Design considerations for Citrix StoreFront: Responding to challenges in the mobile age
Executive summary

Today's fast-paced lifestyle demands instant, on-demand access to anything and everything. As the most technically advanced generation to date, we are changing the way we work, live, and interact on a daily basis. One of the key enablers behind this shift is the ability to be mobile and yet connected—sometimes using multiple devices at the same time to research, create, and communicate. Today's mobile devices serve as the backplane for our professional and private lives, keeping us connected and productive as we transition through the day.

Mobile devices aren't the only thing driving this transformation; access to a plethora of mobile apps is as much a catalyst for change. This upswing in mobile activity has spawned the concept of an app store or app marketplace. Today, to get the latest, greatest app everyone flocks to their respective app store, which serves as the ecosystem for every type of application available to that respective device platform. The app store takes one-stop shopping to a whole new level, by providing every user with one centralized access point for any type of app they desire. The concept of an app store has gained momentum for more than one reason. Apps available in an app store are easy to access. In a few clicks the app is installed and running, a sharp contrast to the process for purchasing, downloading, and installing desktop or server apps. App store users can pick and personalize an app list to meet their individual needs. Then they can synchronize their app set to be the same across all of their devices, making their user experience both personal and consistent.

With Citrix StoreFront you can bring that same on-demand app store experience and more to your enterprise. StoreFront expands on the concept of an app store by allowing IT administrators to create an enterprise store with on-demand access to apps, desktops, and data. It empowers users with a single, consistent point of access to business resources from any device while strengthening security, simplifying management, and enabling a XenApp and XenDesktop deployment. This whitepaper highlights how creating an enterprise app, desktop, and data store will provide employees with the instant access they desire while giving IT administrators centralized control.

Accommodating an on-demand workforce

StoreFront allows IT admins to create a one-stop enterprise app store that works across any device type, including mobile. Like app stores from Android or Apple, StoreFront is about self-service and personalization, but creating an enterprise app store with StoreFront is even more versatile. A StoreFront app store delivers access to XenApp and XenDesktop resources from any type of device while also allowing mobile access to Windows apps that weren't originally designed for a mobile world, like Microsoft Outlook, Word, and Excel. An app store created by StoreFront is universal meaning that there isn't a separate enterprise app store for Mac users, Android users, and Windows users; there is just your IT organization's enterprise app store for all devices.

Think about how combining an enterprise app store provided by StoreFront with the application, data, and desktop resources delivered by XenApp and XenDesktop will change the way employees conduct business and administrators manage business resources:

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Today’s workforce is technically advanced, constantly acquiring the latest devices, which is why the Bring Your Own Device (BYOD) movement has seen so much activity. In the past, IT always tried to control the endpoints. They developed one rigid, perfect desktop image that was issued to all corporate laptops. Each mobile device was tested and validated before it was approved for the workplace. Now with StoreFront, you can use an enterprise app store to deliver instant access to apps, desktops and data to the employee’s device of choice.

IT has traditionally battled the process of employees transitioning from a local workplace located within the corporate network to a remote workplace located on a potentially unsecure network. Mobility has made that concept even more complicated with the introduction of mobile devices and Wi-Fi, but with StoreFront, this distinction proves irrelevant as all users—local, remote or mobile—have the same user experience and the same level of access to apps, desktops and data.

IT organizations are making the transition from controlling the user experience into an era of enabling or empowering the employee. BYOD programs have launched the initiative, but an enterprise app store can make the employees feel even more in control. With an app store, employees have the ability to create an on-demand, personalized environment that follows them from device to device, giving each employee a personalized experience without relinquishing complete administrative control.

StoreFront has emerged as an indispensable component of the overall XenApp and XenDesktop architecture and performs a wide range of functions. Maximizing all of the benefits depends upon adequately addressing a number of crucial design considerations and understanding the high level architecture of StoreFront.

**StoreFront components and services**

StoreFront is an integral component of any XenApp and XenDesktop implementation. Strategically located as the liaison between Citrix Receiver on the endpoint and XenApp/XenDesktop in the datacenter, StoreFront helps admins enable enterprise mobility to allow employees to work anywhere, from virtually any device. It also helps IT improve enterprise security and simplifies XenApp and XenDesktop deployments built on a more modern, flexible and powerful framework providing next generation technology.
Here’s a detailed breakdown of StoreFront as defined by these major components:

**Store Services.** The Store retrieves employee credentials from the Authentication Service and forwards them to the XenApp or XenDesktop server which revalidates the credentials before using them to determine the list of available resources. When the list of available XenApp and XenDesktop resources is enumerated, it is cross referenced within the Store’s personalization settings for that individual user to create a unique set of resources that are both customized and personalized for that user. The Store is essentially a component that has all the advantages of a database, without forcing an admin to implement database replication and synchronization. The Store collects each employee’s preferences and seamlessly replicates that information across StoreFront servers, making the architecture and implementation of StoreFront very simple.

**Authentication Services.** This service authenticates employee credentials against Active Directory. With Authentication Service, employees only enter their credentials once and then the Authentication Service manages the delivery of those validated credentials to the other architecture components when needed delivering a streamlined access approach to XenApp and XenDesktop resources.

**Receiver for Web.** StoreFront enables employees to access apps, desktops and data from a customizable web page. Employees may utilize Receiver for Web as a web-based, alternative to the client-based Receiver. If an employee would like to download and install Receiver, Receiver for Web provides all the necessary downloads to install the Receiver client on their device. Receiver for Web also provides strategic features such as allowing an employee to electively change their

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password, restart a desktop, or auto launch. If an employee is unable to install Receiver, Receiver for Web can automatically leverage Receiver for HTML5 to enable access via a supported HTML5 compatible browser. Allowing employees access without installing any software on the endpoint.

**Desktop appliance site.** Desktop Appliance Site is an additional web site that can be installed on the StoreFront server. When enabled, this site allows Windows and Linux embedded thin clients or PCs repurposed as thin clients to automatically launch a virtual desktop. This site also includes additional features that allow the employee to restart their virtual desktop when necessary.

**XenApp services.** XenApp Services is an additional web site that can be installed on the StoreFront server that enables employees on a Windows device to enumerate apps and display them within the Windows start menu under programs. With the XenApp Services site, employees can access their XenApp apps from both their Windows device start menu or within Receiver.

**NetScaler Gateway.** NetScaler Gateway is a feature of the physical or virtual NetScaler appliance, which secures and encrypts access to XenApp and XenDesktop resources. The appliance is typically located within the DMZ and exposed to the Internet. NetScaler Gateway is commonly configured in-line with the StoreFront servers to secure communication from the employee's device while providing IT administrators with granular application-level policies and action controls.

**Features to drive outstanding execution**

The StoreFront user experience is designed to optimize productivity. Allowing employees to transition from client meetings to offsite workshops to coffee shops to their homes, calling up any data, apps and desktop functions they require in a rapid, seamless manner. The StoreFront enterprise app store is customized to suit the needs of each employee: If they consistently use a few specific business apps--of the dozens provisioned from the store--then a simple employee initiated configuration present only those icons on their screens, reducing visual clutter and confusion.

As for specific features, StoreFront includes the following:

- **Self-service enterprise store.** IT provisions, manages and updates a complete list of resources for each employee, but that employee is empowered to personalize their own list of apps, desktops and data from the authorized list. This prevents employee confusion that results from admins provisioning hundreds of apps when the employee really only uses three or four. Through Active Directory memberships, IT also can push select resources to employees to make a few apps appear at first login.

- **Follow-Me Data.** As indicated, employees access all apps, desktops and data from any device, anywhere. It's like having their "favorites" stored within the server instead of on the client side.

- **Automated synchronization.** Workers personalize their app, desktops and data sets, and then settings are immediately stored on the StoreFront server and replicated to other StoreFront servers without requiring an external SQL database.
**Desktop control.** Through StoreFront, employees control a variety of desktop tasks, such as desktop reboot and auto launch, supporting a broad pool of Windows and Linux-embedded thin clients. They maintain the level of control they desire, while dramatically reducing help desk calls.

**Remote access.** Integration with Receiver for Android, iOS, Windows and Linux devices enables secure remote access without resorting to a full VPN client.

**Clientless access.** If the employee is unable to download and install Receiver to the endpoint device, StoreFront is able to detect that Receiver is not available and automatically revert to using Receiver for HTML5 for clientless access to XenApp and XenDesktop resources.

**Design considerations**

The focus of this whitepaper is StoreFront, but it’s beneficial to understand the history and evolution of this feature. The precursor to StoreFront was Web Interface, which provided secure, remote access to XenApp and XenDesktop resources through any browser-equipped device. As Citrix looked to the future, the value of delivering a unified access experience across a broad range of endpoint devices, streamlining product architecture and IT management, and enhancing the overall authentication and security of the solution brought about the need for StoreFront. While Web Interface served its purpose well and is still available until the product is officially retired in 2015, StoreFront is now the future.

As part of your IT department’s preparations for a StoreFront deployment, consider the following design considerations as part of the design and planning process:

**Availability.** Although it is likely that a single StoreFront instance could support your XenApp and XenDesktop workload, failover and redundancy are still crucial to maintaining on-demand access. If XenApp/XenDesktop session traffic is routing through a single StoreFront server that suddenly fails, any new connections to the XenApp/XenDesktop applications and desktops will be unavailable; however, it should be mentioned that a StoreFront failure will not impact any existing active XenApp/XenDesktop sessions. Thus, Citrix highly recommends deploying two StoreFront servers, either Windows 2008 R2 or Server 2012, to eliminate any possibilities of a single point of failure that may disrupt productivity and configuring the IP address or DNS name of one controller in each farm. To streamline the management of multiple StoreFront servers, Citrix has provided a single admin interface from which you can manage all the servers in your StoreFront cluster. To make implementation even more robust, Citrix NetScaler appliance can be configured to load balance user requests between the multiple StoreFront instances as well as monitor their availability.

**Scalability.** StoreFront has a highly scalable architecture given that the number of users that a single StoreFront server can support is not limited by the number of users leveraging the server, but rather the number of operations that each user can perform per hour. This is caused by the fact that StoreFront is utilized only when a user performs an action, such as subscribing to an application within Receiver. While the user is connected to their XenApp/XenDesktop published resources StoreFront remains idle.
Secure communications. StoreFront is an intermediary point in the user authentication, application enumeration and session initialization process for a XenApp and XenDesktop solution. Communication from a web browser or Receiver to StoreFront includes sensitive information required to access the list of XenApp/XenDesktop resources available for an individual user or to initialize an actual XenApp/XenDesktop session. In most cases this frontend communication occurs over networks outside the corporate firewall. Once StoreFront receives the request, StoreFront must communicate to the backend XenApp/XenDesktop environment to authenticate and process the request. This communication occurs within the corporate network but still contains sensitive information. In both cases, frontend and backend, it is recommended that the lines of communication are encrypted and secure. NetScaler has been designed to integrate with StoreFront to simplify the secure communication configuration process and SSL certificate management from outside networks to StoreFront. While the line of communication from StoreFront to the XenApp/XenDesktop servers is contained within the corporate network it is still recommended to encrypt and secure this traffic as well. To further enhance the security of the XenApp/XenDesktop deployment albeit for compliance reasons or to promote regulatory standards, StoreFront in conjunction with Receiver can also be configured to enable native smart card authentication including options for bimodal authentication from Windows and Linux endpoints without the use of browsers.

Multi-site deployment. In some cases a XenApp and XenDesktop deployment might span multiple data centers, branch offices, or in some cases a single organization might have multiple XenApp farms and XenDesktop sites. While each individual farm serves its own purpose admins might want their user community to have access to one centralized enterprise app store, a one-stop shop for any employee looking for on-demand business resources. StoreFront can do just that. StoreFront can aggregate the applications across all the individual instances and intelligently remove duplicate instances of repeat apps to deliver a simplified users experience. For example, if one site (Farm A) has Microsoft Word available and as does the other site (Farm B), then the employee only sees one instance of Microsoft Word available, not two. Default apps can also be configured as the default personalization, so the most common apps are already in the self-service section when a new employees log in for the first time. StoreFront can also provide users and user groups with a home and standby site to ensure availability in the event of a failure. If a failure occurs StoreFront provides the ability to replicate user personalization settings across different sites and seamlessly transition the user from their home site to a remote site for business continuity.

Validation. Internal testing remains important to validating any XenApp, XenDesktop and StoreFront recommendations outlined in this whitepaper. Citrix recommends executing thorough validation and performance testing on any implementation prior to a production rollout.
Conclusion
Empower your users with an enterprise app store that gives each employee access to the applications they need to do their jobs. StoreFront enables you to mobilize your workforce today and deliver high performance, personalized access to all your organization’s critical business resources with key features such as:

- Enterprise app store for IT to provision, manage and update all XenApp and XenDesktop resources
- Self-service selection and personalization of apps, desktops and data
- Personalization that follows users from device to device
- Mobile access to traditional Windows apps today

For more information on XenApp, XenDesktop and StoreFront, click here.