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SUNDAY, 10 JUNE 2012

Raspberry Pi - run program at start-up

Anyway, I wanted to get my Raspberry Pi to start no-ip dynamic dns service when it started-up, so I wouldn't have to remember to start it every time it was powered up. For details on how to install no-ip on the Pi, see this [post](#).

There are loads of ways of running a command at start-up in Linux but my favoured approach is to create an initialisation script in /etc/init.d and register it using update-rc.d. This way the application is started and stopped automatically when the system boots / shutdowns.

Create script in /etc/init.d

```
sudo nano /etc/init.d/NameOfYourScript
```

The following is an example based on starting up the no-ip service [/usr/local/bin/noip], but change the name of the script and the command to start and stop it and it would work for any command.

```
#!/bin/sh
# /etc/init.d/noip

### BEGIN INIT INFO
# Provides:          noip
# Required-Start:    $remote_fs $syslog
# Required-Stop:     $remote_fs $syslog
# Default-Start:    2 3 4 5
# Default-Stop:     0 1 6
# Short-Description: Simple script to start a program at boot
# Description:       A simple script from www.stuffaboutcode.com
which will start / stop a program a boot / shutdown.

### END INIT INFO

# If you want a command to always run, put it here

# Carry out specific functions when asked to by the system
case "$1" in
  start)
    echo "Starting noip"
    # run application you want to start
    /usr/local/bin/noip2
    ;;
  stop)
    echo "Stopping noip"
    # kill application you want to stop
  esac
```

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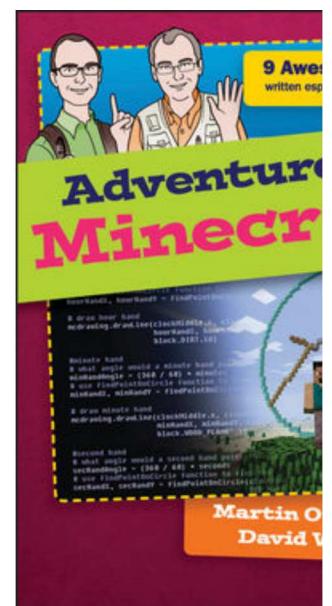


Martin O'Hanlon

StuffAboutCode.com
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```

killall noip2
;;
*)
    echo "Usage: /etc/init.d/noip {start|stop}"
    exit 1
;;
esac

exit 0

```

Warning - its important you test your script first and make sure it doesn't need a user to provide a response, press "y" or similar, because you may find it hangs the raspberry pi on boot waiting for a user (who's not there) to do something!

Make script executable

```
sudo chmod 755 /etc/init.d/NameOfYourScript
```

Test starting the program

```
sudo /etc/init.d/NameOfYourScript start
```

Test stopping the program

```
sudo /etc/init.d/NameOfYourScript stop
```

Register script to be run at start-up

To register your script to be run at start-up and shutdown, run the following command:

```
sudo update-rc.d NameOfYourScript defaults
```

Note - The header at the start is to make the script LSB compliant and provides details about the start up script and you should only need to change the name. If you want to know more about creating LSB scripts for managing services, see <http://wiki.debian.org/LSBInitScripts>

If you ever want to remove the script from start-up, run the following command:

```
sudo update-rc.d -f NameOfYourScript remove
```

Posted by [Martin O'Hanlon](#) at 20:44

 +16 Recommend this on Google

Labels: [raspberry pi](#)

61 comments:



Jumbungla 27 June 2012 at 21:07

Hi Martin,

Thanks for the Blog! I've tried using your code above to run no-ip on start-up (I have the Raspberry Pi B Model running Debian Squeeze) but keep getting the error below when trying to run it:

"11: Syntax error: word unexpected (expecting ")"")"

I've installed the same version of no-ip as you have above, and have installed it in the same location. Any ideas on what is causing this error?

I've done a bit of reading and think i wonder what O/S you are using as it may be that you have writted your code for something other than Debian.

Cheers,

(4) camera (7) Car (4) g
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Myself and David Whale (my co-Adventures in Minecraft) were asked to do a talk on "Hacking Mini Raspberry Pi 3rd

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James

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Martin O'Hanlon 27 June 2012 at 22:52

Hi James,

I don't know what to suggest, I am using the Debian Squeeze distro (19-04-2012). To make sure I have just recreated this script on my pi copying and pasting the script from above and I didn't experience any errors.

Have you made any changes to the distro, installing dev libraries anything like that which might be causing an issue?

Sorry I cant be of more help.

Mart



Martin O'Hanlon 28 June 2012 at 08:14

James,

Something came to mind, have you included the `#!/bin/sh` directive at the top of your script? This tells the linux program loader to use the `/bin/sh` interpreter, although its ignored by the script itself. If you have, check that `/bin/sh` exists and its not in a different directory.

Mart



klricks 1 December 2012 at 07:52

I had same problem. I found that when you copy and paste from the web site you get some hidden characters in the white spaces.

This can be fixed by deleting all if the white space indenting on each line... Even the spaces before any `#` must be deleted. You can put back the spacing using space bar if you wish.

Also found that if I use:

`sudo /etc/init.d/xxx start`

The script works but the imbedded program never starts without any indication.

Starting without using sudo works fine. Must use sudo to stop the program.

Kevin

[Reply](#)



Jumbungla 29 June 2012 at 18:26

Hi Martin,

Thanks for the help, i did have the `#!/bin/sh` and it was in the right directory. I found another script similar to yours above, except with the addition of

```
"User:root  
UserHome:/root/home/
```

```
$Export USERINFO"
```

(or something along those lines)

Which allows me to run vnc and noip on startup!

However, with the downside of having to startup my vnc server as root, which isn't ideal.

I'm thinking maybe I have some permission problems, but can't seem to figure out what is wrong.

Thanks for the help.

James

[Reply](#)

 **Smile** 27 September 2012 at 05:26

Thanks! works fine! :)

[Reply](#)

 **Paul** 8 October 2012 at 21:56

Hi Martin,

I might have an issue here. I used this script to loop a video on startup (works great!) with OMXPlayer using the same code as they used here:

<http://www.raspberrypi.org/phpBB3/viewtopic.php?t=10218&p=115800>

```
*****
#!/bin/sh -x

SERVICE='omxplayer'
while true; do
if ps ax | grep -v grep | grep $SERVICE > /dev/null
then
echo "running" # sleep 1
else
omxplayer /usr/local/bin/LTC.mp4

fi
done
*****
```

When I stop the video (Q) the shell code starts the video again.

It works perfect for the initial idea (fool-proof plug and play video loop for exhibition, except for the small gap between end&start), but I wonder if there are options to get out without needing to format the card :)

If any of you have some suggestions, except for typing

"sudo update-rc.d -f NameOfYourScript remove" in a second..

Thanks!

Paul

[Reply](#)

 **Doc Torbin** 27 November 2012 at 11:01

Martin, great post! This worked right out of the box for me. Two questions for you as I'm a bit of a UNIX noob:

1) If I should have a typo in my script, will that cause the entire boot process to stop or will it just ignore the bad script? IOW, will I be able to easily fix the bug?

2) I'm running my NodeJS server at start up and I see the following processes when I check:

```
root 1919 1 4 10:56 ? 00:00:03 node /var/www/vevo/app.js
root 1921 1 0 10:56 ? 00:00:00 startpar -f -- nodejs
root 2286 2275 0 10:57 pts/0 00:00:00 grep node
```

Now, the first one and the last one I'm expecting but what is the second one?

Thanks,

- MT

[Reply](#)

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Doc Torbin 27 November 2012 at 11:03

BTW, my script is named "nodejs" (all lowercase).



Martin O'Hanlon 27 November 2012 at 14:32

- 1) No, if you have an error in your script it wont stop the boot process, you will probably see the error on screen when your Pi boots up. I would recommend you test your script before committing it to run at boot by using /etc/init.d/nodejs start - this will show you whether it works or not
- 2) Not a clue, I know nothing about nodejs or how it runs, startpar is a linux utility used to run scripts in parallel, but thats where my insight ends!



Doc Torbin 29 November 2012 at 07:58

Thanks Martin! Script was tested as per your instructions above and it works great!

[Reply](#)



buxiaoyang 7 December 2012 at 09:50

Hello Martin, thanks for your blog!

I followed your steps to make my python script auto run after raspberry pi power on but got some error message when run command "sudo update-rc.d lcd12864 defaults":

```
update-rc.d: using dependency based boot sequencing
insserv: warning: script 'Fonts.pyc' missing LSB tags and overrides
insserv: warning: script 'Fonts.py' missing LSB tags and overrides
insserv: warning: script 'ST7565.pyc' missing LSB tags and overrides
insserv: warning: script 'main.py' missing LSB tags and overrides
insserv: warning: script 'ST7565.py' missing LSB tags and overrides
```

I googled the error message and got this link <http://wiki.debian.org/LSBInitScripts>, but after i did what it said i still got the same error message after run that command.

Do you have some ideas of this? thanks in advance!

[Reply](#)

Replies



Martin O'Hanlon 7 December 2012 at 11:35

They are warnings letting you know you have scripts in init.d which aren't LSB compliant. They look a bit scary but they won't affect the script and it will still work. Creating LSB compliant scripts for a simple startup program is overkill and quite frankly a pain in the backside. So, in summary, my advice would be "don't worry".



buxiaoyang 7 December 2012 at 13:22

Yes, as you said, I just tested that my python script can auto run after power on. Even if I got warnings message when adding it to the init.d. Thanks very very much! :)

Reply



mark amos 15 December 2012 at 16:51

@Martin - thank you very much. This is precisely what I was looking for! Works great.

Reply

Replies



Martin O'Hanlon 16 December 2012 at 21:00

No worries

Reply



Jan Paulussen 7 January 2013 at 21:55

Martin, Thanks for this explanation.

Yet: Now I have put it in, it works only sometimes (Random if it works or not).

The script I am using is also using an SQL database (it's a thermostat that starts/stops the heating, and it is controlled remotely by writing values in a MySQL). The script then looks at the database to see if it should enable/disable the heating in the house).

As far as I can see it seems that the SQL server sometimes comes up later than the script, causing the python-script to stop because it cannot connect.

My question therefore: Can you actually control which service should start first or last? Would it make sense to have a pause at the start of the script?

Reply

Replies



Martin O'Hanlon 8 January 2013 at 10:02

You have some control over when your script runs by modifying the Required-Start tag in the LSB header, you should be able to add \$all to the tag (after \$syslog) which tells the script to run after all other scripts.

See <http://wiki.debian.org/LSBInitScripts> for more info.



Jan Paulussen 8 January 2013 at 10:23

Hey Martin,

Thanks for the reply; I now know where to look!

I have implemented it over SSH remotely, so I will be able to see if it works only once I am at the Raspberry, to see if the GPIO is really functioning. Yet, I am confident it will!

Thanks again!

[Reply](#)

 **Mille** 8 February 2013 at 18:31

Hi Martin I tried the above for iPlayer and it doesn't seem to start it automatically.

when running (I called the file iPlayer)

```
sudo /etc/init.d/iPlayer start  
sudo update-rc.d NameOfYourScript defaults
```

both run without errors and iPlayer starts, but after reboot this has to be run manually, I copied your script about and replaced

```
/usr/local/bin/noip2  
with  
perl ./get_iplayer-2.82/get_iplayer.cgi --port=1935 --getiplayer=./get_iplayer-2.82/get_iplayer  
2>> /logfile/path/logfile.log &
```

does it not like perl on bootup?

Regards

John

[Reply](#)



Martin O'Hanlon 9 February 2013 at 17:57

Hi John,

I think you problem is due to 'relative' paths, when you use ./ it effectively says use "my current directory". dot [...] is your current directory dot dot [...] is the parent directory.

When your command ./get_iplayer-2.82/get_iplayer.cgi runs at start-up the current directory will be different and your program wont be found.

So I think you will be able to solve your problem by using full paths (which is always a good idea when creating scripts), if get_iplayer is installed in your home directory (/home/pi), referred to as ~, the following should work

```
perl /home/pi/get_iplayer-2.82/get_iplayer.cgi --port=1935 --getiplayer=/home/pi/get_iplayer-  
2.82/get_iplayer 2>> /logfile/path/logfile.log &
```

Let me know how you get on.

Mart

[Reply](#)



Mille 11 February 2013 at 11:45

Martin - thanks very much for your help.

I can confirm this is now loading on boot perfectly

[Reply](#)



Miroslaw Bagrowski 16 February 2013 at 00:46

killall -> pkill

[Reply](#)



Marko 25 February 2013 at 13:11

Hello,

I'm having a little problem with my script. I wanted to test if a simple script that I already had written starts on boot. It does, however I didn't think about including a way to stop the script and now I can't log in to my Raspberry. CTRL+C doesn't work as well as any other commands I tried. I tried searching for a way to stop the script manually but I didn't find anything useful. Any suggestions?

[Reply](#)

[Replies](#)



Martin O'Hanlon 25 February 2013 at 13:21

Im surprised you cant login - What does the script do? Is it waiting for a user input? Has it hung while starting up?

Can you login to the pi via ssh from another machine? If you can I would use sudo update-rc.d -f NameOfYourScript remove, to remove the script from the startup process and reboot. If you cant login at all, Im stumped, you might be able to modify the contents of the SD card if you have a linux pc and delete your script from /etc/init.d.

Let me know how you get on.



Marko 26 February 2013 at 09:53

I tried everything I could think of, everything I found with google, I even asked a friend of mine who is a linux expert, but nothing worked. The script was waiting for user input so basically none of the linux commands worked.

I didn't set up SSH either so that wasn't an option.

So the only option left was to back up all the important data from my SD card and reinstall Rasbian.

Lessons learned: always include a failsafe in your code.



Marko 26 February 2013 at 10:02

Oh yeah, almost forgot. I reinstalled Rasbian because I didn't have a linux pc at my disposal and for Windows I could only find a ext reader application, no write permission.



Martin O'Hanlon 26 February 2013 at 11:14

Ill update the post to put a warning about making sure your script doesn't hang waiting for a user input which wont ever happen.

[Reply](#)



ReadiesCards 17 March 2013 at 07:06

Like Marko I ended up with a non interruptable script running preventing me doing anything and only option I could do was to rebuild SD card. Therefore I would appreciate your post update you mention above and any tips on how to run a program at startup in the background. Or what not to do!

Many thanks!

[Reply](#)



kawarashii 19 March 2013 at 11:47

Thank you very much!

I tried this , but when the ip address changes it does not work . I can't access it online (it's not recognizing the change in ip)

I thought it might be a problem with the startup so I went to run it it said it already is running

..

Do you have any idea what might be the problem?

[Reply](#)



Miles Hayler 3 April 2013 at 11:52

Thanks for the post, but I just can't get mine to work on boot!

I want to open iceweasel on startup and have written the following script called startweasel:

```
-----  
#!/bin/sh  
# /etc/init.d/startweasel  
  
### BEGIN INIT INFO  
# Provides: iceweasel  
# Required-Start: $remote_fs $syslog $all  
# Required-Stop: $remote_fs $syslog  
# Default-Start: 2 3 4 5  
# Default-Stop: 0 1 6  
# Short-Description: Simple script to start a program at boot  
# Description: A simple script from www.stuffaboutcode.com which will start / stop a  
program a boot / shutdown.  
### END INIT INFO  
  
# If you want a command to always run, put it here  
echo "Starting Iceweasel"  
iceweasel  
  
# Carry out specific functions when asked to by the system  
  
exit 0
```

The script runs fine but doesn't run at startup. I have run "sudo update-rc.d startweasel defaults"

Do you have any suggestions?

[Reply](#)

[Replies](#)



Miles Hayler 3 April 2013 at 12:38

I think the problem is that it S04 on the start whereas x11 is S16 so it's trying to start the browser before the GUI. I've tried running "sudo update-rc.d startweasel defaults 17 17" but it still comes up as S04



Martin O'Hanlon 7 April 2013 at 14:52

Hi Miles, have you had any luck? I've never tried to start up X programs using a init.d script, so sorry Im not a lot of help.

[Reply](#)



Wouter Burger 7 April 2013 at 10:21

Hello Martin,

How can you build in dependencies, i have to wait till apache is started before my specific program may start.

regards,W

[Reply](#)

[Replies](#)



Martin O'Hanlon 7 April 2013 at 14:50

You have some control over when your script runs by modifying the Required-Start tag in the LSB header, you should be able to specify the apache service here, although it might be easier to add \$all to the tag (after \$syslog) which tells the script to run after all other scripts.

See <http://wiki.debian.org/LSBInitScripts> for more info.

[Reply](#)



Daan Mouha 12 June 2013 at 07:40

hello Martin

I start noip at boot (works) but when I shutdown my rpi, it halts. I guess that noip doesn't properly be killed.

My script is the same as yours.
I tried killall en pkill but nothing.

Regards DM

[Reply](#)

[Replies](#)



Martin O'Hanlon 12 June 2013 at 10:47

Sounds odd are you sure its noip which is halting the shutdown?

If you use killall noip from the command prompt does that work?



Daan Mouha 12 June 2013 at 14:58

This comment has been removed by the author.



Daan Mouha 12 June 2013 at 15:04

Ok problem is fixed but I don't know how.
I didn't change a thing on the script and now everything works.

Thanks for helping

[Reply](#)



Jijo Mathew 13 July 2013 at 00:08

Hi Martin,

I'm trying to start a bluetooth dongle which auto starts on boot and scans for other bluetooth devices. I used your code to start it on boot up. The code works perfect but it shows an error during boot

"Error Initializing the bluetooth device"

But once I log in to the pi and run the program, it works!

I guess the bluetooth is only started after the init script is run. I tried adding \$all but still it doesn't work. Pls help me!!

[Reply](#)



Nicholas Harris 6 August 2013 at 18:53

Hey Martin!

I am trying to make my passcode program run on startup, and I tried this. The program runs correctly, but the RPi still starts up as normal and does not wait for the program to finish. Is there a way for it to not boot into the GUI until the program has finished running (the passcode is correct)?

[Reply](#)

[Replies](#)



Martin O'Hanlon 7 August 2013 at 07:03

I dont know! Ive had a quick read of the debian lsb init scripts documentation and it suggests that you can put the tag X-Interactive: true into the header to stop the program running in parallel and give the user acces to the console.

I havent tried it so have a go add # X-Interactive: true just before the ### END INIT INFO line. One word of catuion though... Make sure you have got stuff backed up, a few guys have said that they have been locked out f their pi when experimenting with the boot sequence. But if we dont try we dont learn!

[Reply](#)



lorentz 6 August 2013 at 20:45

i have found this post useful in finding out a way to create a automatic method to connect the pi to a 3g internet via sakis3g script. the details are posted in <http://goo.gl/w01Bdz>.
thanks for the info

[Reply](#)



STAN 8 August 2013 at 23:24

Hi Martin,

Thank you for being so active in responding to these questions. I have an issue I wasn't able to find answered above (though I may not have recognized the answer - I'm new to linux). I'm running Debian on a Raspberry Pi as a server in my home. (lightweight, but fun to experiment with). I've installed Google Cloud Print and Chromium, and am able to print from my Android devices through the RPi IF I manually start Chromium after boot in an ssh window. (chromium --type=service) This actually works without the X environment started.

The problem (at least in my mind) is that this does not 'complete' and return to a command line prompt. It will just monopolize the session and never return a command prompt.

Since this command never actually completes, can I use an init.d script?

Thanks

[Reply](#)

[Replies](#)



Martin O'Hanlon 9 August 2013 at 06:17

Hi,

You can run any command in linux in the background by adding a & to the end of the command e.g chromium --type=service & .

This is known as a daemon. Init.d scripts are designed to run these types of commands. S put an ampersand, &, at the end and all should be good.

Mart

[Reply](#)



Gustaf Engström 24 August 2013 at 22:32

Maby this might seem as a rather strange question, but what programming language is the script written in? It looks like the one you can use in windows to.
(compeletely new to the Linux and the Raspberry universe.)

[Reply](#)

[Replies](#)



Martin O'Hanlon 27 August 2013 at 14:04

Er, I would just call it a bash script. If you're used to windows its the equivalent of a command (aka batch) file.

[Reply](#)



Eduard 16 September 2013 at 13:15

Thank you for your nice explanation.
I just wrote a small tutorial about starting applications at boot time with root privileges in Debian.

You can find it in here:

<http://cosmolinux.no-ip.org/raconetlinux2/boot.html>

I wish it is useful to someone.

[Reply](#)



Post it Art Creators 22 September 2013 at 16:13

I tried your tutorial but when I try to start the program it says "permission denied". Any ideas how to fix that?

[Reply](#)

[Replies](#)



Martin O'Hanlon 23 September 2013 at 06:51

Are you using sudo to run your program?

[Reply](#)



MrCottonmouth 9 November 2013 at 09:56

Thanks!!

[Reply](#)



James Cooper 6 January 2014 at 19:06

Right, massive problem here, I run this to operate a looping python script, which works, however, now I cannot connect via ssh or anything (Connection refused), because whilst this is looping, it seems to stop it from continuing on with the boot phase, is this right? What can I do?!?!?!?!?!?!

[Reply](#)

Martin O'Hanlon 6 January 2014 at 22:37



You need to put an ampersand & on the end of your command e.g. python myprogram.py &. To make it run in the background. Otherwise the boot sequence will wait for the command to finish.

[Reply](#)



Ben Pfeil 3 February 2014 at 18:34

Great tutorial. I am trying to implement this for a node.js app. If I manually run it it will run just fine, but I can't get it start on boot. Any suggestions?

[Reply](#)

[Replies](#)



Martin O'Hanlon 4 February 2014 at 20:59

Are you getting an errors? It might be worth writing the output to a file. E.g. node.js ##### >> /home/pi/logfile.txt.

One thing, make sure you are using full paths in your commands. e.g. /home/pi/file not ~/file or file.

[Reply](#)



Vladimir Kramarenko 18 February 2014 at 19:55

Thanks a lot! Did work for me.

[Reply](#)



Random Chappy 18 February 2014 at 20:29

This comment has been removed by the author.

[Reply](#)



Will Bicks 23 March 2014 at 15:28

Hi, thanks for the post!

I can get messages that my startup script is running, but I need to run the command as the "pi" user. I have tried runuser, but that does not work. Help would be greatly appreciated

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[Replies](#)



Martin O'Hanlon 28 March 2014 at 08:28

Have you tried executing your command with:

su -c /path/to/command pi

[Reply](#)



Frank 10 April 2014 at 21:00

Hi Martin,

Is it possible to run a pi cam to make a time lapse video when the pi boots up, and then shut down when it has finished? What if you want to remove it when you have finished the project? Thanks

[Reply](#)

[Replies](#)



Frank 10 April 2014 at 21:09

Sorry I just found your blog about time lapse video. Thanks. Great stuff

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