FreeNAS and bhyve

Where the shark bites the hive

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Agenda

- ❏ Who am I?

- ❏ FreeNAS and bhyve architecture

- ❏ FreeNAS and bhyve in numbers

- ❏ FreeNAS new UI

- ❏ devel/libhyve-remote

- ❏ devel/bhyve-vm-goagent
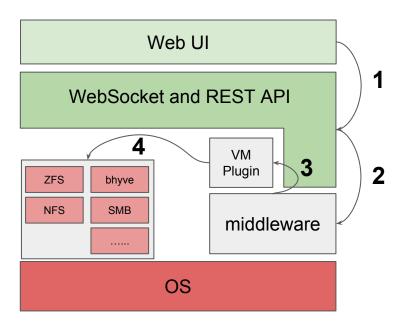
- ❏ WIP: bee prepared

About me

- ❏ Name: Marcelo Araujo
- ❏ FreeBSD ports bit since 2007
- ❏ FreeBSD src bit since 2015
- ❏ Working for iXsystems Inc. since December/2016
- ❏ Github: araujobsd
- ❏ Interested in bhyve since 2014

From   **To**

FreeNAS and bhyve Architecture

1. UI WebSocket/Rest calls to middleware

2. Middleware provides WebSocket and primary functionality

3. Provides methods related to VMs and interactions with the userland

4. Userland: bhyve, bhyvectl, grub-bhyve...

What we want to achieve?

- ❏ Allow FreeNAS/TrueNAS to provide a hybrid storage solution

- ❏ Offer more alternatives to Jails for FreeNAS users

- ❏ Provide users a friendly virtualization experience

- ❏ Easy to use and intuitive UI, removing bhyve complexities

- ❏ Provide more external tooling for user VM management

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FreeNAS and bhyve by the numbers

- ❏ FreeNAS has 10+ Million downloads and over 200K active users

- ❏ FreeNAS Forum has 61,012 users

    - ❏ 2.200 posts only related with bhyve

- ❏ We introduced the VM feature in Febuary of 2017

- ❏ bhyve officially available on FreeNAS 11.0

- ❏ From that point to the present, 244 bhyve-related bugs have been reported
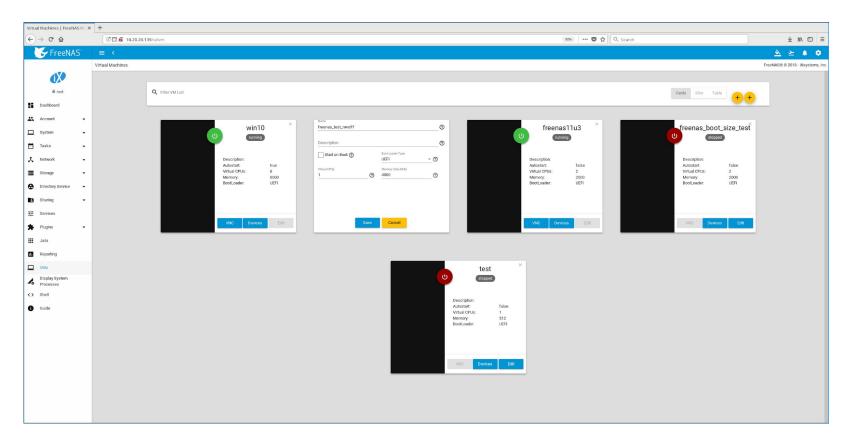
- ❏ 21 bugs related to VNC support alone

FreeNAS new UI

❏ New UI made with Angular

❏ VM Wizard: Six steps to create a VM

❏ Friendly and intuitive UI

❏ Access VMs with VNC Web interface

❏ Flip Cards that are awesome

❏ … and more to come
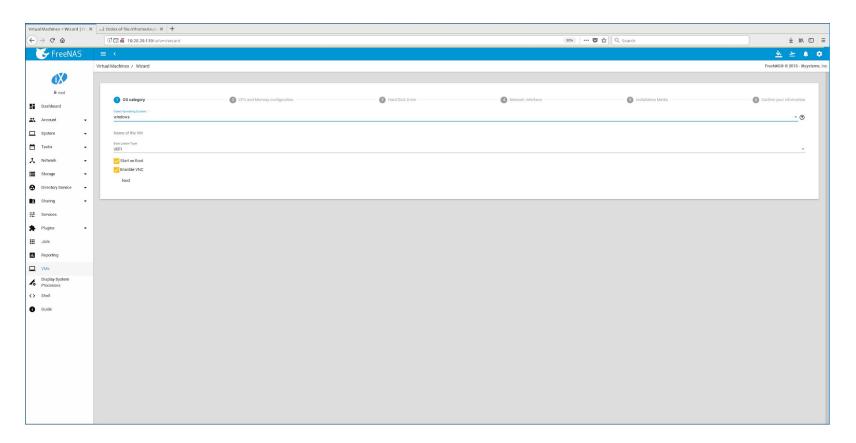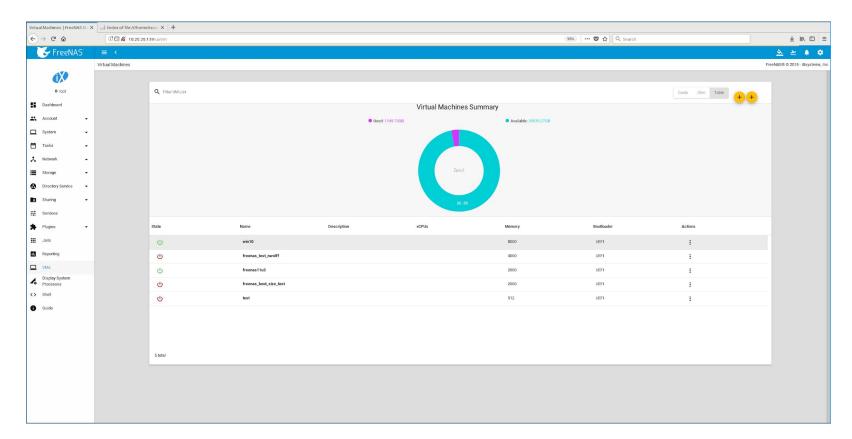
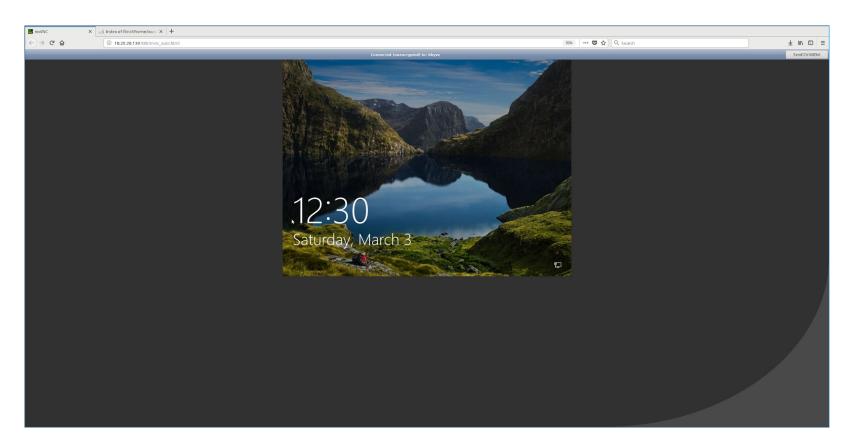# FreeNAS new UI: VM List

FreeNAS new UI: Wizard

FreeNAS new UI: Graphs

FreeNAS new UI: VNC Web

devel/libhyve-remote

- ❏ A library that aims to abstract functionality from other third party libraries such like libvncserver, freerdp and spice

- ❏ Uses a dynamic linker, loads only functionality from other libraries that are necessary to launch the service

- ❏ Created mainly to solve some bugs we had with VNC implementation reported on FreeNAS

- ❏ Now we only support libvncserver

devel/libhyve-remote

❏ Some issues that libhyve-remote solves with VNC:

❏ Better compatibility with different VNC clients

❏ IPv6 support

❏ Non-US keyboard

❏ Better cursor handler

❏ Fewer glitches updating screen

❏ Better compression

❏ Password authentication (It is already in the RFB implementation)

devel/libhyve-remote

❏ How to use it with bhyve?

   ❏ cd /usr/ports/devel/libhyve-remote

   ❏ make config, select BHYVE

   ❏ libhyve-remote is installed, and bhyve is patched,, rebuilt, and reinstalled

   ❏ If something goes wrong, it falls back to RFB bhyve implementation ;)

   ❏ Launch bhyve with the new option, ex.:

> "**-s 29,fbuf,vncserver,....**"

devel/bhyve-vm-goagent

❑   An agent in Go that runs inside a guest vm and allows host hypervisor to obtain information from guest VMs

❑   Supports virtio-console and WebSocket protocol

❑   Pre-built binaries, i386 & amd64, for FreeBSD, Linux, NetBSD and Windows

❑   Information available from guest VM: mem, cpu, nics, uptime and ping

❑   Easily extended to do anything else

devel/bhyve-vm-goagent

❏ How to use:

    ❏ Host:

        ❏ Launch the guest VM with the virtio-console parameter:

> "**-s 2,virtio-console,org.freenas.bhyve-agent=/tmp/FreeBSD12.sock**"

devel/bhyve-vm-goagent

❏ How to use:

    ❏ Guest:

        ❏ Download the binary compatible with your guest OS

        ❏ From inside your VM:

kldload virtio_console

./bhyve-vm-goagent-freebsd-386 **-virtio**

devel/bhyve-vm-goagent

❏ How to obtain guest information:

❏ Host:

❏ We provide tools like goserial

root@freenas:/tmp # **./goserial -socket="/tmp/FreeBSD12.sock" -ether -uptime**
Result:
[{"mtu":1500,"name":"**em0**","hardwareaddr":"00:a0:98:1e:c0:08","flags":["up","broadcast","multicast"],"addrs":[{"addr":"**192.168.100.193/24**"}]}
{"mtu":16384,"name":"**lo0**","hardwareaddr":"","flags":["up","loopback","multicast"],"addrs":[{"addr":"::1/128"},{"addr":"fe80::1/64"},{"addr":"**127.0.0.1/8**"}]}]
Result: {"seconds":5742,"days":0,"hours":**1**,"minutes":**35**}

WIP: bee prepared

❏   A new tool for manage bhyve will come this year

❏   Improve bhyve-vm-goagent

❏   Extend libhyve-remote to support at least freerdp

References:

- ❏ libhyve-remote:
    - ❏ GitHub: https://github.com/freenas/libhyve-remote
    - ❏ Review: https://reviews.freebsd.org/D11768
    - ❏ Ports: devel/libhyve-remote

- ❏ bhyve-vm-goagent:
    - ❏ GitHub: https://github.com/freenas/bhyve-vm-goagent
    - ❏ Ports: devel/bhyve-vm-goagent

Thank you!

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