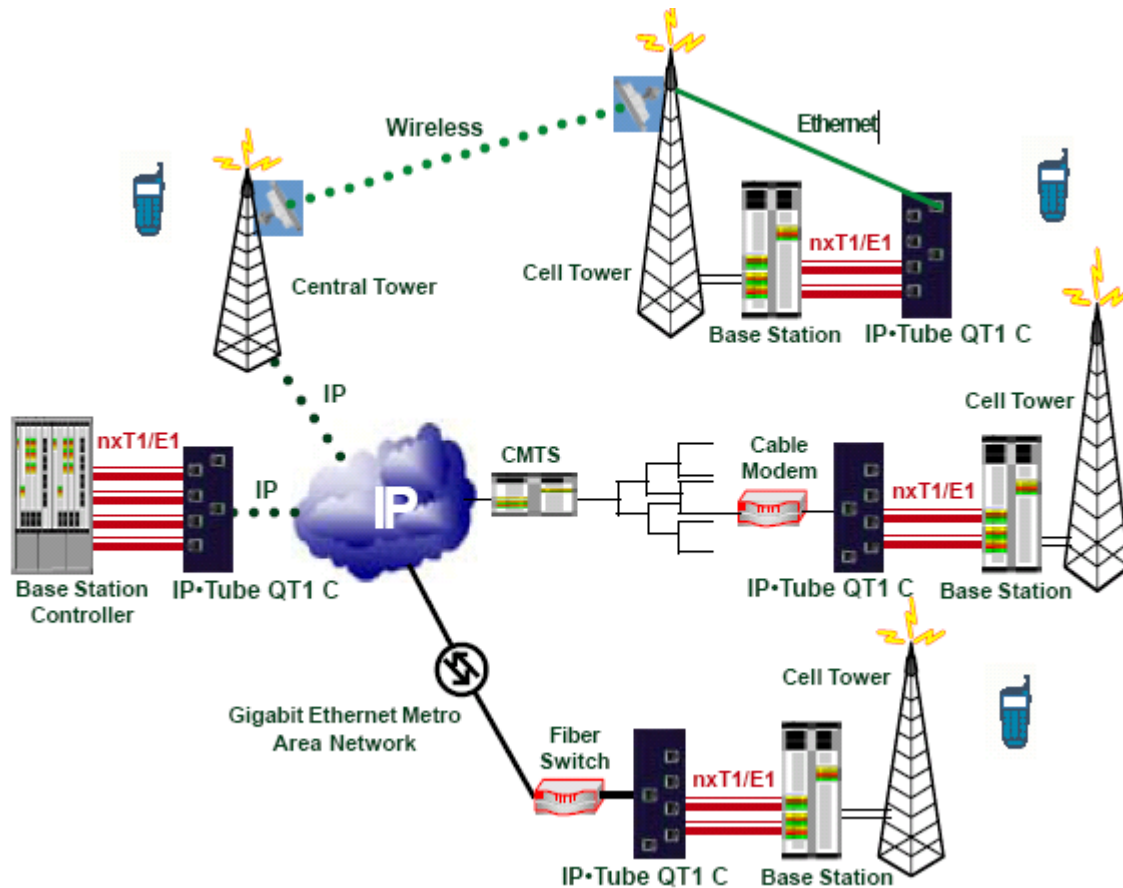


## BHUMIKA APPLICATION NOTE

### Cellular Backhaul over IP / Ethernet

Cellular phone service providers have been historically burdened with acquiring T1 or E1 circuits from Telcos to turn up cell sites. Limited availability, expensive leases, extensive delays, and unreliable service are all common with E1 / T1 circuits. This is no longer the case when cell sites have access to flexible IP services. IP data service providers are strategically focused on the cellular backhaul business as they have a cost basis that is a fraction of a leased E1 / T1 circuit. Cell site access to aggressively priced IP services delivered via xDSL, Optical Ethernet, HFC Cable Modem, Wireless Ethernet, and PLC Power Line Ethernet is becoming ubiquitous.

The **IP•Tube xT1 / IP•Tube xE1** allows Cellular providers to leverage ubiquitous, economical, and reliable IP / Ethernet services as an alternative to E1 / T1 circuits. The **IP•Tube xE1 / IP•Tube xT1** encapsulates the Base Station's E1 / T1 traffic into IP / Ethernet packets for interconnection to the Base Station Controller. Full and Fractional E1 / T1 connections are supported. The size and frequency of the IP packets is user configurable. Data rates from 64 Kbps to 2.048 Mbps are supported.



Cellular Backhaul over IP utilizing the IP•Tube T1/E1 is an economical solution that uses ubiquitous, flexible, and reliable IP/Ethernet services.

## BHUMIKA APPLICATION NOTE

### Cellular Backhaul over IP / Ethernet Networks

The IP•Tube is used to provide transparent interconnection of the base stations (BTSs), base station controllers (BSCs) and mobile switching centers (MSCs) over IP / Ethernet packet-switched networks. The IP•Tube E1 / T1 maintains all the features of the cellular network BSC to BTS interconnections. Cellular phone service providers are able to save substantially by converting to a packet switch network from circuit TDM lease lines. The IP•Tube E1 / T1 has duplicate packet transmission and reception features that provide for resilient performance even through a lossy interconnect. The existing deployed investments in mobile switching technologies are retained while less expensive access technologies **maximize the Return on Investment** for the cellular provider.

The IP•Tube E1 / T1 transparent operation maintains the proprietary signaling required to support cellular voice communications. Voice quality is not compromised. The IP•Tube E1 / T1 is available with one to four E1 / T1 interfaces and with one to two 10/100 BaseT Ethernet interface(s). The E1 / T1 interfaces have configurations that provide independent protocol, compression, packet sizing, buffering, clocking, framing, coding and channel settings. The protocols supported are IPTube and CESoIP.

The IP•Tube T1•C / IP-Tube E1-C adds the power of lossless data compression. This optional functionality continuously detects idle/redundant data within each DS0 resulting in as much as a 56 to 1 bandwidth savings (40 to 1 for E1 version). TDM over IP bandwidth is not consumed by silent or redundant circuits. The IP•Tube T1•C / IP-Tube E1-C lossless data compression option is ideal for environments where network bandwidth is limited such as point-to-point and point-to-multipoint wireless, HFC cable modems, xDSL, Power Line Ethernet or the Internet.

#### Additional IP•Tube xT1 Applications

- PBX/Voice over IP/Ethernet
- T1/E1 Leased Lines over IP/Ethernet
- SS7 Signaling/Monitoring over IP/Ethernet
- Serial Data (RS530, V.35, RS232, X.21) over IP/Ethernet
- Toll Bypass over IP/Ethernet
- Encrypted Data over IP/Ethernet

#### IP•Tube xT1 Features

- 1 and 4 port T1/E1 models available
- 1 and 2 port 10/100T models available
- Optional Lossless Data Compression
- Optional Load Sharing and Redundant Ethernet port capabilities
- AC and DC Power Options
- Supports Full and Fractional T1/E1
- Straightforward Configuration

To get more information about IP-Tube E1 / T1 or to obtain a Data Sheet, Technical Specifications and a Quotation, Please contact Bhumika International Inc. at [info@bhumika.ca](mailto:info@bhumika.ca) or at +1 416 930-2931