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| *Title:* | **Entropy Coders: How many do we need in HEVC?** | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Information | | |
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# Abstract

This contribution comments on possible options for the top level entropy coding architecture in HEVC: single entropy coder, scalable entropy coder or a switch between two entropy coders. It suggests adopting a principle of “only one entropy coder unless there is a very good reason to do otherwise”.

# Architectural View of Entropy Coding

* Best architecture is a single entropy coder
  + One tool per function unless there is a very good reason to do otherwise
  + Clean standard with no entropy-related interoperability problems
* Second best is a scalable entropy coder
  + Relatively clean standard
  + Manageable interoperability issues (e.g. onion ring profile structure)
* Third best is to switch between two entropy coders
  + Many decoder ICs will have to implement both entropy coding schemes
    - more complex design than either one alone
    - increased cost of verification testing
  + Less elegant standard
    - Increased risk that application-focused standardisation bodies (e.g. DVB) define their own application-specific profiles
  + More effort required during standardisation work
    - Many more lines of code and more pages of documentation to maintain

# Why do we have Two Entropy Coders in HM?

* Historical Reasons
  + JCT-VC participants are familiar with AVC architecture
    - Made sense at the time it was developed
  + Step change in entropy coding performance became possible (but difficult) to implement when AVC was developed 10 years ago
    - We are now 5 cycles of Moore’s Law later - a factor of 32
* HM entropy coders grew out of TMuC compromises
  + Performance/complexity trade-off points offered by the two entropy coders have subsequently converged
* Now is the right time to perform a sanity-check on the HM entropy coding architecture

# Suggested way Forward

* Agree principle of “only one entropy coder unless there is a very good reason to do otherwise”
* Agree to determine whether or not there is a very good reason
  + Decision should be based on verifiable facts
* Set up a CE to gather information and perform preliminary analysis to enable decision at next meeting
  + Or could be AHG if the tasks cannot be sufficiently well defined this week
* After deciding on architecture, then decide on solution

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