1. Introduction

Router-based unrestricted digital internetworking connectivity solution (RUDICS) is an enhanced gateway termination and origination method for circuit switched data calls across the Iridium satellite network. RUDICS is an optional service offered by Iridium facilitating remote-terminated and remote-originated connections to/from the Uplogix. RUDICS is Iridium's shared modem pool that facilitates dial-in and dial-out to modems registered to the Iridium constellation. The RUDICS product offering from Iridium provides a less expensive means of connecting a user or network to a remote Iridium modem.

Technically a VPN is established to connect modem services at the Iridium teleport to your network operations center.

RUDICS must be set up through an Iridium VAR to provide seamless network communication after the connection is initiated. Without RUDICS, one must dial directly between Iridium modems, or using an international dialing code dialing from an analog land-line (POTS); these options can be very expensive.

2. RUDICS Benefits

RUDICS is an enterprise class networking solution providing out-of-band connectivity to Uplogix appliances. There are four key benefits of using RUDICS over the conventional Public Switched Telephone Network (PSTN) data connectivity or ISU-to-ISU data solution:

- Scale to 250 concurrent RUDICS connections
- Elimination of analog modem training time
- Increase call connection quality, reliability, and maximize throughput
- Protocol independence. The connectivity illustrated shows a simple connection of multiple Uplogix appliances to the home network with or without TCP/IP stack.

3. RUDICS Service Types

There are two types of Uplogix/RUDICS connections: Mobile Originated and Mobile Terminated.

3.1. Mobile Originated (MO)

When an Uplogix appliance is configured with an Iridium Subscriber Unit (ISU or remote Iridium modem), it is able to initiate a circuit switched call to a specific target number at Iridium. Based on Caller ID, the RUDICS server completes the call using the point-to-point protocol (ppp) and directs IP packets to a customer's IPSec tunnel providing two-way IP connection between services and users on the Customer network and the Uplogix appliance.

Caveat: For security purposes, all SIM cards connecting to this service must be provisioned by the same Iridium VAR on the same account.

The Uplogix can initiate a connection based on a predetermined time or frequency; on the intersection of various automatically correlated events; or manually initiated via an SMS text message from the Uplogix Control Center.

This method allows for encrypted, robust IP based networking to the Uplogix appliance designed to reestablish Uplogix Control Center connectivity; centralized authentication, authorization and accounting; syslog; and multiple user sessions simultaneously.

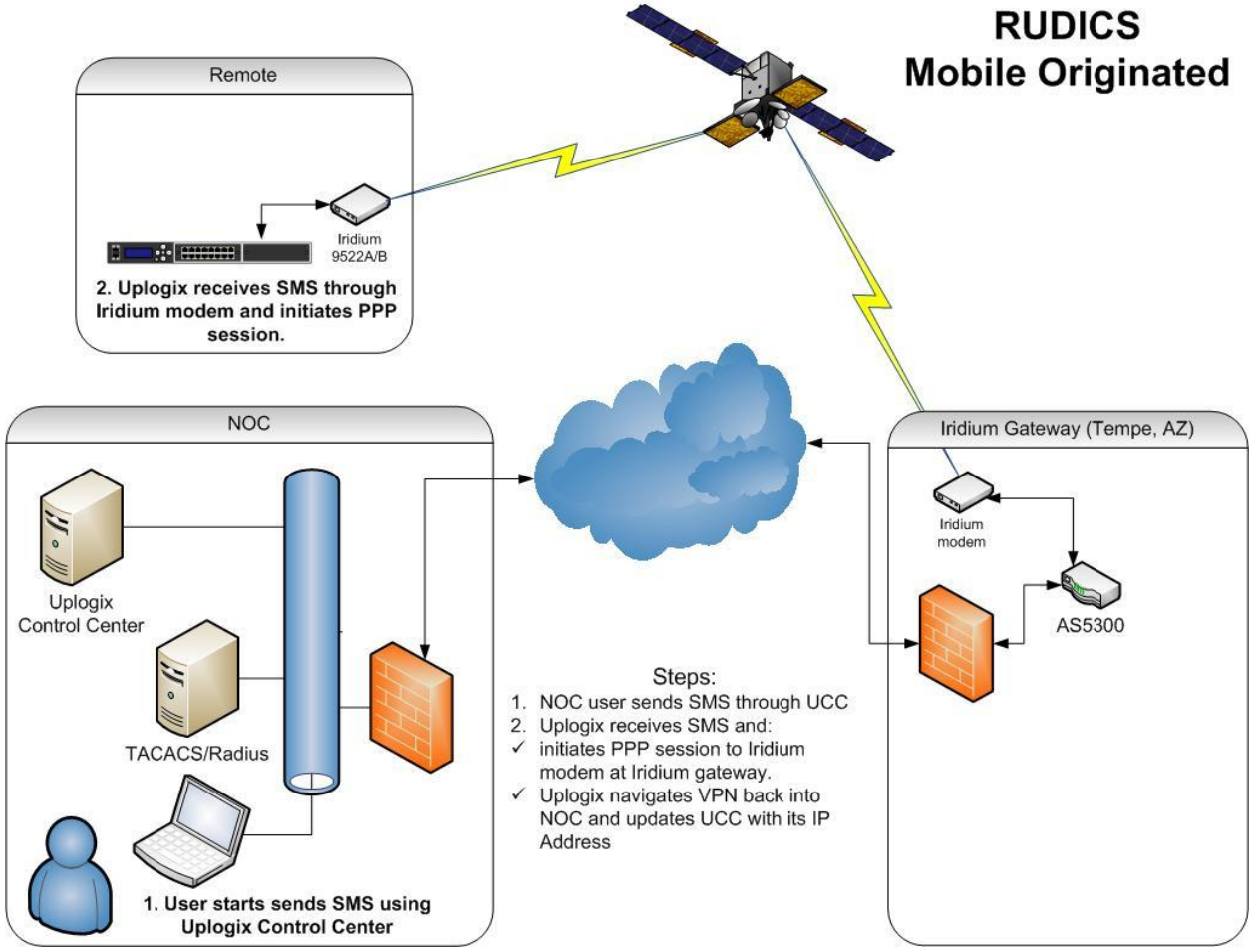

Figure 1: Mobile Originated RUDICS Call

3.2. Mobile Terminated (MT)

An Uplogix appliance can be optionally configured to answer a Terminal Teletype (tty) based circuit switched call from an individual user or system. Functionality includes user authentication (possibly using cached credentials), navigation of command line interactions with the Uplogix as well as managed network devices managed and executing complex troubleshooting and maintenance actions. In this model RUDICS

functions as a modem pool with multiple asynchronous calls possible concurrently to multiple Uplogix appliances.

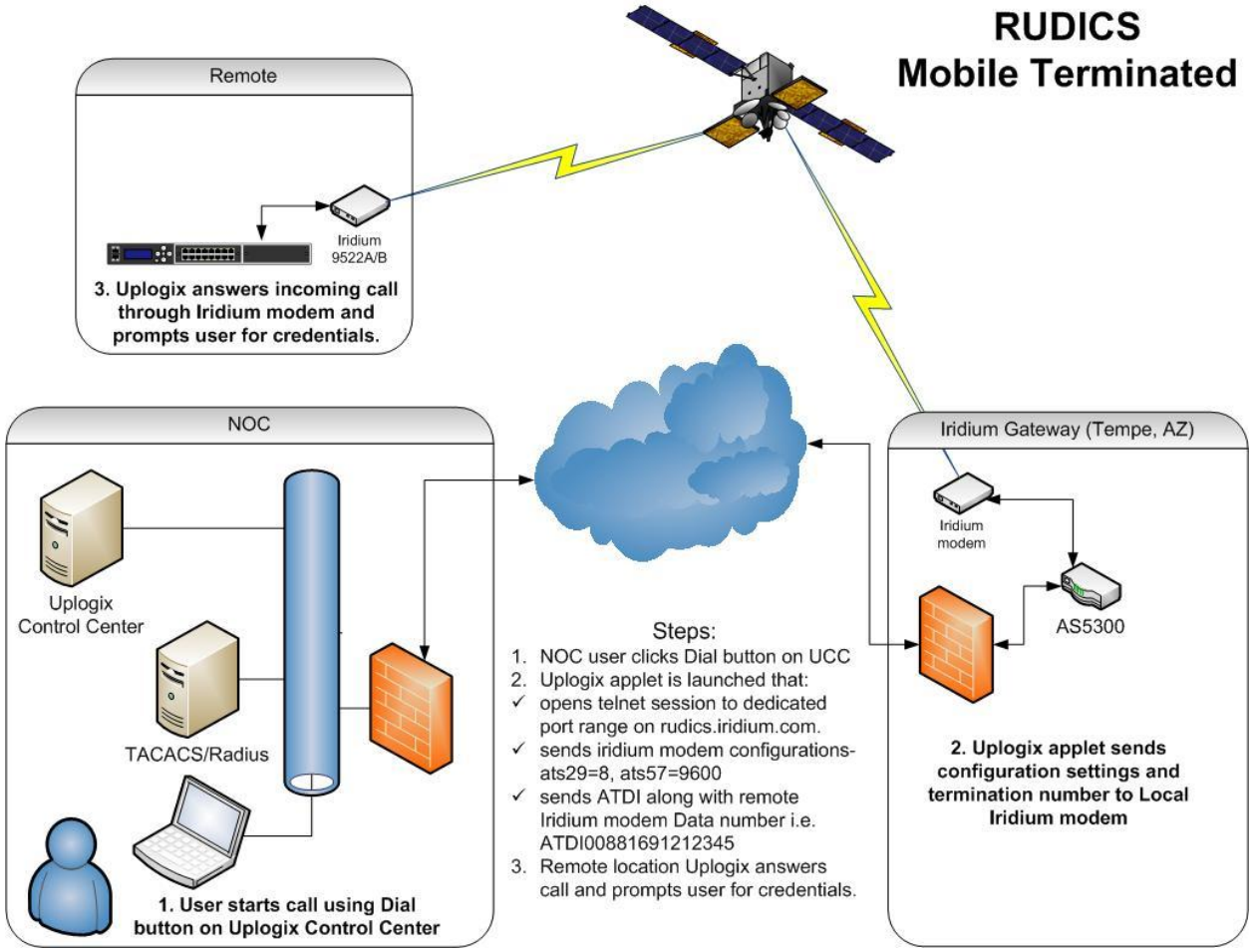

Figure 2: Mobile Terminated RUDICS Call

4. RUDICS Setup Details

This section describes the required elements for both MO and MT connections as well as recommended SIM card configurations for use in RUDICS implementations.

4.1. Mobile Originated

- ☐ PPP number
- ☐ SIM associated with appropriate RUDICS group
- ☐ Static IP assigned to Uplogix (if necessary)

4.2. Mobile Terminated

- ☐ Data number of mobile iridium _____
- ☐ RUDICS gateway IP (and route) for telnet session _____
- ☐ Telnet ports

☐ Route from the Uplogix to the UCC (often accomplished using SS5 Socks proxy installed on the UCC)
☐ Socks proxy IP
☐ Socks proxy port
☐ Socks username
☐ Socks password

4.3. Ancillary

☐ Voice number of mobile iridium _____

4.4. Iridium SIM Card Part Number

When requesting new SIM cards for use with a RUDICS, the Iridium SIM configuration is called: RUD-TS-xxD1-DATA ONLY. This plan includes the following configurations:

- Block All Voice Calls
- Circuit Data BS25
- Circuit Data BS26
- RUDICS
- SMS MO (NOT ON ALL CREW)
- SMS MT
- Telephony
- Uniform Call Treatment

4.5. Iridium RUDICS Part Numbers

When implementing RUDICS there are three Iridium part numbers.

Part #	Description
RUDICS-MT*	Mobile Terminated Standard RUDICS Connection (5 ports included)
RUDICS-PPP-MO*	Mobile Originated PPP RUDICS Connection to the Internet
SBDVPN*	VPN Setup Fee

* These items have a one-time setup cost

5. Configuring the Uplogix Control Center for MT Dialing

Uplogix has simplified the process of MT Dialing with the addition of a “Dial” button on the summary page of an Uplogix appliance in the Uplogix Control Center. An applet is loaded from the UCC on your workstation that connects to RUDICS or a modem bank in your NOC, sets up the modem with the appropriate parameters and dials the mobile Iridium’s data number.

In order to use this dial button several settings must be in place. First, configure the Remote Access Server section of the Uplogix page in the Uplogix Control Center (UCC) as in figure 3.

- The Host field should be populated with the Iridium gateway IP address (assigned by Iridium).
- The Port Range field is populated with a range also provided by Iridium.
- The Phone number field is populated with a combination of ATDI and the remote Iridium data number (note the inclusion of the two leading zeros).
- The Initialization (Init) String field contains settings necessary for the Gateway modem to respond correctly and can always be the same as below.
- Local Port and Forward On Connect are not required.

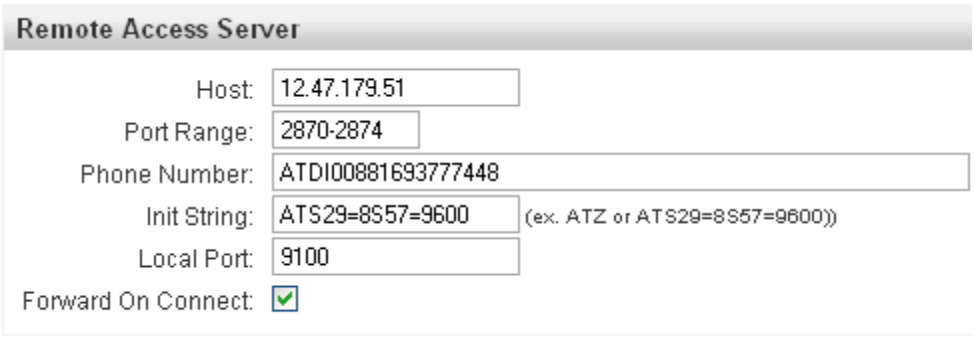

Figure 3: Remote Access Server Configuration Example

The Iridium gateway is generally configured to allow one source IP address to seize a modem from the allocated pool and complete a MT call. Because Internet gateways for user workstations may use a variety of ip addresses based on user location, a SOCKS service can be used to gateway all communication

A SOCKS service is available on the Uplogix Control Center and is installed and configured by Uplogix Support.

The Applet Settings section of the Uplogix page in the UCC must be populated see figure 4, below.

- The Socks Proxy Version should be set for 5.
- The Socks Host field should be populated with the SOCKS server IP address.
- The Socks Port, Username, and Password should be populated with the information set in place by Uplogix.

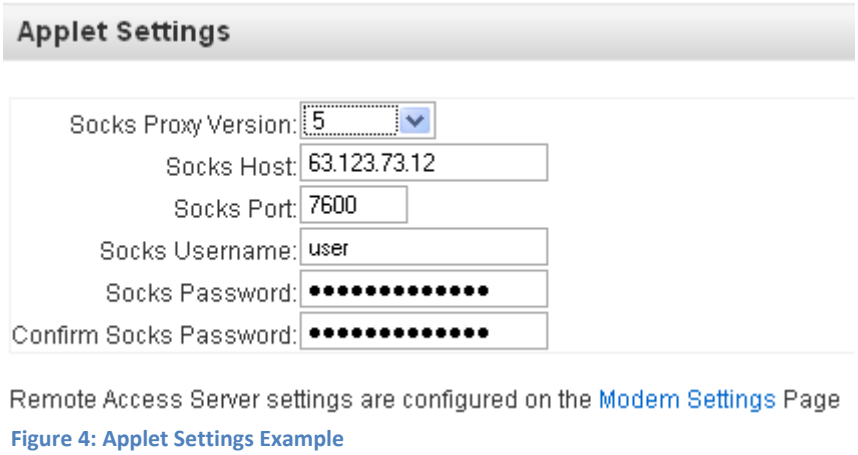

Figure 4: Applet Settings Example

Caveat: if the applet is configured for a Socks Proxy then not only will the Dial button use that Socks proxy server but the CLI buttons will as well.

6. Using Bandwidth Intensive Applications Over Iridium

When using bandwidth intensive or latency sensitive applications, the maximum bandwidth possible should be dedicated to the application for proper performance. To balance application bandwidth needs with security policies, Uplogix recommends the following business policy when Iridium RUDICS MO and a VPN have been setup:

1. Uplogix appliance opens (MO) a VPN session to send an email alert when the primary link is down
2. Uplogix appliance closes the VPN session
3. Customer opens (MT) a VPN session to troubleshoot remotely
4. Customer closes the VPN session when primary link is reestablished

MT is a less secure out-of-band model but due to bandwidth constraints is a good option because it is not taxed with the overhead of PPP and SSH which would be included in the MO out-of-band model.