Red Hat Unix to Linux

Migrations and Performance

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Why Migrate

Red Hat

- Performance gains
- Increase stability
- Combat vendor lock-in
- ISV support is dwindling by 75% (Gartner forecast)
- Unsupported or end-of-life
- Security
- Modernization – desire for open-standards
- Reduce costs
  - IT Infrastructure costs
  - Maintenance costs
  - Reduce total cost of ownership (TCO)
    - Up to 79%
    - Retaining talent

Are you still buying parts from eBay to support your aging UNIX systems?

Red Hat

- X86 vendors providing RAS features now
- X86 vendors selling large systems
  - 16 socket systems
  - 12 TB of memory
- X86 vendors year-over-year
  - Improve energy efficiency
  - Increase computing power

Reliability,

Availability,

Serviceability

(RAS)

Not just for big iron any

more!

- Red Hat Enterprise Linux is co-engineered to take advantage of hardware and RAS features
- Red Hat ISV portfolio
  - > 2,200 vendors
  - > 3,000 certified applications
- RHEL has earned the highest security credentials
- RHEL is standards-based, open platform with a proven lower TCO

90% of Fortune 500 companies run on Red Hat products and solutions!

Migration Steps

- Assessment
  - What systems are approaching end of maintenance contracts?
  - What hardware is end-of-life?
  - Which systems are capacity-constrained?
  - Which applications are commercially purchased?
    - Do they support RHEL?
    - If not, is there an alternative?
  - Is the application home grown?
    - Can it be recompiled?
  - Is the application supporting an infrastructure need?

What makes sense?

- Easy Targets
  - Web servers
  - Firewalls
  - Backup/Restore tooling

Low risk,

High reward!

- Commercial-off-the-shelf (COTS)
  - RHEL certified version?
  - Engage the vendor
  - Engage Red Hat

Look, they have a RHEL certified version, this will be straightforward!

- What about the data?
  - Big Endian, Little Endian
  - Intel has support for conversion with byte swap (BSWAP) instructions
  - Convert your data appropriately

The battle is over, little endian won!

- Optimal Migration steps
  - Proof of concept migration
    - Run the new application on the new hardware
    - Confirm it works
  - Rehearsal migration
    - Convert the data
    - Run performance tests to make sure
  - Production migration
    - Do it for real!

Easy as 1, 2, 3!

Performance Testing

- Baseline
  - How does the current environment perform?
  - How does the new environment perform?
- Compare
  - Look at current settings … map to RHEL
  - Engage RH, expert performance team
- Tweak
  - Adjust any settings on new RHEL systems
  - Re-measure new environment
  - Repeat if needed

Measure once,

Measure twice,

Measure thrice!

- RHEL tools we all use today
  - top
  - vmstat
  - sar
  - iostat
  - free
  - snmp
  - ethtool
  - tuned-adm

My trusty tools are awesome!

- A few new tools
  - Cockpit
  - Performance Co-Pilot (PCP)

I need a bigger toolbox!

- Cockpit
  - Install, enable and start cockpit service on systems

    # subscription-manager repos --enable rhel-7-server-extras-rpms

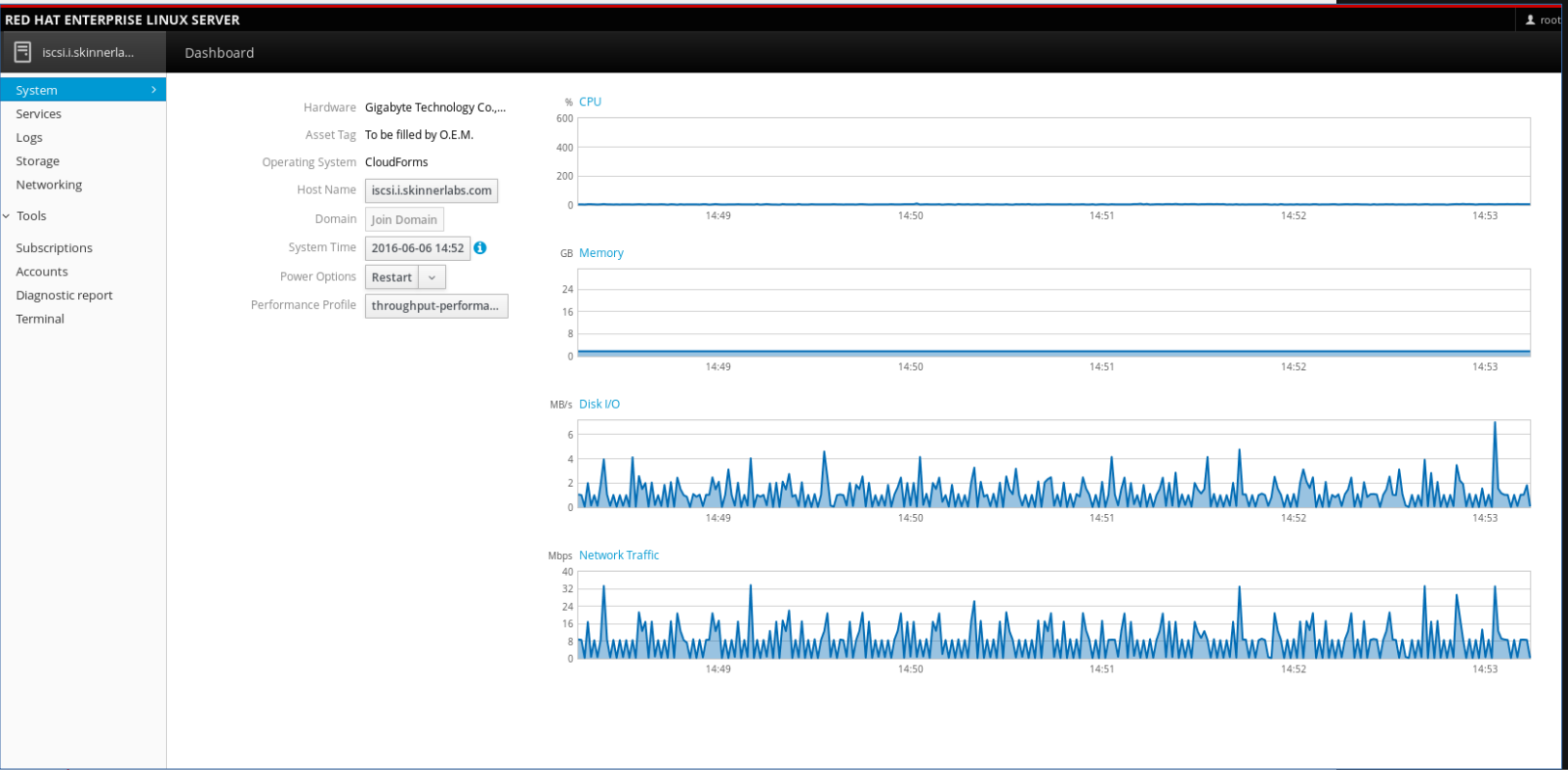
    # yum install cockpit

    # systemctl start cockpit
  - Connect via port 9090 with web browser
  - https://myserver.com:9090
  - Enter local username/password

Must use mouse ...

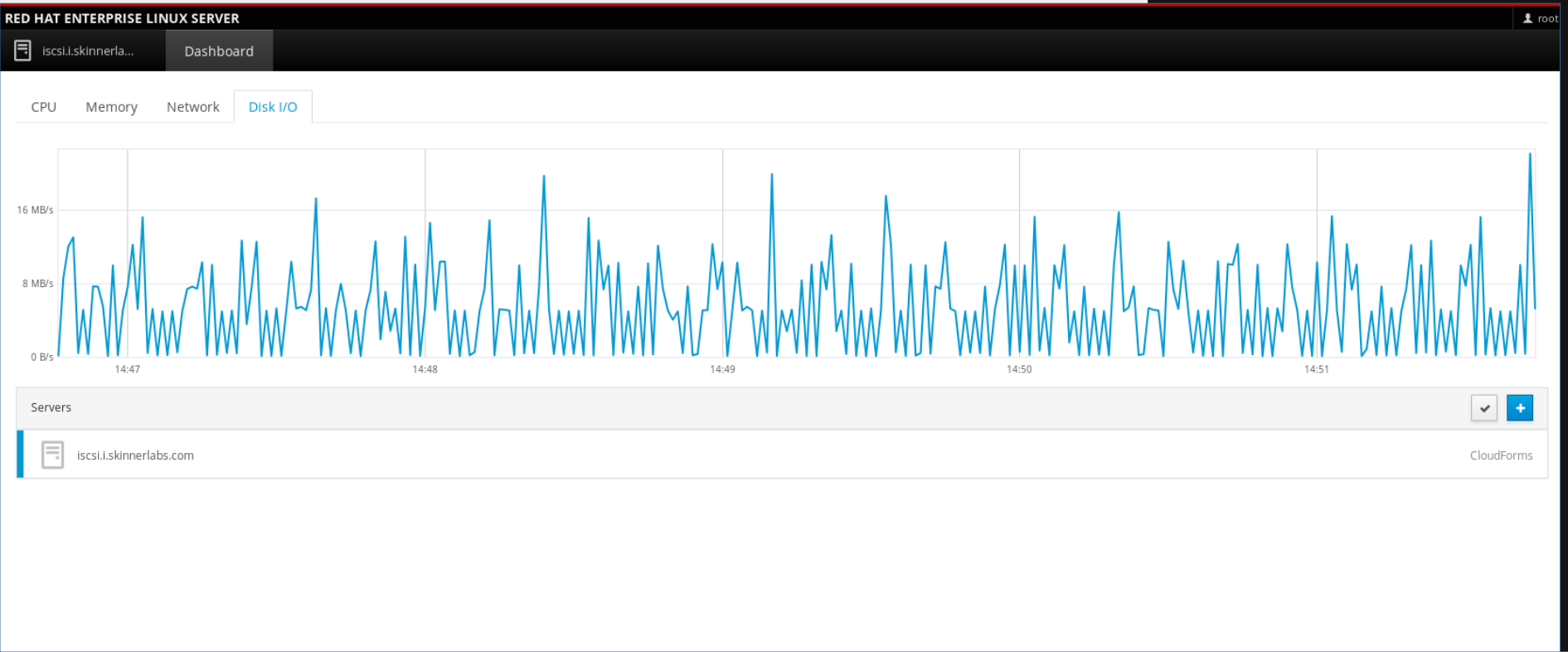
Cockpit saves the day!

- Admire your performance



Red Hat

- CPU :: Memory :: Network :: Disk I/O



- Performance Co-Pilot (PCP)
  - PCP = Performance Co-Pilot (RHEL 7,8 and RHEL => 6.6)
  - RHEL 7,8 how to install:

```
# yum install pcp
# systemctl enable pmcd
# systemctl enable pmlogger
# systemctl start pmcd
# systemctl start pmlogger
```

Give me a P - “P!”

Give me a C - “C!”

Give me a P - “P!”

Whats that spell?

“PCP!”

- PCP :: Charts
  - Extensive list of PCP metric chart add-ons

    # yum search pcp | grep pmda

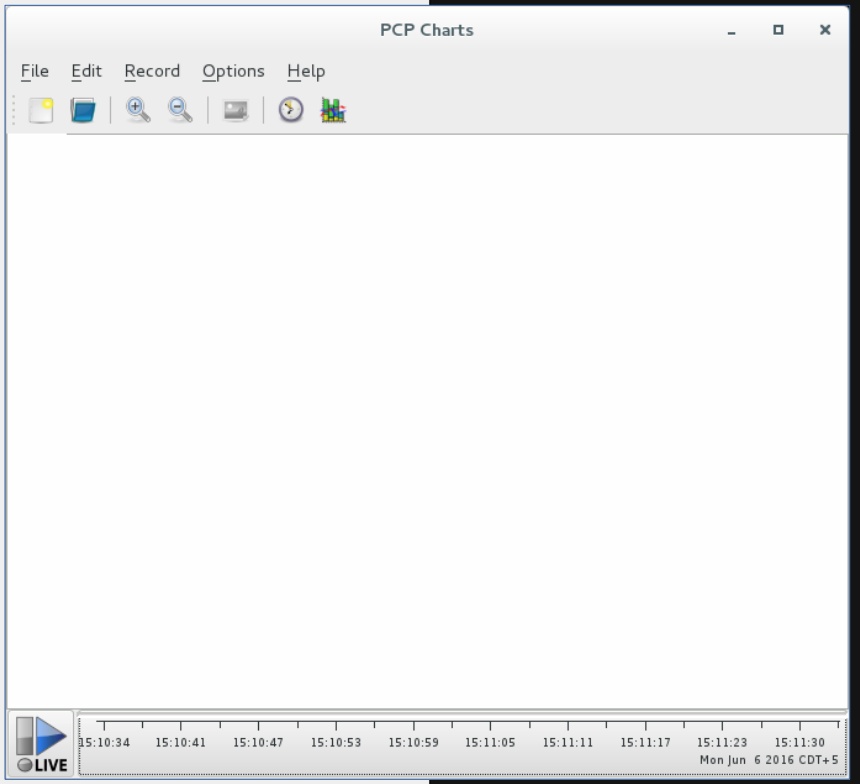
ActiveMQ
Apache
Bash shell
Bonded network
Cifs shell
Cisco shell
Device Mapper
389 Directory
Gfs2 shell
Gluster
GPFS Filesystem
Infiniband
JSON data
KVM
Lmsensors
Arbitrary log
Lustre
Mailq shell
Memcached
Mounts shell
MySQL
Named
Netfilter
Usenet News
NFS Clients
Nginx
Nvidia
Performance API
PowerDNS
Postfix
PostgreSQL
Roomtemp
Rpm shell
Rsyslog
Samba
Sendmail
Simple Network
Systemd
Trace shell
Unbound DNS
VMware
Weblog shell
Zimbra

What do we need to graph?

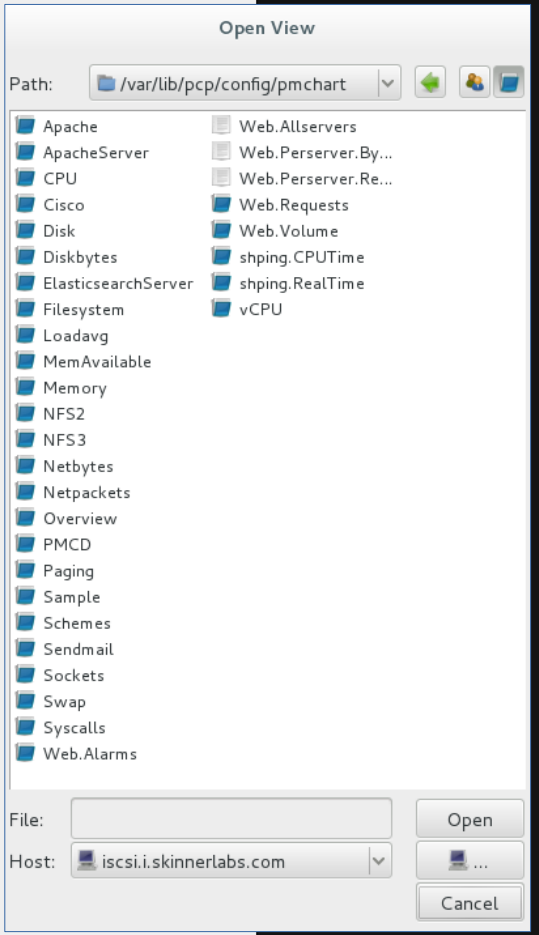
- PCP :: Client/Server
  - Client: pmchart
  - Server: pmcd and pmlogger

Start collecting data!

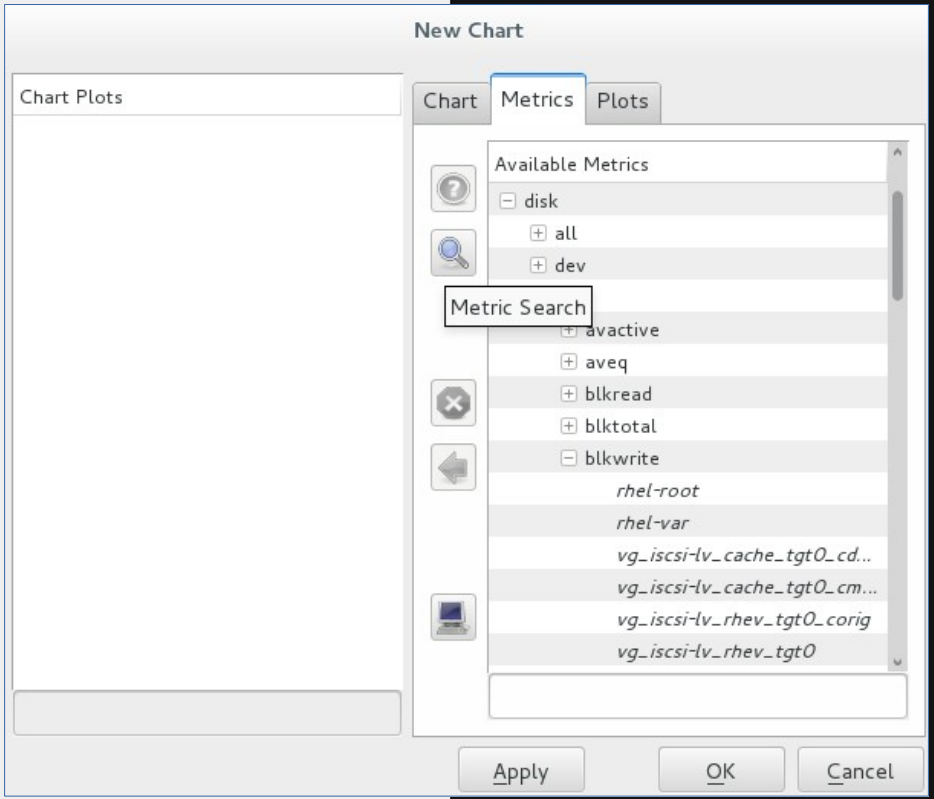
- PCP :: Client
  - GUI client interface



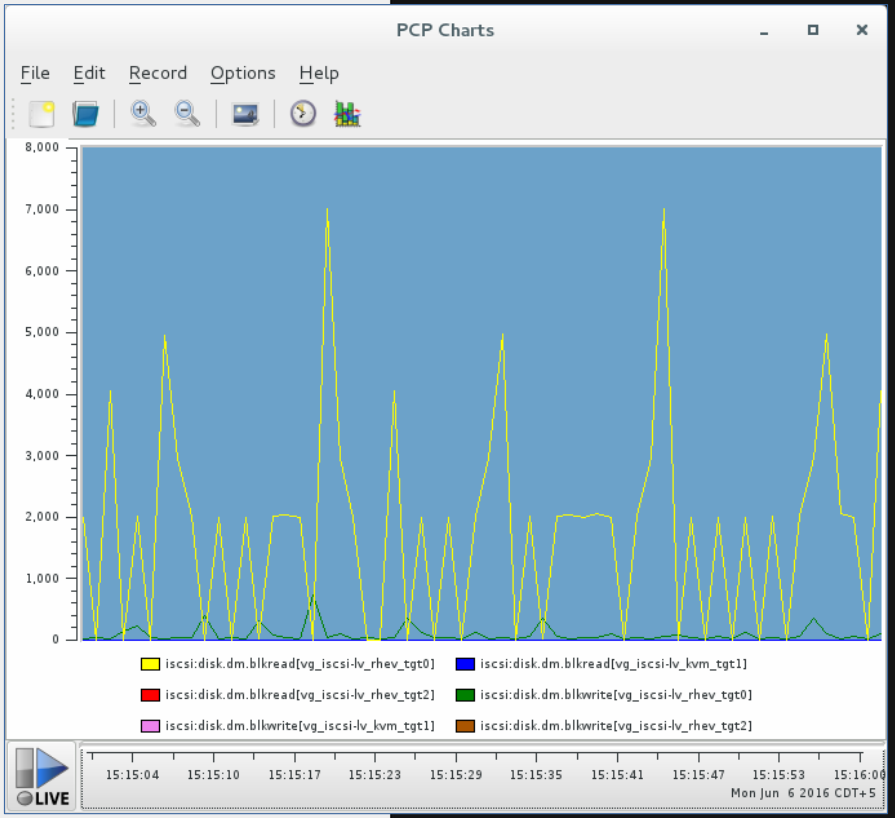
- PCP :: Client
  - Open pre-configured charts
  - Select from Open View list



- PCP :: Client
  - Create new charts
  - Choose host to monitor
  - Select from available metrics
  - Select 1 to n metric



- PCP :: Client
  - Disk chart created
    - Disk blkread
    - Disk blkwrite
  - Export as graphic
  - Record for playback
  - Import data from Collectd
  - Export data to Webapps
    - Grafana, Graphite, Vector



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Thank you

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