

# KAAZING IN TELECOMMUNICATION

WEB COMMUNICATION WITHOUT LIMITS

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## Background

Carriers are facing rapidly increasing network demands that are taxing 3G networks and eroding profit margins. As carriers' average revenue per user (ARPU) shifts to be more dependent on data revenues instead of voice revenues, there are increased demands on data operating margins. Additionally, carriers are racing to enrich their mobile portal experiences to fight customer churn and differentiate the carrier experience from the handset experience.

### Extending High-Performance Messaging Systems to the Web and Mobile

Now there's Kaazing and its flagship product, Kaazing WebSocket Gateway. Kaazing WebSocket Gateway is a high-performance platform that delivers full-duplex Web communication. Kaazing makes it possible to deploy fast, reliable real-time applications directly to any browser – mobile or desktop – utilizing the full feature set of any enterprise messaging protocol and without the overhead, delays, and operational headaches that traditionally plague such deployments.

Platforms such as the Apple iPhone and iPad, and the Google Android drive users towards higher data usage while the promised lower data provisioning costs of 4G networks is still years away. Carriers looking for ways to deliver a rich Internet experience to their entire portfolio of customers, on both feature phones and basic phones, are hampered by the concerns of pushing such seemingly data intensive content to the handset. The resulting increase of backhaul requirements will cause not only bandwidth bottlenecks but also increase operational expenses (OpEx), potentially eroding the future cost savings gained by deploying the 4G networks. One way to combat this margin erosion is to use a set of technologies that improves bandwidth utilization. For example, there are several technologies that improve video compression and delivery while others offer ways to reduce the refresh requirements of dynamic Web 2.0 sites.

### Reducing Cost and Improving Performance

Kaazing offers a solution to this conundrum; Kaazing WebSocket Gateway, an HTML5 standards-based WebSocket gateway that enables full-duplex communication from any Web-enabled device to any TCP-based back-end service. Kaazing reduces the bandwidth required for communication to the backend server by up to 90%. Kaazing WebSocket Gateway reduces the overall bandwidth required for rich Internet experiences while also improving latency, allowing applications such as online trading and mobile gaming applications to communicate in real-time over the Web.

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*Kaazing's WebSocket Gateway enables carriers to lower bandwidth requirements for the rich experiences mobile users are demanding, offering better bandwidth utilization and lower overall data services provisioning cost.*

*- John Feland, Ph.D, Chief Technologist, SK Telecom.*

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A Kaazing-enabled mobile gaming network would bring real-time multiplayer gaming to a carrier's network with very little network overhead to support such a novel experience. Additionally mobile instant messaging clients that lower the network chatter required to support this highly demanded service by users could be written on top of Kaazing WebSocket Gateway. Kaazing's platform allows carriers to build applications for their customers that work across handsets, since applications run in a browser, not as standalone applications, providing carriers the opportunity to create a stickier user experience on their network and fight customer churn.

### **Improved Smartphone Provisioning**

As handset manufacturers continue to assert themselves as the orchestrators of the mobile user experience, carriers are challenged to differentiate their services from the competition. For example, AT&T is leveraging only contractual agreements to hold onto Apple iPhone exclusivity. Carriers have the opportunity to create applications and other handset features that drive increased customer loyalty. Kaazing WebSocket Gateway is a key enabling technology in deploying rich, real-time experiences that both delight customers and minimize network bandwidth requirements.

### **Richer Feature Phone Experiences**

Carriers are also looking for methods to increase data revenues for customers that do not have Smartphone's. By building an application infrastructure based on Kaazing's technology, these less powerful handsets could mimic the richer Internet experience of their more capable Smartphone cousins. By serving only the minimum data from servers required for that exact experience, carriers can leverage Kaazing WebSocket Gateway to offer a full portfolio of feature phone applications that is not hampered by the performance limitations of Java ME, Brew or other multi-handset development environments.

### **Integrated Web and Mobile Experiences**

As users begin to blend experiences and activities across handsets and other devices, there is increased demand that these experiences be coherent across platforms. For example, Facebook on handsets offers only part of the complete Facebook experience and Twitter clients are similarly equipped. As carriers begin to offer compelling mobile experiences, Kaazing WebSocket Gateway allows an easy extension of these experiences to carrier web portals. Kaazing can also enable customers to manage their handset experience from the carrier's Web interfaces as carriers move from a billing and customer support focus and embrace the opportunity to build and sustain communities of customers.

### **Kaazing WebSocket Gateway**

Kaazing's flagship product, Kaazing WebSocket Gateway, is a platform for building real-time Web-based applications quickly and cost-effectively. Acting as a gateway, it connects any JavaScript-enabled browser to real-time data over a reliable full-duplex connection. At the core of Kaazing WebSocket Gateway is Kaazing's patent-pending WebSocket Acceleration™ technology, which seamlessly connects Web users directly to any real-time data feed.

Kaazing's WebSocket Acceleration technology eliminates the overhead and latency inherent to HTTP by extending the use of any TCP-based messaging format to any browser, delivering ultra high performance and bi-directional communication over the Web. Rather than translating between in-house, high-volume applications and Web front-ends, KEG just extends the application's reach - turning every browser into a full-featured enterprise platform, a first-class citizen of the backend system that is both fast and fully manageable.

WebSocket Acceleration does not rely on costly "long-polling" techniques that eat up server resources and induce latency. It works with a wide variety of client-side technologies, including JavaScript, Adobe Flash, Microsoft Silverlight, Java Applet, and JavaFX. Kaazing technology implements the latest W3C and HTML 5 communication standards, which many analysts and industry experts believe will be the foundation of future Web development.

### Kaazing WebSocket Gateway

Our flagship product, the Kaazing WebSocket Gateway, is a high-performance platform that enables full-duplex Web communication ideal for building real-time RIAs quickly and cost-effectively. Acting as a gateway, it connects any Web-enabled device and JavaScript-enabled browser to real-time data over a reliable full-duplex connection. At the core of Kaazing WebSocket Gateway is Kaazing's patent-pending WebSocket Acceleration™ technology, which seamlessly connects Web users directly to the real-time data flowing through an organization.

WebSocket Acceleration eliminates the overhead and latency inherent in HTTP by extending the use of any TCP-based messaging format to any browser, delivering ultra high performance and full-duplex communication over the Web. Rather than translating between in-house, high-volume applications and Web front-ends, Kaazing WebSocket Gateway just extends their reach - turning every browser, and Web-enabled end point, into a full-featured enterprise platform, a first-class citizen of the messaging system that is both fast and fully manageable.

WebSocket Acceleration requires no browser plug-ins, and integrates quickly and easily with enterprise messaging platforms. It does not rely on costly "long-polling" techniques that eat up server resources and induce latency. Furthermore, it works with a wide variety of client-side technologies, including JavaScript, Adobe Flash, Microsoft Silverlight, Java, Java-applet, Google Android, Apple iOS and JavaFX. The technology implements the latest HTML5 communication standard - WebSocket, which many analysts and industry experts believe will be the foundation of future Web development. However, with Kaazing WebSocket Gateway, we ensure that even older, pre-HTML5 browsers can benefit from the same HTML5 communication features and work with real-time messaging protocols without additional software.

### Bandwidth Utilization

To illustrate the impact of using WebSocket technology in contrast to traditional HTTP, the below graph (figure 1) shows the usage of a trading application deployed to the Web. The graph shows how much overhead data was transmitted to and from a web-enabled client, not the actual data displayed to the users, for each Web technology.

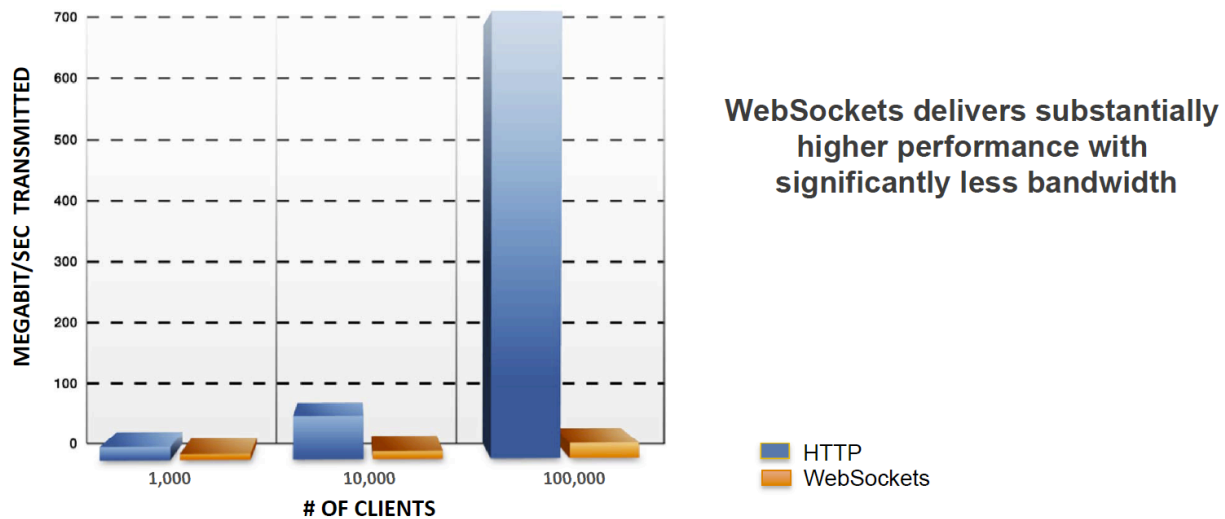


Figure 1. Comparison between HTTP and WebSocket traffic

The use case is simple; the web client receives 1 update per second, which is a low number if related for trading but sufficient to illustrate the point. Using HTTP to deliver the spot rates we wrap the spot rate data with HTTP request and response headers that, in this example, adds an additional 6,300 bits (788 bytes x 8) of overhead in network traffic per update. At 1,000 clients we send 6,3Mbps (1 update/sec x 6,300 bits x 1,000 clients) of unused header data. At 100,000 clients we send 630Mbps of unused header data. Compare this to WebSocket traffic where the header data equals 16 bits (2 bytes) of additional data traffic per update. Using the same data points as in the HTTP example we now, at 100,000 clients, send 1.6Mbps (1 update/sec x 16 bits x 100,000 clients) of additional data compared to 630Mbps in the HTTP example.

As shown in the above example, KWG saves a tremendous amount of network bandwidth compared to traditional HTTP polling or long-polling traffic. This also impacts the overall performance of the trading application and significantly reduces the latency of delivering the actual spot rates and the CPU/Memory resources on the server host that delivers the data. Plus, KWG provides a ubiquitous upstream delivery mechanism for traffic flowing back to the server based on executed trades, upstream chat, or other such responses from the dashboard user.

KWG is more than just a traditional unidirectional “push” server. KWG is the next generation high-performance Web platform that enables full-duplex bi-directional delivery of information,

as well as easy integration of popular enterprise messaging services such as 29West, Tibco EMS, IBM MQ Series, or other TCP-based transports with Web applications. It requires no third party browser plug-in or client-side installation, integrating seamlessly with existing user interfaces on virtually any browser and Web-enabled device.

## Product Features and Benefits

Using KWG, developers build services faster, CIO's streamline operations and meet the needs of the business at significantly lower cost, and end user clients enjoy a dramatically improved application experience.

Consider just some of the benefits:

Choice	Integration	Performance
<p>Ships with development libraries for HTML/JavaScript, Java, Adobe Flex/Flash, and Microsoft Silverlight—providing you with your choice of Rich Internet Application (RIA) development platforms. KWG supports all major browsers, such as IE5.5+, Firefox 1.5+, Opera 9.5+, Safari 3.0+, and Chrome 1.0+.</p>	<p>Provides easy integration with many popular messaging services such as 29West, TIBCO EMS, WebSphere MQ, ActiveMQ, and RabbitMQ. KWG can also be extended to support any number of TCP-based standard and custom transport protocols that may be required.</p>	<p>Offers a high-performance Web architecture that streams more data with less latency, ensuring you meet your Service Level Agreements (SLA), comply with performance requirements, and deliver a much more satisfying experience to end users.</p>
Scalability	Reliability	Standards Compliance
<p>Delivers up to 100 times the capacity of other approaches while reducing capital outlay and operational expenses and also preparing your organization for rapid adoption and traffic spikes. In cloud computing or virtualized environments, this also means fewer virtual machines and lower monthly bills.</p>	<p>Meets the exacting reliability requirements of Financial Services, ensuring that Web clients are as dependable as your existing messaging systems and enabling guaranteed message delivery. KWG can traverse any network, tunneling automatically through proxy servers and firewalls so that you can be sure your services are delivered.</p>	<p>Kaazing is spearheading work on industry open standards, ensuring availability of skilled development resources, and protecting your applications against vendor lock-in while ensuring their longevity and maintainability. Kaazing has taken a leadership position in the HTML5 specification, ensuring our clients have access to the latest technology today.</p>

## About Kaazing

Kaazing lets you build, deploy, and manage real-time Web applications that can handle very large numbers of users and very high message volumes, using standard browsers and protocols, without changing the way you build and integrate software. We are paving the road for the next iteration of the Web – one in which millions of people and devices communicate with one another instantly and efficiently in real-time.

With our tight focus on the Financial Services industry, we connect in-house messaging protocols directly to browser-based Rich Internet Applications, offering previously unattainable levels of performance and reliability that make browser-based applications perform as well as desktop software.

At Kaazing, we believe that this approach will become the standard way that all real-time Rich Internet Applications are expected to be delivered.

To learn more, visit us at [www.kaazing.com](http://www.kaazing.com) or contact [sales@kaazing.com](mailto:sales@kaazing.com)