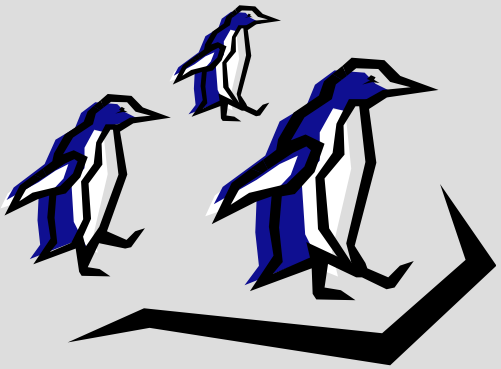
Session 09754



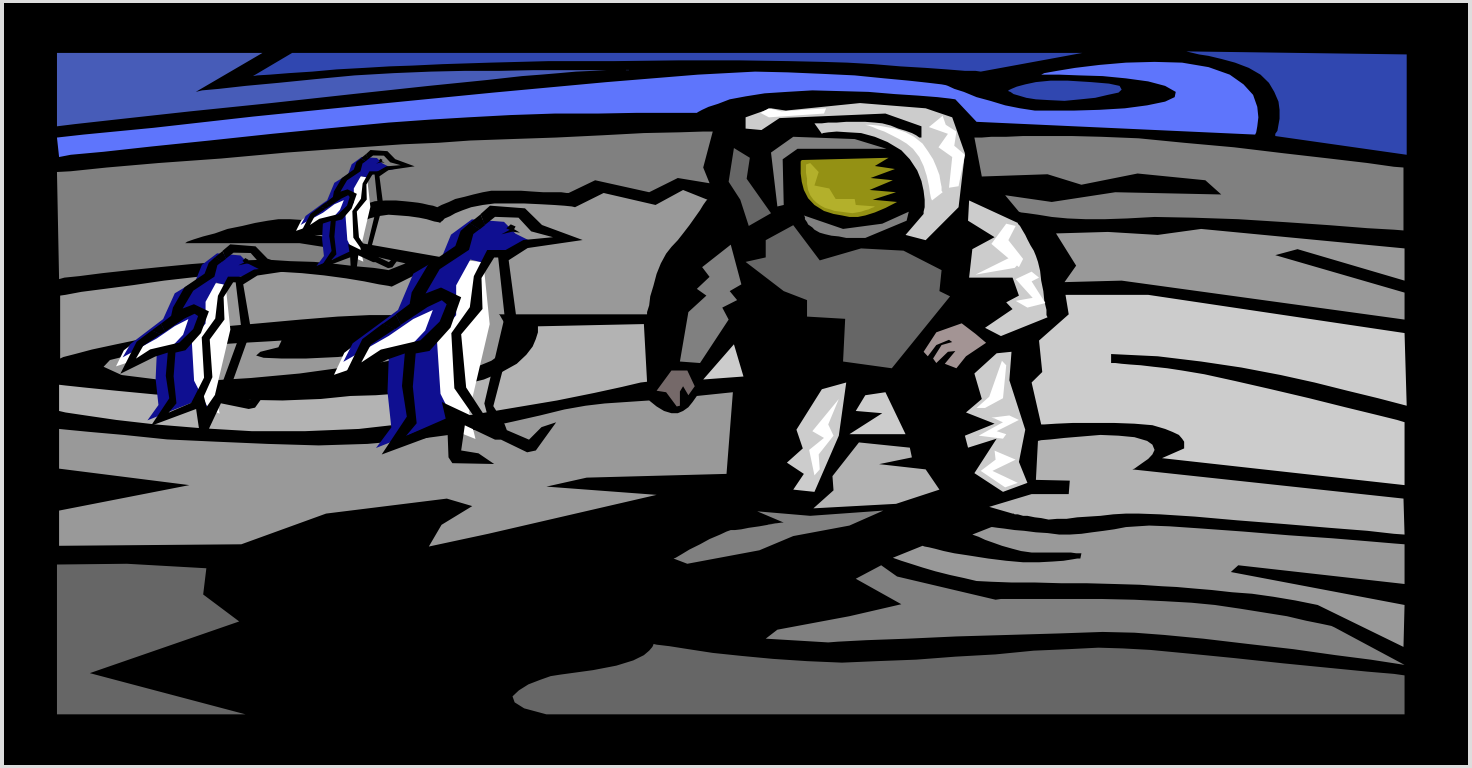
The Penguins Have Landed- Changes and Improvements with Linux on Z at Shelter Insurance

Shelter Insurance © 2011

Shelter Insurance

- Midwest - 13 states
- Property and Casualty
- Life
- Reinsurance
- Other holdings

What's in a Name?

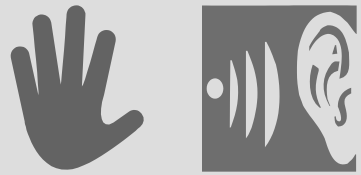


Or maybe…

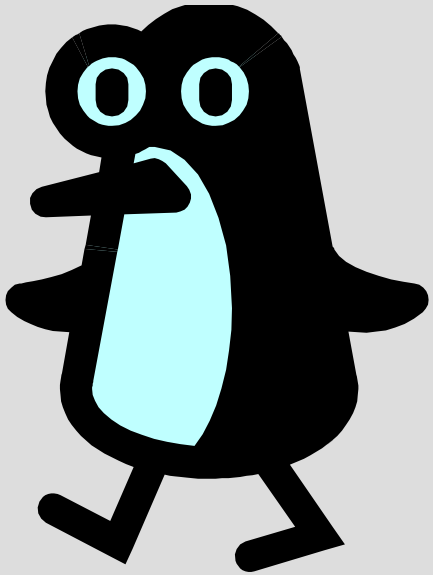
- Herding z Penguins
- Hording the Penguins
- Penguin Roundup
- Who’s your Penguin?
- Penguins o’ Plenty
- Spanking the Penguins
- Penguins R Us

The Penguins Have Landed

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



Why Penguins

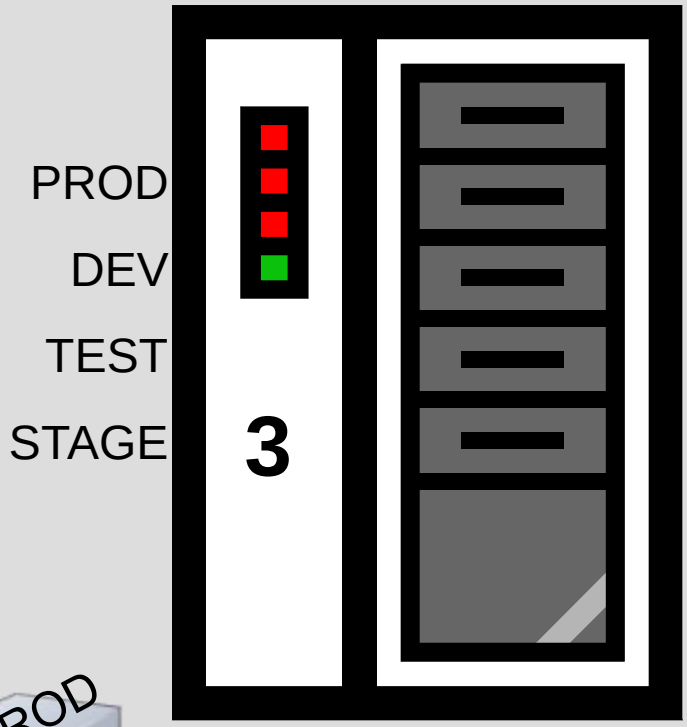


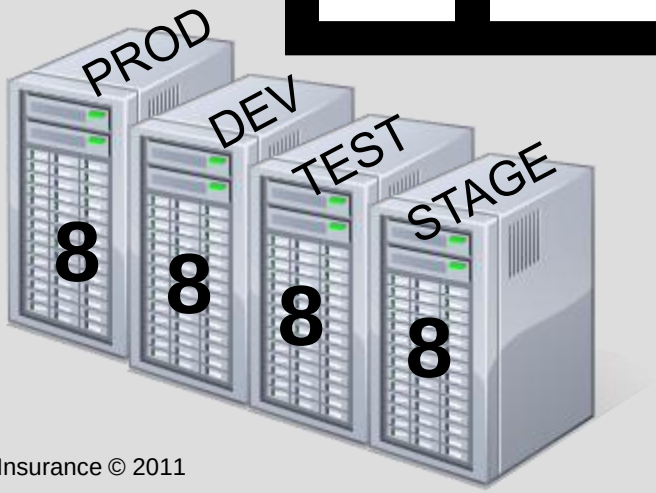
Why Penguins…

- 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

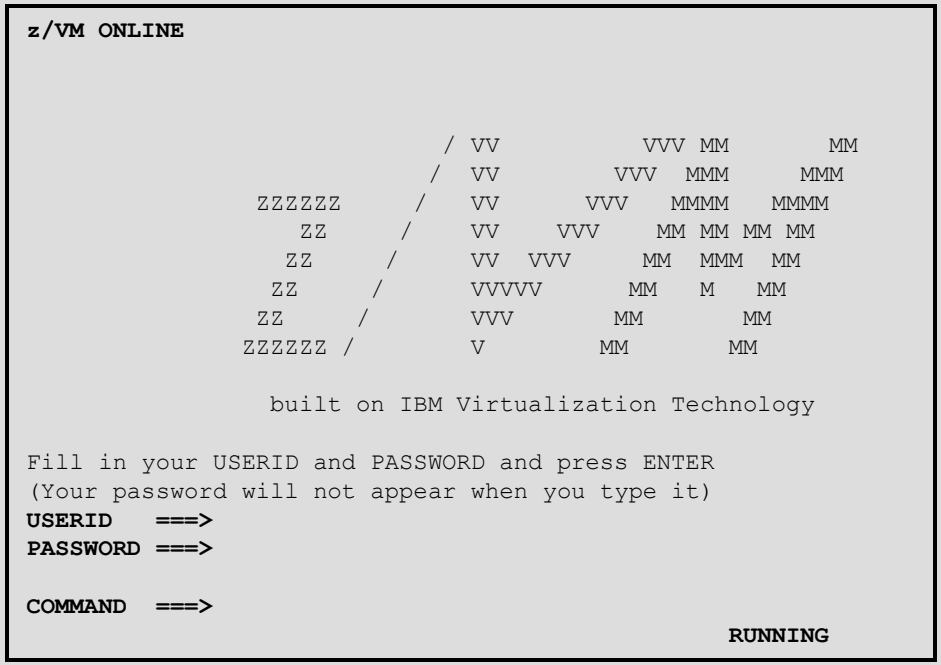
Nesting the Penguins

Nesting the Penguins

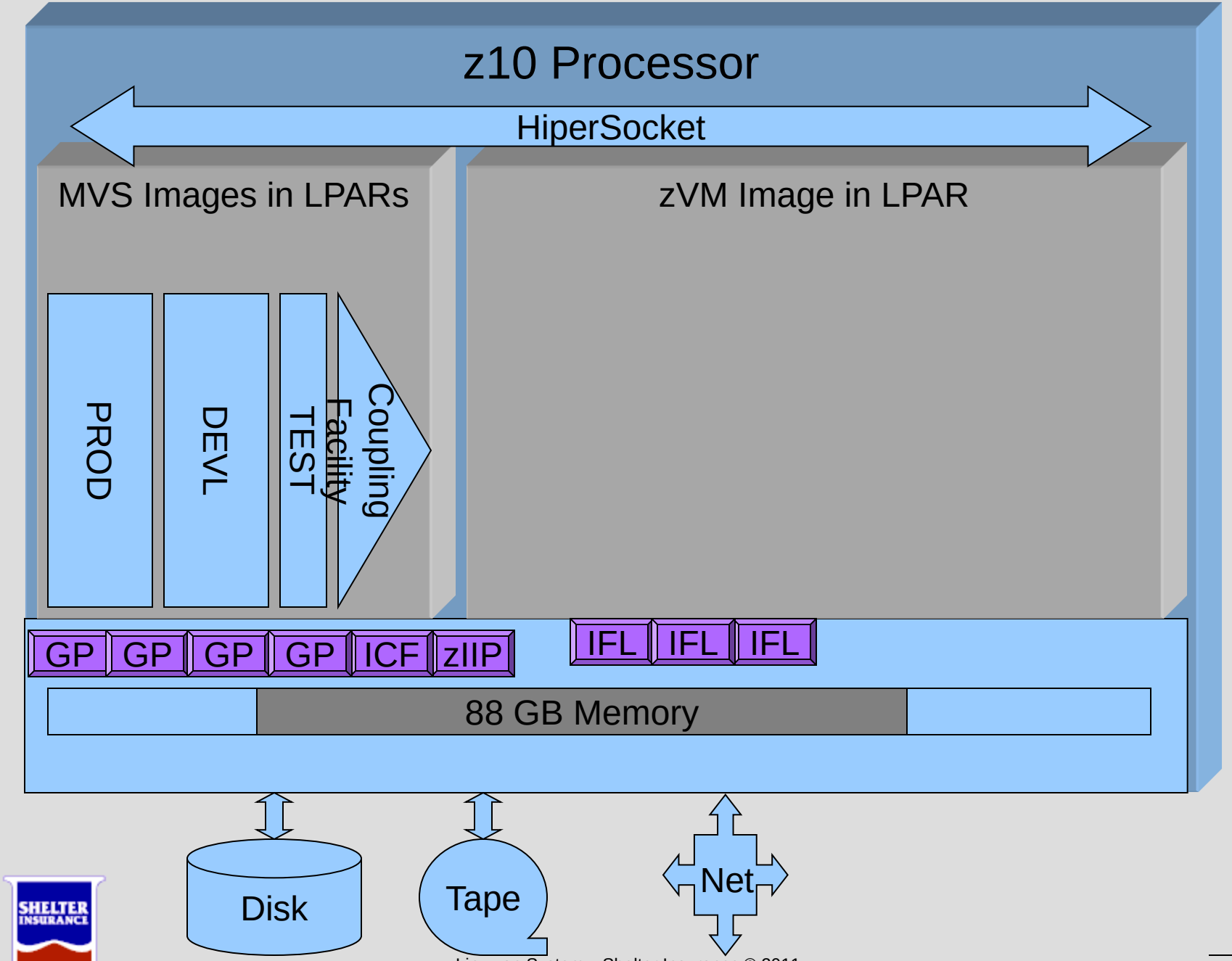
- System z Hardware
  - z/OS & z/VM support
  - Linux support
- Networking
- Virtualization
  - z/VM Hypervisor
  - CPU
  - DASD
  - Memory

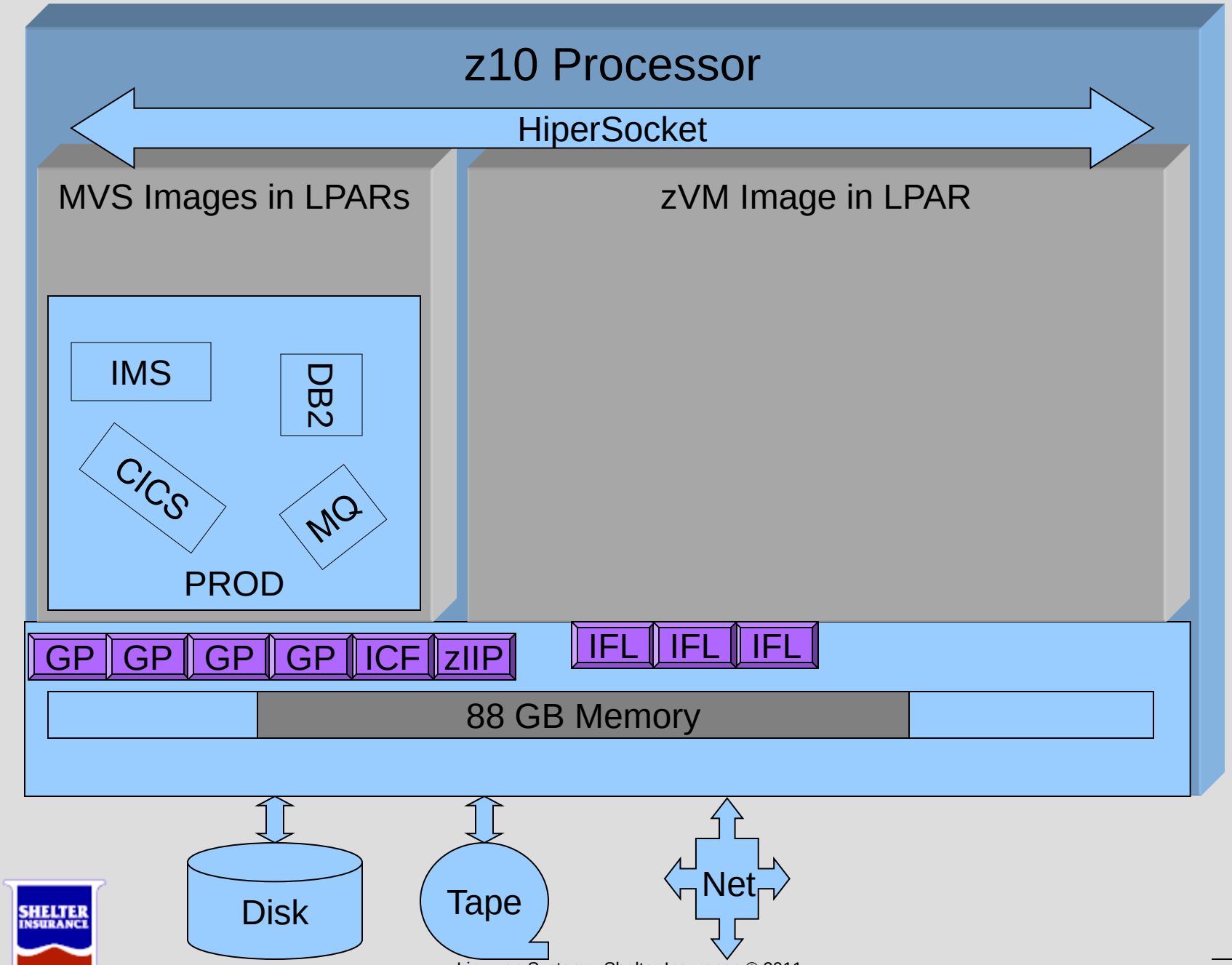
z/VM Hypervisor

- 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



z10 Processor


z10 Processor
HiperSocket
MVS Images in LPARs
zVM Image in LPAR
PROD
DEVL
TEST
Coupling Facility
GP
GP
GP
GP
ICF
zIIP
IFL
IFL
IFL
88 GB Memory
Disk
Tape
Net


z10 Processor
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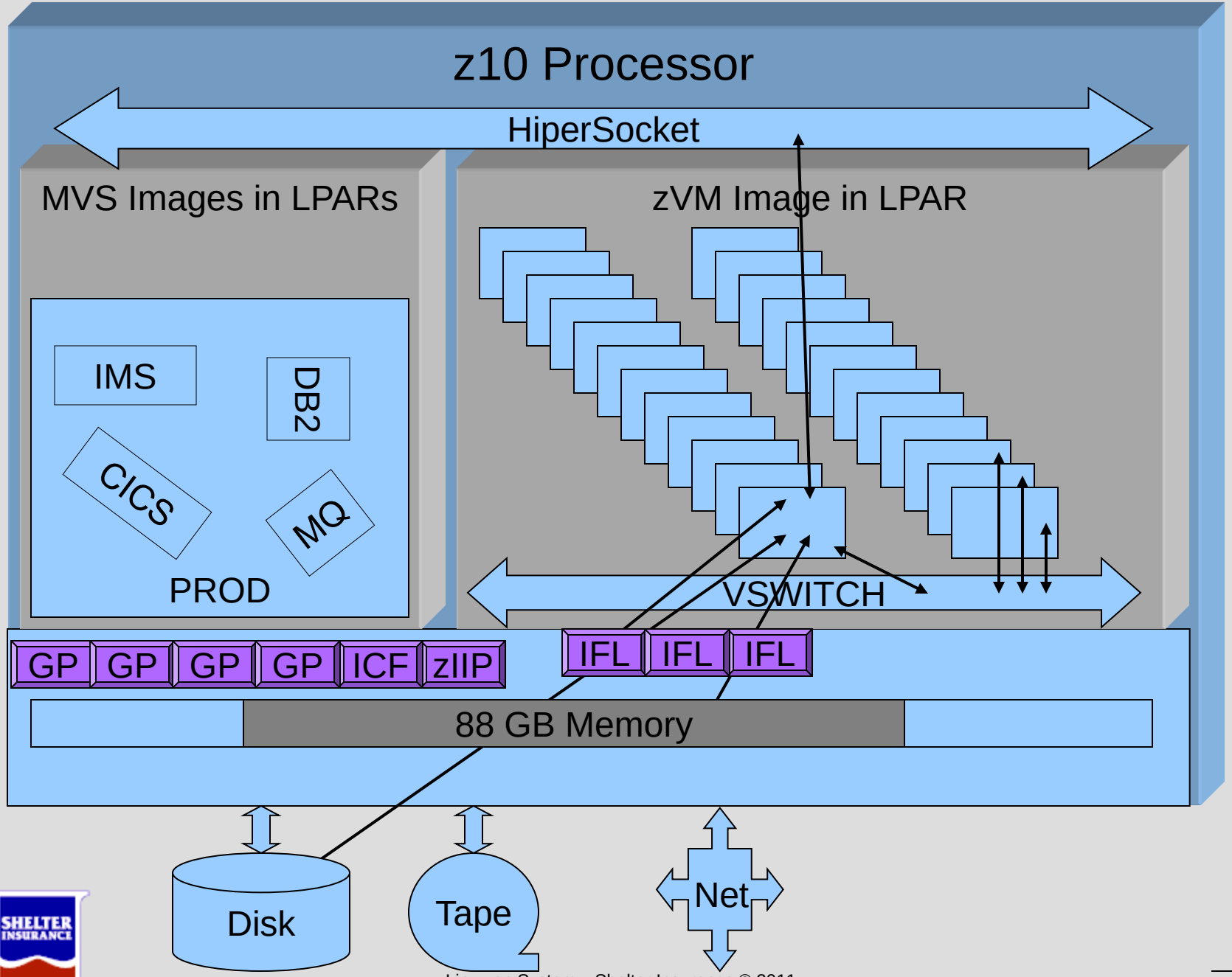
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ICF
zIIP
IFL
IFL
IFL
88 GB Memory
Disk
Tape
Net

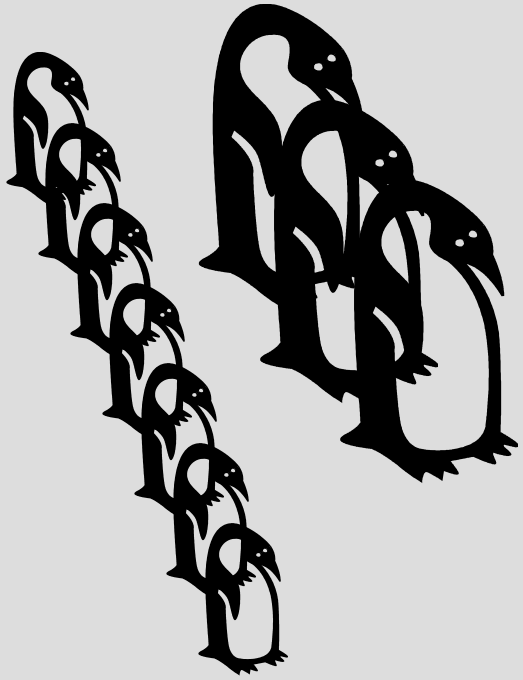
Feeding the Penguins

Feeding the Penguins…

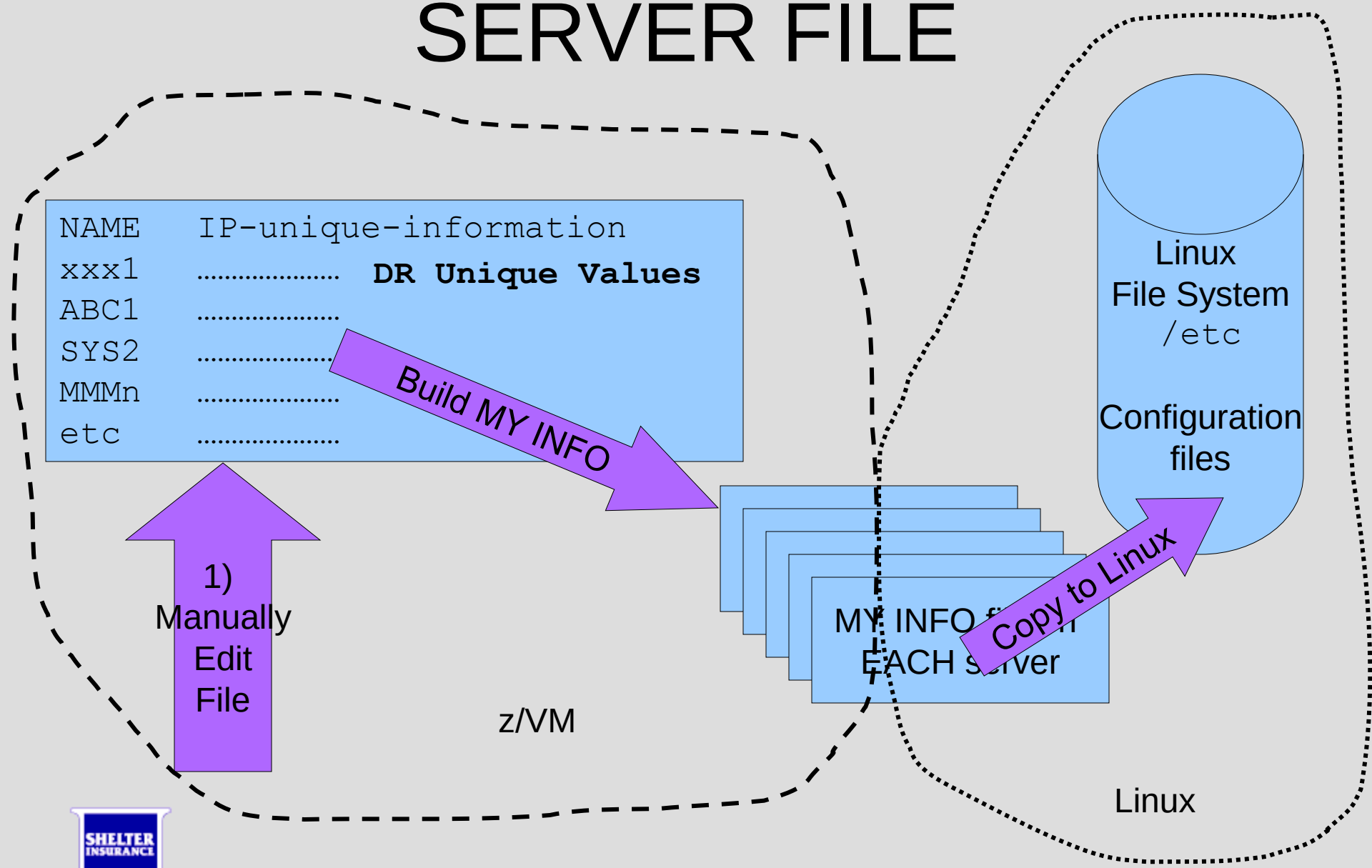
- SLES 11 Linux for System z
  - Build **Template (Gold)** servers
    - DASD Sized by application type
      - Six Gigabyte – basic
      - Thirteen gigabyte – Modest Application
      - Twenty-seven Gigabyte – Larger Application
  - Clone and grow
    - Six or 20 gigabyte increments

…Feeding the Penguins…

- Cloning
  - `SYSTEM FILE` – list of unique attributes of the system – gateway, subnet mask, etc.
  - `SERVER FILE` – list of servers and unique attributes
  - Copy virtual disks of base server to new server
  - Provision a new virtual server in five to ten minutes



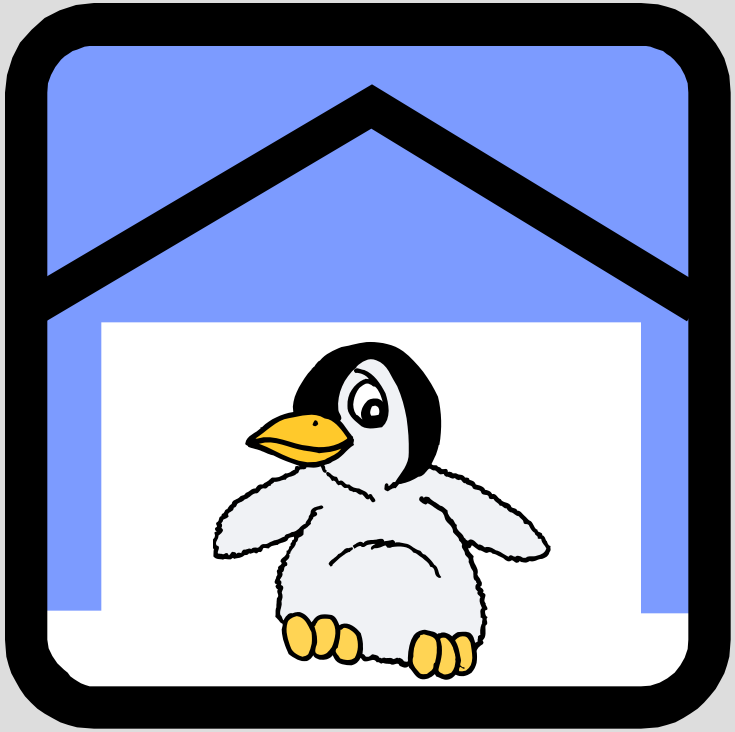
SERVER FILE


NAME IP-unique-information
xxx1 ..... DR Unique Values
ABC1 .....
SYS2 .....
MMMn .....
etc .....
Build MY INFO
1) Manually Edit File
z/VM
Linux File System /etc
Configuration files
Copy to Linux
Linux

Protecting the Penguins

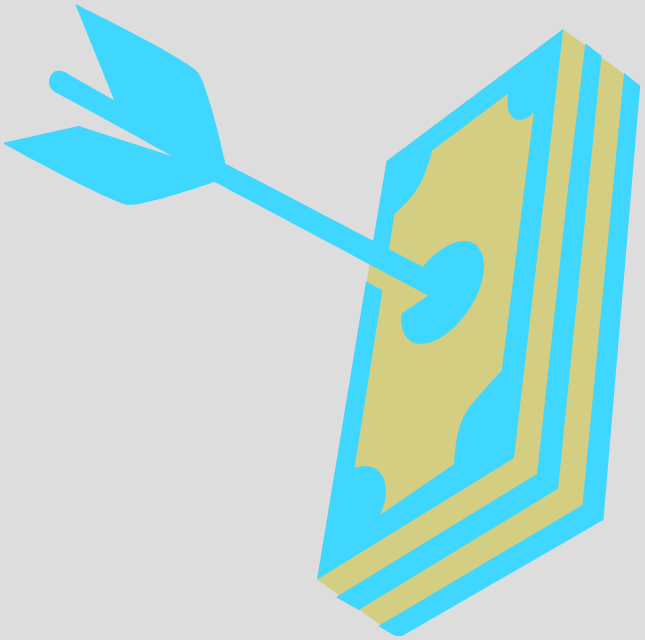
Protecting the Penguins

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

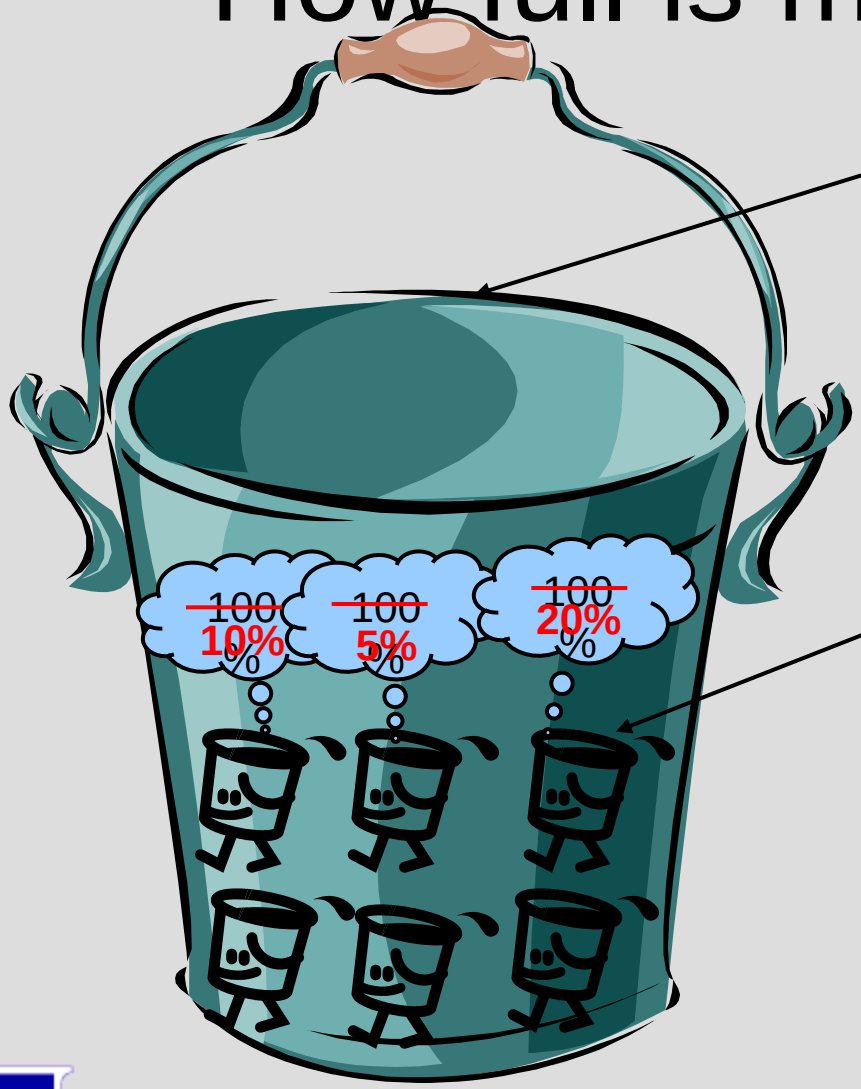


Monitoring…

- 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?



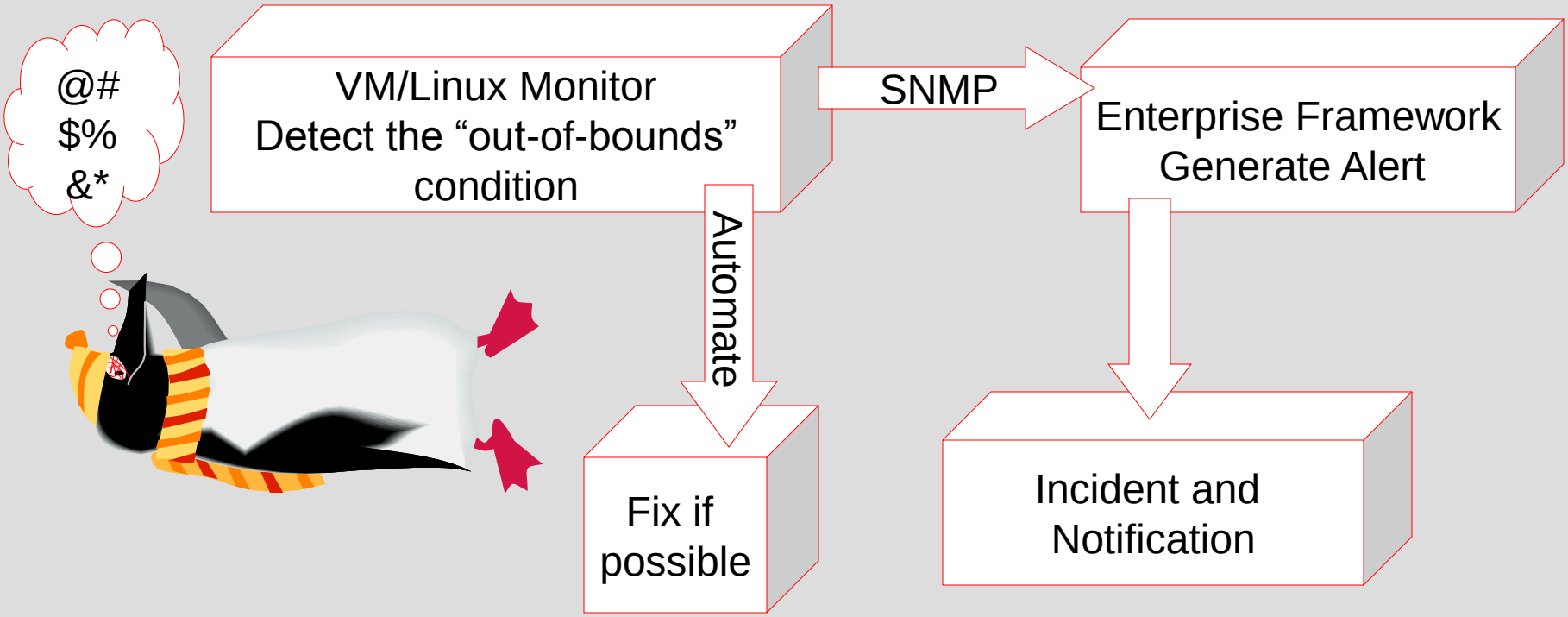
Real Bucket
Actual Available CPU
35% used

Virtual Buckets
Perceived Used CPU

Alerts…

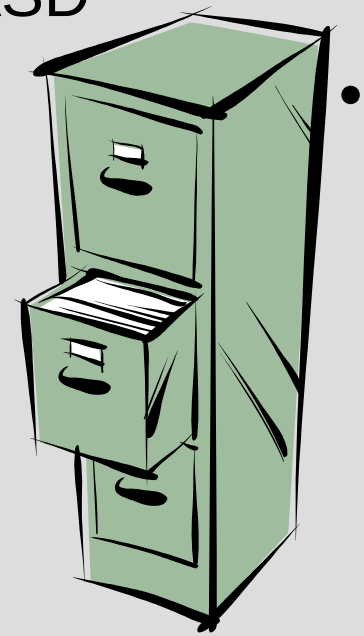
- We need to know when
  - Server is down
  - Server is looping
  - File system is almost full
  - System storage is almost full
  - System is too busy
  - Other bad stuff

Generating an Alert



Penguin Storage

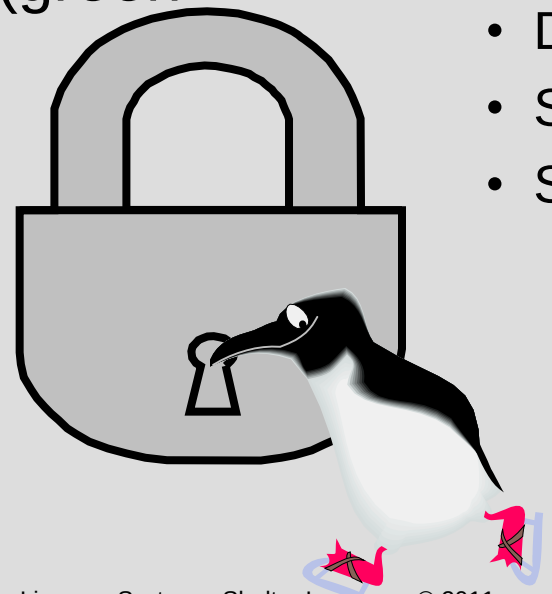
- z/OS Management
  - All existing processes
  - Allocating and Managing DASD volumes
  - Backup
  - Restore
  - Recovery



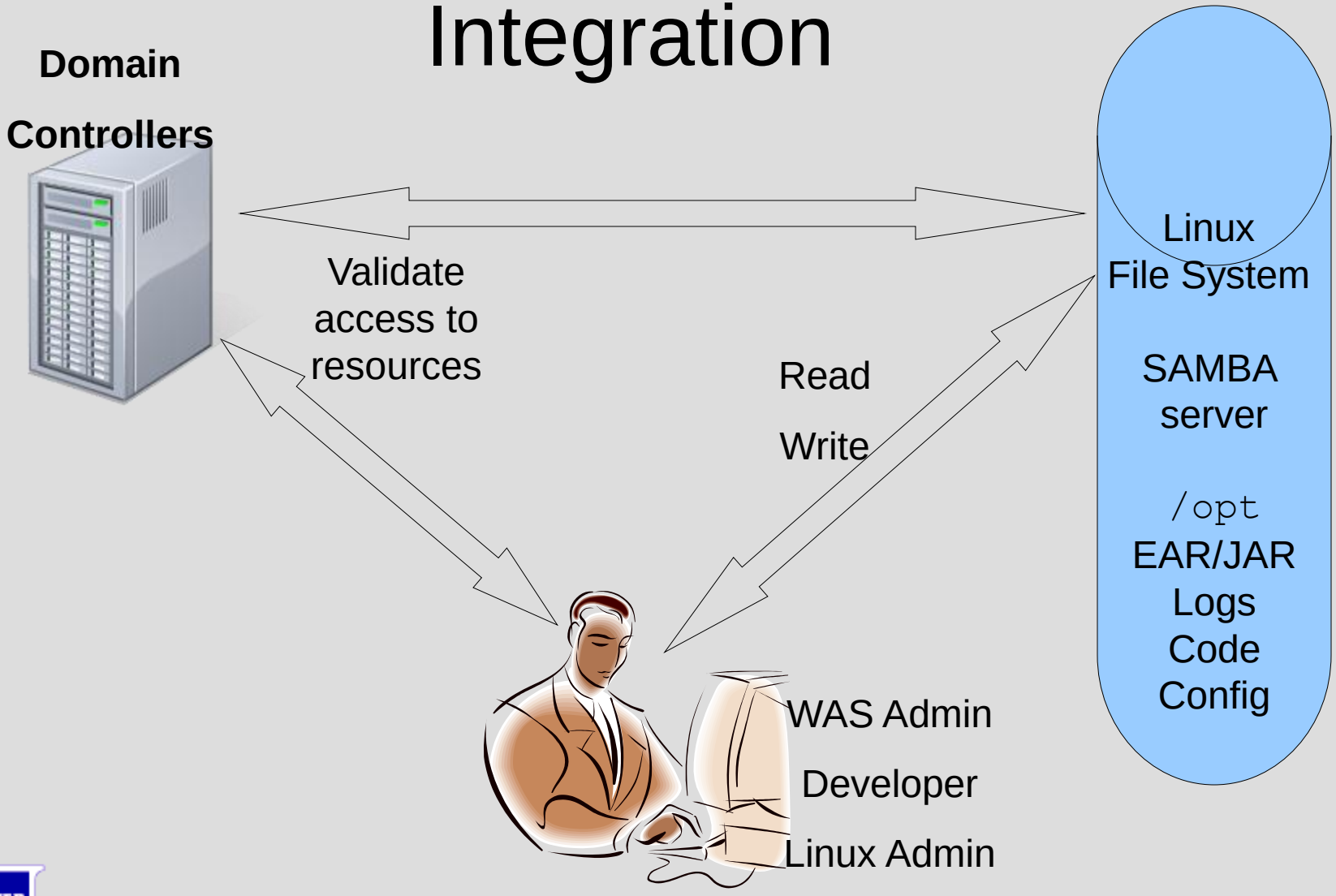
- z/VM Management
  - Assign DASD volumes to servers
  - Monitor
- Linux management
  - Logical Volume Manager (LVM)
  - Dynamically enlarge server application storage

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



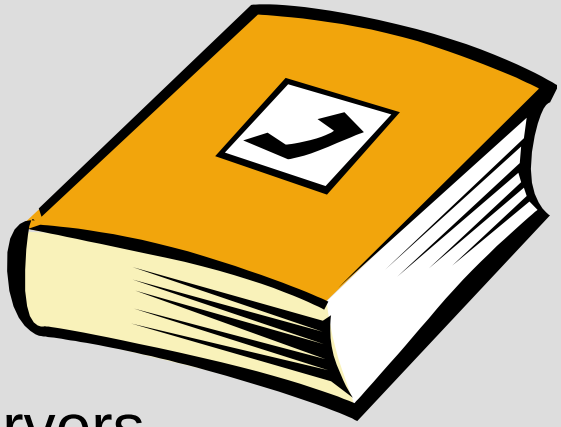
Working the Penguins

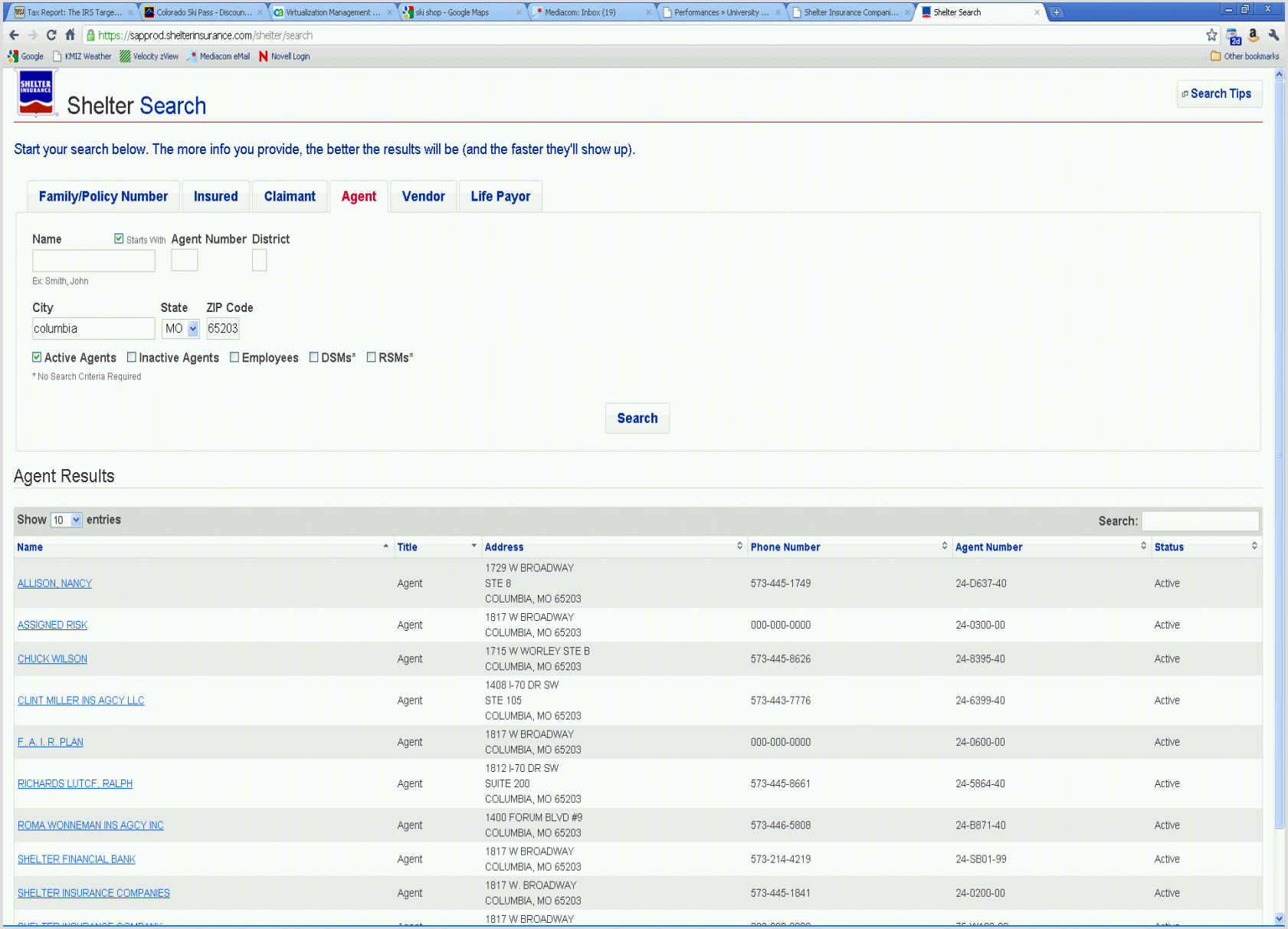
Working the Penguins…

- 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




Tax Report: The IRS Targe...
Colorado Ski Pass - Discoun...
Virtualization Management ...
ski shop - Google Maps
Mediacom: Inbox (19)
Performances > University ...
Shelter Insurance Compani...
Shelter Search
https://sapprod.shelterinsurance.com/shelter/search
Google
KMIZ Weather
Velocity zView
Mediacom eMail
Novell Login
Other bookmarks
Shelter Search
Search Tips
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
columbia
MO
65203
Active Agents
Inactive Agents
Employees
DSMs*
RSMs*
* No Search Criteria Required
Search
Agent Results
Show 10 entries
Search:
Name
Title
Address
Phone Number
Agent Number
Status
ALLISON, NANCY
Agent
1729 W BROADWAY
STE 8
COLUMBIA, MO 65203
573-445-1749
24-D637-40
Active
ASSIGNED RISK
Agent
1817 W BROADWAY
COLUMBIA, MO 65203
000-000-0000
24-0300-00
Active
CHUCK WILSON
Agent
1715 W WORLEY STE B
COLUMBIA, MO 65203
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CLINT MILLER INS AGCY LLC
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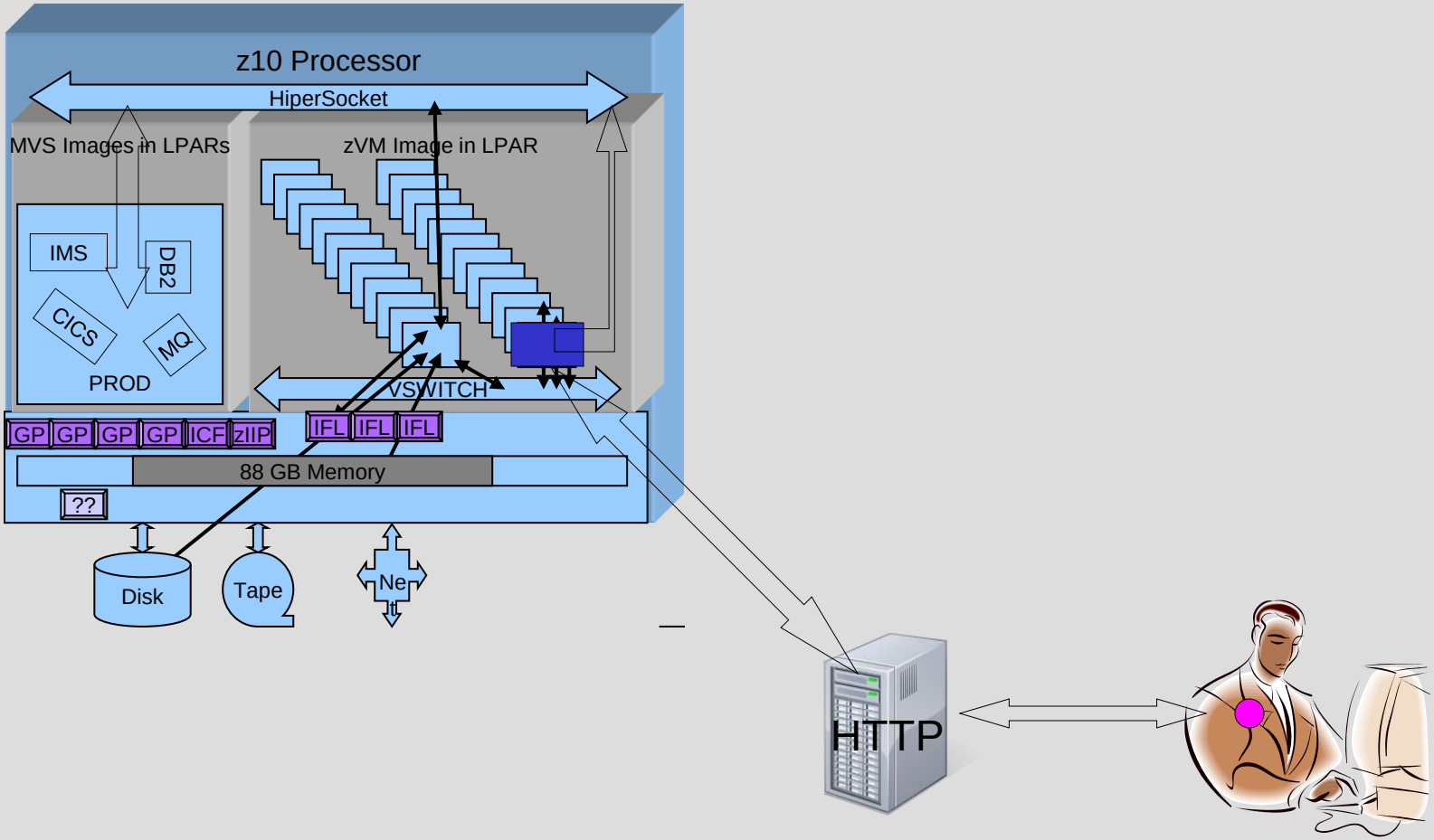
Data Flow


z10 Processor
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IFL
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IFL
88 GB Memory
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Disk
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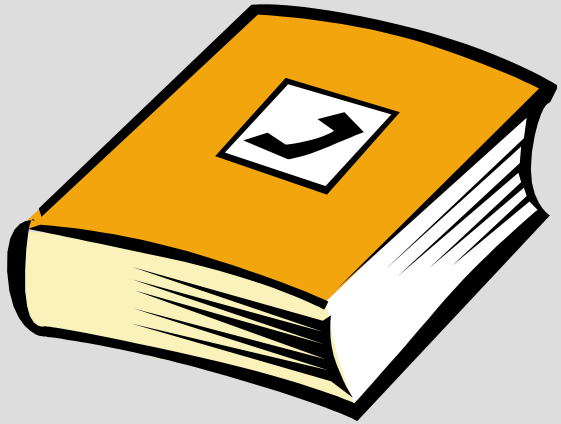
HTTP

Penguin Jobs…

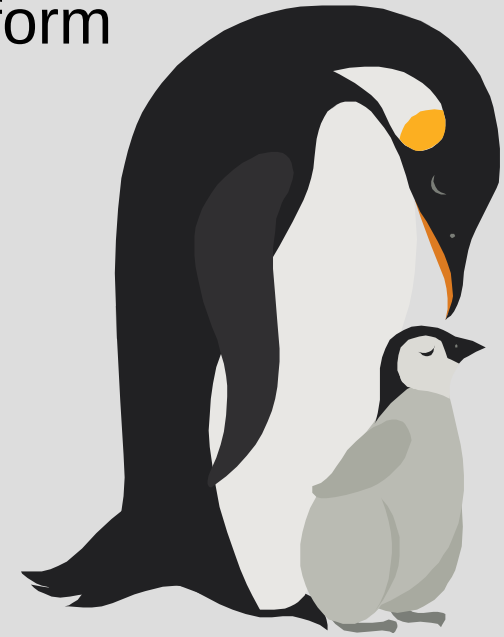
- Insurance Verification System
  - WAS 7 application
  - Internally Developed
  - Law enforcement verification
  - Nevada June, 2011
  - Oklahoma ‘soon’



Hatching New Penguins

Hatching new Penguins

- More workload moving to Linux on z
  - WAS
    - New applications
    - Move existing apps from Intel platform
- IBM recommendations
  - Best fit
  - Good fit



New Penguin Jobs

- Billing System
  - Vendor application
  - WebSphere
  - Communications Framework
  - 1Q 2012?

New Penguin Jobs

- Common Services (CSA)
  - WebSphere
  - Customer Access
  - eCommerce
  - 4Q 2011?
- SOA Enablement
  - WebSphere Registry and Repository
  - WebSphere Enterprise Service Bus
  - ?20??

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 / Lotus Notes**
- **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

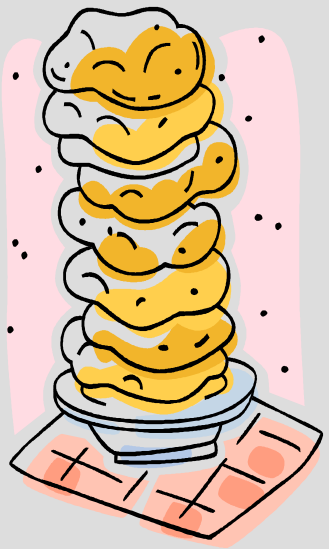
Good Fit Application Workloads*

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

*Bill Reeder – IBM Linux for System z Sales and Strategy

Actual Software Stack

- z/VM – IBM
  - Virtualization
  - System management
  - RACF, DIRM
- SLES – Novell
- zVPS – Velocity
  - Monitor
  - Alerts



- Tivoli Omegamon – IBM
  - Enterprise Framework
- Service Desk – CA
  - Problem and Incident
  - Notification

FDR on z/OS

- Backup, restore, recover

Knowing that The Penguins Landed

- Annual Dept. Meeting
  - accomplishments
- ‘We did it!’
  - Linux on z
- Another team listed the accomplishment
  - Not our team
  - WAS Admins
    - They deserved it

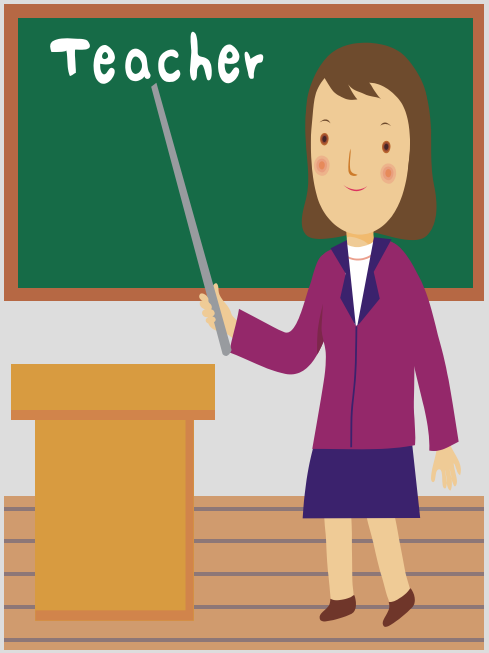
Penguin Tales
“Ok, that worked but…”

- Backup / restore
  - DR problems
  - Need a VM solution
- Linux gold
  - More use of LVM
  - Do not include WAS
- WebSphere
  - Horizontal scaling
  - Shared binaries
    - XIP

- LPARs
  - Need development
- Migration Processes
  - VM
  - Linux
  - WebSphere
  - Application

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
- ✓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