

The logo for Platform Computing, featuring the word "Platform" in a white, bold, sans-serif font on a dark blue rectangular background.

Platform

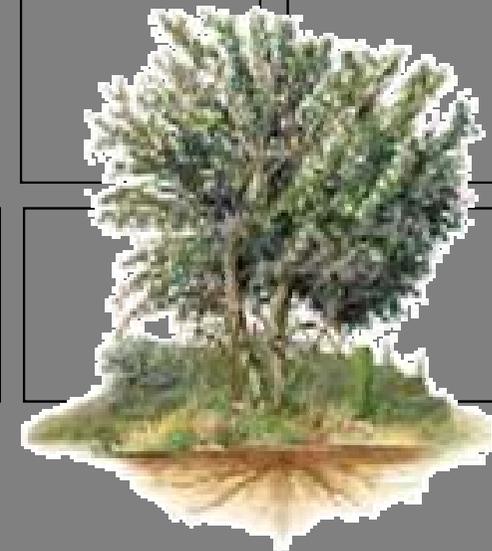
Agile Enterprise Powered by Grid

A silhouette of a man in a dark suit standing with his back to the camera, leaning on a dark horizontal railing. He is positioned in front of a large window that looks out onto a bright, hazy landscape. A white grid of squares is overlaid on the entire scene, including the man and the window. The grid consists of approximately 10 columns and 8 rows of squares.

Platform Computing KK
Director
Hidetoshi Kobayashi
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Agenda

- 1, Introductions**
- 2, Industry Perspective**
- 3, Platform Solutions**
- 4, Case Study**
- 5, Q &A**



Platform

1, Introductions



- The world's largest, most established provider of **grid computing** solutions
- Over 2000 customers in many vertical markets
 - Electronics, Financial Services, Manufacturing, Aerospace, Automotive, Life Sciences, Oil & Gas, Government, Universities & Research, Telco
- Recognized leader and pioneer in grid computing
 - 14 years in grid
 - Global offices, resellers and partners
 - Ongoing innovation in new product development & open standards
 - 24x7 Worldwide service, support, and consulting

Winner of Gartner's "**Cool Vendor, 2006**"

Platform Computing awarded "Cool Vendor in IT Operations Mgmt, 2006"

Coverage & Size

- Standard: 8x5 local time (9:00am-5:00pm)
- **Extended:** 7x24 for Severity 1 problems provided via 24-hour hot-line.

- Severity 1

- Initial response: 1 hour
- Work plan: 6 hours
- Status update: daily
- Problems opened during standard hours will be worked on off hours as required.

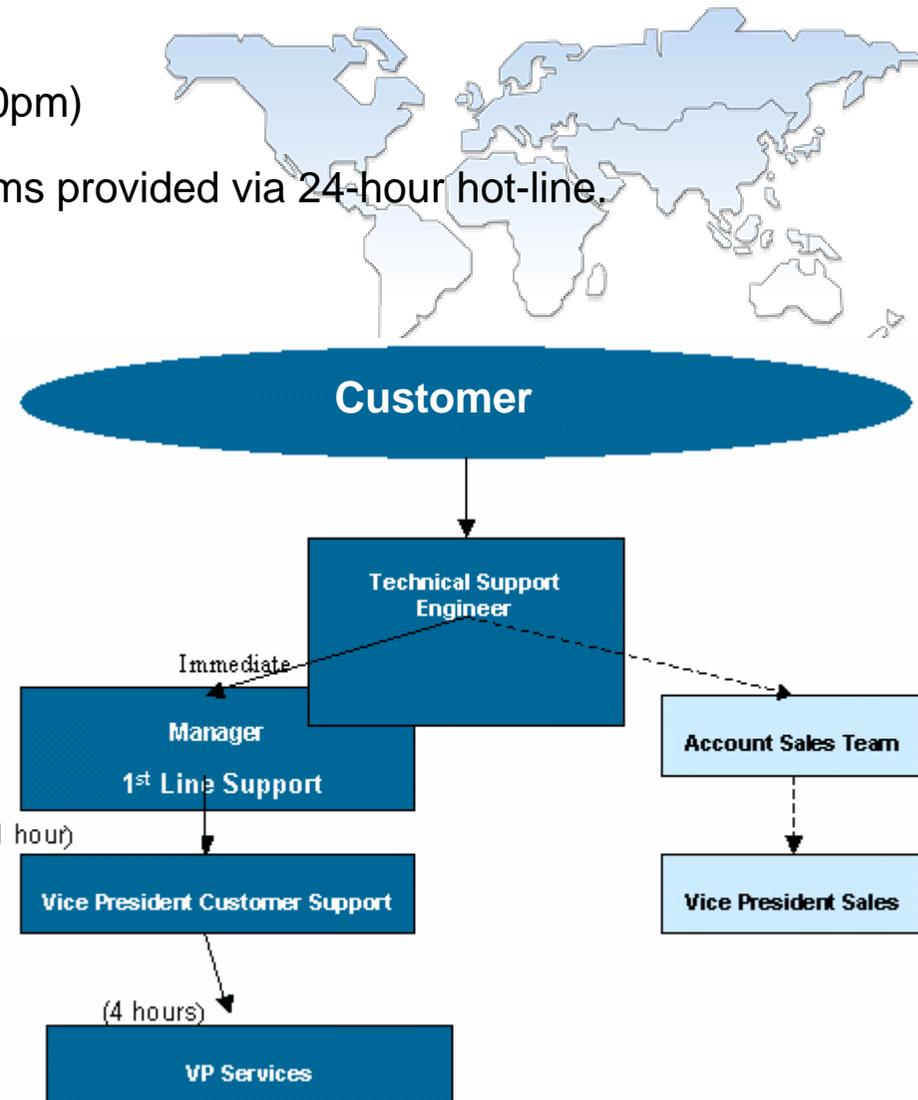
- Severity 2

- Initial response: 1 business hour
- Work plan: 2 business days
- Status update: weekly

- Severity 3/4

- Initial response: 2 business hour
- Work plan: 3 business days
- Status update: weekly

- 56 support professionals globally



- **Platform LSF**
 - Grid Mgmt, used by most large companies in Electronics, Life Sciences, Oil & Gas, Manufacturing, Automotive, Aerospace
- **Platform Symphony**
 - Used in Financial Services and Insurance – grid middleware
- **Platform Virtual Machine Orchestrator**
 - Dynamically allocate VM's (like Xen & VMware), JVM's and Web Services
- **Platform EGO (Enterprise Grid Orchestrator)**
 - Foundation layer for grid mgmt

Financial Services

- Citigroup
- HSBC
- JP Morgan Chase
- Lehman Brothers
- Société Générale
- UFJ
- Royal Bank of Canada
- Mass Mutual
- Sal Oppenheim
- Fidelity



Electronics

- AMD
- ATI
- Broadcom
- Cadence
- Cisco
- HP
- IBM
- Motorola
- NVIDIA
- Qualcomm
- Samsung
- ST Micro
- Synopsys
- TI
- Toshiba



Industrial Manufacturing

- BMW
- Boeing
- Bombardier
- British Aerospace
- Daimler Chrysler
- GE
- GM
- Lockheed Martin
- Pratt & Whitney
- Toyota
- Volkswagen



Life Sciences

- AstraZeneca
- Bristol Myers-Squibb
- Celera
- Dupont
- GSK
- Johnson & Johnson
- Merck
- Novartis
- Pfizer
- Wellcome Trust Sanger Institute
- Wyeth



Government & Research

- ASCI
- CERN
- DoD, US
- DoE, US
- ENEA
- Fleet Numeric
- MaxPlanck
- SSC, China
- TACC
- Univ Tokyo



Other Business

- Bell Canada
- Cablevision
- Ebay
- Starwood Hotels
- Telecom Italia
- Telefonica
- Sprint
- GE
- IRI
- Cadbury Schweppes



Strategic Partners



Premier Partners



Select Partners



Platform

2, Industry Perspective

Gartner

Top 10 Strategic Technologies in 2006

1. **Virtualization**
2. **Grid computing**
3. **SOBA**
4. **Pervasive computing**
-
7. **Linux**

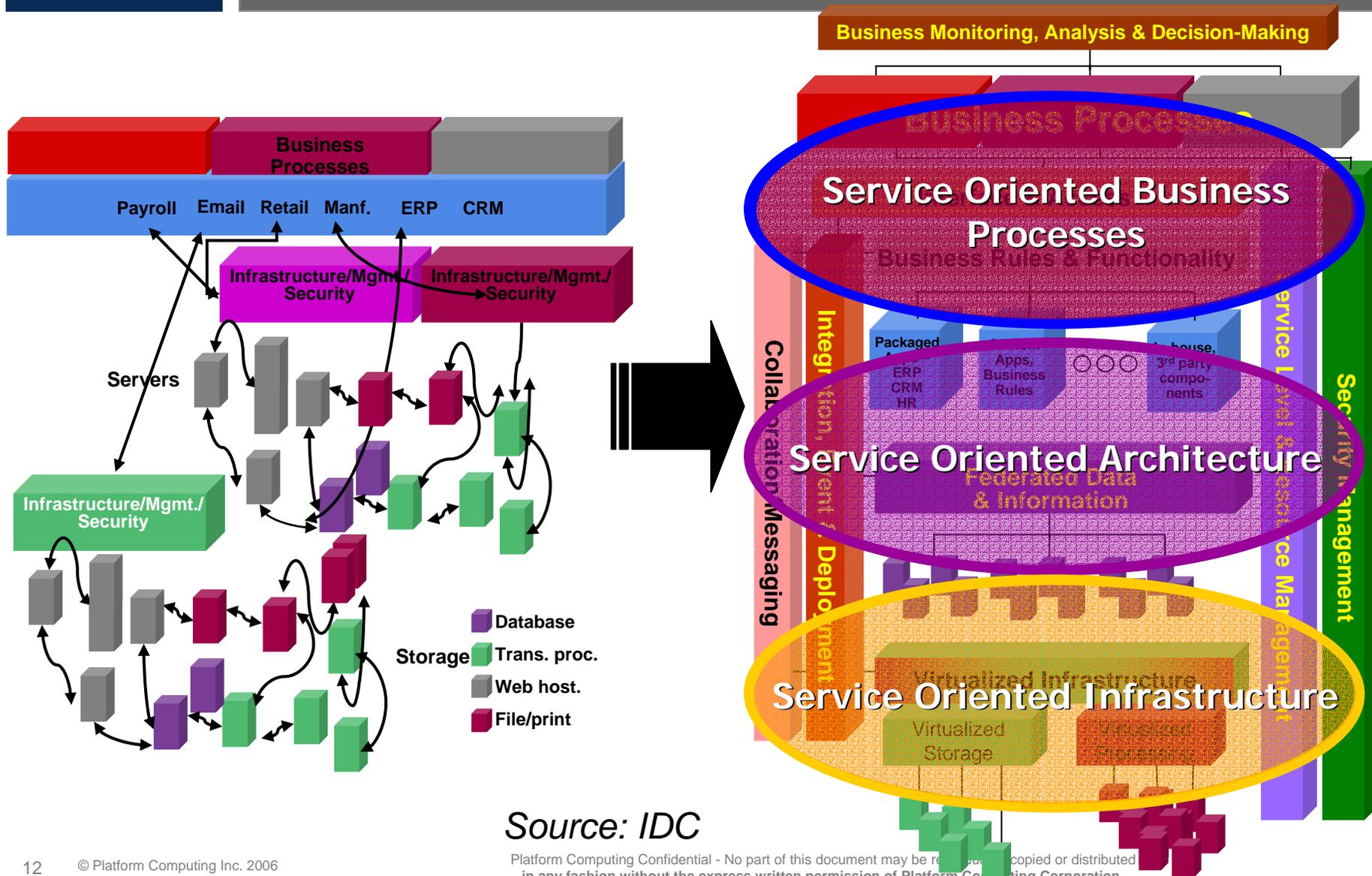
IDC

- HPC market revenue \$7.25B, 30% growth
- Cluster market share >50%, 50% growth
- Top challenge: management

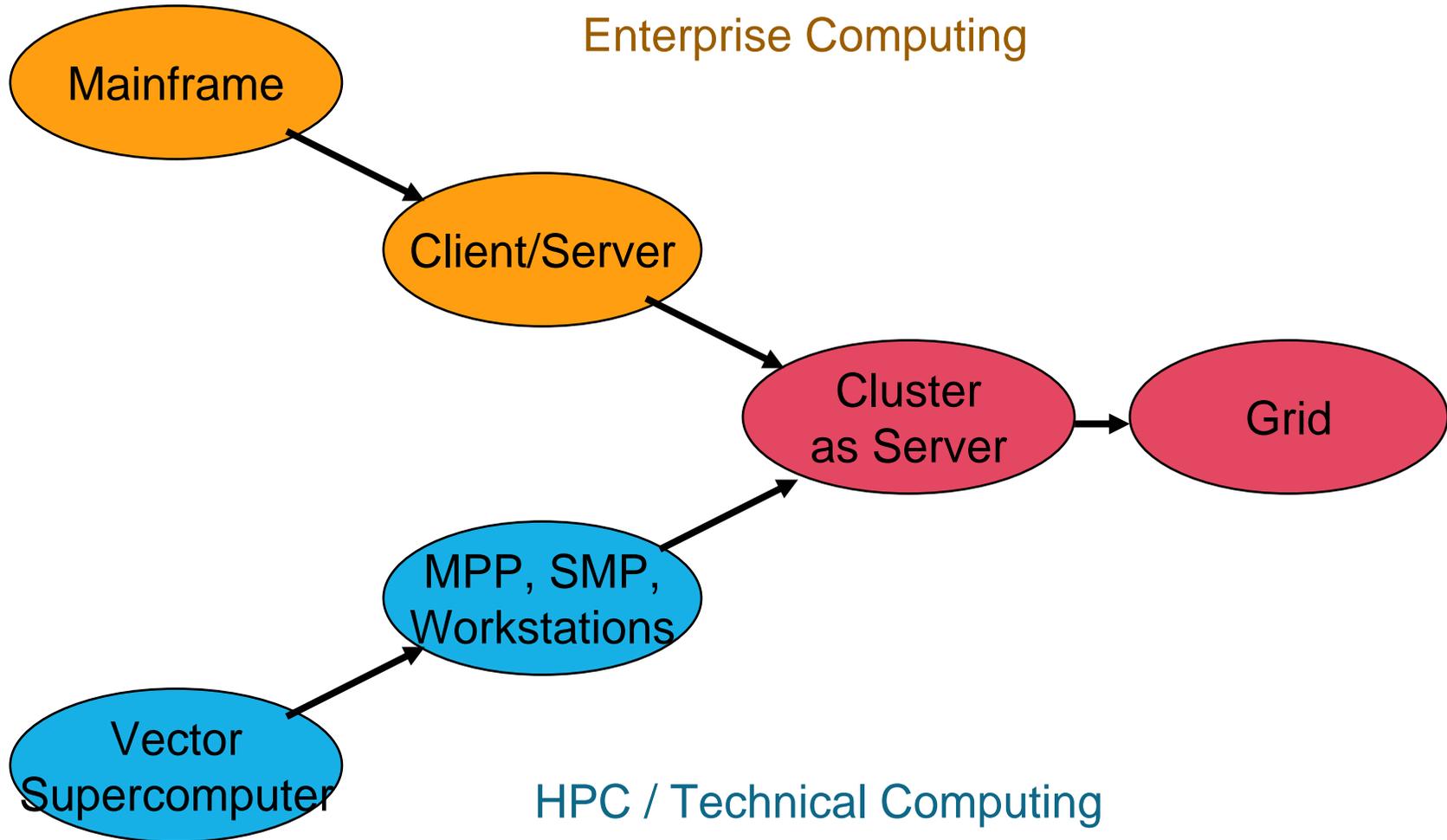
Adaptive Enterprise, Dynamic IT, Grid, On Demand, Organic IT, Scalable Enterprise, SOA, SOI, SOE, Utility Computing, Virtualization,

- Business' dependency on IT never been higher, yet, IT can't keep up with business - too much time & effort to enable for a new app, too slow to react to changing app resource demands, ...
- Business agility requires IT agility
 - *agility - the power of moving quickly and easily; nimbleness* - Dictionary.com

The Challenging Transition to Agile Enterprise



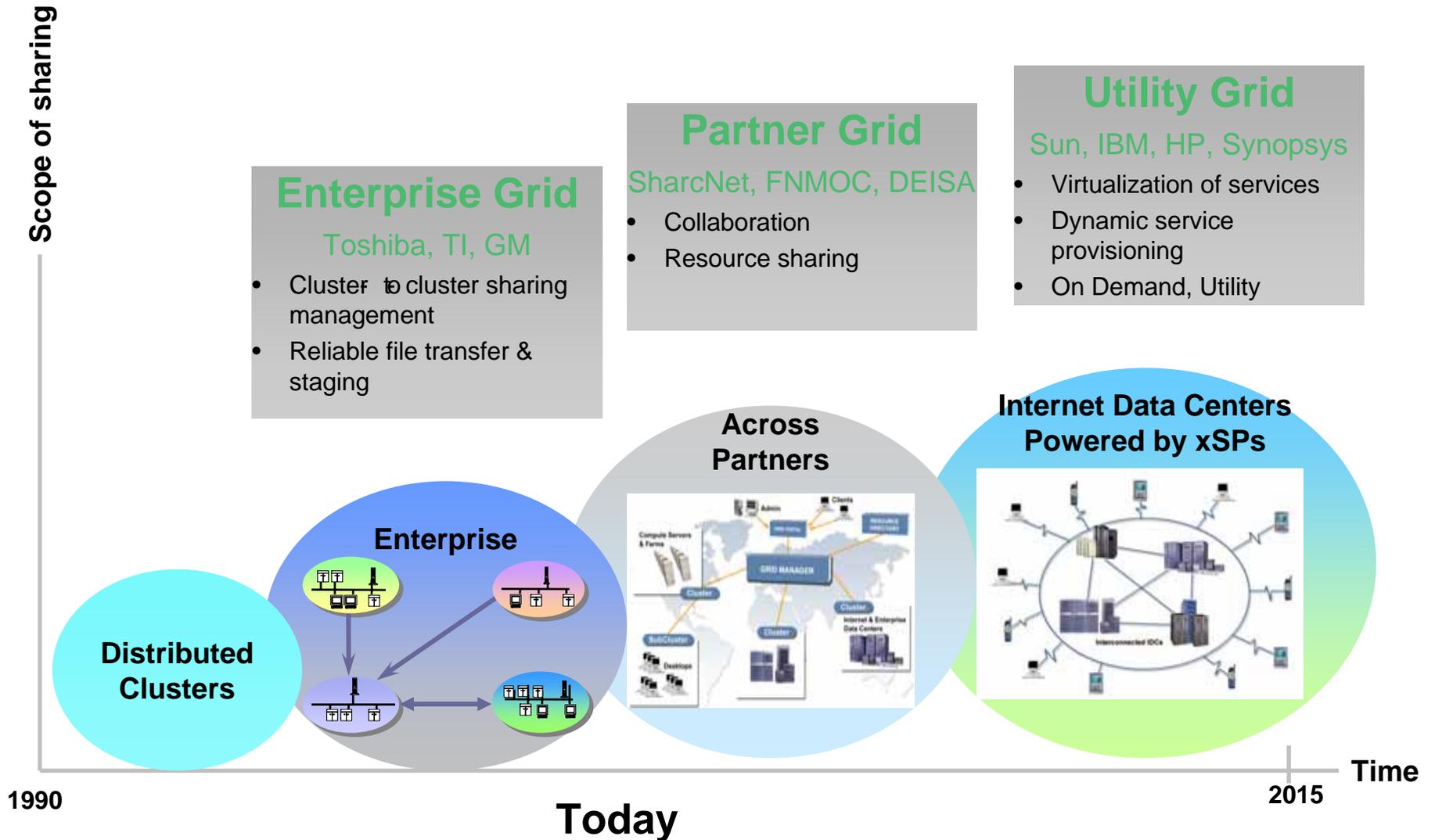
Source: IDC



'60s – '70s

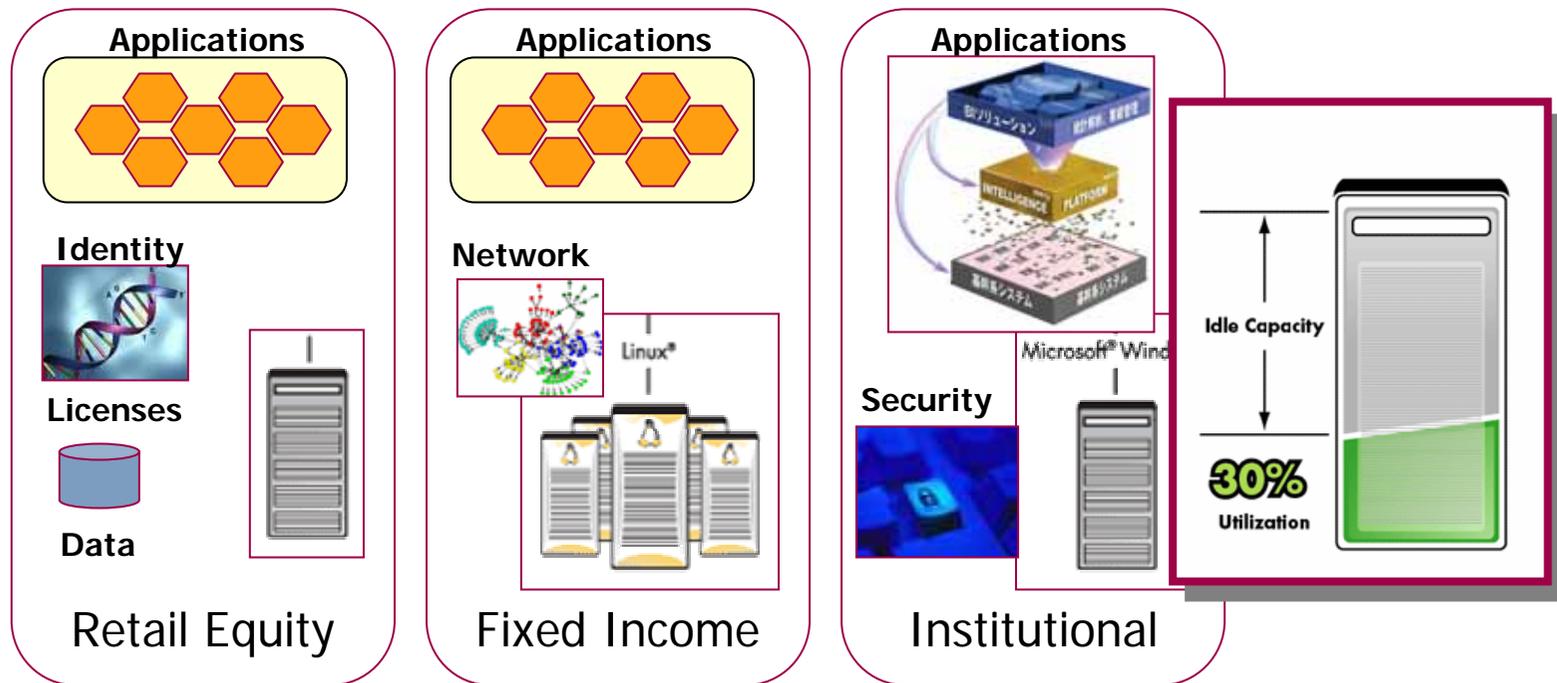
'80s – '90s

21st Century

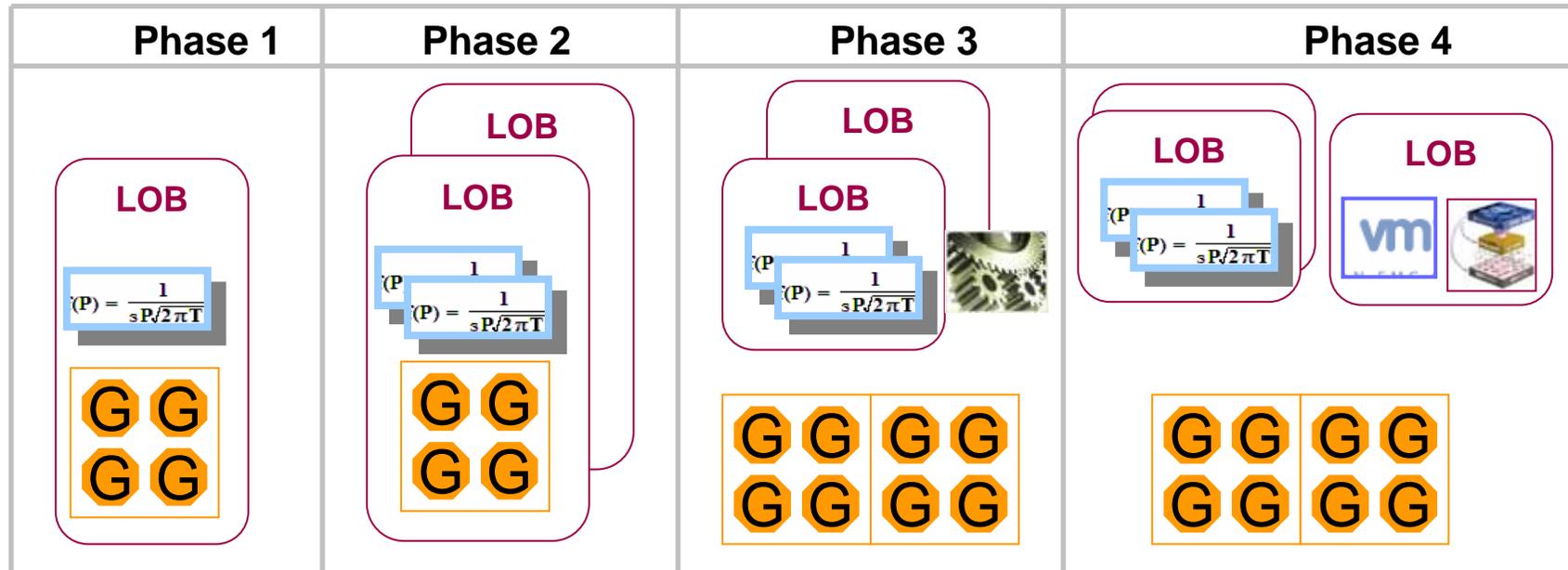


Today's IT Realities

- ❑ Virtualization silos: **hard to scale and expensive to maintain**
- ❑ **SMP** boxes hitting “the performance wall”
- ❑ **Overprovision** to meet business demands resulting in under utilization of expensive hardware

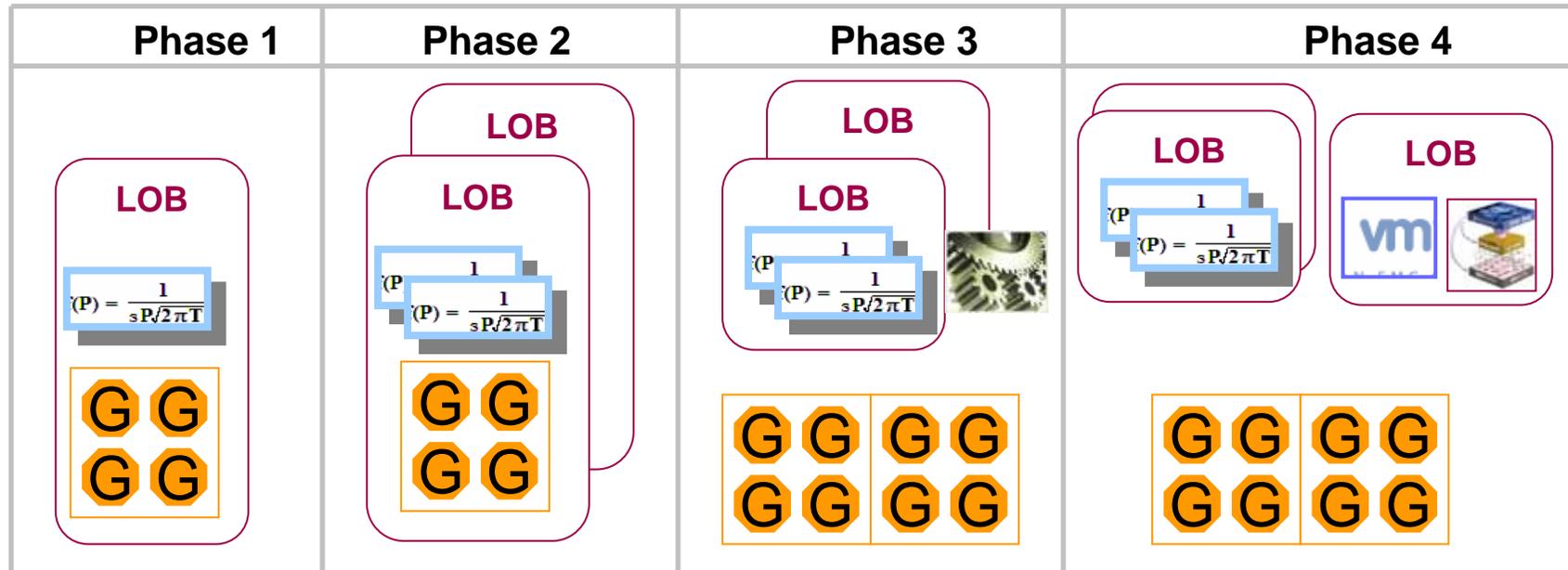


So, what does this mean in terms of Grid and Virtualization?



Compelling Drivers, Realities, and the Politics of Adoption:

- Grid Enable Applications for better performance and Lower Cost
- Easy Of Deployment for Multiple Application Owners
- Management Capabilities
- Beyond Analytics: Virtual Containers, App Servers, Dynamic Provisioning



- Virtualization of resources & services across a scaled-out environment
- Open interface & architecture to on-board any application type
- Orchestration of virtual resources to meet any workload demands based on business-driven policies
- Highly available, secure, and production-proven

Platform

3, Platform Solutions

EGO

LSF

Pymphony

Platform

3, Platform Solutions

E G O

Comprehensive System Security

Consistent, integrated security framework for EGO

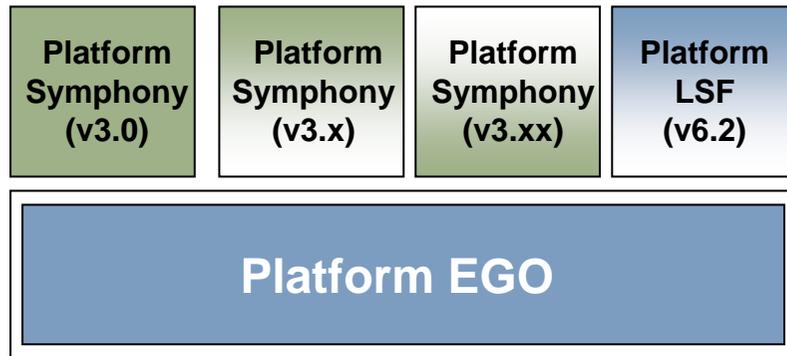
Provides a consistent, single-point of management and control for grid management

- Authentication: based on Web Services standards
 - Can be integrated with any authentication system such as LDAP, Kerberos, X.509

- Encryption & Integrity: session key and symmetric cipher for data encryption and signature
 - Can be integrated with any encryption and integrity plug-in such as PKI
- Authorization: role-based user authorization
- Delegation: consumer-based user delegation



Platform EGO provides centralized security and a pluggable framework across all components of an EGO cluster



Support for multiple applications on the same grid

Business Agility

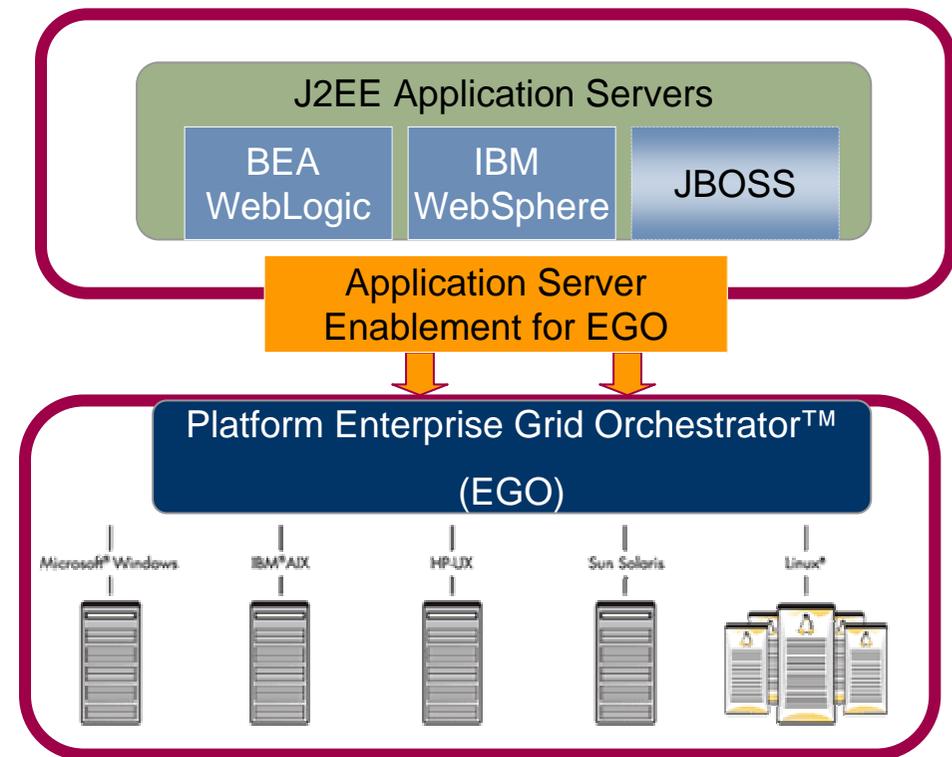
- Support multiple applications on the same EGO grid
- Share resources across different workload managers, applications, LOBs
- Support different versions of Symphony applications in the same cluster
- Upgrade an application in isolation while other applications continue to run

Higher Flexibility and Availability

- Add new applications on the EGO grid as your business grows
- If one instance of Symphony fails, other instances are not impacted
- If EGO encounters problems, Symphony is not impacted

ASE allows enterprises to add J2EE application servers to the range of applications that can leverage the benefits of EGO

- **Enable application servers to share compute resources**
- **Optimize resource utilization**
- **Share resources with other types of applications**



Acceleration Driven

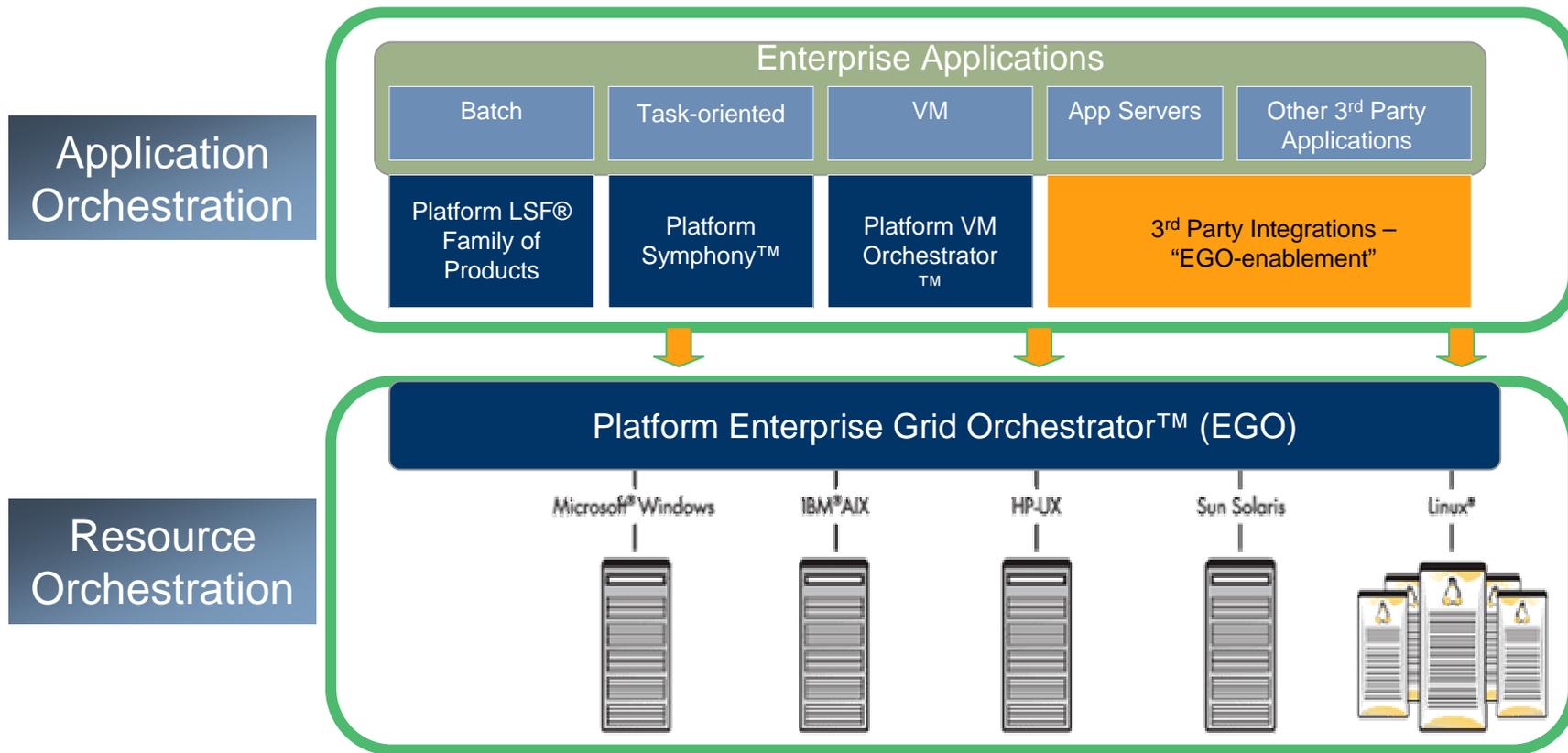
- Faster response time
- Throughput
- Utilization
- Parallelization
- Performance

Orchestration Driven

- Virtualization
- High-availability/failover
- SLA-aware policies
- App, resource monitoring
- Accounting/chargeback

- Common resource virtualization platform
- Common SOA infrastructure
- Common resource plug & play
- Common data collection & reporting
- Common GUI based on portal & Web
- Common management environment, incl installer
- Full extensibility: below, above, across
- Usable by 3rd parties & Platform products

- *Industry standards where & when applicable*



Providing Dramatic Improvements in I.T. Agility

Platform

3, Platform Solutions

LSF

1. **Scalability:** LSF 7.0 on EGO is the foundation for higher scalability in follow-on releases when multiple instances of LSF on top of EGO will be available
2. **Enhanced Robustness:** EGO de-couples workload management from resource management.
3. **Enhanced Reliability:** The EGO service controller (SC) monitors all LSF daemons and automatically restart them if they fail. The SC can also monitor other critical processes that the cluster needs - such as flexlm and lmgrd, and restart them.
4. **Additional scheduling functionality:** EGO provides the foundation for resource ownership policies (e.g. EGO enabled SLA).
5. **Single reporting framework across various application heads built around EGO**
6. **Centralized Management and Administration framework**

LSF 7.0 will include EGO at no extra charge to existing LSF customers

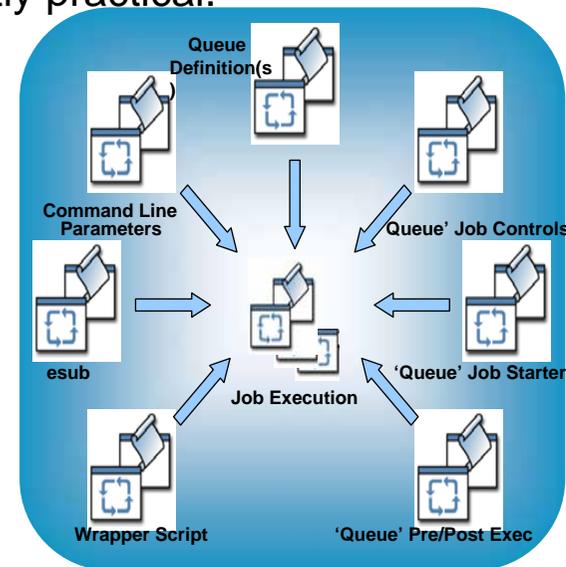
- For a distributed cluster of 5,000 dedicated hosts (10K CPU's, 20K cores) :
 - Sustain a submission/query rate of 20 jobs/second, peak of 100/sec
 - A minimum of 90% utilization with a mean job run-time of 15 minutes
 - Support 10 million completed jobs per day
 - 500K jobs in the system at any given time
 - Reconfiguration should take no longer than 5 minutes
 - Failover should take no longer than 5 minutes
- Support for directly managing 8,192-way parallel jobs

- ❑ Improved user experience for “batch system not responding”

Customizable messages for:

- The scheduler being busy
 - Network errors
 - and the scheduler being down
- ❑ **Faster detection of failed and hung execution nodes**
 - ❑ **Optional EGO management of LSF daemons**, including parallel/asynchronous start-up/shut-down
 - ❑ **Robustness and fault tolerance** for LSF commands when dynamic hosts are configured - LSF commands will work without waiting for slave LIM register to master LIM

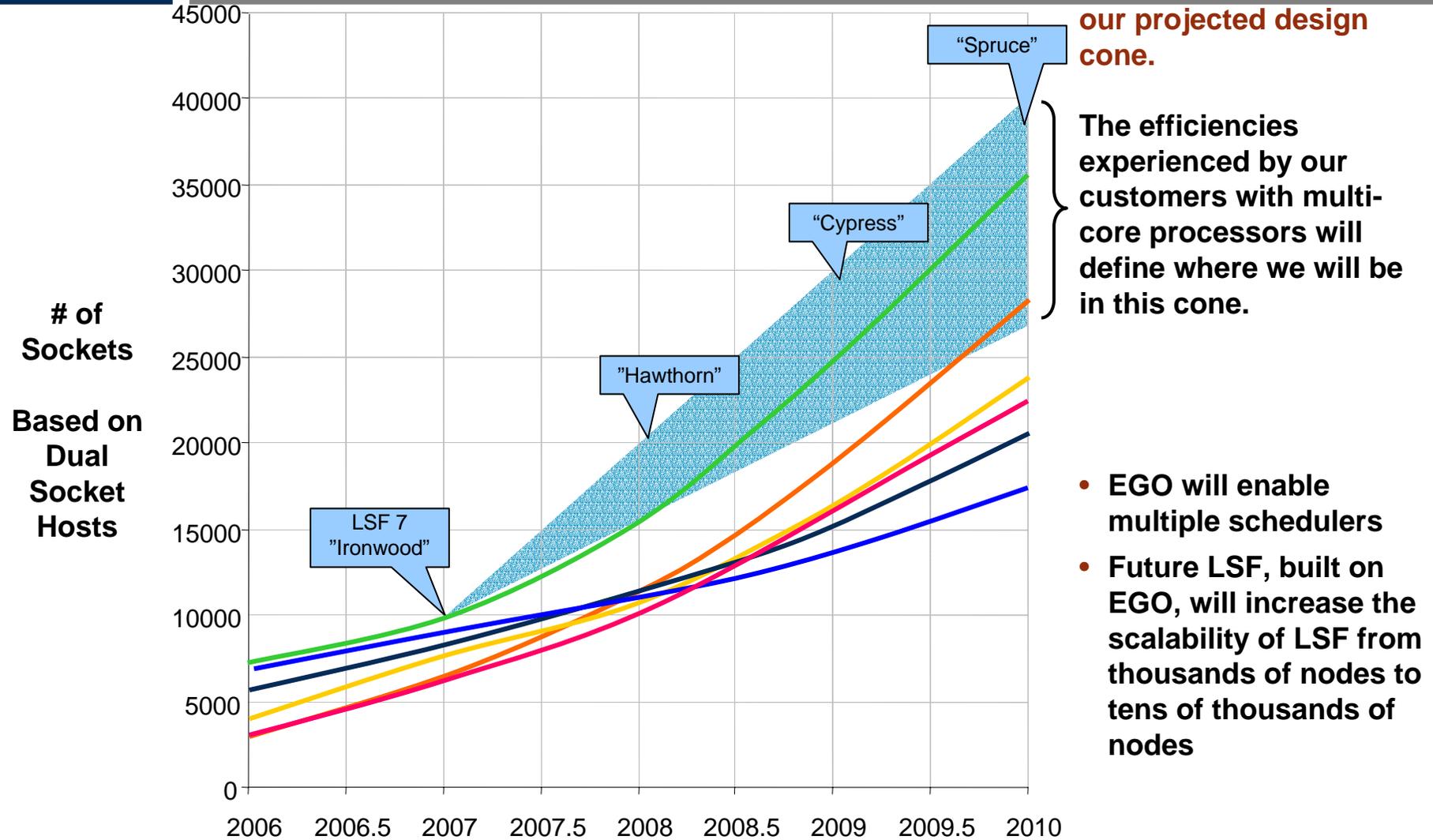
- In clusters with large number of applications, it is crucial to handle **related applications** in a simple consistent manner to avoid complication and an unnecessary load on the LSF Administrator.
- Many of LSF's configuration parameters apply to the queue, to all queues, and to hosts. This can result in the LSF Administrator becoming involved in defining application specific queues.
- Application Encapsulation will enable the **abstraction of "host" and "queue" functionality to be application or "job class" specific.**
- It will also enable "per job" attributes that are not currently practical.





Scalability Roadmap

Based on projected Customer Cluster Growth

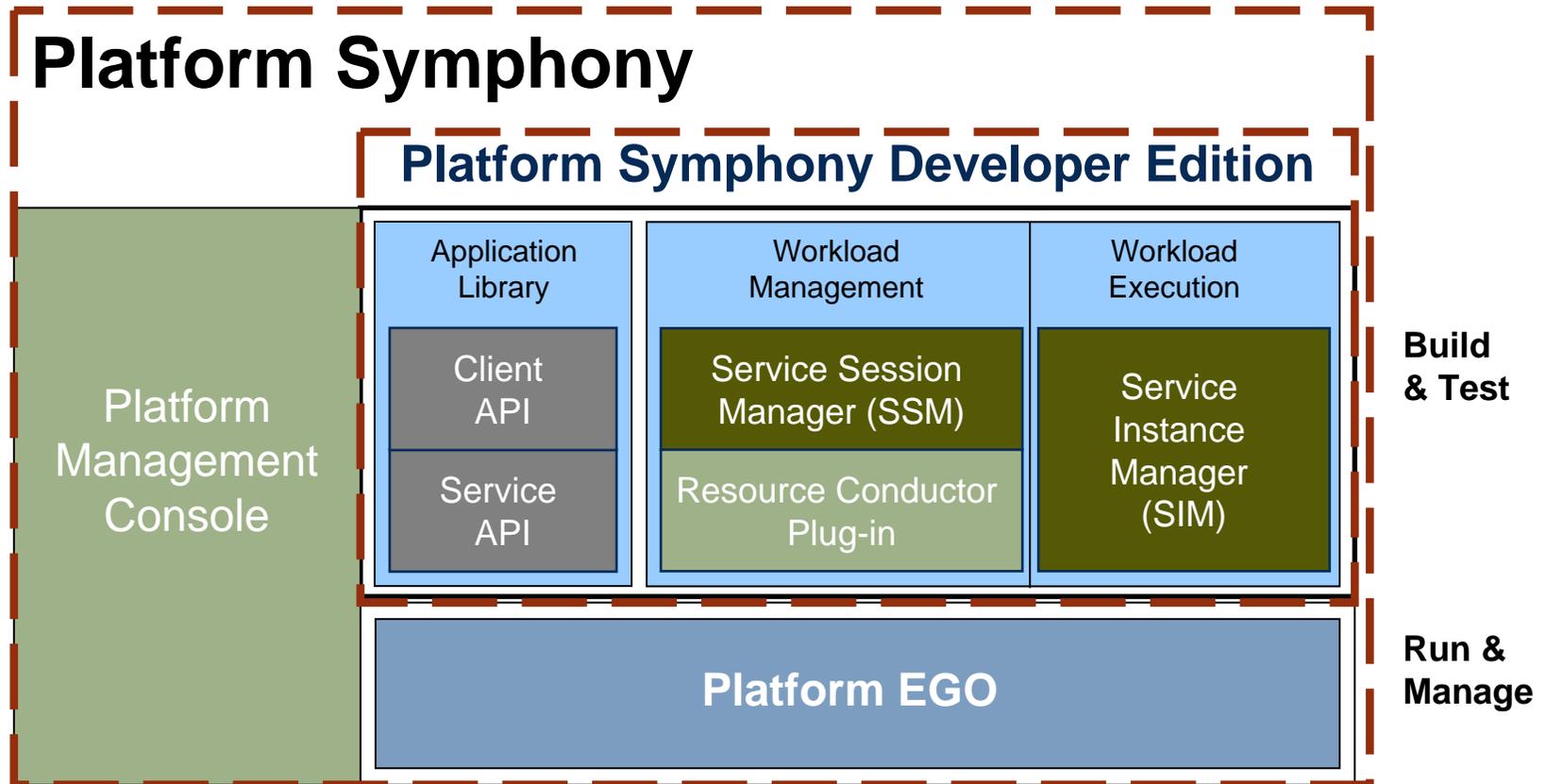


Platform

3, Platform Solutions

Symphony

Symphony 3: Built on Platform EGO



Platform Symphony 3

Unique Benefits to Financial Services Customers



1. Enable Businesses to execute faster with timely pricing and risk exposure calculations

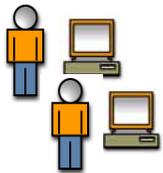
- **The Power of Platform EGO**

- Share IT resources across multiple applications
- Faster results = Faster competitive growth

2. Empower Application Developers to easily grid-enable applications

- **Symphony Developer Edition**

- Build and test applications independent of the grid and IT
- Faster time to grid-enable applications = Faster revenue generation



3. Enable Enterprise IT to create an agile and adaptive infrastructure

- **Unsurpassed Reliability**

- Highly fault-tolerant solution, with world-class reliability and support
- Significantly increase resource utilization = Lower TCO

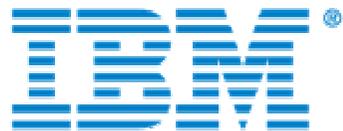


Platform Symphony 3

Scalability and Performance Testing in IBM's DCCoD

Large scale testing of Platform Symphony on IBM Blades

- Leveraging IBM's Deep Computing Capacity on Demand Center (DCCoD)
 - Stress testing Symphony to 1000 physical CPUs
 - Sustained high performance even while scaling to large clusters
 - Validated simulated tests in a real environment
- Validated Symphony to support in excess of 20,000 CPUs
- Demonstrated extremely high throughput with 2,000 concurrent clients running 100 grid-enabled applications
- Ensures customer's IT environment will dynamically grow as their business grows



Symphony 3.0 Performance Speed and Scalability

	Symphony 3.0 RTM	Symphony 3.0 at IBM DCCoD
Scalability 1,000 concurrent clients, 100 applications	10,000 CPU's (5,000 hosts) in one cluster	20,000+ CPU's simulated on 1,000 physical CPU's (500 hosts) in one cluster
CPU Utilization 1-100 clients, 1 sec task, 1KB message, 2,000 CPU	> 97%	98%
Task Throughput 1KB Message	1000 – 3000 messages/sec	1000 – 2700 messages/sec
Single Task Round Trip	1.6 – 2.8 ms	2.4 – 3.3 ms
Single Session Round Trip 100KB common data, 10 second 1KB Task	7.6 – 12.3 ms	11.8 – 12.8 ms

Test results are consistent for IBM DCCoD 1,000 CPU cluster and Platform simulated cluster

Platform

4, Case Study

JPMorgan Chase

Improves Service Levels, Cuts Costs

Challenge: Expanding compute capacity while reducing costs



- Dedicated SMP hardware – expensive, not scalable, provisioned for peak
- Seven Major Trading and Risk Systems – expensive to maintain, difficult to scale

Solution: Platform Symphony

- Built a grid infrastructure combining 7 major trading and risk systems

results

Several million dollars of savings

A new credit trading application was built in just 10 weeks instead of the 5 months

“The grid approach allows the bank to reduce operational risk, for instance when an isolated server fails, you have an ability to respond much more flexibly.”

Michael
Ashworth
CIO, JPMC

Platform

5, Q & A

Platform

Thank You