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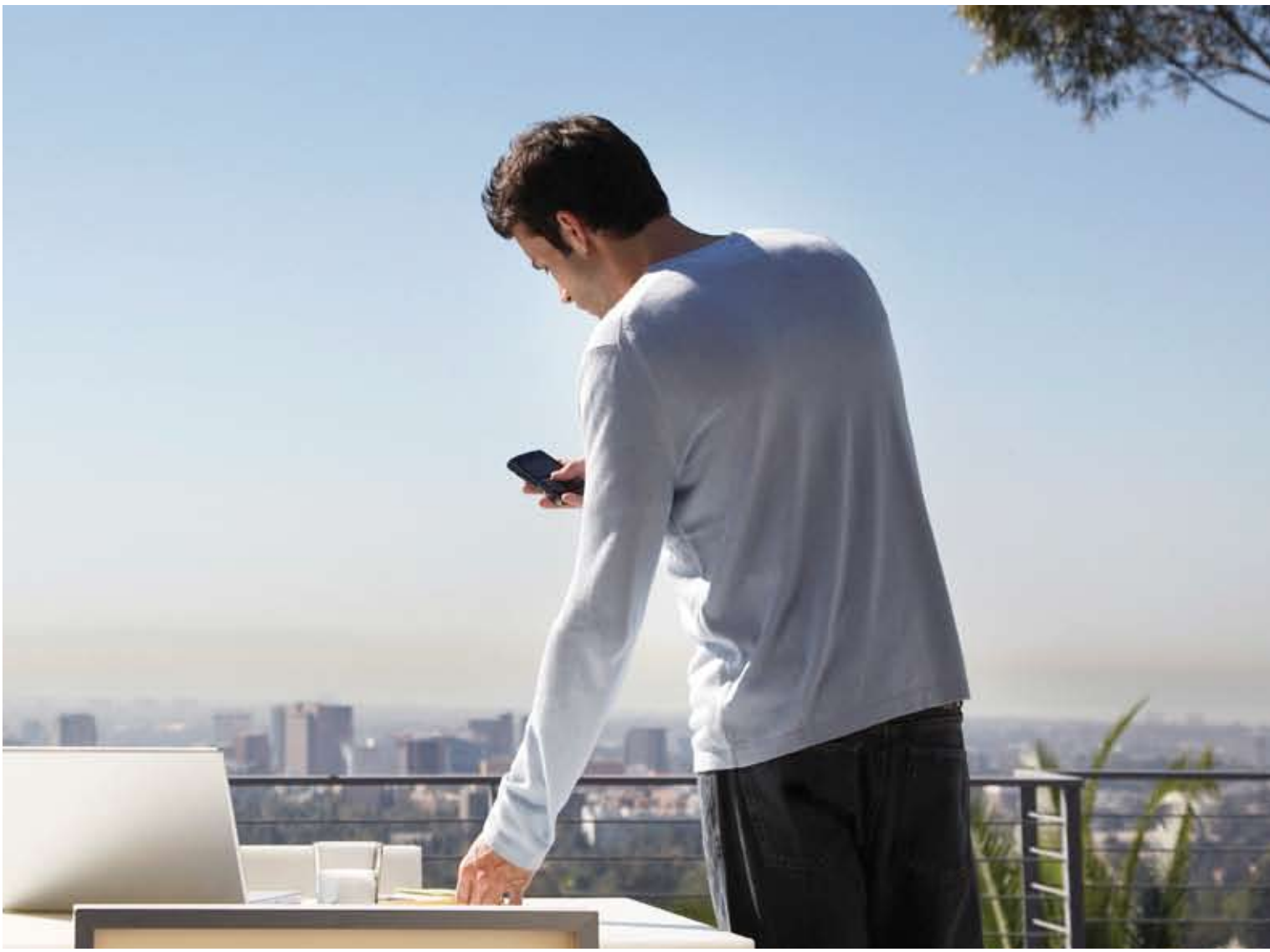

Wi-Fi DRIVING MOBILE INTERNET

EXPLOSION IN NEXT GENERATION NETWORKS

Abstract

The mobile Internet explosion was a result and a victim of its own success; several contributing factors of which, the evolution of better and faster bandwidth, ability to connect multiple nodes (users) from a primitive point to point connectivity to mesh connectivity, advancement of mobility that gave new meaning of pervasive connectivity and more affordable devices, resulting in downward pressure on price per connectivity. Given the proliferation of Wi-Fi enabled devices and growth in Wi-Fi hotspot deployment prediction to rise 350%[1] by 2015, it is necessary for operators to innovate quickly to an ecosystem of scalable, integrated, efficient network to drive customers experience; offload busy mobile broadband networks; and provide a value-added services platform.

Some Wi-Fi enthusiasts suggest that Wi-Fi is a more economically option to offset some of the revenue decline in traditional telecom services like 3G/HSPA. With greater industry adoption and development of Hotspot 2.0, Wi-Fi is set to continue to dominate in the immediate to mid-term operator strategies to reach its full potential.

Operators are turning customer centric strategies to pragmatic practice. Universally, operators have expressed strong interest to derive revenues beyond connectivity. The vision of broadband has allowed juggling a mix between cost, revenue, intelligence and performance. In this paper, the study of Wi-Fi explores the potential of new generation of services, connected devices value chain and growth opportunities from emerging embedded systems that is worthwhile investing strategically.

Shift of connectedness is key component in bringing new services to market, closing the gap on disparate radio technologies onto integrated delivery platform for smart monetization of new service models and simplifying the Wi-Fi experience altogether.

[1] Source : WBA Industry Report 2011

Contents

Overview 01

Big Screen to Small Screens 03

Extending into M2M Services 05

4 Key Aspects of Creating New Services with Wi-Fi 06

Convergence

Standards

Growth

Loyalty

Policy Based Controls for Smart Monetization of Service 08

Usage Pattern Shaping

Personalized Services

Premium Plans

Conclusion 10

Why Wi-Fi? Be Creative with Services 12

Overview

Unprecedented data growth has put pressure on operator's network with a marked interest to plan and manage through pricing strategies. It is becoming apparent that smartphone shipment will overtake laptops globally. According to a recent report by Gartner[2], smartphone sales are up by 74% year-on-year with greater volumes forecasted in the next 4-5 years.

Operators are increasingly aware of the importance of controlling and maintaining a balanced portfolio of products and services to remain competitive and see it through to the next generation network. Everything and anything that can be connected will stand to benefit from being connected. In the current phenomenon of ubiquitous connectivity, people are connected through various means of technology, be it cellular, Wi-Fi, fixed or any combination of converged platform. The Wi-Fi experience has shown that a common standard can create a market and expand operator's position and boost their fortunes in an all encompassing network of interconnected world. Pervasive connectivity will reshape communications for consumers, organizations, businesses and society at large. Data pricing strategies at some level are beginning to resonate with Wi-Fi. Of course, there will be critical challenges that must be overcome to bring successful and seamless integration of Wi-Fi and cellular networks. Working closely with industry regulators, the barrier to adoption can be reduced significantly. Initiatives such as Next Generation Hotspot is driving the standardization bodies like WBA and Wi-Fi Alliance to simplify workflows, authentication, roaming and network selection processes to make Wi-Fi realize untapped opportunities.

The need to constantly innovate and create new experience is driving a new class of operators, platform developers, service integrators, aggregators and consumers. The true power of the Internet is just only beginning to see the potential to move beyond smartphones. The other segment of the M2M connections created over tablets, consumer electronics (CE), embedded fleet telematics, digital signage and smart grids. It has already begun by combining user demand, network evolution and an ecosystem that is breaking down barriers.

[2]Source : Gartner April 2011 "Forecast: Media Tablets by Operating System, Worldwide, 2010-2015"

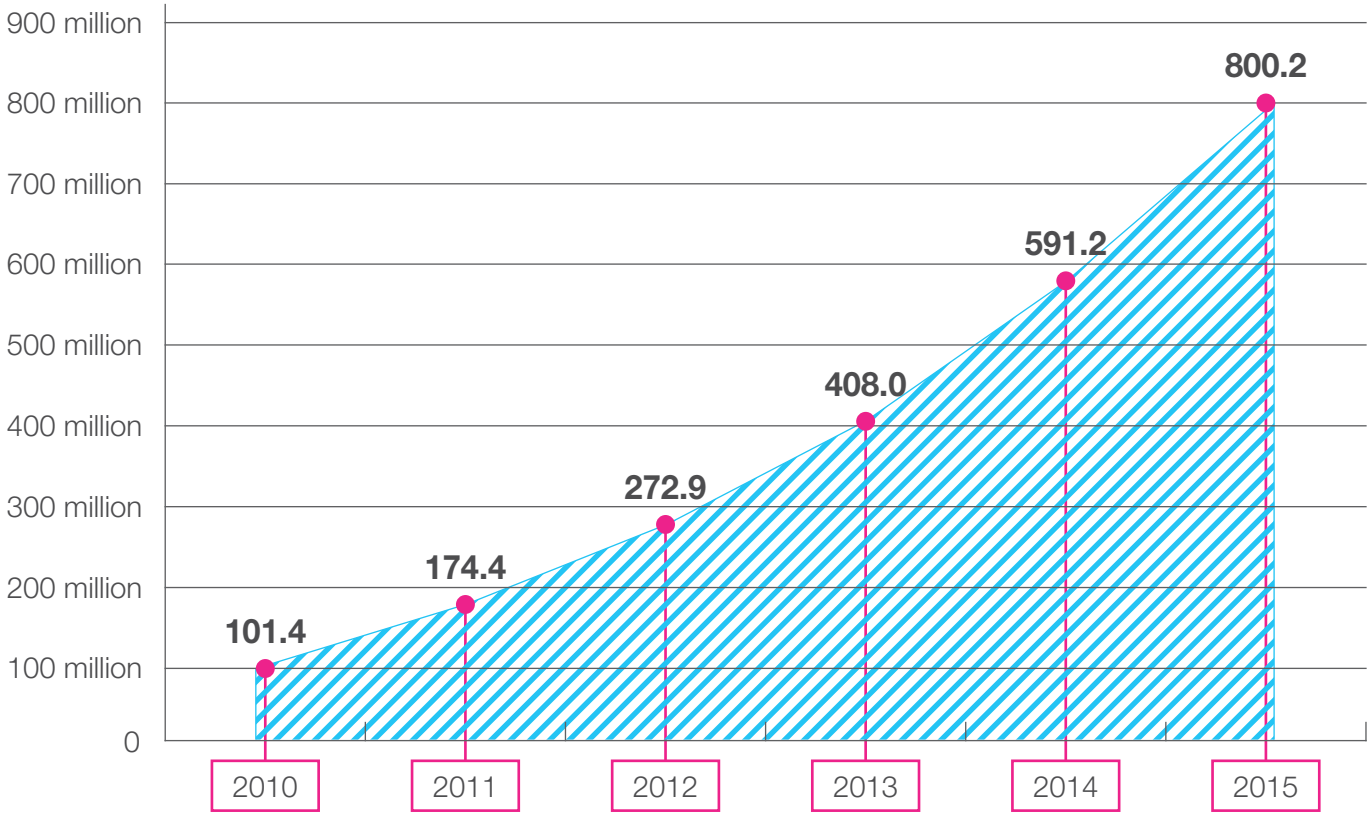

Figure 1 : Total Global Connected Devices, 2010-1015
Source : Yankee Group, 2011

According to an Ericsson report, there will be more than 50billion connected devices by 2020. The vision of a connected world will see profound manners in the way people connect, businesses conduct transactions and society interact with the convenience of ubiquitous mobile broadband enabled Internet access. Meanwhile in the immediate term, operators and service providers globally are finding ways to improve service delivery over the existing platforms and innovating newer technologies to integrate their networks, devices, ICT, applications and devices. Ultimately, pricing models will have to balance the economic feasibility and make the networks technically possible to sustain the demand. As a start, some operators are already shifting their paradigm to create service differentiation by tying certain usage-based applications to certain user demographics.

Big Screen to Small Screens

Smartphone experience is borne out of the need to constantly be connected and bringing the experience to the consumers at their fingertips rather than the popular concept of smartphone encouraging usage of mobile broadband. Where next would this bring us? Many believe that Wi-Fi will come of age with other wireless technologies as the race for the “Internet of Things”, where everything that can be connected will benefit from the connection.

The evolution of Wi-Fi from its role of” connector” to “Wi-Fi as a service” has come a long way. Throughput speeds have leap-frog from 2Mbps to 11Mbps and now at an astounding rate of up to 150Mbps. Take for example, the chain of actions by connecting a device to the Internet regardless of geographical boundaries - Patients can connect remotely to the hospitals; students can connect to universities worldwide, rescue workers can be mobilized to disaster areas immediately, real-time fleet tracking of goods and services amongst the varied use case for efficient response.

The introduction of small screens i.e. smartphone form factors, have changed the way data is transmitted, with the core intention of customizing the necessary information with the least amount of processing and most efficient (energy saving) consumption of power and time. Previously, the invention of the family TV sets seemed like yesterday, where content was delivered via terrestrial satellite in big screen mode. Fast forward today, you will find that the TV set top box now can run multiple converging technology (cable, Wi-Fi, fiber, mobile) that enables quad play; internet, video, voice and mobile broadband all in one. Falling prices for communication plus the increasing new services and functionality of digital broadcast is connecting virtually everything to serve individual needs and society at large. Moving away from the big screens, now content are delivered over small screens.

The arrival of smartphones has made the Internet experience more mobile than ever, giving flexibility to consumers to bring it around and at some level, user expectations. There are challenges to overcome when porting the experience to the small screens, as operators struggle to keep SLA's in place. The need for better optimization of trans-coding methods and battery consumption is crucial as applications and content are first and foremost bandwidth hungry. The latency and jitter are the main issues associated with voluminous uncompressed video files. Creating content for small screens inherently requires a different thought process. For this reason, the UI design can influence the usability of the small screen device. The various mechanisms which service providers use to compress and stream content can compromise on the quality and is also confronted with complications of combining cellular and Wi-Fi access to ensure a speedy, visual, streamline and intuitive experience.

Extending into M2M Services

Another segment of the connected devices fall under the grouping of machine-to-machine connections and communication – which is seeing the user demand, network evolution and ecosystem breaking down barriers in a flexible mix of intelligence and performance. M2M communication will set the building blocks for a networked society in an area that is expected to grow significantly in the coming years, as the business models for cloud based solutions will minimize entry barriers.

While network evolution provides the foundation for connectivity, connected devices will only be as good as the applications and services built on top of them. However, solution providers, enterprises, and consumer electronics and other device manufacturers are already beginning to demonstrate a variety of connected device solutions across multiple sectors. Several vertical industries have already taken advantage of connected devices to cut costs and increase efficiency. Fleet management and remote asset monitoring devices have been in use for over a decade. However, its potential is taking-off in vertical markets relevant to utilities, transportation, smart grids and healthcare. The need for ensuring the security, integrity and privacy is needed on both the logical and functional level of the system to allow a quick and easy way for people to and devices to communicate, relate and understand.

Wi-Fi Investment Strategies

Many consumers are interested in sharing its data plan with multiple devices such as tablet, smartphone or laptop. The flexibility to allow the user to move and access the Internet in multiple devices is key to creating new services that are tailored to the needs of certain markets and sectors. Usage patterns suggest that consumers are already adopting their handheld devices as entertainment tools and willing to pay a premium for content like mobile TV, Internet music, live sports and social networking, aside from the basic emailing, text, browsing and voice services. It would not be surprising to see that the small screen devices will eventually become the de-facto device to carry all data traffic, voice, apps, multimedia, HD quality content in the near future, where the functional abilities is embedded and thus relegating the large screens to mere role of projection for large visuals. Increasingly, operators are moving into greater customer-centric approach through consumer and market behavior needs, listening carefully to the issues and resolving these issues to create more value to the consumers.

Experience

Different types of devices are turning into hybrid based communication devices. Tablets and smartphones, in different forms and shapes are expected to evolve into the portals of integrated services and applications. With that in mind, operators are beginning to put emphasis on the SLA's that can be fulfilled from the aspects device performance, usability and efficiency of power together with better control over network-based traffic management methods. To the consumers at large, the benchmark for quality is not how well the device works in the network, but rather how well YouTube or Facebook works over the network, regardless of the access technology platform.

Scalability

Wi-Fi has inspired many an application platform for developers, pipeline for operators and the boom of smarter gadgets and devices to pack in as many things as possible in the meaning of transmitting and sharing information in a connected society. The rate at which operators build out new infrastructure is lagging far behind demand and thus turn to effective alternatives in Wi-Fi. To monetize their 3G and 4G networks more effectively some choose to build partnerships via Wi-Fi aggregators such as Boingo and iPass. Whichever way, operators are now seeing their strategies to pragmatic practice to strengthen its market position and leverage on network convergence.

Bundling

The obvious reasons for adopting Wi-Fi presents itself in several areas such as maximizing the use of available spectrum to deliver the best service experience. It is common for operators today to bundle Wi-Fi with existing subscription to give additional value on top of the mobile or broadband package, while serving as a retention tool to increase operator's perceived service value which forms part of the operator's mobile broadband strategies.

Loyalty

One of the marginal approach of focusing on generating revenue from free Wi-Fi venues (through retailers, cafes, hubs), can create "stickiness" for users through the appeal of zero cost access. These access cost is somehow, supported indirectly through potential revenue streams such as measurable difference between brands; building loyalty. A positive customer experience can create positive effect on customer acquisition (loyal customers are more likely to recommend a product or service to friends).

Policy Based Controls for Smart Monetization of Service

Smarter network enables better and stronger pricing models to thrive. The subscriber appetite for mobile Internet services is eating away the operators' business model faster than the operator's reaction to implement newer networks. To cope, operators are better off leveraging on Wi-Fi approach and pursuing tiered pricing to slow the subscriber behavior, while carefully strategizing how to succeed in their service models in the longer term. As such, policy based controls have evolved from the 1st Generation type of exercising control on the network level to the 2nd Generation of advanced policy control that relates to both the device and network level. The need to have control with greater granularity and intelligence will help understand how subscribers use the Internet rather than frantically launching products and marketing that are confusing to the subscribers. Operators must perform a better job in communicating to their customers about data usage in a language that is clearly understood.

Unlimited data plans although popular with end-users, is rapidly exiting the market as Operators find it too expensive to provide. Increasingly, Operators race to make the user experience economically and technically feasible through alternative means. Many users are interested in shared data plans, where they have the flexibility of connecting multiple devices in one subscription plan. Some Operators are experimenting with multiple device plans and Wi-Fi bundling to incentivize Wi-Fi usage. By incorporating offloading over Wi-Fi and dynamic policy; where operators have the flexibility to manage context information in network discovery and selection procedures in push and/or pull mechanism with a policy controller contribute to better understanding of the traffic models relevant to prioritizing subscribers to the corresponding services.

Generally, people are willing to pay a premium for guaranteed user experience in some parts. Therein exist segmented consumer base particularly to serve different needs. Although many users choose to access their services over 3G wherever possible, the adoption of Wi-Fi that bring better promise for periodic data burst applications is a compelling enough for users to adopt Wi-Fi. It is not as important, which access technology the applications run on, but rather the user experience that counts in mission critical use cases. The user benefits from hugely by being able to access hundreds of applications in an instant. Monetization of data is possible by including a flexible billing and charging engine, self service interfaces to turn the marketing and pricing models to profit.

Usage Pattern Shaping

Subscriber aware and context aware is necessary to create a smart mobile Internet network. By gathering real-time information such as location, time, applications, volume and usage frequency of each subscriber is using at any one time, give the operator visibility to develop tiered pricing plans to that are aligned to the subscriber profile. Similarly for users, they deserve the same level of transparency on their data usage in order to have control on their choice of services. For example, operator offers an unlimited access plan to specifically Facebook use. On other sites, the user will incur higher fees for less frequented sites.

Personalized Services

Given the diverse price plans, the need for creating personalized service for different user groups can be complex. With policy based controls, it allows operators to track different types of traffic, whether mission critical or otherwise to offer an opt-in for best QoS. Such is prevalent in corporate users that require strict control over security and efficiency. Another useful option would be to exercise parental control over their children's Internet activities. The added benefit of advanced content-awareness platform also serves as traffic management mechanism on the choke points, where congestion can be minimized, by provisioning bandwidth resources on the spot to deliver the best possible performance.

Premium Plans

There are various charging variable in the price plans. A smart strategy is to evolve the network into a smarter network that can tell which apps and services that is accessed most. These users are willing to pay for a premium, as long as the service is guaranteed. If, the user is charged in quantities which bears little meaning to them in GB will be difficult to comprehend. However, with tiered pricing and the option of premium plan upgrade, users can have the comfort of knowing, where and when the data plan is spent on. For example, the premium plans can be structured in a way where there are measureable counts of video downloads for a particular size in a given package and the corresponding speeds that they are guaranteed.

Conclusion

Many Wi-Fi Networks began as networks of convenience, intended to supplement wireless connectivity wherever necessary in niche markets. Now we are seeing a general move for Wi-Fi to replace these networks for many types of users, applications and use case. This fundamental change in use brings a fundamental change in expectations. Networks must now offer not only secure access, but must also be able to support multimedia applications, the type and number of which continues to grow.

From a product marketing and revenue management perspective, operators are driven to constantly measure and monitor the entire value chain of the network elements. Subscribers will benefit from simple and intuitive alerts on their data allowances in terms of which activities, email, video downloads that is important to the users. Instead of operators selling plans based on speeds and GB, without the transparency. Similarly, the backend processes must be advanced and agile enough to enable and carry out the charging, billing and rating engine in an integrated manner to policy management mechanism. The various behavior models derived as a result of closer inspection at granular level, brings insight on the types of possible service models. By indentifying the correct the subscriber profile and aligning them to personalized services can build greater understanding and successful pricing strategies. Both the consumer and operators benefit from bandwidth boost and service excellence.

In short, converging technologies between wireless variants of 3G, LTE and Wi-Fi plays an important role in delivering new mobile Internet experiences which many networks are already a hybrid of sorts. The sophistication of both device clients and backend integration ability to anticipate and provide a considerable level of predictive analysis on the usage intensity and behavioral preferences can be rewarding.

When examined closely, the relationship between the context of user's behavior and perceived value from the Operator can be described in an analogy; streaming a youTube video during peak hour at a café via a smartphone with Wi-Fi policy notification, without noticeable visual impairments or delay interruption is great service value. In contrast, the same activity will not have the same effect, when the user is mobile and moving between locations. The user would likely turn to GPS applications and broadly associate the experience of the device-enabled or operator-enabled location-based service in direct relevance to navigational properties to which extent is valuable information. The navigational service may not be data intensive, but nonetheless important to the user. By co-relating the context of usage behavior with advanced analytics, service aware intelligence and subscriber aware intelligence, prediction models help Operators identify the type of services it can capitalize and turn into profitable dollars now.

Why Wi-Fi?
Be Creative with Services

Come talk to our experts to embark on tailored Wi-Fi solutions to monetize your service to market. At Greenpacket, we understand the demands placed on Operators like you. Our solutions are designed to give you the flexibility to constantly deliver cutting-edge offerings without exhausting your capital and operating expenditures.

With Greenpacket, limitless freedom begins now!

Free Consultation

If you would like a free consultation on how you can apply Wi-Fi solutions, feel free to contact us at marketing.gp@greenpacket.com. Kindly quote the reference code, SWPS1211-C when you contact us.

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For more information on Greenpacket's products and solutions,
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