



Current and Future State of Red Hat Enterprise Linux

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 **RED HAT®
ENTERPRISE LINUX®**

- Before we get started...



- Linux is everywhere



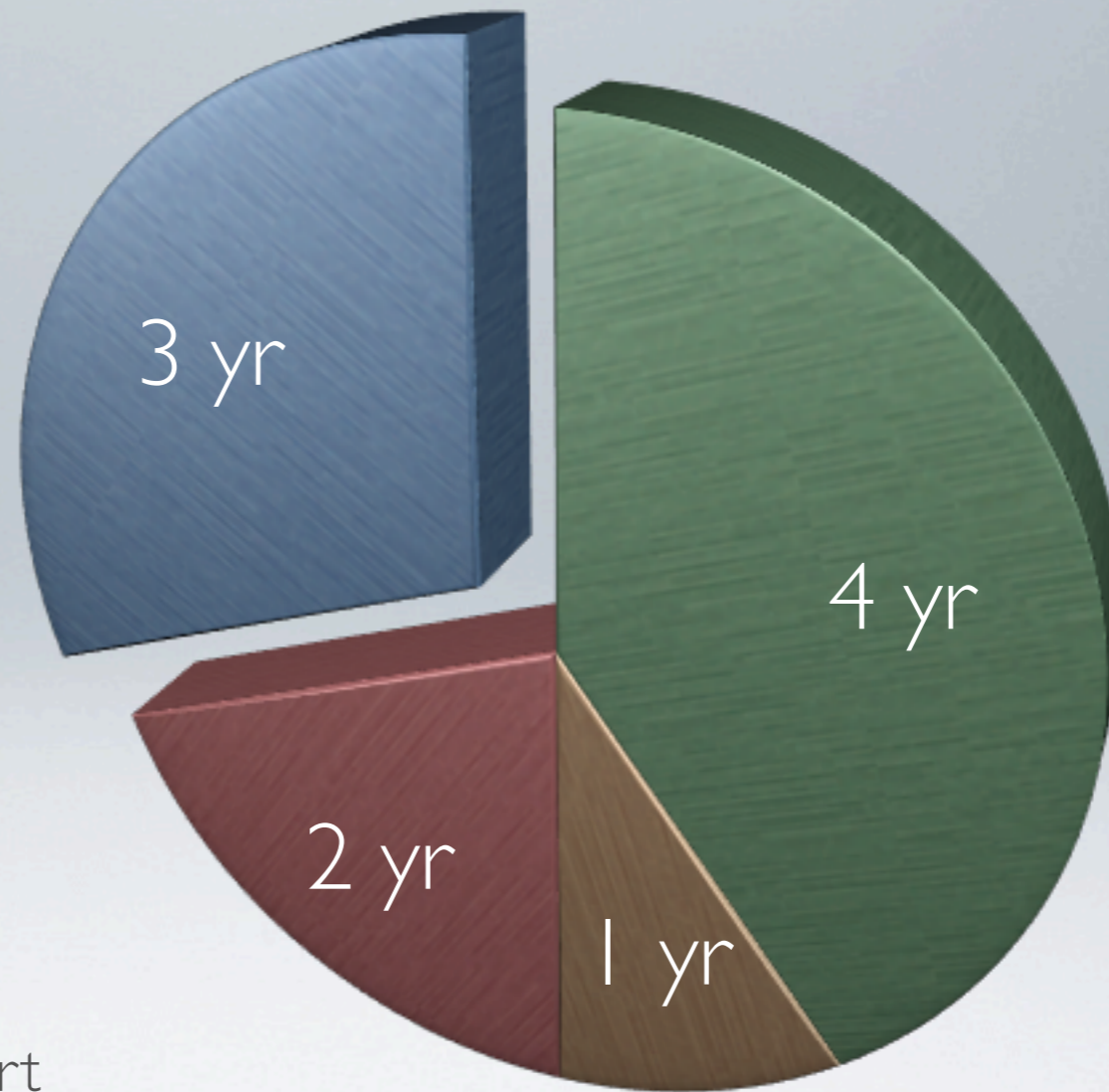
AGENDA

- RHEL Lifecycle
- RHEL 6.0 Recap
- RHEL 6.1 Features
- RHEL 5.7 Features
- New cool stuff



- RHEL Lifecycle

- Production I Phase
 - Bug fix errata
 - Feature enhancements
 - Updated hardware support
- Production II Phase
 - Transition period
 - Minor hardware updates
- Production III Phase
 - Only urgent fixes
- Extended Life Cycle Phase
 - Optional add-on for additional support
 - Urgent defects and security fixes



- RHEL Lifecycle



<http://access.redhat.com/groups/red-hat-enterprise-linux-7-ideas>

The screenshot shows a web browser window displaying the Red Hat Customer Portal. The page title is "Red Hat Enterprise Linux 7 Ideas | Red Hat Groups". The browser address bar shows the URL "https://access.redhat.com/groups/red-hat-enterprise-linux-7-ideas". The page header includes the Red Hat logo, "CUSTOMER PORTAL", and navigation links for "Red Hat Network" and "Try OpenShift". A search bar is also present. The main navigation menu includes "Knowledge", "Groups", "Support", "Downloads", "Security", and "Subscriptions". The "Groups" section is active, showing the "Red Hat Enterprise Linux 7 Ideas" group. The group description states: "This is a group for sharing ideas and feedback related to development of our new RHEL 7 product. We encourage you to provide input that will make your Red Hat Enterprise Linux experience as rewarding as possible!". The page features several sections: "Recent Announcements" with three items, "Featured Content" with two items, "Most Recent Discussions" with three items, "Red Hat Enterprise Linux 7 Ideas" with a "Join" button, "Most Active Discussions" with five items, and "Highest Rated Discussions" with two items. The footer of the page includes the Red Hat logo.

Red Hat Enterprise Linux 7 Ideas | Red Hat Groups

redhat.com https://access.redhat.com/groups/red-hat-enterprise-linux-7-ideas

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Red Hat Enterprise Linux 7 Ideas

Overview | Browse

This is a group for sharing ideas and feedback related to development of our new RHEL 7 product. We encourage you to provide input that will make your Red Hat Enterprise Linux experience as rewarding as possible!

Recent Announcements

- We really appreciate your input! **new**
- Welcome to the Red Hat Enterprise Linux 7 Ideas Discussion Group: PLEASE READ THIS FIRST! **new**
- Starter Topics and Questions **new**

Featured Content

- CUPS: To Fork or Not?**
Discussion by Dennis Hunter on 20 Jul 2011 - 0 comments
- Virtualization: Storage Live Migration**
Discussion by Bhavna Sarathy on 20 Jul 2011 - 11 comments

Most Recent Discussions

- Installer & Kickstart options to disable hi-res video modes**
03:59am 7 Aug 2011 . 6 comments . ★★☆☆☆
- systemd replacement for /sbin/init**
10:33pm 6 Aug 2011 . 6 comments . ★★☆☆☆
- Do not set run-level 5 by default, and add xrdp or freenx to rhel software channel.**
05:04pm 6 Aug 2011 . 5 comments . ★★☆☆☆

Red Hat Enterprise Linux 7 Ideas

- [Join](#)

Most Active Discussions

- Use apt+dpkg**
28 Jul 2011 . 17 comments . ★★☆☆☆
- Virtualization: Storage Live Migration**
4 Aug 2011 . 11 comments . ★★★★★
- Server Recovery method**
4 Aug 2011 . 8 comments . ★★★★★
- DRBD Support In RHEL7**
4 Aug 2011 . 7 comments . ★★★★★
- Installer & Kickstart options to disable hi-res video modes**
7 Aug 2011 . 6 comments . ★★☆☆☆

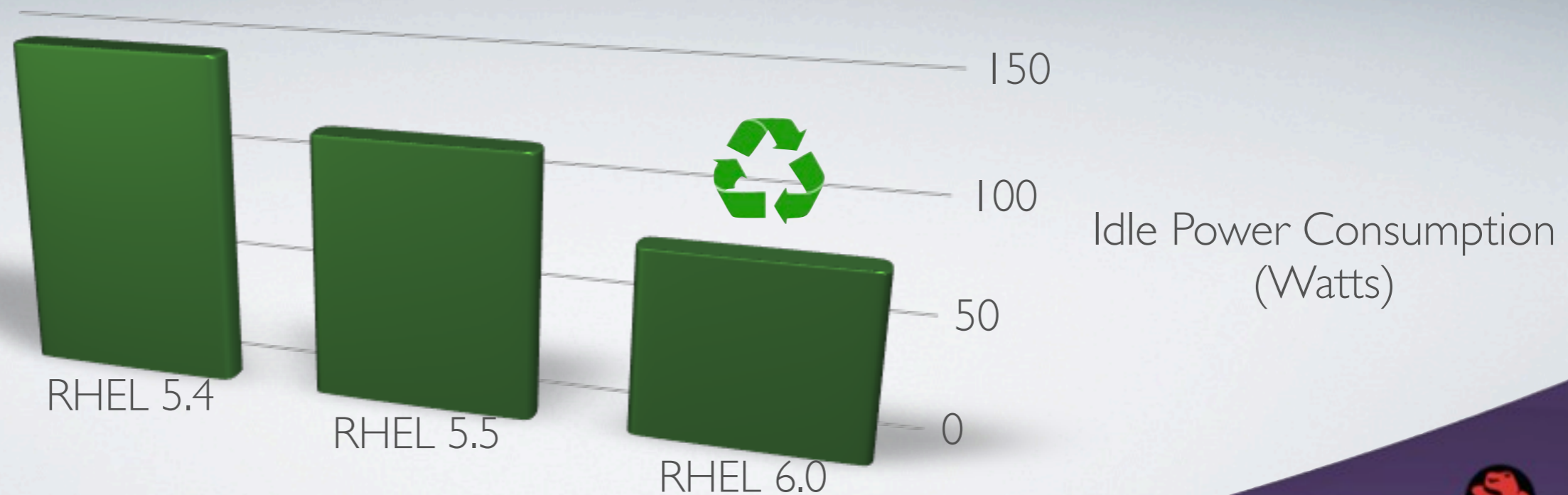
Highest Rated Discussions

- Real/Easy Active Directory Integration For Large/Complex Domains**
29 Jul 2011 . 0 comments . ★★★★★
- Virtualization: Storage Live Migration**

- RHEL 6.0 Recap: Key Features

Power Management

- Adaptive system tuning through new **tuned** service
- Powertop utility to measure power consumption per process/application
- Improvements through the application stack to reduce wake up events.



- RHEL 6.0 Recap: Key Features

File systems and disk

- Introduction of 2 new file systems: **ext4** and **btrfs**
 - Better scalability, higher performance

FCP automated port discovery

- WWPN (path) activated automatically when available
- LUN scanning with **Isluns** utility

More FCP advancements

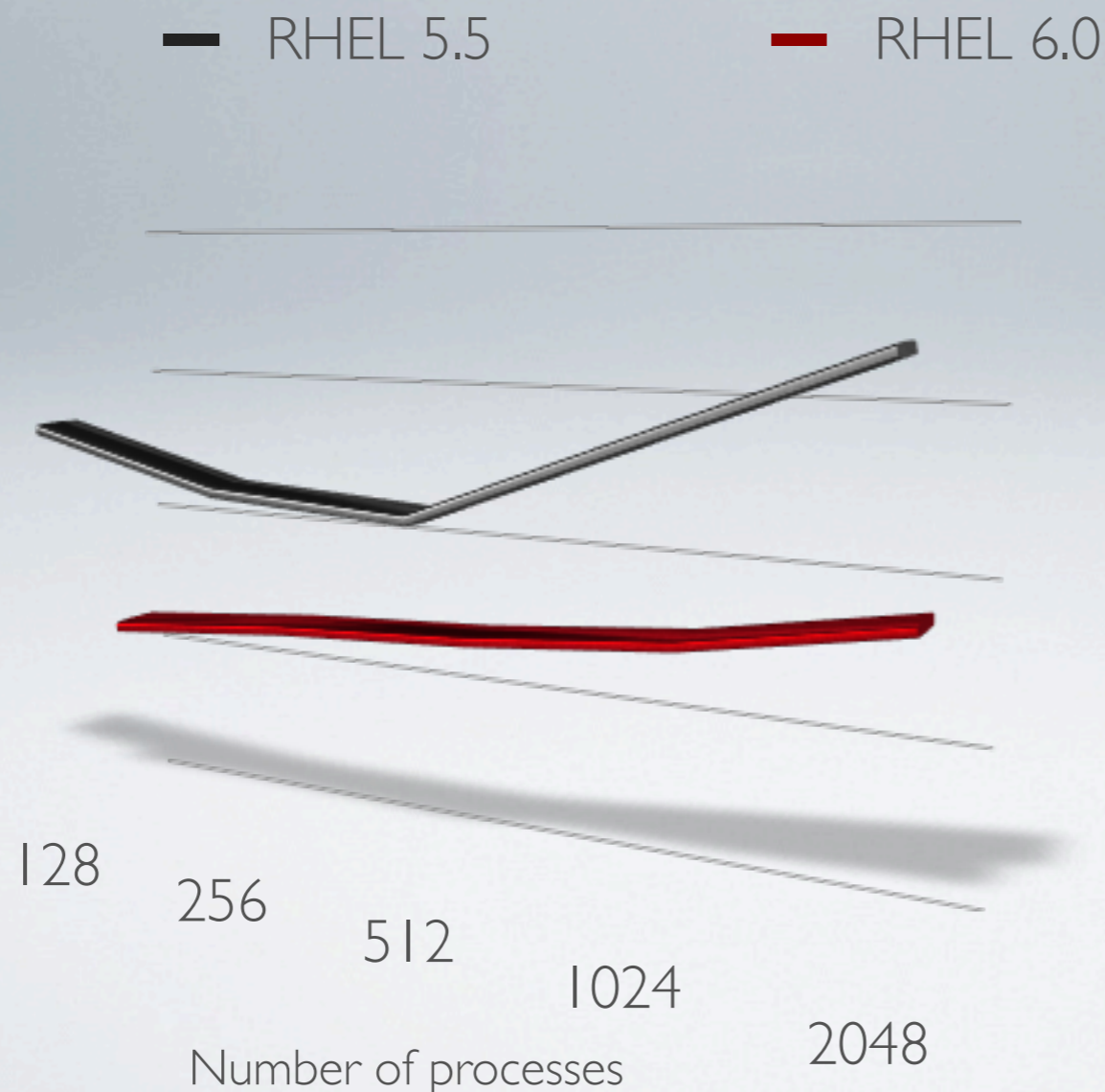
- High performance FICON reduces I/O overhead
- Dynamically adjustable queue depth
- I/O configuration support in LPAR mode



- RHEL 6.0 Recap: Key Features

Application scheduler

- Improved process scheduling and better resource management with **Completely Fair Scheduler (CFS)**



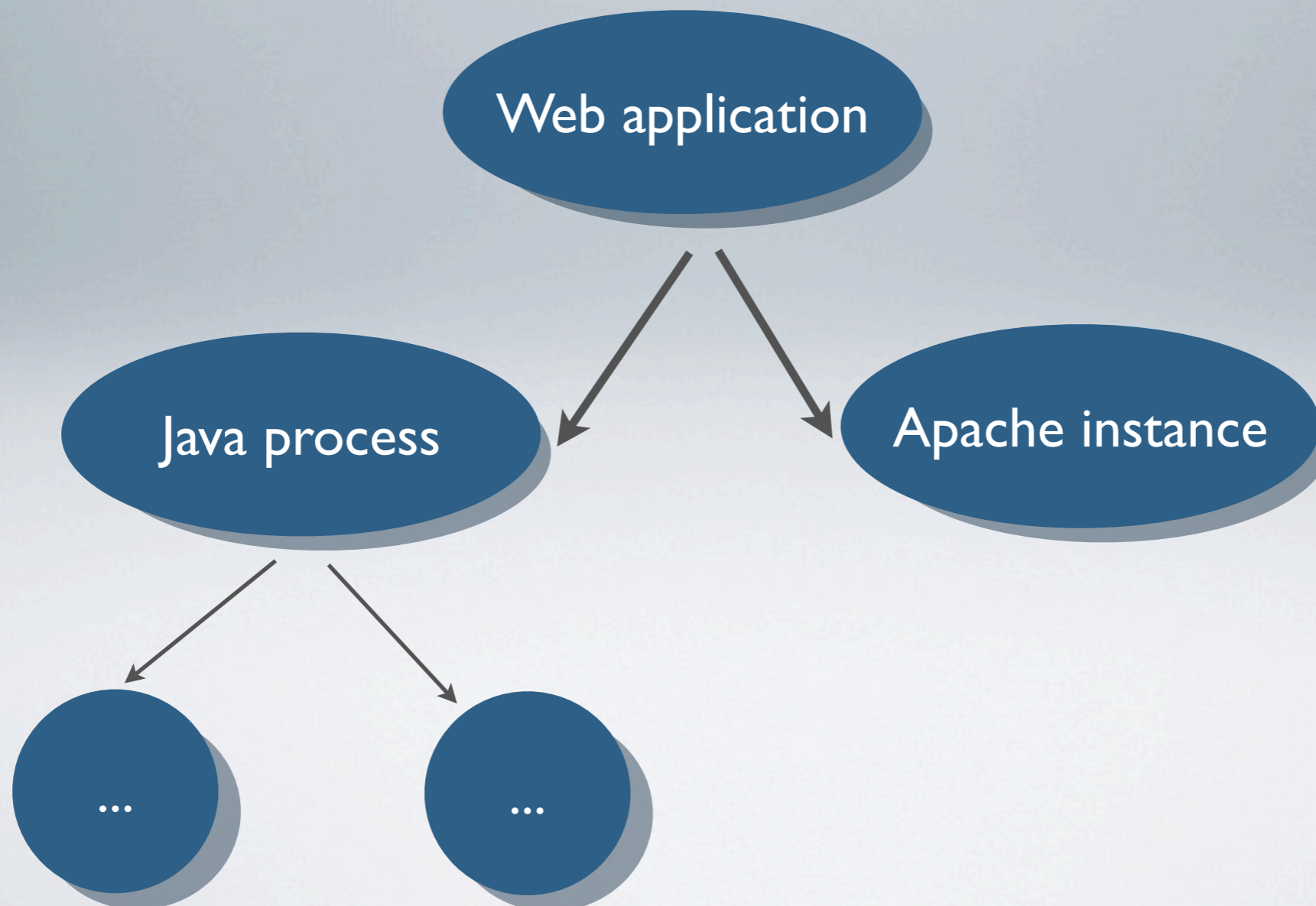
Concurrency Thread Test
(lower is better)



- RHEL 6.0 Recap: Key Features

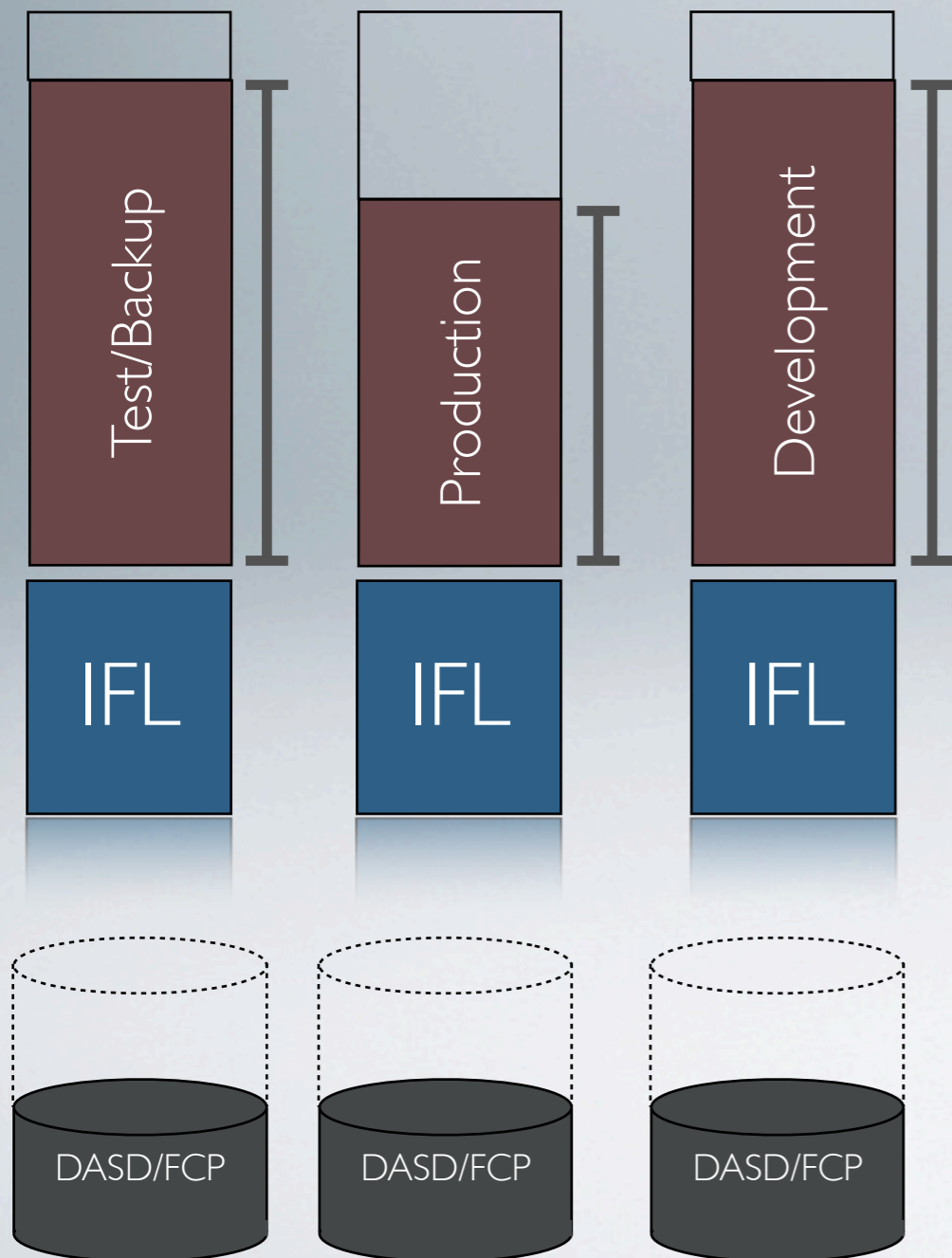
Control Groups

- Process Containers. Lets you transform groups of applications into workloads



- RHEL 6.0 Recap: Key Features

Control Groups



Isolation

- Each group has separate namespace

Prioritization

- For mission critical workloads

Resource Limiting

- Specify limits on CPU, memory, disk

Accounting

- Run report on resource utilization
- Create a chargeback model

Control

- Freeze group for checkpoint



- RHEL 6.0 Recap: Key Features

New features enabled through z/VM integration

- Better CPU utilization
- HyperPAV
- Suspend/Resume support
- Dynamic memory resizing

Development and Runtime support

- **SystemTap** allows instrumentation of running kernel
- Major updates to tool chain
 - **glibc 2.12, gdb 7.1, gcc compiler 4.4**
 - zI/O optimized = 10% performance improvement



- RHEL 6.1 Features



Released 19 May, 2011
Available for download at
<http://access.redhat.com>



- RHEL 6.1 Features

Performance and application scheduling

CPU scheduling algorithms optimized

- 5% performance gain system-wide
- 3% performance boost for Java
- 8% gain for transaction workloads

Better concurrent processing

- **Read-Copy Update** (RCU) locking. Access shared data without traditional locks.
- Deigned for today's faster processors
- <http://lse.sourceforge.net/locking/rcupdate.html>



- RHEL 6.1 Features

File systems and I/O



CIFS improvements for accessing Windows shares

- Multi-user mounts for secure access
- Support for Unix-style symbolic links (mfsymlink)

Quota management

- Consolidation of quota management tools for file systems



- RHEL 6.1 Features

File systems and I/O



I/O Barriers

- Align data reads/writes to geometry
 - 4k block for ECKD
 - 512 byte for FBA/SCSI

LVM

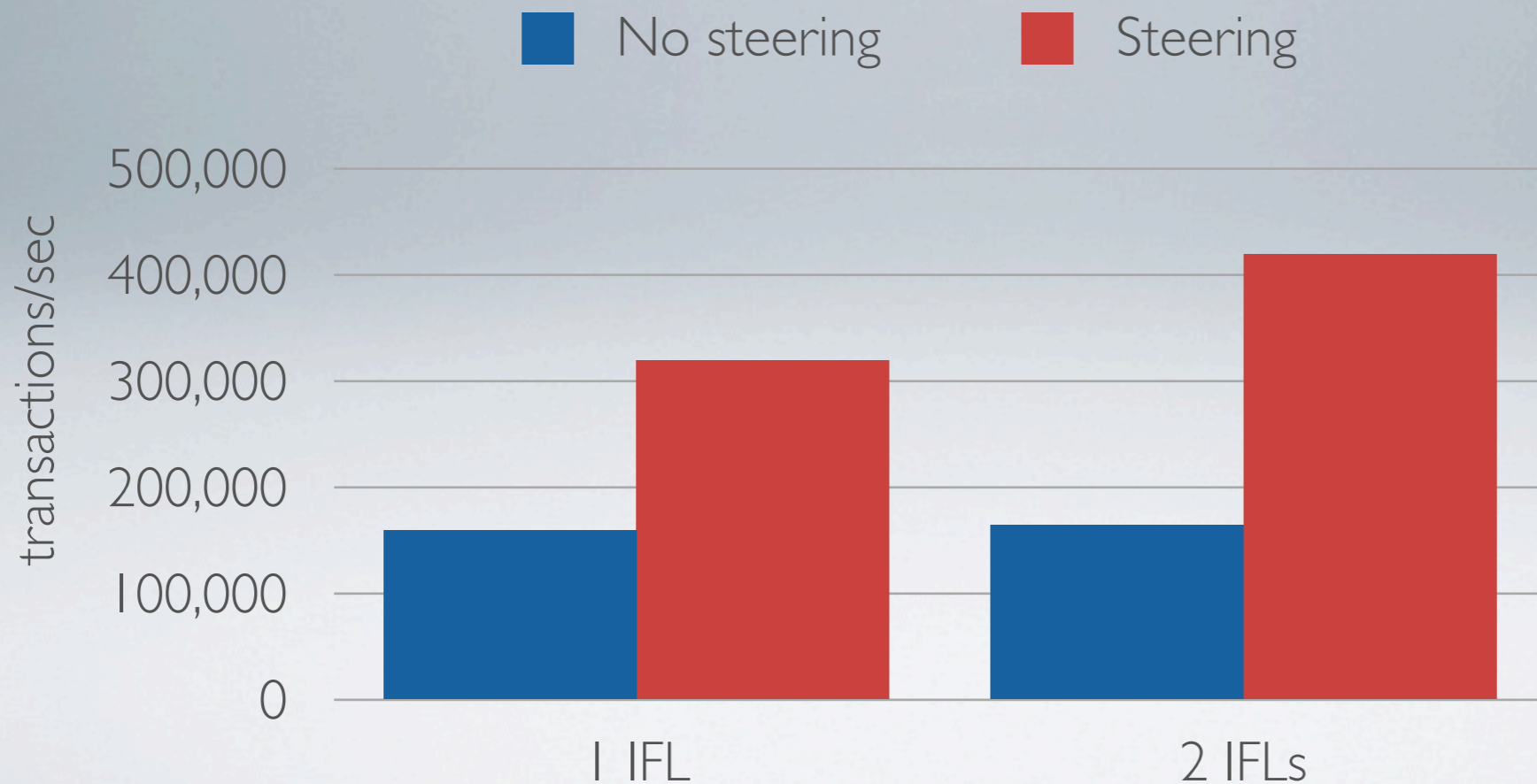
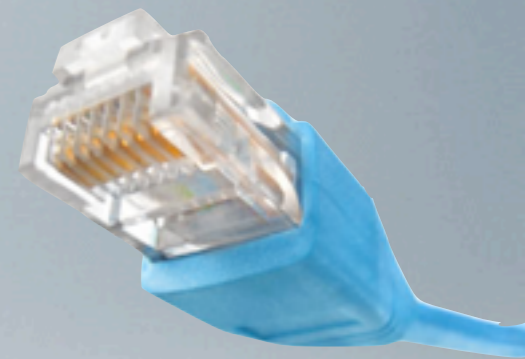
- Improved recovery times by skipping scans on failed devices
- Snapshot/rollback of mirrors
- Mirror devices on striped RAID



- RHEL 6.1 Features

Networking

Optimized network traffic processing in multi-CPU environments



100 concurrent TCP/read benchmark tests



- RHEL 6.1 Features

Networking

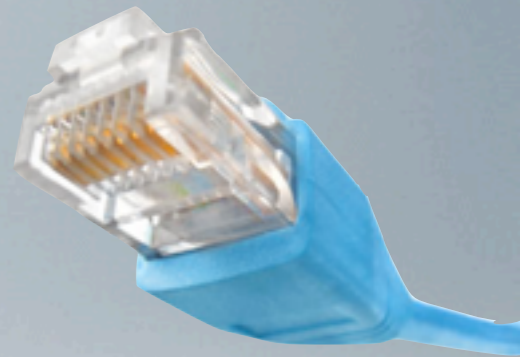
Reduced latency for retransmission of lost packets

- Time sensitive applications

Transparent proxy support

Active-Active bonding for load sharing

- Useful for LPAR mode without VSWITCH



- RHEL 6.1 Features

Resource management with Control Groups

Block I/O throttling

- Limit I/O rate based on cgroup

Reduce latency for interactive tasks under CPU intensive workloads

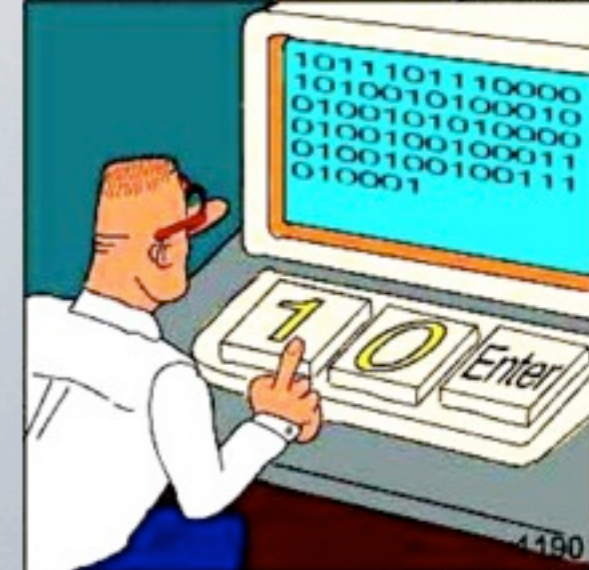
- Prevent process from monopolizing system



- RHEL 6.1 Features

Software development

- SystemTap
Remote scripting capability, performance optimizations
- GDB
C++ debugging enhancements, Python support
- Valgrind
Handle z196 with three levels of cache
- GCC compiler
Bug fixes and optimizations
- Eclipse developer environment
Platform update (Helios), plugins update



Real programmers code in
BINARY



- RHEL 6.1 Features

Security and audit

Multiple updates to **System Security Service Daemon (SSSD)**

- SSSD integration with identity management services
- Better DNS-based discovery
- Auto renewal of Kerberos tickets, plus support for Kerberos FAST protocol
- Password obfuscation (LDAP)



- RHEL 6.1 Features

Security and audit

Identity management

- Password policy management for users and groups

Centralized management of SSH keys using LDAP



- RHEL 6.1 Features

System z specific updates



49 new features, **56** bug fixes
Here are some highlights...



- RHEL 6.1 Features

System z specific updates

Fix and recompile openSSH to enable HW Crypto

- Performance improvement.
Enable openSSH to offload secure processing to Crypto card.

zEnterprise support for 4096-bit RSA FastPath

- Extends current RSA hardware acceleration and decryption to handle the zEnterprise Crypto Express3 card.

Installer: /boot partition on LVM & ext4

- zipl bootloader supports device-mapper (LVM & multipath) devices, and ext4



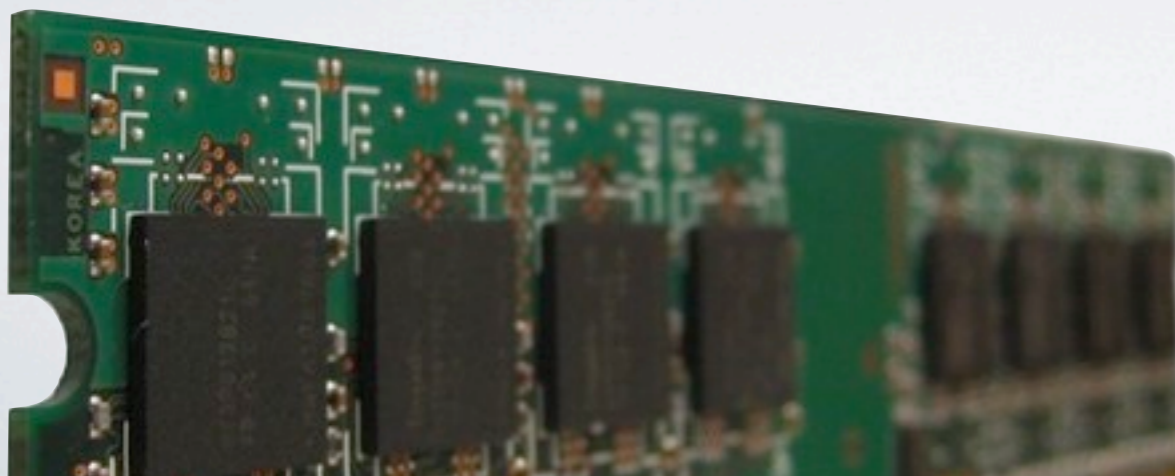
- RHEL 6.1 Features

System z specific updates

Dynamic memory resize tools: **lsmem** and **chmem**

```
# lsmem
Range                               Size (MB)  State  Removable  Device
=====
0x0000000000000000-0x000000000fffffff 256       online no         0
0x0000000010000000-0x000000002fffffff 512       online yes        1-2
0x0000000030000000-0x000000003fffffff 256       online no         3
0x0000000040000000-0x000000006fffffff 768       online yes        4-6
0x0000000070000000-0x00000000fffffff 2304      offline -          7-15

Memory device size : 256 MB
Memory block size  : 256 MB
Total online memory : 1792 MB
Total offline memory: 2304 MB
```



- RHEL 6.1 Features

System z specific updates

CMSFS write support

- Support for writing to CMS file system. You can now edit your PROFILE EXEC with **vi!**

z10 prefetching instructions

- Toolchain update.
- Prefetching instructions introduced to enhance memory access

z196 out-of-order instruction scheduling

- Generate faster code sequences, using CPU facilities for better instruction scheduling



- RHEL 6.1 Features

System z specific updates

Optimized kernel parameters

- Automatic kernel tuning in /etc/sysctl.conf, optimized specifically for System z

hyptop: Hypervisor “top” shows IFL usage across LPARs

```
# hyptop
14:08:41 | H05LP30 | CPU-T: IFL(18) CP(3) UN(3)           ? = help
cpuid   type   cpu   mgm visual.
(##)   (str)  (%)  (%) (vis)
0      IFL   96.91 1.96 |#####|
1      IFL   81.82 1.46 |#####|
2      IFL   88.00 2.43 |#####|
3      IFL   92.27 1.29 |#####|
4      IFL   83.32 1.05 |#####|
5      IFL   92.46 2.59 |#####|
6      IFL   0.00 0.00 |
7      IFL   0.00 0.00 |
8      IFL   0.00 0.00 |
9      IFL   0.00 0.00 |
                    534.79 10.78
```



- RHEL 5.7 Features



Released 21 July, 2011
Available for download at
<http://access.redhat.com>



- RHEL 5.7 Features

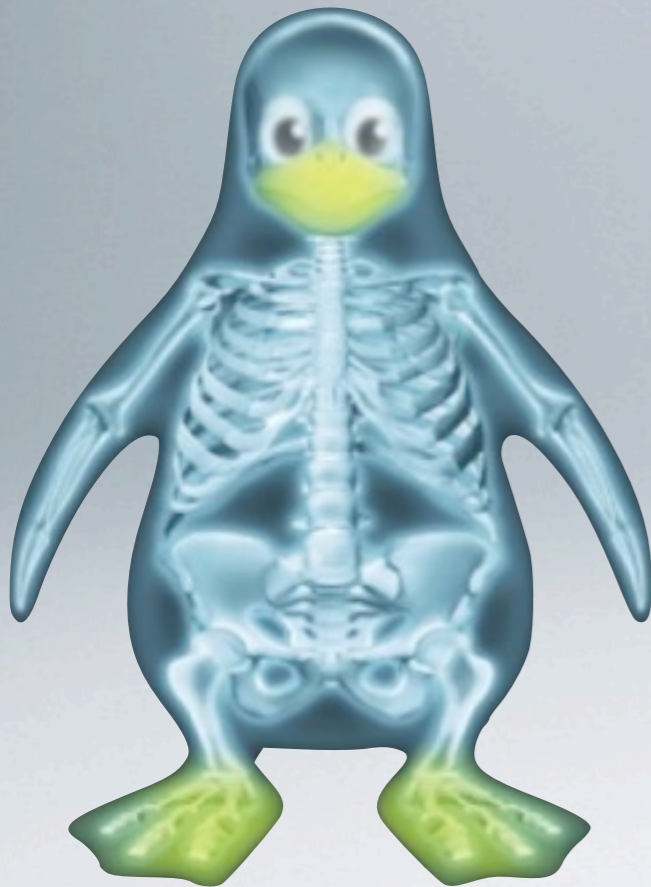
Security Content Automation Protocol (SCAP)

Open source framework for maintaining security of enterprise systems

Verify existence of patches, scan systems for signs of compromise

Includes library and set of utilities

Backported from RHEL 6



- RHEL 5.7 Features

Developer tools

CMake

- Cross-platform, cross OS development tool
- Generates native makefiles and compiler independent configuration files
- Backported from RHEL6

Buildsys-macros

- For developers building RPMs
- Backported from RHEL 6



- RHEL 5.7 Features

rsync: remote file/folder synchronization

Update to version 3.0.7

- Improved replication speed
- Replication starts while file list is still being compiled

Users requiring global data set replication will see major benefits



- RHEL 5.7 Features

Remote file systems and storage

Updated automounter (**autofs**)

- Support for localityName attribute in LDAP maps
- Encrypted secret for LDAP authentication

iSCSI initiator

- Support for s390x architecture



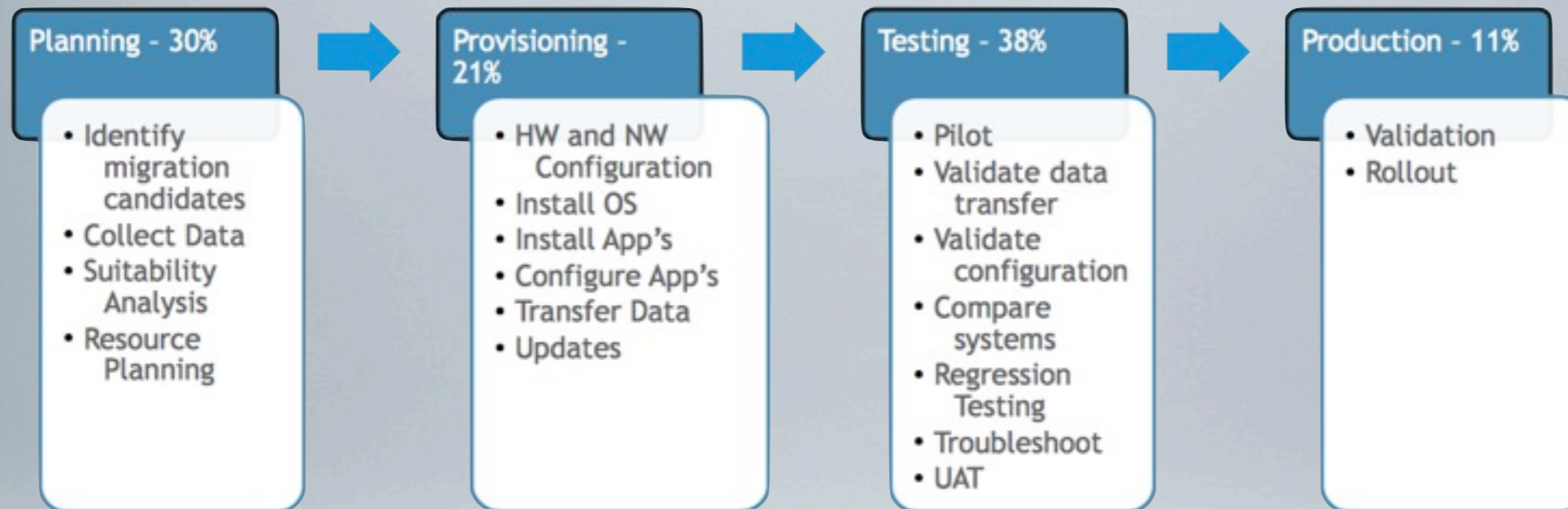
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- New cool stuff



- New cool stuff

Migration tools: 

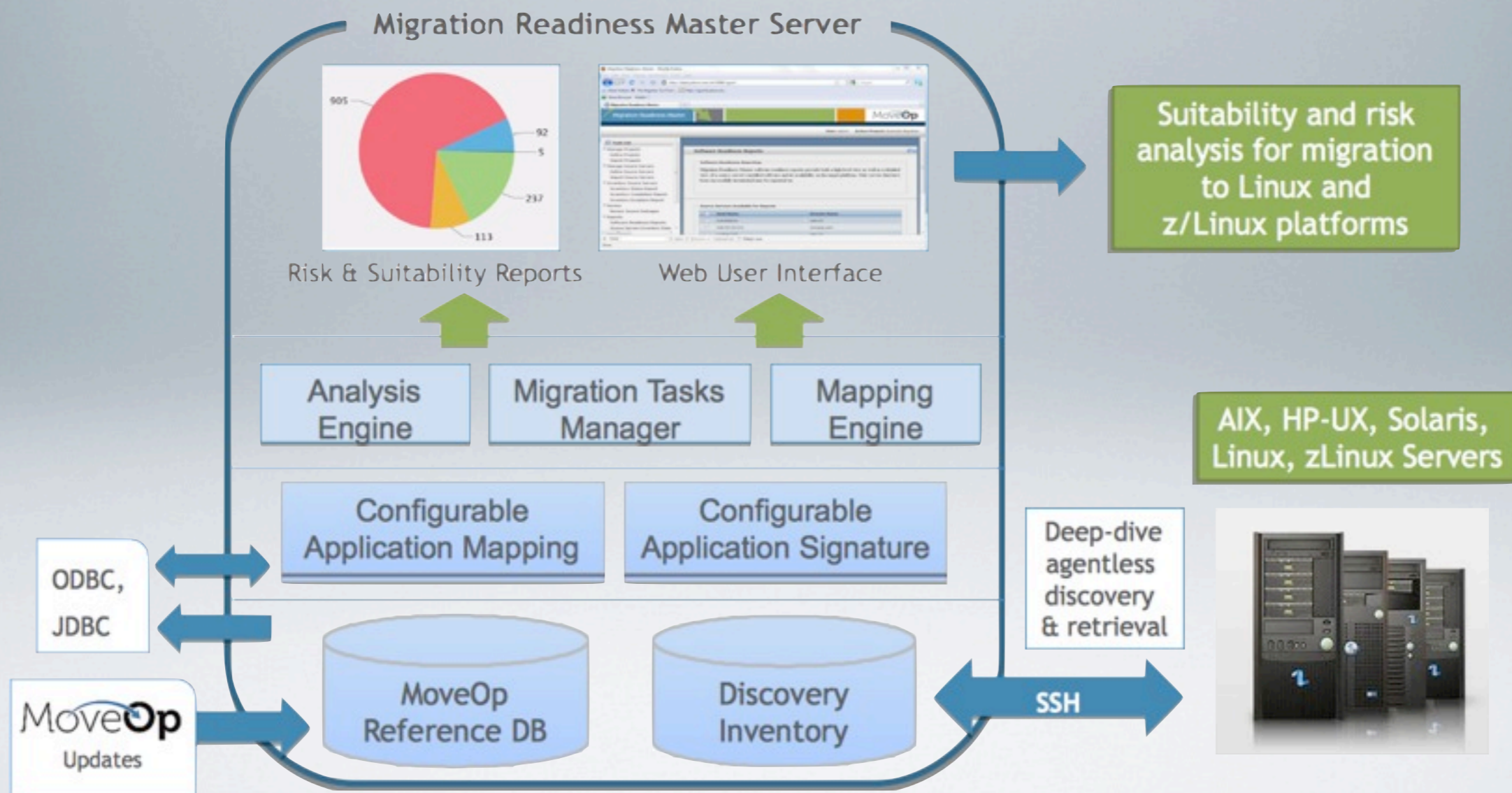


MoveOp brings automation to migrations to Linux
to like or different platforms, distributions, versions
to like or different hardware (e.g. x86 -> s390)
to new environments (e.g. cloud)
to and from physical or virtual servers: P2P V2V P2V



- New cool stuff

Migration tools: MoveOp



- New cool stuff

Migration tools:  MoveOp

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- New cool stuff

Clustered file systems

NFS version 4 for network file system

- Included, supported in RHEL 5, RHEL 6
- Clustered file system with support for read/write access from multiple guests simultaneously.
- Use VSWITCH for fast “network” access, or hipersockets for memory-speed transfers.



- New cool stuff

Clustered file systems



Supported file systems for RHEL on System z

- GFS <http://www.redhat.com/gfs/>
- OpenAFS <http://www.openafs.org>
- GlusterFS <http://www.gluster.org>
- Ceph <http://ceph.newdream.net>

Contact

info@sinenomine.net



- Documentation Links

Redbook, *z/VM and Linux on IBM System z: The Virtualization Cookbook for Red Hat Enterprise Linux 6.0*

<http://www.redbooks.ibm.com/abstracts/sg247932.html>

DeveloperWorks

http://www.ibm.com/developerworks/linux/linux390/documentation_dev.html

Red Hat Knowledgebase

<http://kbase.redhat.com>

Red Hat on System z

<http://www.redhat.com/z>

