

# Impermanence

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What is impermanence?

# What is impermanence

- Delete the root filesystem on every boot
- State is temporary by default

# Why is impermanence

- Because NixOS can
- Avoid configuration drift
- Opt-in state
- Predictability

# How To Impermanence

```
/nix          /          /persist
+-----+
/store/x -|-> /var/x      |
          | /var/lib/bluetooth <-|- /var/lib/bluetooth
/store/y -|-> /bin/y      |
          | /home/admin/.local <-|- /home/admin/.local
/store/z -|-> /etc/z      |
+-----+
```

```
{ ... }: {
  boot.initrd.postDeviceCommands = lib.mkAfter ''
    mkdir /btrfs_tmp
    mount /dev/mapper/encrypted /btrfs_tmp
    if [[ -e /btrfs_tmp/root ]]; then
      mkdir -p /btrfs_tmp/old_roots
      timestamp=$(date --date="@$(stat -c %Y /btrfs_tmp/root)" "+%Y-%m-%d_%H:%M:%S")
      mv /btrfs_tmp/root "/btrfs_tmp/old_roots/$timestamp"
    fi

    delete_subvolume_recursively() {
      IFS=$'\n'
      for i in $(btrfs subvolume list -o "$1" | cut -f 9- -d ' '); do
        delete_subvolume_recursively "/btrfs_tmp/$i"
      done
      btrfs subvolume delete "$1"
    }

    for i in $(find /btrfs_tmp/old_roots/ -maxdepth 1 -mtime +30); do
      delete_subvolume_recursively "$i"
    done

    btrfs subvolume create /btrfs_tmp/root
    umount /btrfs_tmp
  '';
}
```

Opt-in state with the  
impermanence module

```
{
  inputs = {
    impermanence = {
      url = "github:nix-community/impermanence";
    };
  };

  outputs = {self, ...} @ inputs: let
    system = "x86_64-linux";
    pkgs = inputs.nixpkgs.legacyPackages.${system};
  in {
    nixosConfigurations = {
      default = inputs.nixpkgs.lib.nixosSystem {
        inherit system;

        modules = [
          inputs.impermanence.nixosModules.impermanence
          ...
        ];
      };
    };
  };
}
```



```
{ ... }: {
  fileSystems."/persist".neededForBoot = true;
  environment.persistence."/persist" = {
    hideMounts = true;
    directories = [
      {
        directory = "/etc/nixos";
        user = "demo";
        mode = "u=rwx,g=rx,o=rx";
      }
      "/var/log"
      "/var/lib/bluetooth"
      "/var/lib/nixos"
      "/var/lib/systemd/coredump"
      "/etc/NetworkManager/system-connections"
    ];
    files = [
      "/etc/machine-id"
      {
        file = "/var/keys/secret_file";
        parentDirectory = {mode = "u=rwx,g=,o="};
      }
    ];
  };

  users."demo" = {
    directories = [
      "this-will-persist"
    ];
  };
};
};
```

Live Demo

# Resources

- Impermanence

- <https://github.com/nix-community/impermanence>
- <https://www.youtube.com/watch?v=YPKwkWtK7I0>
- <https://grahamc.com/blog/erase-your-darlings/>

- Disko

- <https://github.com/nix-community/disko>  
(check the examples)

Thanks