

Intel® Cloud Builders Guide: Cloud Design and Deployment on Intel® Platforms

Balanced Compute Model with NetSuite and Gproxy Design



Intel® Core™ vPro™ Processor Family



AUDIENCE AND PURPOSE

Cloud computing offers a path to greater scalability and lower costs for service providers, infrastructure hosting companies, and large enterprises. However, building and using a cloud can be a daunting task. With its partners, Intel is providing reference architectures through the Intel® Cloud Builders Program, a starting point for building a cloud by providing a basic hardware and software blueprint.

Clouds are often used to deliver services to client devices, including notebooks, phones, and tablets. End users are seeking not only to use a service but also to enjoy the best experience possible on a given device. This paper explores how the cloud can deliver a service in a way that adapts to specific client devices and optimizes the end-user experience.

The NetSuite Ecommerce* Cloud platform and Gproxy's CLIDES* (Client Device Score) product are two solutions. The usages described in this paper can be used as a baseline to build more complex usage and deployment models to meet specific customer needs.

The target audience of this paper is cloud service providers, enterprise and consumer ISVs, and enterprise IT departments that are looking to deploy a balanced web solution using the capabilities of the end-client to deliver a rich end-user experience. The paper introduces a set of publicly available web APIs and design-in methodology.

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Executive Summary

With the multitude of client devices flooding the market, cloud computing poses new questions about the optimal client strategy for enterprises and consumers. More and more applications and services are moving to the cloud, and users expect support across multiple devices. In many cases, users don't understand the difference in usage experience across devices.

Intel, working with NetSuite and Gproxy, found that an enhanced user experience can be delivered through a more balanced compute model, in which a client provides some of the computing resources for running a web application. Whether used for private or public cloud-hosted services, this new model achieves significant performance benefits in terms of screen refresh rates. In addition to delivering optimal user experience and interfaces, more-capable client devices often provide for mobility and support a variety of service delivery models.

The example cloud implementation presented here consists of client devices based on the Intel® Core™ i5 vPro™ processor, Intel® Core™ Duo processor, Intel® Pentium® M processor, and Intel® Xeon® processor 7500 series-based servers. The software stack consists of Gproxy's CLIDES (Client Device Score) platform, NetSuite Ecommerce Cloud platform, and Intel® Web APIs, tested on several Internet browsers.

Introduction

The emergence of cloud-based services and the consumerization of IT provide a wide variety of users and usage options to both business and consumer end users. Web developers are increasingly taking advantage of rich media and graphics-intensive applications to attract users and present the best possible web experience. If cloud computing is equated with the use of a less-capable, or "thin" client, the experience demanded by the users will degrade, limiting a cloud service provider's ability to differentiate their offering.

With the goal of an optimal user experience in a client-aware cloud environment, applications are aware of key attributes associated with the endpoint, including device type, policy, available connectivity, and battery life. With this information, cloud-based applications can run in the most efficient and effective manner by optimizing resources and capabilities both in the cloud and the endpoint. This balanced model is important as rich Internet applications are increasingly based on newer runtime environments, such as Adobe AIR,* Google Chrome,* and Microsoft Silverlight* that take advantage of computing of the end-user's client device.

Client-aware Cloud

More capable clients can combine performance, connectivity, and security to optimize the end-user experience. Local execution provides the performance needed for applications that require rich graphics and media, optimizing resource utilization and improving the end-user experience. PCs based on Intel® Core™ vPro™ processors enable applications to execute on the endpoint with hardware-based mechanisms that enhance both device assurance and security.

Intel has introduced a series of Web APIs that allow web developers to assess the capabilities of the client. Using a tool such as Gproxys development environment on the NetSuite Ecommerce Cloud platform, developers can enable these Web APIs in their web applications. As a result of enabling, the application is able to obtain information about the client capabilities to optimize both the end-user experience and application delivery. Developers can also provide a cloud-based linkage of data and services across a range of devices from an Intel-based PC to a tablet to a handheld for anytime, anywhere flexibility (see Figure 1).

Figure 2 illustrates the reference architecture showcased in this paper. The web servers are provided by Gproxys and NetSuite.

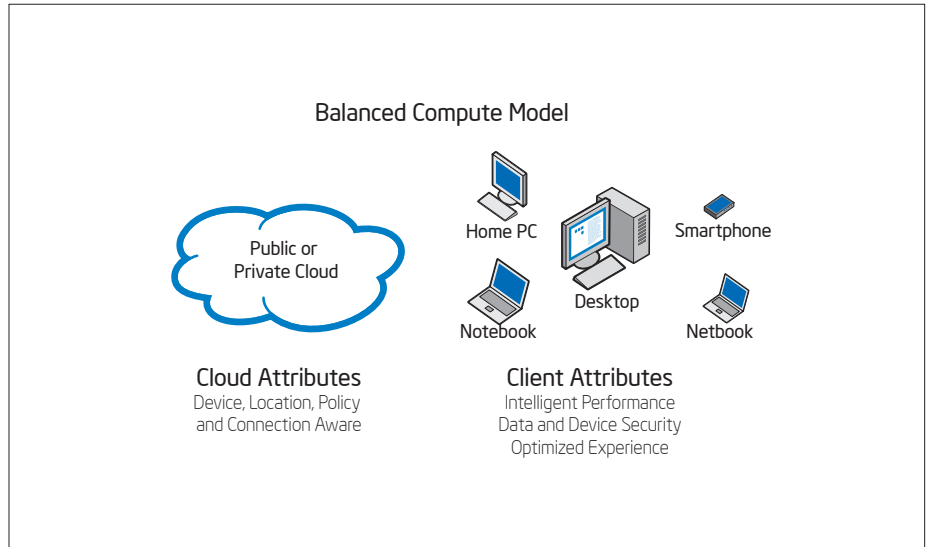


Figure 1. Client-aware Cloud Framework

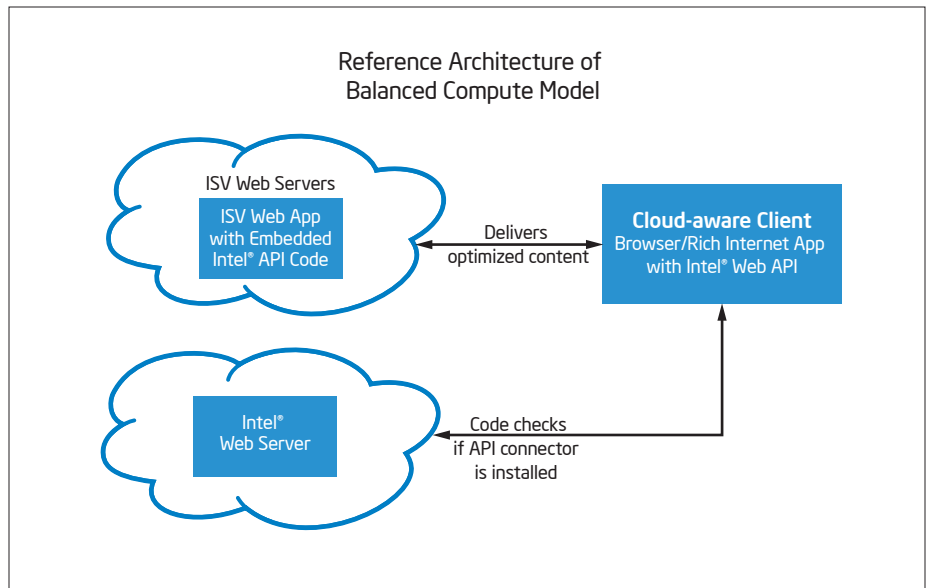


Figure 2. Reference Architecture of a Balanced Compute Model

Intel® Web APIs Design Methodology

The Intel Web APIs enable web applications to detect endpoint information including CPU, battery life, and network connection. Developers can easily integrate these APIs using existing web development tools to help web sites avoid common pitfalls by providing more platform context. An example of this is the beta site www.gproxye-commerce.com, powered by the NetSuite Ecommerce Cloud platform. The Intel Web APIs connect the JavaScript APIs to native browser plug-ins and also use the Intel Web API Connector to seamlessly install APIs and keep them updated over the web.

Figure 3 shows how the APIs are deployed, and Table 1 provides usage models and links.

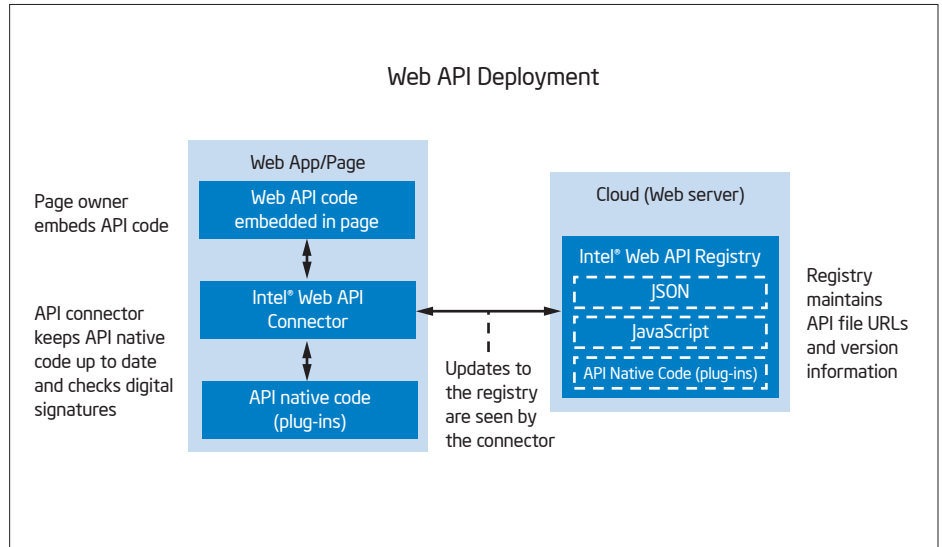


Figure 3. Client/Cloud Web API Architecture

Table 1. Examples of Usage Models

API/Widget	Usage
CPU API	Detect the CPU type and only display content that can be displayed or decoded optimally on that CPU. For example, less-powerful CPUs may only be able to decode 480p video, whereas more powerful CPUs can decode 1080p. software.intel.com/en-us/articles/intel-cpu-web-api-documentation-and-examples
CPU, Power, and Connection Indicator Widget	Web apps can receive periodic updates about CPU load, battery power level, and network signal strength. An application may wish to avoid having a user start a long-running task if the battery level is too low, or instruct the user to find wall power. software.intel.com/sites/whatif/webapis/widget/cpc/
Connection API	Web apps can detect current wireless network signal strength. If signal strength is poor, the application might use lower-quality content or suggest to the user that they move to a location with better signal strength. software.intel.com/sites/whatif/webapis/api/connection/
Media API	Media APIs allow incorporation of media processing tasks into web applications (ex. Video encode). These APIs, which are processing intensive, are built using a distribution compute model so that they can be executed on the client or in the cloud depending on the needs of the application. These APIs are aware and optimized for Intel hardware by being layered on Intel SDKs such as the Intel Media SDK. To be released – In development

ISV Product Implementation Overview

Client Device Score (CLIDES) by Gproxys

CLIDES, or Client Device Score, ranks a client device’s capabilities, including CPU, CPU load, connection type (LAN or Wi-Fi), bandwidth, and screen resolution (see Figure 4). This score will assist the client-aware application, optimizing the user experience based on the client device’s capabilities.

A demo of CLIDES is available on the Gproxys eCommerce demo site (www.gproxyscommerce.com). Developers can experience how simple criteria like the CPU name can be used to improve a user’s experience, according to the CPU’s performance capabilities. For example, a user can experience HD-quality video from a web site if CLIDES determines that the system CPU name contains “Core.”¹

NetSuite Ecommerce Cloud Platform

Gproxys’s eCommerce demo site uses the NetSuite Ecommerce Cloud platform, which offers retailers a comprehensive system that incorporates not only the shopping cart, but web analytics, online marketing, customer self-service, inventory management, complex pricing, product catalog, payment processing, and shipping integration (see Figure 6). Specific features used in this reference architecture are the webstore, shopping cart, and web analytics.

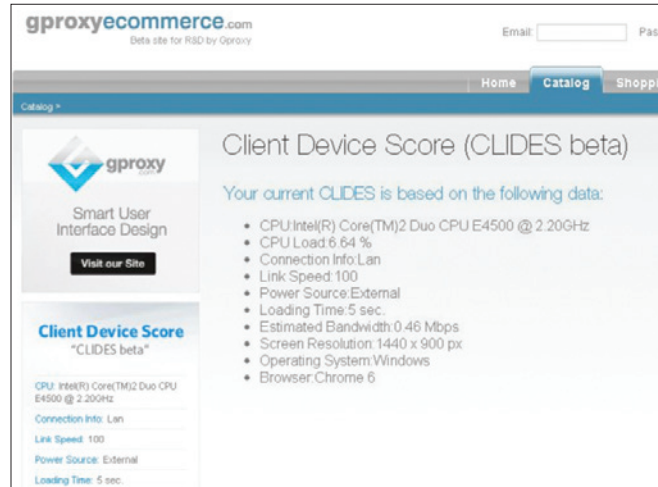


Figure 4. CLIDES* Web Portal

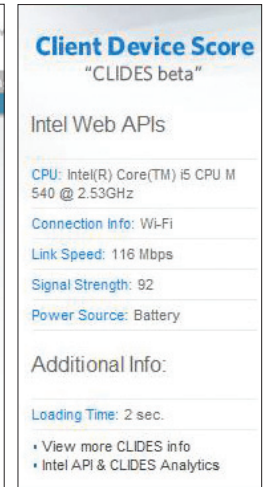


Figure 5. CLIDES* Device Score

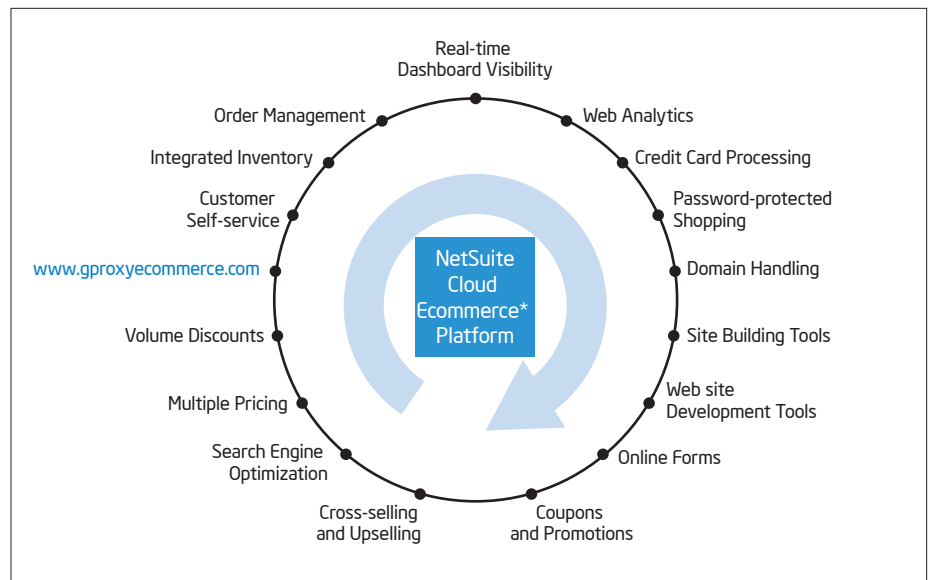


Figure 6. NetSuite Cloud Ecommerce* Platform Capabilities

Balanced Compute Model Use Cases and Scenarios

Use Case 1: Enabling Multi-platform Design and UI Optimization

Businesses must differentiate their service and site from the competition. With the balanced compute model, Web developers can take advantage of a client's specific hardware and connection configurations to customize user interfaces and experiences. Based on the type of client device, consumers can enjoy richer media, including HD videos, rotating banners, dynamic menus, or completely new designs (see Figure 7). This allows businesses to target their delivery across the compute continuum, and advertise and market their products and services accordingly.

Intel Web API Reference Guide

Intel® Web APIs allow the use of JavaScript and HTML to access more features of the device on which a web application runs. In these pages, you will find JavaScript APIs, embeddable widgets, and mashup demos to help you enable richer web applications (see Figure 8). Supported web browsers include Firefox* 3.5.x +, Chrome* 4.x +, Safari* 4.x +, Internet Explorer* 8.x + (Compatibility View OFF), Opera* 10.x +, and SeaMonkey* 2.x +.

Use Case 2: Shopping Cart Optimization/Preserving User-state

With the balanced compute model, web applications can proactively inform users and preserve user-state if a shopping experience is about to be disrupted. For example, the web site can send a non-invasive message to a user if a low-power state threatens to interrupt their online shopping. Instead of losing a possible sale, the vendor can assure the user that the web site will retain the entered data for further processing when they return to the site (see Figures 10 and 11 on the next page).

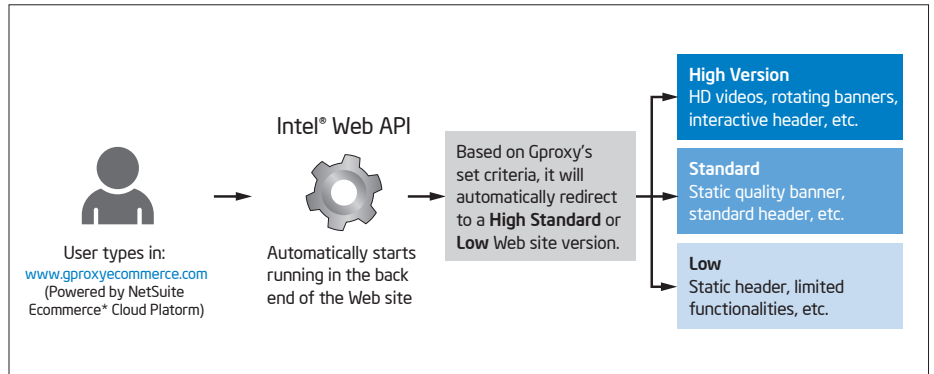


Figure 7. Typical Usage Flow - Interactive Content (using Intel® Web APIs)

```
<div id="cpci_div"></div>
<script type="text/javascript"
src="http://software.intel.com/sites/whatif/webapis/intelwebapis.js"></script>
<script type="text/javascript"
src="http://software.intel.com/sites/whatif/webapis/widget/cpc/IntelCPCIWidget.js"></script>
<script type="text/javascript">
(function() {
//modified update interval - updates every 1 second instead of default 5
var theIntelCpciInst = new IntelCPCIWidget('cpci_div', ('updateInt':1));
})();
</script>
```

Figure 8. Example of Embedding the API Widget Code into a Web Application



Figure 9. Example of an Ecommerce* Screenshot

Use Case 3: Improving Web Analytics

Analytic modules capture information about the capabilities of end-user devices, which can be used to generate reports about a web client’s hardware configuration. This information can be used to help improve the web functionality of cloud computing applications (see Figure 12). An example of these analytics can be seen at www.gproxye-commerce.com/Intel-APIs-Analytics, powered by the NetSuite Ecommerce Cloud platform.

Conclusion

Enabling cloud applications to be client-aware increases the opportunities for businesses to deliver a more robust and differentiated web experiences to their customers. Taking advantage of client performance, security, and communication capabilities enable the service provider to deliver a better end-user experience and greater flexibility. Developers can design web applications for a single client or create services across multiple devices to enable a compute continuum.

Intel Web APIs combined with Gproxys development tools on the NetSuite Ecommerce Cloud platform is one way web developers can create better user interfaces using the capabilities of the client device. Businesses also benefit with the ability to differentiate their site from other web offerings. Finally, service providers can improve the end-user experience by taking advantage of the capabilities of the local device to cost effectively deliver increasingly rich media.

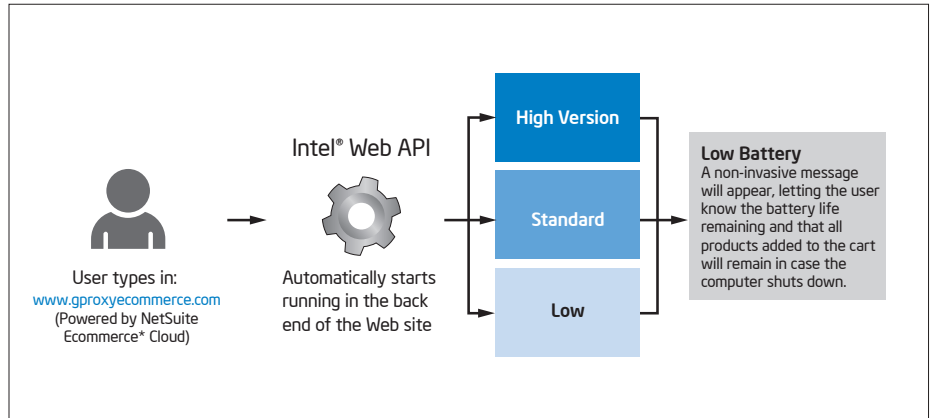


Figure 10. Typical Usage Flow - Battery Level

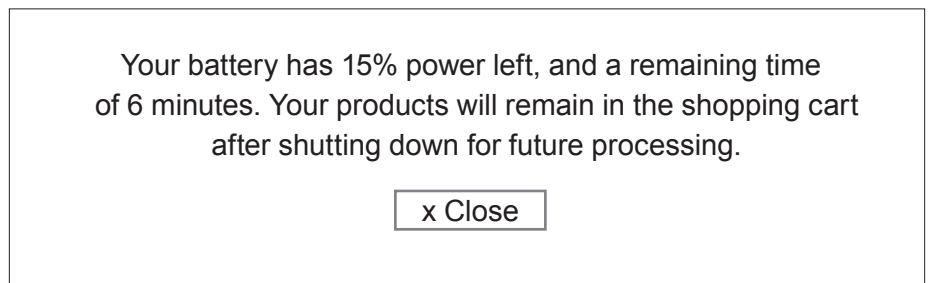


Figure 11. Example of a Message Screenshot

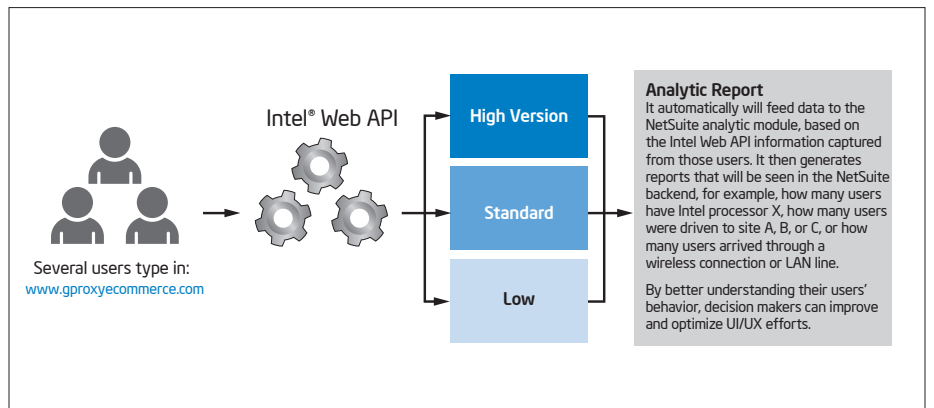


Figure 12. Typical Usage Flow - Analytic Reporting

Intel® Cloud Builders: www.intel.com/cloudbuilders

Intel® Xeon® processors: www.intel.com/itcenter/products/xeon/index.htm

Intel® processor-based Laptops and Desktops:
www.intel.com/itcenter/system/client/index.htm

Intel® Web APIs: software.intel.com/sites/whatif/webapis/

NetSuite: www.netsuite.com

Gproxy: www.gproxy.com

Disclaimers

¹Note: Intel Web APIs must be used with CLIDES to produce a complete scorecard. Otherwise, only partial information will be provided. For more information about CLIDES, visit www.gproxye-commerce.com/CLIDES.

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