

SUMMARY: Moving /usr From Under Root "/" To Its Own Partition

Source: <http://unix.derkeiler.com/Mailing-Lists/SunManagers/2003-06/0118.html>

From: Dave Warchol (Warchol_at_harthosp.org)

Date: 06/04/03

Date: Wed, 04 Jun 2003 13:28:53 -0400

To: <sunmanagers@sunmanagers.org>

First, thanks to all who responded:

Joe Ritter
Ian MacPhedran
Darren Dunham
Ravi Kumar
Michael Morton
Julie Baumler
Crist Clark
Charles Homan
David Beard
Mark Cain
Andrew Maddox
Karl Vogel
devnull
Dave Mitchell, and,
John Timon

The original post is at the bottom. I have also included everyone's responses. I should have also mentioned that I am running Solaris 8.

Couple of comments on the responses:

1. The consensus seemed to be that doing this whole evolution (as originally described) in single-user mode would be a good thing.
2. Several folks noticed that I had missed some steps where I would need to (between the original steps h. and i.):
mkdir /usr
chown root /usr
chgrp sys /usr
chmod 755 /usr
3. There was a lot of discussion about how/when to rename the original

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/usr and the issues involved with doing so.

One of the reasons for doing this is to end up with a smaller root partition on the new drive
(local tape capacity issue).

4. Julie's comments about using Live Update are intriguing. I plan on looking at this.
5. Don't use the "c" option in ufsdump.
6. The alternatives to using ufsdump/ufsrestore. tar, etc.
7. Make sure to set 'mount at boot' to 'no' for the new /usr

After mulling over everything for a bit and talking it over locally, another approach that we think will work comes to mind.

1. Dump/restore /usr to its own partition on the new drive.
2. Create a temporary slice on the new drive large enough to hold the existing root partition (including /usr).
3. Dump/restore from the existing root slice to this temporary root slice.
4. Mount the temporary root slice as /dave, delete usr under /dave and change the device names in etc/vfstab under /dave.
5. Dump/restore the temporary root slice (now smaller because we have deleted usr) on the new drive to the permanent root slice on the new drive (c1t2d0s0)
6. Install the boot block and boot off the new drive.
7. Reslice and finish moving the remaining filesystems from the old to the new.

The nice thing about this approach is that I still have the existing drive, untouched, if I need to fall back.

Thanks again everyone,

Dave

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>From John Timon:

Why not boot off of the cdrom, dump and restore the /usr to the new slice,
edit /etc/vfstab and reboot

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>From Dave Mitchell:

On Tue, Jun 03, 2003 at 02:39:17PM -0400, Dave Warchol wrote:

> h. mv /usr /usr_prev (do I need to do this in single user mode?)

> i. Reboot

you also need h2. mkdir /usr.

You will probably need to be booted off a CD when you do this, as the mkdir and reboot commands will no longer be found under /usr, and even if

you use their current path, the shared libraries they link against will

not be found.

>From devnull@adc.idt.com:

Here is something to think about, lifted directly from Christopher A. Petro' "fix solaris"

" In order for the root partition to be fscked and remounted read-write,

the system needs to be able to run fsck. Generally this isn't a problem, but because of the way some of the system binaries are installed, it can be.

Let's take a look at /sbin/fsck...

```
ls: /sbin/fsck: cannot open file: No such file or directory
```

GAK! It's not there. It's actually in /usr/sbin/fsck, which means that Solaris needs to mount /usr before it can fsck the root partition. Now, /usr is the sort of partition that's likely to get updated a lot, and therefore is likely to not mount cleanly during boot. This means that if /usr won't mount, not only can Solaris not fsck the root partition, it can't even fsck /usr to clean it up enough

to mount it read-only."

I don't think this is a big problem, you could always have logging enabled,

if you are running 8 or 9

```
> f. ufsdump 0ucf - /usr | ufsrestore xf
```

Would tar be easier ?

```
cd /usr
```

```
/usr/local/bin/tar cvf - * | ( cd /usr2 && /usr/local/bin/tar xvf -)
```

Watch for symlinks if needed.

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> *h. mv /usr /usr_prev (do I need to do this in single user mode?)*

That's what i would do.

> *i. Reboot*

sync;sync; reboot :)

Good Luck,

Since you have the /usr_prev, i think you should be ok...

>From Karl Vogel:

>> *On Tue, 03 Jun 2003 14:39:17 -0400,*

>> *"Dave Warchol" <Warchol@harthosp.org> said:*

D> I need to move /usr from under root "/" to its own partition (space and

D> backup issues). The system is currently running under c1t1d0, with one

D> large root partition. I don't have any space that I could use

D> temporarily on the existing disk. This is one piece in migrating from a

D> smaller (c1t1d0, 18G) disk to a larger one (c1t2d0, 36G). The steps

D> that I have are:

D> *h. mv /usr /usr_prev (do I need to do this in single user mode?)*

Just make sure the mv is the absolute **last** thing you do before rebooting because all the libraries under /usr will become inaccessible, and nothing will work except static binaries.

I created a new vfstab file, compiled a static version of "mkdir" and followed these steps when moving /usr:

```
root# cd /usr
root# mount /dev/dsk/c2t0d0s0 /newusr
root# find . -print | cpio -pdumv /newusr
root# sync
root# cd /
root# umount /newusr
root# fsck /dev/rdisk/c2t0d0s0
root# mv /usr /old.usr
root# /sbin/mkdir /usr
root# mount /dev/dsk/c2t0d0s0 /usr
root# mv /etc/vfstab.newusr /etc/vfstab
```

All the open files under the original /usr were still open under /old.usr, so at this point I rebooted.

If you're going to keep the smaller disk, it may help to evenly divide

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your swap space between both drives.

>From Andrew Maddox:

Sounds mostly fine, but one or two notes:

you don't need to change the name of /usr – you absolutely don't want to, in fact! What you want to do is just change vfstab to mount the new copy of everything in place of the old slice. Don't do anything to the original partition, just let it not be mounted. If you need to revert, you can boot from CD (or maybe into single-user mode) and change vfstab back, so keep both lines in there.

Using ufsdump/ufsrestore is good, either that or a tar piped to the new FS to retain ownerships and permissions.

Oughta work, though. Good luck!

>From Mark Cain:

>

> Hello:

> I need to move /usr from under root "/" to its own partition

> (space and backup issues). The system is currently running under

> c1t1d0, with one large root partition. I don't have any space that

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> could use temporarily on the existing disk. This is one piece in

> migrating from a smaller (c1t1d0, 18G) disk to a larger one (c1t2d0,

> 36G). The steps that I have are:

>

> a. Document and backup everything first.

> b. Create a new directory under root, /usr2

> c. Run newfs on c1t2d0s4 build the filesystem on the new usr partition on c1t2d0s4

> d. mount /dev/dsk/c1t2d0s4 /usr2

> e. cd /usr2

> f. ufsdump 0ucf - /usr | ufsrestore xf

I'd use ufsdump 0f

I think the c indicates a cartridge, and the default cartridge size may not be large enough for you to copy your entire /usr directory.

Also, I'd not want to modify the dumpupdates file when doing a directory

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or partition copy.

- > *g. Change /etc/vfstab to include /usr as a filesystem*
- > *h. mv /usr /usr_prev (do I need to do this in single user mode?)*

Ouch. I'd do this while booted over the network or off a CD if possible.

Once you've moved /usr, most of your commands (including the mv and reboot commands) would probably fail.

You might be able to do the move and then stop-A and sync, but you still have to create a new /usr for the new partition to be mounted on and that could be difficult at this point.

It sounds like there's plenty of room on the new drive, so if you can't boot from the net or off a CD, just copy the existing root partition over to the new drive at a location where it won't interfere with your new / and /usr partitions, modify the vfstab to refer to the new partition, install the bootblock and boot off of the copy. Then you can do your rearranging while not using the old root directory.

- > *i. Reboot*
- > *j. When comfortable that everything is ok, remove /usr_prev (reclaim space).*
- > *k. Migrate the remaining partitions from the small disk to the large disk, install the bootblk on the large disk and boot off the large disk....*

You probably need to modify the boot prom settings (nvram??) to use the new disk to boot from.

And I'd run fsck on the new partitions before using them and probably try to do a full backup (in single user mode) as soon as possible after moving them to give me a "reliable" starting point for backups. Actually, I'd fsck after doing the newfs also.

– Mark

>

- > *Just want to make sure (in advance) that I haven't missed anything.*

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If

> *there is a better way, I am all ears.... I will summarize.*

>

> *Thanks*

> *Dave*

>*From David Beard:*

One crucial step you've forgotten – you'll need to rename /usr2 to /usr before rebooting. That'll be a little tricky once you've renamed "/usr" though – /usr/bin/mv also needs some runtime libraries (try ldd /usr/bin/mv), so you might need to experiment with setting LD_LIBRARY_PATH to look at /usr2/lib (et al) first, and use the new pathname for mv "/usr2/bin/mv

You might also want to check that /usr2 has the right file & group ownerships and protection mask before and after mounting it ...

I would do the whole lot in single user mode to ensure that /usr remains quiescent during the dump/restore.

Oh – your usfrestore command is missing a "-" at the end.

Sorry I can't be more precise, I'm ad-libbing from home.

I hope this helps.

>*From Charles Homan:*

I'm not sure you should move /usr even in single-user mode. You definitely won't like the results if you do it in multi-user mode.

Second, between steps "h" and "i" you need to "mkdir /usr" (since you just moved the directory you now have no /usr mount point.)

If it were me, I would boot from cdrom ("boot cdrom -s") then do the steps you mentioned (after mounting the root partition to "/" – and pre-pending all of the paths you mention with "/a".) This has the advantage of making sure that nothing can change on the partition between the time you dump it to the new disk and the time you mount the new partition in the right place. The disadvantage is the length of the downtime is obviously greater.

Here's a question, though: if the goal is to migrate the whole machine to

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the new disk, why not do it all at once? You could use the same basic methodology, but dump the entire root partition onto the new disk (also as one partition) and be done with it. Again, if done when booted from CD you don't have to worry about anything changing. Then install your bootblock, modify vfstab to point to the new disk, and you are done.

>From Crist Clark:

>
> Hello:
> I need to move /usr from under root "/" to its own partition
> (space and backup issues). The system is currently running under
> c1t1d0, with one large root partition. I don't have any space that
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> could use temporarily on the existing disk. This is one piece in
> migrating from a smaller (c1t1d0, 18G) disk to a larger one (c1t2d0,
> 36G). The steps that I have are:
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> a. Document and backup everything first.
> b. Create a new directory under root, /usr2
> c. Run newfs on c1t2d0s4 build the filesystem on the new usr
> partition on c1t2d0s4
> d. mount /dev/dsk/c1t2d0s4 /usr2
> e. cd /usr2
> f. ufsdump 0ucf - /usr | ufsrestore xf
> g. Change /etc/vfstab to include /usr as a filesystem
> h. mv /usr /usr_prev (do I need to do this in single user
mode?)

This is going to really mess up the system (remember that /bin is really a symlink to /usr/bin). I don't even think single-user mode is good enough, unless you are implicitly indicating boot to single-user mode off of different media.

> i. Reboot
> j. When comfortable that everything is ok, remove /usr_prev
> (reclaim space).
> k. Migrate the remaining partitions from the small disk
to
> the large disk, install the bootblk on the large disk and boot off
the
> large disk...

I would, starting from your (d), being as safe as possible,

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- d. Bring down system, boot off of other media (CDROM, netboot, etc.)
into single user.
- e. mount /dev/dsk/c1t1d0s0 /mnt
- f. mount /dev/dsk/c1t2d0s4 /mnt/usr2
- g. cd /mnt/usr2
- h. ufsdump 0f - /mnt/usr | ufsrestore xf -
- i. Change /mnt/etc/vfstab to include /usr as a filesystem
- j. mv /mnt/usr /mnt/usr_prev
- k. mkdir /mnt/usr
- l. umount /mnt/usr2
- m. rmdir /mnt/usr2
- n. Reboot
- .
- .
- .

Alternately, you can still try the backup on the live filesystem, but I'd still boot the root filesystem and /usr off of different media before I'd try move /usr around.

>From Julie Baumler:

While what you are planning to do looks fine, when we do this, we use Live Upgrade to build a new boot environment on the new disk; Live Upgrade takes care of everything from newfs to copying the data to setting the eeprom so the proper disk boots. It makes it particularly easy to split, combine, grow or shrink partitions. I simply use: "lucreate -c old -n new" and then assign partitions using the F-keys, after it is done copying, you simply run "luactivate new", and reboot onto the new disk. If you need to go back, you simply run "luactivate old" and reboot. It's easy, does most of the work for you, and is supported by Sun if you run into problems.

>From Michael Morton:

do everything in single user mode.
safer
quicker

sun's bigadmin site has a script to clone disks or partitions.
www.sun.com -->system administrators-->scripts
being a script, it can be modified for your specific needs.
it is quick and works flawlessly from my experience.

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>From Ravi Kumar:

i did the same thing on my machine a few weeks back. the process u have suggested will work just fine.

- go into single user mode first
- newfs the new partition
- mount it
\$ mount /dev/dsk/cxtxdxsx /mnt
- move /usr..i prefer to use tar
\$ tar cf - /usr | (cd /mnt; tar xf -)
- add an entry to vfstab and reboot

as a precaution, u can back up the root partition. hope this helps.

>From Darren Dunham:

- >
> Hello:
> I need to move /usr from under root "/" to its own partition
> (space and backup issues). The system is currently running under
> c1t1d0, with one large root partition. I don't have any space that I
> could use temporarily on the existing disk. This is one piece in
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> e. cd /usr2
> f. ufsdump 0ucf - /usr | ufsrestore xf

Generally you'd use 'r' instead of 'x' for transferring an entire filesystem.

- > g. Change /etc/vfstab to include /usr as a filesystem

Make sure you set 'mount at boot' to 'no'.

- > h. mv /usr /usr_prev (do I need to do this in single user mode?)

Safest of all would be to do it while booted from a cdrom, but it should be okay. You will not be able to run any dynamically linked program

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at
that point, so most shutdown scripts will fail (as would 'reboot' and
'halt'). You could probably just remount your new disk into /usr
though
(since /sbin/mount is static).

> *i. Reboot*
> *j. When comfortable that everything is ok, remove /usr_prev*
> *(reclaim space).*
> *k. Migrate the remaining partitions from the small disk*
to
> *the large disk, install the bootblk on the large disk and boot off*
the
> *large disk....*
>
> *Just want to make sure (in advance) that I haven't missed anything.*
If
> *there is a better way, I am all ears.... I will summarize.*

Sounds okay to me. However if you're moving root to the larger disk,
why not do it all at once?

ufsdump|ufsrestore all partitions onto 36G
modify /etc/vfstab on 36G
installboot on 36G

reboot onto 36G

>From Ian MacPhedran:

On Tue, 3 Jun 2003, Dave Warchol wrote:

> *g. Change /etc/vfstab to include /usr as a filesystem*
> *h. mv /usr /usr_prev (do I need to do this in single user mode?)*

Yes, and you'll also need to:

mkdir /usr
chown root /usr
chgrp sys /usr
chmod 755 /usr

after that.

> *i. Reboot*
> *j. When comfortable that everything is ok, remove /usr_prev*
> *(reclaim space).*

>From Joe Ritter:

You don't have to do this in single usermode no. You

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just need to reboot after you have the /usr in place.

===Original Post===

Hello:

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Thanks

Dave

sunmanagers mailing list
sunmanagers@sunmanagers.org
<http://www.sunmanagers.org/mailman/listinfo/sunmanagers>