More on Stimulus and unique response

A follow up to “DTE Power Problem Set and Solution Methodology” by Mike McCormack, Nov 99

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3Com

The Premise

- Stimulus and Unique Response
  - Stimulus is different from response
  - Network side contains only a stimulator, can not generate response
  - Terminal side responds only when stimulated correctly
  - Responses must be different from responses possible from passive termination

Some Examples

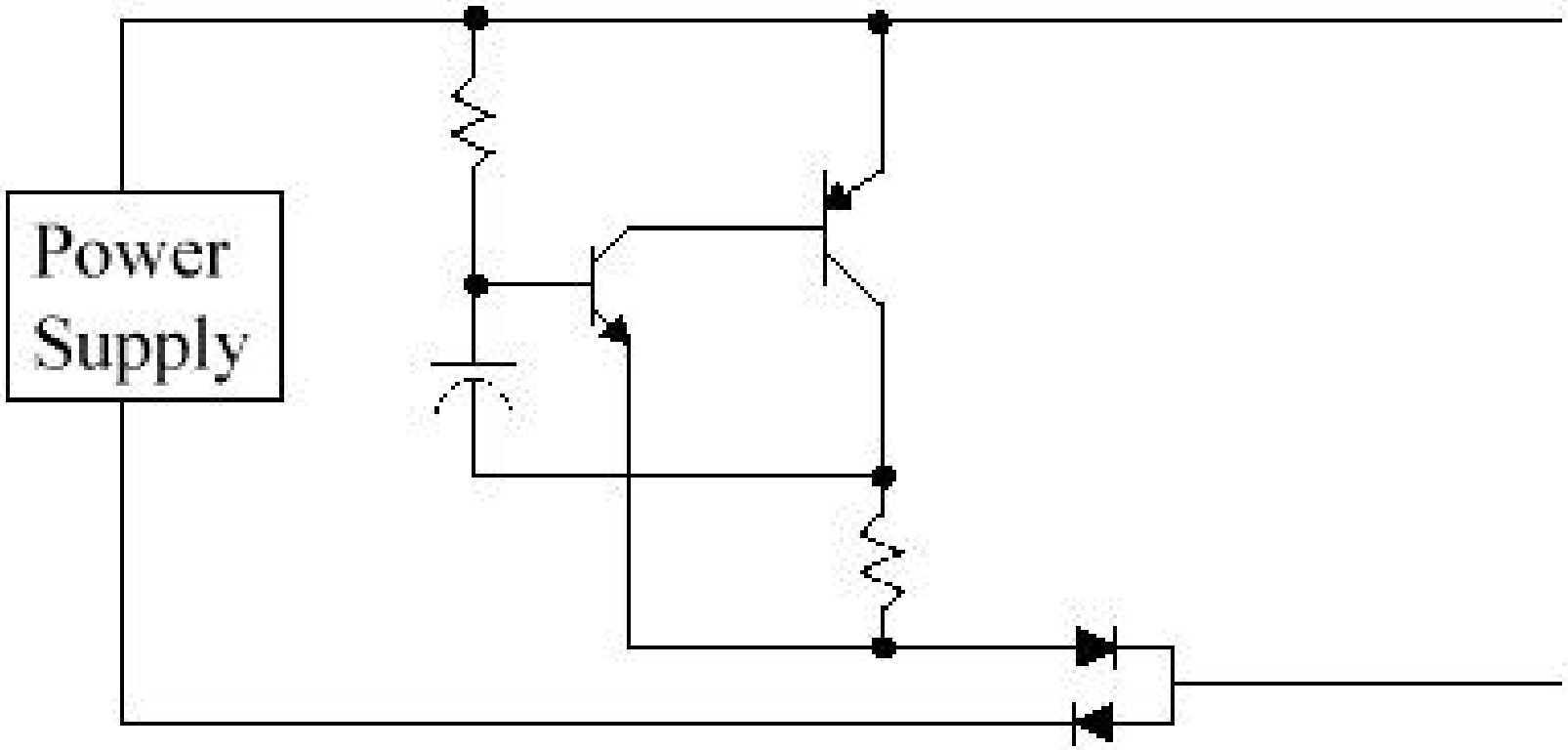
- Zener Diode Bridge
  - Stimulate with two voltages / currents
  - Zener produces non - linear current profile
- Oscillator Bridge
  - Stimulate with current limited low voltage
  - Oscillator creates a distinctive voltage / current profile
- Dual Tone and Filter Bridge
  - Stimulate two tones
  - Filter bridge only allows a single tone to loop

Oscillator Bridge eg

- 2.2VDC is applied across two pairs
  - Current is measured
  - Current > 45 milliamps Þ Short, remove power
  - Constant current < 45 milliamps Þ Passive termination, remove power
  - Oscillating current Þ Power Device
- During Powered State current draw must be constantly monitored
  - Too high Þ Short or failure, remove power
  - Too low Þ disconnected or failure, remove power

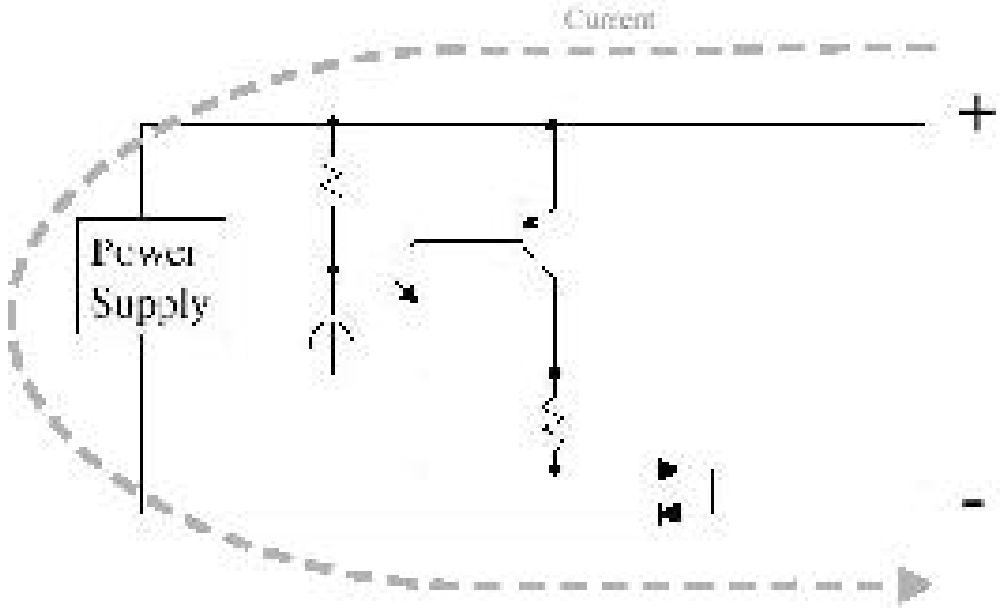
Client Side

The DTE End



Client Side

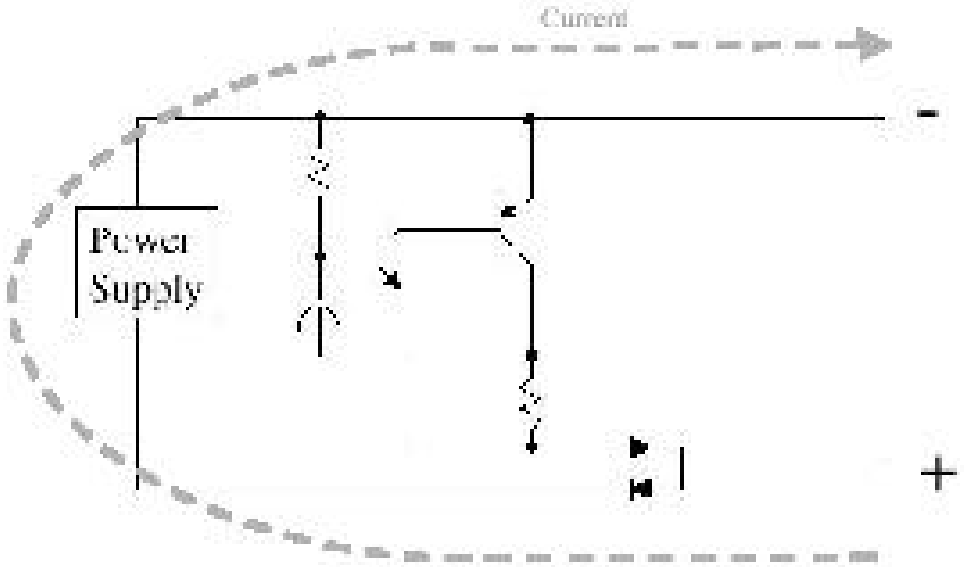
The DTE End - Detection Phase



- Operates from 1.2 to 5V
- Alternates from near zero current to a programmable current draw
- Operational power supply is removed from current path
- Current draw profile is distinctive

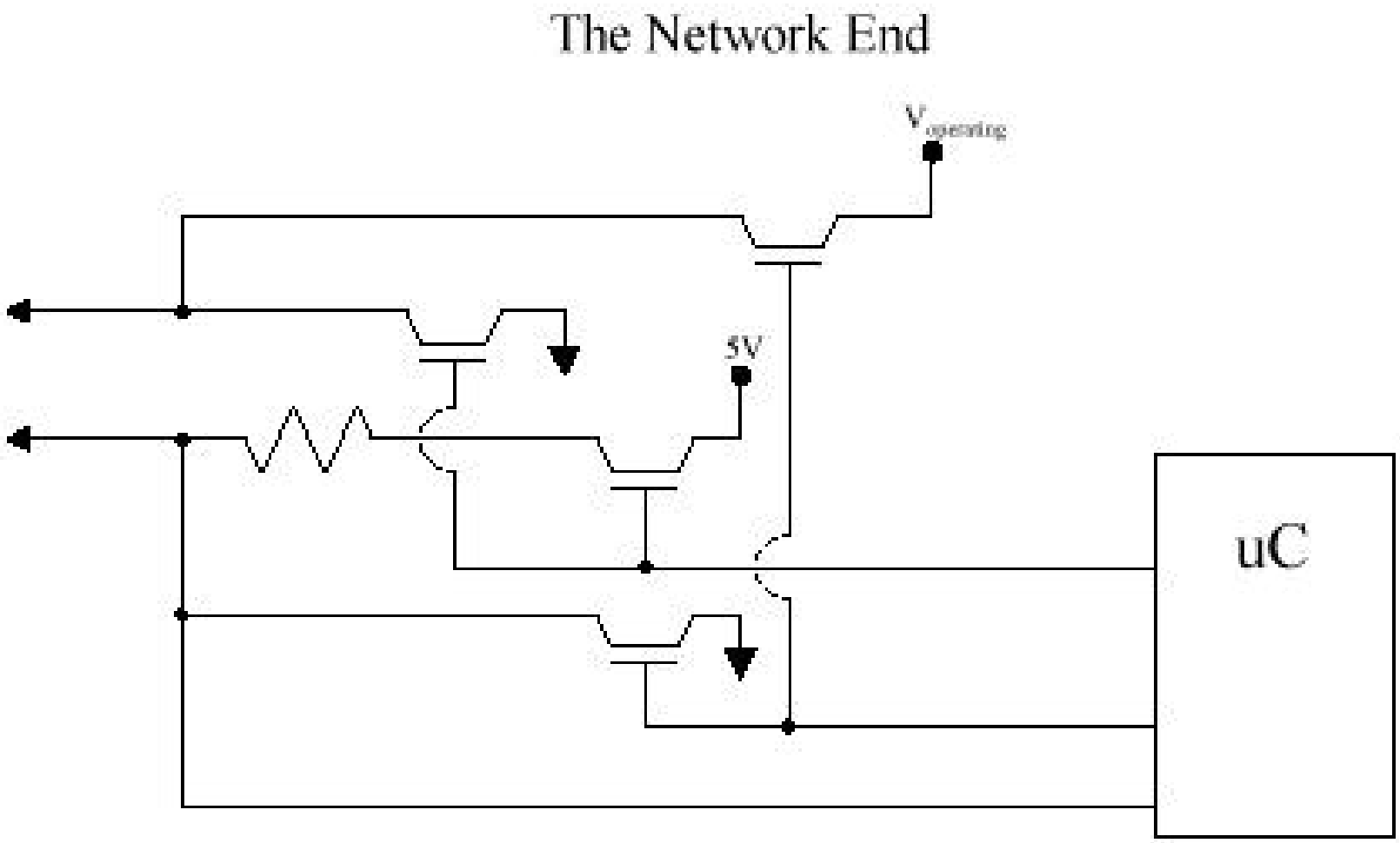
Client Side

The DTE End - Powered Phase



- Oscillator is protected from "high" voltage power
- Current is only drawn by the operational supply
- Current **must** still be monitored to detect faults and failures.

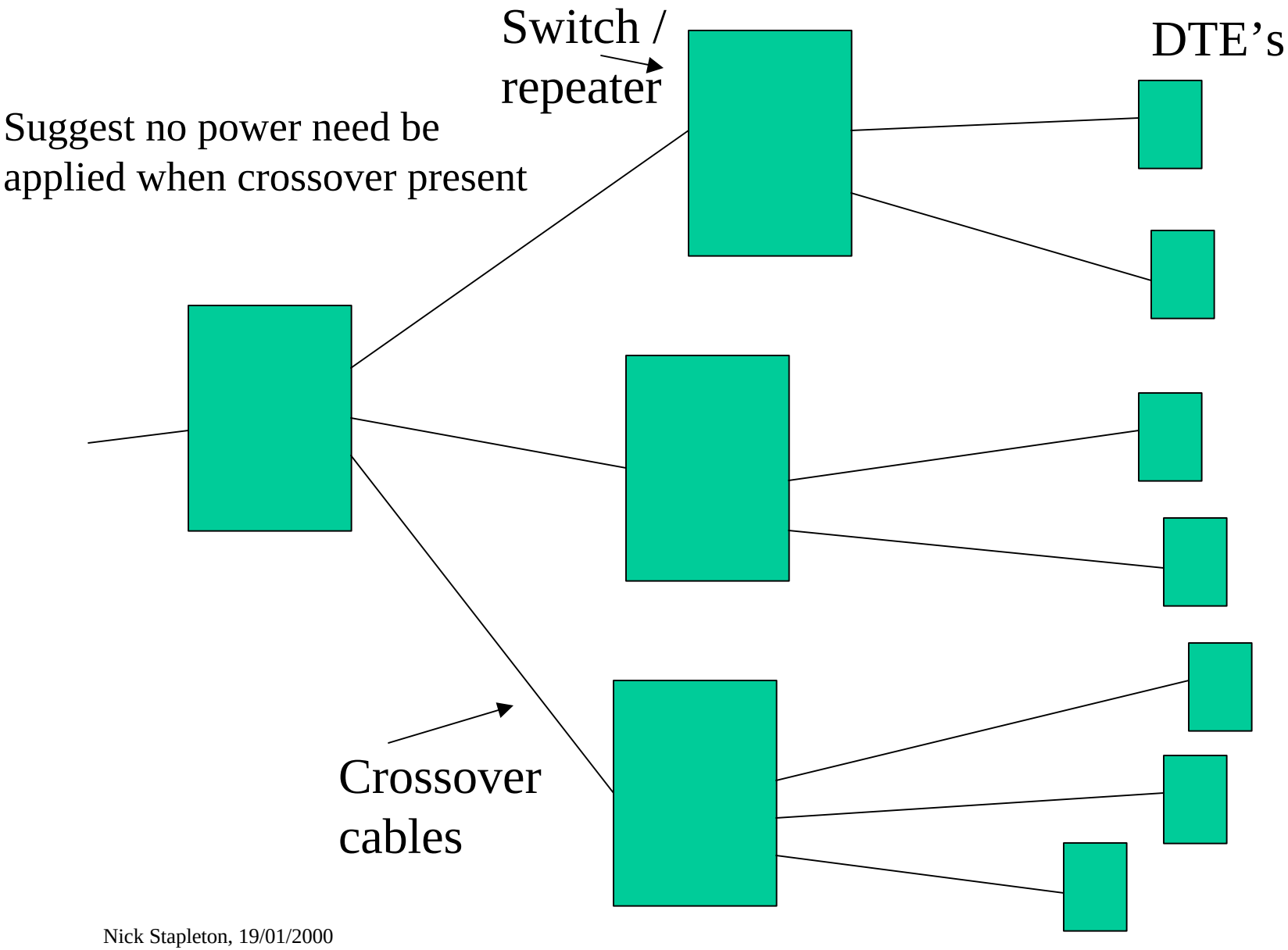
Supply Side



Problems ?

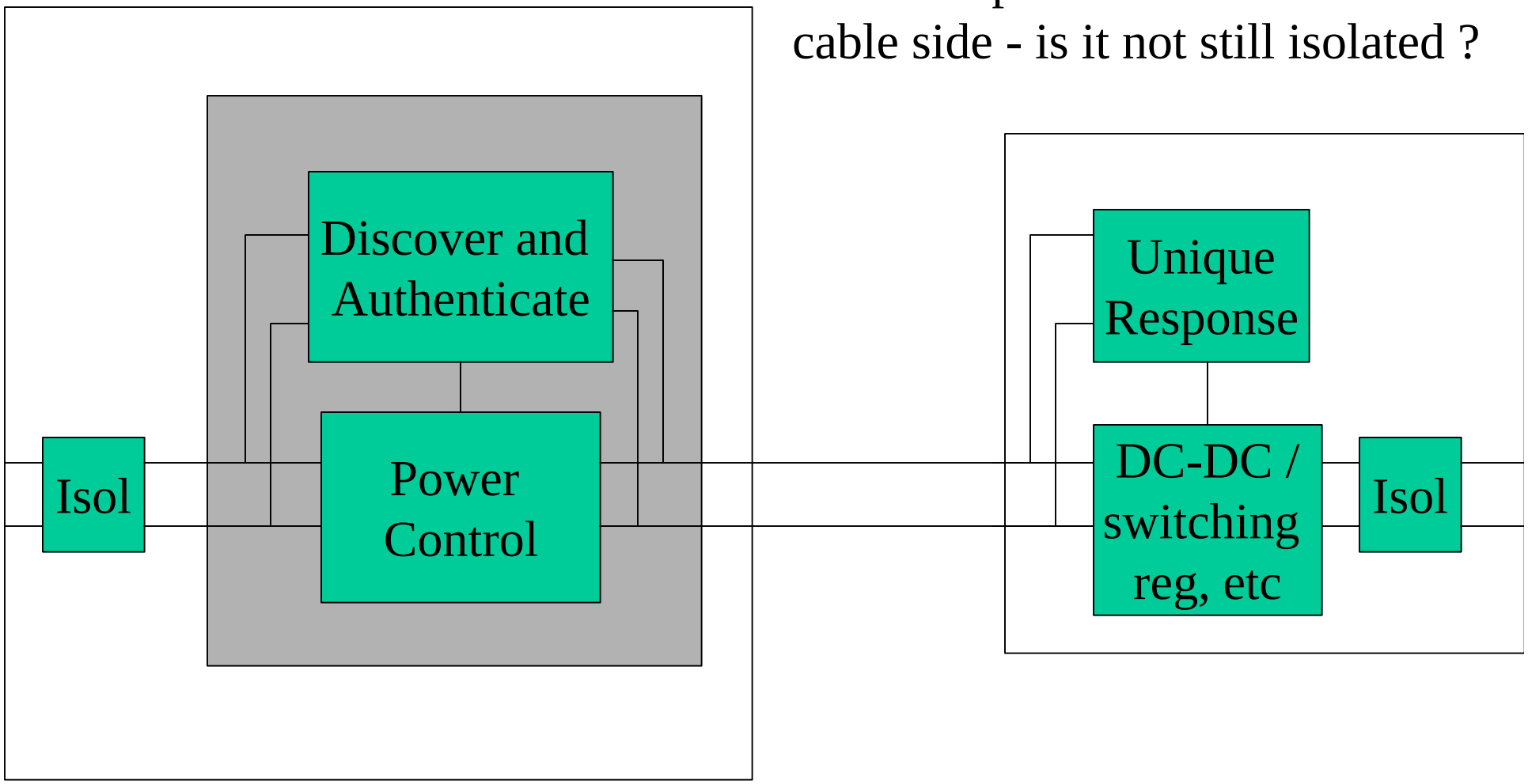
- Wont work with Crossover cables
- DC coupled - no isolation
- Isolation and high voltages

Crossover cables ?



Isolation

If Isolation present - does it matter if DC coupled circuit exists on cable side - is it not still isolated ?



Stimulus & unique response

- Exploit Power control and monitoring circuitry (I sense, V sense, Pwr sense) for discovery and Authentication also.
- Consider what other methods in this family available - eg Current loop, etc
- Need to characterise typical load circuit (ie switching regulator DC - DC converter etc with low voltage / current input
  - does it need to be out of circuit during discovery / authentication cycle