SUSE Linux 10

Chris Gacesa
Solution Architect
Novell, Inc.
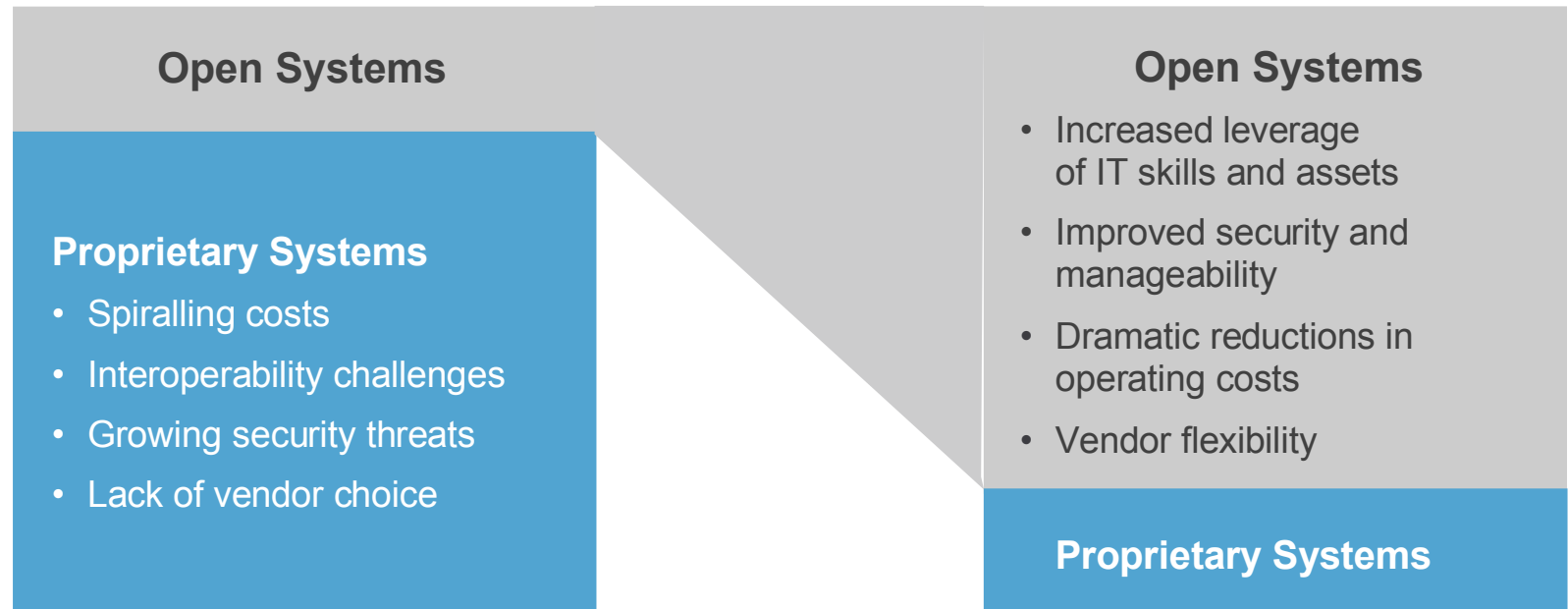
August 2007

Novell.

Enterprises are Shifting to Open

Today's Enterprise:
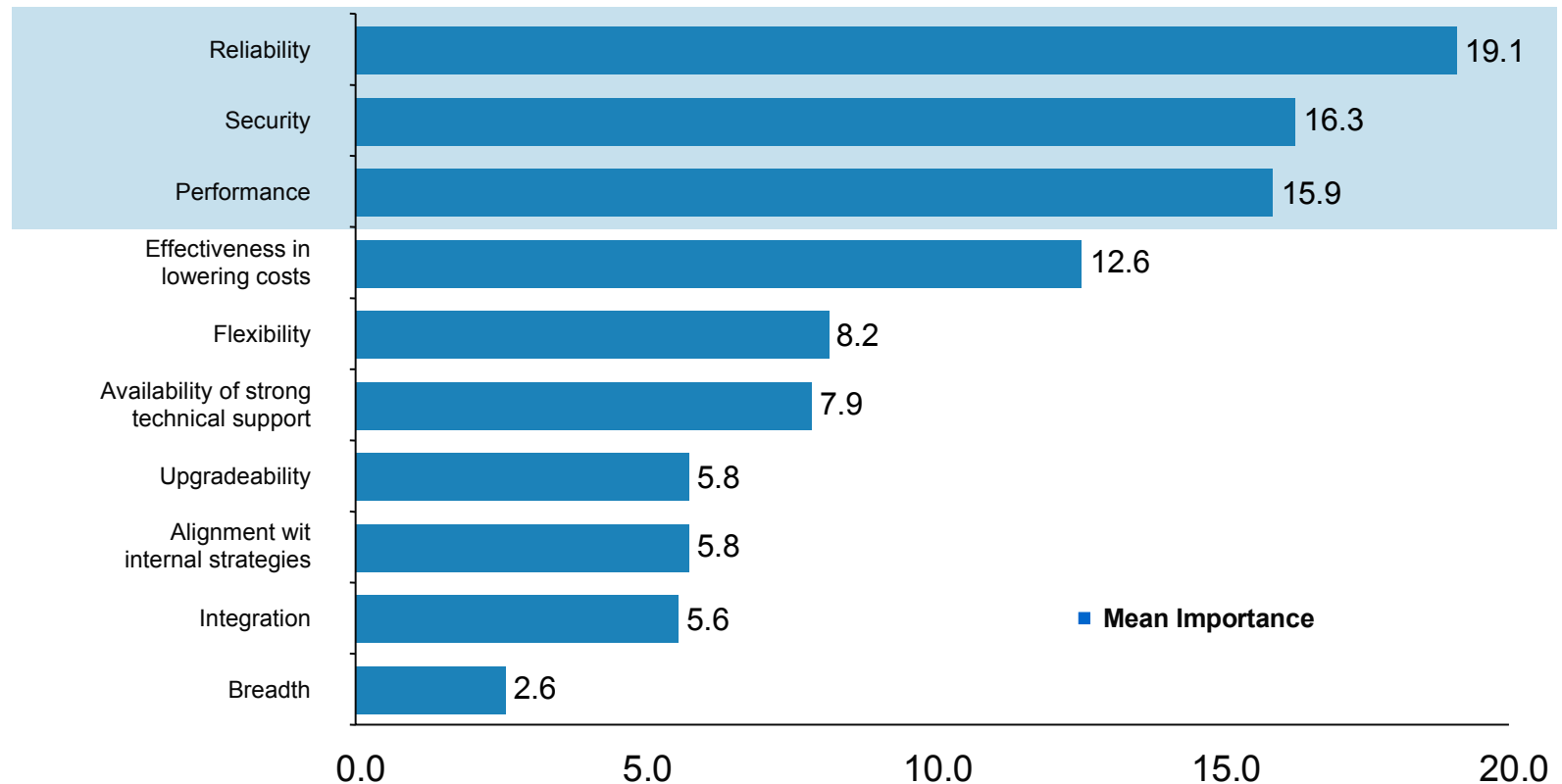Multiple platforms, proprietary technologies, management and security challenges

Tomorrow's Open Enterprise:
Performance, reliability, and world-class support on standards-based, open platforms

Open Systems

Proprietary Systems

- Spiralling costs
- Interoperability challenges
- Growing security threats
- Lack of vendor choice

Open Systems

- Increased leverage of IT skills and assets
- Improved security and manageability
- Dramatic reductions in operating costs
- Vendor flexibility

Proprietary Systems

Lower Cost No Longer the Driving Force

Decision Criteria for Linux Products and Services: *Linux Users and Planned Users*

Criterion	Mean Importance
Reliability	19.1
Security	16.3
Performance	15.9
Effectiveness in lowering costs	12.6
Flexibility	8.2
Availability of strong technical support	7.9
Upgradeability	5.8
Alignment wit internal strategies	5.8
Integration	5.6
Breadth	2.6

■ Mean Importance

Benefits of Linux in the Data Center

Dramatically Lower Costs

– 40% hardware savings over UNIX*

– 34% software savings over Microsoft*

Greater Choice

– Open source and open standards

– Choice leads to competition among vendors

Enhanced IT Flexibility

– Average server utilization < 20% on x86

– Utility computing will deliver real-time management of resources on-demand

*Robert Francis Group, July 2005

Novell® Offers Solutions in Five Key Markets

1 Data Center

2 Security and Identity

3 Resource Management

4 Workgroup

5 Desktop

N

Why Novell® for Linux

Leading Linux Innovation

- **First** enterprise distribution to ship on 7 architectures:
    - x86, x86-64, IA64, PPC, PPC64, s390, s390x

- **First** enterprise distribution to ship 2.6 Kernel

- **First** journaling filesystem for Linux Kernel

- **First** Linux distribution to receive Common Criteria
    - EAL2+, EAL3+ and EAL4+

- **First** to ship with integrated IPsec support (1999)

- **First** to rely on CIM standard for System Management

- **First** enterprise distribution to ship Xen Virtualization

Novell® Gains Linux Market Share

2004

5%
22%
73%

$178 Million

2005

2%
40%
57%

$368 Million
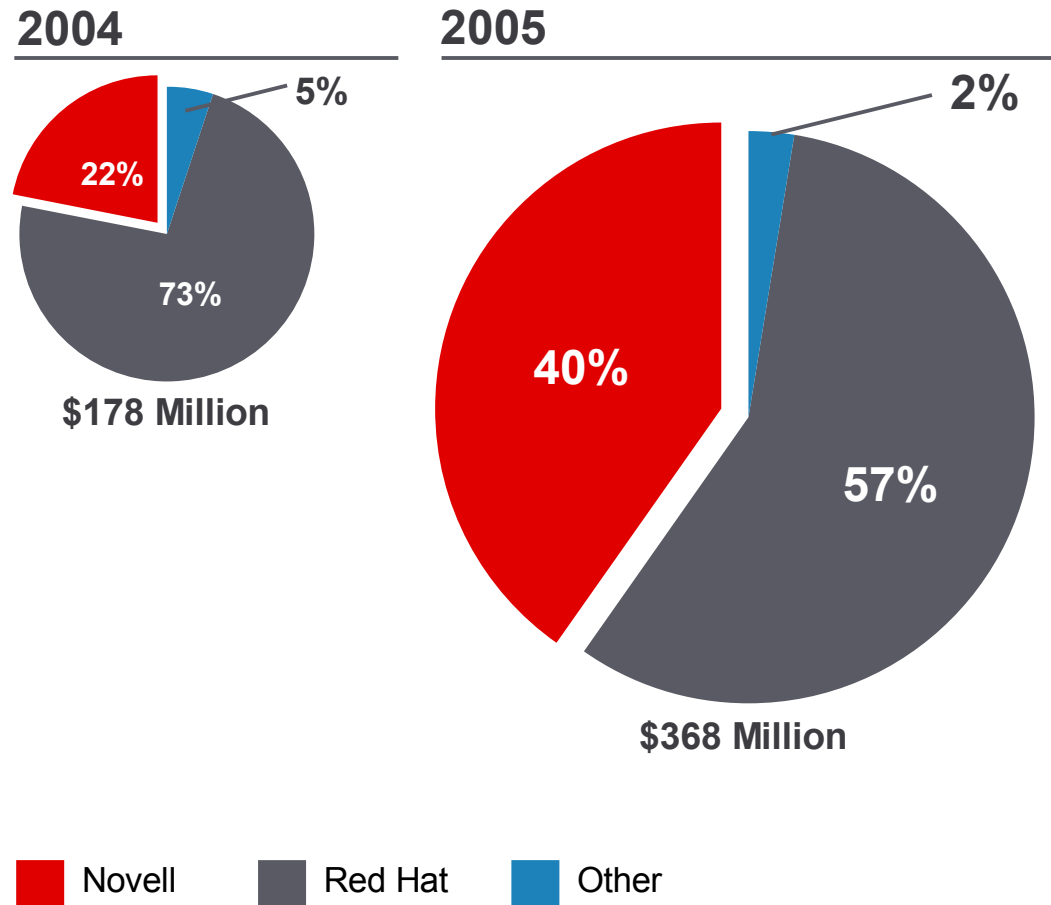
Why Novell is Winning

- Acquired SUSE® Linux in early 2004

- Establishing F2000 accounts who standardize on SUSE Linux Enterprise

- Enterprise-grade software solutions and technical support

- Successful migrations from NetWare® to Linux

■ Novell   **■ Red Hat**   **■ Other**

Leading Open Source Development

Novell® is a key contributor to these and other open source projects:

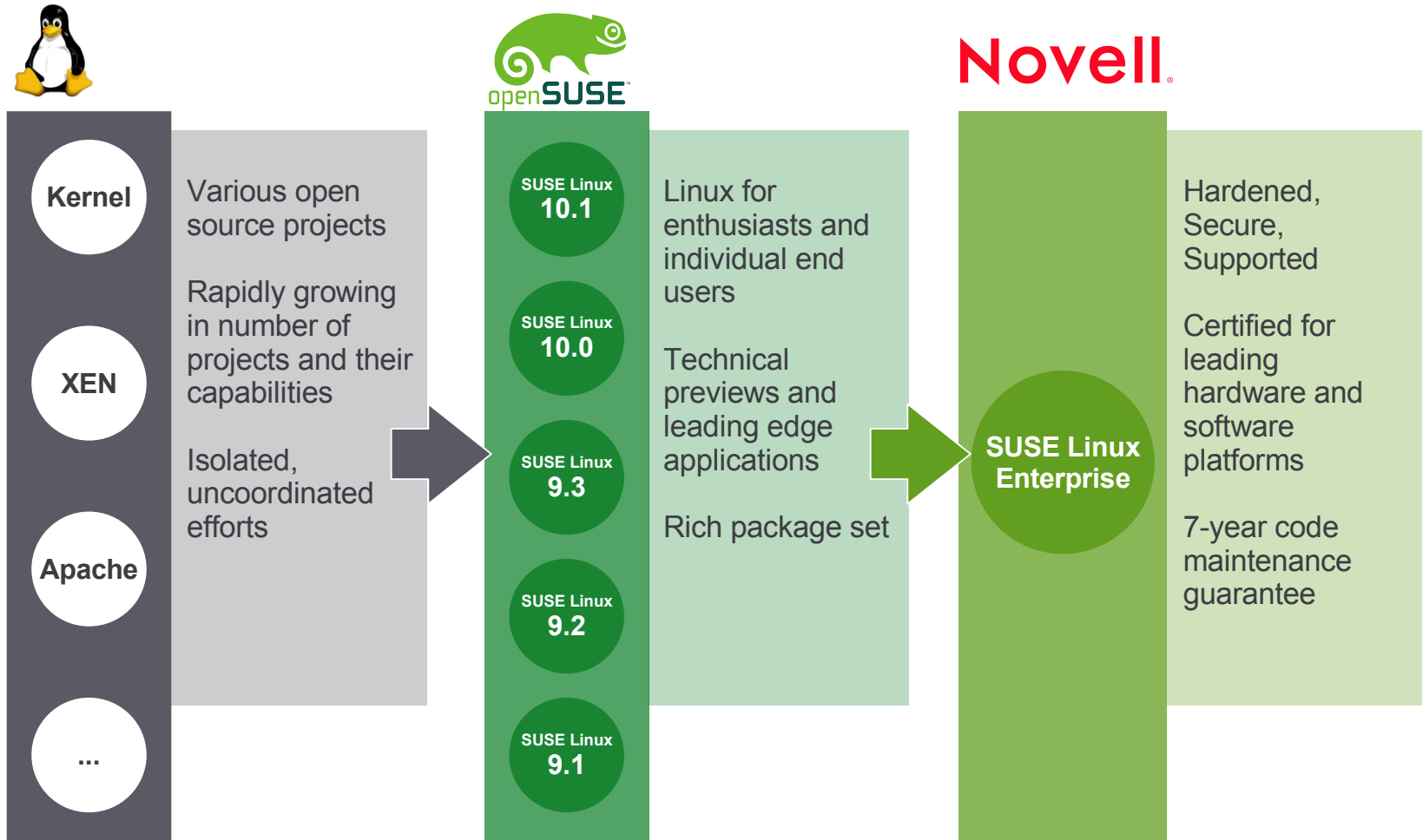|		
Apache	Linux Kernel	Open WEBEM
AppArmor	Mono®	PHP
Bandit	Mozilla	Perl
BetterDesktop	MySQL	PostgreSQL
Eclipse	Open Invention Network	Reiser
Evolution™		rsync
GCC	OpenLDAP	SAMBA
GNOME	OpenOffice.org	Tomcat
HULA®	OpenSSL	X.org
Novell iFolder®	openSUSE™	XGL
KDE	Openswan	YaST

**Novell is a leading contributor

From Community to Enterprise
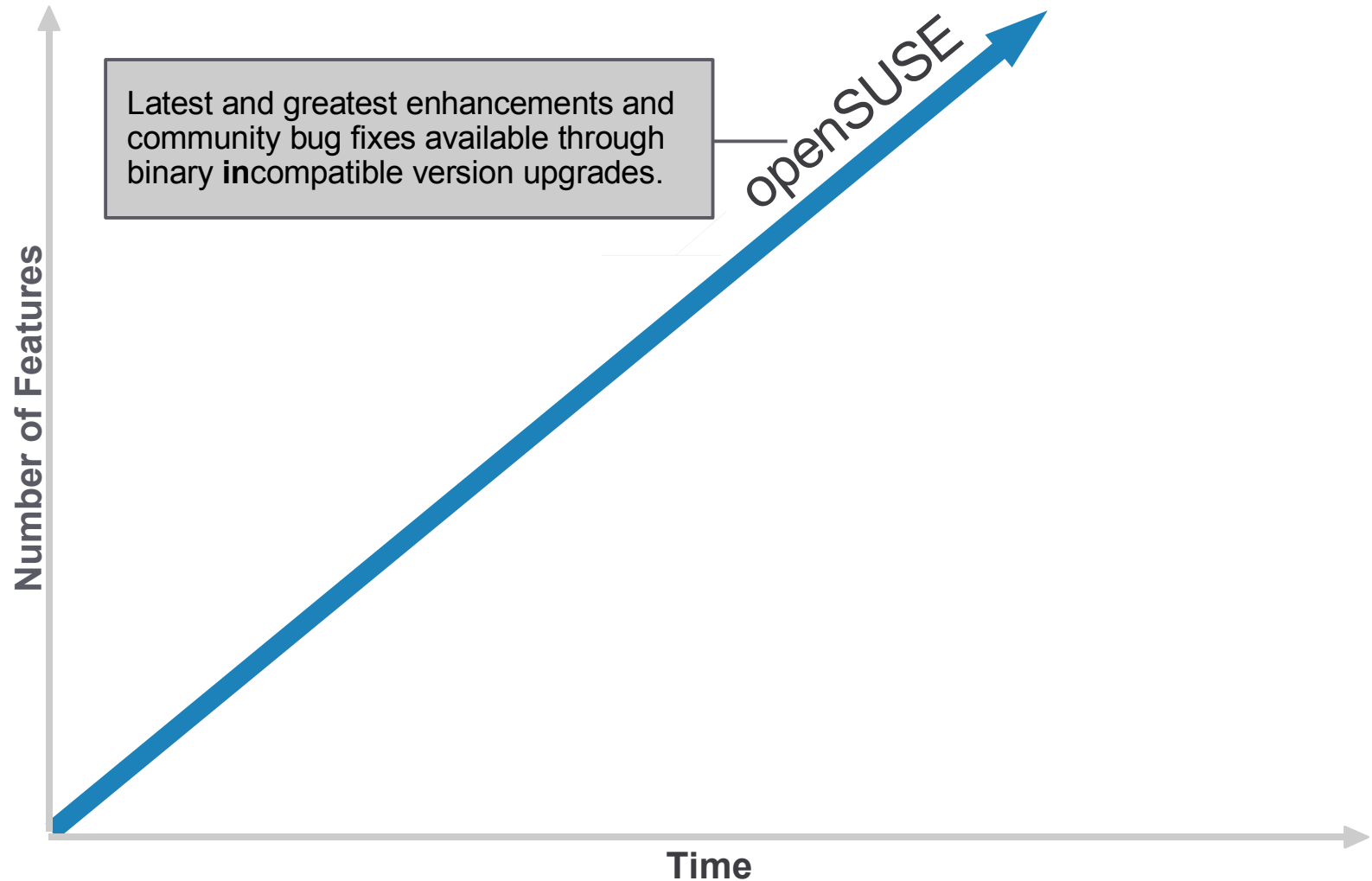openSUSE feeds Novell's Linux offerings

Enthusiasts, Developers

Home User

Corporate User

SUSE LINUX 10.0	SUSE LINUX	SUSE LINUX
SUSE LINUX 10.1	Enterprise	Enterprise Server
SUSE LINUX 10.2	Desktop	

common code base

openSUSE
www.opensuse.org

Open Source Projects
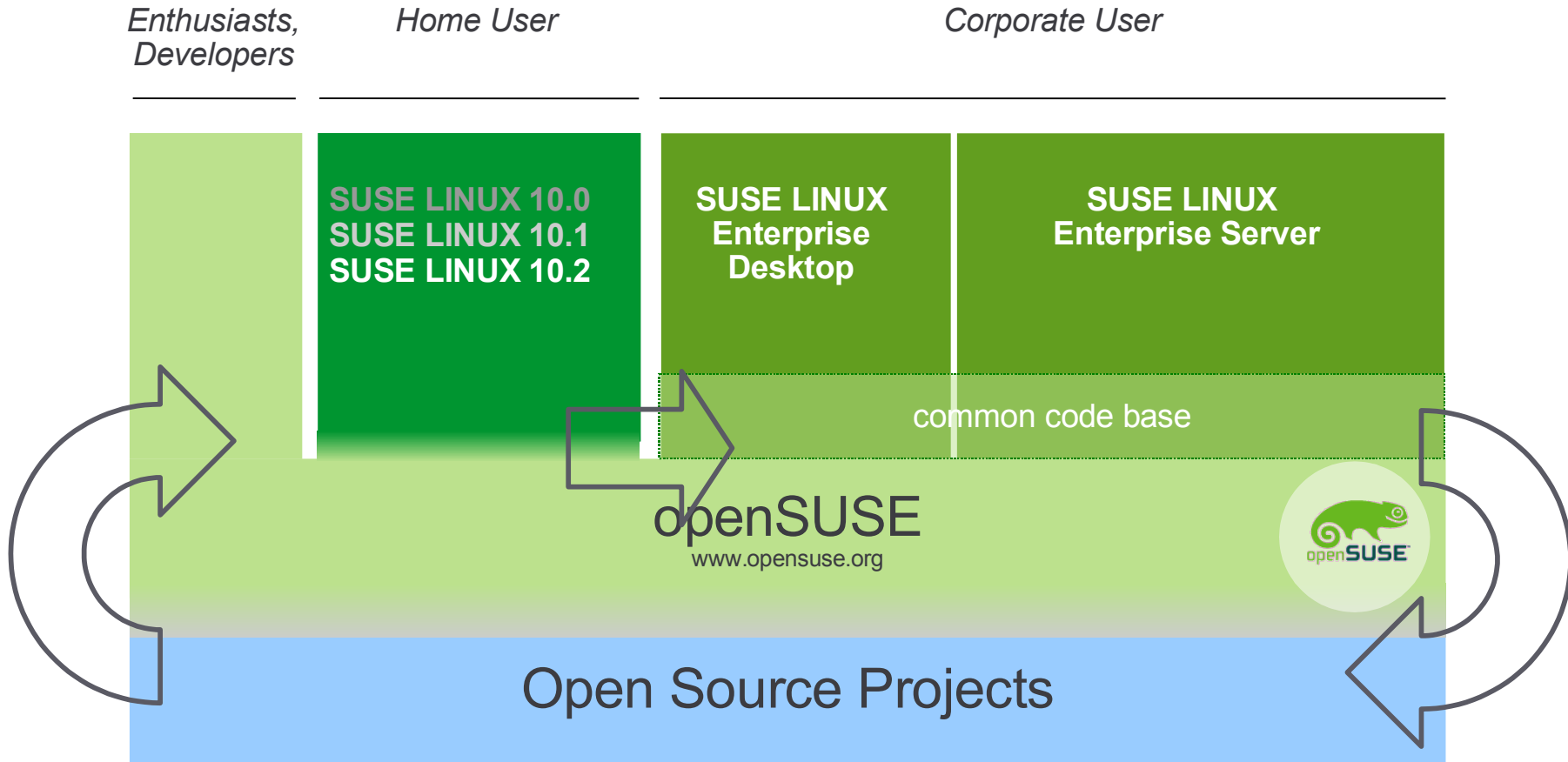
The SUSE® Linux Development Process

Kernel · **XEN** · **Apache** · **...**

Various open source projects

Rapidly growing in number of projects and their capabilities

Isolated, uncoordinated efforts

openSUSE™

SUSE Linux 10.1
SUSE Linux 10.0
SUSE Linux 9.3
SUSE Linux 9.2
SUSE Linux 9.1

Linux for enthusiasts and individual end users

Technical previews and leading edge applications

Rich package set

Novell®

SUSE Linux Enterprise

Hardened, Secure, Supported

Certified for leading hardware and software platforms

7-year code maintenance guarantee

The AutoBuild Advantage

Open Source Projects	Package Selection and Integration	AutoBuild	Quality Testing	Enterprise-Class Software
		x86	**Feature Test**	**SUSE Linux Enterprise**
		AMD64/EM64T	**Manual Regression**	
		Itanium	**Automated Regression**	
		POWER	**Novell System Test**	
		zSeries		

Contribution
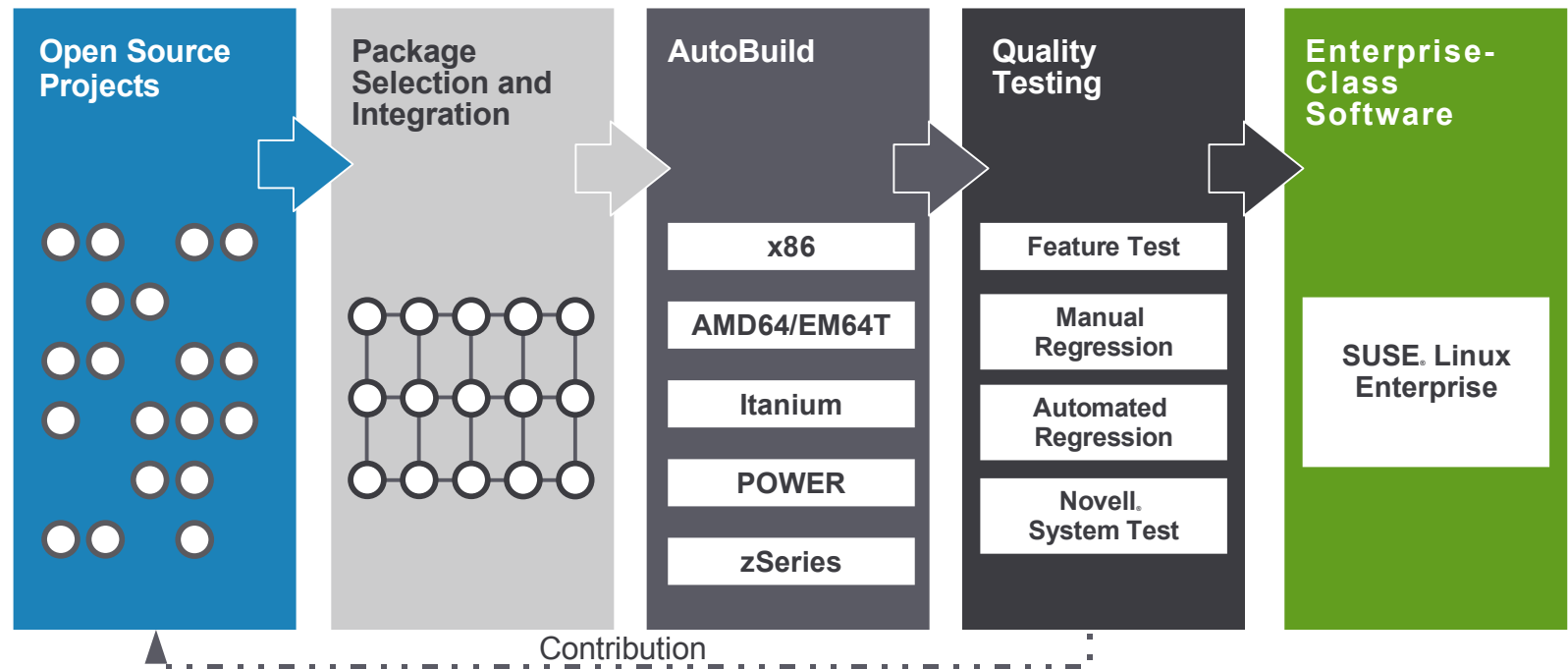
- Reduces production problems
- Consolidates IT skills across disparate systems
- Delivers critical updates in hours – not days or weeks

Open Source Community:
Continuous Incompatible Rebuilds

Latest and greatest enhancements and community bug fixes available through binary **in**compatible version upgrades.

openSUSE

Number of Features

Time

SUSE Linux Enterprise Products:
Stable User Space ABI

Number of Features (y-axis) vs Time (x-axis)

openSUSE

FCS · SP1 · SP2 · SP3 · SP4

SUSE Linux Enterprise products

PRODUCTION
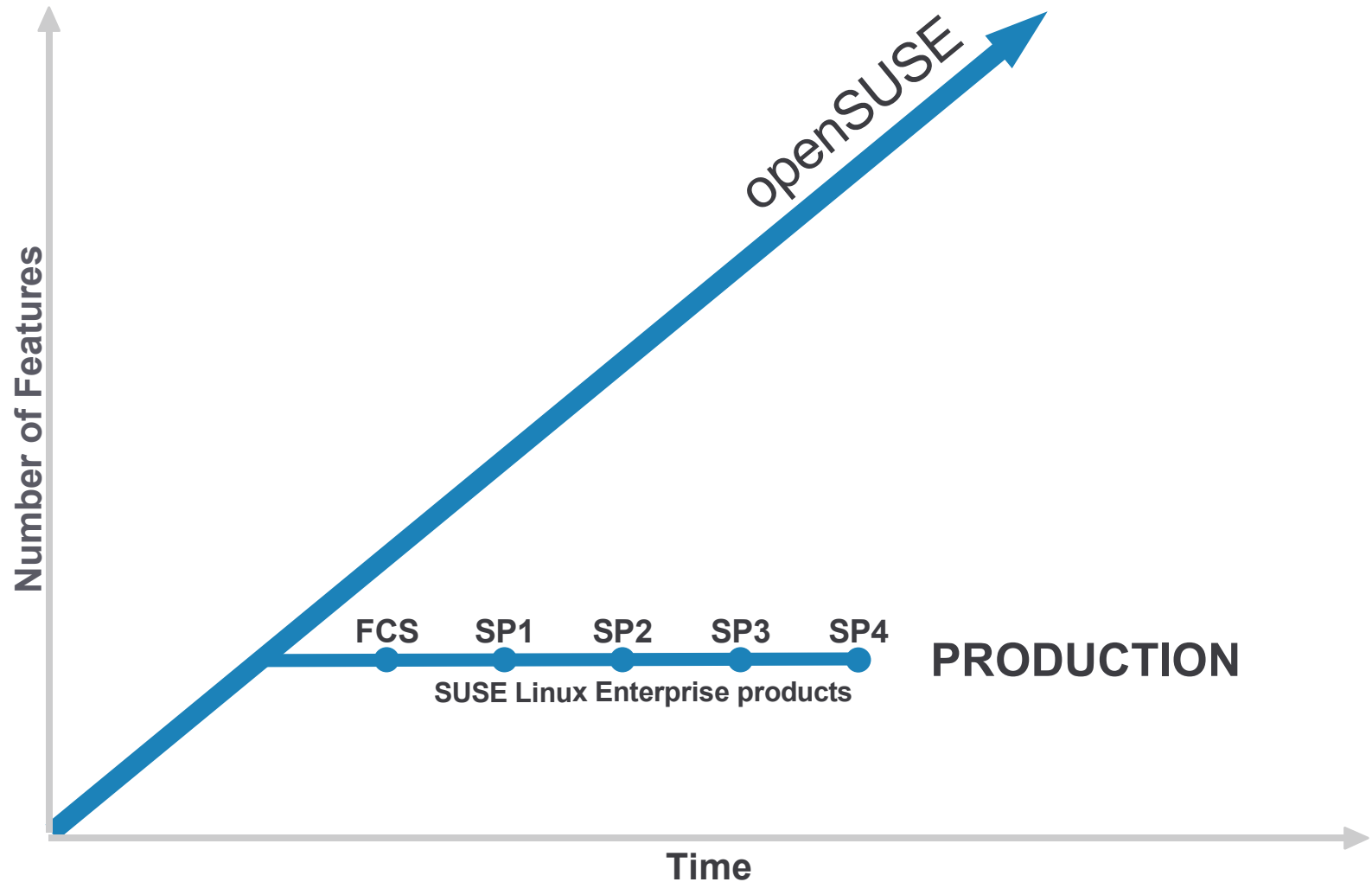
SUSE Linux Enterprise Products:
Only Selected Backports

Number of Features (vertical axis)

DEVELOPMENT openSUSE

- Selected **backports**
- User space updates keep certifications.
- Kernel updates require recertification.
- **Require strong business case**

PRODUCTION

SUSE Linux Enterprise products

Time
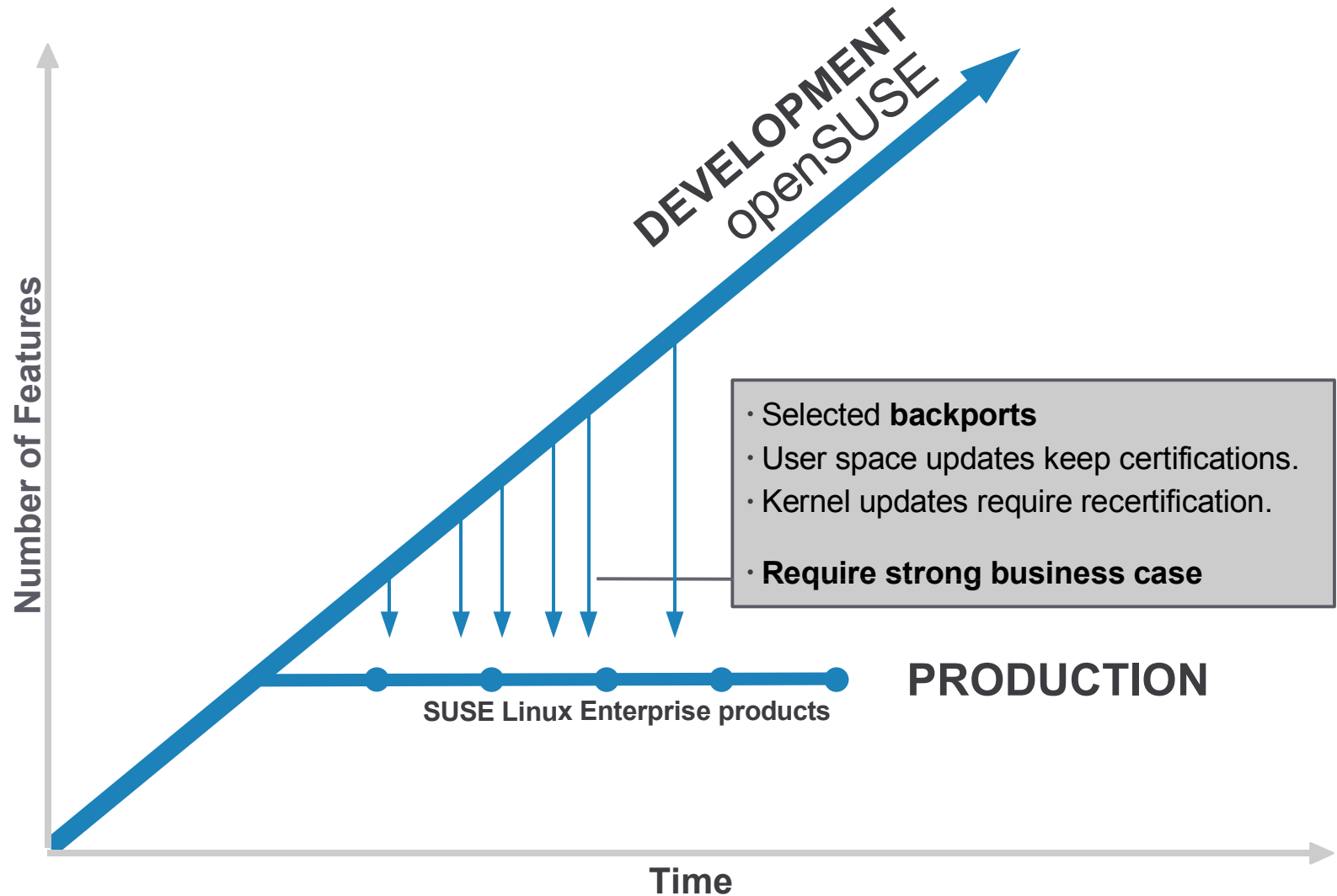
SUSE Linux Enterprise Products:
Several Kernel Versions
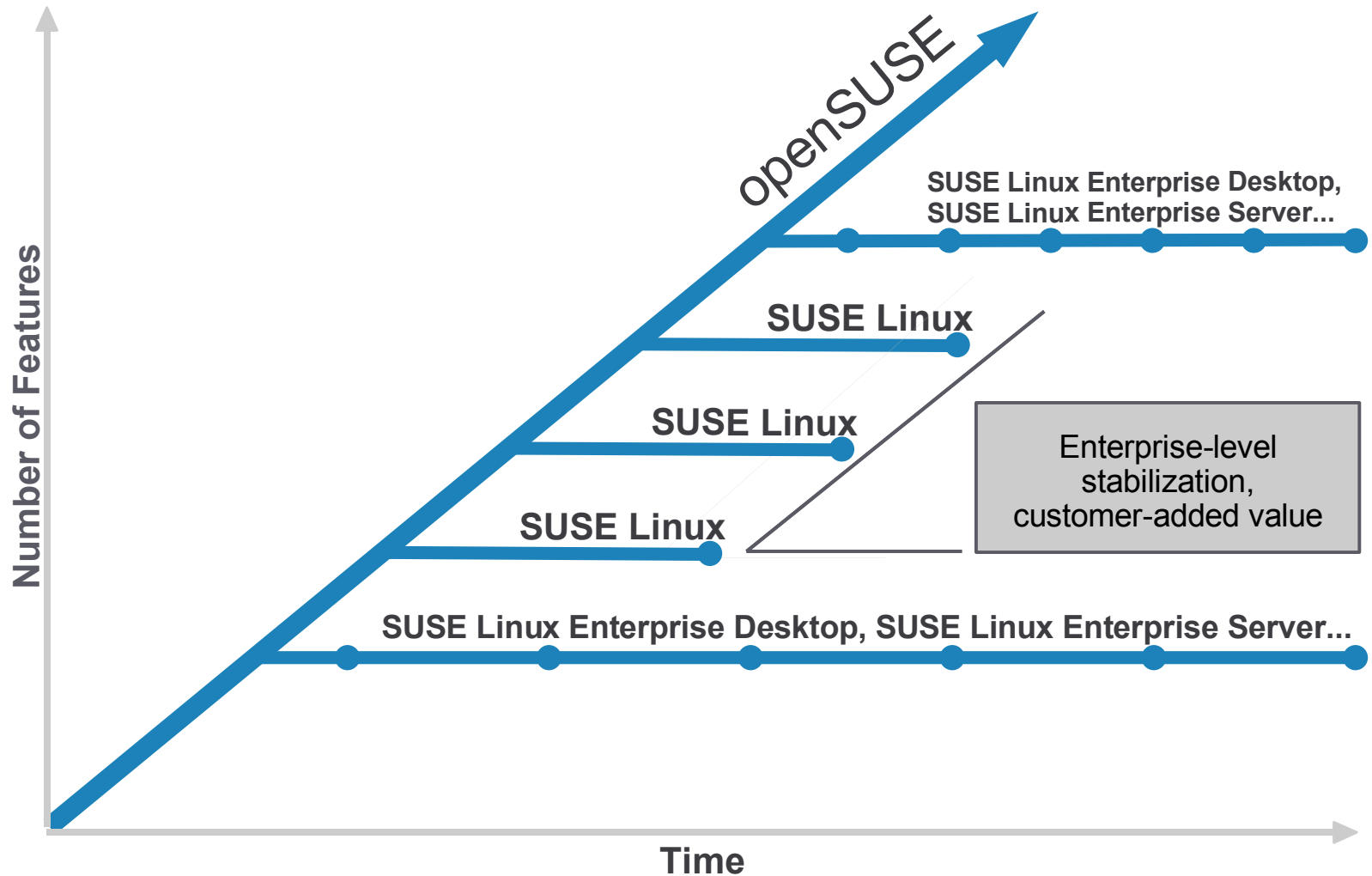
Microsoft and Novell

Open Source Continues to Advance in the Data Center

Q: What is the make-up of major enterprise data centers?

40%	**24%**	**3%**	14%	4%	10%	4%
Mainframe, UNIX, Linux, and Windows	UNIX, Linux, and Windows	Windows and Linux	Mainframe, UNIX, and Windows	Mainframe and Windows	UNIX and Windows	Windows Servers Only
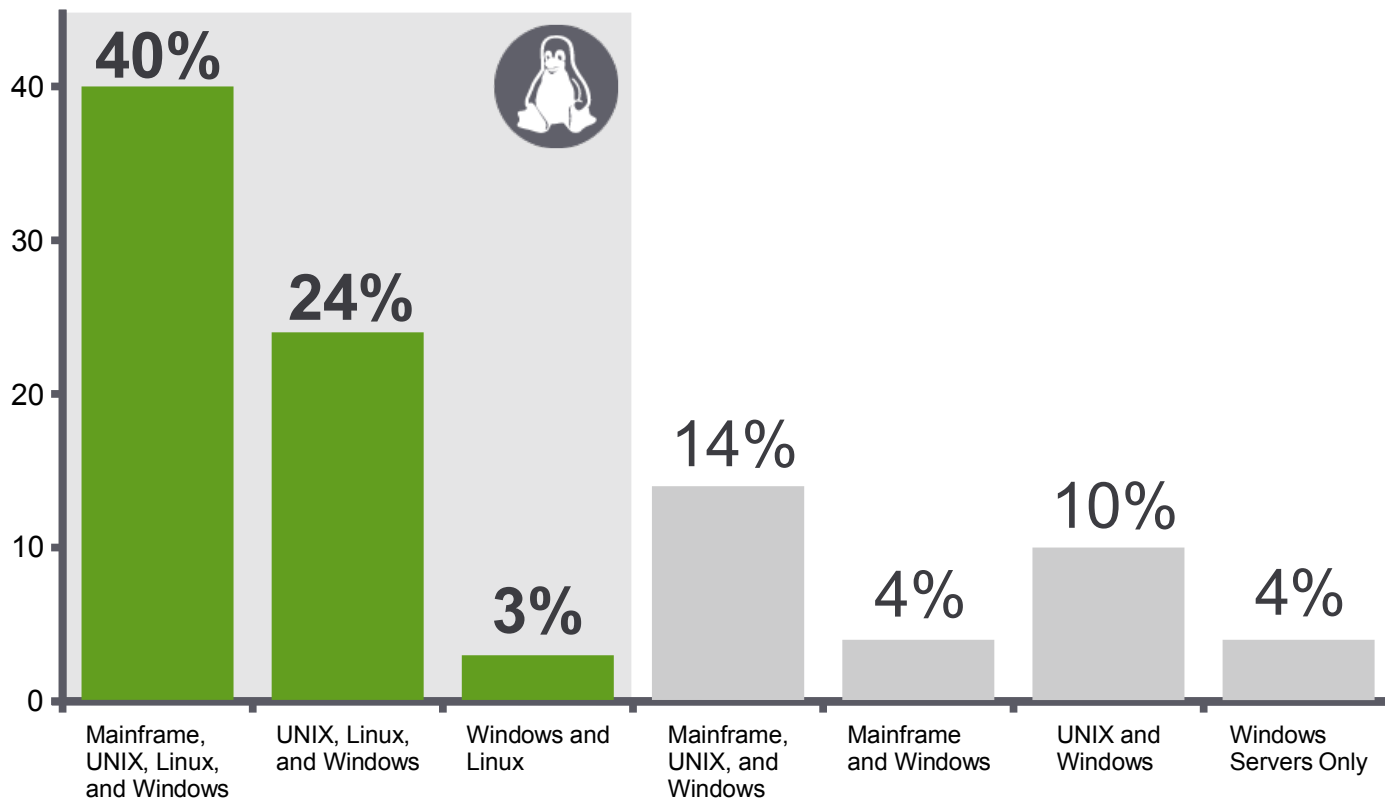
Source: Gartner report, #G00138277, *Linux Continues to Advance into the Data Center*, George J. Weiss

The Microsoft / Novell
Business Partnership

- Microsoft reselling $240M of SUSE® Linux Enterprise Server certificates over five years

  - Microsoft officially recommends SUSE Linux Enterprise for mixed IT-environments

  - Microsoft distributes certificates to customers that entitle them to subscriptions and support for one- or three-year contracts

- Joint sales & marketing efforts

  - Co-marketing fund

  - Dedicated Microsoft sales force

  - Significant technical collaboration work

- Joint interoperability lab

The Market Has Embraced the Partnership

- Early Customer Adoption
  - AIG
  - Credit Suisse
  - Deutsche Bank
  - Wal-Mart
  - HSBC
- 40,000 certificates activated for 3-year priority support
  - Very strong customer pipeline
- Overwhelming customer support data
  - 97% of respondents approve of the Microsoft and Novell collaboration
  - 97% said they wanted platform providers to improve interoperability

Survey jointly commissioned by Microsoft & Novell by Penn, Schoen & Berland Associates

Customer Endorsements

HSBC

"The Microsoft-Novell agreement is a great catalyst to helping us reduce the complexity of our Linux environment as we standardize our Linux infrastructure with SUSE Linux Enterprise. ... That's why we have selected Novell as our preferred Linux partner to support our Linux infrastructure."

Matthew O'Neill, Group Head of Distributed Systems

Credit Suisse

"For us, interoperability is key. We see both Windows and SUSE Linux Enterprise as strategic platforms going forward, and we're very pleased to see Microsoft and Novell, who support these platforms, step up and work on interoperability."

Tom Sanzone, Chief Information Officer

Deutsche Bank

"Microsoft and Novell's agreement gives us the benefit of choice in platforms and tremendous flexibility that will help make our company more competitive and efficient"

Clemens Jochum, Chief Technology Officer

Wal-Mart

"We have wanted information technology vendors to deliver interoperability and IP assurance between multiple platforms for some time now, and we are pleased that Microsoft and Novell are committed to fulfilling that need."

Nancy Stewart, Senior Vice President and Chief Technology Officer

The Microsoft / Novell
Technical Collaboration

Virtualization

- Interoperability between Microsoft® Virtual Server, Windows Server®, Longhorn and SUSE® Linux Enterprise

Standards-based Systems Management

- Interoperability for managing mixed environments (WS-Management)

Directory and Identity Interoperability

- Improve identity interoperability 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

SUSE® Linux Enterprise Server

SUSE® Linux Enterprise Server 10
Major Areas of Investment

- Virtualization
  - Xen 3 for SMP, PAE and 64-bit CPUs
  - Server Consolidation, Compatibility
  - Scheduled Maintenance
- Deployment and Management
  - CIM Providers and Improved YaST
  - Pattern Deployments
- Security
  - Application Security, EAL4+
  - Network Detection, Monitoring
  - Secure Encapsulation with Xen

- Performance and Scalability
  - 1024 CPUs, 10+TB Memory
- New Hardware and Update Drivers
  - x86, x86-64, ia64, ppc, ppc64 and s390x
  - New storage, network & graphics drivers
  - Hotplug Improvements
- High-availability Storage Foundation
  - Clustered File System OCFS2, EVMS
  - HA with Heartbeat 2 (up to 16 nodes)
  - NFS v4
  - iSCSI Target and Initiator
  - DRBD to build HA Clusters

SUSE Linux Enterprise Server enables businesses to deliver mission-critical IT services with enhanced security and reduced costs while improving data center reliability and performance.

Hardware Support

- Consistent code base across all architectures

- Latest hardware and peripheral support

- Kernel module updates

- Hotplug support

- Advanced multi-core / hyperthreading processor support

- Large-scale memory support

Fact:
SUSE® Linux Enterprise runs consistently across popular architectures and integrates with a broad range of hardware

Result:
Leverage IT skills across Linux systems

Complete Server Functionality

File and Print Services

- Samba 3 with improved integration into Windows environments (authentication against Active Directory)
- NFS v4
- CUPS
- Apple File Protocol (AFP) - NetATalk
- Support for Linux, UNIX, Windows and Macintosh clients

Mail Services

- SMTP / Postfix
- IMAP / Cyrus
- SASL

Security

- SUSEFirewall
- ClamAV Anti-Virus Protection
- Snort
- VPN with FreeS/WAN

Middleware Services

- Apache Web Server 2.2.0 and scripting support (PHP5, PERL, Python, Ajax, Ruby on Rails, etc.)
- Java Runtime Environment 1.4
- Geronimo (Java Application Server)
- Tomcat
- Mono 1.1

Network Services

- DNS / DHCP
- NTP
- NIS
- OpenLDAP
- SLP
- TFTP

Databases

- MySQL
- PostgreSQL
- ODBC connectivity

SUSE® Linux Enterprise Customers

Management & Novell® Customer Center

Management Lifecycle
Installation

- 1 to 1
  - YaST Installation Workflow
  - Pattern based software deployment

- 1 to many
  - AutoYaST
  - ZENworks® Linux Management
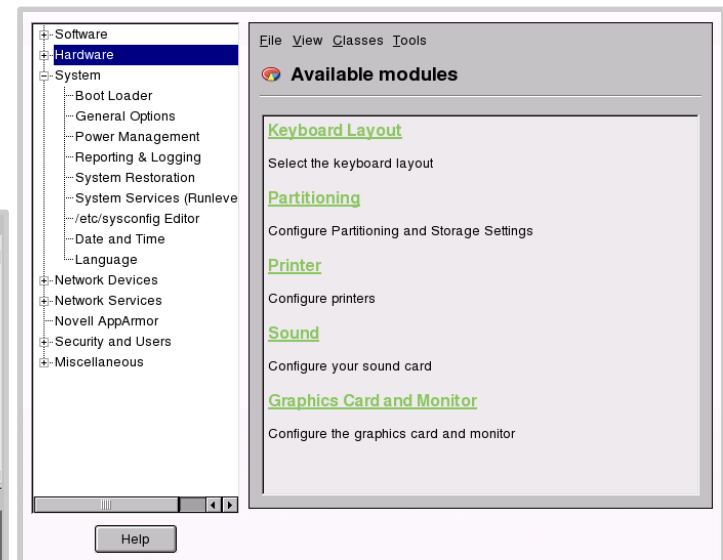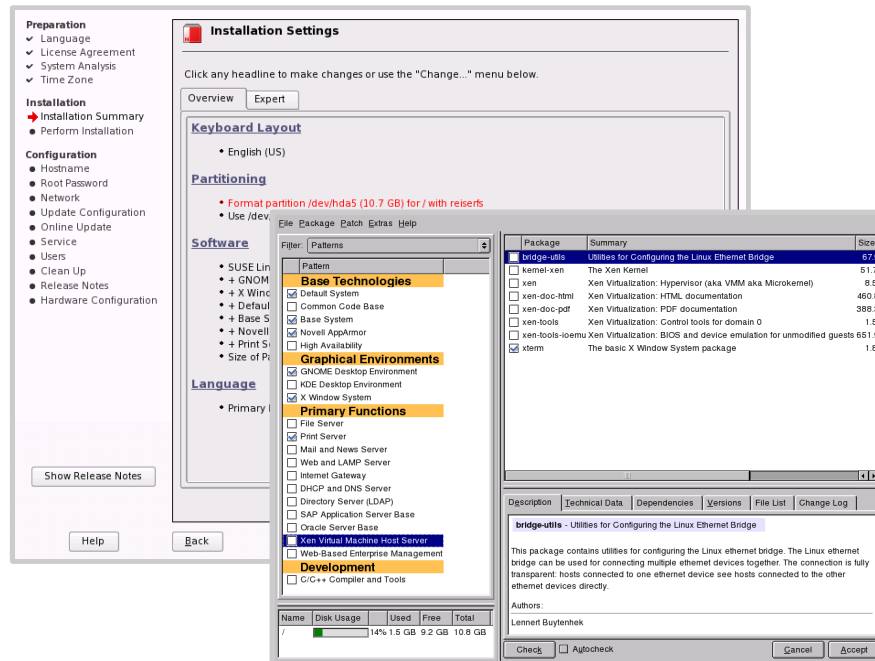
Management Lifecycle
Configuration

- 1 to 1
  - YaST Control Center
    - Module based
    - Categorized
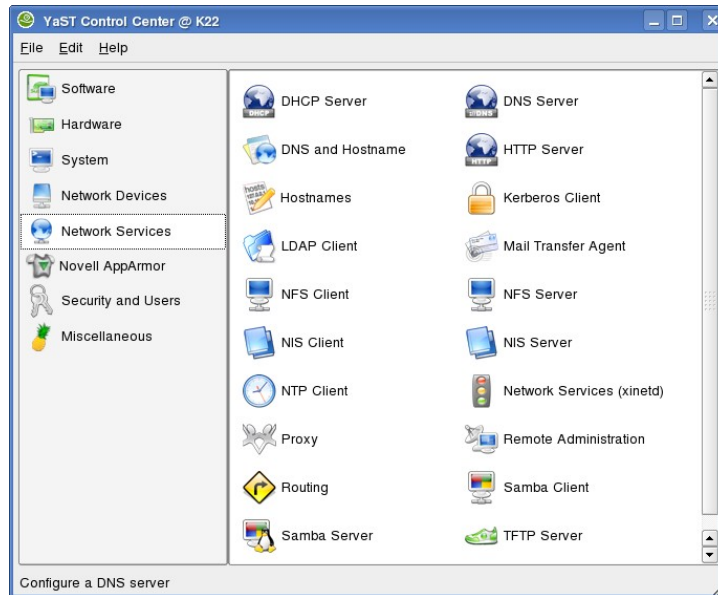
- 1 to many
  - AutoYaST
  - ZENworks® Linux Management
    - Machine lock down
    - AppArmor profile deployment
  - OpenWBEM / CIM support

YaST Control Center @ K22

File   Edit   Help

Software	
Hardware	
System	
Network Devices	
Network Services	
Novell AppArmor	
Security and Users	
Miscellaneous	

DHCP Server	DNS Server
DNS and Hostname	HTTP Server
Hostnames	Kerberos Client
LDAP Client	Mail Transfer Agent
NFS Client	NFS Server
NIS Client	NIS Server
NTP Client	Network Services (xinetd)
Proxy	Remote Administration
Routing	Samba Client
Samba Server	TFTP Server

Configure a DNS server

EthernetAdapter {D}

MaxDataSize : uint32
Capabilities : uint16[ ] {enum}
CapabilityDescriptions : string[ ]
EnabledCapabilities : uint16[ ] {enum}
SymbolErrors : uint32
TotalPacketsTransmitted : uint64

Processor

Role : string
Family : uint16 {enum}
OtherFamilyDescription : string
UpgradeMethod : uint16 {enum}
MaxClockSpee
CurrentClockSp
DataWidth : uin
AddressWidth :
LoadPercentag
Stepping : strin
UniqueID : strin
CPUStatus : uin
ExternalBusClo

MediaAccessStatData

ReadOperations : uint64
UnrecoverableReadOperations : uint64
WriteOperations : uint64
UnrecoverableWriteOperations : uint64
RecoveredReadOperations : uint64
RecoveredWriteOperations : uint64
RecoveredSeekOperations : uint64
UnrecoverableSeekOperations : uint64

Management Lifecycle
Updates

- 1 to 1
  - YaST Package Manager
  - ZENworks® Tools
    - zmd
    - rug
    - zen-updater
  - Novell® Customer Center
    - Automatic Configuration
    - Registration and Entitlement Management

- 1 to many
  - Use ZENworks Linux Management as a remote server

Novell Customer Center ← → **SUSE Linux Enterprise**

ZENworks Linux Management
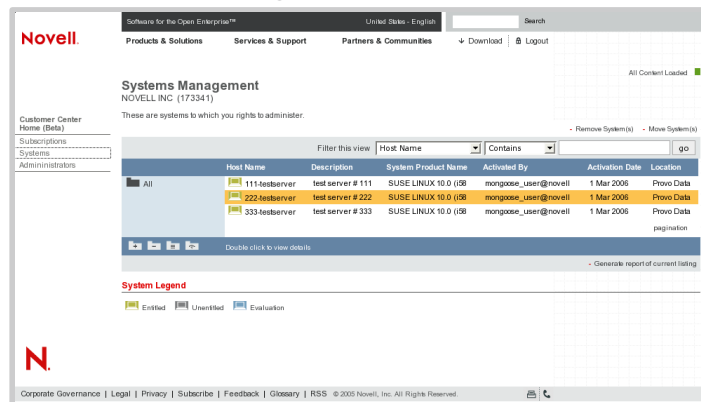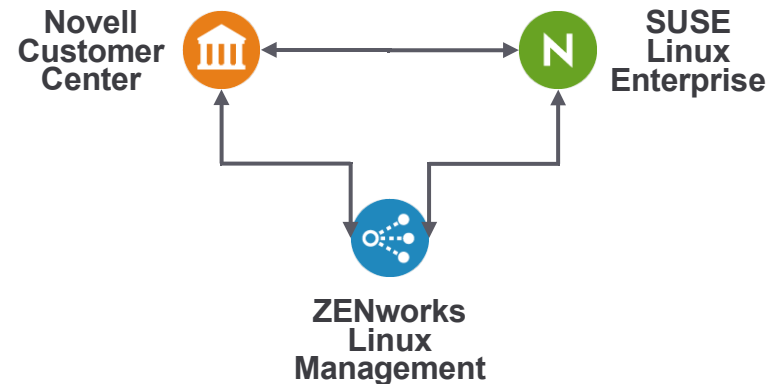
Management Lifecycle
Monitoring

- 1 to 1

  - sysstat-package for decent low level monitoring

  - ksysguard using graphical frontend

    > Local

    > Remote

- 1 to many

  - nagios

  - OpenWBEM / CIM support

  - ZENworks®

Novell® Customer Center

Novell Customer Center   **SUSE Linux Enterprise**

ZENworks Linux Management
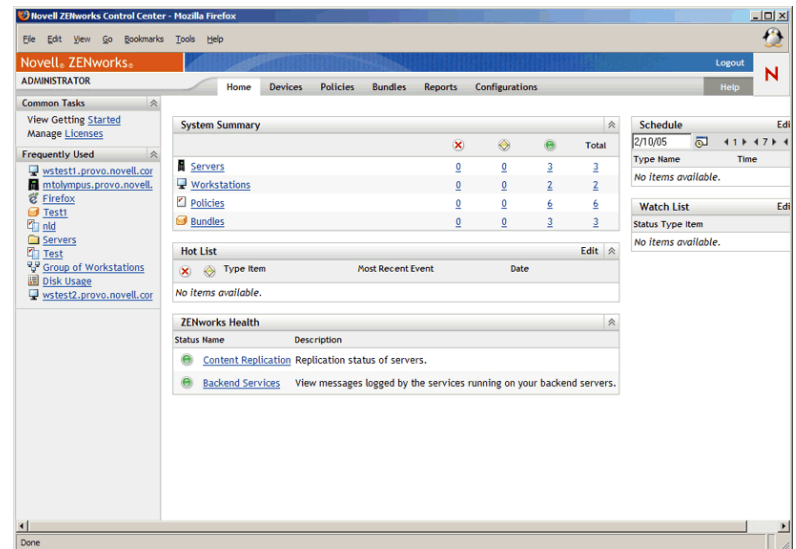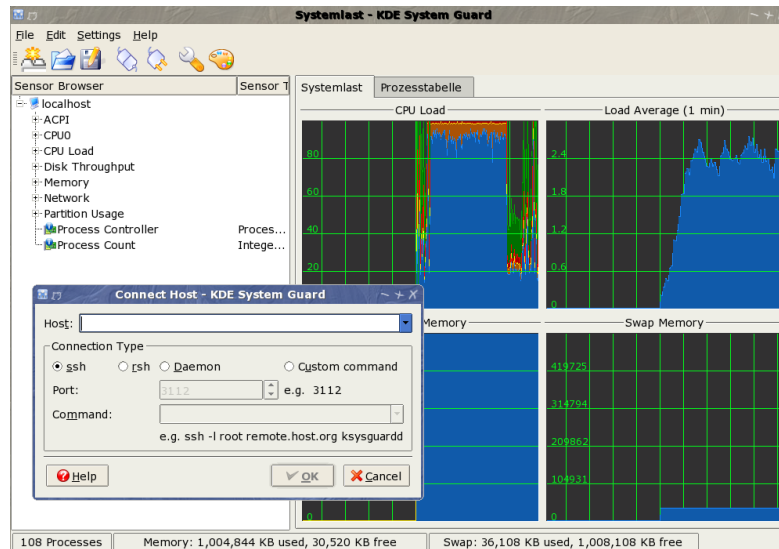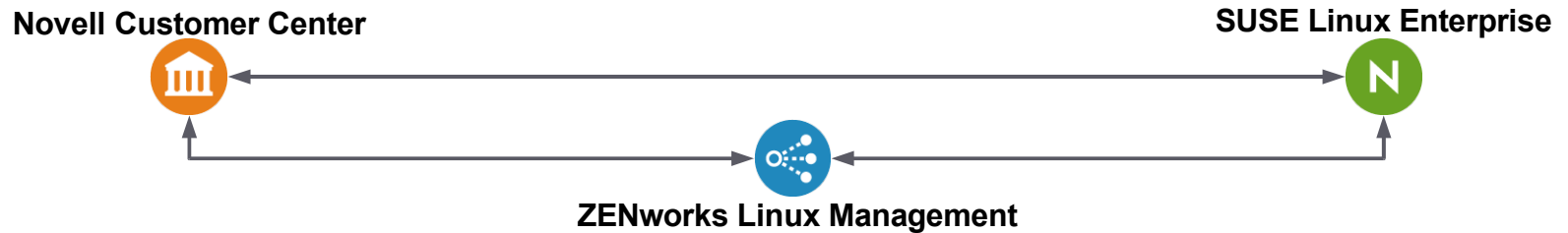
- **Subscription and update service**
  - One tool to manage purchase, renewal, expirations.
  - Easy reporting on compliance and forecast future purchasing needs
  - Integrated patch management and update service, powered by Novell ZENworks®
- **Access to Novell Support**
  - Easy-to-use portal for support
  - One location for access to knowledge base, electronic support requests, and downloads.
- **Intuitive management console**
  - One console to discover, update and manage Linux systems

Novell Customer Center makes it easy to register, update, secure and monitor all Linux systems on the network, from the desktop to the data center.

Novell® Customer Center

SUSE® Linux Enterprise Desktop

InfoWorld – June 16, 2006

Novell Hits a Desktop Home Run with SLED 10

"Novell should be proud of this latest release. SLED 10 is hands down the most polished desktop Linux distribution I've ever used — and that includes Ubuntu. If Novell can sustain the level of effort it put into this release for future versions, SLED will rapidly become a serious contender for enterprise workstation use."

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http://www.infoworld.com/article/06/06/16/79142_25TCsled_1.html

Major Investments in Linux Desktop

Investing in the Linux desktop *ahead of the market*

- Full-time Linux desktop engineers

Key roles in open source projects

- GNOME: founders, chairman & president, maintainers
- Firefox: Robert O'Callahan
- OpenOffice: #2 contributors after Sun
- Kernel: Robert Love, Greg KH, Andi Kleen, Olaf Kirch, ...
- X: Egbert Eich, Matthias Hopf, Stefan Dirsch, David Reveman

Working with partners

- Co-engineering with Intel on media, ACPI
- Co-engineering with Adobe on Acrobat, ATI on drivers
- Co-engineering with Real Networks on media with clean IP
- Relationship with Google, moving apps to Linux

Clean, fast and easy interfaces

- Users will quickly adapt to an easy and friendly working environment

SUSE Linux Enterprise Desktop is the result of extensive usability testing

Novell shares this work through www.betterdesktop.org

Powerful Desktop Applications
SUSE® Linux Enterprise Desktop 10

Office Suite:	OpenOffice.org 2.0 project	
Collaboration Tools:	Evolution™	
Personal Information Management:	Beagle™ project	
Desktop Lock-down with Application Instrumentation:	Novell® AppArmor integration	
Multi-media Player:	Banshee project	
Photo Management:	F-Spot project	
Note Taking Application:	Tomboy	
Web Browser (Extension Testing and Integration):	Mozilla Firefox	

Plugs into a Windows environment

- How does SUSE Linux Enterprise Desktop become a good citizen on the Windows network?

Becomes a member of Active Directory allowing users to authenticate seamlessly

Connects to enterprise messaging systems, such as Microsoft Exchange

Readily handles Microsoft Office document formats