

Mz - "Managing z"

A systems management tool for z/VM and Linux

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VM Workshop

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Agenda

- **Introductions**
- **One question**
- **Why? What? Who? and How?**
- **Why Open source?**
- **Function provided**
- **Command line vs. Web interfaces**
- **Documentation**
- **One more question**
- **Demonstration**

Introductions

- Who am I?
 - ▶ Michael MacIsaac
 - ▶ 26 years at IBM
 - ▶ Lots of different jobs
- Who are you?
 - ▶ Who has tried Mz?
 - ▶ To do systems management of z/VM and Linux
 - All *roll your own*?
 - Single encompassing tool?
 - Some tools, some *roll your own*?

One question

- Q. Is there a lightweight, free, open source, powerful, fast, intuitive, solid, well-tested systems management tool for z/VM and Linux?

One question

- Q. Is there a lightweight, free, open source, powerful, fast, intuitive, solid, well-tested systems management tool for z/VM and Linux?
- A. **Absolutely not!**

One question

- Lightweight?
- Free?
- Open source?
- Powerful?
- Fast?
- Intuitive?
- Solid?
- Well-tested?

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Why? What? Who? and How?

- To solve the business problem of *virtual server sprawl*
- To build the *foundation* before the *storefront*
 - ▶ 2 interns, summer of '08
- To prototype real-world requirements:
 - ▶ "No root login"
 - ▶ RPM history/reporting
 - ▶ OVF reference implementation
 - ▶ Device conflicts/reporting
 - ▶ Start and stop Linux (not poweron, poweroff)
 - ▶ z/VM health screen

Why? What? Who? and How?

- To "scratch an itch"
- Len Santalucia - "this is innovation"
- "Steve Jobs" by Walter Isaacson
- To help you the customer solve your IT needs and be successful

Why? **What?** Who? and How?

- What is Mz?
 - ▶ A systems management tool on z that is:
 - agentless, daemonless, databaseless, stateless
 - ▶ A tool with commands of the form **mz<verb><object>**
 - Linux verbs: **mk** (make), **ls** (list), **rm** (remove), etc
 - Objects: **server**, **client**, **tree**, **appliance**, **monitordata**, etc.
 - ▶ A tool with the Linux file system as its database
 - ▶ A tool that crosses CECs and LPARs
 - ▶ Allow pings, copies and commands to all Linuxes in parallel
 - ▶ Command-line-centric, with a growing Web interface
 - ▶ Able to support 1st, 2nd and 3rd level Linux systems
 - ▶ A "poor man's" backup and monitoring tool

What? (cont'd)

CEC 1

LPAR 1 - z/VM	LPAR 2 - z/VM
Virtual Machine 1 Linux	Virtual Machine 4 Linux
Virtual Machine 2 Linux	Virtual Machine 5 Linux
Virtual Machine 3 Linux	Virtual Machine 6 Linux

CEC 2

LPAR 3 - z/VM	LPAR 4 - z/VM
Virtual Machine 7 Linux	Virtual Machine 9 Linux
Virtual Machine 8 Linux	Virtual Machine 10 Linux

What? (cont'd)

CEC 1

LPAR 1 - z/VM	LPAR 2 - z/VM
Virtual Machine 1 Administrative Linux	Virtual Machine 1 Administrative Linux
Virtual Machine 2 Linux	Virtual Machine 5 Linux
Virtual Machine 3 Linux	Virtual Machine 6 Linux

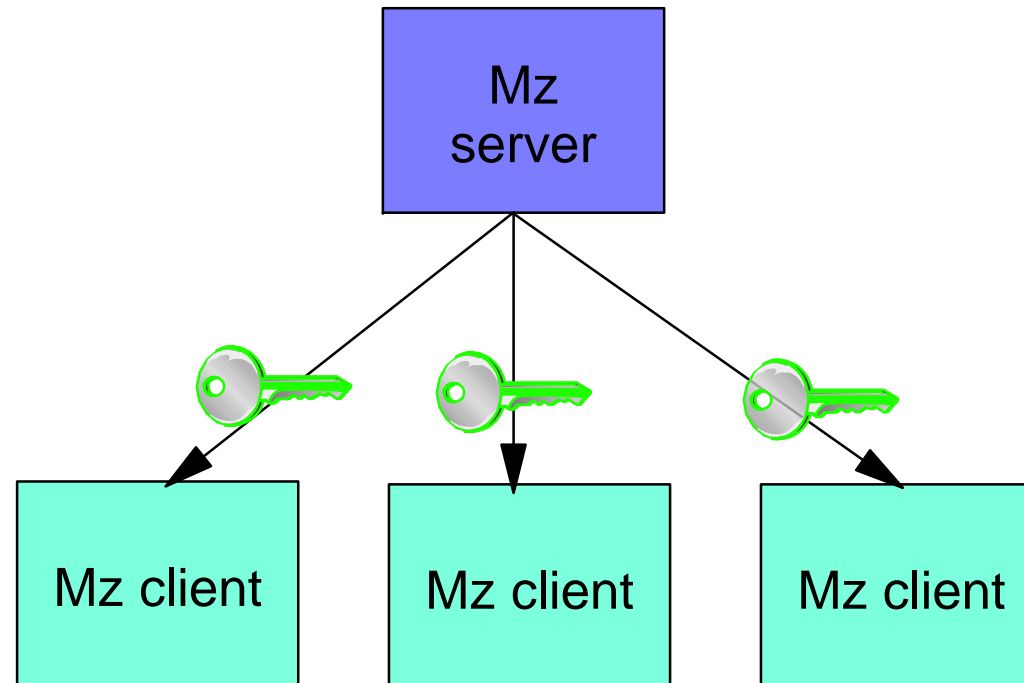
CEC 2

LPAR 3 - z/VM	LPAR 4 - z/VM
Virtual Machine 1 Administrative Linux	Virtual Machine 9 Administrative Linux
Virtual Machine 8 Linux	Virtual Machine 10 Linux

What? (cont'd)

An Mz "server"

CEC 1 LPAR 1 (z/VM)

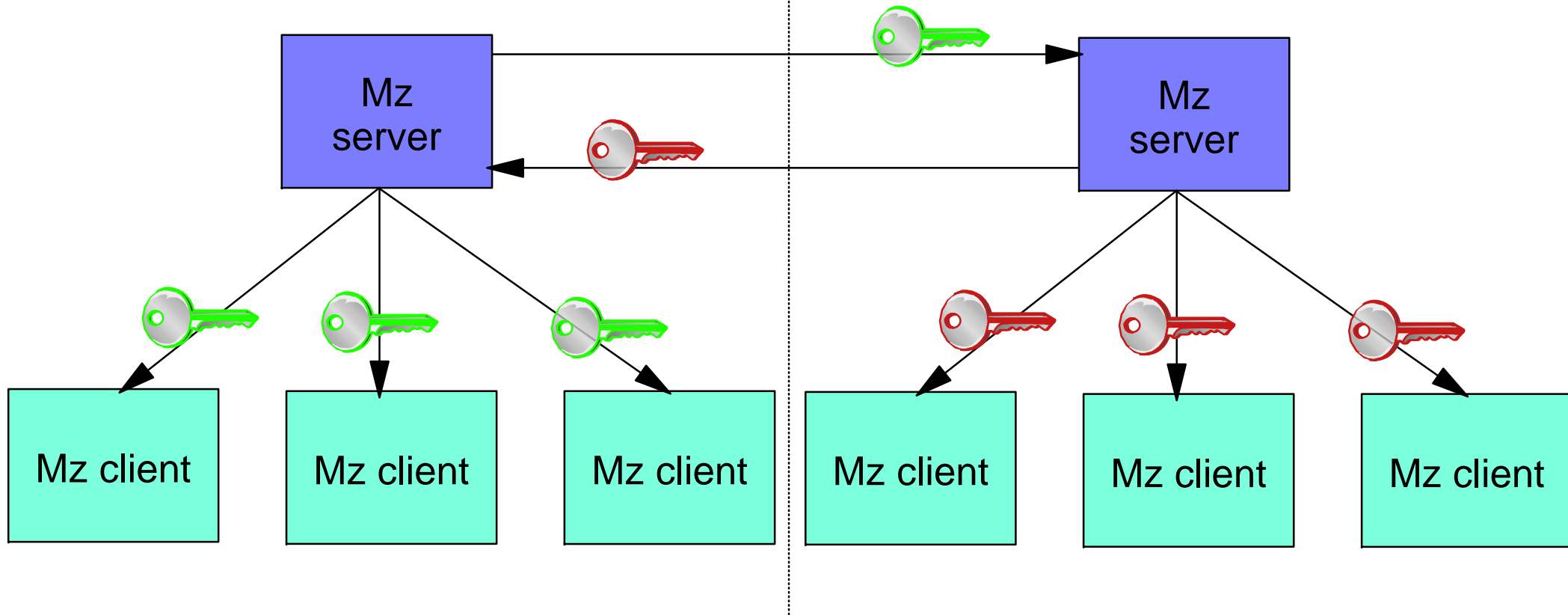


What? (cont'd)

An Mz "cluster"

CEC 1 LPAR 1 (z/VM)

CEC 2, LPAR 1 (z/VM)

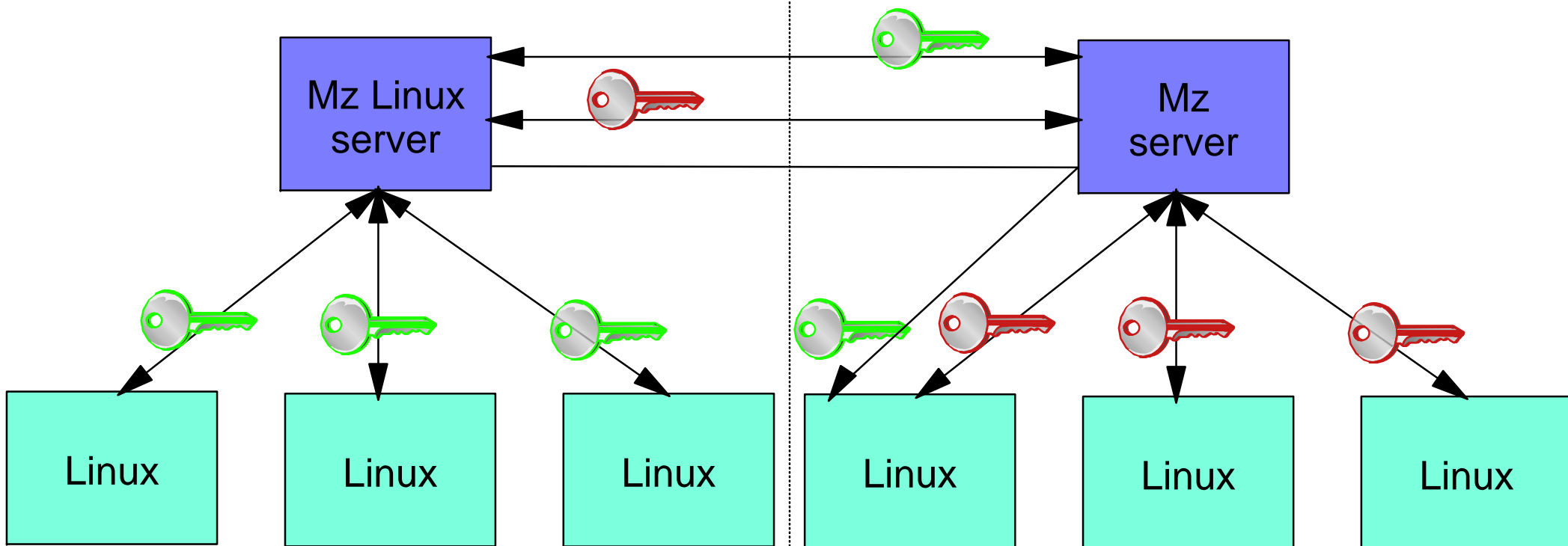


What? (cont'd)

Cross-LPAR/CEC key exchange

LPAR 1 (z/VM)

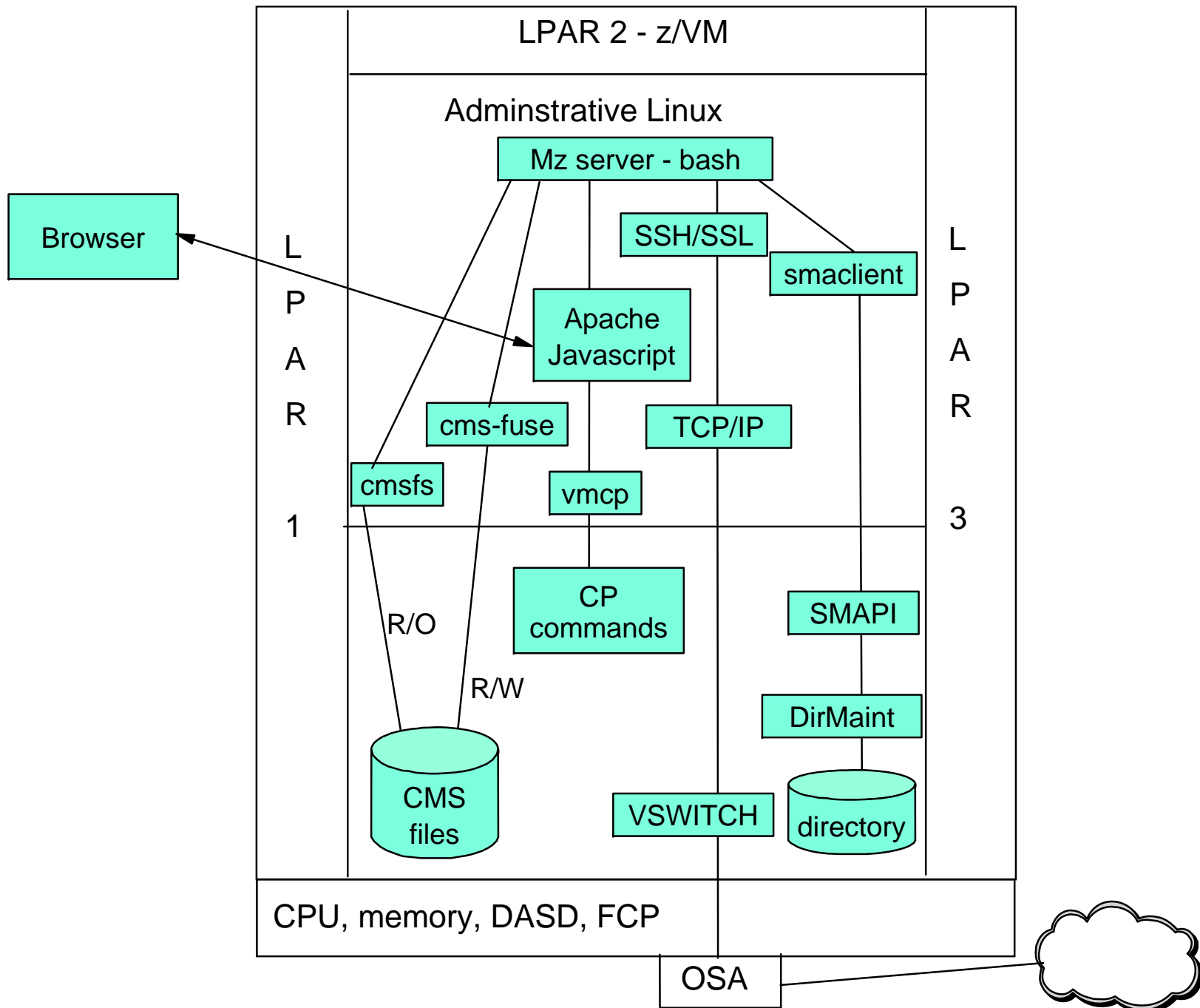
LPAR 2 (z/VM)



Why? What? **Who?** and How?

- Coders
 - ▶ Myself
 - ▶ Marian Gasparovic
 - ▶ Two others (mentioned in the PDF)
- Collaborators
 - ▶ Carlos Ordonez
 - ▶ Alan Altmark
- Supporters
 - ▶ many (mentioned in the PDF)

Why? What? Who? and How?



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Why open source?

- It's the best software development model
 - ▶ Linux is the only cross-IBM-platform operating system (QED)
- To be able to "Release early, release often"
- To enable community contribution
- To be sure it's the best model:
 - ▶ Document reasonably well
 - ▶ Don't put out crap code
 - ▶ Don't abandon and leave dead projects

Function provided

- Captures z/VM and Linux hierarchy cross-enterprise
- Command line interface
 - ▶ Many **mz-verb-object** commands
- Web interface
 - ▶ **mzdevices**: show system devices in a table
 - ▶ **mztable**: show Linux, z/VM systems in a table
 - ▶ **mztree**: show a hierarchy of the tree
 - ▶ **mzhelp**: show a help screen
- **Description** and **owner** fields for all z/VM & Linuxes
- Capture and deploy with OVF
- *No-root* SSH support
- Monitoring
- Shared devices

Function provided

- Mz tree construction
 - ▶ **mzaddclients** - add clients to the tree
 - ▶ **mzmktree** - make an Mz tree
 - ▶ **mzrmclients** - delete client(s) from the tree
 - ▶ **mzrmtree** - delete the Mz tree except for appliances directory
 - ▶ **mzsyncclient** - synchronize an Mz client
 - ▶ **mzsyncserver** - synchronize Linux info on this Mz server
 - ▶ **mzsynczvm** - synchronize z/VM information in the mz tree
- Mz clustering
 - ▶ **mzaddserver** - add an Mz server to form/join an Mz cluster
 - ▶ **mzlsnodes** - list multiple Mz nodes
 - ▶ **mzlsservers** - list multiple Mz servers
 - ▶ **mzlszvms** - list multiple Mz zVMs
 - ▶ **mzrmserver** - remove a server from an Mz cluster
 - ▶ **mzsynccluster** - synchronize all servers in an Mz cluster

Function provided (cont'd)

- Copy, ping and SSH
 - ▶ **mzcpclients** - copy files to Mz clients
 - ▶ **mzcpnodes** - copy files to Mz nodes
 - ▶ **mzcpservers** - copy files to Mz servers
 - ▶ **mzpingclients** - ping multiple Mz clients
 - ▶ **mzpingnodes** - ping multiple Mz nodes
 - ▶ **mzpingservers** - ping multiple Mz servers
 - ▶ **mzsshclients** - executes commands on clients
 - ▶ **mzsshnodes** - executes commands on nodes
 - ▶ **mzsshservers** - executes commands on servers
- Operations
 - ▶ **mzaddcpus** - add virtual CPU(s)
 - ▶ **mzmvclients** - move multiple clients
 - ▶ **mzpoweroffclients** - power off multiple clients
 - ▶ **mzpoweronclients** - power on multiple clients
 - ▶ **mzrebootclients** - reboot multiple clients
 - ▶ **mzrmcpus** - remove virtual CPU(s)
 - ▶ **mzstartclients** - start multiple clients
 - ▶ **mzstopclients** - stop multiple clients

Function provided (cont'd)

- Cloning
 - ▶ **mzcaptureappliance** - create OVF appliance
 - ▶ **mzdeployappliance** - clone OVF appliance
 - ▶ **mzlsappliances** - list appliances in the tree
 - ▶ **mzmkvirtualmachine** - add new virtual machine
 - ▶ **mzrm appliance** - remove appliance from the tree
 - ▶ **mzrmvirtualmachine** - remove a Linux system and virtual machine
- z/VM
 - ▶ **mzqdasd** - query DASD devices
 - ▶ **mzqdevices** - query all devices
 - ▶ **mzqfcp** - query FCP devices
 - ▶ **mzqosa** - query OSA devices
 - ▶ **mzqdirentry** - print a user directory entry
 - ▶ **mzsendcpcommand** - send a CP to z/VMs systems
 - ▶ **mzsetdevices** - set devices in Mz tree from /etc/mz.conf values
- Editing
 - ▶ **mzcatdescription** - print the description file
 - ▶ **mzeditdescription** - edit the description file
 - ▶ **mzcatowner** - print the owner file
 - ▶ **mzeditowner** - edit the owner file

Function provided (cont'd)

- Tree branch listing
 - ▶ **mzlscec** - show a zCEC branch of the tree
 - ▶ **mzlslinux** - show a linux branch of the tree
 - ▶ **mzlsipar** - show a zLPAR branch of the tree
 - ▶ **mzlsystems** - show the systems branch of the Mz tree
 - ▶ **mzlstree** - show the entire Mz tree
 - ▶ **mzlszvm** - show a zVM branch of the tree
 - ▶ **mzlsvirtualmachine** - show a virtual-machine branch of the tree
- Resource listing
 - ▶ **mzlscpus** - list virtual CPU(s)
 - ▶ **mzlsdasd** - list DASD on Linux systems
 - ▶ **mzlsdisk** - list DASD and FCP/SCSI disk on Linux systems
 - ▶ **mzlsfilesystems** - list on Linux systems
 - ▶ **mzlsmemory** - list memory on Linux systems
 - ▶ **mzlsfcpscsi** - list FCP/SCSI disk on Linux systems

Function provided (cont'd)

- Monitoring
 - ▶ **mzaddmonitordata** - Add a set of monitor data
 - ▶ **mzlsmonitordata** - Print all monitor data
 - ▶ **mzrmmonitordata** - Remove all monitor data
 - ▶ **mzsamplemonitordata** - Print a sample set of monitor data
- Other listing commands
 - ▶ **mzcatfiles** - type contents of files in the Mz tree
 - ▶ **mzfindobjects** - list file and directory names in the Mz tree
 - ▶ **mzlscecs** - list multiple Mz zCECs
 - ▶ **mzlslpars** - list multiple Mz zLPARs
 - ▶ **mzlsclients** - list multiple Mz clients
 - ▶ **mzlsnodes** - list multiple Mz nodes
 - ▶ **mzlszvms** - list multiple Mz zVMs
 - ▶ **mzlservers** - list multiple Mz servers
 - ▶ **mzlstree** - show the entire Mz tree

Function provided (cont'd)

- RPM commands:
 - ▶ **mzdiffrpms** - compare RPM information
 - ▶ **mzrpmsyncnodes** - synchronize RPM info on Mz nodes
 - ▶ **mzrpmsyncclients** - synchronize RPM info on Mz clients
 - ▶ **mzrpmsyncservers** - synchronize RPM info on Mz servers
- Error and log file commands:
 - ▶ **mzcaterrorfile** - list the Mz error file
 - ▶ **mzcatlogfile** - list the Mz log file
 - ▶ **mzrmerrorfile** - delete the Mz error file
 - ▶ **mzrmlogfile** - delete the Mz log file

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Command line vs. Web interfaces

- CLI is
 - ▶ function-centric for the sysadmin
- Web interface is
 - ▶ R/O except **Description** and **Owner** fields
 - ▶ Richer in drill down capabilities?

Documentation

- One manual as a PDF (~60 pages)
- Help flags
- CLI help command
- Web help page
- No man pages (yet)

One more question

- **Q.** Is or will Mz be cross-platform?
- **A.** No, possibly
- **Potter's rule of systems management:**
 - ▶ "The temptation in systems management is to try to abstract function and code across platforms. Resist that temptation - it is better to drill down into a platform-specifics sooner rather than later."
- **However, `/var/lib/mz/systems/` could be**
 - ▶ `/var/lib/mz/systemz/`
 - ▶ `/var/lib/mz/systemp/`
 - ▶ `/var/lib/mz/systemx/`
- **mzlstree** could also be **mplstree** and **mxlstree**
 - ▶ (some day, but I'm not coding it :))

Demonstration

- Network dependent...

System z hierarchy (cont'd)

