NetSuite BOS:

The Business Operating System For On-Demand Application Development

A White Paper for Growing Businesses

February 2008

Find out more: contact NetSuite, Inc. at 1800 NETSUITE or visit www.netsuite.com

Executive Summary

NetSuite's Business Operating System (NS-BOS) provides a unique development environment for the creation of applications that are both created on and run on the Web. The NS-BOS platform provides more than access to an underlying infrastructure; it provides access to an award-winning set of business management functionality. A rich set of development and testing tools allow developers to develop new applications and whole vertical solutions using this core NetSuite platform.

Developers using NS-BOS benefit from access to the IT infrastructure, the secure networking environment, the Oracle database, web services, and an unparalleled integration and customization capabilities. The flexibility inherent in NetSuite BOS allows developers to create custom records, workflows, and user interfaces as part of new products that can leverage the core NetSuite suite of applications.

Developers using NS-BOS also benefit from the infrastructure security and accessibility of NetSuite's state-of-the-art data center. The data center is collocated at a global leader in IT infrastructure services for enterprise applications.

NetSuite BOS: The Business Operating System For On-Demand Application Development
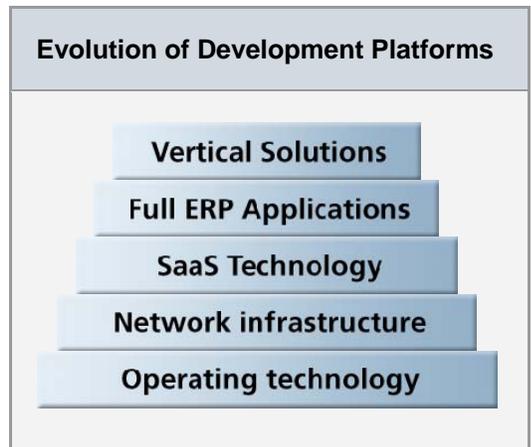
Preface

In the past, application development was a bottoms-up activity, usually starting from scratch with each program, and then requiring porting to any different hardware or operating systems that the developer wanted to support. With each upgrade, all that porting and the resulting support issues and errors became a very limiting way to develop, sell, and support business applications.

Today, developers have a marked advantage. They can develop on an existing platform, rather than solely on an operating system or a specific database. With the platform approach, several distinct benefits emerge, such as open APIs, and SDKs that provide the tools for application development. However, with the advent of Software-as-a-Service as a "platform" to be developed upon, the advantage for application developers increases exponentially.

The rapidly growing support of Software-as-a-Service (SaaS) or "on-demand" computing radically changes the dynamics of application programming. In the same way that the underlying infrastructure is transparent to the users of SaaS solutions, it can also be a transparent building block for programmers — presenting a hardware and software, database and network infrastructure on which to create new applications. With the appropriate set of tools to build to that new environment, developers are able to devote their time to their solutions and less to the structural requirements to support them.

But today, another layer of building blocks is available to application developers: a platform that supersedes solely the rudimentary infrastructure of operating systems and communication infrastructures that previously defined platforms. Today, application programmers can build on a solid core of real applications to use functionality such as CRM, eCommerce, sophisticated accounting, inventory or project management solutions and other true business platform building blocks – rather than just technology building blocks.

Evolution of Development Platforms

- Vertical Solutions
- Full ERP Applications
- SaaS Technology
- Network infrastructure
- Operating technology

Today's "Platform" World

A development platform is intended to give a programmer a head start in application creation – by providing some portions of the underlying environment on which the eventual application will run. Rather than beginning from scratch, today's applications can be developed to this underlying infrastructure, allowing the attention that used to have to go to testing against each operating system, network, or database to be applied to creating excellence in the application itself – not to the environment in which it will run.

But what exactly is a "platform" and specifically, what are the benefits to developers of a SaaS platform for application and total solution development? At its simplest, a platform is an infrastructure for developing applications. Over time, the concept has changed from just APIs and SDKs to JavaScript and .NET to middleware and web services integration schemas such as Service Oriented Architecture (SOA), SAP's NetWeaver, Oracle's Fusion, and IBM's WebSphere.

Building on an on-demand architecture gained popularity with Salesforce.com's Force.com, but developers were stymied by the very definition of "platform" underlying this option. Here there were two choices: one could develop a CRM-related application with links to Salesforce.com's CRM or use the underlying SaaS architecture to create brand-new, start-from-scratch business applications. While the latter provided architecture for hosted applications and access to the data center to run them, it did not provide a core business infrastructure on which to draw.

The Dilemma for Developers

Today's development community has a plethora of choices: which architecture to employ, which programming language and tool set to use, what standards to adhere to. Then there is the look and feel issue — what GUI and how flexible should it be? What integration points need to be defined? How customizable should the resulting application be? How scalable? And then there are practical choices about data center support and the ensuing security if they plan on developing SaaS applications. What channels can I sell through given each choice? How do I plan for the global market? And am I locked into a particular architecture? A proprietary platform? A proprietary programming language? And what about the long-term viability of the platform provider? Might it get bought out by yet another platform provider and further limit my flexibility?

The SaaS Advantage for Application Development

The SaaS paradigm revolutionizes the business model for solution developers in several ways. Software-as-a-Service provides a lower cost of entry and typically requires less staff to deploy, implement and support. Additionally, on-demand solutions take less time to deploy, so valuable staff time can be spent on more customers rather than more time on fewer customers. SaaS is simply cheaper, faster, and requires less human capital – for both the user and the developer.

Part of the attraction of SaaS for developers is its resonance with customers. SaaS is gaining significant traction across all sizes of companies as its value proposition resonates with firms who:

- Do not want or cannot afford an IT staff;
- Require a rapid ROI;
- Want a predictable cost structure;
- Want universal access to their business functionality any time, anywhere;
- Seek worry free upgrades; and
- Want to quickly ramp up new business functionality without having to engage consultants or expensive integrators.[4]

> **The SaaS Explosion**
>
> - IDC reports that it expects customer spend on SaaS to increase to $14.8 billion by 2011.[1]
>
> - Two out of three businesses are either buying or considering buying software via the subscription model.[2]
>
> - McKinsey reports that the proportion of CIOs considering adoption of SaaS applications in the coming year has gone from 38% a year to 61%.[3]

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1 Erin TenWolde, Research Analyst, IDC. August 2007.

2 "Businesses Get Serious About Software-as-a-Service." InformationWeek Research. Reported in InformationWeek, April 14, 2007.

3 Abhijit Dubey. McKinsey. Panel at the SIIA OnDemand Summit. San Jose. November 8, 2006.

4 Michael Mankowski, Senior Vice President, Tier 1 Research.

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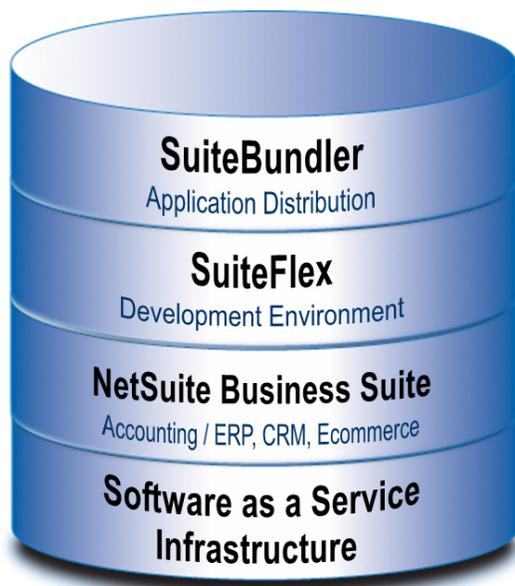![NetSuite logo - N1 NETSUITE ONE SYSTEM. NO LIMITS.]

Introduction to NetSuite BOS: The Complete Business Operating System

NetSuite's Business Operating System (NS-BOS) is a solutions development platform that provides not only a SaaS infrastructure, but also – uniquely – an entire core of integrated applications which provide core functionality which the developer can, when desirable, use in his or her own application. (See Appendix A for the complete components of NS-BOS).

NetSuite BOS provides developers with:

- Core processes in accounting, ERP, inventory management, ecommerce, web site and store support, CRM, and many more verticalized functions on which to build
- Business process management and workflow flexibility
- SuiteFlex for customization, extension, creation and debugging of applications that make use of the underlying core applications
- SuiteBundler that supports the "packaging" of newly created applications for easy integration with NetSuite and hastens distribution
- The ability to build and run applications entirely over the Web

NetSuite Business Operating System
NS-BOS

SuiteBundler
Application Distribution

SuiteFlex
Development Environment

NetSuite Business Suite
Accounting / ERP, CRM, Ecommerce

Software as a Service Infrastructure

> With the NetSuite suite of applications, the BOS platform, and the SuiteFlex development tools and capabilities, developers have an unprecedented ability to create SaaS applications and entire vertical solutions that run over the Web.

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The "Buyer's Guide" for Selecting a Development Platform

The popularity of SaaS with business buyers has driven application developers to look for the best platforms. Figure 1 shows the criteria for selecting a winning development platform.

Category	Criteria	Rationale	Solution*
SaaS Foundation	Multi-tenant	Eliminates the barriers between the platform and the applications that run over it	NetSuite Multi-tenant Architecture
Business Data Security and Accessibility	Reputable data center; high standards of up-time; robust SLAs for performance and access	Always-on architecture removes set-up costs/time, on-going maintenance	Data Center security; up-time guarantees
Application Foundation	Complete Business Suite	Eliminates need for integration between disparate systems	NetSuite Applications: CRM, ERP/Accounting eCommerce
Database Customization	Ability to create Custom Records; Enables seamless extension of core functionality	Customization based on industry standards, point-and-click	SuiteBuilder
Integration Tools	Standard-based web services	Facilitates easy communication with	SuiteTalk SOAP-based web services
Programming Language	Industry standard JavaScript	Ease of use, no need to learn new language	SuiteScript
Interface Development Tools	Easy-to-use; well documented GUI tailoring or extending	Tailorable look and feel based on role, application, or client	SuiteScript UI Objects and Suitelets
Customization Replicator	Create once; deploy often business model	Customizations migrate seamlessly with upgrade; Service as Software enabler	SuiteBundler
Quality Assurance Tools	Real-time error-isolation and notification environment	Catch programming bugs immediately	SuiteScript D-Bug; Sandbox for testing
Development Longevity	Reusability automated	Repeatable and reusable across multiple customers	SuiteFlex for persistent, reusable customizations and applications
Industry-specific core	Industry best-practices embedded in the platform	Facilitates vertical industry-specific customization	NetSuite's industry editions embed best practices

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The Developer's Requirements Checklist

1. The core enterprise application has to be easily extensible, with exposed interfaces.

2. The application should have widespread acceptance to best leverage the solution provider's investment in adding functionality to it.

3. The toolkit provided for extending the application to meet the needs of vertical industries should be stocked with tools, documentation, and access to support when needed.

4. A test-bed must be available for trial runs, trouble shooting, and integration checking.

5. Access to the remote application is required — a solution provider should not have to invest in a hardware and software infrastructure to succeed in the move from a service to software.

6. The SaaS application architecture has to provide a layer of abstraction between the core application and the customizations the solution provider has created for the customer. This insures that those customizations will automatically carry forward to the next version of the application without intervention on the part of the solution provider.

7. A centralized, readily accessible library with documentation for each script should be available through which to experiment and sell the applications created to customers.

8. For maximum value, the added functionality should be able to be built within the core application as opposed to outside of it. Solutions built outside the application require the extra work and cost of maintaining integrations into that core.

* See Appendix B for detailed information on the NetSuite tool sets included here.

Summary

NetSuite's Business Operating System provides a unique development environment for the creation of applications that are both created on and run on the Web. The BOS platform provides more than access to an underlying infrastructure; it provides access to an award-winning set of business management functionality. A rich set of development and testing tools allow developers to develop new applications and whole vertical solutions using this core NetSuite platform.

NetSuite BOS is a solutions development platform that provides not only a SaaS infrastructure, but also – uniquely – an entire core of integrated applications which provide core functionality which the developer can use in his or her own application.

Appendix A: NetSuite BOS Developer Program Components

NetSuite Business Operating System provides the SaaS infrastructure, all of the NetSuite business management application, and SuiteBundler, a tool which serves as a means of compiling and reusing code developed for specific applications.

- **Software-as-a-Service (SaaS) Infrastructure** – NS-BOS provides a multi-tenant, on-demand architecture that leverages an exceptional collocated data center. SaaS removes large setup costs and eliminates on-going maintenance while delivering a browser application that can be accessed securely anytime, and anywhere.

- **Complete Suite** – NS-BOS eliminates the need for integration between disparate systems and serves as the system of record for businesses to automate their end-to-end business processes, rather than dealing with separate, disconnected point solutions. The NS-BOS operating environment includes the complete NetSuite application as a base for the platform.

- **SuiteFlex Toolkit** – NS-BOS provides SuiteFlex tools for development and customization specific to a single customer or an entire industry. SuiteFlex includes a variety of tools to develop and test networked applications. (See Appendix B for details).

- **SuiteBundler** – breakthrough technology which allows for the delivery of ISV-built customizations and vertical solutions to SaaS customers in a repeatable manner – just select and inject – eliminating the time-consuming, error prone overhead of re-coding.Vertical solutions, add-on applications, end-to-end business process customizations, and integration solutions developed using the components of SuiteFlex — such as SuiteBuilder, SuiteScript, SuiteTalk, and SuiteScript D-Bug — can be packaged together to create a SuiteBundle, which can in turn be repeatedly installed by customers at the click of a button. SuiteBundler includes:

    - **Bundle Builder** — an easy 3-step graphical assistant for selecting and creating SuiteBundles. Bundle-able components include anything configurable and customizable in NetSuite from the simple elements — such as user roles, Dashboards, custom tabs, custom centers, custom KPIs and Scorecards, custom reports, custom lists and custom forms — to database elements — such as custom fields and custom records/objects — to scripted business process and application development elements — such as client SuiteScript, Server SuiteScript, SuiteScript UI Objects and Suitelets.

    - **Bundle Distribution** — choose from 3 modes when making SuiteBundles available to customers. Partners creating a SuiteBundle for commercial availability would distribute it as "shared" to particular customer accounts that have purchased the solution, while customers leveraging SuiteBundler to prototype their own customizations and implementation of new business processes would set availability to Private. Finally, some developers or even customers can choose to distribute a Public SuiteBundle, fostering an open-source community for sharing small add-on enhancements to NetSuite.

    - **SuiteSource Bundle Repository** — partners creating SuiteBundles can leverage the SuiteSource Bundle Repository in their development process to conveniently save off the customer-installation-ready version of their SuiteBundle, while continuing to work on the next iteration of their solution in their NetSuite developer account.

    - **Bundle Installation** — customers looking to install a SuiteBundle would first locate it by browsing the SuiteSource Bundle Repository or searching by a specific Bundle ID given to them by the partner they purchased the solution from. Once they have located their particular SuiteBundle, installation is as easy as one-click and all the contents of the bundle are automatically inserted into their account. Un-install is also available in SuiteBundler if it turns out that the bundle contents need to be removed. All customizations and solutions deployed using SuiteBundler are carried forward with version upgrades, just as is the case with customization changes made directly in NetSuite accounts.

Appendix B: NetSuite BOS SuiteFlex Development Environment

SuiteFlex is the technology environment for customization, verticalization, and business process automation that are created and run on NetSuite's Business Operating system. SuiteFlex gives customers, partners and developers all the tools they need to easily customize all aspects of NetSuite and create new applications that run on the BOS platform. SuiteFlex includes SuiteBuilder, SuiteScript, SuiteTalk, and SuiteScript D-Bug.

SUITEBUILDER is a set of easy-to-use, point-and-click tools provide unlimited personalization, configuration, customization and vertical tailoring all managed in-system.

- **Dashboard Personalization**
  Now every user gets his or her very own software. From key performance indicators to performance snapshots, trend graphs, job reminders, and report and transaction shortcuts, each person in your company gets the tools they need for highest productivity. Who says software has to be boring? Add drag and drop content layout, RSS feeds from ESPN to pork belly futures, and favorite college color schemes, your teams will work hard and be happier doing it.

- **Company and Process Configuration**
  SuiteBuilder lets you set up NetSuite to your company and industry requirements. SuiteBuilder allows industry and business specific terminology to be applied throughout NetSuite by re-naming standard objects such as Customer to Client. Standard objects can also be customized with the addition of fields to track additional data points. These custom fields can be organized on custom forms that utilize proven user interface elements such as sub-tabs. Custom fields can also be added to customized list views, leading to convenient eXtreme list editing capabilities. Additionally, Published Tabs can be created to share information, documents and other files for purposes such as Intranets and collaboration portals.

- **Customize Data Relationships and User Interface**
  Fundamentally alter NetSuite's Web-native, on-demand products with the addition of database tables via Custom Records. Custom Records can stand-alone or easily tie in with standard objects such as customers or items in data relationships ranging from one-to-one, one-to-many, to many-to-many. SuiteBuilder also allows application extensions built and hosted within NetSuite to leverage user-interface elements such as drop-down navigation, eXtreme list editing and real-time dashboards. Custom Centers and Tabs let users easily build entire Centers (and roles) from scratch — including all the tabs, all the links, all the dashboards allowing users to tailor the NetSuite User Interface to be exactly right for their company's use.

- **SuiteBuilder Tools Include:**

✓ Color Themes	✓ Custom Forms
✓ Record Re-naming	✓ Custom Sub-tabs
✓ Custom Roles	✓ Custom Records/Objects
✓ Custom Lists	✓ Custom Tabs
✓ Custom Fields	✓ Custom Centers

SuiteScript is built on industry standard JavaScript and introduces customization capabilities that allow complex processes with branching logic and time-based decision trees to be automated. SuiteScript provides Application Programmer Interfaces (APIs) to NetSuite objects or custom objects added by the customer, all of which are acted upon within the NetSuite framework. SuiteScripts can be triggered by user events such as new records or changes to existing records, or be scheduled to run in batch mode. They can trigger NetSuite standard activities, create or modify data in the system, communicate with external data sources or even string together specific pages into a multi-step workflow process, complete with decision tree branching capabilities. As a result, time-based workflows and escalations such as drip-marketing based on orders and collections escalation can be automated.

In addition, Suitelets allow you to construct a new custom front-end from scratch or build a completely custom back-end process and host it inside NetSuite. Suitelet technology is comparable to what is commonly referred to as Servlet and opens up numerous

new possibilities for the SuiteFlex platform. You can create a multi step online form for your customers. Each step can be branched and customized based on user's choices on previous steps, tailoring user experience for a more effective customer interaction. A standard sales order form can be extended to include a custom product configurator using Suitelet UI objects, complete with custom slaving of available options, to make order entry for complex products less cumbersome. SuiteScript is comprised of several components enabling the most useful customization in SaaS:

- **Suitelets** — extensions to SuiteScript let you build a custom interface that is hosted within the NetSuite framework. Suitelets allow for completely custom HTML, Flash or NetSuite-based front-end development that can be build from scratch or by leveraging revolutionary SuiteScript UI Objects. Suitelets can also serve as the back-end for external HTML interfaces, providing complete flexibility in developing application extensions to NetSuite.

- **SuiteScript UI Objects** — Serve as extensions which let you build a custom interface that runs invisibly within the NetSuite framework.

- **Portlet SuiteScript** — scripted Dashboard portlets allow for listing of any NetSuite content on the Dashboard or inclusion of external data-feeds via RSS, HTML or Flash, as well as Web 2.0 mashups (e.g. instant messaging, maps, blogs, more) via embedded Inline HTML fields, or iFrames.

- **Scheduled SuiteScript** — facilitates business process customization via JavaScript extensions and allow for records to be processed as a scheduled batch to automate workflows such as re-assignment of stale leads, drip-marketing or scheduling of collection calls based on days overdue.

- **User Event SuiteScript** — SuiteScript can be used to enforce data validation and business rules. User Event SuiteScripts are triggered as users work with records and data changes in NetSuite as they open, edit or save records.

- **Client SuiteScript** — field-level calculations, alerts and business logic are facilitated by SuiteScripts which run within the user's browser as they work with data and records within NetSuite. Additionally Server SuiteScript APIs can be invoked via the Client SuiteScript code to apply business logic beyond a single record.

SUITETALK is the standards-based integration tool that makes it easy to enhance, extend, and integrate third party and legacy systems seamlessly with NetSuite. It includes:

- Simple Object Access Protocol (SOAP), standards-based Web service APIs extend NetSuite to other systems, third party vertical applications and legacy applications, or build add-on capabilities.

- SuiteTalk gives you the ability to use any programming language or platform that supports the SOAP standard in order to generate NetSuite business objects in that language, such as Java or Microsoft .NET.

- In-depth CRM and Accounting/ERP objects are exposed for simpler integration.

- SuiteTalk uses a role-based authentication model similar to the NetSuite user interface.

- SuiteTalk includes a comprehensive, error-handling architecture that utilizes error and warning codes, as well as some of the built-in SOAP constructs for error handling.

- There's full support for customization, including strongly typed custom fields with automatic validation based on the field type.

SUITESCRIPT D-BUG is a tool to troubleshoot code or metadata written to run in the NetSuite environment. It provides real-time feedback on the success of a newly created application in its integration with the BOS platform, and alerts the developer of any break points that require fixing before the application is pushed live. SuiteScript D-Bug is the first SaaS development diagnostic tool that allows for real-time code validation, resulting in faster iterative development.

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