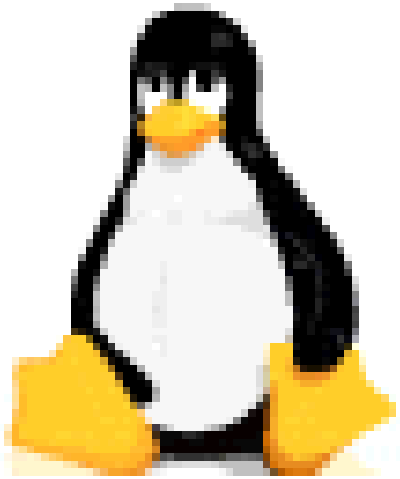# The Penguin

.

Fastest bird underwater

LINUX on zSeries

- Idaho Power Company – Who (?)
  - Headquartered in Boise, Idaho
  - Investor owned Electric Utility, a subsidiary of IDACorp, Inc.
  - 883,000 people served across the Southern Idaho area
  - Primary electric power source – Hydro
  - One of the lowest cost/KW providers

LINUX on zSeries

- Idaho Power's IT Department
  – Primary Data Center in Boise, ID
  – MainFrame (z900, 2064-103)
  – INTEL-based Windows (300+ Servers)
  – Approximately 30TB of storage
  – 95 People, supporting Application Maint, Server and Network support and Operations

LINUX on zSeries

- Why on the MainFrame?
  - Dead Dinosaur, isn't IT?
  - Everybody else is moving off, aren't they?
  - Leverage the Investment – What else?
  - Leverage ORACLE licensing costs (per CPU)
- What this is about
  - Is about "What makes sense for IT, our corporation and our customers"

LINUX on zSeries

- Why on the MainFrame?

  "Abilities"

  – *Reliability* – redundancy in multiple areas
  – *Availability* – 100% of stated time
  – *Capability* – Multiple processors, I/O pathing, communications
  – *Stability* – Patch coordination/Maintenance
  – *Disciplin-ability* – Production mentality

LINUX on zSeries

- How did we chase the Penguin down?
  - Industry research
  - References via an unbiased IBM
  - Evaluated potential Cost Savings – based on ORACLE licensing alone, realized break-even at two ORACLE dBases running on 2 CPU INTEL-based servers
  - Invested $400K, with estimated cost savings of $400K above the investment for "initial" 6 ORACLE servers, 1 DB2 Connect server and 1 LDAP server

LINUX on zSeries

- Phased Production Implementation
  - Proof of Concept – MVS LPAR with a native Red Hat installation
  - Test Integrated Facility for LINUX (IFL), running on z/VM to host SuSE Guests
  - Production Implementation with a dual IFL supported LPAR

LINUX on zSeries

- Phase I – Concept Project
  - MVS LPAR and storage
  - Native Red Hat install
  - Test Guests established
  - Connectivity verifications
  - No attempt at "Real" application support

LINUX on zSeries

- Phase II – Pilot Project
  - 90 day, no obligation – no commitment to buy
  - 90 days from IBM, SuSE and FDR for hardware, software and technical support
  - Coordination via CornerStone, Inc – IBM Partner
  - Installed single Integrated Facility for LINUX, or IFL – single CPU supporting an LPAR
  - Used MVS disk space
  - Initial testing done on HR ORACLE dBases and DB2 Connect

LINUX on zSeries

- Pilot Project evaluated as successful
- Moving toward full Production status
- Initial environment supported by:
  - Two IFL's – implying about 400 MIPS
  - Four Fibre Channels for data I/O to Disk
  - Open System configured disk – twice the speed

LINUX on zSeries

- Phase III – Current Production support
  - 30 LINUX Guests
  - Primarily ORACLE dBases hosting HR applications (meet ORACLE v8 support drop date)
  - DB2 Connect – Test, with Production –June
  - WEB Sphere – Test only with no installed application
  - Data Center Power Monitoring System (DB2)
  - Source Code Mgt and webMethods – Test

LINUX on zSeries

- LINUX Environment notes
  - Using an LDAP server to authenticate LINUX Guest access via RACF dBase confirmation
  - 64-bit based – now
  - FDR Upstream used for Backup and Restores of LINUX Guest
  - Successfully tested ORACLE's RMAN/FDR
  - DR plan mirrored with MainFrame scenarios

LINUX on zSeries

- What a real LINUX Guest Candidate?
  - dBases, as can handle the I/O and licensing
  - WEB based applications
  - File Services
  - Middleware (DB2 Connect or MQ Series)
  - Utilities (Print or FTP)
  - JOB Scheduling
  - Automate via scripting of numerous processes

LINUX on zSeries

- What not a LINUX Guest Candidate?
  - X-Windows application – one dependent primarily upon a GUI interface
  - CPU intensive – CADD applications

LINUX on zSeries

Future Direction: Working off tactical success to form a strategic direction

- Tactical: z/VM upgrade v4.4 to v5.1

- Transition application dBase from ORACLE's v8 to v9 or v10

- Additional LINUX Guests based upon benefit analysis justification

LINUX on zSeries

- Lessons Learned – Primary
  - Cost Benefit proven true within the Idaho Power environment
  - LINUX Administrator on a z/Series is a critical component to success – unique skill set directs towards a System Programmer level

LINUX on zSeries

Lessons Learned – Secondary

- – MainFrame availability is not 7X24, but 100% of stated uptime
- – Sharing datasets or files sounds good, though must plan and test for the environment
- – Real Memory is important to performance
- – SCSI storage provide almost twice the performance as opposed to MVS hosted

LINUX on zSeries

- Lessons Learned – Secondary
  - Networking with others LINUX on z/Series
  - LINUX vendor support
  - LINUX is still maturing under Fibre Channel Protocol (FCP) and SCSI storage
  - v/Switch versus HiperSockets for communications as related to speed and use
  - WEB Sphere requires Real Memory – 2GB

LINUX on zSeries

- Penguin Summary
  - Successful Phased approach to a new technology
  - Configuring LINUX environment to support Guests – dBases and Applications
  - Still learning about configurations and architecture for the Penguin
  - Testing is important to understanding, not only the new environment, but application response in general
  - Use the Penguin where it makes sense to leverage our MainFrame investment