

Protect T1 SLAs and Revenue: T1 Restoral over Cellular

T1 circuits continue to be an important connectivity solution for many businesses. Whether providing Internet access, inter-office connectivity, credit card processing or critical 911 infrastructure; the key advantage for T1 service is its reliability. It is a mature access technology that, unlike cable and DSL, provides guaranteed performance and availability. So when a T1 circuit fails, every hour of down time is another nail in the coffin leading to service level agreement (SLA) refunds or, worse, a disillusioned customer looking at service alternatives.

Providing T1 service has become more challenging as the TDM infrastructure ages. Outages due to equipment failure, faulty copper, and backhoe cable cuts are increasing in frequency, severely impacting an operators ability to maintain this critical connectivity to their business customers.

Traditional methods used to increase T1 availability include automatic protection switching to a backup T1, over copper, microwave or fiber links. The redundant T1 circuit may be impacted by the same outage as the primary, and all of these backup methods rely on costly dedicated infrastructure, often making them impractical.

With the increased availability of 3G/4G cellular technologies, an alternative method for backup of T1 links

has emerged. The cellular network’s bandwidth and reliability have increased to levels that can now support backup solutions for critical T1 connections. Cellular technology has the added benefit of on-demand capacity with quick connect times, reducing cost and complexity. A method is required, however, to convert circuit-based T1 connections into packets for transport over next generation IP-based cellular networks.

IP-Tube Circuit Emulation solutions from Engage Communication bridge the gap between circuit-based T1 and packet-based cellular technologies. The IP-Tube provides T1-over-IP transport, enabling T1 connections over fiber, satellite, wireless and, now, next generation cellular networks. In fact, rapid deployment T1 restoration kits can be created with appropriate Engage and cellular access equipment.

Immediate Restoration of T1 Service – Carriers can deploy these T1-over-Cellular kits to quickly re-route customer T1 traffic over the cellular network while the primary T1 is repaired, significantly reducing outage time. Combining IP-Tube circuit emulation with cellular routers, these T1 kits can be deployed by technicians at the customer premises to immediately restore customer T1 Router or PBX connectivity to the Central Office over the cellular network. See figure 1.

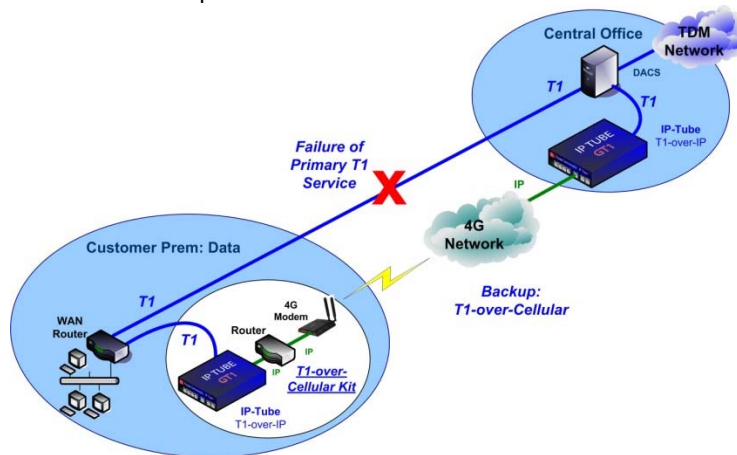


Figure 1 – Customer T1 Service Restored over 4G Cellular upon Failure of T1 Service

Automatic Backup of T1 over Cellular – For critical customers who won't accept an outage lasting the time it takes to deploy the T1 restoration kit, Engage offers an automatic protection switching option. In this case, the T1 restoration kit is installed permanently at the customer premise and the Engage IP-Tube is ordered with the Link Protector

(LPT) option. Link Protector continuously monitors the primary T1 connection and automatically switches traffic to the backup cellular path when a failure on the primary T1 is detected,. Once the Primary T1 connection is restored, traffic is switched back to the Primary T1. See figure 2.

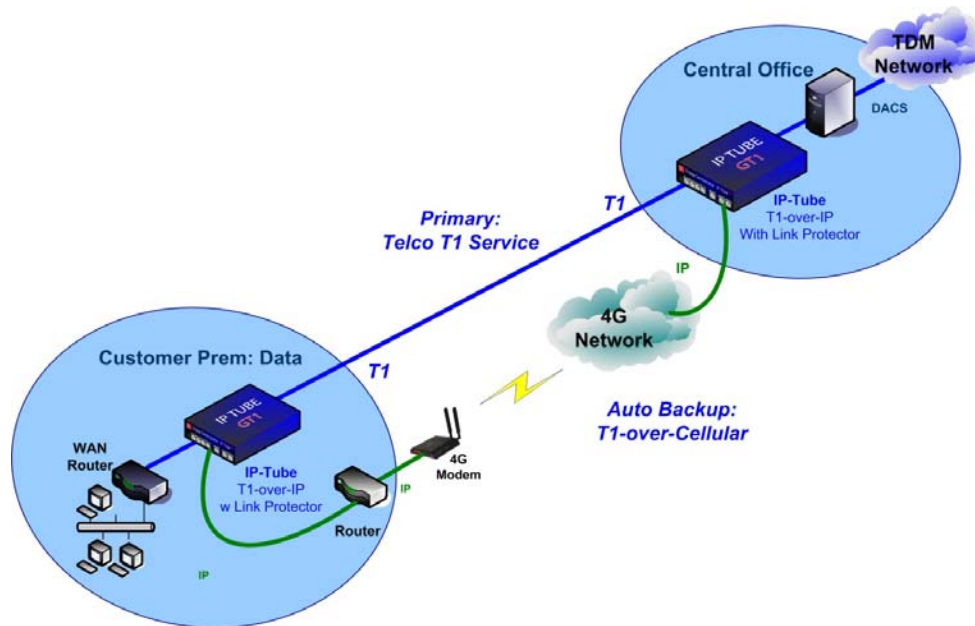


Figure 2– Link Protector: Continuous Monitoring of Primary T1 with Auto Failover to T1-over-Cellular

The **IP-Tube** circuit emulation solution offers a number of specialized features which help to ensure a quality T1 connection over the cellular network:

- Lossless Data Compression minimizes cellular bandwidth required.
- Echo Cancellation suppresses echo in PBX Voice applications;
- Transparent TDM over IP mode ensures all customer traffic types can be carried over the emulated T1 circuit;

- Alternatively, the HDLC-over-IP protocol makes efficient use of cellular bandwidth for WAN router traffic;
- Dual LAN interfaces permit Load Balancing over dual low bandwidth paths, or always-on dual path transport, resolving dropout problems.

Engage Communication provides a full line of Circuit Emulation solutions, enabling legacy protocol transport over IP, including T1/E1, DS3/E3, Serial (RS530, RS232, X.21, etc.) as well as SS7 and non-routable Ethernet.

Since 1989 Engage Communication has developed and delivered specialized Networking & Telecom products for mission critical applications to the Service Provider, Enterprise, Government, Defense, Utility, and Education markets.

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