



SOA, Web Services, and RtWebParts Integration

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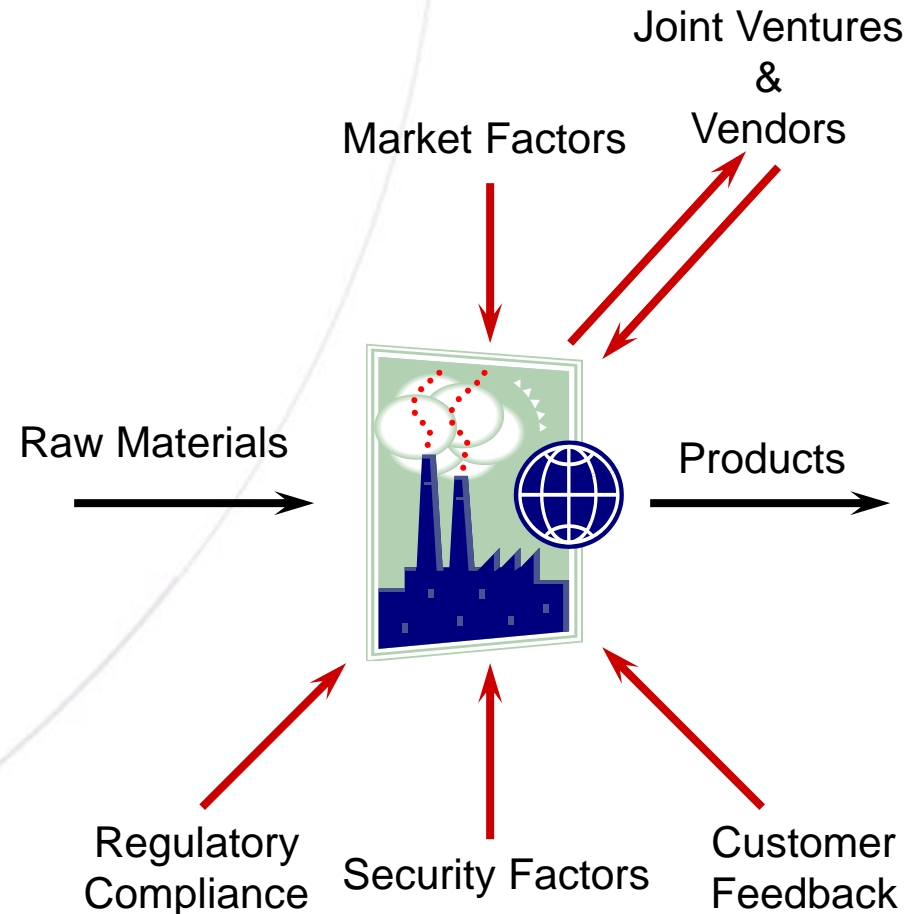
Outline

- Your environment
- Point-to-Point vs. SOA
 - Why SOA + Web Services will be different
- Starting down the SOA road
 - Guidelines
 - Examples
- OSIssoft's role in your SOA
- Your SOA roadmap



Protecting Yourself

- **Your environment is in constant transition**
 - Acquisitions
 - Mergers
 - Infrastructure changes
 - Cross-site variability
- **You start with standards, you end up with a heterogeneous mix of systems**



SOA Challenges

- Build an application in one site that gets data from soon-to-be-replaced heterogeneous systems
- Build an application at multiple sites with homogenous systems but different standards
 - a common naming system must exist due to implementation variability
- Build an application at the Enterprise-level spanning sites with heterogeneous systems



Service Oriented Architecture

- Service Orientation is nothing new
 - It is, however, unique to your business
 - Provides high value to customers
 - Services are “business level” by nature and necessity
- The Architecture protects your service investment
 - Supports reuse both with the aggregate steps and the electronic document
 - Encapsulates changes in platform, process, and growth



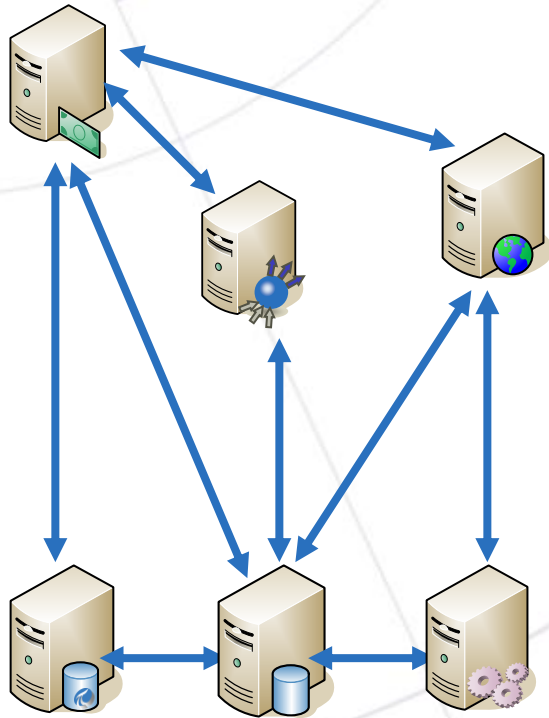
Web Services Support the Architecture

- Platform Independent
- Standards Based
 - Common communication protocols like HTTP and SMTP
 - Message Schemas
 - Separation of Operational Policies from Message Body
- Schema and Contract will not change

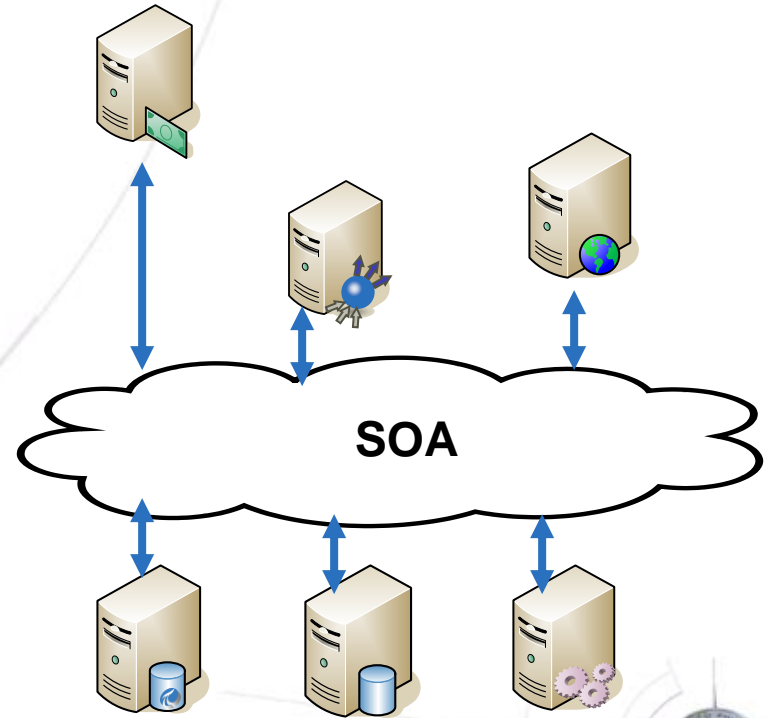


System Connectivity

- Point to Point

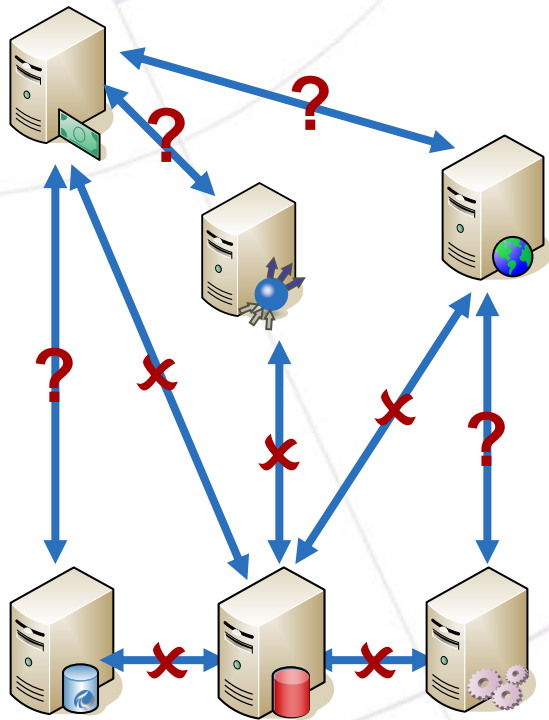


- Loosely Coupled

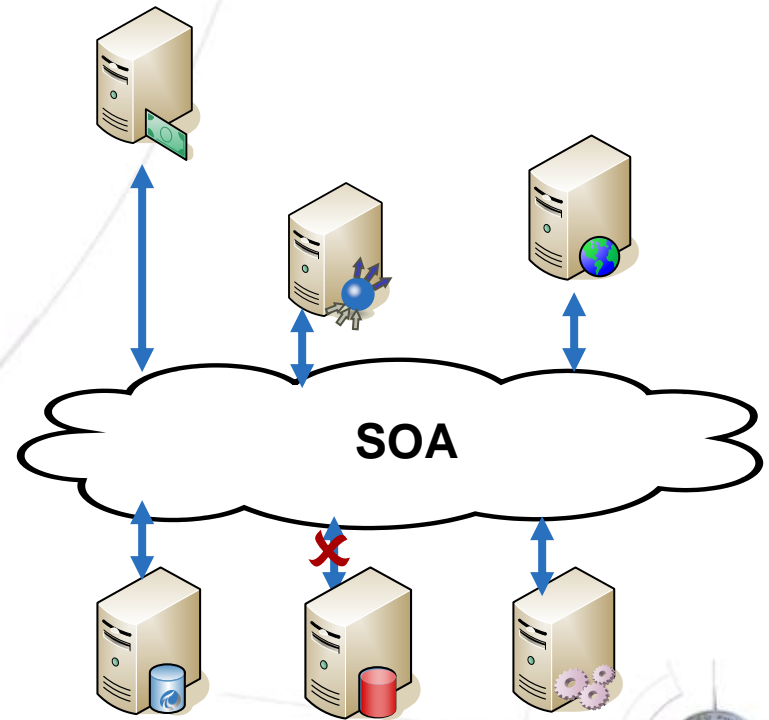


Change Out a System

- Point to Point

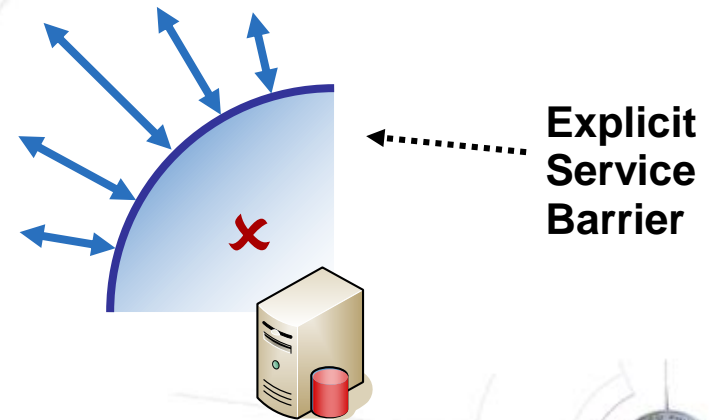
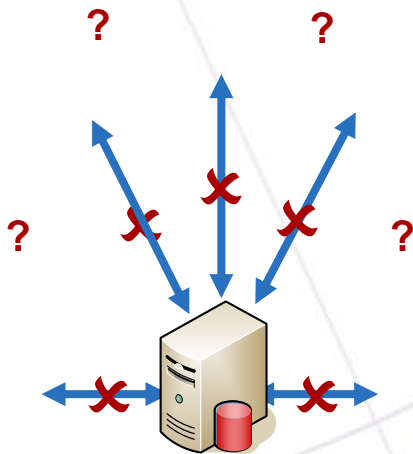


- Loosely Coupled



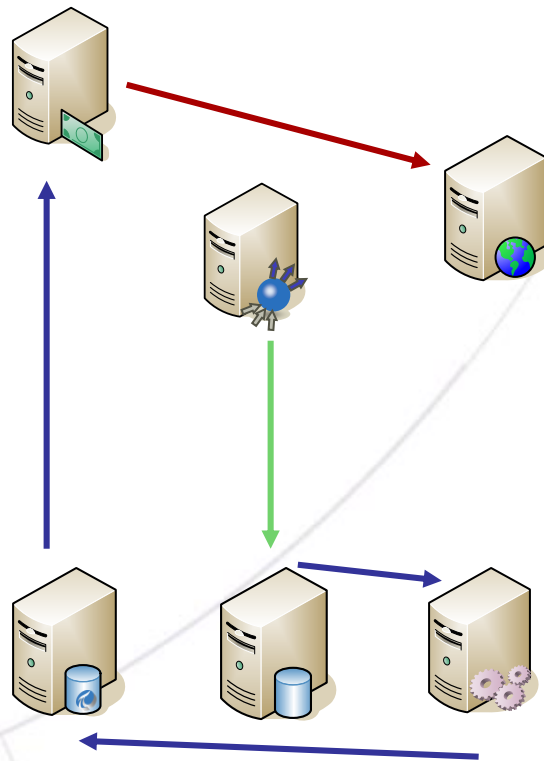
Work Required to Adapt

- Must re-implement each connection to the system
- Must evaluate ancillary connections
- Must re-implement service-layer abstraction
 - Not necessarily a 1:1 mapping to services due to service reuse



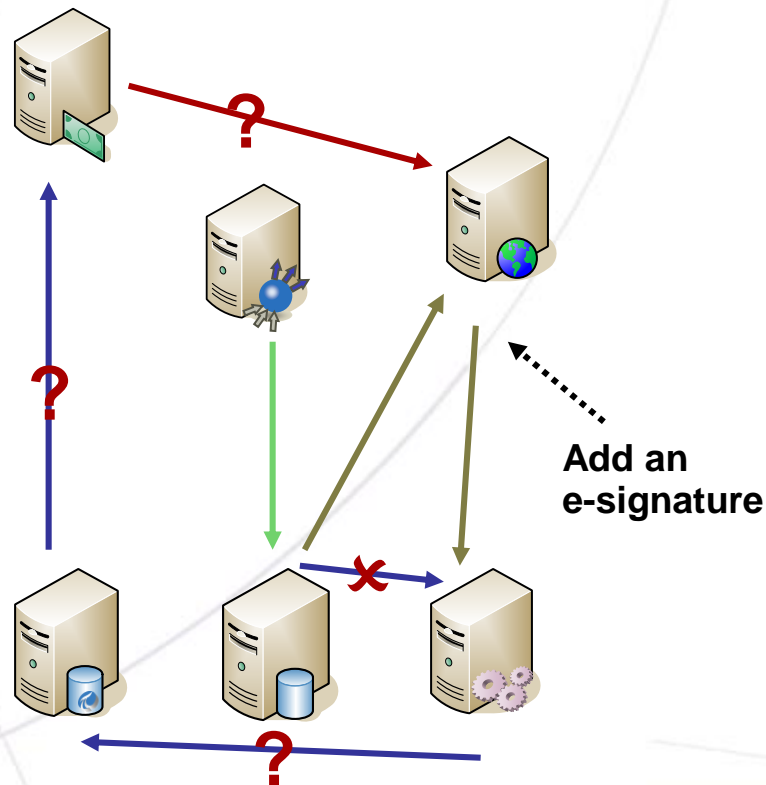
Workflow and Business Logic

Monolithic design



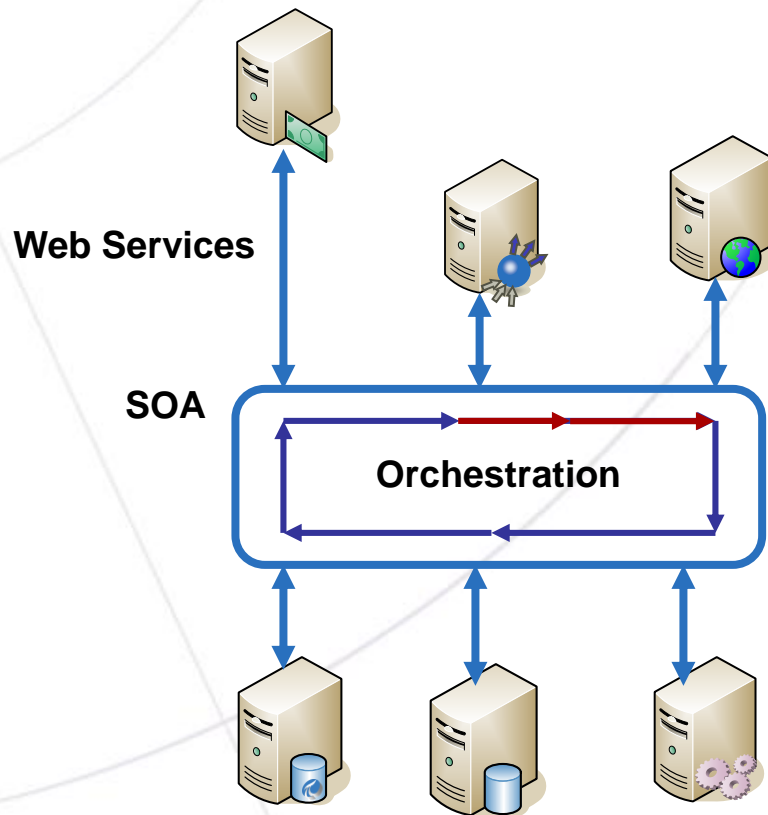
Workflow and Business Logic

Business Logic and Workflow Tightly Coupled



Workflow and Business Logic

Extend the Workflow and Message Schema to Incorporate the Electronic Signature



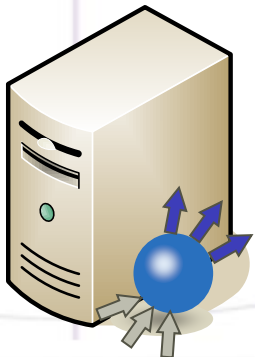
SOA + Web Services = Agility

- Features

- Autonomous services
- Discoverability
- Platform neutral
- Orchestration

- Flexibility

- Rerouting workflow happens in orchestration
- Adding data to a service is a schema extension
- Insulates from architecture changes



What About Performance?

- Performance may be a key requirement
- Scalability may be a key requirement
- Web Services add an XML layer, both the message and the reply
- Appropriate granularity is an important factor
- Use tightly coupled calls when performance is needed



And Security?

- Use of common standard protocols offers many options; Anonymous through Certificate
- If tracking usage is important
 - Audit trails may be turned on without affects to the web service contract or schema.
 - Simple text logs in IIS
 - HTTP filters may be produced for detailed logs
 - Might be built into the contract and schema



How do we get there?



Implementation Guidelines

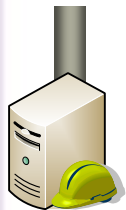
- Decide what problem you are going to fix
- Involve both business and IT
 - Business defines requirements
 - IT implements the services
- Involve strategic vendors like OSIsoft
- Create services that deliver tangible value
 - Start small, but solve a real business need



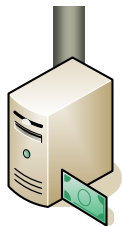
SOA Service Example 1

- Problem:
 - Users need to get quality information from different sites.
 - Requires site, production line, time frame, and friendly name of the quality metrics to return.
 - Each site runs a different quality system with unique naming conventions.
- Service:
 - Exposes a friendly naming conventions, connects to the appropriate site systems, and returns the requested quality metrics.

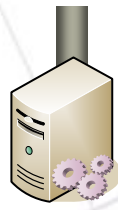
Site 1



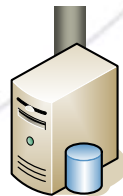
Maintenance System



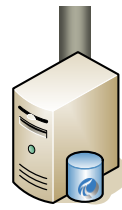
Accounting



App Server

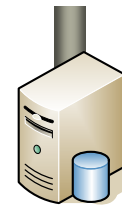


LIMS System 1

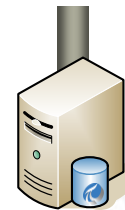


PI System 1

Site 2



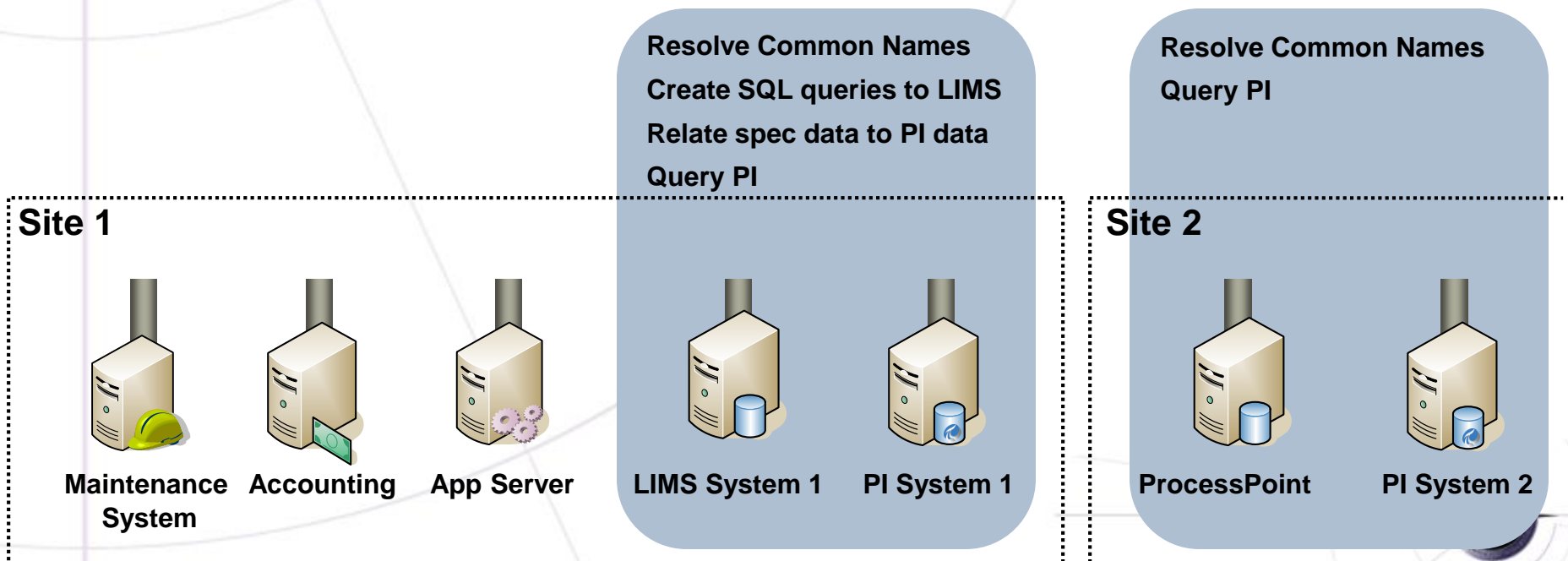
ProcessPoint



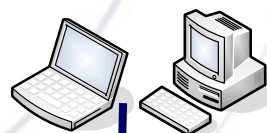
PI System 2

SOA Services for Example 1

- Define a good service interface
 - Normalize the namespace between all the sites
 - Ensure proper linkage with lower level systems



SOA Architecture for Example 1

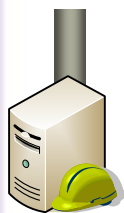


Portal Server

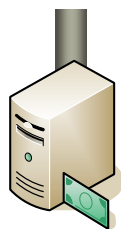


Users work in either portal based thin clients
Or SOA enabled smart clients.

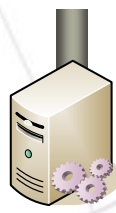
Site 1



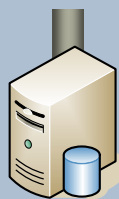
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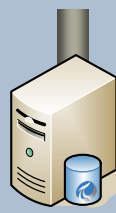
Accounting



App Server



LIMS System 1



PI System 1

Site 2



ProcessPoint

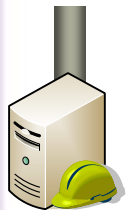


PI System 2

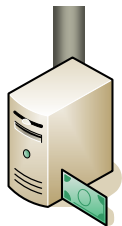
SOA Service Example 2

- Problem:
 - Customer calls with quality issue, supplies invoice number and description of quality problem.
- Services:
 - Pass in invoice information and return site, order, and scheduled production information.
 - Pass in scheduled data and compare specs to quality analysis data.
 - Pass in order information and return accounting information, and available inventory to help CSE resolve issue.

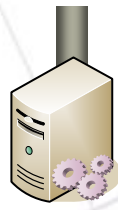
Site 1



Maintenance System



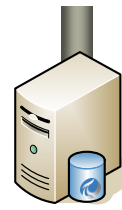
Accounting



App Server

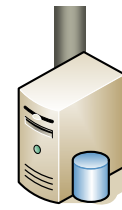


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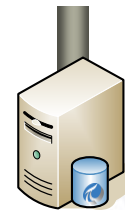


PI System 1

Site 2



ProcessPoint

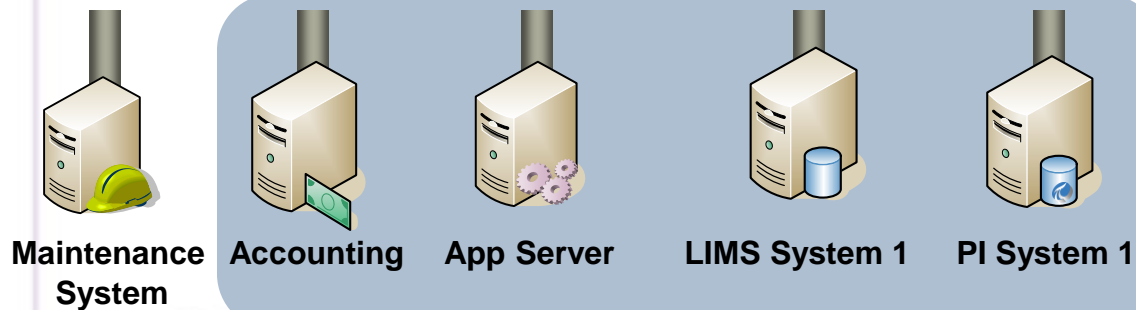


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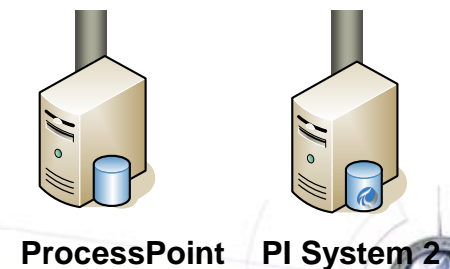
SOA Services for Example 2

- A set of services is created
 - Reference accounting system for customer information
 - Reuse services from Example 1
 - Return the cost of different possible resolution scenarios
- Services are used together to answer the posed questions

Site 1



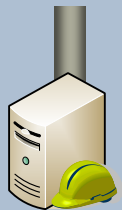
Site 2



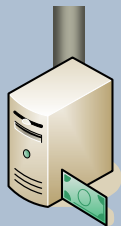
SOA Service Reuse Example

- Research Problem:
 - In between maintenance intervals, product quality drops and customer satisfaction drops due to receipt of lower quality product.
- Combine Services:
 - Determine the longest acceptable maintenance interval and illustrate that the potential revenue gain exceeds the additional maintenance costs.

Site 1



Maintenance System



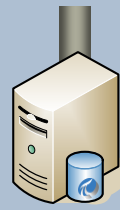
Accounting



App Server



LIMS System 1



PI System 1

Site 2



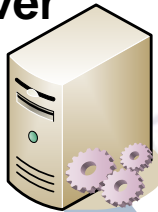
ProcessPoint



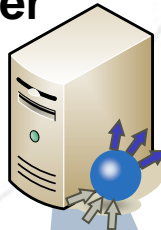
PI System 2

Potential Service Consumers

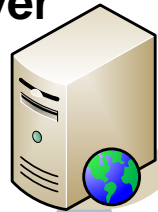
Application Server



BPM Server

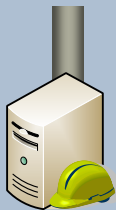


Portal Server



- **Portal** – Customer Service Representative Screens
- **BPM** – Generate a Certificate of Analysis
- **App Server** – Cycle time analysis application

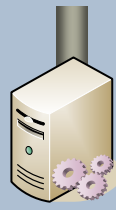
Site 1



Maintenance System



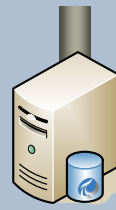
Accounting



App Server



LIMS System 1



PI System 1

Site 2



ProcessPoint



PI System 2

How do we get there?



What is SOA to OSIssoft?

- Business level services vs. CRUD
- Some business systems can characterize high level services



OSIsoft's Commitment to Customer SOA's

“Our contribution to an SOA is two-fold. We make the general purpose routines that can be called many ways. We also provide ways to create the Web Services that would be the business-level interfaces in an SOA.”

– Mark Hughes, President OSIsoft



OSIsoft's Roadmap to SOA Participation

- Today
 - SDK sample code
 - Web services and documentation
 - Lower-level functions (get data, perform simple searches)
 - Examples are properly architected and designed for extension by customers
 - The Advanced Computing Engine (ACE)
 - Calculations in ACE can be exposed as Web services



Targeted SOA Participation Methods

- Portal support
 - Build new services for portal users
- Application development
 - Enable services for business level applications
- Business process integration
 - Support for EAI platforms



Long Term SOA Participation Plans

- RtBaseline Services “v2.0”
 - Part of “Foundation” initiative (stay tuned)
 - Will connect to and reference data inside and outside of the RtPM Platform family of products



How do we get there?



Start the Journey

- Have a good idea of your requirements up front
- Context is key to SOA
 - Establish a cross-site naming convention
 - Develop context around business uses
- Envision applications that
 - Span sites
 - Span systems
 - Span lines of business
 - Span organizational boundaries



What You'll Find on the Road

- Frequently Debated Topics
 - What is or is not SOA?
 - What is the right service contract?
- Who has the keys?
 - Business or IT?
 - Funding infrastructure vs. applications



As you Draw your Roadmap...

- You can't buy an SOA from a vendor
 - An SOA reflects your business needs, vendors can't know these in advance
 - But don't ignore vendors that can augment your SOA effort and reduce implementation costs
- Both your IT department and business stakeholders need to be on the team
- Involve OSIsoft early on in your planning process to realize the value of the RtPM Platform





Further Information

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A list of Microsoft SOA white papers:

<http://msdn.microsoft.com/architecture/soa/default.aspx>

Avoiding Bad SOA: <http://www.zaphink.com/report.html?id=ZAPFLASH-200531>

ROI of SOA: <http://www.zaphink.com/report.html?id=ZAPFLASH-20050127>

There is no SOA Wizard: <http://www.zaphink.com/report.html?id=ZAPFLASH-2005110>