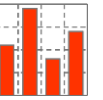


## Complexity of Oracle Platforms

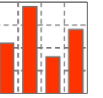
Technical Presentation

May 2014



- The performance of Oracle platforms is not predictable - due to complexity of platforms
- Benchmarking is the only way to predict performance of an Oracle database platform

# Complexity of Oracle platforms



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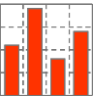
## Storage System

**Storage System**

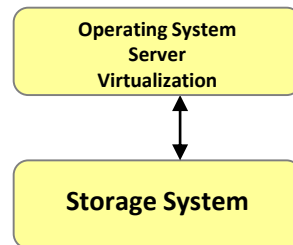
### **Storage System**

Different storage systems, storage tiers and storage technologies: hdd and ssd, spindle count and speed, RAID management, cache management, server interface technology, storage system options like remote copy, hardware striping and/or mirroring, virtualization of resources.

# Complexity of Oracle platforms



Operating System, Server, Virtualization



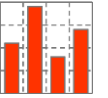
## Operating System - Server - Virtualization

Different server systems, processors and CPU architectures, (x86, IA-64, SPARC, Power), #cores, multithreading, main memory, bus architecture. Different operating systems and patches, over hundred configuration parameters, virtualization of resources.

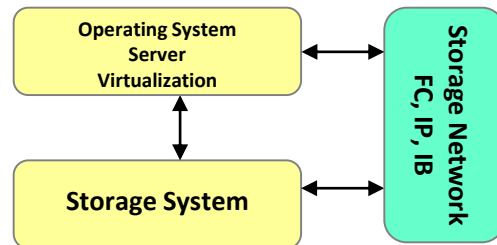
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# Complexity of Oracle platforms



## Storage Area Network



### Storage Network (IB-, FC- or IP-based)

Bandwidth, local latency, remote latency during remote storage mirroring (sync, async) due to switches, hubs and distance.

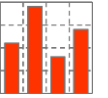
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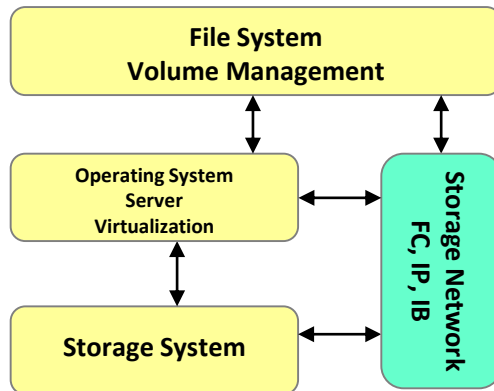
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# Complexity of Oracle platforms



## Volume Management, File System



### Volume & File Management

Different volume managers (VxVM, ASM) and file systems (UFS, VxFS, ext3, JFS, ZFS, raw devices), different I/O methods (async, direct), a lot of config parameters (#LUNS, queue depth, max i/o unit), software striping and/or mirroring, multipathing.

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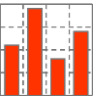
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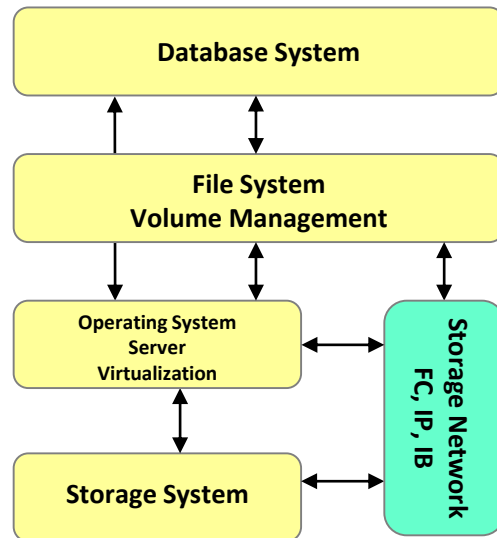
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# Complexity of Oracle platforms



## Database System



### Oracle Database

Different versions, patches and options, about hundred configuration parameters.

### Volume & File Management

Different volume managers (VxVM, ASM) and file systems (UFS, VxFS, ext3, JFS, ZFS, raw devices), different I/O methods (async, direct), a lot of config parameters (#LUNS, queue depth, max i/o unit), software striping and/or mirroring, multipathing.

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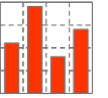
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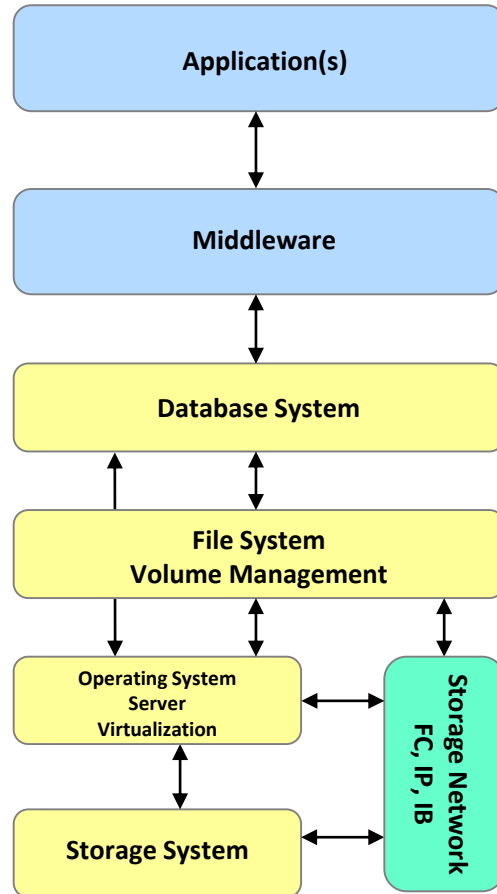
### Storage System

Different storage systems, storage tiers and storage technologies: hdd and ssd, spindle count and speed, RAID management, cache management, server interface technology, storage system options like remote copy, hardware striping and/or mirroring, virtualization of resources.

# Complexity of Oracle platforms



## Middleware, Application



### Oracle Database

Different versions, patches and options, about hundred configuration parameters.

### Volume & File Management

Different volume managers (VxVM, ASM) and file systems (UFS, VxFS, ext3, JFS, ZFS, raw devices), different I/O methods (async, direct), a lot of config parameters (#LUNS, queue depth, max i/o unit), software striping and/or mirroring, multipathing.

### Storage Network (IB-, FC- or IP-based)

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### Operating System - Server - Virtualization

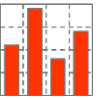
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### Storage System

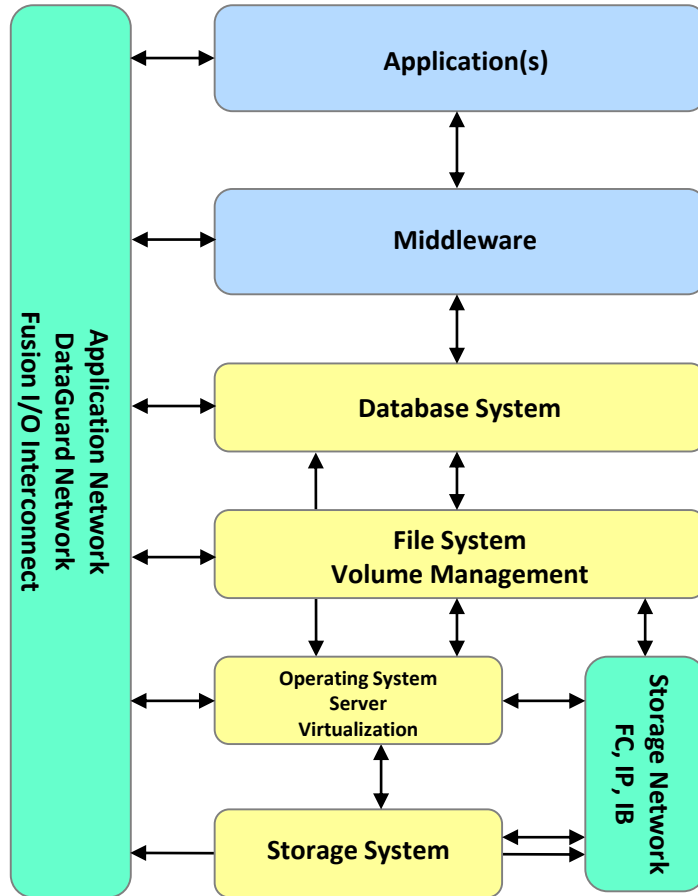
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# Complexity of Oracle platforms



## Application Network



### Application Network (IP-based)

Bandwidth, latency during remote database mirroring (sync, async) due to switches and sql\*net and tcp/ip stack (frame size, ...).

### Oracle Database

Different versions, patches and options, about hundred configuration parameters.

### Volume & File Management

Different volume managers (VxVM, ASM) and file systems (UFS, VxFS, ext3, JFS, ZFS, raw devices), different I/O methods (async, direct), a lot of config parameters (#LUNS, queue depth, max i/o unit), software striping and/or mirroring, multipathing.

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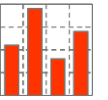
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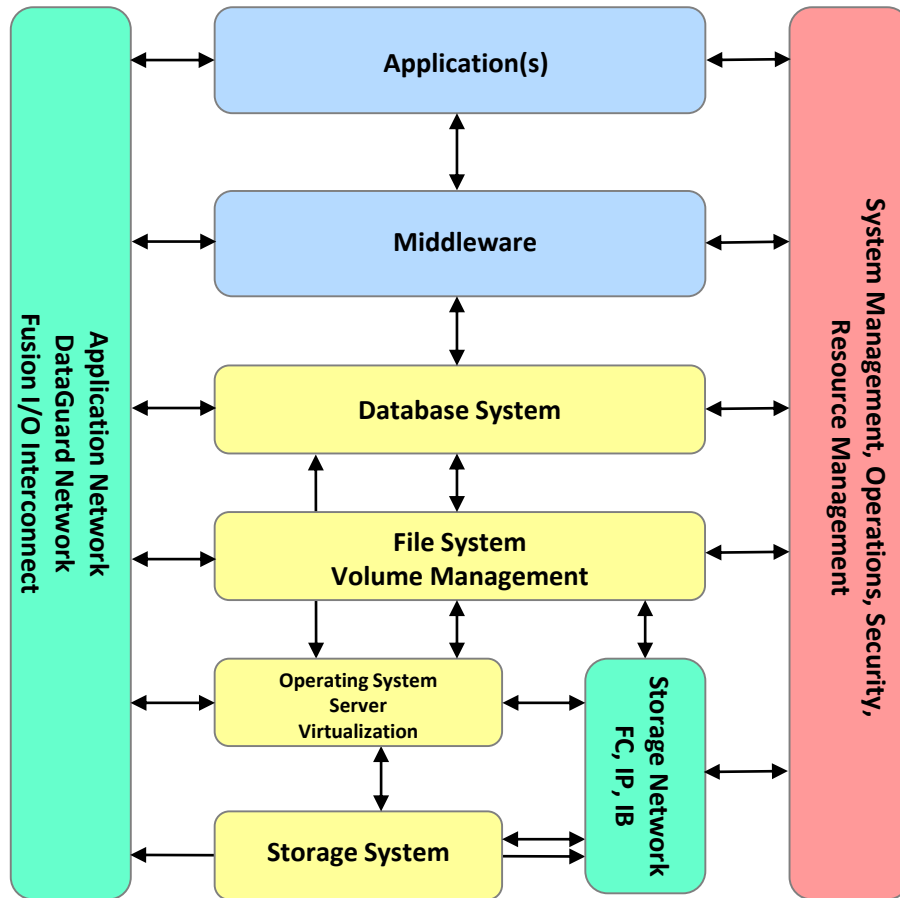
### Storage System

Different storage systems, storage tiers and storage technologies: hdd and ssd, spindle count and speed, RAID management, cache management, server interface technology, storage system options like remote copy, hardware striping and/or mirroring, virtualization of resources.

# Complexity of Oracle platforms



## System Management



### Application Network (IP-based)

Bandwidth, latency during remote database mirroring (sync, async) due to switches and sql\*net and tcp/ip stack (frame size, ...).

### Oracle Database

Different versions, patches and options, about hundred configuration parameters.

### Volume & File Management

Different volume managers (VxVM, ASM) and file systems (UFS, VxFS, ext3, JFS, ZFS, raw devices), different I/O methods (async, direct), a lot of config parameters (#LUNS, queue depth, max i/o unit), software striping and/or mirroring, multipathing.

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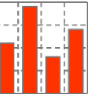
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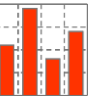
# Database Platform Architecture



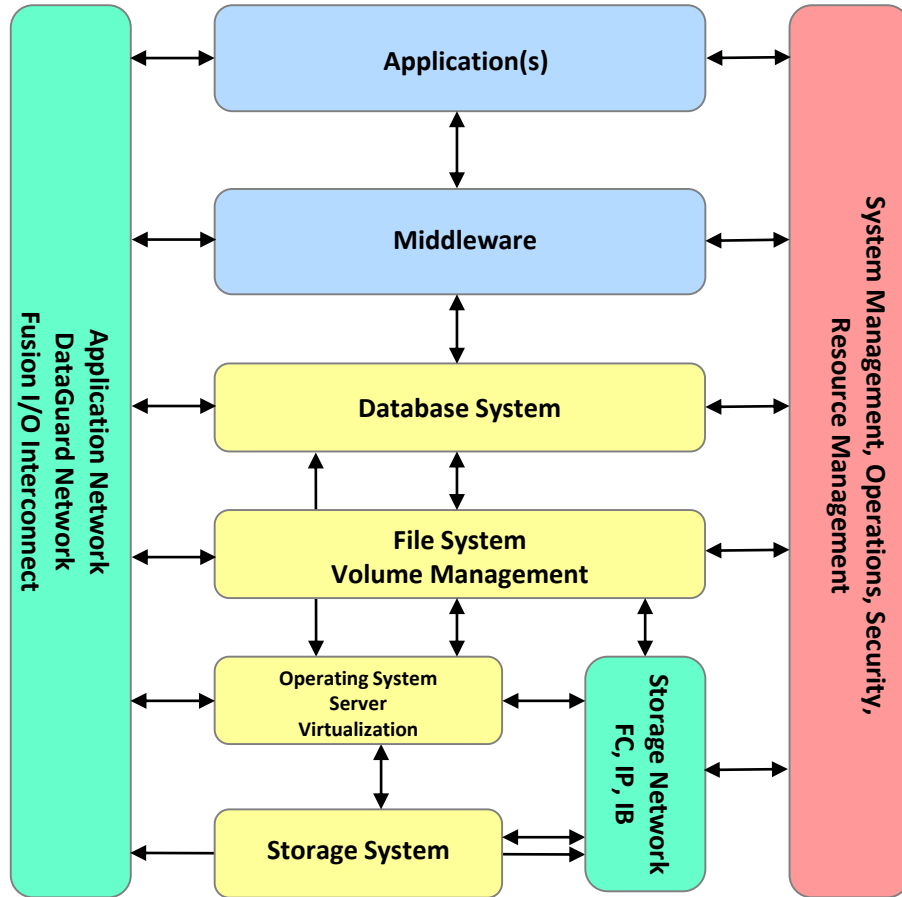
Trends in IT industry to reduce complexity of Oracle platforms

- Reference Architectures & Converged Platforms
  - Hitachi Unified Compute Platform
  - IBM PureFlex
  - VMware Cisco EMC (VCE) V-Block
- Engineered Systems
  - Oracle Exadata
  - Oracle Database Appliance
  - Oracle SuperCluster

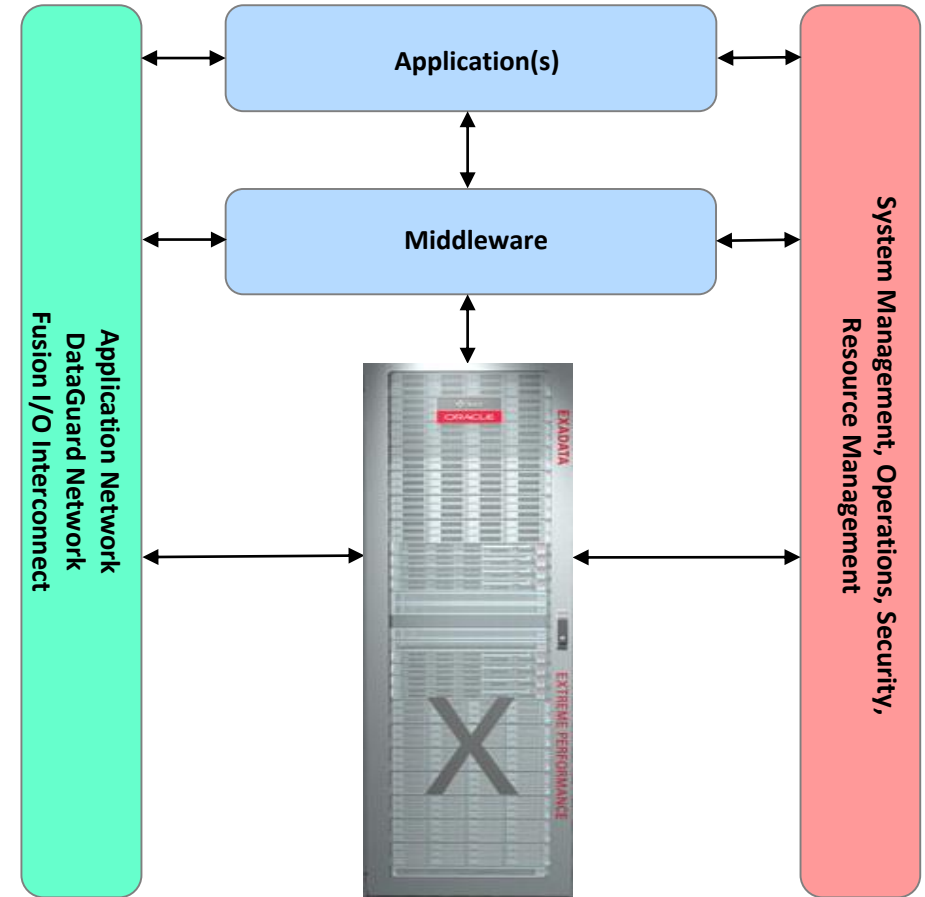
# Database Platform Architecture



## Hand-Crafted versus Reference Architectures versus Engineered Platforms

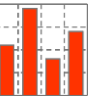


*Hand-crafted Oracle platform – Best of Breed*

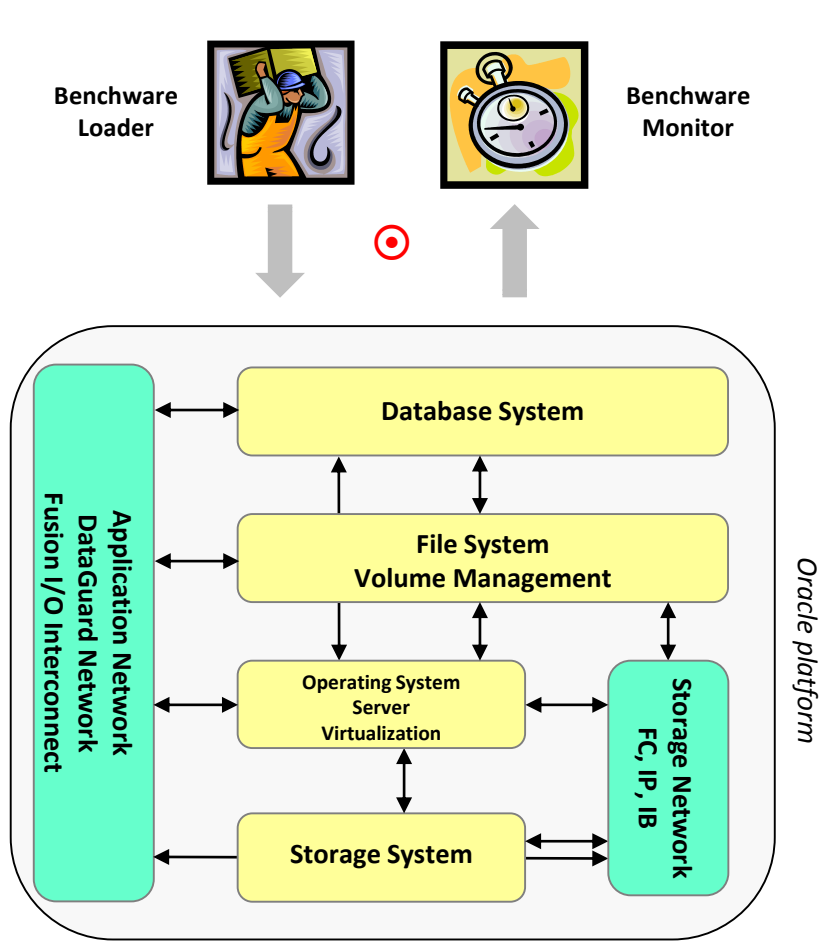


*Reduced complexity with engineered systems*

# Database Platform Architecture



Complex architecture of Oracle platforms requires benchmarking



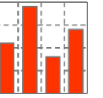
## Application Performance Requirements (Benchware Monitor)

- ✓ Performance measurement at the interface between application and Oracle database platform
- ✓ Key Performance Metrics can be used for SLA between IT operation and business
- ✓ Detects performance bottlenecks

## Oracle Platform Performance Delivery (Benchware Loader)

- ✓ Benchware uses Oracle database software to generate all kinds of loads for cpu, server, storage and database performance tests

# Conclusion



Complexity of Oracle platforms requires benchmarking

- High complexity due to the huge amount of combinations
  - Components
  - Configurations
  - Architectures (e.g. for HA and DR)

there are probably no two identical Oracle platforms -  
even in the same company
- Performance of Oracle platforms is not predictable
- Benchmarking is the only way to predict performance of an Oracle database platform

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*[www.benchmarkware.ch](http://www.benchmarkware.ch)*

*[info@benchmarkware.ch](mailto:info@benchmarkware.ch)*