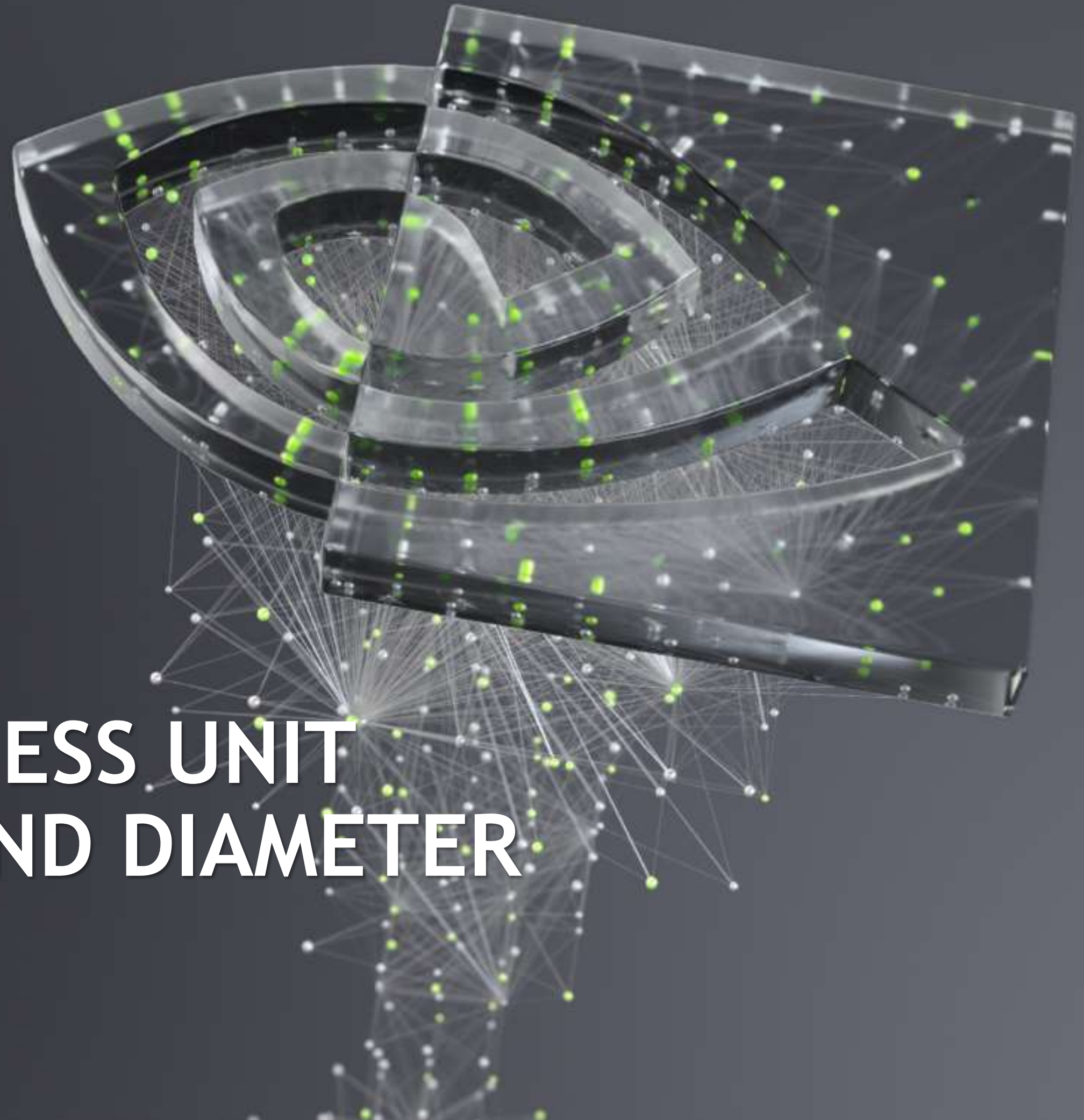


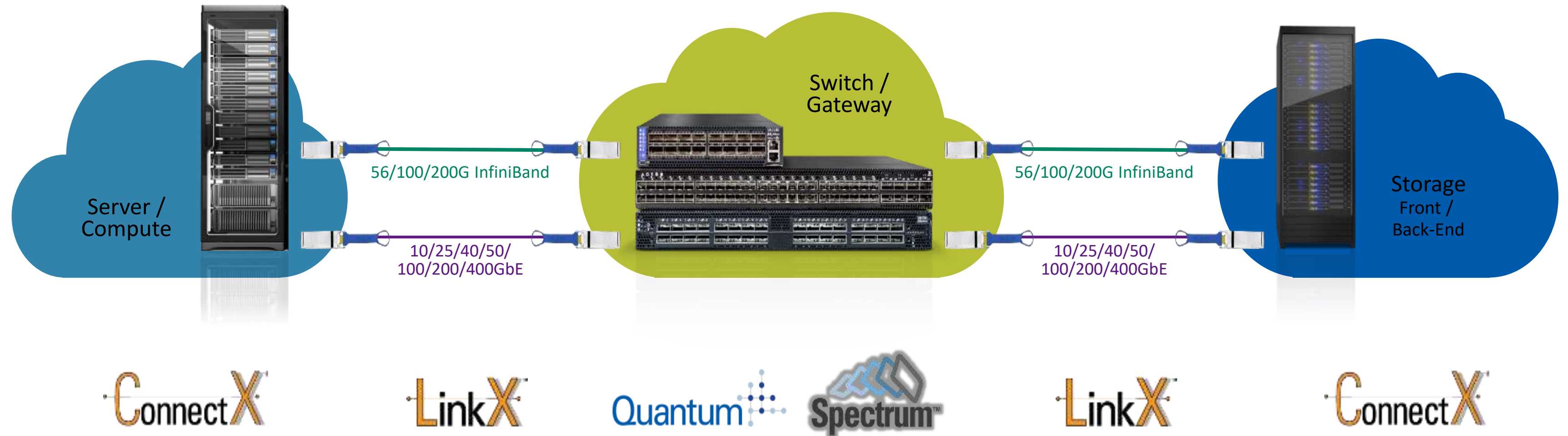


# NETWORKING BUSINESS UNIT SWITCH LATENCY AND DIAMETER

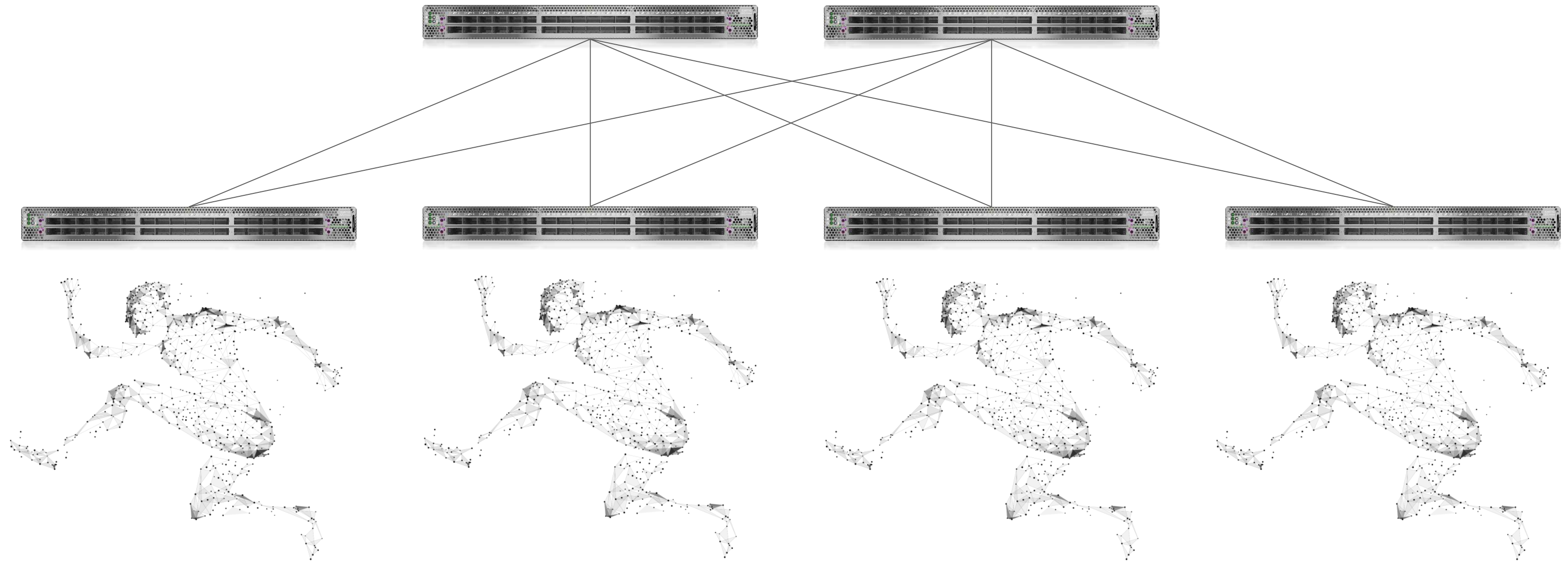
Darren J. Harkins, June 2020



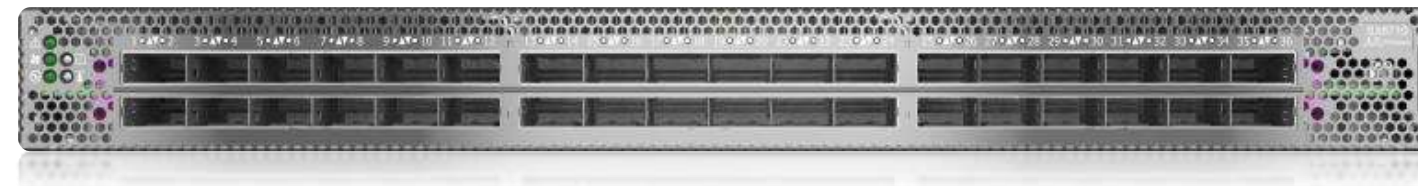
# LEADING SUPPLIER OF END-TO-END INTERCONNECT SOLUTIONS



# RUNNING FAST JOBS ON A CLUSTER

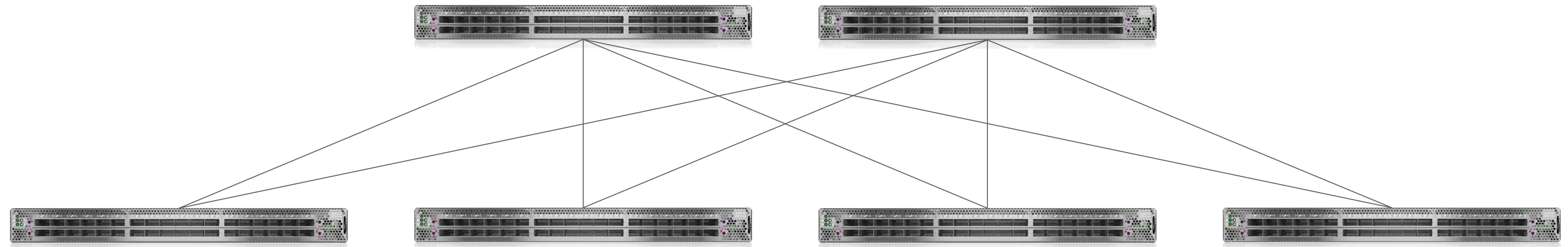


# SWITCH NETWORKS



- One Switch
- 36 port switch
- Maximum 36 nodes at 100Gb/s
- 110ns any node to any node

# SWITCH HOPS

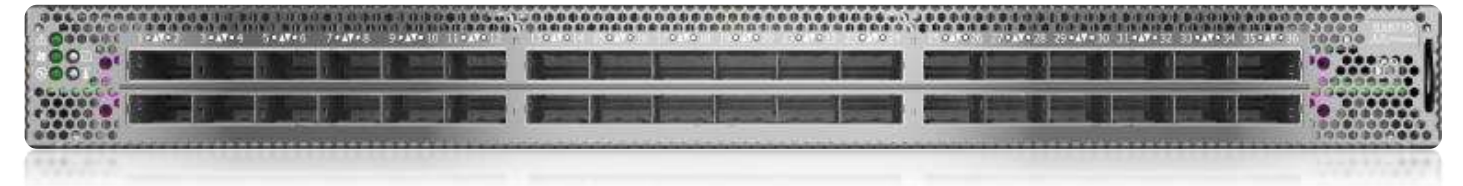


- Six 36 port Switches
- 18 Servers per switch
- 72 nodes at 100Gb/s
- 110ns any node to any node on the same switch
- 350ns any node to any node on different switches



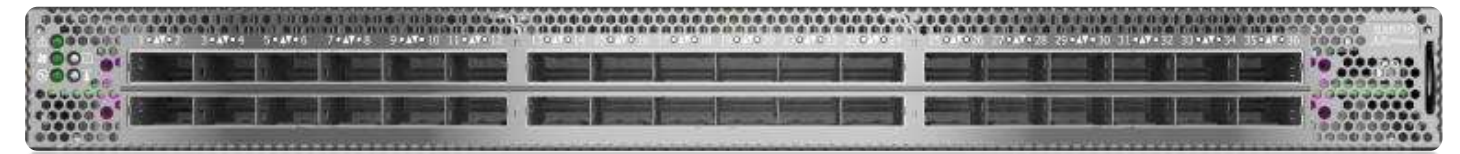
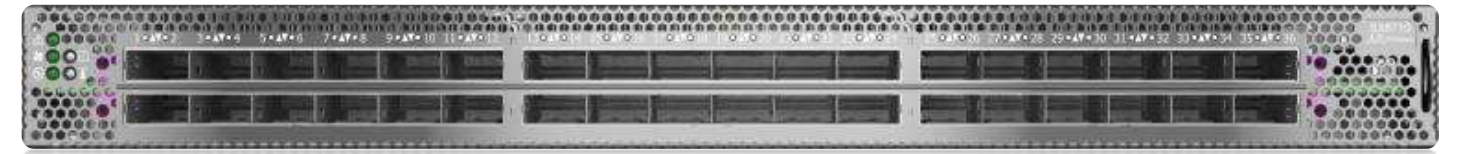
# SWITCH LATENCY

- FDR - 56Gb/s
  - 190ns



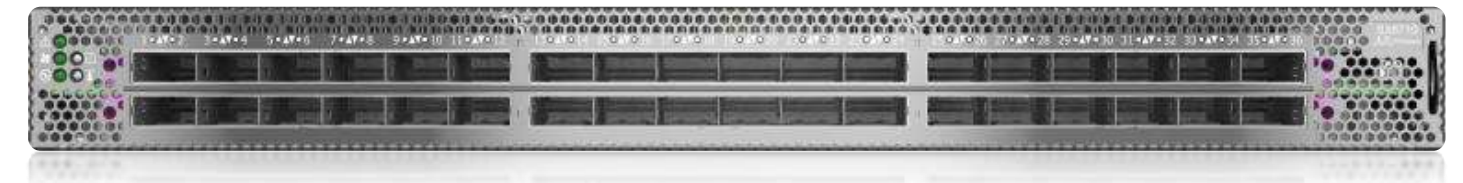
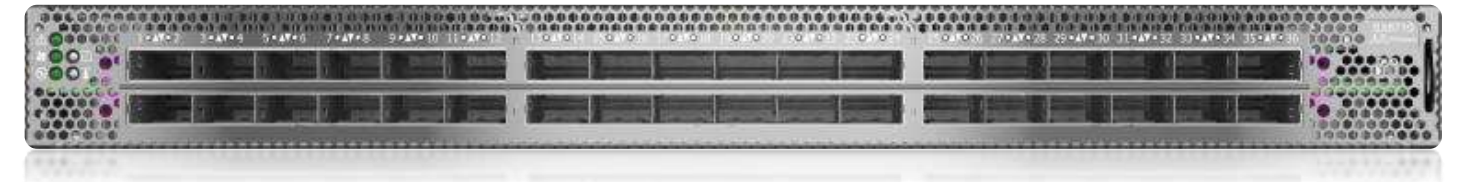
# SWITCH LATENCY

- FDR - 56Gb/s
  - 190ns
- EDR - 100Gb/s
  - 110ns



# SWITCH LATENCY

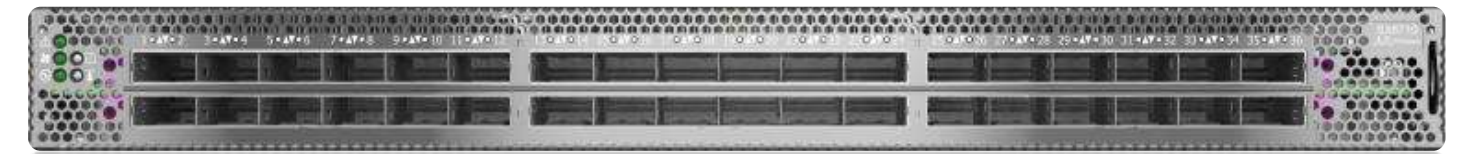
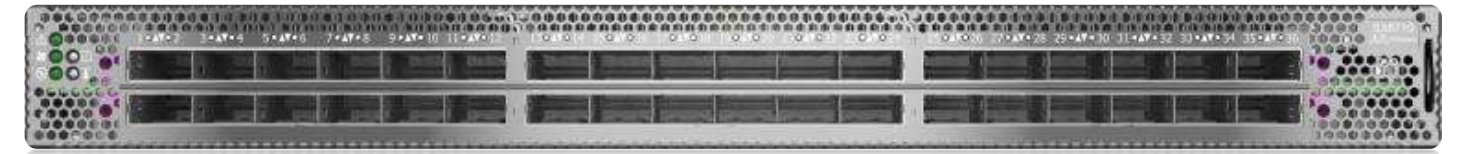
- FDR - 56Gb/s
  - 190ns
- EDR - 100Gb/s
  - 110ns
- HDR - 200gb/s
  - 110ns





# SWITCH LATENCY

- FDR - 56Gb/s
  - 190ns
- EDR - 100Gb/s
  - 110ns
- HDR - 200Gb/s
  - 110ns
- NDR - 400Gb/s
  - 150ns

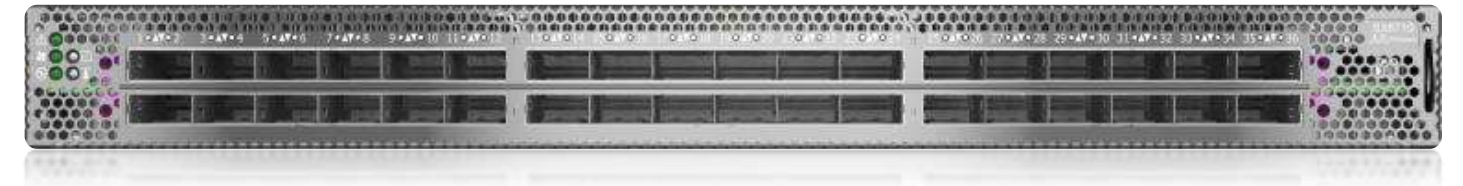


# SO - HOW DO WE MAKE THINGS BETTER/BIGGER?

- We cannot change the laws of physics

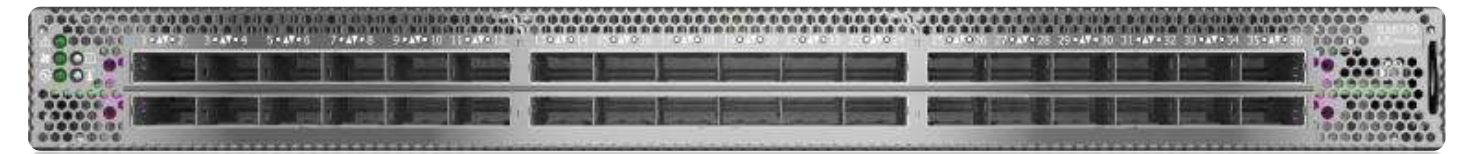
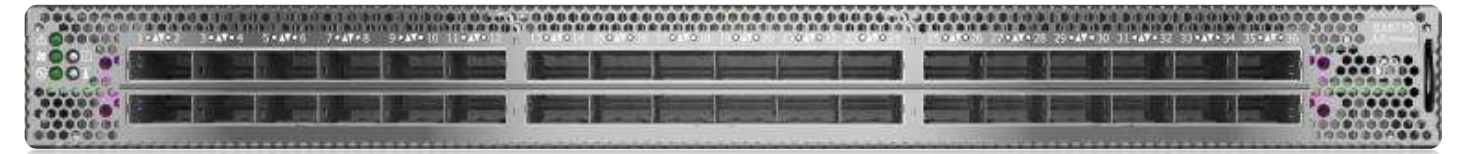
# SWITCH DIAMETER

- FDR - 56Gb/s
  - 36 ports



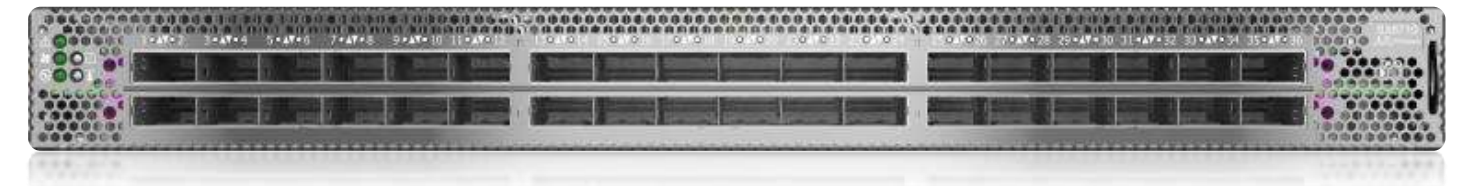
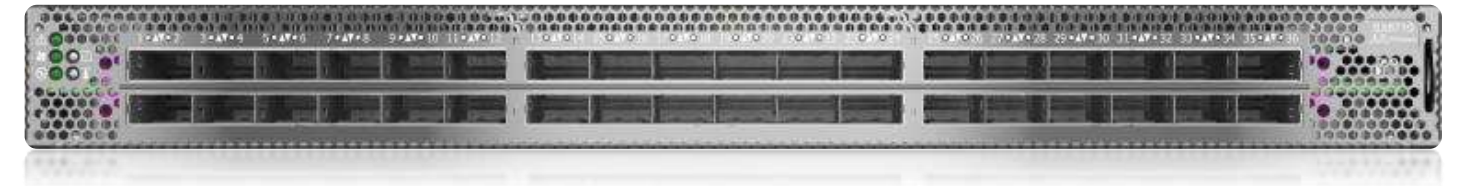
# SWITCH DIAMETER

- FDR - 56Gb/s
  - 36 ports
- EDR - 100Gb/s
  - 36 ports



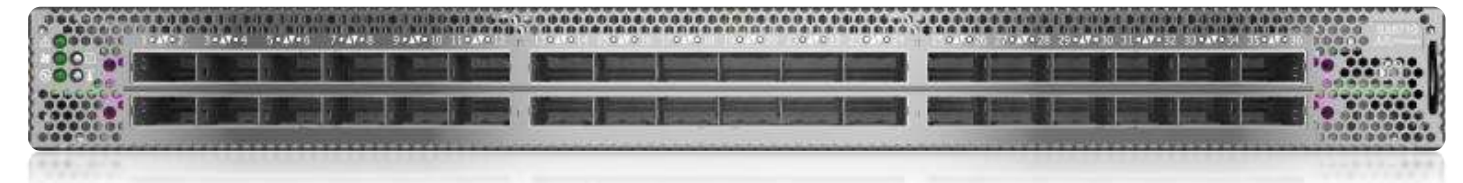
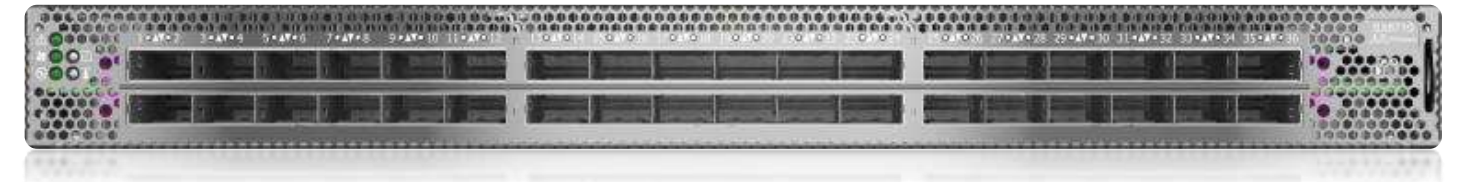
# SWITCH DIAMETER

- FDR - 56Gb/s
  - 36 ports
- EDR - 100Gb/s
  - 36 ports
- HDR - 200gb/s
  - 40 ports @ 200gb/s, 80 ports @ 100gb/s



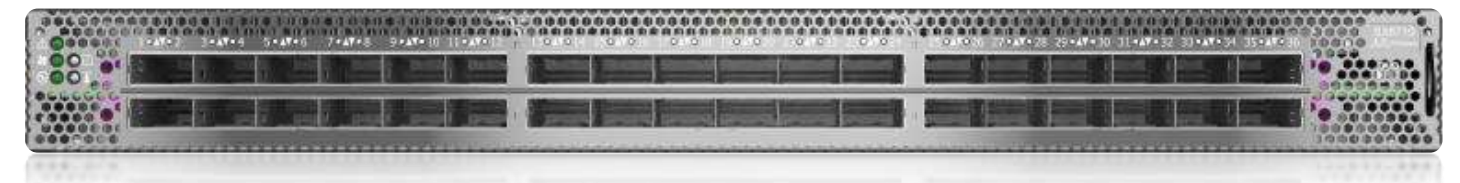
# SWITCH DIAMETER

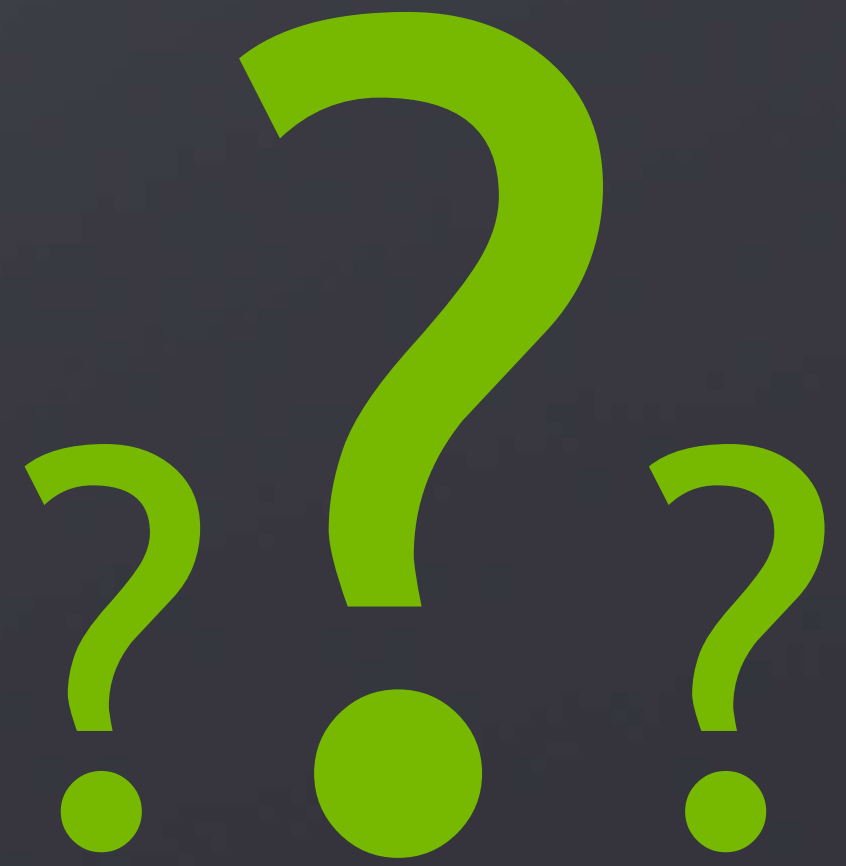
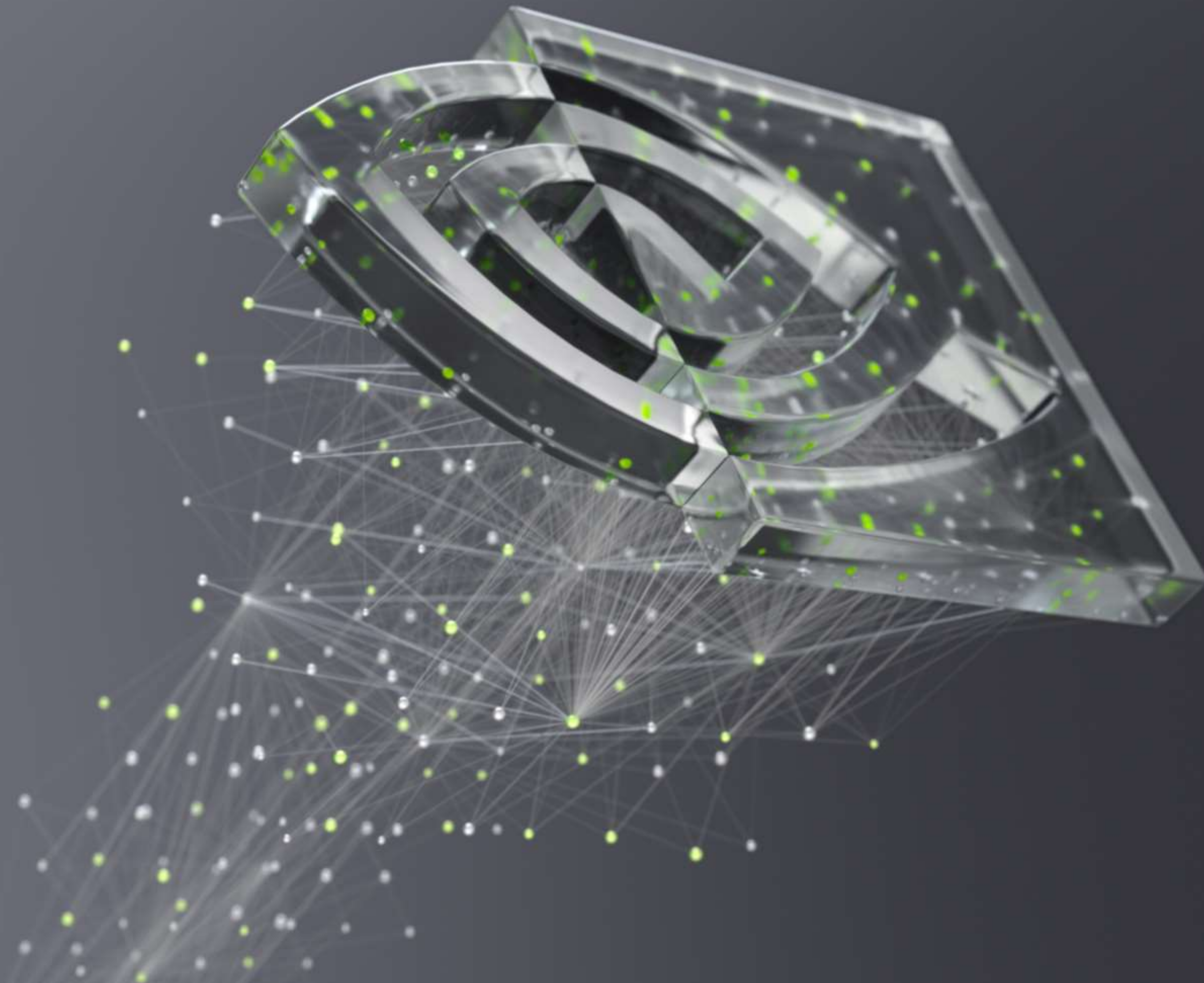
- FDR - 56Gb/s
  - 36 ports
- EDR - 100Gb/s
  - 36 ports
- HDR - 200gb/s
  - 40 ports @ 200gb/s, 80 ports @ 100gb/s
- NDR - 400Gb/s
  - 64 ports @ 400gb/s, 128 ports @ 200gb/s



# SWITCH DIAMETER

- EDR - 100Gb/s
  - 18 nodes @ 100Gb/s, 110ns
- HDR - 200gb/s
  - 20 nodes @ 200gb/s, 110ns
  - 40 nodes @ 100gb/s, 110ns
- NDR - 400Gb/s
  - 32 nodes @ 400gb/s, 150ns
  - 64 nodes @ 200gb/s, 150ns





Questions?



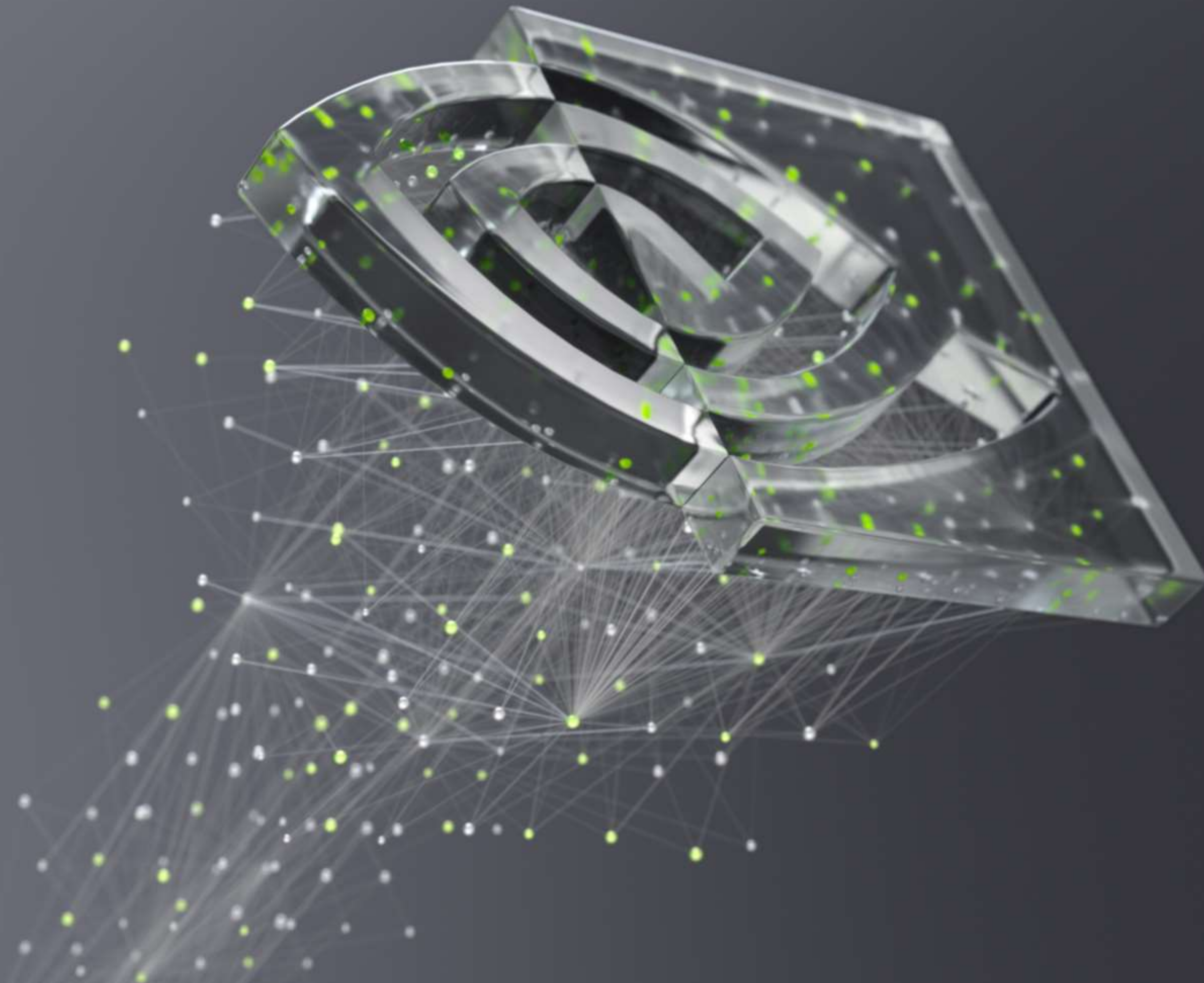




**Darren J. Harkins**  
Staff Systems Engineer  
[darren@nvidia.com](mailto:darren@nvidia.com)  
+44 7944 786208

**Thank You**





**nVIDIA**