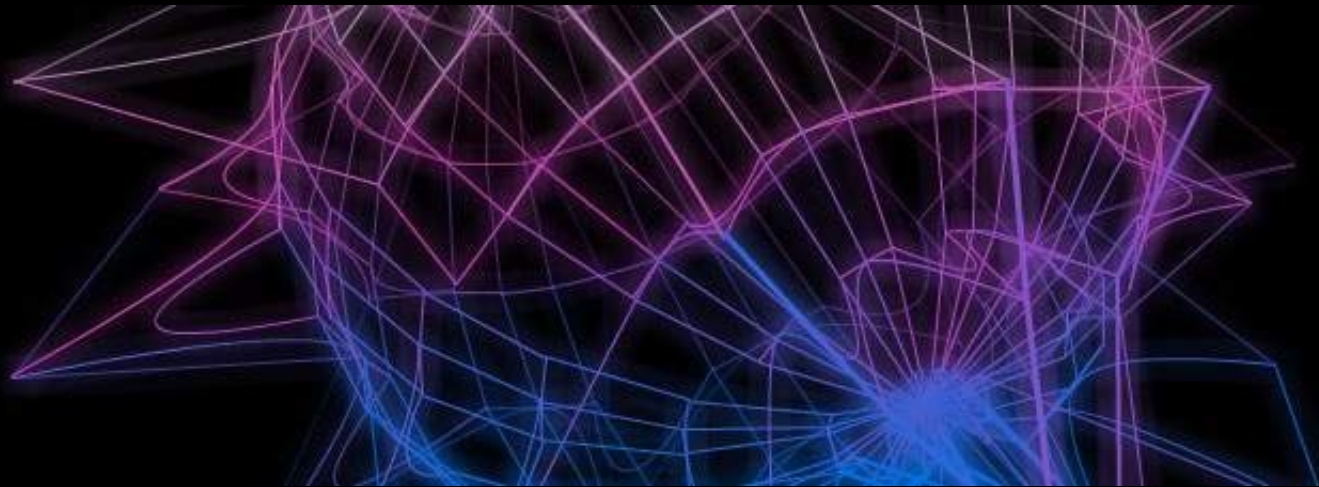


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# Smarter Systems for a Smarter Planet



# Agenda

- Workload optimisation and why it matters
- Which applications belong where?
- System design characteristics
- Smarter Systems for a Smarter Planet
- Summary observations

# What is “workload optimisation”?

## Applications

- Execution Style
- Threading
- Memory usage
- Design Points

## Systems

(Servers, Storage, Networks)

**MATCH  
THESE**

- Reliability / availability
- Performance characteristics
- Scalability / capacity
- Memory management and capacity
- Consolidation / Virtualisation / Provisioning / Workload Balancing characteristics
- Power management & energy usage
- Heat dissipation
- Security

Design/Execution  
Requirements

Service Levels

# Which applications belong where?



- Batch
- Interactive
- Transactional
- Scientific
- Industry
- Analytics
- Other



**Various Workloads**

# What is “Workload Optimization”?

*Workload optimization is about matching applications characteristics/ service level requirements to the best execution engines...*

- Applications get the services they need
- Systems provide optimized access
  - To meet memory requirements
  - To meet I/O requirements
  - To meet scalability requirements
  - To meet security requirements
  - To meet storage requirements



*... and paying attention to systems pre-integration and pre-optimization.*

# What is “Workload Optimization”? (continued)

*“Pre-integrated” is not just about packaging...*

- **It’s about innovation and integration at all levels**
  - **Example: IBM System x**
    - Hardware: eX5 (innovation) memory scaling (access to 600% more memory than other x86 vendors)
    - Allows virtualisation to perform faster – increases utilisation leading to higher ROI
    - Applications and databases run faster
    - Allows more data in memory – enabling a new generation of business analytics, decision support, and other data intensive applications
    - Hardware and software are integrated from top-to-bottom

*...Pre-integration truly changes the way that systems perform!*

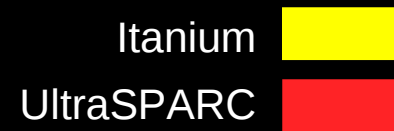
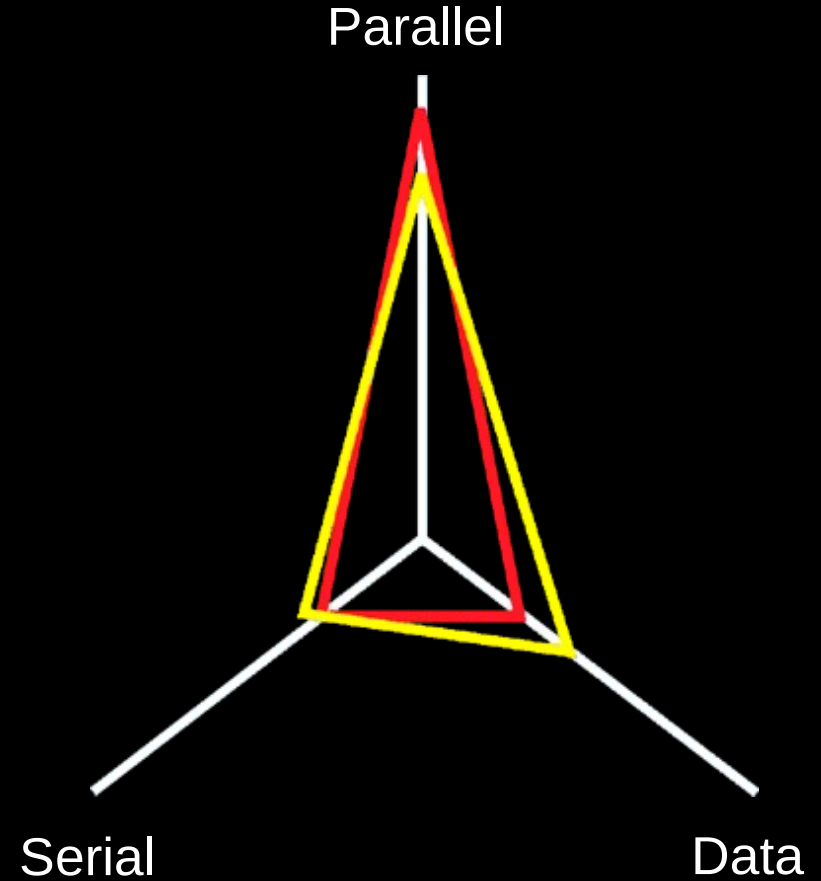
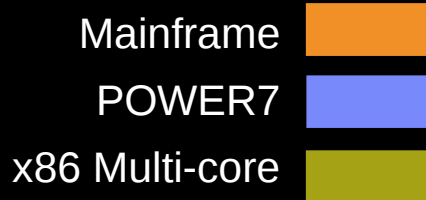
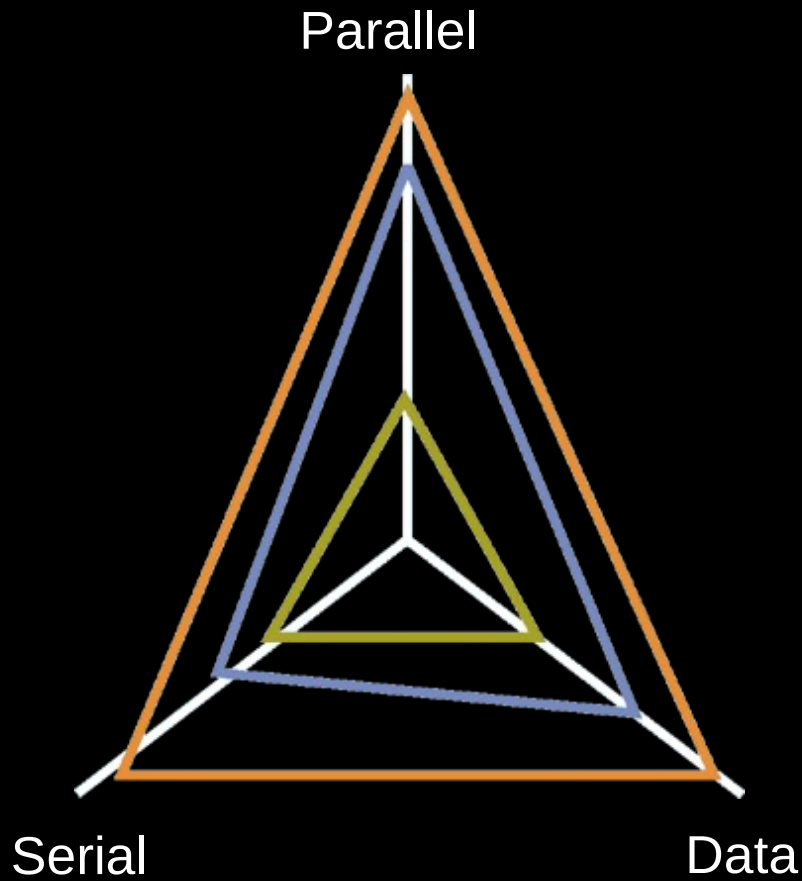
# What is “Workload Optimization”? (continued)

*Pre-optimized - Software engineers write instructions all the way to the processor level to exploit advanced microprocessor functions...*

- **Systems designed and tuned for major performance advantages**
  - Example: Financial industry/Retail
    - Floating point as a software function
    - IBM POWER7 – floating point at the chip level leading to **4X to 16X** execution improvements
  - Examples: IBM zIIP and zAAP engines
    - Speciality processors that allow Java applications or databases to execute at record rates

*...leading to infrastructure, management, application and database implementations optimized for maximum performance!*

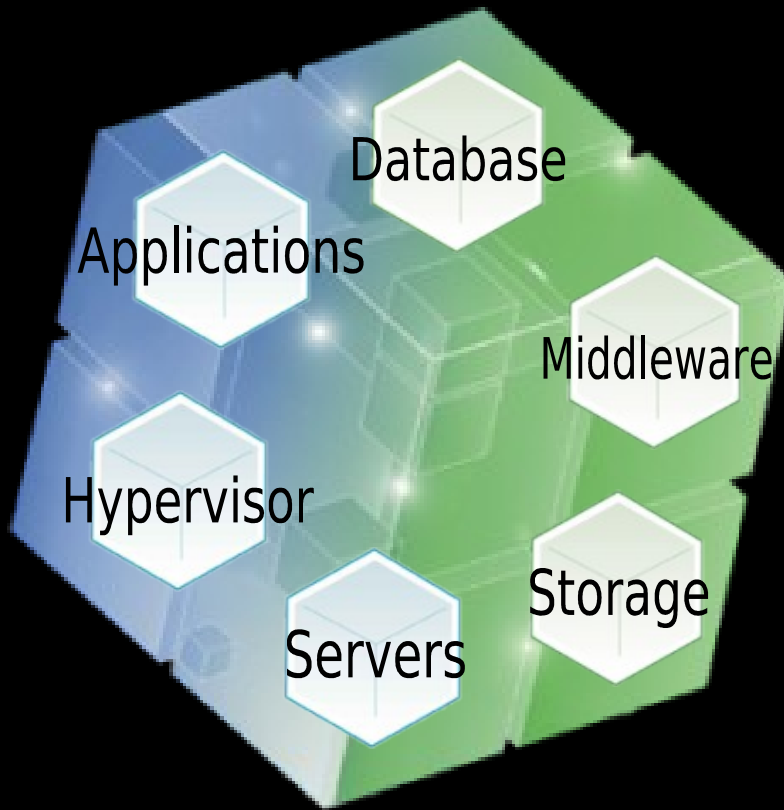
# Systems design characteristics



# Why heterogeneous choices are important

- An incredible amount of data is now being generated
  - Amount of data captured is doubling or tripling every year
    - Mobile devices, instruments, etc.
- This data needs to be processed and managed
  - New applications (business intelligence, decision support, etc.)
- The current model of adding people to manage systems and data cannot be sustained
  - We're going to have to become *SMARTER* in how we manage our systems environments and related data

# Smarter Systems for a Smarter Planet



## Benefits:

- Faster Time to Value
- Greater Agility and Management
- Embodies Deep Client Experience
- Better Performance, Lower Cost

*Smarter Systems for a Smarter Planet*

# Smarter Systems Meet the Demands of a Smarter Planet

## Workloads



### TRANSACTION PROCESSING AND DATABASE

*Keep up with exploding data growth with fast and secure transaction handling*



### BUSINESS INTELLIGENCE AND ANALYTICS

*Uncover deeper insights hidden among diverse information sources*



### BUSINESS PROCESS MANAGEMENT

*Respond to change more efficiently and effectively with Business Process Management*

## Smarter Business Infrastructure



### CONSOLIDATION & VIRTUALIZATION

*Reduce costs and increase agility through consolidation and Integrated Service Management*

# Summary

- Application characteristics should dictate systems choices
- Platforms are optimised differently
  - Different systems offer different service levels and are balanced differently
- Be aware that the applications/server market is changing
  - x86 vs. POWER vs. SPARC vs. Itanium vs. mainframe
  - General purpose servers are NOT the same as application servers
- Understand other important heterogeneous systems differences
  - HW and SW integration and innovation at all levels
  - Systems designed and tuned for MAJOR performance improvements