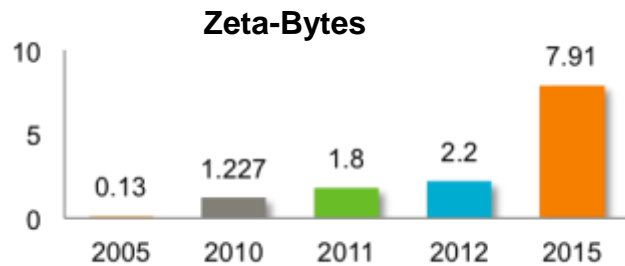


DSP: Shaping with Digital Storage World

Presented by: Yuan Xing Lee, Engineering VP, LSI Corporation, July 15, 2012



Data Explosion in Digital Universe



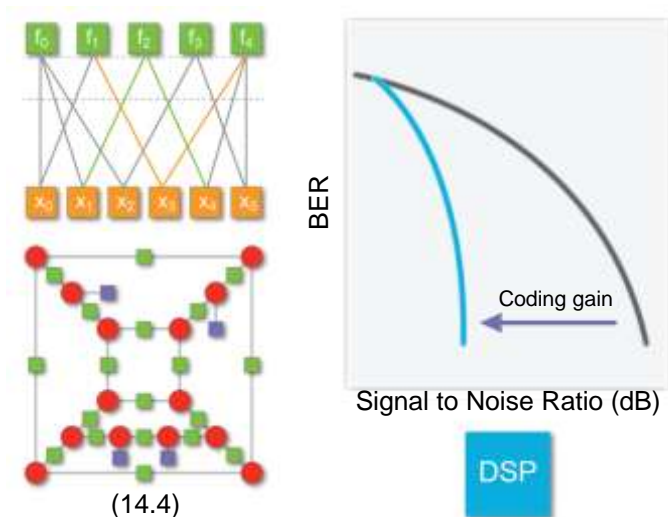
Data source: storagenewsletter.com

2012 WW Spend on Information (in \$B)



Some Conspicuous Breakthrough in DSP


- A recent conspicuous breakthrough in DSP salutes to the advent of LDPC (low-density-parity-check) codes into data storage products to fuel the capacity growth.
- It took about 45 years from the concept to storage products and whole productization progress got accelerated about fifteen years ago when LDPC got “re-discovered”.
- LDPC is applicable to all the digital storage devices for error correction.



LSI Delivers Industry's First 40nm Read Channel to Hard Disk Drive Manufacturers

MILPITAS, Calif., June 23, 2009/PRNewswire-FirstCall/ -- LSI Corporation (NYSE: [LSI](#)) today announced the TrueStore(R) RC9500, the industry's first 40-nanometer (nm) read channel. Now sampling to hard disk drive (HDD) manufacturers, the RC9500 is designed to support notebook through enterprise HDD form factors and capacity points. The RC9500's next-generation low-density parity check (LDPC) iterative decoding technology enables a greater than 10 percent increase in the data storage capacity of HDDs, reduces read channel power consumption and delivers industry-leading performance with data rates exceeding 4.0Gb/s.

Evolving Digital Storage Landscape

Storage Configuration	Markets	Estimated Growth	Cost
HDD	<ul style="list-style-type: none"> Traditional rotating media Market: "Data Tub" for mountain of big data from cloud services; Client devices; and personal storages 	~900M units in 2015 from ~700M in 2012	 <p>5 to 10X</p>
Hybrid HDD	<ul style="list-style-type: none"> Adding flash to HDD to boost performance of OS and applications Market: Primary in high performance notebook and ultra-book From 9.5mm Z-height to 7mm and 5mm 	~20 to 80M unites in 2015 from ~2M in 2012	
Dual Drives (or cache SSD)	<ul style="list-style-type: none"> Offering the benefits of scalability, swap-ability, and upgradability in capacity over Hybrid HDD Flash module along side with slim HDD Market: Primary in ultra-book 	>100M units in 2015 from ~24M in 2012	
SSD	<ul style="list-style-type: none"> Low latency, high IOPS, and low power Market: Mobile PC & enterprise markets 	>100M units in 2015 from ~50M in 2012	
eMMC Memory	<ul style="list-style-type: none"> Flash, controller, and MMC are integrated into one die; Maintaining high data rate, high through and high density Market: Smart phones and media tablets 	>800M units in 2015 from ~500M in 2012	



Storage. Networking. **Accelerated.**[™]