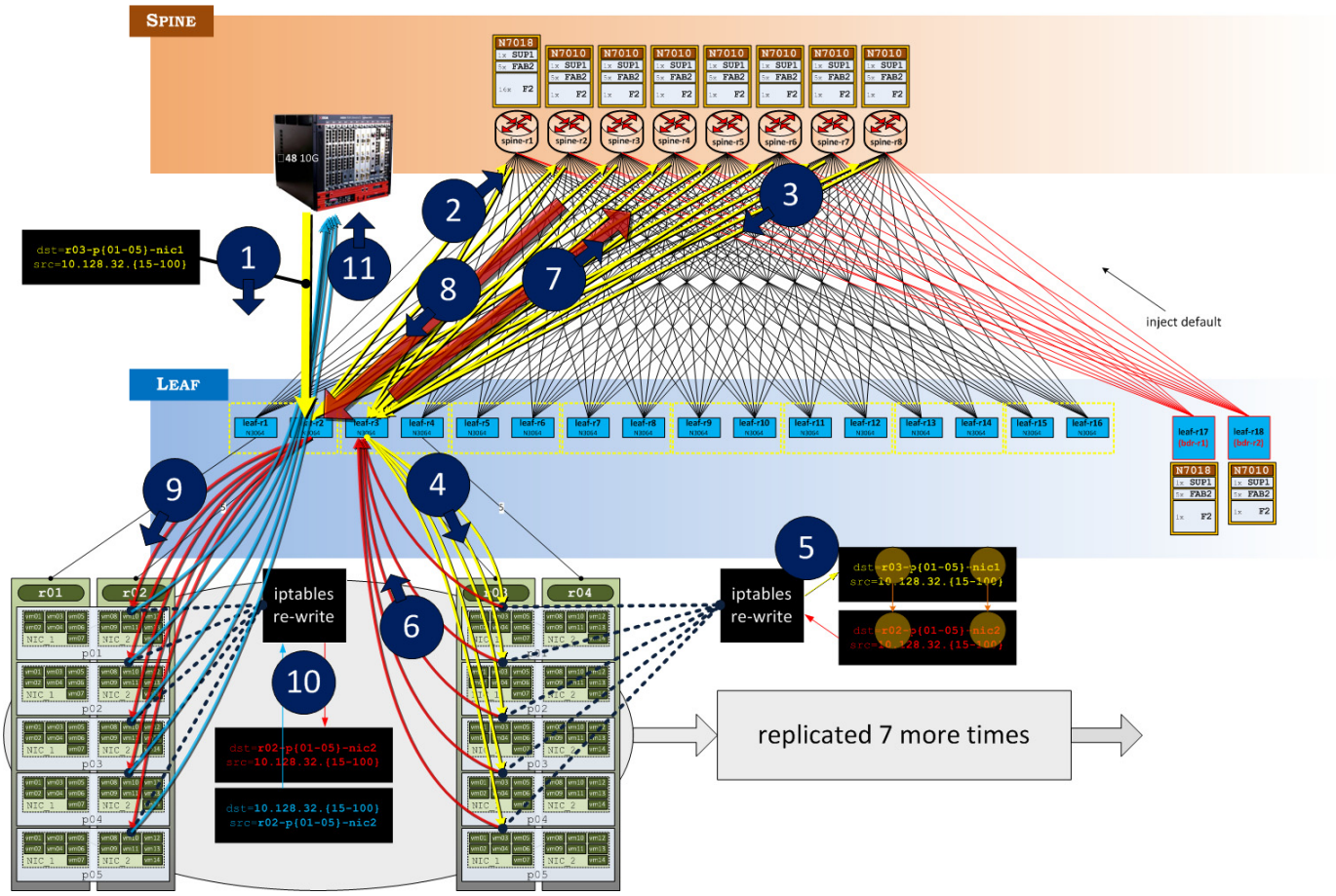
APPENDIX F

Bandwidth Utilization Noise Floor Traffic Generation

Figure F-1 shows a walk-through of how noise traffic is generated by utilizing both IXIA and iptables on the servers:

Figure F-1 Noise (offset) Traffic Generation



1. IXIA sends 6-8Gbps traffic down each of the 5 links connected to leaf-r2, with ip_dst set to servers hanging off leaf-r3. ip_src is set to a range owned by the IXIA ports.
2. Since ip_dsts don't live off leaf-r2, traffic is attracted to Spine layer in ECMP fashion.

3. Spine layer sends traffic to leaf-r3.
4. Virtual servers (r03-{p01-p05}-n01) hanging off leaf-r3 receive traffic.
5. Incoming traffic travels up the tcpip stack, the Linux bridge subsystem receives packets, then iptables (ip_forward) performs packet rewrite, changing ip_dst to be servers off leaf-r2.
6. Packets reflected back to leaf-r3
7. Since ip_dsts don't live off leaf-r3, traffic is attracted to Spine layer in ECMP fashion.
8. Spine layer send traffic to leaf-r2.
9. Virtual servers (r02-{p01-p05}-n02) hanging off leaf-r2 receive traffic.
10. iptables re-writes ip_dst (IXIA) and ip_src (themselves).
11. Traffic is forwarded back to IXIA.

Testing shows 99% linerate is achieved with this method, albeit at an [acceptable] 5% hit on server CPU resources. The desired noise floor was adjusted, as necessary, by tweaking packet rates on the IXIA – no changes required on the servers.