

ICEfaces®

OPEN SOURCE AJAX FOR JAVA EE



ICEfaces is an integrated Ajax application framework that enables Java EE application developers to easily create and deploy thin-client rich Internet applications (RIA) in pure Java. ICEfaces is a fully featured product that enterprise developers can use to develop new or existing Java EE applications at no cost.

ICEfaces leverages the entire standards-based Java EE ecosystem of tools and execution environments. Rich enterprise application features are developed in pure Java, and in a pure thin-client model. There are no Applets or proprietary browser plug-ins required. ICEfaces applications are JavaServer Faces (JSF) applications, so Java EE application development skills apply directly, and Java developers are isolated from doing any JavaScript related development.

Product Features and Benefits

The benefits of using ICEfaces to enrich enterprise web applications are numerous:

- **Rich User Experience:** Create a superior user experience and produce more effective enterprise Java EE Ajax applications. Leverage the ICEfaces Component Suite of 55+ JSF Ajax components and create a new class of enterprise applications that will transform the user experience.
- **Open Source:** ICEfaces is the most successful enterprise Ajax Java framework available under open source. The ICEfaces Java EE Ajax developer community is extremely vibrant, already exceeding 85,000 developers in 36 countries worldwide.
- **Standards-based:** ICEfaces is a pure Java enterprise solution so developers can continue to work the way they are use to. Existing Java IDEs and test tools can be leveraged during development.
- **Easy Ajax:** ICEfaces is much more than a component suite, it is a Java Ajax application framework that provides ease of development for Java/JSF developers. ICEfaces applications are developed with minimal design effort in Java/JSF not JavaScript.
- **Ajax Push:** Ajax Push is a revolutionary capability of the ICEfaces framework that enables asynchronous, web-based push of presentation changes to the client browser based on server-side events. Ajax Push is a fundamental capability of the ICEfaces framework, available from the very first release. The framework handles all of the low-level intricacies of the push mechanism, providing the developer with a simple, pure Java API for application development. This frees the developer to focus on creative aspects of push-style application development.
- **Security:** ICEfaces EE is the most secure Java EE Ajax solution on the market today. It is compatible with SSL, prevents cross-site scripting, malicious code injections and unauthorized data mining. As a server-based solution, ICEfaces EE doesn't expose application logic or user data, plus it is especially effective at preventing fake form submissions and SQL injections attacks.

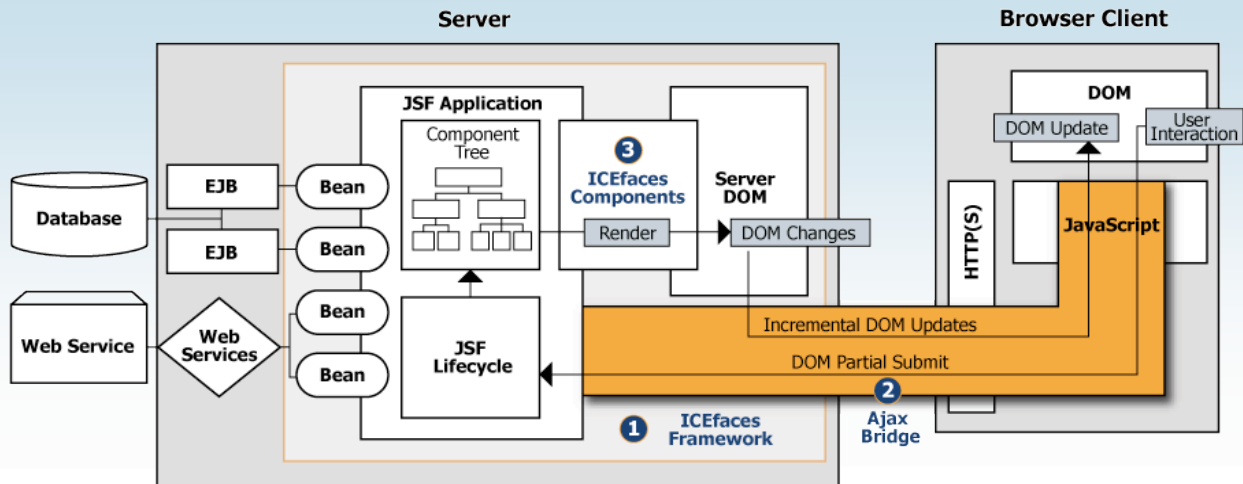
Architecture

Application Development Model

The primary goal of the ICEfaces architecture is to provide application developers with a familiar Java Enterprise development model, and completely shelter them from the complexities of low-level Ajax development in JavaScript. The key to the ICEfaces architecture is a server-centric application model, where all application logic is developed in pure Java, and executes in a standard Java Application Server runtime environment. This means that existing Java EE infrastructure, development environments, and best practices remain relevant and useful.

The rich presentation features of ICEfaces are based on the JavaServer Faces standard. ICEfaces applications development is essentially JSF development, which promotes a component-based architecture using familiar tag-based declarative UI definition, and dynamic data binding into the server-resident application data model. Utilizing the ICEfaces Ajax-enabled component suite, which provides all the standard JSF components, as well as a complete set of extended components, developers can build a standard JSF application that adheres to the standard server-centric JSF application lifecycle, but benefits automatically from rich Ajax-based features of ICEfaces. ICEfaces also enables Ajax Push style applications, making it simple to enhance applications with instantaneous presentation updates driven by server-side state changes, or collaborative user interactions. Using ICEfaces and pure Java/JSF programming techniques, application developers can develop next-generation rich web applications without ever writing a single line of JavaScript.

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ICEfaces Architecture

While the underlying Ajax-based rich presentation mechanism in the ICEfaces implementation is completely transparent to the application developer, it is useful to understand what is happening behind the scenes in ICEfaces applications. There are three core elements to the ICEfaces architecture illustrated in the diagram on the right.

ICEfaces Framework

The ICEfaces Framework is an extension to the standard JSF framework, with the key difference in ICEfaces related to the rendering phase. In standard JSF, the render phase produces new markup for the current application state, and delivers that to the browser, where a full-page refresh occurs. With the ICEfaces framework, rendering occurs into a server-side DOM and only incremental changes to the DOM are delivered to the browser, and reassembled with a lightweight Ajax Bridge. This results in seamless, smooth update of the browser page with only the necessary presentation elements being re-rendered. The ICEfaces Framework also provides complete run-time management of Ajax Push and integrates the mechanism seamlessly with the JSF lifecycle.

Ajax Bridge

The Ajax Bridge has server-resident and client-resident elements that coordinate Ajax-based communication between the client browser and the server-resident application. The Bridge is responsible for delivering incremental presentation changes to the browser client, and reassembling those changes in the browser DOM to affect presentation changes. The Bridge is also responsible for detecting user interaction with the presentation, and delivering user events back to the application for processing through the standard JSF lifecycle. A mechanism called *partial submit* is built into the ICEfaces components and facilitates automatic event generation across the bridge, so the application developer is not exposed to the low-level event mechanism. The Ajax Bridge is established automatically on first page load of the application and coordinates presentation updates and user event transmission for the entire lifetime of the application.

ICEfaces Component Suite

The ICEfaces Component Suite provides all of the building blocks for the application UI. It includes both the standard JSF components, and a wide array of advanced components that enable the developer to assemble sophisticated application user interfaces efficiently. All ICEfaces component renderers leverage the server-based, direct-to-DOM rendering mechanism provided in the framework, and use their partial submit attribute to facilitate automated event generation over the Ajax Bridge based on user interaction with the component's presentation. Optionally, ICEfaces components can be enabled with a variety of script.aculo.us effects such as drag and drop. Again, ICEfaces components carry attributes that enable various effects, so the developer is never exposed to low-level JavaScript programming to get dynamic features from a component.

ICEfaces EE

ICEfaces EE is a commercial software product that extends the ICEfaces open source project to provide advanced enterprise features and capabilities. To find out more about ICEfaces EE, refer to the ICEfaces EE Datasheet.