

# Strategies to drastically improve congestion control in high performance data centers: next steps for RDMA

Jesus Escudero Sahuquillo (UCLM), Pedro Javier García (UCLM),  
Francisco J. Alfaro (UCLM), Francisco J. Quiles (UCLM)  
and Jose Duato (UPV)

E-mail: [jesus.escudero@uclm.es](mailto:jesus.escudero@uclm.es)

UCLM: University of Castilla-La Mancha, Spain

UPV: Universitat Politècnica de València, Spain

# Executive summary

In current high-speed Datacenter Networks (DCNs), Remote Direct Memory Access (RDMA) has become the dominant network technology. Congestion control strategies are required to reduce the negative effects of congestion, such as Head-of-Line (HoL) blocking. Among the proposed solutions to mitigate congestion, Explicit Congestion Notification (ECN) and some solutions based on it, are the most popular ones.

Unfortunately, the ECN closed-loop mechanism is not able to react in a smooth way under most congestion scenarios. In this talk, we describe the effects that lead the ECN closed-loop mechanism to generate oscillations when congestion is notified to the NICs. We also propose several ideas to improve ECN based on some research we have conducted in the past years.

# Agenda

- Current congestion control (ECN)
- Consequences
- How can we improve it
- More detailed feedback
- Conclusions