Centralized Network Configuration

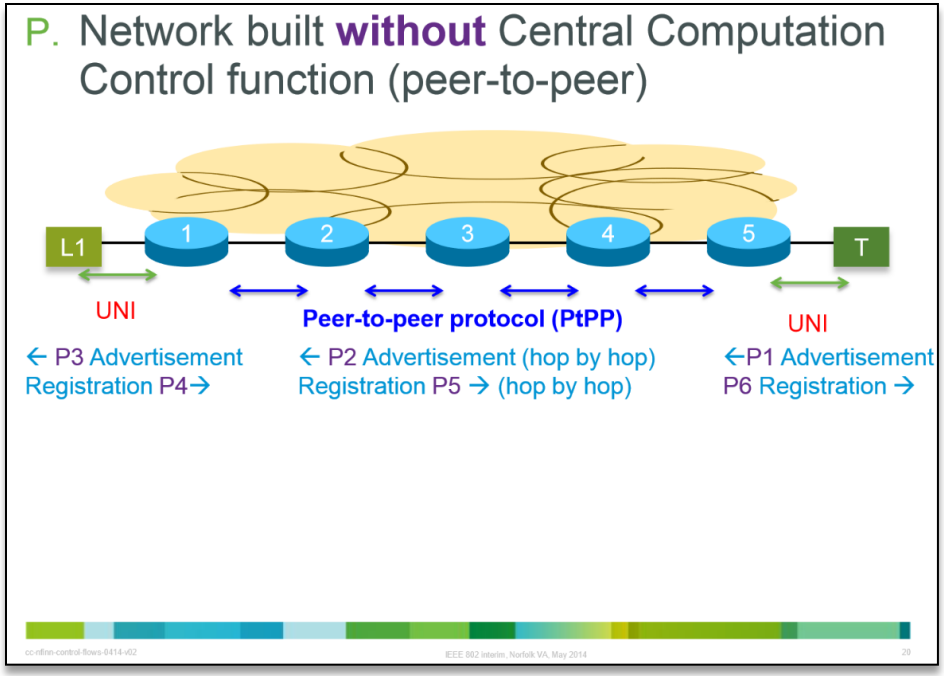
View from the End (Node)

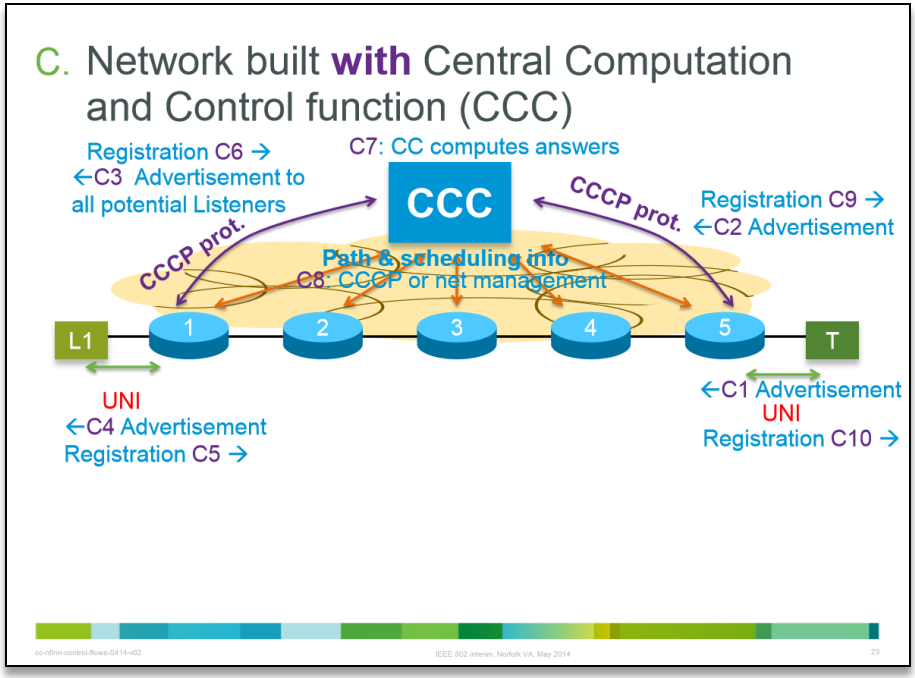
9/9/2014, v01

Todd Walter

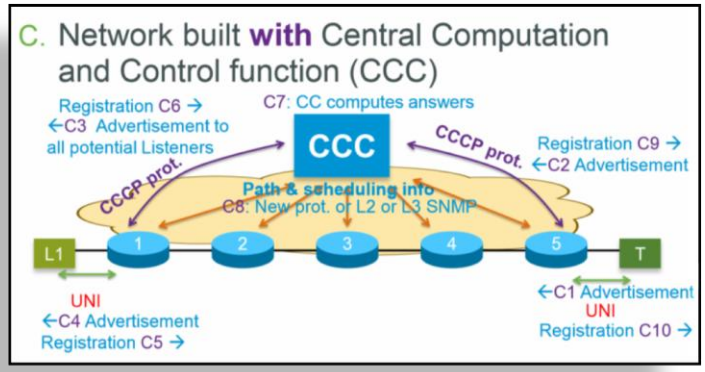
Network Configuration Assumption

- We will support peer-to-peer configuration (AVB)
- We will also support a centralized computation configuration

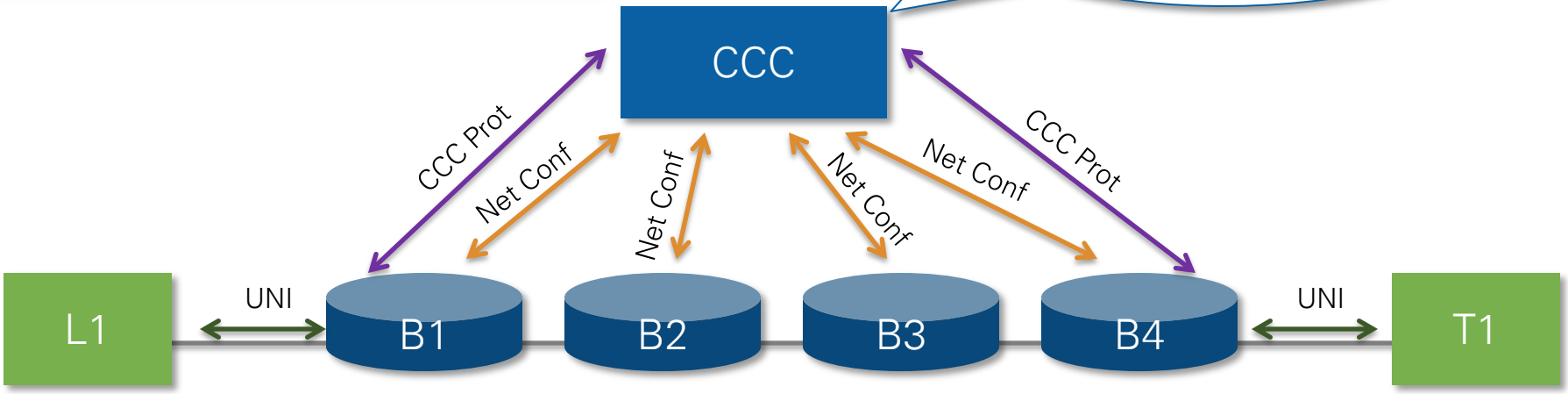




Vision for Centralized Network Configuration



Path Planning
Explicit Routing
Latency Calc
Timing Slot Assignment
Redundancy



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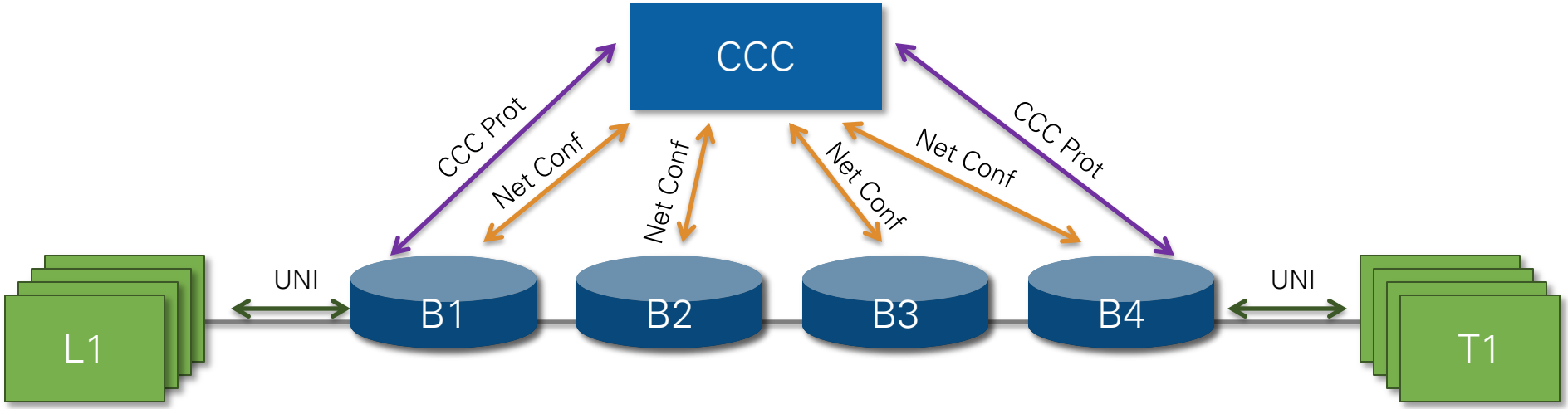

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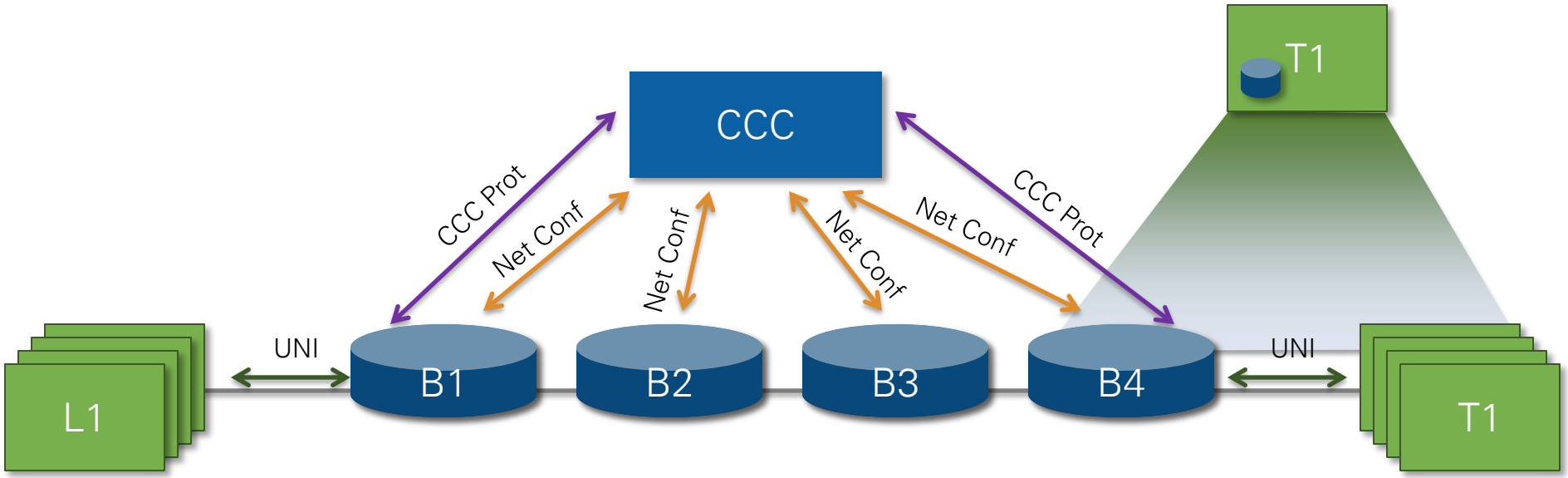
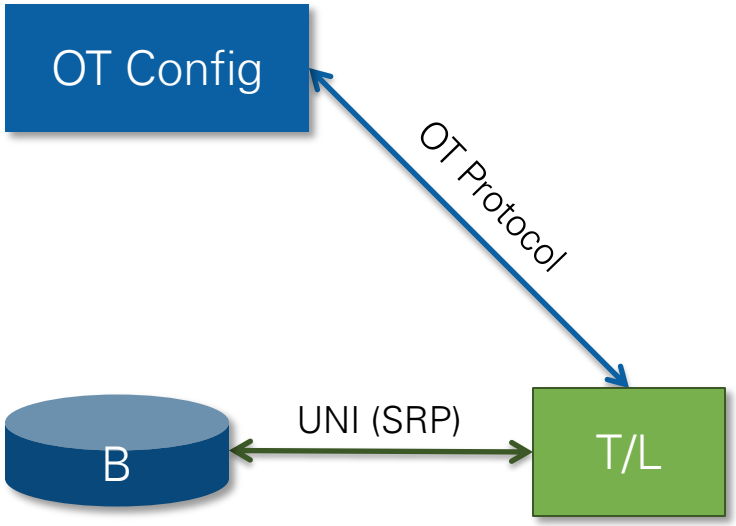


End Node Protocols



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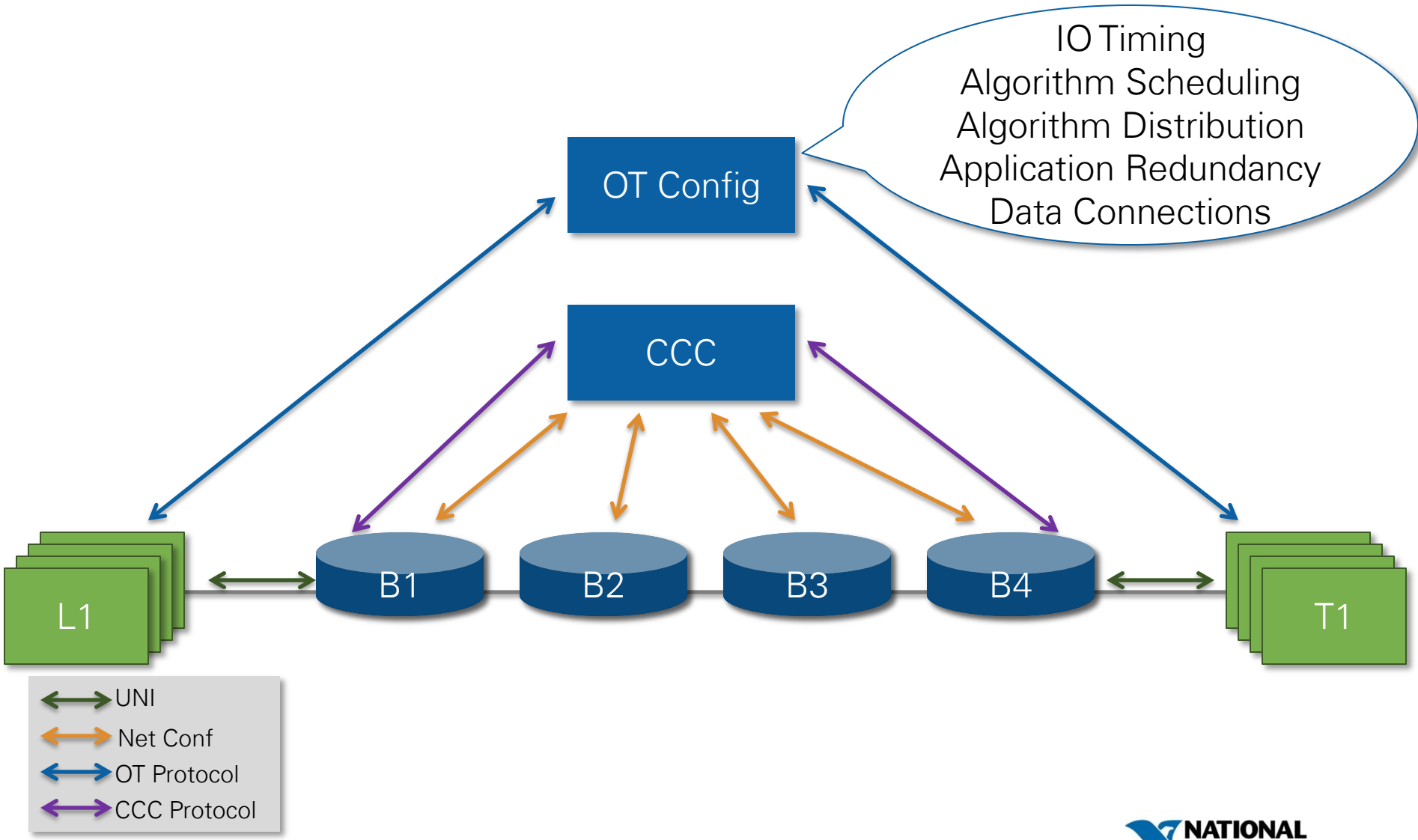
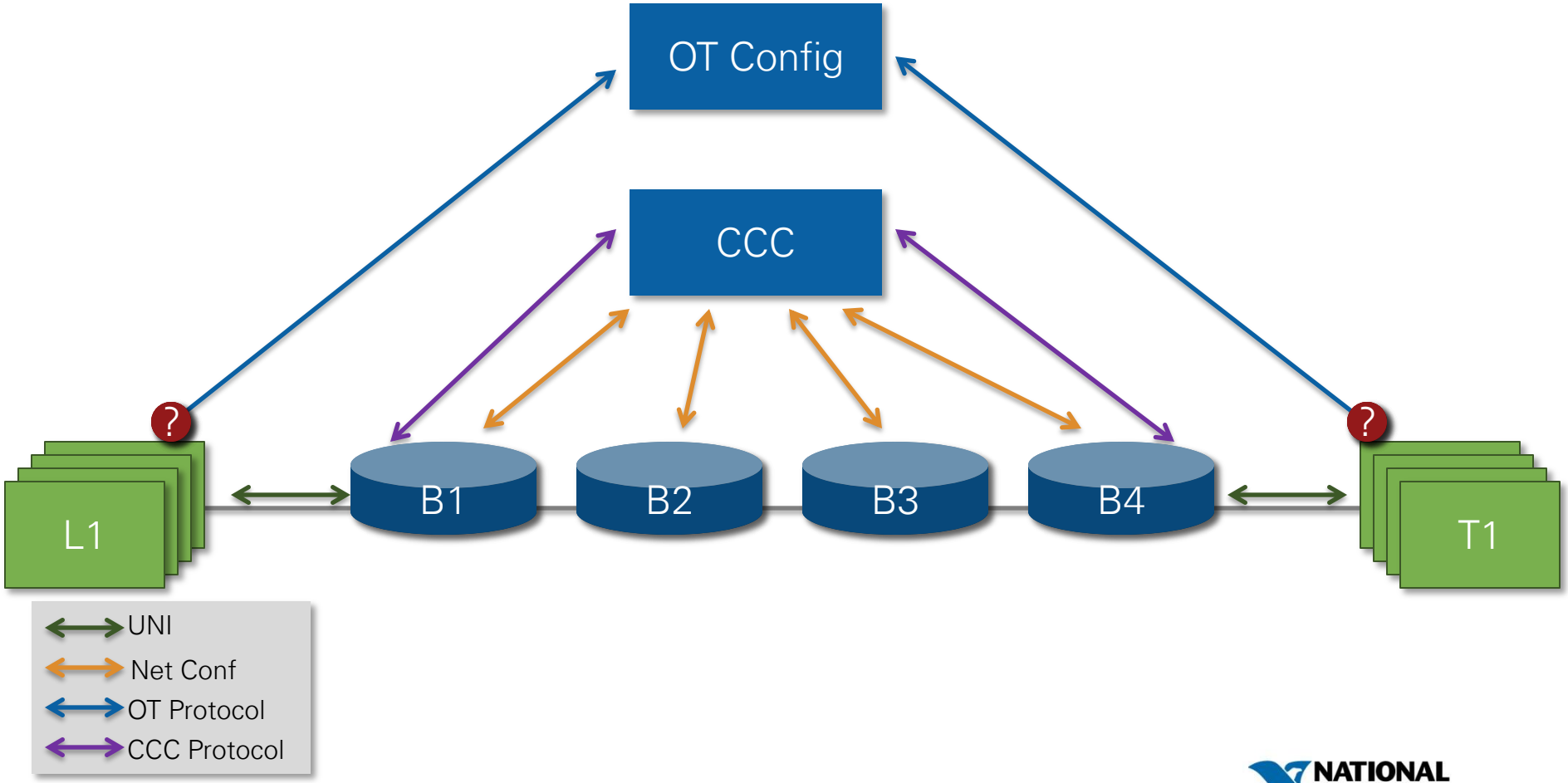


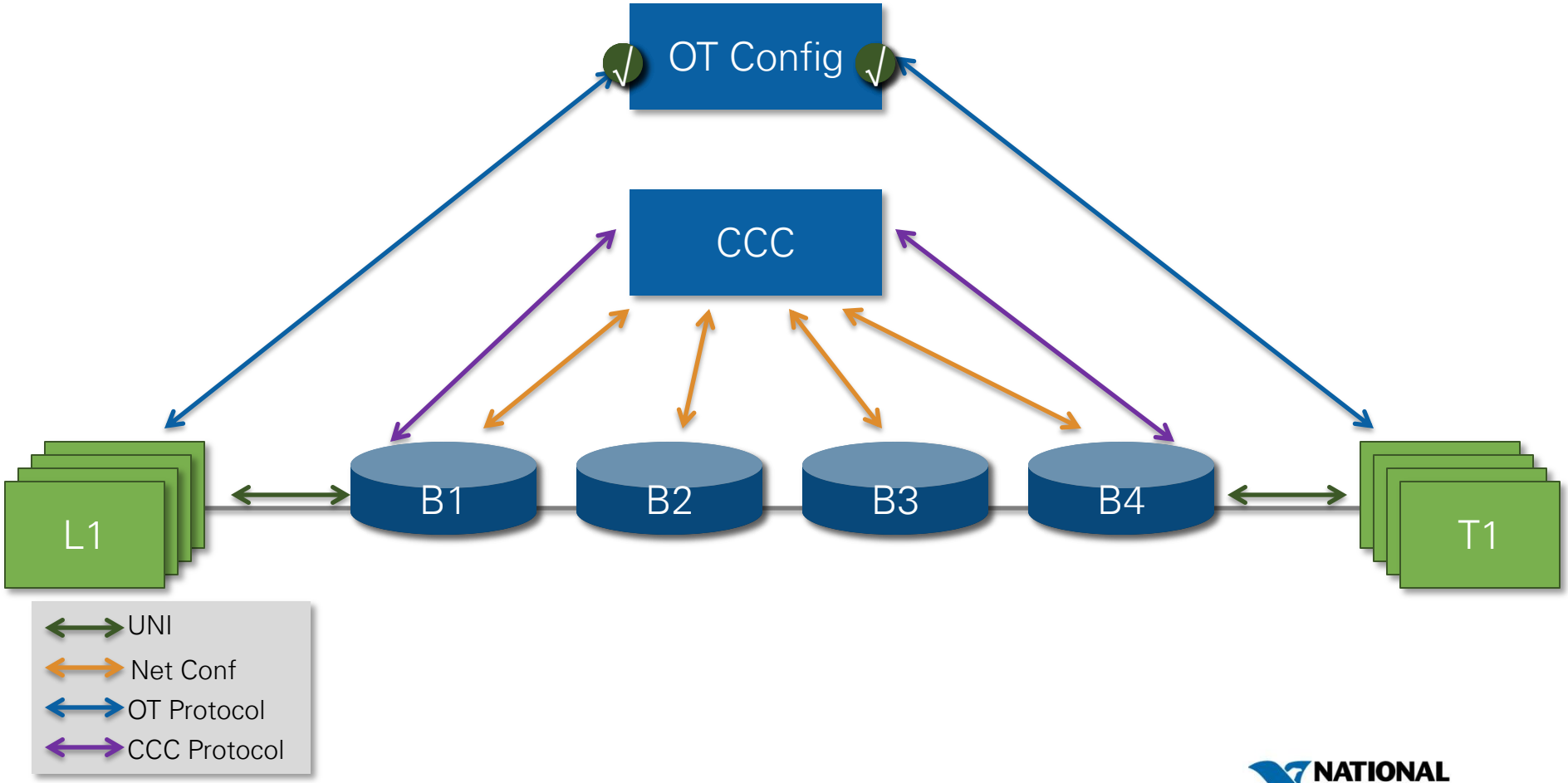
Vision for Centralized Network Configuration

1. OT Config Tool Identified Devices and Determines Application Logic and IO Connections and Timing



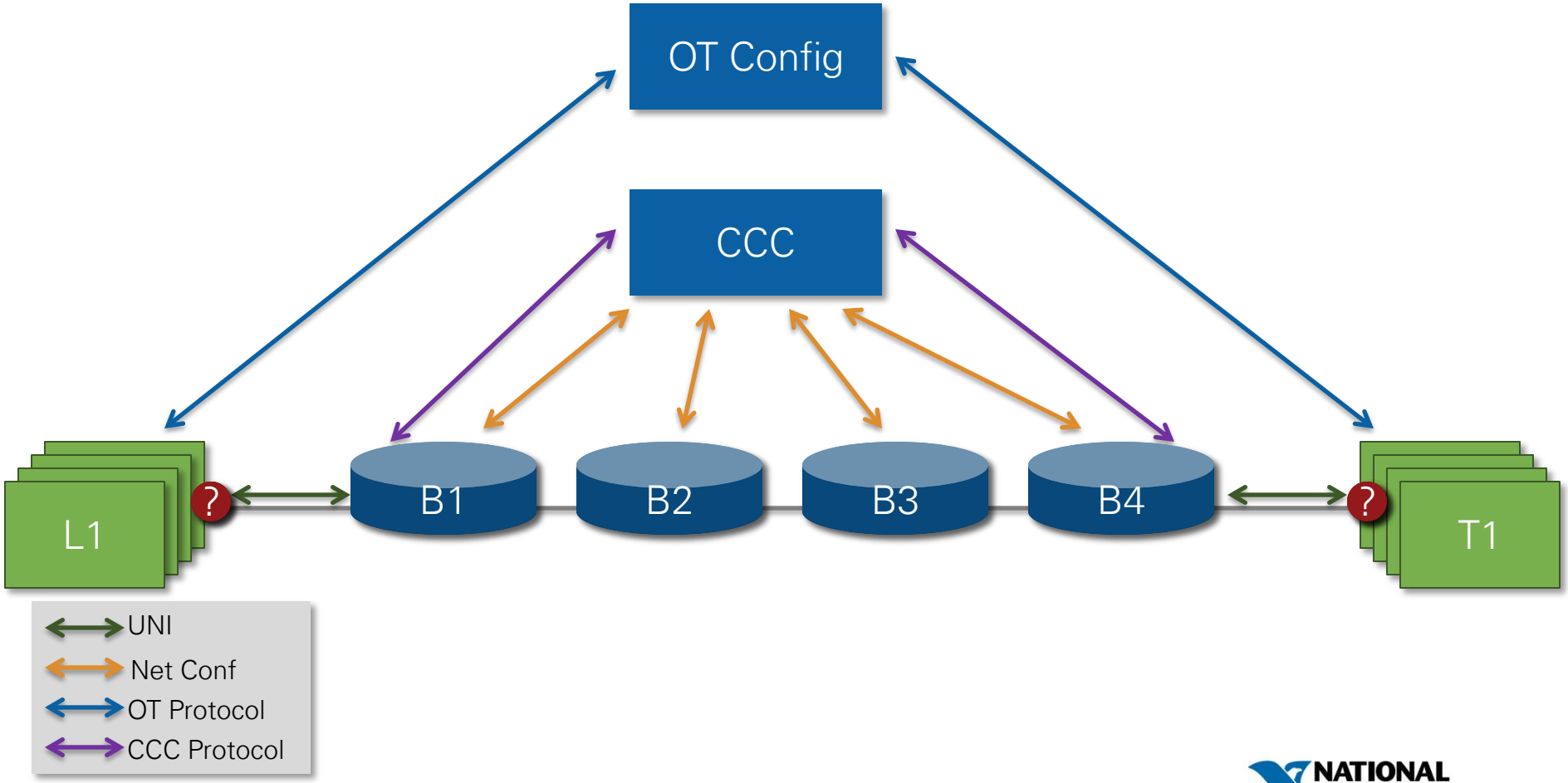
Vision for Centralized Network Configuration

2. OT Config Tool Sends Desired Configuration to End Devices for Logic, IO, Connections, and Timing



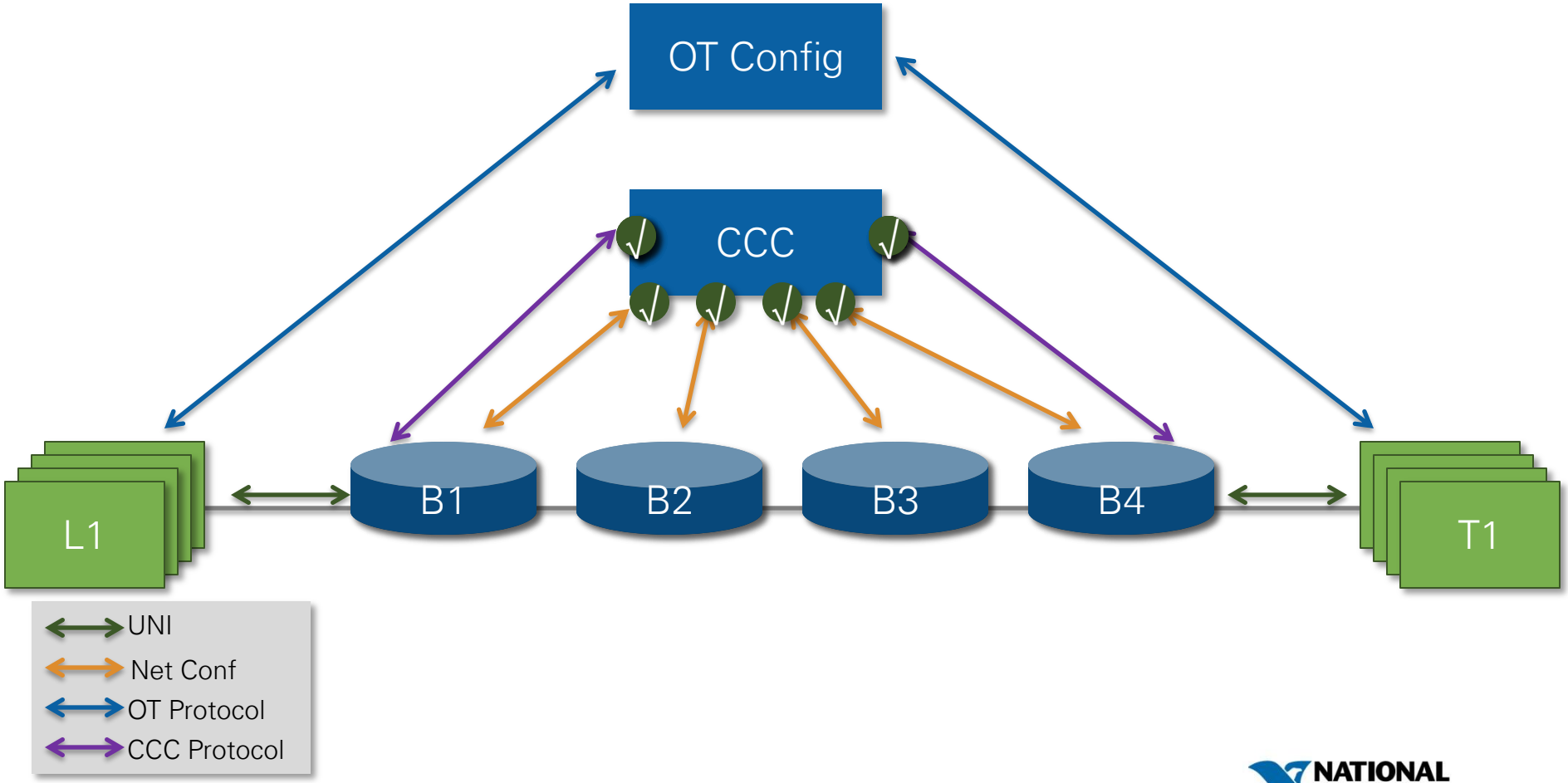
Vision for Centralized Network Configuration

3. End Devices Request Routing and Timing to CCC



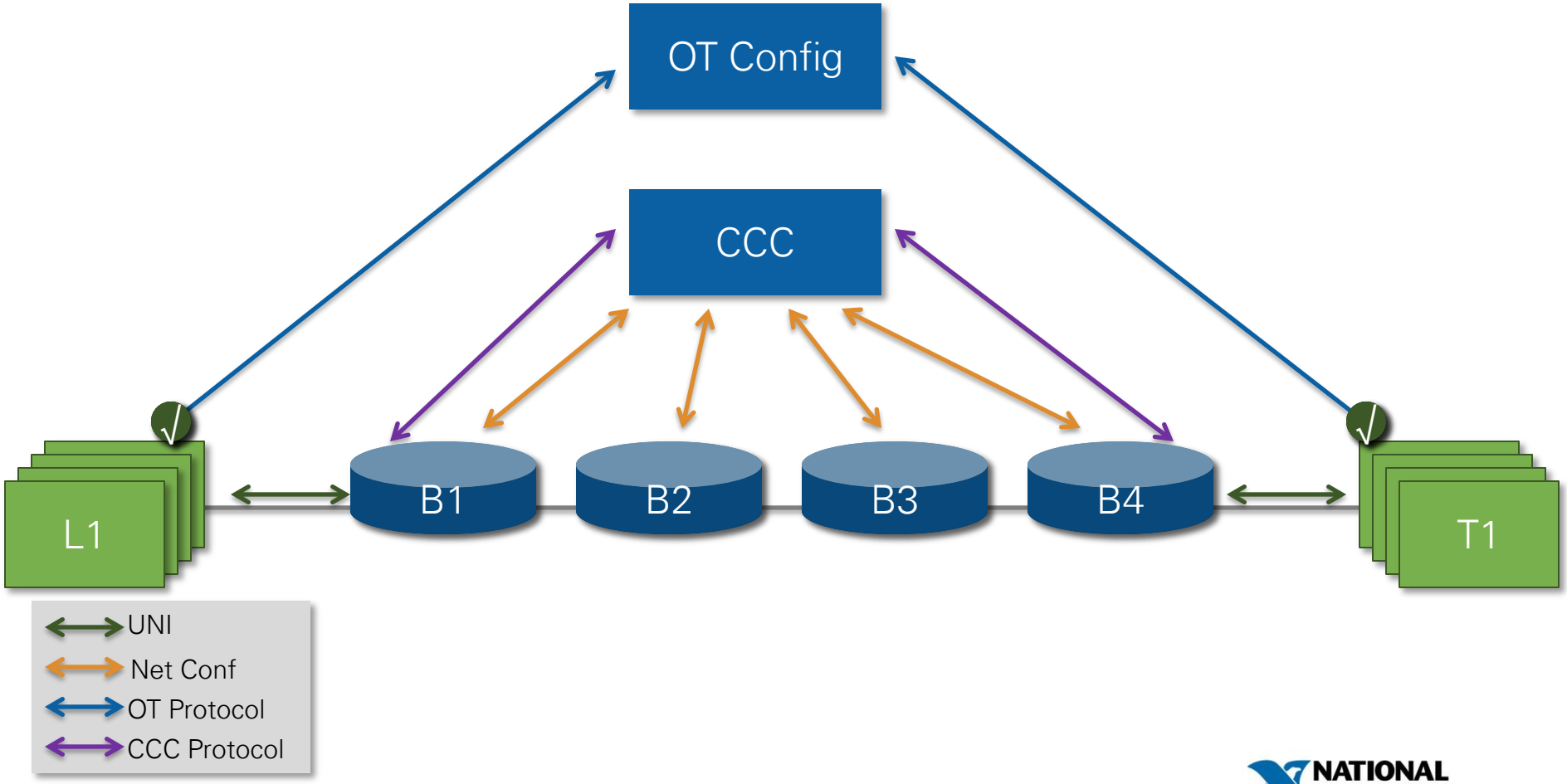
Vision for Centralized Network Configuration

4. CCC Distributed Routes and Schedules



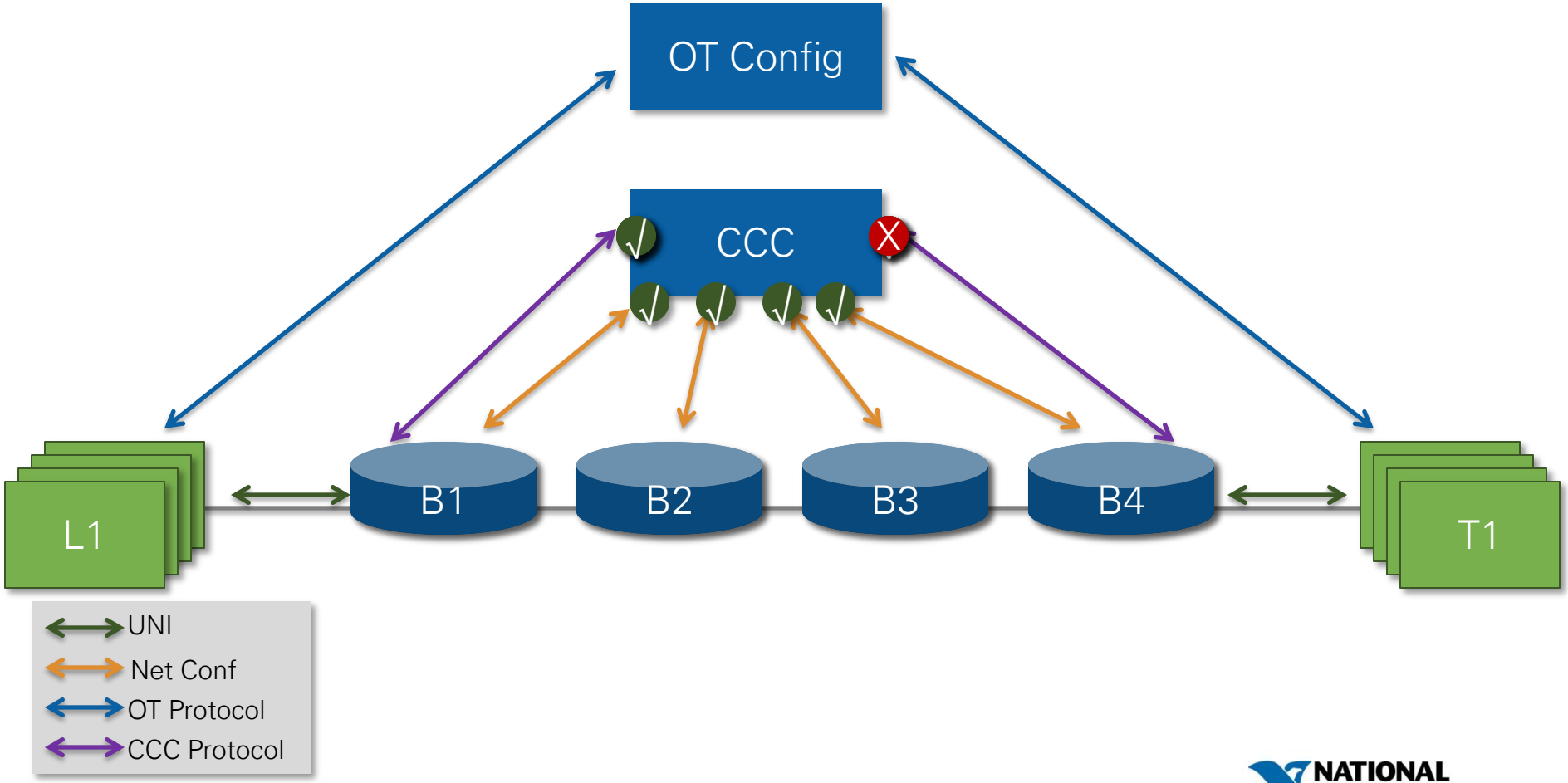
Vision for Centralized Network Configuration

5. End Nodes Confirm success with OT and OT brings-up application



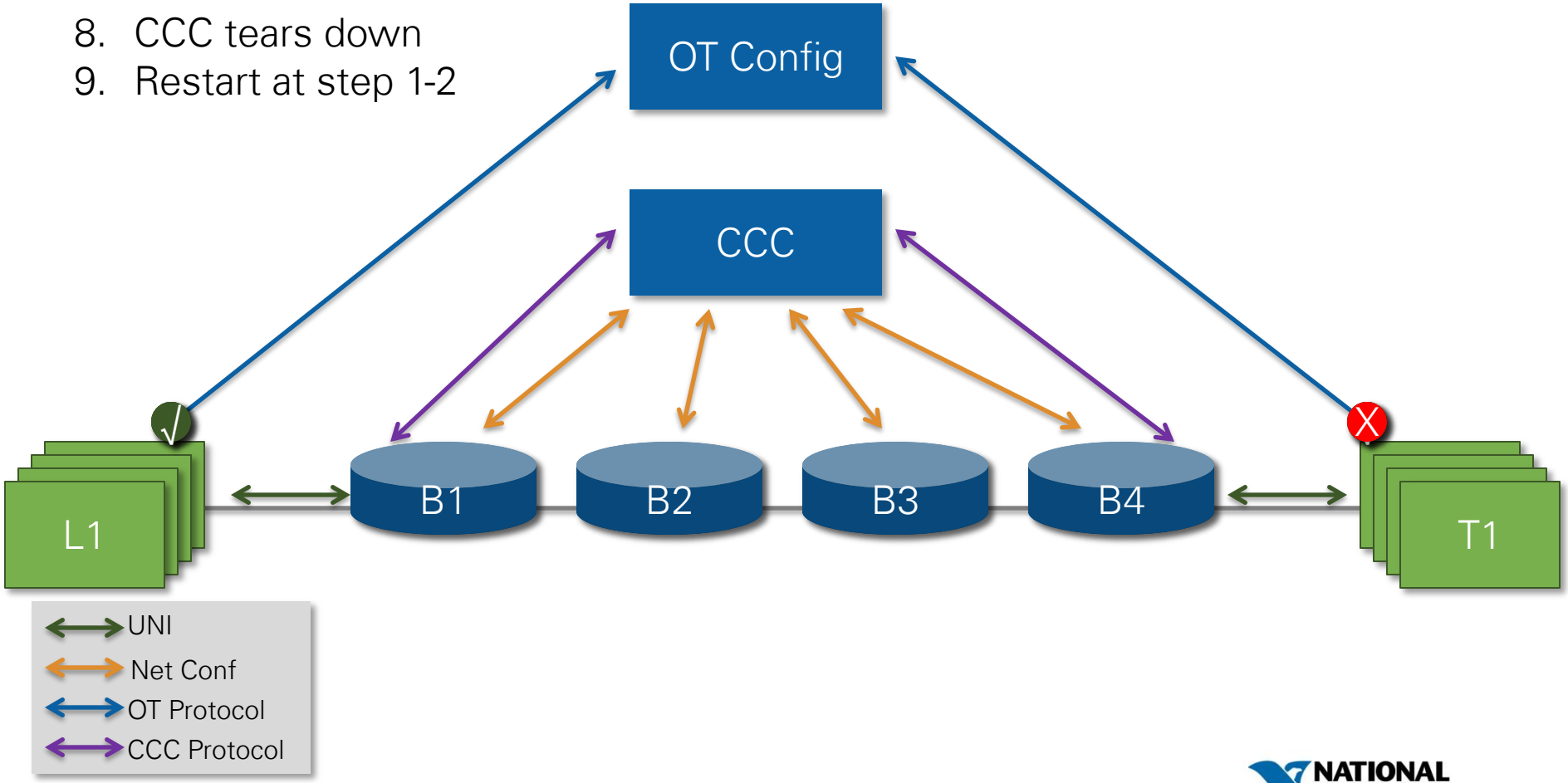
Vision for Centralized Network Configuration

4. CCC Distributed Routes and Schedules



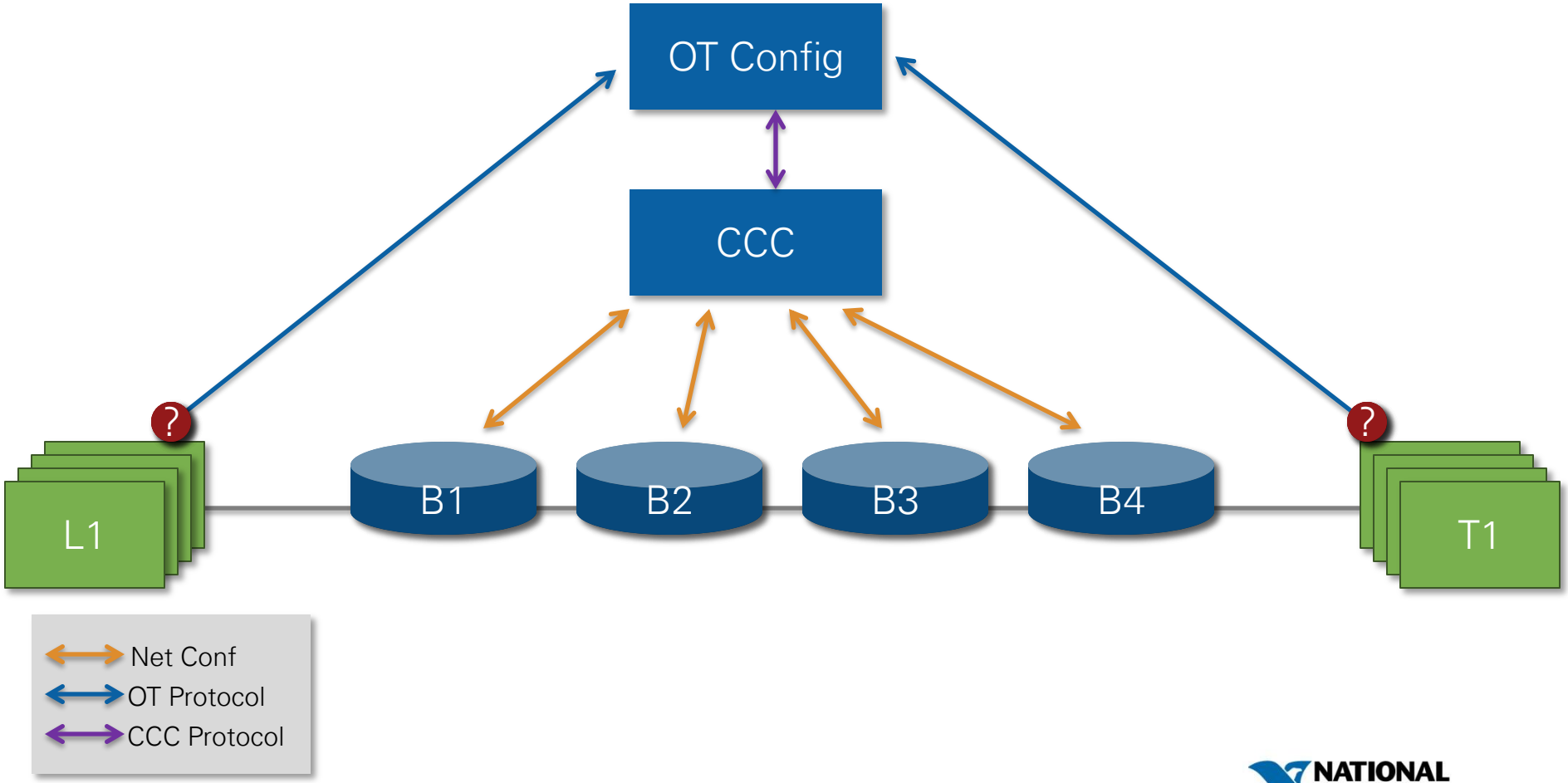
Vision for Centralized Network Configuration

5. End Node Indicates Failure.
6. OT tells end nodes to tear down
7. End Nodes tell CCC to tear down
8. CCC tears down
9. Restart at step 1-2



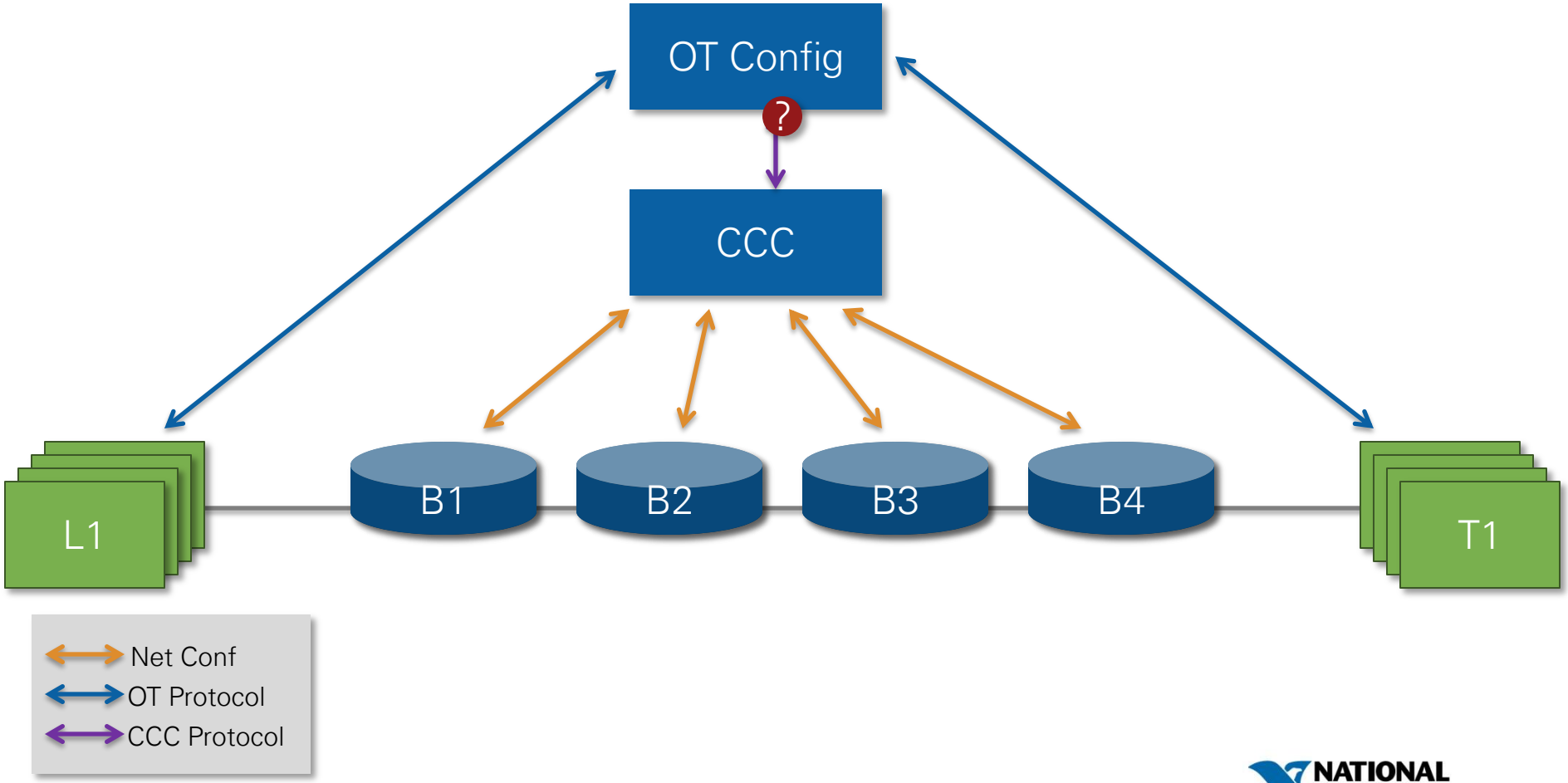
Enhanced Vision for Centralized System Configuration

1. OT Config Tool Identified Devices and Determines Application Logic and IO Connections and Timing



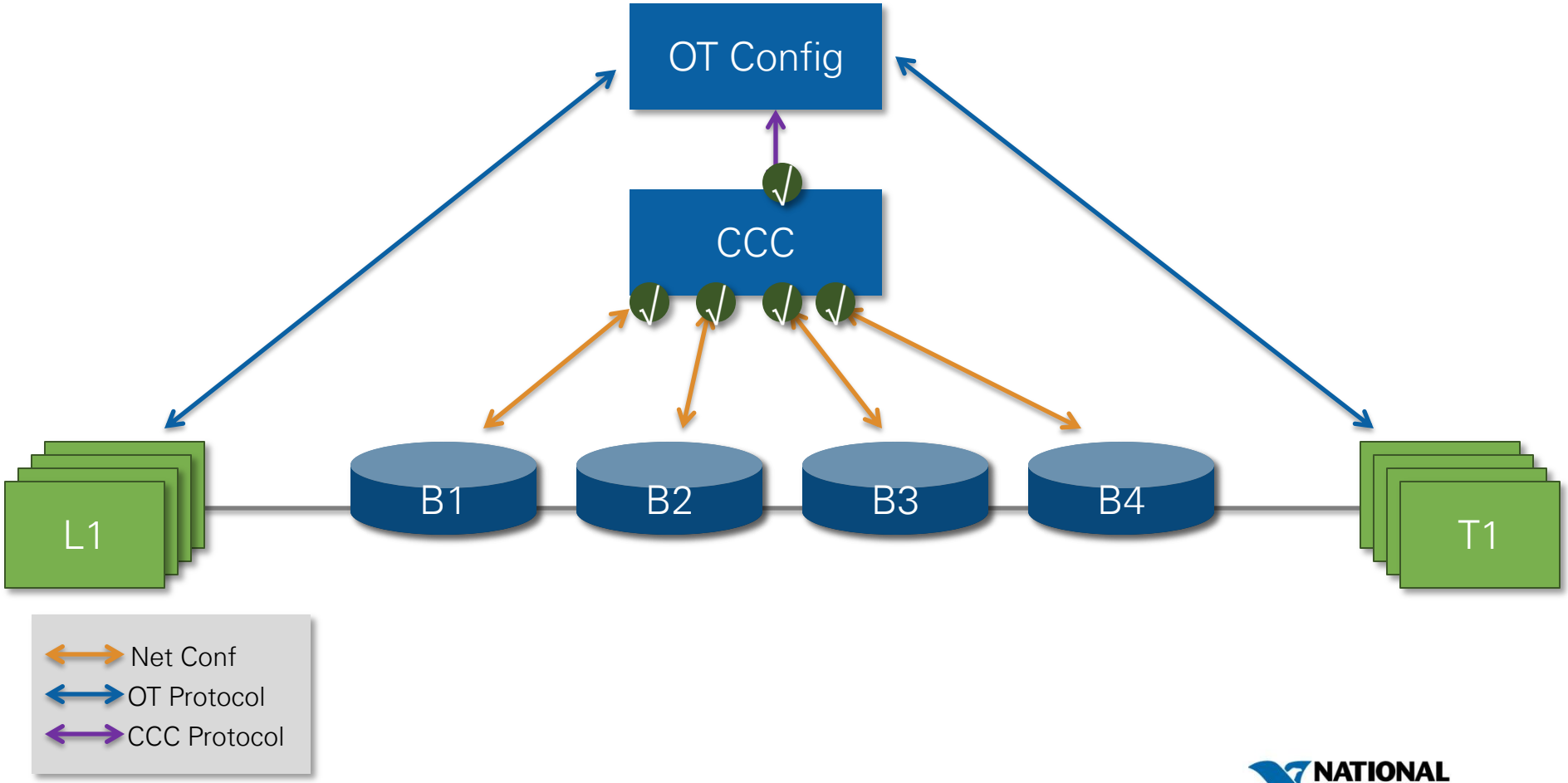
Enhanced Vision for Centralized System Configuration

2. OT Config Tool Request Routing and Timing to CCC



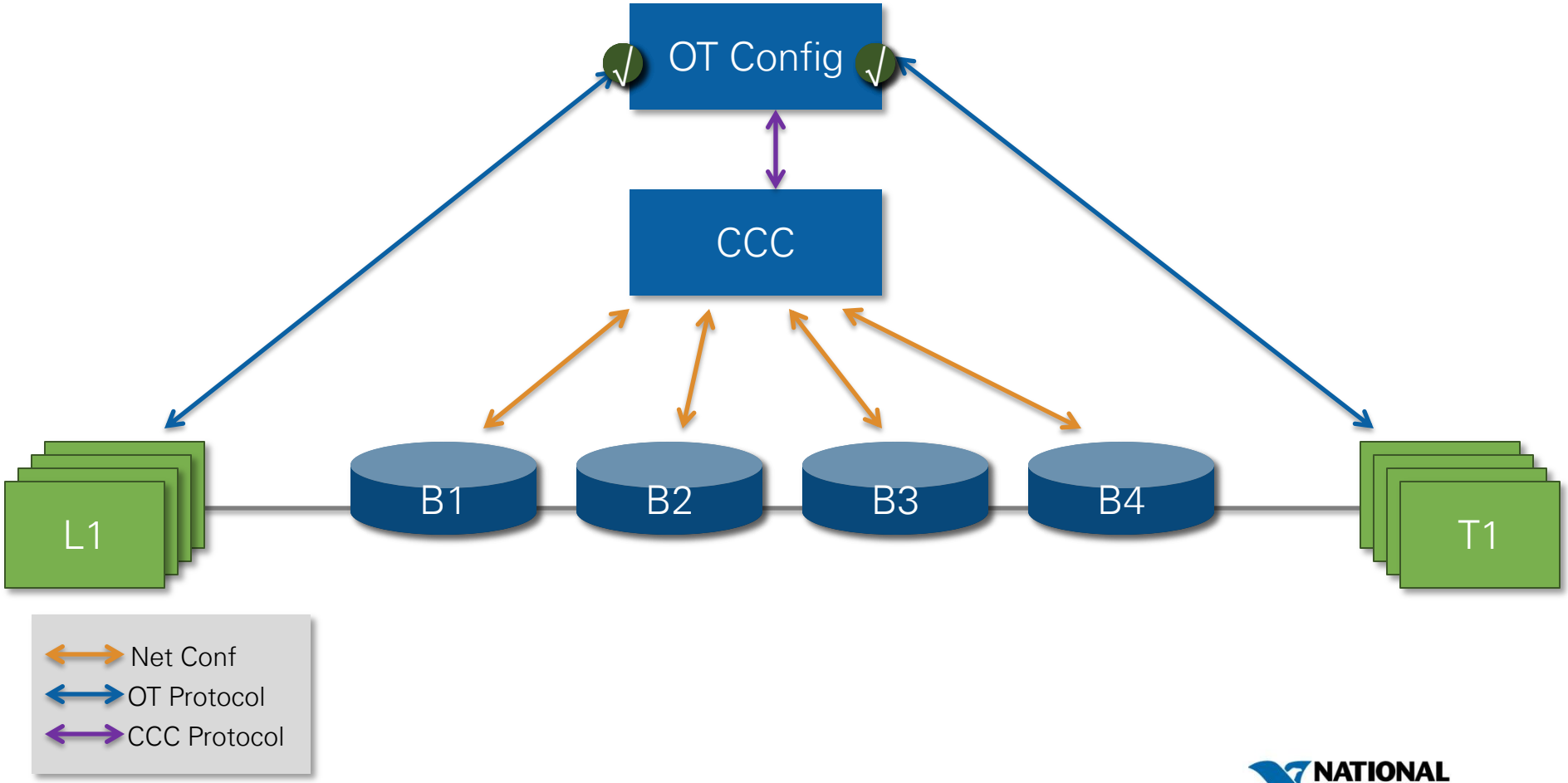
Enhanced Vision for Centralized System Configuration

3. CCC Distributed Routes and Schedules



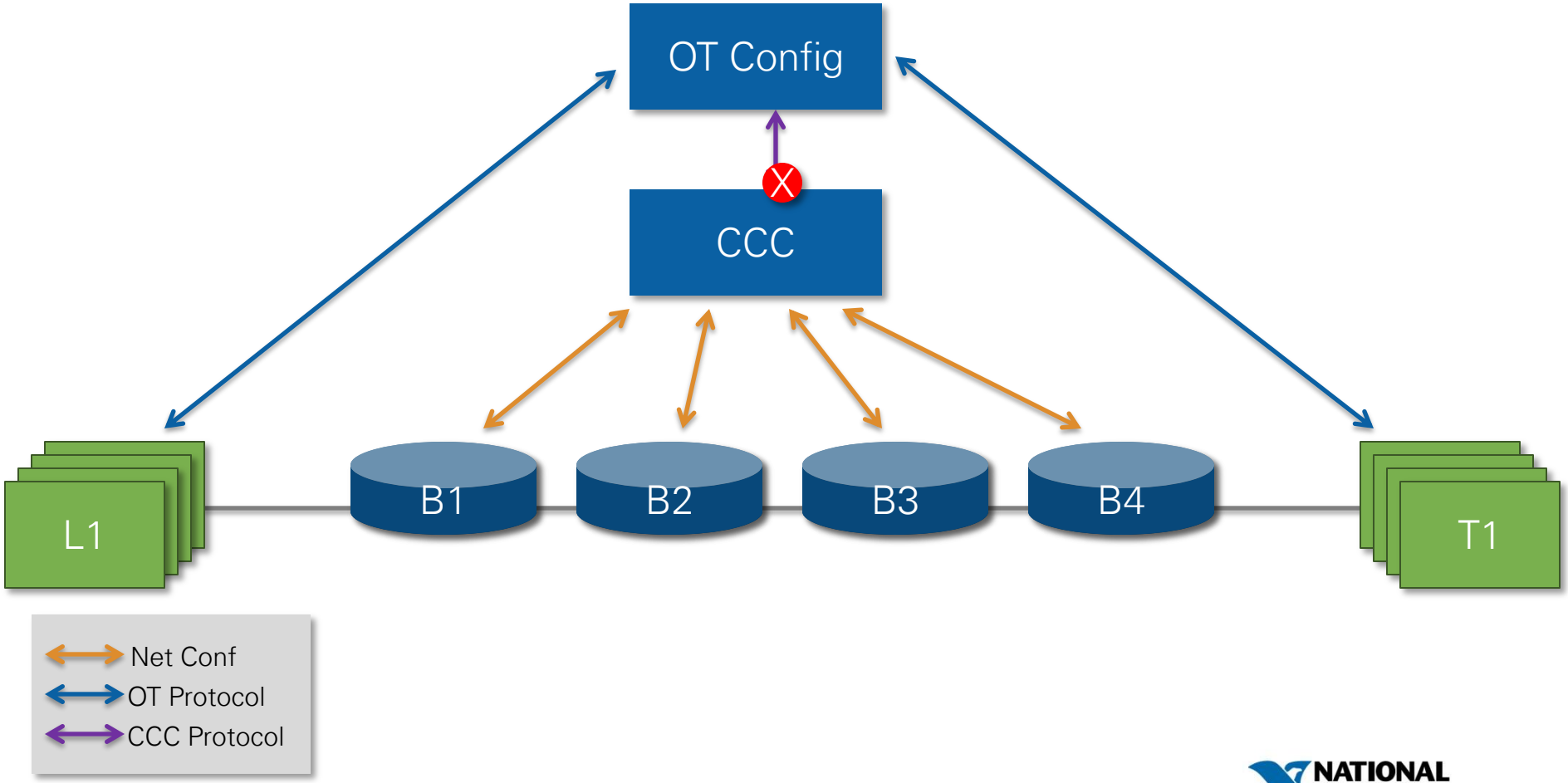
Enhanced Vision for Centralized System Configuration

4. OT Config Tool Sends Configuration to End Devices for Logic, IO, Connections, and Timing and starts application



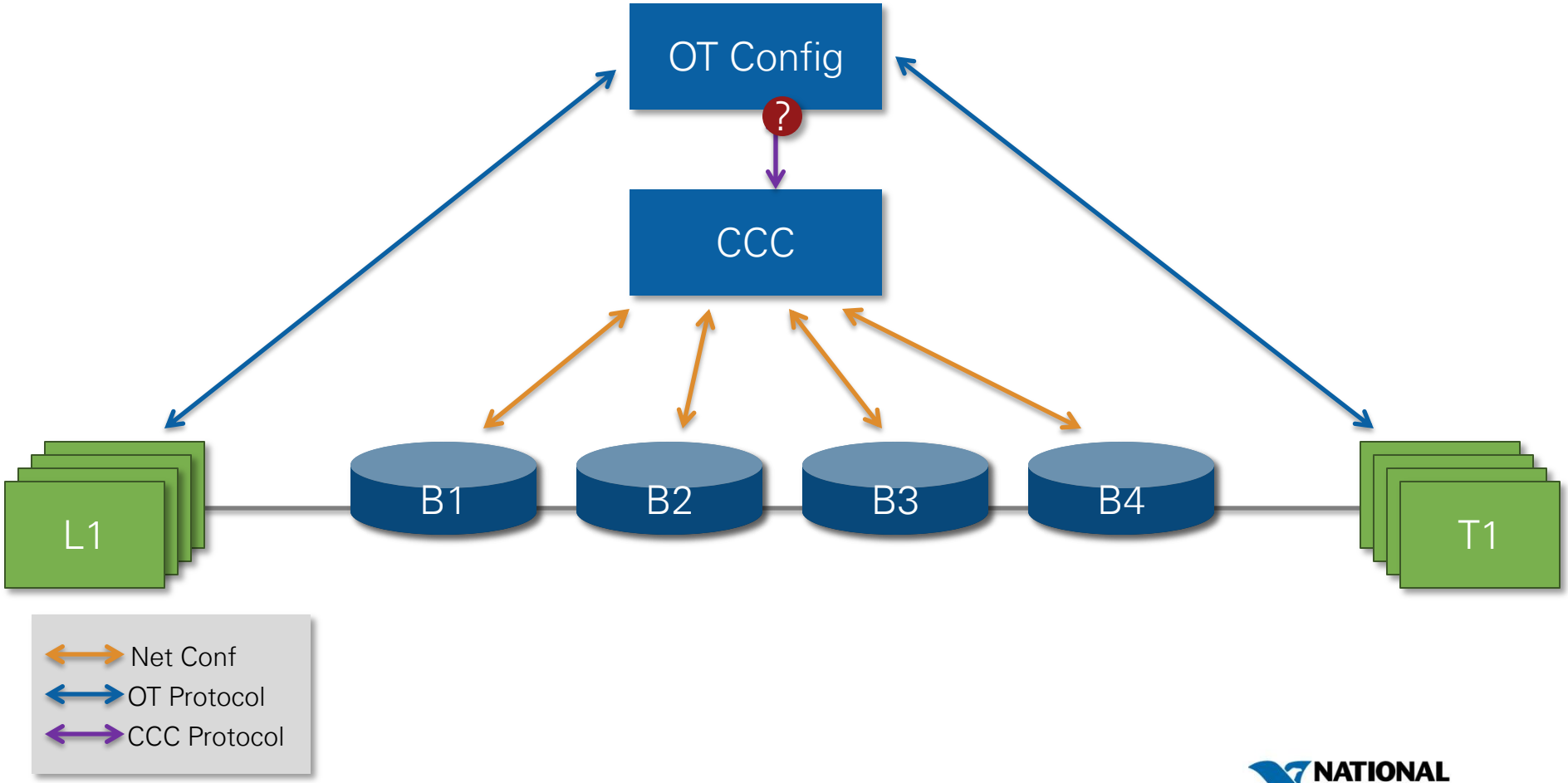
Enhanced Vision for Centralized System Configuration

3. CCC Communicates Failure



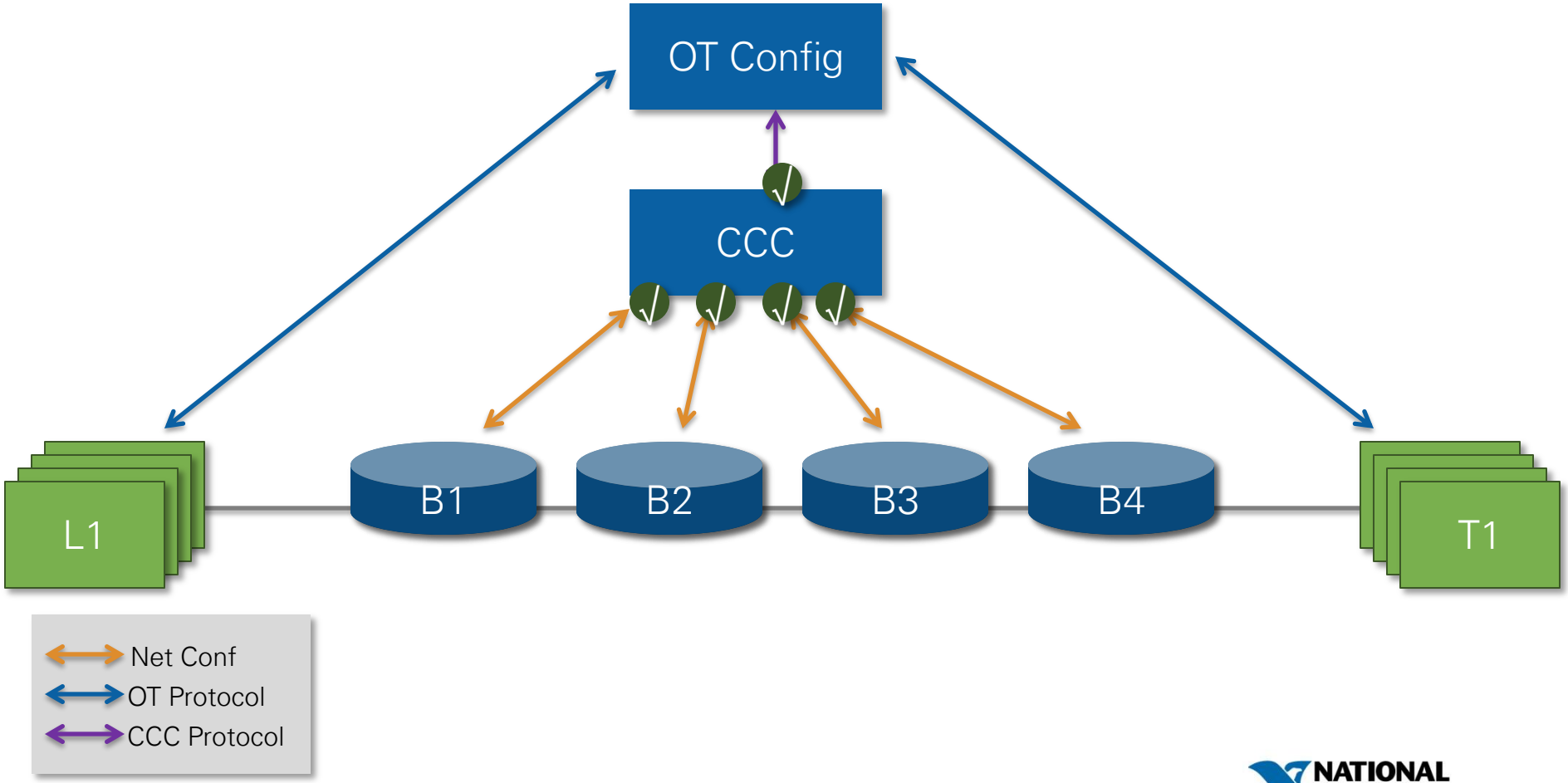
Enhanced Vision for Centralized System Configuration

2. OT Config Tool Requests Different Routing and Timing to CCC



Enhanced Vision for Centralized System Configuration

3. CCC Distributed Routes and Schedules



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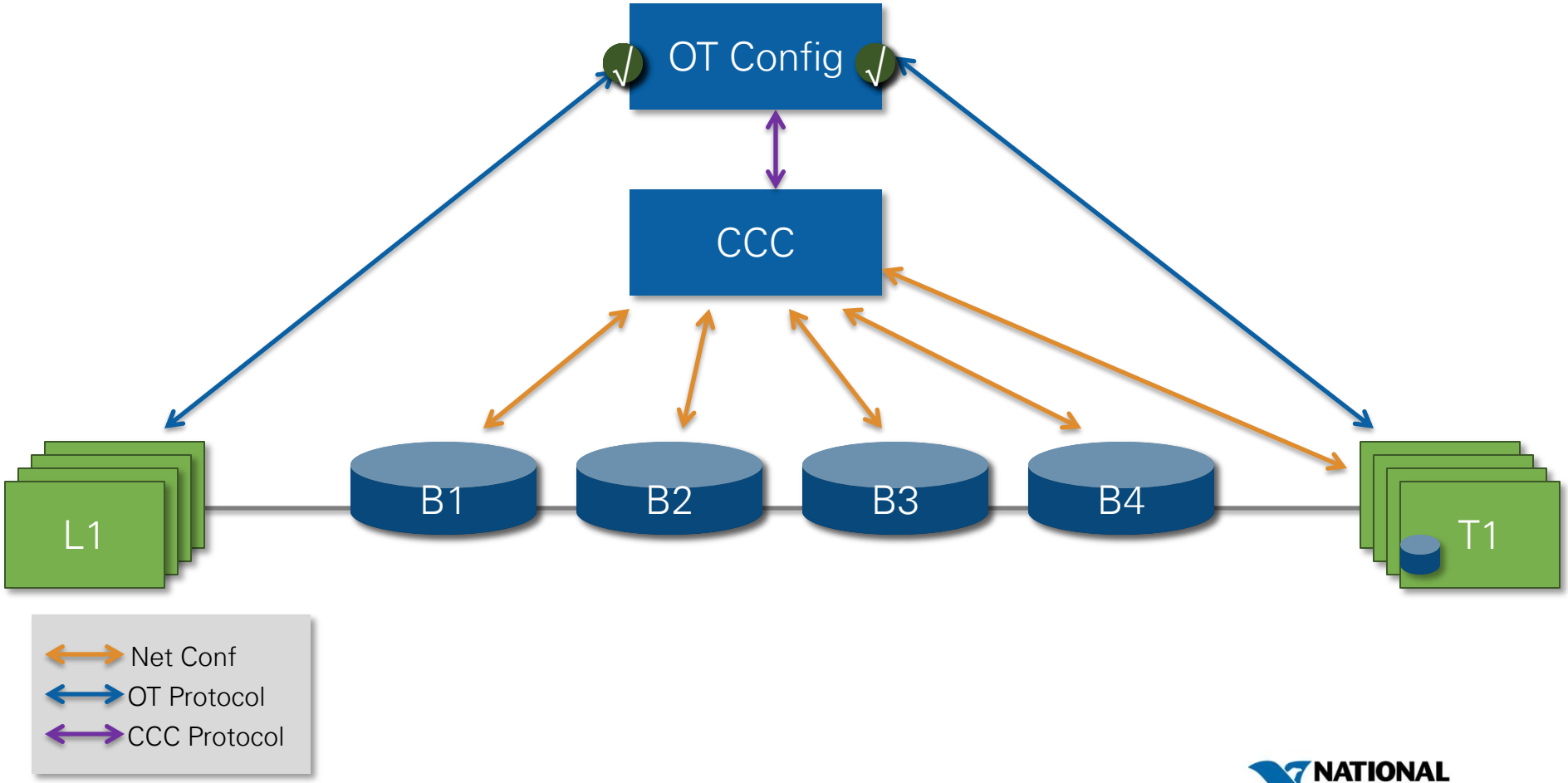
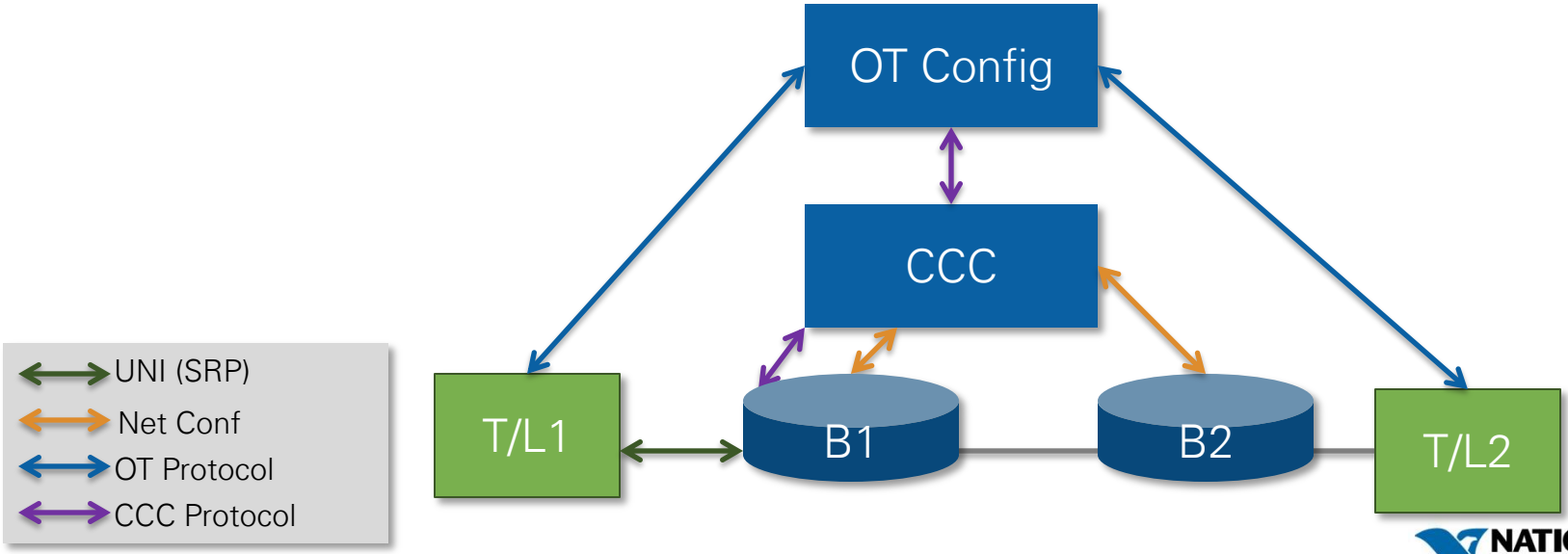


Combined Vision for Centralized System Configuration

- T/L1 – Classic End Node
  - Communicates TLVs to CCC via bridge proxy (SRP)
- T/L2 – "Centralized End Node"
  - Communicates TLVs to CCC via OT Config proxy (OT Protocol)
- CCC
  - Gets requests and sets end parameters via CCC proto
  - Gets network information and configures bridges via Net Conf



Recommended Next Steps

- Define TLVs from end stations needed by CCC ⟷ UNI (SRP) ⟷ OT Protocol
  - Could be carried by SRP or OT Config
- Design CCC algorithm to work with: ⟷ CCC Protocol
  - Individual commands coming from bridges
  - "Batch" commands coming from OT config
- Determine other network information needed by CCC and determine appropriate mechanisms (NetConf, LLDP, ISIS, etc) ⟷ Net Conf, Others?
  - Already proposed: http://www.ieee802.org/1/files/public/docs2014/cc-nfinn-control-flows-0414-v02.pdf