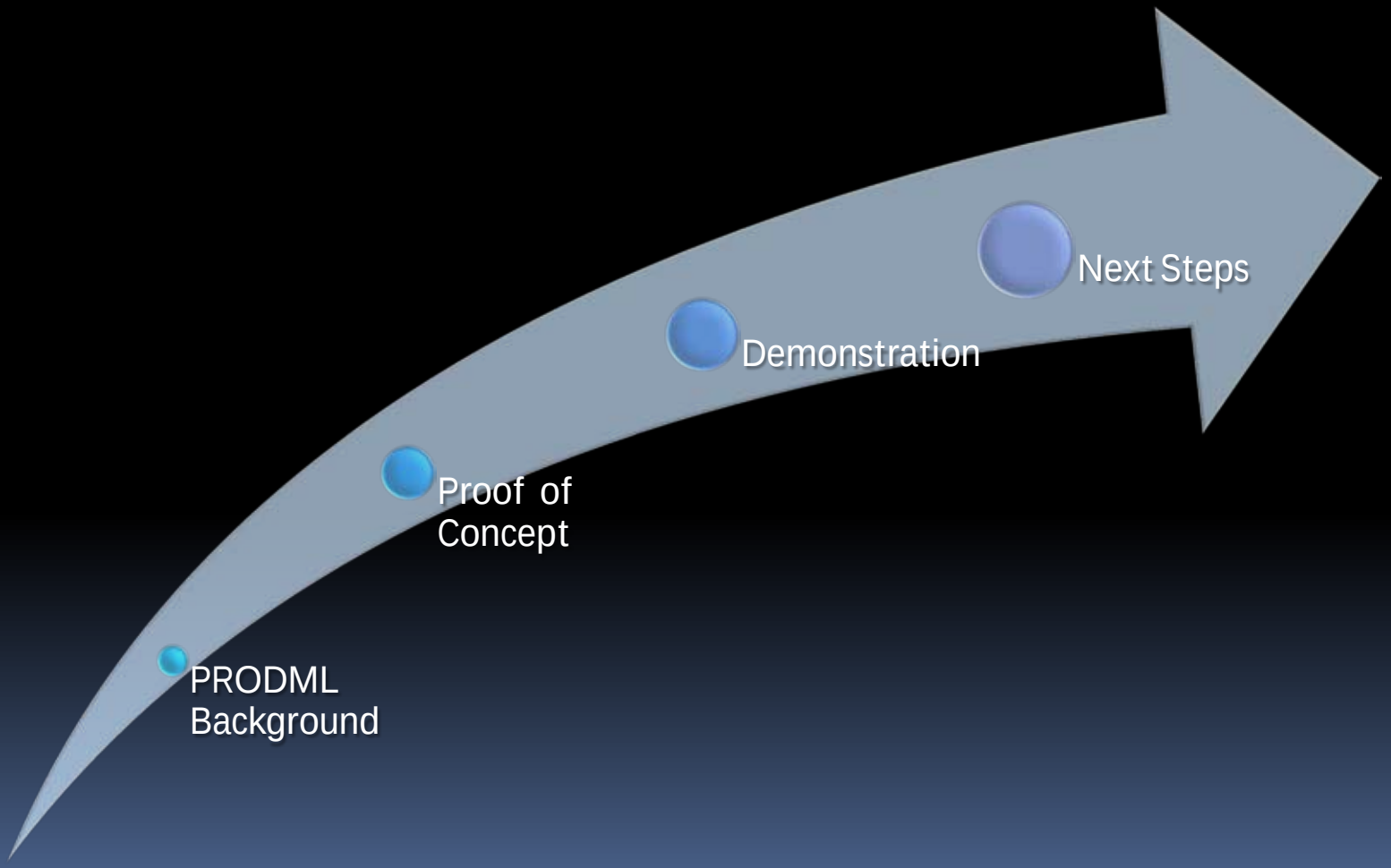
PRODML enables the vision of Digital Oil Fields of the Future

PRODML reduces the lifetime cost of information exchange in the Energy industry.

PRODML standards are key components in today's IT Enterprise Architectures

PRODML schemas standardize information exchange

Agenda…


Next Steps
Demonstration
Proof of Concept
PRODML Background

A High-level Perspective

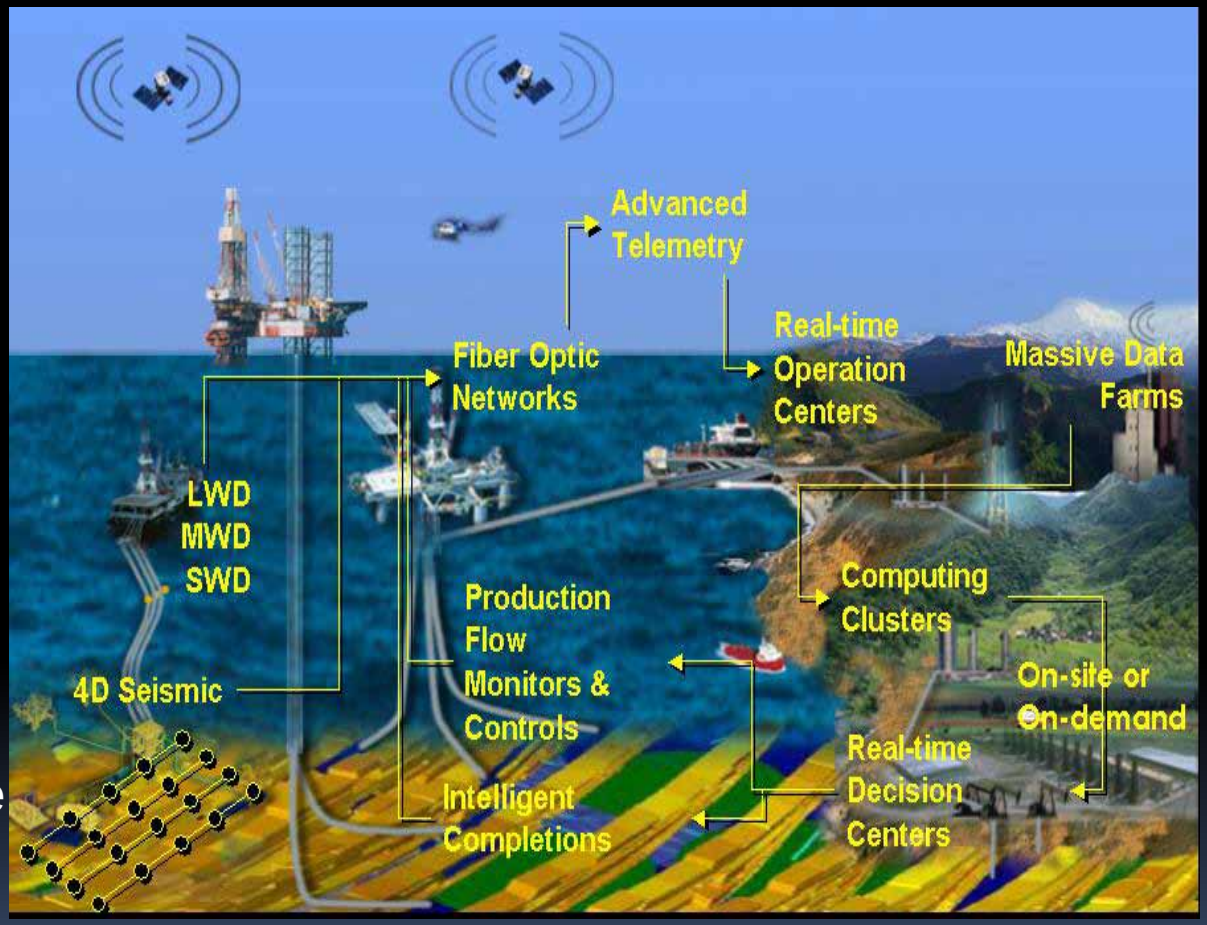
PRODML BACKGROUND

How can the industry best achieve production optimization for current and future producing fields?

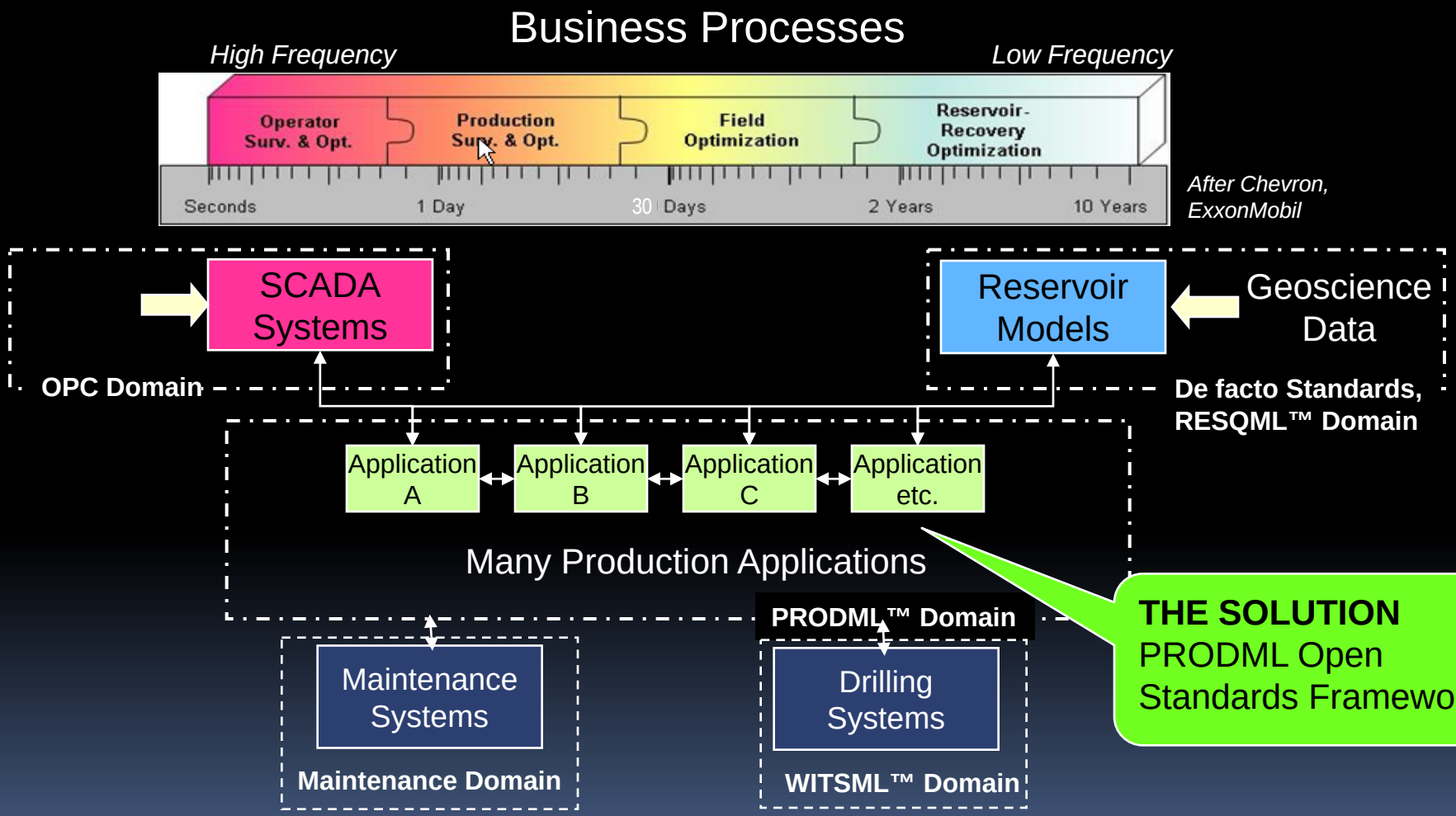
<PRODML/>™

The Energistics PRODML standards :

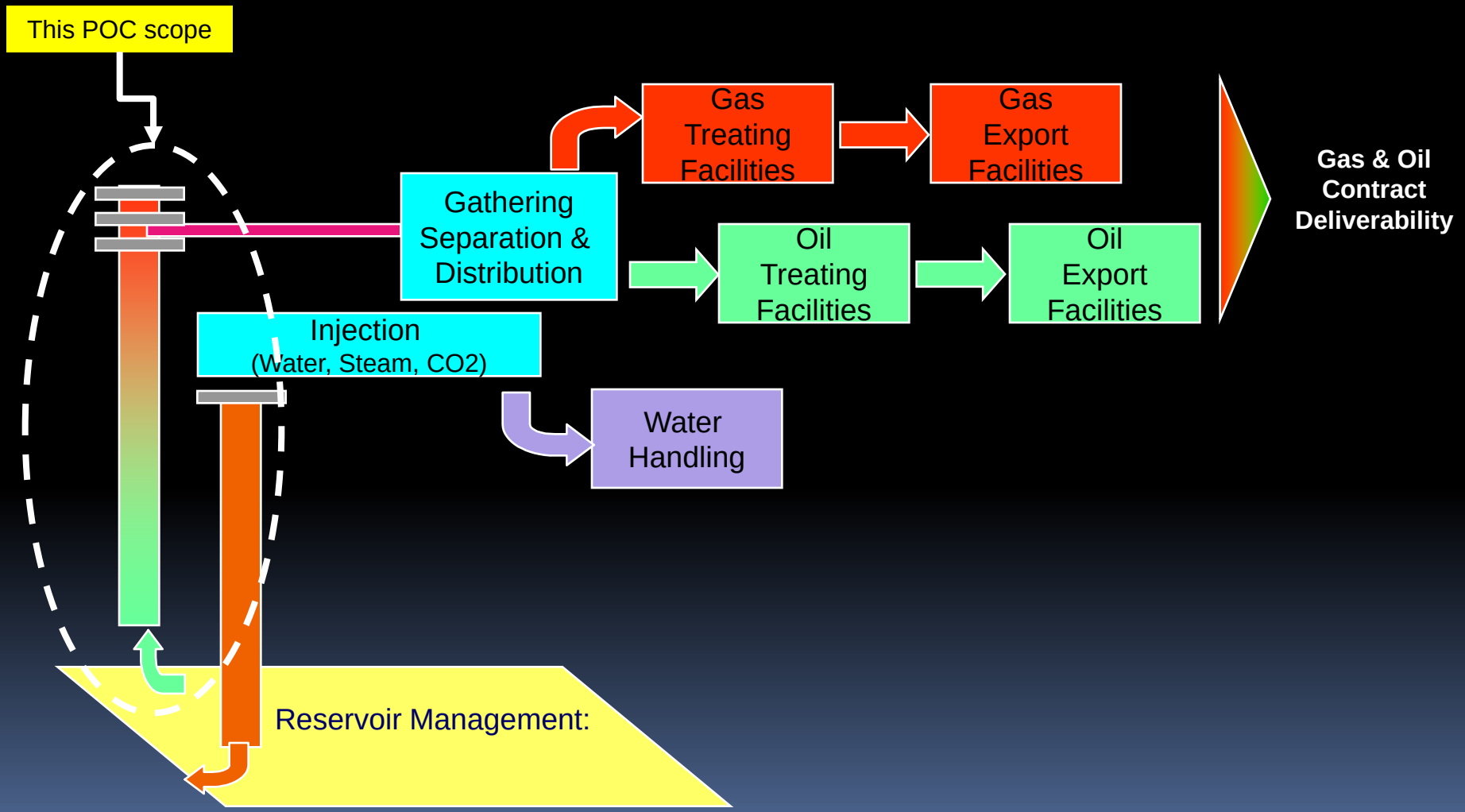
- Are freely available and universally applicable
- Enable low-risk and low-cost use of proven optimization solutions
- Accelerate and encourage innovation



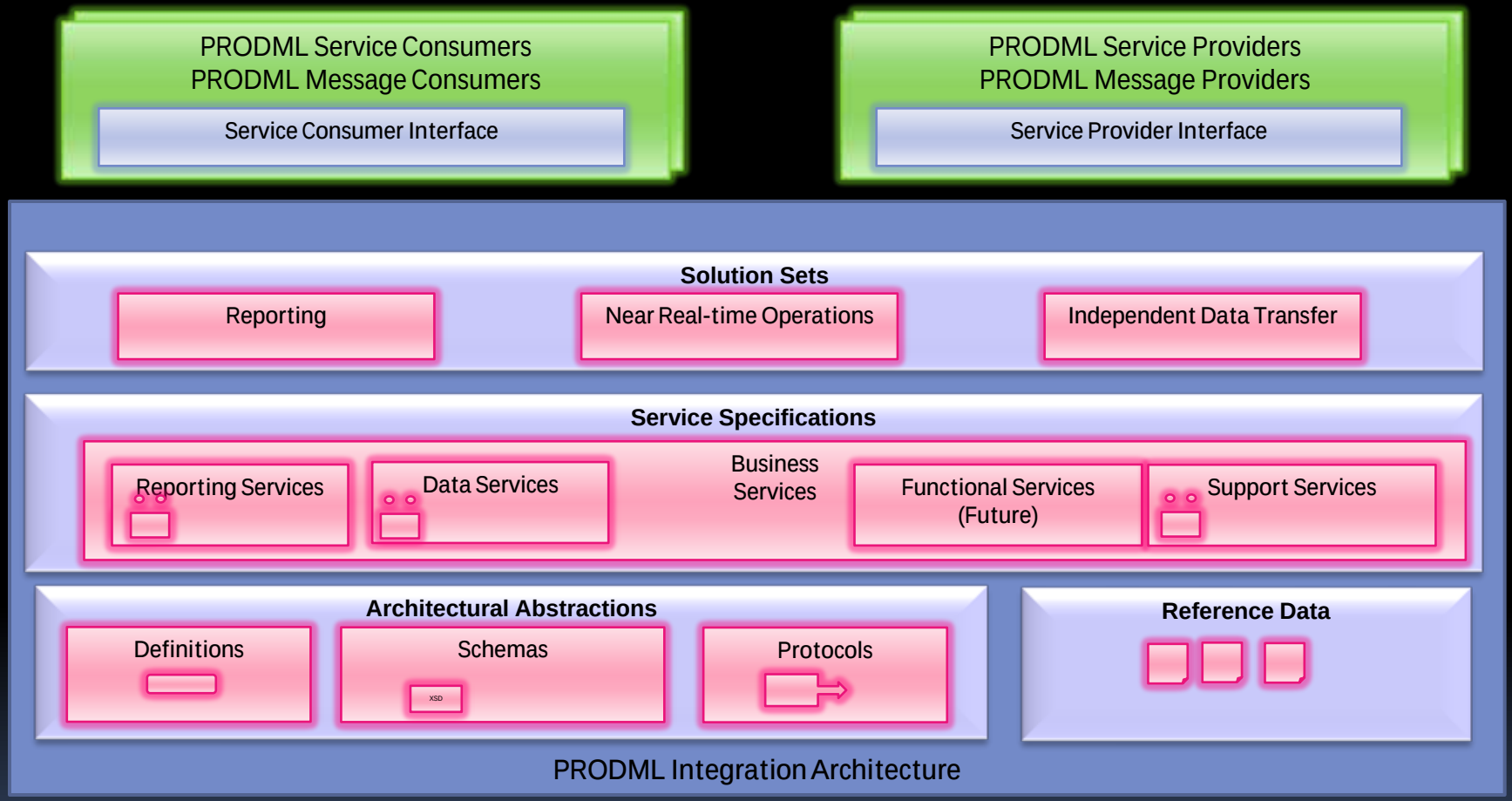
PRODML Positioning in E&P Business Processes



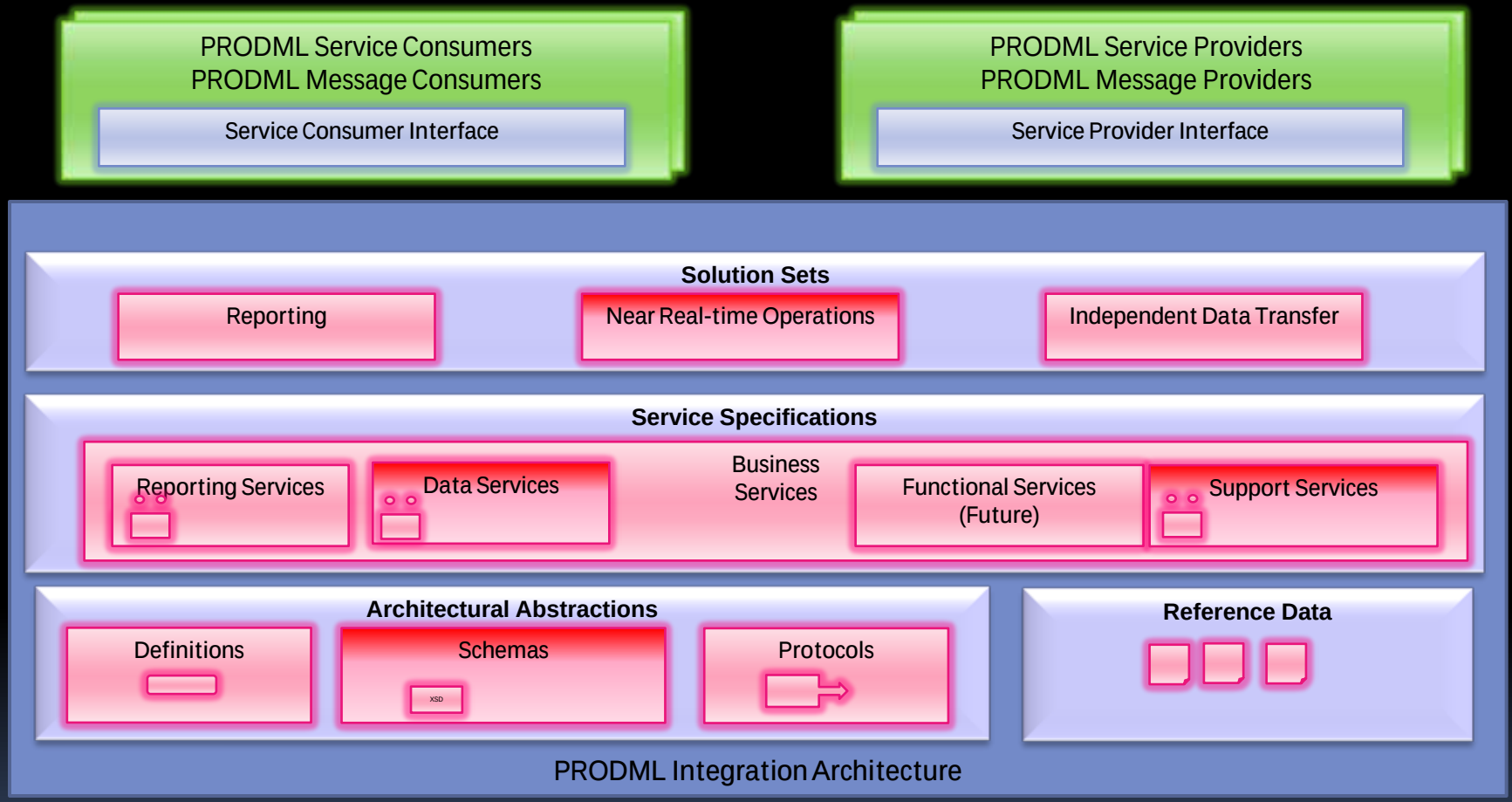
The Scope of the PRODML Standards Framework within a Producing Asset



PRODML Reference Architecture

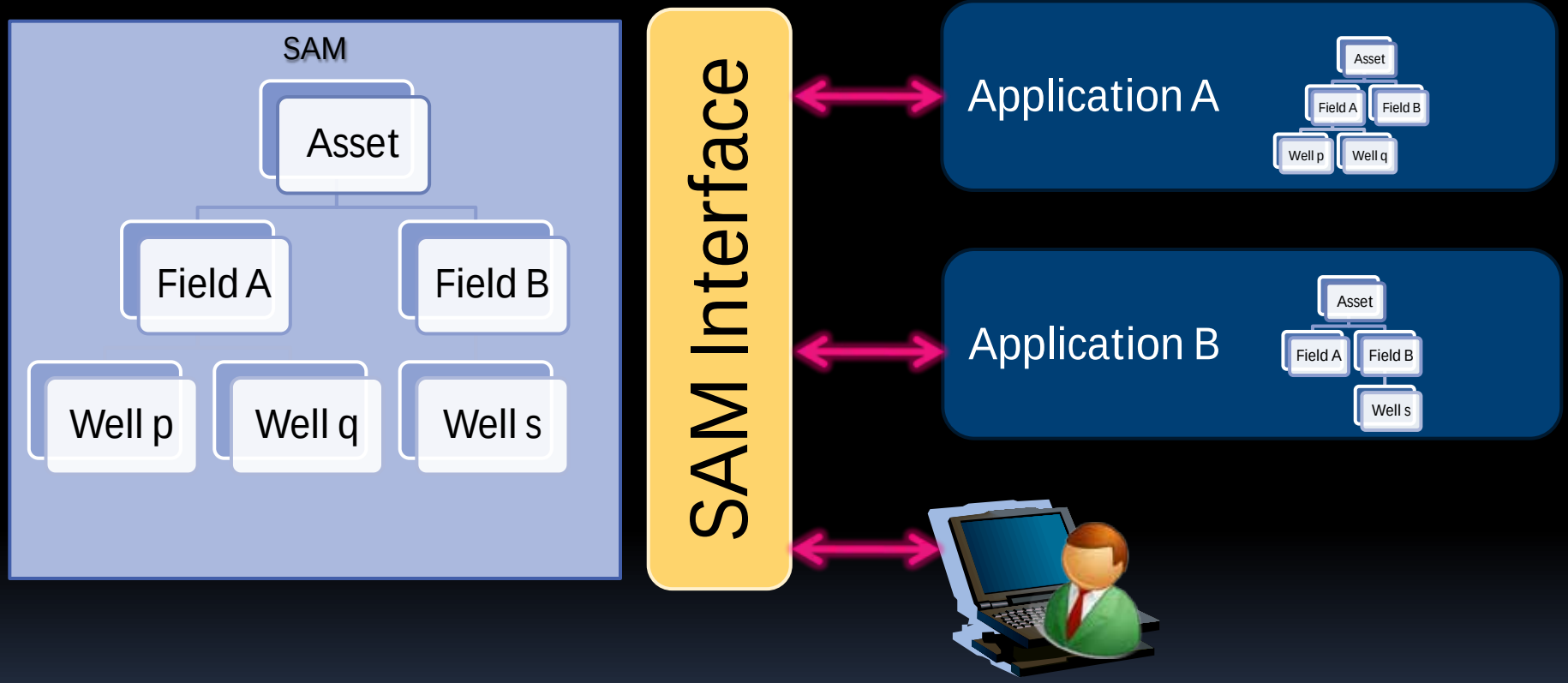


PRODML Reference Architecture

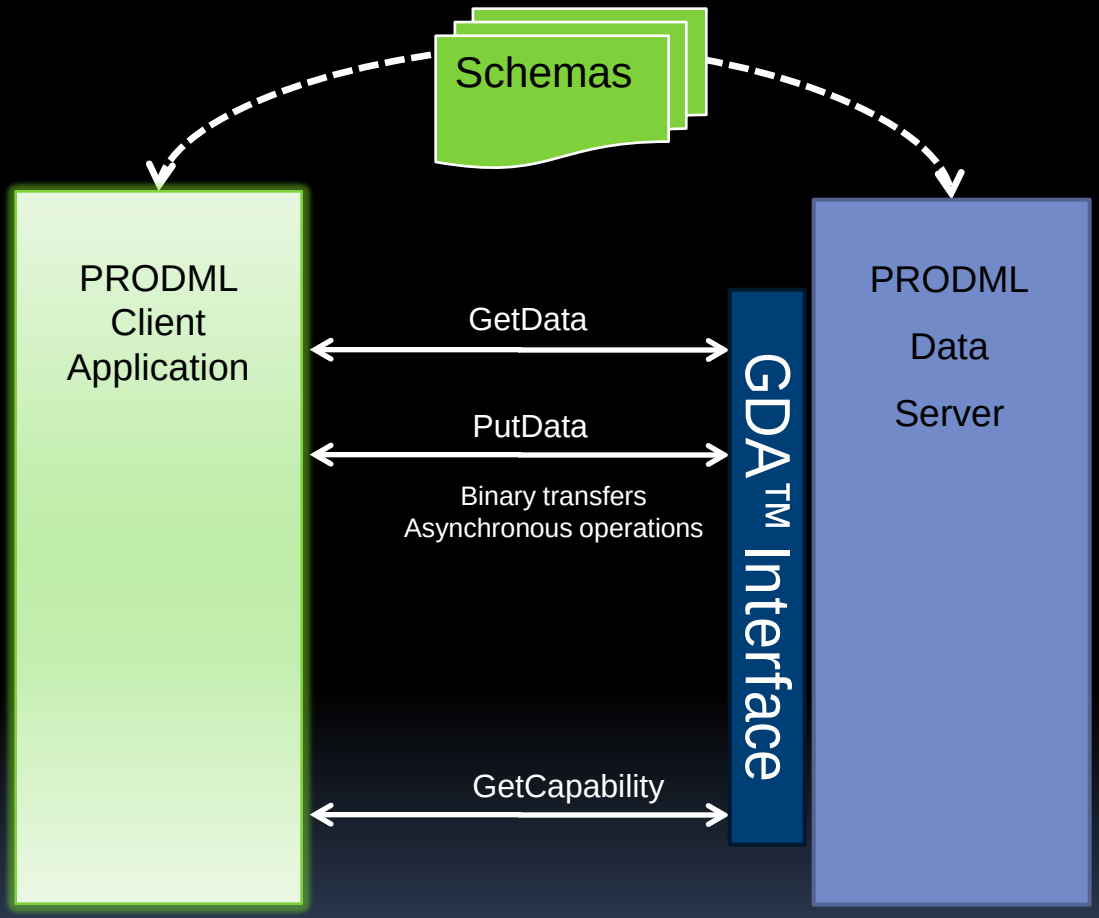


PRODML for Near Real-Time Operations

PRODML Shared Asset Model™ Concept

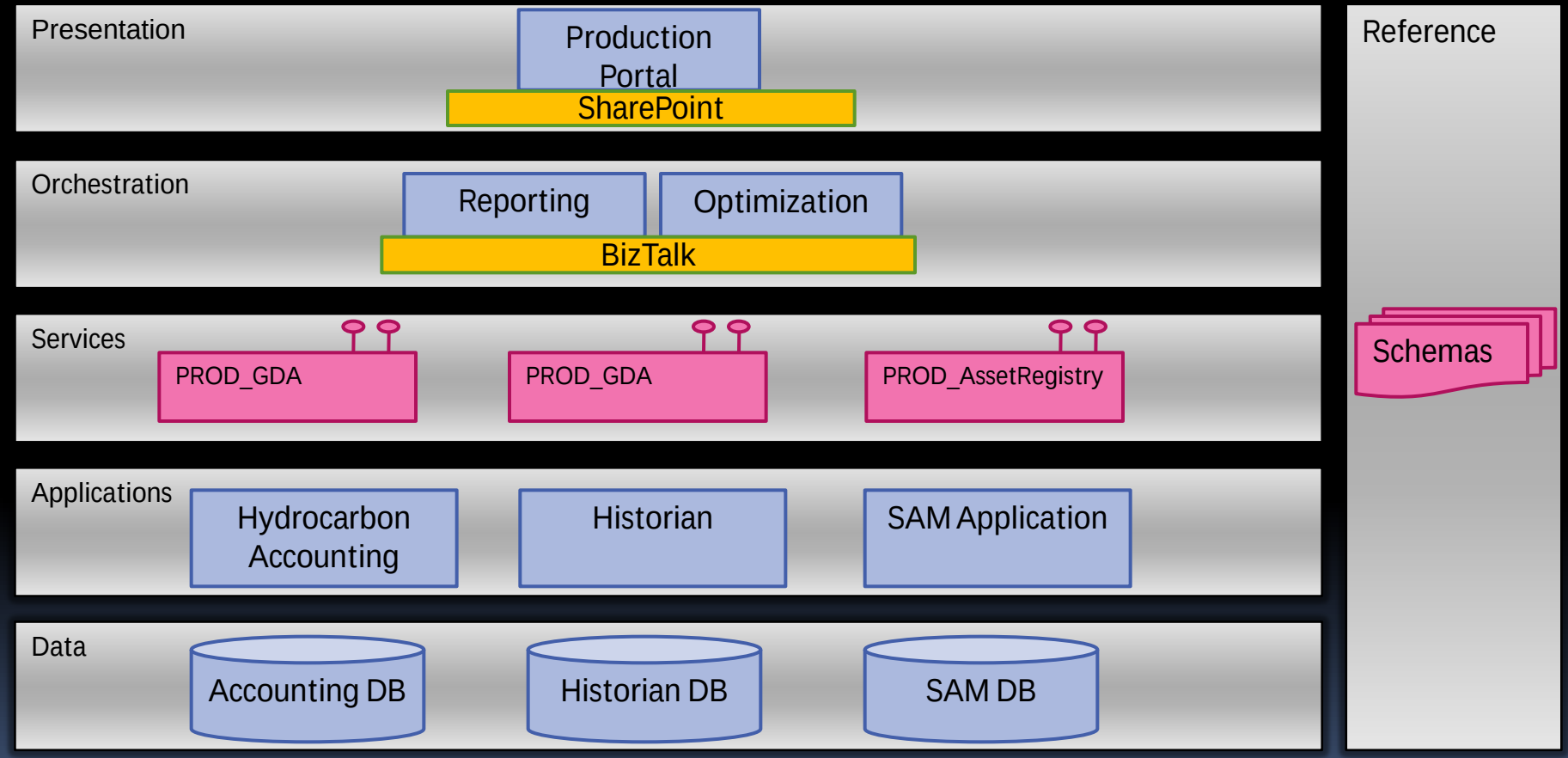


PRODML Generic Data Access™ Concept



Enterprise Architecture Positioning

Example Applications



Background

PROOF OF CONCEPT

The Proof-of-Concept Demonstration

- Combines continuously sampled temperature profile with accurate point temperature sensors
- Corrected temperature profile
  - Provide more accurate flow rates for oil, gas and water using existing vendor products
  - Can improve accuracy of models that predict flows
- Industry standards framework
  - Enables integration into larger workflows

Broader Oilfield Context

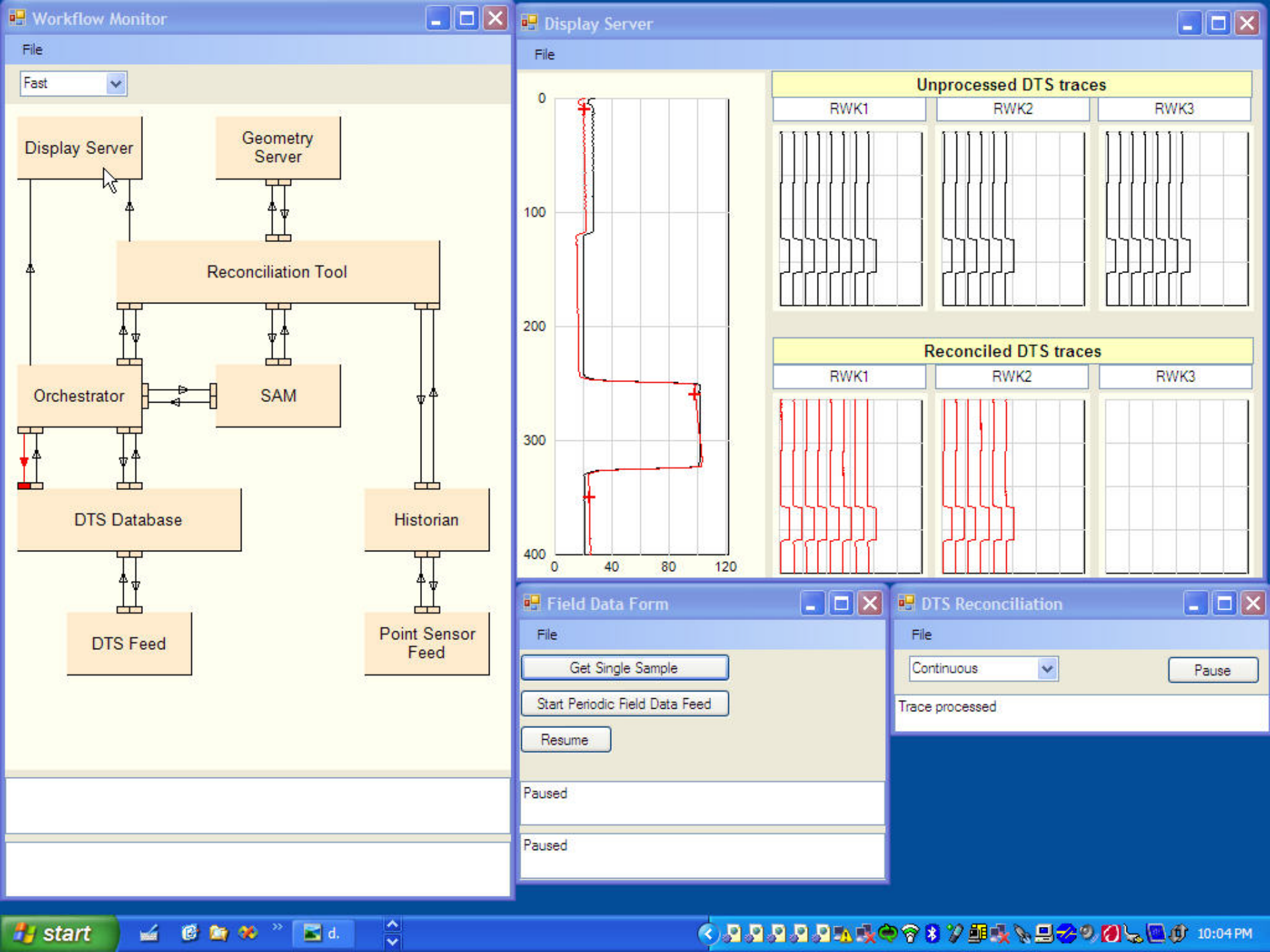
- The demo's production surveillance orchestration can be a subset of a larger workflow:
  - where corrected data is used for production optimization processes, such as
    - problem detection and diagnosis,
    - throughput maximization etc.
- Without this degree of automation:
  - acquired data tends to pile up, un-validated, and is not properly exploited for key business processes.

Demo Components

- Raw DTS data as WITSML –defined data objects
  - Received from remote well and is stored in a database
- PT sensor data
  - Available from a historian
- Reconciliation software component (e.g. Weatherford)
  - Corrects the raw DTS data to become calibrated DTS data
- Viewer (e.g. Weatherford or a ‘web part’)
  - Displays raw and corrected DTS data
- Orchestrator (e.g Biztalk)
- Shared Asset Model

Demonstration

PROOF OF CONCEPT

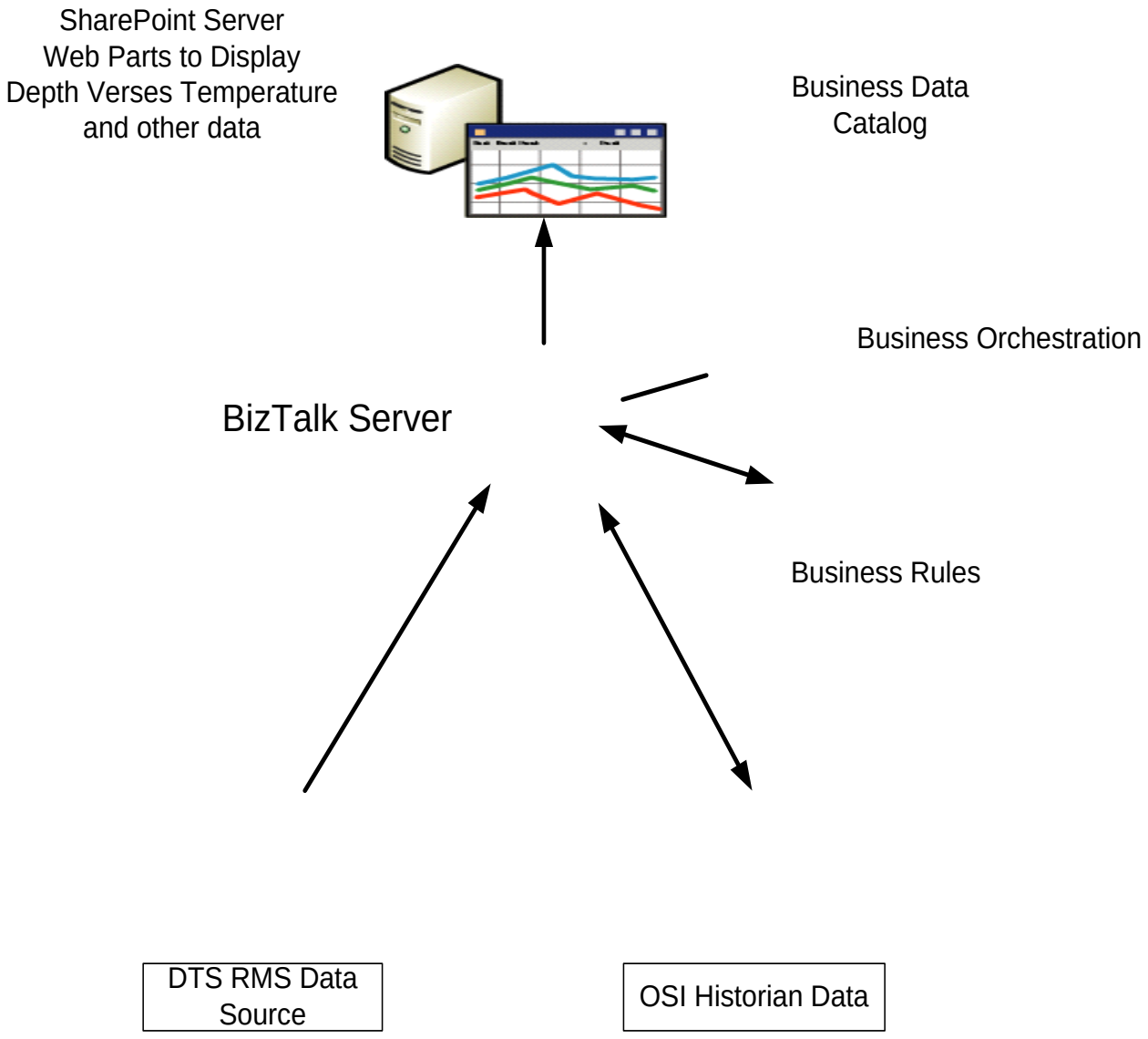

Workflow Monitor
File
Fast
Display Server
Geometry Server
Reconciliation Tool
Orchestrator
SAM
DTS Database
Historian
DTS Feed
Point Sensor Feed
Display Server
File
0
100
200
300
400
0
40
80
120
Unprocessed DTS traces
RWK1
RWK2
RWK3
Reconciled DTS traces
RWK1
RWK2
RWK3
Field Data Form
File
Get Single Sample
Start Periodic Field Data Feed
Resume
Paused
Paused
DTS Reconciliation
File
Continuous
Pause
Trace processed
start
10:04 PM

NEXT STEPS

Our next steps …

- Work is ongoing to replace the orchestrator with BizTalk Server and the Display Server with SharePoint web-parts.
- This proof of concept solution, with documentation, will be made available on the Energistics site for use by anyone, to try, test and extend.
- The solution can be used to experiment with and familiarize with the PRODML standards
- Details will be posted on the Microsoft GEF site as well as the Energistics / PRODML site (www.prodml.org).

Architecture



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THANK YOU

Robin.Getty@PDS.NL