Project Overview

- Move WAN links from tcom-gs-1 to flra. Retire tcom-gs-1.
- No new equipment is required
  - Additional 1G/10G fiber ports at FL are available
  - Some BRAN channels will be reallocated
- Add a dedicated UCAR FRGP Research wave
  - R7 wave to replace shared RE wave, which is often running > 7 Gb/s
  - Land it on FLRA for now, but add/drop at bldr-tcom-adva
  - If R&E flows shift from FL to ML-29, we can groom this circuit from FL to ML
- No WAN single-point-of-failure is introduced
- Eliminate a router at a difficult-to-access location
  - Save equipment upgrade costs for 2016
  - Save ongoing maintenance costs
4 of 8 UCAR BiSON circuits shown in red. Two are shared with NOAA. Purple BiSON circuit becomes dedicated to NOAA.

UCAR BISON circuits not shown:
- 2 diverse links between NWSC and ML
- 2 diverse links between NWSC and FRGP-1850
Failure Scenarios - Impacts to UCAR

After this change, UCAR still uses 8 x 10G BiSON circuits. FL2-3095 becomes a focal WAN facility (of similar importance to 1850 Pearl). “BPoP” 1-Gig participants will rely on Flra, which assumes the role of tcom-gs-1.

- If Flra fails (4/8 circuits down), these stay up:
  - 2 x ML - NWSC
  - 2 x NWSC - FRGP
- bldr-fl-adva (5/8 down), these stay up:
  - ML - NWSC
  - FL - FRGP I2 (1850 short path)
  - NWSC - FRGP
- FL2-3095 (6/8 down), these stay up:
  - ML - NWSC
  - NWSC - FRGP
- TCOM, 910 15th, or BLDR-DEN BiSON span (5/8 down, status quo), these stay up:
  - ML - NWSC
  - FL - FRGP (1850 long path)
  - NWSC - FRGP
- 1850 Pearl (6/8 down, status quo), these stay up:
  - ML - NWSC
  - FL - FRGP (910)
tcom-gs-1 links - proposed grooming

- Te1/1 bldr-movaz-2-2:FRGP-1850-Short, RE wave - connect directly to NOAA via BRAN brown-3,4 (already LR client)
- Te1/3 NOAA via brown-3,4 - connect directly to RE wave bldr-movaz-2-2:FRGP-1850-Short (already LR client)
- Te1/4 bldr-adva-1-9:TCOM-L3-RAF - express wave to bldr-fl-adva, FLRA (Te1/14 or Te3/2)
- Te8/1 bldr-adva-1-11:FRGP-910-West - express wave to bldr-fl-adva, FLRA (reuse Te1/15 with tap)
- Te8/3 mlra Te7/1 - remove, recover BRAN pair and fiber tap
- Te9/2 UCB - remove, drop BGP session, routing via FRGP
- Te9/4 fir Te5/4 - remove - BRAN pair reused for new UCAR R&E 10G (Te3/4 with tap)
- Gi3/4 NEON via BRAN - NEON to ?? ### (fira insufficient GE SFP ports)
- Gi3/6 noaa-bw-wb BRAN slate-1,2 - NOAA to firl Gi5/1 (ML BRAN spur backup)
- Gi3/7 UNAVCO Level3 - L3 demarc (ICG/Walnut?) to fira Gi5/2 ###
- Gi3/12 CoB-1 - CoB to fira Gi5/3 ###
- Gi5/1 CoB-2 - CoB to fira Gi6/3 ###
- Fa4/1 tcom-wd1-env - connect to bldr-tcom-adva NCU or decommission it
- Fa4/2 bldr-movaz-2 - connect to bldr-tcom-adva OSCM (renumber to 172.31.2.52/24, OSPF, loopback 172.31.3.52/32)
- Fa4/4 bldr-tcom-adva - remove - BiSON DCN gateway moves to bldr-fl-adva, 172.31.51.250/24 FLRA (6148 GE-Tx port)

### Identify BRAN channel
Odds and ends

New UCAR FRGP Research wave, not shared with NOAA

- Build new wave between bldr-tcom-adva and den-1850-adva on the short path
- Move den-1850-adva CH-1-6 (RAF WCC) to bldr-fl-adva, replace with 2WCC gained during previous augments
- Repurpose RAF XPDR at TCOM for new Research wave

NOAA has plans to disconnect from BPOP at UCAR-FL as part of their TIC buildout. Alex Hsia has reviewed and approved this plan. They will decommission their RE wave when TIC is turned up. In the meantime, we have a hot spare RE wave as insurance.

Consider populating fira module 4 with 6704 card from tcom-gs-1

Proposed timeline: Begin grooming links this winter, power down tcom-gs-1 in the spring / summer timeframe
Groom 1

Build new wave for RAF and swing RAF to FL

- Replace den-1850-adva CH-1-6 (RAF WCC) with 2WCC
- Provision NE 194.90, reconnect filter, reconnect client (C1 same optic/jumper as old C)
  - Verify RAF comes back up
- Provision NW 194.40, connect C2 (LR or SR) to core-l3 “UCAR R&E”
- Provision 194.40 passthru XC at den-910-adva
- Patch thru channel 194.40 at bldr-tcom-adva
- Redeploy Denver RAF WCC at bldr-fl-adva
- Provision N 194.40, connect C to flra Te3/4
- Swing VLAN 334 to flra Te3/4, and also on core-l3
- Tear out VLAN 333 on mlra, tcom-gs-1, core-l3, wy-em20-c1-gs
- Disable tcom-gs-1 Te1/4
- 194.40 is available for UCAR R&E
Grooms 2-5

New BRAN channels

- CoB
- UNAVCO
- NEON
- NOAA-BW-WB
Groom 6

Shared FRGP 910 wave, extended to FLRA Te1/12.

Can likely reuse the same VLAN and IP addresses.
Grooms 7-8

- NOAA dedicated wave (existing RE)
  - Renumber
- UCAR dedicated wave at FLRA Te6/5 (built during Groom 1)
  - Possibly keep numbering from tcom-gs-1
Finish

Management, monitoring, physical clean-ups