



Citrix Receiver for Enterprise Applications – The technical detail

This technical paper details a solution that lets on-the-road personnel get to enterprise applications using their smart phones. The solution can be replicated by other organizations that publish enterprise applications on a XenApp server farm.



Citrix Receiver™ for Enterprise Applications refers to a solution that enables smart phone users to interact with enterprise applications published on their Citrix® XenApp™ server farm, behind the corporate firewall.

This solution was designed by members of the Citrix CRM Practice to enable mobile Citrix personnel to remain in touch with key enterprise applications while away from their laptops or intranet access. The solution can be replicated by other organizations that have enterprise applications published on XenApp server farms.

The approach establishes a secure pathway between the smart phone and the XenApp server farm, where an alternate mobile version of the enterprise application is published. That secure pathway consists of a combination of Citrix products, starting with Citrix Receiver, a free downloadable software, on the smart phone.

The value proposition

This approach bridges the access gaps created when the mobile user is without a computer, Wi-Fi, or other intranet access. As long as users have a smart phone with 3G bars, they can stay in touch even while dining, at the gym, or preparing to board a flight.

The challenges

Regardless of the enterprise application in question, a development team looking to utilize enterprise applications via a smart phone will face similar concerns. Those include:

- Usability of a complex enterprise application on a small smart phone display
- Data security over 3G
- Potential platform incompatibilities between the smart phone and the target application
- Performance
- Keeping development time down to minimize costs for an internal tool

When the solution makes sense

The solution is applicable for organizations with mobile employees who need to keep in touch with their enterprise applications, even when away from their computer and intranet. An organization can take advantage of the solution when the target enterprise application is published on a XenApp server farm.

The platform of the target application is irrelevant. Even IE can work through the seemingly incompatible Apple® iPhone® because of the technology behind Citrix Receiver.

The one caveat is how usable the UI is to navigate. For many enterprise applications, it makes sense to simplify navigation and layout for the small mobile screen size. In the Citrix case study that follows, this usability concern was the reason for light customization to the target application, a minimal effort to generate an alternate mobile UI.

Applicable smart phones

A key technology in the solution is Citrix Receiver for Mobile, which must be downloaded to the smart phone from the Apple® App StoreSM to enable secure access to the enterprise applications behind the firewall. Citrix Receiver has already been optimized for the iPhone and Windows®-based smart phones. A version optimized for Android® is complete and nearing the end of a technical review phase. BlackBerry® optimization is in development.

For the Citrix case study below, the team focused on the iPhone in response to the interest of internal Citrix users.

The alternate mobile version created in the case study matches the 320 x 480 iPhone screen size. But any mobile device with 320 x 480 screen size can run the mobile version as long as there is a Citrix Receiver version optimized for that mobile device.

Citrix case study

The solution for Citrix used the Apple iPhone and two Oracle-owned applications:

- **Siebel CRM** – This service-oriented, data-rich application manages customer service requests and contracts. Like many enterprise applications, this application involves interrelationships between several different record types such as Accounts, Contacts, Service Requests, Contracts, Entitlements, and more.
- **OBIEE** (Oracle Business Intelligence Enterprise Edition) – This analytical application displays metrics and reports in highly graphical formats such as bar charts, pie charts, line graphs, etc.

This case study focuses on the creation of the Siebel CRM for Mobile application.

High-level solution steps

The solution involved the following high-level steps. These steps apply to any organization working with this solution.

1. Created an alternate mobile version of the target application published on the XenApp server farm. This involved only light customization.
2. Generated a new URL for the mobile application version.
3. Published the mobile application to the XenApp farm.

4. Established a secure pathway between the smart phone and the mobile application hosted on XenApp. This pathway included a combination of Citrix products and technologies.
5. Instructed each smart phone user to download the free Citrix Receiver and enter a few key elements such as the enterprise server address, as a one-time setup process.

Toolset used to customize the applications

We needed only Siebel Tools to customize the layout and navigation. This tool was already in-house to modify the existing Siebel applications.

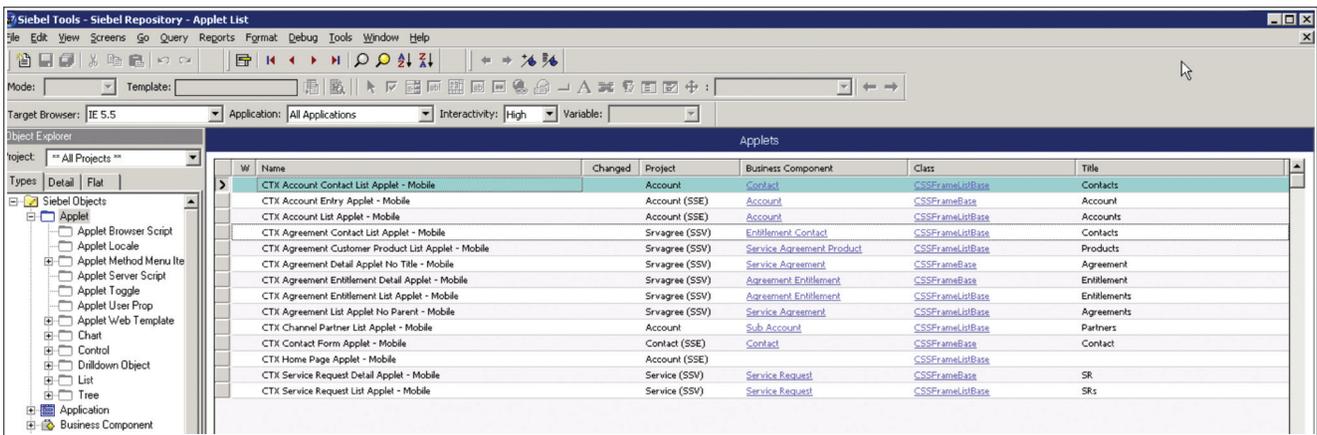


Figure 1 – Siebel Tools shows a list of new applets for the alternate Siebel CRM for Mobile version

Modifications to the front end

The solution required only light customization to the user interface. Siebel applications have three layers: UI layer (applets, views, screens—all use Siebel web templates), object layer (relationships), and database layer. All work was done on the UI layer. Specifically:

Layout refinements

This involved minor customization to fit within the iPhone screen size. New UI applets were needed so the information placement and sizing made sense for the iPhone’s 320 x 480 display dimensions. We followed the standard design process for sizing:

- We created new Siebel web templates as a basis for the new applets, using copies of the existing CRM application form and list applet templates and then simplifying.
- Deleted menus, buttons, and tabs since they were not going to be used on the mobile version.
- Modified swt files to remove toolbar/button space on the template, thus eliminating what would have displayed as empty space on the small iPhone screen.
- Determined that a view would contain no more than one applet, to keep it simple for the user.
- Identified how many fields could fit on a form and list applet within the iPhone dimensions. Through trial and error, we settled on a maximum of 14 fields on the vertical form applets and three horizontal fields/columns on the list applets.

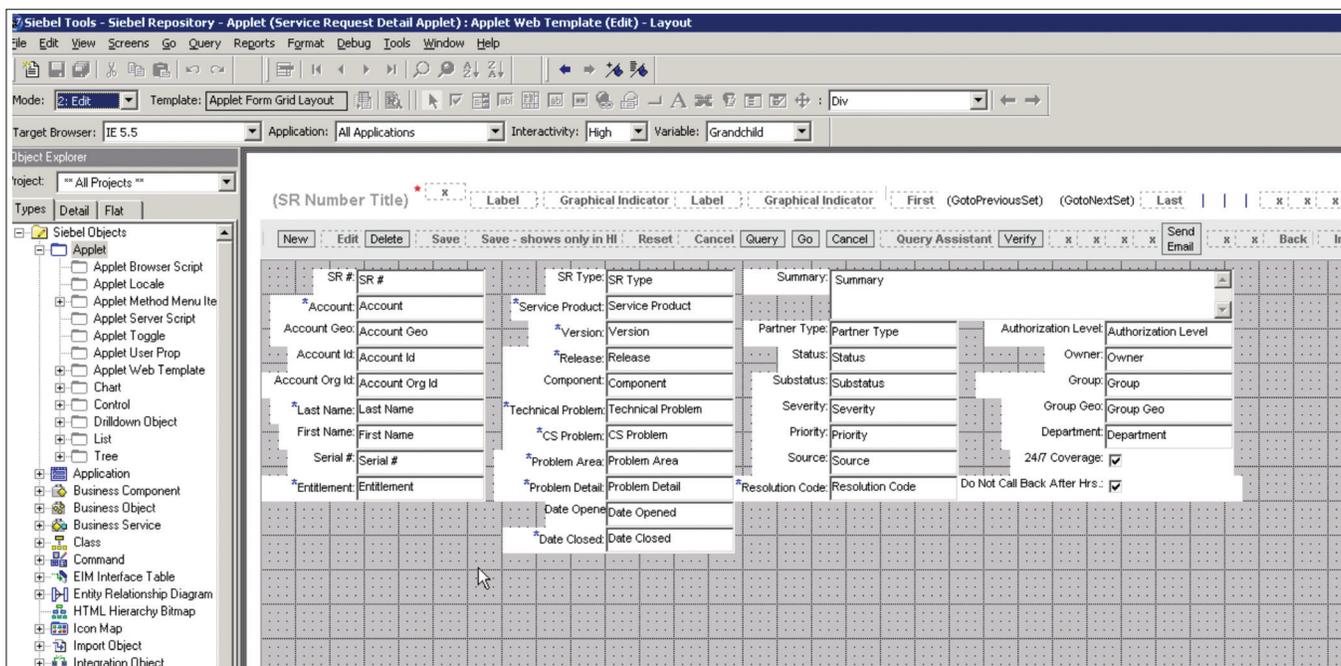


Figure 2 – The web template for the full CRM Service Request form applet

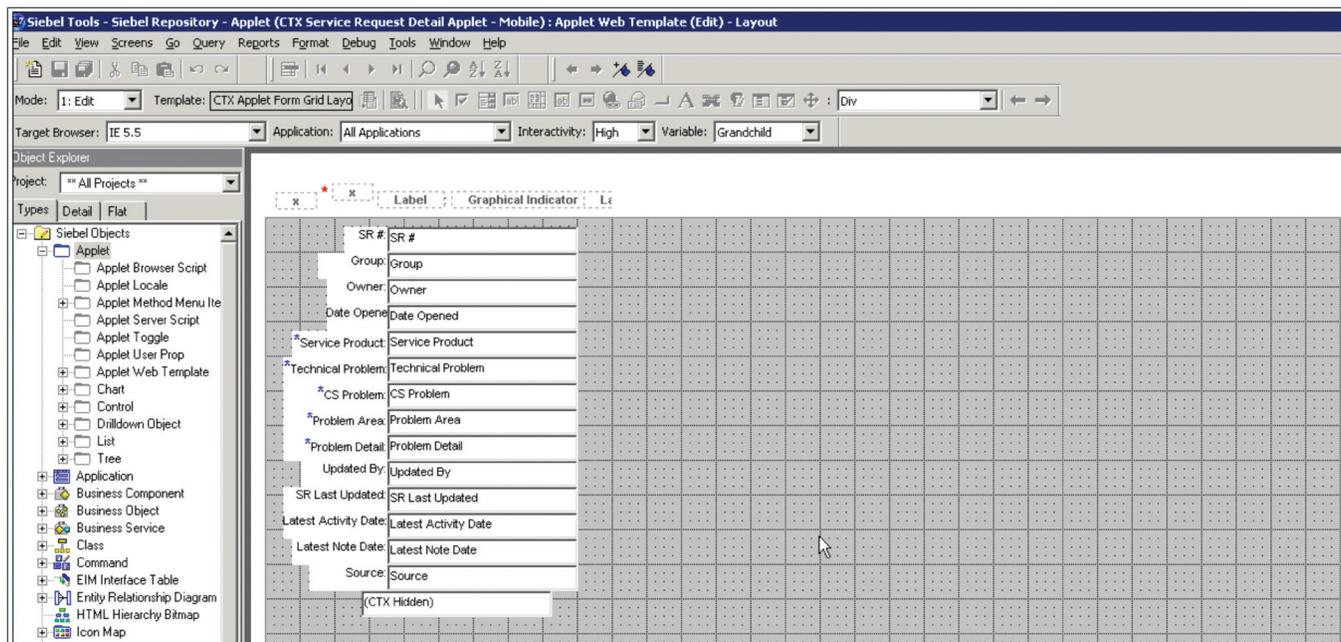


Figure 3 – The simplified mobile version of the CRM Service Request form applet

- If we had not performed this light customization to create an alternate UI, the solution would still run with the full enterprise version but would not be very usable—users would need to scroll left-right-up-down to view information laid out to fit the dimensions of a computer monitor.

Navigation refinements

This involved light customization of the UI to navigate easily within the dimensions of the iPhone. Examples:

- To move forward through the application, we relied on hyperlinks for easy navigation. This enabled drill-down movement and cross-entity navigation as the user progressed through a search. Screen and view tabs were not incorporated—the hyperlink drilling replaced tabs.
- During a search, users moved across entities using hyperlinked field labels on form applets. These controls were configured with an HTML Type of Link. The Method Invoked was configured using standard GoToView methodology with applet server script utilizing Siebel eScript.

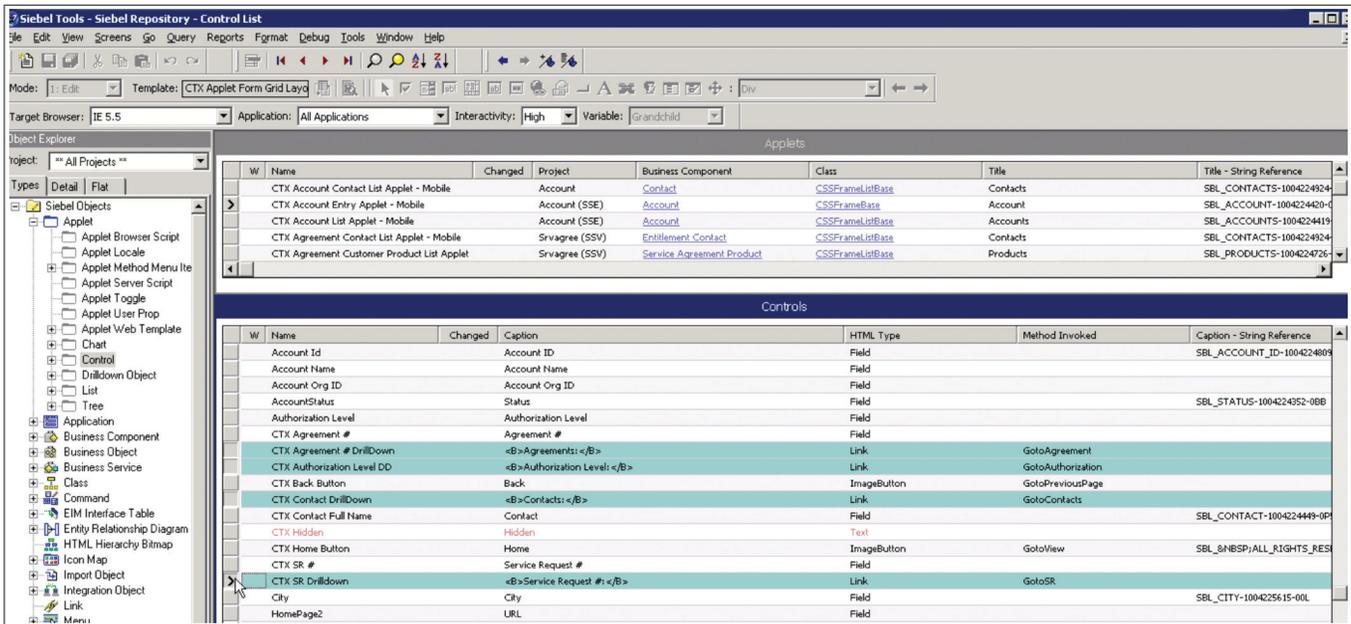


Figure 4 – Examples of the Control HTML Type and Method Invoked

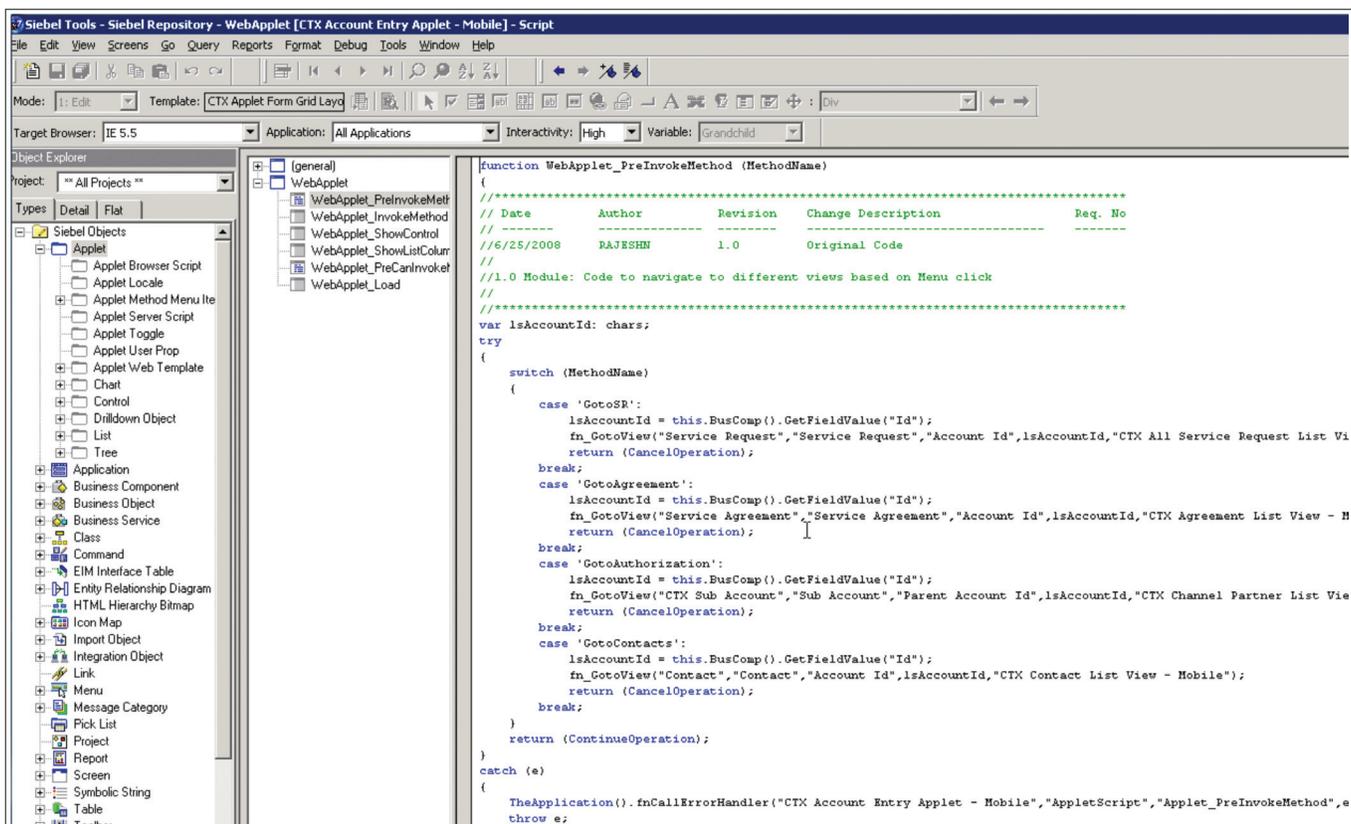


Figure 5 – How GoToView was configured using Siebel eScript syntax

- To move backward one screen within the application, we replicated the IE browser’s Back button and added it to the top of the mobile views. This involved creating custom Back button functionality script. The Back button provides dynamic functionality so the user can move back one step to the previously visited view.

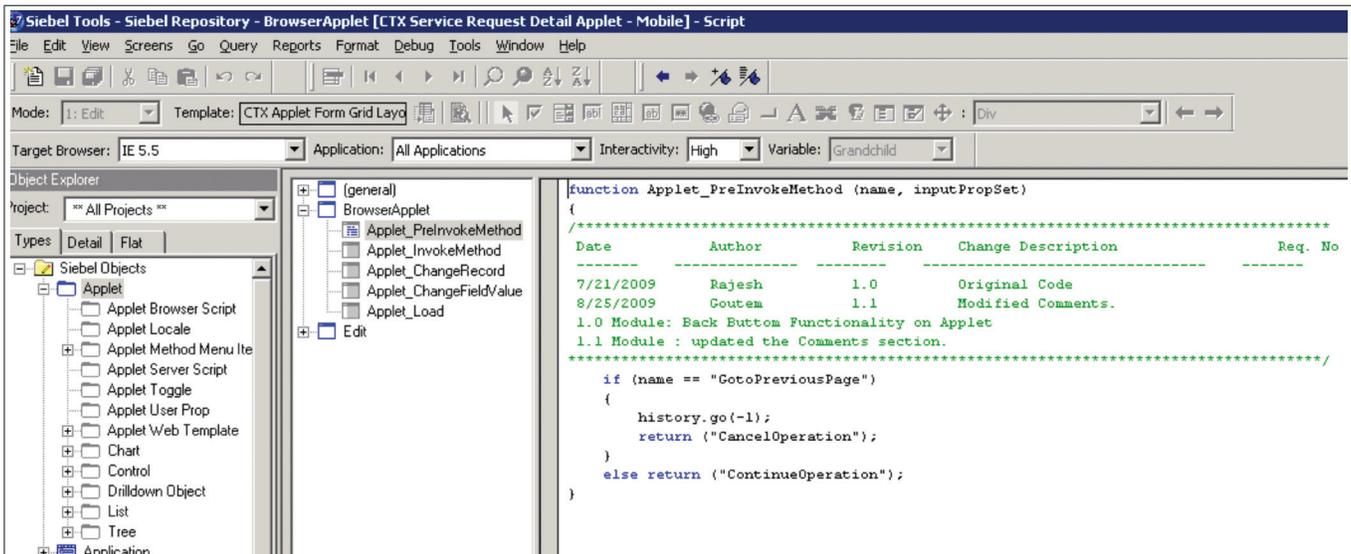


Figure 6 – The Back button script

- To move directly back to the Home view to start a new search, a Home button was added to the top of the mobile views. This is vanilla Siebel GoToView functionality.
- To keep the mobile version as simple and lean as possible, the intended business users identified the information that was important for their smart phone usage scenarios. Only those fields were incorporated.

The result maintained the look and feel of Siebel applications. For example, users still see the familiar list and form applet structures, hyperlink navigation, list of value dropdowns, search boxes, and column header sorting.



Figure 7 - iPhone screens from the two mobile applications adapted by Citrix

Modifications to the back end

- Needed no back-end coding. The mobile application shares the same database and repository as the original intranet application version. The solution reuses existing code and business workflows.
- Incorporated new object managers into the existing Siebel infrastructure to handle the mobile connections associated to the mobile application URL.
- Retained the original run-time environments. The mobile application runs behind the corporate firewall at the XenApp server farm, which is why there were no compatibility issues with the Active X controls and the high interactivity UI framework used by Siebel. The iPhone simply acts as a display monitor and keyboard; the work is going on in the datacenter.

Timeframe involved

The amount of time to implement this solution depends upon how much of the original application is to be included within the mobile version.

For Siebel CRM for Mobile, the team devoted approximately 120 dev hours + 80 admin hours to create a mobile version with 15 applets. Plus, analyst time was needed to gather business requirements and test. End-to-end, the solution involved about nine weeks of time.

How the solution works

- **Step 1** – The iPhone user taps the Citrix Receiver icon downloaded for free from the Apple App Store to open the Citrix Receiver for iPhone application.

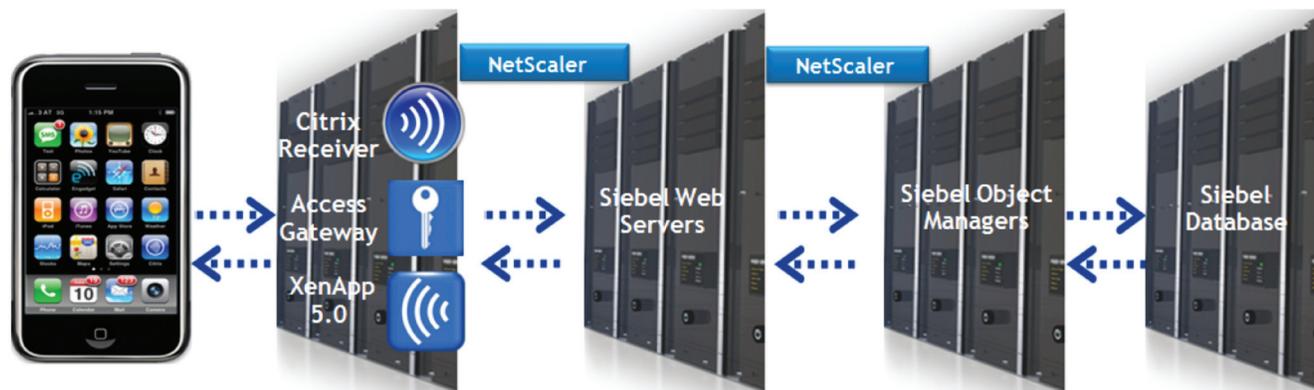


Figure 8 – Siebel CRM for Mobile Delivery architectural diagram

- **Step 2** – The user enters valid network login credentials, and moves into the corporate intranet.
Behind the scenes: Citrix Receiver bundles Citrix® Access Gateway™ technology to provide secure user authentication, and XenApp client technology to move through the corporate network and view the list of applications available on the XenApp server farm.
- **Step 3** – The user sees the list of applications available on the corporate XenApp server farm and selects the mobile version of interest.
Behind the scenes: The user connection passes through Citrix load balancing technology (Citrix® NetScaler® and Citrix® Branch Repeater™) to reach the requested mobile application on one of the redundant Siebel Web Servers.
- **Step 4** – The user is presented with the requested application (no need to sign on here—this is a single sign-on pathway). The user navigates to and interacts with the selected mobile application.
Behind the scenes: The user requests pass through NetScaler load balancing technology to reach a redundant Siebel Object Manager server, which processes the logic and interacts with the Siebel database.
Information passes back to the iPhone user in the form of partial screen paints. No actual data elements travel over the network, keeping data securely within the datacenter. These screen paints are sent to the user following the reverse pathway.



Setup by users

From the iPhone device, a new user must download the free Citrix Receiver application and then enter a small amount of one-time setup information. Setup includes the enterprise server address, domain information, username, and password.

Once set up, the user taps the Citrix Receiver icon, logs in, and navigates to the target application.

When users access from within their domain, they use domain authentication. When accessing from outside the domain, they use RSA token plus domain authentication.

Solution benefits

100% secure and 100% data retention with world class performance

Data is protected in two ways: The smart phone user must provide valid login credentials to enter the corporate network, and data elements are not exposed over 3G due to the screen paint approach. As a bonus, the screen paint protocol delivers world class performance for rapid information retrieval.

Avoids incompatibility issues between the mobile phone platform and the target application's platform

This is possible because all processing occurs within the enterprise datacenter, with the smart phone simply displaying screen paints. In the Citrix-specific situation, the server farm handled the Active X controls and all other technical elements that may otherwise conflict with an Apple environment.

Minimizes development time and cost

As explained earlier, customization focused on creating new front-end views (applets) to enable the UI to fit and navigate within the confines of the small mobile display.

Minimizes user training

The application's mobile version can retain much of the look and feel of the original intranet application, minimizing the amount of training for users of the original application. In the Citrix situation, the Oracle applications retained familiar features such as applets, hyperlink drilling, column sorting, and Siebel search.

Summary of solution elements

Key players within the Citrix Receiver for Enterprise Applications solution

Solution component	Details
Intranet versions of enterprise applications	These must already be in place, published on the enterprise's XenApp server farm
Alternate mobile versions of intranet enterprise applications	Lightly customized versions that conform to the smart phone display format
Citrix Receiver for Mobile (select the version optimized to the mobile device)	<ul style="list-style-type: none"> • This is a free application available as a download • Access Gateway technology is bundled into Citrix Receiver to manage secure user authentication • XenApp client is bundled into Citrix Receiver, enabling the user to connect to the enterprise intranet and select from the list of applications hosted on the XenApp server farm
XenApp server farm	<ul style="list-style-type: none"> • The XenApp server farm hosts the original enterprise applications and alternate mobile versions • Mobile applications run from the server farm, passing back only screen paints to the smart phone
NetScaler and Branch Repeater	Products that contribute load balancing technology for the Siebel Web Servers and Siebel Object Manager Servers

For additional detail

For detail regarding the Citrix Receiver for Enterprise Applications solution, readers can contact the Siebel CRM Practice directly at Citrix: #SiebelCRMPracticeNews@citrite.net.

Solution owners:

- **Raminder Singh**
Senior Director – Siebel CRM, IT
- **Girish Yadav**
Director, Siebel CRM – Architecture
- **James Cagle**
Director, Siebel CRM – Program Management

For additional detail on Citrix Receiver and other Citrix technologies, please visit www.citrix.com.

**Worldwide Headquarters**

Citrix Systems, Inc.
851 West Cypress Creek Road
Fort Lauderdale, FL 33309, USA
T +1 800 393 1888
T +1 954 267 3000

Americas

Citrix Silicon Valley
4988 Great America Parkway
Santa Clara, CA 95054, USA
T +1 408 790 8000

Europe

Citrix Systems International GmbH
Rheinweg 9
8200 Schaffhausen, Switzerland
T +41 52 635 7700

Asia Pacific

Citrix Systems Hong Kong Ltd.
Suite 6301-10, 63rd Floor
One Island East
18 Westland Road
Island East, Hong Kong, China
T +852 2100 5000

Citrix Online Division

6500 Hollister Avenue
Goleta, CA 93117, USA
T +1 805 690 6400

www.citrix.com

About Citrix

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