Cloning Linux with z/VM

Session 9206
Richard Troth, BMC Software
This Session

› Cloning Concepts
› Overview of MAINVIEW for VM Systems Cloning
› Evolution and Development
› Related Info and Contact Info

MAINVIEW for VM System Cloning == VCT
Cloning Linux with z/VM

About Us …

▶ About BMC
  ▪ 3270 Optimizer, 1980
  ▪ z/OS biz, “distributed” biz, but always BSM
  ▪ MAINVIEW, Patrol, Control/*, Remedy, Marimba, …

▶ About Rick
  ▪ VM/SP 1982, VM/HPO, VM/XA, VM/ESA, and … z/VM!
  ▪ Unix circa 1985 (UTS on VM)
  ▪ Linux since 0.99, even for development (UFT)
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Linux Cloning – made easy
Linux Cloning – made easy
Linux Cloning – made easy
Cloning Linux with z/VM

V12N is the new game

- I18N == Internationalization
- V12N == Virtualization

Please don’t speak with your mouth full! ☺
The Cloning Life of a System Administrator

› Create v-machine and install Linux
  ▪ This is a lot of work you don’t want to repeat
› Define second v-machine like first
› Copy all “private” disks
› Arrange networking for the clone
› Within the newly cloned image, set new identity
  ▪ Requires guest OS knowledge or participation
MAINVIEW for VM System Cloning

True Cloning from a single screen – not just a disk copier

› Create and configure new CP Directory entry
› Creates and copies all mini-disks (not links)
› Modifies and activates TCP/IP network connections
› Autolog the newly cloned image
  - Modifies the Linux image configuration and network files
  - Reboots to bring in new configuration

› **Result – a fully operational clone ready for work**
**MAINVIEW for VM System Cloning**

**Key Benefits**

- Independent of MAINVIEW architecture
  - Does not require MVS
- Centralizes and simplifies z/VM cloning
- Eases the pain of using DirMaint or VM:Secure as standalone utilities
- Complements 3rd party VM systems management tools
- Increases the productivity of the IT staff
Simplifies the process of cloning systems, enabling the IT staff (distributed as well as mainframe) to clone Linux instances without having detailed knowledge of z/VM.

Lowers the operational cost of managing z/VM and improves the “time to clone” by 90 percent, enabling the IT staff to be more productive.

Reduces the manual complexity of DirMaint & VM:Secure from over 20 steps to a single input screen.

Priced to sell- Low cost & flat across all zSeries IFL groups.
MAINVIEW for VM Systems Cloning

Top Features

- Ease of use for the expert as well as the novice
- Solves a critical provisioning pain-point
  - Uses DirMaint or VM:Secure behind the scene!
- Centralized management for z/VM
- Scalable and secure
- Offers 3 interfaces (Web, GUI, CMS 3270)
- Provides an API for customer product integration
- Low price point
- Complements 3rd party VM monitors
Need to clone? - We've got you covered!

1. Create VM user account
2. Assign mini-disk to VM user account
3. Minidisks same size (source-target)
4. Same? – use DDR under VM
5. Different sized copy under Linux
   1. dasdfmt
   2. fdasd
   3. Create filesystem – ext2/3
   4. mkReiserFS
   5. Mount new filesystem
   6. Copy from the old filesystem: tar or cpio
6. RH or Novell-SuSE?
   1. mknitrd
   2. chccwdev – e <devno>
   3. Adjust /etc/zipl.conf
   4. zipl
7. Adjust variables: hostname, network, config files
8. Network additions or modifications
9. Shutdown & reboot

Cloning a Linux partition has over 19 steps and could take more than 1 hour to complete

MV-VM Systems Cloning
1. Single screen for input
2. Hit enter
Done in 10 minutes!!

1 hour vs. 10 minutes !!!!
VCT User Interfaces ...

- HTML/REXX/Pipes web interface
- Tcl/Tk based GUI interface
- use the same engine as text mode uses
Cloning via 3270

Source Image Name: LINUX0
Clone Image Name: LINUX1
Password:

IP Addresses:
- Clone: 172.10.23.79
- Peer: 172.10.18.20
- DNS: 172.10.27.119
- Domain: BMC.COM

TCP Name: TCPIP
Config: TCPIP
DTC Parms: BBSYSC
Auto update P

CTC Start: 800
End: 808

DASD Pool: LNXPOOL

Master Shared Filesystems

Select one of the following: Derived X or Master _ /usr N /opt N

Optional Parameters:
Virtual storage size: ___ CPU's 1

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Cloning via GUI

MAINVIEW for VM Systems Cloning

Source image name: [ ] Select
Clone image name: [ ] Password: [ ]

IP address: [ ] Resolve from clone hostname
Peer address: [ ] Resolve from source config
Domain: [ ]
Nameserver: [ ]
TCP Name: [ ] TCP Prof: [ ] DTCParms: [ ]
CTC Start: [ ] End: [ ]
DASD Pool: [ ]

- Master (not sharing) or plain copy
- Master to share /usr
- Master to share /opt
- Derived

Virtual storage size: [ ] CPUs [ ]

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Cloning via HTML Form (Web Form)

BMC VM Cloning Tool

Source image name: eifs390d
Target image name: eifs390n  Password: *****
IP address: 192.168.106.212  Peer: 192.168.106.193
DNS: 172.17.19.252
Domain: bmc.com

TCP Name: vmtcip  Config: vmdtcp
CTC Start: End:
DASD Pool: pool2

Select one of the following:
- Master (not sharing)
- Master to share /usr
- Master to share /opt
- Derived

Optional Parameters:
MAINVIEW for VM Systems Cloning

- Can be called via API using languages such as:
  - REXX (both CMS and Regina), Perl, Tcl
- Create, view, delete and maintain Linux instances via the API
- Utilizes standard hypervisor utilities
  - DirMaint, VM:Secure
- Start/Stop Linux instances (Start/Stop any guest OS)
- Guest networking via VM TCP/IP or GLAN or VSWITCH
- Manage VM user accounts via API
  - create, view, modify, delete
VCT Hypervisor Server

Remote web/HTML clients

Remote VCT clients

Local VCT clients

Operating Systems:
- Windows
- Linux
- Solaris

Applications:
- VM TCP/IP
- VCT HS
- CMS
- Linux
- DirMaint
- VM:Secure

Workers:
- websrv
- worker
- worker
**VCT HS Configuration**

```
**************************************************************
* CONFIGURATION FILE FOR VCTHSRVR                          *
**************************************************************

ACCESS 100 LOG
KEEP 5 LOG FILES
KEEP 5 STATUS DAYS
DIRECTORY VMSECURE VMSECURE POOL1 POOL2
TCPIP TCPIP 1333
GRANT ADMINISTRATOR TO MAINT @VMC @SYSCIBM @syslexia
GRANT ADMINISTRATOR TO troth rtroth lwd ldinwidd ldw lwetmore
grant administrator to @powhatan @tenforward @superman
grant administrator to @cowboys @texans @eifp390 @eifalpha
grant administrator to @color scarl jasmith chap pkloves kearp
grant administrator to rhiggin jott kminter mkarier
GRANT OPERATOR TO MAINT
IDENTIFY SERVERS VCTHSRVR
IDENTIFY WORKERS VCTHSWK1
IDENTIFY WEBSERVERS VCTHSWEB:1990 troth:1990
```
# default
VCTHSRVR='VCTHSRVR VCTHSRVR'
export VCTHSRVR

# via IUCV
VCTHSRVR='vmid service'
export VCTHSRVR

# via TCP/IP
VCTHSRVR='vmhost vchtsport'
export VCTHSRVR
MAINVIEW for VM Systems Cloning

- Uses CP Directory for all v-machine definitions
  - Does not require a separate database
  - Exception: “hostinfo” files on 191 disk
- HS runs entirely on z/VM
  - Does not require Linux
  - Embedded web server for CGI
- Independent clients for CMS and Linux
- Client/Server using TCP/IP or IUCV
- Linux component installs via RPM
REXX (CMS and Regina)

rc = vcths("start", vmid, "REPLYVAR")
If rc ^= 0 Then Say replyvar

Tcl/Tk

vcths start vmid

Perl

$rc = vcths("start", "$vmid", "REPLYVAR");
print "$REPLYVAR\n";
Cloning Linux with z/VM

The Clone Identity ...

- GHINFO function in VCT
- File on 191 minidisk

NAME=MYLINUX1
IPADDR=1.2.3.4
NAMESEVER=1.2.3.1
...
CMS FS for Identity File

- HS runs CMS
- Source must have a 191 (CMS formatted)
- `vmid HOSTINFO` (plain text, `var=value`)
- Not limited to Linux clones
AF_IUCV for HS connect and Identity Function

- Socket Family for Linux
- Same as CMS AF_IUCV
  - Compare to AF_INET
- Client Only
- Not limited to VCT product
- Module Source (next release)
AF_IUCV versus AF_INET

#include <sys/types.h>
#include <sys/socket.h>

int s1;  /* file descriptor for the socket */
struct sockaddr_iucv sadr;  /* “address” */

s1 = socket(AF_IUCV, SOCK_STREAM, 0);
/* ... fill-in the sockaddr ... */
rc = connect(s1, &sadr, sizeof(sadr));
/* ... now do reads and writes ... */
close(s1);
The MAINVIEW VM-Linux Advantage

- MAINVIEW for VM Systems Cloning
- MAINVIEW for Linux Servers
- MAINVIEW Performance Assurance

- Provisioning
- Monitoring
- Capacity planning
Who to Contact

▶ Kathy Klimpel – Product Marketing Manager
  713-918-xxxx; Kathy_Klimpel@bmc.com

▶ Rachel Krezer – Product Line Manager
  713-918-3717; Rachel_Krezer@bmc.com

▶ Richard Troth – Product Developer
  713-918-1180; rtroth@bmc.com

Please take a free copy. Leave your business card if you would like to be contacted with more information.
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