
DDS Analyzer

 ***GL Communications Inc.***

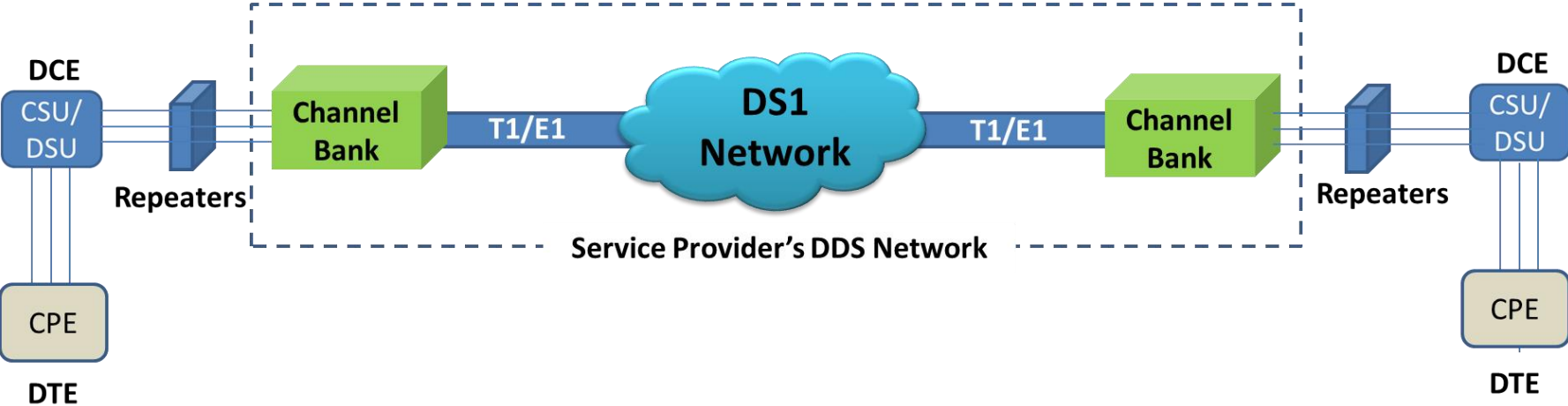
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Outline

- DDS Networks and Testing Techniques
- DDS Protocol Analysis
- T1 Analyzer Hardware and Accessories
- Software Operation

DDS Networks

CPE – Customer Premise Equipment
DSU – DATA SERVICE UNIT
CSU – Channel Service Unit



DDS Data Format

- Digital data rates are serviced at : 2.4kbps, 4.8kbps, 9.6kbps, 19.2kbps, 38.4kbps, 56kbps, 64kbps, N x 56kbps or N x 64kbps.
- Rate multipliers above 56 kbps/ 64 kbps require a T1 circuit to the subscriber

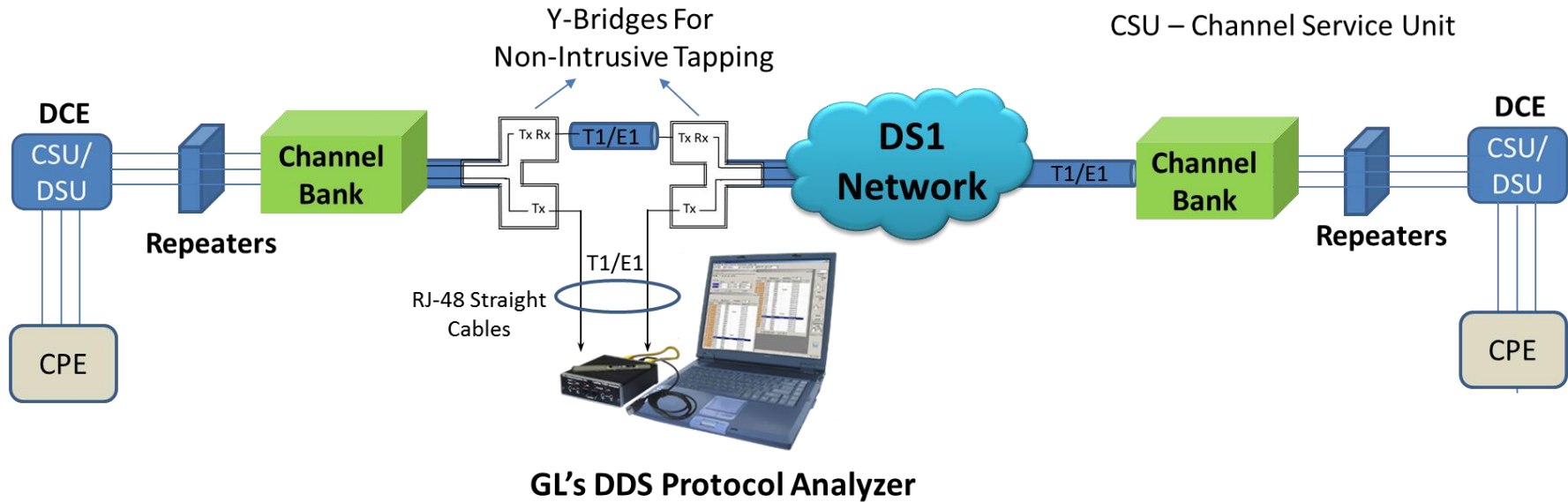
DDS Testing Techniques

Normal testing methods used to verify DDS circuits are –

- BERT Testing at DS0 level with standard set of pseudorandom and fixed patterns
- Circuit sync at subscribed rate (4.8kbps, 9.6kbps, 19.2kbps, 64kbps, etc)
- Loopback or End-to-End tests to isolate faulty DDS circuits
- Non-Intrusive monitoring and analysis of frames at certain points within the network infrastructure or at customer premises

DDS Protocol Analyzer

CPE – Customer Premise Equipment
DSU – DATA SERVICE UNIT
CSU – Channel Service Unit



T 1 Analyzer Hardware



Dual T1 E1 Express (PCIe) Board



Quad / Octal T1 E1 PCIe Card



Rackmount Quad T1 E1 Analyzer

16-Port T1 E1 Breakout-Box



PCIe Board



tProbe™ - Portable USB based T1 E1 VF FXO FXS and Serial Datacom Analyzer



Portable USB based Dual T1 E1 Analyzer Unit



Dual HD Universal T1 E1 PCI Card

Hardware and Accessories



- Y-Bridge

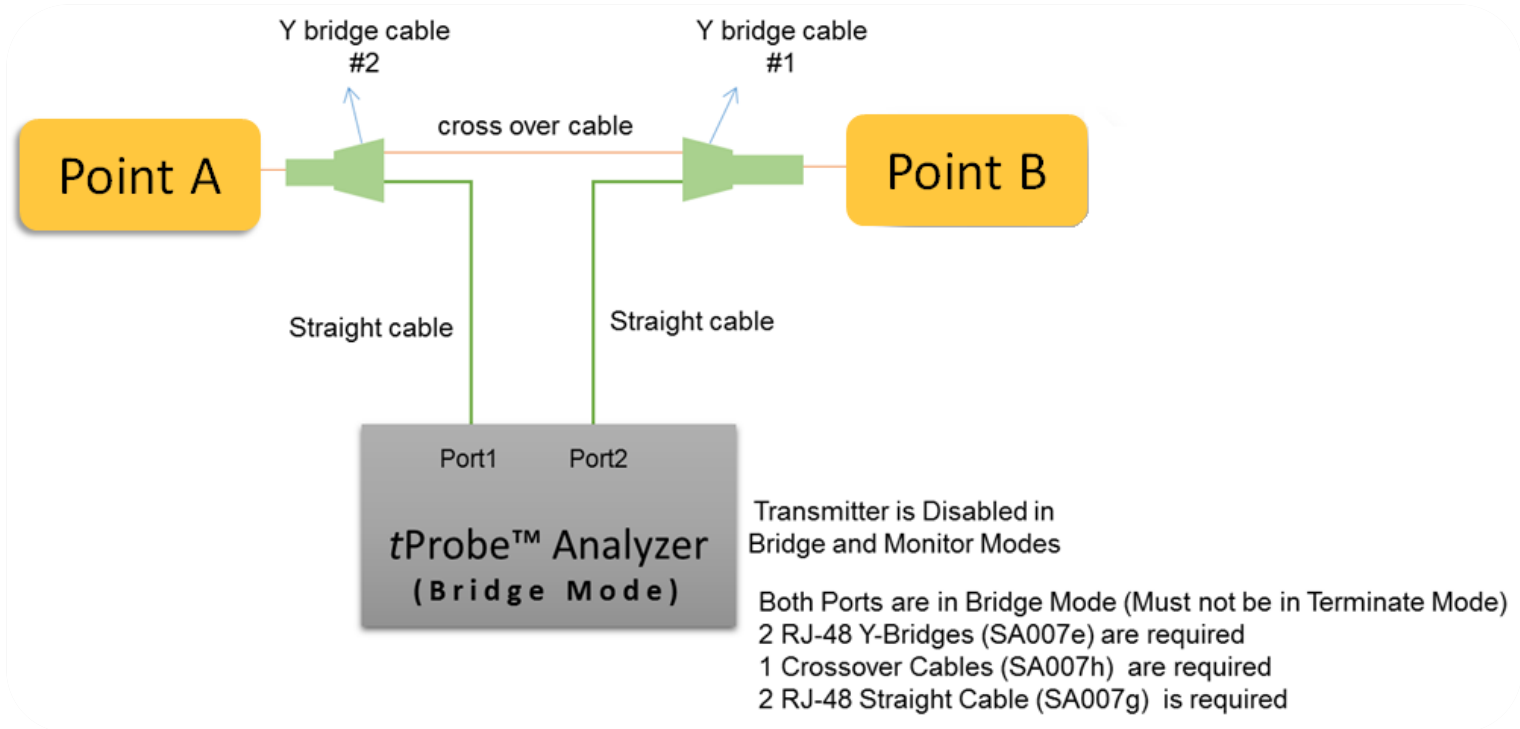


- RJ-48 Crossover Cable



- RJ-48 Straight Cable

Operations



- GL's T1 Analyzer Hardware non-intrusively taps the T1 line using Y-bridges to capture all frames

Operations

T1 tProbe Analyzer 32-bit (Administrator)

File Config View Monitor Intrusive Test **Special Applications** Window Help

Port	Framing	Loopback	Termination	Clock	B8ZS	Cross-port
1	ESF (193E)	No Loopback	Terminate	Internal	On	Normal
2	ESF (193E)	No Loopback	Terminate	Internal	On	Normal

Set all cards as selected

< Double-click to change values

Special Applications

- Protocol Analysis** ▶ **DDS Analysis**
- Windows Client Server (WCS) ▶
- Record to File ▶
- Dial Digits ▶
- Call Capture & Analysis ▶
- Physical Layer Testing ▶
- Echo Test Solutions ▶
- MCBERT, HDLC, TRAU ▶
- Facility Data Link ▶
- AudioBridge, StripChart ▶
- Voice Quality Assessment

T1/E1 Alarms

Reset	All Ports	#1	#2
Sync Loss	✓	✓	✓
Bipolar Violation	✓	✓	✓
Carrier Loss	✓	✓	✓
Frame Error	✓	✓	✓
Blue Alarm	✓	✓	✓
Yellow Alarm	✓	✓	✓
AIS	✓	✓	✓

T1/E1 Statistics

	#1	#2
Frequency (Hz)	1544000	1544000
Level (dBdtx)	0.029	-0.029
BPV Errors	0	0
CRC Errors	0	0
Frame Errors	0	0
Transmit Under Run	0	0
Receive Over Run	0	0
==Bit/Frame Clock Slip==		

Card 1

-Vf (Audio)

-Tx (Vf In)

Gain(dB)

0.0 dB

TS

0

Insert

Speaker

-Rx (Vf Out)

Gain(dB)

0.0 dB

TS

0

Drop

Speaker

Ready

T1/E1 Sync Info

Operations

The screenshot shows a software interface with several sections:

- PORT ACTIONS:** A table with columns for ports 00-23 and checkboxes for actions like 'P...', '1', and '2'. A red box highlights the row for port 1, where channels 0 through 23 are selected.
- Data Transmission Rate:** A section with radio buttons for 'Single Channel' (64 kbps, 56 kbps), 'Hyper-Channel' (Nx64 kbps, Nx56 Kbps (bits 1-7), Nx56 Kbps (Bits 2-8)), and 'Multiple Hyper-Channels' (128, 192, ... kbps). A red box highlights the '64 kbps' option.
- Subchannels 8-56 kbps:** A section with radio buttons for 8, 16, 24, 32, 40, 48, 56, and 'All'. A 'DSO bits' slider is also present.
- All Port Settings:** Includes 'HDLC FCS' (16 bits, 32 bits, None), 'Interface' (User, Network), and 'Bit Inversion 1<->0'.
- Octet Bit Reversion (MSB <-> LSB):** A checkbox that is checked. A red box highlights this checkbox.
- Row (Port) Select, Clear, Paste Operations:** Includes buttons for 'Select All', 'Clear All', 'Paste All', and 'Paste List'.

Select Data Rate as 64 Kbps

Select Port and Channel on which the DDS frames are expected

Enable Octet Bit Reversion

Operations

The screenshot displays the DDS Protocol Analysis software interface. At the top, there is a menu bar (File, View, Capture, Statistics, Database, Configure, Help) and a toolbar. Below this is a table of captured frames with columns: Dev, TSlot, SubCh, Frame#, TIME (Relative), Len, and Error. The table contains several rows of data, with the first row highlighted in blue. Below the table, a specific frame is selected and its details are shown in a text area. The details include the frame's position and length, followed by an ASCII decode of the DDS layer data. At the bottom, a hex dump of the frame data is displayed, showing the raw bytes and their corresponding ASCII values.

Dev	TSlot	SubCh	Frame#	TIME (Relative)	Len	Error
✓ 1	2		42	00:41:50.246500	411	
✓ 1	3		43	00:42:20.699000	411	
✓ 1	0		44	00:42:41.681875	411	
✓ 1	2		45	00:45:10.427625	411	
✓ 1	6		46	00:45:26.277000	411	
✓ 1	2		47	00:46:03.320625	411	
✓ 1	4		48	00:47:26.436875	411	

Card1 TimeSlot=2 Frame=42 at 00:41:50.246500 OK Len=411
HDLC Frame Data + FCS
===== DDS Layer =====
DDS = 202
DDS = A4- 36 ESN=029 2
DDS = (903) 203-4861 17:25 07/28/2017
DDS = 101
DDS = GUM SPRINGS RD - SE SECTOR
DDS = (903) 511-9812 WRLS
DDS = LONGVIEW TX
DDS = WIRELESS-ATT MOBILITY
DDS = ALT#=
DDS = X=-94.7156023 CNF=000 TELCO=ATTMO
DDS = Y=32.49131441 UNC=0
DDS = VERIFY
DDS = VERIFY

Hex Dump of the Frame Data

32 30 32 0D 41 34 2D 20 20 33 36 20 20 20 20 20 20 202 A4- 36
45 53 4E 3D 30 32 39 20 20 20 20 20 20 20 20 20 20 ESN=029
20 32 20 0D 28 39 30 33 29 20 32 30 33 2D 34 38 2 (903) 203-48
36 31 20 31 37 3A 32 35 20 30 37 2F 32 38 2F 32 61 17:25 07/28/2
30 31 37 0D 20 20 20 20 31 30 31 20 20 20 20 017 101
20 20 20 20 0D 47 55 4D 20 53 50 52 49 4E 47 53 GUM SPRINGS
20 52 44 20 2D 20 53 45 20 53 45 43 54 4F 52 20 RD - SE SECTOR
20 52 44 20 2D 20 53 45 20 53 45 43 54 4F 52 20

Summary View

All captured DDS frames are displayed here

Right-click on decoded layer to copy content to clipboard

Detail View

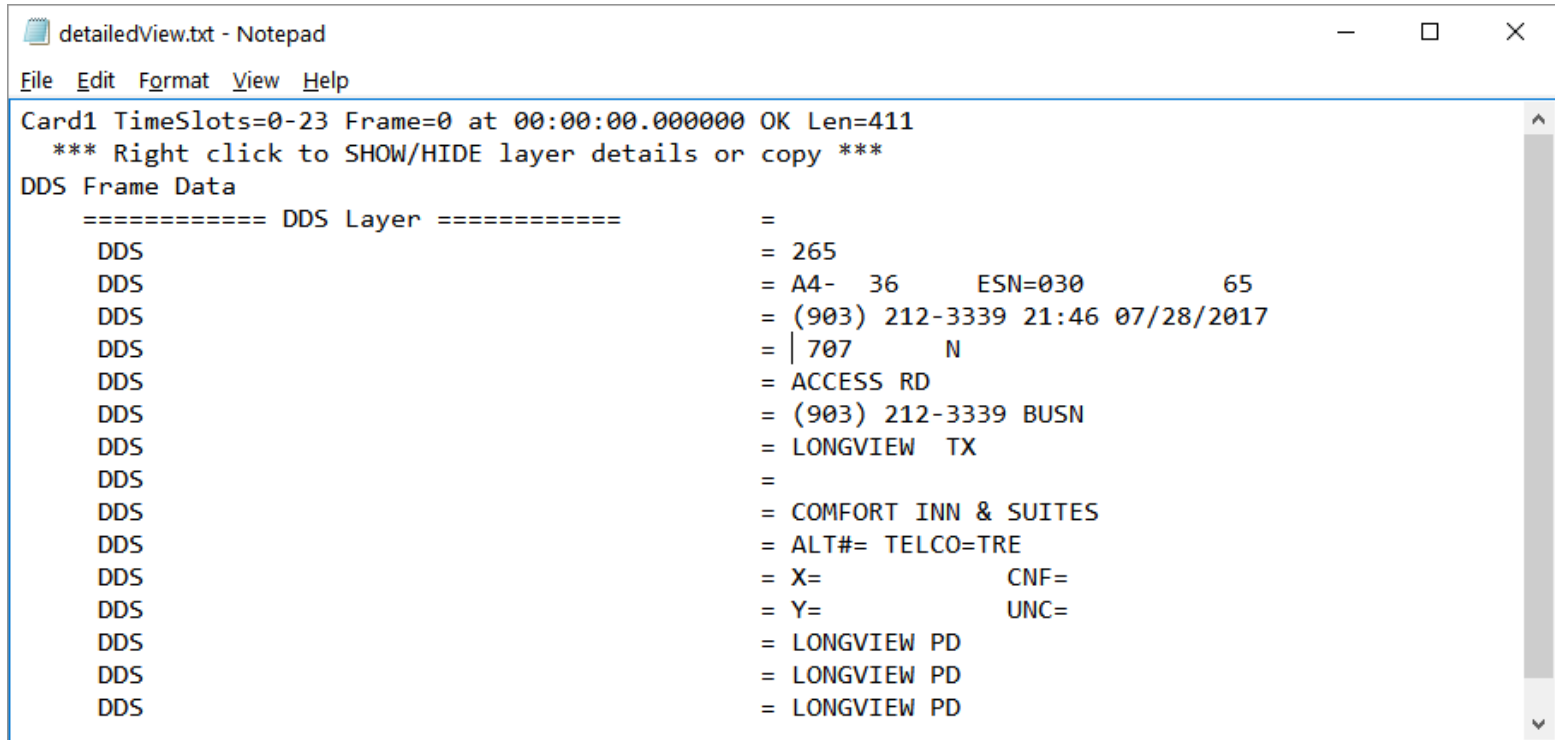
Displays the ASCII decode of selected DDS frame

Hex Dump View

Displays Hex Dump Data

Operations

- Right-click on **Detail View** and copy layer contents to a notepad for further diagnosis and troubleshooting



```
detailedView.txt - Notepad
File Edit Format View Help
Card1 TimeSlots=0-23 Frame=0 at 00:00:00.000000 OK Len=411
*** Right click to SHOW/HIDE layer details or copy ***
DDS Frame Data
===== DDS Layer =====
DDS =
DDS = 265
DDS = A4- 36 ESN=030 65
DDS = (903) 212-3339 21:46 07/28/2017
DDS = | 707 N
DDS = ACCESS RD
DDS = (903) 212-3339 BUSN
DDS = LONGVIEW TX
DDS =
DDS = COMFORT INN & SUITES
DDS = ALT#= TELCO=TRE
DDS = X= CNF=
DDS = Y= UNC=
DDS = LONGVIEW PD
DDS = LONGVIEW PD
DDS = LONGVIEW PD
```

Thank You