ArcaOS – Thrusters on full*

Hardware and virtualization technology will:

Add extreme virtualization to your Desktop/Laptop
Run more OS's at the same time.
Overcome problems inherent to any one OS.

JT Agnello
jtagnello@yahoo.com

Bringing Thrusters Online ...

- Hardware technology has advanced to the point where we have a "datacenter in a box"
  - multi-core cpu, gb's of ram, ssd's - don’t give all this to one OS, only to have it running at idle.
  - All this hardware opens powerful possibilities and opportunities for virtualization and emulation; easily more than one OS per system.
- You just have to wrap your mind around bypassing the limitations, vs. accepting and living with them.

Bringing Thrusters Online ... cont’d

- Software Technology: virtualization & emulators have also advanced!
  - Type 1: VMware ESXi (“slim” type 1)
  - Type “1.5” (IE-like): Microsoft Hyper-V (“fat” type 1)
  - Type 2: VMware Workstation, Oracle Virtualbox
  - Emulators: QEMU, 86box, Dosbox-X …
- They all run FAST on “modern” Desktop/Laptop (DT/LT) hardware.

Bringing Thrusters Online ... cont’d

- Don’t give all that power to just one OS, because any one OS can’t solve all problems.
  - Every *single* OS has limitations, but if we combine them, all limitations fall to the wayside.
  - Underneath all this power is a set of virtualization rules that govern the removal of limitations. Know the rules, remove the limits!

Bringing Thrusters Online ... cont’d

- To engage thrusters, simply:
  - Install Windows or Linux at “Host OS” level
    - Make them “mean and lean”
  - Install VirtualBox or VMware Workstation (Type 2)
  - Install ArcaOS (1, 2, or more of them) in a VM
  - Add your applications (at appropriate OS level)

  Done ...

Thrusters are engaged ...

- And I’m sitting in the Captain’s chair … looking at:
  - All modern services (networking, filesystem, x64, etc.) on the Host OS are available to every VM
  - Each *VM* is your daily driver ... with the Internet, with your applications, with your data

Oh, you want details ...

- Any modern DT/LT, defined as:
  - Multi-core CPU, 16GB RAM, *SSD* (or better)
    - Rule of thumb: 4GB RAM = one OS, either Host or VM; choose wisely
    - All 3 elements are req'd (multicore, ram, ssd)
    - My $200 (ebay) 2018 Dell Precision 7520 Laptop: i7, 32GB RAM, 512GB SSD … translates into 8 OS "slots"
  - Thrusters could possibly be engaged on an 8GB RAM model, but you'll learn to love "tweaking"

Oh, you want details … cont’d

- Host OS: 64-bit Windows or Linux (many distros)
  - Linux distros can be had or made lean/mean, so already suitable as a HostOS
  - Windows (10/11, pro & enterprise) can also be made lean and mean. Use AME, WAU Manager, etc. to strip the bad stuff out of Windows
- Both HostOS's are suitable, so it's personal choice ... nothing "technical" in the way

Oh, you want details … cont'd

- Install ArcaOS in a VM … give it at least 2 vCPU's, 4GB RAM, and one or more of 512GB disk drives.
- Install any other OS in other VM's … example: Internet VM (has your browser of choice & other 'net apps, plus security)
- You now have these modern services on your DT/LT:
  - Networking (ethernet, wifi), Browser (Firefox, Chrome), 64bit apps (in a single window, directly on the ArcaOS desktop)
- Switch VM windows as easily as you switch between windows on your current desktop! Other UI options are available.

Possibilities and combinations ...

… are now endless, and any virtualized OS with Guest Additions can overcome any technical issue. Many, if not all, of an OS’s 32-bit difficulties can be bypassed!

- networking (including WiFi): available to any VM
- NTFS (and others): available as common filespace to any VM
- Memory address space: multiple guest VM's, in parallel
- 64-bit apps: available *within* 32-bit VM's

We now need ...

... the 3 laws of virtualization (3LV)*

1.) Once virtualized, all features become exploitable.

2.) Bitness doesn't matter in exploitation through virtualization.

3.) Virtualized exploitation is enabled in all dimensions.

These laws & their corollaries resolve most, if not all, of the "that can't be done" scenarios

* 3 Laws of Robotics" is from the Isaac Asimov books, and the fair use is to transformatively and educationally motivate folks to find and read those books. Both the Asimov books and this effort is to portray "governing rules".

3LV examples ...

- Limited to 4GB RAM in 32-bit OS/2? #3 says:
  - run 2 or more vm's in parallel; 2 OS/2 VM’s yield 8GB of RAM address space.
- Can't run 64-bit app directly on a 32-bit OS? #'s 1 & 2 say:
  - Use Winflector, and have a 64-bit app in it’s own window on the OS/2 desktop.

3LV examples … cont’d

- HPFS/JFS limitations in OS/2? #3 says:
  - If Windows Host OS, then NTFS benefits available to any guest VM’s
  - If Linux Host OS, then various Linux filesystems available to any guest VM’s
- No device driver for a networking need? #3 says:
  - Host OS provides any kind of networking need, and virtualizes it for any guest VM

Problems (from OS2World posts) ...

- Can’t run old Wordstar (program):
  - If “wordstar version” ran in DOS, or dos/win, then give it a separate VM for that ... Old wordstar files “resurrected”.
- Can’t do WiFi, no device drivers (or using kinky hardware):
  - Host OS provides wifi conn, all VM’s benefit.
- Challenge: Can’t do (whatever) … pick something from forum.
  - 3LV scenarios usually* solve the problem

* legalese, escape hatch

Another 3LV benefit

- Reuse those old licenses ... put an old desktop/server OS in a VM, no matter how ancient, and make it work for you
  - Autocad 14, or Wolfram math engine, or … whatever. No security issues, no need to update an OS that no longer gets updates; VM protected by the Host OS.
- OS as a "compute" platform, an "application server", or …
  - All that money sitting in old or unused licenses, brought back to life, put into production again. We've saved $thousands, $millions …
- Thus, 3LV's (working) motto is … "Obsolete this!"*, **

* Just say no to "churn"; while we are at it, 3LV helps you to just say no to "subscriptions", "cloud", and so on …,

- ** USA version only; might need help with the translation on this one for other countries ...

Main presentation finished ...

- You now have a “toolbox”, full of solutions to problems
  - They are in the toolbox, and ready to use; the toolbox keeps expanding with newer tools.
  - The hard part is knowing the tool exists, and pulling it out to build a new solution to an old problem.
  - I have no idea how you’ll use these tools, or not use them. Share your thoughts on OS2World … I’ve asked for a “Virtualization” category, to capture/consolidate virtualization posts.

Starfield ...

- Picture the “starfield” effect, where the stars are whizzing by at Warp speed.
- That’s what you’ve done, with a 3LV DT/LT …

  … thrusters at max!

That’s a wrap ...

… until next year’s Warpstock!

Note: my presentation at Warpstock 2023 was entitled “The 3 Laws of Virtualization”, but I’ve had to simplify the messaging. It’s now:

“ArcaOS – Thrusters on full*”

* “Thrusters on full …” is from the J.J. Abram’s 2009 movie Star Trek, and the fair use is to transformatively and educationally motivate folks to see that movie. Both the movie and this effort is to portray “running at your best”.

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JT Agnello, 719-422-3834

jtagnello@yahoo.com