

**“If you can dodge a wrench,
you an dodge a ball”**

June 13, 2015

**Dylan Stark
George Stelle**



*Exceptional
service
in the
national
interest*



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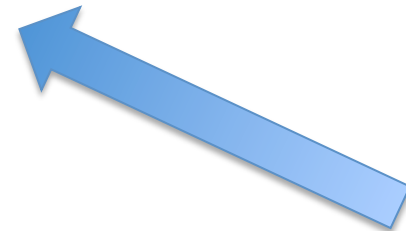
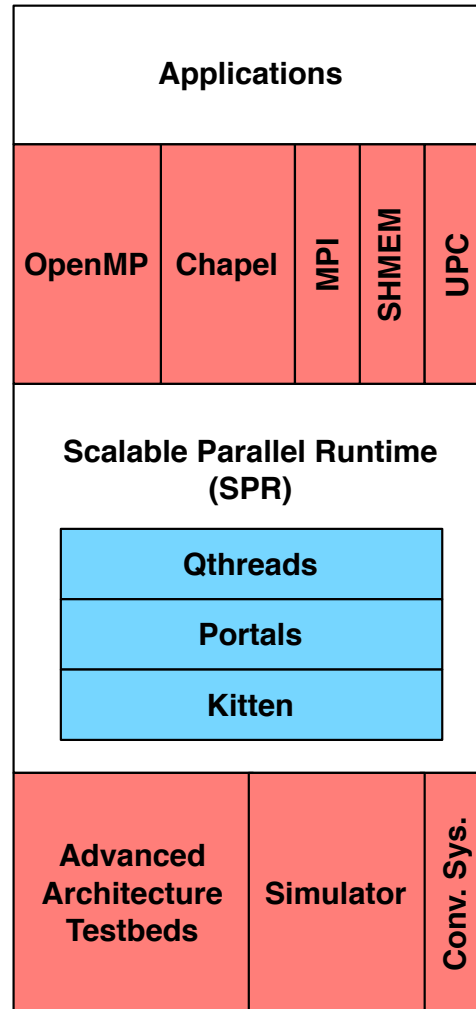
Requirements



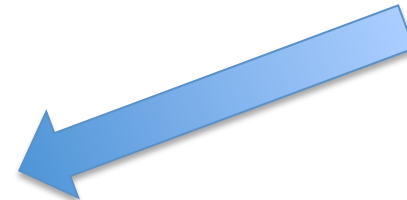
Wrench



Capabilities



Fun



“It is important to understand what you CAN DO before you learn to measure how well you seem to have DONE IT.”

–John Tukey

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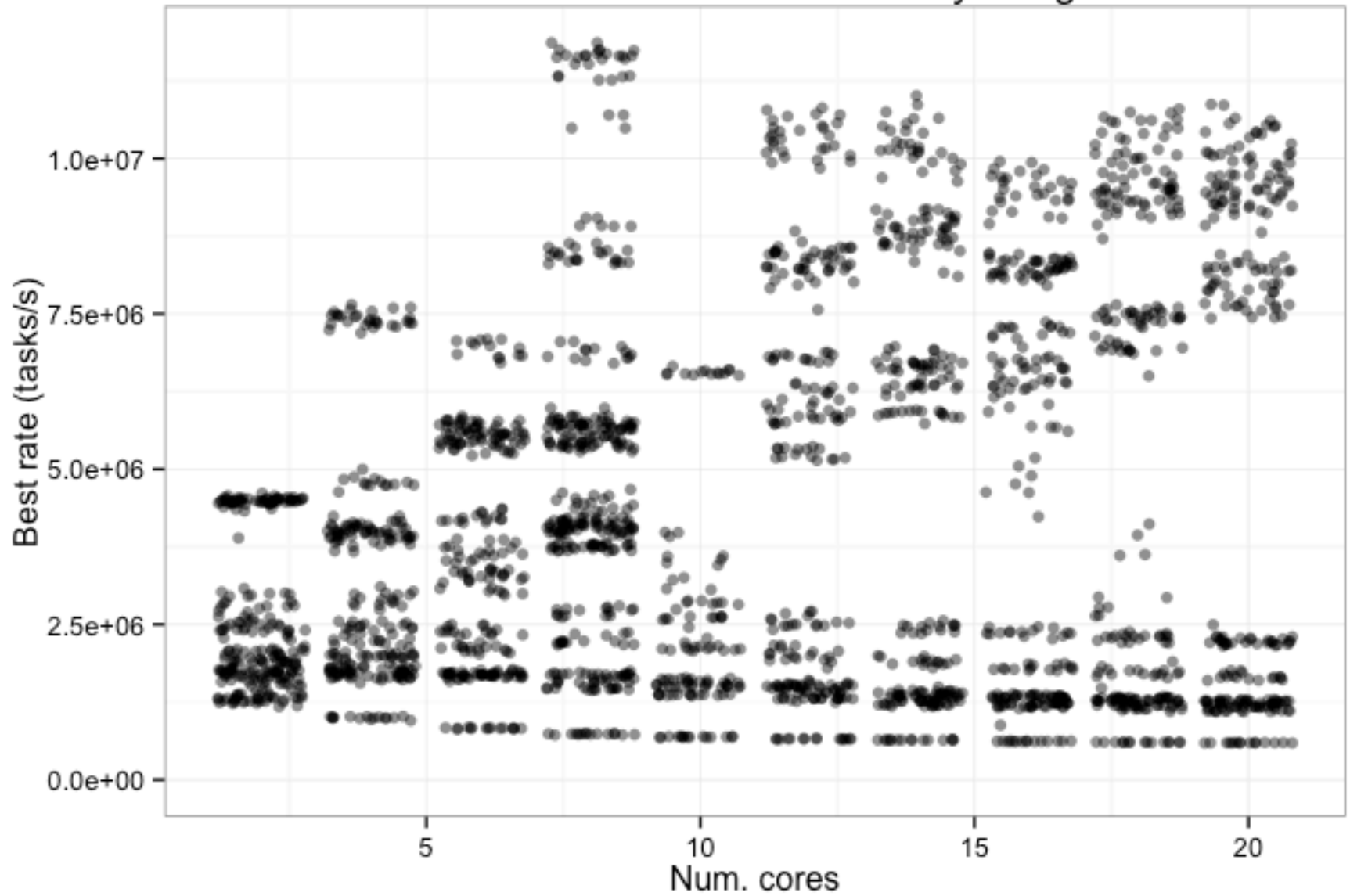
—John Tukey

START WITH THE BASICS:

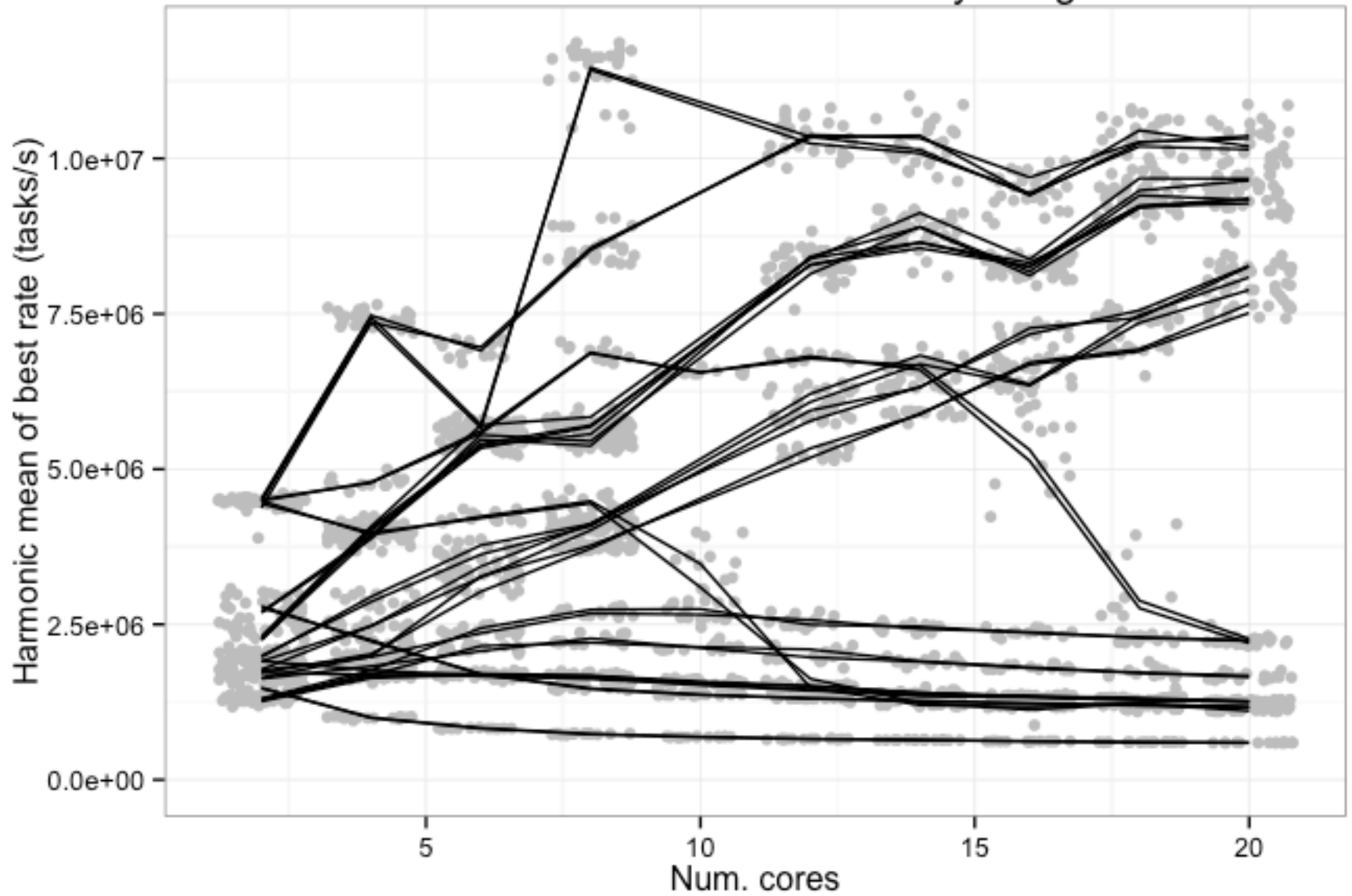
UNBALANCED TREE SEARCH (UTS)

INTEL XEON IVY BRIDGE (20-core dual-socket)

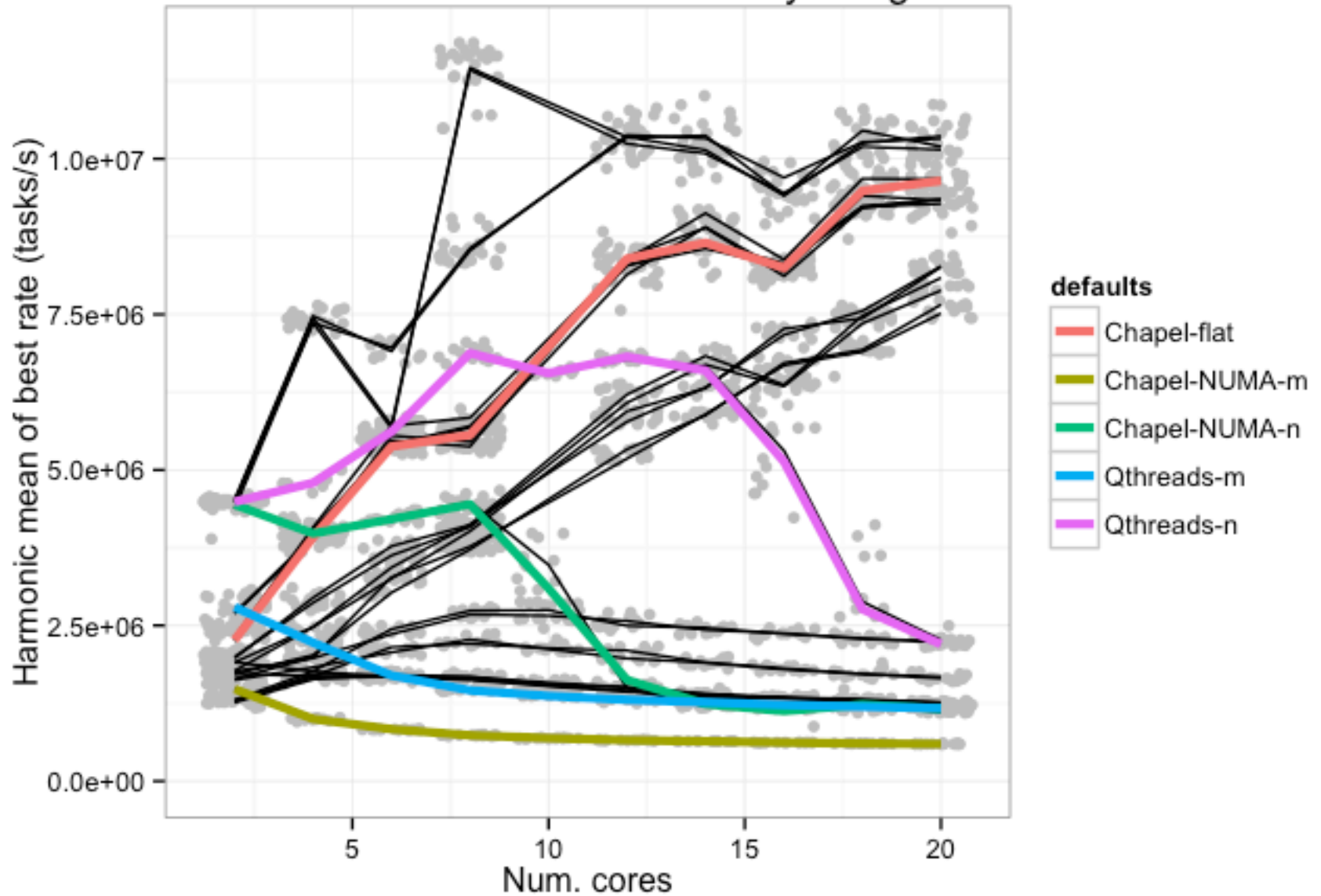
UTS on 20-core dual-socket Ivy Bridge



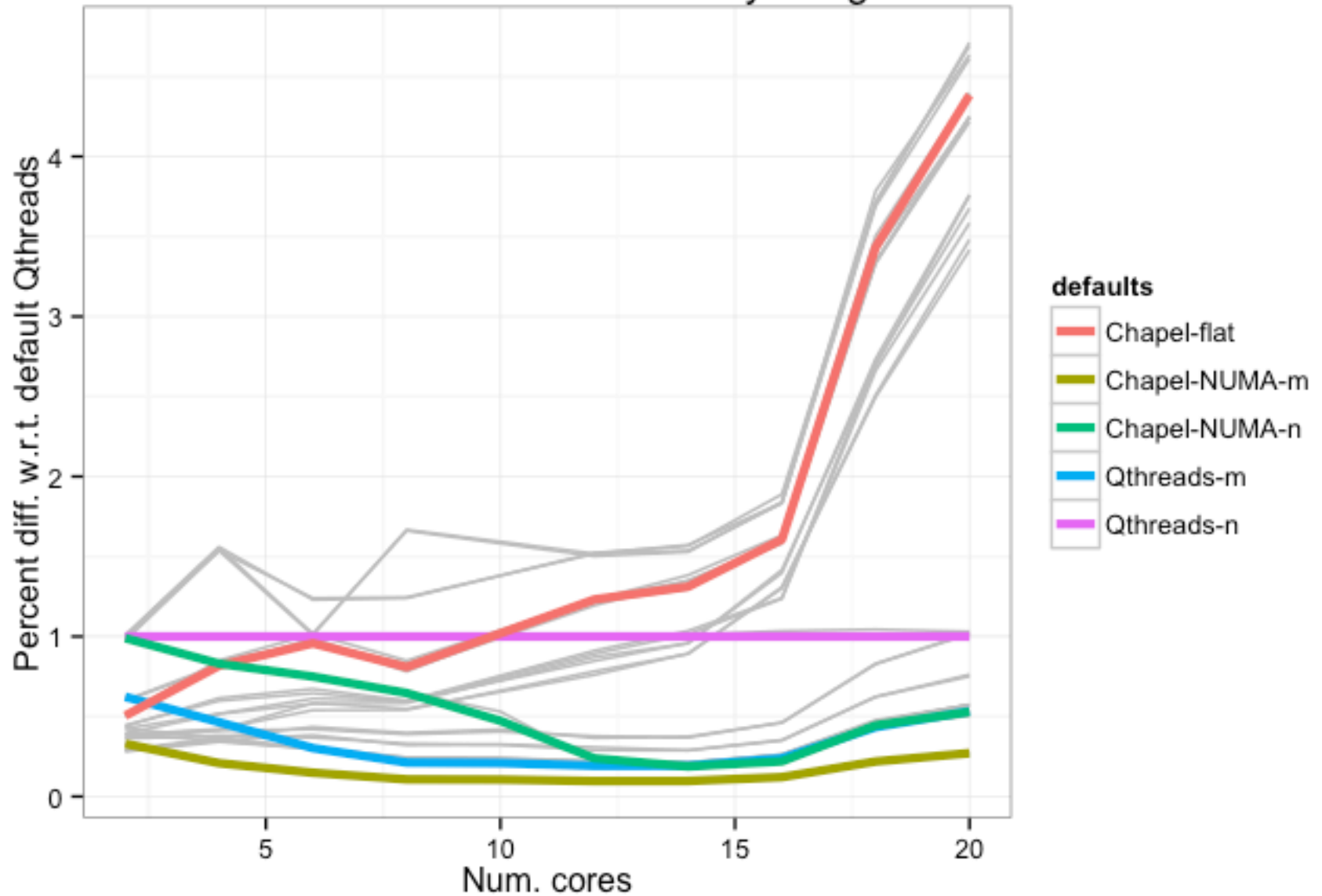
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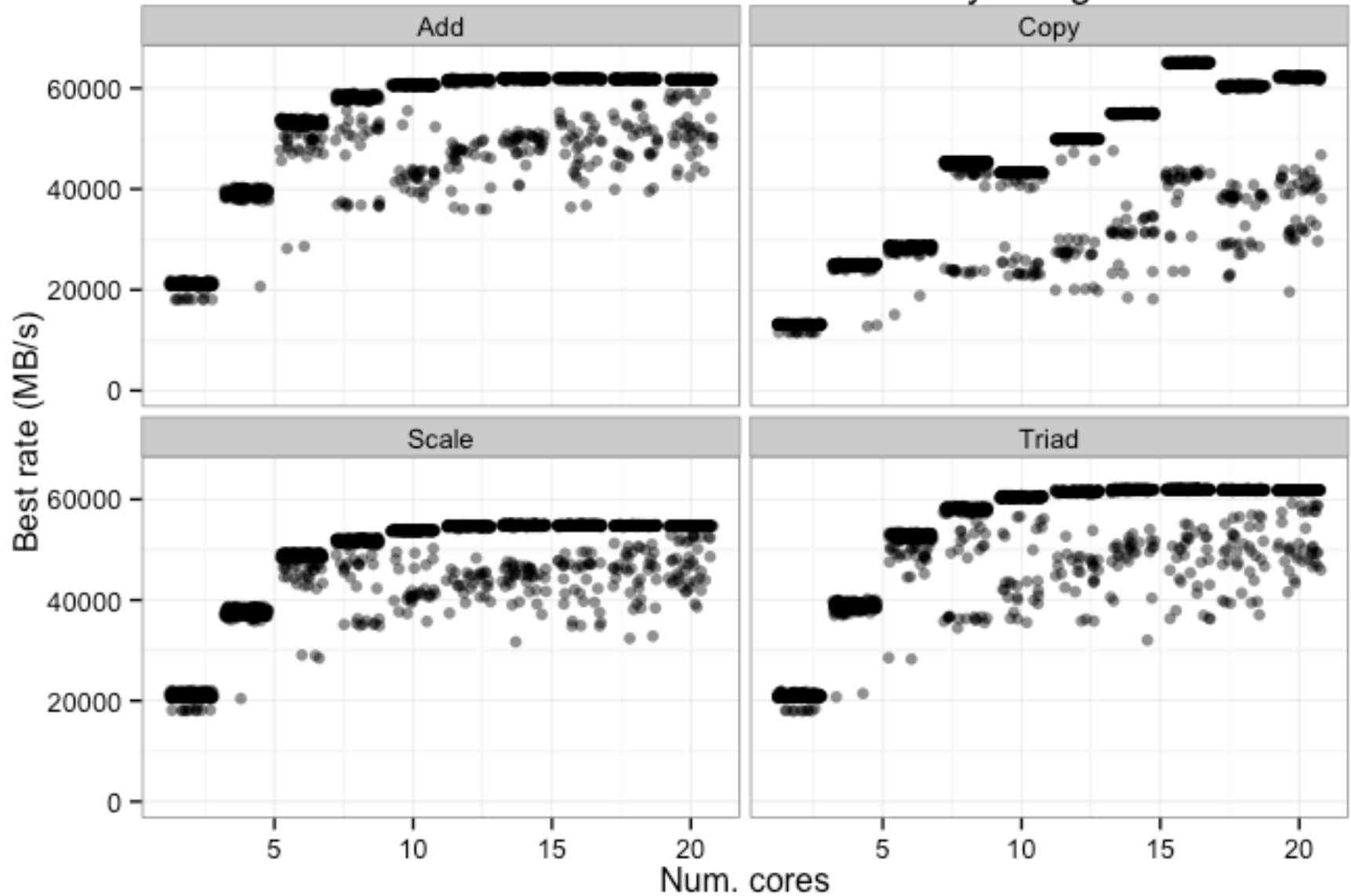
—John Tukey

CHANGE THE APPLICATION (REQUIREMENTS):

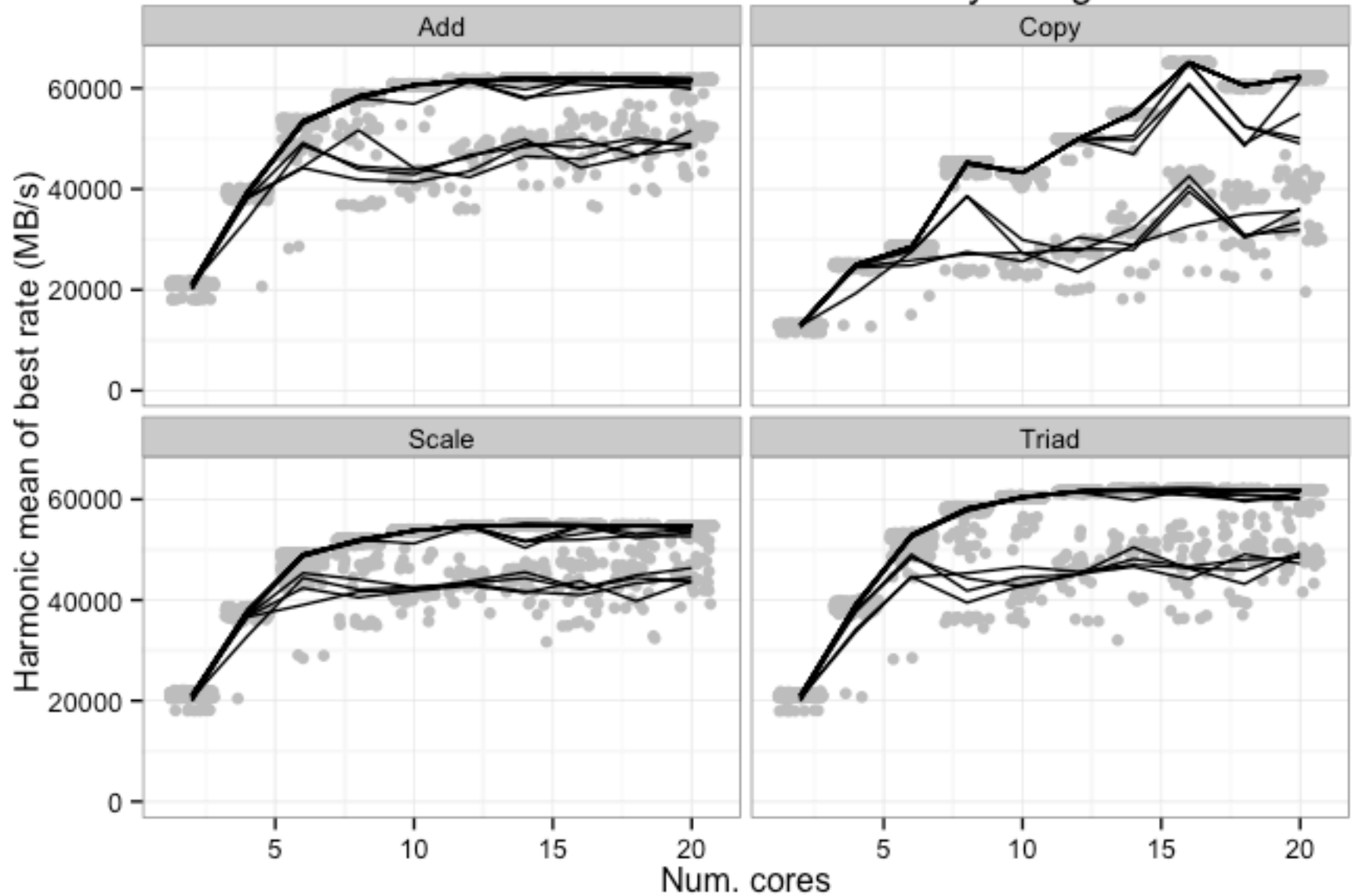
STREAM

INTEL XEON IVY BRIDGE (20-core dual-socket)

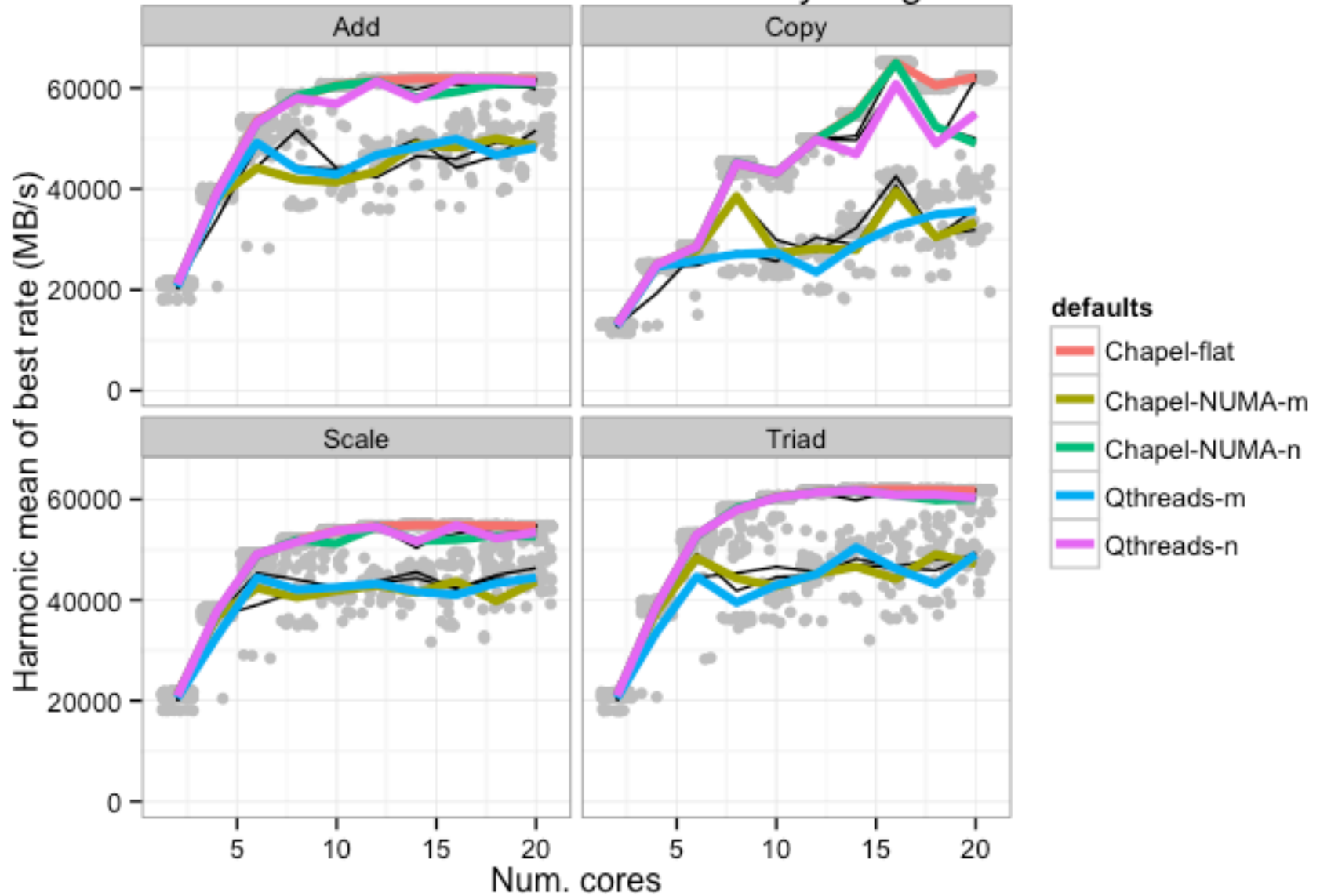
Stream on 20-core dual-socket Ivy Bridge



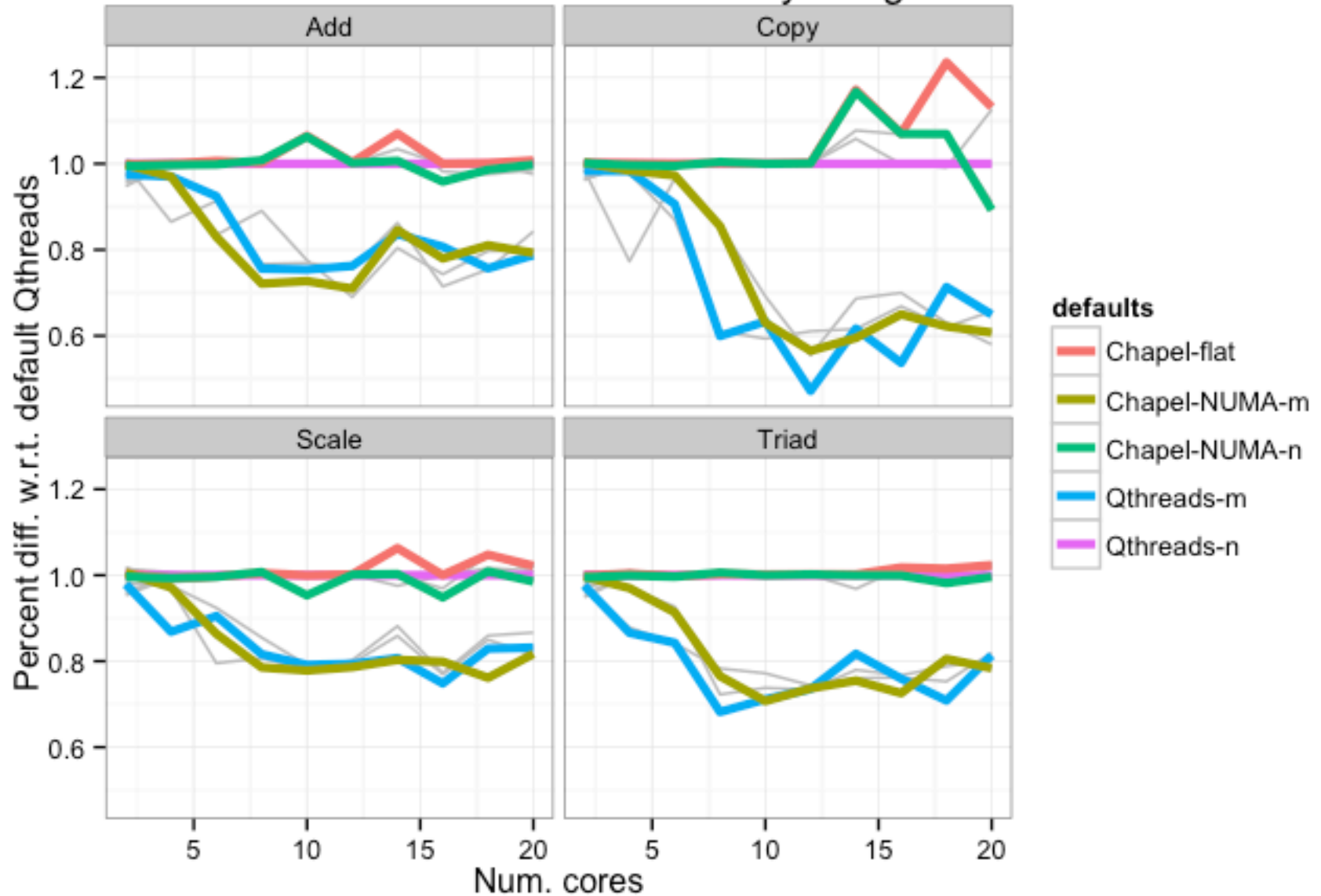
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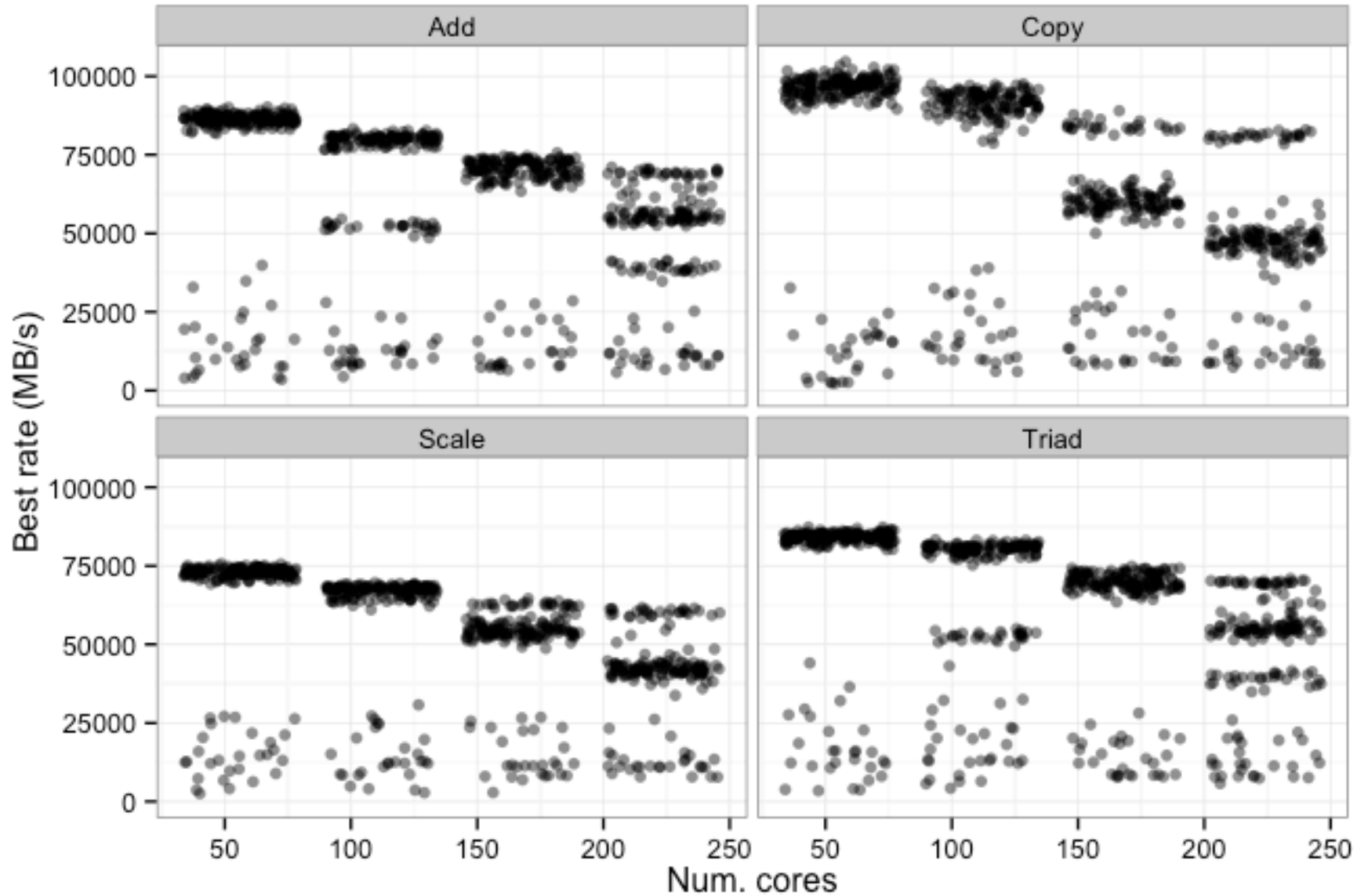
—John Tukey

CHANGE THE ARCHITECTURE (CAPABILITIES):

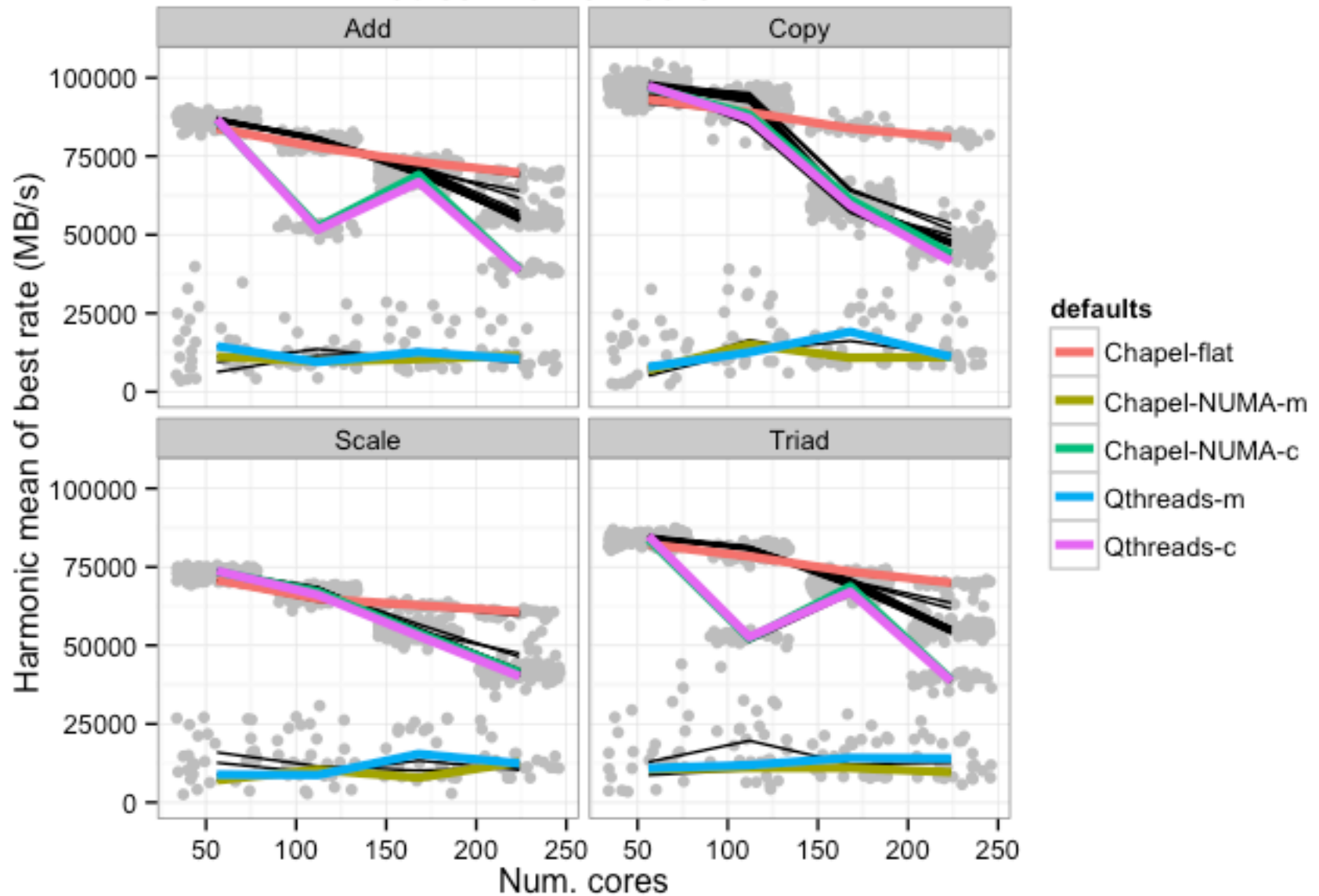
STREAM

INTEL XEON PHI (57-core)

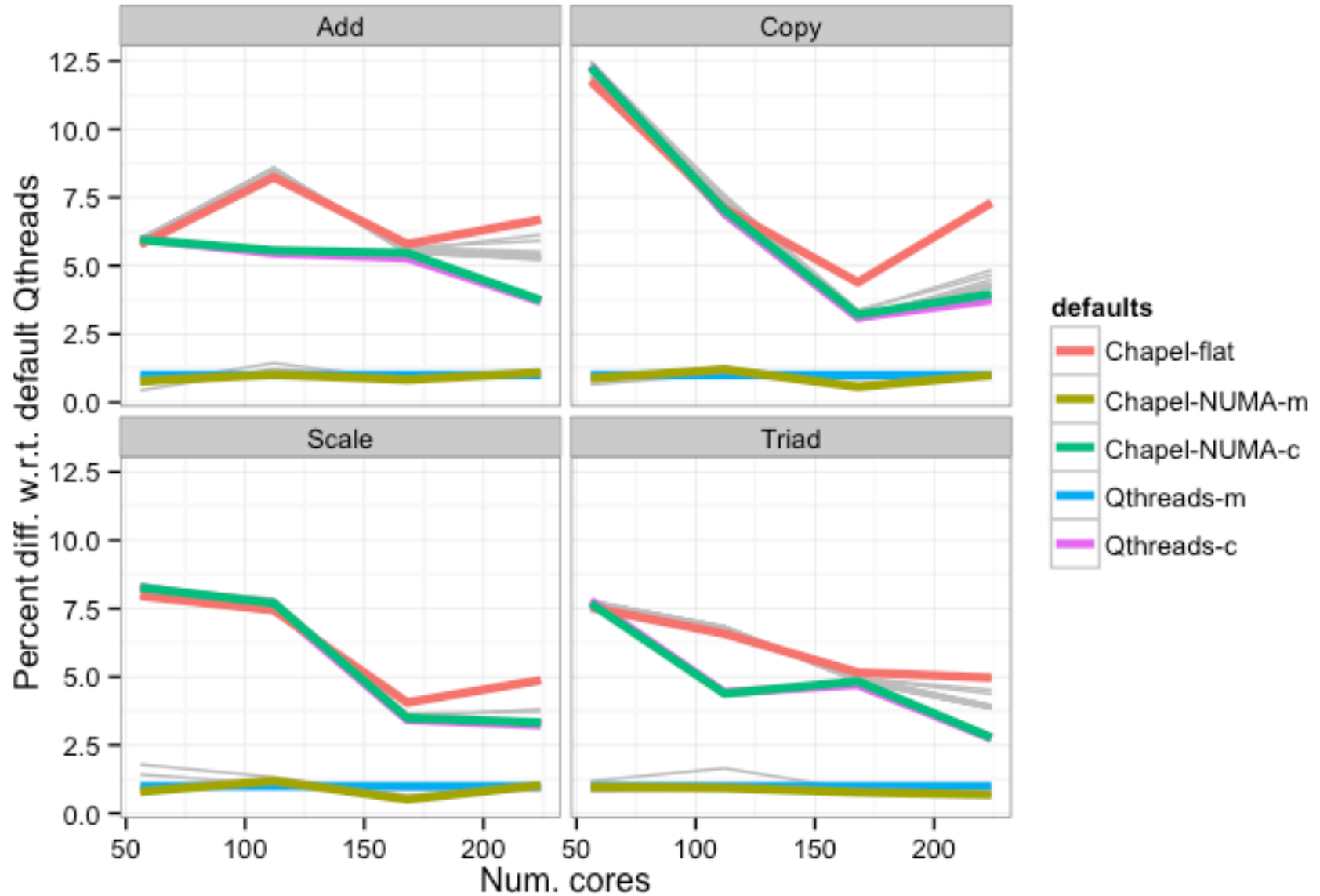
Stream on 57-core Phi



Stream on 57-core Phi



Stream on 57-core Phi



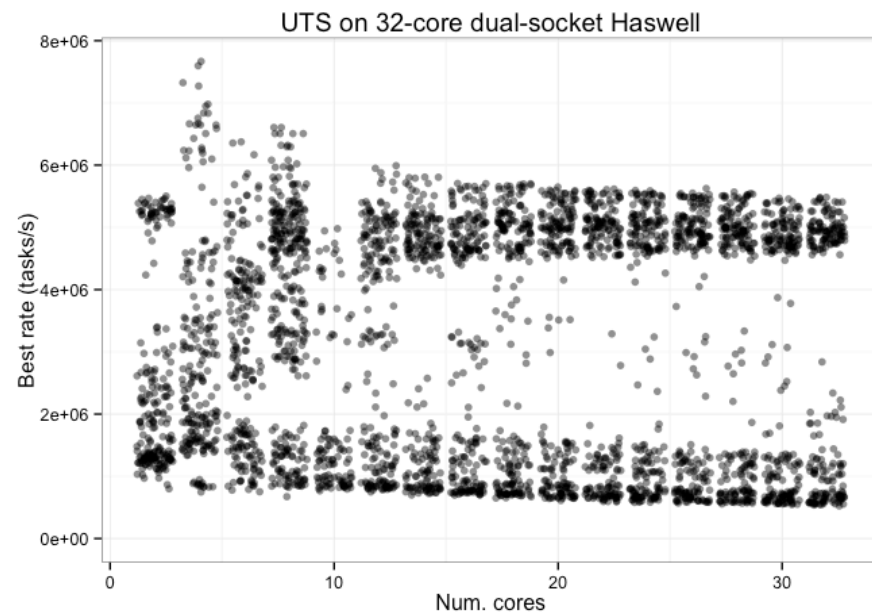
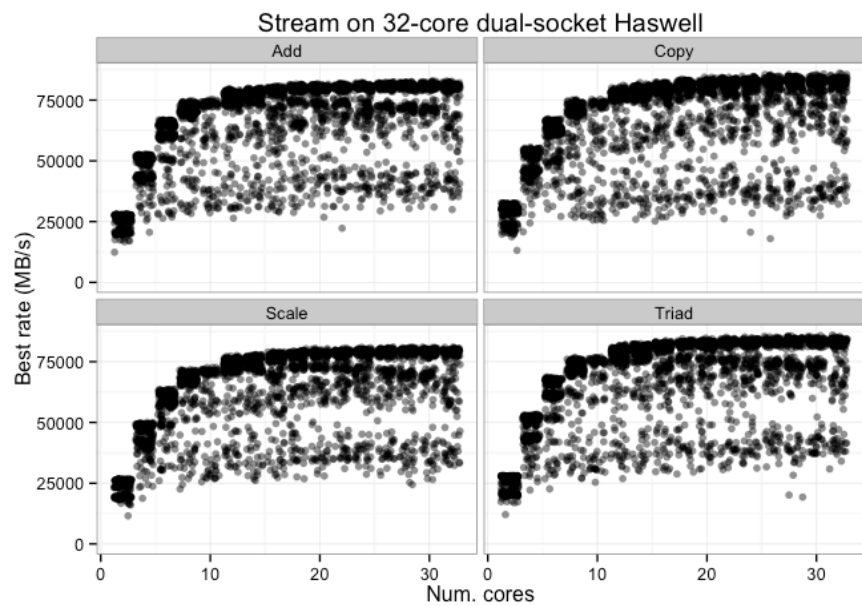
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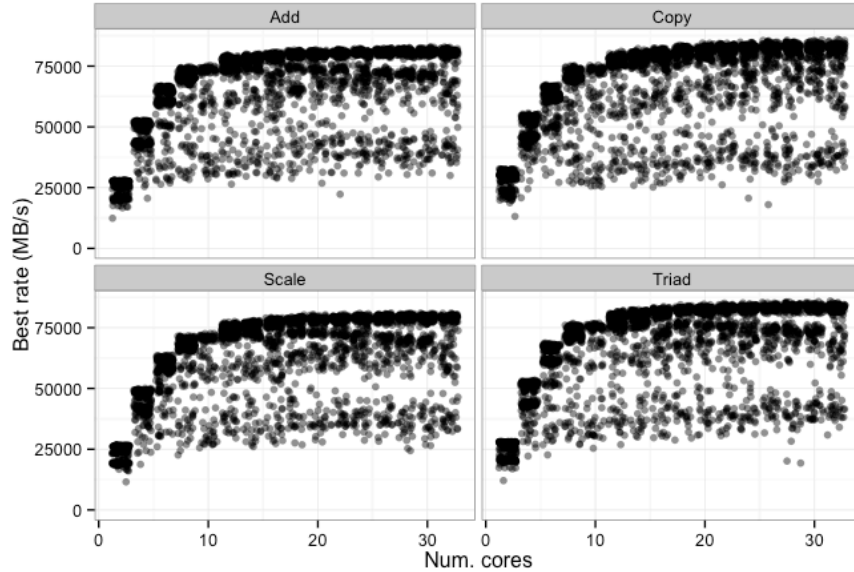
RINSE AND REPEAT:

STREAM & UNBALANCED TREE SEARCH (UTS)

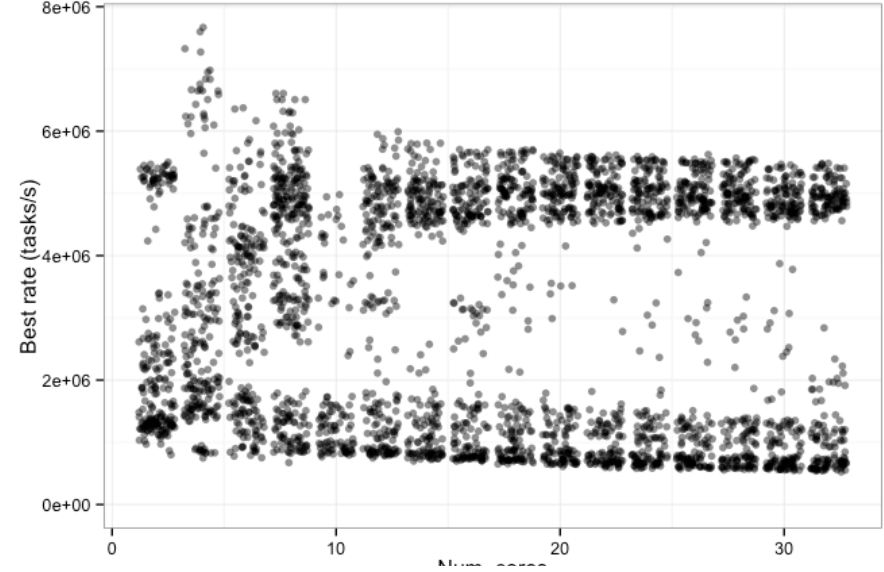
INTEL XEON HASWELL (32-core)



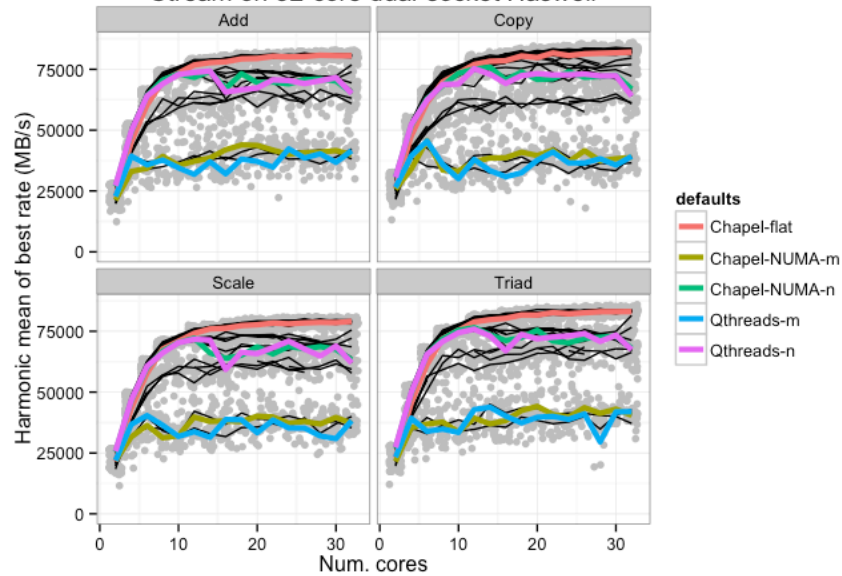
Stream on 32-core dual-socket Haswell



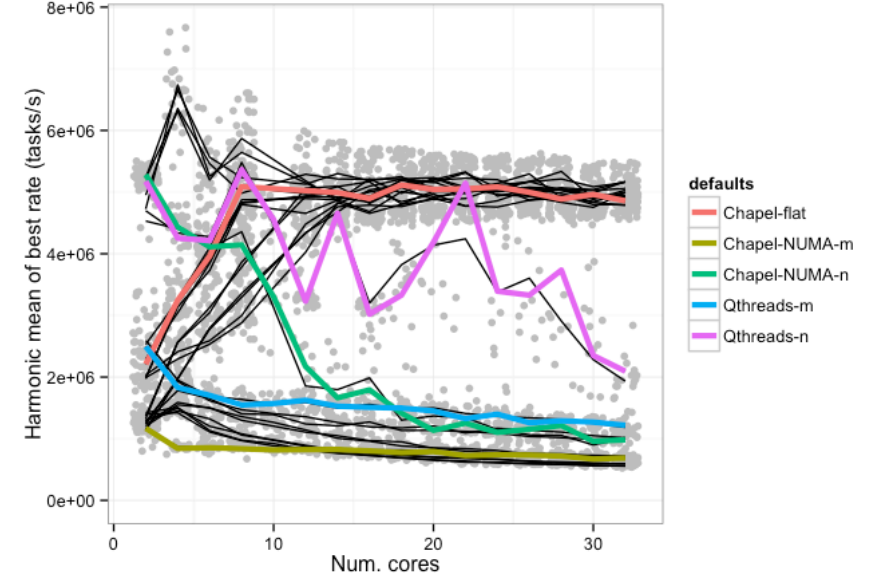
UTS on 32-core dual-socket Haswell



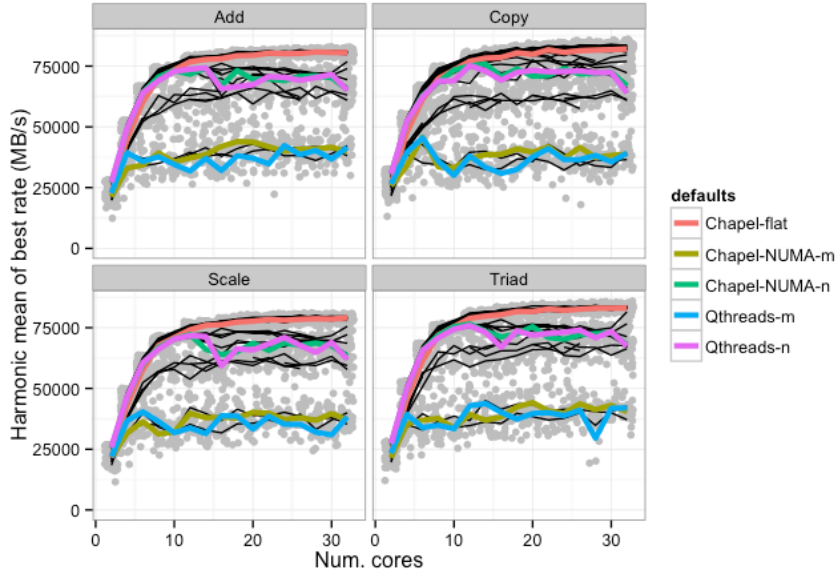
Stream on 32-core dual-socket Haswell



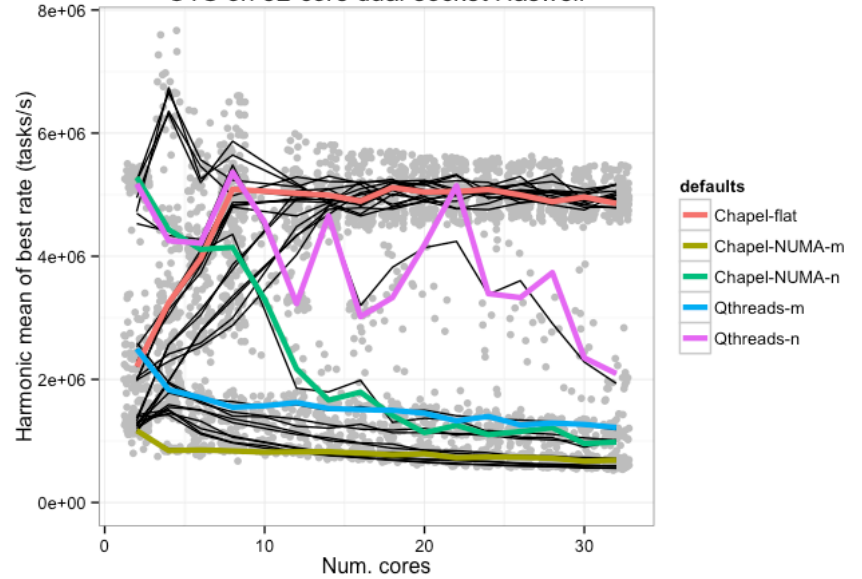
UTS on 32-core dual-socket Haswell



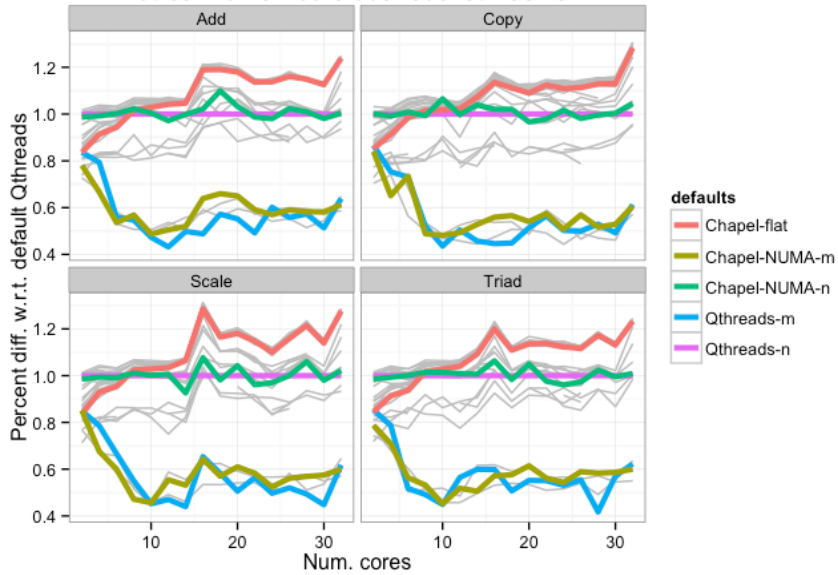
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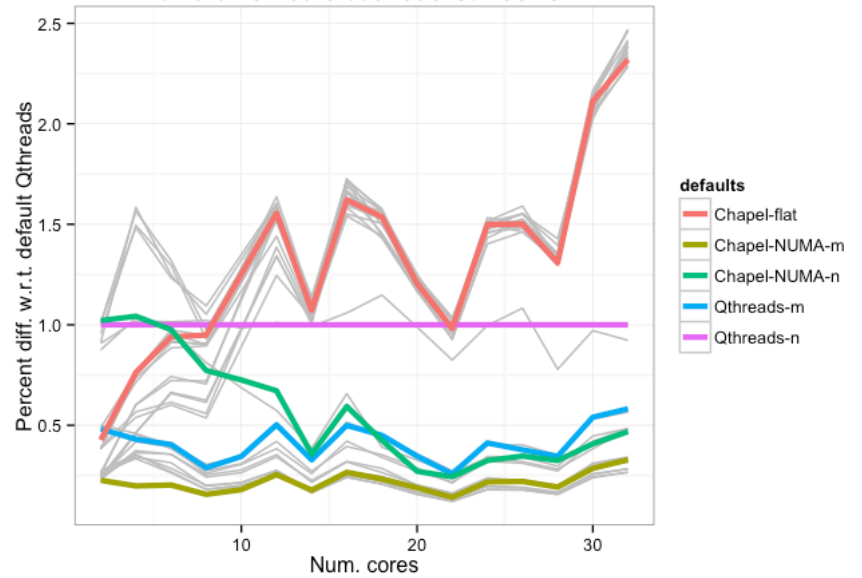
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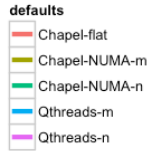
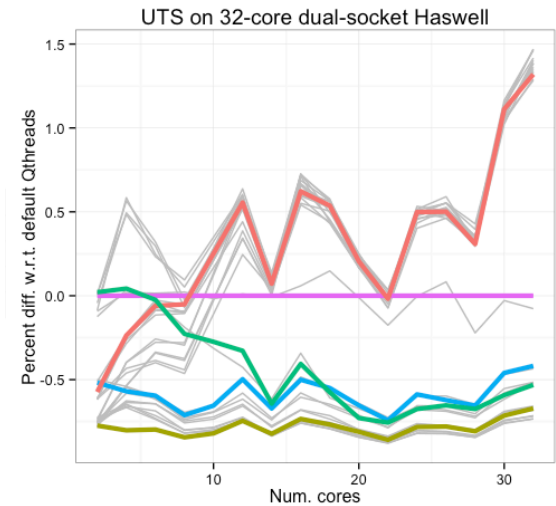
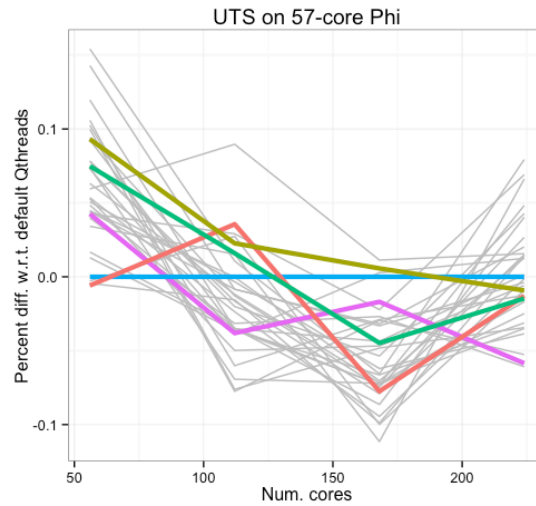
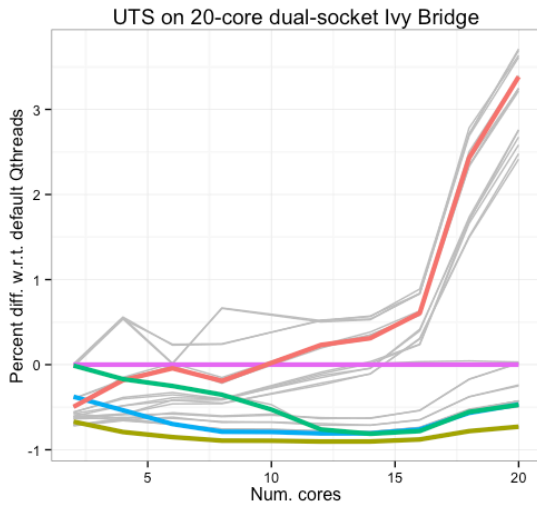


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Beware what you don’t know you don’t know about what the runtimes are doing (there lie extraneous variables, and confounders!)

But keep exploring with more applications and architectures



Any questions?

