

Pervasive Software + NetSuite = Seamless Cloud Business Processes

Successful integration solution between cloud-based ERP and on-premise applications leveraging Pervasive integration software.

Prepared by Mercury Consulting, a leader in “Ground to Cloud Integration.” Mercury removes the fog around cloud computing by providing clients with detailed independent research on cloud applications.



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Executive Summary and Overview

The primary goal for business applications is to automate and simplify many business processes. Unfortunately, most existing applications fall short when implementing a complete end-to-end solution. So enterprises typically install multiple software products from different vendors to achieve the desired automation effect. Yet, these applications often do not communicate with each other directly. And when one of the applications executes in a hosted or cloud-based environment, additional “impedance” may occur. This paper presents a solution from Pervasive Software which eliminates communication issues and truly automates the business process through software integration. It presents two successful customer case studies that have implemented NetSuite ERP and on-premise software. It demonstrates how a solution such as Pervasive Data Integrator can solve data integration delays.

Challenges Faced with Cloud-based Integration

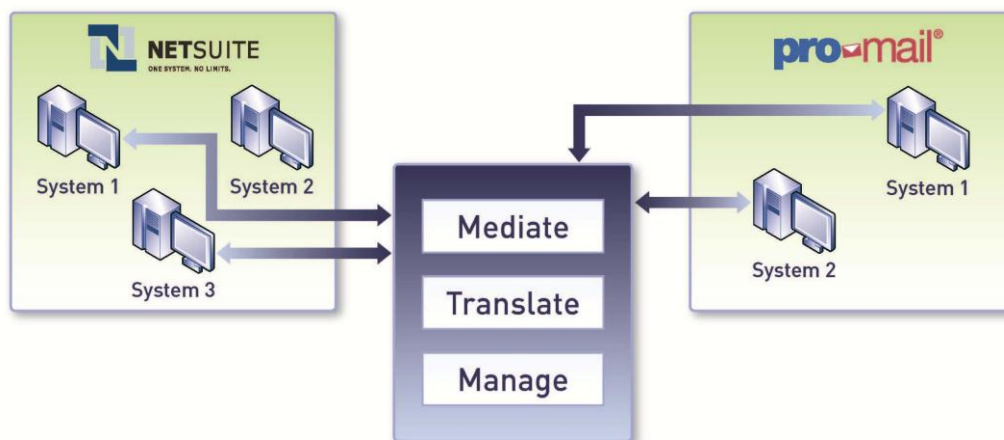
General Architectural Issues

During any enterprise level software implementation, the cost of connecting disparate applications can easily exceed the initial cost of software licenses. Usually, these integration costs are not apparent at the beginning of the implementation project. This situation results in budget overruns and project delays. Ever since the days of integrating Enterprise Resource Planning (ERP) packages with legacy code, integration efforts required deep technical expertise as well as business process knowledge. In today’s world of cloud computing, additional architectural challenges must be overcome.

When integrating multiple disparate apps, forward thinking enterprises will leverage software tools that perform integration tasks such as:

- Connectivity – technical links between applications.
- Data Transformation – the conversion of data formats and semantic meaning between applications.
- Data Integrity – Ability to ensure data is consistent between applications at any point in time with required performance metrics.

These activities still exist in a cloud to on-premise integration scenario. Yet these actions must be implemented in a heterogeneous environment beyond an enterprise’s four walls:



Cloud to Ground Integration Issues

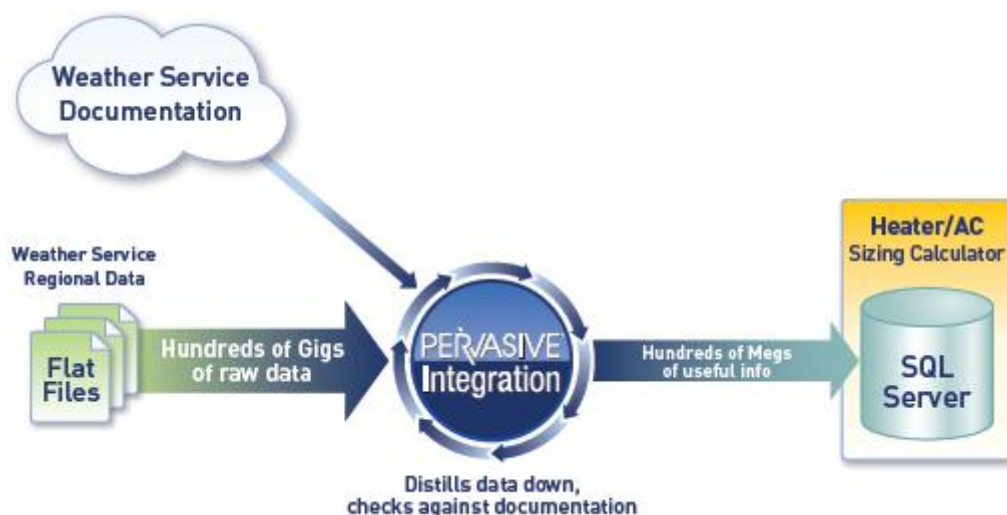
Therefore, at a minimum, enterprise integration products need to:

- Maintain Security – assure that information shared between applications is not accessible by other parties. And support different security protocols used by the cloud application and the on-premise environment.
- Support changing interfaces – Cloud-based application programming interfaces (API) are subject to change. This can occur during the regular upgrade cycle for the SaaS product. The metadata which defines a business process may also change.
- Integrate across firewalls – The integration tool itself may be cloud-based (sometimes called “Integration as a Service”), yet need to access on-premise systems through the firewall. Or an on-premise integration product may need to reach an internet based web service.
- Provide performance bandwidth – Repeated API calls, sometimes numbering close to a million, must be supported. As well as the ability to push large amounts of data across the internet in a single call.

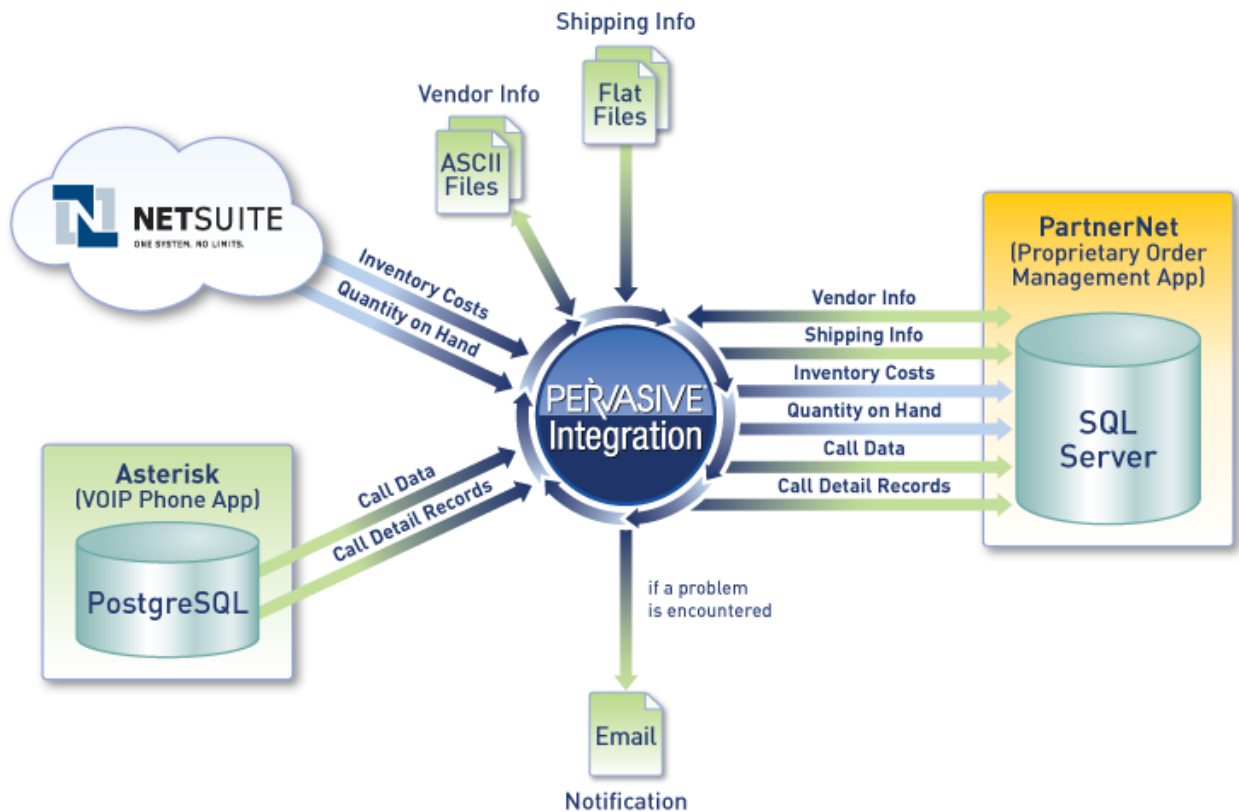
Proprietary Application Integration Scenario

A common scenario that many enterprises face will be financial data integration to proprietary or custom built applications. Increasingly one (or both) of these applications reside in the cloud. As cloud-based ERP applications become widely adopted, products such as NetSuite become common endpoints in the scenario. A single point-to-point solution could be built with a variety of programming languages, but when multiple endpoints are involved in the business process, it becomes far more efficient to implement an integration manager (or middleware) solution. The data manager will act as a traffic cop to schedule and route data to the various endpoints to complete the business process.

For example, Alpine Home Air Products (based in Rockford, IL), leverages Pervasive Software to manage data flows between the following systems. Alpine provides heating and air conditioning products to consumers and HVAC contractors throughout the United States. All order processing and technical support is performed on line or telephone. Alpine uses Pervasive in a couple of scenarios. First, Pervasive routes data between cloud-based applications such as governmental weather data services and demographic data (used to configure HVAC equipment orders) and their Order Configurator.



Second, Pervasive integrates FedEx freight databases, Asterisk VOIP telephony (service calls); custom PartnerNet order management system; and NetSuite financials. Alpine has used NetSuite since 2009 to manage all corporate financial data. Inventory costs and product quantity on hand data is transferred from NetSuite to PartnerNet on an hourly basis.



According to Jason Todd, CEO/CTO of Alpine, the main advantage of using a tool like Pervasive is “centralizing the management of the data as it moves from system to system.” In addition, “One of the benefits of Pervasive Data Integrator is the ease of visualizing the data. When building a map for instance, you can easily see your source and target, make changes, and see results. The structured data designer is heads and shoulders above SQL.”

Like many integration efforts, Alpine realized that adopting an integration broker scales much better than point-to-point development. Alpine reported that they could have built a custom Coldfusion based integration to Netsuite for the same cost as purchasing Pervasive. But the Pervasive solution includes many more built in endpoint connectors (such as the databases used at Alpine). And ongoing changes are implemented much faster with Pervasive. As Jason stated, “It’s heads and shoulders better with Process Designer. If I have to change a source or target, I don’t have to build it all over again.”

Packaged On-premise Integration

Typically order fulfillment applications are implemented on-premise. This allows for software customization, tighter security, and closer access to on the ground warehouse processing. Yet order status and completion needs to be updated in the financial system of record. Wonderlic, Inc. a leading provider of pre-screening tools and employee assessments for over seventy years, decided in 2010 to outsource their entire order fulfillment process. They chose Lake County Press to manage their print orders. Lake County uses ProMail fulfillment software to process orders. Wonderlic also implemented NetSuite for their CRM solution. Orders are placed in NetSuite and then sent to Promail for processing. Order status and inventory availability is also shared between Promail and NetSuite. Pervasive Data Integrator acts as the hub between these systems and exchanges data on a scheduled basis.



Wonderlic's integration has been in production for over a year. During this time, the Pervasive solution has operated continuously. Only one downtime incident occurred and this was attributed to NetSuite maintenance. Also during 2010, NetSuite upgraded their cloud-based software three times. These upgrades did not impact the Pervasive integration. Tom Glover, Wonderlic's Director of Services and Operations, states "The Pervasive solution is very stable. It runs in the background and doesn't require any maintenance." In a sense, this is the best praise for integration software – it just needs to work! From a business perspective, Wonderlic has been able to reduce headcount and physical warehouse storage due to the outsourcing project.

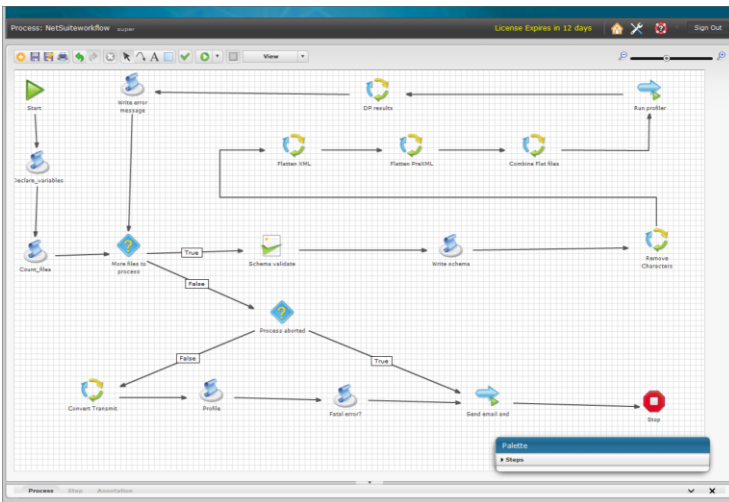
Pervasive Software – Data Integrator

Pervasive Data Integrator is a robust and mature solution for integrating disparate data sources. It supports literally hundreds of connectors for importing and exporting. These connectors bring data to the DI Integration Engine. The transformation engine executes maps built via a powerful data mapping tool. Data mapping features include :

- Rich client interface to make data connections and mapping easy. Especially if one is used to a development IDE such as Microsoft Visual Studio. The User Interface is very “Access form” oriented.
- Excellent event handling for all types of conditions (before, during, after insert records, etc)

DI can be deployed in a variety of models. It can run as a standalone executable (for small point-to-point solutions); embedded within a J2EE server in both asynchronous (Java message driven bean) and synchronous (web service) options; accessed via a HTTP based web service; and implemented with a cloud-based model. DI’s runtime component, Integration Engine, can implement a variety of integration scenarios – from internal Enterprise Application Integratin (EAI), to data warehouse loading (ETL), to B2B inter-enterprise situations (XML/SOA, EDI, HIPAA, etc). Multiple Integration Engines can be distributed throughout an enterprise. These are managed by a browser based console which allows the IT department to monitor the health of any integration.

Beyond the wide array of data connectors (over 150 including SAP, Oracle, Salesforce, and NetSuite), DI also includes a powerful process designer. The process designer provides a graphical development environment to visually build complex interactions between applications. For example, you can design several maps (data flows between source and target data stores) in the Map Designer and link these up in the Process Designer based on conditional logic. These interactions can be event driven (such as a message or DBMS based trigger) or time based/scheduled, and include call outs (“shell” commands) to any executable program. This last feature provides the capability to implement very complex business rules in any programming language of choice. Process Designer’s user interface is similar to a flowcharting tool such as Visio. Analysts can insert steps that execute data transformations, look up additional data, perform logic decisions, and queue new events. It can also pass processes to BPEL engines. Alternatively, Data Integrator can replace BPEL engines and serve as a hub for XML Web services. Its components can be used within complex workflows to control interactions between services and packaged applications.



Process Designer

The screenshot shows the Mapping Engine interface for a map named 'AccountsExtract'. It displays the source schema 'ACCOUNTS' and the target schema 'ACCOUNTS'. A mapping table is shown below, listing fields like 'ID', 'Name', 'Type', 'ParentID', 'BillingDate', 'BillingCity', 'BillingState', 'BillingPostalCode', 'BillingCountry', and 'ShippingDate' and their corresponding target fields. Below the mapping table is a job execution log table.

Time	Job ID	Event Name	Status	Read Count	Write Count	Based on Files	Total Records in Files	Last Code	Message
9/13/2011 10:18:28 AM		Waiting job...							
9/13/2011 10:18:28 AM	JOB_8278916-FR00-194D-8616-AB24A80276	JobQueued							
9/13/2011 10:18:28 AM	JOB_8278916-FR00-194D-8616-AB24A80276	JobAboutToRun							
9/13/2011 10:18:31 AM	JOB_8278916-FR00-194D-8616-AB24A80276	ConversionProgress		0	0	0			
9/13/2011 10:18:33 AM	JOB_8278916-FR00-194D-8616-AB24A80276	ConversionProgress		12	12	12			
9/13/2011 10:18:32 AM	JOB_8278916-FR00-194D-8616-AB24A80276	JobFailed	FR00MID_OK						
9/13/2011 10:18:32 AM	JOB_8278916-FR00-194D-8616-AB24A80276	Log location is							HTTP://sapware-us01.f01.com/services/hub/30401
9/13/2011 10:18:32 AM	JOB_8278916-FR00-194D-8616-AB24A80276	Runtime Configuration Location							HTTP://sapware-us01.f01.com/services/hub/30401

Mapping Engine



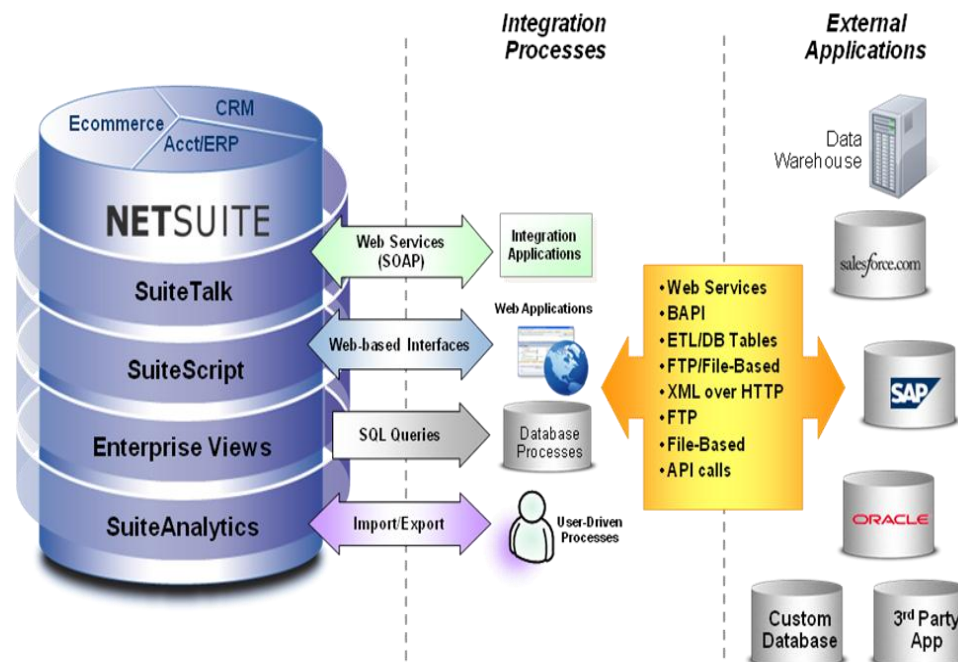
NetSuite ERP Integration Capabilities

NetSuite provides a full service Enterprise Resource Planning environment. The applications range from core financials to Human Resources. However, NetSuite is more than just hosted ERP, as represented by their NS-BOS (Business Operating System), SuiteScript, and SuiteTalk (web services integration) offerings. The SuiteTalk Platform provides programmatic access to NetSuite data and business processes through an XML-based API. The SuiteTalk Platform has the following characteristics:

- The SuiteTalk Platform uses SOAP-based Web services with document style encoding.
- Doc style encoding consists of message-oriented exchanges where an XML schema specified within the SOAP message defines the structure of any messages sent between two applications.
- HTTPS Transport: as defined in the WSDL document.
- XML data loading utility.

Web Services Support

NetSuite enables fairly standard import and export interface technologies, as depicted in the next figure. It is left to the System Integrator or customer to deal with security and firewalls for on-premise integrations.



SuiteTalk Integration Platform Details

Another characteristic of SuiteTalk is that its behavior is similar to that of the NetSuite UI. The workflow of a SuiteTalk application and its underlying SOAP exchange with NetSuite tightly mimics the browser interface. SuiteTalk operates on the same role-based permission structure as the browser interface. Since a SuiteTalk application needs a pair of sign-in credentials to login, its permission to various operations and records is subjected to the role it uses, just like one would expect when accessing via a browser session. For example, a SuiteTalk application that logs in with the Accountant role will receive the same permissions as it will logging in to the browser interface using the same role.

NetSuite web services requests can be processed synchronously or asynchronously. In asynchronous requests, the client application sends a request to the SuiteTalk Platform where it is placed in a processing queue and handled asynchronously with other requests. The client application can then check on the status and result of the request as needed. NetSuite Web Services can be built with .Net, Java, and PHP languages. For each of these environments, NetSuite provides an SDK which becomes a bolt-on with the development environment. SuiteTalk provides a Web Services Usage Log allowing users to filter Web services requests by specified date and time periods, record type, and action (operation). There exist pre-built queries for reporting performance statistics. Error handling is also supporting with SuiteTalk. Based on the error code or fault that is received, the client can take the appropriate action.

- Warnings: informational notifications requiring an action within the UI but requiring no response from a Web service call.
- Errors: exceptions returned on a record-by-record basis due to invalid or incomplete data.
- Faults: a fundamental exception type that results in the entire request not being processed.

Summary

This report focused on Pervasive Data Integrator integration capability between cloud-based and on-premise software. This is an increasingly common integration scenario. Enterprises look to the benefits of Software as a Service for core ERP and CRM functionality. Yet not all applications do or even should run in the cloud. When this situation occurs, it becomes important to leverage integration software that supports “ground to cloud” connectivity. The integration software needs more than standard connectors to major ERP software packages. It needs to be powerful enough to build integrations to proprietary software as well as packaged solutions. NetSuite ERP provides ample support for a variety of interfaces. And Pervasive DI can leverage these interfaces to build powerful integration solutions.

About Pervasive Software

Pervasive Software provides agile data integration software that speeds the flow of data between applications and between organizations. Our robust technology addresses SaaS, SOA and traditional integration modes and allows customers to re-use the same software for integration scenarios that span data warehouses, real-time application integration and data exchange with trading partners.

About NetSuite

NetSuite Inc. is a leading vendor of cloud computing business management software suites. NetSuite enables companies to manage core key business operations in a single system, which includes Enterprise Resource Planning (ERP), Accounting, Customer Relationship Management (CRM), and Ecommerce. NetSuite's "real-time dashboard" technology provides an easy-to-use view into up-to-date, role-specific business information.

About Mercury Consulting

Mercury (<http://www.mercuryinthecloud.com/>) is your trusted cloud technology advisor, specializing in integration services. We make your adoption of cloud services easier by bringing our deep expertise to architect your cloud enterprise and provide un-biased guidance on cloud vendor and their SaaS solutions

