Network Testing & Emulation Solutions

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LANforge Mesh Test Solution

Mesh Test Floorplan
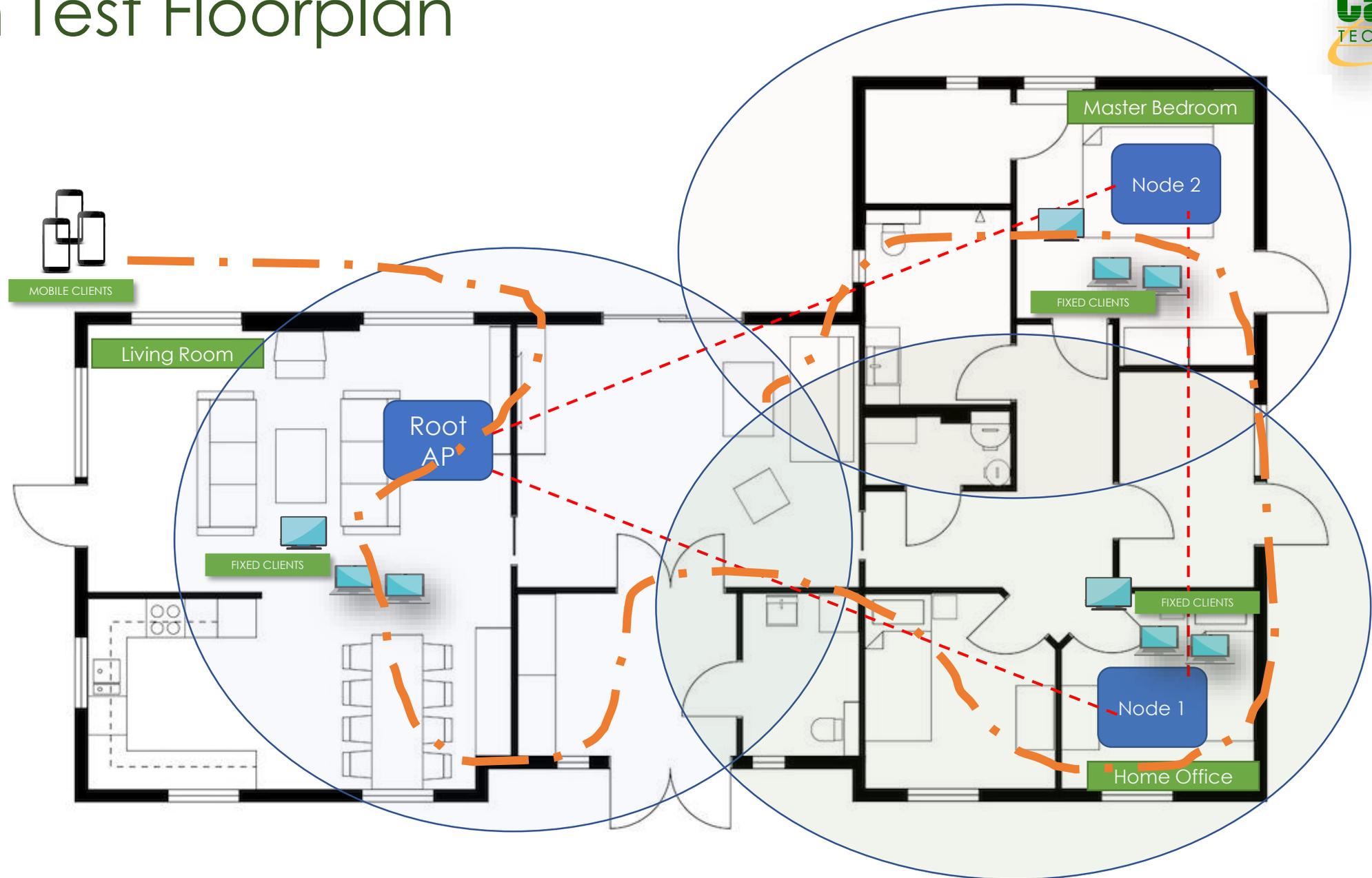
3 NODE TESTBED

MESH NETWORK

MOBILE CLIENTS

Internet

ROOT

FIXED CLIENTS

NODE2

FIXED CLIENTS

NODE3

FIXED CLIENTS

NODE5

FIXED CLIENTS

NODE1

FIXED CLIENTS

NODE4

FIXED CLIENTS
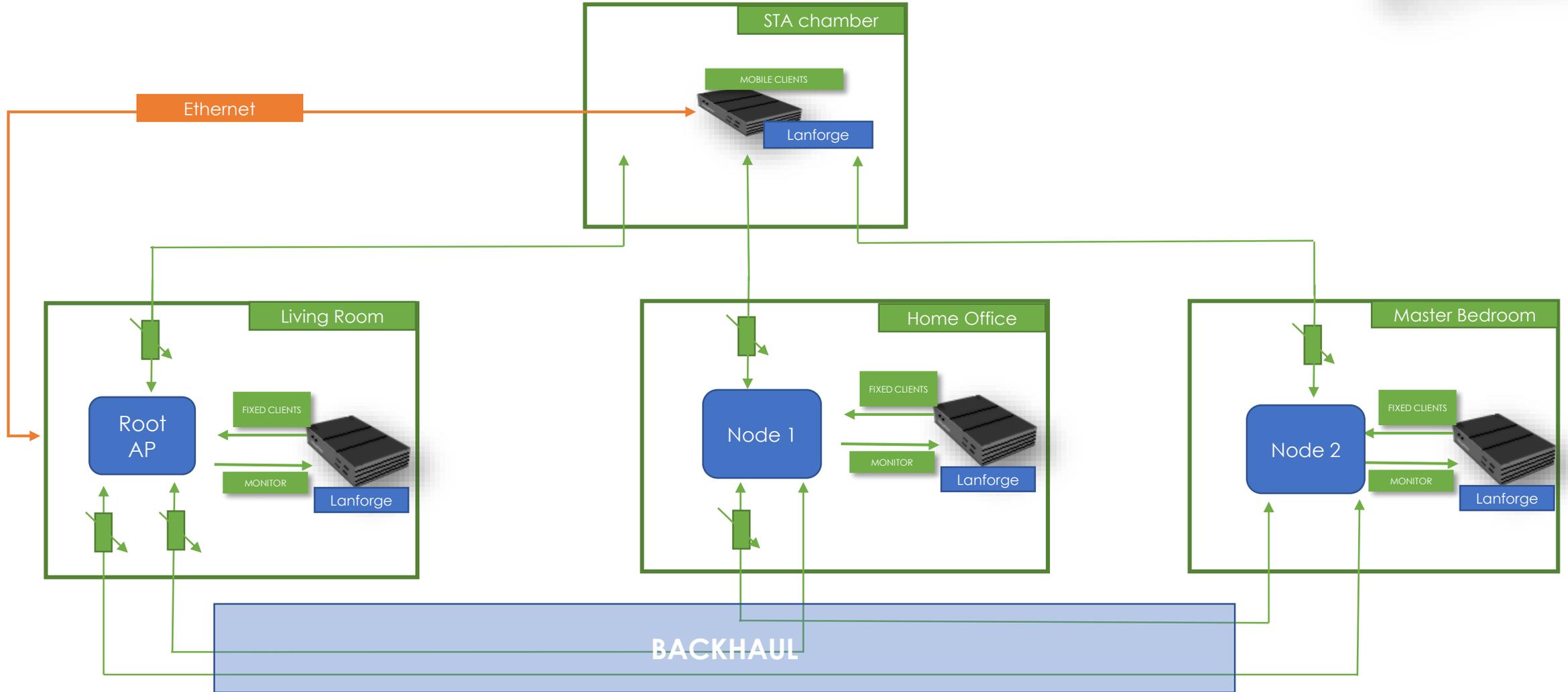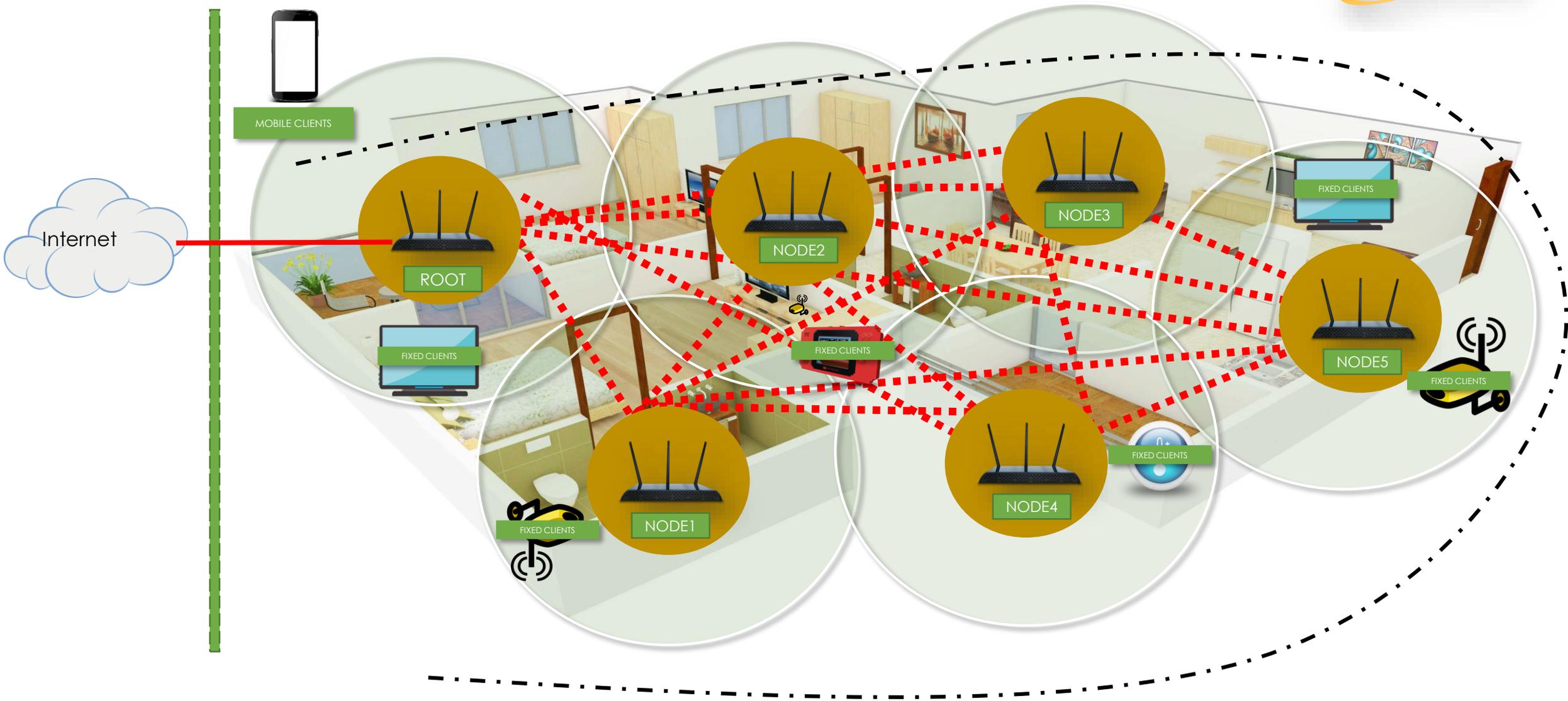
Testbed Building Blocks

- ✓ RF enclosures
- ✓ Programmable Attenuators
- ✓ RF & Ethernet Cables
- ✓ Splitters/Combiners
- ✓ LANforge Hardware for Station Emulation
- ✓ LANforge-MESH Test Application Software

Sample DUT Details

- ✓ Triband 11ac 2x2 MIMO

- ✓ 3 Nodes (1 AP and 2 Satellite Nodes)

- ✓ Antenna Set 1 (2.4GHz and Upper 5GHz : channel sets to 6 and Auto respectively)

- ✓ Antenna Set 2 (5GHz only radio in lower UNII, set to channel 48)

- ✓ Access Connections : Antenna Set 2

- ✓ Backhaul Connections : Antenna Set 1

All testing is done completely cabled with the DUT units inside RF enclosure and both RF cables all the way to the UFL/MS-156 probe connector on the boards. All cabling done for 2x2 MIMO.

Testbed Picture - Front

Testbed Picture - Back

Programmable Attenuators

Access Connections

Backhaul Connections
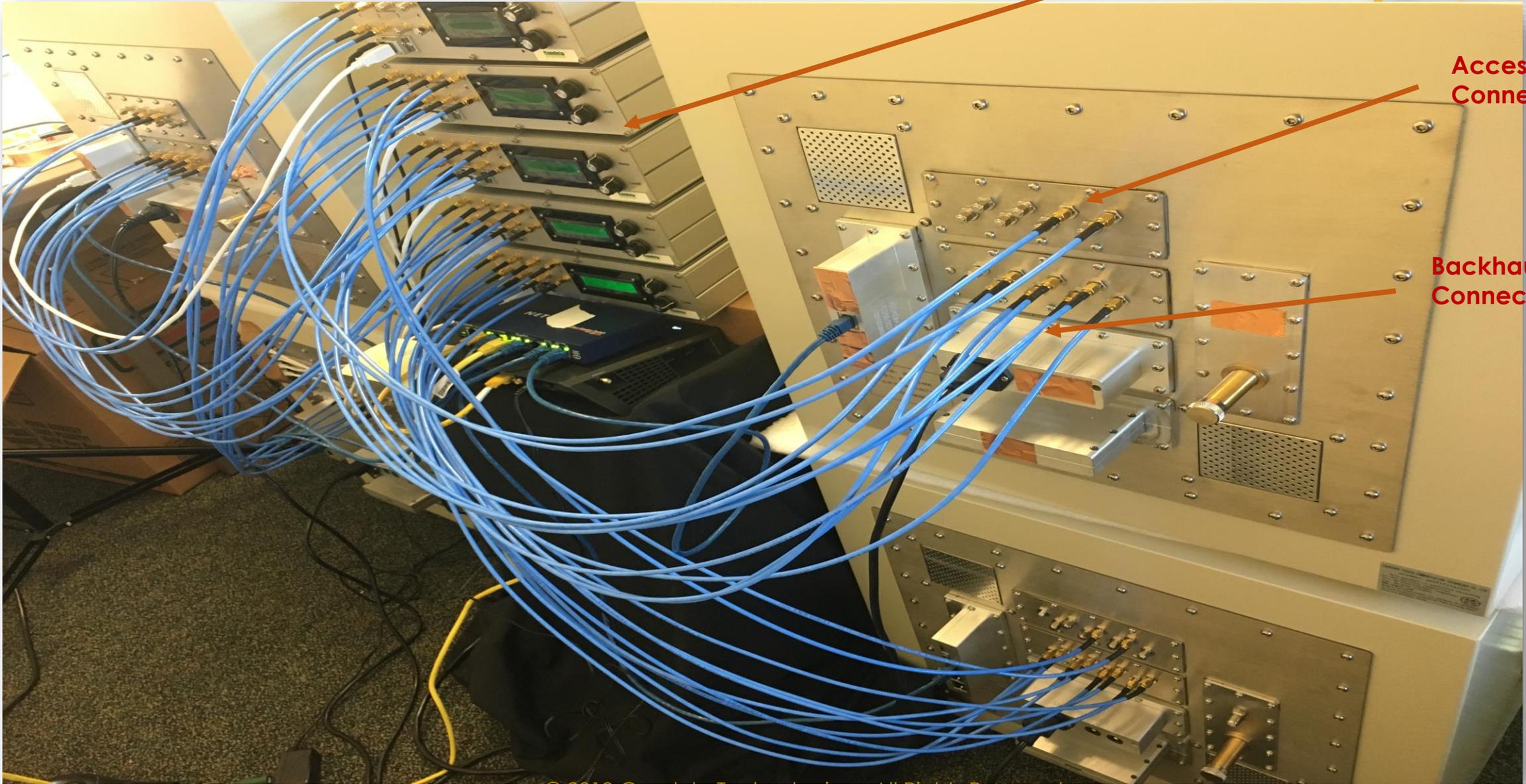
Testbed - Inside

LANforge systems doing Fixed clients, Mobile clients, Background traffic, interference, monitoring, roaming etc…

Mesh AP Nodes under Test

MORE DETAILED TESTBED DIAGRAM
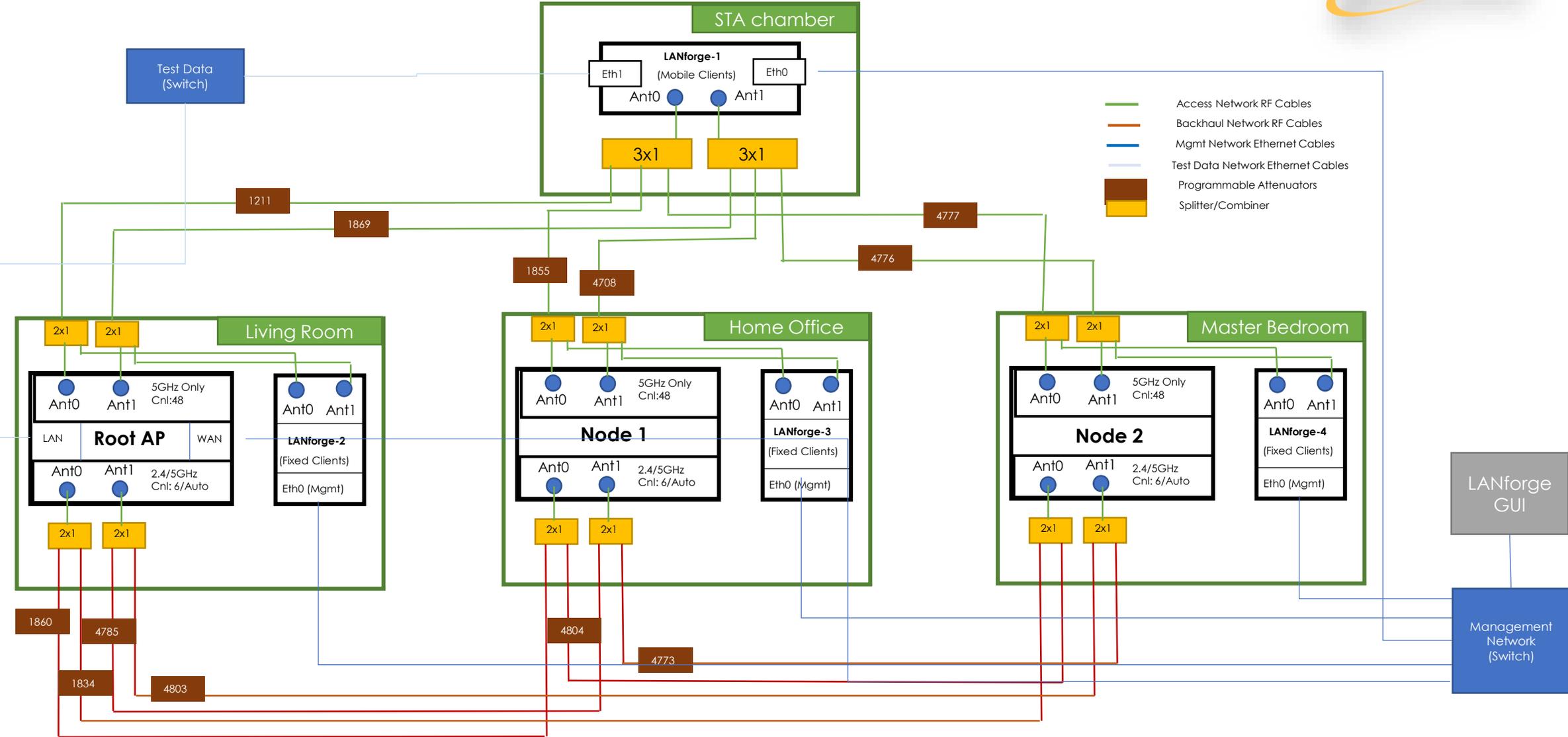
LANforge Chamber View
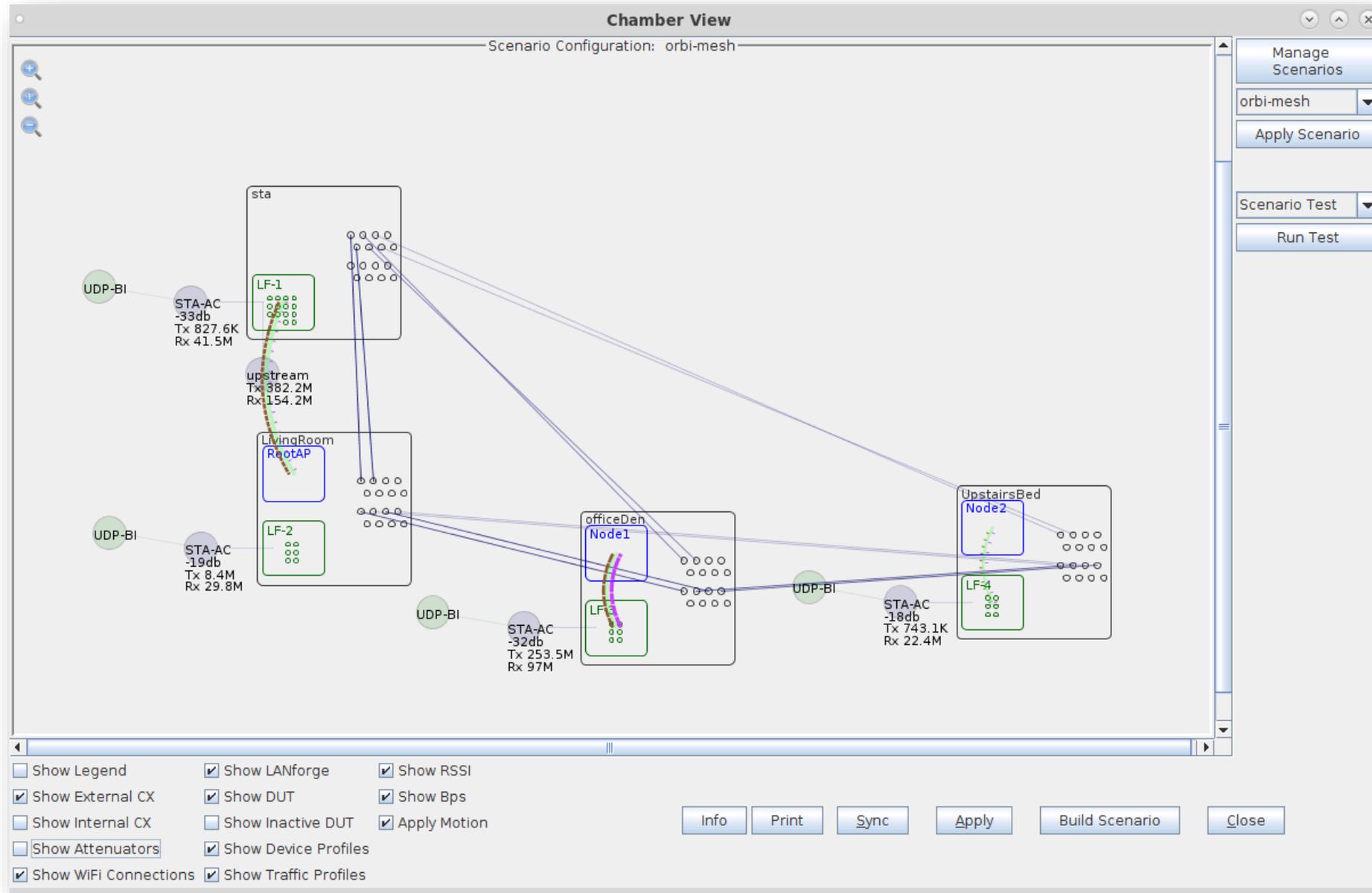
Key Tests

✓ Measure maximum upstream and downstream throughput that can be achieved per each hop in the mesh.

✓ Repeat test 1 on different channels, Channel Bandwidths, MIMO types.

✓ Measure the maximum number of stations each node in the mesh can handle.

✓ Measure the connection times and number of connection drops for the stations for each node in the mesh over time.

✓ Repeat 1,2,3 and 4 with different distance settings between the nodes in the mesh.

✓ Measure the maximum possible distance between the nodes in the mesh where they can all still maintain connectivity.

✓ Test how the mesh backhaul can rate adapt and find the best possible channel in a noisy environment.

✓ Force a disconnect on a specific link on the mesh and measure time taken to find the next best path in the mesh.

✓ Create different levels of co-channel and adjacent channel interference and measure overall performance.

✓ Run performance test with different mixes of voice, video and data traffic and measure quality of experience.

✓ Repeat tests 1 through 10 with different security types (Open, WPA-PSK, WPA-Enterprise)

✓ Test load balancing and band steering capabilities of the nodes in the mesh by creating different amounts lof stations and traffic loads on different nodes in the mesh.

✓ Test handoff delays for stations handing off been various nodes in the mesh.

✓ Measure roaming performance with different security methods and fast roaming methods and 802.11k/v/r

✓ Measure performance over distance for stations connecting to each mesh node.

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