Cable vs. DSL
HIGH SPEED INTERNET

Mediacom
MEANS BUSINESS

INTRODUCTION

For today's businesses, fast Internet access is more than a competitive advantage. It is an operational necessity. Changes in the way companies are working– and the tools they are using – have created the need for high-speed connections to services and individuals off-site. Videoconferencing is helping businesses cut travel costs. Mobile devices – with easy links to work-related content – are enabling more employees to be more productive, from any location. All of these applications have one factor in common: they require bandwidth. And plenty of it.

A decade ago, most small- and medium-size businesses could get by with an Internet connection of 1.5 megabits per second (Mbps). But with today's usage, the benchmark is closer to 50 Mbps – and very soon, it will reach 100 Mbps. Businesses that don't have that kind of bandwidth will find themselves unable to fully leverage trends like the cloud and remote access. And to be sure, if they don't, the competition will. Spending on public IT cloud services – including applications, servers, and storage – is expected to grow from $47.4 billion in 2013 to more than $107 billion in 2017, according to International Data Corporation (IDC). Not surprisingly, many business Internet customers are already reporting that their bandwidth requirements are increasing by nearly 25 percent each year.

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How, then, will today's businesses meet their need for speed? For most small- and medium-size companies, the choice will be between two broadband technologies: DSL (Digital Subscriber Line) and high-speed cable. Both have made significant advances in recent years, and promise faster Internet access than ever before. But DSL and cable are very different technologies, with different characteristics and capabilities. Users need to understand these differences if they are to meet their bandwidth needs – and their business goals – not just for today, but for tomorrow, as well.

BROADBAND TECHNOLOGIES: HOW THEY COMPARE

DSL may transmit data, but it is based on a technology developed for voice: traditional twisted-pair copper wires. Twisted-pair was a breakthrough when it was invented by Alexander Graham Bell in 1881, eliminating crosstalk and other interference from telephone calls. More than a century later, phone companies developed the means to send data over those same wires. Voice and data could travel simultaneously over a single cabling infrastructure, with the data traveling at a different frequency. Since telephone companies had already deployed huge networks of twisted-pair cabling, they naturally became the prime providers of DSL service.

Cable high-speed Internet, on the other hand, was developed specifically to transmit data. Its breakthrough is far more recent, occurring in the late 1990s when the first version of DOCSIS – the Data Over Cable Service Interface Specification – emerged. DOCSIS is a global standard that enables the addition of high-speed data transfer to the existing hybrid fiber-coaxial infrastructure used by cable providers. The most recent version of the standard – DOCSIS 3.0 – supports the simultaneous delivery of video, voice, and data at speeds that already meet the 100 Mbps threshold.

The differences between DSL and cable run far deeper than pedigree, however. For businesses deciding

between the two, the following breakdown of key attributes may prove informative.

- **Speed.** DSL has made great strides in recent years, with significant improvements in speed. But those increases still may not be sufficient for many businesses. Major DSL providers can today offer speeds exceeding 20 megabits per second – and at least one company has announced speeds of 45 Mbps coming soon. But this is still below the 50 Mbps threshold has become the de facto standard for business.

  High-speed cable, on the other hand, has not only been able to deliver that 50 Mbps benchmark for the past couple of years, by has gone far beyond it. Leveraging DOCSIS 3.0, top-tier cable providers are providing 100 Mbps service today, and speeds reaching 250 Mbps are expected in the near future.

- **Distance.** By running over twisted-pair cabling, DSL relies on a proven technology. But it is also a century-old technology, and not one designed with data in mind. While voice calls can be carried vast distances over twisted-pair wires with no degradation in quality, data does not fare as well. In fact, if subscribers are located more than a couple of miles from a phone company's central office, DSL performance degrades markedly – so much so, that the service may not be available at all.

  Consider, for example, today's most common type of DSL technology: Asymmetric Digital Subscriber Line. With ADSL, broadband service is technically possible over a range of about 18,000 feet (roughly 3.4 miles). But because of performance degradation, providers generally limit service to a shorter distance – and even then, top speeds may be hard to obtain. Twisted-pair wires may provide a reliable way to call a client or colleague, but they may not work so well – or at all – for sending them a large file, sharing cloud-based data with them, or joining them in a videoconference.

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Designed from the ground up for transmitting data, high-speed cable is not distance sensitive. Whether subscribers are located next door to the cable company or many miles away, they can enjoy the same broadband speeds.

- **Consistency.** With so much of a company's operations depending on fast, reliable Internet access, consistency is crucial. If the speed businesses expect is not the speed they get, undesired results occur, including degraded video and Voice over IP (VoIP) quality, sluggish downloads, and slow connections to mission-critical applications and data in the cloud.

  The true test for consistency comes during peak usage hours, when Internet traffic – and stress on networks – is at its highest. For businesses, these are the periods when they rely on their broadband most and when the consequences of slowdowns are greatest. To explore how different providers and technologies stack up, the Federal Communications Commission launched the Measuring Broadband America program in 2011. It's study published in 2014, found that DSL-based services delivered, on average, 91 percent of advertised speeds during peak periods. Cable-based services, on the other hand, delivered 102 percent of advertised speeds.

- **Availability.** The distance limitations of DSL mean that for a large percentage of a phone company's footprint, the service will not be available. This is especially true in rural areas, where the cost of installing DSL infrastructure, combined with low population density, means that DSL is rarely economically viable for providers. Indeed, some of the largest phone companies in the country can offer DSL to just 25 percent – or less – of their customers. Since high-speed cable Internet doesn't degrade over distance, and runs over the same infrastructure that brings cable TV to both densely and sparsely populated areas, it is available to a far wider customer base; in cities and rural areas alike.

- **Roadmap for the future.** A broadband technology should meet a business's current bandwidth needs, but it should be positioned to meet tomorrow's needs, as well. The use of tools like videoconferencing and VoIP are growing; so, too, are emerging trends like centralized data warehouses and Big Data. As they grow, bandwidth demands will grow.

Both DSL and high-speed cable will continue to improve, but in different ways, with different results. New DSL technologies like ADSL2 and VDSL (Very high bit rate Digital Subscriber Line)

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and VDSL2 will offer higher maximum speeds than today's DSL, but even the highest rates now envisioned will just barely meet the 100 Mbps standard most businesses will require in the very near future. Nor will these technologies get around the distance and availability issues inherent with all DSL service. Top speeds will be achievable by just a fraction of a phone company's footprint – the subscribers located close to a central office.

Cable's roadmap is ambitious and far-reaching, intended to take speed and reach well beyond what next-generation DSL will offer. While DOCSIS 3.0 is already enabling cable providers to deliver 100-Mbps broadband, this is just the beginning. DOCSIS 3.0 will reach speeds of up to 250 Mbps in the near future, and its successor – the forthcoming DOCSIS 3.1 – is expected to turbocharge bandwidth even more, bringing speeds of 500 Mbps to 1 gigabit per second (Gbps) to a coverage area far and wide.

SUMMARY

For small- and medium-size businesses, bandwidth requirements are growing rapidly, as the tools they rely on are becoming increasingly dependent on fast, reliable Internet access. Meeting today's needs is vital, but so, too, is laying the foundation to meet tomorrow's needs. That means selecting a broadband technology that not only provides the highest speeds – reliably, consistently, and to as large a service area as possible – but will support future requirements, as well. Breaking down the two main options, DSL and cable, demonstrates that for most businesses, only one hits every mark. With cable high-speed Internet, businesses get a network built for the next century – not built around the last one.