UPLOGIX

iDirect Satellite Modem Management

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For more technical information about Uplogix support for iDirect, see the
iDirect Satellite Modem Configuration Example at www.uplogix.com/resources

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The Remote Management Challenge

The convergence of voice, video, and data transmission via satellite is increasing demands on the network teams to deliver uninterrupted availability, reliability, and security. Finally, as more mission critical applications become dependent on the network, tolerance for network problems approaches zero. What is worse—delivering against these expectations costs time and money that we don't often have.

Making sure communications work at remote locations presents a number of specific management challenges for operations and IT staff. Communications are often disrupted due to environmental interference which can require the dispatch of a service technician to the remote site to re-establish connectivity. Likewise, routine network maintenance such as re-provisioning an antenna controller or upgrading a router's operating system with the latest security patch often necessitates a costly on-site visit. Addressing a satellite network outage on an isolated oil platform, for example, can be a very expensive, difficult, and time-consuming challenge for IT staff that can quickly cost tens of thousands of dollars or more.

> Uplogix solutions are designed to work when software-only technologies are (by their design) likely to fail and unable to act.

Options for Remote Management

Existing network monitoring tools fall short of meeting these challenges because they only work when the satellite network is up and lack the automated capabilities to correct problems without onsite intervention. IT staff have been left to manage with tools designed for centralized, terrestrial-based networks that are not able to respond to the unique challenges of satellite-based communications. A simple task such as reconfiguring a router can turn into a major headache and expense if it requires deploying support personnel to hard-to-reach locations on the network.

Uplogix provides the first fully-integrated remote management solution through co-located management appliances that automate routine administration, maintenance and recovery tasks, securely and regardless of network availability. Uplogix is designed to work when software-only solutions are (by their design) likely to fail and unable to act.

Key iDirect Satellite Modem User Scenarios for Uplogix

Whether deployed in extreme remote conditions such as a seagoing vessel, drilling platform, a refugee camp far from modern conveniences, or just a branch office without on-site IT staff, Uplogix appliances automate routine administration, maintenance and recovery tasks—securely and regardless of network availability.

Software Recovery Scenarios

Option File

In any satellite location, the iDirect option file is a critical component with a number of potential points for failure that will result in losing the connection, including:

- ▶ iDirect iNFINITI 5100 modem has had the wrong version of the option file downloaded, which has taken it out of the network, preventing forced UDP downloads.

- ▶ iDirect iNFINITI 3100 modem locks up during a version upgrade and drops out of the satellite network. The modem has corrupted images and an older version of option file than what is now running on the hub.

Virus Attacks

The symptoms of a virus attack might appear to be caused by any number of issues, for example, an iDirect NetModem II Plus locks up due to a virus attack saturating the input QOS default queue, but the evidence is lost when local staff power cycles to recover link. The downtime isn't attributed to the root cause, extending troubleshooting and the loss of service.

Hardware Recovery Scenarios

Hardware failures

It's a fact: at times electronic devices fail due to physical problems. When this happens the quickest route to getting back online is replacing the unit. This sounds easier than it is, since replacement modems require configuring in addition to installation. Often local technicians or other personnel don't have the skill set or permissions to get the system working.

Environment

The very nature of most satellite deployments means they are placed in difficult environments. Distant locations often have frequent environmental issues that create issues for remote administration of the satellite system, including:

▶ Unreliable power availability including scheduled or sudden outages, and fluctuations in power, causing satellite networks to lose connections. Sites need to be able shut down and start up effectively to restore connections. Conversely, some network infrastructure problems might appear to be power issues when viewed remotely. Remote network management needs to be able to help troubleshoot effectively by allowing administrators to rule out power as the cause of a lost connection.

▶ Extreme changes in the environment can influence sensitive networking equipment. Remote sites need to be able to monitor and react to changes in the environment that could impact performance.

Proactive Maintenance Scenarios

More than just staying online, satellite deployments need routine maintenance and performance tuning to operate effectively and ensure delivery of the highest quality of service.

Routine Maintenance

With remote administration of satellite networks, even routine maintenance like pushing a change or update to a configuration file can risk an error that results in losing connection with an iDirect modem. Or, in the case of a mobile installation, crossing between satellite footprints requires a change in the iDirect OS and option file. Even in routine manual processes, miscalculations can happen, making recovery actions necessary.

Quality of Service

With many satellite installations providing both voice and data traffic to a single site, it's imperative QOS parameters are set correctly to prioritize the voice traffic or call quality can suffer. Remote management solutions need monitoring capabilities to ensure the network is delivering required service levels.

Special Maritime Satellite Scenarios

GPS systems are critical components of mobile satellite systems, yet add additional layers of complexity and potential for problems that disrupt connectivity.

iDirect Integration with GPS

iDirect modems in mobile state require periodic updates of their location from GPS devices. If this information is disrupted due to loss of GPS signal or problems with the GPS device itself, network connectivity is lost.

Compliance with Vessel Tracking Regulations

Upcoming security regulations will require the ability to collect and store GPS information for vessels. As part of the ship's network infrastructure, GPS devices will need to be connected to storage and managed to ensure compliance.

Uplogix Solutions for iDirect Satellite Modems

Uplogix offers a new approach to reducing the cost and complexity of supporting satellite network environments. Uplogix Automated Remote Management appliances combine automation with the ability to enable operators to remotely monitor and control both satellite and terrestrial-based network equipment. The appliances co-locate and connect serially with network and satellite communications equipment. With functionality to connect as needed through alternative means such as a LEO satellite system, Uplogix can provide non-stop local management and control.

Administrators can manage all Uplogix appliances via the Uplogix Control Center—a centralized, web-based portal that presents a full inventory of both Uplogix appliances and the infrastructure equipment connected to them. Working via the Control Center console, operations staff can schedule and coordinate all network maintenance and management operations to be performed by Uplogix appliances. In addition, the Control Center serves as the central repository and reporting interface for all data collection and audit logs provided by the appliances.

Whether deployed on a windswept drilling platform in the North Sea, an undisclosed desert location with massive swings in temperature, or the remote office of a small bank in a developing country securely connected to corporate headquarters through a satellite link, Uplogix increases uptime and functionality in iDirect satellite networks, primarily through use of the following features and functionalities uniquely integrated into a single appliance.
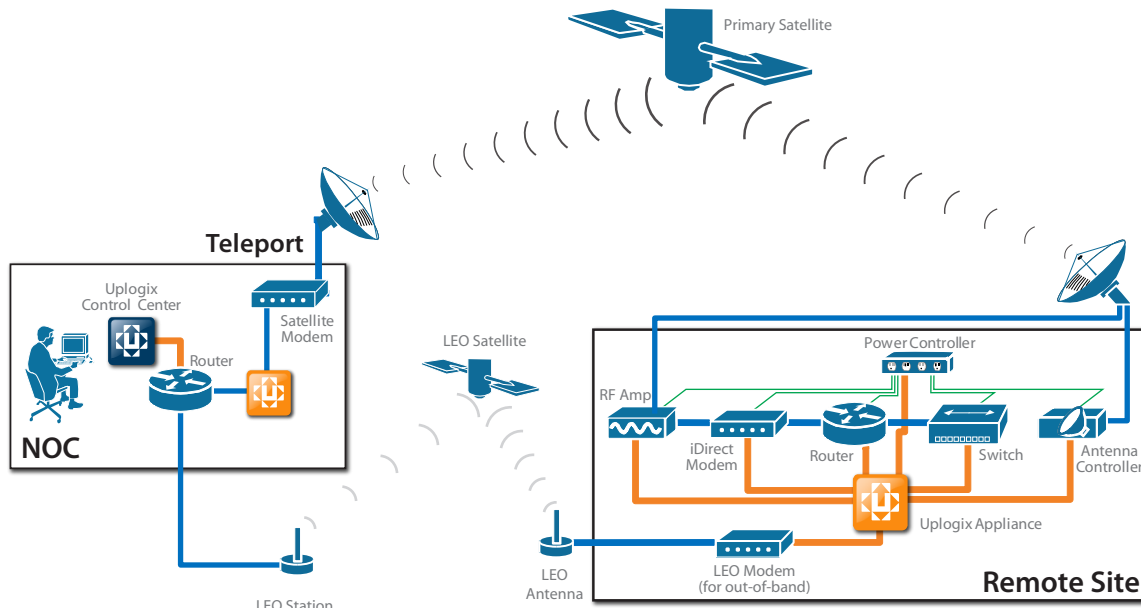
Uplogix deployment in a satellite network.

Secure Out-of-Band Access

The ability to connect out-of-band is a requirement for remote management of satellite networks. Uplogix solutions don't rely on the network to manage the network. With multiple backup modem options including LEO satellite using Iridium or Globalstar, cellular via CDMA or GPRS, or PPP/dialup through an internal v.92 or external DB-9, Uplogix ARM appliances can automatically (or on command) reestablish connectivity to Control Center via a secure out-of-band path. This enables secure, always-on access and connectivity to the remote devices you need to manage.

Power Management

Satellite network infrastructure devices can enter states that are not recoverable through normal remote administrative commands. This often leads to a hard reboot, which requires power cycling the device which is not possible without local control. Uplogix achieves this control by combining the functionality of remote power management through a connection to a PDU over the console port with the intelligence of the Uplogix RMOS.

Power to non-responsive remote devices can be controlled as well as more complex recovery actions such as recovering from a failed configuration change. For example, Uplogix appliances can power cycle a satellite modem, break into the reboot se-

quence and restore the last known good configuration file for the device—all within seconds and without having to dispatch a support technician on-site.

GPS Integration

Uplogix provides special support for iDirect modems in mobile state with GPS integration. The GPS device is connected directly to the Uplogix appliance which passes the information on to the satellite modem. If the GPS information is interrupted, the embedded rules engine in the Uplogix appliance continues to feed the modem the last known coordinates, preventing the modem from locking up.

This location information is also stored internally and can be transferred to the Uplogix Control Center for compliance with regulations governing documentation of vessel location.

Auto recovery with SurgicalRollback™ from Uplogix

When a device fails due to a configuration or software problem, the immediate need is to bring the device back online by restoring it to its previous working state. Uplogix can immediately roll the device back to the last known good configuration using the unique SurgicalRollback™ feature—an automated safety net to recover from configuration errors without requiring an on-site visit.

How SurgicalRollback Works

1. Utilizing an out-of-band connection such as a LEO satellite, the administrator connects and authenticates to the co-located Uplogix appliance via secure (SSHv2) connection. The appliance initiates a connection to the iDirect modem and starts a terminal connection to device.

2. During the terminal initialization to the modem, and a current running configuration is cached by the appliance.

3. The administrator makes changes to the modem and executes OS commands for the device.

4. If during the session the user logs out of the device or loses connection due to a configuration error, a running configuration is pulled again.

5. A list of changes made during the session is collected and the Uplogix appliance prompts the user with a confirmation to accept, reject or delay the changes made. If the user session times out due to configuration error or general inactivity after a configurable amount of time, the appliance backs out all uncommitted changes made during that session. The default action is to rollback all uncommitted changes and start a countdown to Surgical-Rollback. If there is no response, the appliance will rollback only changes made to the device, bringing the device back to its initial working state.

Proactive alerting

In the same time it takes traditional network monitoring tools just to discover a problem at a remote site, Uplogix can find it, fix it, and alert that the problem has been resolved.

Alerts are based on permissions:

▶ Users/groups subscribe to resources they are responsible for to receive emailed alerts containing alarms about that resource.

▶ Subscriptions define which network device resources a given user will receive alerts for.

▶ Users will receive alerts for any resource on which they have permission and are subscribed to.

▶ Each alert is sent with currently active alarms and the relevant data matched to each alarm condition.

Service Level Verification

The Advanced version of the Uplogix Remote Management Operating System (RMOS) includes Service Level Verification (SLV) which monitors, measures and manages the performance of critical network services and applications from an end-user's perspective, including TCP/IP communications, web-based transactions and voice over IP telephony.

Uplogix appliances capture 40 specific QoS metrics that reflect the health of the IP-based telephony system using standard Harvard sentences and "tone" tests to gauge IPT performance and monitors important metrics such as jitter, latency, packet loss, MOS scores, and R values. By performing continuous active testing to measure QoS performance indicators, Uplogix enables enterprises to more quickly diagnose issues and resolve them, before they impact business operations.

How SurgicalRollback Works

Connects and authenticates to Uplogix via secure (SSHv2) connection

Connects to device via Uplogix

Initiates a terminal connection to device

During the terminal initialization to the connected device, a current running configuration is cached by the appliance

Makes changes to the connected device

Executes OS commands for the device

If during the session the user logs out of the device or loses connection due to a configuration error, a running configuration is pulled again

Generates a list of changes made during the session and prompts the user with a confirmation to accept, reject or delay the changes made. If the user session times out due to configuration error or general inactivity after a configurable amount of time, the appliance backs out all uncommitted changes made during that session.

The default action is to rollback all uncommitted changes

Starts countdown to SurgicalRollback

If no response, Uplogix will rollback only changes made to the device

Logs event and changes and sends data to Control Center for reporting purposes

ROI Example: Schlumberger

The Remote Connectivity Group within Schlumberger Information Solutions is responsible for providing secure, reliable communications for oil and gas customers with locations around the world. Schlumberger's primary objective was to optimize their service offering by deploying a next generation communication management solution that could automatically detect, diagnose and resolve network-related faults and improve end-to-end communications from global teleports to customers' remote locations.

Schlumberger

Schlumberger is the world's leading oilfield services company supplying technology, information solutions and integrated project management that optimize reservoir performance for customers working in the oil and gas industry. The company employs more than 64,000 people of over 140 nationalities working in more than 80 countries.

Ensuring Constant Connectivity

By leveraging out-of-band capabilities, Uplogix appliances are always able to manage Schlumberger's network even when the main satellite broadband link is down or degraded. Since the appliance is serially connected to all devices under management, it continues to monitor and control connected devices in the case of an outage. And the appliance will automatically establish an alternate management connection via integration with an external modem to a low earth orbit satellite in order to send important monitoring, logging, and audit data back to the Uplogix Control Center for Schlumberger's staff to see and use.

This unique capability has helped Schlumberger staff greatly improve both the quality and availability of service they provide their customers by enabling them to more quickly and correctly triage support events and remotely resolve critical service problems. Now Uplogix appliances ensure that a secure communications path is always available between the site under management and Schlumberger's NOC, and that Schlumberger's staff has constant access and visibility with up-to-the-minute performance statistics from all networked sites under management.

Minimizing Tech Support Trips

Before deploying Uplogix, when communications went off-line due to an outage or service disruption, the electrical or barge engineer onboard an offshore platform was conscripted to become the eyes and ears of the Schlumberger engineers back at the Network Operations Center (NOC) to troubleshoot the problem. If the problem could not be solved due to the lack of local technical expertise, language barriers, or personnel availability on the rig, a support technician would be dispatched to solve the problem. The Mean Time to Recovery (MTTR) could therefore take many

hours or even days, depending on the rig's location and availability of technical expertise.

Uplogix minimizes these costly inefficiencies by continuously monitoring, diagnosing and autonomously repairing service-related problems within minutes. If the co-located appliance cannot fix the problem on its own, it forwards, through a secure out-of-band path, detailed performance and diagnostic data as well as recommended recovery actions to Schlumberger's NOC engineers so that they can remotely repair the problem and restore service without having to send a technician on-site.

Reducing Configuration Errors

Satellite communications are subject to frequent service disruptions caused by interference due to bad weather. To restore service, Schlumberger's operational staff often has to reconfigure and re-provision devices, such as satellite modems, antenna controllers and other communications equipment. This manual process can be both time-consuming and occasionally error-prone.

The Uplogix Remote Management Operating System (RMOS) is the intelligence behind ARM. A rule-based engine in the RMOS automates this routine maintenance by applying best-practice procedures provided by the device manufacturer. The Uplogix platform's automated capabilities have helped provide Schlumberger staff with a secure, consistent and repeatable approach to remotely perform these routine maintenance tasks error-free with minimal manual intervention required.

To learn more about Automated Remote Management from Uplogix, please visit us online or contact us for a technical demo and free evaluation of the benefits of ARM in your infrastructure:

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ABOUT UPLOGIX // Uplogix provides the first fully-integrated remote management solution. Our collocated management appliances automate routine administration, maintenance and recovery tasks— securely and regardless of network availability. In comparison, traditional network and systems manage-ment requires multiple tools, relies on the network, and remains labor intensive. Uplogix puts the power of your most trusted IT administrator everywhere, all the time.

Uplogix is privately held and headquartered in Austin, Texas with European offices in London.
For more information, please visit **www.uplogix.com**.

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