

Mobile broadband reliability: a user perspective

N RNET

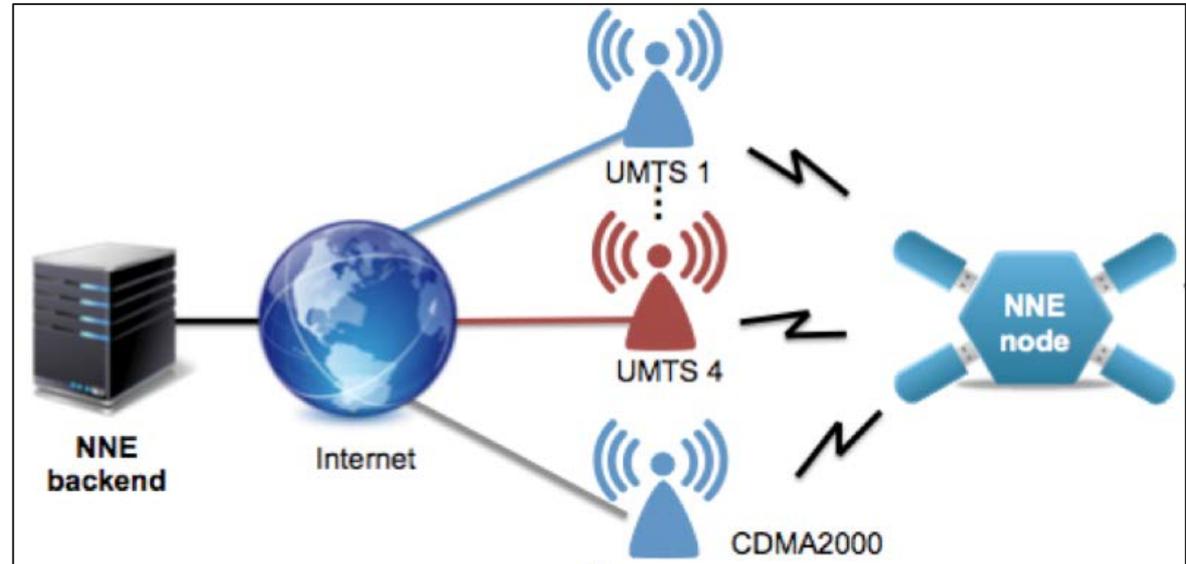
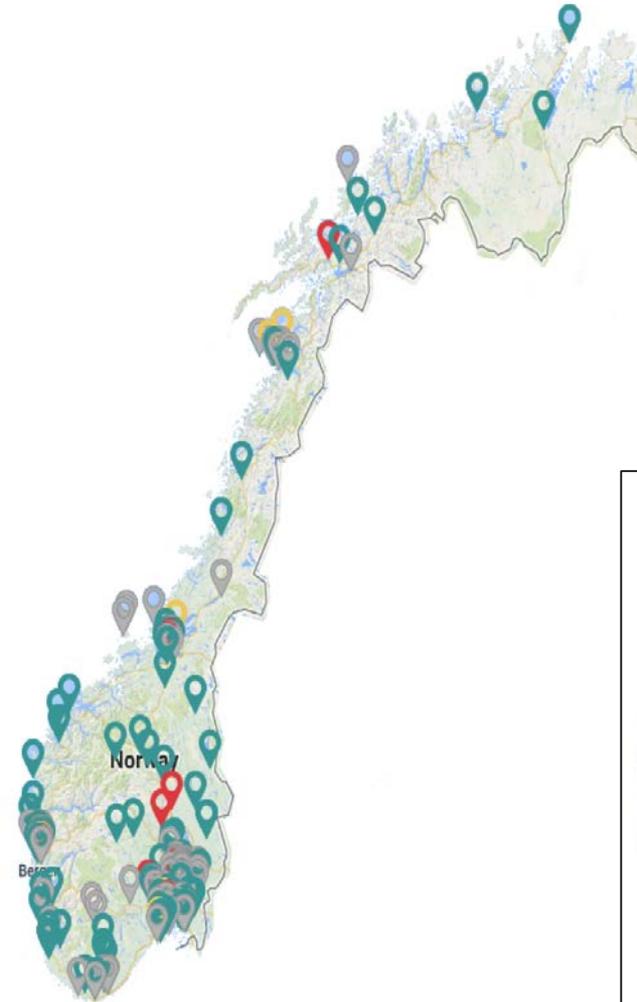
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Nornet-Edge is a country-wide stationary infrastructure for measuring mobile broadband

- ◆ About 300 measurement nodes
- ◆ Five operators (4 UMTS+1 CDMA2000 1x Ev-DO)
- ◆ Fully operational since July 2013

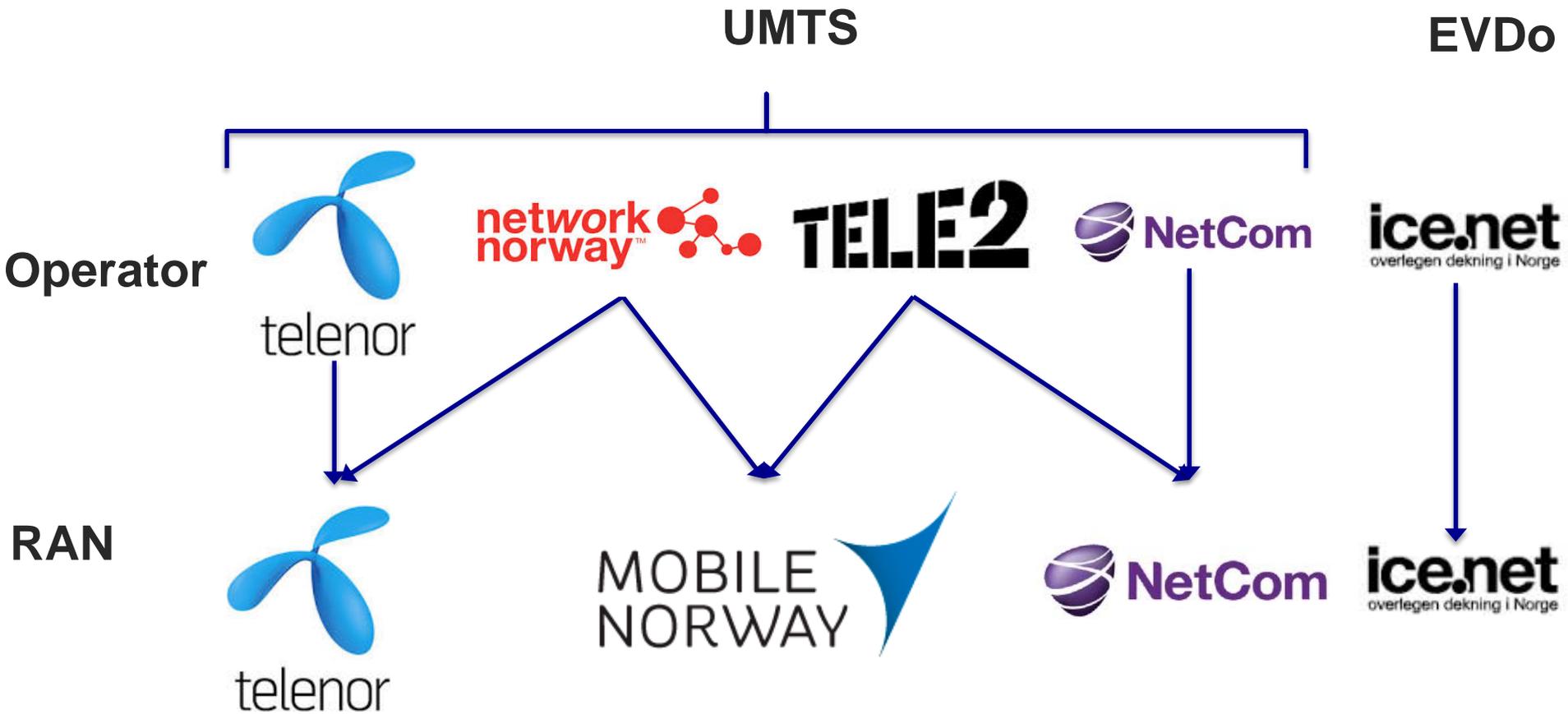


Reliability is a complex notion encompassing several stability and performance metrics

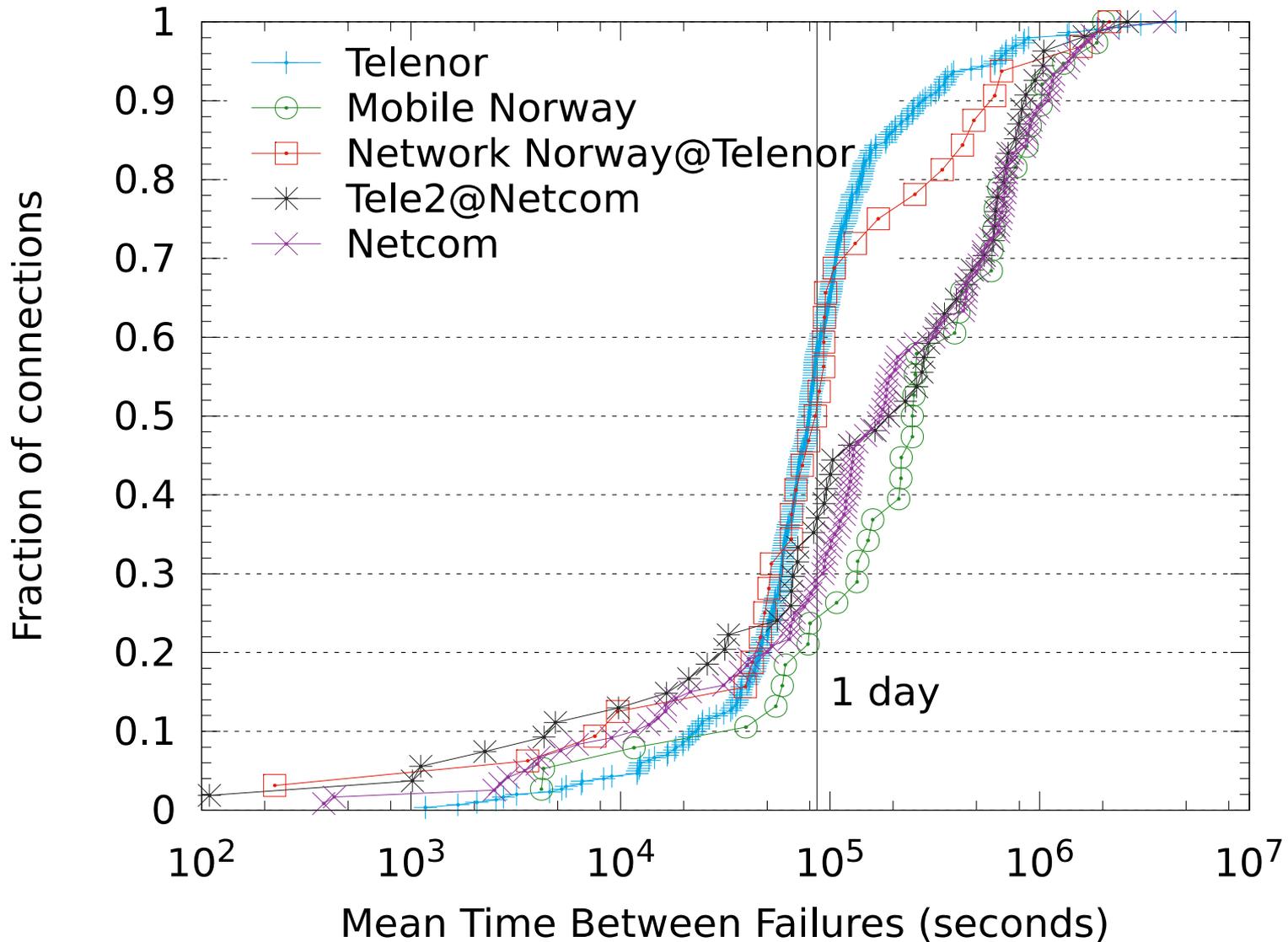
- ◆ The stateful nature of mobile networks adds to the complexity
- ◆ Reliability needs to be assessed at multiple levels

	User experience	OSI layer	Metrics
User value ↑	Performance reliability	Application layer	HTTP throughput, VoIP success rate
	Data plane reliability	Network layer	Packet loss, loss runs, large events
	Network reliability	Link layer	Connection failures, radio conditions

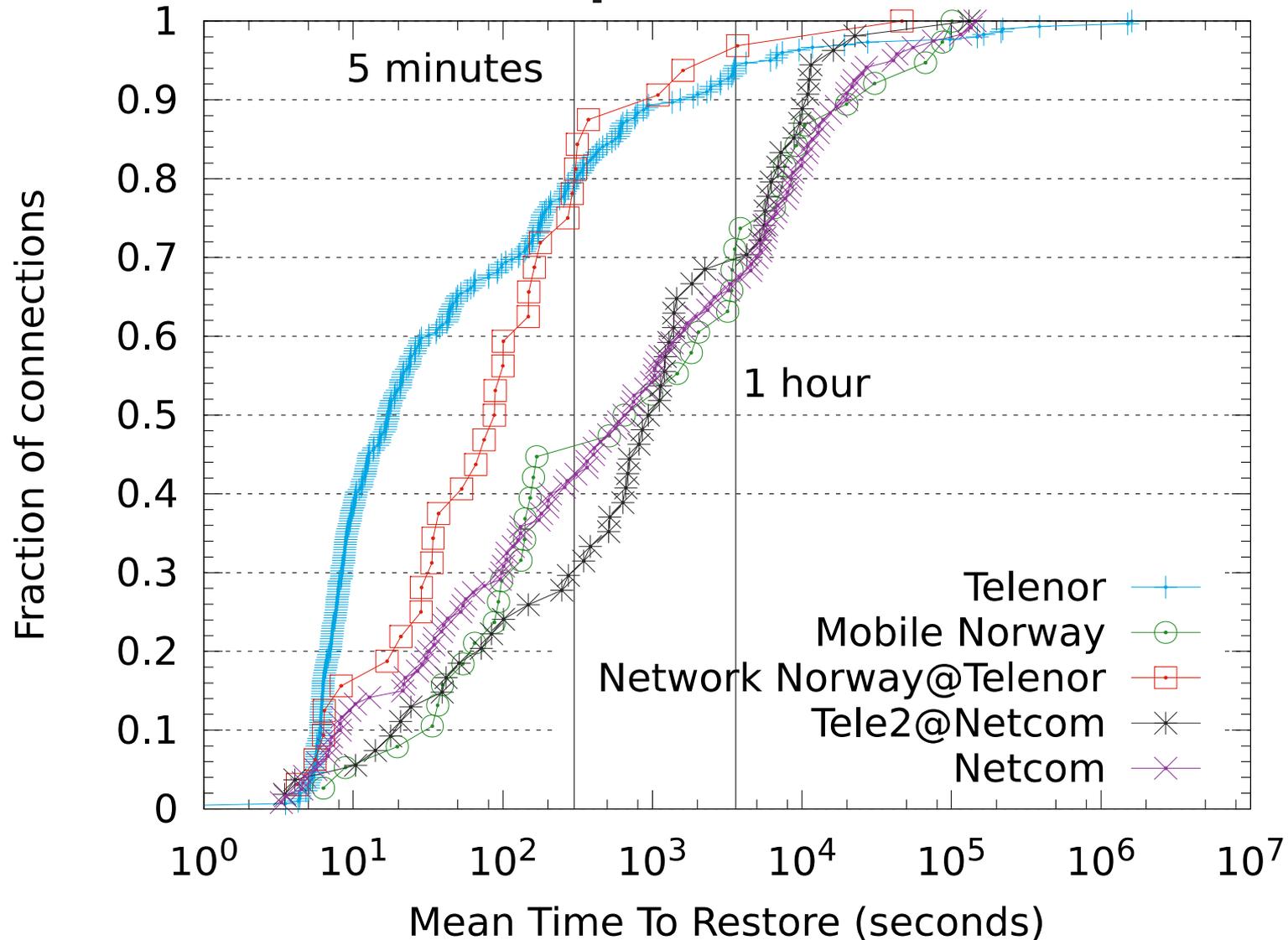
A quick guide to the networks we measure



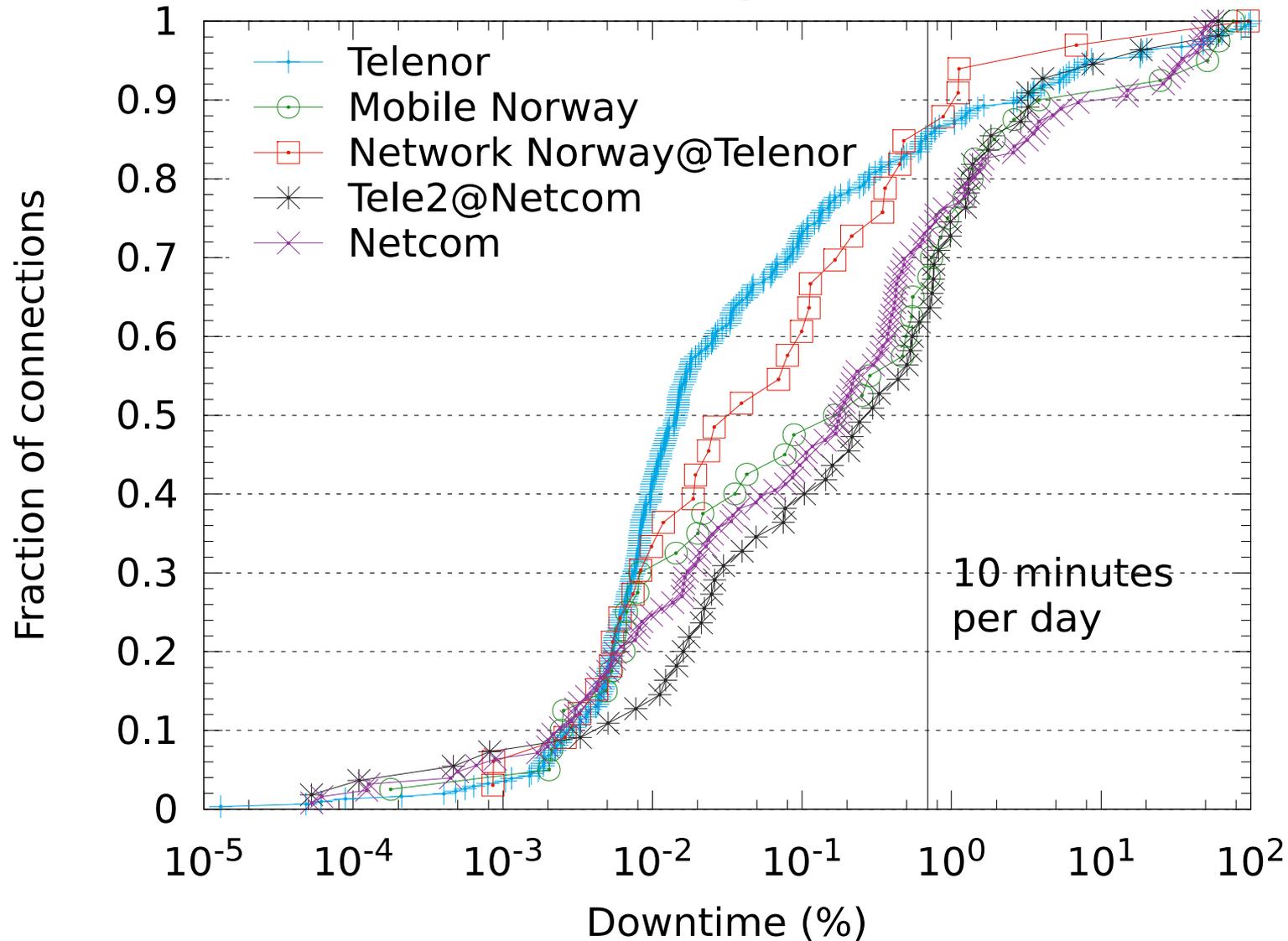
Connection stability varies widely across operators



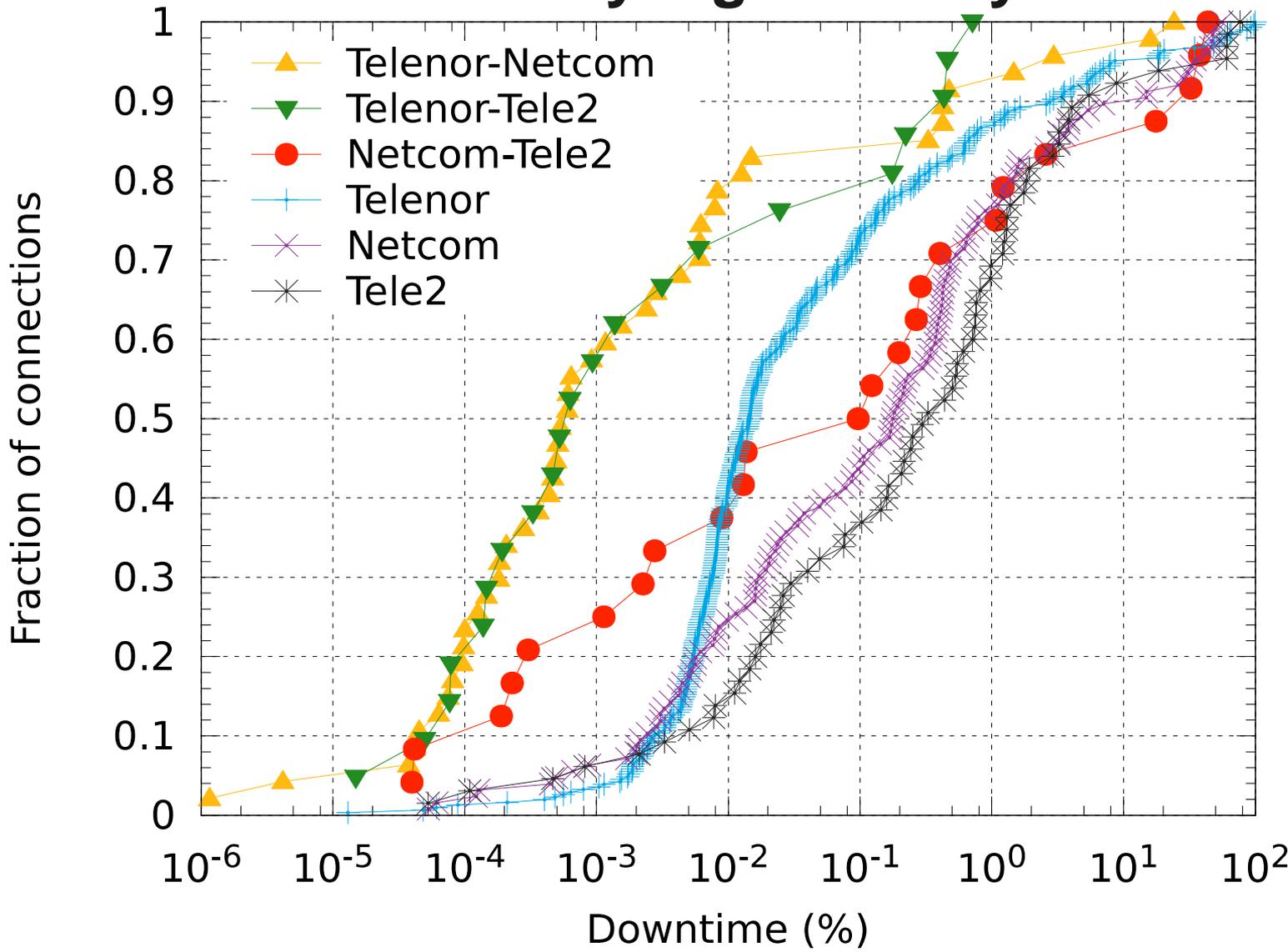
Connection recovery also varies widely across operators



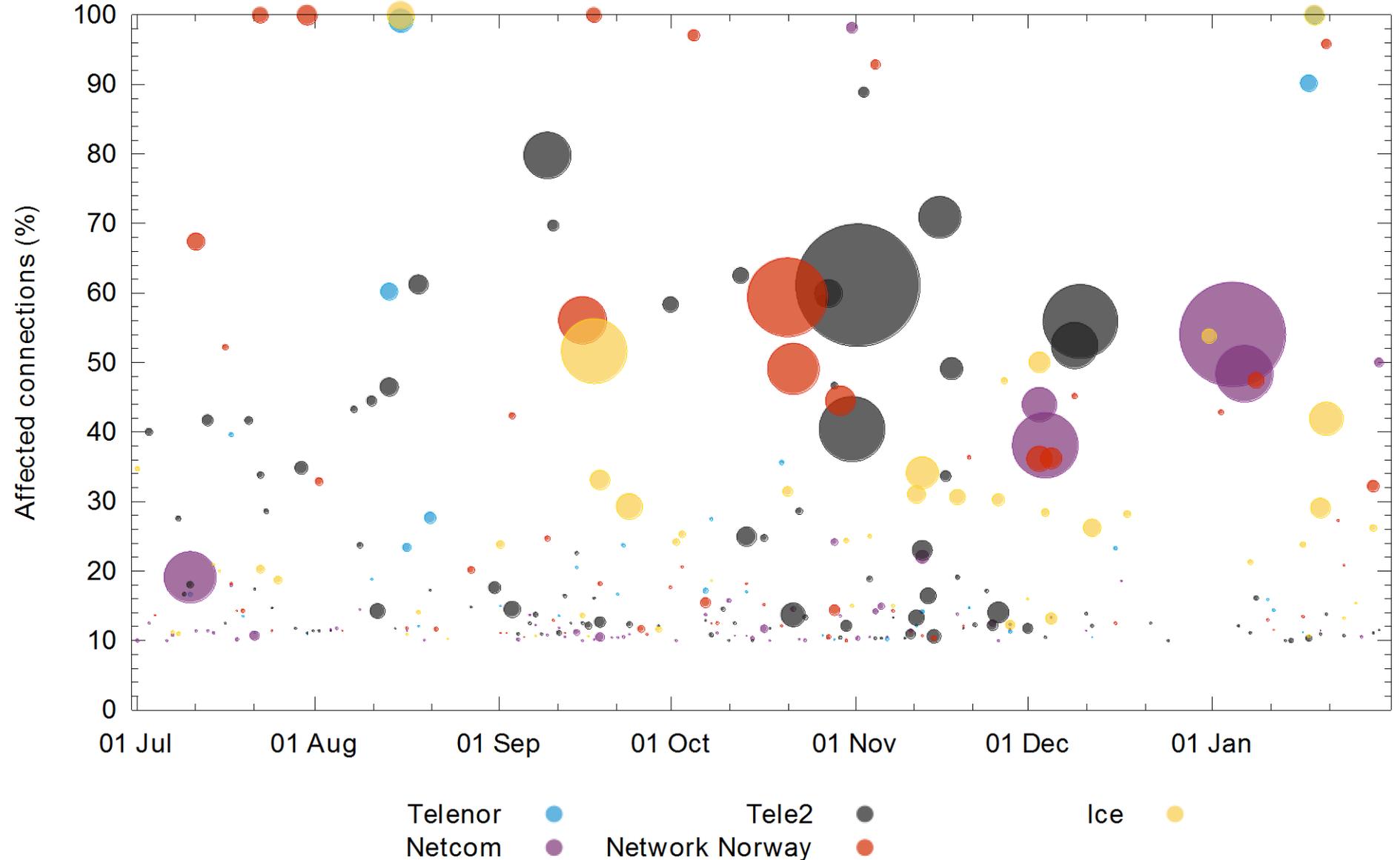
Clear differences in connection-stability between operators and as expected high dependency on the RAN



Leveraging multi-connectivity enhances connection-stability significantly



Independent Measurements can help operators identifying problems that are hard to spot using network-side monitoring



Data sharing policy ?

- ◆ Not available publicly yet, but no restrictions we just need to talk 😊
- ◆ We are also open if you want to run experiments on our infrastructure

Input from the workshop

- ◆ Feedback on the framework and metrics
- ◆ I would like to discuss infrastructure-based measurements vs user-initiated measurements and measurements apps

Questions ?

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