

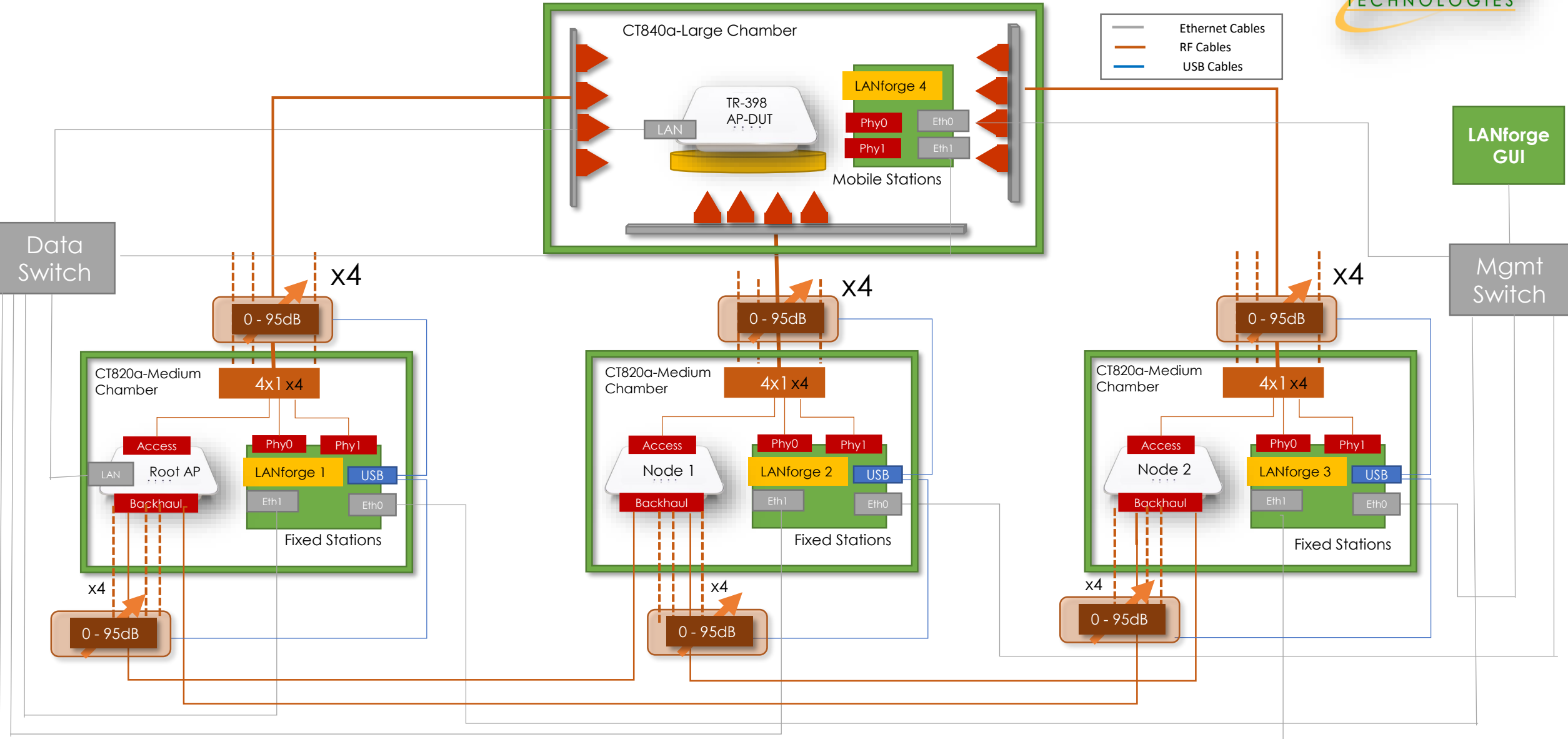


Network
Testing &
Emulation
Solutions

TR-398 and 3-Node Mesh Testbed Setups

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TR-398 + 3-Node Mesh Tested



Testbed Bill of Materials (BOM)

✓ Hardware

- ✓ **04x** LANforge Units – minimum 2 radios per unit (1x 2.4GHz, 1x 5GHz NICs), 2-eth ports (optional 10gE Ports)
- ✓ **03x** CT820a-Medium RF Chambers
- ✓ **01x** CT840a-Large RF Chamber with Programmable Turntable
- ✓ **06x** CT704b- 4 Port Programmable Attenuators
- ✓ **24x** 2:1 Splitters
- ✓ **12x** 4:1 Splitters
- ✓ **12x** Directional Antennas (optional)
- ✓ **96x** RF Cables
- ✓ **32x** 30dB Fixed Attenuators
- ✓ **32x** Ethernet Cables
- ✓ **02x** 8-port Ethernet Switches
- ✓ **03x** USB Hubs
- ✓ **03x** USB to USB Cables

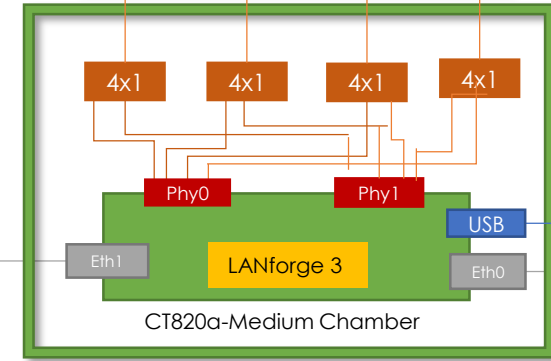
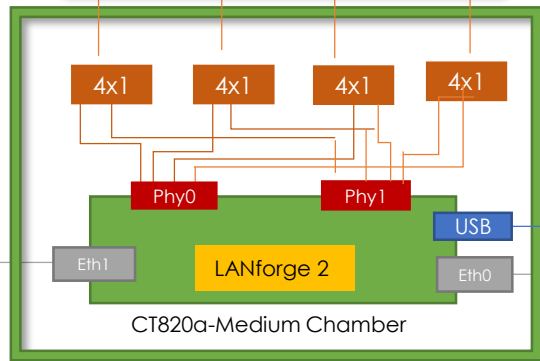
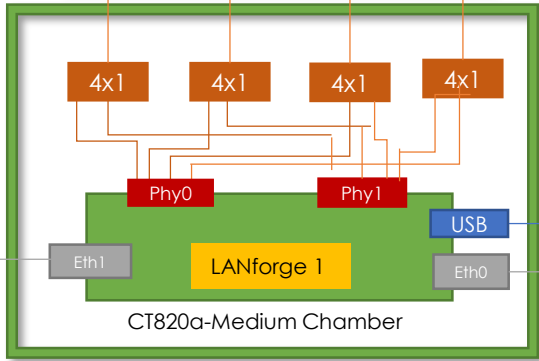
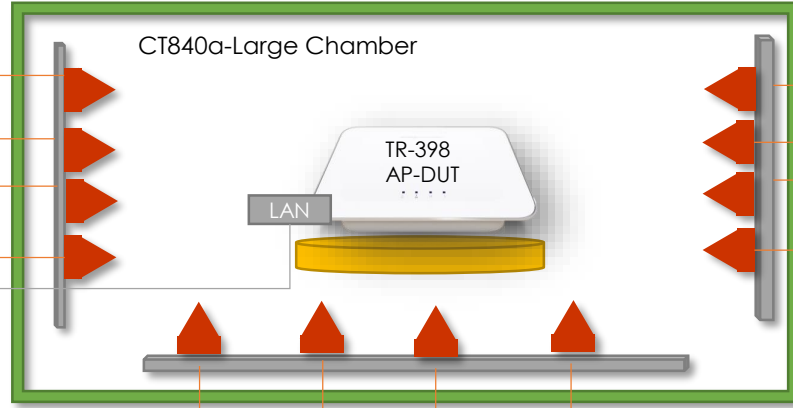
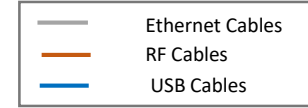
✓ Software

- ✓ **04x** 128 Virtual Stations License
- ✓ **04x** 1000 Concurrent Connections License
- ✓ **04x** 10GE Port License (optional)
- ✓ **08x** 1GE Port Licenses
- ✓ **04x** Mesh Test Automation Software License
- ✓ **04x** TR-398 Automation Software License

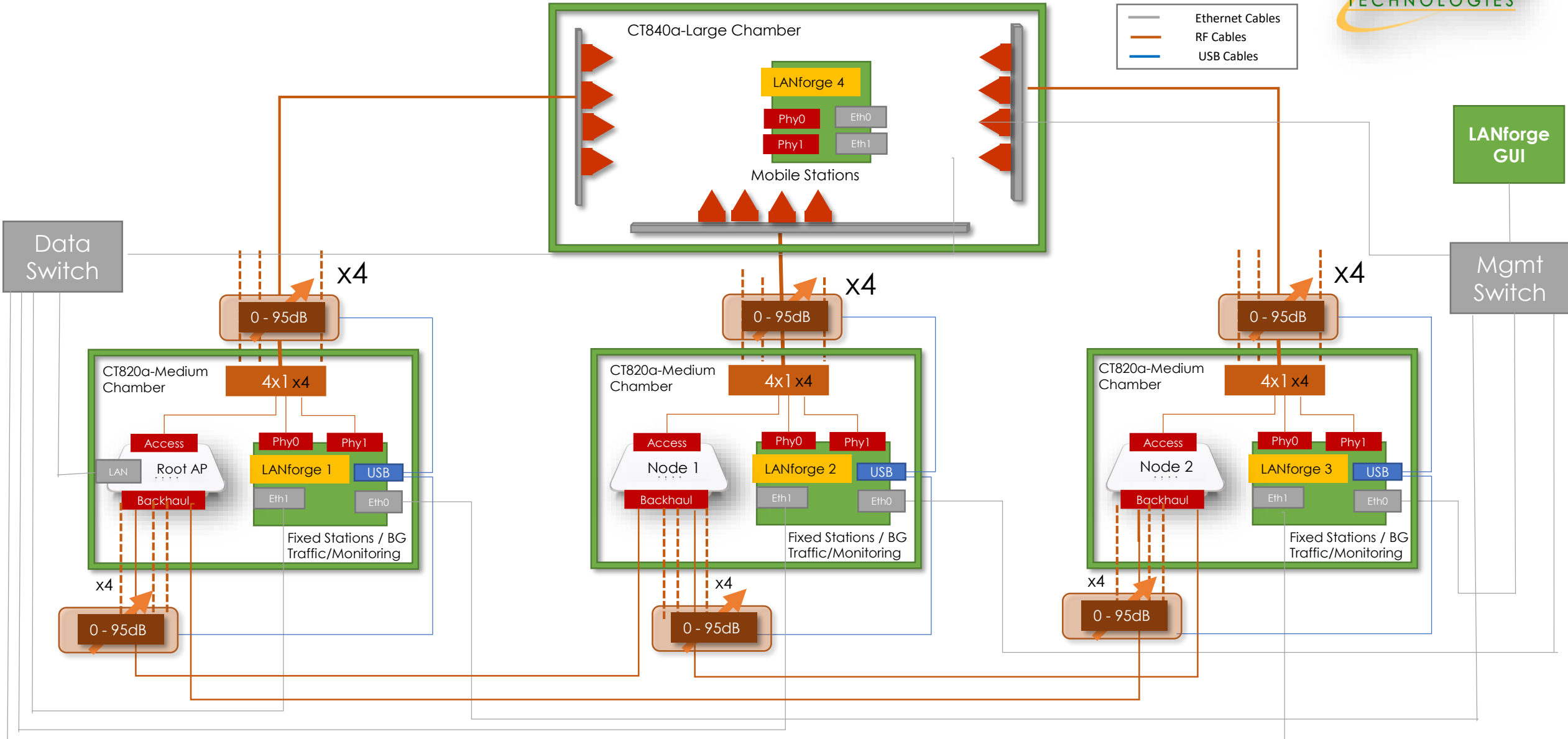
✓ Support/Warranty

- ✓ **01x** 1-year hardware and software support

TR-398 Part of the Testbed



3-Node Mesh Part of the Testbed



Roles of Hardware Components

3-Node Mesh Testing

| Component | Role |
|--------------------------------|--|
| LANforge1,2 and 3 | <ul style="list-style-type: none"> ➤ Fixed stations created on each mesh node ➤ Optional Background Traffic/Interference ➤ Optional Real-time Capturing |
| LANforge4 | <ul style="list-style-type: none"> ➤ Mobile Stations Roaming across the Mesh |
| Medium RF chambers | <ul style="list-style-type: none"> ➤ Provide Isolation for the 3 nodes in the mesh |
| Big RF Chamber | <ul style="list-style-type: none"> ➤ Provides Isolation for the Mobile Stations LANforge system |
| Programmable Attenuators 1,2,3 | <ul style="list-style-type: none"> ➤ Used for access network connections between the Mobile Stations LANforge and the 3 nodes in the mesh. Used for Roaming STAs between Mesh nodes |
| Programmable Attenuators 4,5,6 | <ul style="list-style-type: none"> ➤ Control the connections and distance between the mesh nodes on the backhaul |
| | |

TR-398 Testing

| Component | Role |
|--------------------------------|---|
| LANforge1 | <ul style="list-style-type: none"> ➤ Create the stations needed for receiver sensitivity test, Rate vs Range, throughput test, maximum connection test, airtime fairness test, spatial consistency, long term stability and multi Assoc/Disassoc stability tests |
| LANforge2 | <ul style="list-style-type: none"> ➤ Create additional stations at different distances for multiple STA perf test. ➤ Create additional STAs for Mu—MIMO Test ➤ Create Alien APs for AP co-existence Test |
| LANforge3 | <ul style="list-style-type: none"> ➤ Add more clients for Mu-MIMO test ➤ Create Alien Clients for AP co-existence test |
| LANforge4 | <ul style="list-style-type: none"> ➤ Not Used |
| Medium RF chambers | <ul style="list-style-type: none"> ➤ Provide Isolation for the LANforge units |
| Big RF Chamber | <ul style="list-style-type: none"> ➤ Programmable turntable used for Spatial Consistency test and other tests that need changing antenna orientation. |
| Programmable Attenuators 1,2,3 | <ul style="list-style-type: none"> ➤ Used to simulate distance for Receiver Sensitivity and Rate vs Range tests. ➤ Create far clients for multi STA Perf Test. |
| Programmable Attenuators 4,5,6 | <ul style="list-style-type: none"> ➤ Not Used |

Standalone TR-398 Testbed

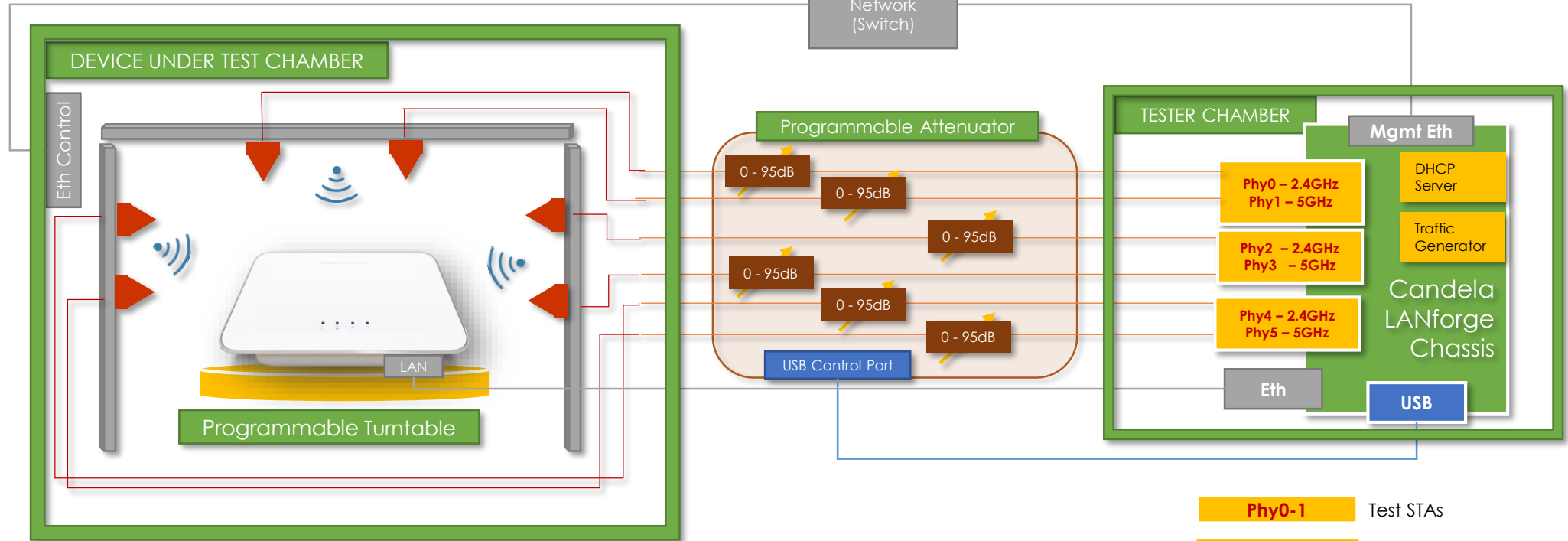
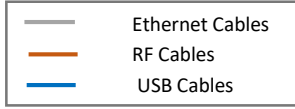
Automated TR-398 Tests



LANforge GUI



PASS/FAIL Reports



- Phy0-1** Test STAs
- Phy2-3** Mu-MIMO STAs/Alien APs
- Phy4-5** Mu-MIMO STAs/ Alien STAs

Testbed Bill of Materials (BOM)

✓ Hardware

- ✓ **01x** LANforge Units – minimum 6 wave-2 radios (3x 2.4GHz, 3x 5GHz NICs), 2-eth ports (optional 10gE Ports)
- ✓ **01x** CT820a-Medium RF Chambers
- ✓ **01x** CT840a-Large RF Chamber with Programmable Turntable
- ✓ **02x** CT704b- 4 Port Programmable Attenuators
- ✓ **16x** 2:1 Splitters
- ✓ **08x** Directional Antennas (optional)
- ✓ **48x** RF Cables
- ✓ **08x** Ethernet Cables
- ✓ **01x** 8-port Ethernet Switches
- ✓ **01x** USB Hubs
- ✓ **01x** USB to USB Cables

✓ Software

- ✓ **01x** 128 Virtual Stations License
- ✓ **01x** 1000 Concurrent Connections License
- ✓ **01x** 10GE Port License (optional)
- ✓ **02x** 1GE Port Licenses
- ✓ **01x** TR-398 Automation Software License

✓ Support/Warranty

- ✓ **01x** 1-year hardware and software support



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