SUSE® Linux Enterprise Server for SAP Applications

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SAP Global Partner

SUSE®
We adapt. You succeed.

SUSE Linux Enterprise Server for SAP
Agenda

- Why Linux?
- SUSE Linux Enterprise Platform
- SUSE Linux Enterprise Server for SAP Applications
- Questions and Answers

Your Linux is SAP ready.™

Why Linux?

Top reasons for Deploying SAP on Linux

#1 Cost savings

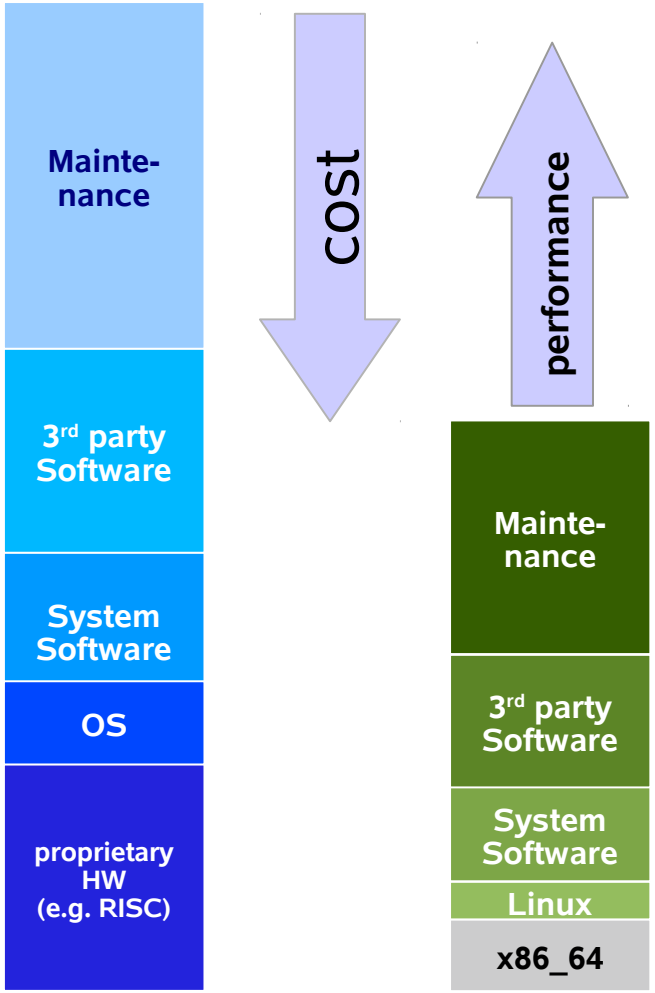
- Hardware Investment (~75%)
- Hardware Maintenance (~90%)
- OS License Cost (~60%)

#2 Standardization

- **Transform Unix to Linux:** Less OSs
- **Virtualization:** Less Servers (on commodity hardware)
- **Windows and Linux Interoperability:** Less hardware platforms

#3 Choice

- More options (e.g. hardware purchase)
- Longterm investment protection
- More flexibility for technology decisions



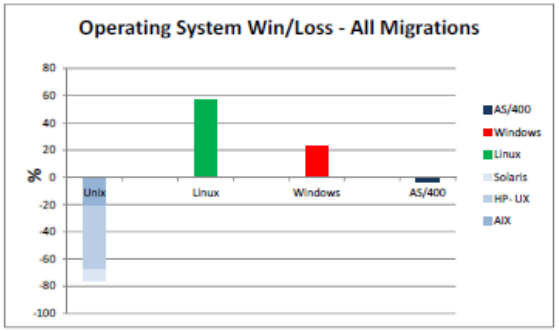
The Trend from Unix to Linux in SAP Data Centers

Realtech trend study proves that Linux has become the preferred platform for SAP systems and that UNIX dramatically loses market share.

- Linux gains 56% market share
- UNIX loses an overall 77%
- Windows gains 23%
- The top 13 CPUs in the price/performance ranking come from the x64 family
- There is no real limit what size of system or database can be run on Linux
- SUSE Linux Enterprise High Availability Extension is best integrated into SAP
- Linux and the x64 CPU architecture in SAP data centers as mainstream solutions

REALTECH

Linux, with existing SAP systems to follow as soon as possible. Thus, quite some of Solaris' 7% gain of this evaluation period will become the loss of the next one, added by those systems running on Solaris and the SPARC CPU in this financial institution for about 10 to 15 years. Therefore, 7% target share for both Solaris and AIX *seem* to be the same, but they have very different meanings. The later discussion of CPU properties and the development in the price/performance ratio will demonstrate why.



For ease of interpretation, we have put this together into a win-/loss-statistics as shown frequently with elections. As a matter of fact, it *is* an election, kind of. And of course, the logic of mathematics holds: UNIX loses an overall 77% market share, with HP-UX being the major loser in the field at 46%. On the other hand, Linux gains 56%, Windows 23%. For the x64 CPU architecture, this adds up to an overall gain in market share of 79%, with all other architectures losing at this pace.

So far, we have answered the questions about who is losing and who is winning, but we have not shed any light on where in the world this is going on. It is highly interesting for us, that although our overall organizations in Europe are larger than in the Americas or the APAC region, the absolute number of migrations performed is absolutely comparable, with only a slight advance in

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SUSE Linux Enterprise Platform

SUSE® Leadership

MAINFRAME LINUX

OVER 80%

of all Linux running on mainframe computers is SUSE Linux Enterprise Server

SAP ON LINUX

OVER 70%

of all SAP running on Linux runs on SUSE Linux Enterprise Server

LINUX IN CHINA

SUSE Linux Enterprise Server is the most widely used commercial enterprise Linux distribution in China — more than Red Hat

LINUX IN AEROSPACE AND DEFENSE

Nearly 80% of the US Fortune 500 aerospace and defense companies use SUSE Linux Enterprise Server

MOST CERTIFIED APPLICATIONS

Over 8500 applications are certified and supported on SUSE Linux Enterprise Server, more than any other Linux distribution

OVER 8500

LINUX IN RETAIL

NEARLY 70%

of the US Fortune 100 general merchandisers, specialty retailers, and food and drug stores use SUSE Linux Enterprise Server

LINUX IN AUTOMOTIVE

SUSE Linux Enterprise Server is used by nearly all of the world's major automobile manufacturers

LINUX IN HPC

Half of the world's largest supercomputer clusters use SUSE Linux Enterprise Server

BEST LINUX SUPPORT

SUSE offers better Linux support than Red Hat or Oracle

LINUX IN GLOBAL FORTUNE 100

Over two-thirds of the global Fortune 100 use SUSE Linux Enterprise Server

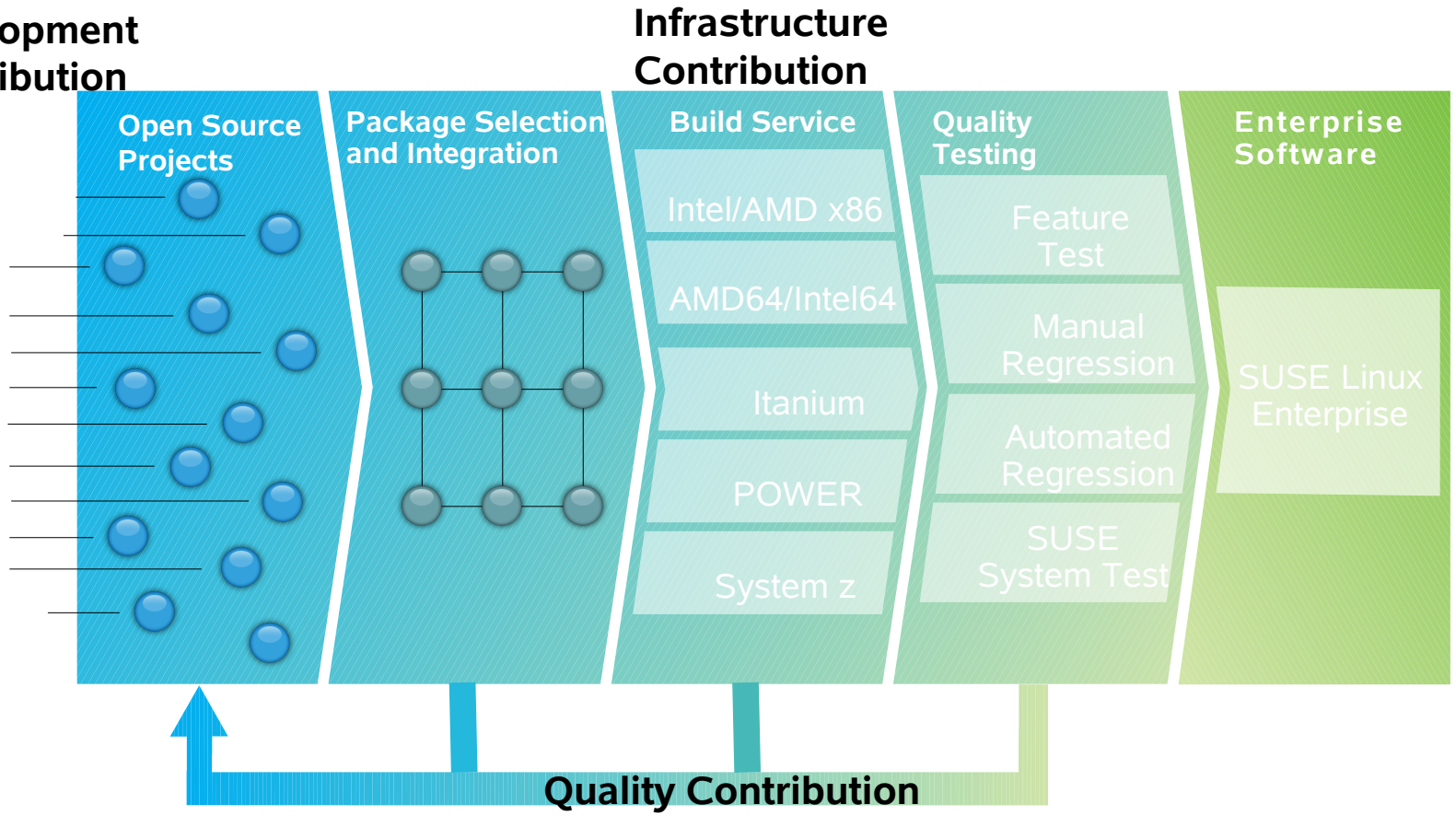
MOST CERTIFIED HARDWARE

Over 13,500 hardware systems are certified and supported on SUSE Linux Enterprise, more than any other Linux distribution

13,500

SUSE Linux Enterprise Server

The Build Service Advantage



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

SUSE Build Service is the internal entity of the openSUSE BuildService

SUSE Linux Enterprise Server
Strategic Linux Platform for VMware

- VMware and SUSE have a strategic partnership for Linux Enterprise Server in VMware vSphere environments
- SLES is standard-OS for VMware Virtual Appliance Products
- Common ISV Software Certifications
- SLES optimized as 'best-guest' for VMware ESX

  http://www.suse.com/partners/alliance-partners/vmware/
- VMware OEM partnership to offer SLES Subscriptions with vSphere, VMware support
- SLES for SAP Applications for critical SAP Systems in vSphere environments

SUSE Linux Enterprise Server
Strategic Linux Platform for Microsoft

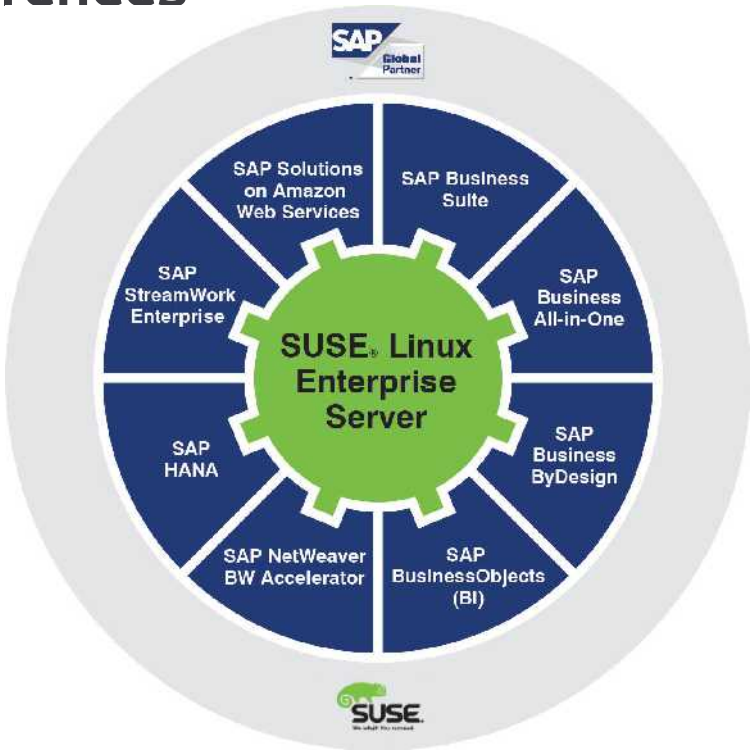
- Windows and Linux are the main future Operating Systems in the Data Center
  http://www.suse.com/partners/alliance-partners/microsoft/

- Customers expect them to interoperate smoothly

- SUSE & MICROSOFT Interoperability
  - Reduce complexity
  - Increase productivity
  - Greater flexibility
  - Improve support
  - IP protection and lower risk
  - Lower costs

SUSE Linux Enterprise Server
Strategic Platform for SAP

- is SAP Software Development Reference Platform
- First SAP on SLES certification in 1999
- 4000+ joint customers, 100+ References
- 70+% Market share
- Integrated 24x7 Support through SAP Solution Manager
- Appliance and OS Platform
  - SAP NetWeaver BW Accelerator*
  - SAP High Performance Analytic Appliance*
  - SAP StreamWork Enterprise Agent*
  - SAP NetWeaver Enterprise Search*
  - SAP Business All-in-One Fast Start
  - SAP Business ByDesign*



* SLES only

What is SUSE® Linux Enterprise Server for SAP?

SUSE® Linux Enterprise Server for SAP Applications

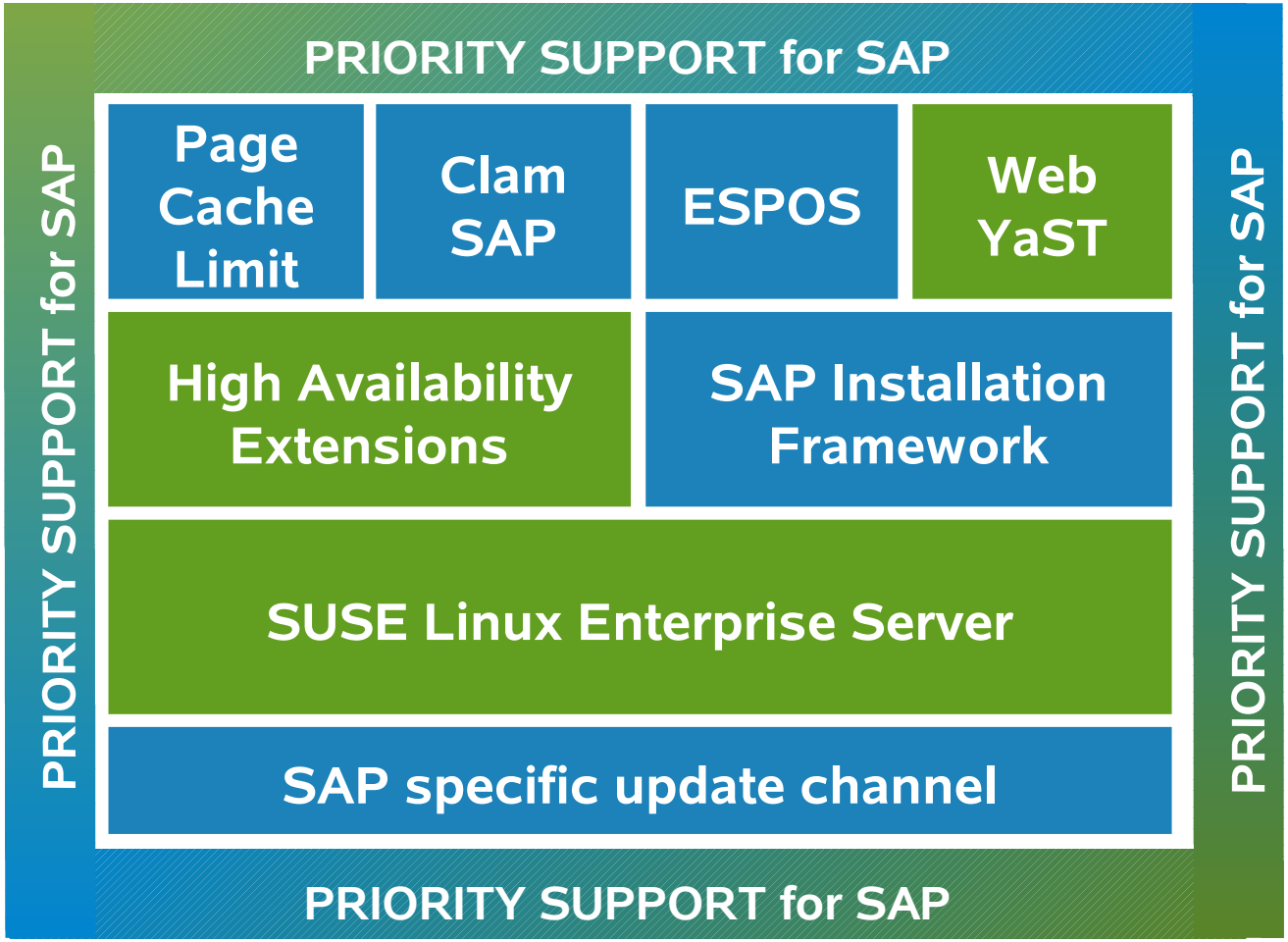
A bundle of SOFTWARE and SERVICES that addresses specific needs of SAP users.

Example target Use Cases:

- Unix to Linux Migrations, Replatforming
- SAP Appliances
- SAP Cloud Deployments

Software	Services
■ SUSE Linux Enterprise Server ■ Installation Wizard ■ SUSE Linux Enterprise High Availability Extension ■ Page Cache Limitation	■ Extended Service Pack Overlap Support ■ Separate Update Channel ■ SUSE Linux Enterprise Server Priority Support for SAP Applications (optional)

SUSE Linux Enterprise Server for SAP Applications



What is SUSE® Linux Enterprise Server for SAP?

SUSE Linux Enterprise Server

- SAP's Dev.Reference Platform
- Certified
- Optimized
- SAP's preferred Appliance platform
- SAP priority support

What is SUSE® Linux Enterprise Server for SAP?

- Guided Installation (OS + SAP)
- Install. Framework 3rd party ext.

SAP Installation Wizard

- Automatic SLES and SAP installation and configuration (3rd party installation interface)
- Automatic SLES installation and configuration (preconfigured for SAP)
- Custom Installation

What is SUSE® Linux Enterprise Server for SAP?

- Cluster manager
- Cluster filesystem
- SAP resource Agents

SAP on SUSE High Availability Extension (HAE) Enqueue Replication Server

Best Practice (120 pages)

SAP on SUSE Linux Enterprise

SAP NetWeaver on SUSE Linux Enterprise Server with High Availability - Enqueue Replication Server and sap_suse_cluster_connector Integration

11 SP2 www.suse.com

October 17, 2012 | Best Practice

SAP® Certified
Integration with SAP NetWeaver®

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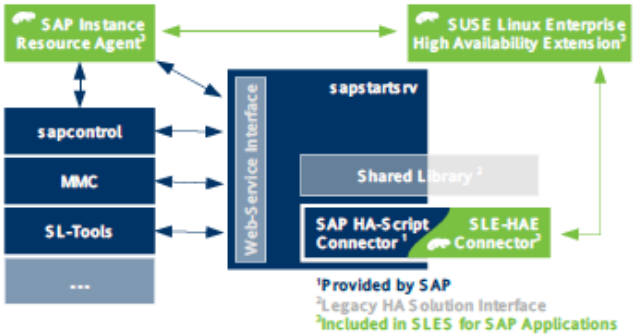
agent expects a standard SAP installation and therefore needs fewer parameters to configure. The monitor operation of the resource agent can test the availability of the database by using SAP tools (R3trans or jdbcconnect). This ensures that the database is really accessible for the SAP system.

3.3.3 The SAP SUSE cluster connector

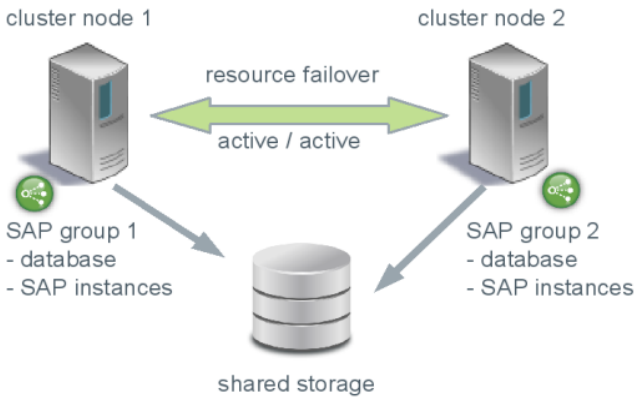
The integration of the HA cluster through the SAP control framework using the sap_suse_cluster_connector is of special interest. "One of the classical problems running SAP instances in a highly available environment is that if a SAP administrator changes the status (start/stop) of a SAP instance without using the interfaces provided by the cluster software than the cluster framework will detect that as an error status and will bring the SAP instance into the old status by either starting or stopping the SAP instance. This can result in very dangerous situations, if the cluster changes the status of a SAP instance during some SAP maintenance tasks. The solution is that the central component SAPSTARTSRV, which controls SAP instances since SAP Kernel versions 6.4, will be enabled to communicate the state change (start/stop) to the cluster software." (SAP SDN article "How to Connect SAPSTARSRV and Cluster Frameworks using the Components saphascriptco.so and SAP_Vendor_Cluster_Connector" http://scn.sap.com/docs/DOC-28875).

Figure 3.4 Cluster Integration with SAP Control Framework

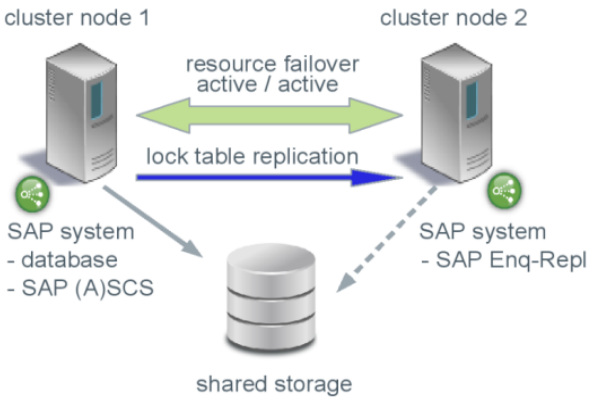


High Availability – Best Practice

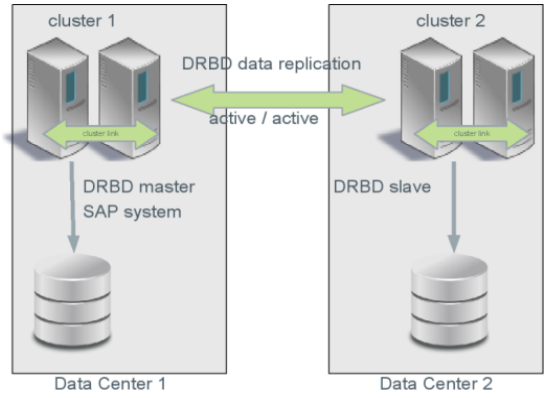
Simple Stack



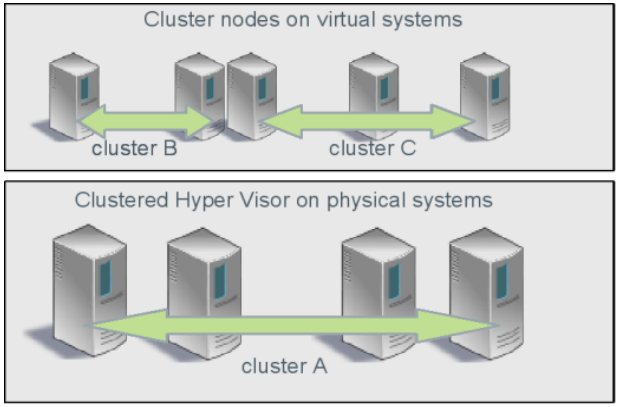
Enqueue Replication



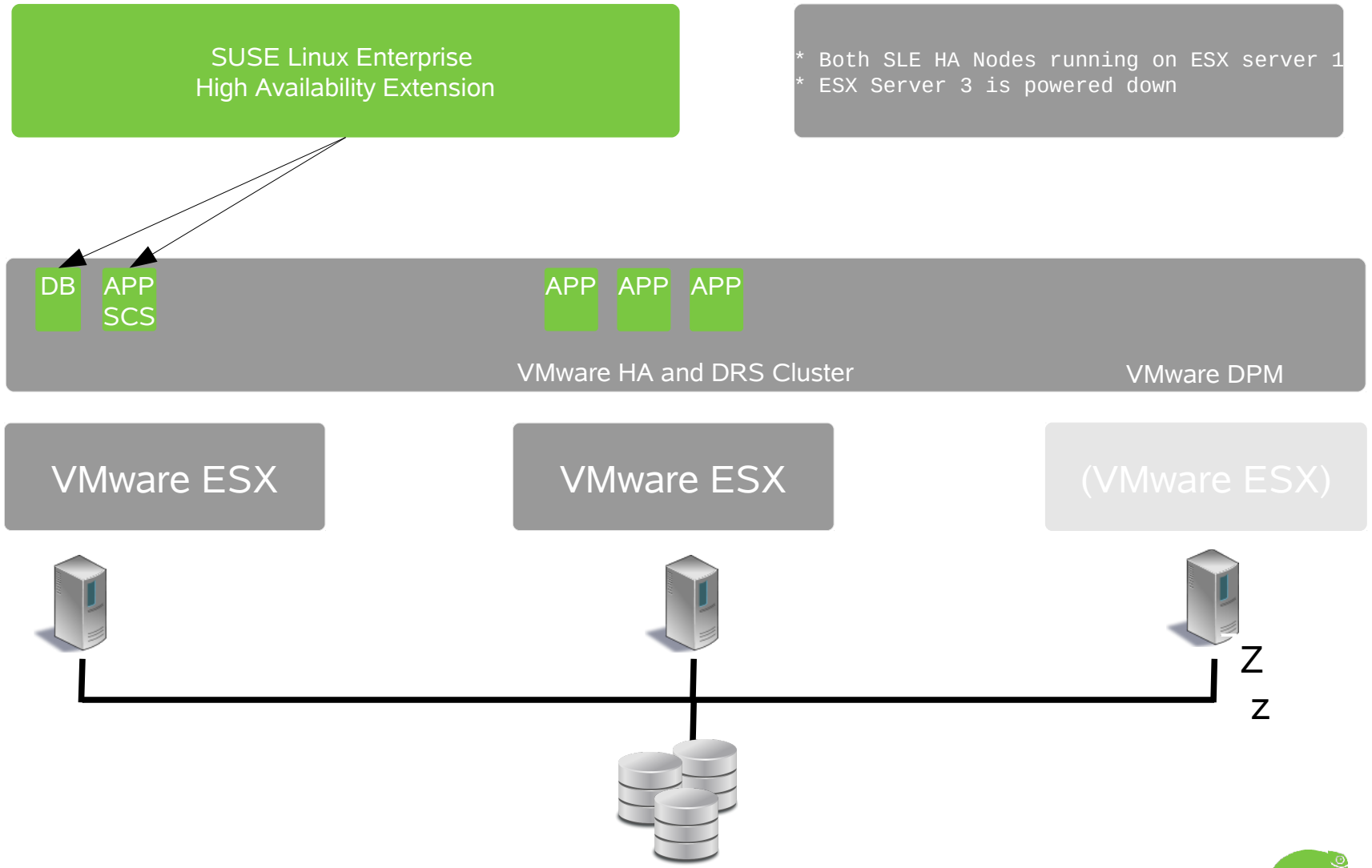
DRBD Data Sync



HA in Virtual Environments

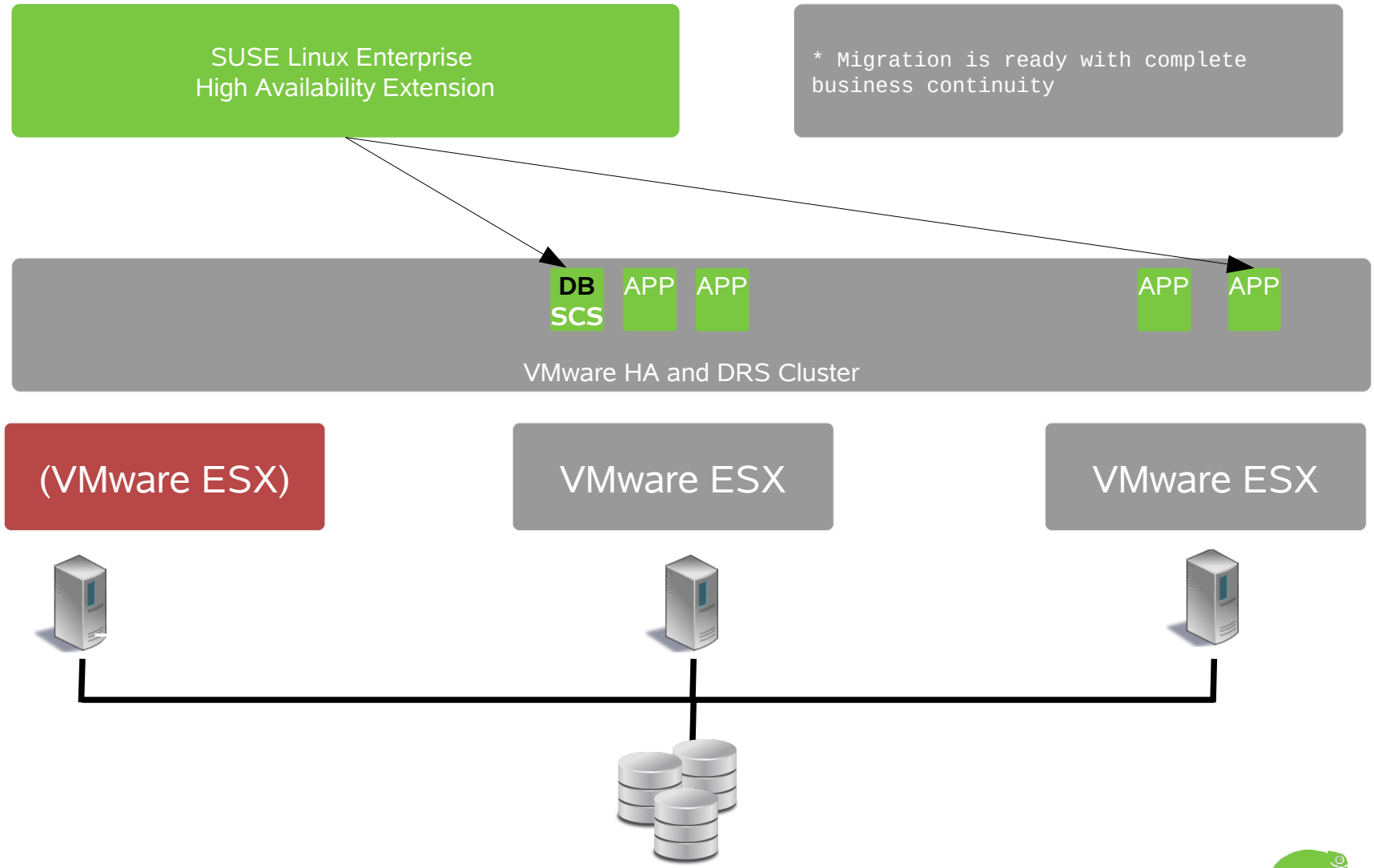


VMware HA and SUSE HAExtention



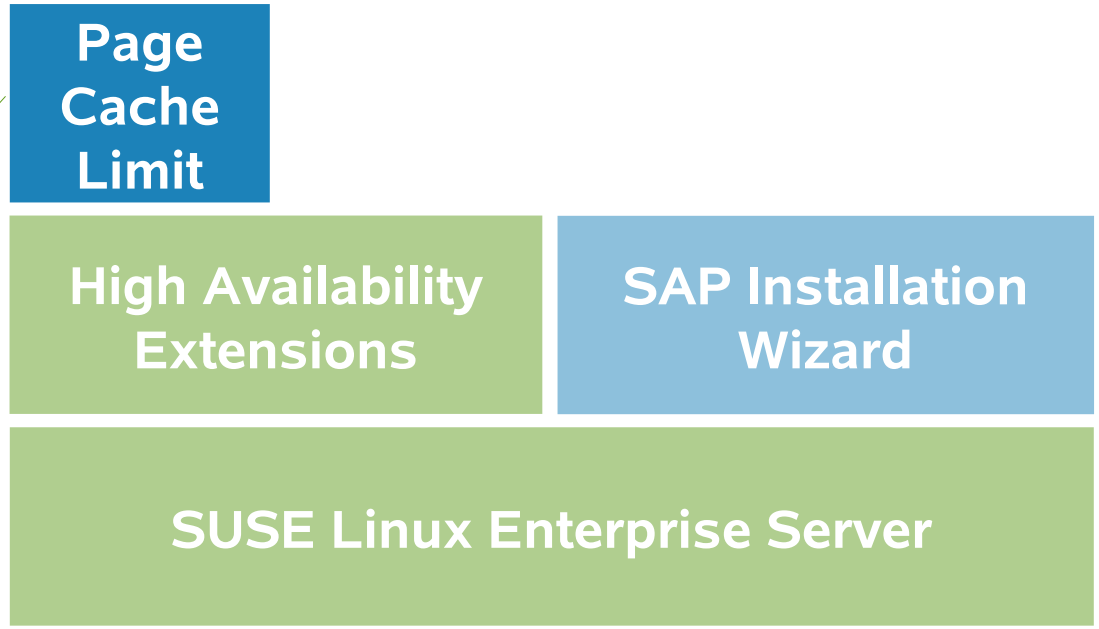
DPM = Distributed Power Managment
DRS = Distributed Resource Scheduler

VMware HA and SUSE HAExtention



What is SUSE Linux Enterprise Server for SAP?

Fully supported optimization for SAP workloads



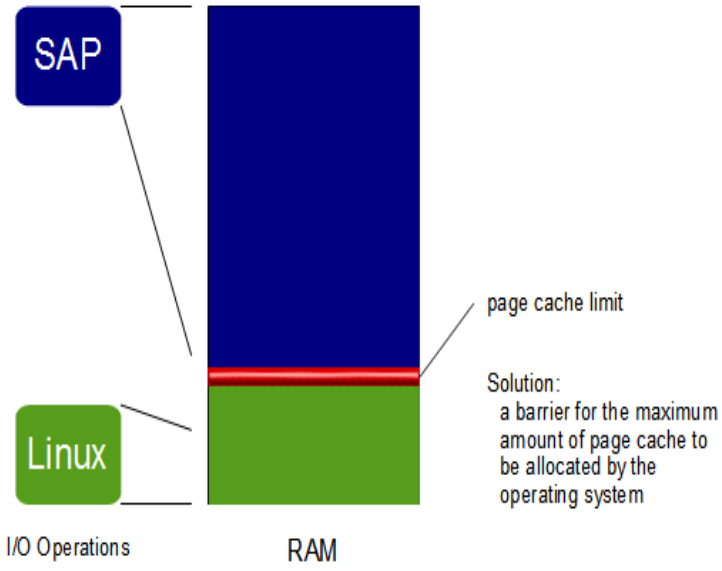
Pagecache Limit Feature

Solution Overview

Tells kernel that once page cache is filled to configured limit, application memory is more important and should not be paged out

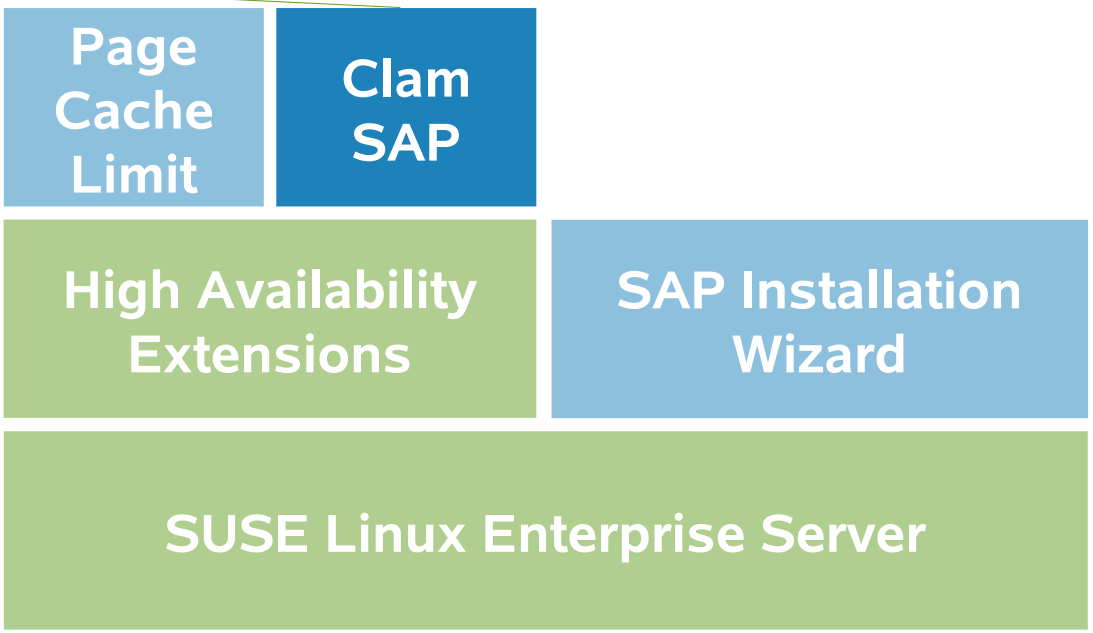
No memory paged out if memory footprint of the workload plus the configured page cache limit does not exceed the amount of physical RAM

SAP Note 1557506: Linux paging improvement

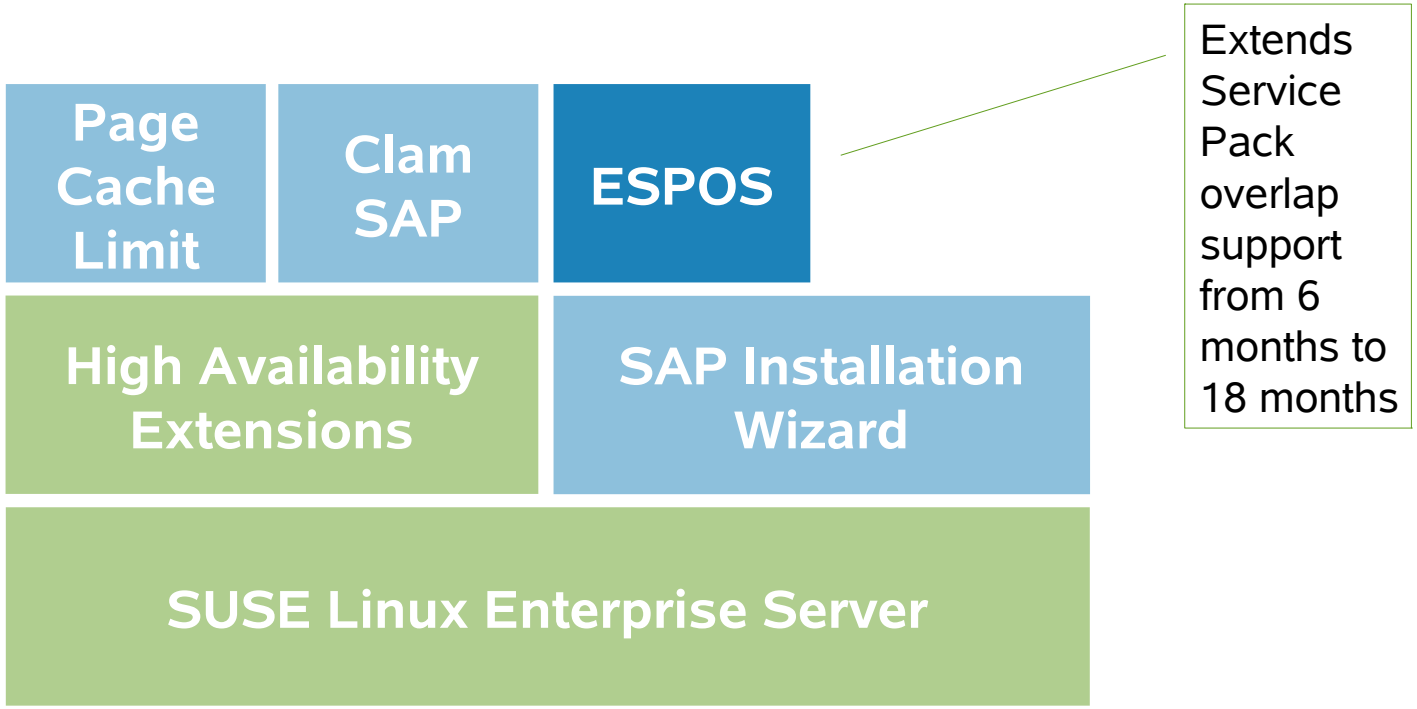


What is SUSE® Linux Enterprise Server for SAP?

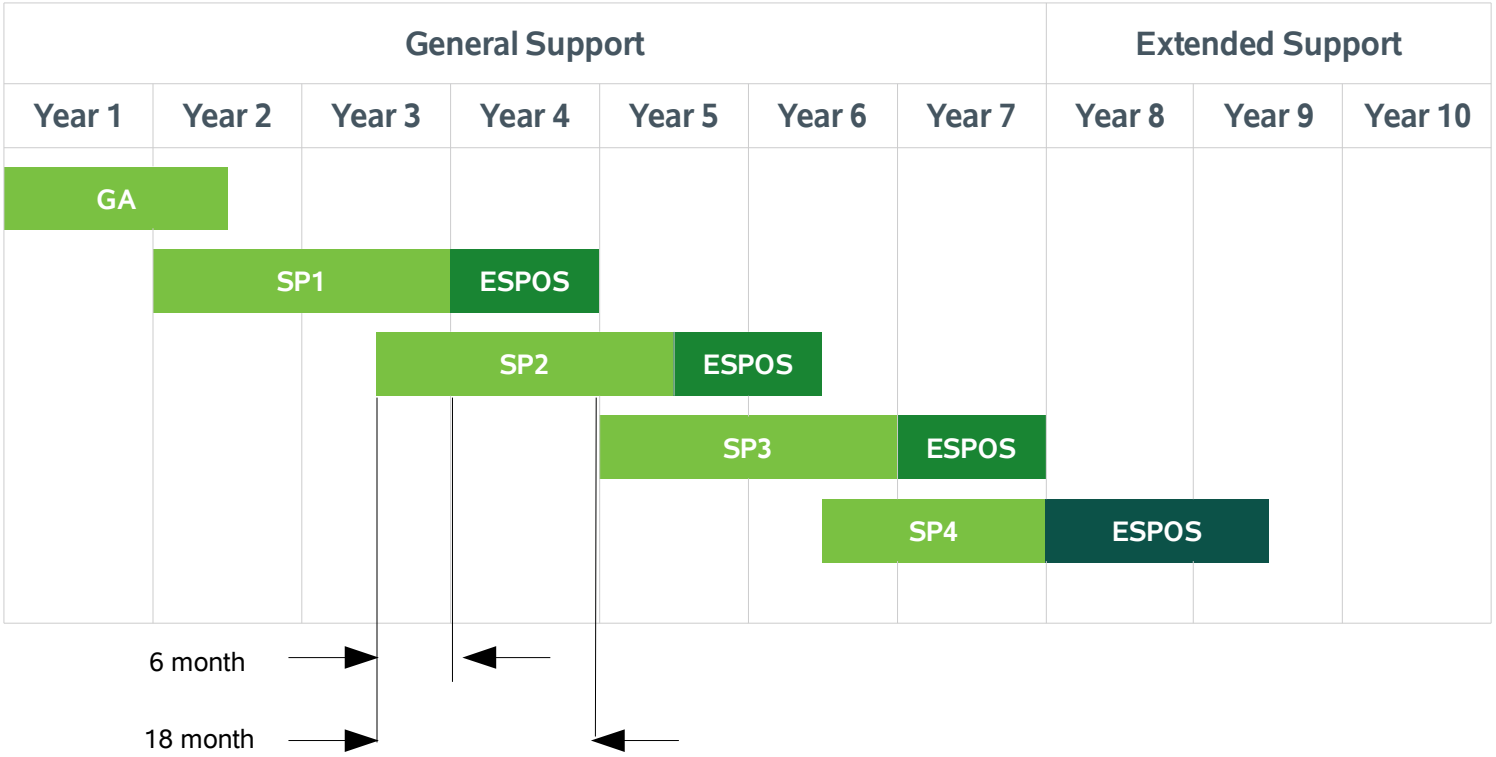
A SAP application can use the ClamAV engine to scan for malicious uploads



What is SUSE® Linux Enterprise Server for SAP?



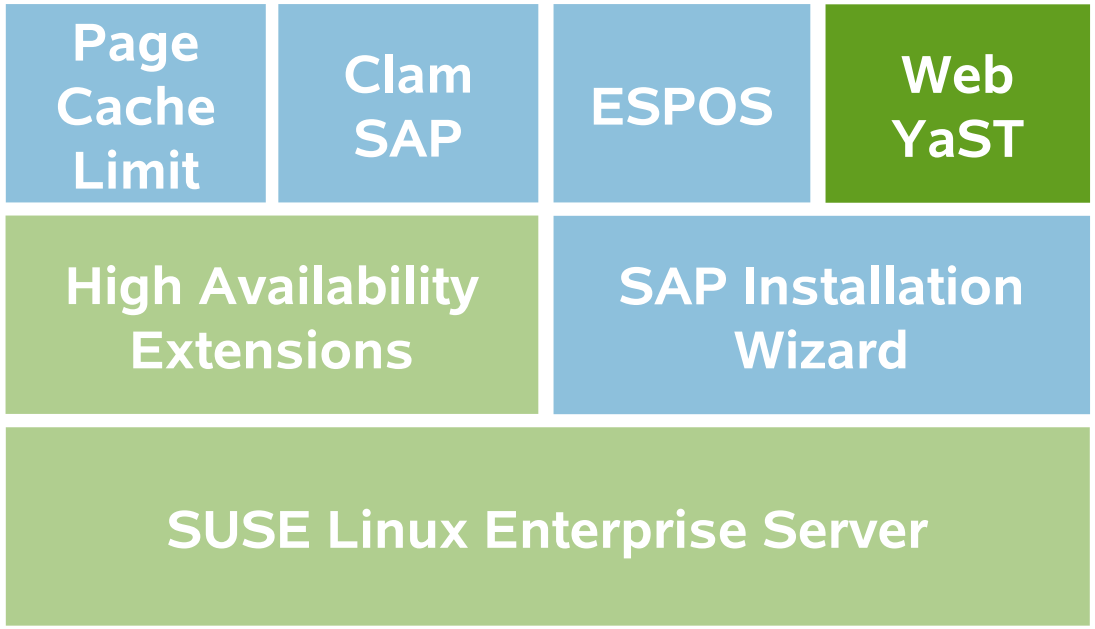
Extended Service Pack Overlap Support



18 month upgrade window

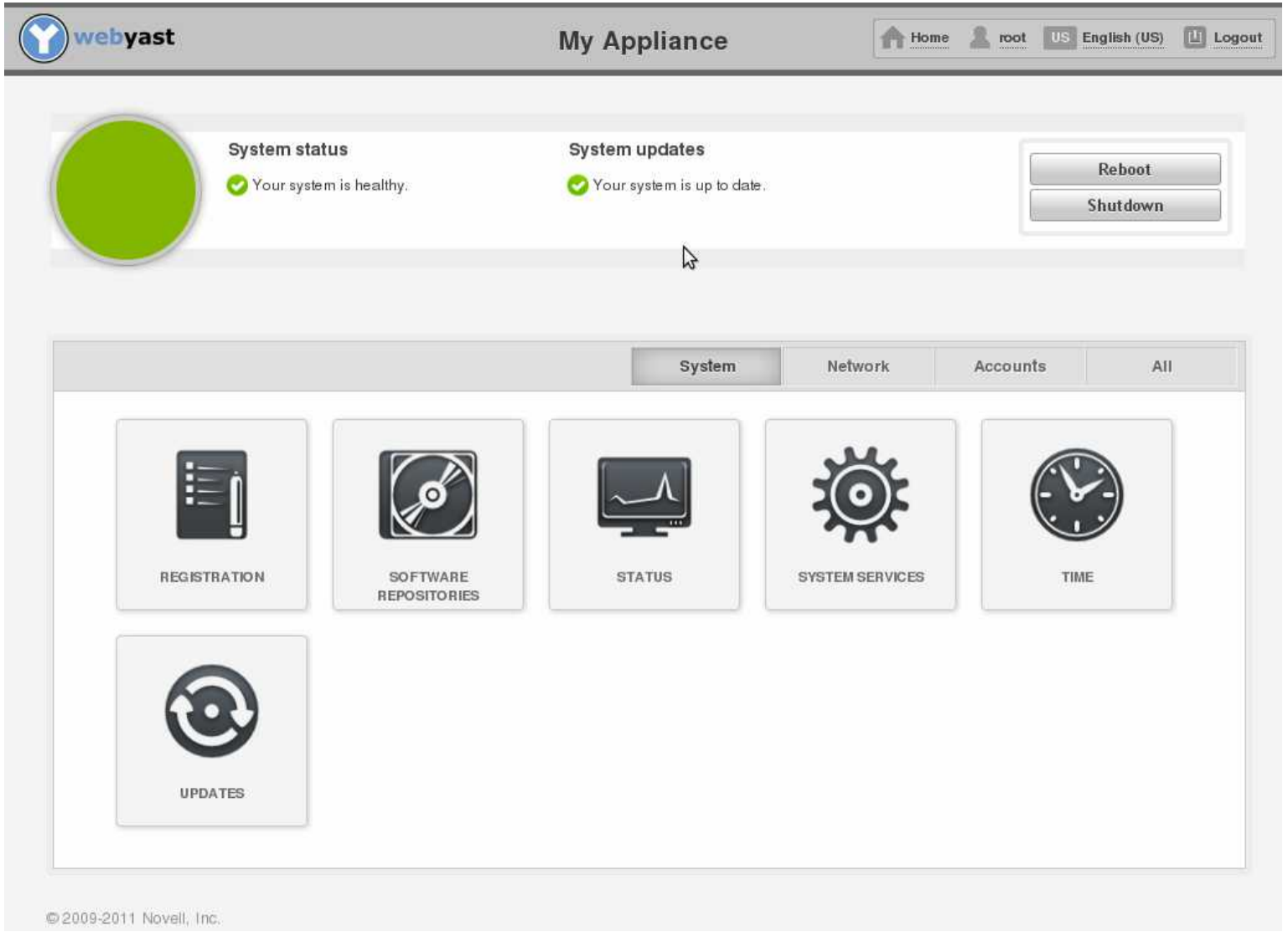
18 month extended lifecycle

What is SUSE® Linux Enterprise Server for SAP?



- Web based Management interface
- required for appliances

WebYast


webyast
My Appliance
Home
root
US
English (US)
Logout
System status
Your system is healthy.
System updates
Your system is up to date.
Reboot
Shutdown
System
Network
Accounts
All
REGISTRATION
SOFTWARE REPOSITORIES
STATUS
SYSTEM SERVICES
TIME
UPDATES
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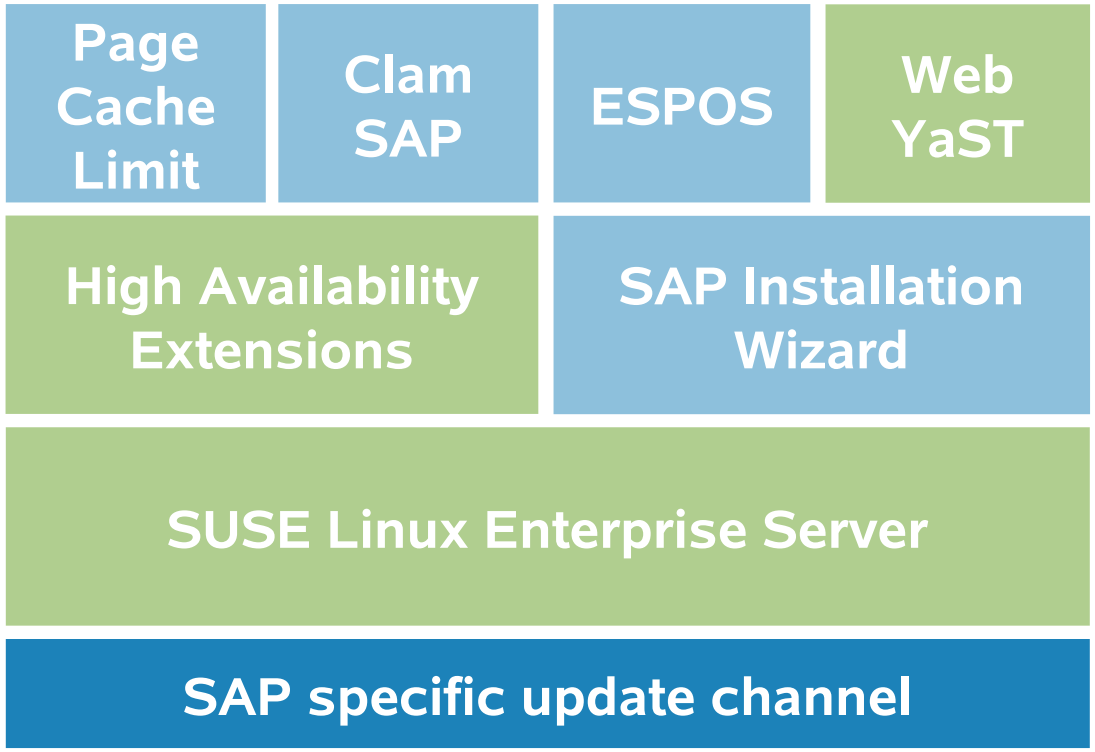
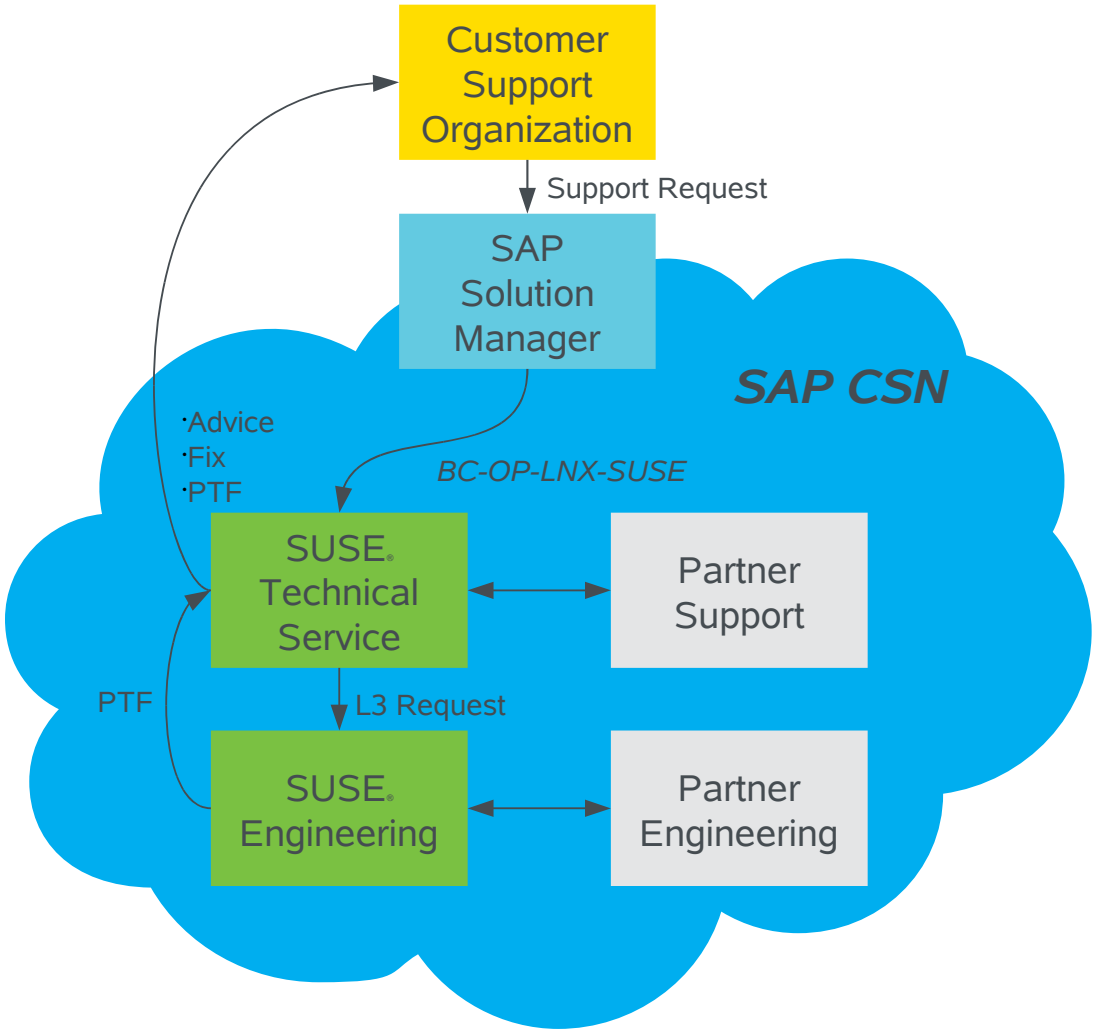
What is SUSE® Linux Enterprise Server for SAP?



- Additional maintenance channel
- Allows SAP specific patches
- Updates for SAP specific packages

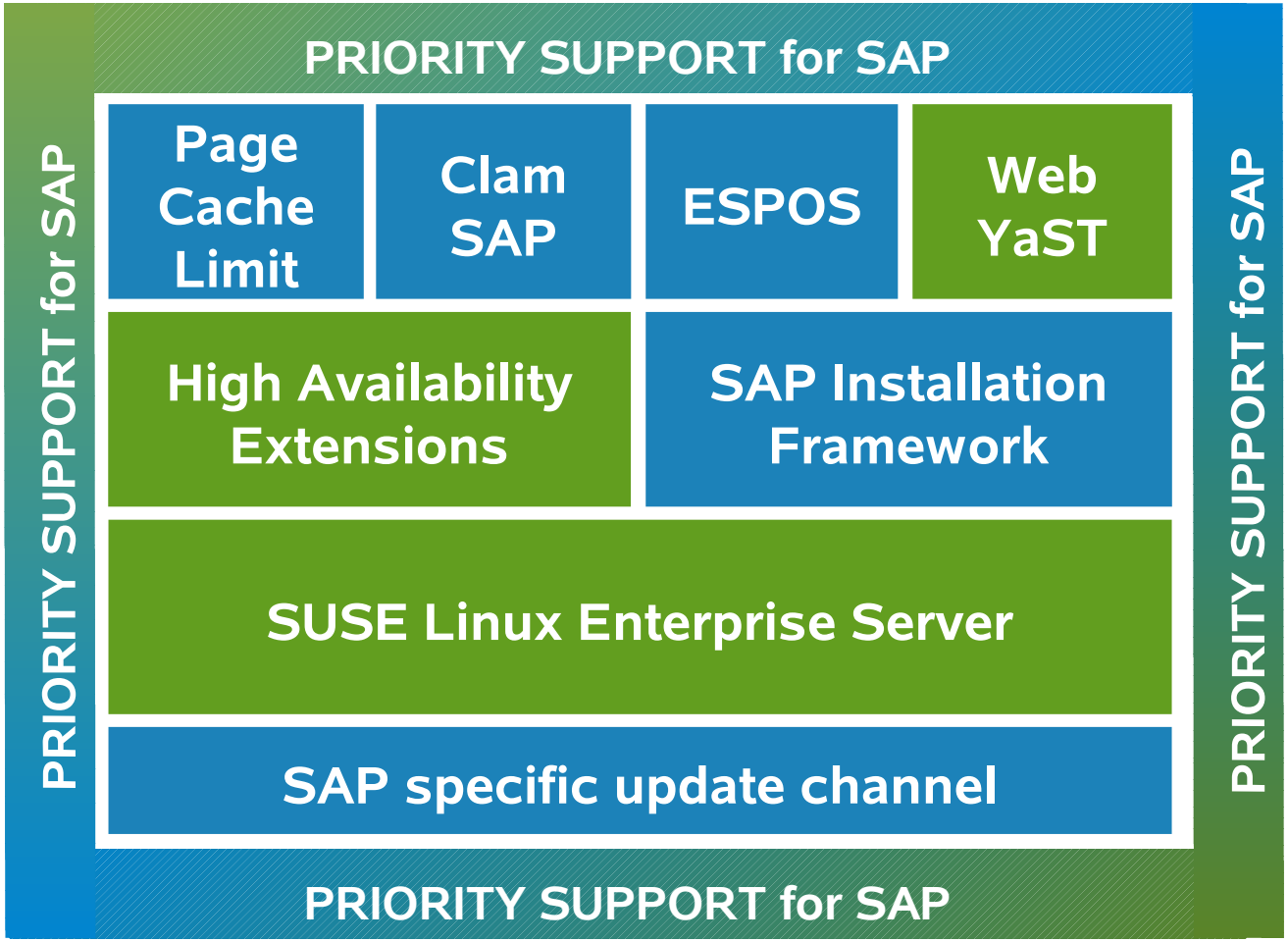
SUSE® Linux Enterprise Server Priority Support for SAP



- Integrated in SAP Support Process
- 24x7
- Leverages SAP Customer Support Network
- Quick support by SAP LinuxLab Experts

SAP Note 1056161 - SUSE Priority Support for SAP-Applications

SUSE Linux Enterprise Server for SAP Applications



SUSE® Linux Enterprise Server for SAP

The only operating system optimized for all SAP software solutions

FEATURE	FUNCTION	BENEFIT
Page Cache Limit	Limit OS cache size to influence swapping behavior	Gain performance by allocating memory to application
Expanded Service	Additional one year maintenance cycle	More time to the next upgrade
Installation Wizard	Guided automated installation	Faster, Simplified install
High Availability Extensions	Toolbox to build HA scenarios	No need to buy separate product
Priority Support	Integrated SAP and SUSE Support	One place for your requests

E3 Magazine – Cover Story (SUSE / SAP / Realtech)

COVERSTORY Linux, eine Evolution

dort die Anschaffungs- und Lizenzkosten für proprietäre Erweiterungen und deren Zertifizierung entfallen. Service Pack 2 erhöht den Komfort für die Anwender. Zwar empfiehlt Suse nach wie vor, komplexere Cluster von einem erfahrenen Systemarchitekten entwerfen zu lassen. Doch grundlegende Setup-Aufgaben kann jetzt jeder IT-Administrator auch ohne Detailwissen über Linux-Clustering durchführen: Die nötigen Vorlagen und Assistenten sind in die Lösung integriert, für die Implementierung eines Basis-Clusters stehe ein Motif-unterstützter Setup-Prozess zur Verfügung. Ihre eigentliche Stärke jedoch zeigt Suse Linux HA Extension in virtualisierten Cluster-Umgebungen: Sie garantiert selbst für heterogene Cluster aus physischen und virtuellen Linux-Servern Hochverfügbarkeit – während sie in rein virtualisierten Clustern die saubere Trennung von physischen und virtualisierten Servern vollzieht. Für virtualisierte Umgebungen auf vSphere 5 hat Suse mit VMware einen vollautomatisierten Ablauf entwickelt, der sämtliche Prozesse überwacht und steuert: Während Suse Linux HA Extension dabei die Überwachung der SAP-Applikationen übernimmt, ist VMware HA für die Steuerung der Hardware zuständig. Durch die vollständige Unabhängigkeit der Server-Ebenen im Cluster ist es möglich, virtuelle Maschinen zur Laufzeit von einem physikalischen Host auf den anderen zu verschieben. Dadurch entfällt selbst die kurze Downtime, die bei redundanten Servern in einem redundanten Design bei einem Hardwareausfall auftritt, bevor der andere Server anspringt.

Reibungslose Prozesse

Der erste Schritt zur optimierten Lösung auf Basis vollkommen unabhängiger Ebenen ist in der Regel die Verschiebung wichtiger SAP-Anwendungen, etwa Zentralinstanz oder Datenbank auf verschiedene physische Hosts. Auch diese Migration ist durch die vollständige Trennung von virtueller und physischer Ebene zur Laufzeit möglich, und allein durch sie ist die SAP-Workload bereits besser gegen Hardware-Ausfall abgesichert. Für die Überwachung der Funktionen ist in einer solchen Umgebung die Suse Linux HA Extension zuständig. Stellt sie fest, dass eine virtuelle Maschine nicht mehr aktiv ist, migriert sie diese automatisch auf einen anderen Host. Wurde nun beispielsweise die Datenbank verschoben und fällt dadurch auf dem neuen Host eine zu hohe Last an, so registriert die HA Extension auch dies und migriert den Applikationsserver wiederum auf einen anderen physischen Server. Auf dies e Weise sorgt Suse Linux HA Extension für eine sinnvolle Verteilung der SAP-Workload, während VMware HA die Überwachung und Steuerung der Hardware sowie der virtuellen Maschinen übernimmt. Da sämtliche Komponenten der Cluster-Lösung miteinander kommunizieren, ist ein Hostübergreifend der reibungslose Ablauf aller Prozesse sichergestellt.

Die SAP Private Cloud

Durch die vollständige Trennung von physischem und virtuellem Layer unterstützt die Suse Linux HA Extension mit VMware HA jedoch nicht nur den schnellen Auf- und Ausbau beliebig skalierbarer, hochverfügbarer Cluster innerhalb der klassischen Infrastruktur eines Rechenzentrums. Auf Wunsch ermöglicht sie sogar den Einstieg in die SAP Private Cloud. Gerade für rechenintensive Anwendungen bietet sich eine solche voll virtualisierte, hochverfügbare SAP-Landschaft bereits heute an. Auch Hana wird von einer solchen Umgebung profitieren, sobald die virtualisierte Version freigegeben ist – zumal Suse Linux die HA Extension permanent weiterentwickelt: Die Integration einer zusätzlichen Orchestrierungslösung ist bereits in Arbeit. Sie wird den Ausgleich der SAP-Workloads zwischen den physischen Hosts weiter optimieren und damit die ohnehin bereits hohe Performance von rechenintensiven Applikationen wie Hana auf Suse Linux noch weiter steigern.

Das SAP LinuxLab

Seit 1999 arbeiten SAP, Hardwarehersteller und Distributoren im SAP LinuxLab gemeinsam daran, die Verfügbarkeit von SAP unter Linux kontinuierlich zu erhöhen: Die Experten des LinuxLab unterstützen die Zertifizierung sowie Veröffentlichung von SAP-Software auf Linux und treiben die Portierung von SAP auf neue Plattformen voran. Außerdem beraten sie andere Abteilungen von SAP bei der Entwicklung auf der sowie für die Linux-Plattform und bearbeiten bei Bedarf Linux-spezifische Support-Themen. Suse engagiert sich im LinuxLab für strategische Projekte zu den Themen Appliances, Hochverfügbarkeit sowie Virtualisierung und arbeitet kontinuierlich an der maximalen Kompatibilität des Suse Linux Enterprise Server for SAP Applications mit den SAP-Applikationen und -Datenbanken. Neben Entwicklern von Suse und SAP arbeiten aktuell auch Vertreter von AMD, Bull, Dell, Fujitsu, HP, IBM, Intel, Oracle, RealTech, Red Hat, VMware dauerhaft im SAP LinuxLab mit. Eine enge Kooperation besteht außerdem zwischen dem LinuxLab und der Server-Infrastruktur-Abteilung von SAP. Diese entwickelt in direkter räumlicher Nachbarschaft den SAP-Kernel, der als Basis-Layer über dem eigentlichen Betriebssystem liegt und die Unabhängigkeit der SAP-Business-Application-Plattform sicherstellt. Sämtliche Partner ziehen im LinuxLab an einem Strang – selbst wenn einige von ihnen außerhalb Konkurrenten sind. Die Kooperation ist so erfolgreich, dass Suse sogar anlässlich eines 20-jährigen Firmenjubiläums zahlreiche Auszeichnung an seine Partner vergab, etwa an VMware, Realtech, SAP sowie an viele einzelne Akteure des SAP LinuxLab.

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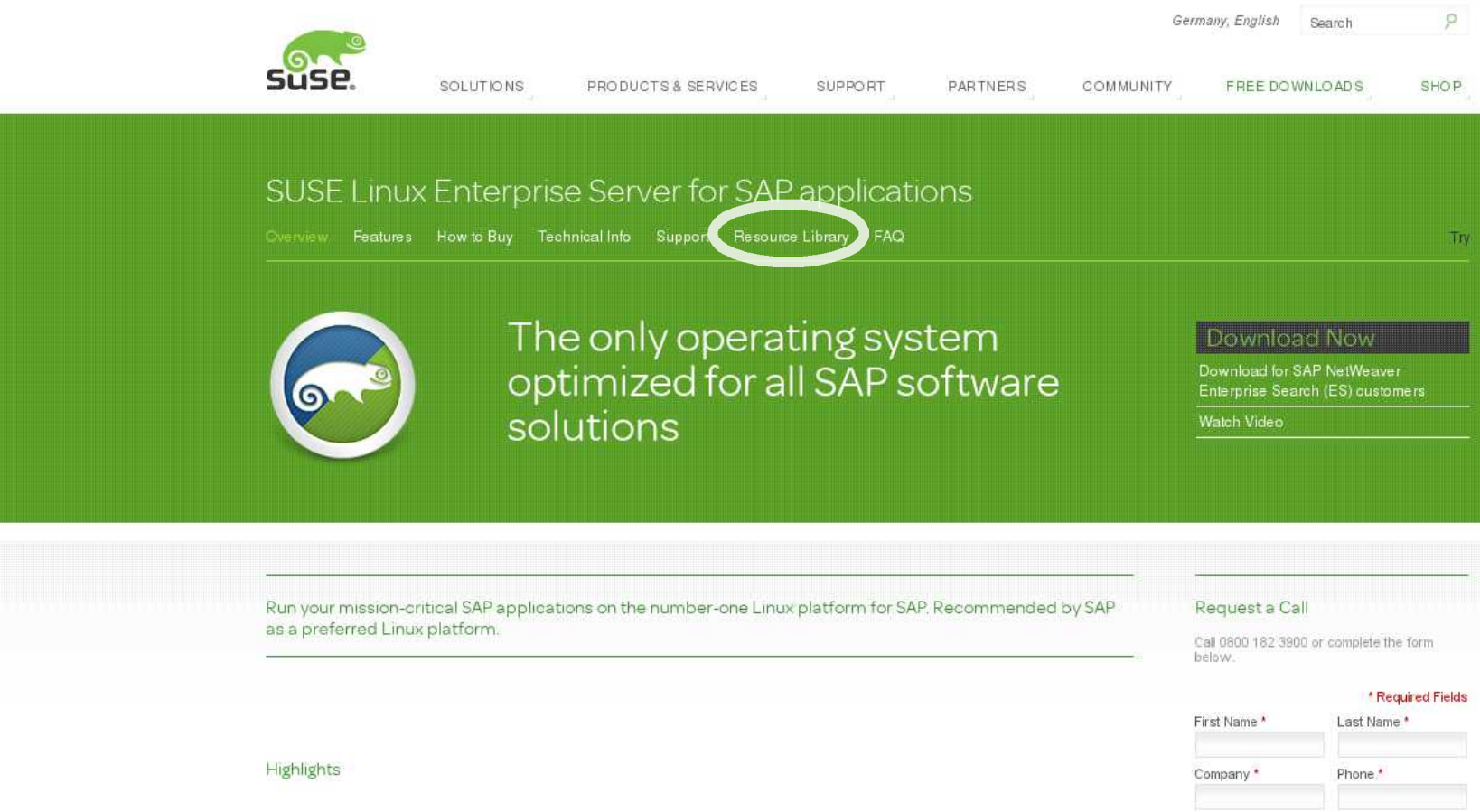
More information

http://www.suse.com/products/sles-for-sap



Your Linux is SAP ready.™

References

SUSE Landing Pages

SLES for SAP Applications http://www.suse.com/products/sles-for-sap/

SUSE Alliance Partners https://www.suse.com/partners/alliance-partners/

Whitepapers and Best Practices

Running SAP NetWeaver on SUSE Linux Enterprise Server with High Availability
https://www.suse.com/products/sles-for-sap/resource-library/sap-best-practices.html

Protection of Business-Critical Applications in SUSE Linux Enterprise Environments Virtualized with VMware vSphere 4 and SAP NetWeaver as an Example
http://www.cc-dresden.de/en/whitepaper/

SAP Cluster Certification

SAP NetWeaver High Availability Cluster 730 Certification

http://scn.sap.com/docs/DOC-26718

http://www.e3cms.de/index.php?id=5544

SUSE Linux Enterprise Server for SAP

SLE 11 SP 2 (3.0.10)	x86	x86_64	ia64	s390x	ppc64
CPU bits	32	64	64	64	64
max. # logical CPUs	32	4096	4096	64	1024
max. RAM (theoretical/practical)	64/ 16 GiB	64 TiB/ 16TiB	1 PiB/ 8+ TiB	4 TiB/ 256 GiB	1 PiB/ 512 GiB
max. user-/ kernelspace	3/1 GiB	128 TiB/ 128 TiB	2 EiB/ϕ	ϕ/ϕ	2 TiB/ 2 EiB
max. swap space	up to 29 * 64 GB		up to 30 * 64 GB		
max. #processes	1048576				
max. #threads per process	tested with more than 120000; maximum limit depends on memory and other parameters				
max. size per block device	up to 16 TiB	and up to 8 EiB on all 64-bit architectures			

Supported on certified x86_64 hardware only

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