The Penguins Have Landed

Getting started with Linux on System z at Shelter Insurance

Mark Workman
Shelter Insurance Companies
Shelter Insurance

- Midwest - 13 states
- Property and Casualty
- Life
- Reinsurance
- Other holdings
What’s in a Name?
Or maybe…

- Herding z Penguins
- Hording the Penguins
- Penguin Roundup
- Who’s your Penguin?
- Penguins o’ Plenty
- Spanking the Penguins
- Penguins R Us
The Penguins Have Landed

- Why Penguins (Linux)
- Nesting the Penguins
- Feeding the Penguins
- Protecting the Penguins
- Working the Penguins
- Hatching new Penguins
Why Penguins
Why Penguins...

- Linux on System z
  - Ten year old technology
  - Linux virtual servers under z/VM or in an LPAR

- Virtualization
  - More with less
  - Extreme Virtualization
...Why Penguins...

- Software Licensing
  - IBM Processor Value Units (PVU)
  - Per “core”
  - Distributed servers
    - Many servers
    - Many cores
  - System z servers
    - Few physical servers, cores
    - Many servers per core

- Power and cooling
…Why Penguins

• Really cool DR Model
  – Recover entire system
  – IPL Hypervisor (z/VM)
  – Customize environment
  – IPL Servers
  – Faster Recovery Time

Objective
…Why Penguins

• Architectural
  – Application closer to data
  – Applications closer to each other
  – Positioning for SOA
Nesting the Penguins
Nesting the Penguins

• System z Hardware
  – z/OS & z/VM support
  – Linux support
• Networking
• Virtualization
  – z/VM Hypervisor
  – CPU
  – DASD
  – Memory
z/VM Hypervisor

- Evolved from IBM’s VM/370
- Forty years of evolution
- Other uses
  - Virtualize IBM Virtual Storage Extended (VSE)
  - PROFS / OfficeVision (email of 1980s and 1990s)
  - Application development
  - Run-time environment
  - Predecessor to PR/SM

```
z/VM ONLINE

/  VV    VVV    MMM  MMM
/  VV    VVV    MMM  MMM
ZZZZZZZ /  VV    VVV    MMM  MMM
ZZ      /  VV    VVV    MM  MMM  MM
ZZ      /  VVVVV    MM  M    MM
ZZ      /       VVV    MM       MM
ZZZZZZ /        V        MM       MM

built on IBM Virtualization Technology
```

Fill in your USERID and PASSWORD and press ENTER
(Your password will not appear when you type it)
USERID ===>
PASSWORD ===>
COMMAND ===>
RUNNING
z10 Processor
Linux on System z

Shelter Insurance © 2010
Feeding the Penguins
Feeding the Penguins…

- SLES 11 Linux for System z
  - Build **Template (Gold)** servers
    - Sized by application type
    - Six Gigabyte – basic
    - Thirteen gigabyte – Modest Application
    - Twenty-seven Gigabyte – Larger Application
  - Clone and grow
    - Six or 20 gigabyte increments
…Feeding the Penguins…

• Cloning
  − **SERVER FILE** – list of servers and unique attributes
  − Copy virtual disks of base server to new server
  − Configure with unique server name, IP addresses, etc
  − Provision a new virtual server in five to ten minutes
SERVER FILE

NAME       IP-unique-information
xxx1       ..................  DR Unique Values
ABC1       ..................
SYS2       ..................
MMMn       ..................
etc         ..................

Linux
File System
/etc

Configuration
files

MANUALLY
Edit
File

Build MY INFO

Copy to Linux

z/VM

MY INFO file on EACH server

Linux on System z Shelter Insurance © 2010
Protecting the Penguins
Protecting the Penguins

- Monitoring
  - z/VM Hypervisor
  - Linux Servers
- Alerts
- Storage Management
- Penguin Security
Monitoring…

- You need a tool
  - You have numerous options
- Choose carefully
  - You do not get what you do not pay for
  - Reconcile the difference between virtual and real
How full is my bucket?

Real Bucket
Actual Available CPU
35% used

Virtual Buckets
Perceived Used CPU

100%
10%
5%
20%
Alerts…

• We need to know when
  – Server is down
  – Server is looping
  – File system is almost full
  – System storage is almost full
  – System is too busy
  – Other bad stuff
Generating an Alert

VM/Linux Monitor
Detect the “out-of-bounds” condition

Fix if possible

SNMP

Enterprise Framework
Generate Alert

Incident and Notification

Automate

@# $% &*
Penguin Storage

• z/OS Management
  – All existing processes
  – Allocating and Managing DASD volumes
  – Backup
  – Restore
  – Recovery

• z/VM Management
  – Assign DASD volumes to servers
  – Monitor

• Linux management
  – Logical Volume Manager (LVM)
  – Dynamically enlarge server application storage
Penguin Security

• z/VM Security
  – RACF for VM
  – Independent database
  – Admin use only
  – Logon to 3270 (green screen)

• Active Directory (AD)
  – Integrate Linux servers into existing AD environment
  – Group structure
    • Developer
    • Server Admin
    • System Admin
Samba / Active Directory Integration

Domain Controllers

Validate access to resources

Linux File System

SAMBA server

/opt
EAR/JAR
Logs
Code
Config

Read
Write

WAS Admin
Developer
Linux Admin
Working the Penguins…

- WebSphere Application Server (WAS)
  - Home grown applications
  - Vendor applications

- Provisioning
  - Environments / number of servers
  - Size – depending upon application
  - Clone and Deploy servers
  - Install / verify / implement applications
Penguin Jobs…

- “Shelter Search”
  - WAS 6.1 application
  - Locally Developed
  - Insured / Agent search
  - Multiple environments
  - Previously multiple Wintel servers
  - Moved all environments to Linux 2010
Start your search below. The more info you provide, the better the results will be (and the faster they’ll show up).

Name  Agent Number  District
Ex Smith John  
City  State  ZIP Code
Columbia  MO  65203

Active Agents  Inactive Agents  Employees  DSHs  RSHs
* No Search Criteria Required

Agent Results

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<tr>
<th>Name</th>
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Data Flow

- z10 Processor
- MVS Images in LPARs
- zVM Image in LPAR
- IMS
- CICS
- DB2
- MQ
- PROD
- HiperSocket
- VSWITCH
- IFL
- IFL
- IFL
- GP
- GP
- GP
- ICF
- zIIP
- 88 GB Memory
- Disk
- Tape

HTTP
…Penguin Jobs…

• WebSphere Process Server (WPS)
  – IBM application
  – Work Flow management
  – Enterprise Service Bus (ESB)
  – Enables Service Oriented Architecture (SOA)
Penguin Saves PVUs

- Processor Value Units (PVUs)
- WPS
  - $250,000 for 360 PVUs
  - $?,???,???,??? For 3,200 PVUs
New Penguin Jobs

- **Billing System**
  - Vendor application
  - WebSphere
  - Communications Framework
  - 4Q 2011?

- **Common Services (CSA)**
  - WebSphere
  - Customer Access
  - eCommerce
  - 3Q 2011?

- **Insurance Verification System (IVS)**
  - Internally Developed
  - Law Enforcement can verify status of an insured
  - WebSphere
  - Nevada initially
  - 2Q 2011?
Hatching New Penguins
Hatching new Penguins

- WAS - More of the same
- IBM “Best and Good Fit” lists
Best Fit Application Workloads*

- WebSphere MQ Series
- DB2 Connect
- CICS Transaction Gateway, IMS Connect for Java
- WebSphere and JAVA applications development
- WebSphere - Application Server (WAS), Portal
- Domino
- Network Infrastructure: FTP, NFS, DNS etc.,
- Applications requiring top end disaster recovery model
- Virtualization and Security Services
- InfoSphere/Cognos

*Bill Reeder – IBM Linux for System z Sales and Strategy
Good Fit Application Workloads*

- DB2 (LUW)
- Apache web serving
- SAMBA
- TIM/TAM (LDAP Services)
- TSM

*Bill Reeder – IBM Linux for System z Sales and Strategy
Other things for the future

- Shared WebSphere binaries
- Tools for WAS Admins to serve themselves
- More performance / scalability testing
- Better management of patches
- Move to VM-based backup / recovery
Actual Software Stack

- **z/VM – IBM**
  - Virtualization
  - System management
  - RACF, DIRM
  - SLES – Novell
- **zEPS – Velocity**
  - Monitor
  - Alerts
- **Tivoli Omegamon – IBM**
  - Enterprise Framework
- **Service Desk – CA**
  - Problem and Incident
  - Notification
- **FDR on z/OS**
  - Backup, restore, recover
Lots of resources out there

• Red Books
• Whitepapers
• SHARE presentations
• Linux Forms
• Linux and VM Listserv
• Vendor support
• Existing staff
What we have learned (so far)

• Nothing is as easy as it sounds
• There is no substitute for smart, hard work
• Experience is all about knowing what shortcuts to avoid
• Don’t underestimate cultural challenges
• Do you homework – never stop learning
• Start with the infrastructure
• People - Processes - Tools
The Penguins Have Landed

✓ Why Penguins (Linux)
✓ Nesting the Penguins
✓ Feeding the Penguins
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✓ Hatching new Penguins
Anything Else?

Complex

Counter-Cultural

Opportunity to Learn

Journey – Not a Destination
“Whenever you find yourself on the side of the majority, it is time to pause and reflect.”

Mark Twain
Cheers!

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