

Moving from RHEL 6 to RHEL 7

RHUG Q3 Meeting

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What's holding you back from RHEL 7?



AGENDA

1

WHAT'S CHANGED

2

UPGRADES VS RE-DEPLOY

3

DEPLOYMENT

4

QUICK HITS



RED HAT[®]
ENTERPRISE LINUX[™]

RED HAT ENTERPRISE LINUX 7

QUICK OVERVIEW



RED HAT ENTERPRISE LINUX 7 - BASICS

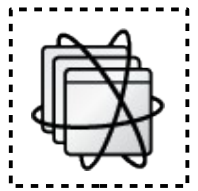
- Branched from Fedora 19
 - Includes some user-space from f20 & f21
- 3.10 kernel
- Arch: X86_64, PPC & PPC64, s390x
 - Support for 32-bit applications enabled via inclusion of 32-bit libraries (multilib).
- glibc-2.17
- systemd-208

RED HAT ENTERPRISE LINUX 7 – DEFAULTS

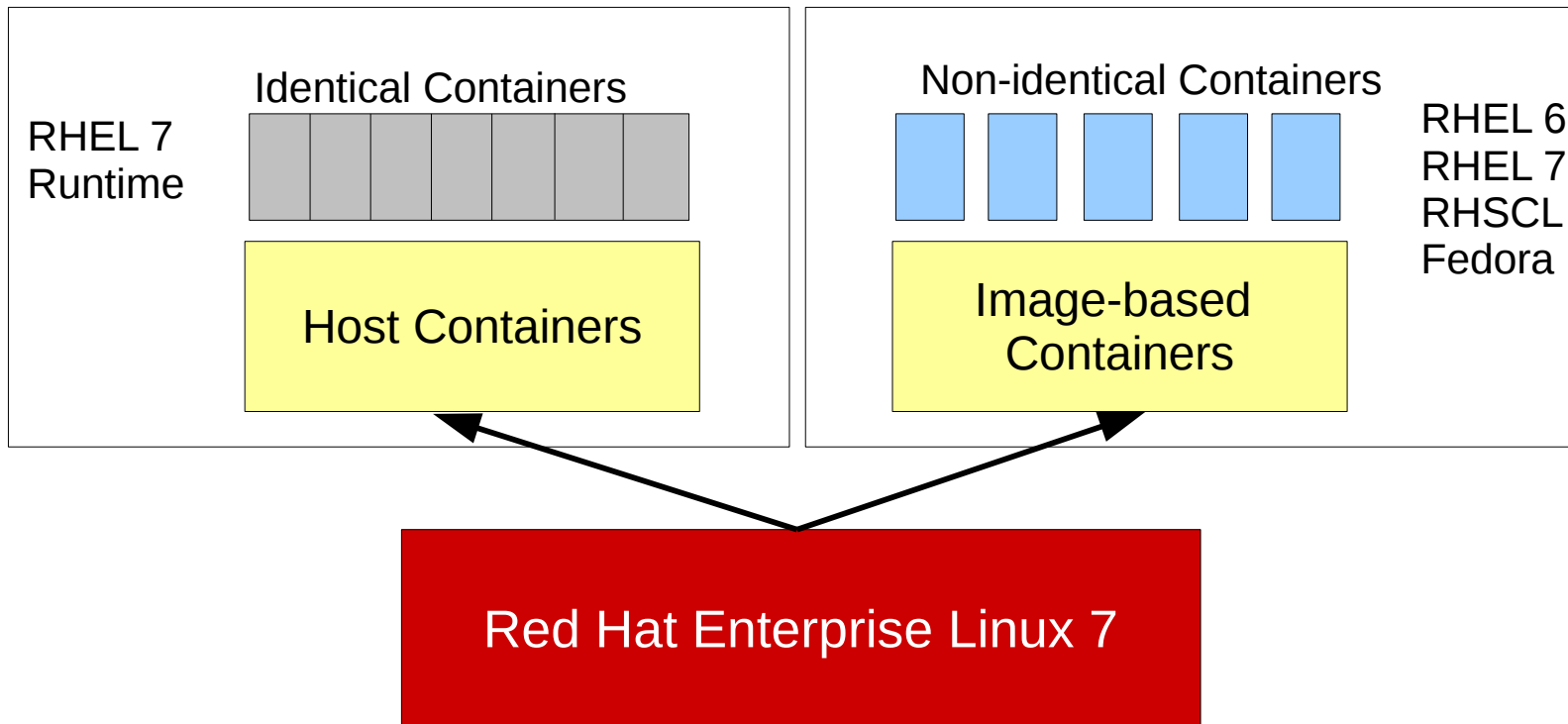
- **GRUB2**
- **XFS** on LVM
- **tuned** enabled with throughput-performance
- **systemd** (everything runs in a cgroup)
- **NetworkManager** (don't worry it's good now)
- **firewalld** replaces static iptables rules --read the wiki
- **GNOME3** Classic Mode (GNOME2ish look and feel)
- **Chrony** for NTP

RED HAT ENTERPRISE LINUX 7 – WHAT ELSE IS NEW

- Streamlined Installer (anaconda) – can also create and deploy images
- realmd – easy sssd & Active Directory configuration
 - `realm join domain.example.com`
- IdM – Cross-realm trust with Active Directory
 - Legacy client support is currently tech preview
- Tuna profiles
- System Storage Manager (ssm)
 - <https://access.redhat.com/videos/898463>
- nmcli & nmtui – easy network configuration/management



CONTAINER OPTIONS! DOCKER & LXC



Docker
format

RHEL 7 supports both host containers (RHEL 7 carved into secure containers) and image-based containers using Docker format

Linux containers can be deployed in baremetal or virtual environments

RHEL 7 supports both Virtualization with KVM and Application Isolation with Linux Containers

That's a lot of change. Why bother moving?

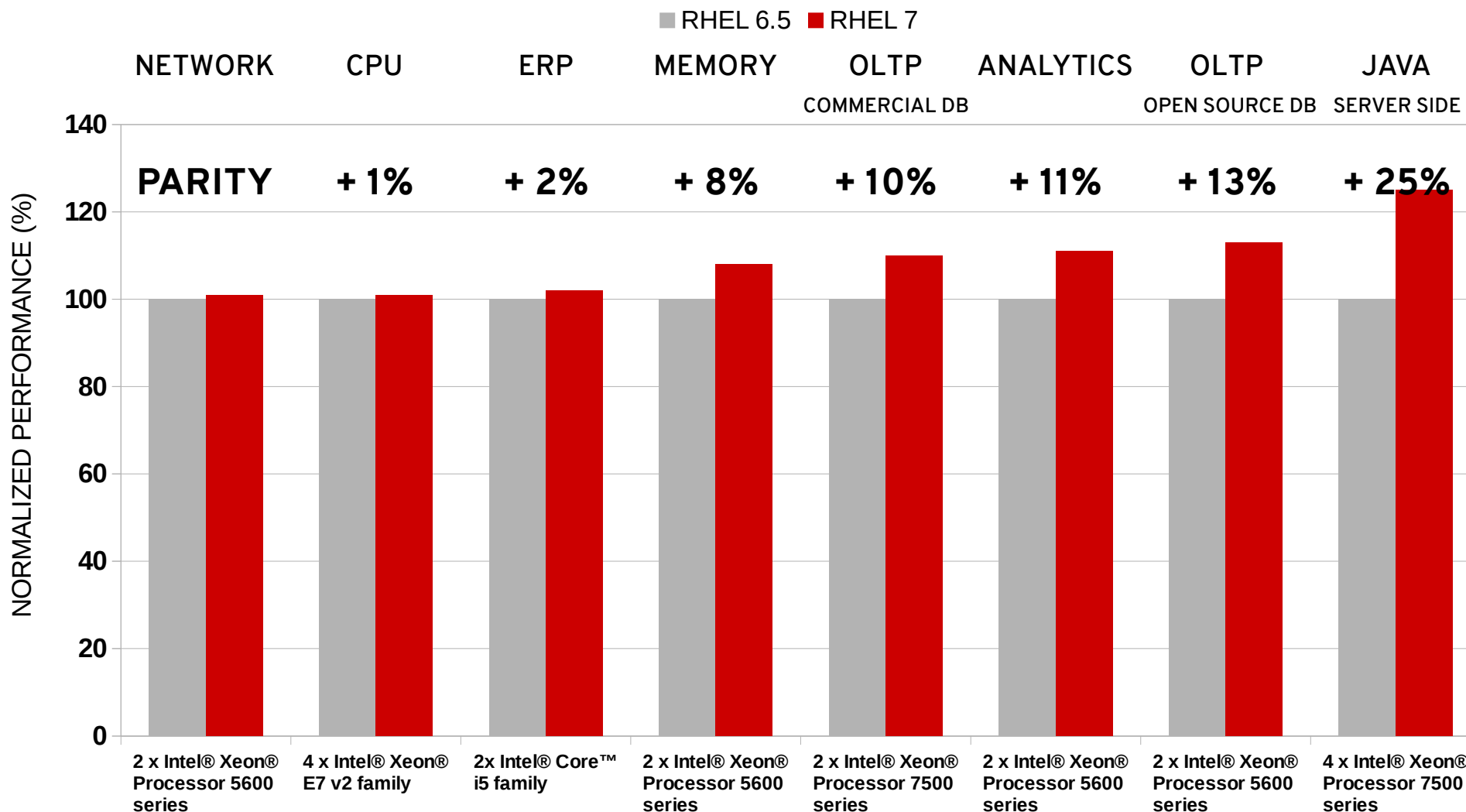
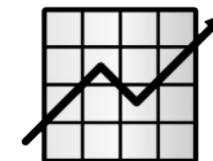
RHEL 7 ADVANTAGES

- Better performance (next slide is the reference)
- Resets the clock on the 13 year life-cycle
- Faster time to value – streamlined deployments, performance tuning, simplified configuration and system management, etc.
 -it's like a big “easy” button
- Better interoperability with Windows environments
- Docker Docker Docker
-did I mention Docker!

BETTER PERFORMANCE ACROSS WORKLOADS

RHEL 7 VS RHEL 6.5

PERFORMANCE GAINS ACROSS WIDE RANGE OF WORKLOADS
AND MULTIPLE GENERATIONS OF HARDWARE



IN-PLACE UPGRADES FROM 6.X TO 7

- **Preupgrade Assistant** checks for potential issues and risks using openscap

```
$ preupg
```

- **redhat-upgrade-tool** will download the packages and run the upgrade.

```
$ redhat-upgrade-tool-cli --network 7.0  
--instrepo \  
http://satellite.example.com/ks/dist/ks-  
rhel-x86_64-server-7-7.0/
```

- <https://access.redhat.com/site/solutions/637583>
- Upgrade will happen when the system reboots

KICKSTART ARE SIMPLE TO CONVERT

Goal: Limit the number of changes to preserve existing scripts

- Removed commands
 - interactive, monitor, upgrade
- Added commands
 - btrfs
 - realm
 - liveimg
 - eula --agreed
- Use ksverdiff & ksvalidator tools (from pykickstart)

systemd



Note: hilarious gif is not accurate and systemd should never be capitalized

systemd Quick Info



- `service` & `chkconfig` still work
- `systemctl {start, stop, restart, status, enable, disable} httpd`
- Use bash-completion to make life easy
- `systemctl list-unit-files -t service` (similar to `chkconfig --list`)
- **Drop-ins:** `/etc/systemd/system/httpd.service.d/50-httpd.conf`
- **Cgroups:** `systemctl set-property httpd.service CPUShares=2048`
- http://people.redhat.com/bbreard/presos/Summit_Demystifying_systemd.pdf

RHEL 7 – QUICK HITS

- /usr merge – Reduces complexity and maintains compatibility. Almost the entire OS is under /usr.

```
/
|-- etc
|-- usr
|   |-- bin
|   |-- sbin
|   |-- lib
|   `-- lib64
|-- run
|-- var
|-- bin -> usr/bin
|-- sbin -> usr/sbin
|-- lib -> usr/lib
| `-- lib64 -> usr/lib64
```

- /run - volatile data; mandatory tmpfs filesystem

RHEL 7 – QUICK HITS

- RHN Classic has been deprecated for RHEL 7
 - Subscription Manager
 - Satellite 5.6+
- hostnamectl – to configure the hostname
 - `hostnamectl set-hostname camacho.idiocracy.com`
 - `/etc/hostname`
- timedatectl [set-time,set-timezone,set-ntp]
- IO elevator: deadline for Server, cfq for Workstation
- New HA cluster stack: pacemaker, corosync, & pcs
- Loadbalancer – piranha is deprecated; keepalived & HAProxy

Subscription Managertl;dr

1) Register the system

- subscription-manager register

2) List subscriptions

- subscription-manager list --available

3) Attach subscription(s)

- subscription-manager attach --pool=[pool-id]
- subscription-manager attach --auto

4) List/Add/Remove repos

- subscription-manager repos --list
- subscription-manager repos --disable=*
- subscription-manager repos --enable=rhel-7-server-extras-rpms --enable=rhel-7-server-optional-rpms --enable=rhel-7-server-rpms --enable=rhel-7-server-supplementary-rpms

PERSISTENT NETWORK NAMING

```
$ ip ad sh
```

```
.....
```

```
2: enp0s25: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500  
qdisc pfifo_fast state DOWN qlen 1000
```

```
link/ether ff:ff:ff:ff:ff:ff brd ff:ff:ff:ff:ff:ff
```

```
3: wlp3s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500  
qdisc mq state UP qlen 1000
```

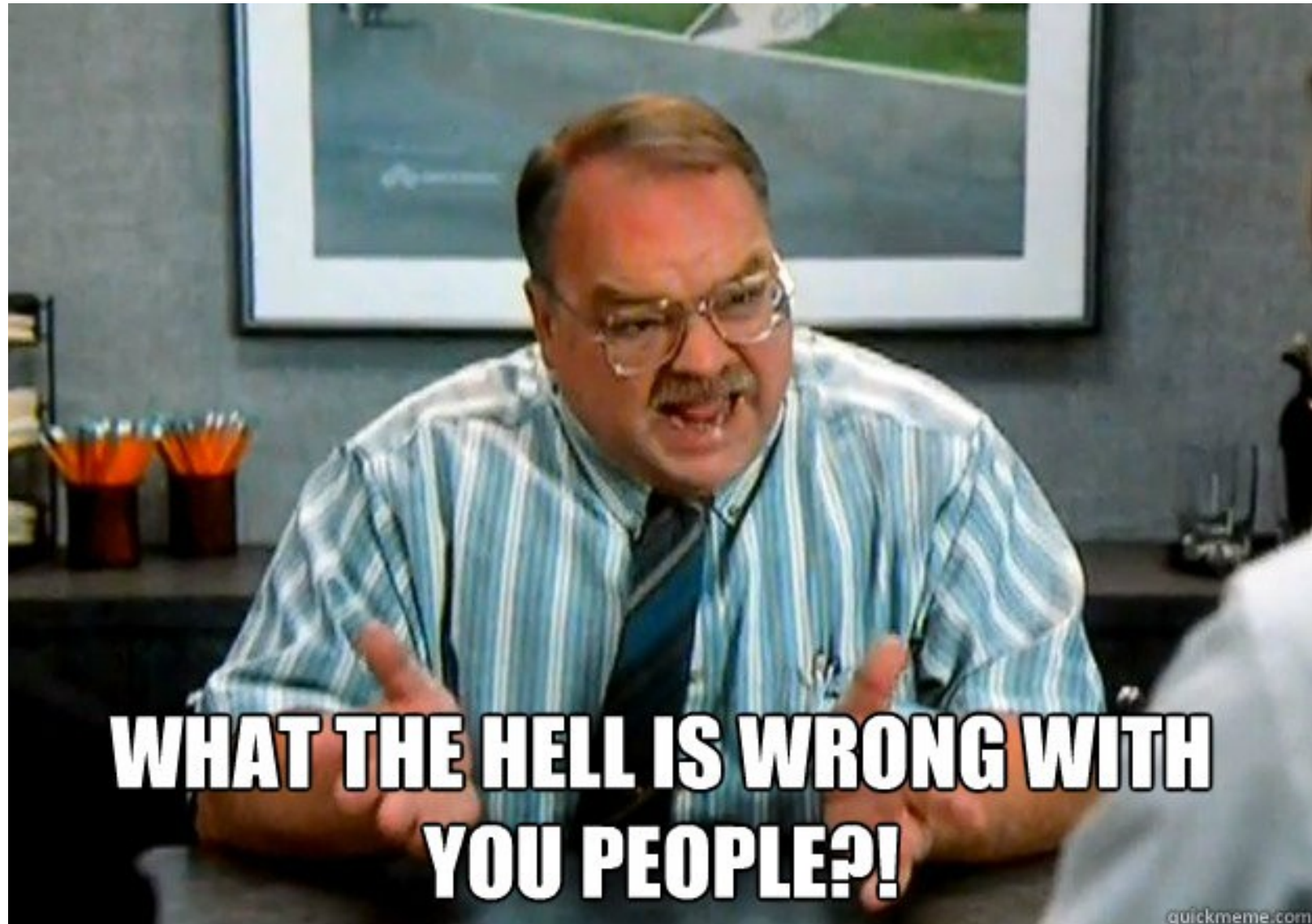
```
link/ether ff:ff:ff:ff:ff:ff brd ff:ff:ff:ff:ff:ff
```

```
4: ens192: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500  
qdisc pfifo_fast state UP qlen 1000
```

```
inet 10.11.164.103/23 brd 10.11.165.255 scope global
```

```
.....
```

Wait. enp0s25? wlp3s0? ens192?



PERSISTENT NETWORK NAMING

- en – ethernet
- wl – wlan
- o – on-board eno1
- s – hotplug slot ens1
- p – physical location (path) enp2s0f1
- P<domain>p<bus>s<slot>[f<function>][d<dev_id>]
 - enp2s0f1
- Legacy ethX naming
- https://access.redhat.com/site/documentation/en-US/Red_Hat_Enterprise_Linux/7/html/Networking_Guide/ch-Consistent_Network_Device_Naming.html

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- P<domain>p<bus>s<slot>[f<function>][d<dev_id>]
 - enp2s0f1
- Legacy ethX naming ← 4) Fall back to orig scheme
- https://access.redhat.com/site/documentation/en-US/Red_Hat_Enterprise_Linux/7/html/Networking_Guide/ch-Consistent_Network_Device_Naming.html

But What about BIOSDEVNAME?

- Provides persistent emXX naming scheme
- Installed w/ @ Core
- Disabled by default
 - **Except for Dell hardware!!**
- Enable by appending biosdevname=1 to kernel

TOO MUCH? CAN'T TAKE IT? NO PROBLEM.

First consider

- Consistent naming is incredibly valuable.
 - No more NICs flipping after install!!
- We recommend not disabling this functionality.

.....but if you must:

- Enable legacy eth* scheme by appending:
 - `biosdevname=0 net.ifnames=0`

Grub2

- GRUB2 is now a common bootloader for x86 & PPC64
- Improved UEFI and secure boot support
- Install the boot loader: `grub2-install /dev/sda`
- Configure default options in `/etc/default/grub`
- Add custom menu entries here: `/etc/grub.d/40_custom`
- Generate the config:
 - `grub2-mkconfig -o /boot/grub2/grub.cfg`
 - `grub2-mkconfig -o /boot/efi/EFI/redhat/grub.cfg`
- Menu file: `/boot/grub2/grub.cfg` (best not to edit directly)

Resources

- RTFM
https://access.redhat.com/site/documentation/en-US/Red_Hat_Enterprise_Linux/
- Navigating RHEL 7
<https://access.redhat.com/site/articles/887923>
- RHCSA & RHCE Training
<http://www.redhat.com/training/>



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