

# Overview on two current Linux on System z Projects



# Agenda

1

**Two Projects – of many**

2

**Summary**



# Case 1

## Project 1 Introduction

- Customer reorganizes and renews his application environment
- One part in the landscape is an application which
  - *Imports* data from an old format and translates it into a new format
    - Much xml handling
    - Is basically of limited life time, when all data are imported this phase is no longer necessary
  - *Exports* according to end-user requirements
    - Again much xml handling
    - Throughput is of high interest as this part is the core of the application
    - For the workload left during day-shift the night-shift must be sufficient to run/re-run workload
  - The piece with most of the data and load from the new environment
- *Customer searched for a scalable environment*

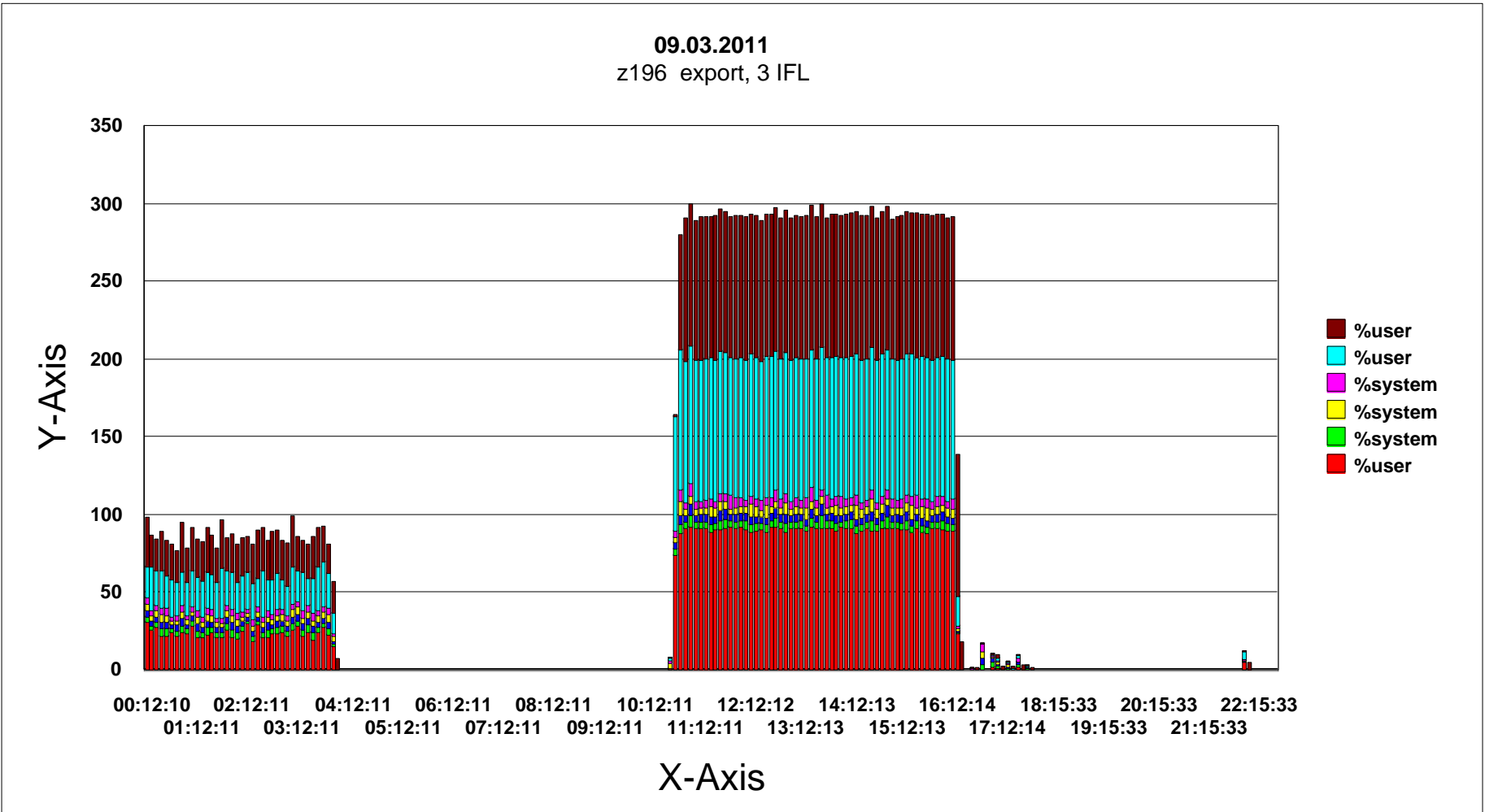
## Project 1 The environment

- The usual Intel environment
  - Linux
  - ryo application server, pure Java
  - Oracle DB
  - Application uses coordinates
    - Oracle spatial extension are necessary
  
- ISV was willing to work on System z !
  - Initially asked his customer for a service contract
    - But this was never needed! Very small effort for the ISV!
  
- Followed our proposal to start at home using IBM JDK
  - Some (really!) minor changes
  
- Started PoC in IBM's Laboratory Böblingen

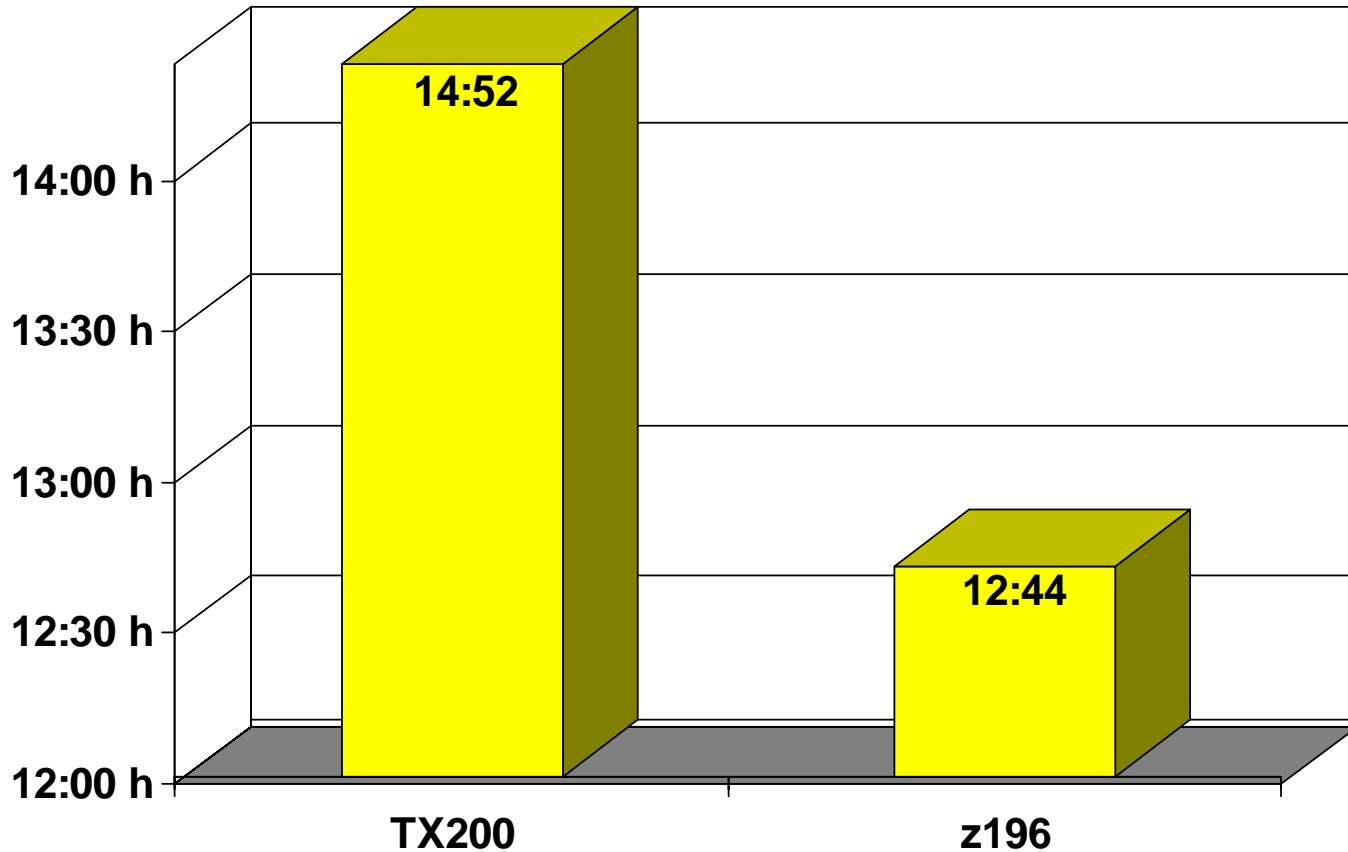
## Project 1 – The Proof of concept

- IBM colleagues at the IBM Lab set up
  - A guest under z/VM
  - 12GB main storage
  - 2 (3) processors
  - External storage on disk
  - Initially everything was on an edev
  
- Both ISV and customer got access to the system via vpn
  - ISV set up his application server and data base
  - Customer loaded data from at home (!)
  
- Customer had prepared a typical set of data
  - As the export was of specific interest they provided more data than expected for the usual ‘batch’
  
- Comparison with equal test runs on an Intel System which was selected to be the production system
  - 4 cores XEON, running @ 1,33GHz, internal scsi disks, 15k/min

# Project 1 – CPU utilization export



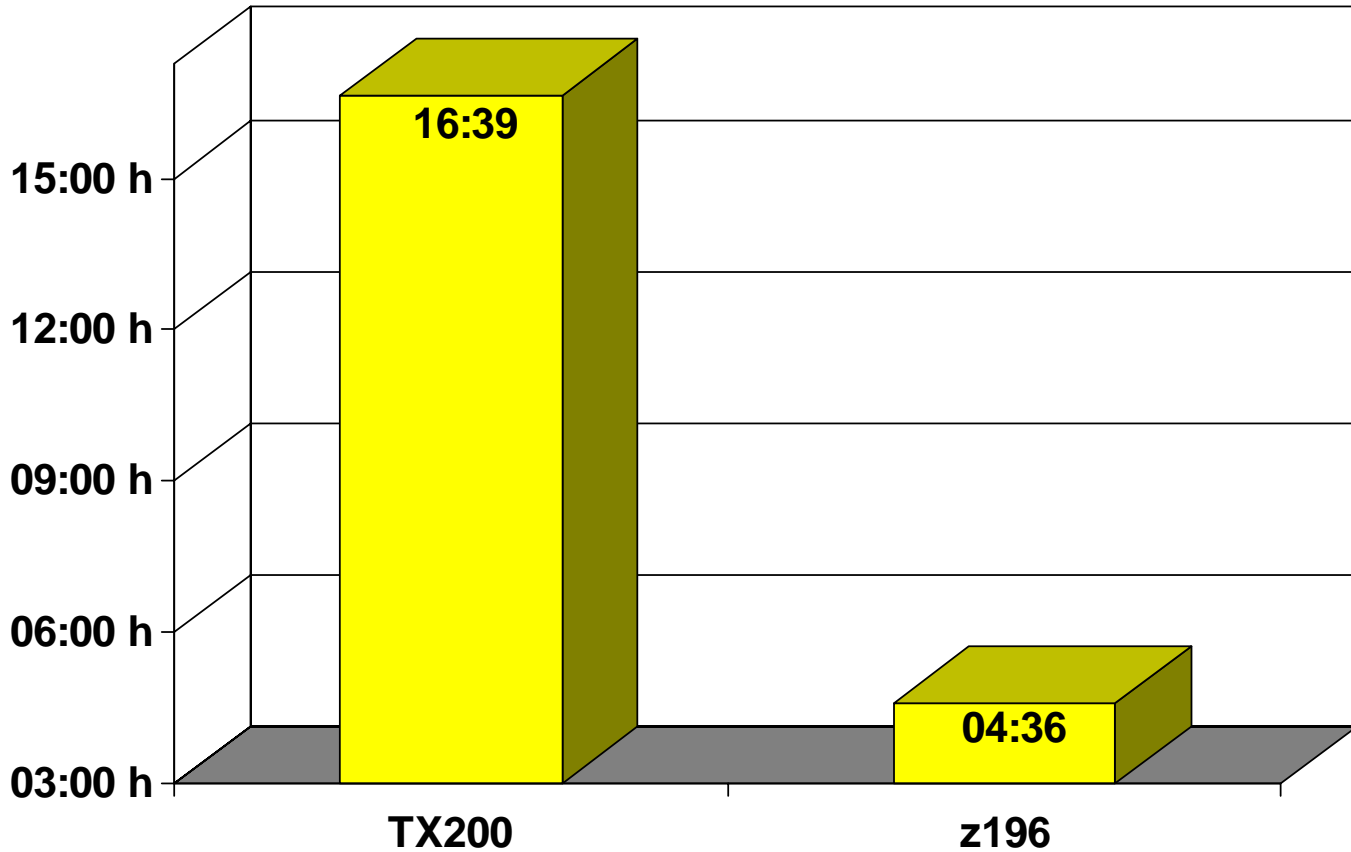
## Project 1 – Comparison Intel/System z196 - Import



Key point → single threaded workload



## Project 1 Comparison Intel/System z196 - Export



Key point → System z scalability and speed

## Project 1 - Outlook

- Customer has already a System z196 in their IT environment
- How can this application integrated
  - Internal negotiations started
- How can customer put more on System z
  - This PoC made other departments aware of their System z
- IBM will offer adequate System z extensions (mainly IFL, storage, disk)

# Case 2

## Project 2 Introduction

- Customer is running a large application in the area of funds and tax information
  - Millions of accounts
- Challenges
  - Most of the workload has a deadline in the 1st quarter
    - ➔ System is sized for workload which is mostly used in the first 3 months
  - Workload will *drastically increase* in 2012 and 2013
- The usual distributed UNIX environment
  - several servers for the core are surrounded by many other servers
    - Like import/export server, LDAP, etc
  - Fixed resources
- Customer wants
  - Modern – *virtualized* - environment
  - *Efficient resource usage* – look at the duty cycle
    - I.e. move resource from production to test
    - More similar non-production systems, not the n-1 generation
- *High service requirement*

## Project 2 – The environment

- The application
  - WebSphere based
  - Completely written in Java
  - Oracle DB
  - Reasonable part is very similar to batch 😊
  
- The Infrastructure
  - 6 UNIX Server running Solaris
  - Total number of CPUs:
    - 32 @ 1,9GHz for the DB Server (2 server)
    - 32 @ 1,9GHz for the application server (4 server)
  - 1 Gb Ethernet copper
  - SAN Storage on *EMC VMAX*

## Project 2 – The phases

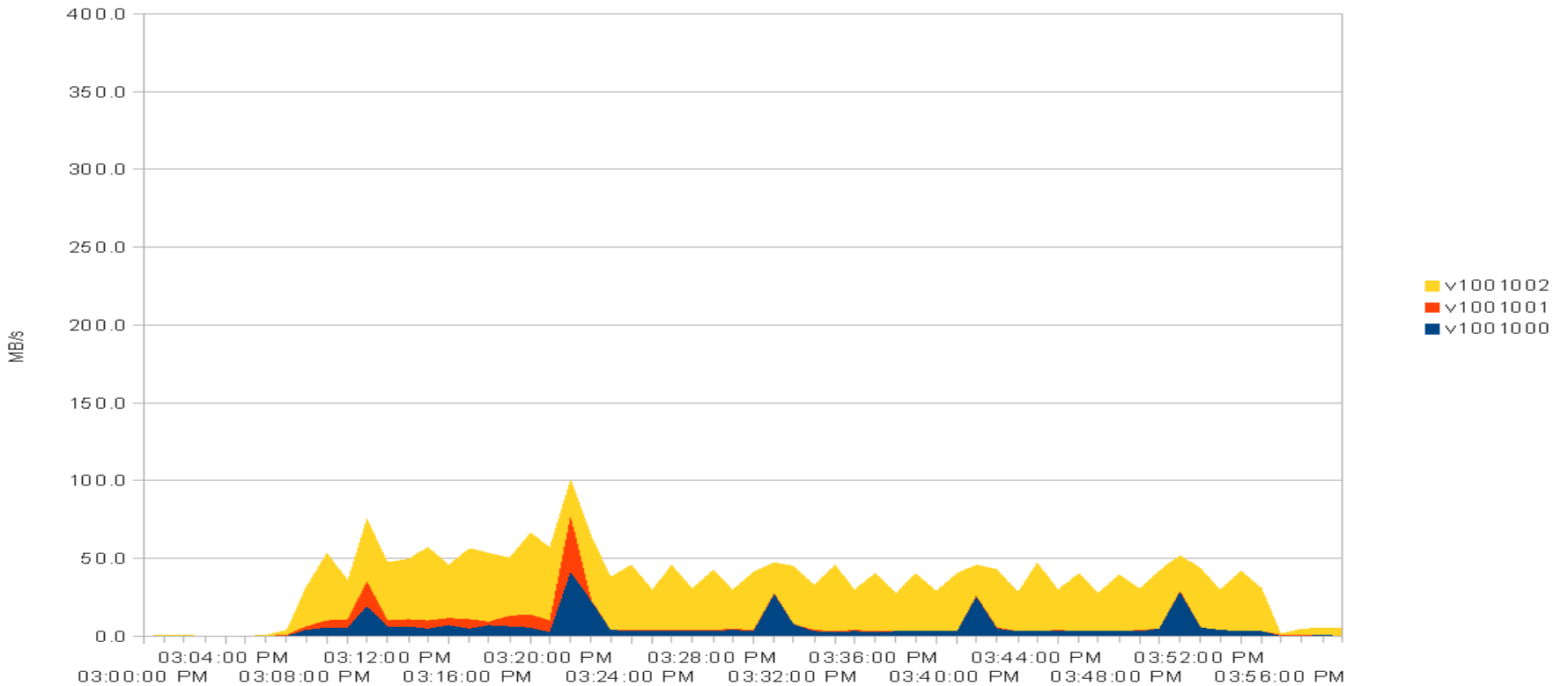
- First steps 2010
  - Paperworks – can application run on Linux for System z?
    - WebSphere, Oracle, Netbackup, EMC VMAX, etc
  
  - PoC in the Laboratory Böblingen
    - Core components only
    - Easy install
    - No performance test
    - First tests were *very* convincing
  
- Decision to buy z196
  - Delivered in June 2011
  - Setup of 3 guests to do more refined tests

## Project 2 – Test Phase

- July/August 2011 more elaborated tests started on that z196
  - Already very stable environment
  - Using customer test driver
    - Modeled after typical production workload
  - System z196 demonstrated flexible environment for the tests
    - Many combinations of IFL assignment to guests could be tested
    - A large set of variants could be tested quickly
      - i.e. # of jvm, heap sizes, etc
  
- Results were used to do the sizing of the target system

# Accumulated utilization - SAN Adapter

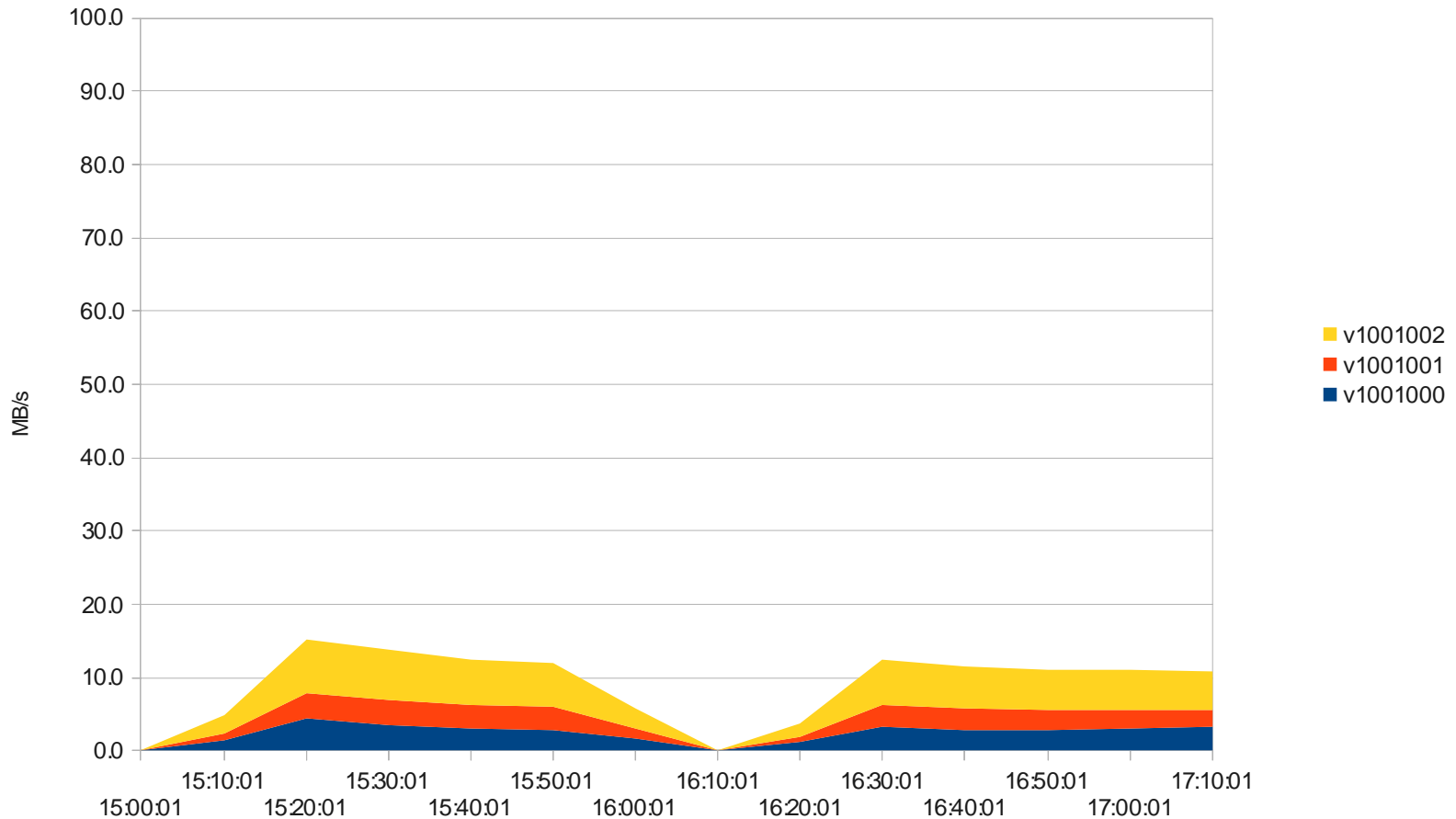
Disk IO während Lasttest





# Accumulated utilization - LAN Adapter

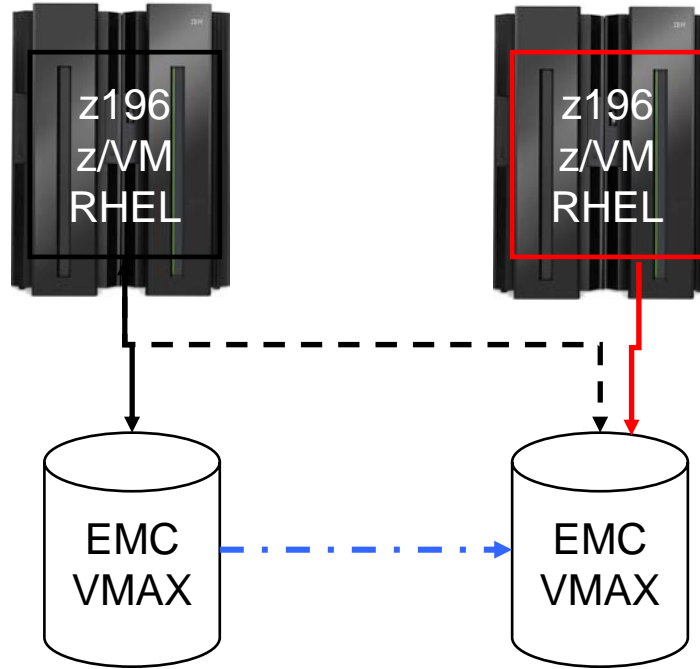
Netzwerk IO während Lasttest



## Project 2 - Technical Solution Overview

### System A

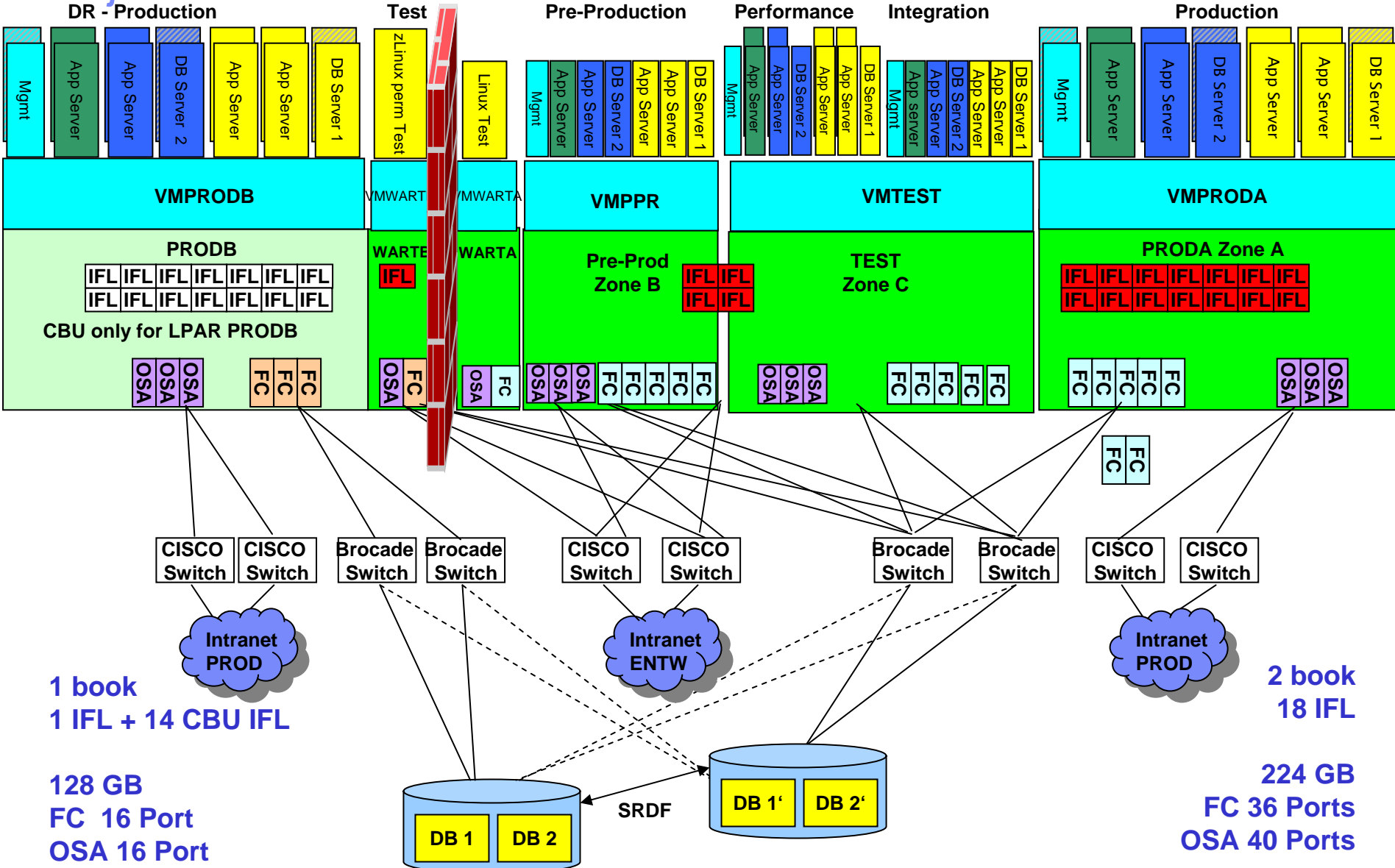
- z196 M32
  - Production system
  - Several test systems
  - Three security zones
  - Multipathing to storage
  - Resource sharing where allowed



### System B

- z196 M15
  - 1 IFL active + 14 IFL CBU
  - Take over production only

# Project 2 – More detailed view



1 book  
1 IFL + 14 CBU IFL

128 GB  
FC 16 Port  
OSA 16 Port

2 book  
18 IFL

224 GB  
FC 36 Ports  
OSA 40 Ports



## Summary



## Lesson learned - 1

- In all cases very smooth move
  - If necessary changes were easy and could be applied with very small effort
  
- Java
  - Start with IBM's jdk on the initial platform
  - Be aware of differences in the *behavior* of both
    - Look at gclog and get help from an expert!!
    - ROT – keep gc overhead below 5%
  - Some classes are options ....
  - Have the newest JDK/SR available
    - To get code from the jit for System z196
  
- Many ISV SW is available
  - Search! the good colleague Google or even better - ask the ISV directly
    - Be penetrate ...
      - Do not believe in the first answer....





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Thank You for your  
attention