

# Linux & Innovation

## Are you Ready for Linux?



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**Novell®**

# Agenda

- What makes Linux Special ?
- Charting the Linux Roadmap
- What's Next
- Linux & Leading edge of Computing

# You Face Challenges Every Day



Server  
sprawl



Heterogeneous  
environment



Server  
maintenance costs



Desktop cost  
and security



Lack of  
agility



Business  
continuity



Real-time  
processing

# SUSE® Linux Enterprise

## The Value Proposition



Best  
engineered



Lowest  
cost



Best  
supported



Most  
interoperable

Reduce costs • Manage complexity • Mitigate risk



SUSE Linux Enterprise is the best platform for your mission-critical computing – from the desktop to the data center.

# Linux the Cost Effective Solution



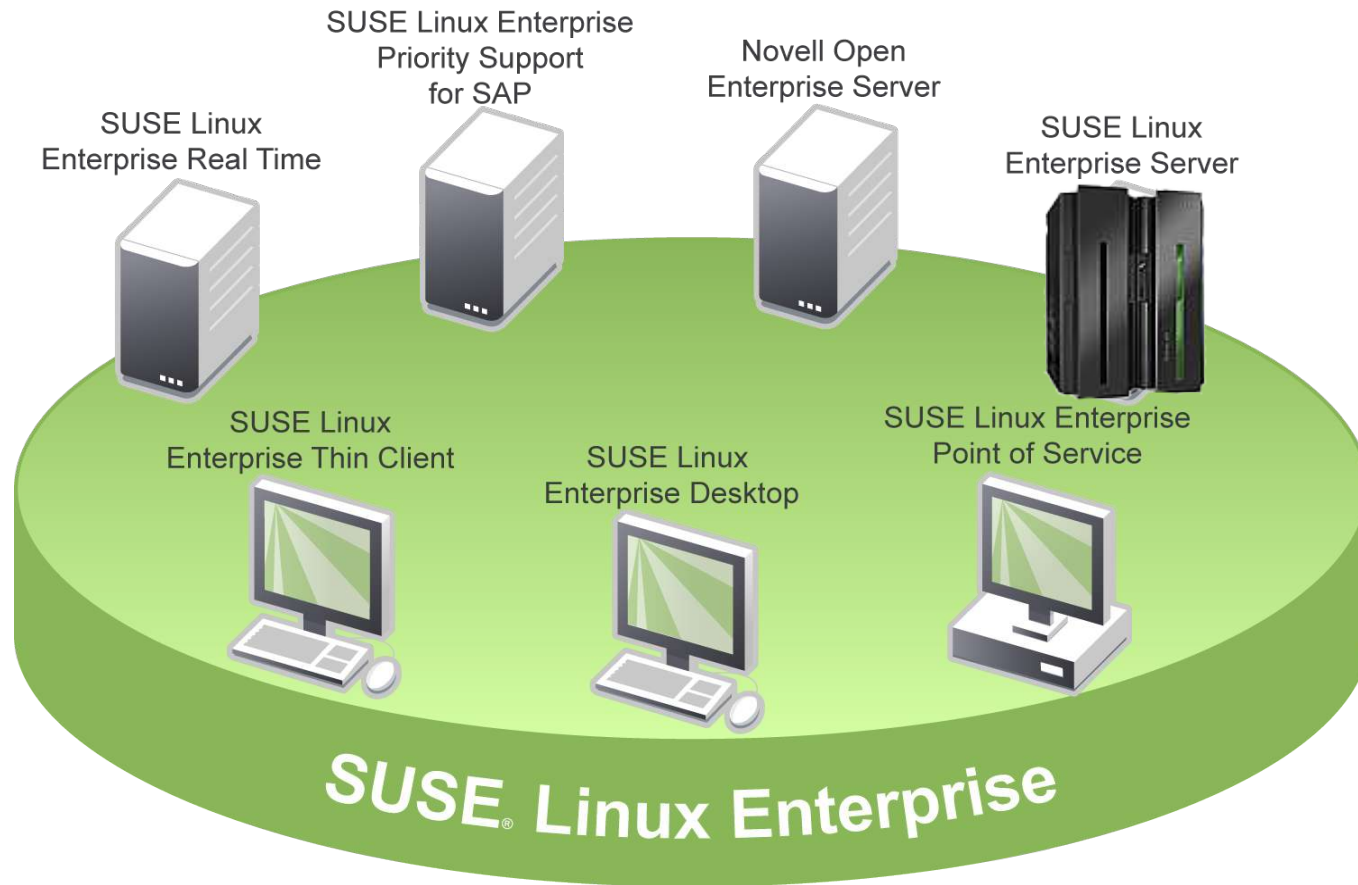
- Linux has no upfront licensing
  - It is free to use
  - Publish any changes you make
- Simply pay for the support you want
  - None (Self Supporting)
  - Office Hours (Standard)
  - 24x7 (Premium)

The background of the slide is a solid blue color with a pattern of diagonal lines in various shades of blue, creating a sense of motion and depth. The lines are more densely packed on the right side and become more sparse towards the left.

What make Linux Special ?

# SUSE® Linux Enterprise 10

## A Desktop to Data Center Platform



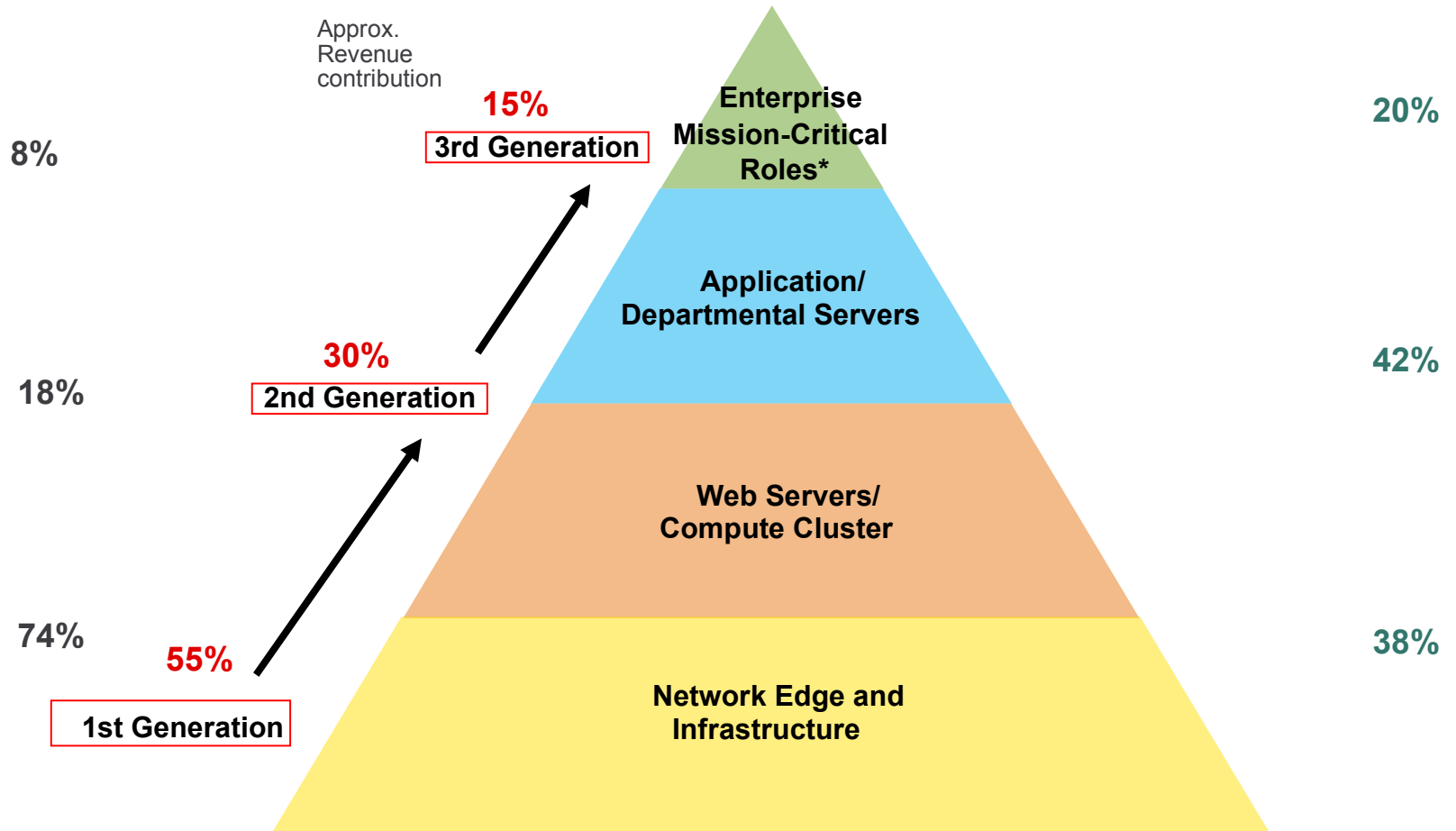
The best engineered, lowest cost and most interoperable platform for mission-critical computing

# Linux: 3 Generations of Evolution

Server Revenue Distribution 2003

Server Revenue Distribution 2006/2007

Server Revenue Distribution 2009



2007 server expenditures: \$3 billion

2007 server expenditures: \$8.6 billion

2009 server expenditures: \$10.5 billion

\* Also includes virtualized infrastructures, grids, real-time, SOA, fault-tolerant and massively scalable commerce Web sites

Source: Gartner (February 2007) Is Linux Mission Critical?

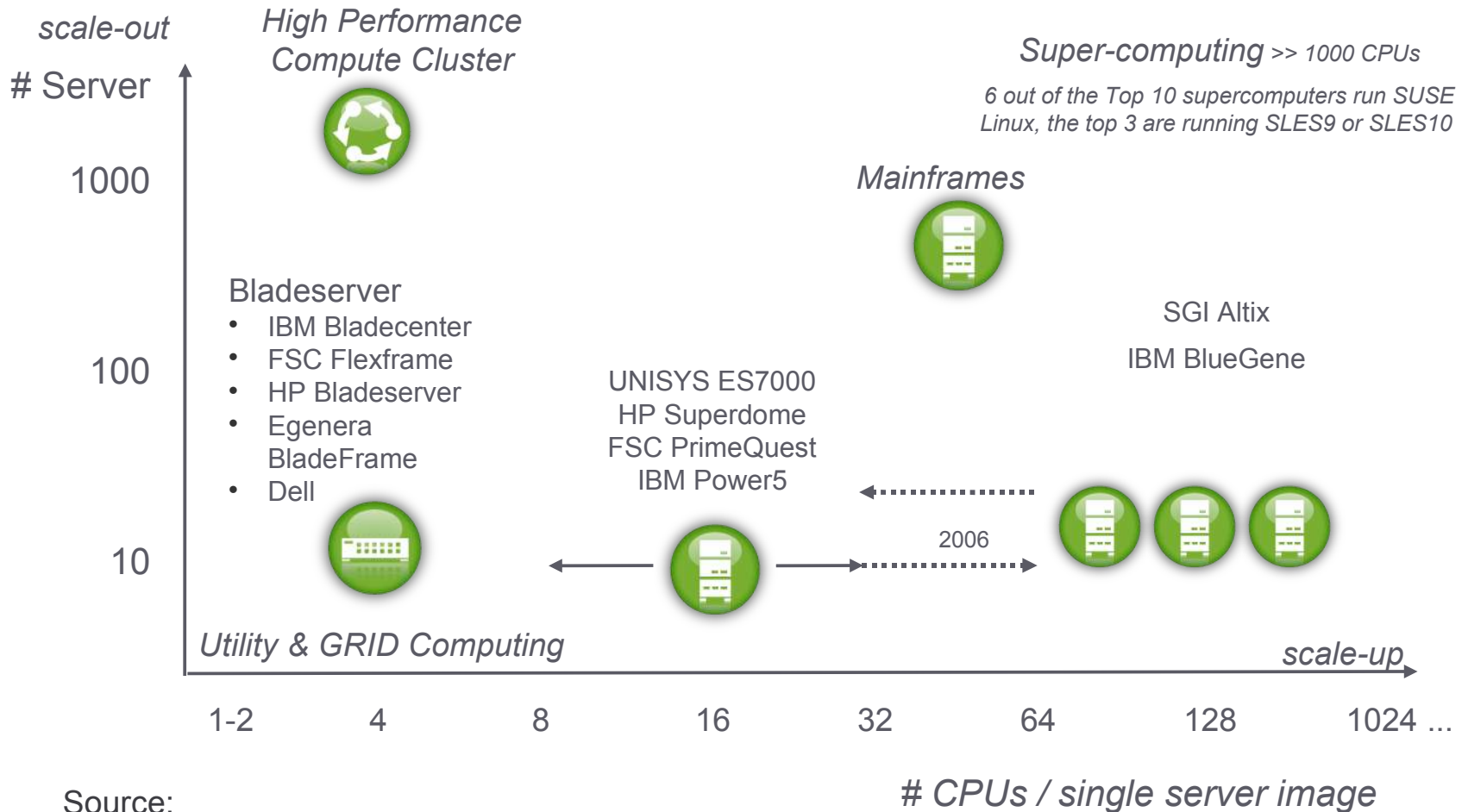


# Virtualisation is Commodity



Choose your virtualisation  
Run Linux across all Platforms  
Reduce your TCO

# SUSE® Linux Enterprise Scalability



Source:

<http://www.top500.org>

November 2007

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# Application Armour : AppArmor

- Increased IT productivity
  - Empowers IT professionals to plan system updates, not just react
- Software Reliability
  - Much easier to specify what your application should do than to make bug-free software
- Peace of mind
  - Protects against unknown threats and “zero-day” attacks



# Why Use Mono®

- Multi-platform
  - Supports multiple platforms with a single code-base (Including Linux on IBM System Z)
  - Provides a complete cross platform runtime
- Multi-language
  - Leverage developer skill sets, take advantage of high level language features
- .NET compatibility
  - Run existing .NET applications on non-Windows operating systems
  - Allows Windows developers to port to Linux
- Object-oriented
  - Secure, efficient development environment that can take advantage of distributed environments

# What is Real Time Linux?

- Real time operating system provides predictable and relatively short time to real-world events
- Standard Linux kernel is not a real-time operating system
- There are add-on options available that bring real-time capabilities to Linux-base systems
- The most common method is the dual kernel approach



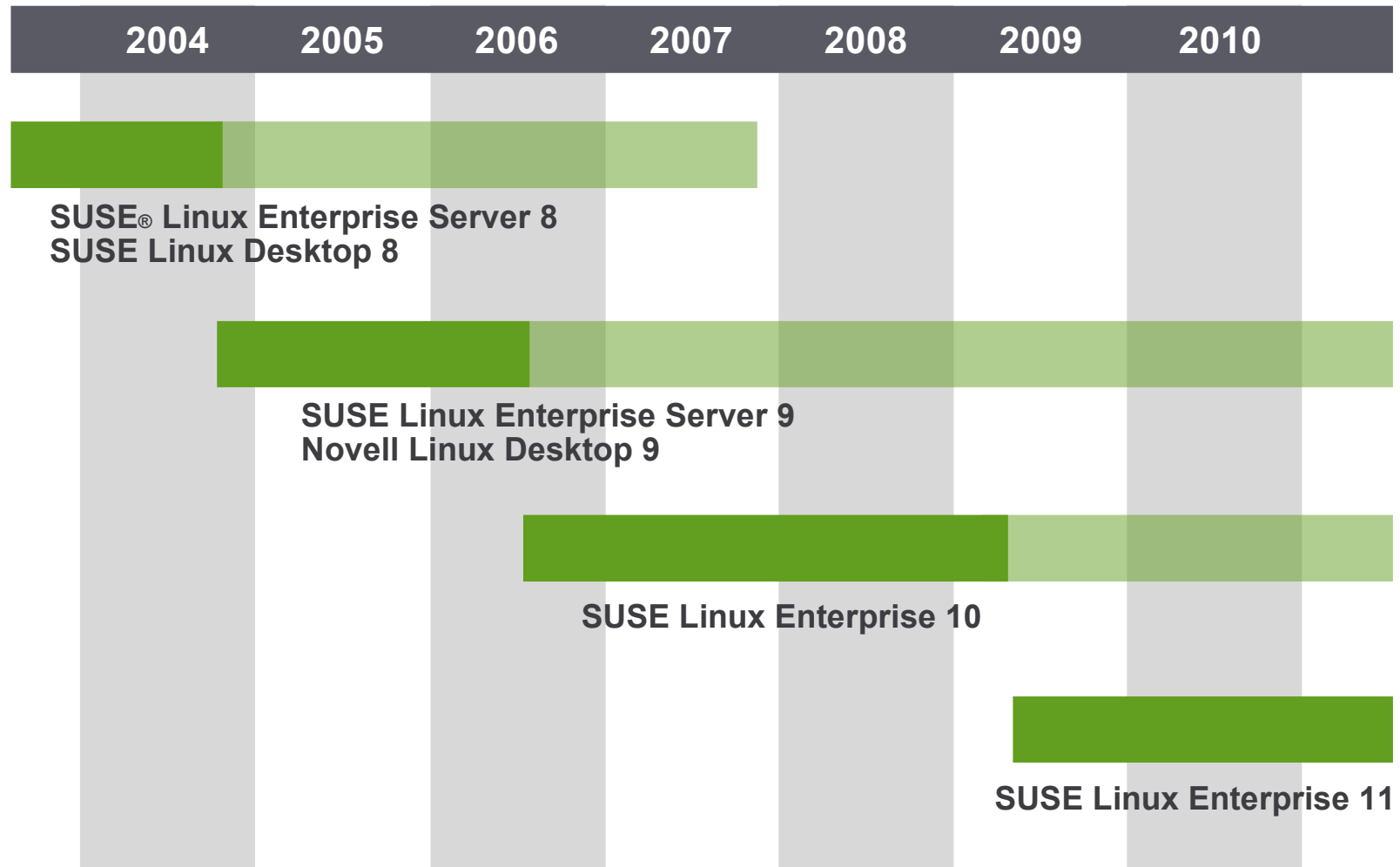
# Charting the Linux roadmap

# Common ERP & ISV Vendor Platform Priorities



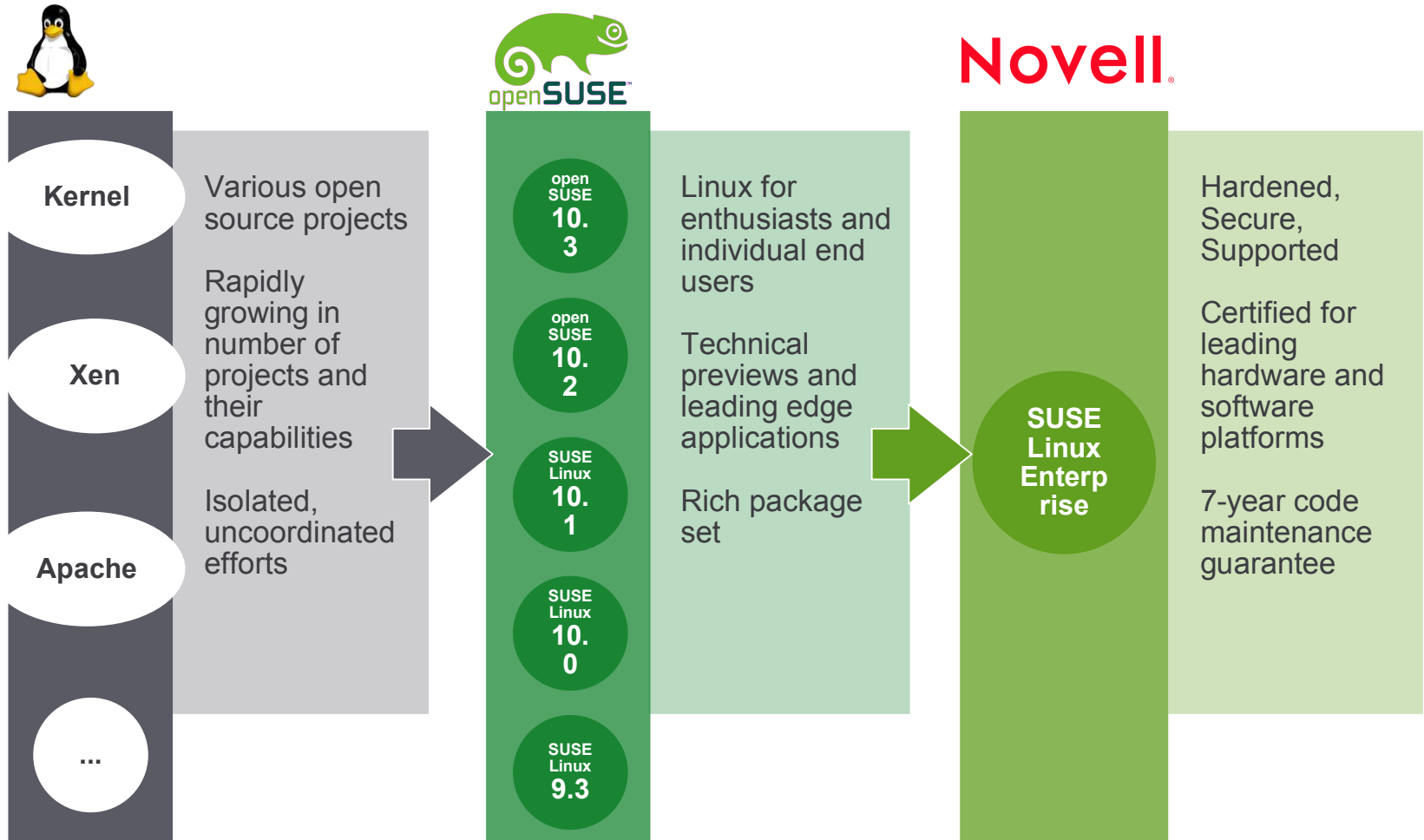
- ISV and ERP vendors are increasingly focusing new application functionality first on Tier 1 ports.
- Tier 2 ports are viable for mainstream applications and functions (potentially with delayed new features)
  - Tier 1 easily takes advantage of these features in test and production environments.
  - Tier 2 projects must consider tactical use of Tier 1 to bring in the new functionality.
  - Tier 3 ports are high risk high exit costs for both application and infrastructure – move off!

# Reliable 7-Year Support Life Cycle

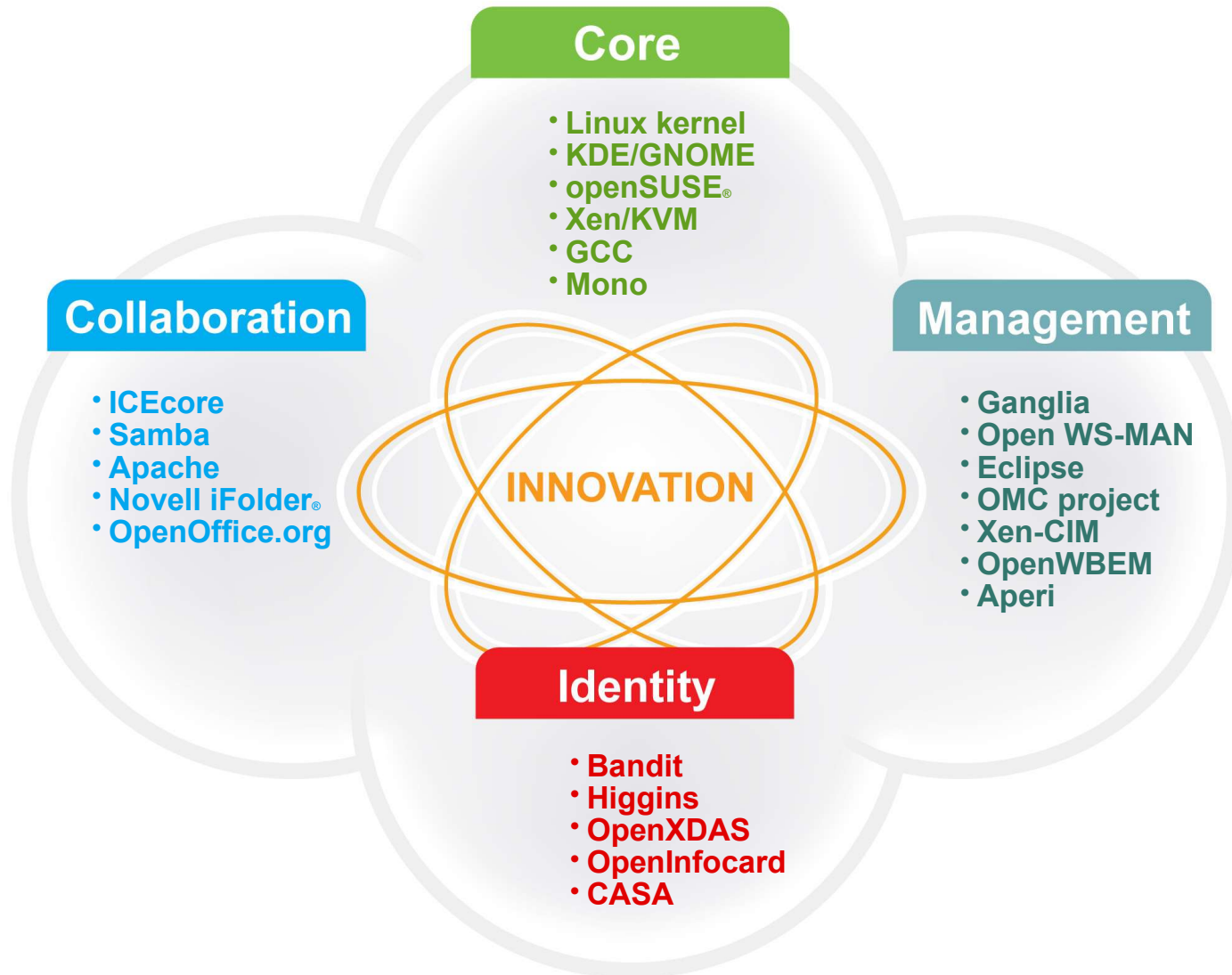




# SUSE® Linux Enterprise Development Process



# Open Source Is the Catalyst



# About Open Source Developers

- Experienced in creating stable, high quality applications
- 58% of them are professional IT programmers or administrators
- 11 years of professional experience
- Motivated by the need to rapidly respond to problems at work



Open Source Community

# Windows & Linux Interoperability



## Virtualization

- Support optimized bi-directional virtualization between SUSE Linux Enterprise and Windows Server 2008



## Standards-based Systems Management

- Adopt a common framework for solutions to enable management of mixed environments based on the WS-Management standard



## Directory and Identity Interoperability

- Directory and identity federation between Microsoft and Novell products



## Document Format Compatibility

- Enhance interoperability for Open XML Format and ODF documents between Microsoft Office and OpenOffice.org Novell Edition



## Moonlight

- Interoperability between Microsoft's Silverlight rich media player and Linux desktops



## Accessibility

- Interoperability between Microsoft and Linux accessibility projects

# Linux Innovation

**Enterprise** distributions ship on many architectures:

- x86, x86-64, ia64, ppc, s390x

**Security First** Linux Enterprise distribution have been certified to Common Criteria CAPP/EAL4+ certificate

**Systems Management**, CIM as standard

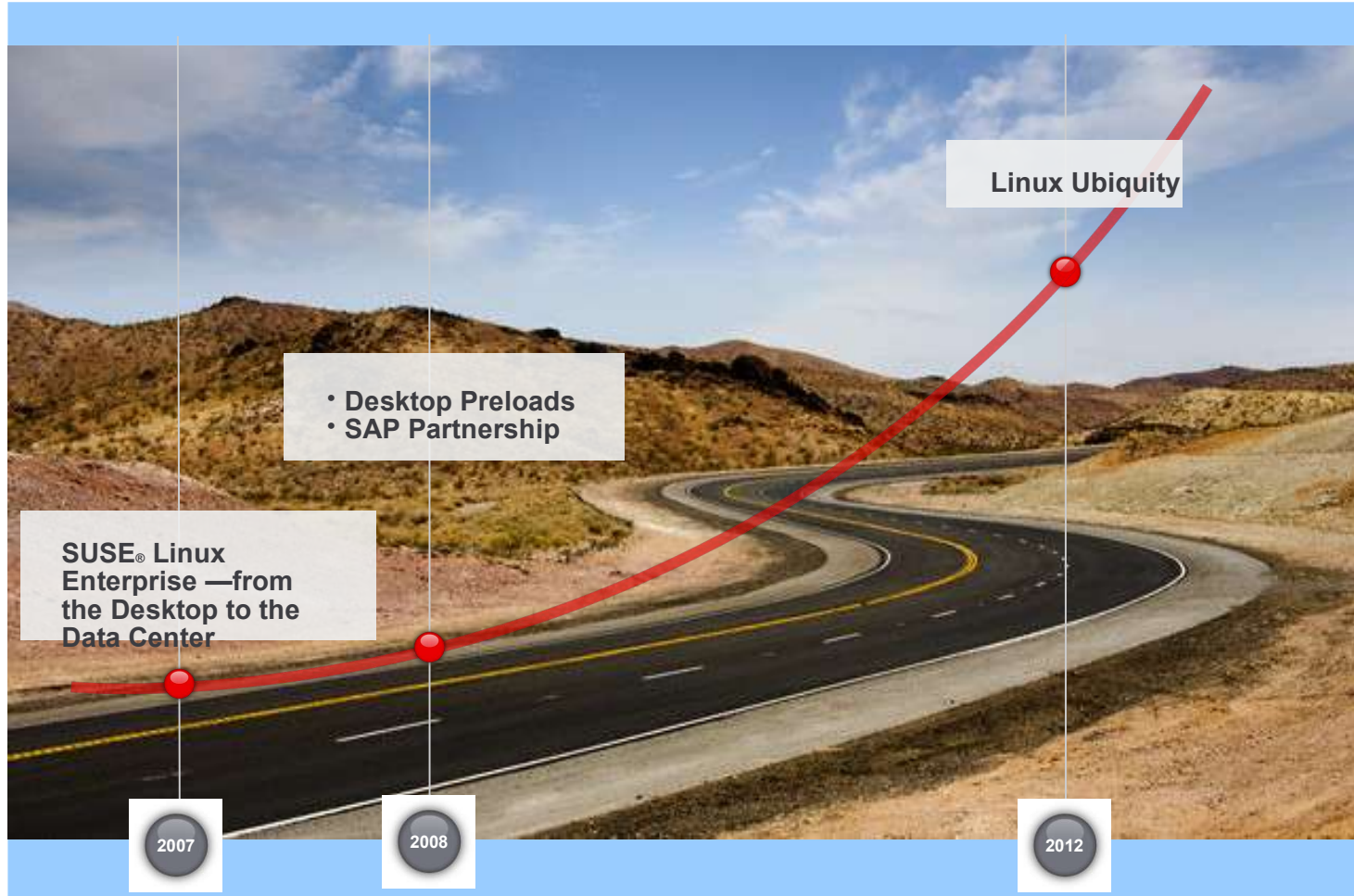
**Enterprise** distribution include Xen Virtualization, making virtualisation commodity

**High Availability** (up-to 16-way clusters) built-in, making HA commodity

The background of the slide is a solid blue color with a pattern of diagonal lines in various shades of blue, creating a sense of motion and depth. The lines are most prominent on the right side and fade towards the left.

What's Next

# Linux



# The Lean, Green Computing Machine

Consolidate HW as the first step



Policy based Hibernation of HW and Services for low demand



Fluidly return to high production level as needed, without manual IT intervention



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# Linux and the leading-edge of computing

# Major Themes for NG Enterprise Linux



- Next Generation Linux will include -
  - Mission-critical applications
  - Unix server replacement
  - Virtualization
  - Appliances
  - Low Latency Data Centers
  - Green IT - “tickless idle”
  - Automated and Assisted Healing
  - Kernel Resource Management

# Appliances

....You may already be using  
Linux Appliances

- SAP NetWeaver BI Accelerator

Or Build your own -

- Create a tuned server appliance, containing your application and just enough operating system components
- Spin a live CD or DVD with just the packages and software you need
- Create a ready-to-run VMware or Xen virtual server appliance
- Create a live USB key and carry your Linux system with you wherever you go
- Build a hard disk image for preloading onto hardware
- Install from your live CD, DVD or USB key to your hard drive



<http://studio.suse.com/>

# Benefits of Virtualization

## Server Consolidation

- > Higher resource utilization
- > Lower hardware costs
- > Smaller footprint (Less square footage, power, cooling)
- > Lower management costs

## Dynamic Provisioning

- > New VM's take minutes, not hours to deploy
- > Greater usage flexibility
- > Improved workload QoS
- > Reconfigurable clusters

## Virtual Hosting

- > More dynamic price points
- > Lower admin and HW costs
- > Less down-time, greater security

## Workload Management

- > Workload isolation
- > Quality of service
- > Vertical applications
- > Legacy compatibility
- > Investment protection

## Reliability, Availability, Serviceability (RAS)

- > Live migration between physical machines
- > Hardware upgrade & maintenance
- > Hot swap... regardless of OS
- > Software release migration
- > Mixed production and test
- > Mixed OS types/releases

# Virtualization and Xen

## Gartner's Perspective

The virtualization market will completely commoditize; the market will shift to the management of virtualization

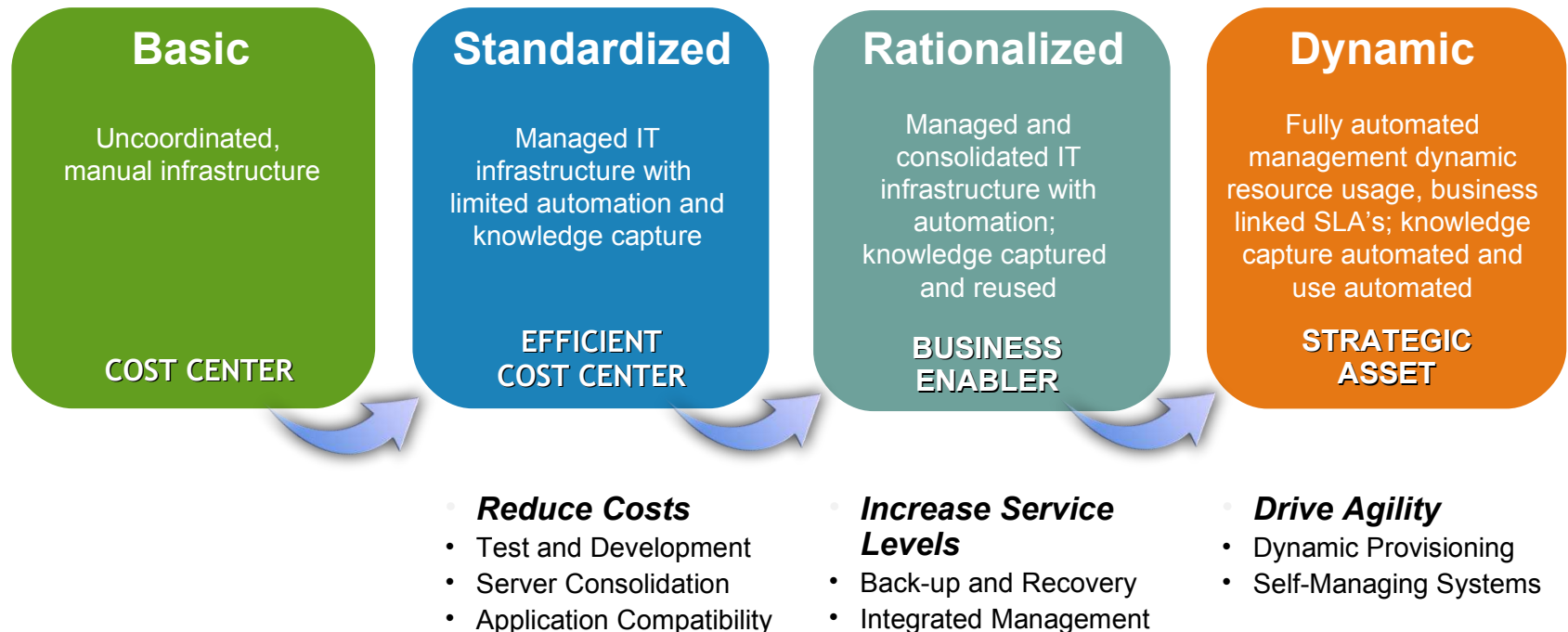
- Xen will benefit from wide availability (SUSE and RHEL) that seeds markets interested in open source solutions
- Linux will be seen as the crucible where virtualization technologies are tested and developed
- The first trusted implementations of Xen will likely come from the platform leaders (IBM and HP)
  
- VMware will continue to be predominant X86 virtualization technology in next 3-4 years but will face price pressures

A high priority for Linux: greater manageability and ease of deployment

*Source: Gartner (February 2006)*

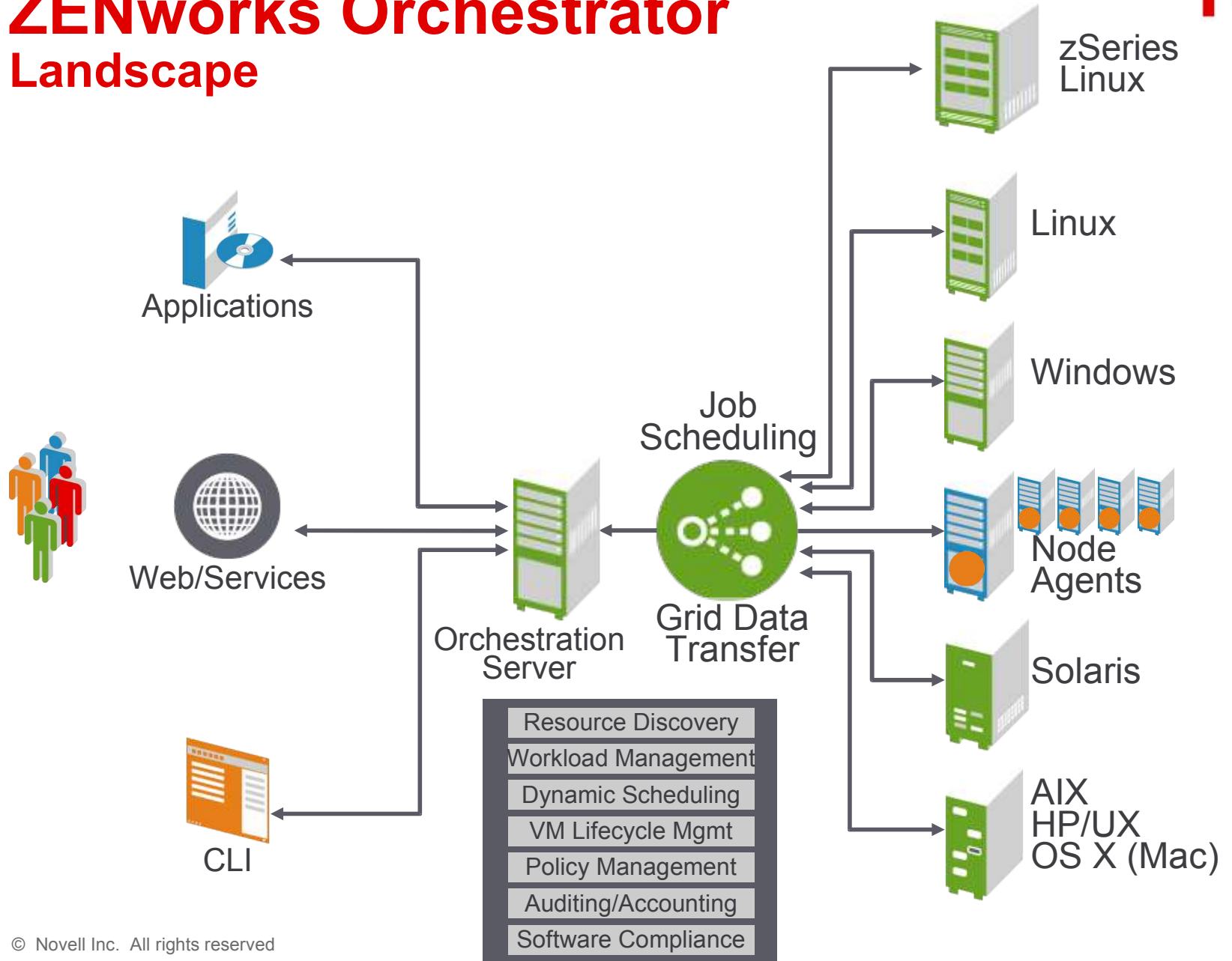
# Benefits Accrue with Increased Automation

Progression towards Dynamic IT will *Reduce Cost, Improve Service Levels, and Drive Agility*

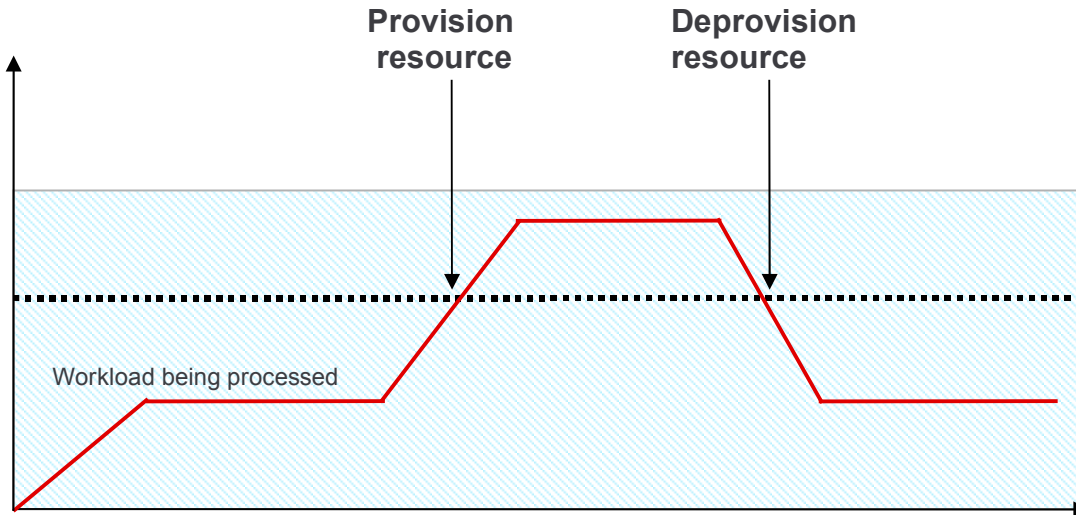




*...and Virtualization technologies help the progression...*

# ZENworks Orchestrator Landscape

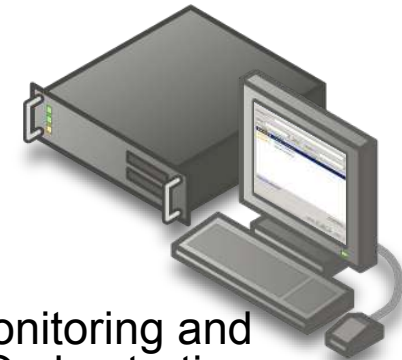


# Dynamic Provisioning



 Illustrative capacity that would be permanently provisioned (overprovision to comfortably handle peaks)  
 SLA

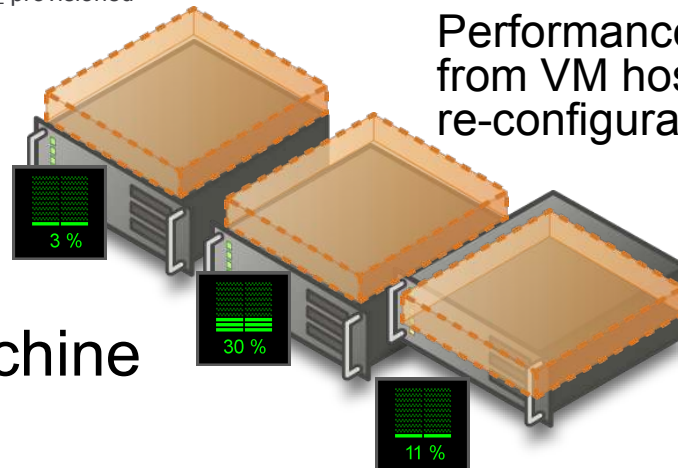
## Management Tools



## Monitoring and Orchestration

Performance data monitored from VM hosts for dynamic re-configuration






## Virtual Machine Hosts








# Novell Virtualization & Automation

## Value at Every Stage of Maturity

	How does it fit together?	How should you use it?
 <b>SUSE® Linux Enterprise Server</b>	Foundation, platform Management server OS Managed node OS	Create host (physical) or guest (virtual) Machines
 <b>SUSE® Linux Enterprise Virtual Machine Drive Pack</b>	Device drivers for guest operating systems	Extend virtual machines and improve performance
 <b>PlateSpin PowerRecon</b>	Planning and chargeback tool for VMware, Xen and Microsoft OSes	Gather workload utilization for profiling and consolidation
 <b>PlateSpin PowerConvert</b>	Migration tool for VMware, Xen and Microsoft	Perform P2V, V2V, V2P, P2P conversions
 <b>ZENworks® Orchestrator</b>	Management server and agent for automating Xen, VMware and Microsoft VMs and other Data Center automation tasks	Automate and Manage <b>physical and virtual</b> machines

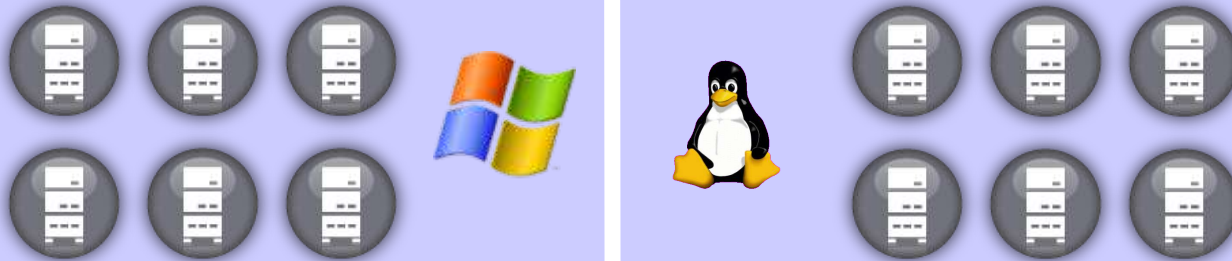
# SUSE Linux Enterprise

## Optimized for Virtualization

	Novell optimization	Benefits
 <b>VMware</b>	<p>SLES <b>only</b> enterprise Linux distribution to support VMware Virtual Machine Interface (VMI)</p> <p>PlateSpin recommended by VMware for large-scale planning and conversion</p>	<p>10-15% improved performance, better server consolidation and support. Best performing Linux guest.</p> <p>Premier planning and conversion tool with VMware interoperability</p>
	<p>Optimized SLES &lt;-&gt; Hyper-V virtualization.</p>	<p><b>Interoperability</b> between Microsoft and Linux, better server consolidation, <b>support</b> from Microsoft (today!)</p>
	<p>Xen 3.2 fully integrated and supported open source paravirtualization. Driver pack for fully virtualized guests.</p>	<p>Included <b>at no additional cost</b> Better scalability and performance. Open source eliminates vendor lock in. Unlimited VMs included with subscription. Best OS as either host or guest.</p>

# Recommended & supported

**Microsoft & Novell will support MS Windows Server on SUSE Linux Enterprise/XEN or SLES on MS-Virtual Server / MS Hyper-V, without requiring workloads to be converted back on to physical servers to fix issues.**



# Where to now ....

- Cloud Computing (SaaS)
  - Amazon Elastic Compute Cloud (EC2), Google File System (GFS), Apple MobileMe (.MAC)
- Supercomputers
  - Over 1088 CPU's in a single image
  - Almost all Supercomputers are run on Linux
  - IBM Blue Gene

# Linux – Critical Reliability



- Real Time - US Navy AEGIS combat control system
- Standard - DFS Deutsche Flugsicherung GmbH (German Air Traffic Control)

# Novell® and IBM Partnership

- Novell is Strategic IBM Alliance Partner since December 2005
- SUSE® Linux Enterprise Server (SLES) is on IBM's Passport Advantage (PPA) Program
- SLES is available via the IBM Configurator
- SUSE Linux Enterprise runs on all IBM hardware platforms
- Unique: Common Code Base / Autobuild Process
- IBM and SUSE co-developed Linux for Power and System z
- IBM/Novell co-developed IBM Retail Environment on SUSE (IRES)
- IBM Leaders for Linux and Novell PartnerNet® aligned programs
- IBM support-line on SLES
- 1300+ IBM staff in EMEA in the Novell Linux Champion Club



# The Final Word

SAP

*desktop*

*virtualization*



**Your Linux is**

*more than*

**ready.**

*interoperability*

*real time*

*migration*

**Novell®**



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# SUSE® Linux Enterprise Server 10



**The best engineered, lowest cost, most interoperable platform for enterprise computing, with built-in Xen virtualization**

- Integrated Xen hypervisor
- Paravirtualization and full virtualization
- Bidirectional virtualization
- Advanced security
- High availability and failover

# SUSE® Linux Enterprise Virtual Machine Driver Pack



## Device drivers that improve the performance of virtualized legacy Windows and Linux workloads

- Near native performance
- Support for virtualized Windows Server 2008, 2003, 2000, and XP, and Red Hat Enterprise Linux 4 and 5 workloads
- Extend life of legacy applications

# Novell® ZENworks® Orchestrator



**Third generation orchestration engine that uses intelligent automation to manage heterogeneous virtual machines, enabling you to align IT to business requirements, control costs, and minimize risks**

- Resource Discovery
- Workload Management
- Dynamic Scheduling
- VM Lifecycle management
- Policy Management
- Auditing and Accounting
- Software Compliance

# Novell® ZENworks® Virtual Machine Management



**A collection of jobs that snap into ZENworks Orchestrator and uses it to run them in the most efficient manner**

- Heterogeneous virtual machine management (SLES, VMware, Microsoft and Xen)
- Automated deployment and management of virtual data center assets
- Dynamically provisioned workloads that ensure business continuity