



IRIDIUM

RUDICS – Multi-link PPP
Application Note

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Iridium Satellite LLC Proprietary & Confidential

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1 Introduction

The purpose of this application note is to provide an explanation of how multiple Iridium data circuits can be bound into a single higher bandwidth connection. The objective also is to be able to bind multiple channels with only the use of commercially available equipment, software, standard protocols, and no custom equipment at the customer's premise. This application note will provide detailed information on the necessary configuration of end user equipment and an overall high-level network design.

2 Configuration

2.1 Equipment

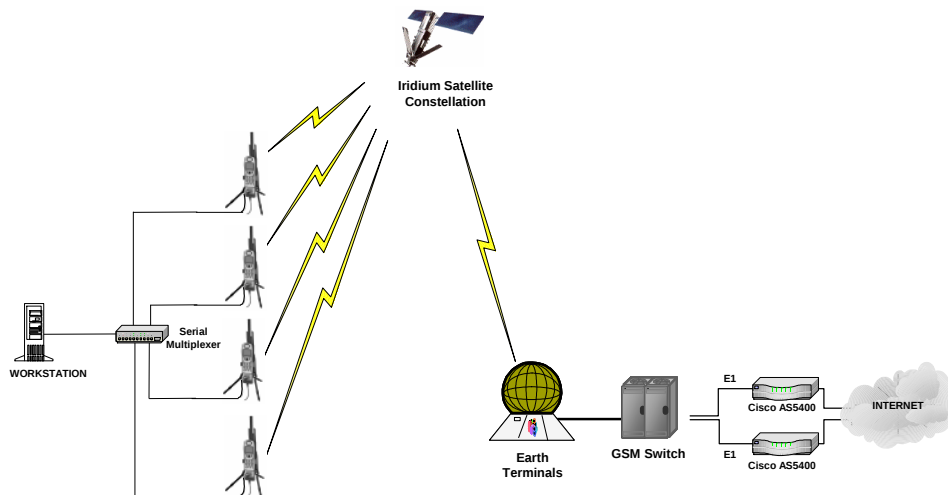
The following equipment was used during Iridium's prototype testing:

- 4 - 9505's in Docking stations
- 4 - Iridium World Services Data Kits
- 1 - Edgeport™ 4 Port USB-to-Serial converter
- 1 - HP Powerbook running Windows XP Pro
- 4 - Fixed mast antennas

The EdgePort™ is an intelligent, stackable expansion module that connects to a PC or server via the Universal Serial Bus (USB) port, providing four high-speed RS-232 serial ports with DB9 connectors. More information on the EdgePort device can be located at:

<http://www.ionetworks.com/products/edgeport.html>

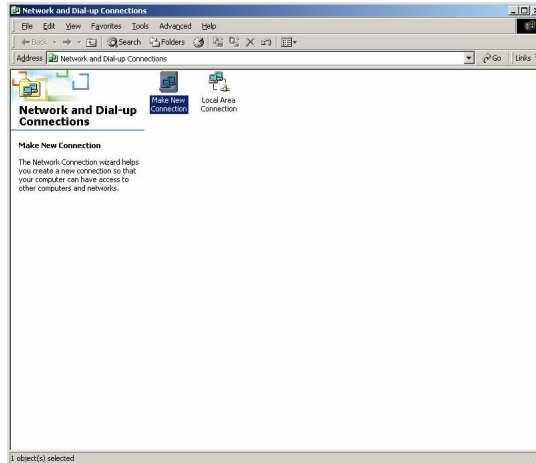
A graphic of the end-to-end configuration is depicted in Figure 1 below:



2.2 PC Configuration

The following sequences of screen prints provide a step-by-step method to configure the PC in support of MLPP. This section assumes that the user is already familiar with Iridium circuit switched data services and already has the Iridium satellite modem driver loaded on their PC.

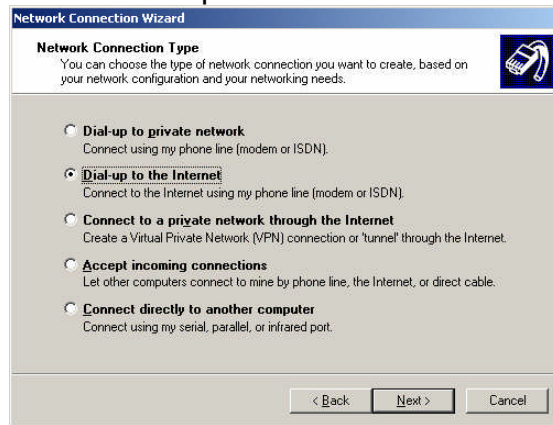
Open up “Network and Dial-up Connections” and double click on “Make New Connection”.



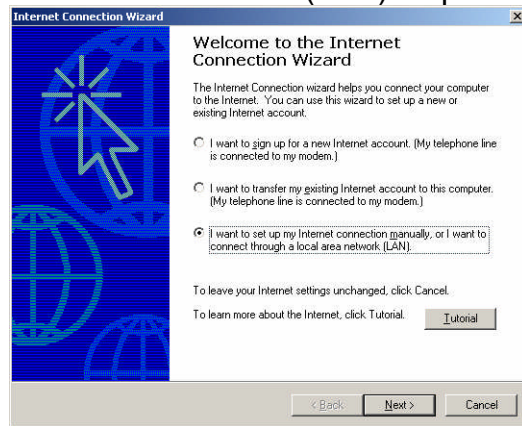
You will receive a Welcome screen to the Connection Wizard.



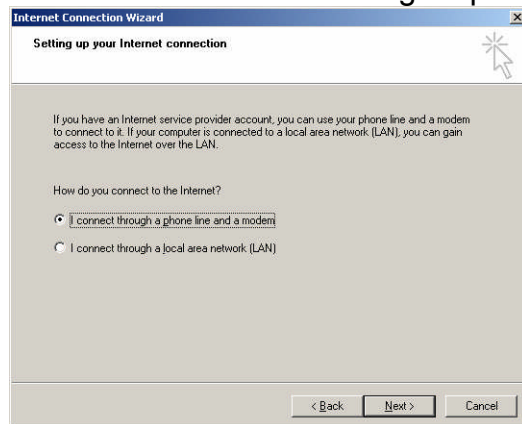
Select “Dial-up to the Network”.



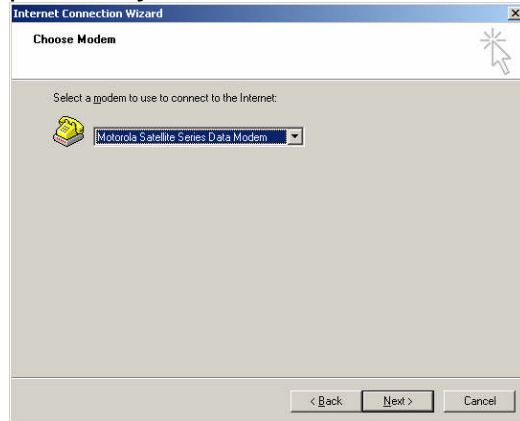
The Internet Connection Wizard screen is then displayed. Select “I want to setup my Internet connection manually, or I will want to connect through a local area network (LAN).” Option.



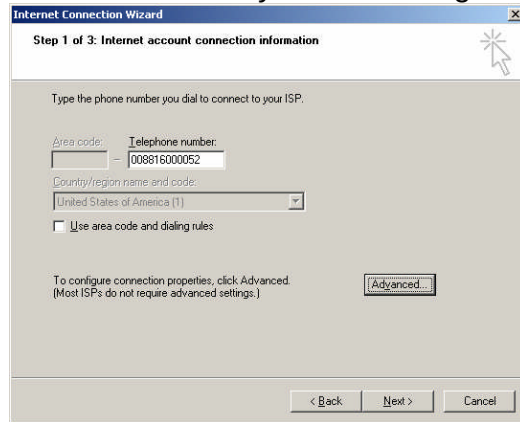
Next select “I connect through a phone line and a modem”.



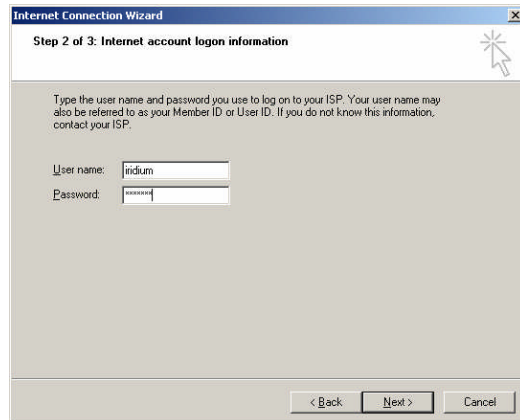
Select one of the Motorola Satellite Series Data Modems that were previously installed.



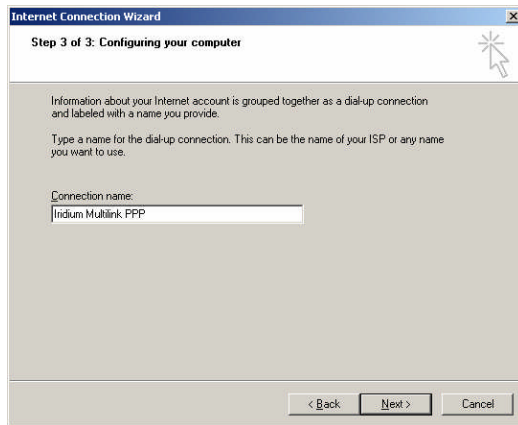
Uncheck “User area code and dialing rules” if it is selected and type in the RUDICS number you were assigned.



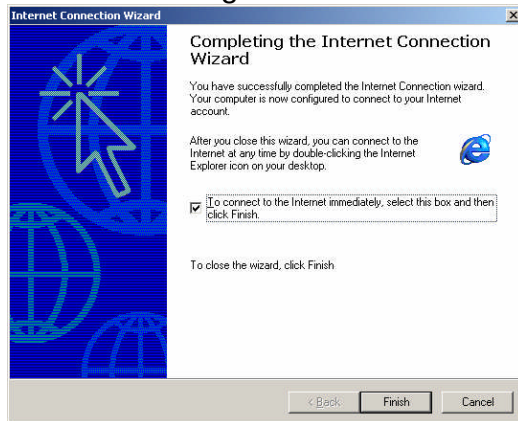
Enter in “iridium” as the username and “iridium” as the password (please note that the authentication is actually done based on the phone MISDN).



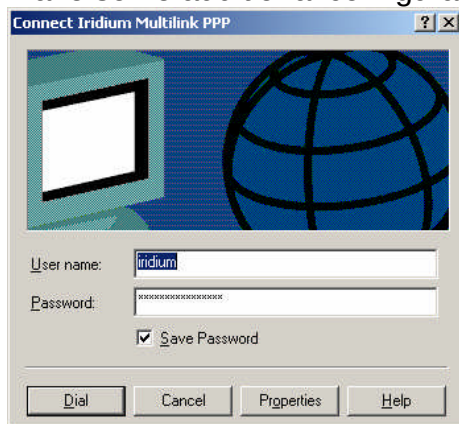
Name the connection “Iridium Multi-link PPP”.



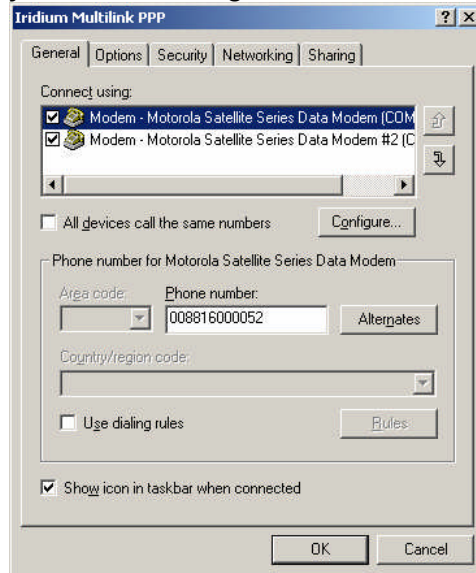
Check the option to “Connect to the Internet Immediately” as there is additional configuration that needs to be done.



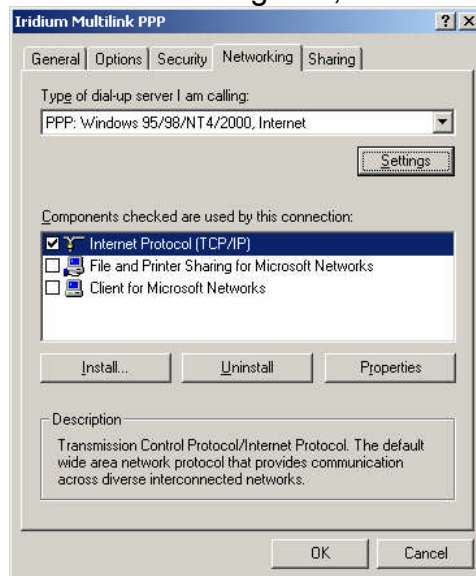
The connection dialog box will appear to connect, select “Properties” to make some additional configurations.



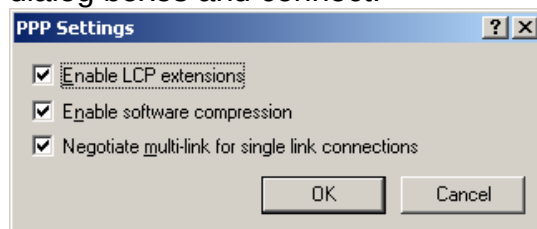
In the “General” tab check all of the Motorola Satellite Series modems that you will be using to connect.



In the “Networking” tab, select “Settings”.



In the “PPP Settings” windows select all three options. Click OK to the two dialog boxes and connect.



2.3 RUDICS Configuration

It is required for each MLPP beta tester to coordinate and work with Iridium so that the RUDICS system can be properly configured to permit system access. Each tester will need to register all the MSISDNs that will be used for the MLPP test. Iridium will load these MSISDNs into the RUDICS system.

Iridium requires pre-payment of a set-up fee to conduct all the necessary configuration steps and to cover the support that will be required throughout the testing period. Iridium will also assign a single phone number for each unit to dial for access to the RUDICS platform. This phone number is used in Section 3.

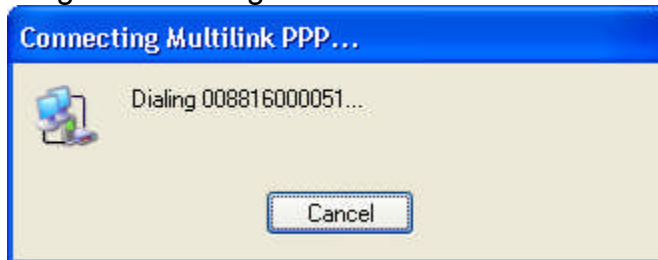
Iridium has also configured the RUDICS system to support: compression and data streaming as well, in support of Multi-link PPP.

3 Establishing MLPP Session

Once the PC is configured through the steps in Section 2.2, a connection can be made. To make a Multilink call, double click on the connection that you created in the previous steps:



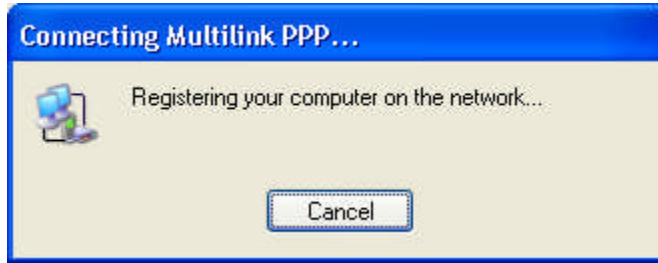
While connection is being initiated, the phone should show “Data Call in Progress” flashing.



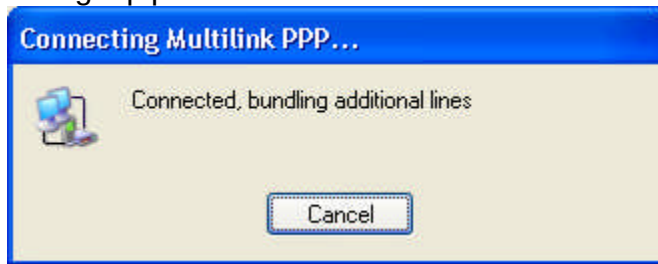
Next, “Data Call in Progress” should no longer flash, but remain steady during the user/name password authentication phase,



Once the username/password has been accepted the system will be registered on the network and obtain an IP address, Default Gateway, and DNS information.



Then the system and the RUDICS system will bind all of the channels into a single pipe.



3.1 Testing the Speed

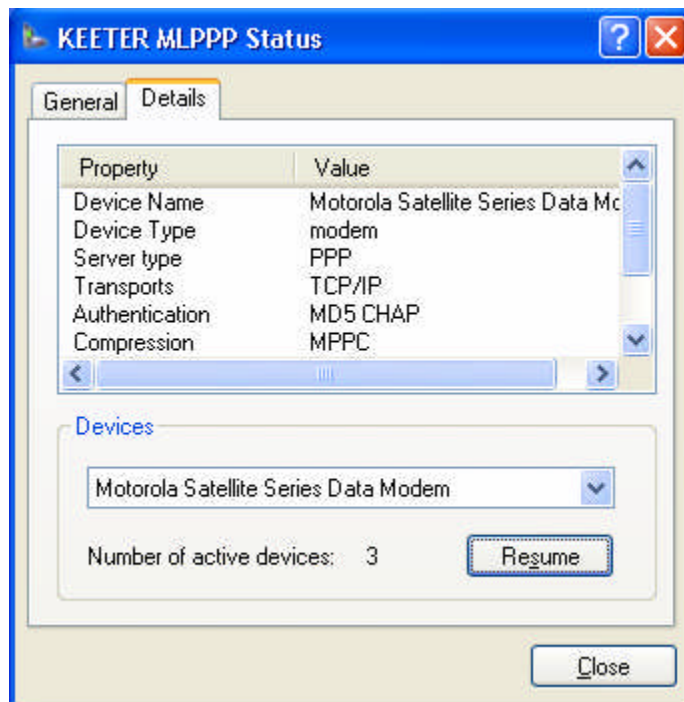
Once the session has been established, the user can test the speed by the following method:

Connect to a FTP server on the internet. Try pushing and pulling various types of files. Different file types will give different types of speeds, for example if you send a text file the speeds will be considerably faster then if you transfer a jpeg or a bmp file. This is due to the fact that all channels use encryption and text files are much more compressible than jpeg or bmp files. The way to determine the actual speed is to take the size of the file and divide it by the amount of time it takes to transfer the file. If you use the standard windows FTP client, this information is displayed after the file is transferred.

3.2 Re-establishing Dropped Connections

In the event that one of the links becomes disconnected (“unbound”), the user can re-establish this connection by following the following procedure.

To detect which one of the channels has dropped check the displays on all of the phones and ensure that they all say “Data Call In Progress”. If one or more of the phones no longer displays “Data Call In Progress” this means that the phone/channel is no longer in the Multilink bundle. If one of the phones/channels has dropped, go into the stats for the MLPPP connection and click on the “Details” tab. Then click on the Dropdown box on the Devices portion of the window until you see the “Resume” option on the box below the Device name and click the Resume button. Once the dropped call has been re-established, the RUDICS system will automatically re-bind the channel into the existing session.



3.3 *Automatic Rebinding of Dropped Channel*

The MLPP protocol does not have provisions for automatically detecting and re-establishing channels that may be dropped from the session. To implement this feature would require a client to monitor the connections and execute a re-dial script when a connection is dropped.