

METRONET[®]
YOUR HIGH SPEED BROADBAND INTERNET
CONNECTION FROM INFOCOM



- **HOW DOES IT WORK**
- **USEFUL INFORMATION AND ADVICE**

Business-Class Internet Connectivity

Internet Access Made Easy



Dear Client,

Thank you for considering Infocom as the Internet service provider of your choice and welcome as a new Infocom Metronet client.

- **THE CONNECTIVITY AND TECHNOLOGY BEHIND METRONET**

Metronet[®] is Infocom's broadband Internet access and High-Speed-Data-Network (HSDN) service based on Wireless Local Loop (WLL) connectivity, using Alvarion (Breezecom) wireless technology.

Alvarion is one of the leading companies developing and producing broadband wireless access technology with superior equipment performance and reliability. The system based on Frequency Hopping Spread Spectrum (FHSS) technology is designed to meet the requirements of real world environments and applications in the 2.4GHz frequency spectrum assigned by Uganda Communications Commission (UCC) for which Infocom is a license holder.

As a Metronet subscriber you will connect to Infocom through one of the several high-sites we have setup within Kampala and upcountry, via the radio modem and a directional antenna our engineers have installed at your premises (refer to appendix "A" for a principle connectivity diagram). This connectivity will give you 24hrs / 7days a week access to the Internet with no phone line or resultant cost: **instantly and permanently online.**

You will have a fixed global IP address allocated with your Metronet connection, which can be utilized for a number of additional Internet services such as your own mail server and website in relation with your own domain name. Or you can setup a Virtual Private Network (VPN) to permanently interconnect other company offices via the public communications infrastructure of the Internet, maintaining a private network characteristic through the use of special protocols and security procedures. Please contact our sales department on 342681 or sales@infocom.co.ug and our staff will be happy to assist you with all relevant questions in respect to registration and hosting of domain name, website design and hosting or VPN implementation.

- **BANDWIDTH ISSUES OR "WHAT IS MY INTERNET SPEED"**

An always-raised issue is of course speed or bandwidth available with your Metronet connectivity. This question needs a careful evaluation of various factors along the way between a global Internet point and your local PC or

server. This is necessary to understand how the Internet works and what determines speed.

We distinguish between two different Metronet service categories:

- Standard service with managed capacity bandwidth

- Dedicated bandwidth based on a Service-Level-Agreement (SLA)

Both service categories can have various bandwidth levels according to your requirements, i.e. 64, 128, 256 kbps etc.

For a standard Metronet service it is important to note that this is NOT a shared bandwidth as such, but a managed bandwidth. This is a very important distinction. Infocom is currently Uganda's only ISP providing a sophisticated bandwidth management system, which not only ensures even distribution of capacities among all users but based on access rules, it guarantees a minimum bandwidth to all users and avails in a prioritized way additional (burst) bandwidth currently not allocated. This means for a 64 k connection that your speed can be up to 2 times the base rate of 64 kbps (see figure 1 below).

There is another important factor to be considered: Any Internet service provider can only control and guarantee speed up to the access point into the global Internet backbone. The Internet itself is a dynamic and rather volatile network infrastructure, which administers itself and adapts to variations with no single organization or institution having control over it. Once your data packets are in the Internet, traffic is regulated or limited by global network infrastructure rules and routing aspects of the Internet at this very moment and not by limitations of the ISP or Infocom for that matter.

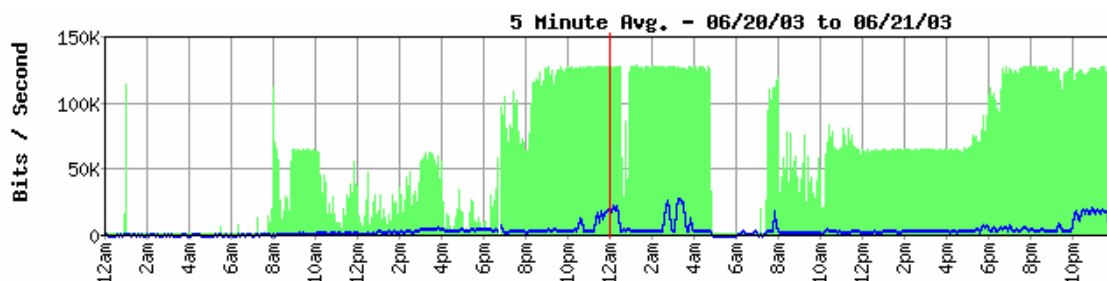


Figure 1: This client is on standard 64/64 kbps managed bandwidth subscription. Above graph clearly shows the burst feature for both days. While bandwidth is limited to 64 kbps (seen between 8 AM and 10 AM on the 20th June and between 10 AM and 5 PM on 21st June) it was up to 128 kbps during off-peak hours (seen after 7 PM on 20th June throughout the night and again after 6 PM on June 21st).

This is very important to understand in order to qualify questions of “slow” speeds, which also need to be evaluated in respect to the global Internet site accessing. Limitations in effect might give you not more than say 30-40k at a particular time because of either bandwidth limitations due to many simultaneous connections to a particular server (i.e. hundreds of connections can be open parallel at the same time to a Norton server for downloading antivirus updates). Or routing regulations and bandwidth restrictions apply on a certain segment of the Internet where you have to pass through in respect to the URL or IP address you have entered, etc. etc. In this case you will not get more overall speed out of your Metronet connectivity than the slowest link segment will provide.

Another very important factor influencing the “feel” of speed of your Internet connection is the number of computers on your office LAN or corporate network, concurrently accessing the Internet. Depending on your usage profile, but as a general guideline, we recommend a maximum of 10 computers for a 64k connection. For heavy or commercial users (i.e. Cybercafes) this might even be less.

If you have e-mail only distribution on your LAN via your own mail server for example, the size of your network is not so much of a concern as e-mail is a store-and-forward principle thus utilizing bandwidth in a different way than real-time access while browsing the Internet.

Whatever your demands are, Infocom can provide you with the very best and scalable connectivity solution which allows you to grow with your future requirements. And via your Metronet account information page you have access to a full featured tool for real-time monitoring of your link utilization with a traffic graph (see figure 2 below), which puts you in control of your connection.

Our customer care department (342681 or customer@infocom.co.ug) will provide you with your access ID and password.

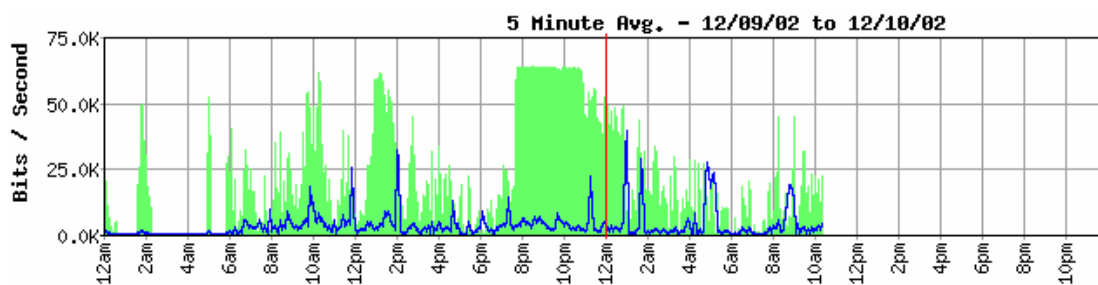


Figure 2: Client real-time graph of a 64/64 kbps managed bandwidth subscription

In any event, should you have concerning questions about your Metronet Internet speed and would you like to have someone explaining to you all the “nitty gritty” techie words around Internet, speed and connectivity, Infocom has all the experts and our sales department will be very happy to hand you over to one of our senior engineers who will be in position to sort all these terms out for you and put them in the right perspective. Because we want you to fully understand the Internet service you are subscribing to at Infocom and we want you as a satisfied customer and a reference to others. No jargon, but clear and understandable technology is what we want to provide to our customers with all our services – and explaining complex techie stuff is a part of our service; and an important one too.

- **SOMETHING ABOUT SECURITY**

Another often overlooked but very important issue is your protection against virus or intrusion attacks from the Internet as well as “open mail relays” if you are running your own mail server with our domain name. Needless to repeat and quote the hundreds of documents and advice published in this respect. Even though we are providing network address translation with the Metronet connection, which gives a certain degree of security, but it does not provide virus protection!

We urge you to install and permanently update an adequate antivirus program on your server and workstations to avoid expensive data loss. If you are running your own mail server you will be able to relay your messages through Infocom’s high performance mail servers for a quick dispatch of your mail to the Internet. Your systems or network administrator needs to make sure however that your mail server (MDaemon, M/S Exchange or others if you run Linux for example) is configured properly and necessary security measures are in place i.e. no “open mail relay”, which can be exploited by hackers for spamming.

This is a very crucial issue since the fixed global IP address allocated to you is from our IP address blocks and you risk your domain being banned by Internet security agencies if your network is virus infected and one of your computers is subsequently performing a port scan of Internet servers in the attempt to infect others or if an “open mail relay” was exploited for spam mail. Our backend system will detect such abuse and shut down a connection until the problem is solved. This is a requirement all ISPs need to follow in terms of Internet security and we trust in your understanding and co-operation. In any case we will notify you if it is related to your IP address. Again our team of support technicians is at hand should you require any assistance to solve this problem.



- **WHAT TO DO IN CASE OF PROBLEMS**

As explained earlier, with Metronet you are permanently online to Infocom and the Internet. And your connection is managed not only in terms of the allocated bandwidth level but also in terms of your online status. This means we are permanently monitoring your connectivity status and can qualify when things go wrong. Please report all problems or faults to the Customer Care Department on 342681 or customercare@infocom.co.ug.

Our team can immediately qualify your online status and advise whether the problem might be related to your PC workstation, server or other equipment, which is connected to the Metronet equipment. Our Customer Care team will do everything possible to assist you during your call or escalate your problem to our Technical Support or Metronet Department for further clarification and get back to you as soon as a technical staff can attend to your query.

We do hope that this document will give you an informed start into your new Internet connectivity experience which, if correctly understood and maintained, will give you unlimited freedom of access and a high performance connection at all times. And our well-trained and experienced staff is there for you to make this experience pleasant and affordable.

One last but important issue: At Infocom we believe in an active customer forum with our clients and we strive to improve constantly. How better could that be done than with a constructive feedback from our clients? We appreciate your input and experience you have with Infocom. Tell us your feeling and where you think we should improve. Or just tell us what you feel is worth a positive note as well.

GLOSSARY

ISP – Internet Service Provider

LAN – Local Area Network, a networked group of computers and associated devices that share a common communications line and typically share the resources of a single processor or server within a small geographic area (for example, within an office building)

SLA – Service Level Agreement, a contract between a network service provider and a customer that specifies, usually in measurable terms, what services the network service provider will furnish (quality of service level), i.e. minimum access bandwidth or data volume per month, minimum service availability (up-time), fault escalation procedure and handling

VPN – Virtual Private Network, a private data network that makes use of the public communication infrastructure (Internet), maintaining privacy through the use of special protocols and security procedures

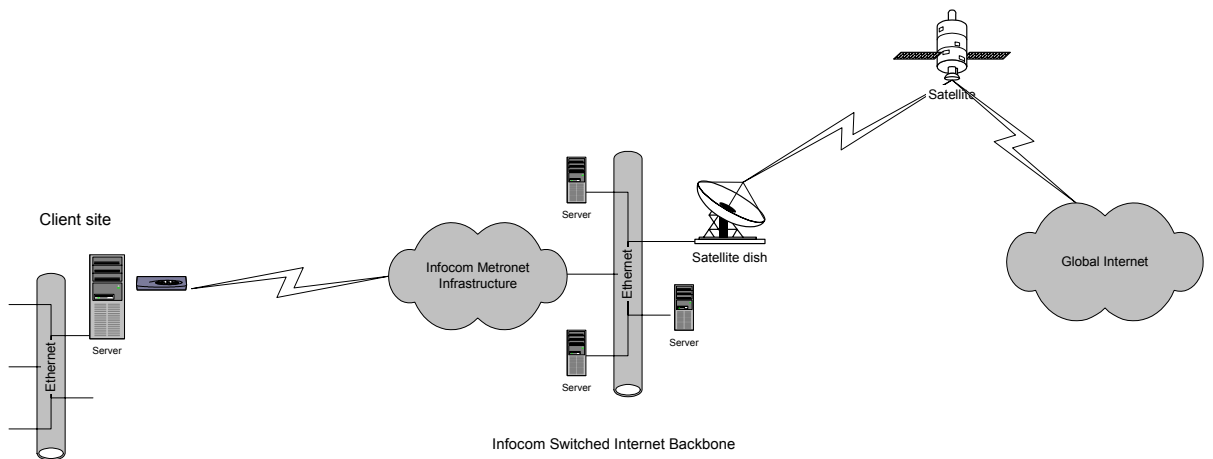
WAN – Wide Area Network, a geographically dispersed data network across distant buildings or office locations. It distinguishes a broader network structure from a local area network. Several LANs can link to a WAN

WLL – Wireless Local Loop, wireless radio technology for high speed data connectivity


Your Metronet Team @Infocom

APPENDIX A

Principle Metronet Connectivity



SYMBOL KEY

 Metronet WLL station adapter



Uganda's leading Internet provider

Tel: 342681 Fax: 342192

www.infocom.co.ug

sales@infocom.co.ug

Dial-up access (countrywide):

049 5100 (local call rate within UTL fixed network)

031 217100 (MTN)