



June 2025

The Future of Unattended and Advanced Linux Deployments

Agama: Redefining Automated Linux Installations

Presented by:
Joseph Zikusooka (ZIK)



// Minimum Profile: About Me



```
{  
  profile: {  
    name: "Joseph Zikusooka (ZIK)",  
    title: "Linux Systems Engineer",  
  
    developer: ["Jambula OS Linux", "JambulaTV"],  
    contributor: [  
      "Linux Applications", "Embedded Linux",  
      "Monitoring & Observability", "Smart Home Automation",  
    ],  
    trainer: ["Linux Introduction", "Server Administration"],  
    advocate: "Free & Open Source Software (FOSS)",  
    founder: "Jambula Labs",  
  
    system: {  
      timezone: "Africa/Nairobi",  
    },  
  
    personality: {  
      humor: "dry",  
      caffeine: "required",  
    },  
  },  
}
```



Unattended & Advanced Linux Installations

- Automated installation
- Use of pre-configured files or scripts
- Silent (and boring) Installation routines
- Package based installation i.e. Minimum
- Pre-defined security settings
- Boot using Network (PXE) or ISO

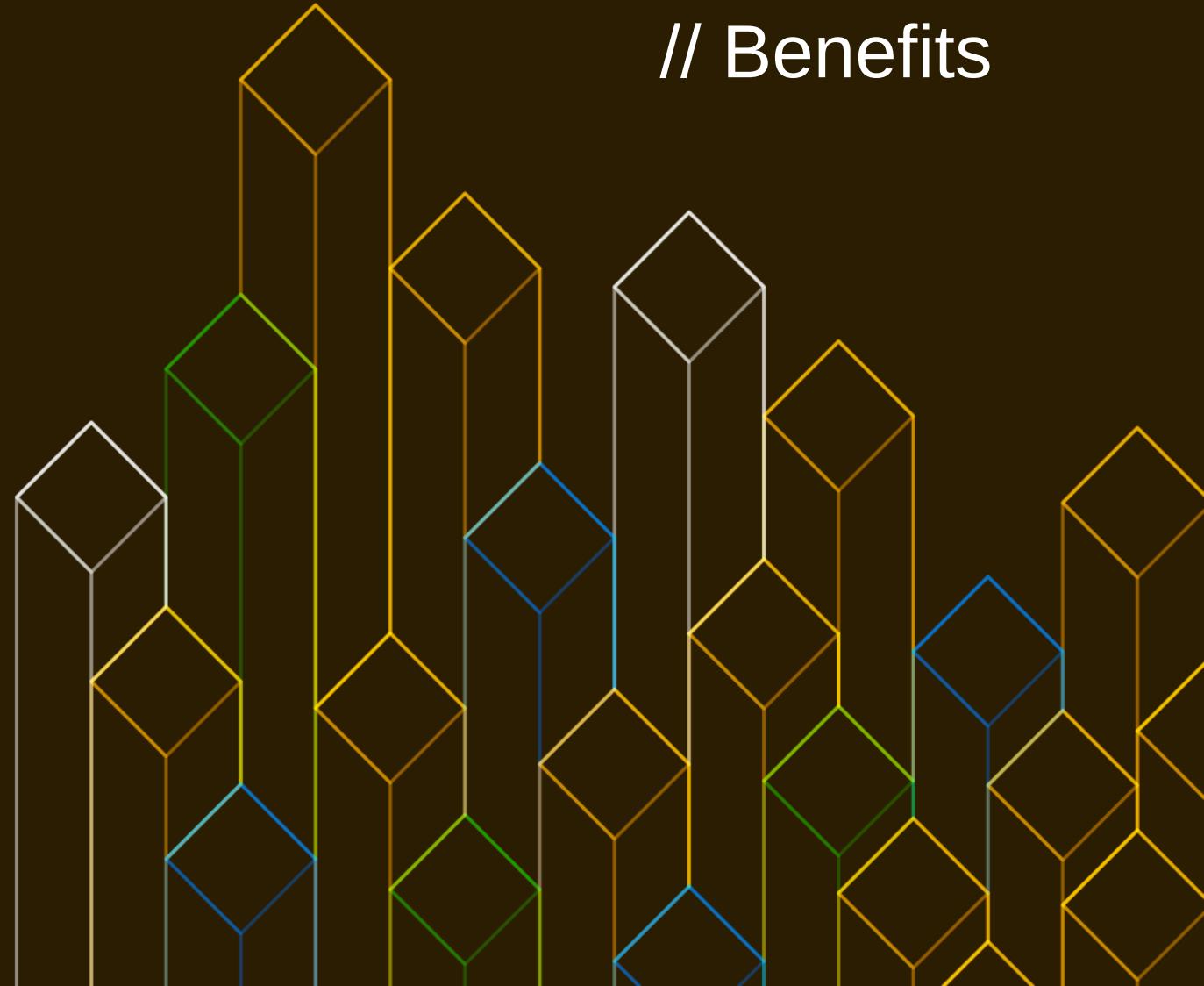
// Characteristics



Benefits of Unattended Linux Installations

- Efficiency & Speed
- Consistency & Standardization
- Customization & Extensibility
- Flexibility & Scalability
- Integration & Advanced
- Recovery / Business Continuity

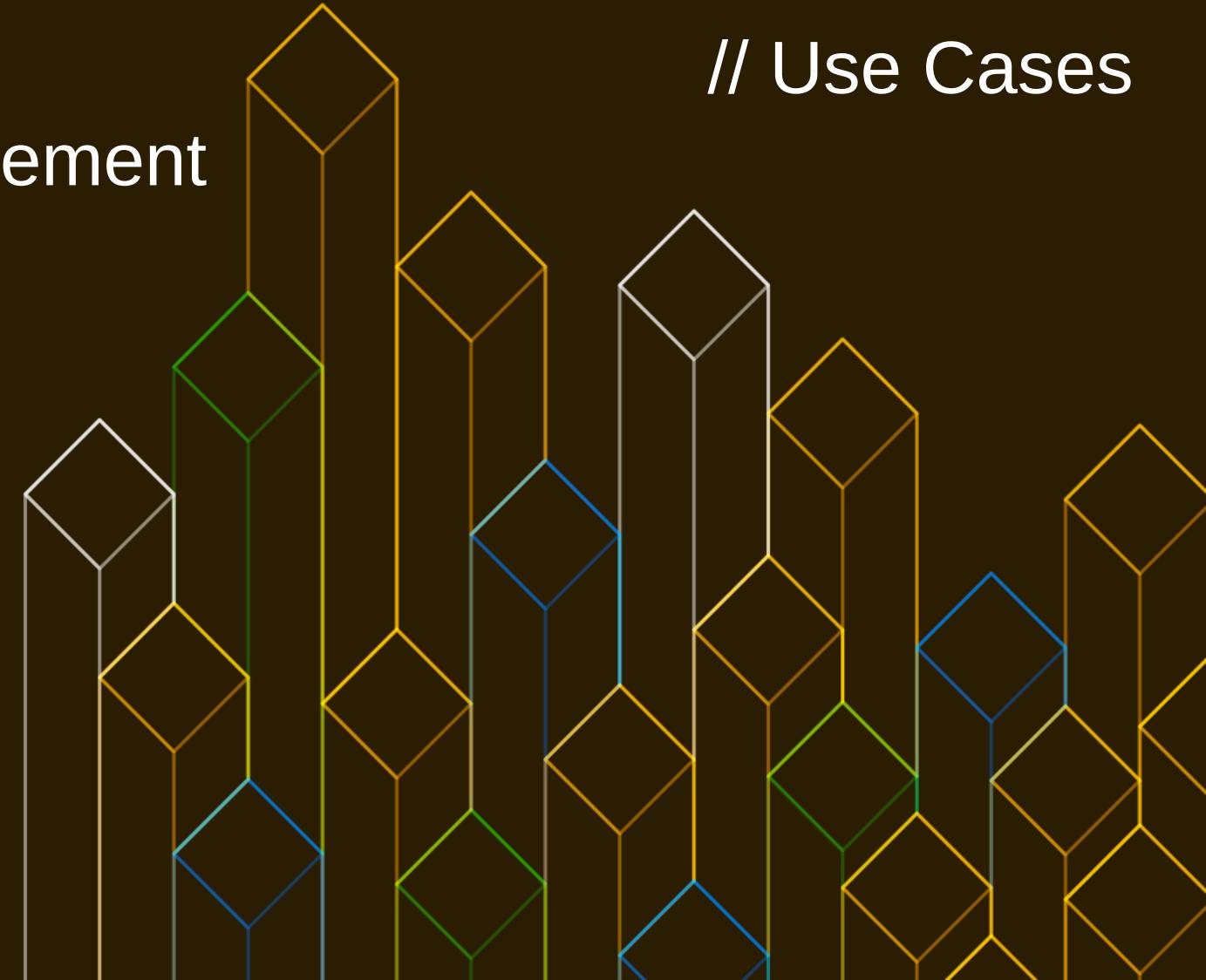
// Benefits



Unattended & Automated Linux Deployments

- Enterprise / Fleet Management
- Cloud provision
- Data Centers
- Edge Devices
- Computing Labs
- Testing / Development

// Use Cases



Agama

Service based Installer

- Modernization
- Friendliness
- Adaptiveness
- Remote Accessibility
- Futuristic



// Goals & Vision



Image credit: "openSUSE's Agama Installer Takes Shape," Linuxiac, <https://linuxiac.com/opensuse-agama-installer-takes-shape/>

Agama

// Key Features

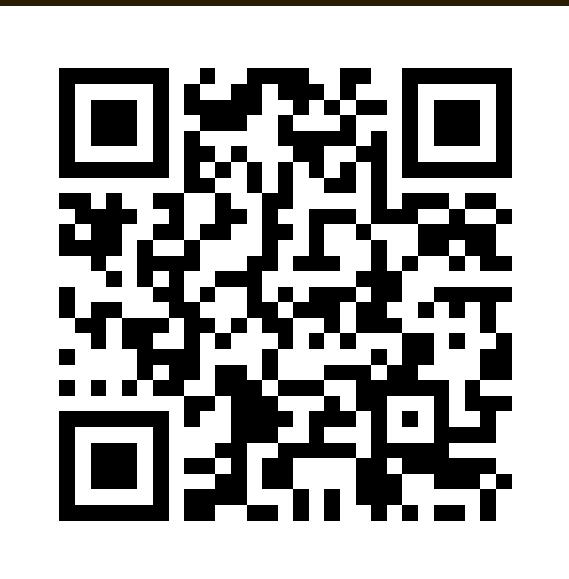
Going Beyond Yast

- Web Interface
- Smart product selections
- Smart storage filtering
- Jsonnet based profiles
- Monitor using CLI



Image credit: "openSUSE's Agama Installer Takes Shape," Linuxiac, <https://linuxiac.com/opensuse-agama-installer-takes-shape/>

Agama – A first look



Snapshot Images (Daily)

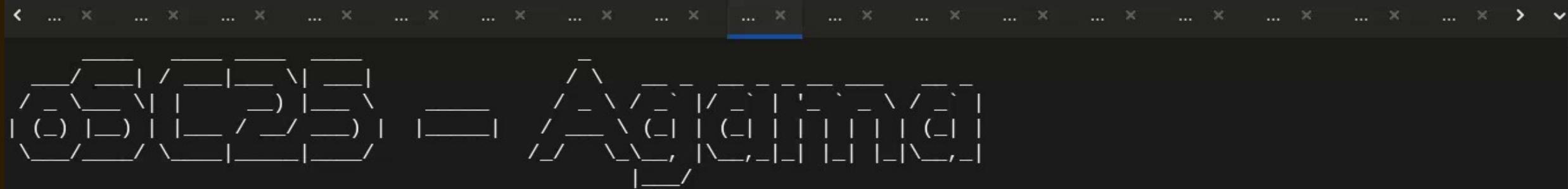


Download: <https://agama-project.github.io/download>



// Downloads

zik@nuremberg:~



This script is available at: <https://github.com/zikusooka/OpenSUSE>
Free free to use and modify as you see fit

Press enter to proceed ...



Agama – Controlling the Boot Process

// Boot loader

- hostname=
- live.password=
- inst.auto=
- inst.repo=
- Ip=

Other flags:

- inst.finish=poweroff
- inst.copy_network=0
- proxy=

hostname=agama.jambula.net

live.password=secret

inst.auto=<http://192.168.124.1/agama/profile.json>

inst.repo=<http://download.opensuse.org/tumbleweed/repo/oss/>

ip=192.168.124.100::192.168.124.1:255.255.255.0::eth0:none nameserver=192.168.124.1 nameserver=8.8.8.8



```
zik@nuremberg:~
```

```
SHA256:zTiKw/0wfjNZE6jyv52C18jmhYi+VCFjxDNdMg0yQnk (RSA)
SHA256:TNoqvJyAx8aU4llevcWTgpKVmunjVrEl4SSZpaMWZ80 (ED25519)
SHA256:BXFStpcIshEGfio78YTKkB4XYUKg1Pg00vaZg8BmA (ECDSA)

Agama installer SSL certificate fingerprints:
SHA256: 20:DA:68:14:95:42:8A:65:4D:36:11:64:90:AE:E3:D2:2C:90:5A:C1:00:39:CA:80:B9:00:0F:E2:F2:39:99:85
SHA1: B2:B5:39:B5:A5:FC:BE:11:AF:36:0A:66:FD:13:74:A6:13:D2:48:0B

Connect to the Agama installer using these URLs:
https://agama.local

https://192.168.124.76

Password for root user: wxesLwGM
agama login: 
```

Machine View QEMU

Agama localhost/#/products

English us

Select a product

- Leap 16.0 Beta**
The latest version of a community distribution based on the latest SUSE Linux Enterprise Server.
- openSUSE MicroOS**
A quick, small distribution designed to host container workloads with automated administration & patching. openSUSE MicroOS provides transactional (atomic) updates upon a read-only btrfs root file system. As rolling release distribution the software is always up-to-date.
- Slowroll**
An experimental and slightly slower rolling release of openSUSE designed to update less often than Tumbleweed

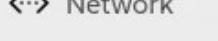
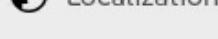
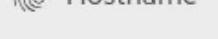
Select





Overview

These are the most relevant installation settings. Feel free to browse the sections in the menu for further details.



Localization

The system will use English (United States) as its default language.

Storage

Install using device sda, 14 GiB and deleting all its content.

Software

The installation will take 1.6 GiB including:





Congratulations!

The installation on your machine is complete.

At this point you can reboot the machine to log in to the new system.

Reboot

Agama – Types of Unattended Installations

1. Profile-based

2. Script-based

```
{  
    "localization": {  
        "language": "en_US.UTF-8"  
    },  
    "product": {  
        "id": "Tumbleweed"  
    },  
    "storage": {  
        "bootDevice": "/dev/sda"  
    },  
    "user": {  
        "fullName": "Zik Joseph",  
        "password": "mysecret5",  
        "userName": "zik"  
    }  
}
```

set -ex

Import profile
/usr/bin/agama \
config \
load \
http://\$IP/profile.json

Install
/usr/bin/agama \
install



Profile – Based Installation



```
// Source: https://github.com/agama-project/agama/blob/master/rust/agama-lib/share/examples/profile_tw.json
{
    "localization": {
        "keyboard": "es",
        "language": "es_ES.UTF-8",
    },
    "software": {
        "patterns": ["gnome"],
        "packages": ["helix"]
    },
    "product": {
        "id": "Tumbleweed"
    },
    "storage": {
        "drives": [
            {
                "partitions": [{ "generate": "default" }]
            }
        ]
    },
    "user": {
        "fullName": "Jane Doe",
        "password": "123456",
        "userName": "jane.doe"
    },
    "root": {
        "password": "nots3cr3t",
        "sshPublicKey": "..."
    },
    "network": {
        "connections": [
            {
                "id": "Ethernet network device 1",
                "method4": "manual",
                "method6": "manual",
                "interface": "eth0",
                "addresses": ["192.168.122.100/24", "::ffff:c0a8:7ac7/64"],
                "gateway4": "192.168.122.1",
                "gateway6": "::ffff:c0a8:7a01",
                "nameservers": ["192.168.122.1", "2001:4860:4860::8888"]
            }
        ]
    }
}
```

Generate, Evaluate & Validate Profiles

IMPORTANT: Recent Changes in versions 15+

// Profile Management

a) Show:

```
$> agama config show
```

b) Evaluate:

```
$> sudo agama config generate profile.json
```

c) Validate:

```
$> agama config validate profile.json
```

Evaluate & Validate:

```
$> sudo agama config generate profile.json | agama config validate -
```



Script - Based

// Pre-Installation

```
set -ex  
  
/usr/bin/agama config load http://SERVER_IP/profile.json  
  
/usr/bin/agama install
```



For a more detailed and fine-grained script, take a look at:

<https://raw.githubusercontent.com/agama-project/agama/refs/heads/master/autoinstallation/bin/agama-auto>



Script - Based

// Until Partitioning



```
set -ex  
  
/usr/bin/agama config load http://SERVER_IP/profile.json  
  
# Until the partitioning step  
/usr/bin/agama install --until partitioning  
  
# Add your changes e.g. Add extra device and mount in fstab  
  
# Complete the installation  
/usr/bin/agama install
```

Script - Based

// Until Deploy



```
set -ex

/usr/bin/agama config load http://SERVER_IP/profile.json

# do partitioning, rpm installation and configuration step
/usr/bin/agama install --until deploy

# Do custom modifications e.g. use zypper -root /mnt to
install more pkgs, apply security patches, tweak configs

# Complete the installation - unmount and copy logs
/usr/bin/agama install
```

Agama - Jumpstarting an Installation

// PXE Install

- TFTP (e.g. tftp-server, tftpd-hpa, atftp)
- DHCP (e.g. dnsmasq, isc-dhcp, kea)
- HTTP (e.g. apache, nginx, python -m http.server)
- PXELINUX (e.g. syslinux)
- Agama PXE installation image



Agama - Starting Automagically

1. For Profile based Installation

Pass “inst.auto=” Linux kernel boot parameter:

i.e. inst.auto=http://SERVER_IP/profile.json

Alternatively, create your own image – The profile search sequence is: autoinst.{jsonnet, json, xml}

NOTE: Place profile under OEMDRV or “/”

// Profile search



2. For Script based installation



Customize PXE or initrd to run your script automatically

Troubleshooting Unattended Installations

// Gotchas

- ☒ Validate your configs/profiles

- ☒ Check your firewall settings

```
sudo firewall-cmd –permanent --add-service={dhcp,tftp,http,ftp,mdns}
```

- ☒ Adjust SELinux contexts for TFTP/HTTP:

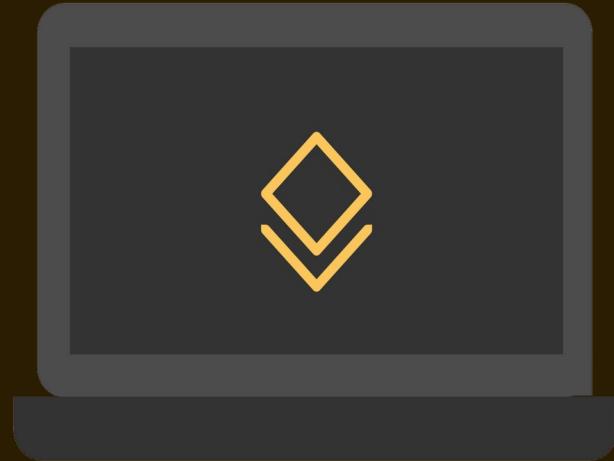
```
sudo setsebool -P tftp_home_dir=1 httpd_read_user_content=1
```

- ☒ Download and view logs: agama logs [list | store]

- ☒ avahi-browse -t -r _agama._sub._https._tcp

- ☒ Ensure profiles/configs are served outside of the installation

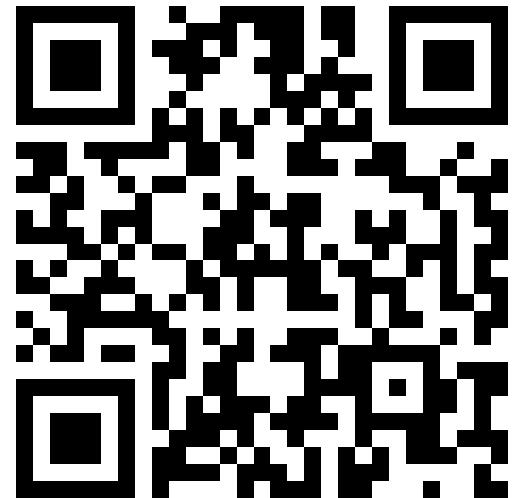
- ☒ Stay up to date with the Agama project – Read release notes



Agama - Upcoming Features and Plans

- Improve storage handling
- Installer questions
- Boot loader password
- Connection to NFS shares
- Advanced handling of Btrfs file systems
- Improve integration with other tools

// Roadmap



<https://agama-project.github.io/docs/roadmap>



That's it folks, Let's connect!

// Questions

