

## **CIIBIS Inc. Satellite Internet FAQ's**

### **Residential & Business ||**

#### **What does "two-way" service mean ?**

"Two-way" service means that data is both downloaded and uploaded via satellite. Some satellite systems, one-way systems, download via satellite, but upload via your telephone line through a dial-up modem. This is a slower uploading process, and it ties up your phone line when you're on the Internet. Two-way service means faster uploads and much faster downloads and no busy telephone.

#### **What are the speeds for uploading and downloading?**

We offer different packages Please go to Residential or Business packages section.

#### **Is it satellite in both directions or is it using a land line (phone) for the uploads?**

The satellite connection is in both directions. The Service is not through a land line (phone) for uploads. It is through the dish receiver and transmitter. The Satellite signal runs through a modem, supporting both uploads and downloads, that is connected to your computer.

#### **What are security features?**

CIIBIS knows how important your privacy is. That's why this service uses conditional access and triple encryption (3DES) to protect both your incoming and outgoing information. This broadband access is as secure as you can get. Conditional access uses encryption technology to secure service against unauthorized access. It protects multimedia and digital files from being intercepted by any site except those designated. Information you send is inherently secure because of the complexity of satellite transmission.

#### **What is the price for a home user? I assume there is a cost for the dish and installation and then some monthly fee.**

You are right, there is a cost for the dish, installation, monthly fee and a one time licensing fee. The cost of the dish is dependant on the size of dish required for a particular region. Challenging terrain (mountainous regions etc) and weather condition dictate the size of dish required. Contact Us for a quote specific to you needs (780-431-0732)

Seasonal service is available:  
Disconnect & reconnection fee \$75

#### **How many users can connect to one dish and at what range?**

Sharing your Satellite Internet signal with neighbours is possible. CIIBIS would have to assess the proximity to see if it is feasible.

#### **I live at my cottage/resort for 6 months, and at my winter home for 6 months. Can I use this in both places ?**

Yes, options are available:

Option 1: That for a reasonable price, you can install the second dish at your home. Then all you have to do is move the modems and you can enjoy the high speed connection from the other location. Contact us for the details.

Option 2: You can activate the dish for 4 or 6 months only. This way you do not pay during the winter months. You will however be required to pay a reasonable fee for this service. Contact us for the details.

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### **Are any other services is included (e-mail, web page etc)?**

The costs above pertain only to Internet service. Although we do offer other services such as email, web hosting, and web development.

Email when CIIBIS web hosting services are used \$4/mo./person

Purchase of Domain (includes Web hosting) \$50 per month

Website Design & Development hourly rate|| requires estimate

### **What areas of Alberta are covered?**

All Areas of Alberta are able to benefit from satellite Internet service. We began our testing in Inuvik (NWT), which is the most extreme conditions to overcome for satellite internet service due to the fact that it is at the edge of satellite signal range. This was a successful test of our ability and Iqualuit is now fully connected with high speed Internet. Since then we have implemented dishes in many areas within Alberta without any difficulty.

### **Is it purchased directly from CIIBIS or do you use a dealer?**

Everything is purchased through CIIBIS.

### **Can I use the service to get TV?**

The ability to use the satellite signal for both Internet and TV is dependant on the region of your dish. We have configured dishes in the past to receive both Internet and TV signals from a single dish. We can configure the dish to receive both signals, but the fees are separate. The monthly Internet fee is through CIIBIS and the TV service fee is from a provider such as Bell ExpressVu. CIIBIS installs both TV and Internet signals within one installation fee, you do not need both service providers to do separate configurations/installs.

### **Can I install the new 2-Way system myself?**

No. The hardware is a sophisticated piece of satellite equipment and must be installed by a professional. Because this is a transmit antenna, directing power up to the satellite, the installation and pointing is tightly controlled by the FCC and Industry Canada. The FCC and Industry Canada requires a certified installation of this type of transmitter, therefore a certified professional must do the installation.

### **Exactly how fast will this connection be?**

The speed at which data will flow from the Internet to your PC will average 400++kbps, which is roughly 8 times faster than a 56K modem. The speed at which data will flow from your PC to the Internet (e.g., when sending an email) can burst up to 128kbps. Internet use consists mainly of downloading lots of information, and sending very little back to the Internet, so this translates to blazing fast Internet for you. Remember the satellite transmission is not restricted by inferior telephone lines or improper modem protocols. Owners have been reporting speeds well in excess of 1000 Kbps ... sometimes even reaching 2000 Kbps ! That's faster than most cable & DSL connections.

### **How does that compare with DSL and cable modems ?**

These speeds are similar to what you would get from a competitively priced DSL or cable modem service. Most SOHO DSL is rated for 640kbps down, 64kbps up, but this is the maximum and the numbers drop the farther you are from your telephone company's central office. Cable modem speeds can burst up to 1,000 or 2,000kbps, but their speed varies depending on how many people are online at the same time.

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### **What is 2-Way High Speed Internet fair access policy (FAP) ?**

The service is a shared bandwidth service. Because it has been found that a small number of users (5%) were consuming a disproportionate share of the available bandwidth, to ensure that each subscriber experiences the benefits of that bandwidth, it became necessary to ensure the integrity of the service to all our customers. In order to make the experience good for all users the Fair Access Policy has been initiated. The rights are reserved to throttle the speed of an individual user if they are using too much bandwidth. This is called the Fair-Access Policy and is explained in the Subscriber Agreement.

### **What triggers a FAP restriction to be activated on my account ?**

Users should be able to download a fairly large amount of data every evening without activating the FAP. The system is not designed to handle users that require heavy downloading over extended periods of time. The plans are not intended to handle heavy downloading activities such as lengthy streaming videos, DVD downloads, and large files such as those typically downloaded with applications such as Napster. FAP is straightforward: based on an analysis of usage data, Hughes Network Systems has established a usage threshold well above the maximum typical usage rates. When a customer exhibits patterns of system usage that exceeds that threshold for an extended period of time, the FAP may temporarily limit that subscriber's throughput to ensure the integrity of the system for all subscribers.

Here's the "Bucket" analogy that fits the FAP to the best of our knowledge: think of a bucket full of 169 MB of data, no matter how fast you drain it, once the 169 MB is gone, it's empty. Period. It fills at a trickle rate, 47 kbps for the Consumer Edition so it takes approx. 8 hours to refill if you "empty" it. If it fills for an hour or so, you can download another few megs until it's empty again. The Business Edition refills at a slightly higher rate of 56 kbps and is a bigger "bucket" of 500 megs but the same analogy applies.

### **If FAP is activated on my account, how long do I have to wait for it to be lifted completely?**

Typically, FAP restrictions will be lifted within 8-12 hours. While customers can download prior to that time, they may experience less than optimal download speeds or be subject to additional FAP restrictions.

### **What is Uplink beam?**

Sometimes you may see satellite coverage maps marked with G/T and PFDsat contours. These are uplink maps and refer to the sensitivity of the satellite receive system to signals sent up from the ground. This is of particular importance to satellite internet access services since it is desirable to keep the personal satellite earth station as low size and with as low power transmitter as possible, yet powerful enough to get a good signal into the satellite. If the satellite uplink is very good (high G/T) then it can pick up weaker signals from your little transmit dish.

G/T contours are typically +4 dBK +3 dBK +2 dBK etc. The beam peak number varies a good deal according to the size of the coverage beam. Small spot beams receiving from just the area of one country have much higher G/T than larger regional zone or hemi or global beams.

G/T means gain to noise temperature ratio. Gain is simply the gain (in dBi) of the satellite receive (uplink) antenna with consideration of what contour you are on. The temperature is the system noise temperature of the satellite receive system. This will primarily be the satellite LNA noise temperature plus the earth surface temperature (approx) which, of course, is fully visible to the beam from the satellite.

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PFDsat contours follow the G/T contours exactly. PFDsat is the uplink power flux density required at the satellite to saturate a transponder. So if you put up sufficient power to achieve that PFD you will just saturate the transponder. Note the PFDsat is altered to suit the use of the transponder by selecting on board gain step settings using telcommand.

For the satellite internet outlink DVB-S carrier, a high PFDsat is better since this forces the large hub dish to transmit a more powerful uplink signal, thus maximising the uplink C/N and reducing the potential for interference.

For the satellite internet return links you need a low PFDsat to keep the customer dishes small and transmitter costs down but you can't go too far otherwise you pick up too much noise and interference from the ground.

### What is Downlink beam?

The satellite downlink beam coverage maps show contour lines where each line refers to a particular power level from the satellite. The lines are marked with EIRP values like 45 dBW, 44 dBW, 43 dBW, 42dBW etc in descending order from the maximum.

The highest number, towards the middle of the coverage map shows where the downlink beam is strongest and most easy to receive. In the centre of the beam a smaller receive dish on the ground is required. As you move further away from the beam peak the beam becomes less powerful and a larger dish is required. A 3 dB reduction in power level (like going down from 45 dBW to 42 dBW) means you need a receive dish of 2 times the area. A 6 dB reduction requires a receive dish with 4 times the area.

The expression dBW refers to the power radiated from the satellite in the direction towards the contour line.

EIRP means Equivalent Isotropic Radiated Power. 45 dBW is the same as  $10^{(45/10)} = 31622$  watt transmitter feeding an omni-directional antenna.

In practice, an EIRP contour of 43 dBW could be produced by a satellite using a 200 watt transmitter ( $200W = 10\log(200) \text{ dBW} = 23 \text{ dBW}$ ) plus a satellite transmit down antenna with a gain of 22 dBi (maximum) but on the -2 dB beam contour.

### What do I need to have before getting a System ?

- PC with 333 MHz Pentium-class processor or better
- Dedicated USB Port Interface.
- Operating System:  
Windows 98 SE, Windows ME, Windows 2000, Windows XP - with DW 4000  
Unix, Linux, Mac, Windows NT, Windows 98 SE, Windows ME, Windows 2000, Windows XP - with DW 4020.
- 64 MB RAM Win98/128MB RAM ME/2000/XP, 20 MB hard disk space.
- 28.8 kbps modem or higher (needed for commissioning of system).
- Clear view of sky 35 degrees above horizon at 208-228 degrees on a compass.

### Can I use my Macintosh with 2-way high-speed internet?

Yes. If your computer is running a Mac® or UNIX operating systems, you will need a HNS DW4020 system. DW4020 terminal is a self-hosted, stand-alone unit that requires no software to be loaded on any user machines. DW4020 provides an integrated LAN solution to Windows, Unix, Linux, MAC and other platforms running IP over the Internet and offers an easy plug-and-play solution through its four Ethernet ports. This state-of-the-art accessory, which won an innovations award at the 2001 Consumer Electronics Show in Las Vegas, can network all types of computers, peripherals, and operating systems. Because the Mac OS 10.0 release is not supported by Apple, we do not develop products around non-supported OS

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systems. We recommend you upgrade your Mac OS to 10.1 or higher, which is supported.

### **Can you use any browser?**

All of the major browsers function properly in the environment.

Can you use any e-mail program? (Outlook, Eudora, OPERA, etc.) Yes! All of the e-mail programs we've tested work.

Will the ping times be quick enough for online multi-player games ?

CIIBIS does not recommend satellite internet for gaming. You will be able to play the online games, but since the signal travels over 44,000 miles to the Internet, there will be latency in response time.

### **What is the latency of the connection ?**

The way a satellite stays in orbit, without using any type of engine or rocket to correct its orbit, is to gain a balance between gravity and centrifugal force. The closer to earth, the greater the gravity pulling the bird toward earth. The faster it moves, the greater the force pulling it away from the earth. It turns out that there is a spot, about 22,300 miles above the equator, where the speed an object must travel to gain equilibrium against gravity is exactly the same as the speed the earth is turning. By placing a satellite in this spot, its relative position above the earth stays constant. Satellites used for broadband internet and TV must stay in one place in the sky so that you can point your dish in one spot and get the signal. The only other alternative would be to have a constellation of satellites in a lower orbit, that would rise and fall like the sun and stars. There would need to be enough of these flying that there was always one overhead, which requires a lot of satellites, a lot of infrastructure ,and therefore a lot of money.

In the case of a two-way satellite system, when you request something by clicking on a link, or any other way, that message travels 44,600 miles just to get to the NOC. The stuff coming back to you must travel the reverse route, so the round trip is 89,200 miles. The speed of light is 186,000 miles per second in a vacuum, slower through the atmosphere. But even if you assumed 186,000 mps then the total time taken in space travel is about 480ms. Given the atmosphere problem, it is actually more like 500ms. Add to that the terrestrial internet latency, which should be about 100ms. Also you can add delays through transponders, gateways, proxies, etc.

Software and protocols can reduce the effect of latency for certain applications, but they can't change the physics...the latency remains. For instance, by increasing the number of simultaneous TCP connections, web pages can load faster after they get started, but they will always take the same amount of time to get started. Better yet, by replacing the protocol between the NOC and the user from TCP/IP - which doesn't handle high latency well at all - to another protocol designed for long fat pipes, even more could be done to reduce the effects of high latency. No doubt, that is the future of these systems. But still, there will be a delay of somewhere around 625+ms between any interactive activities.

### **How much latency should I expect ?**

Round trip ping times will be 550-650 milliseconds. Any satellite Internet service that uses GEO satellites will be about the same. Data packets travel about 2 x 44,600 miles to and from the satellite, plus the distance to their Internet destination and back. Average trip length is around 100,000 miles. These packets travel roughly at the speed of light (176,000 miles per second), so the expected travel time is  $100,000/176,000=568$  milliseconds, plus processing time by routers and switches.

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Most of the time your average ping times stay below 700 ms. Satellite can have high ping times during heavy traffic periods throughout the day - could be up in the 1400 ms (milliseconds) range.

The nature of the satellite connection is good for Web browsing and for downloading of files. Because of long latency compared with purely land-based systems, interactive applications such as online gaming are not compatible with satellite networks.

### **What is Throughput?**

You can see from the graphic below that each level of service has throughput levels from 300 up to 1000 Megabytes. You can think of these "throughput levels" as working like batteries, they have a certain amount of download power in them. The recovery rate is the rate at which the "battery" is recharged.

For example, a customer on the Business Basic service has a throughput reserve of 500 MB. This "battery" is recharging 24x7 at the rate of 56Kbps but it cannot be charged past the point of being full (500MB). As files are downloaded, they will download at approximately 400 kbps and this reduces the reserve amount. If the "battery" is fully emptied, the bandwidth speed will then be reduced to the recharge or recovery rate of 56kbps. The next morning the reserve will be full again and it all starts over.

If a customer is consistently running out of reserve before the end of the day, he needs to consider a larger reserve or if possible, spreading out some of the downloads with the use of a task scheduler.

### **What exactly will I get when I buy a System?**

You will receive hardware, a software CD and documentation.

The hardware will consist of:

- A dish roughly 24" x 36"
- mounting hardware
- 2 modem-sized boxes that will connect to your PC via a dedicated USB cable
- various cables and accessories

The CD will include all the software the installer will need to connect your PC to the Internet Additional software on the CD will allow you to take full advantage of your always-on, broadband Internet connection.

### **I presume it would also work the same as satellite TV, bad weather no reception! Is this the case ?**

It's the size of the dish and the poor installation that makes it vulnerable to the weather. The 0.74m (2.5 foot) dish has a larger receive signal footprint and thus takes a lot more to knock down in bad weather. We monitor both and when it is extremely hard rain, or a blizzard the TV signal will be knocked off line. The performance of the Satellite Internet dish receiving capabilities are 60% better than the small dish.

Since 2-way satellite dishes are already bigger than DirecTV and Bell ExpressVu dishes, rain fade and signal degradation periods are extremely decreased. Less down time than any telephone company will have.