



Connecting PBX Trunks together using E&M cards

The E&M card must be connected to an E&M interface on the PBX. Unlike a POTs line, E&M does not have a DC offset on the talk path. The talk path is on a set of wires that are separate from the -48 VDC signaling lead wires. The voice signal is modulated onto the tip and ring when operating in a 2-wire full duplex configuration. In the 4-wire configuration, the voice is transmitted onto the T/R pair and received on the T1/R1 pair. The signaling (on hook, off hook) is still done with 48 VDC but it rides on the E&M leads. The PBX is an "M lead originate" device and the ADTRAN E&M card is an "E lead originate" device. When PBX A wants to place a call, it raises the M lead. The PBX does this by applying -48 VDC to the M lead. Our E&M card sees -48 VDC and converts that -48 VDC into signal bits. The remote E&M card sees the bits coming from the other side and converts the signal back to analog by grounding the E lead. This causes current to flow from the PBX to the ADTRAN E&M card on the E lead. When PBX B sees that the E lead has gone high, it knows a call is coming in and rings the appropriate phone. When the ringing phone goes off hook, PBX B then signals PBX A by applying -48 VDC to the M lead. Our E&M card sees that the M lead now has voltage and transmits signal bits back to PBX A. The ADTRAN E&M card at site A converts the bits back into an analog state by grounding the E lead. Now current is flowing from PBX A into the ADTRAN E&M card A. The originating PBX A has now seen the E lead return high and the connection is complete.