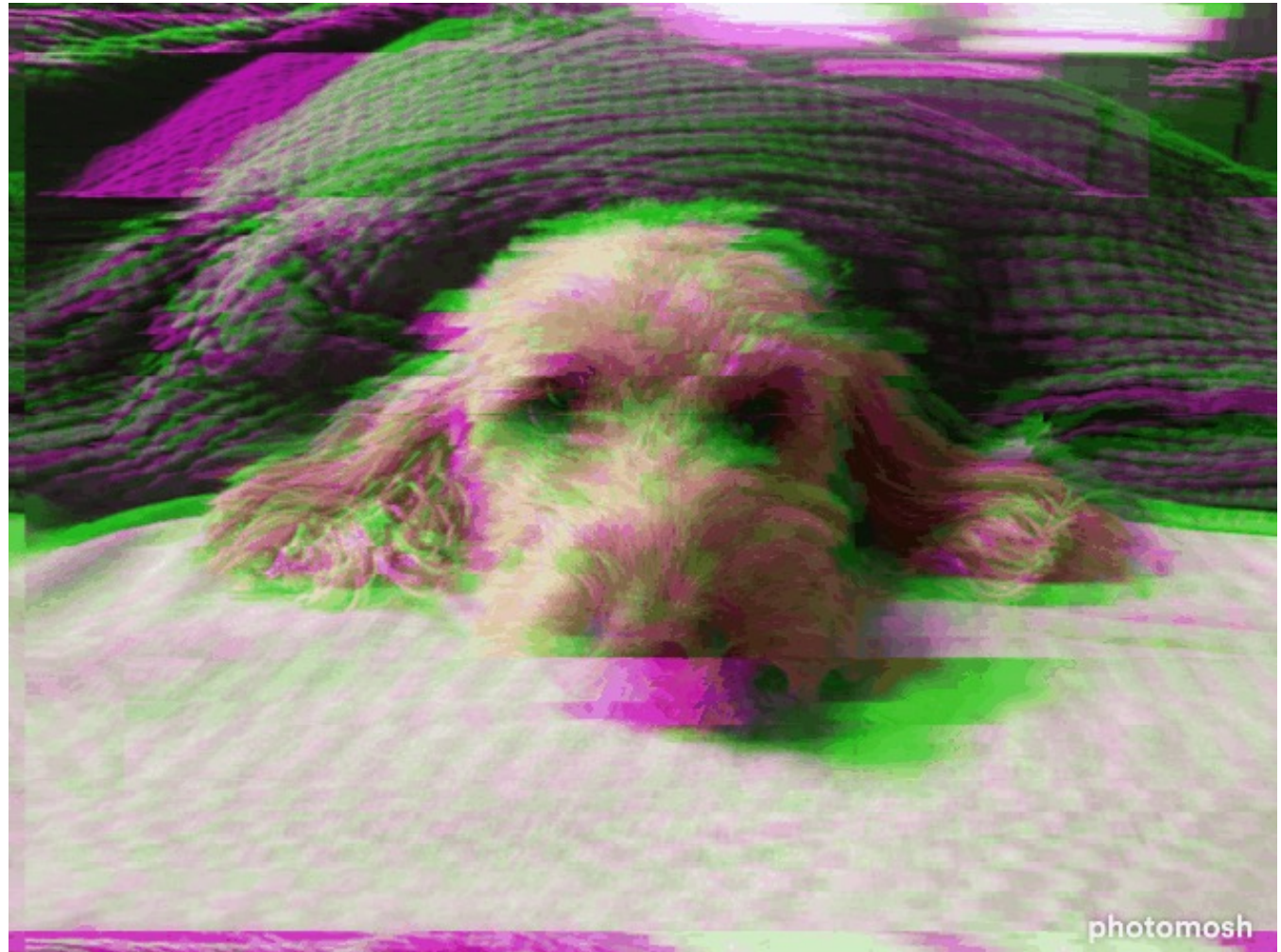


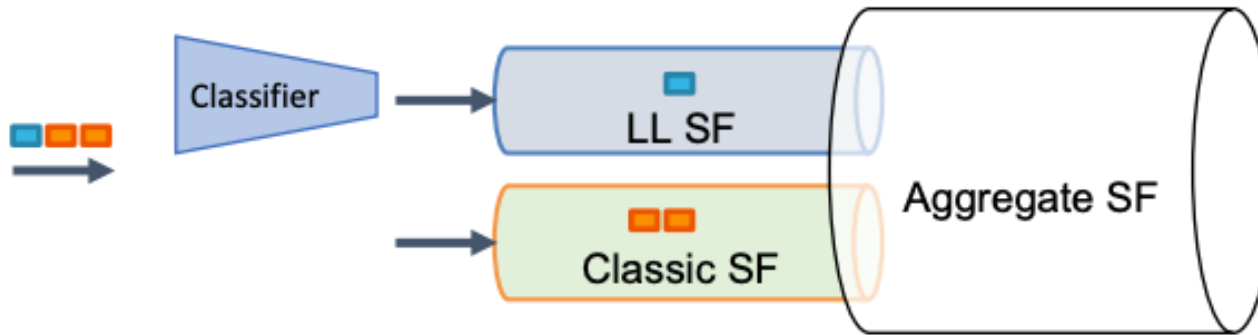
**Comcast
Dual Queue Low Latency
Field Trial Update**

IETF 119 – March 2024

Presented by Jason Livingood



Refresher: DOCSIS and L4S/NQB



- Both queues share the same **capacity**
- Both queues are best effort **priority**
- Classifier function examines ECN and DSCP fields of packet header to select queue & can also provide queue protection
- L4S and NQB are implemented in DOCSIS, but can also be implemented in any network (5G, LEO, DSL, FTTP, etc.)

Low Latency Networking Trial: Latest Updates

1. Completed backbone router config updates to preserve **ingress DSCP-45** marks – any network can now mark for NQB (other last mile technologies in process: EPON, Ethernet, Commercial DOCSIS)
2. Deployed **downstream support** via vCMTS software update
3. Released **new cable modem bootfile** to fix bugs we'd identified. LL queue is now performing as expected – it was experiencing bandwidth limitations.

Unlike AQM (DOCSIS-PIE) – LLD is not on/off:

```
"direction": "upstream",  
"max-concatenated-burst": 12345,  
"max-traffic-burst": 12345,  
"max-traffic-rate": 12345000,  
"maximum-buffer": X,  
"min-reserved-packet": X,  
"multiplier-bytes-requested": X,  
"multiplier-contention-request-window": X,  
"peak-traffic-rate": X,  
"priority": X,  
"service-class-name": "ABCD",  
"sf-aqm-latency-target": XX,  
"tos-and-mask": "XX",  
"tos-or-mask": "XX",
```

Conclusions & Next Steps

- Testing to continue for a TBD period of time
- Preparing to operationally scale to **millions** of users in 2024