LEASED LINE PROVISIONING WITH OCB-283 USING SEMI-PERMANENT LINKS

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Abstract

The data leased lines are provided using normal primary mux. The primary mux involves lot of wiring which is the trouble spot in the maintenance of the leased lines. As a reliable and cheaper alternative using semi-permanent links of OCB-283, has been discussed in this article. In this ocb-283 works as digital cross connect for any purpose like Nx64 kbps data leased lines and Nx64 Internet leased line. It utilizes the capability of ocb of making semi-permanent links. This facilitates avoiding first order mux and 64 kbps data cards expenditure and unnecessary fault prone channel level wiring of the first order Mux.

1.0 Introduction

Leased lines are one of the potential sources of earning in present era of data transmission. The leased line requirement of corporate /banks are growing due to present day's scenario. The banks area connecting each and every branch for providing services from any branch irrespective of the account location. The corporate is using it for connecting WAN of different offices located at different places for various purposes like ERP & other on-line activities.

For providing a typical leased line from one location A to the other location B of SSA located in different SDCA's. Two pair of MUX are used one pair with SSA HQ to Location A and other for location B to SSA HQ. And required 64 kbps channel is physically patched at SSA HQ level.

The leased line provisioning, management, fault diagnosis are tough task. Best available technical staff is always required to be posted for all these works. The first order MUX takes lot of space and wiring for all channels are required to be done and further patching of different channels on different routes for leased lines. This involves lot of physical connections which are prone to fault due to human errors. While testing one circuit unintentionally other circuit goes faulty. This way circuits get faulty. These types of testing routine are very typical for leased line.

To manage the leased line, Managed Leased Line System capable of handling all types of circuits e.g. 2MB, Nx64 kbps, Hot Line, P-Wire Circuit, 9.6 kbps/ Speech circuit etc is very much required in the BSNL network. But, it may take time to come in the BSNL network. MLLN are planned for certain sites but, it may be in-sufficient for scatter demand as it is coming for limited locations.

SSA Solan is using OCB-283 as digital cross connect. This type of arrangement may be adopted by field unit to provide better service to customers and systematic working.

2.0 LEASED LINE NETWORK

The partial leased line network of SSA Solan is shown in fig. 1. The customer end exchange has been provided with first order MUX with 64 Kbps Data Card wherever required. But at SSA head quarter Solan where intra SSA circuits are to be patched has been achieved by semi permanent links of OCB-283 exchange. Further, for long distance connectivity to other SSA has been achieved by again with OCB-283 cross connect. This way out of two ends, one end MUX requirement has been completely eliminated and made physical connection free. Daily status of PCM/ Channel is monitored with routine exchange testing. This helps in knowing the fault before subscriber actually complaints about this, if it is due to PCM fault.

3.0 INTERNET LEASED LINES 64kbps

To provide 64 Kbps Internet leased line it is a practice that one first order MUX is put with data cards and thirty 64 Kbps circuits are segregated and again for one customer one pair of MUX is provided for giving just 64 Kbps Internet leased line. This is quite expensive proposition but with the help of OCB semi permanent link capability, it has been achieved by eliminating the MUX.

One G.703 Internet E1 port is connected to OCB-283 for n number of N x 64Kbps leased lines. Another E1 which goes to distant end exchange (customer end) is also connected to OCB. Say, 31st time slot of the Internet PCM is patched with other PCM on 31st time slot with LDCR command in OCB. This will ensure the availability of 31st 64 Kbps channel on 30th channel of first order MUX at the distant end exchange (customer end). This 64 Kbps can be taken out with the 64 kbps data card and can be carried over to customer premises with the help of 64 kbps leased line modem pair (RAD's, ASM-31 Modem pair).

One more option is also available. The customer can buy modem that support N x 64 kbps speed which directly takes E1 and no need of first order MUX at all. The customer modem should be configured for one time slot only. In this case the customer has flexibility that while up gradation of the speed of the line, there will be no need of change of any hardware. This logic equally applies to other 64 kbps leased lines.

4.0 INTERNET LEASED LINES Nx64kbps

To provide Nx64 Kbps Internet leased line. One G.703 Internet E1 port is connected to OCB-283 for n number of N x 64Kbps leased lines. Another E1 which goes to distant end exchange (customer end) is also connected to OCB. Say, 17th to 24th time slot (8 time slots) of the Internet PCM is patched with other PCM on 1st to 8$^{th\ t}$ time slot with LDCR command in OCB. This will ensure the availability of 512 Kbps (8x64 kbps) on 1 to 8 channel at the distant end exchange (customer end). At the customer end N x 64 kbps speed supported modem pair (line driver) is installed to carry Nx64 kbps to customer premises from exchange. The customer modem should be configured for one to eight time slot only. In this case the customer has flexibility that while up gradation of the speed of the line, there will be no need of change of any hardware. This logic

equally applies to other Nx64 kbps leased lines. The cross connection has been shown in Fig 2.

5.0 Creation of Semi-Permanent Links

OCB has capabilities to make semi-permanent links of many types. The type-3 data link connects two trunk interface circuits of a PCM handler. The typical command is as follows.

@LDCR:
@**AFCTE=202-4-2,AFCTS=202-2-1,ILS=INTETSNR,**TYLD=3,SRV=T3,
DISLD=SURV1;

AFCTE & ARCTS is time slots or circuit on the PCM which are to be connected. ILS is the name of the circuit. Other parameters are normally fixed.

The list of the values of AFCTE , AFCTS and ILS for network shown in fig 1 is as per table 1.

(Partial Leased Line Network of Solan SSA)

SN	Name of Circuit	ILS	AFCTE	AFCTS	Remarks
1	64 kbps PWO-CHD-1	satyam	202-0-31	202-1-31	Inter SSA
2	64 kbps PWO-CHD-2	iocpwo	202-0-27	202-1-27	Inter SSA
3	64 kbps PWO-SOL	solanlic	202-0-30	211-12-30	Intra SSA
4	64 kbps PWO-NLG	pwolic	202-0-29	202-7-6	Intra SSA
5	64 kbps DMP-ND	patime	202-8-30	211-12-26	Inter SSA
6	64 kbps BRTL-UDP	brtludp	211-12-27	202-3-30	Inter SSA
7	64 kbps BDI-CHD	iocbdi	211-12-28	202-3-31	Inter SSA
8	64 kbps BDI-CHD(P)	spinbdi	202-3-29	202-1-30	Inter SSA
8	64 kbps NLG-SOL	nlglic	211-12-29	202-7-1	Intra SSA
9	64 kbps DRG-BY(P)	grgby	202-9-1	211-12-25	Inter SSA
10	64 kbps KSU-ND	airksu	202-6-1	211-12-31	Inter SSA
11	64 kbps Internet SNR	insnr	202-4-3	202-6-4	Internet 64 kbps
12	64 kbps Internet Nauni	innaunii	202-4-2	202-5-2	Internet 64 kbps
13	64 kbps Internet Green Hill Engg Collage	Inetghc	202-4-5	202-11-1	Internet 64 kbps
14	512 kbps Internet Leased Line JP University	Jp1	202-4-17	202-10-1	512 kbps Internet Leased Line
		Jp2	202-4-18	202-10-2	
		Jp3	202-4-19	202-10-3	
		Jp4	202-4-20	202-10-4	
		Jp5	202-4-21	202-10-5	

		Jp6	202-4-22	202-10-6	
		Jp7	202-4-23	202-10-7	
		Jp8	202-4-24	202-10-8	

For checking the status of leased lines **LDIL: TYLD=3;** command is used.

6.0 INERNET LEASED LINE CONFIGURATION ON C-3 NODE

The following sequence of command s are required to be given on C-3 node Tigris. The equivalent command are also there for cisco router. With only one G703 port at router three 64 kbps and one 512 kbps leased line has been provided.

Configuration of j0.4 (2MB)for Leased Line (For n number of Nx64 leased line)

SET DS1 INTERFACE FRAMING J0.4 NOCRC
SET DS1 INTERFACE CIRCUIT NAME J0.4 "leased"
SET DS1 INTERFACE SIGNALING MODE J0.4 NONE
SET DS1 INTERFACE LINE LENGTH J0.4 LONG
SET DS1 INTERFACE MESSAGE LEVEL J0.4 7
SET PHYSICAL PORT SPEED J0.4.1 2048000

Configuration of j0.4.1 (64 kbps)for Leased Line Nauni

SET DS1 CIRCUIT SUPERRATE J0.4.2 2
SET DS1 CIRCUIT NAME J0.4.2 "nauni"
SET PPP MESSAGE LEVEL J0.4.2 3
ADD IP NETWORK ENTRY J0.4.2
SET IP UNNUMBERED INTERFACE SOURCE ADDRESS J0.4.2 61.0.95.129
ADD IP ROUTE ENTRY 210.212.45.32 255.255.255.240 J0.4.2 1

Configuration of j0.4.1 (64 kbps)for Leased Line Sanawar

SET DS1 CIRCUIT SUPERRATE J0.4.3 3
SET DS1 CIRCUIT NAME J0.4.3 "snr"
SET PPP MESSAGE LEVEL J0.4.3 3
ADD IP NETWORK ENTRY J0.4.3
SET IP UNNUMBERED INTERFACE SOURCE ADDRESS J0.4.3 61.0.95.129
ADD IP ROUTE ENTRY 210.212.45.0 255.255.255.240 J0.4.3 1

Configuration of j0.4.5 (64 kbps)for Leased Line Green Hills Engg College

SET DS1 CIRCUIT SUPERRATE J0.4.5 5

SET DS1 CIRCUIT NAME J0.4.5 "KUMENG"
SET PPP MESSAGE LEVEL J0.4.5 3
ADD IP NETWORK ENTRY J0.4.5
SET IP UNNUMBERED INTERFACE SOURCE ADDRESS J0.4.5 61.0.95.129
ADD IP ROUTE ENTRY 210.212.45.160 255.255.255.240 J0.4.5 1

Configuration of j0.4.17 (512 kbps)for Leased Line JP University

SET DS1 CIRCUIT SUPERRATE J0.4.17 17:24
SET DS1 CIRCUIT NAME J0.4.17 "JP"
SET PPP MESSAGE LEVEL J0.4.17 3
ADD IP NETWORK ENTRY J0.4.17
SET IP UNNUMBERED INTERFACE SOURCE ADDRESS J0.4.17 61.0.95.129
ADD IP ROUTE ENTRY 210.212.45.128 255.255.255.224 J0.4.17 1

Note :- 61.0.95.129 is IP address of node

7.0 SYNCHRONISATION

Providing the leased line over E1 links directly have the advantage of no stringent synchronisation requirement. But at 64 kbps channel level physical patching requires the synchronisation of all the MUXs from single higher order clock source. So, clock drivers etc. are also required at many places. The OCB is always synchronised with higher level TAX as per national synchronisation plan of BSNL. The clock of OCB is highly stable and the first order MUX connected through E1 are operated in receive clock source mode. This arrangement ensures error / slip free 64 kbps channel recovery at customer end exchange MUX.

However, there is need for guidelines for synchronization of leased line network with our PSTN network. So that leased network, NIB, PSTN, Transmission Networks and other network are synchronized from single clock source.

8. 0 OTHER IMPORTANT ISSUES

8. 1 Proper UPS/INVERTER For Leased Line

The customer modem should be operated with very good quality branded UPS. Because local made UPS generates lot of harmonics in the A.C. output which leads slips and errors in the data. This type of field problems has been frequently observed. This results customer dissatisfaction and complaints, so, only branded UPS must be insisted for local lead modems.

8.2 OCB PCM ,Primary MUX and Internet Node

The OCB PCM created with VV=YES in MICCR command are used for R2_MF working and works with Primary MUX. But in case Internet, the OCB PCM should be created with VV=NO as the Internet node PCM carries no signaling channel (TS16) unless configured for specific use.

8.3 HFCL DLC as Cross Connect

The DLC of HFCL make can work as digital cross connect. So in addition to normal works it may be used for cross connect on the spare PCM's. The 64 kbps data channel can be used for checking digital loop of Leased lines where 64 kbps meters are not available. But, this is very crude method of testing as it does not give slip/BER.

9.0 CONCLUSION

Using OCB-283 as digital cross connect has resulted in avoiding procurement of new first order MUX and DATA Cards thus saving in cost of provisioning of leased lines. Over all better performance due to inherent stability of OCB switches. Troubleshooting will be also be simplified to great extent. Even after the deployment of MLLN , the proposed method will be helpful for the sites where MLLN is not deployed. In Solan SSA, MLLN is being supplied for two locations but we have leased lines for more than 15 locations. So, even after deployment of MLLN we will have to use it for other locations where MLLN system is not deployed. The MLLN is very costly affair for the places where demand is for single 64 kbps leased line. The combination of MLLN and OCB and Other New Tech Switches semi permanent links will be ideal solution in the present scenario.