

Yandex

Compression

Kinds of compression

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- › Block-level compression
 - › used in SequenceFiles, RCFiles, Parquet
 - › applied within a block of data

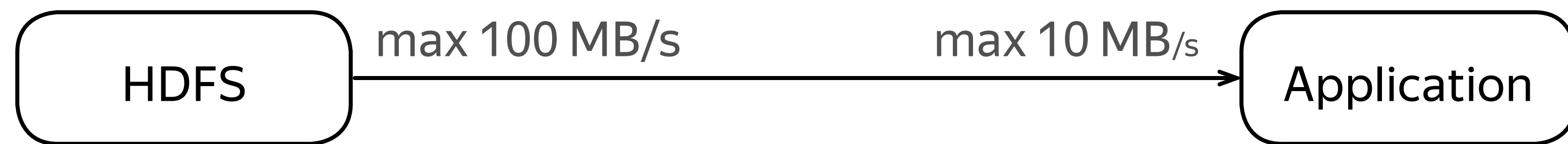
Kinds of compression

- › Block-level compression
 - › used in SequenceFiles, RCFiles, Parquet
 - › applied within a block of data
- › File-level compression
 - › applied to the file as a whole
 - › hinders an ability to navigate through file

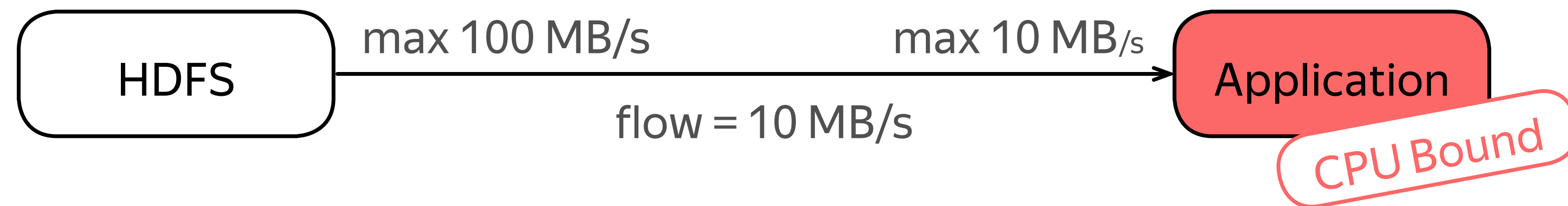
Codecs

- › Gzip
 - › compression speed ~16-90 MiB/s
 - › decompression speed ~250-320 MiB/s
 - › ratio ~2.77 .. 3.43
- › Bzip2
 - › compression speed ~12-14 MB/s
 - › decompression speed ~38-42 MiB/s
 - › ratio ~4.02 .. 4.80
- › LZO
 - › compression speed ~77-150 MiB/s
 - › decompression speed ~290-314 MiB/s
 - › ratio ~2.10 .. 2.48
- › Snappy
 - › compression speed ~200 MiB/s
 - › decompression speed ~475 MiB/s
 - › ratio ~2.05

When to use compression?

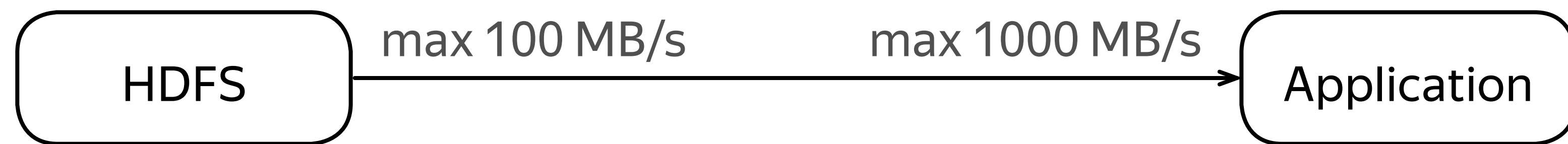


When to use compression?

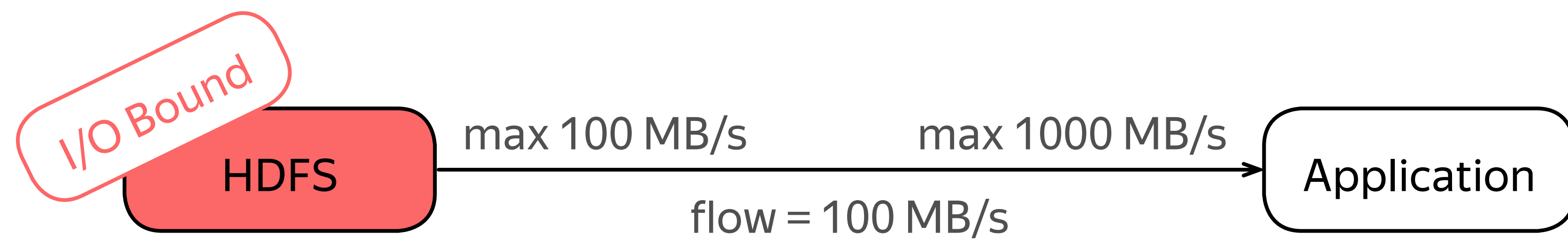


No benefit in using compression

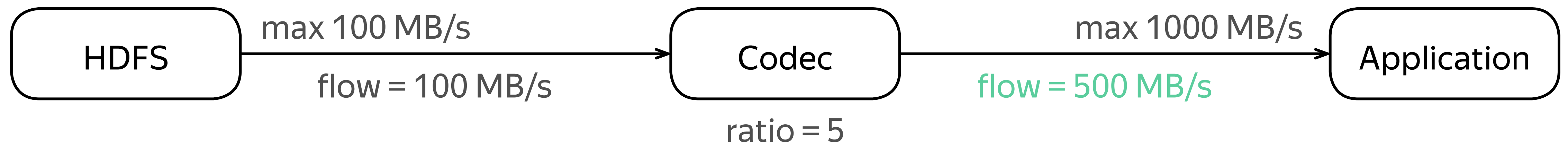
When to use compression?



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When to use compression?



Five times more throughput when using compression

Conclusion

- › Raise awareness about application bottlenecks
 - › CPU-bound → cannot benefit from the compression
 - › I/O-bound → can benefit from the compression
- › Codec performance vary depending on data, many options available

Conclusion (lesson)

- › Many applications assume relational data model
- › File format defines encoding of your data
 - › text formats are readable, allow quick prototyping, but inefficient
 - › binary formats are efficient, but more complicated to use
- › File formats vary in terms of space efficiency, encoding & decoding speed, support for data types, extensibility
- › When I/O bound, can benefit from compression
- › When CPU bound, compression may increase completion time

BigDATAteam