

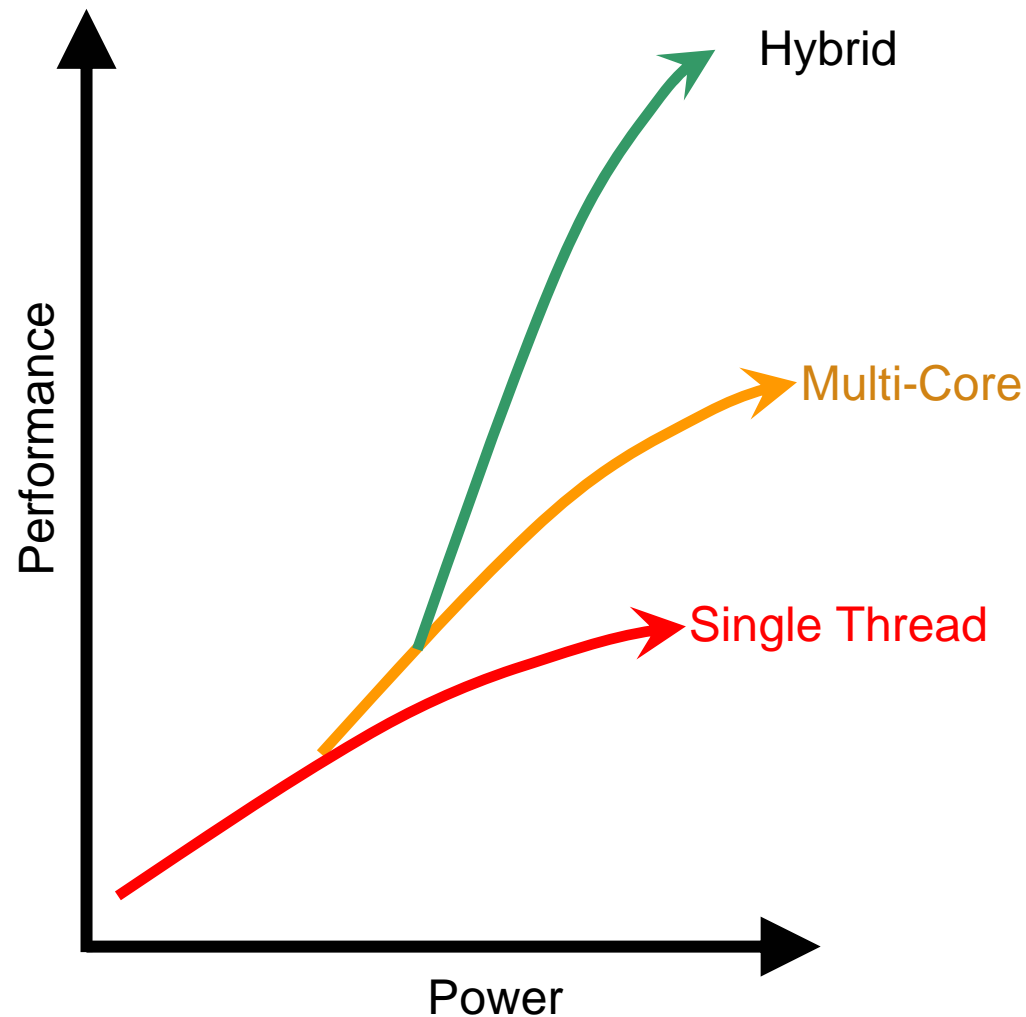


The Potential of Cell BE as a Platform for Embedded Systems

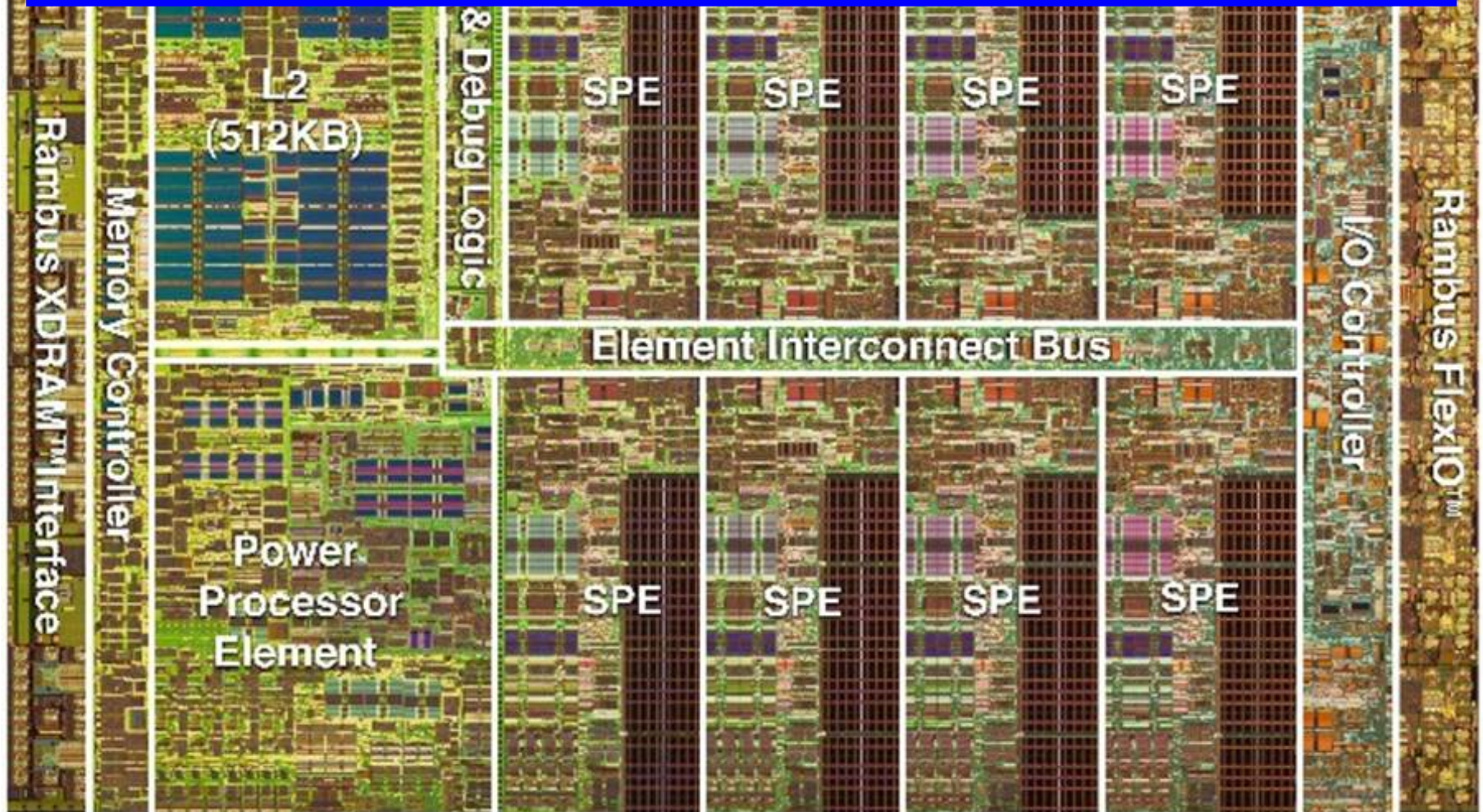
H. Peter Hofstee
Cell BE Chief Scientist
IBM

Microprocessor Trends

- Single Thread performance power limited
- Multi-core throughput performance extended
- Hybrid extends performance and efficiency

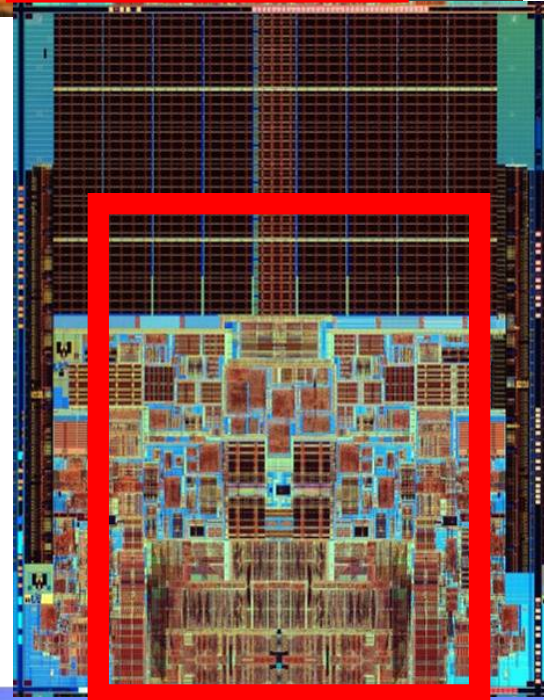
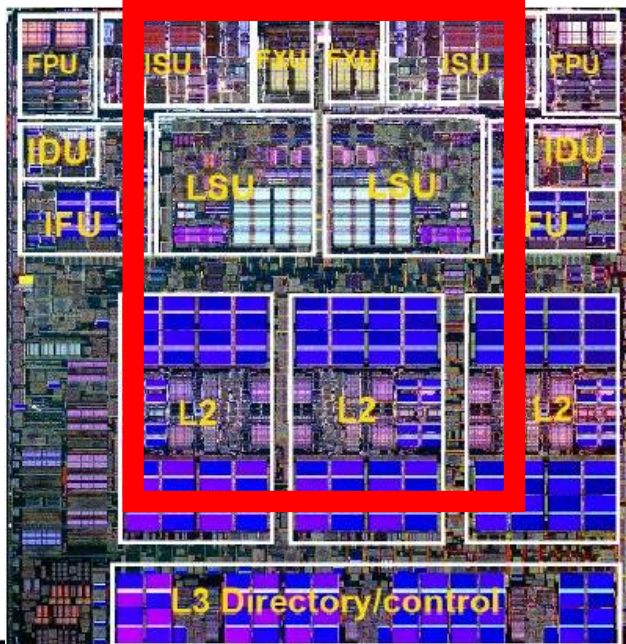
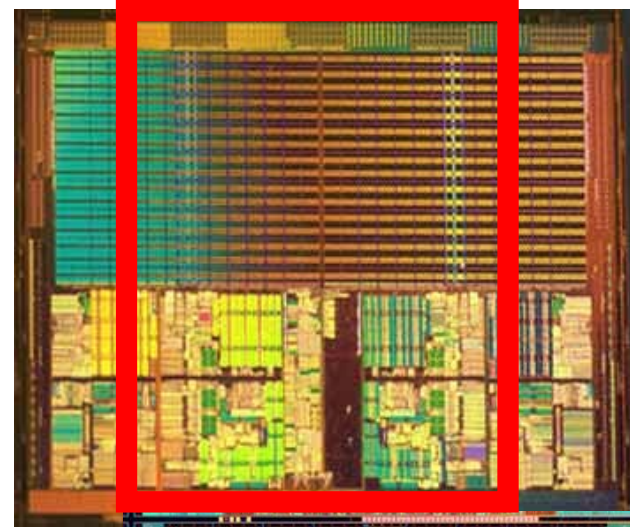
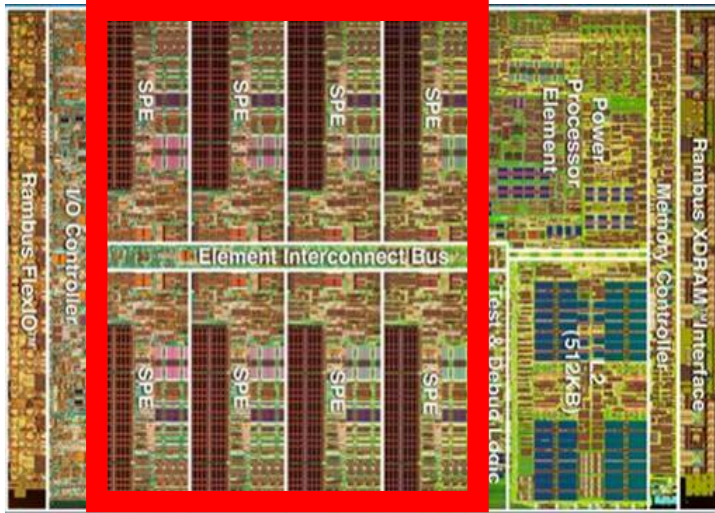


Cell Broadband Engine™: A Heterogeneous Multi-core Architecture



* Cell Broadband Engine is a trademark of Sony Computer Entertainment, Inc.

Memory Managing Processor vs. Traditional General Purpose Processor



Evolution: TV / Web / Games / Services



Who will deliver the "best" platform and customer experience?

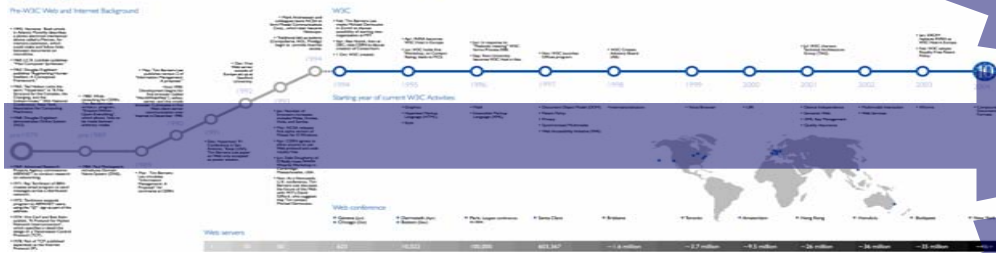


MMORPGs



"New Platform"

W3C10 WORLD WIDE WEB CONSORTIUM Tenth Anniversary



Second Life Virtual World



Today's Content Value Chains

Creation	Aggregation	Content Services	Analytics & correlation	Distribution	Network	Device
Entertainment Television	Television channels		Program guide	Cable companies	Cable	Set top box / Tivo
Movies				Satellite	Satellite	
Phone				Telco (IPTV)	Telco	Phone (cell)
Music	Music labels	Hosting, commerce		Stores		MP3 players, CD players
Web content	Web aggregators	Commercial web hosting	General search sites	ISP	Wired IP WAN	PC
Games		Game hosting				Game console
Books, papers, magazines	Publishers	Printing, distribution		Stores		Books, papers, magazines

The individual value chains are held together and “fenced” from one another by content type & format and by distribution technology.

Digital convergence removes the “glue” and the “fences”, and enables complete reconfiguration of the value chains and new services.

Digital Convergence Enables Value Chain Convergence

Creation	Aggregation	Content Services	Analytics & correlation	Distribution	Network	Device
Entertainment Television	Television channels		Program guide	Cable companies	Cable	Set top box / Tivo
Movies		Advertising		Satellite	Satellite	
Phone		commerce		Telco (IPTV)	Telco	Phone (cell)
VoIP,				Telco (3g / wireless, IMS)		
Musicians	Music labels	Hosting, commerce		Stores		CD players, MP3 players
Video IM		Storage svcs	Video search		Wireless LAN	
Web content	Web aggregators	Commercial web hosting	General search sites	ISP	Wired IP WAN	PC
Commercial content (non-entertainment)		Email / v-mail	Commercial (e.g. zillow, TLR, nexis)	Overlay CDNs	Wireless WAN WiMax	
End-users	Social networks (youtube, flickr, myspace, 2 nd life, ...)	Application svcs (location services, ...)	Web raters			
Games		Game hosting				Game console
Other (e.g., surveillance)						Public displays

All Content is Digital Content

All Networks are IP

Digital IP devices

Consumer device key elements

- **USER INTERFACE**
- **CONTENT**
- **FLEXIBILITY**
 - Content
 - Device function
- **PERFORMANCE**
- **SECURITY**

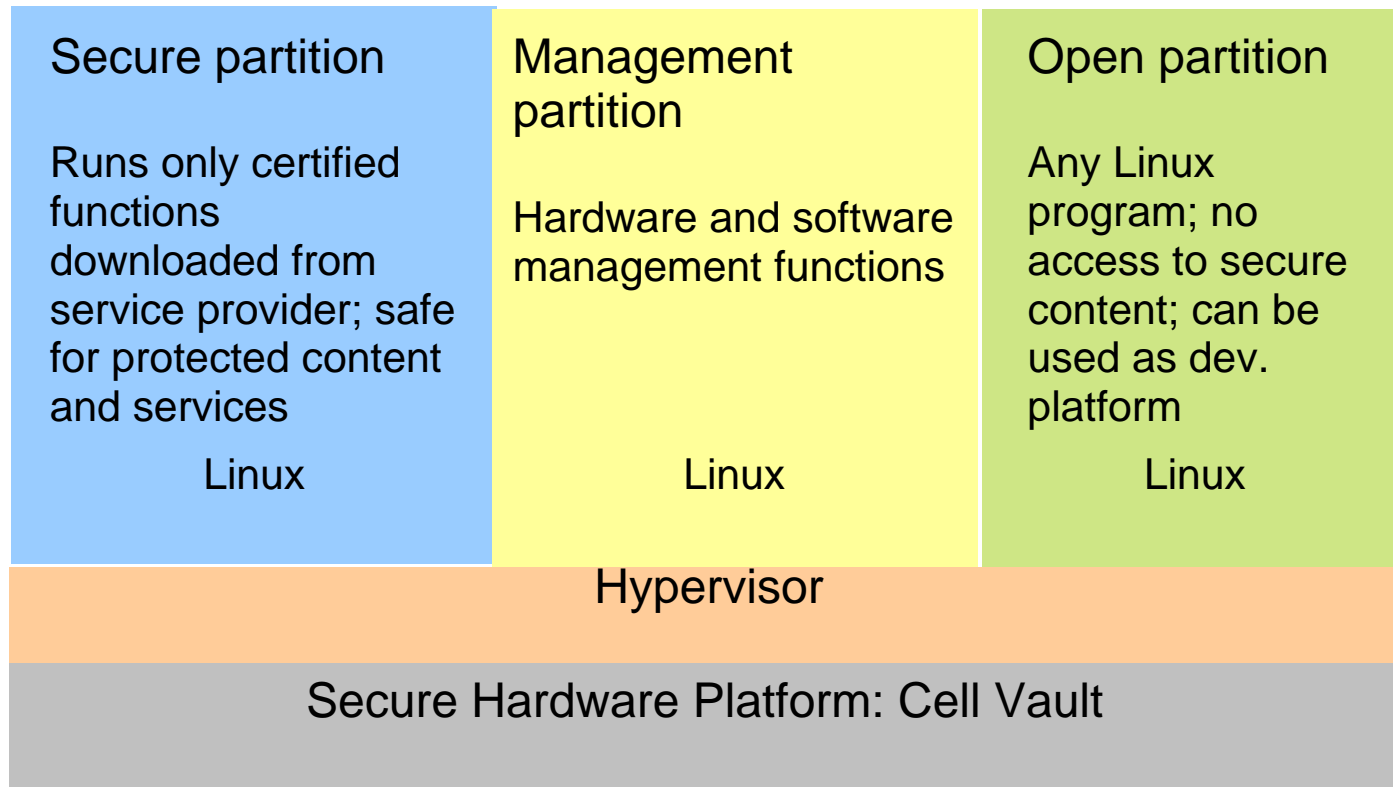
Why Cell BE?

- Open Development Environment
 - Published Architecture
 - Simulators
 - Variety of HW available
 - Linux, Compilers, SDK
 - High volume driver
- Optimized for digital media
 - High-quality Visualization
 - Image Processing -> User Interface
 - General Purpose -> Flexibility
- Allows control over end-device and content
 - Hardware based root of trust / SPE Isolation support enables security and content protection
 - Hypervisor-based partitioning enables remote systemmanagement



What is needed is a community effort to create a digital content platform based on open standards and enabled by Cell BE.

Secure Software Platform



Management partition and secure partition are controlled by a service over the network
Remote management

Relieves consumer of management function -> ease of use

Assures only certified, qualified function in the box -> reliability & security

Supports service branding, advertising & subscription business models

Allows dynamic addition of services by service provider or subcontract service