

# STATISTICAL TIME DIVISION MULTIPLEXING ARCHITECTURES AND DESIGN

A2

15 mV

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200mV

20mV



0.1 500ns

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INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

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## Editors

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## 17. Multiplexing and Operational Scenarios

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### 17.0 Abstract

The design of multiplexer operation can be based upon certain simulation parameters. In this chapter a design of STDMA is based upon some parameters considering a 64 Kbps satellite channel. Allowing each user a capacity of 6.4kbps, 10 users can be multiplexed in a normal situation. Using VAD and packet discarding for each of the users allow more users on the same link. In this chapter design architecture is proposed and explained in detail.

### 17.1 Information rate

A 64 kb/s information rate carrier normally can carry 10 users of each 6.4 kb/s voice channels excluding signalling information. If data rates also desired any, combinations such as voice channels, a fax and data channels and image transmission configurations can be made available. Alternatively, by a statistical multiplexing, several lower rate users (e. g one 4.8 kb/s and two 2.4 kb/s) can be accommodated through the 9.6 kb/s data channels. Although the 64 kb/s information rate appears to be adequate for most thin-route applications, most multiplexer are able to support higher rate, such as 128 kb/s, [10] [44] further enhancing the flexibility of users with growing traffic patterns. For the simulation all the users are speech sources, each of which is generating equal bits per frame of speech i.e., 128 per 20 ms. Data frame are generated by all the users are synchronised and aligned.

### 17.2 Capacity Issues

The multiplexer design is based on the following assumptions. The output link capacity is 64 kb/s, Each user on the link is assigned a 6.4 kb/s capacity. Ideally '10 users can be accommodated on the link in parallel if individual links of 6.4 kb/s are considered to be shared such as circuit switching systems. If a packet switching is considered then 10 packets, a single packet or frame of speech from each user can be transported per 20 ms. Each source has to carry control information. Employing, VAD for each of such source and allocating bandwidth only during talkspurts the silent periods can be utilised by statistically multiplexing other users.