The JT-NM Tested network

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JT-NM Tested

(IP, SHOWCASE"

- Lead by AMWA, EBU, SMPTE & VSF
- O An opportunity to test ST 2110 / NMOS implementations in real-world scenarios
- 45 vendors, 110 participants





JT-NM TESTED

The JT-NM Tested Program returns to IBC 2022 and will again offer documented insight into how vendor equipment conforms to specific SMPTE standards, AMWA NMOS specifications and selected real-world scenarios. As on previous occasions, the JT-NM is publishing the JT-NM Tested Catalog, which lists vendor results and also contains test plans executed by the JT-NM Tested Team in Wuppertal, Germany in August of 2022 at Riedel.





Preparation....



A team of "Experts" is assembled:

- Infrastructure
 - The network; architecture, design, addressing, provisioning
 - Services; DHCP, DNS, PTP, NTP
 - Access; WiFi, Internet
- Testing
 - Test plan definition
 - Documentation of results
- Arista responsible for the architecture, design, and provisioning of the network
- The EBU provided/configured the DHCP/DNS servers
- Riedel (hosts) provided firewalling, Internet and WiFi

Network Objectives



The network objective was to provide a "real-world" scenario

- Maximise applicability of results for customers
- Best Provide a straight of the straight of
- Resilience and Reliability through design
- Devices manageable from wired or wireless + Internet access

What did this mean?

- Pushing TR-1001-1 expectations DHCP, DNS etc
- Layer 3 routed design (BGP Dynamic routing)
 - IGMP / PIM
 - D Full unicast routing globally
 - DHCP, DNS, IS-04 RDS, NTP all universally reachable
- Amber and Blue media networks (M/C air-gapped)
 - Full multicast routing within Amber and Blue (IGMP / PIM)
- Routable C&M network(s)
 - Multiple M&C vlans provided for Main, and NMOS-X workflows
- Dual resilient PTP GMs
- Routable OOB network for switch management

The physical network



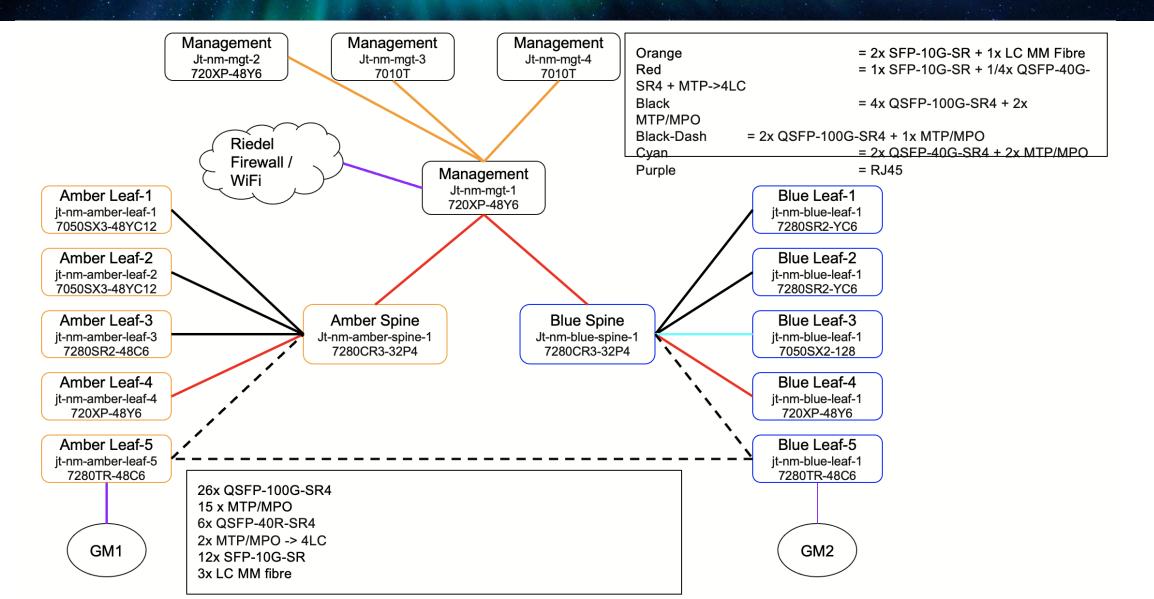
- 8 Racks for equipment
- Spine + 5 leafs in Amber and Blue
 - 83x 1G Media
 - 75x 10G Media
 - 116x 25G Media
 - 8x 40G Media
 - 48x 100G
- 4x1G C&M network
 - 132x 1 C&M connections

More interfaces than last JT-NM Tested event Overall, a strong move from 10->25, and 40->100G



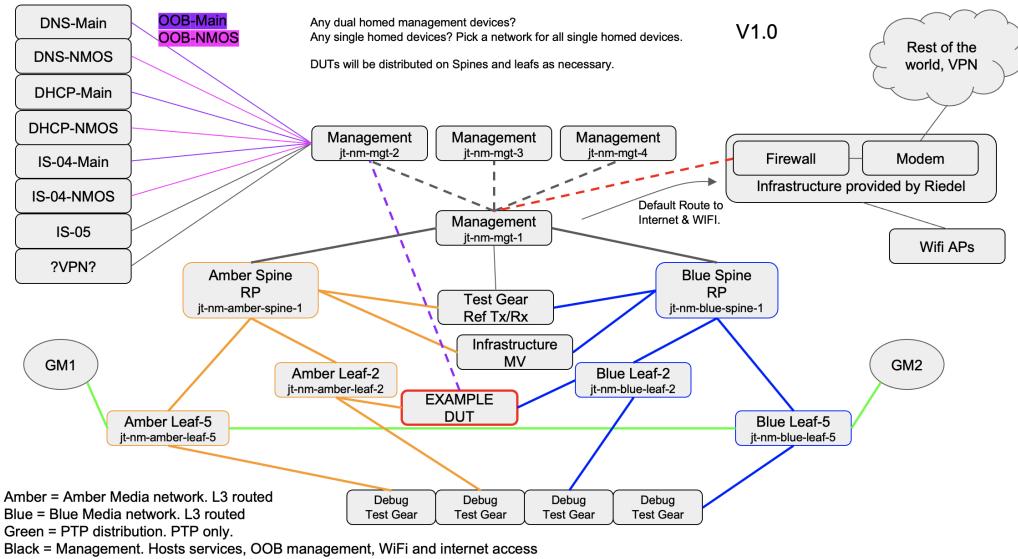
The physical network





JT-NM Network





Solid = Routed. Dashed = L2. Thin = host (routed, L2, Trunk etc)

Config Generation for 16 Switches?

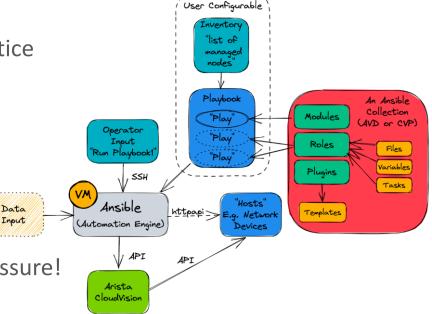
Traditional approach

- Wait until you're on-site
- Work 24 hours / day for the whole weekend
- Expect errors and inconsistencies

Work Smart approach

- Apply a "network as code" approach
- Have a source of truth as yaml files, revision controlled
- Use Red Hat's Ansible automation
- O AVD (Arista Validated Designs) Collection provide validated best practice

 - PIM / RP
 - PTP Boundary Clock
 - Common infrastructure
 - & DHCP, DNS, hostnames, management addresses,
- Routed host port configs automated
 - CSV spreadsheet export + python -> yaml
- Pretty much the only manual additions were...
 - FEC settings on 25/100G interfaces -> This was due to time pressure!
- Then I went on holiday 🙂



OWCASE

Health Monitoring?

Showing 10 of 16 rows

Export to CSV · Show next 6 rows



Lasted 26m Started 2w ago

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Export to CSV · Show next 10 rows · Show all 24 rows

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t-nm-amber-leaf-5		_	83	147	9	Device Config Complia	ance	_	_	77	Source		Title	Interface Ethe	rnet13 on					Durati	on Start Time
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t-nm-amber-leaf-3		_	95	93	22	Input Errors Detected		-	56	-	Ethernet3 on jt-nm		Interface went down unexpectedly	down but adn	ninistrative status	s is					27s Started 2w ago
t-nm-blue-leaf-5		-	65	131	9	Low Disk Partition Spa	ace Available	-	51	_	▲ Ethernet4 on jt-nm		Interface went down unexpectedly			_				Laster	27s Started 2w ago
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t-nm-blue-leaf-3		-	60	89	10	High Interface Symbo	Errors	-	32	-	 Ethernet52/3 on jt- 										23m Started 2w ago
t-nm-blue-spine-1		-	29	67	31	Abnormally Small Fran	nes	-	31	-	 Ethernet52/4 on jt- 		Runts detected								26m Started 2w ago
jt-nm-amber-spine-1		_	34	58	31	Change Control Creat	ed	_	_	_	Ethernet52/4 on it-										26m Started 2w ago

Showing 10 of 24 rows

Ethernet52/4 on jt-nm-blue-leaf-2 Input errors detected

How did it all go?



- Pre-staged the switches with minimal, but representative connectivity prior to on-site event, and pretty much everything seemed to work just fine. (Huge Kudos to Hugo@Riedel)
- No network config / reliability issues
- No impediment to testing from 9am Mon
- Network free to assist with other tasks
- Typical problems
 - FEC mismatches on 25/100G
 - IP addressing / DHCP

 - Bad IGMP joins
 - IGMP Group Specific Queries being ignored
 - Large unicast streams sent to public IP
 - Large unicast streams to switch control plane



Any Questions?













