

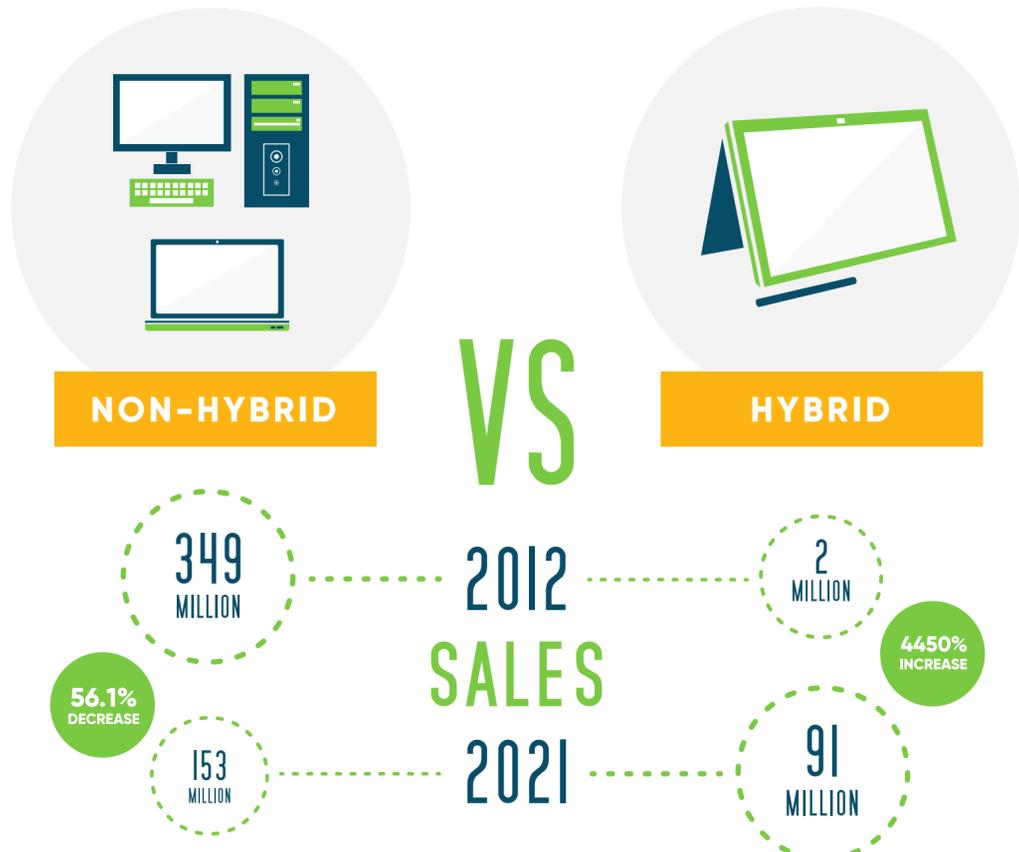


# STORAGE SOLUTION TRENDS

## Consumer Notebook Market

### CHANGES IN PERSONAL COMPUTING

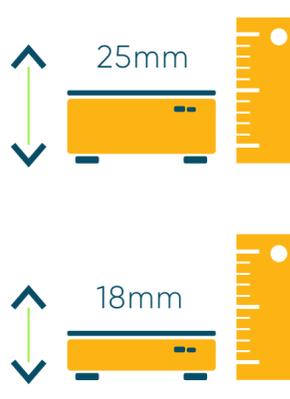
Back in 2012, more than 351 million PCs were sold, nearly 349 million of which were laptop/notebook or desktop systems. Fast forward to 2021, we forecast 244 million PCs will be sold, of which only 153 million will be desktops or laptops.



### CHANGES IN STORAGE SOLUTIONS

All these shifts in the PC marketplace have an impact on – and in turn are impacted by – storage solutions.

As hard disk drive (HDD) technologies have grown smaller, laptops using HDD have been able to slim down from 25mm thick to around 18mm thick – without sacrificing capacity. These changes are significant as users continue to migrate towards lighter, portable devices.



### EMBEDDED FLASH STORAGE GAINS TRACTION

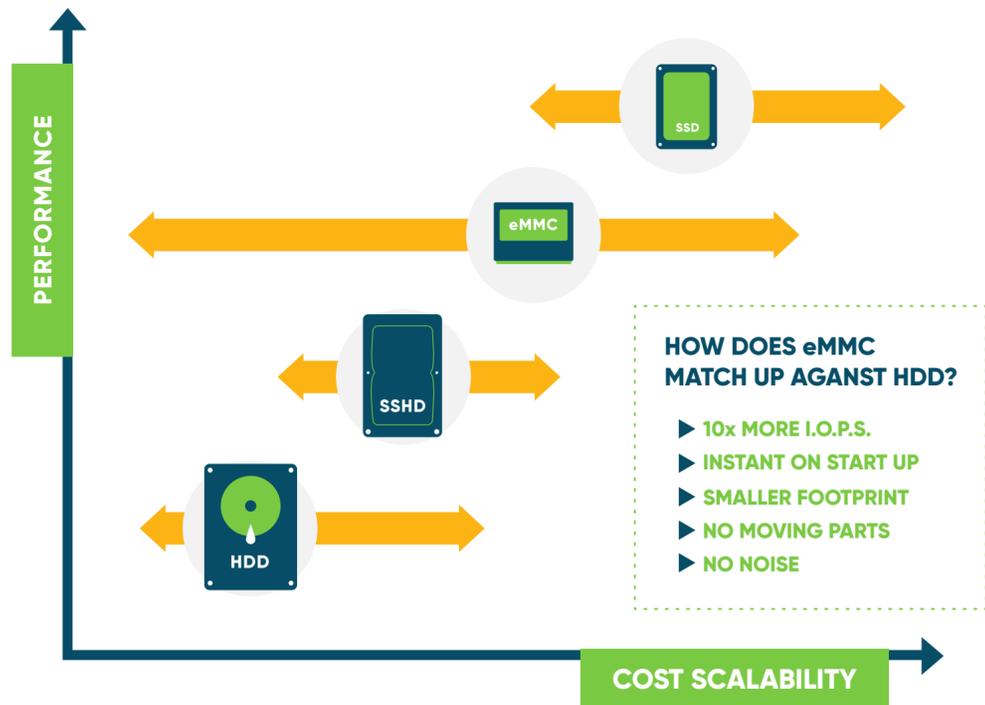


e.MMC memory storage solutions in the 32GB to 128GB range are less costly than SSDs and have a smaller footprint than HDDs.

Currently, the sub-\$400 notebook space garners more than 33% of the total consumer notebooks segment, representing significant total available market opportunity.

### COST VS. PERFORMANCE COMPARISON

Storage solutions based on e.MMC are highly cost-scalable. 32GB and 64GB storage configurations can be ideal for entry-level consumer notebooks and cost less than a 500GB HDD. We estimate that the cost of a 128GB e.MMC Flash storage solution will be on par with (if not less than) a 500GB HDD by 2017.



### ADOPTION TRENDS OF MEMORY IN NOTEBOOKS

We estimate that 15 million e.MMC-based notebooks were shipped in 2015, a figure that represents a market penetration of close to 9% (and a growth rate of almost 95% YoY since 2010). By 2021, we project that 40 Million laptops/notebooks – 22% of all laptops/notebooks sold – will contain e.MMC-based storage solutions.



### CONCLUSION

The laptop/notebook PC segment is undergoing a significant form-factor evolution as increasing numbers of consumers demand sleeker hardware, lighter weight and snappier performance. These outcomes are possible only with the adoption of a smaller, thinner, lighter storage solution. Since high performance SSDs remain costly and HDDs remain bulky, e.MMC-based storage solutions offer an ideal balance of price, size, and performance to meet the demands of consumers seeking a “mobile computing” solution.

NON-HYBRID = Traditional desktop PCs and laptops.  
HYBRID = 2 in 1 PCs, convertibles and PCs in tablet form.