

John Humphreys  
Research Manager  
High Performance and Commercial Servers

## The Evolution of Grid Computing and the Emergence of Utility Model

[www.idc.com](http://www.idc.com)



### Agenda

- What defines a Grid?
- What are the emerging categories for Grid?
- What are suppliers saying, customers demanding and what is the opportunity for both?
- What is the customer approach to adoption and what are the inhibitors?
- How does Grid relate to utility computing concepts and where will the end user "sweet spot"?



## Some Quotes of Note

**“We want to lower cost, we want to shrink dollars out of our hardware, but we certainly don’t want to jeopardize the service level”**

- Large Publishing House considering a grid

**“It was more sort of a grass roots movement than sort of a big bang, bring it in”**

- Independent Oil & Gas Producer having deployed a grid

**“We have identified a couple of applications that require compute power that has been heretofore too expensive to apply”**

- Large Financial Services Firm strongly considering a grid

**“[The grid] needs to be simple to administer in order to provide the value and I don’t think the vendors have done a good enough job at demonstrating that”**

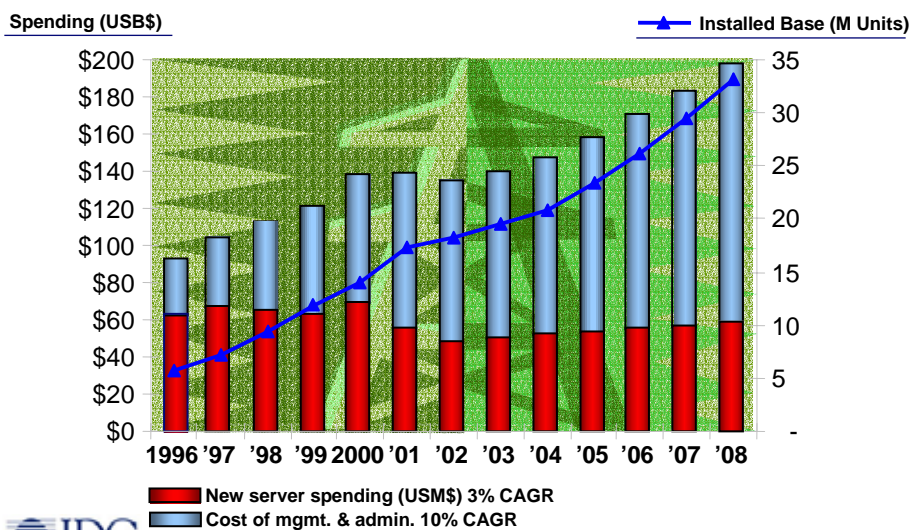
- Large Pharmaceuticals Company considering a grid

**“You need to be able to do more with less and the smarter way to do it is to have a piece of software that manages that environment for you”**

- Large Telecommunications Provider considering a grid

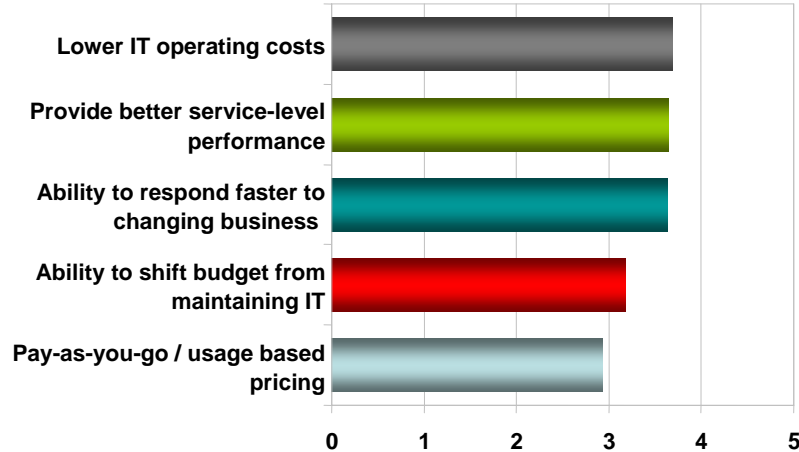


## What Is the Opportunity for Customers and Suppliers?



## What Are Enterprise Customers Demanding?

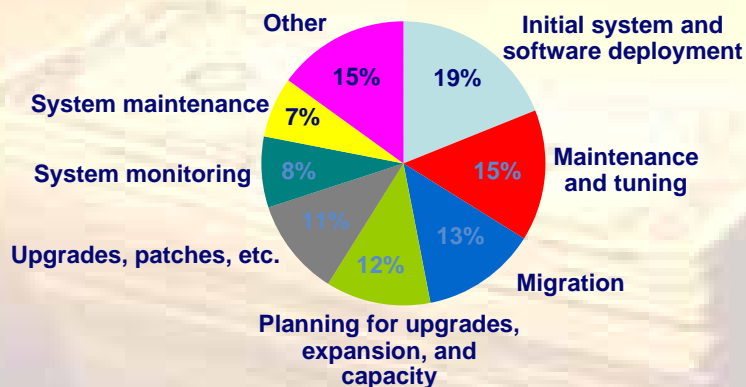
Q: How Valuable Are the Following Potential Benefits of Grid Computing?



Source: Project Barometer II, IDC March, 2004  
N = 414 Worldwide; 126 in the U.S.

## Where Are the Operational Costs Going?

### Server Management and Administration Costs



**2004 Total = \$95B**

Source: IDC Survey Data, 2002-2004

# Customer Demands: Driving Utility Computing

## Grid Infrastructure

Legacy infrastructure is costly to migrate    IT provides unique business value  
Solution complexity    IT is costly to manage

### High Performance

- Cost reduction
- "IT" is a commodity
- Adopt standards & multiple sourcing

### Transactional

- Align with business unit priorities
- Adapt to business change
- Integrate with partners & suppliers

### Compute

- Add throughput to reduce the time to solution and minimize cost of the solution

### Data

- Integrate data sources in order to make better, more informed decisions

### Optimization

- Pool resources together for better economy of scale
- Provide methods to streamline mundane manual tasks of the Admin
- Provide means for provisioning and change management

# Compute Grids Remain Specialized, Incremental Opportunity is in Hardware

## Compute Conclusions

Compute grids are a specialized market – early adopters but limited growth opportunity

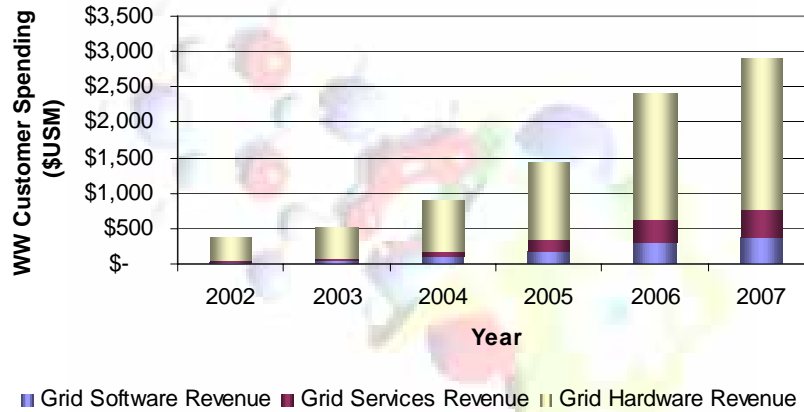
Incremental revenue is almost all HW

Primary opportunity is establishing credibility

## Key Assumptions

- Large projects attempt to harvest disparate compute cycles
- Specialized applications require access to specific services/resources
- Most deployments are HPC-related with R&D apps: Oil, Financial, Bio, Content Creation, etc.
- Custom software development and implementation largely done in-house (tight budgets, technically proficient early adopters, and few packaged solutions)
- Predominant services is training: small/cheap, up-front, and non-recurring
- Prove technical merits, seed the market, establish foothold for the future
- Value is predominantly in buying an option for future

## WW Compute Grid Revenue Opportunity



## Data Grids are a Necessary Niche Opportunity

### Data Conclusions

Data grids are a specialized market where information integration not efficiency or performance drive the market

Spending will be more evenly spread across hardware software and services

Opportunity is a niche but an important one in bridging technical and commercial gap

### Key Assumptions

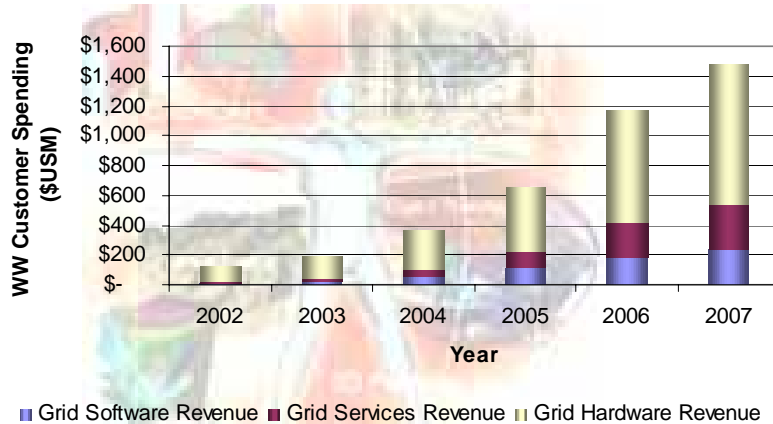
- Large projects attempt to disperate information sources together
- Data integration applications are available for the grid and early adoption is underway
- Most deployments are R&D efforts: Bio, Financial, Computer/IT.

- Complexity of bringing sources together translates to more services and software spending.
- Motivation is faster more informed decisions— hardware utilization less of an issue
- Predominant services is system integration: up-front and non-recurring but high dollar

- Prove technical merits, seed the market, establish foothold for the future
- Value is predominantly in buying an option for future



## WW Data Grid Revenue Opportunity



## Optimization Grid Opportunity Fragmented, Constrained by ISV Business Model

### Optimization Conclusions

Optimization opportunity is the most balanced

Large-scale adoption depends on key applications becoming grid-enabled...

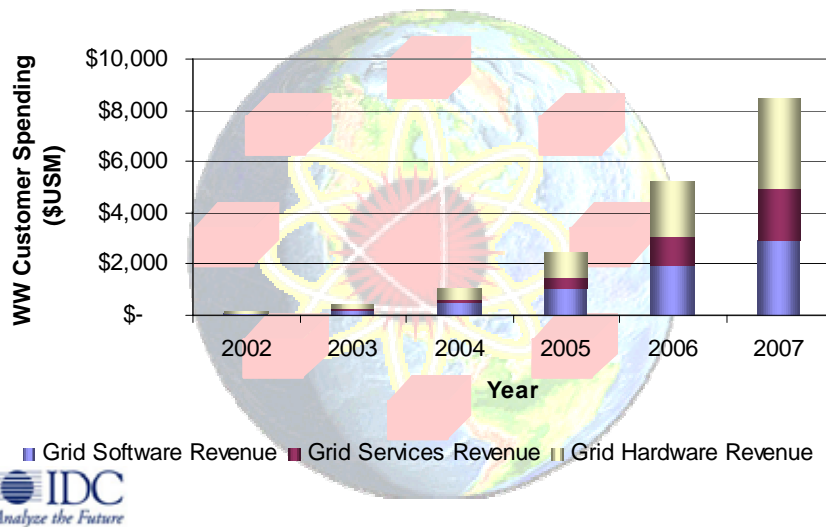
But ISV migration constrained by business model (pricing) more than technical

### Key Assumptions

- Spread across HW, SW, Services
- The largest vertical (Fin Svcs) is only ~20%
- Early adoption starts with non mission critical applications
- Few high-volume packaged applications are grid-enabled
- Many commercial deployments use custom apps with no license fees; the need for custom software development limits commercial appeal
- ISV migration to grid platform likely to be slower than expected (e.g. 64-bit computing)
- Current licensing models incongruent with grid usage patterns—homegrown apps and Linux early
- ISV licensing models will need to migrate: from Box to CPU to User; eventually pay as you go
- Grid-enabling by ISVs will ultimately depend on customer pull from HW and operational savings and lost software opportunity



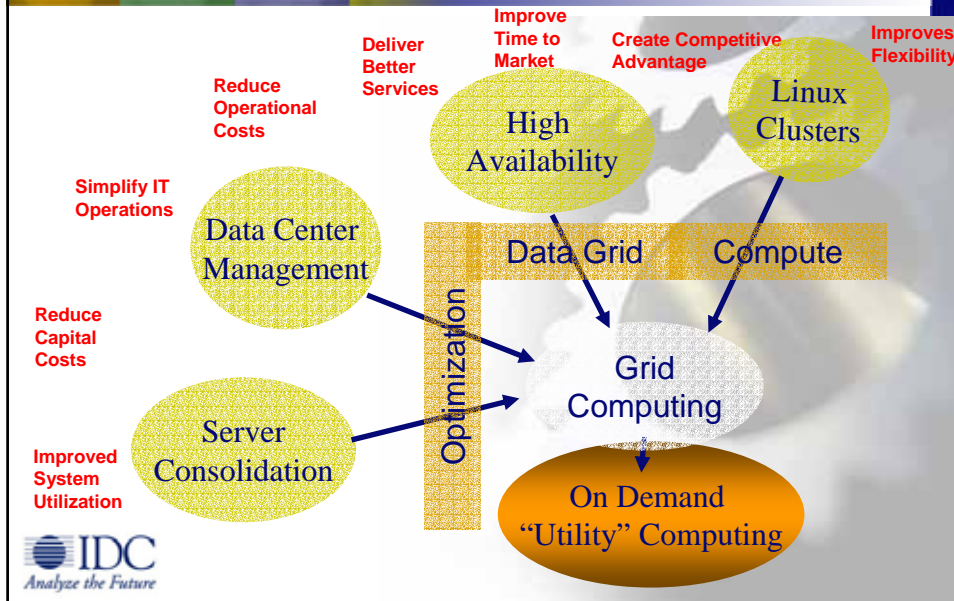
## WW Optimization Grid Revenue Opportunity



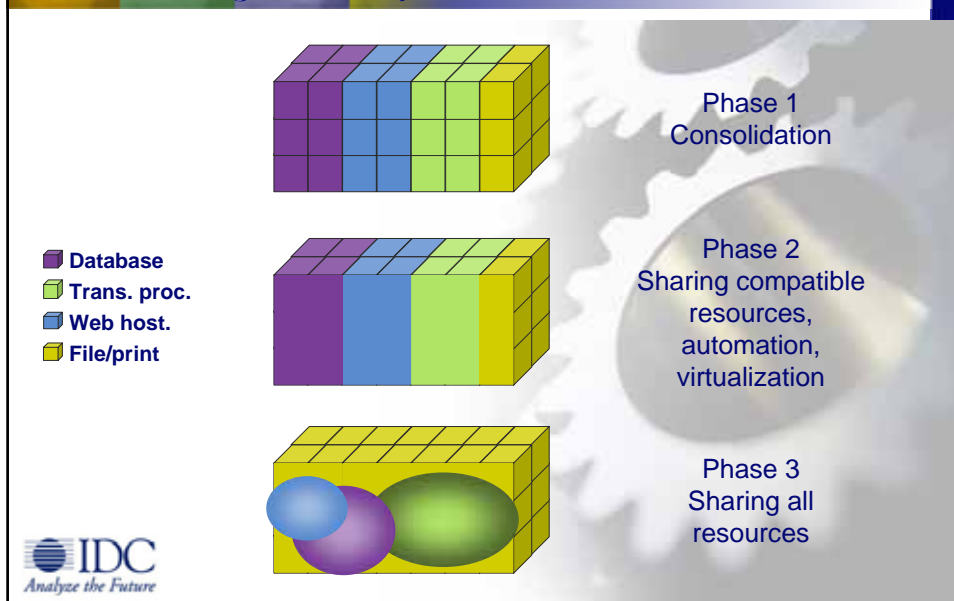
## User Challenges & Constraints for Grid

- **Cultural, Economic, and Technical**
  - **Grids require a different way of thinking about how to deliver cycles – normal resistance to changing behavior is always the toughest hurdle to overcome in technology adoption**
  - **Lack of Software Tools—lack of good management tools for the grid, lack of standards**
  - **Lack of tools means its going to be hard to implement and deploy applications**
  - **Lack of vendor support**

# Connecting Motivations to Grid Computing



# The Vision of On Demand Computing—Thinking Globally



# What Are the Process and Technology Solutions?

## Customer Adoption for IT Utility Infrastructure Adoption Inhibitors

### Service Level Automation

(SLA for departments / customers, resource priorities, billing)

### Infrastructure Virtualization

(Pooling scale-out infrastructure to meet workload demand)

### Application Provisioning

(Deployment of software above the OS)

### Infrastructure Provisioning

(Bare metal through OS)

### Platform Management and Control

(Remote Group Management)

### Platform Monitoring

(Remote Group Monitoring)

Full Virtualization Model Assumes Solid Security

Segment Growth Relies on Wide Industry Standards

Software Vendors Resist to Preserve License Revenue

Solutions are Complex – Not Easy to Implement

Customer LOB and Departments Fight for Ownership & Control

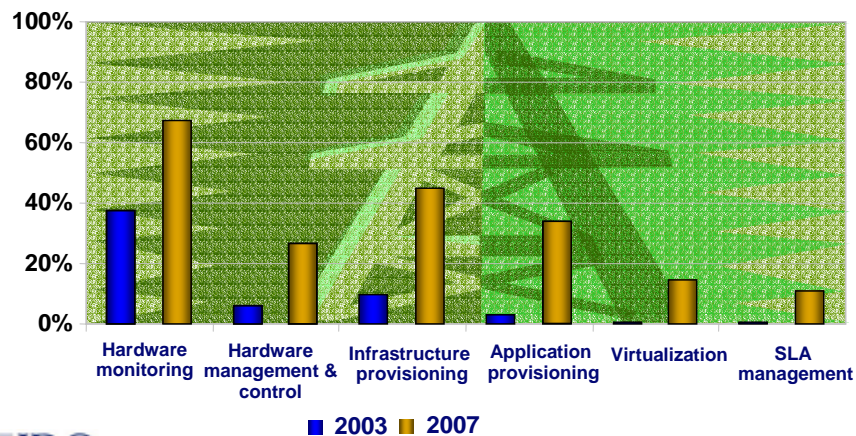
Co-Location

System Consolidation

Application Consolidation

# Do Customers Need a Utility-Like Environment?

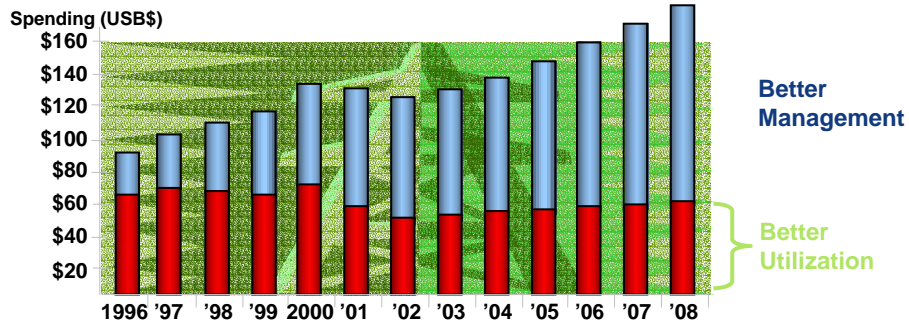
## End-User Adoption: Share of Total Server Shipments



IDC  
Analyze the Future

Source: IDC Document # 30426

## Is the Utility Computing Vision What Customers Will Adopt?



Service-Level Automation

Infrastructure Virtualization

Application Provisioning

Infrastructure Provisioning

Platform Management and Control

Platform Monitoring

Better Utilization: Reduce Capital Costs

Better Management: Reduce Operational Costs

Analyze the Future

Source: IDC, 2004

## Grid Market Futures

- Grids today largely connote technical applications in the users minds, but increasingly interest is emerging in the commercial market
- Licensing issues and the lack of applications for the commercial market holds back adoption
- Only through addressing the needs of a broader market will Grid technology reach critical mass
- Users will need to see Grid as a means to provide cost benefits, productivity and business policy improvements to both batch and transactional workloads

## Essential Guidance

Grid and utility computing are becoming synonymous—though open versus proprietary approaches are impacting the time to market

Address customer pain points directly — slowing the velocity of operational expense growth

Market and introduce incremental solutions that reduce operational costs

Realize the market for virtualization and service-level automation will be some time in maturing

Remember — When customers internalize “Utility Computing”, expect many to deploy something different

## Contact Info

Please email me at

[jhumphreys@idc.com](mailto:jhumphreys@idc.com)

