What (If Anything) Have We Learned after Twenty Years?
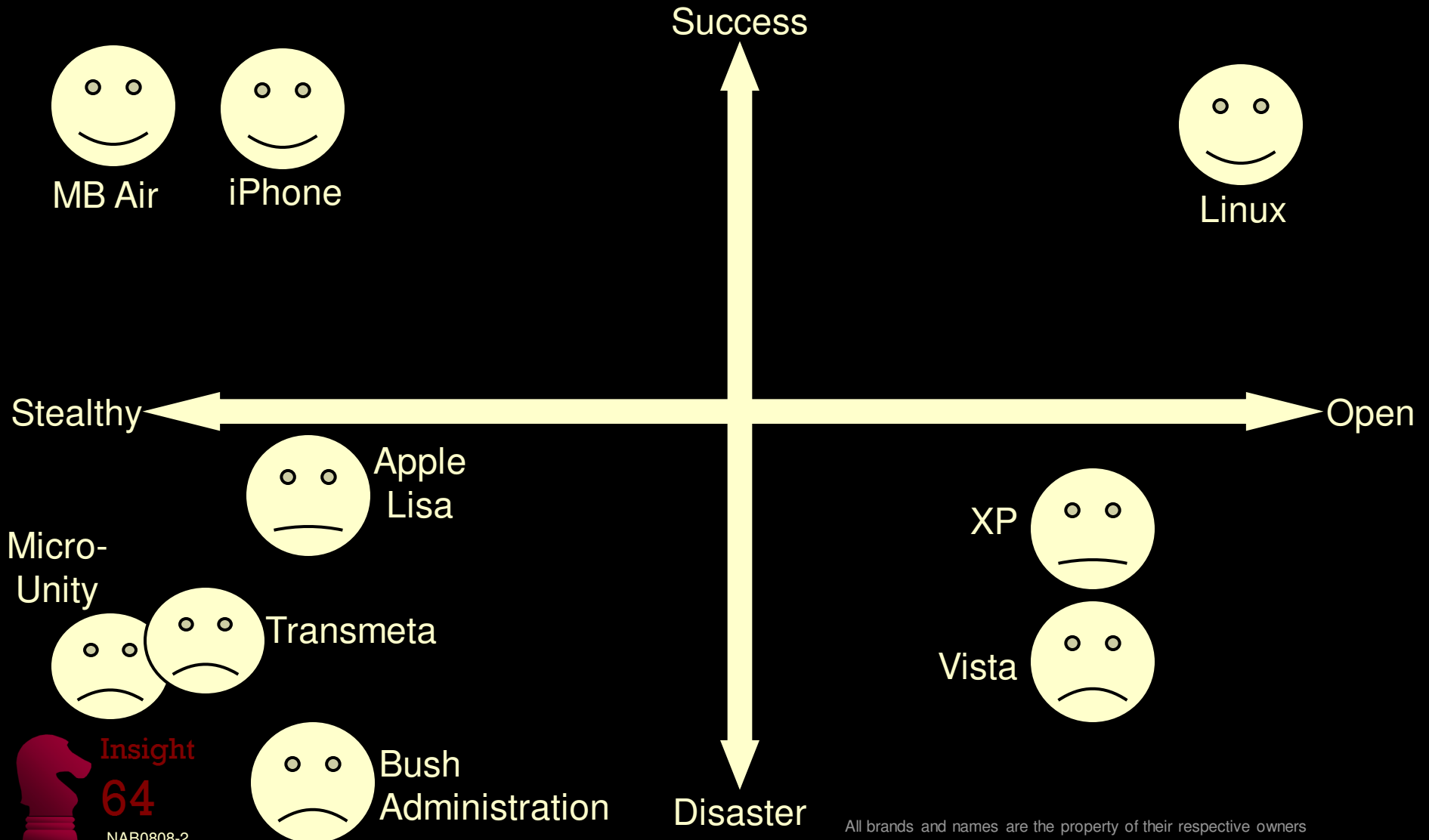
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Hot Chips 20
August 2008

Insight
64

"Super Stealth Mode"
Is Silly and Counterproductive

Success

MB Air   iPhone

Linux

Stealthy   Open

Apple
Lisa

Micro-
Unity   XP

Transmeta

Vista

Insight
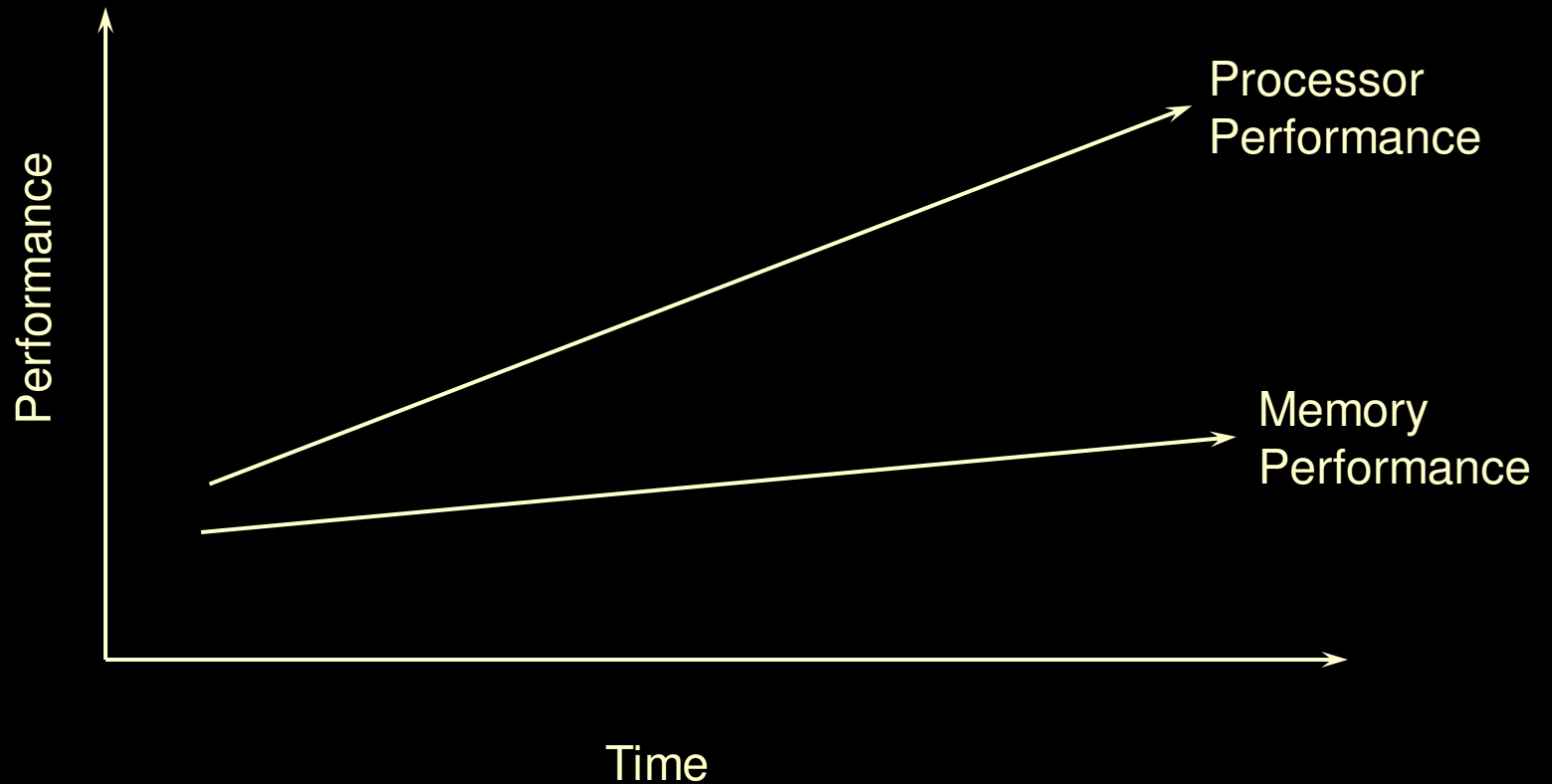64   Bush
Administration   Disaster

NAB0808-2   All brands and names are the property of their respective owners

ROI (Legal) >> ROI (Marketing)

- Start-ups That Lose in the Marketplace Can Still Win in the Courtroom
  - MicroUnity ($300M from Intel)
  - Transmeta ($275M ++ (from Intel et al.))
- You Don't Have to be a Start-Up to Play
  - Intergraph (Clipper: $525M; PIC: $200M)
  - Rambus (DDR Patents: Priceless)

The Memory Wall Just Gets Higher; Get Over It

Processor Performance

Memory Performance

Performance

Time

Least Productive Architectural Pursuit During the Past Two Decades:

Instruction Level Parallelism

Most Productive Architectural Pursuit During the Past Two Decades:

- *Multi-Core*
- *Multi-Thread*

Most Surprising Developments During the Past Two Decades:

- *X86 Remained Relevant*
- *X86 Crushed Alternate GP Architectures*

My Forecast for the Next Two Decades

- Performance/Watt Considerations Will Make "In-Order Execution" the New Black

- Those of Us Still Alive in 2028 Will Still Be Complaining About Lousy System Performance