

How to Estimate Business Broadband Needs

Understanding Dedicated Leased Lines Versus Shared Access

Leased lines (such as T1, DS1 lines) are a common Internet access solution for high-speed, guaranteed broadband services for businesses. Leased lines are defined by a contract and provide a dedicated connection between the ISP and business premises. They are typically symmetrical lines, meaning the download and upload speeds are the same. Leased lines come with service level agreements that define performance, reliability and support criteria. Installation cost is based on the equipment needed, location of the business premises and distance to the nearest ISP access point.

Shared access lines are less expensive because they are shared by multiple users. However, as the number of users in the area increases, the peak performance is reduced. An example of shared access would be the DSL or cable Internet service to your home. If you choose to go this route, ask your provider for their “contention ratio” which is the ratio of the potential maximum demand to the amount of actual bandwidth for which you pay. The higher the ratio, the greater number of users who are trying to use the actual bandwidth at any one time. High ratios will lower the bandwidth you can use, especially at peak usage times. You can see this effect by taking speed tests at various times of day (one test is available at <http://www.colorado.gov/BroadbandSWF/speedtest.htm>).

Bottom line, when calculating what you need for shared access lines, you’ll want to over-purchase (for example, from 1.5 to 3.0 Mbps) if you can’t afford slow-downs during peak usage times.

Estimating Needs

In determining basic broadband needs, a recent forum discussion on Spiceworks (a community of small-medium business IT professionals), suggested that a 1.5 Mbps dedicated leased line (not shared) would support 10-20 typical office users. However, this is dependent on the type of applications your users typically run and how often. General use of email, web searching or document sharing is different than businesses who have a large web, e-commerce or e-business presence. Businesses with IT professionals typically monitor their Internet traffic to see if they have enough bandwidth.

For businesses without such IT help, the following table can help you estimate your needs. You can also work with your ISP.

NOTE: The table on page 2 is estimating speed needed per single user for acceptable performance, unless otherwise noted. If your users will be doing high-bandwidth applications at the same time, you’ll need to look at the requirements of the services you use. This will usually include finding out the typical file sizes that are downloaded or uploaded by the application and by looking at the stated bandwidth requirements of your applications, along with knowing the number of users online at the same time. Most software applications will provide you guidance on minimum and optimum Internet speeds. Microsoft also suggests that you assume your daily peak will be twice the average speeds you calculate.

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Typical applications and their performance for various download/upload speeds - single user

Application	1.5 Mbps / 384 Kbps	7 Mbps / 768 Kbps	10 Mbps / 1 Mbps	20 Mbps / 2 Mbps	50 Mbps / 2 Mbps	100 Mbps / 10 Mbps
Simple email, no attachments	Green	Green	Green	Green	Green	Green
Web browsing	Green	Green	Green	Green	Green	Green
Email, attachments and graphics	Green	Green	Green	Green	Green	Green
Download small files (1 MB, 50 pages)	Green	Green	Green	Green	Green	Green
Download large files (2 MB, 100 pages)	Green	Green	Green	Green	Green	Green
Online trading, e-business	Green	Green	Green	Green	Green	Green
Online meeting, with document sharing	Green	Green	Green	Green	Green	Green
Videoconference (384 Kbps) - 1 user	Yellow	Green	Green	Green	Green	Green
Skype videoconference - 5 users	Yellow	Green	Green	Green	Green	Green
Cloud applications (business apps, backup)	Yellow	Green	Green	Green	Green	Green
VPN, remote service access	Red	Yellow	Yellow	Green	Green	Green
Videoconference (768 Kbps) - 5 users	Red	Yellow	Yellow	Green	Green	Green
Voice over IP (ten external lines)	Red	Red	Yellow	Green	Green	Green
Upload videos, presentations (1 GB)	Red	Red	Yellow	Yellow	Green	Green
Download HD video (2 GB) in real-time	Red	Red	Red	Yellow	Green	Green
Server backup, up to 20 GB (off-hours)	Red	Red	Red	Yellow	Green	Green
Telecommuting	Red	Red	Red	Yellow	Green	Green
Distance learning	Red	Red	Red	Yellow	Green	Green
Telemedicine (160 MB, radiologic images)	Red	Red	Red	Yellow	Green	Green

Table adapted from "The Impact of Broadband Speed and Price on Small Business" at <http://archive.sba.gov/advo/research/rs373tot.pdf>