Intelligent Embedded Systems

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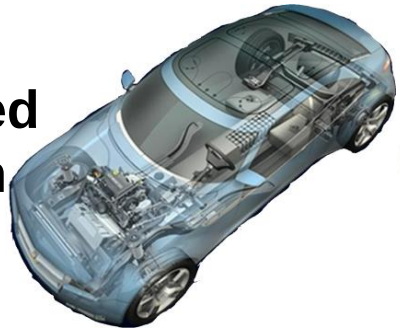
The Times, They are a Changing…

Evolving Embedded Systems

The Integration of Intelligence

Apps / Integration

Specialized Function



Endpoint / Sensor

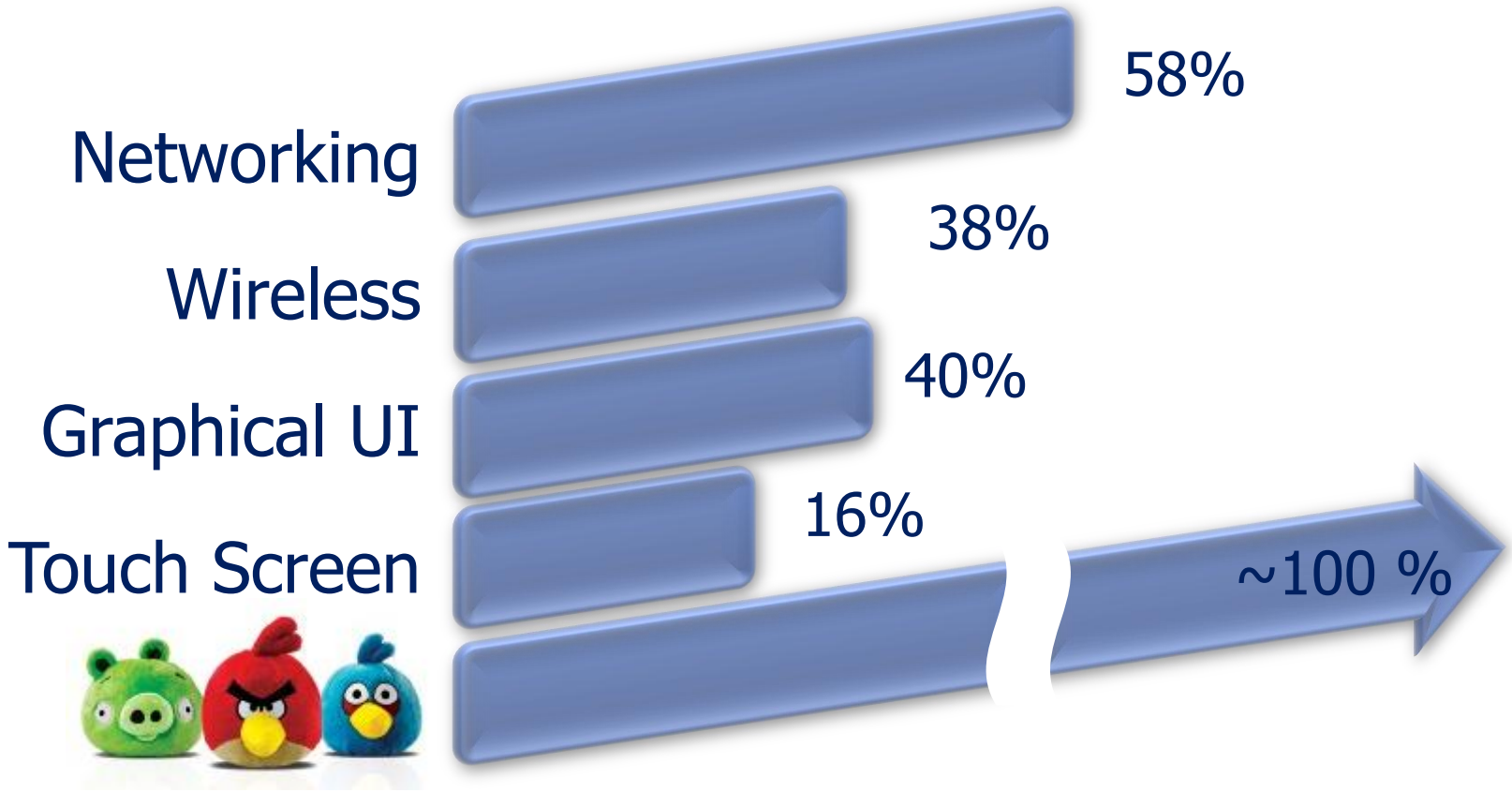
25 billion devices by 2020

Source: IDC

Don’t just take my word for it…

UBM 2012 Embedded Market Survey – May’12

Does your current embedded design have…?

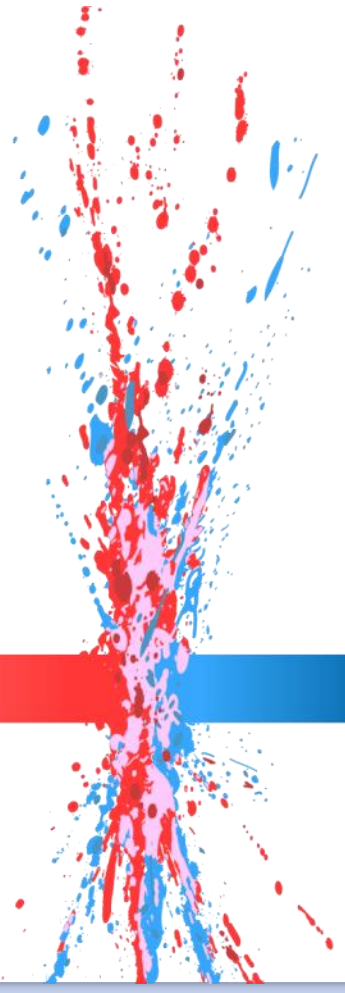


* Angry Bird results estimated

Embedded World and Mobile/Compute World Collide

Compute World

- Mobility
- Flexibility
- Rapid Innovation



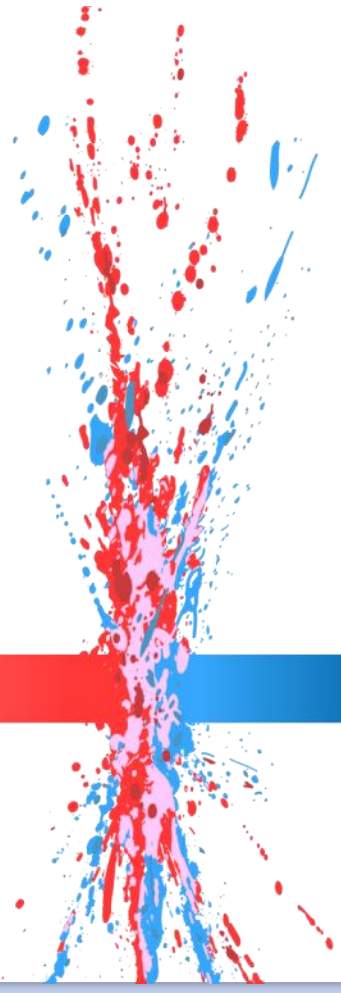
Embedded World

- Stability
- Longevity
- Quality/Reliability

Embedded World and Mobile/Compute World Collide

Compute World

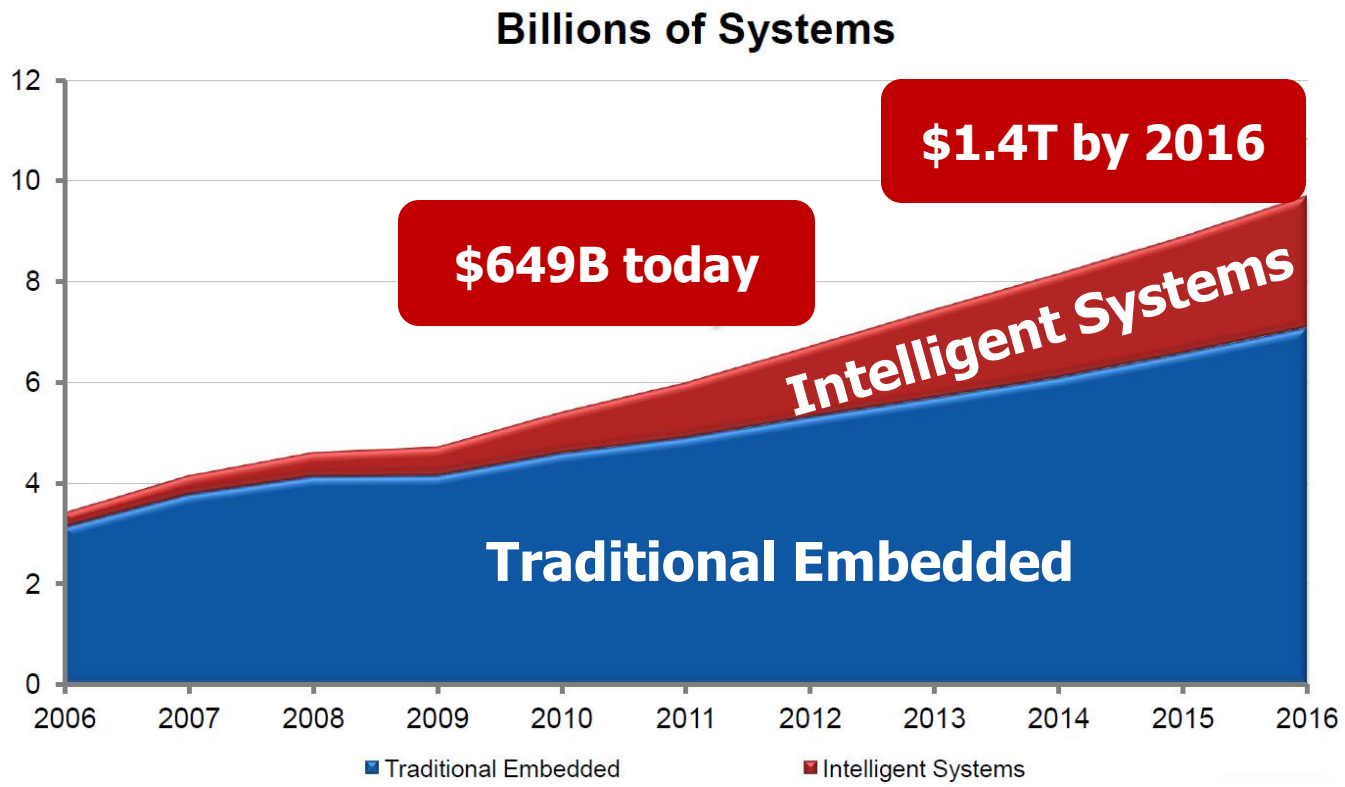
- Open Connectivity
- Standard OS/Cores
- User accessible



Embedded World

- No / Proprietary connectivity
- Custom OS/CPU
- Closed Systems

Creation of Intelligent Systems Segment



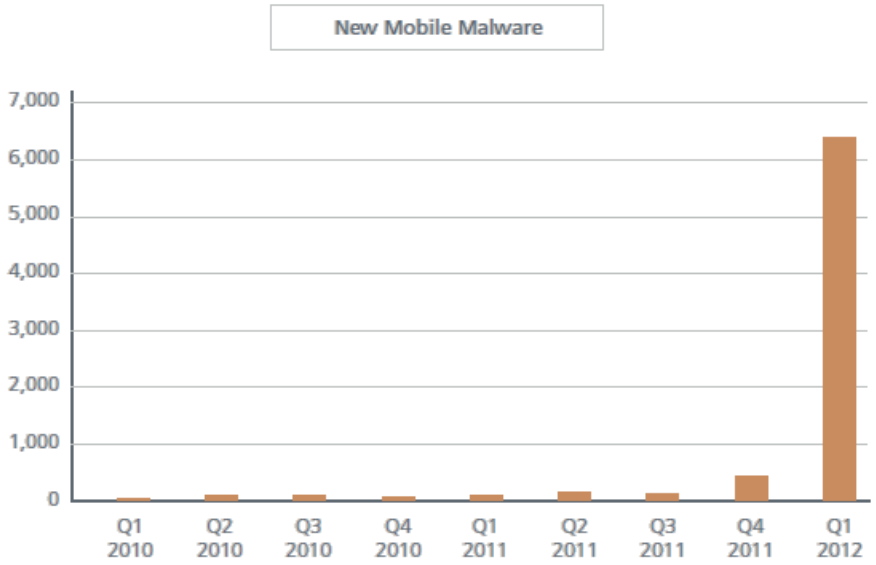
Multi-core/Advanced Processors
Always on/intelligent connectivity
High-level OS & User-Machine I/F
Data Generation & Analysis

Source: IDC

Evolving Embedded Systems

Security & Other Implications

- Standardized operating systems and building block components becoming more prevalent in non-PC architectures
- Always-on connection provides another conduit for infection
- Advanced Persistent Threats difficult to detect and damaging to embedded systems



Source: McAfee Threats Report Q1-2012

Protection starts at boot

- Tamper-proof firmware in BIOS or boot loader using locking or other cryptographic security measures for NOR flash memory
- Measurement and attestation of image to confirm root of trust
  - Leverage techniques available with Trusted Computing and a Trusted Platform Module, if available
- Additional security primitives from NOR flash memory are available
  - Code/data integrity, binding to the system though cryptographic means
  - Last line of defense against physical tampering of the system

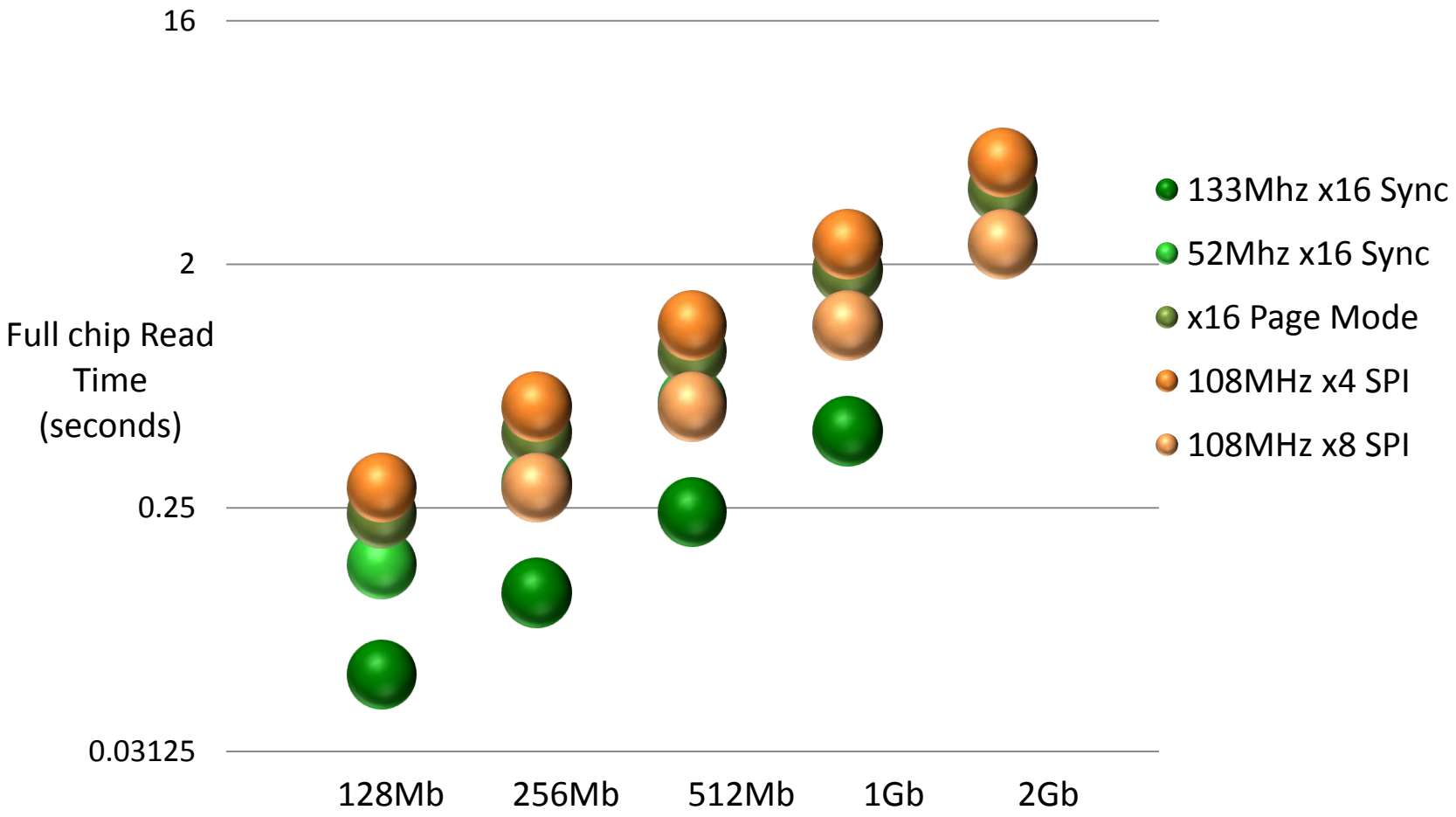
Complexity, code size, and latency

GREAT TASTE.

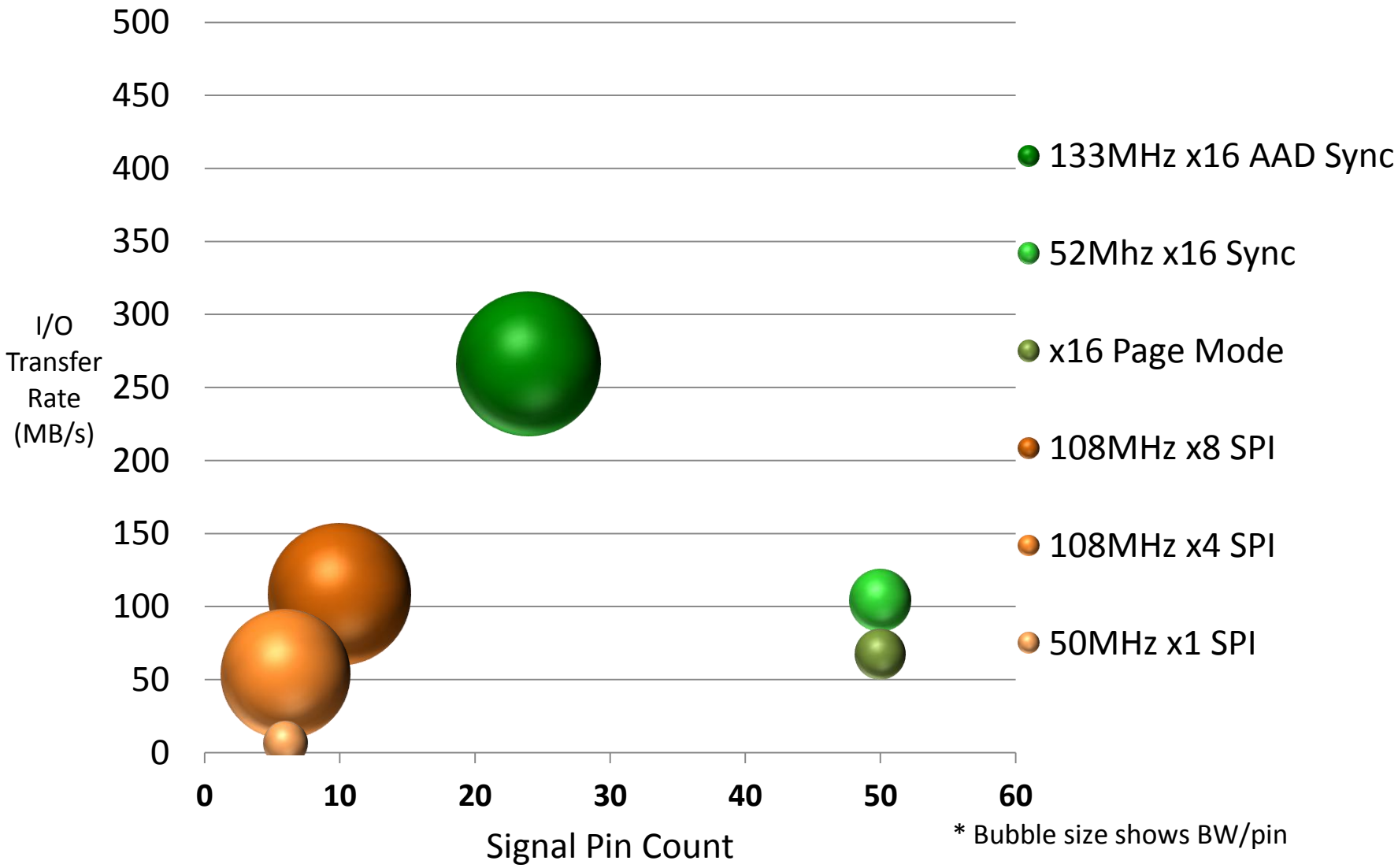
LESS FILLING.

- High-level OS, UIs and connectivity in Intelligent systems are driving code size growth
- At larger sizes, simple SPI NOR has growing performance considerations

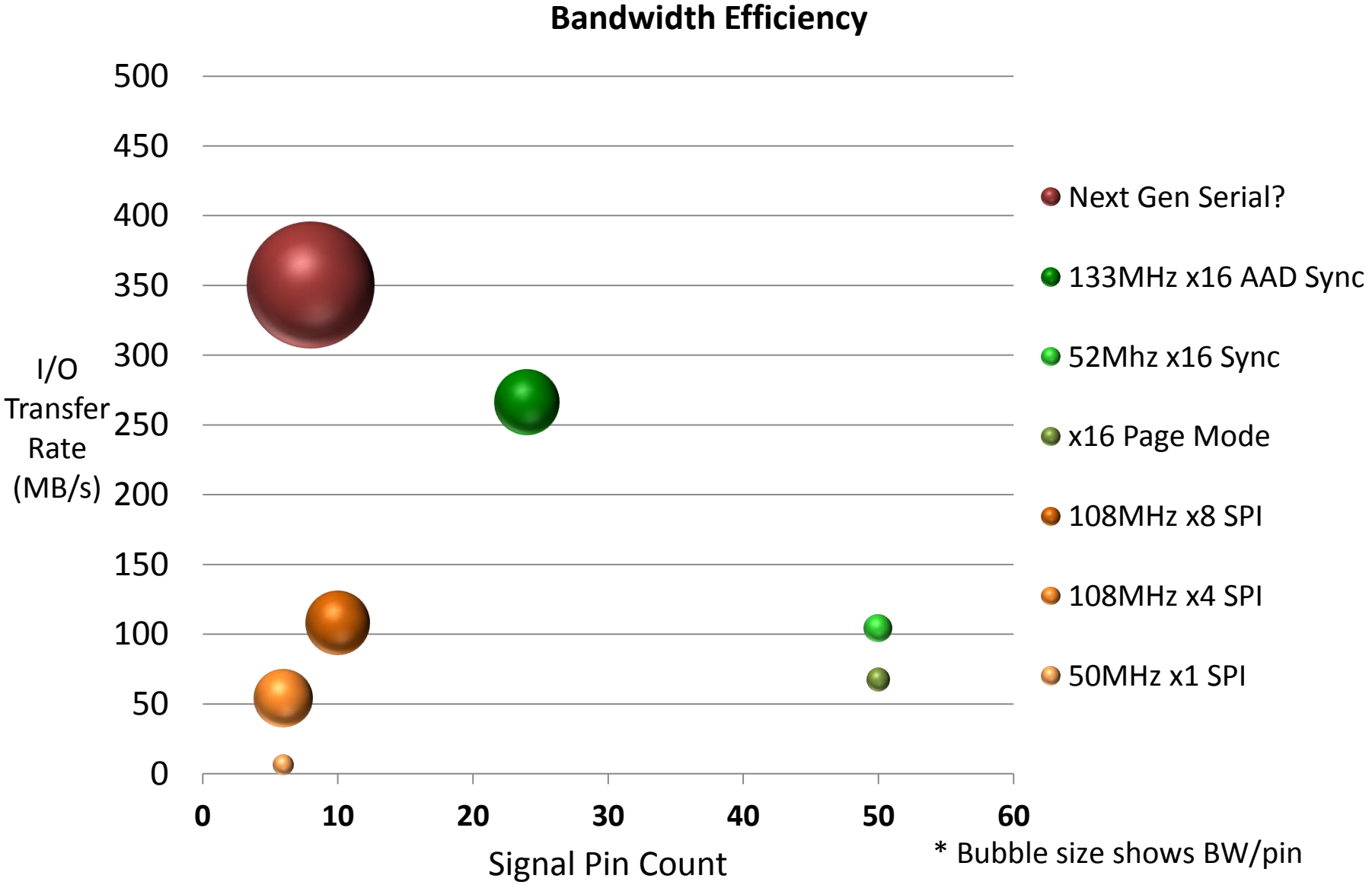
Full Chip Read Time



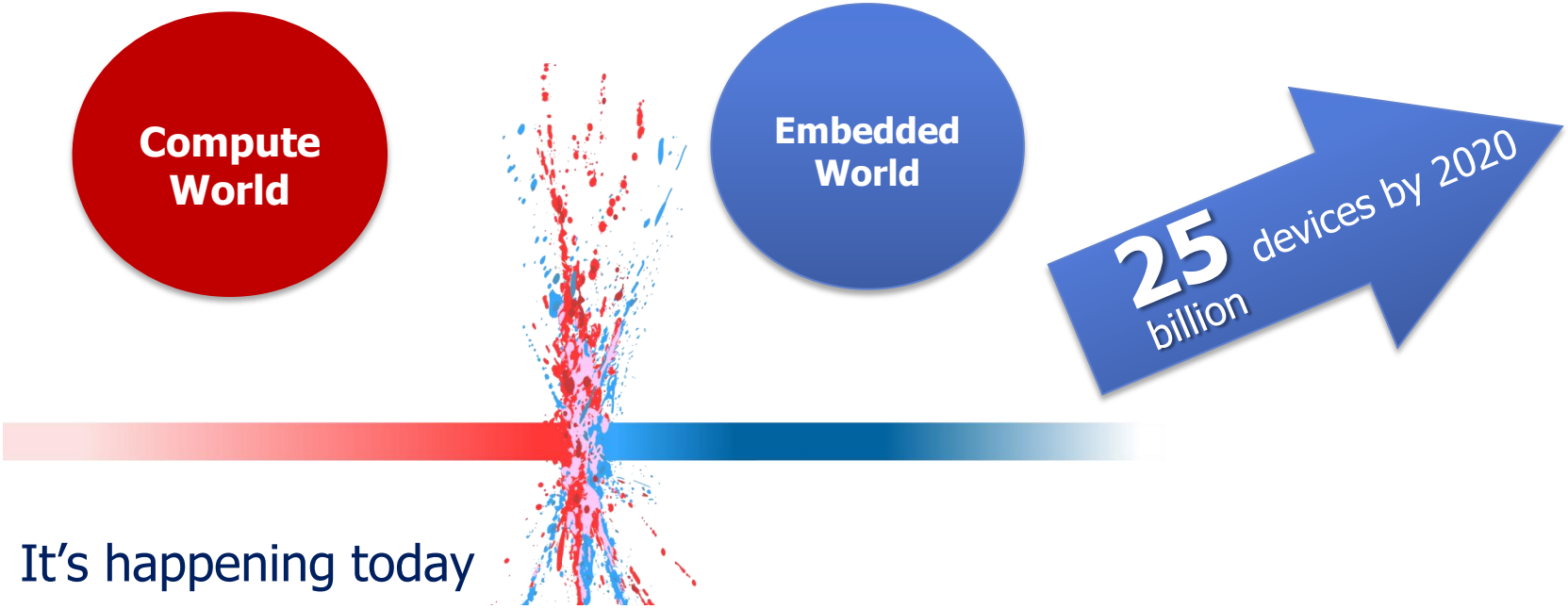
Bandwidth Efficiency



Future Serial Interface



Summary



- It's happening today
- Driving system complexity and memory growth
  - Including NAND and DRAM
- Performance and Security growing needs that NOR memory can fill
  - SPI, Advanced Parallel and future SPI architectures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