

# The Impending Vertical Market Failure (VMF) In Secondary Storage

*The Semiconductor Research Corporation (SRC) addressed the VMF in September 2021 in its published article “New Trajectories for Memory and Storage”, stating, “The prospect of vertical market failure can be mitigated by private sector market participants through risk-share agreements between customers and suppliers, as well as increased vertical integration.” Hyperscale Data Centers (HSDCs) are at the VMF epicenter.*

- The slowing rate of HDD and tape development roadmaps in recent years along with HDD and tape storage supplier consolidations are particularly concerning trends to HSDCs.
- Neither HDD nor tape technology is currently positioned by itself to effectively meet the enormous HSDC storage requirements that future performance and capacity demands:
- Vendors/Manufacturers are dis-incentivized to invest in novel technology; risk reward is not high enough, while HSDCs are using their buying and bargaining power.
- The Secondary Storage market is left with incremental investments in existing technologies and moves slow compared to secondary storage demand.

## Risk Factors – To the Current Secondary Storage Model (Tape is Currently the Optimal Technology)

- The Zettabyte+ WW secondary storage market has become the exclusive domain of few suppliers
- IBM is the only tape drive developer/supplier controlling tape ecosystem specifications
- Fujifilm and Sony are the only tape media suppliers
- IBM, HPE, Quantum, and Spectra are the primary large-scale tape library suppliers
- Seagate, Toshiba and WD are the only HDD suppliers
- IP litigation risks, as evidenced by recent lawsuits, can impact and delay roadmap progress

## Current Secondary Storage Scenario (2022)

- The LTO roadmap product specifications have been relaxed and delivery dates pushed out by the LTO Consortium (led by IBM) delaying higher capacity tape formats required by HSDCs and raising concerns about the extensibility of the current secondary storage ecosystem.
- In the event of a tape (energy efficient) based VMF, sustainability challenges will become insurmountable for HDDs to address
- The HDD industry is also facing roadmap challenges to increase capacity while any performance gains (IOPs) appear to be minimal
- Cost reduction is critical for HSDCs, however the race to zero (\$0.00/PB) puts supplier margins, future R&D funding levels and storage innovation at significant risk
- The ability of the current secondary storage model to meet these demands is in now jeopardy accelerating a VMF

## Hyperscalers Defining Future Blueprint For Secondary Storage Requirements

