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Multi-Use, Multi-Revenue Networks for the Hospitality Industry

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Introduction

HSIA Today

One of the most requested guest amenities in hotels today is high speed Internet access (HSIA). Pressured by the pains of travel and the need to be more productive, guests are rating HSIA among the top amenities they seek in a hotel. In a study conducted last year by Business Week, respondents ranked HSIA as the second most important attribute they consider in making a hotel selection decision (quality of guest room was first and quality of hotel staff was third).

According to Gartner Group, there are 36 million business travelers in the U.S., 75% of whom carry laptops and smart phones. These road warriors expect to be able to conveniently connect to the Internet on the road just as they do in their offices and at home. Not surprisingly, usage rates have grown exponentially across the industry in recent years. Marriott reported that the number of monthly guest connections in its hotels more than tripled in 2004 to approximately 2 million connections per month. Many of the industry's leading HSIA providers reported similar increases in connection rates over the same period.

HSIA has therefore become a must-have in the hotel industry and most major brands now require broadband connectivity in the guest rooms. Marriott and Hilton both recently reported that nearly 100% of guest rooms have been installed with HSIA across all brands and many other hotel companies are close behind. Unfortunately, despite the huge investment that many hotel operators have made in recent years to install and/or upgrade their networks, inconsistency with HSIA performance has become an increasing source of frustration for hotel guests as expectations have outpaced these improvements.

Focus on Reliability

Over the past few years, Hospitality companies have rapidly deployed HSIA solutions to meet rising demand for broadband connectivity. According to a recent article from Newsweek, "Business trips used to mean flying business class, staying in a chic hotel and attending a short meeting before hitting the town with the company credit card. But just as years of corporate cost-cutting has forced road warriors aboard budget airlines, more and more of them are now ditching glitzy hotels for practical ones, where they can put in a full a day's work as they do back home. In response, hotels are reinventing themselves as offices away from the office."

Unfortunately, the reality is that many hotel networks are not living up to guest expectations. In a recent study by Jupiter Communications, 78% of respondents reported problems with their HSIA experience in hotels. In a rush to meet the demand, many companies deployed wireless solutions

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in a very tactical and patchwork manner. In addition, they were caught off-guard by the recent explosion in usage and were not equipped to effectively support guest needs. As a result, problem occurrence levels are sky high while resolution rates are nowhere near acceptable.

Hotels that do not address these issues will inevitably lose market share to those that do. According to the same study by Jupiter, more than half of business travelers surveyed said they would be less likely to stay in a hotel again after a single bad experience with HSIA in that particular hotel. Given rising guest expectations and usage levels, just having HSIA is no longer enough for hotels to be competitive. The system must be reliable, fast, and easy to use in order to meet guest needs.

The building blocks for any successful HSIA system are the following:

- The right infrastructure
- The right support partner
- Hotel commitment

Infrastructure

The foundation for any public high-speed network is obviously the quality of the hardware used. Hotels need to be careful about the type of solution they implement. The market is littered with smaller providers that use lower end components in order to save money. However, low cost does not necessarily mean you are getting a good deal. Many lower cost systems are slow, tend to be out of service frequently, and do not provide the level of security that guests require. In addition, cheaper equipment typically needs to be replaced more often and is more expensive to maintain, ultimately driving up the costs of the solution Hotels need to be careful when reviewing proposals to ensure that the equipment included will meet their needs and the needs of their guests.

There are three types of HSIA solutions available:

1. Wireless –Wireless networking uses radio signals instead of wires. This solution is usually the cheapest and provides the guest with the most flexibility and mobility
2. Wired CAT 5 Cable – Utilizes in-room CAT5 cables. CAT 5 has been a construction standard for approximately 5 years and new hotels built within that time may already have this cable plant available. This solution is about the same cost as wireless and offers slightly more security to the guest, but restricts guest mobility due to the use of a cable connection
3. Wired CAT 3 Cable - Uses existing telephone cabling. This is the most expensive of the three solutions due to the equipment and labor involved and causes the most disruption to the hotel during installation. It provides slightly slower connection speeds than CAT5 but offers similar security capabilities

Wireless is becoming increasingly popular. It is estimated that 90% of PCs deployed in 2005 will be wireless enabled, although wireless is still not as secure as wired alternatives, wireless

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technology is evolving rapidly and tends to be less expensive and easier to implement than most hard-wired solutions.

One point of caution, however: Wireless networks are still not as reliable as wired networks. Many HSIA support vendors are reporting nearly three times as many trouble tickets (as a percentage of users) from hotels equipped with wireless as wired-only properties. Many feel that the benefits of increased mobility and lower deployment costs still outweigh the risks. However, hotels should be prepared with alternative high-speed solutions for guests (either by overlaying some or all rooms with wired connectivity or having business center computers available if a guest has a problem) if they choose to deploy a wireless solution.

With respect to security, a number of concerns have been raised by the media and others regarding the security of wireless networks. This issue is significantly over-stated as most hotel companies have deployed wireless in their hotels and have experienced very little backlash from the business community. In a recent survey, only a small group of companies in select industries, including aerospace, biotechnology, and defense currently have "no-Wi-Fi" policies. Hotels can meet the needs of these customers by equipping a portion of their rooms with wired access, giving guests the choice of which service to use.

Additionally, many hotel companies have recently enhanced their standards with respect to network security, making wireless networks almost as secure as wired networks. Hilton and Marriott now require their properties to use hardware, which can support VLAN tagging, and other security protocols that are able to isolate data traveling to different guestrooms and prohibit the ability for one guest to view another guest's network traffic. Most visitor-based networks, whether wired or wireless, are designed to be non-secure in order to enable plug-and-play access. Guests should therefore use caution and utilize technology such as VPNs to protect their computers and information.

Effective Third Party Support

Deploying the right equipment is the first step. Having the right partner to support it is the next step. Although the goal of any HSIA system is to make it truly plug-and-play, the unfortunate reality of operating a public network is that you only have control of the infrastructure up to the guest's PC. Because the configuration of a guest's PC is out of the hotel's control, a 100% unassisted connection rate is virtually unattainable. Hotels need to understand this fact going in and make sure that they have the appropriate support infrastructure in place to handle issues as they pop up. Having a problem is not the end of the world as long as you respond accordingly.

HSIA vendors typically shoot for a 95% of 98% unassisted connection rate (depending on the size and complexity of the network). This means that 2% to 5% of users will need some support to get connected. Successful resolution of these issues is the difference between an effective HSIA solution and a sub-standard one. As a result, it is extremely important that a hotel choose a partner that has a strong commitment to guest satisfaction and the knowledge to support these

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issues. Some studies have shown that guests who have experienced a problem and had that problem successfully resolved are actually more loyal than guests who have not experienced a problem at all, so hotels need to make sure that they select a partner that embraces this opportunity.

Hotel Commitment

The last major component is hotel commitment. Although hotels should rightfully be focused on operating the hotel vs maintaining the HSIA network, the reality is that support starts with the property. The first line of defense for any successful HSIA system is an effectively trained hotel staff. If a guest experiences a problem with their shower, they are not expected to call a plumber to fix the problem. Similarly, many guests feel that they should not need to rely on a third party vendor to resolve issues with HSIA.

Some best practices to consider:

- **Designate a Champion:** Someone at your hotel needs to take ownership of your high-speed solution. Designate a champion who will monitor the working relationship with your HSIA provider. This person should become knowledgeable in the technology so he/she can train other employees

- **Partner in Problem Resolution:** Sometimes guests will have challenges with high speed. Hotels should try to take a more active role in resolving these issues vs simply referring guests to their support vendor. Hotels should train staff to be able to resolve commonly reported, non-technical guest issues (e.g. the guest needs to know the SSID, etc.). Eliminating the need for the guest to call the HSIA vendor will save the guest time and ultimately lead to significantly improved guest satisfaction

- **Monitor the Network:** Make sure that your public access service operator (PASO) is able to equip you with the proper tools to proactively monitor your network, including network uptime, usage levels, and WAN consumption. Also, track key performance metrics relative to SLAs to make sure that your support provider is meeting its obligations

Market Trends

Several market trends are impacting HSIA requirements such as falling prices for laptops and other Internet-ready devices, the availability of Wi-Fi™ access points and increased demands on Internet Application reliability.

HotSpot Penetration

Up until 2 years ago, the HotSpot industry was caught in the midst of a chicken and egg problem. HotSpot operators had been reluctant to deploy access points due to low consumer demand, and consumers had been unwilling to invest in wireless access card/devices due to the lack of convenient access points.

However, thanks largely to the Intel® Centrino™ platform, the industry has exploded over the past 24 months. Gartner Group estimates that 90% of all PCs are wireless enabled.. Today, HotSpots are being deployed around the country in airports, hotels, coffee shops, retail outlets, and restaurants. The total number of HotSpots in the United States is expected to grow from 3,700 in 2003 to 41,000 by 2007. In addition, some cities have deployed wireless HotZones in business districts in an attempt to stimulate local commerce and many others are contemplating similar strategies.

Looking at the broad market of HotSpot and HotZone locations (i.e.: airports, restaurants, retail, enterprise guest access, etc) people spend considerably more time in hotel rooms than in any of these other venues. Because of this captive audience, the hotel industry will have enormous influence over the future of public access networks.

3G vs WiMAX vs Wi-Fi

Many people in the hotel industry are concerned about the impact of 3G, WiMAX and other competing technologies.

With respect to 3G, speed is still an issue. Although speeds appear to be increasing, it will be years before the majority of guests have 3G with one of the major carriers. The fact that many carriers, including T-Mobile, Sprint, and Nextel, are investing heavily in deploying Wi-Fi HotSpots around the country is a strong signal that 3G is nowhere close to offering a comparable level of service to Wi-Fi. Many believe that 3G will never get there and will ultimately serve as a complementary product to Wi-Fi, acting as the WAN connection to fill in the holes that Wi-Fi does not cover.

Similarly, WiMAX is viewed by many as a complementary product to Wi-Fi. WiMAX has significantly longer range than Wi-Fi (up to 31 miles) with bandwidths that are somewhat higher. However, it will not be a viable connectivity solution for consumers for at least the next two years

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due to the cost of the receiver. Most experts currently view WiMAX as a cost effective alternative to terrestrial point-to-point connections (e.g. T-1 lines, DSL, or cable modems).

New Revenue Opportunities

Complimentary vs Fee Based

The decision to offer a complimentary service or make it fee based seems to be a function of geographical location and what peer hotels are providing. While it is true that the full service brands have continued to charge for the service in many cases and usage is increasing, limited service brands typically offer the service complimentary.

The good news is that guest expectations regarding service levels appear to be lower when they don't have to pay for the service. The bad news is that usage levels will skyrocket, putting increased pressure on the network and WAN connection as "free hotels" typically see double to triple the usage of "pay hotels".   Also, as new guest applications like VoIP end up being used on devices the guest brings into the room, the expectation for service quality will increase. In the near future, guests will expect to be able to use Internet Applications like VoIP as easily as they browse the Web or do email today. From a competitive positioning standpoint, it is critical for hotels to have the appropriate infrastructure in place today to support increased usage levels so that it can react quickly when the market shifts.

Regardless of the financial model for the HSIA service, a business plan must be developed to fund ongoing development of the infrastructure and support services to continue to meet guest demands.

Roaming Revenue

In order to succeed in signing up Wi-Fi subscribers, cellular service providers will need to be able to offer ubiquitous coverage to their subscribers (or at least broad enough to make it worthwhile). Like the early days of cellular and ATMs, there is a lack of unified roaming in Wi-Fi that is holding back the industry. Far fewer people used ATM cards when they were only accepted at the issuing bank's locations. Similarly, cellular adoption only took off when people could roam from area to area and were not required to change phones and providers.   Wi-Fi users today are forced to either maintain accounts with each of the PASOs they encounter in their travels or give their credit card number each time they want to connect. Although many have been aggressively trying to build out Wi-Fi HotSpots in hotels, coffee shops, fast food restaurants, and retail outlets,

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it is far too expensive and time-consuming for a single service provider to build a network that offers nationwide access to its subscribers in all locations. Roaming between service providers is essential in order to offer universal customer access.

Hotels can benefit greatly by engaging in data roaming. The single most important attribute of roaming is the ability to attract guests. Also, unlike cellular, the hotel can own, operate, and better control the revenue potential through roaming agreements. Hotels that build a **Carrier Neutral** environment, supporting access from a variety of carrier subscribers and not allowing themselves to be locked into a single carrier network, will benefit most in this roaming environment.

Hotels are strongly positioned to extract value out of the roaming market, as any successful service provider roaming business plan must include the Hospitality segment given the amount of time people spend in hotels. From a hotel perspective, roaming offers three potential benefits:

1. It offers the potential of incremental roaming revenue via a small fee paid by the carrier each time one of their subscribers connects to the hotel's network (carriers are currently willing to pay a connect fee even to hotels that are not charging for the service)
2. More importantly, it offers the potential of increased room revenue as subscribers proactively seek out hotels that they can roam on without a charge
3. Hotels can engage in marketing opportunities with multiple carriers with large subscriber bases

Advertising Revenue

Similarly, hotels have the opportunity to generate advertising revenue. Banner advertising has bounced back as revenues for companies like Google and Yahoo! have skyrocketed in recent years. The business traveler represents a premium demographic for many advertisers. Additionally, local merchants definitely have an interest in promoting their services to hotel guests.

However, similar to the roaming opportunity, advertising is all about scale and the size of your network. Hotels will need to partner with a larger operator that has aggregated a number of eyeballs and impressions in order to attract any significant advertising dollars.

Customer Retention

Although not necessarily a direct source of revenue, many hotel companies are beginning to appreciate the value of the HSIA home page as a critical customer touch point. Many hotel companies have already standardized the "first-up" page in order to convey a consistent brand image to guests. As usage rates continue to rise, this real estate will become an increasingly

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important promotional and customer retention vehicle as hotels begin to use the first-up page as a portal to communicate with hotel guests.

New Applications

Although the new revenue opportunities mentioned above are exciting, the real opportunity for hotels to monetize their HSIA networks is to leverage them for other applications. Many hoteliers are already experimenting with opportunities to utilize their HSIA network infrastructure for other purposes. Opportunities range from guest applications like VOD and VoIP to hotel productivity applications like wireless handhelds for front desk staff and restaurant servers. Although some of these applications are still nascent, many will likely become common over the next 2 to 3 years. As a result, it is important today for hotels to begin thinking about what infrastructure will be required in order to take advantage of these opportunities.

Guest Applications

Video on Demand: Many companies are beginning to look at delivering video-on-demand and free-to-guest television programming over the IP network in the hotel. Although wireless is still not reliable enough, ADSL technology now offers sufficient bandwidth to support video distribution. Wireless may become more viable over the next couple of years with the introduction of MPEG4 decoding as well as improved wireless reliability. The premise here is that hotels will be able to save infrastructure dollars by only needing to deploy an IP network vs a traditional coax based MATV system as well. Additionally, the thought is that you can provide richer assets through an IP based system than a traditional analog system. There are still not many IP based systems deployed today, but this is something hotels can expect to see more of over the next few years.

Portable Guest Entertainment Devices: Guest entertainment models are quickly evolving. Experts suggest that guests will soon travel with their own personal media assets like movies and music. Future in-room devices like smart TVs and stereo's will enable users to access their hard drives via the wireless network and play movies from their hard drives directly to TV's. While these smart devices are not currently in mass production, there are a number of prototype products available and the Wi-Fi network will be the communication conduit to connect guest's personal media with in-room devices.

Voice over IP: Voice over IP is another application that is gaining in popularity. Hotel networks today can support soft phone applications like Skype, which allow guests to plug headsets into

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their computer and talk over the Internet. Similar to the VOD opportunity described above, hotels are also beginning to evaluate options to converge voice traffic onto the IP network at the hotel in an effort to save infrastructure costs as well as WAN fees.   Obviously, the infrastructure will need to be robust and reliable in order to support voice or any other mission-critical application.

Probably the most intriguing opportunity for VoIP relates to cell phones. Many experts believe that traditional cell phones will begin offering Wi-Fi connectivity for the purpose of communicating via the Internet without having to incur monthly 'per minute' usage fees. In other words, when a guest makes a call from their cell phone from within a Wi-Fi enabled hotel, the voice call will be routed through the 802.11 network and will be carried over the Internet rather than over carrier's networks. Hotels are continuing to explore opportunities in this area. By negotiating Wi-Fi Roaming Agreements with cell phone service providers, Hotels may be able to recover a portion of Telecom revenue that had been previously lost to cell phone providers. If nothing else, this will represent a tremendous opportunity for hotels to increase guest satisfaction by improving the quality of cell coverage in the hotel.

Hotel Productivity Applications

Wireless Check-In/Out: Guest Service Agents, equipped with a Wi-Fi enabled handheld device and a small printer (similar to what rental car agents use), will be able to check in/out guests from remote locations (either on site or off site). This will allow hotels to more effectively manage overflow issues related to large group arrivals and departures as well as to provide unique services to guests, such as enabling travelers to check in while they are on the airport shuttle or waiting for their luggage at the airport. Using this device, GSAs will be able to print folios and registration cards, make room keys, and read data off credit cards.

Handheld Device: Housekeeping: Room attendants with Wi-Fi enabled devices will be able to notify the front desk in real time that a room has been cleaned and is available to be added to inventory vs waiting until the end of their shift. This should help hotels substantially improve performance with respect to room readiness upon check-in, which guests consistently highlight as a critical issue relating to guest service. In addition the property management system will be able to notify room attendants when hotel rooms are empty and ready to be cleaned, thus eliminating the need for maids to roam the hall looking for a room that is available to clean.

Handheld Device: Property Operations: Engineers equipped with wireless communication devices will be able to access work orders remotely, without paper and improve how quickly they can respond to guest needs. In addition, by providing engineers with a device capable of handling

voice communication, email, and work order & ticket systems, hotels will be able to consolidate three devices into one.

Handheld Device: Food & Beverage: By equipping wait staff with wireless devices, hotels will be able to make dining recommendations based on guest preferences delivered via a CRM profile. The wait staff will enter the information directly into the device and instantly the chef will see the order and begin preparing the meal. These devices will enable hotels to provide better guest service, turn tables faster, and reduce the number of food ordering errors.

Handheld Device: Luggage Services: By equipping bellmen with wireless devices, supervisors will be able to more effectively manage workflow, task allocation, and scheduling. A bellmen that is delivering bags to Room 205 can now be notified of a "pick-up" in Room 207, thereby eliminating an extra trip and increasing guest service and response time.

Loss Prevention: Wireless Key Lock System: Wi-Fi will allow hotels to remotely poll door locks to determine who has entered a room without needing to send security staff to the room. This should substantially increase productivity as well as improve overall security by immediately notifying hotel staff if an unlawful entry is occurring. Because of the costs associated with re-wiring hotels for such connected locks, this type of application can only be implemented in a wireless setting.

Convention Services: Wireless devices can be used by meeting planners to gain instantaneous access to participant feedback. Rather then waiting months to determine participants' responses, planners will be able to evaluate survey responses in real time, before the conference has been concluded.

Climate Control: Smart devices such as Wi-Fi enabled thermostats may ultimately lead to substantial energy savings. For example, when a guest checks in, a "turn-on" signal could immediately be sent to the thermostat to begin cooling the room before the guest arrives. Likewise, when the room is unoccupied, the thermostat will be turned off.

Hotel Design and Innovation: Wireless may eventually offer an alternative to costly room wiring in new builds. Also, smart Wi-Fi enabled devices could allow guests to control the lights, window drapes, and TV all via a Wi-Fi remote control.

HSIA Moving Forward

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Over the past three years, HSIA has gone from being a novelty item to a must-have for hotel guests, and there are no signs that this trend is slowing down. In fact, guest expectations and the importance of HSIA will continue to rise exponentially over the next several years as HSIA ultimately becomes the primary communication backbone for the entire hotel.

Today, business travelers are using HSIA primarily for Web surfing and email. In the future, hotel guests will expect to be able to connect to the network using a Wi-Fi enabled cell phone and/or PDA and to use the network to download movies or other forms of digital content onto their PCs.   This will require a network that is robust enough to support higher bandwidth applications and flexible enough to handle multiple forms of data transport.

Just as important, hotels will have an enormous opportunity to lower costs and improve guest service by leveraging the network to take advantage of some of the productivity applications describe above. However, given the potential impact on operations if there is a system failure, the network will need to be extremely reliable and robust to support these mission critical tools, and those with sub-standard networks will be at a substantial competitive disadvantage to other hotels.

The future is now and hotels need to begin planning today to make sure that the equipment that they deploy is capable of supporting their future needs. HSIA is one of the important amenities in the guest room and its value will only increase over time. Those that attempt to deploy lower end equipment to save money are taking an enormous risk that could ultimately result in the loss of significant market share to those that were willing to make a more substantial investment in their HSIA network.

Nomadix Solutions

With over 9 years of experience working in the public access network space and having shipped 38,000 units worldwide, Nomadix is well versed in creating multi-use, multi-revenue networks. Embracing a carrier neutral position allowing maximum use of hotel guest networks, the Nomadix Service Engine (NSE) software represents the optimal choice for Hospitality customers building HSIA networks today that are scalable for the challenges of tomorrow. Nomadix helps to ensure a robust solution by maintaining growing a patent and patent-pending portfolio of intellectual property in over 15 unique areas of functionality designed to support public access networks worldwide.

Nomadix Service Engine (NSE)

Nomadix is the leading provider of intelligent network devices and interconnect services that make nomadic computing easy. The company offers the Nomadix Service Engine™ (NSE), which allows the public access service operators and venue owners to deploy a cost effective, secure and easy to use high-speed Internet access offering. NSE technology plays a key role in

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deploying supportable multi-use, multi-revenue networks. Key attributes include creating a plug-and-play and secure environment for the user, a strong branding opportunity for the venue, and a variety of service enablement for the operator.

Nomadix Support Services (NSS)

Nomadix Support Services are a suite of support services for operators and venue owners that provide for software upgrades, advanced replacement hardware support, call center with Service Level Agreements and support escalation for NSE gateways.

Nomadix, Inc. is headquartered in Newbury Park, Calif., and sells and supports its products and services globally through licensing, Value Added Resellers and Systems Integrators. For additional information, please visit http://www.nomadix.com .

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