DAS and Wi-Fi:
The Essential Guide for a
Comprehensive Wireless Strategy.

When You're Asked to Optimize Efficiency, Wireless Is Usually the Answer… and the Problem.

Increasing Wireless Demand
Today, enterprise IT facility teams are tasked with improving workflow and satisfying user demands for in-building wireless. Networks once designed for a limited number of corporate-administered mobile devices are giving way to new trends in "bring your own device" (BYOD) in order to drive efficiency. As demand is skyrocketing, IT professionals are struggling to keep up with both volume and density requirements.
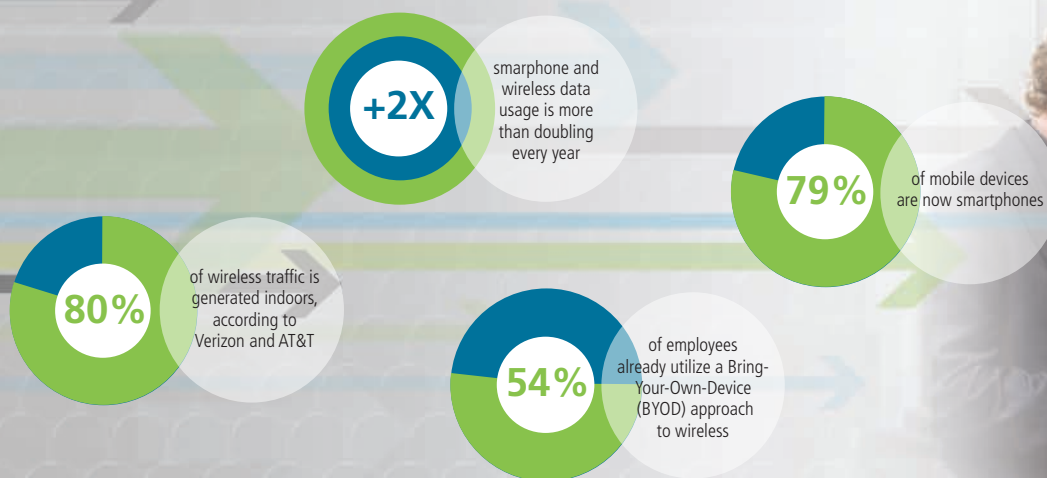
You Have to Strike a Delicate Balance Between Resources and Expectations

Strategic initiatives to mobilize the workforce have reset network parameters. Now, your wireless network is expected to accommodate thousands of clients, pushing data-intensive applications anywhere and everywhere throughout the enterprise with unfailing continuity.

Budget constraints and manpower limitations make it difficult to keep pace with rapidly evolving wireless demands. Today, creating a leading-edge mobile environment that supports more users and more devices has led to more demands, more choices, and an increasing chance the solution will not live up to expectations.

Today's reality is that your enterprise IT team often lacks the resources to implement a broad-based wireless strategy and the expertise to resolve core wireless issues internally. The resulting costs of not doing wireless correctly can pose significant investment risks.

Wireless Proliferation Continues to Escalate

+2X smarphone and wireless data usage is more than doubling every year

79% of mobile devices are now smartphones

80% of wireless traffic is generated indoors, according to Verizon and AT&T

54% of employees already utilize a Bring-Your-Own-Device (BYOD) approach to wireless

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The New Realities of Wireless Illustrate that Wi-Fi Alone Is No Longer Adequate

The Mounting Cost of Failure

For years, businesses built their wireless requirements around a simple Wi-Fi-based strategy. But the rapid proliferation of mobile devices and their massive data requirements have changed the wireless ecosystem for good. As demand escalates, coverage and capacity issues continue to plague Wi-Fi initiatives. As many enterprises are finding out, business as usual is not enough. Creating mission-critical Wi-Fi, while also supporting the massive growth of smartphones and other non-Wi-Fi devices, is the new reality.

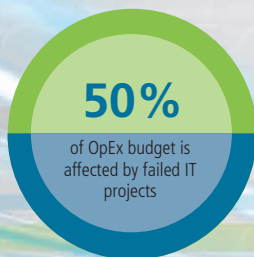### Conventional Thinking Fuels Frustration

As budget constraints and manpower concerns persist, IT staffs are resorting to stopgap fixes of more systemic issues. Expanding WLANs can rudimentarily support new devices such as smartphones and tablets, but it limits their native reachability and usability, while adding stress to mission-critical applications. A single cellular carrier approach can get needed 3G/4G coverage in place. However, it neglects the requirements of employees and visitors who use other carriers, while creating interoperability headaches as other carriers are onboarded. Or, IT can implement Wi-Fi simply to support a single, new application. While this may temporarily address the immediate problem, it does nothing to support ALL additional wireless applications and devices that will be required.

How bad can it get? One corporation opened a brand new facility that had designed its workflow based solely on the use of 4G wireless communication devices. The initial deployment failed when cellular signals were partially blocked due to the use of e-rated glass, and the IT organization had to scramble to change strategies. What should have been an overwhelmingly positive event resulted in nothing but wasted resources and frustration.

Yet, at the same time, Symantec research indicates that those organizations that have successfully deployed a wireless enterprise model are growing revenue 50% faster. The question is what's the most efficient way to get there?

The Cost of a Poorly-Executed Wireless Strategy

71%
of employees are unhappy with the tactical wireless options available

50%
of OpEx budget is affected by failed IT projects

$300K
per year can be spent in labor expenses alone for wireless and mobile device troubleshooting

To Address Today's Wireless Challenges Successfully, IT Teams Are Broadening Their Thinking

Comprehensive, Enterprise-Centric Wireless Holds the Key

The majority of IT Departments are fundamentally rethinking how they approach in-building wireless. In order to accommodate quantum leaps in data volume and density, they are considering all the technological resources at their disposal.

Incorporating Technologies According to Need

Today's mission-critical wireless enterprise requires fully-enabled connectivity for key wireless services across the enterprise. This includes multi-carrier 3G and 4G for employee and visitor smartphones and tablets, Fire/Life/Safety, as well as 802.11a/b/g/n and 802.11ac with optimized WLAN performance for cellular offloading and enterprise laptop services.

To make this goal a reality, IT professionals are looking at wireless more holistically, broadening their thinking to uncover more effective ways to keep pace with rapidly-expanding device demands.

A growing number are seeing the benefits of a comprehensive strategy that leverages the combined strengths of high-performance Wi-Fi and a Distributed Antenna System (DAS).

Here are a few examples of facilities that are making giant strides forward by strategically integrating their wireless technologies into a seamless, comprehensive wireless solution. This solution is engineered to optimize and improve today's Wi-Fi performance while enabling the bandwidth for smartphones and other non-Wi-Fi devices.

Rockefeller Center Concourse

ROCKEFELLER CENTER®

Comprehensive solution provides tenants and visitors with seamless wireless connectivity throughout the underground concourse – one of the highest traffic commuter thoroughfares in Manhattan.

Diageo – North American Headquarters

DIAGEO

Overcame previous poor coverage. Now has uninterrupted access to wireless in order to enable mobility everywhere within the organization.

One Beacon Court

One Beacon Court

Their comprehensive wireless solution ensures wireless coverage and safety for residential, corporate, and retail tenants of this 1.4-million-square-foot mix-use tower.

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What if You Could Free Up Time for Your Staff While Improving Workflow and User Satisfaction?

Match Your Wireless Needs to the Appropriate Network Technology

By incorporating both Wi-Fi and DAS into your wireless network solution, you eliminate many of the shortcomings of trying to get the job done by choosing only one or the other.

Many devices and applications are better-suited to Wi-Fi deployment. Others make far more sense to be implemented via DAS. In some instances, either could be used. It's a matter of which is the better choice for your particular applications and devices involved, and your overall system and strategy requirements.

Ultimately, the goal is to have the entire solution operating seamlessly and at peak efficiency. This is where Black Box Network Services' experience can be instrumental. For over a decade, we've been deploying a full spectrum of wireless services for some of the largest financial institutions and enterprise organizations in the world. As a valued partner to Fortune 500 companies and leading

corporate real estate developers, we're uniquely equipped to help you navigate the complexities posed by wireless within your enterprise. Our unmatched quality enables you to stay ahead of the wireless curve, and reliably deliver virtually any wireless service enterprise-wide.

Black Box's Proven Comprehensive Capability
- Consistently delivers the seamless integration of Wi-Fi and DAS into a truly comprehensive wireless solution
- Offers extensive RF and IT expertise
- Uniquely accommodates cellular, Wi-Fi, public safety, 2-way, and paging

Demonstrated Design Excellence
- Successfully addresses coverage, capacity, and criticality requirements
- Includes full carrier connectivity compliance and full support for all carriers
- Assures unmatched Wi-Fi performance across the enterprise

Flawless Implementation
- Achieves 100% first-time acceptance
- Incorporates lifecycle assessments and monitoring

Ensure Carrier Connectivity Throughout the Enterprise

InnerWireless4G Helps You Retain Control

Black Box Network Services brings wireless coverage indoors through InnerWireless4G. This solution leverages best-in-class, in-building wireless Distributed Antenna System (DAS) technology with unique know-how. The result supports the delivery of wireless services with mission-critical service quality.

A Neutral Host Assures Your Independence

By delivering services from multiple cellular carriers – including leading carriers, public safety, and more – InnerWireless4G helps you retain control. Neutral hosting means you never have to worry about your strategic objectives having to take a back seat to network requirements.

What's more, Black Box's experience in the commercial, residential, and retail space means we offer an array of comprehensive wireless solutions that include DAS capabilities to help ensure you get the best network fit for your specific needs.

Traditional DAS – Supports cell phones, two-way radio, public safety, paging, etc.

Convergence Technology – Capable of doing more than traditional DAS, such as enabling Ethernet and wireless LANs.

Integrated Small Cell – Allows the use of the DAS and the small cell.

With InnerWireless4G, we independently engineer each wireless service frequency to create uniform signal-level coverage. These frequencies work seamlessly with the cellular carriers' external networks, producing unsurpassed wireless continuity for today's mobile environment.

Achieve Mission-Critical Performance

Coverage

Black Box's unique design enables one system to effectively support service for all carriers. Ensuring reliable wireless coverage enterprise-wide is the first crucial step towards achieving the mobile workflow today's leading-edge organizations require.

Capacity

Our RF engineering process and extensive experience with the effects of building materials on RF signal penetration enable us to work with your providers more effectively. Together, we are able to create a compliant signal source that aligns with the capacity requirements of your enterprise – whether it involves a single building or an entire campus.

Criticality

InnerWireless4G helps optimize the 4G experience for mobile device users throughout the network, minimizing the number of help desk calls you need to handle. By successfully accommodating streaming video and other data-intensive mobile device applications, it also helps preserve Wi-Fi bandwidth for data-dense, mission- critical applications.

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Optimize WLAN Performance…
Regardless of the Application

InnerWirelessHD3 Offers You Options

Whether you have identified strategic objectives that call for specific, leading-edge wireless technologies, or you want the ability to leverage wireless innovations as they become available, Black Box can help. From discrete, high-density deployments, to layers, which allow isolation of different traffic characteristics, we can engineer a Wi-Fi solution ideally suited to your needs.

Achieve All Necessary Wi-Fi Coverage

Our extensive experience with leading Wi-Fi solutions for mission-critical data, VoIP, location, and personal data gives us an intimate, hands-on knowledge of application and device characteristics. It facilitates the determination of optimum desired data rates to drive signal level, and therefore, AP density. Client device capabilities also help set limits. This expertise ensures that you get sufficient signal everywhere it's needed.

Accommodate Escalating Capacity Demands

We engineer your Wi-Fi solution to maximize the number of users who can exchange information over the air, while maintaining acceptable speeds. To achieve this, we take into account latency, jitter, and retries, as well as your anticipated user density, necessary channel width, and channel availability for RF re-use planning. To preserve precious Wi-Fi capacity for mission-critical applications, mobile device applications can be deployed via the DAS to achieve unsurpassed performance and reliability.

Manage Data According to Criticality

With the explosive growth of Wi-Fi demand, coverage and capacity are only part of the equation. Controlling the priority in which your capacity is consumed is becoming increasingly important.

For example, research indicates that guest network services can consume all network resources available, often with video receiving the highest Wi-Fi traffic priority even though it's not the highest mission criticality.

That's why we provide you with the ability to operate multiple wireless LANs concurrently in the same footprint. This capability, called layering, cleanly and clearly segments traffic according to criticality, without interference. The layered, high-density WLAN network improves coverage and quality. It also isolates mission-critical interactive business applications from guest-critical applications, such as streaming video, for maximum network reliability.

1000% Increase

No Problem

One Black Box healthcare client experienced a 1000% increase in GuestNet traffic over a 3-year span. Yet due to the Wi-Fi solution that Black Box engineered, the facility saw no impact to mission- or life-critical performance.

How Can You be Sure You're Matching the Right Network Technologies to Your Needs?

Start With a Comprehensive Site Survey

For over a decade, Black Box Network Services has mastered the successful design and deployment of mission-critical, in-building wireless systems.
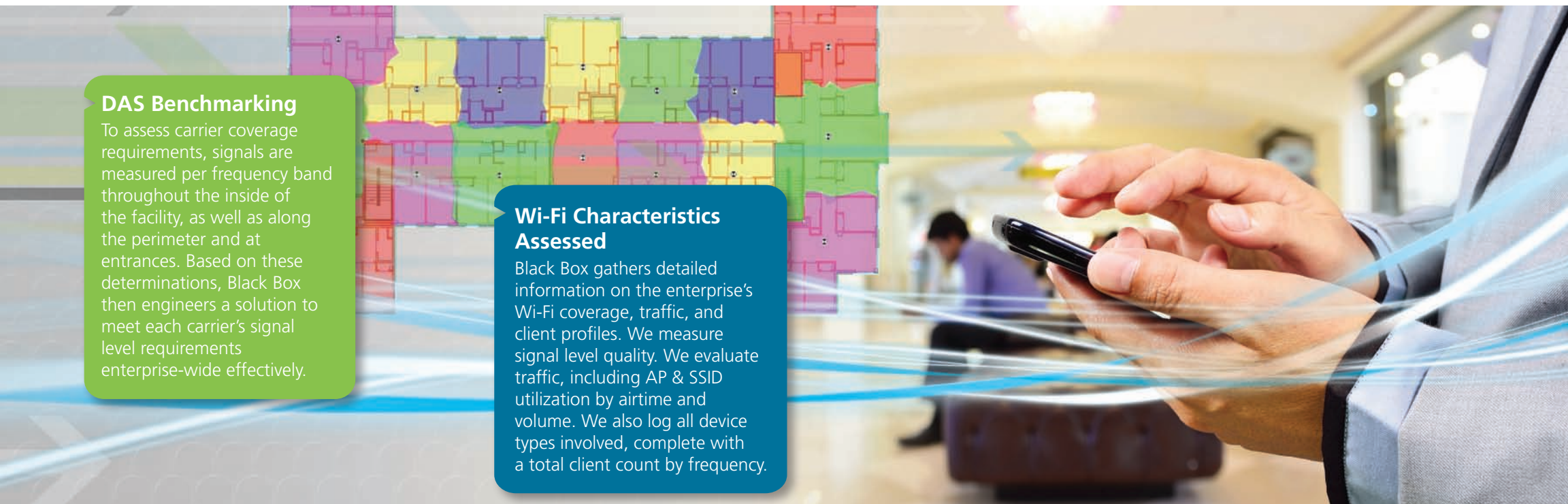
Our focus on predictable outcomes has allowed us to deliver the highest quality design, installation, and operations – backed by an unmatched **100% first-time acceptance rate**.

Our approach to deploying mission-critical wireless successfully starts with determining the scope of your needs and the current state of your wireless. We then match the best devices and applications for your needs to the best network for each.

Unsurpassed RF Expertise

Having deployed wireless network solutions in some of the largest commercial, financial, and residential spaces, we have a thorough understanding of the RF challenges posed by high-rise environments. By taking into account everything from building materials layout, use cases, and workflow, we help you reliably get wireless wherever it's needed throughout your enterprise – even if that means getting reliable signals in hallways, elevators, stairwells, parking garages, and underground corridors.

DAS Benchmarking

To assess carrier coverage requirements, signals are measured per frequency band throughout the inside of the facility, as well as along the perimeter and at entrances. Based on these determinations, Black Box then engineers a solution to meet each carrier's signal level requirements enterprise-wide effectively.

Wi-Fi Characteristics Assessed

Black Box gathers detailed information on the enterprise's Wi-Fi coverage, traffic, and client profiles. We measure signal level quality. We evaluate traffic, including AP & SSID utilization by airtime and volume. We also log all device types involved, complete with a total client count by frequency.

Enjoy the Black Box Difference Throughout Your Wireless Lifecycle

Optimize Your Wireless While Minimizing Headaches

From our professionally structured design and implementation process, to our wireless life-cycle management solutions, Black Box is committed to providing you with an unmatched wireless experience.

Best-in-Class System Design

Our highly experienced RF engineers work with your team, your wireless service providers (WSPs), and OEMs to ensure all facility-specific design criteria are met. Every floor is formatted according to use case, workflow, building materials, and signal requirements. We also detail RF prediction on each required band, and outline cabling plans in our key design documents.

Convenient, Turnkey Deployment

After acceptance of the design, our certified project management team takes care of the rest of the implementation process for you,

scheduling the delivery and installation of the infrastructure, identifying key roles and responsibilities, and overseeing the entire deployment from start to finish.

Partner With Us to Improve Your TCO

We deliver wireless assurance beyond your initial deployment with ongoing professional services. Monitoring, annual preventive maintenance, system revalidation, ongoing assessment, and IT training are just some of the ways we help you minimize your total cost of ownership and maximize your return on investment.

Wireless assurance begins with 24×7 monitoring of all DAS and Wi-Fi electronic components. Provided remotely from our Network Operations Center, we monitor the entire wireless network and promptly assist with troubleshooting and problem resolution.

In addition, ongoing application and device consulting helps ensure that your mission-critical wireless can continue to deliver everything, everywhere, everytime, at a lower total cost-of-ownership to your enterprise.

Deployment

Our deployment motto is "never re-enter the ceiling" – meaning we are dedicated to a quality deployment with minimal disruption to your business. We certify all deployment crews on proven methods and subsystem testing, and a Black Box project manager ensures the job gets done right the first time.

Acceptance Testing

Every deployment concludes with testing to ensure the integrity and performance of your new wireless infrastructure.

To Achieve an Effective, Comprehensive Wireless Solution, Experience Matters.

Black Box Delivers

Our proven track record of successful deployments is based on years of close collaboration with leading industry providers. Together, we help you stay ahead of the wireless curve in order to enhance the overall experience for employees and guests alike, and optimize your operational efficiency.

Guest Critical Wi-Fi

Mission Critical Wi-Fi

3G/4G

700/800/850/1900/2100 MHz

Public Safety/2-Way Paging

450/700/800/900 MHz

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About Black Box

Black Box is a leading technology solutions provider dedicated to helping customers build, manage, optimize, and secure their IT infrastructure. Black Box delivers high value products and services through its global presence and over 4,000 team members. To learn more, visit the Black Box Web site at www.blackbox.com.

www.blackbox.com | 1-877-877-2269 | contact@blackbox.com