



enlighten



Engineering
Out Of The Box

Your Game Changer.

Serve Side JavaScripting for connected devices user experience

WHITE PAPER

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HCL

INSTRUCTIONS

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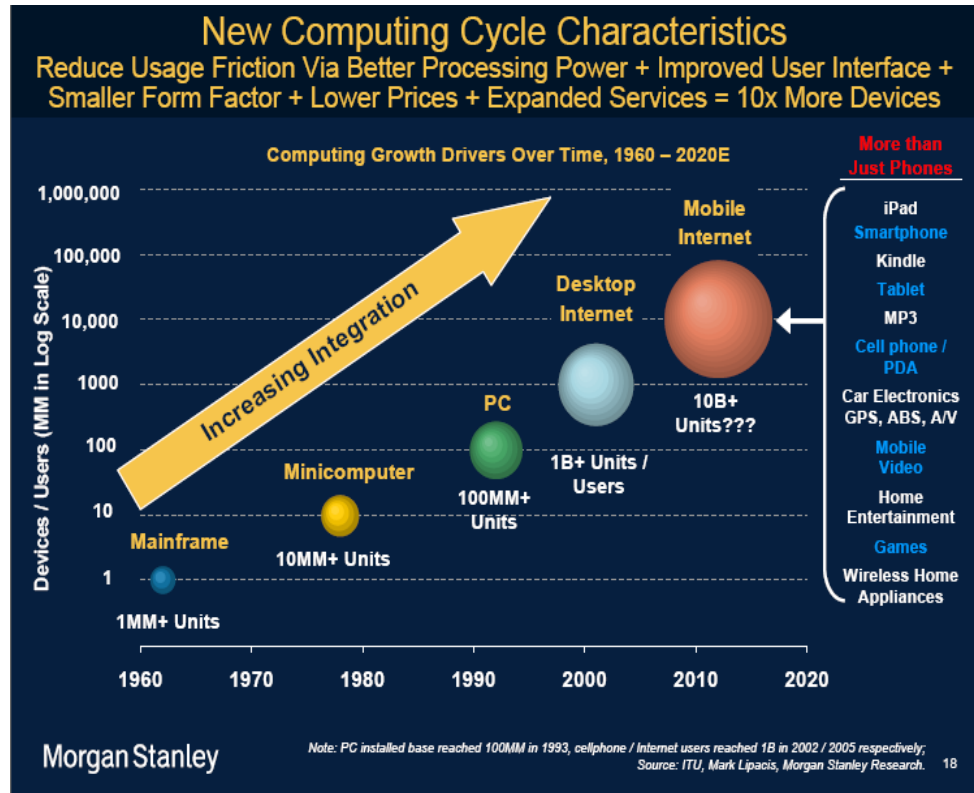
Abstract

During the last ten years there is a rapid change in devices used for web browsing. From powerful desktop to mobile to all other kind of connected devices aka Smart TV, Gaming console, Tablet etc. Now user expect web to be available where ever he go or as it is referred technically “Multimodal communication” for web properties is expected. User experience expectation also changes as the device used to browse the web changes. In this white paper, we explore the use of JavaScript on the server, also known as server-side JavaScript (SSJS) as a means to write application which caters to diverse set of web browsers and client devices

Market trend/ Challenges

Morgan Stanley report depicts trend for next decade where user will use plethora of other kind of devices and appliances to browse web. For better web traffic and user retention, web properties have to support all these kind of devices for browsing seamlessly. Challenges we are facing today is how to support all kind of end devices which are growing rapidly and still

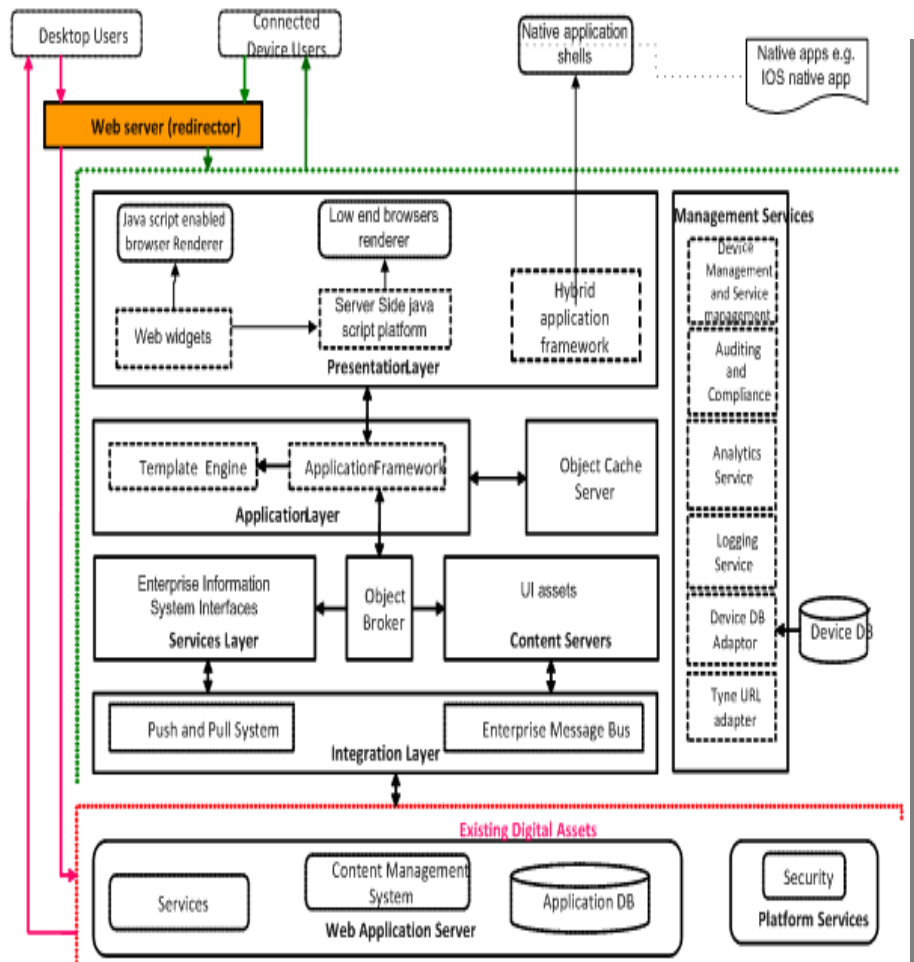
- Maintain single source code base
- Keep cost of software development and maintenance under control
- Cater to the UI of future devices automatically or with minimum code changes.
- Reuse existing digital assets



In the earliest days of the Web, when client devices possessed limited processing power, servers performed all Web page composition and manipulation, shipping the whole Web page for display as a response to every browser request. With desktop getting powerful we get into the era of heavier client side browsers with embedded run time environment like java script interpreter, Flash etc. With the invent of other connected devices like smart phone, smart TV gaming consoles it has created lot of complexity between various languages and cross platform portability problem. What do we need is a web application framework that makes application run both browser-side and server-side. With server side Java scripting, developers will no longer have to write different code for the server backend and browser frontend. Not only that, if we make server side smart enough then there should be no more warnings on web pages reading “JavaScript enabled is required”, since whenever JavaScript is not enabled in the browser, server side javascript-based applications will still run on the server side, all using a single code base.

Solution

In the diagram below we are going to propose reference architecture for server side java enable server application infrastructure. There are multiple server side java script platforms which enable such kind of infrastructure. In subsequent section we will provide a comparison of such platforms



Reference server side application architecture which support multimodal communication

Major component of architectures is as follows

Components	Responsibility
Web server redirector	Web server redirector based on user agent contact browser manager to redirect request to appropriate browser renderers. If browser supports full JavaScript it will redirect traffic to java script enabled browser renderer services
Java script enable browser renderer	This component serves the request for the browser that support full JavaScript. Essentially pages are server containing scripts etc which get render on client devices
Low end browser renderer	This component serves the request for the low end browser. Essentially it usages server side java script platform to process all java script code and serves plane HTML which is supported across browsers. It acts as a run time execution environment between web widgets and executes all java script code at the server. This layer enable serving user experience to low end browser still keeping single source code base.
Hybrid application framework	iOS or Android is a strong platform. These kinds of platforms have native apps which connect to server to fetch data. UI rendering etc happens on the device. Hybrid application framework enables application written in HTML, CSS, JavaScript and compile it in native code. E.g. phone gap
Application layer	Application layer consists of template engine. UI is prepared at run time depending on devices, factors rendering capability etc. Application layer interface with device database manager to gather device attributes pertaining to user experience. Application layer facilitate template base UI rendering keeping single source code base for all kind of communication mode.
Object Cache	Object cache is used to cache precompiled web pages to avoid sticking pages again and again. It is meant to enhance performance and help in scalability.
Object Broker	Object broker decouple UI assets container like images, video, etc and data sources like e-mail, feeds etc
Integration layer	To reuse existing digital assets of enterprise we need integration layer. Integration layer either can be push or pull type.
Management layer	Management layer provide various services to application layer to properly stitch pages base on device form factor and provided UI templates.

Having a single language makes some sense. For one thing, we can reuse code between browser and server implementations rather than try to map APIs between different languages. We can also happily use JSON as our default serialization. Above we only need to learn one language. This enables to provide an infrastructure to create lean, mean JavaScript-based server applications.

Comparison of different server side javascript platform

Name	Java script engine	Unique selling proposition	When to use?
Node.js	V8	Very few dependencies, runs very fast, and has a very active community	For prototype demanding real-time applications such as multiplayer game
Ringo	Rhino	A stable, high-performance runtime for server-side use	Java-JavaScript integration
Jack		Interface between JavaScript and the web server	To develop specialized server-side javascript framework or middleware.
Nitro		The Nitro JavaScript engine is an advanced bytecode JavaScript engine that makes web browsing even faster, and it's what powers Safari on the Mac, PCs, and iOS devices.	To deploy application using Google's App Engine
Opera	Futhark	You can stream music, show photo galleries, share files and folders, or even host your own Web pages directly from your browser.	To create and share simple applications
Apache sling	Rhino	It is an innovative web framework that is intended to bring back the fun to web development.	When you to use server-side JavaScript with a Java content repository (JCR)

Conclusion

Server-side JavaScript is an obvious direction for the evolution of web applications and services that ties in well with the developments on the client side of things like HTML5. While many of the current platforms are quite young, there is a very active community, and an active engagement in standardisation, that makes is a promising area for developers to look into. JavaScript is finally emerging from the scripting ghetto to become recognised as the web's most important programming language - the only language usable in both browsers and servers.

Reference

1. http://en.wikipedia.org/wiki/Comparison_of_server-side_JavaScript_solutions
2. <http://dailyjs.com/2010/07/19/javascript-comparison/>
3. <http://zope.cetis.ac.uk/members/scott/blogview?entry=20110124133546>

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