

The Importance of Satellite Communications During Natural Disasters

CTO/ITU Disaster Management Forum

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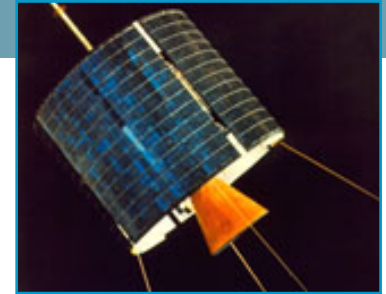
Intelsat History

Key Timeline

- **August 20, 1964** – International Telecommunications Satellite Consortium (Intelsat) is formed.
- **June 28, 1965** – Intelsat I, (“Early Bird”), the world's first commercial communication satellite begins providing television, voice and facsimile services.
- **July 1, 1969** – INTELSAT achieves full global satellite coverage as INTELSAT III is positioned over the Indian Ocean.
- **July 18, 2001** – Intelsat becomes a private company — Intelsat Ltd. — after 37 years as an Intergovernmental organization.



August 31, 1962 – President John F. Kennedy signs the Communications Satellite Act



Intelsat I (Early Bird)



30 years of coverage: Olympics and World Cup Games



July 20, 1969 – A record 500 million television viewers worldwide watch the APOLLO moon landing “Live via INTELSAT.”

Intelsat Facts

- **Core Business:** Fixed Satellite Service (Owner and Operator)
- **Network:**
 - 51 Satellites
 - 6 World Class Teleports
 - 30+ POPs
 - over 40,000 miles of Fiber Connectivity
- **Employees:** 1000+
- **Revenues:** US\$2+ Billion
- **Corporate Office:** Washington D.C.
- **Primary Engineering & Operations Center:** Atlanta, GA
- **Sales Offices:** Global

Markets

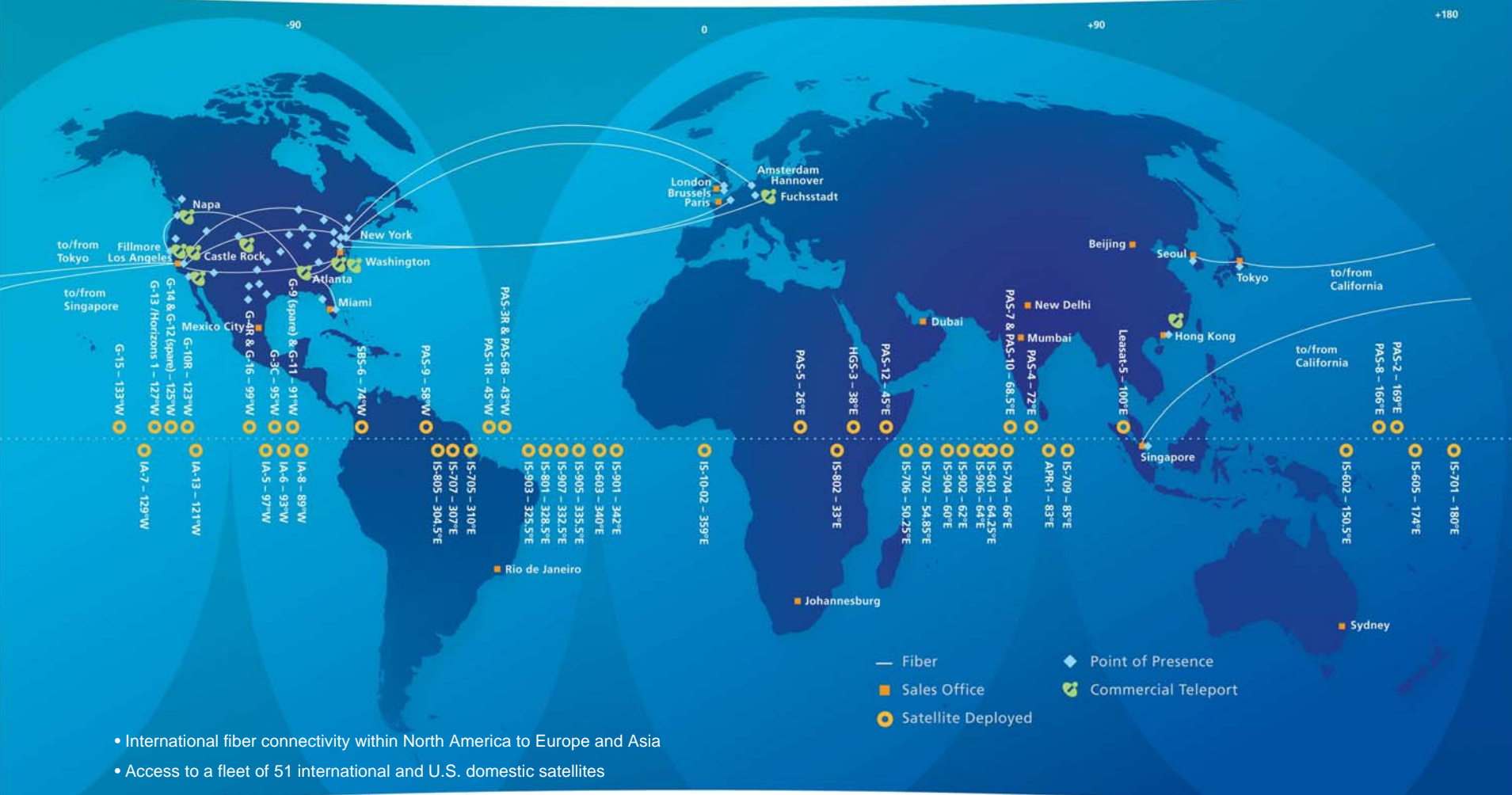
- Enterprise Solutions
- SNG / Fly-aways
- Broadcasters
- Disaster Recovery
- Distance Learning
- Oil & Gas
- Maritime / Shipping
- Telemedicine
- Mining / Exploration
- Military/DOD
- Banking / Finance
- And More...



Disaster Response Principles

- **Preparedness**
 - Remote Sensing & Monitoring
 - Technical Support
 - Information Sharing using VSAT
- **Response/Relief**
 - Rapid deployment of ground equipment
 - Uninterrupted communications (ex. cellphones)
 - Cross-trained staff
 - Power supply is a necessity

Industry Leading Satellite and Terrestrial Network



- International fiber connectivity within North America to Europe and Asia
- Access to a fleet of 51 international and U.S. domestic satellites

Intelsat has a Long History of Providing Relief to Disaster-Affected Areas

- Intelsat's existing offerings can rapidly meet the needs of the affected populations
 - GlobalConnex(GXS) solutions like Cellular Backhaul and QuickSpot were quickly deployed to restore communication networks throughout the hurricane affected areas
- Flexibility: The degree of Intelsat involvement is dictated by the requirements of our customers
 - Typically as an access or transport component of our partners' solutions
 - In certain cases as the Prime Contractor – Typically international, with multi-country or multi-language issues
- Key hurdle: Informing governments, corporations, public of how to best prepare for disaster-resultant communications outages
 - Having the equipment in place is only a part of the solution: training, testing and pre-integration are necessary as well

There Are Four Broad Methods Of Addressing The Recovery Of Communication Networks

Preparedness Strategy	Implications	Level of Readiness	Difficulty of restoration	Restoration Activities/Time
Primary Path – Satellite embedded in network and used as the primary (or secondary) access means for some parts of the network	<ul style="list-style-type: none"> • On-site, pre-provisioned satellite modems • Staff trained on platform & familiar with apps & platform through consistent use 	High	Seamless – provision additional capacity as needed	<u>Seconds</u> – typically auto-cutover in place
Diversity Path – Satellite is used redundancy	<ul style="list-style-type: none"> • On-site, pre-provisioned equipment; apps tested • Staff trained on platform and has likely tested platform 	Med	Easy - some hiccups likely	<u>Hours</u> – if site staff trained & experienced
“Rapidly Deployable” Restoration Solutions	<ul style="list-style-type: none"> • Equipment moves with trained staff • Assumes apps integration familiarity of installation staff 	Low	Medium	<u>Days</u> - Dispatch + Arrival + Set-up
Post-Disaster Response – Plan on whom to call in case of an outage but unclear equipment	<ul style="list-style-type: none"> • Restoration in queue behind others – typically outsourced • Integration issues worked out real-time, not in advance 	Minimal	Highly Difficult; requires outsourcing	<u>Weeks</u> – Dispatch, Arrival, Set-up & Integration

Case Studies

“INTELSAT Solutions at Work”



Hurricanes Katrina & Rita

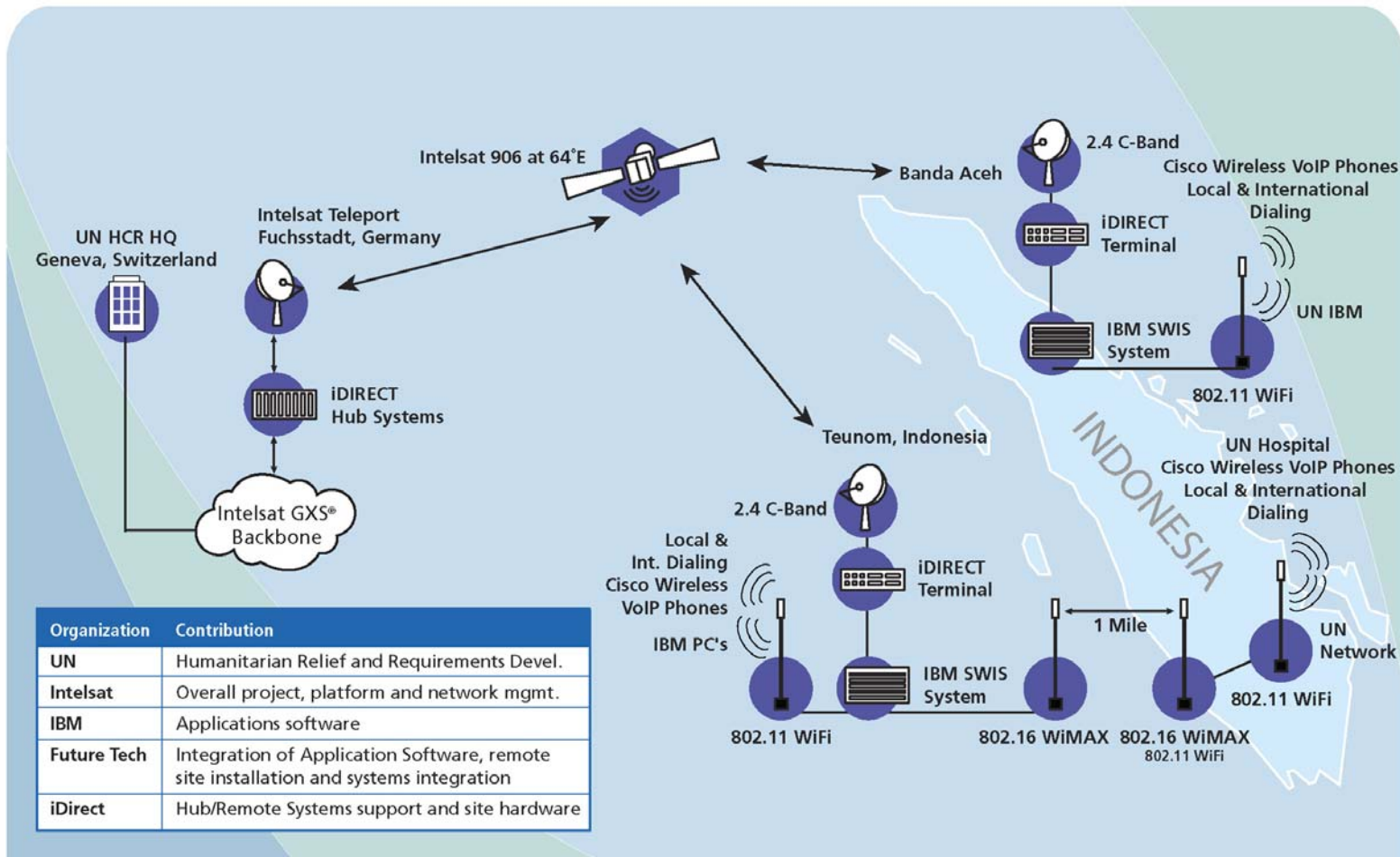
Our Partners Utilized our Network to Provide Multiple Solutions

- Primary Path
 - Business Continuity / Enterprise Restoration – allowed retailers to re-open and provide goods and services to the affected populations – and act as city halls
 - On-air programming for major broadcasters
- Diversity Path
 - Terrestrial Fiber Restoration – major providers utilized our satellite network to replace decimated in-land fiber networks using equipment that was already in-place
- Rapidly Deployable
 - Wireless Aggregation & Backhaul – three major wireless providers quickly restored communications services in key areas
 - Communications trucks for displaced populations – provided telephony, internet access and e-mail
 - Broadcasting: Satellite News Gathering (SNG) feeds from New Orleans to major media centers
- Post-Disaster Response
 - Communications services for relief organizations, including satellite phones

Post-Disaster Response – United Nations (UN) Tsunami Relief Network

- **The impact of the tsunami of December 2004 necessitated ongoing relief efforts – with communication links and applications the focus of this discussion**
- **Multiple organizations answered the call for help, and responded successfully with coordinated efforts for two separate efforts**
 - **A transport network for governmental web cafes and IP telephony**
 - **A separate network for specific emergency response applications**
- **The key lesson learned is preparedness & coordination**
 - **Intelsat and our partners have designed pre-engineered, rapidly deployable solutions to be utilized in case of any emergency, anywhere**
 - **Our coordinated efforts resulted in success in delivering these solutions**

UN IBM Tsunami Relief Network – Delivered Identification Applications, VoIP, VPN, WiFi, WiMAX



SEA-ME-WE3 Restoration and Asian Earthquake

- Diversity Path: The Pakistani leg of the SEA-ME-WE3 cable failed, causing significant disruption to services provided by Pakistan Telecommunication Ltd. (PTCL)
- Intelsat was able to restore service to the affected country within hours:
 - Data: Using its GlobalConnexSM infrastructure, Intelsat provided five E3 duplex links using GlobalConnex Internet Trunking services, allowing PTCL to connect to an IP backbone networks in Europe & Asia and enabling the restoration of Internet traffic and call center traffic in Pakistan.
 - Voice: Intelsat also provided space segment capacity to restore 21 E1 duplex circuits which were used to restore voice traffic between Pakistan and various other countries
- Rapidly Deployable: These terminals were subsequently redeployed to the regions affected by the earthquake and are providing ongoing communications for the affected populations

GlobalConnexsm – NBB Product Summary

Broadband Internet access for small, medium and large-size enterprises requiring:

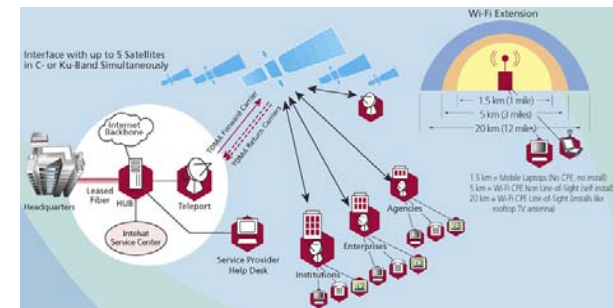
High QoS

Quick pan-regional service reach

Low cost, low risk for service provider

Service available on all the Intelsat satellites seen from INTELSAT teleports

Managed service providing robust support for VoIP, VPN and converged voice and data communications



Tailored Enterprise Solution

Disaster Recovery, First Responders and Mobile Office

Instant connectivity
via IP applications

- Voice over IP
- Video Teleconferencing
- Corporate Applications
- Web access
- Encrypted VPN
- File Transfers



OnDemand Services Product Summary

Automated “On-Demand” Satellite Access Solutions

Fully automated managed IP network solutions with instantaneous satellite access

Supports both fixed and mobile applications

Voice, video and data

Provides customers with the flexibility of usage based pricing

Efficient Bandwidth Management



Fly-away & Fixed Antenna Systems

Auto-Acquire (Fly-away)

Single Button Activation

Ease of use/ Quick Assembly

Lightweight Solution for Air Travel



Fixed Antenna

Reliable Low Cost Solution

Permanent / Long-term use

Durable multi-use construction

In-Motion Antenna Systems

In-Motion Antenna

“SATCOM on the Move”

Voice / Video / Data while
in-route to a disaster

Single Button Operation

Operates with Dedicated or
Shared services at rates
up to 2 Mbps



Successfully deployed:

Biz Continuity



Disaster Recovery



Broadcasters



First Responders



Disaster Recovery & Emergency Restoral Solutions

Full Program Management activities including:

Creation of a Disaster Action plan

Single call for implementation

Service agreement based on total solution

Equipment staging reducing deployment times

Awareness of technical requirements

Testing and configuration prior to deployment

Environmental and Climate controlled storage

Readiness Plan consists of:

Emergency Response Systems pre-staged, configured & ready for shipment.

Power of Partnership enhances access to additional solutions, hardware and installation services.

Conclusions

- Intelsat's existing set of services have proven to be readily adaptable to aid in Disaster Recovery and ensure continuity of communication networks
- The degree of Intelsat involvement is flexible and is dictated by the requirements of our customers
 - In the case of Hurricanes Katrina and Rita, Intelsat services enabled our customers to deliver timely, ongoing solutions to the affected regions – Providing Satellite Phones, Restoring Cellular Networks as well as delivering Continuity to key Corporate Networks
 - In the case of the Tsunami, Intelsat executed from an overall project management and delivery perspective for multiple networks
 - In the case of SEA-ME-WE3 Failure, Intelsat delivered Fiber Restoration Services which were seamlessly redeployed to support earthquake relief efforts
- The amount of preparation directly correlates to the ease of restoration and reduces the likelihood of long-term outages
 - We continue to deliver cost-effective full-time redundancy solutions to corporations to prevent network outages to their mission critical communications infrastructure

Intelsat has been delivering these solutions for decades and remains the provider to call when communications networks are challenged by Disaster Recovery, Disaster Prevention or Business Continuity Issues.

Thank You!

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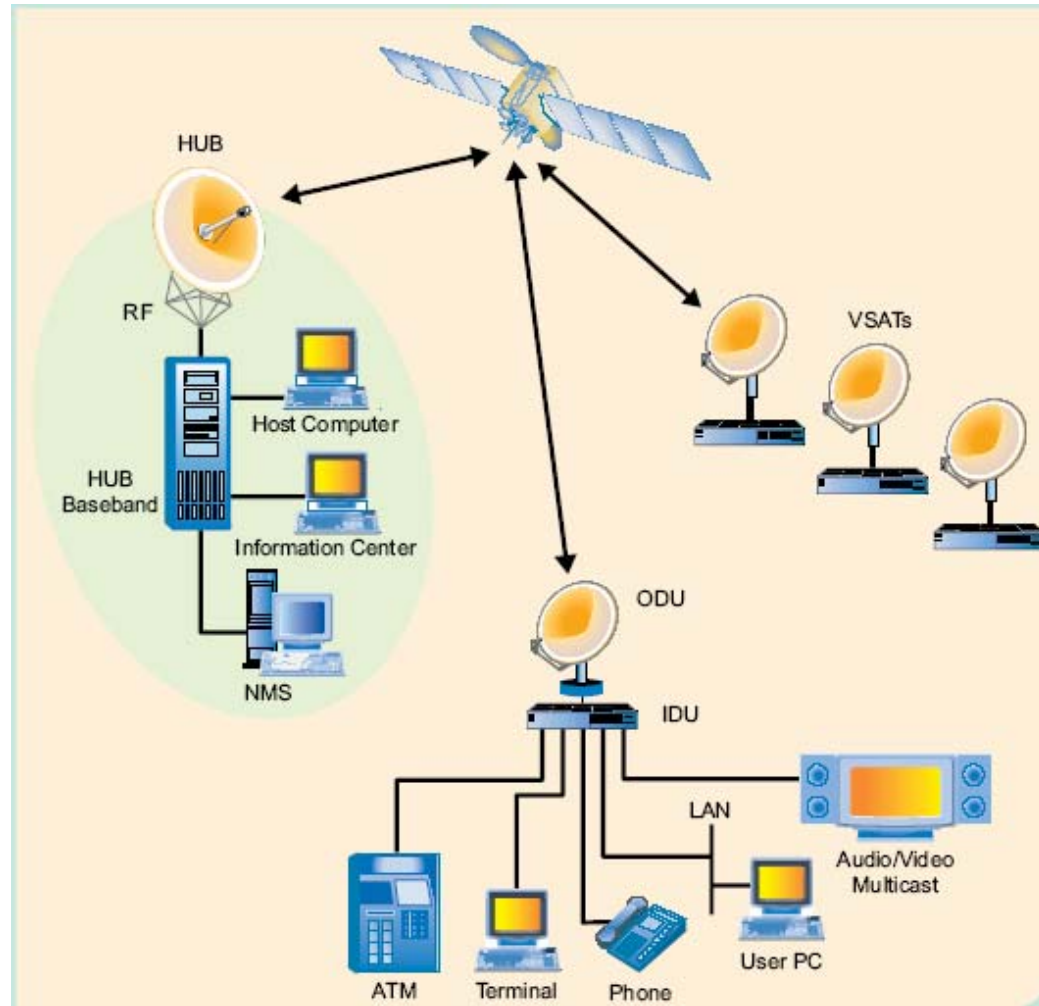
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Hurricanes Michelle - Bahamas Telecommunications Company (BaTelCo)

- **Storm damaged a communications hub on the island of Highbourne Cay, the islands lost telecommunications services.**
 - **These services support the extensive tourism industry on the islands and have helped make Nassau one of the world's leading financial centers.**
- **Solution: Duplex DS-3 short-term lease for service from Nassau to the rest of the archipelago of the Bahamas.**
 - **This link restored critical network services for voice, data, and video. In addition, Intelsat provided technical consultation, link budget assistance, and engineering support**

BaTelCo Solution at a Glance



Six World Class Teleports To Address Regional Needs

US West Coast



Riverside

IA-7
IA-13
IS-605
IS-701
IS-805
IS-707



Napa

Galaxy 10R
Galaxy 11
Galaxy 3C
PAS-2
PAS-8
PAS-9

US East Coast



Mountainside

IA-7
IA-13
IA-5
IA-6
IA-8
IS-705
IS-903
IS-801
IS-907
IS-905
IS-603
IS-901



Atlanta

PAS 1R
PAS 3R
PAS 6B
PAS 9
HORIZONS 1
GALAXY 10
GALAXY 11
SBS 6
IS-707

Europe



Fuchsstadt

IS-802
IS-706
IS-702
IS-904
IS-902
IS-906
IS-704
IS-705
IS-903
IS-801
IS-907
IS-905
IS-901
IS-10-02

Asia Pacific



Hong Kong

IS-902
IS-904
IS-906
IS-701

Comprehensive Combined Portfolio Of Services

INTELSAT	GlobalConnex Trunking			GlobalConnex Network Broadband (NBB)	On Demand (Partnered with On Call in US)
	Internet Trunking Service-DVB (ITS-DVB)	Internet Trunking Service-Dedicated Carrier (ITS-DC)	International Private Line (IPL)		
<i>Prior PAS</i>	<i>SPOT Bytes</i>	<i>SPOT Bytes</i>	<i>Private Line Services</i>	<i>iDirect</i>	<i>QuickSpot</i>
What is it?	DVB Internet trunking, with SCPC return	SCPC Internet trunking	SCPC clear-channel circuit	iDirect-based Internet connectivity	Managed network combining STDMA and SCPC solutions (Vipersat)
Availability	Total 14 platforms over Africa, Asia and Latin America	Via any satellite with GXS teleport antenna	Via any satellite with GXS teleport antenna	Total 15 hubs with service on any satellite with GXS teleport antenna. (Not HK)	Galaxy 10R and Horizons 1 (P12 Europe 7/2006)
Data rates	Typically 128kbps – 8Mbps forward, 128kbps – 2Mbps return	128kbps – 155Mbps forward & return	128kbps – 2Mbps, 34 Mbps & 45 Mbps Custom rates supported	128 kbps – 18 Mbps forward & 128 kbps – 4.5 Mbps return. Minimum of 1Mbps aggregate commitment	Forward 64kbps – 3.7Mbps Return 1.5Mbps
Typical Customers	ISPs & Carriers with multiple locations	ISPs/Carriers with higher data requirements and/or larger antennas	Carriers or corporates	SMEs, ISPs, WISPs, corporates & resellers	Enterprise, SNG, Mobile SME, News Gathering, OU.
Pricing	Single per Mbps rate, combining space & ground services	Single per Mbps rate, combining space & ground services	Single per Mbps rate, combining space & ground services	Single per Mbps rate, combining space, ground & hub equipment. (Includes line cards)	Low monthly subscription fee, usage based billing
Extended Services	VOIP, VPN termination and acceleration	VOIP, VPN termination and acceleration	VOIP	VOIP and WiFi	VOIP, VPN termination and acceleration