

802.3da Clause 147 Multidrop Interoperability

Suggested Interpretation of Objective 4

Jason Potterf

Cisco

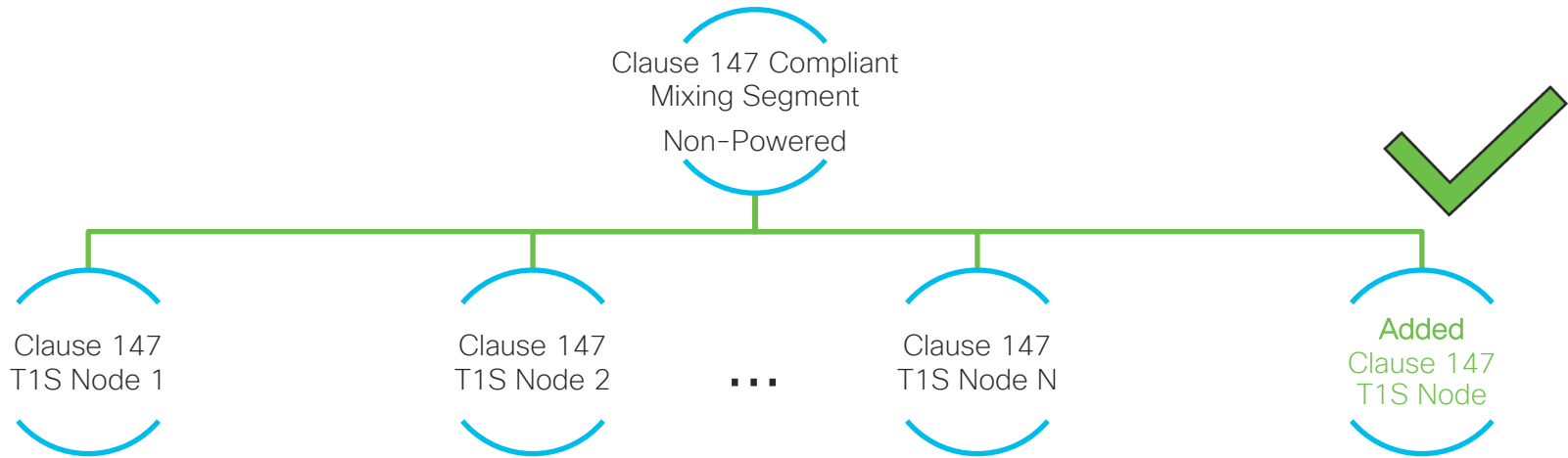
2021-03-10

Objective 4

Support interoperability with
Clause 147 multidrop

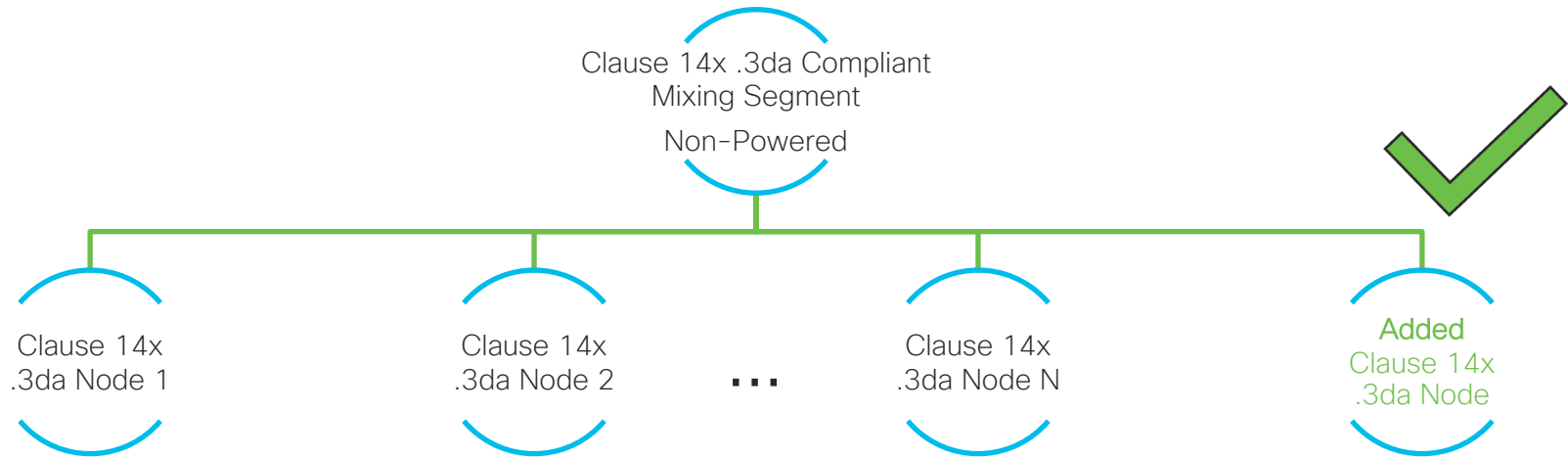
Non-Powered Cases

Simplest Cases - Homogeneous Networks



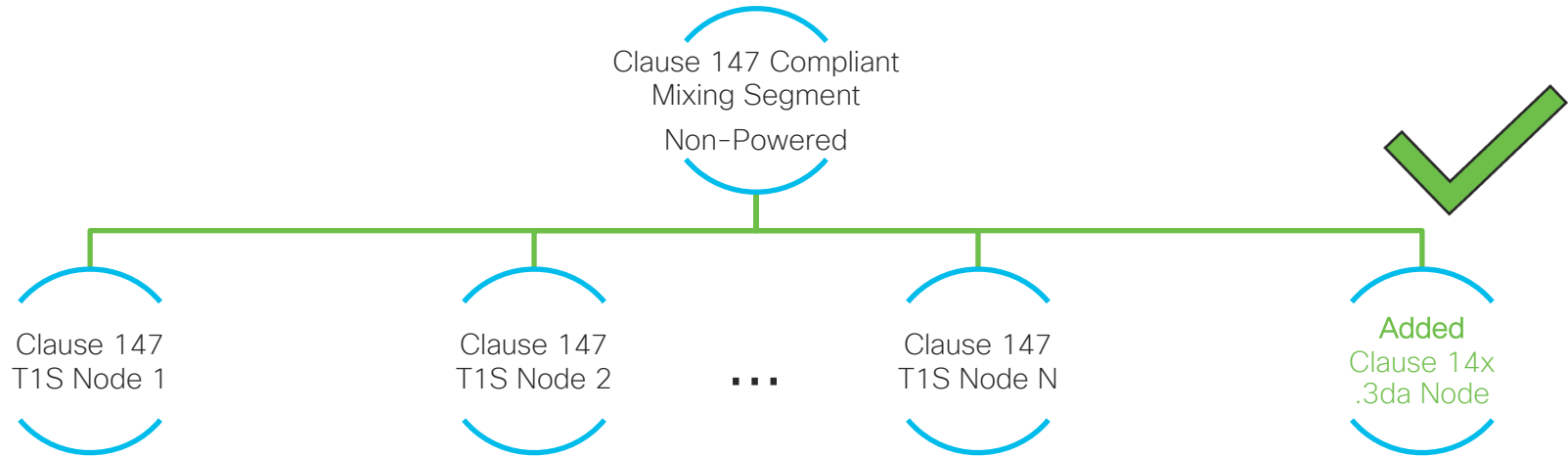
New node successfully communicates due to homogenous network

Simplest Cases - Homogeneous Networks



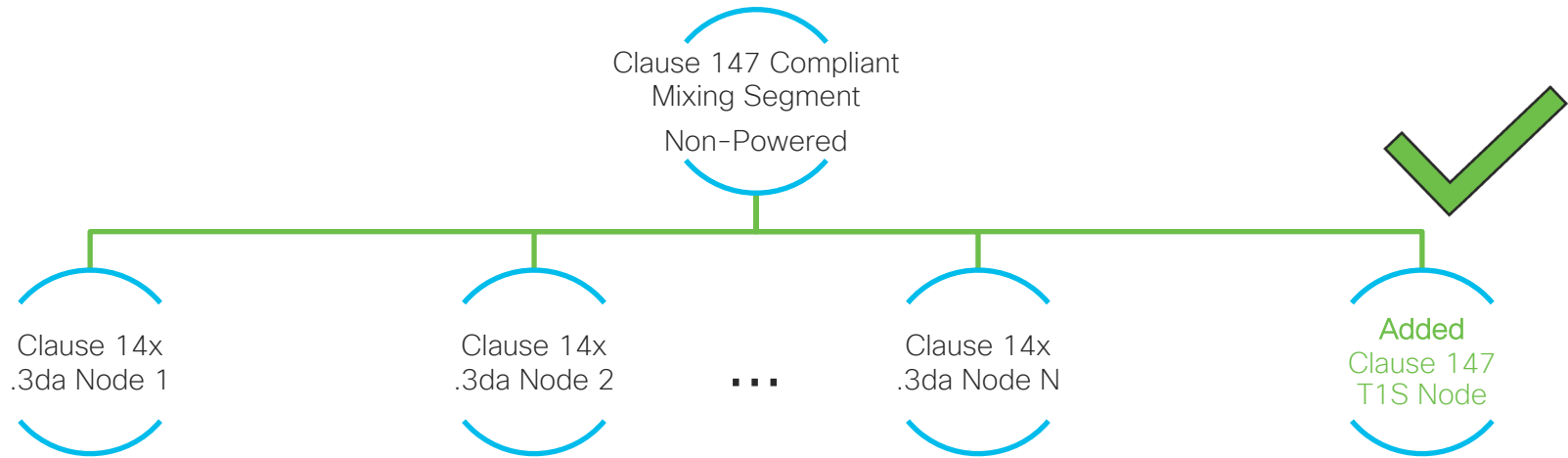
New node successfully communicates due to homogenous network

New 802.3da Node on T1S Network



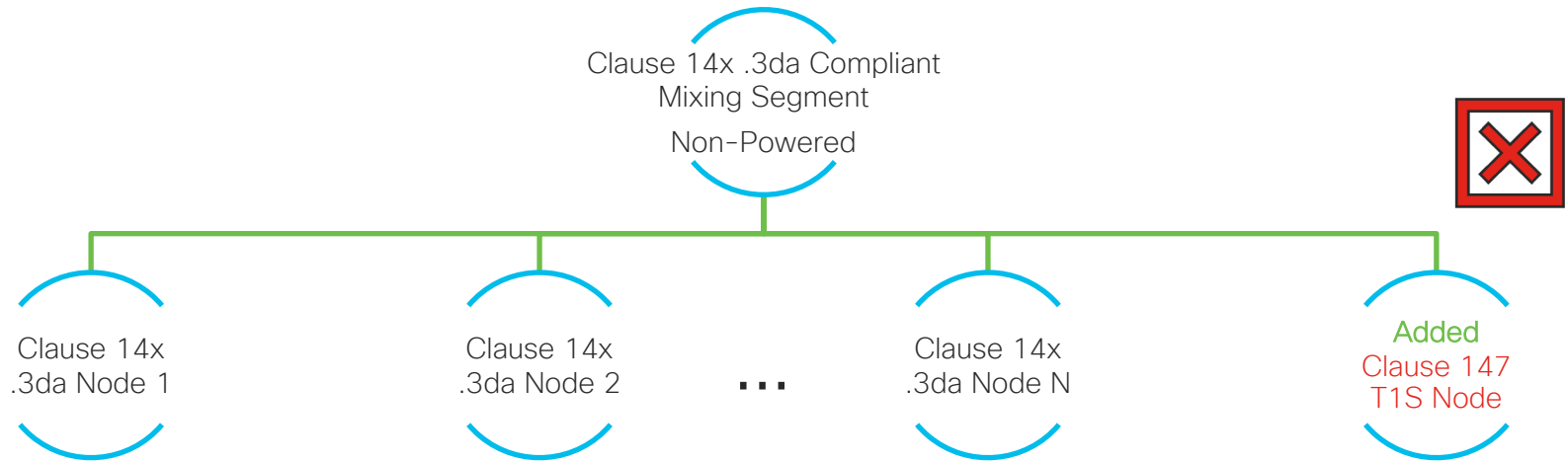
New node successfully communicates due to Obj 4 interoperability

New T1S Node on Compatible Network



New node successfully communicates due to Obj 4 interoperability

New T1S Node on .3da Network



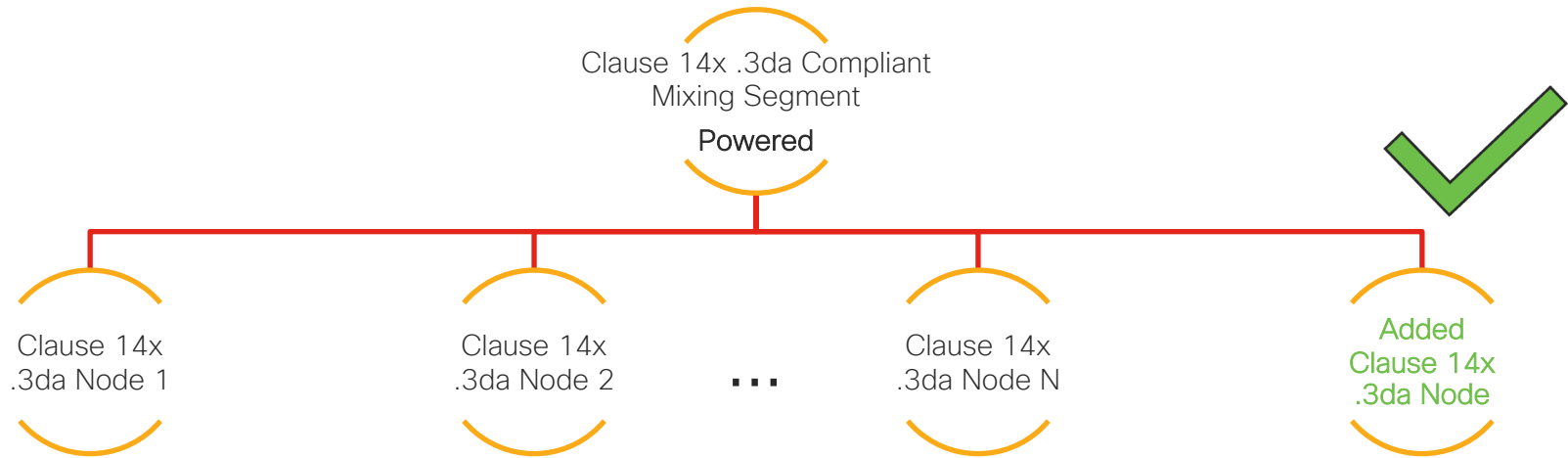
New node **not guaranteed** to communicate due to incompatible mixing segment

Summary – Non-Powered Mixing Segments

Operating Nodes	Existing Mixing Segment	Existing Bus Power	Added Node	Outcome
Clause 147 T1S	Clause 147 T1S	None	Clause 147 T1S	New Node Communicates
Clause 14x 802.3da	Clause 14x 802.3da	None	Clause 14x 802.3da	New Node Communicates
Clause 147 T1S	Clause 147 T1S	None	Clause 14x 802.3da	New Node Communicates
Clause 14x 802.3da	Clause 147 T1S	None	Clause 147 T1S	New Node Communicates
Clause 14x 802.3da	Clause 14x 802.3da	None	Clause 147 T1S	New Node Not Guaranteed to Communicate

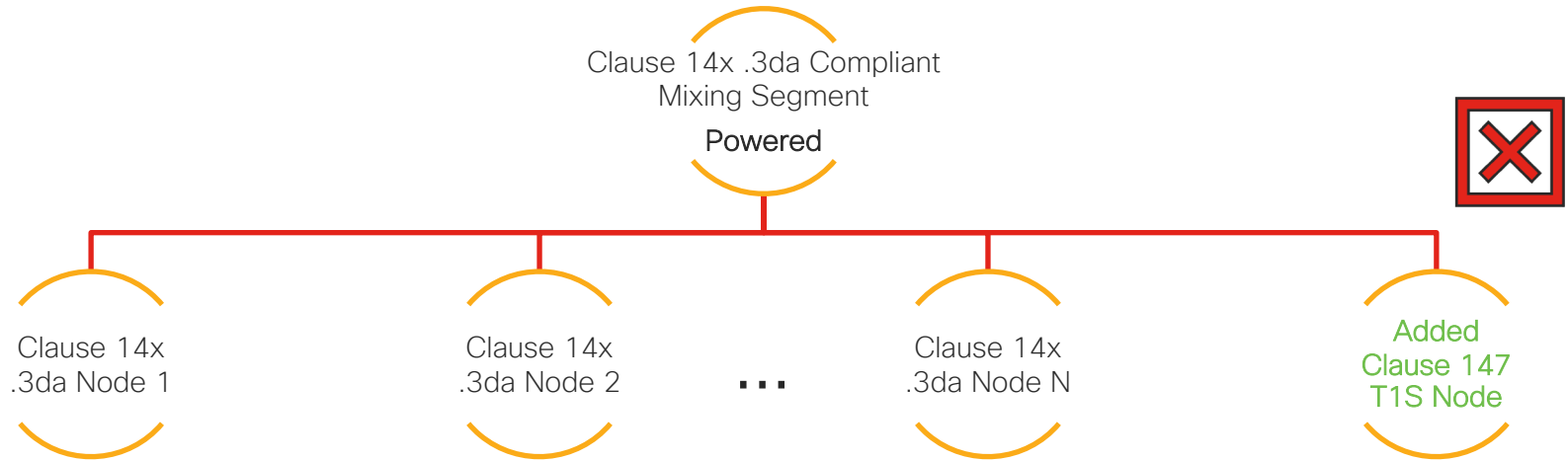
Powered Cases

Simplest Cases - Homogeneous Networks



New node successfully powers and communicates due to homogenous network

New T1S Node on .3da Powered Network



New node **cannot** communicate due to incompatible mixing segment

Summary –Powered Mixing Segments

Operating Nodes	Existing Mixing Segment	Existing Bus Power	Added Node	Outcome
Clause 14x 802.3da	Clause 14x 802.3da	802.3da Powered Multidrop Bus	Clause 14x 802.3da	New Node is Powered and Communicates
Clause 14x 802.3da	Clause 14x 802.3da	802.3da Powered Multidrop Bus	Clause 147 T1S	New Node Not Guaranteed to Communicate

Onerous Use Cases

- ☒ Self-Powered 802.3cg T1S Clause 147 PHY on an 802.3da SPMD powered mixing segment
 - This *may* cause the powered network to shutdown in some cases
 - Clause 147 specifies surviving voltage at the MDI, not properly operating when present
 - Changes needed to Clause 147 to support this would have to be carefully evaluated against their value to the industry

Unsupported Use Cases

- ☒ Clause 104-like powering (PoDL) in a multidrop mixing segment using 802.3cg T1S Clause 147 PHY or 802.3da Clause 14x PHY
 - Stating the obvious, this is out of scope for Clause 104 powering
 - Clause 147 Devices with PoDL capability that is inactive may even have difficulty working on an 802.3da network
 - This would also be the case for any proprietary powering solutions