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6/22/2009

Training Agenda

- RUDICS
 - What is it?
 - Terminology
 - Hardware
 - Common uses
 - Account setup
- Short Burst Data
 - What is it?
 - Terminology
 - Hardware
 - Common Uses
 - Account setup



RUDICS Service Overview

- <u>Router-based Unrestricted Digital Information Connectivity Solution</u>
- Mobile Originated [MO] and Mobile Terminated [MT] circuit switched data connectivity for integrated data applications
- System intended for applications with a large number of fielded units
- Enables a host application to originate and terminate numerous connections simultaneously
- Fastest on/off time of any Iridium CSD connection
- Provide a variety of connection possibilities
 - Standard socket based MO or MT connections
 - PPP connections; single or multiple channel setups (MLPPP)



RUDICS - Key Benefits

- Security. Only group members are allowed to connect.
 - Device must call the special "group" number 8816 0000 xx
 - The MSISDN of the calling unit is validated before access is granted
 - Reduces the need for username/password verification
- Faster connection speed
 - ~25 to 30 seconds for ISU-PSTN or ISU-ISU circuit switched data
 - ~9 to 13 seconds for RUDICS (End-to-end)
- Most efficient CSD connection maximizes data throughput
- Protocol independence No OS or TCP/IP requirements (standard RUDICS)



RUDICS - Support Hardware

- Handsets
 - 9500
 - 9505
 - 9505A
 - 9555
- L-Band Transceivers
 - 9522
 - 9522A
 - 9522B
- LBT Based VAM products



RUDICS - Basic Connection Scenarios

- Connection methods
 - RUDICS Standard
 - Custom "dumb" devices that do not require a TCP/IP stack
 - Mobile originated and mobile terminated
 - Connect to a remote host via the Internet, VPN or leased line
 - TCP/IP device with PPP capability
 - Mobile originated only
 - Connect to the Internet
 - TCP/IP device with multi-link PPP capability
 - Mobile originated only
 - Connect to the Internet



RUDICS - Standard RUDICS Example (MO)



RUDICS - Standard RUDICS Example (MT)



RUDICS - PPP/MLPPP Connection Flow





RUDICS - Setup

- Need to fill out RUDICS setup form and submit to Iridium Account Manager
 - VAR fills out form according to the type of RUDICS connection they are looking to setup
 - If doing a RUDICS standard connection, must specify if MT connections will be made.
 - If calling MT, must provide originating IP address
 - Form submitted to network engineering
 - Group is set up in router
 - DNIS (dial-in number assigned)
 - Group added to SPNet
 - Demo account also available at no additional cost
 - Demo group set up for testing and development
 - Only demo SIM cards can be used in demo RUDICS account



RUDICS - Provisioning

- Limitation
 - Prepaid SIM card cannot be used with RUDICS
- Must select a service package with RUDICS
- Must select RUDICS group name



Short Burst Data (SBD) System Overview



Application

- SBD is an efficient, packet-based service for frequent short data transmissions
- Used primarily for tracking and monitoring in remote locations
- Also used for SSAS (Ship Security Alert System) compliance



Short Burst Data (SBD) Hardware

- Supported devices
 - 9505
 - 9522
 - 9505A
 - 9555
 - 9522A
 - 9522B
 - 9601
- Computing device
 - Usually a small tracking application
 - Not operating system dependent
 - Utilize AT commands to communicate with ISU
 - Sometimes integrated with GPS



Short Burst Data (SBD) Service Details

- Service and billing based on IMEI of device
 - SIM used to register device (LBT and handsets)
 - 9601 does not use a SIM card
- Billing based on bytes, not airtime
- Messages can be delivered to:
 - Up to 5 email addresses (Email delivery)
 - Up to 5 IP addresses (Direct IP)
 - Up to 5 other ISU's (ISU to ISU)

*Delivery methods can be in any combination of above, 5 total max.



Short Burst Data (SBD) Service Details - Message size

- LBT/Handset (Firmware IS06001 or newer)
 - Mobile Originated
 - 1960 bytes

JS1

- Mobile Terminated
 - 1890 bytes



- 9601 (Firmware TD06002 or newer)
 - Mobile Originated
 - 340 bytes
 - Mobile Terminated
 - 270 bytes





JS1	verify byte	limits
	Jason Stygar,	6/1/2009

Short Burst Data (SBD) Architecture Overview



Short Burst Data (SBD) System Overview Step 1: Registration



All ISU except 9601 <u>MUST</u> contain an active SIM card. This allows the device to register with the Switch. If the device is not registered, it will not perform any type of call, including SBD.

Short Burst Data (SBD) Call Path - Mobile Originated



the mobile terminated queue of another ISU, or to the specified IP address.

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Short Burst Data (SBD) MO Message Scenario

Example of email delivered as a result of MO message:

From: sbdservice@sbd.in	ridium.com [<u>mailto:s</u>	bdservice@sbd.iridium.com]
Sent: None		
To: datasupport@iridiur	n.com	
Subject: SBD Msg From U	Jnit: 30000100165528	0
MOMSN: 74 MTMSN: 0 Time of Session (UTC): Seggion Status: TRANSE	ISN – Mobile Originated Message ISN: Mobile Originated Message S Fri Apr 23 15:00:36	Sequence Number (0-65535) Sequence Number (0-65535) 2009
Session Status IRANSFI		
Message Size (bytes): 3	39	Status: TRANSFER OK, INCOMPLETE CALL, SBD DENIAL, SBD TIMEOUT)
Unit Location: Lat = 33	3.317128 Long = -111	.873189
CEPradius = 2		
Message is Attached.	CEPradius – Provides an estimate Estimate is accurate 80% of time be included or excluded or	e of accuracy of the unit location in kilometers. Note : Unit Location and CEPradius info can n a device-by-device basis using SPNet.





Short Burst Data (SBD) MT Message Receipt Back to Host

Subject: SBD Mobile Terminated Message Queued for Unit: 300001000582060
The following mobile-terminated message was queued for delivery:
IMEI: 300001000582060 Time message was queued (GMT)
TimeWed Aug 9 13:57:31 2008 Attachment Filename: koala.sbd Attachment Size: 967
The MTMSN is 9, and the message is number 1 in the queue.
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SBD - Ring Alert (RA)

- MT SBD does not directly deliver message to the unit. RA's provide notification that a message is awaiting retrieval at the gateway
- Multi-step process for setting up RA*
 - Hardware must have firmware that supports RA
 - RA must be activated in SPNet
 - +SBDMTA command must be issued at the field unit to accept RA
 - +SBDREG command must be issued at the field unit to register to the SBD system

*Full explanation available in the SBD Developer Guide available on the developer extranet



Short Burst Data (SBD) SBD Specific AT Commands

9505, 9522, 9505A, 9555, 9522A, 9522B, 9601:

AT+SBDWB - Write binary data to the ISU AT+SBDRB - Read binary data from the ISU AT+SBDWT - Write text data to the ISU AT+SBDRT - Read text data from the ISU AT+SBDI - Initiate an SBD session AT+SBDD - Clear ISU SBD Message Buffers AT+SBDC - Clear (Reset) Mobile Originated Message Sequence Number AT+SBDS - Show status of ISU buffers AT+SBDTC - Transfer ISU MO buffer to MT buffer

9505A, 9555, 9522A, 9522B, and 9601 only:

AT+CIER - Indicator Event Reporting AT+CULK - Unlock AT+SBDDET - Detach AT+SBDIX - Initiate SBD Session Extended AT+SBDMTA - Mobile-Terminated Alert AT+SBDREG - Network Registration AT+SBDAREG - Automatic Registration

9522A, 9522B Only:

AT+SBDSX - Status Extended AT+CRIS - Ring Indication Status

9601 Only:

AT*F - Flush to eeprom AT*Rn - Radio Activity

See AT Command Guide available at Developers Extranet web site for complete list of AT Commands for SBD



SBD Demonstration Utility

🛃 SBD Demo Utility	- ¥2.0						
File Mode Help							
Local Command Set				SSD	Log		
							<u> </u>
MO Message	0	MT Message	0				
MO Status	Unknown	MT Status	Unknown				
MO MSN	2	MT MSN	-1				
		MT Length	Unknown				
Status		MT Queued	Unknown				
	(ir	·				
Write Binary	Write Text						
Read Binary	Read Text	J					
Uear MU	Llear M I	Llear MU/MT	Llear MU MSN				
Manual AT Con	nmand						
	p						
Transmission Comma	and Set						_
Initiate Euton	ded	Initiato P					
		initiate L					Clear Log
Register		MT Alert	•	SSD	Port		
Detach	Regi	stration Mode	•	CO	M1 🔽	Connect	Disconnect
		1					

An SBD Demonstration utility (for Windows operating systems) is available on the Iridium Developer Extranet and on the 9601 Developer Kit CD. This application provides a user-friendly method of experimenting with the various SBD AT Commands.





Short Burst Data (SBD) Provisioning and Reporting

- Separate login account used to provision SBD accounts
- SPNet can be used for:
 - Activating SBD accounts (SIM and hardware)
 - Modify account delivery method and destination
 - Checking for SBD usage
 - Toggle GEO-location on/off
 - Monitor SBD MO/MT activity



Short Burst Data (SBD) Logging into SPNet

SPNet - Production Iridium Satellite LLC	IRIDIUM
Please enter your login information below.	
	ONE SYSTEM, GLOBALLY.
	• Enter SPNet Logon ID and Password (specific to SBD)
	Click "Login"



Short Burst Data (SBD) What is an IMEI?

- International Mobile Equipment Identity (IMEI)
- Can be used to track equipment, particularly if lost or stolen
- Used to identify and authenticate the ISU in the call set-up and registration process on the Iridium network



Short Burst Data (SBD) Provisioning Steps

- VAR sends ISU IMEIs to Service Delivery via email (servicedelivery@iridium.com), requesting that they be allocated to the VAR.
- 2. Service Delivery allocates the IMEIs to the VAR in Iridium's provisioning system (Business Support and Control System BSCS).
- **3**. Using SPNet, the VAR provisions:
 - 1. The <u>ISU</u>, using the ISU IMEI and destination address
 - 2. A <u>SIM Card</u>
 - 1. SIM is provisioned for LBT or handset only
 - 2. The SIM card PIN <u>must</u> be disabled, otherwise the ISU cannot register or place SBD calls.)



Short Burst Data (SBD) SPNet - SIM Card Activation

This is the first page you will see after you log in to SPNet.

SPNet - Production SBD DEMO DATA SUPPO SENGEL0001 (Logoff)	<u>RT</u> - <u>2.27.11.00.1</u>	<u>100000</u>				IR	
Reports	Tools						
Contract Search							
Search for:	by MSISDN	SE	ARCH » CL	EAR »			
New Telephony »	w SBD »						
Activation Date	Contract	MSISDN	Market	S	Change Date	Reason	Action
No Search Results							
Duration: 0.001 sec						ONE SYSTEM	GIORALLY
_						SHE STOLEN?	OLOBALLI.
	'New Telephon SIM care	y' allows the d for an SBD	activation of Device	a			



Short Burst Data (SBD) SBD-Only SIM Card

SPNet - Production INA Gateway - ASNYDE0001 (Loc	2.6.1 . <mark>2.21.15.00.100000</mark> 30ff)	IRIDIUM
Reports Update/Vi	Tools ew Contract (GSM - IRI G	SM) Only a MSISDN-C assigned. Cannot be used to call unit
Sub-Market Rate Plan Service Package Marketing Code Language Services	 (8816310) UNITED STA USD - Demo Account SBD SIM SBD-DS-xxD1-AUTOMATIC CHEC Other (EN)English (EN)English Uniform Call Treatment Circuit Data BS26 SMS MT Operator Block Outgoing Calls SBD SIM Card 	MSISDN: None MSISDN-C: 881692992313 K MSISDN-C: 881692992313 IMEI can be populated but does not need to be IMEI: Contract ID: 206948 RUDICS group: None Two-Stage Dialing: Click here to modify Voice: ENABLED PIN: None Data: ENABLED PIN: None Future Suspension: With SBD only, ignore telephony and CSD fields
		SAVE » CLEAR » CANCEL » ONE SYSTEM, GLOBALLY.



Change/add/delete the delivery destinations of a unit that has already been provisioned





Reports		Tools						
Contract Sea	rch							
Search for: 300001001	New	by SIM Serial (SBD »		SEAF	RCH » CLEAR »			
Activation Date	Contract	MSISDN	Market	S	Change Date	Reason		Action
2005-06-30 16:09:42	<u>222748</u>	881680010953	GSM	а	2005-06-30 16:07:54	Contract Activation	Deactiv	rate Suspend
Duration: 7.316 sec	Click the	e Contract Nu	mber		de	Note: Devices activated or ter	OVE SYSTE	EM, GLOBALLY
					but	suspended usin tons. Deactiva permanen	g these tions are	



Note: An IMEI can have up to 5 Delivery Destinations total.







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Short Burst Data (SBD) Reporting Tools in SPNet

SPNet - Testing IS Training SP (SBD) - 1.1 SENGEL0001 (Logoff)	<u>01032</u>	IRIDIUM
Reports	Tools	
MSISDN's		
SIM Cards		
Pagers		
Contract Status Report	by MSISDN SEARCH » CLEAR »	
Paging Usage	BD ×	
SBD	Activity Summary Market S Change Da	ite Reason Action
	Activity Search	
Duration: 0.001 sec	Devices	ONE SYSTEM CLOBALLY
	Send Message	UNE STSTEM, GLUBALLT.



Activity Summary shows the cumulative activity (total number of SBD messages) for all ISU in this account.

SPNet - Test & SBD DEMO SBDDAT0001 (Training DATA SUPP(Logoff)	ORT						IRIDIUM
Reports		Tools						
SBD Activ	ity Sumr	nary [Cumulative nu	umber of Mobi	le Terminated	messages f	for all devices	in this account
Downlink								
15 min	30 min	1 hour	2 hours	4 hours	8 hours	1 day	7 days	30 days
0	3	3	3	3	3	3	3	5
Uplink			Cumulative n	umber of Mob	ile Originated	messages f	or all devices	in this account
15 min	30 min	1 hour	2 hours	4 hours	8 hours	1 day	7 days	30 days
0	7	7	7	7	7	7	25,417	36,807



Activity Search allows SBD activity monitoring for a particular ISU.

SPNet - Production SBD DEMO DATA SUPPORT SENGEL0001 (Logoff)	- <u>2.27.11.00.100000</u>	IRIDIUM
Reports	Tools	
SBD Call Detail Searc	ch	

Search Parameters	S			
IMEI	Date (yyyy-mm-dd)		Filters	
	Start date: 2003 05 05	Filter:	ALL Transferred	-
300001001360280	End date: 2003 05 05	Results per page:	ALL Transferred Uploads - Delivered	
	1		Uploads - Not Delivered	
			Downloads - Not Delivered	
			Downloads - Transferred	
			Downloads - New	
			Downloads - Pending	



Example of "Uploads-Delivered"

SPNet - Test & Trainin SBD DEMO DAT SBDDAT0001 (<u>Logof</u>	ng A SUPPORT D						•••	: iri	dium
Reports	Tools								
SBD Call Detai	l Search								
Search Parameters									
IMEI	Date (yyyy-mm-dd)			Filters					
S	tart date: 2009 05	15	Filter:	ALL Transfe	erred	~			
300034012265710	End date: 2009 06 (01 Re	esults per page:	5			Search »	Cancel »	
300034012265710	Time Sent 2009-05-29 22:41:05	Size	LAT -22.830308	LNG -51.626151	First CEP 5	Page MOMSN 6209	Previous Page Div. Method	Next Pag Div. Status	Last Page » Call Status 00 - Transfer OK
S IMEI 300034012265710	Time Sent 2009-05-29 22:25:59	Size 0	<u>LAT</u> -22.832586	<u>LNG</u> -51.571418	<u>CEP</u> 4	<u>MOM SN</u> 6208	Div. Method	<u>Dlv. Status</u>	Call Status 00 - Transfer OK
9 IMEI 300034012265710 2	Time Sent Siz 2009-05-29 22:11:01 0	<u>e L</u> -22.8	AT LN0 345304 -49.83	G CEP M 0033 205	I <mark>OM SI</mark> 6207	l <u>Div. Met</u>	hod Div. Statu	l <u>s C</u> 02 - Trans	all Status fer OK Bad Location
IMEI	Time Sent	Size	LAT	LNG	CEP	MOMSN	Div. Method	DIv. Status	Call Status
300034012265710	2009-05-29 21:55:53	10	-22.797018	-51.626151	2	6206	DirectIP	Delivered	00 - Transfer OK
IMEI	Time Sent	Size	LAT	LNG	CEP	MOMSN	Dlv. Method	DIv. Status	Call Status
300034012265710	2009-05-29 21:54:28	10	-22.78833	-51.595622	6	6205	DirectIP	Delivered	00 - Transfer OK
Displaying 1-1 of 1				F	irst P	age »	Previous Page	Next Pag	e Last Page »

ONE SYSTEM, GLOBALLY.



FIELD	DESCRIPTION
IMEI	IMEI of the ISU (SBD Device)
TIME SENT	Time (UTC) of the Mobile Originated call
SIZE	Size (in bytes) of the Mobile Originated data
LAT	Device Latitude (Degrees)
LNG	Device Longitude (Degrees)
CEP	Device Circular Error Probability radius (80% Confidence) in km
MOMSN	Mobile Originated Message Sequence Number (MOMSN) from the ISU. Each ISU manages its own MOMSN independently of other ISUs. The ISU only increments this number if the call completed successfully.
DIv. Method	Delivery method used
Dlv. Status	Email delivery status (Delivered / Not Delivered), from the perspective of the SBD system at the Iridium gateway. This indicates whether Iridium sent the message to the email destination or not. It is <i>not</i> a confirmation that the email was actually received at its destination.
Call Status	Air-Interface status of the call (Transfer OK / Incomplete Call)



Example of "Downloads-Transferred"

SPNet - Test & Trainin SBD DEMO DATA SBDDAT0001 (Logoff	g A SUPPORT		•••	:. ir	idium [.]
Reports	Tools				
SBD Call Deta	ail Search				
Search Parameter	rs -				
IMEI	Date (yyyy-mm-dd)	Filters			
300034012265710	Start date: 2009 05 15 End date: 2009 06 01	Filter: Downloads - Delivered V Results per page: 5	Search »	Cancel »	

Search Results

				« Fi	rst Page	Previous Page	Next	Page Last	Page »
	IMEI	Time Received	Size	Time Queued	Time	Delivered	MTMSN	Msq Status	Delete
	300034012265710	2009-05-15 11:10:17	254	2009-05-15 11:10:17	2009-05	-15 11:10:22	745	Delivered	
	300034012265710	2009-05-15 11:10:47	240	2009-05-15 11:10:47	2009-05	-15 11:10:52	746	Delivered	
ł	300034012265710	2009-05-15 11:11:38	250	2009-05-15 11:11:38	2009-05	-15 11:11:43	747	Delivered	
	300034012265710	2009-05-15 12:27:18	228	2009-05-15 12:27:18	2009-05	-15 12:27:35	748	Delivered	
	300034012265710	2009-05-15 12:29:39	182	2009-05-15 12:29:39	2009-05	-15 12:30:15	749	Delivered	
0	Displaying 1-1 of 1			Firs	t Page »	Previous Page	Next	Page Last	Page »

ONE SYSTEM, GLOBALLY.

Select All Delete Selected »





FIELD	DESCRIPTION
IMEI	IMEI of the ISU (SBD Device)
TIME RECEIVED	Time (UTC) the SBD system received the message
SIZE	Size (in bytes) of the message sent to the ISU
TIME QUEUED	Time (UTC) the SBD system queued the message for download (message is first in line for delivery)
TIME DELIVERED	Completion time (UTC) of the call when the message was sent to the ISU. Corresponds to Mobile Originated "TIME_SENT" in the 'Up' Table for this CALL ID.
MTMSN	Iridium system-assigned number for the call. Mobile Originated and Mobile Terminated entries that are tagged with the same CALL ID were transmitted as part of the same call.
MSG STATUS	Status of the data: 'New' – The data has just been inserted into the database 'Queued' – Data queued to download on the next call for the IMEI 'Pend' – Waiting to be queued 'Delivered' – Message delivered 'Delete' – This message will be deleted from the database.
DELETE	Messages that have not been delivered can be deleted by checking the box next to the message and clicking 'Delete Selected >>'



Short Burst Data (SBD) Reports: Devices

The *Devices* report can display the IMEI, Delivery Method, Delivery Addresses, GEO Data Status and MTMSN for each ISU in this account.

SPNet - Testing <u>IS Training SP (SBD)</u> - SENGEL0001 (<u>Logoff</u>)	<u>1.101032</u>	IRIDIUM
Reports	Tools	
SBD IMEI Repor	t	

IMEI:	SEAR	CH » Cancel »							
IMEI Delivery-Method		Destination MSISDN		<u>Status</u>	Account	<u>Geo Data</u>	MTMSN		
<u>300001001000160</u>	SBD Device	300001001000100	881680010953	Active	1451	YES	1		
<u>300001001000160</u>	SBD Device	300001001000000	881680010953	Active	1451	YES	1		
<u>300001001000160</u>	SBD Device	300001001000200	881680010953	Active	1451	YES	1		
	ONF SYSTEM, GLOBALLY.								
		<u> </u>				\square			
Current Delivery	Current		Current GEO	Cu	arrent MTN	ASN			
Method	Destination	ns	Data Status	f	for the devi	ce			



Short Burst Data (SBD) References

- Iridium Short Burst Data Service Developers Guide
- ISU AT Command Reference
- SBD Demonstration GUI and associated documentation
- FAQs on the Iridium Developer Extranet <u>http://developer.iridium.com/</u>
- Data Support Contact Info
 - Email: <u>datasupport@iridium.com</u>
 - Phone: +1.480.752.5100 option 2
 - Hours of Operation
 - Monday Friday 1300 0100 (+1 day)
 - All other hours supported on-call

