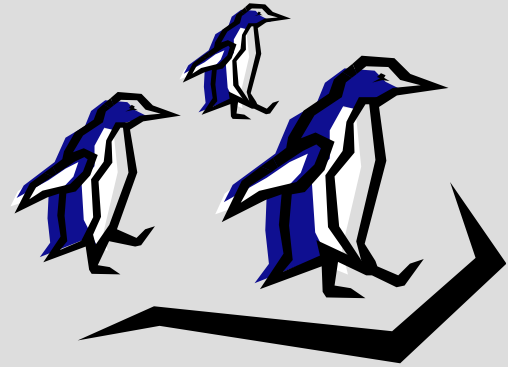


SHARE Session 8554  
Wednesday 3/2, 2011



# The Penguins Have Landed

## Getting started with Linux on System z at Shelter Insurance

Mark Workman  
Shelter Insurance Companies

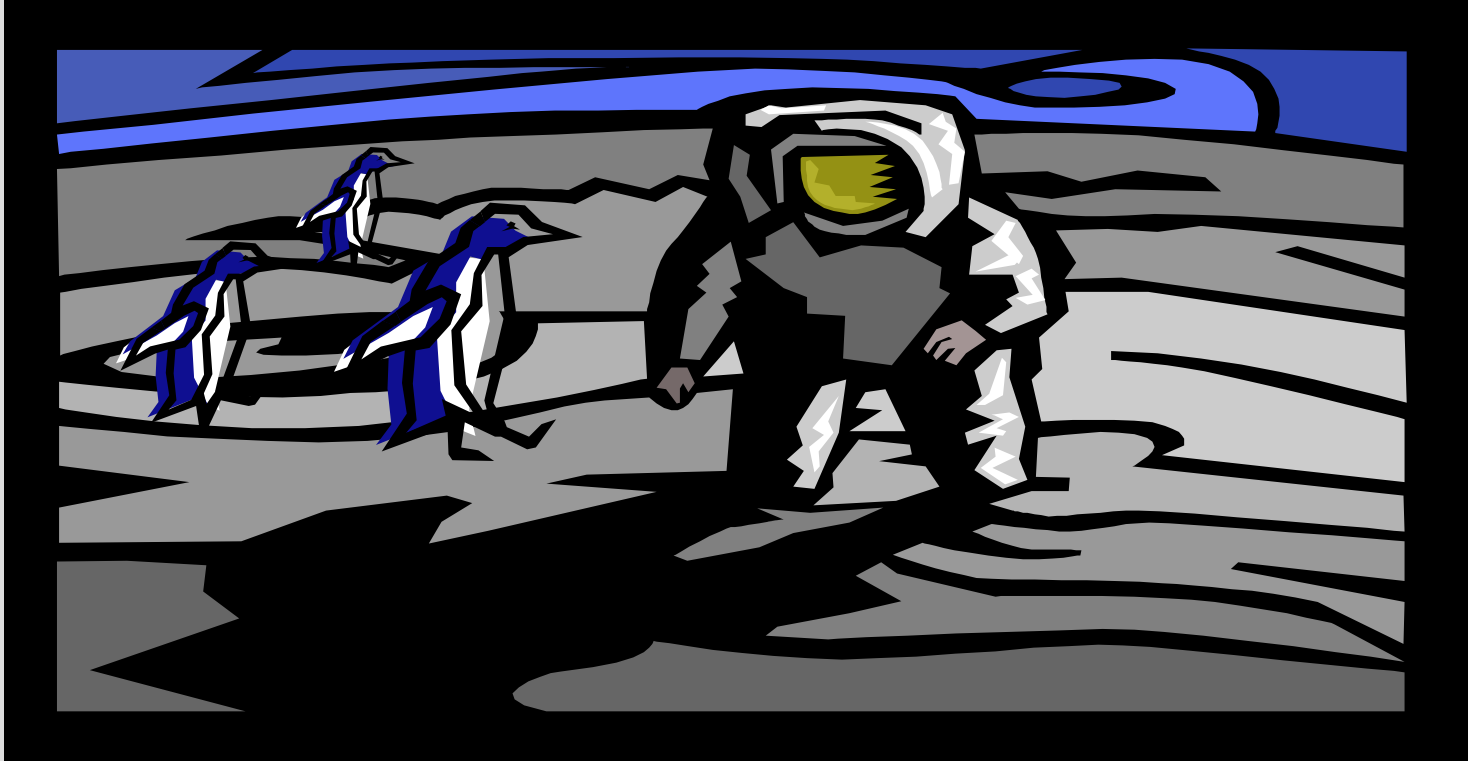


# Shelter Insurance

- 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

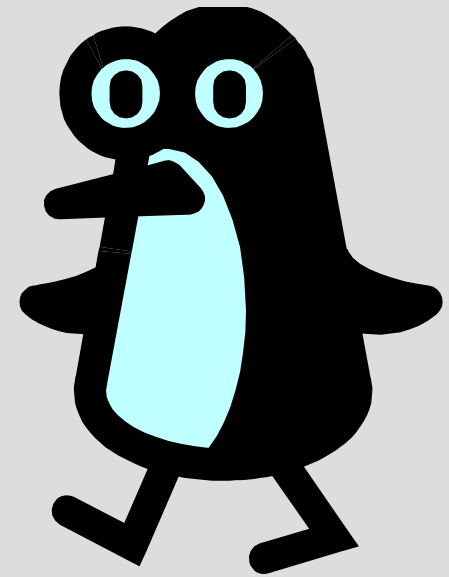


# The Penguins Have Landed

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



# Why Penguins



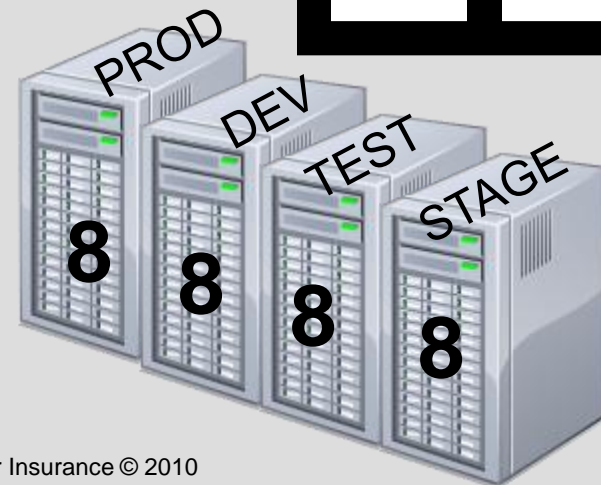
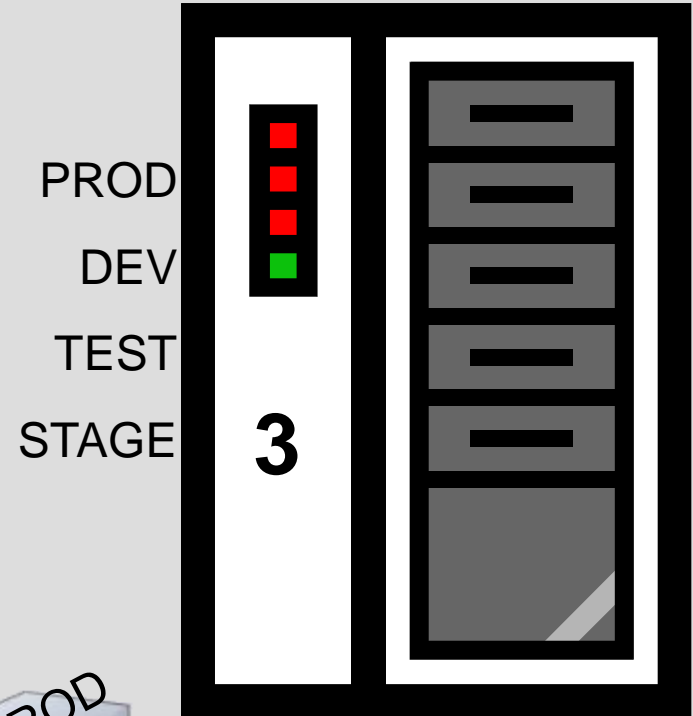
# Why Penguins...

- 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 (e-mail of 1980s and 1990s)
  - Application development
  - Run-time environment
  - Predecessor to PR/SM

```
z/VM ONLINE

                               / VV          VVV MM          MM
                              / VV          VVV  MMM         MMM
                             / VV          VVV  MMMM        MMMM
                            / VV          VVV  MM MM MM MM
                           / VV          VVV  MM  MMM  MM
                          / VVVV         MM  M  MM
                         / VVV          MM          MM
                        / 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 ==>

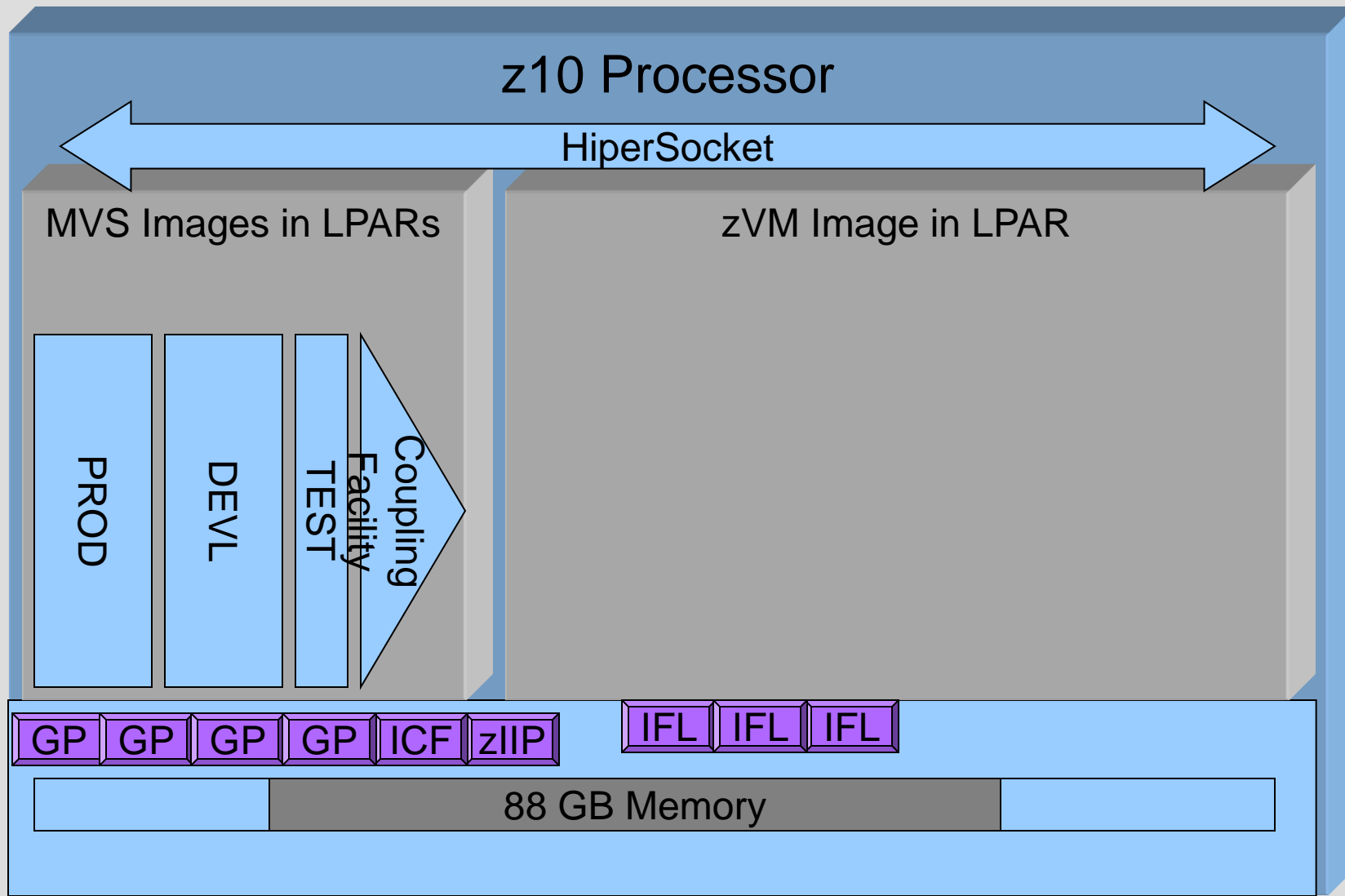
COMMAND  ==>

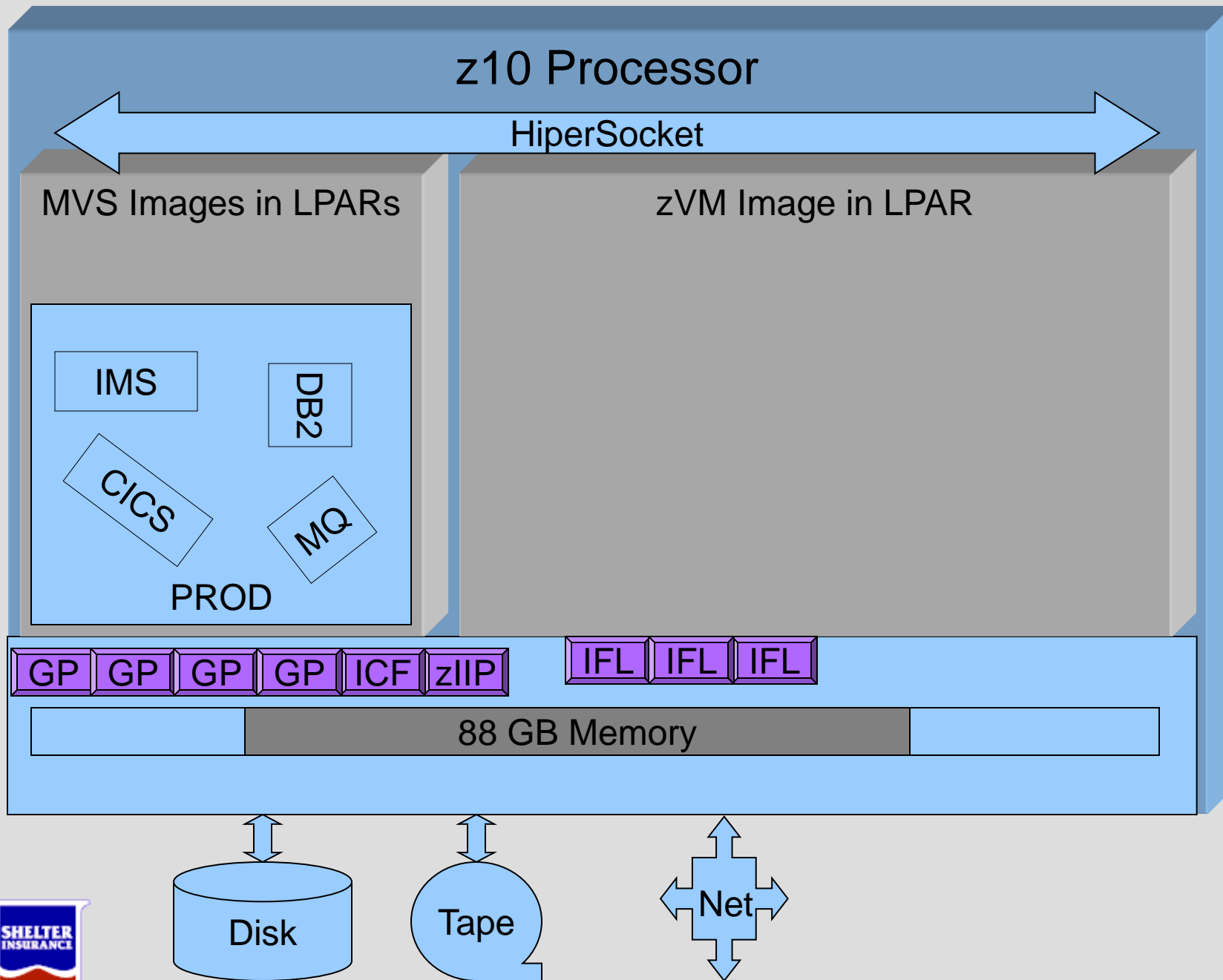
                                             RUNNING
```



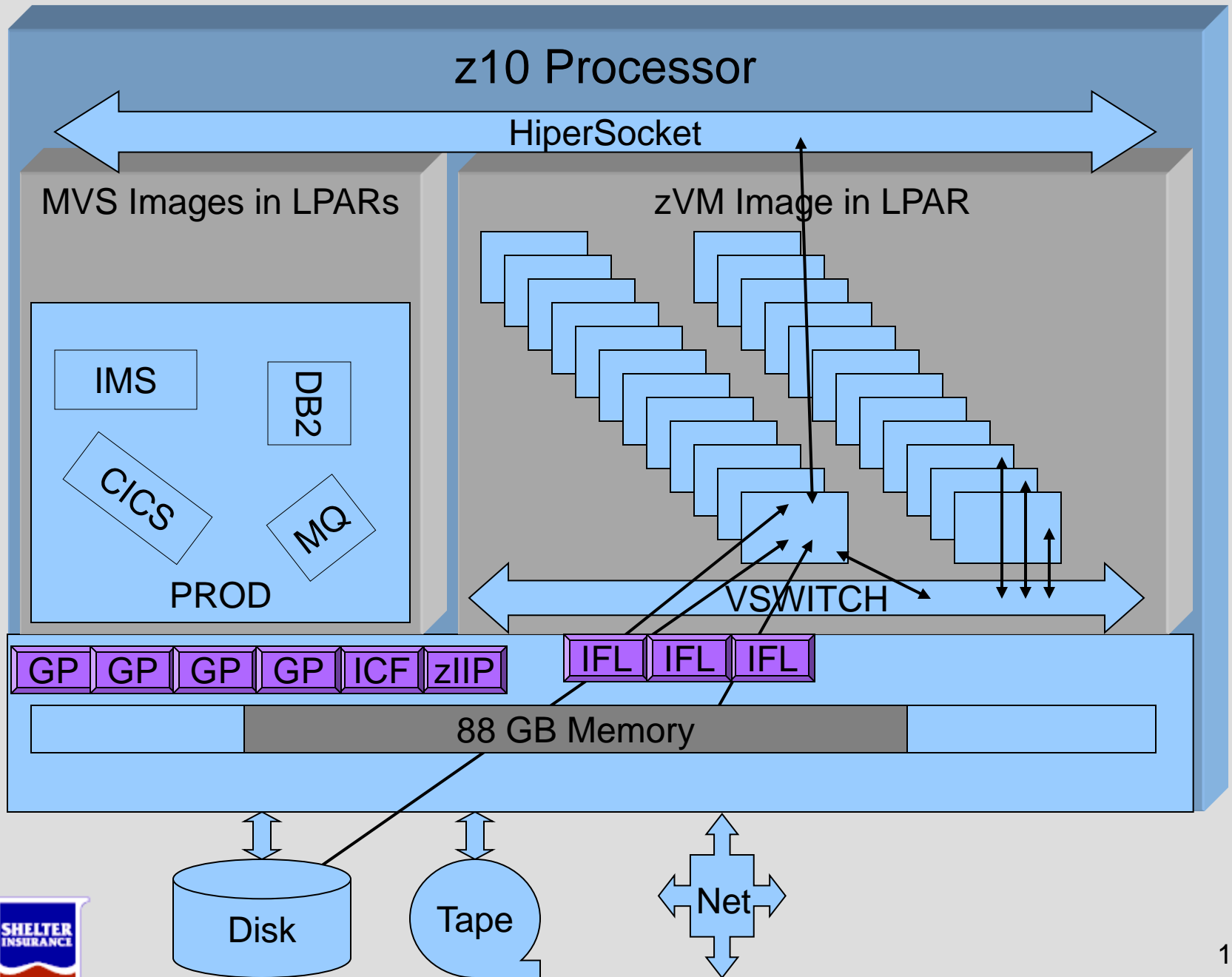
# z10 Processor











# Feeding the Penguins



# Feeding the Penguins...

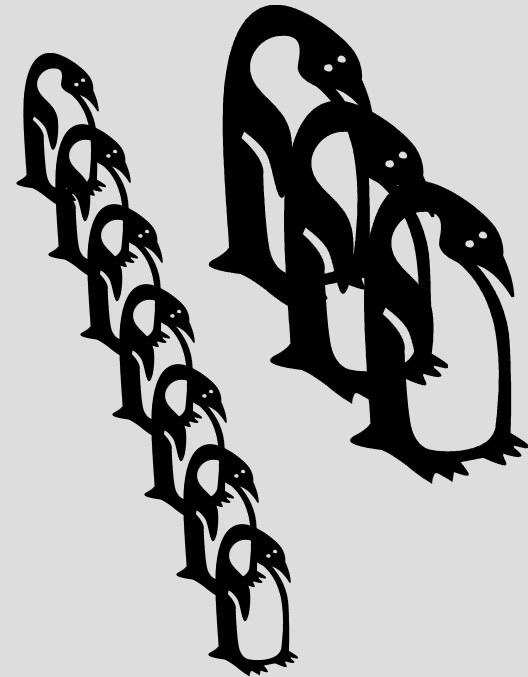
- SLES 11 Linux for System z
  - Build **Template (Gold)** servers
    - Sized by application type
    - Six Gigabyte – basic
    - Thirteen gigabyte – Modest Application
    - Twenty-seven Gigabyte – Larger Application
  - Clone and grow
    - Six or 20 gigabyte increments



# ...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	..... <b>DR Unique Values</b>
ABC1	.....
SYS2	.....
MMMn	.....
etc	.....

Build MY INFO

1)  
Manually  
Edit  
File

MY INFO for  
EACH server

Copy to Linux

Linux  
File System  
/etc  
Configuration  
files

z/VM

Linux



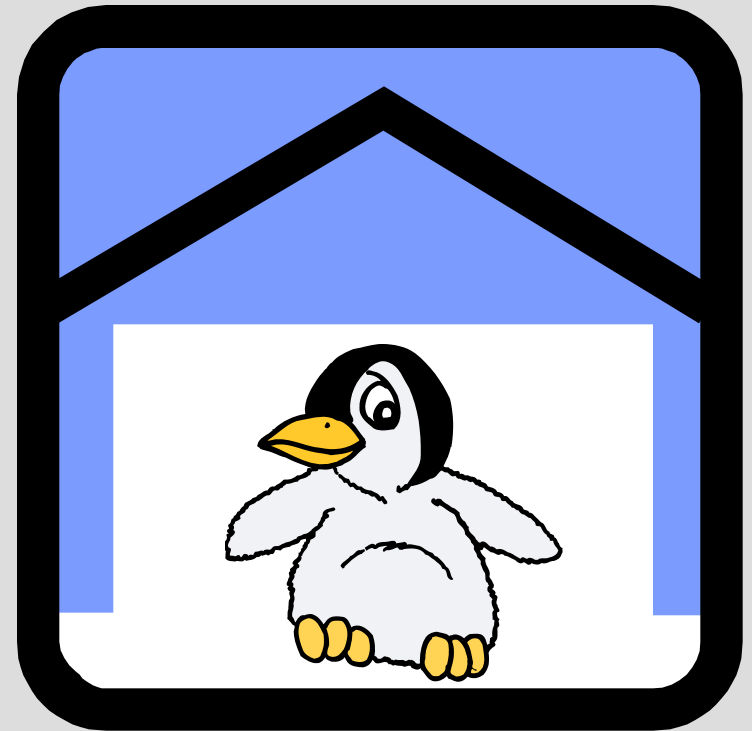


# Protecting the Penguins



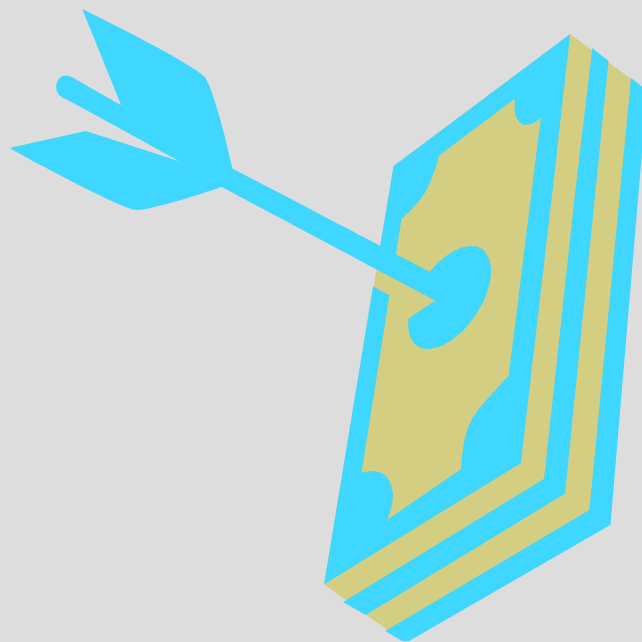
# Protecting the Penguins

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



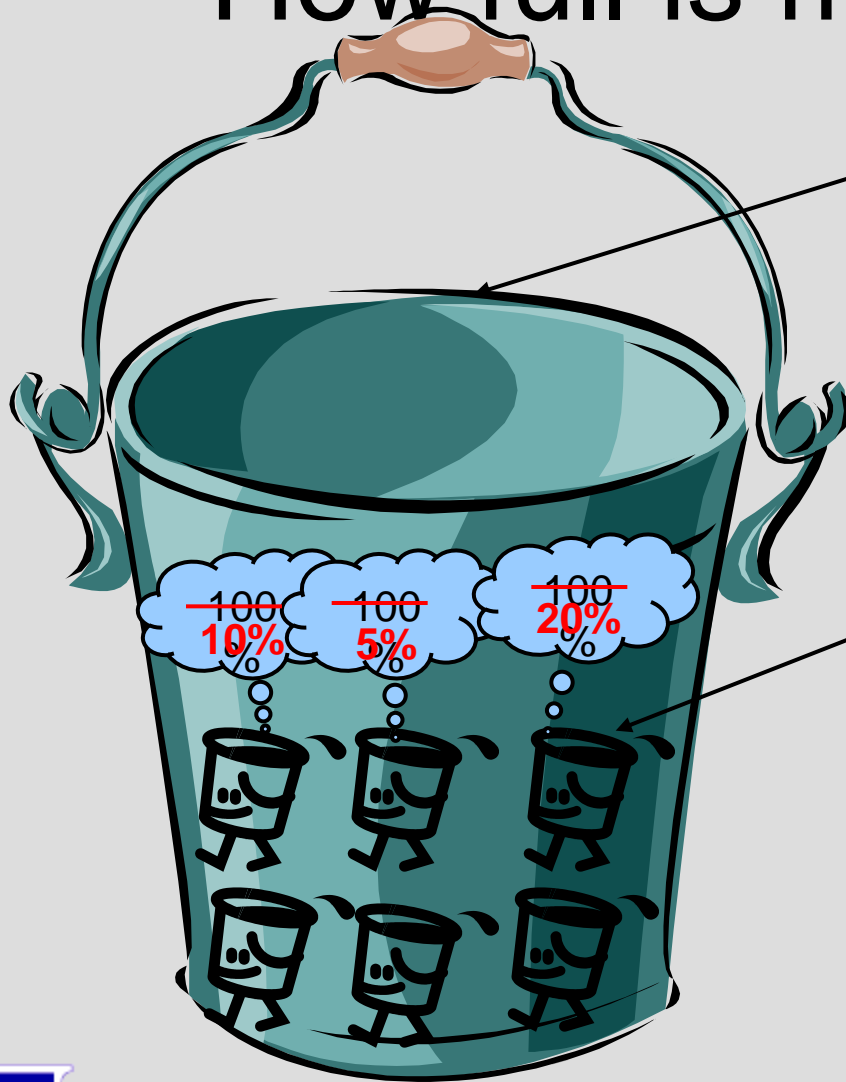
# Monitoring...

- 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

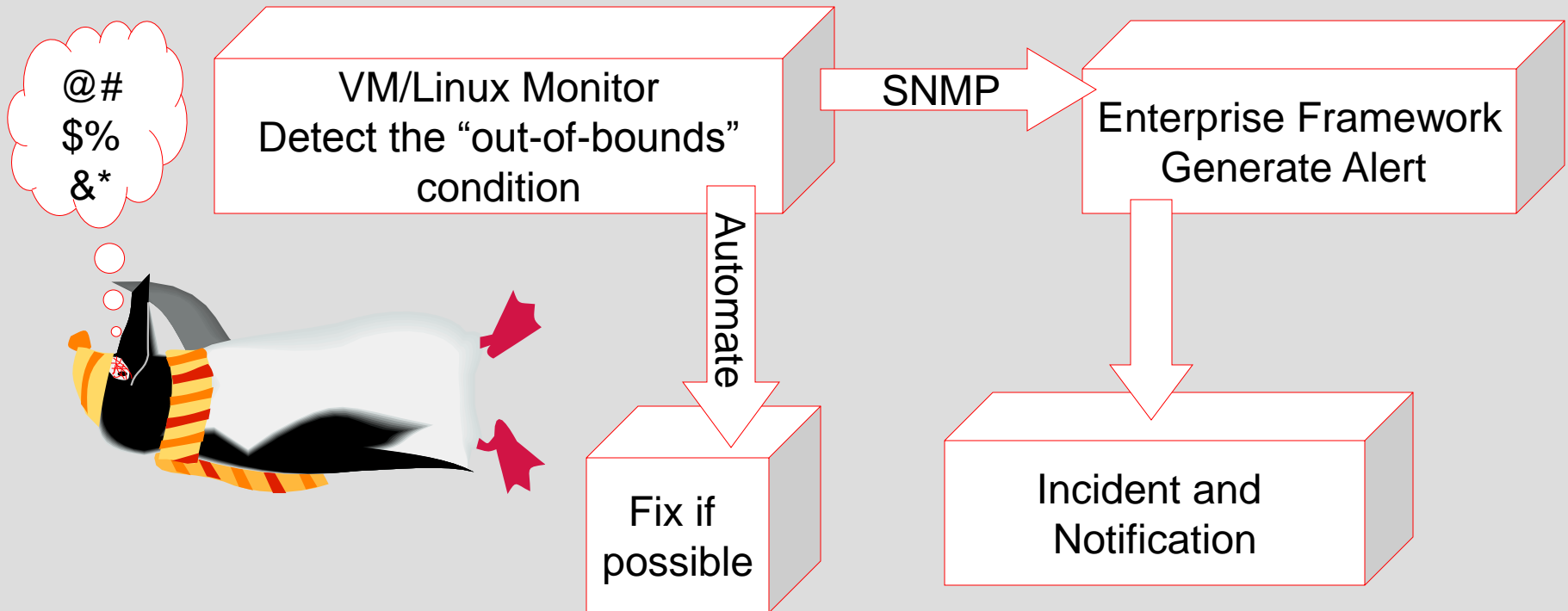


# Alerts...

- 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

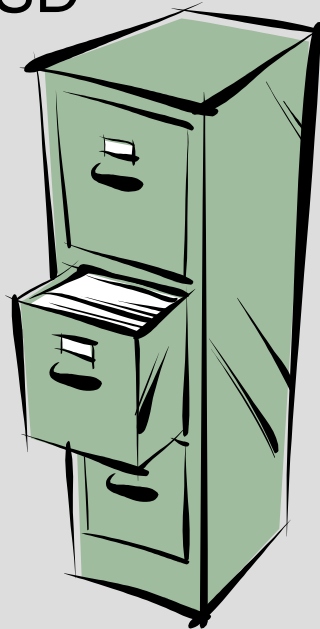


# Generating an Alert



# Penguin Storage

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

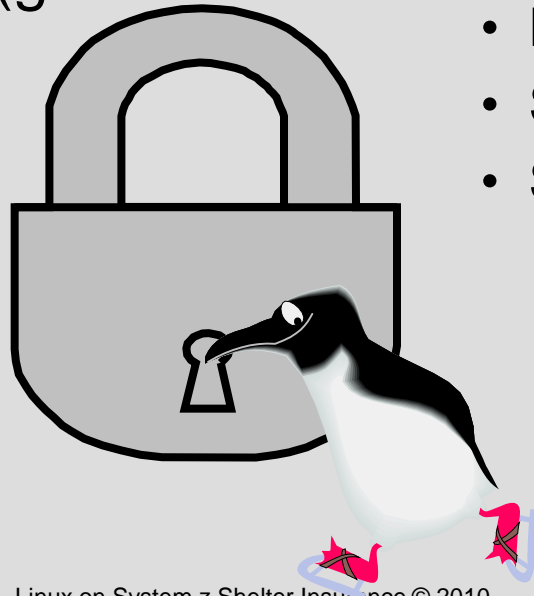


- z/VM Management
  - Assign DASD volumes to servers
  - Monitor
- Linux management
  - Logical Volume Manager (LVM)
  - Dynamically enlarge server application storage



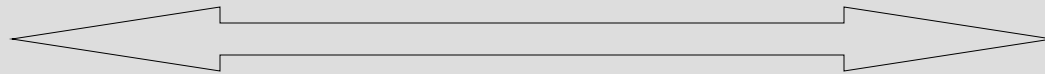
# Penguin Security

- 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

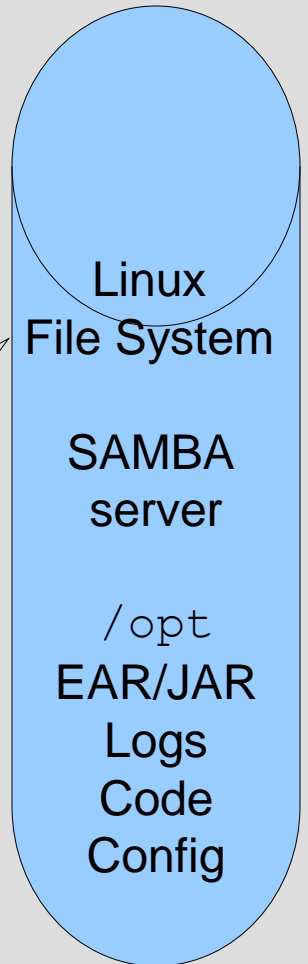


# Samba / Active Directory Integration

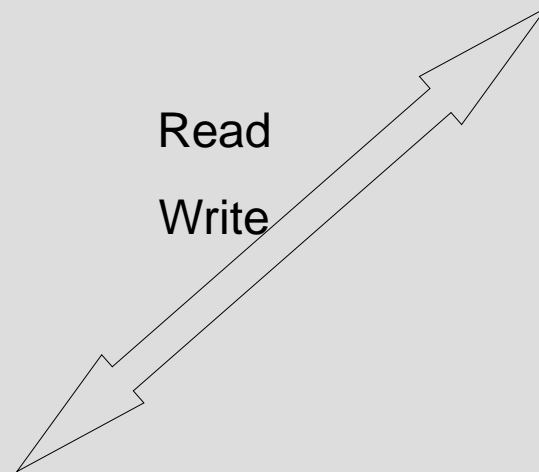
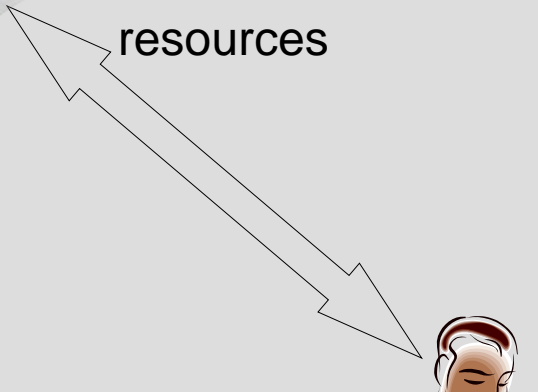
Domain  
Controllers



Validate  
access to  
resources



Read  
Write



WAS Admin  
Developer  
Linux Admin





# Working the Penguins



# Working the Penguins...

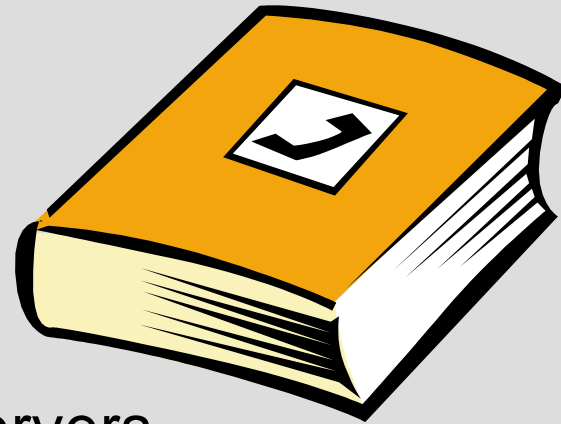
- WebSphere Application Server (WAS)
  - Home grown applications
  - Vendor applications
- Provisioning
  - Environments / number of servers
  - Size – depending upon application
  - Clone and Deploy servers
  - Install / verify / implement applications





# 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).

Family/Policy Number Insured Claimant **Agent** Vendor Life Payor

Name  Starts With Agent Number District

Ex: Smith, John

City State ZIP Code

Active Agents  Inactive Agents  Employees  DSMS\*  RSMs\*

\* No Search Criteria Required

Search

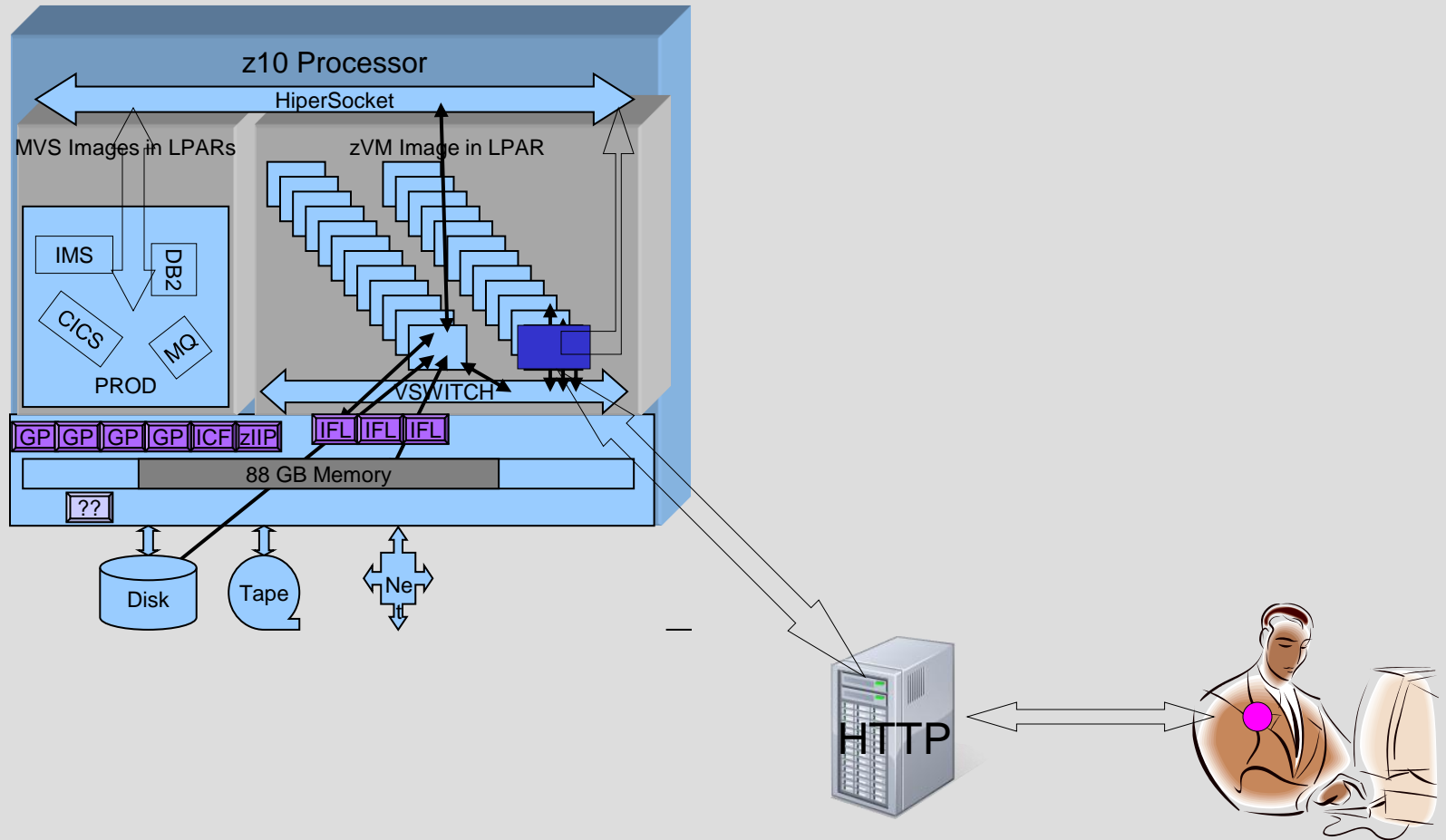
### Agent Results

Show 10 entries

Name	Title	Address	Phone Number	Agent Number	Status
<a href="#">ALLISON, NANCY</a>	Agent	1729 W BROADWAY STE 8 COLUMBIA, MO 65203	573-445-1749	24-D637-40	Active
<a href="#">ASSIGNED RISK</a>	Agent	1817 W BROADWAY COLUMBIA, MO 65203	000-000-0000	24-0300-00	Active
<a href="#">CHUCK WILSON</a>	Agent	1715 W WORLEY STE B COLUMBIA, MO 65203	573-445-8626	24-8395-40	Active
<a href="#">CLINT MILLER INS AGCY LLC</a>	Agent	1408 I-70 DR SW STE 105 COLUMBIA, MO 65203	573-443-7776	24-6399-40	Active
<a href="#">E. A. I. R. PLAN</a>	Agent	1817 W BROADWAY COLUMBIA, MO 65203	000-000-0000	24-0600-00	Active
<a href="#">RICHARDS LUTCF, RALPH</a>	Agent	1812 I-70 DR SW SUITE 200 COLUMBIA, MO 65203	573-445-8661	24-5864-40	Active
<a href="#">ROMA WONNEMAN INS AGCY INC</a>	Agent	1400 FORUM BLVD #9 COLUMBIA, MO 65203	573-446-5808	24-B871-40	Active
<a href="#">SHELTER FINANCIAL BANK</a>	Agent	1817 W BROADWAY COLUMBIA, MO 65203	573-214-4219	24-SB01-99	Active
<a href="#">SHELTER INSURANCE COMPANIES</a>	Agent	1817 W BROADWAY COLUMBIA, MO 65203	573-445-1841	24-0200-00	Active
<a href="#">SHELTER INSURANCE COMPANY</a>	Agent	1817 W BROADWAY	573-445-1841	24-0200-00	Active



# Data Flow



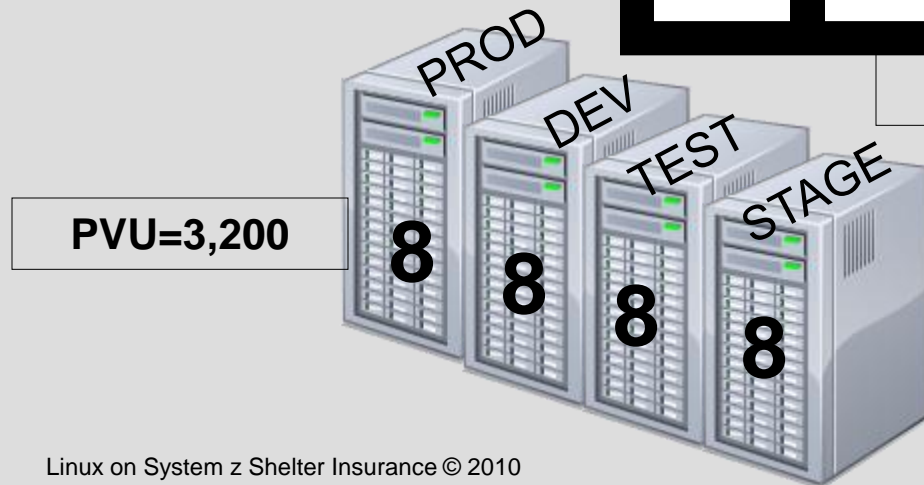
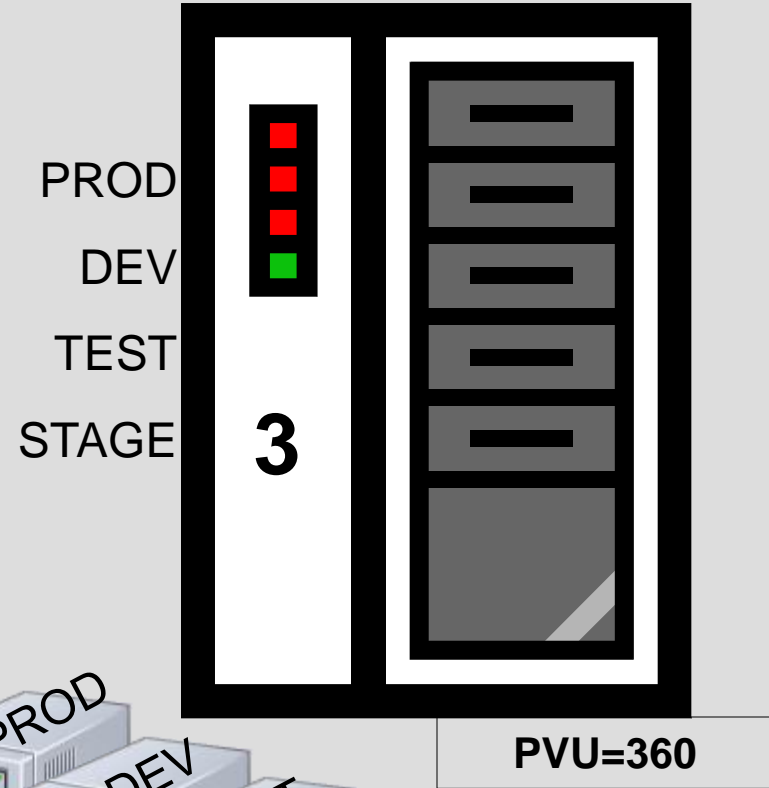
# ...Penguin Jobs...

- 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

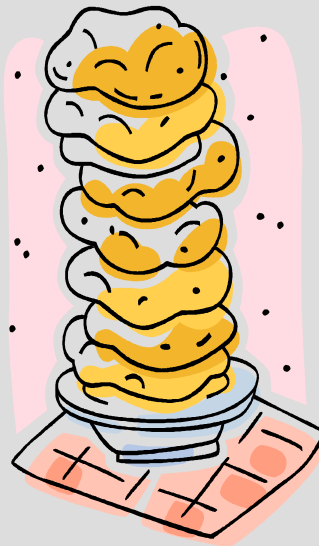
# Other things for the future

- 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 your homework – **never stop learning**
- Start with the **infrastructure**
- **People - Processes - Tools**



# The Penguins Have Landed

- ✓ Why Penguins (Linux)
- ✓ Nesting the Penguins
- ✓ Feeding the Penguins
- ✓ Protecting the Penguins
- ✓ Working the Penguins
- ✓ 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!

Mark Workman

[mworkman@shelterinsurance.com](mailto:mworkman@shelterinsurance.com)

