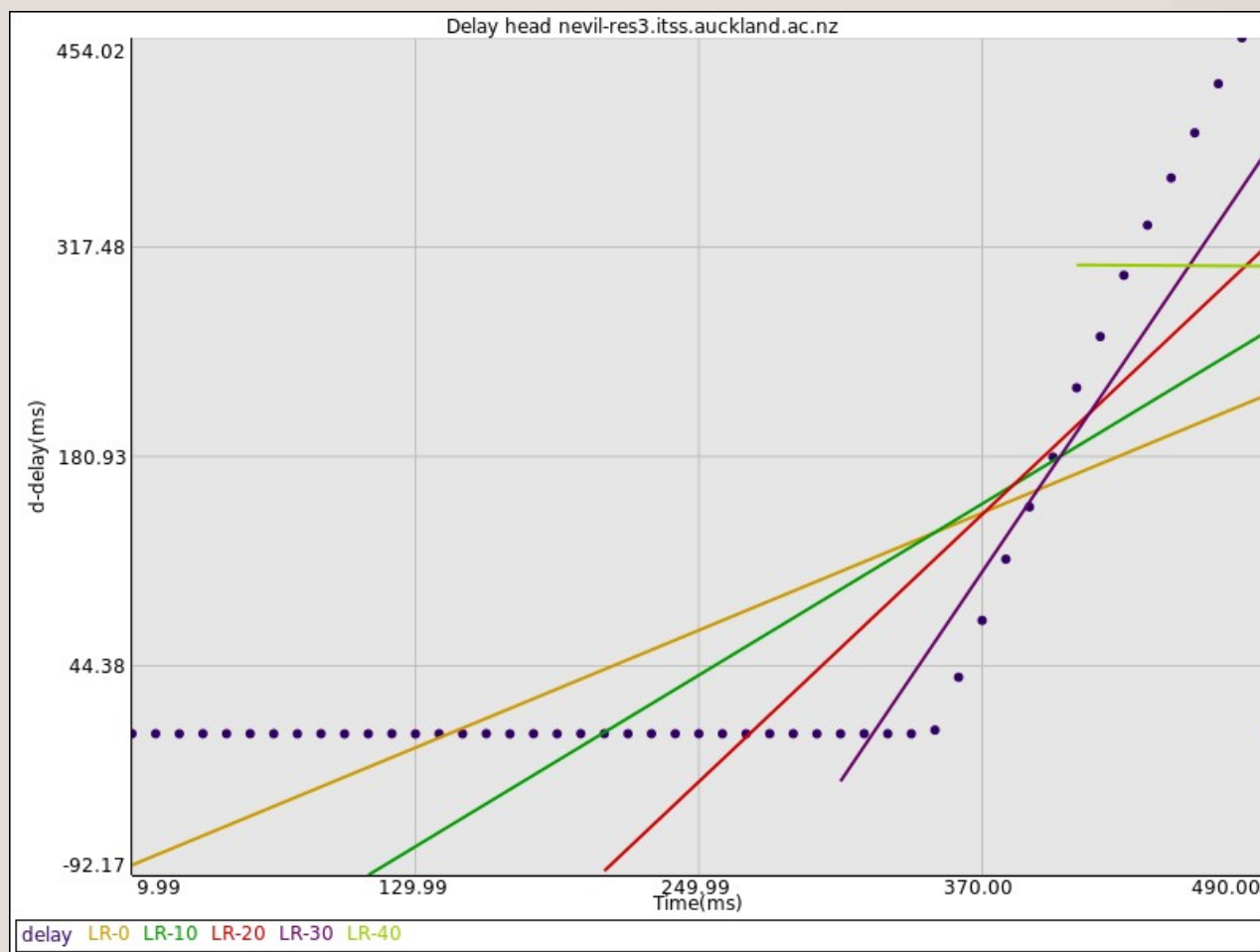


Micro Dependability Measurements

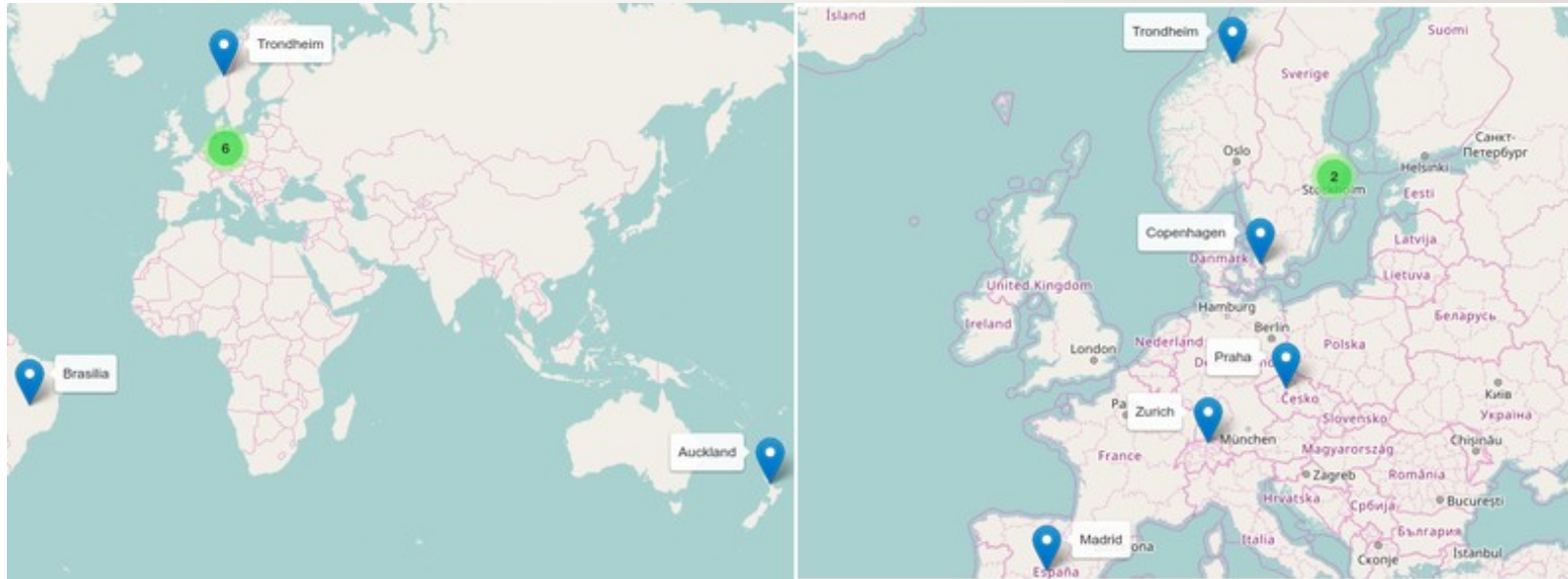
Olav Kvittem
UNINETT
28.03.19



UNINETT



The Dragonlab participants



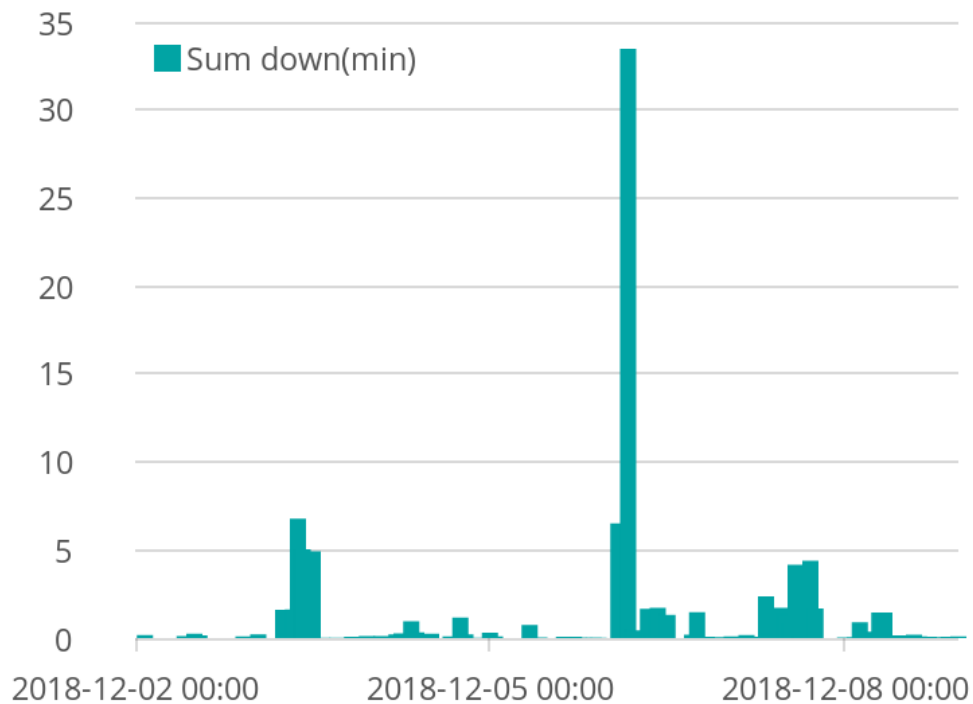
- Participants
 - U.Auckland, RNP(Brasil), Cernet(out but co-initiator)
 - Nordunet, Sunet, Uninett, NTE(commercial)
 - Switch, Cesnet, RedIris, Aarnet
 - Cloud : Amazon, Azure, Google
- NTNU university : PHD's and MSC's
- Measurement setup
 - 100 packets per second with timestamps
 - Traceroute
 - analyze packet loss events

Dragonlab losses, aggregates, delays, reports . Uninett
[losses, aggregates, reports. Docs](#) **how.**

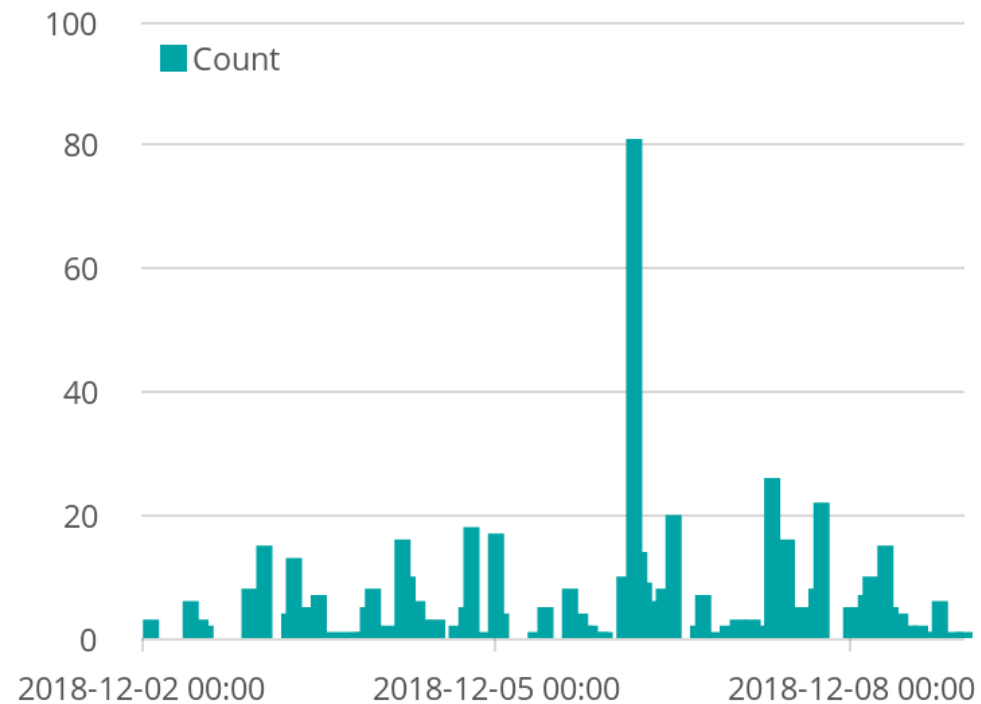
546

5,809,933

sum loss dragonlab



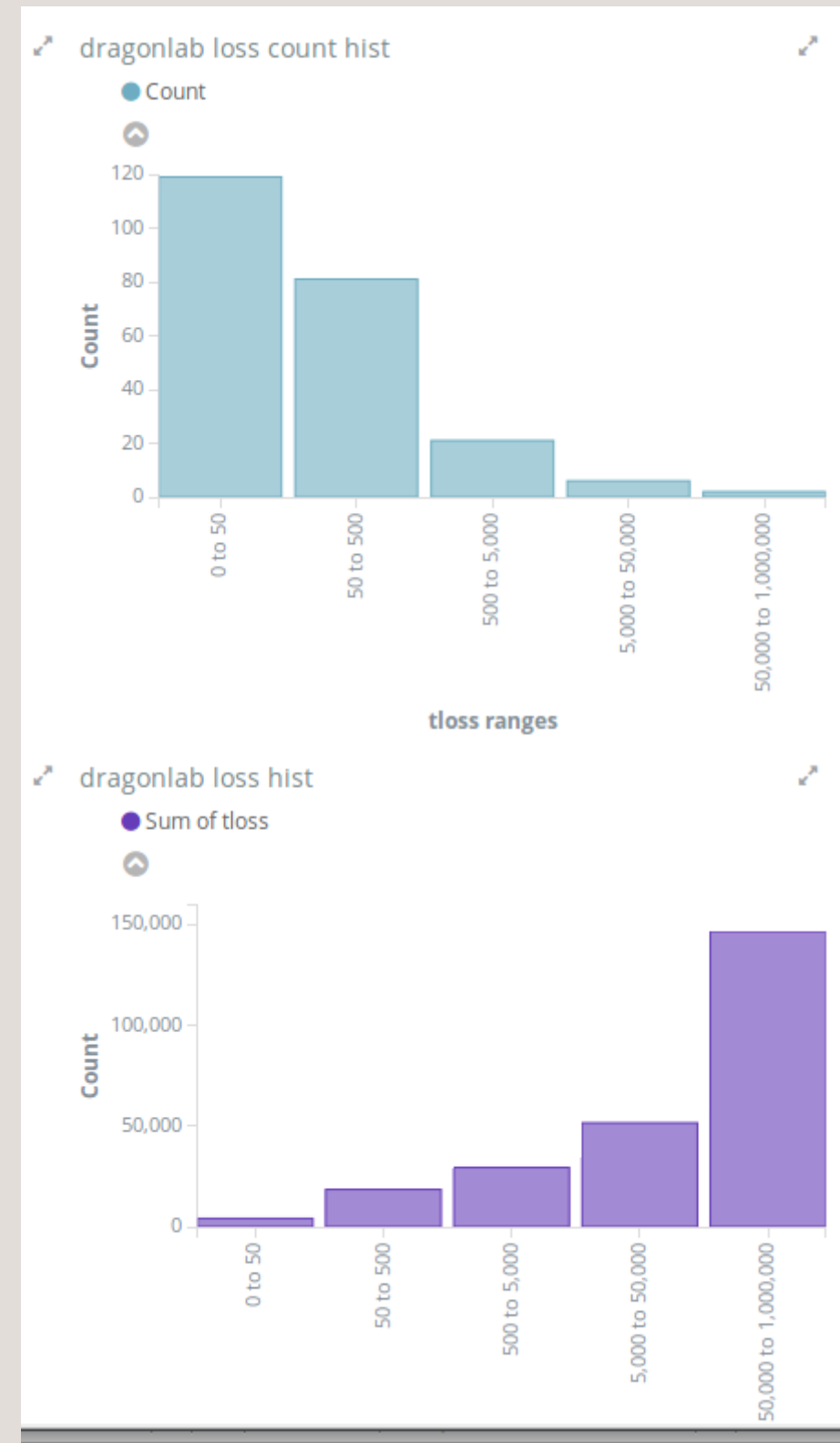
↗ count dragonlab



- **Typical week – outages longer than .5 seconds**
 - 1.5 hours time lost in 546 end to end outages
 - Might be the same actual outage – hitting many
- **Reasons - to be found**
 - Site power loss – 12 minutes
 - Router upgrade 2 minutes
 - Fiber instability (10*1 min) ..
- **Oddities**
 - Old packets sent on when link comes up – hours afterwards
 - Tails of routing loops

Zero reroute time vision ?

- Operations
 - Minimize effects
 - Operationalize stats
- Engineering
 - BGP tuning
 - Lower timers
 - Faster reroutes (PIC)
- Measure and learn
 - Measure across BGP boundaries
 - Inform NOC's about observations
- Improve protocols and routers ?

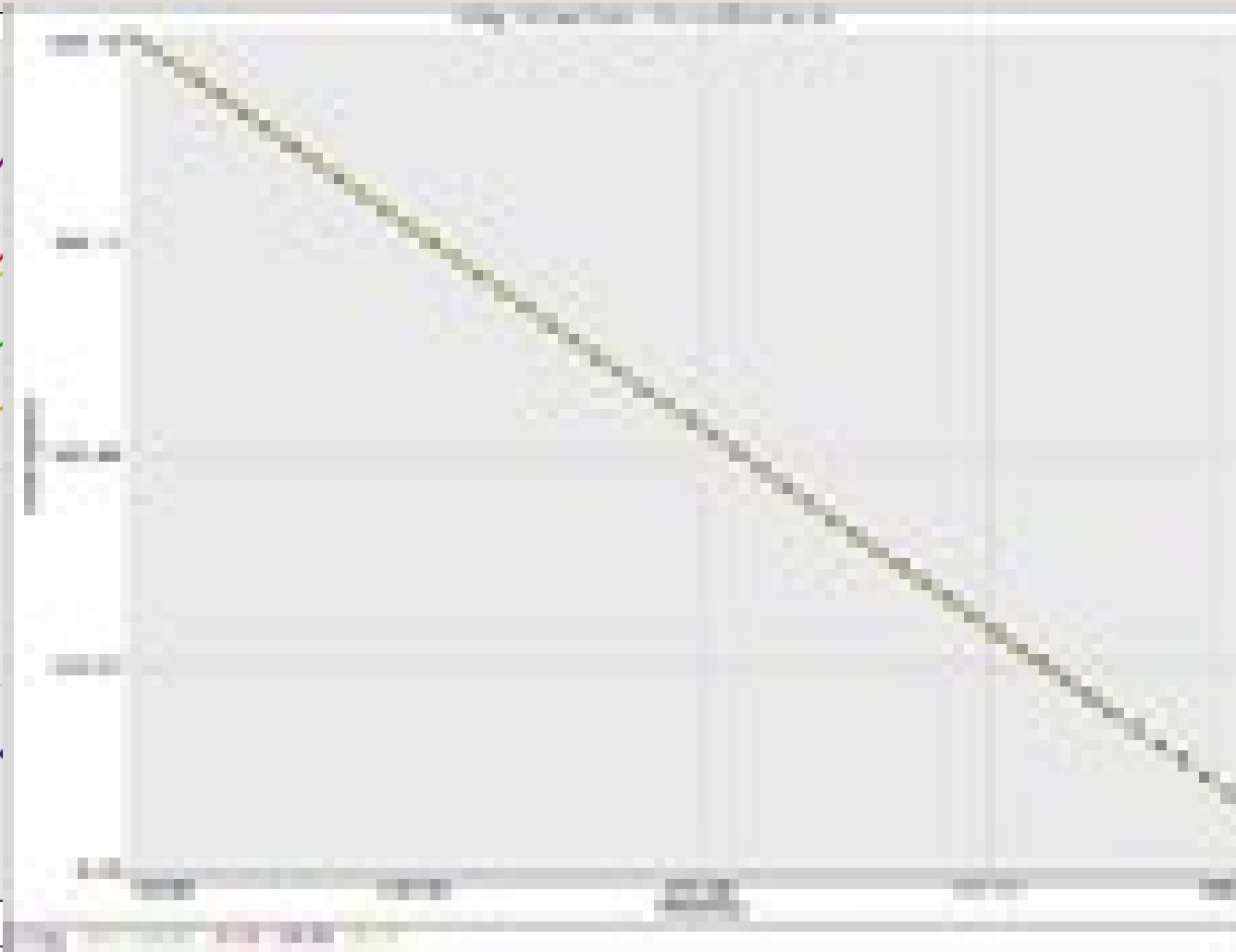
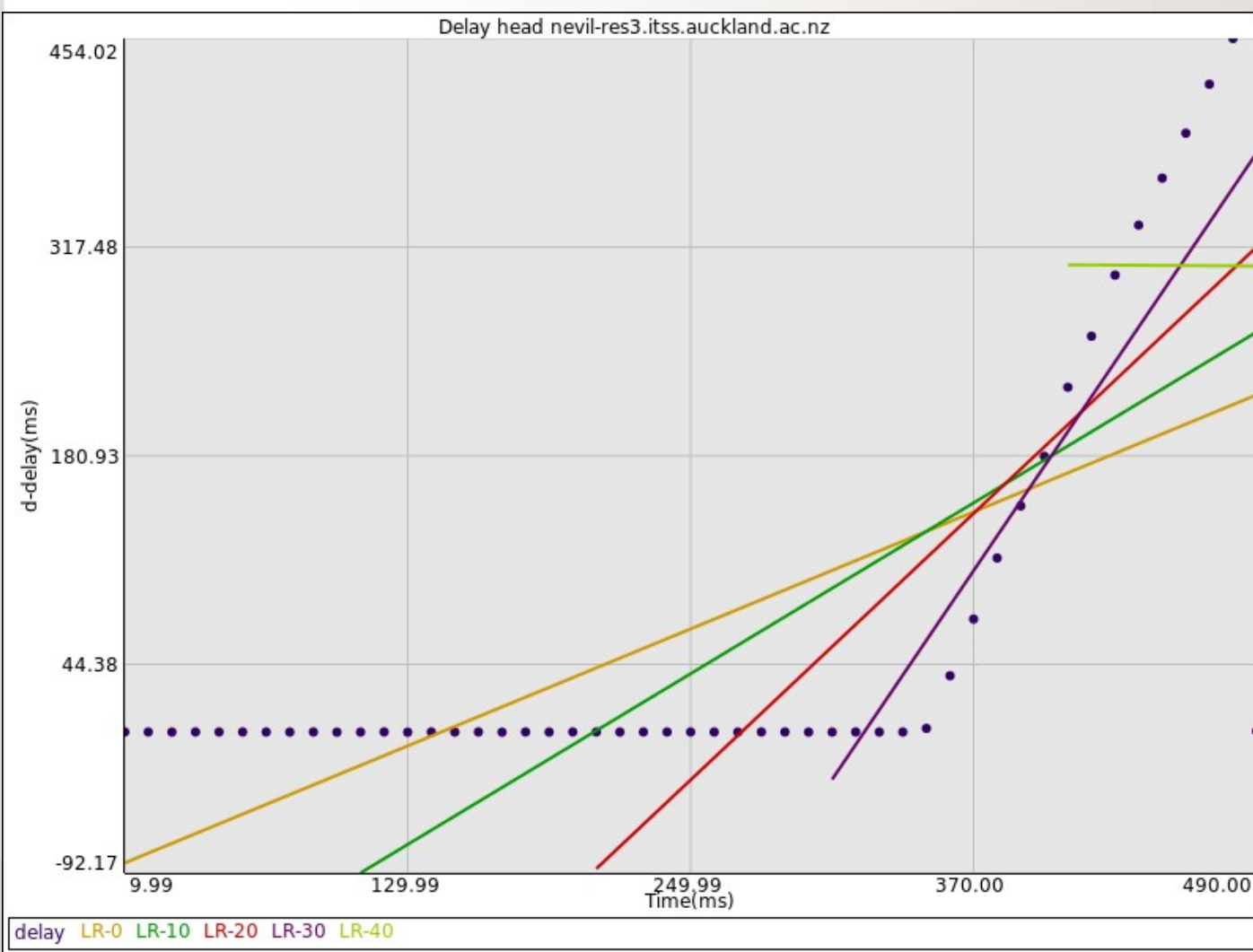


So what ?

- We manage our own networks
 - Mind our own business ..
- How to manage the Internet ?
 - Work on the routing ?
 - Operationalize measurements – perfSonar ?
- Web site : <http://in.uninett.no/dragonlab/>

Thanks !

Delay patterns around loss - congestion



Tracing rerouting

Traceroute charts /dragonlab/mp/trondheim-mp/20170626/trace/

Previous Next Up Raw traceroute Loss summary

Topology

Hops

Docs

