

# Linux for zSeries

... The Roadmap to Success



# What's in a Name?

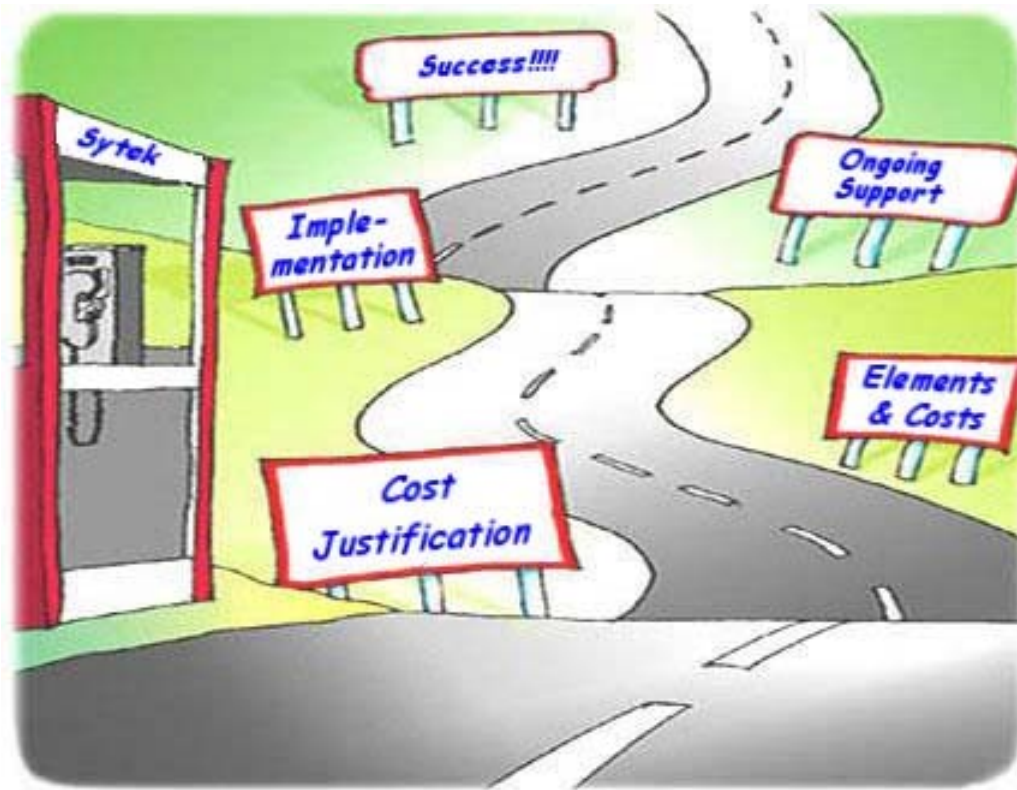
- The real name of the Linux product for “mainframe” usage is either *Linux for S/390* or *Linux for zSeries*, depending on the platform used.
- This presentation uses the same designation for both:  
*Linux for zSeries*

# About Sytek Services...

- **Founded as VM Assist, Inc. in 1986**
- **Nationwide IBM Business Partner and provider of Linux for zSeries (hardware, software, and 24x7 support services)**
- **Computer Associates Preferred Business Partner**
  - Sytek also partners with SuSE, Turbolinux, and other zSeries/Linux Companies



# Where Are We Going?

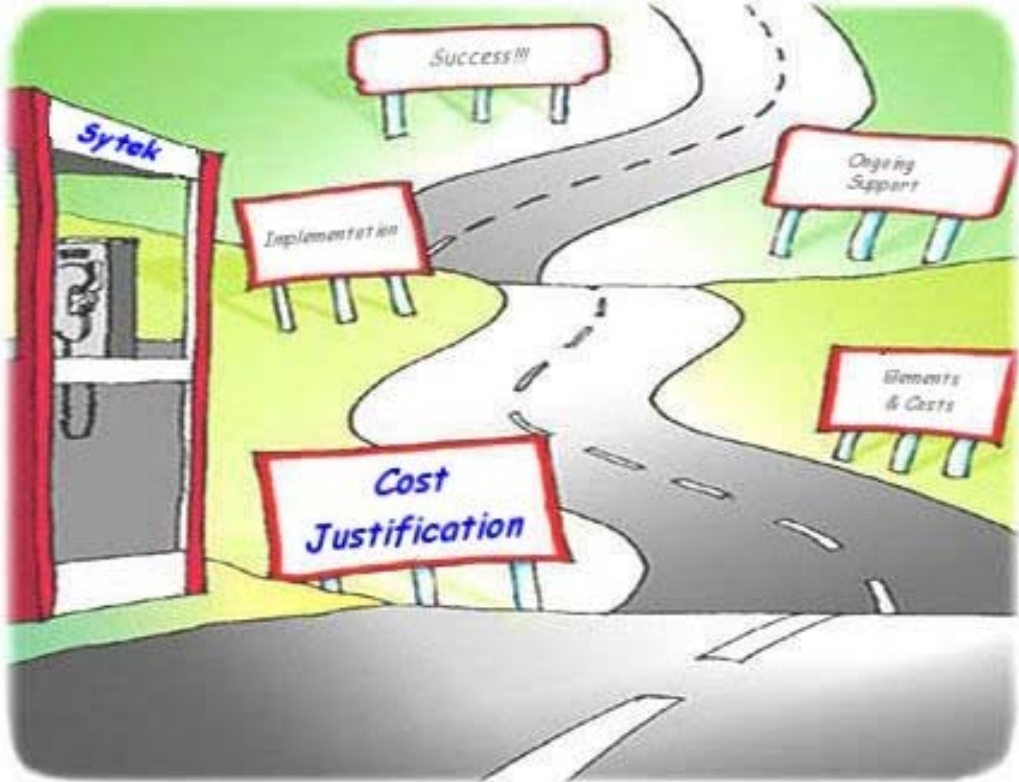


# Preparing For The Trip

- **Remember: Linux is new**
  - Not everyone *likes* new ideas, even good ones!
  - Linux is threatening to some, scary to others
  - Resistance often stems from ignorance
- **So: Prepare for rough roads**
  - Ensure management buy-in
  - Include peer groups as much as possible
- **Now: Get in the car!**



# Cost Justification



# Why Linux?

- **Server Consolidation**
- **Virtualization**
- **Web Serving**
- **Future Considerations**
- **IBM Middleware Components**
- **Security**
- **Samba**
- **Networking Strength**
- **Multi-User Productivity**
- **Applications**

# Why Linux? – Dollars and Sense!

- **Bottom line:**
  - *Linux attracts attention because it saves money on many different levels.*
- **But...**
  - Management wants proof before committing to it as a production computing platform.
- **Best Approach:**
  - Prepare a Business Plan & a Proof of Concept study



# Preparing a Linux Business Plan

- **International Data Corporation (IDC) has collected Cost of Ownership data specific to Linux.**
- ***TCOnow!* (from CIOview Corp.)**
  - A predictive modeling tool
  - Uses IDC data
  - Analyzes Linux for Intel, Risc, new and existing mainframe platforms
  - Available for \$3,995 (or via IBM Business Partners)



# TCOnow!

- **Supplies information in two modes:**
  - PreView (50,000 foot perspective)
    - Takes 2 minutes
  - FullView (Comprehensive analysis)
    - Takes more time, but results may be saved and input changed over time as needed
- **Final Reports:**
  - 25-page mgmt reports, including charts and assumptive data are produced and valuable for passing on to management.

# TConow! Demonstration



Powered by:



**The Financial Impact of Migrating to Linux**



# Sample Output Report

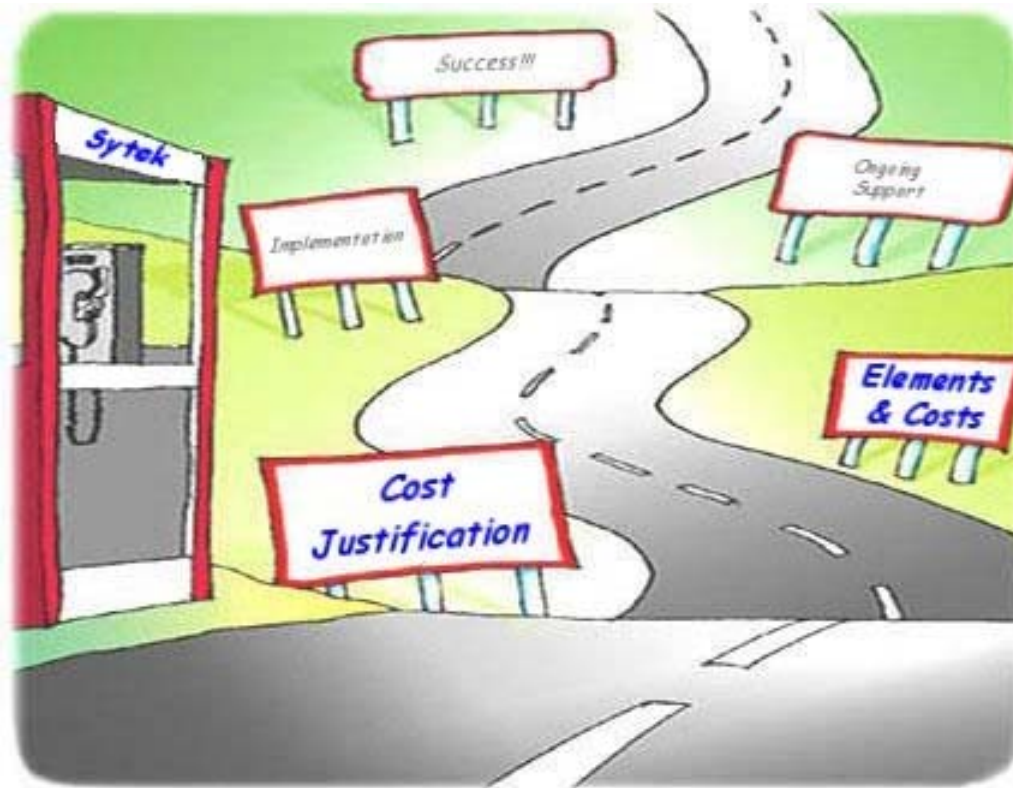
<b>Cost Category</b>	<b>Linux/RISC</b>	<b>Linux/Intel</b>	<b>New z800</b>
<b>Hardware</b>	\$183,164	\$273,879	\$402,975
<b>Storage</b>	\$98,400	\$98,400	\$98,400
<b>Software</b>	\$344,500	\$570,700	\$204,200
<b>Network</b>	\$17,600	\$27,200	\$43,000
<b>Services</b>	\$67,403	\$67,403	\$70,099
<b>Facilities</b>	\$48,455	\$52,673	\$37,511
<b>Personnel</b>	\$489,060	\$733,590	\$152,831
<b>Downtime</b>	\$0	\$0	\$0
<b>Support and Maintenance</b>	<u>\$237,653</u>	<u>\$311,811</u>	<u>\$129,954</u>
<b>Total Cost of Ownership</b>	<b>\$1,486,235</b>	<b>\$2,135,654</b>	<b>\$1,138,970</b>



# TConow! Summary

- **Pros:**
  - Excellent tool, especially in situations where new expenditures are currently being planned for apps that can be hosted by Linux.
- **Cons:**
  - Can not calculate the cost of a competitive environment (Sun, Microsoft, HP).
  - Doesn't do a good job of predicting cost when an existing mainframe is present.

# Infrastructure Elements/Costs



# Preparing *Your* Infrastructure

- **Compare your actual costs to TCO<sub>now</sub>!**
- **Get Help:**
  - Enlist the assistance of your favorite IBM rep or Linux-knowledgeable Business Partner
- **Analyze your Current Environment**
  - Not all mainframes are Linux-ready!
- **Prepare a Cost Analysis for:**
  - Three-Month Proof of Concept Project
  - Three-Year Production Platform
- **Compare to a Non-Linux Strategy**



# Standard Components

- **Processor**
- **Memory**
- **Disk**
- **Communications**
- **Operating Systems Software**
- **Utility Software**
- **Applications Software**



# Processor Checklist

- **“Mainframes” are PCs possessing excellent reliability and I/O characteristics**
- **Only these IBM-designated “Generation 5” architecture machines work well for Linux (from slowest to fastest):**
  - Multiprise 3000
  - 9672-xx6 or –xx7
  - 2066 (z800)
  - 2064 (z900)
- **Which box is best for you?**
  - Cost vs. functionality vs. future growth

# Memory Checklist

- **Linux loves memory!**
  - Order as much as you can afford.
- **New z800 processor comes standard with 8GB (expandable to 32GB)!**
  - Multiprise 3000 limited to 4GB
- **Beware memory allocations under z/VM, however!**
  - z/VM's dispatching algorithms can be easily mis-tuned

# Disk Checklist

- **Don't buy disk just for the mainframe!**
  - Attach open system servers *as well as* the mainframe to the Shark subsystem
- **ESS Enterprise Systems Storage (“Shark”) allows you to:**
  - Build a more comprehensive strategy *including* the mainframe, not *centered solely* on the mainframe
  - Budget wisely; prices have fallen (e.g. \$400k for 1.6TB)
  - Achieve improved disaster recovery ability



# Communications Checklist

- **Linux applications are often Internet-centered (The number one Linux application is Apache web serving!)**
  - Be aware of *your* requirements
- **Newer processors (z800, z900) have wider bandwidths:**
  - Two ports of Gigabit Ethernet cost \$12,000
  - Hipersockets allows for lightning fast communication with z/OS or other Linux images
  - z/VM distributes bandwidth nicely

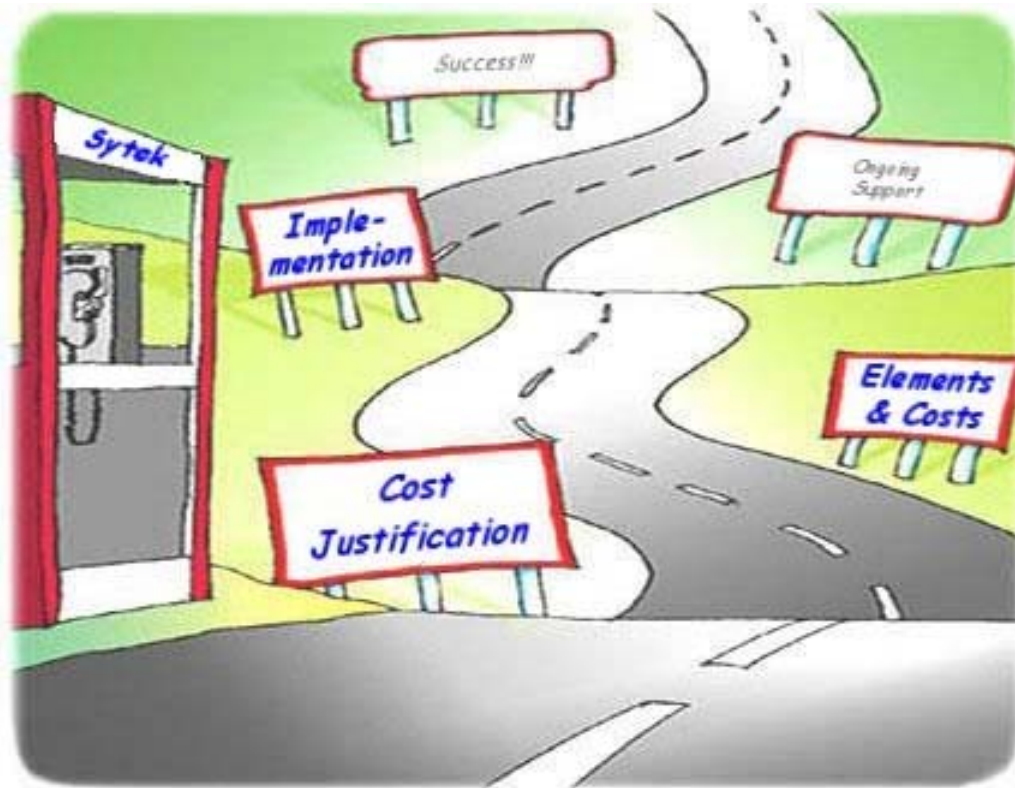
# Operating Systems Checklist

- **Linux, z/VM, z/OS, VSE/ESA**
  - *All* are potential building blocks (not just Linux)
  - Linux doesn't replace. It co-exists, modernizes, and allows for server consolidation
- **z/VM is almost a given**
  - And is now OTC @ \$45k/engine
- **z/OS.e VERY cheap for new workload**
  - About \$1,000 per month
- **Watch for opportunities to share workload, e.g.:**
  - CICS Appl, Apache front-end
  - DB on z/OS, App on Linux

# Applications Checklist

- **Start with the easy stuff: Apache, DNS, Web Serving, Samba**
- **Consider list of apps at:**
  - [www.ibm.com/servers/eserver/zseries/solutions/s390da/linuxproduct.html](http://www.ibm.com/servers/eserver/zseries/solutions/s390da/linuxproduct.html)
- **Look at your own portfolio of applications**
  - Which are causing you pain?
- **There is almost always a way to do anything using Linux; be sure to ask!**

# Implementation



# To Be [z/VM] or Not to Be...

- **There are very few reasons to NOT use z/VM for hosting Linux images:**
  - There is no commitment to Linux (yet)
    - Proof of concept can be done via a pre-G5 or LPAR
  - There will be less than 15 images
    - Remember, one image per LPAR
  - The cost is prohibitive
    - Unlikely, at only \$45k/engine



# To Be [z/VM] or Not to Be...

- **There are many reasons TO use z/VM for hosting Linux images:**
  - It's inexpensive
  - **Resources can be shared**
  - **Simpler manageability**
  - **New Linux guests can be added quickly**
  - **High-performance communication**
  - **Data-in-memory performance boosts**
  - **Functionally rich debug environment**
  - **Control and automation**
  - **Horizontal growth**

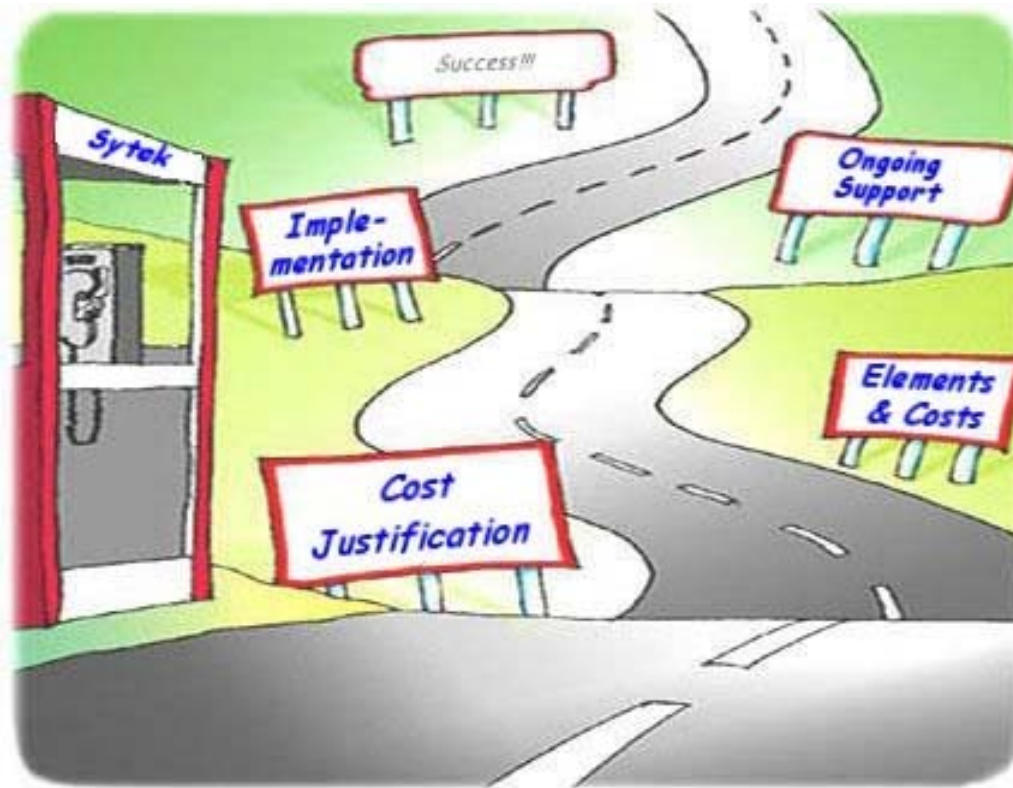
# Implementation Using z/VM

- **Learning how to install Linux is not hard**
  - It is better for a z/VM expert to do it than a Linux expert - Having both work together is best
- **Exploit z/VM features**
  - R/O minidisks for shared system images
  - Data sharing w/other systems
  - Performance tuning
  - Shared bandwidth
  - And many more...

# How Many Servers?

- **Don't expect to get 97,000 Linux virtual servers per mainframe!**
- **Remember, a z900 engine is only as powerful as a 1Ghz Personal Computer**
  - Mainframe strengths come from z/VM time slicing, powerful I/O, and ease of administration
- **Gauge your applications' impact**
  - Steer toward I/O-consumptive vs. CPU-consumptive.
  - Constantly monitor

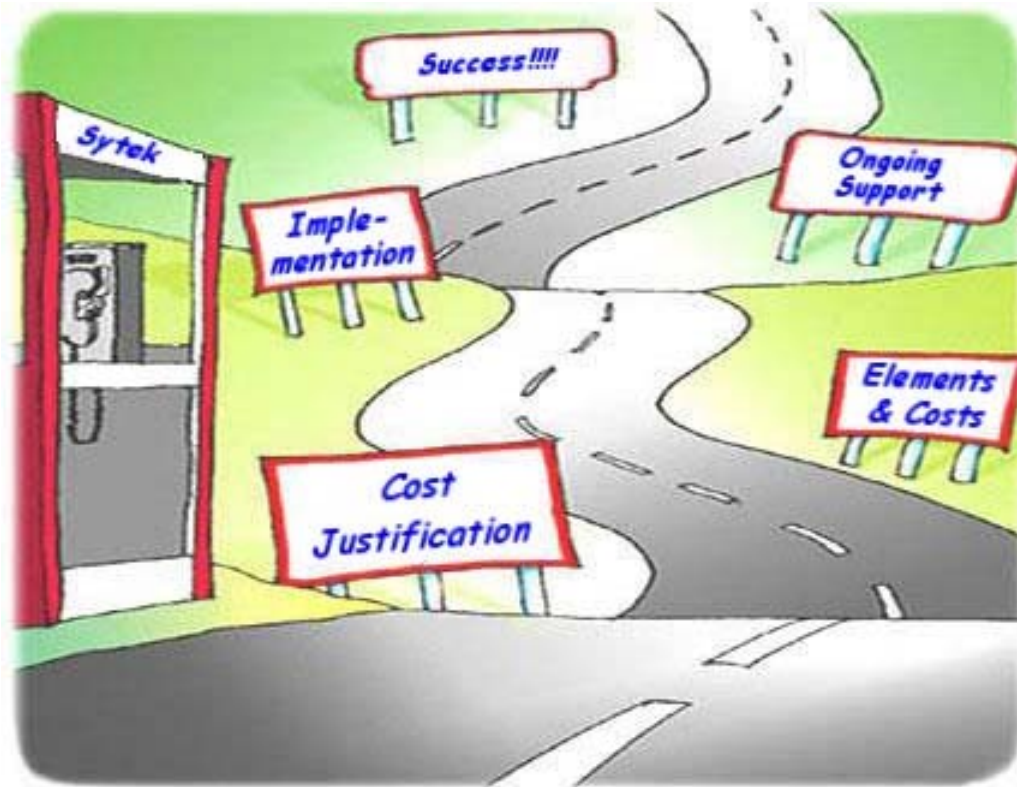
# Ongoing Support



# Support Personnel

- **z/VM requires very little care and feeding after initial setup**
  - Most sites devote less than one full-time person
- **Linux also seldom requires excessive of attention or administration**
- **Procuring the correct software tools to monitor the system is important**
  - *Nothing is built-in to z/VM or Linux!*
  - *CA offers many, others have been developed over VM's 30 year history.*

# Success!



# The End Result

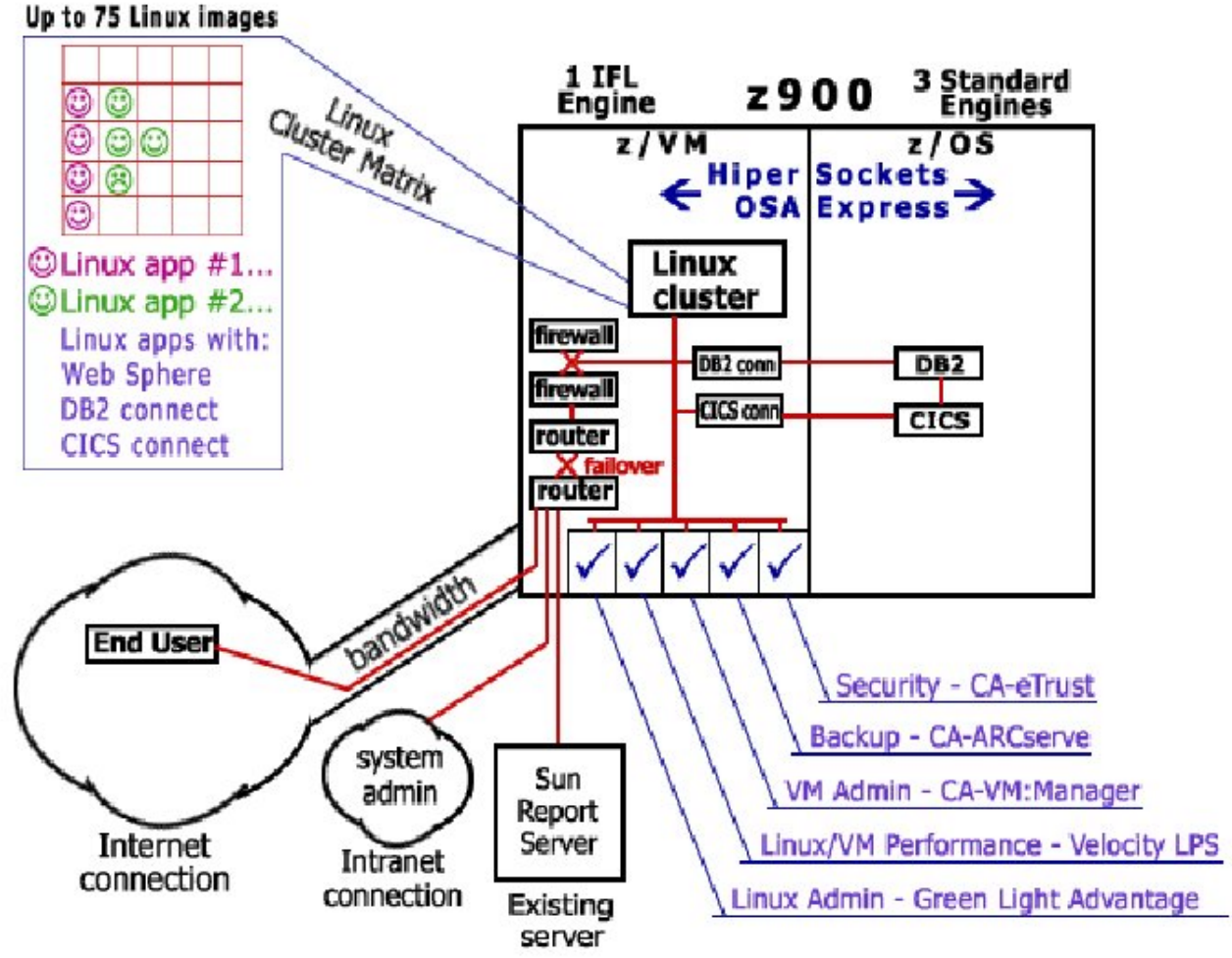
- **There are now many documented cases of successful production sites using Linux in a myriad of ways**
- **Don't forget to return back to your TCO now! Predictions and Business Case.**
- **Continue to grow the Linux virtual server farm as appropriate, avoiding additional server sprawl.**
  - Any new addition makes the overall impact more profitable for your installation

# Case Study -- Overview

- **Major West Coast bank, long-time user of OS/390 (currently on three z900 engines)**
- **Their pain: Sun Server maintenance costs \$48,000/unit (times 250 units) *per year!***
- **Proposed solution: Add an IFL engine solely for z/VM<sup>™</sup> and z/Linux<sup>™</sup> usage**
  - Link to OS/390 data using DB2 Connect
  - Ensure proper controls over all Linux virtual machines
  - Enable application development



# Case Study -- Pictorially



# Case Study – Solution Cost

<b>One IFL Engine (~250 mips)</b>	<b>\$200,000</b>
<b>VM v4 initial license fee (plus \$11,000/year support fee)</b>	<b>\$45,000 \$11,000</b>
<b>SuSE/Turbolinux Annual Distribution Fee</b>	<b>\$11,500</b>
<b>VM:Manager VM Management Suite, including eTrust Security (plus \$14,000/year support fee)</b>	<b>\$70,000</b>
<b>DB2 UDB (including DB2 Connect) initial license fee</b>	<b>\$20,600</b>
<b>Other IBM &amp; ISV products (w/maint after year 1)</b>	<b>\$150,000</b>
<b>Sytek 24x7 hands-on coverage for Linux and z/VM, per year</b>	<b>\$40,620</b>



# Case Study -- Justifications

- **The Pain of Servicing Existing Servers**
  - Maintenance costs are too high
  - Reliability and stability of servers questionable
- **Ease of access to mainframe-based corporate data (on z/OS)**
  - And *speedw/OSA* Express or Hipersockets
- **Linux' networking strength**
- **Ease of application development for accessibility from the web**
- **Ability to efficiently manage the virtual server farm**

# How Sytek Helps

- **Services offered are start to finish, from management consulting to infrastructure planning, implementation, and ongoing 24x7 support.**
- **Sytek's blend of veteran Linux and "mainframe" talent (especially in the z/VM arena) can handle any customer requirement**
- **Sytek understands the pros and cons of Linux for zSeries. We help you understand as well!**
- **Five-day course also available for training *your* staff**



# LinuxAssist<sup>SM</sup>

- **A fixed rate implementation plan.**
  - **Offers unlimited Linux implementation support for one *fixed* price**
  - **Guarantees a working, production application**
  - **Includes 30 days of hands-on, 24x7 follow-on support**

- **Phased Approach:**

- 1) The Definition of a Successful Implementation
- 2) Environmental Reqmts Strategic Consultation
- 3) Implementation Planning / Detailed Project Def'n
- 4) Installation of all Components
- 5) Component and Overall System Testing
- 6) Education and Operational Training
- 7) Production Implementation
- 8) Follow-on 24x7 Support

# References

- **Notable Linux for zSeries references include:**
  - UCLA Medical Computing Services
  - County of Sonoma (California)
  - Washington Mutual Bank
  - Grede Foundries
  - Turbolinux
  - SuSE

# Summary

- **Linux for zSeries is *Viable* and extremely *Cost-Effective***
- **Effective use of Linux for zSeries can enhance a customer's business, but requires creative thinking**
  - Especially when exploiting classic z/VM strengths!
- **The result: A robust, secure Linux for zSeries infrastructure**



# Thank You!



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