



Parking in the Cloud

Hosting and security continue to
change how we play the game.

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■ INTRODUCTION

Despite all of the new technology buzzwords flying around, the primary concerns of the parking professional will continue to be customer service, revenue growth and parking asset management. Of course, that doesn't mean technology isn't changing the way we do our jobs. It is—especially now as payment and system configuration options evolve.

The January/February 2011 edition of *Parking*, the National Parking Association's publication, highlights emerging industry trends in "11 Parking Technologies to Watch in 2011." The article nods to the SFPark experiment in San Francisco, License Plate Recognition, and mobile parking apps, but two items on the list hold uniquely powerful implications for the parking industry: namely, **cloud-based parking systems** and **PCI DSS compliance**.

In the context of the parking industry, a "cloud-based" parking system is a solution that delivers parking software as a service (SaaS) via the Internet. This model allows for ease of service, more predictable expenses, smoother upgrades and a lower total cost of ownership. PCI DSS is the Data Security Standards Council's "framework of specifications, tools, measurements and support resources to help organizations ensure the safe handling of cardholder information at every step."¹ It's what keeps our identities and sensitive information safe. A "cloud-based" parking system significantly lightens the burden of PCI compliance on the parking operator.

Parking Author Denise Gable writes, "Cloud-based Parking Systems—Particularly Access and Revenue Control where the solution is hosted over the Internet—is a highly desirable solution; will grow in 2011." She continues:

Rules around credit card PCI DSS compliance have recently changed; this will be a continuing annoyance for vendors and parking operations both. For organizations that process credit card payments, choosing a vendor with a PCI DSS compliant hosting environment offers huge advantages, including significant cost and time savings (25-27).

Gable's assertions are correct—PCI DSS compliance requires a substantial investment of time and money, and hosting and the SaaS model offers significant time and cost savings to operators, which is why hosted PARCS solutions are gaining some serious ground in the marketplace. But what does it all *mean*?

■ BEING A GOOD HOST

Hosting software and applications in the cloud is the latest step in the evolution of computing. This is not, however, a new idea. Unlike the Local Area Networks and Mainframes of bygone decades, today's computing has moved storage and delivery into the scalable, accessible Internet. It's not surprising that the way we use computers these days is extremely Internet-centric.

The parking industry was slow to adopt hosting because many legacy systems were not designed for it. There was a significant dependency on hardware, especially because landline Internet access was a challenge in parking structures and remote lots. Fortunately, vendors are starting to build the next

¹ PCI SSC Data Security Standards Overview, https://www.pcisecuritystandards.org/security_standards/, on 9/9/2011.

generation of software with a more modern philosophy, and today's leading-edge solutions are both Internet-enabled and highly extensible.

The hardware hasn't disappeared, but it has certainly improved. No longer designed for stand-alone operation, today's hardware operates with robust online and offline capabilities. And since we can now connect to the Internet almost anywhere through WiFi and cellular networks, remote locations are no longer disconnected.

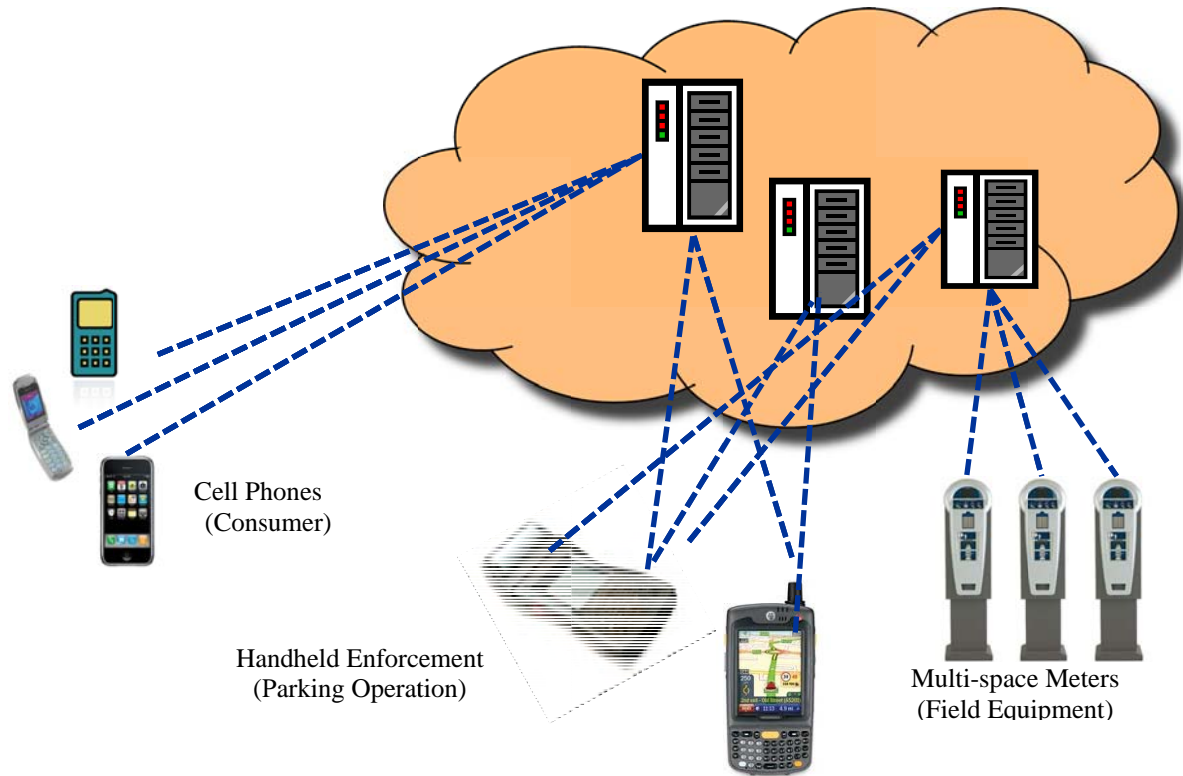
HOSTING IN PARKING

We all depend on email for millions of messages a day, many of which are of mission critical importance. But when you send an email, you don't worry about its routing, protection, or delivery. You just address it, provide your message, attach any relevant content, and let the system handle the rest. You don't think twice. In the same way that you trust your email system with the maintenance, security, and delivery of your emails, you can trust your vendors to host much of your operation's back end.

Both the private and public sectors are turning to the cloud in overwhelming numbers, and for good reason. Hosting has many practical benefits:

1. **Your data anytime, anywhere.** Historically, parking professionals who wanted to manage parking data were tethered to a computer in their office. This is no longer the case. A hosted solution means that information is available virtually all the time. Data is provided in real-time to any (authorized) user who wants it, from any internet-enabled device—whether it's a laptop, workstation, tablet, or smartphone.
2. **Your data as an asset.** In a hosted model, data becomes an asset that you can share with other audiences. There are many beneficiaries of this feature, including the parking audience themselves, who can now perform many self-service activities that used to require a mail response, an office visit or circling around the block looking for parking.
3. **Centralized command center.** This example is in place at Texas A&M University. They are able to run multiple facilities from a central command center. They use web-based PARCS software to run the gates and revenue control equipment. They have IP-based video monitoring at most of the entries and exits of their facilities. They use voice-over-IP technologies to talk with parkers via Intercom. All of these technologies can be leveraged from a distance—which means that, while the Texas A&M command center is located on campus, it could just as easily be located anywhere in the world!
4. **Reduced Total Cost of Ownership.** When you buy a car, you don't just pay the sticker price—gas, maintenance, repairs, insurance, and other expenses factor into your TCO. The same principle applies to parking systems. Total Cost of Ownership includes the costs of hardware, servers, licenses, maintenance, upgrades, and other services associated with upkeep. Luckily, hosted solutions tend to include these costs as part of the service, so expenses are predictable rather than variable. This model prevents unpredictable expenses, streamlines the upgrade process, reduces IT and includes additional services like server management and compliance management.





Given the high up-front purchase expense and continued, unpredictable services associated with the historical model, it's easy to see how hosting tends to drive down total cost of ownership in parking operations.

SOFTWARE AS A SERVICE

Many of the key benefits of hosting are also characteristics of the Software as a Service (SaaS) model. The SaaS, or subscription, model of software delivery has replaced the perpetual license model almost entirely in the world of enterprise software because of the overwhelming benefit it offers to customers—SaaS allows for more informed and predictable budgets, easier updates and enhancements, and dramatic risk reductions.

The SaaS model provides a steady, predictable expense structure that subscribers can count on. And since the SaaS model also places all upgrade and maintenance responsibilities on the vendor, subscribers will never have to shoulder unplanned costs. This means there will be no surprises, and it also means that customers are less committed to their providers should their expectations not be met.

Upgrades and enhancements are usually included in the subscription cost. This means no surprise bills for an upgrade, and no need to choose whether to upgrade to take advantage of the latest technological advances or stay on an old version. As it relates to a solution accepting credit cards, it's often difficult to predict when and how much reinvestment in upgrades may be needed. With a subscription model, all updates are yours for the taking and include changes dictated by PCI-DSS compliance requirements. And if you want to add to your solution later, SaaS makes that less expensive, too. SaaS, like hosting, places a lot of responsibility on the vendor, which means that hosting and the SaaS model allow parking operators to focus on what they want to focus on—their operations—and leave the rest up to their vendors.

WHAT PARKING IN THE CLOUD LOOKS LIKE

Metered Parking

1. Single-space meters tie back to a hosted system for credit card processing, remote diagnostics and programming via a wireless or cellular Internet connection.
2. Multi-space meters tie back to a hosted system for credit card processing, remote diagnostics and programming, and provide basic occupancy information. Enforcement systems can tie in if they have access to meter data (through the host, not through the machine).
3. Pay-by-cell is completely based on having access to a hosted solution. The host maintains the parking accounts and provides mapping between payments and spaces/zones. Enforcement systems also require access.
4. New on-street sensors broadcast and extrapolate occupancy information; mobile apps help find open spaces.

Revenue Control

1. Special Events: online pre-sales of event tickets, including parking, is hosted. Home-printed barcode permits enable prepaid access to a facility.
2. Field-based cashiering: Handheld devices are able to take payment for parking, replacing the change-apron common to parking in a field.
3. Valet Parking: Embraced the mobile aspect of parking with apps for both parkers and operators, some of which use iPhones for hardware.

Access Control

1. Credential tracking has gone hosted with online solutions like that at UBC for mixing and matching your own parking package. Everyone gets a credential, and can pick where they want to park and their parking frequency; the system then computes a price for them. Parkers can update their selection package at any time online.
2. Lane equipment is Internet-enabled. One major parking operator has multiple unmanned facilities operating in a "card-in-free-out" model through a hosted solution. The entire operation requires power and an Internet connection. The gated equipment in different cities can be accessed through a web-based application including controls like "vend gate," and the solution offers consolidated reporting.

Permit Management

1. Permit Systems and Office Management solutions were one of the first to be hosted. You can purchase an entire permit management system without installing software.
2. Enforcement is available as a hosted solution with wireless handheld computers accessing online resources. This eliminates the traditional batch-handheld model and enables real-time data transfer and look-up.

■ WITH GREAT POWER...

While hosting opens a whole host of doors in parking, creating and maintaining a hosted solution comes with its own set of challenges. Maybe Peter Parker's Uncle Ben said it best in *Spiderman*: "With great power comes great responsibility." Hosting enables delivery of powerful functionality over the Internet, and it follows that the provider of the hosting environment is chiefly responsible for:

1. System availability of 99% or more.

Google Apps for Business offers 99.9% availability. Each additional "9" afterwards (99.9, 99.99) will cost you about 10x the price of the previous amount.

2. OS patches include bug fixes, security fixes, and new features for the operating system.
3. Virus protection detects and quarantines viruses.
4. User management determines who can access the server and what rights they have.
5. File privileges and settings relates to making sure that users and services only have access to the minimum set of files needed on the machine.
6. Server monitoring involves keeping track of whether the machine is running and the services are available.
7. Access logging and division of duties involves tracking who is accessing the server and what changes they're making.

Division of duties is a policy to ensure that rogue operators don't perform tasks they shouldn't.

8. Backups of the data and system are the hallmark of ensuring you can recover from a disaster.
9. Installing application software updates and upgrading the end-user software whenever it's updated.

Hosted operations can be handled in-house, but outsourced hosting allows parking offices to disregard almost all of these responsibilities. Which is great for the end user, because the responsibilities can get quite expensive to fulfill. Indeed, outsourced hosting usually leads to substantial savings and headache-free usability. Additionally, there is one responsibility that has been attracting ever-growing attention in the parking industry, especially from those operators and vendors that deal with credit card payments.

■ PCI DSS

The Payment Card Industry Data Security Standard (PCI DSS) is the set of rules that, if followed, keep sensitive information safe and transactions secure. Top institutions like Visa continue to elevate the PCI standards for safe handling of sensitive information. Entities that deal with credit card payments are responsible for ensuring that their systems and business practices and procedures uphold PCI standards, and the fact that the host takes care of most of the expenses and efforts required for PCI compliance might be the most substantial advantage of a hosted solution.

The goal of PCI is not to give vendors and parking offices headaches—in fact, its mission is chiefly to help merchants safeguard their customers' credit card data. PCI DSS is a multifaceted security standard that includes requirements for security management, policies, procedures, network architecture, software design and other critical protective measures.

The recent PCI 2.0 standards have more thorough requirements of hosting environments, driving up the cost to maintain a compliant hosting environment, and as PCI continues to pursue those ends, the standards will continue to rise.

■ GREAT RESPONSIBILITY, GREAT OPORTUNITY

Parking noted that, “Choosing a vendor with a PCI DSS compliant hosting environment offers huge advantages, including significant cost and time savings.” (January/February 25-27) And when you take all of the other advantages—like the incredible functionality and reduced total cost of ownership that come with a hosted solution—into account, it’s easy to see how hosting and security will continue to change how we play the game.