Implementing Linux on z: User Experiences at Isracard

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Agenda

- **Introduction**
- Some History
- Current Status
- Challenges and Solutions
- Observations
- Questions

What you won't hear today

Why Virtualization and Consolidation are good

Linux kernel

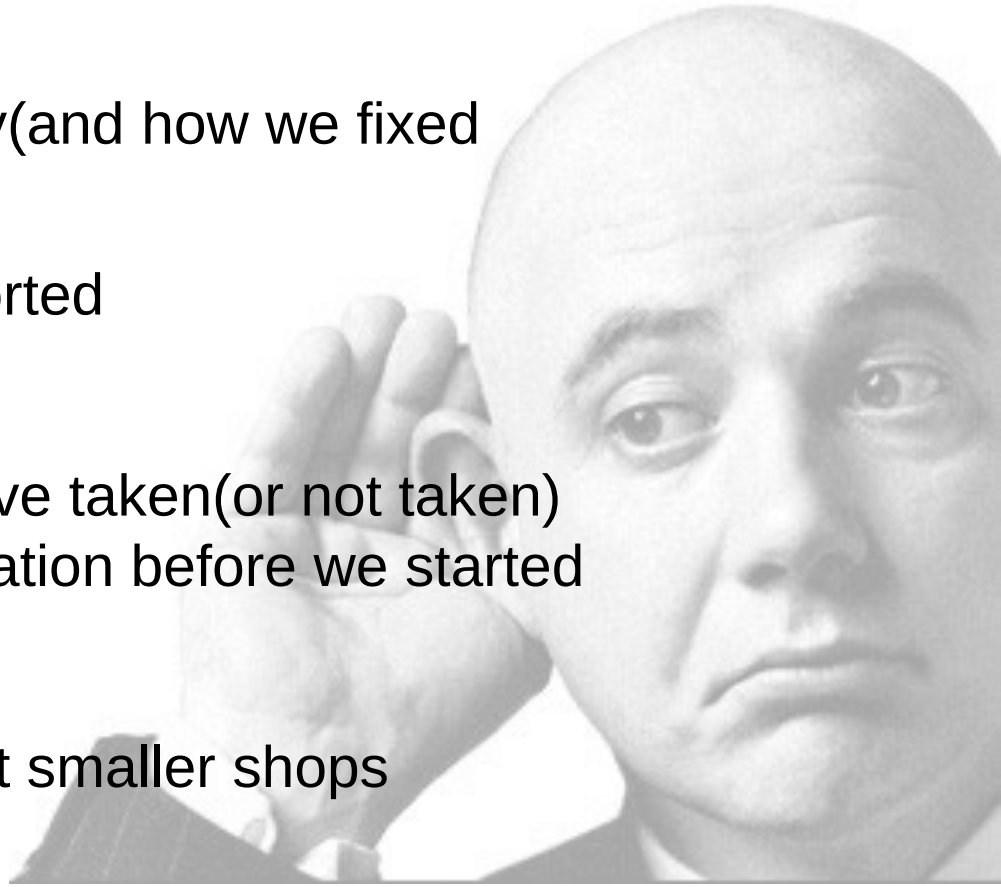
Bash

rpm's

LVM

What you *will* hear today

- ✓ Why zLinux was a good choice for us
- ✓ How we are doing it
- ✓ The potholes along the way(and how we fixed them or bypassed them)
- ✓ Which applications were ported
- ✓ Our toolbox
- ✓ Decisions that we might have taken(or not taken) if we had seen this presentation before we started
- ✓ The challenges ahead
- ✓ How to implement zLinux at smaller shops



Over 100,000 merchants

Over 50 million business transaction per month

Monthly turnover of 9 billion NIS

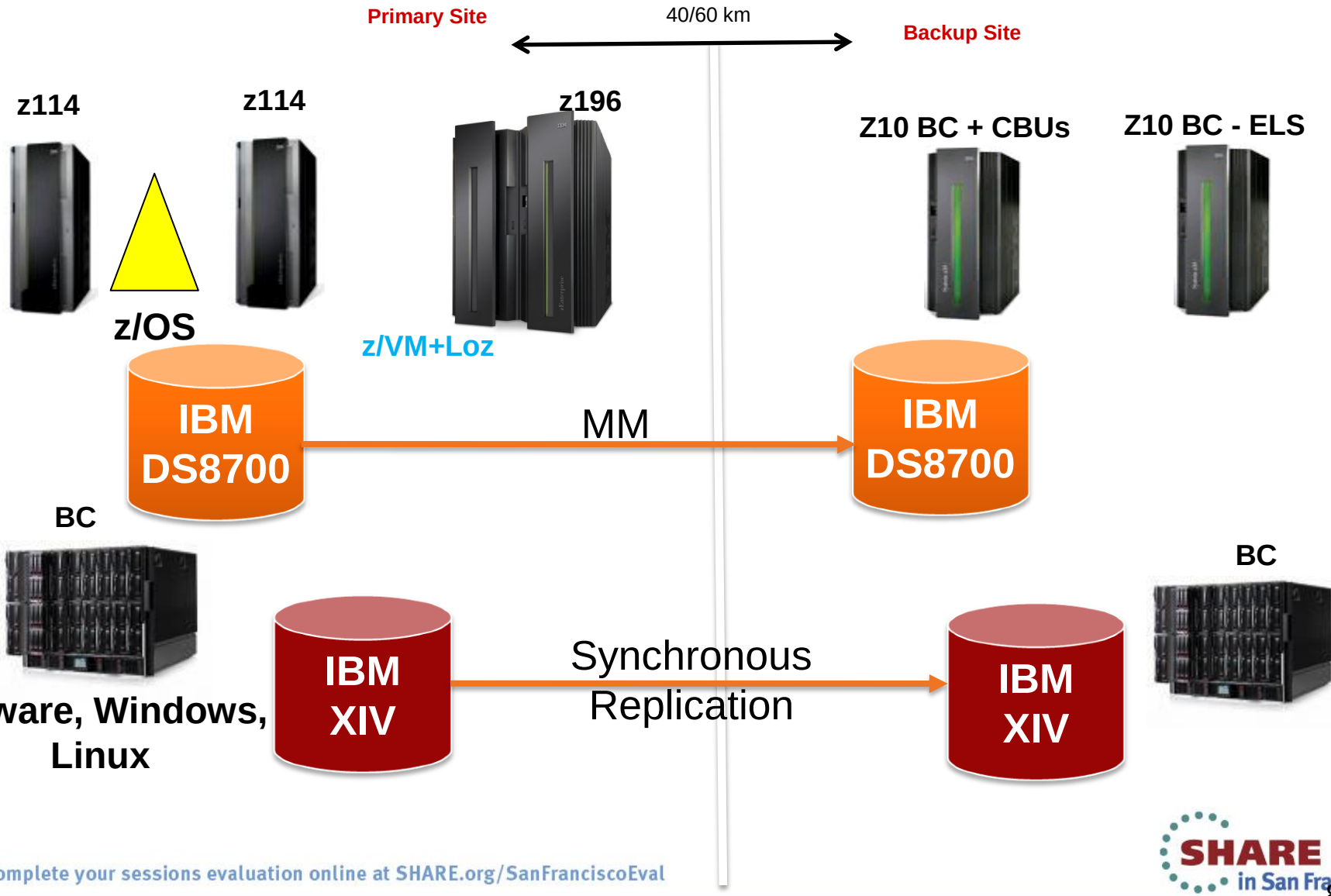
3.5 Million Cards
47 % market share

2 million card holders

About me

- *Manager, Central Infrastructures at Isracard*
- *Responsible for z/OS, z/VM, Linux(z and x), enterprise storage*
- *2 teams – Mainframe OS, Linux and Storage*
- *My background is z/OS system programming, tuning and capacity planning*
- *6 years at Isracard*

Isracard Infrastructure



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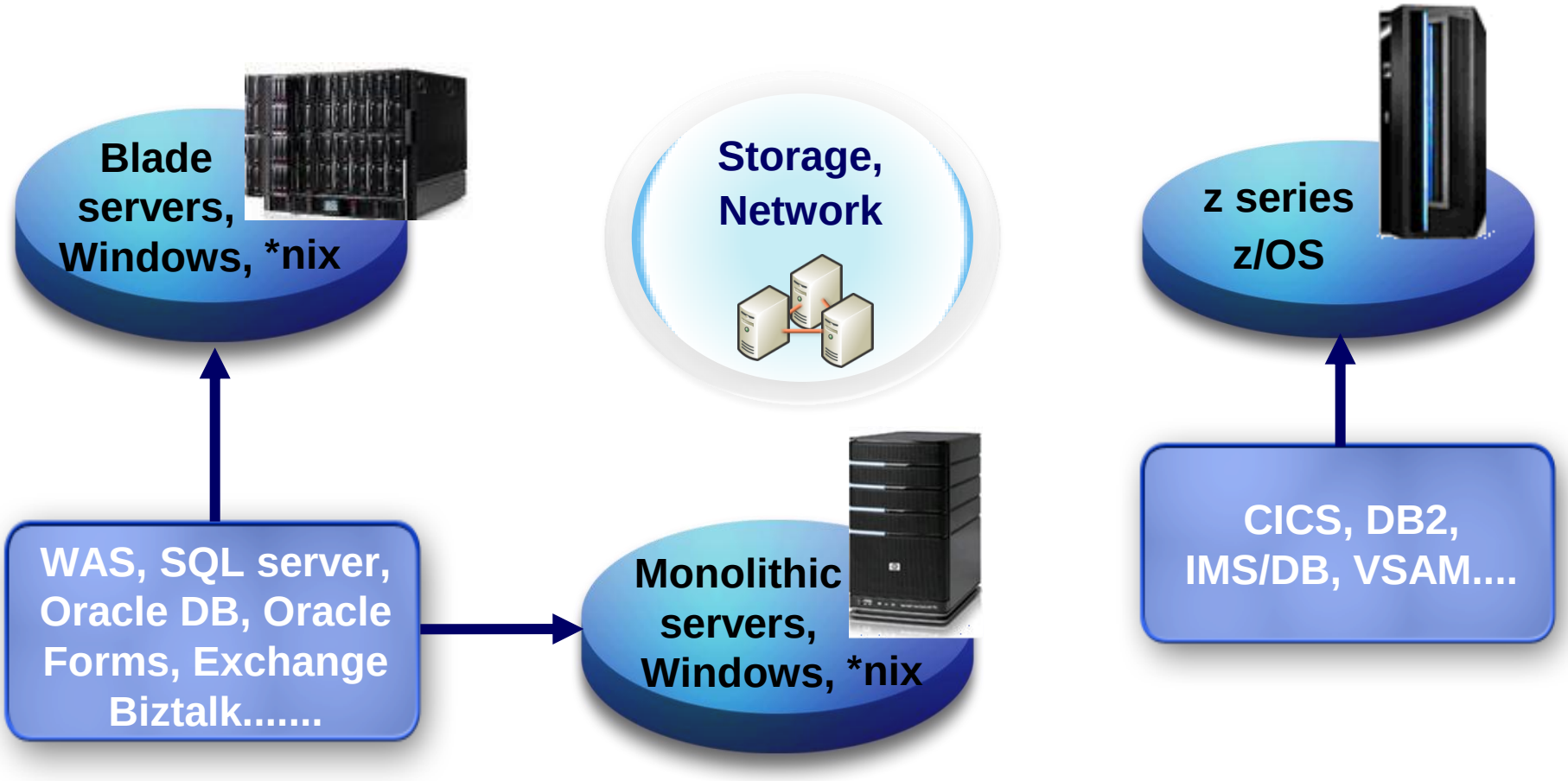
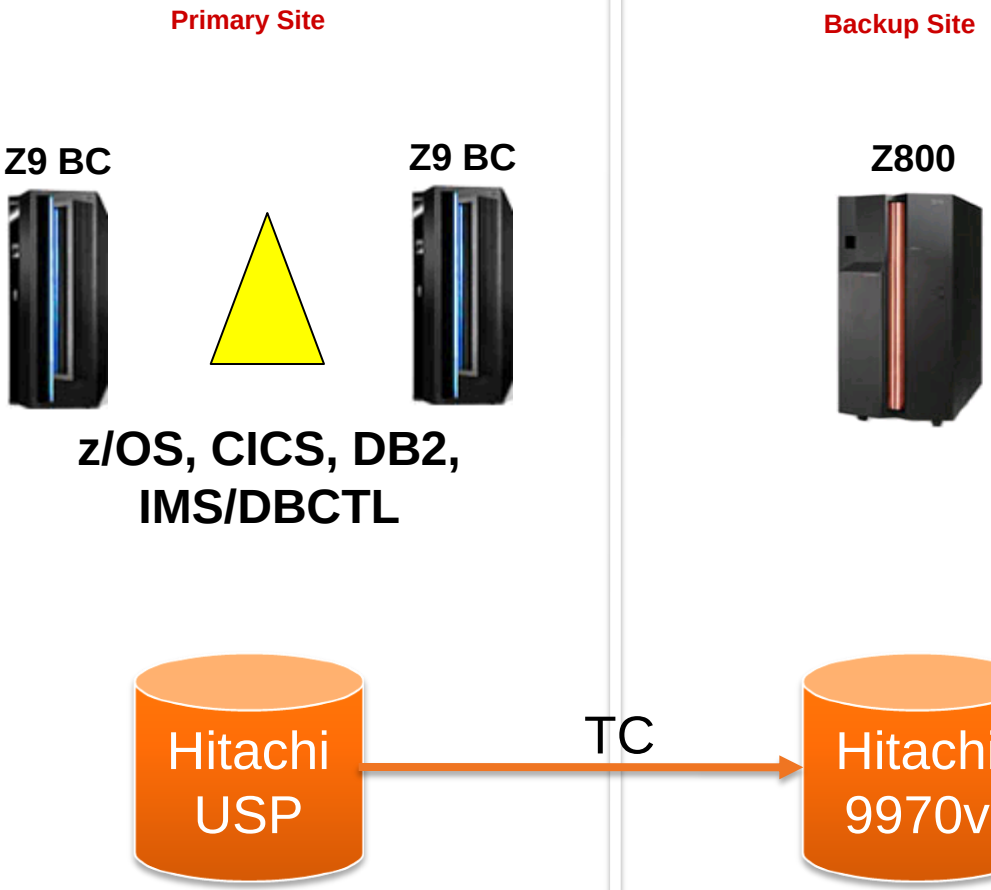
Isracard Before Consolidation



DR Infrastructure before consolidation (3Q08)



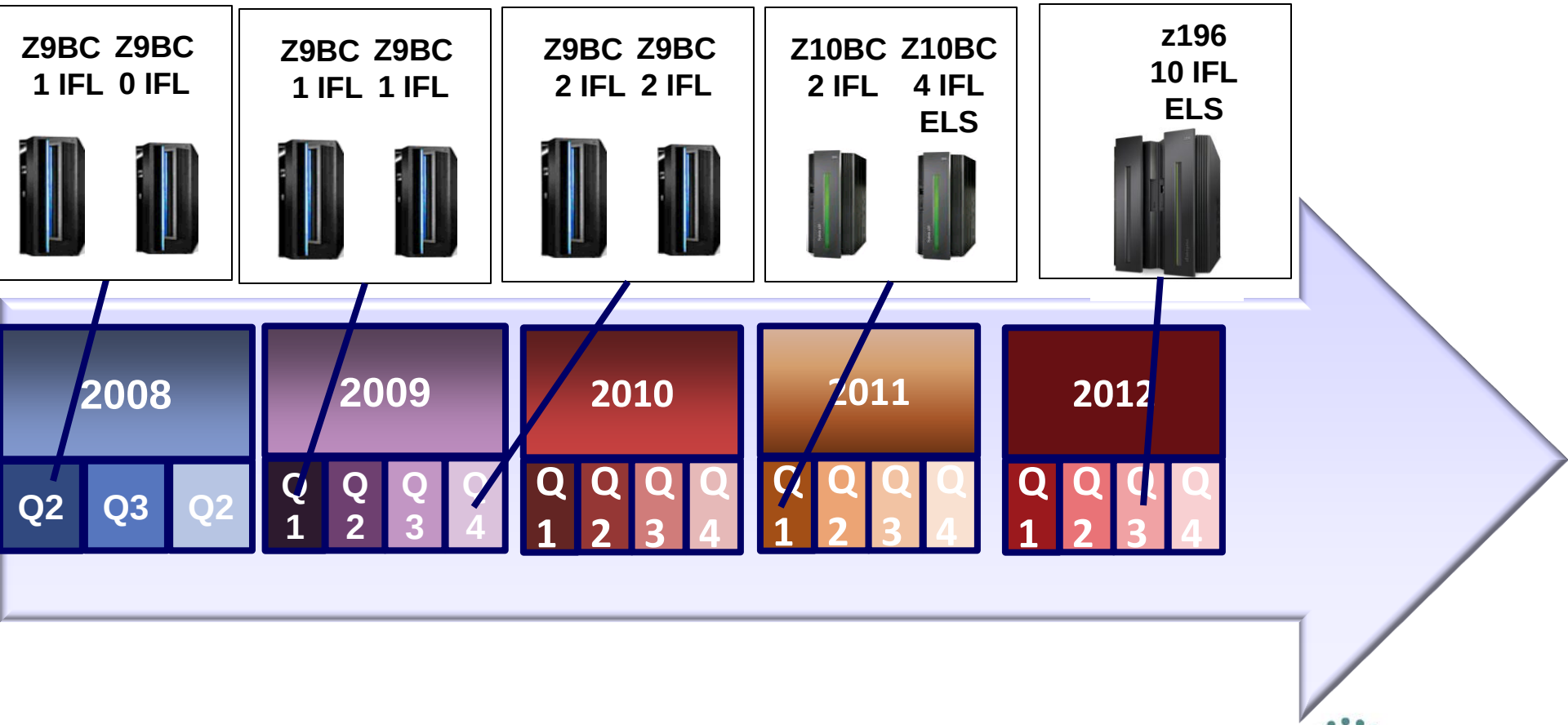
The consolidation trigger

- Until 2008, all core business was on z/OS - hence the distributed systems were not available at the backup site
- Core business on distributed systems - management decision to have them at backup site as well
- Backup site floor space and environmentals were extremely restricted
- We already had a mainframe at the backup site, so zLinux did not take up any additional floor space/power/cooling
- Servers that can not go to zLinux will be consolidated on VMware and blades

Why (z)Linux?

- ✓ Total Cost of Ownership
- ✓ Server Management is easier
- ✓ Built-in DR
- ✓ RASSS
  - Reliability, Availability, Security, Stability, Scalability
- ✓ Performance
- ✓ Close to the core business(aka Hipersockets)

Timeline


Z9BC 1 IFL
Z9BC 0 IFL
Z9BC 1 IFL
Z9BC 1 IFL
Z9BC 2 IFL
Z9BC 2 IFL
Z10BC 2 IFL
Z10BC 4 IFL ELS
z196 10 IFL ELS
2008
Q2
Q3
Q2
2009
Q 1
Q 2
Q 3
Q 4
2010
Q 1
Q 2
Q 3
Q 4
2011
Q 1
Q 2
Q 3
Q 4
2012
Q 1
Q 2
Q 3
Q 4

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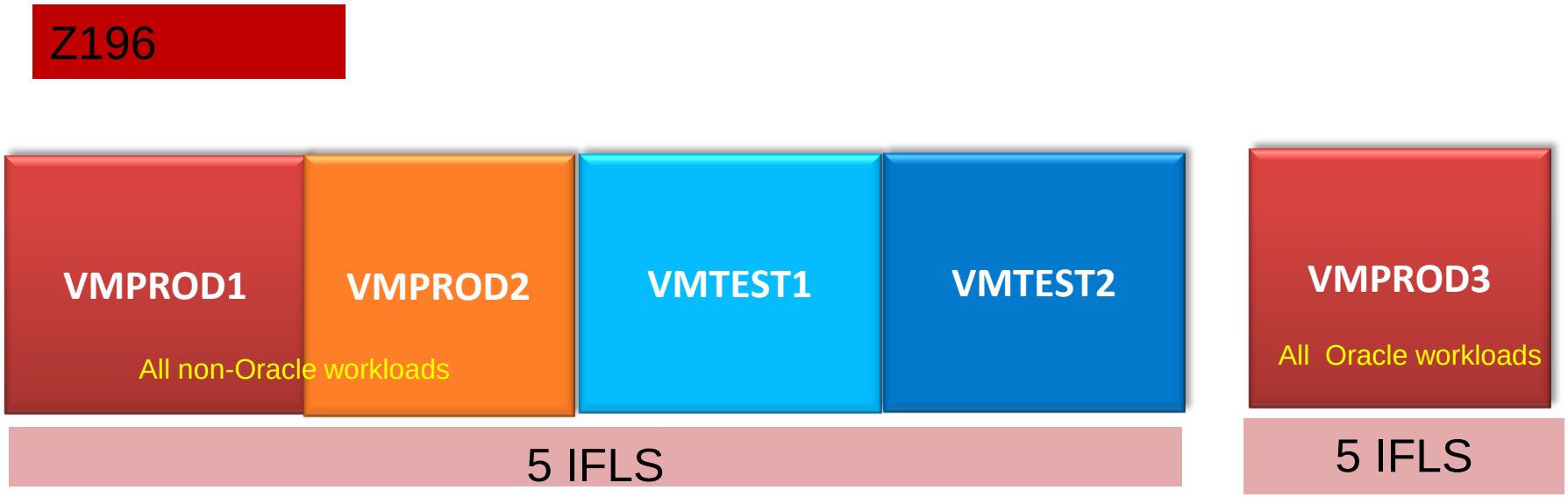
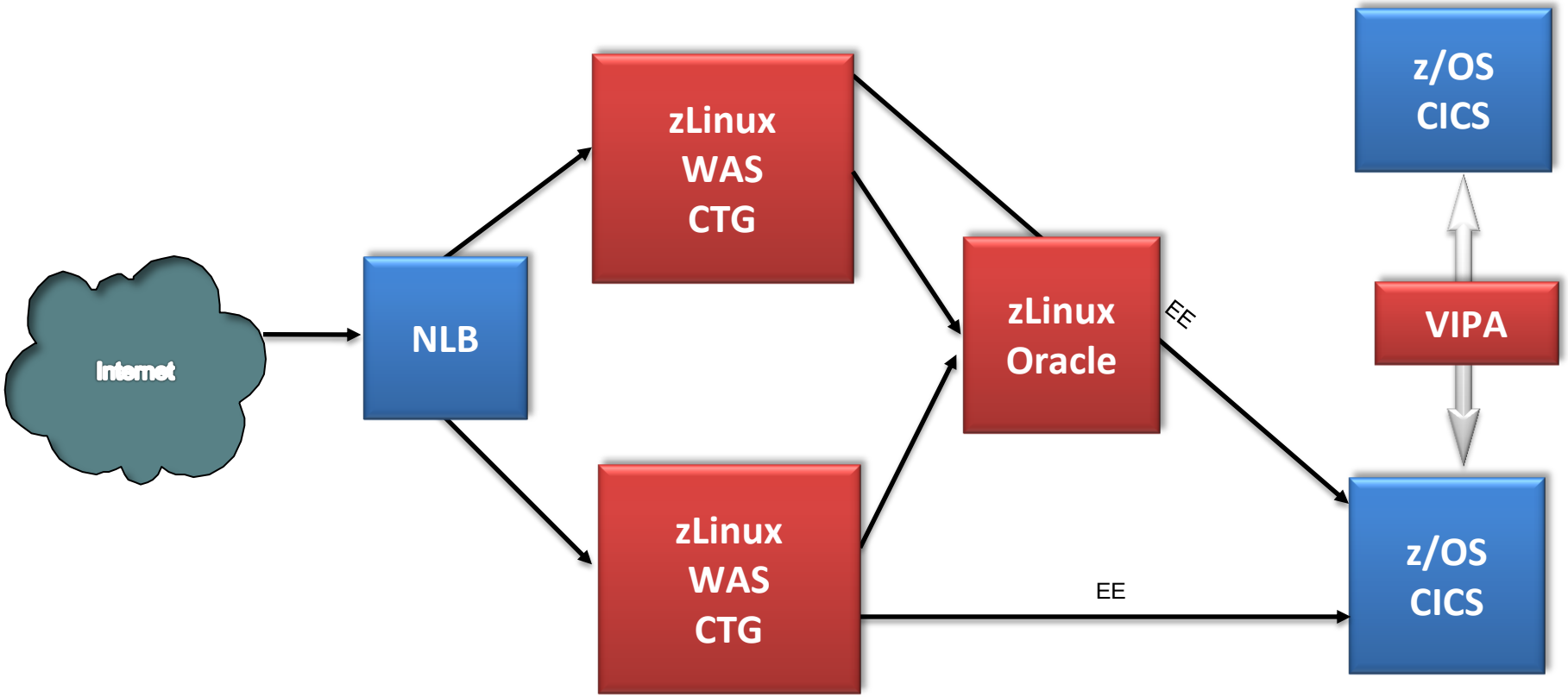
Isracard zVM Infrastructure



High availability example: Internet Application



Current Status(1/3)

- 10 IFLS on a z196
- Storage: DS8700/ECKD for binaries, XIV/FCP for data
- zVM 6.2
  - 3 production LPARs
  - 2 test LPARs
  - 2 QA LPARs
  - 1 system LPAR
- RHEL 5.6
  - 115 linux images
  - 50 production images

Current Status(2/3)

- Software
  - WAS
  - Oracle – work in progress
  - WMB
  - WMQ
  - WODM
  - TEP
  - FILENET

- Applications
  - Internet site
  - Check Authorization
  - ESB
  - Rule Engine
  - Statement Archive
  - Credit Card Issuance
  - Merchants
  - Channels
  - IVR/CTI

Current Status(3/3)

- Tools and utilities
  - BMC/Control-M(scheduling)
  - Symantec/Netbackup and Comvault (backups)
  - Omegamon for zVM(system performance)
  - Omegamon for Linux (server performance)
  - CA Wily Introscope(application performance)
  - CA software for Command and Control
  - RH high availability (clustering – coming soon)
- Manpower
  - 1.5 FTEs for Linux(z and x)
  - 0.5 FTE for zVM

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The Business Class Issues(1/2)

- **Performance**
  - *The z10 BC is no match to the newer Intel processors*
  - ✓ *The z114 is better*
- **Scalability**
  - *BC class machines (such as the z114) have only 10 engines*
  - *BC class machines are limited to 248GB of memory*
  - *2CPs + 2 ICFs + 1 ZIIP + 2 IFLs = 7 CPUS*
  - *What about growth and CBU/CoD?*

The Business Class Issues(2/2)

➲ TCO

- *Most TCO studies were performed for EC*
- *Most ISVs license by IFL core. Any IFL core (z800 = EC12!)*
- *IBM licenses by 120 PVU/EC, 100 PVU/BC. But the performance boost is better than 20%.*

✓ The solution

✓ Z196 ELS – specially priced, IFL only

- ➢ Downside: No Hipersockets with z/OS (is this really bad for us? More later…)
- ➢ IFLS are separated between LPARS for performance (Oracle) and licensing considerations(Websphere)

More challenges

➲ Performance perceptions

- *Users (end users, sysadmins, DBAs) do not like to share*
- ✓ *Tuning. And we try to listen to our users.*
- *zVM shares are inadequate and are difficult to understand*

➲ Some software is not certified for RHEL/z(or gets certified later)

- *Specifically: Clustering software, antivirus, Oracle, DBA Monitoring tools, Asset Management,C² software*
- ✓ *We are working closely with IBM and Red Hat to alleviate this*
- *IBM and ISVs support the platform at the corporate level. This does not always filter down.*

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Some general observations (1/3)

- **Different versions of RH for different software**
  - *would you keep z/OS 1.9 for DB2 8 and z/OS 1.11 for CICS/TS 4.1?*
- **Bleeding edge at times**
  - *Certification - not always there*
    - *Oracle 11g certification came in too late*
  - *Sometimes we had to wait for software to be written*
  - *Not all software is supported on z. Even software provided by big vendors like IBM and CA.*
- **Hipersockets – we have not found a justification for it**

Some general observations (2/3)

- **Managerial issues**
  - *Is it Mainframe or Distributed? - **Try to avoid turf wars!***
    - *We decided to manage it in one place*
  - *You need a full time z/VM expert*
  - *DBAs and Sysadmins do not like virtual platforms - **Educate, Educate, Educate***
- **Scalability Issues**
  - *Business class issues , discussed earlier*
  - *zVM 6.2 is limited to 256 GB /LPAR*

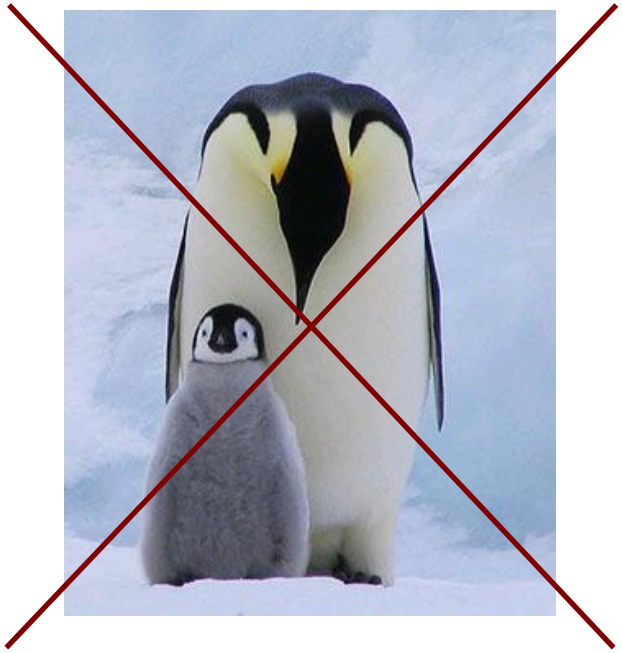
Some general observations (3/3)

TCO

- *TCO studies are not trivial. You need some expert, impartial advice*
- *We saved approximately 45 Oracle licenses by consolidating*
- *List price study for Oracle*

License	$47,500		
Annual maintenance	$10,450		
Existing licenses	40		
New licenses saved	15		
	1st year	2nd Year	3rd year
Savings	$1,287,250	$574,750	$574,750

They multiply



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- Why (z)Linux?
- Chronological road to production
- Some tools
- Observations
- **Questions**

Questions ?