



## HIGH DEFINITION DIGITAL SIGNAGE GOES MOBILE

# Destination Shuttle Services taps AMD embedded processors for advanced in-vehicle digital signage

The travel services industry has embraced digital signage as an effective means to provide timely, location-aware information to travelers on the go. Working in collaboration with Omnivex and iBASE Technology, Destination Shuttle Services tapped into AMD's integrated graphics chipset technology to realize a high-performance HD digital signage platform that delivers content to shuttle bus passengers and hotel guests in and around Los Angeles International Airport.



*Location-aware, interactive signage guides travelers through Los Angeles*

Destination Shuttle Services (DSS), a Shuttle Smart Company, is widely regarded as a pioneer in the travel services industry. Beginning with its inception in 2000 as a first-of-its kind environmentally friendly transit system, DSS has made headlines for seamlessly consolidating shuttle services around the Los Angeles International Airport (LAX) and, in so doing, eliminating approximately 6.6 million pounds of carbon dioxide every year. (source: <http://www.dss-lax.com/news.html>)

Serving up to 2.5 million travelers every year in collaboration with 13 partner hotels, DSS looks for every opportunity to offer its shuttle bus passengers new and innovative amenities that distinguish DSS from competing transit services while enhancing the travel experience for visitors to and from Los Angeles. In this spirit, DSS partnered with Omnivex, a Microsoft Gold Partner and a leader in software development for digital signage networks and electronic displays. DSS tasked Omnivex with implementing its vision of an advanced digital signage network that would feature in-vehicle signage installations in addition to video kiosks located in the lobbies of partner hotels.





### **BETTER HOSPITALITY THROUGH TECHNOLOGY**

DSS's digital signage initiative reflects and exemplifies a growing trend in the travel services industry, which has enthusiastically embraced digital signage as a means to provide timely, location-aware information that enables travelers to acclimate to unfamiliar environments, explore local attractions and get the most possible enjoyment from their visits. By extending the hospitality experience beyond the hotel lobby and into LAX's ground transportation network, DSS ensures that shuttle bus passengers are afforded helpful guidance that lets them travel with confidence from arrival to departure.

Utilizing cellular and WiFi communication networks in combination with GPS tracking, the in-vehicle digital signage 'knows' both the immediate location and the pending destination of each DSS shuttle bus – LAX or hotel – and displays relevant content accordingly. Arriving travelers are shown information about local attractions, events, weather and news, while departing travelers are shown information about airport terminals, shops, and services. At the hotel kiosks, guests awaiting DSS shuttle buses can see the exact location of each bus, with up-to-the-minute 'wait time' updates.

### **IN-VEHICLE SIGNAGE: SOLVING THE DESIGN CHALLENGES**

In-vehicle digital signage presents numerous embedded design challenges, all of which came into play in Omnivex's development of the DSS signage system. To facilitate an intelligent, high definition (HD) video display in a space- and power-constrained mobile environment, the Omnivex design team would need to achieve an optimal balance of system performance, functionality, size and power consumption — all at a competitive cost.

Omnivex's own Moxie digital signage software would facilitate the real-time HD video content management in the DSS signage system, utilizing Omnivex's GPSLink software in coordination with Microsoft® Windows® 7 location based services to help achieve precise location awareness. For the system's hardware platform, Omnivex selected 32" LCD displays from Hyundai, and iBASE Technology's 'book sized' SI-28 digital signage players, featuring AMD's high-performance ATI Radeon™ E4690 discrete graphics processor and 780E chipset for embedded applications.

### **AMD SETS THE BAR FOR ADVANCED DIGITAL SIGNAGE**

Distinguished as the only company in the world to develop and deliver both x86 microprocessors and leading edge graphics processors in volume, AMD leads the market with high-performance, seamlessly integrated chipset platforms for digital signage applications. Leveraging advanced AMD/ATI Radeon™ HD graphics processing technology to deliver dynamic, visually stunning graphics, AMD embedded solutions enable digital signage system designers to tap into the full power and performance of graphics-intensive multimedia systems.

AMD's chipset technology for digital signage afforded both iBASE and Omnivex numerous advantages for optimizing DSS's digital signage. Enabling hardware — and software-level system capabilities that otherwise could not have been achieved with competing technology, AMD helped iBASE's and Omnivex's design teams to realize aggressive design goals and minimize development cycles.

### **'VIDEO CARD ON A CHIP'**

The ATI Radeon E4690 graphics processor embedded within iBASE Technology's SI-28 digital signage player includes four dedicated GDDR memory chips (512 MB) on a single 1½ x 1½ inch (approximately) piece of silicon, paired with an AMD Athlon™ X2 dual-core processor on a custom motherboard. This advanced 'video card on a chip' architecture enabled iBASE Technology to achieve an ultra compact form factor for the SI-28 system, ensuring that it can be easily mounted with a flat panel display in a DSS shuttle bus cabin or hotel kiosk. Delivering 8 to 10X space savings versus a comparably equipped video card, the ATI Radon E4690 graphics processor afforded iBASE's design team unmatched design flexibility, with seamless PCI Express® connectivity to maximize throughput.



*iBASE SI-28 digital signage system (10.2" W x 7.9" D x 1.4" H)*

iBASE's selection of a low-power AMD Athlon CPU (45 watts) to complement the ATI Radeon E4690 discrete GPU (25 watts — approximately half the wattage of a comparable video card) enabled its design team to achieve a low overall power profile. With combined CPU/GPU power rating at a mere 70 watts, iBASE designers ensured that the SI-28 signage system could be powered by a shuttle bus battery without compromising overall system performance or system cooling.

## MAXIMUM PERFORMANCE FROM CPU TO GPU

In iBASE Technology's AMD-powered SI-28 signage system, Omnivex had an ideal platform for its advanced Moxie digital signage software. Designed to support complex, real-time graphics processing and playout with intelligent location awareness, Moxie serves as the core software engine for DSS's digital signage implementation. For DSS shuttle bus passengers, Moxie presents multiple layers of dynamic video content cycling across the in-vehicle display in stunning 1080p HD resolution.

Software as advanced as Omnivex's Moxie would ordinarily require a desktop video card-class processing platform, but the unified AMD CPU/GPU architecture utilized within iBASE's ultra compact SI-28 signage system was more than enough to accommodate Moxie's processing requirements, with enough processing headroom to accommodate three additional screen displays if desired. To achieve maximum performance, Moxie takes full advantage of the ATI Avivo™ HD technology<sup>1</sup> found in AMD/ATI Radeon graphics. With the help of ATI Avivo HD technology, the Moxie software offloads video decoding, encoding and post-processing from the CPU to the GPU, dramatically improving overall graphics performance.

## RESULTS

By all measurements, DSS's digital signage implementation has been a tremendous success. The results of a third-party customer satisfaction audit focused specifically on DSS's digital signage revealed a remarkable 94% customer satisfaction rating, mirroring the overwhelmingly positive verbal feedback reported by DSS's shuttle bus drivers.

In 2011, Omnivex was awarded the Gold APEX Award in the Transportation category for its enablement of DSS's digital signage implementation. Hosted in conjunction with Digital Signage Expo, the annual DSE Apex Awards honor innovation in the development and deployment of technology in the global digital-out-of-home industry.

DSS's digital signage has also proven to be a significant revenue driver, though this wasn't an express goal of the original implementation. Local businesses recognizing the inherent value of DSS's proximity advertising capabilities continue to vie for available advertising space, ensuring that DSS's AMD technology-powered digital signage will pay for itself.



### About Omnivex

Founded in 1991, Omnivex software is used by over 2,000 customers, including many Fortune 500 companies, to manage all aspects of digital signage networks, including content management, real-time data acquisition and distribution, and remote device monitoring and management. Omnivex and its customers have been recognized with numerous awards for excellence in digital signage.



### About iBASE Technology

Founded in 2000, iBASE Technology is an ISO 9001 and ISO 13485 certified company that specializes in the design and manufacturing of industrial PC products. Current product offerings from iBASE include various single board computers, Mini-ITX boards, industrial motherboards, Disk-Size SBC, ETX CPU modules, embedded systems and network appliance for different applications in the gaming, entertainment, automation, medical, military and network markets. iBASE also provides OEM/ODM services tailoring products to customers' requirements.

### About AMD

AMD is a semiconductor design innovator leading the next era of vivid digital experiences with its groundbreaking AMD Fusion Accelerated Processing Units (APUs) that power a wide range of computing devices. AMD Embedded Solutions give designers ample flexibility to design scalable, x86- based, low-cost and feature-rich products, and drive energy conservation into their systems without compromising application performance or compatibility, graphics performance or features. For more information, visit [www.amd.com/embedded](http://www.amd.com/embedded).

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<sup>1</sup>ATI Avivo™ HD is a technology platform that includes a broad set of capabilities offered by certain ATI Radeon™ graphics processors. Full enablement of some ATI Avivo™ HD capabilities may require complementary products.

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