Automating Initial Server Setup with Ubuntu 18.04

Posted April 27, 2018 33k GETTING STARTED INITIAL SERVER SETUP SECURITY AUTOMATED SETUPS UBUNTU 18.04 UBUNTU

By: Justin Ellingwood

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Introduction

When you first create a new Ubuntu 18.04 server, there are a few configuration steps that you should take early on as part of the basic setup. This will increase the security and usability of your server and will give you a solid foundation for subsequent actions.

While you can complete these steps manually, sometimes it can be easier to script the processes to save time and eliminate human error. This guide explains how to use a script to automate the steps in the initial server setup guide.

What Does the Script Do?

This script is an alternative to manually running through the procedure outlined in the Ubuntu 18.04 initial server setup guide and the guide on setting up SSH keys on Ubuntu 18.04.

The following variables affect how the script is run:

- `USERNAME` : The name of the regular user account to create and grant `sudo` privileges to.
- `COPY_AUTHORIZED_KEYS_FROM_ROOT` : Whether to copy the SSH key assets from the **root** account to the new `sudo` account.
- `OTHER_PUBLIC_KEYS_TO_ADD` : An array of strings representing other public keys to add to the `sudo` -enabled account. This can optionally be used in addition to or instead of copying the keys from the **root** account.

You should update these variables as needed before running the script.

SCROLL TO TOP

When the script runs, the following actions are performed:

- Create a regular user account with `sudo` privileges using the name specified by the `USERNAME` variable.
- Configure the initial password state for the new account:
    - If the server was configured for password authentication, the original, generated administrative password is moved from the **root** account to the new `sudo` account. The password for the **root** account is then locked.
    - If the server was configured for SSH key authentication, a blank password is set for the `sudo` account.
- The `sudo` user's password is marked as expired so that it must be changed upon first login.
- The `authorized_keys` file from the **root** account is copied over to the `sudo` user if `COPY_AUTHORIZED_KEYS_FROM_ROOT` is set to `true`.
- Any keys defined in `OTHER_PUBLIC_KEYS_TO_ADD` are added to the `sudo` user's `authorized_keys` file.
- Password-based SSH authentication is disabled for the **root** user.
- The UFW firewall is enabled with SSH connections permitted.

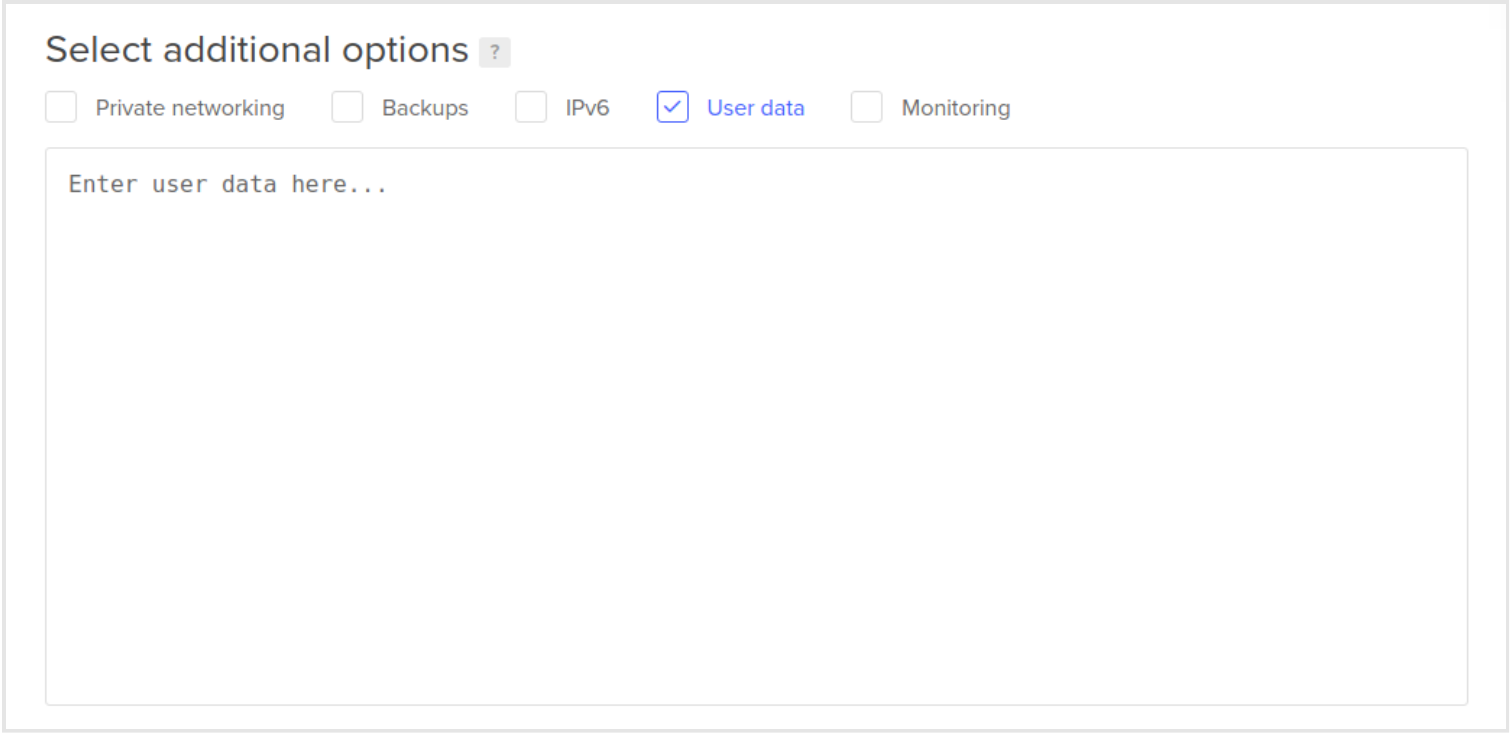
How To Use the Script

The script can be run in two ways: by adding it to the server's user data field during creation or by logging in as **root** and executing it after provisioning.

Using User Data

When creating a Droplet on DigitalOcean, you can optionally specify user data, a script to be run during the initial server provisioning to perform additional configuration.

If you are creating a Droplet from the **Control Panel**, you can select the **User data** checkbox in the **Select additional options** section. A text box will appear where you can paste the script:



If you are creating a Droplet using the **DigitalOcean API**, you can pass in the script using the `user_data` attribute instead.

If you are creating a Droplet with the **`doctl` command line tool**, you can pass in the script using the `--user-data-file` option:

```
$ doctl compute droplet create ... --user-data-file /path/to/script
```

Regardless of the method you use to add the user data, the script will be run the first time the new server boots up. You may have to wait a few minutes for the process to complete, but afterwards, you can log into your server with your `sudo`-enabled user for any further configuration.

The first time you log in, you will be prompted to change your password. The server will terminate the current SSH session once you provide and confirm your new credentials. Afterwards, you can SSH back in again as normal.

Running the Script After Provisioning

If you do not want to use user data, you can also run the script manually over SSH once the server is booted up.

If you have downloaded the script to your local computer, you can pass the script directly to SSH by typing:

```
$ ssh root@servers_public_IP "bash -s" -- < /path/to/script/file
```

You should now be able to log in using your `sudo` account for any further configuration.

If you do not have the script downloaded to your local computer, start by logging into the your server:

```
$ ssh root@servers_public_IP
```

Next, download the raw script to the server:

```
$ curl -L https://raw.githubusercontent.com/do-community/automated-setups/master/Ubuntu-18.04/initia
```

Inspect the script to ensure that it downloaded properly and update any variables that you wish to change:

```
$ nano /tmp/initial_setup.sh
```

Once satisfied, run the script manually using `bash`:

```
$ bash /tmp/initial_setup.sh
```

You should be able to log in using the `sudo`-enabled user to complete any further configuration.

The Script Contents

You can find the initial server setup script in the automated-setups repository in the DigitalOcean Community GitHub organization. To copy or download the script contents directly, click the **Raw** button towards the top of the script, or click here to view the raw contents directly.

The full contents are also included here for convenience:

```
#!/bin/bash
set -euo pipefail

########################
### SCRIPT VARIABLES ###
########################

# Name of the user to create and grant sudo privileges
USERNAME=sammy


# Whether to copy over the root user's `authorized_keys` file to the new sudo
# user.
COPY_AUTHORIZED_KEYS_FROM_ROOT=true

# Additional public keys to add to the new sudo user
# OTHER_PUBLIC_KEYS_TO_ADD=(
#     "ssh-rsa AAAAB..."
#     "ssh-rsa AAAAB..."
# )
```

```
OTHER_PUBLIC_KEYS_TO_ADD=(
)

#####################
### SCRIPT LOGIC ###
#####################

# Add sudo user and grant privileges
useradd --create-home --shell "/bin/bash" --groups sudo "${USERNAME}"

# Check whether the root account has a real password set
encrypted_root_pw="$(grep root /etc/shadow | cut --delimiter=: --fields=2)"

if [ "${encrypted_root_pw}" != "*" ]; then
    # Transfer auto-generated root password to user if present
    # and lock the root account to password-based access
    echo "${USERNAME}:${encrypted_root_pw}" | chpasswd --encrypted
    passwd --lock root
else
    # Delete invalid password for user if using keys so that a new password
    # can be set without providing a previous value
    passwd --delete "${USERNAME}"
fi

# Expire the sudo user's password immediately to force a change
chage --lastday 0 "${USERNAME}"

# Create SSH directory for sudo user
home_directory="$(eval echo ~${USERNAME})"
mkdir --parents "${home_directory}/.ssh"

# Copy `authorized_keys` file from root if requested
if [ "${COPY_AUTHORIZED_KEYS_FROM_ROOT}" = true ]; then
    cp /root/.ssh/authorized_keys "${home_directory}/.ssh"
fi

# Add additional provided public keys
for pub_key in "${OTHER_PUBLIC_KEYS_TO_ADD[@]}"; do
    echo "${pub_key}" >> "${home_directory}/.ssh/authorized_keys"
done

# Adjust SSH configuration ownership and permissions
chmod 0700 "${home_directory}/.ssh"
chmod 0600 "${home_directory}/.ssh/authorized_keys"
chown --recursive "${USERNAME}":"${USERNAME}" "${home_directory}/.ssh"

# Disable root SSH login with password
sed --in-place 's/^PermitRootLogin.*/PermitRootLogin prohibit-password/g' /etc/ssh/sshd_config
if sshd -t -q; then
    systemctl restart sshd
fi
```

```
# Add exception for SSH and then enable UFW firewall
ufw allow OpenSSH
ufw --force enable
```

Conclusion

Automating the initial server setup can save you a bit of time and gives you a good foundation for further configuration. If there are additional steps you'd like to take, you can either log in after the script runs to continue manually, or append the steps to the end of the script to automate the process.

By: Justin Ellingwood

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9 Comments

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baebytasya *April 27, 2018*

0 New

baebytasya *April 27, 2018*

0 !/bin/bash

set -euo pipefail

SCRIPT VARIABLES Name of the user to create and grant sudo privileges
USERNAME=sammy

Whether to copy over the root user's authorized_keys file to the new sudo user.
COPY*AUTHORIZED*KEYS*FROM*ROOT=true

Additional public keys to add to the new sudo user OTHERPUBLICKEYSTOADD=("ssh-rsa AAAAB..." "ssh-rsa AAAAB..." SCRIPT LOGIC Add sudo user and grant privileges
useradd --create-home --shell "/bin/bash" --groups sudo "${USERNAME}"

Check whether the root account has a real password set
encrypted*root*pw="$(grep root /etc/shadow | cut --delimiter=: --fields=2)"

if ["${encrypted*root*pw}" != "*"]; then
# Transfer auto-generated root password to user if present
# and lock the root account to password-based access
echo "${USERNAME}:${encrypted*root*pw}" | chpasswd --encrypted
passwd --lock root
else
# Delete invalid password for user if using keys so that a new password
# can be set without providing a previous value
passwd --delete "${USERNAME}"
fi

Expire the sudo user's password immediately to force a change
chage --lastday 0 "${USERNAME}"

Create SSH directory for sudo user

homedirectory="$(eval echo ~${USERNAME})"
mkdir --parents "${homedirectory}/.ssh"

Copy authorized_keys file from root if requested
if ["${COPYAUTHORIZEDKEYSFROMROOT}" = true]; then
cp /root/.ssh/authorizedkeys "${homedirectory}/.ssh"
fi

Add additional provided public keys
for pubkey in "${OTHERPUBLICKEYSTOADD[@]}"; do
echo "${pubkey}" >> "${homedirectory}/.ssh/authorizedkeys"
done

Adjust SSH configuration ownership and permissions
chmod 0700 "${homedirectory}/.ssh"
chmod 0600 "${homedirectory}/.ssh/authorizedkeys"
chown --recursive "${USERNAME}":"${USERNAME}" "${homedirectory}/.ssh"

Disable root SSH login with password
sed --in-place 's/^PermitRootLogin.*/PermitRootLogin prohibit-password/g' /etc/ssh/sshd_config
if sshd -t -q; then
systemctl restart sshd
fi

Add exception for SSH and then enable UFW firewall
ufw allow OpenSSH
ufw --force enable

---

jasonheecs *May 3, 2018*

1

I have made a bash script to automate the setup process for a newly created droplet, hopefully this will be useful to someone else.

MrDataWolf *May 8, 2018*

0

In the "Running the Script After Provisioning" section there is a curl call listed as
"curl -L https://raw.githubusercontent.com/do-community/automated-setups/master/Ubuntu-18.04/initial_servers_setup.sh -o /tmp/initialsetup.sh"
it should be
*"curl -L https://raw.githubusercontent.com/do-community/automated-setups/master/Ubuntu-18.04/initial*serversetup.sh -o /tmp/initialsetup.sh"
You can see it listed correctly under "Script Contents" -> "click here to view the raw contents directly."

As it currently is you get "404 Not Found" written to the new tmp file.

---

jellingwood MOD *May 15, 2018*

0

@MrDataWolf Good call. Thanks for the catch!

SCROLL TO TOP

leonardoburci *June 4, 2018*

1 I would like to change the script to disable root SSH login and password authentication.
Would the following change work?

```
# Disable root SSH login and password authentication
sed --in-place 's/^PermitRootLogin.*/PermitRootLogin no/g' /etc/ssh/sshd_config
sed --in-place 's/^PasswordAuthentication.*/PasswordAuthentication no/g' /etc/ssh/sshd_confi
if sshd -t -q; then
    systemctl restart sshd
fi
```

leonardoburci *June 4, 2018*

1 Wouldn't it be useful to also include updating to the setup script?
Would the following lines – added at the end of the script – work?

```
apt-get update
apt-get -y upgrade
apt-get -y autoremove
```

jellingwood MOD *June 5, 2018*

0 @leonardoburci Yes, you can add whatever you'd like to the script. Since this setup is intended to directly mirror the steps in the manual initial server setup guide, we've only included those procedures in our script.

As for disabling password authentication in the script, we avoided adding that here because DigitalOcean automatically disables password authentication if a key is included when a Droplet is created. The script lets users add additional keys, and if you plan on doing that every time, the `sed` lines you added would probably be a good choice. We decided to leave that out for the time being to avoid accidentally locking users out on first run.

Thanks for the comments! We might be iterating on these in the days and months to come.

siaarzh *June 20, 2018*

1 Nice! I've made a script of my own with CentOS based on this. The only difference is this line:

```
useradd --create-home --shell "/bin/bash" --groups wheel "${USERNAME}"
```

Also, I omitted the firewall part.