# Migration from I to X

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# Agenda

- Bank-Verlag

- The Authorisation application and active-active

- Decision for migration and delivery of the systems

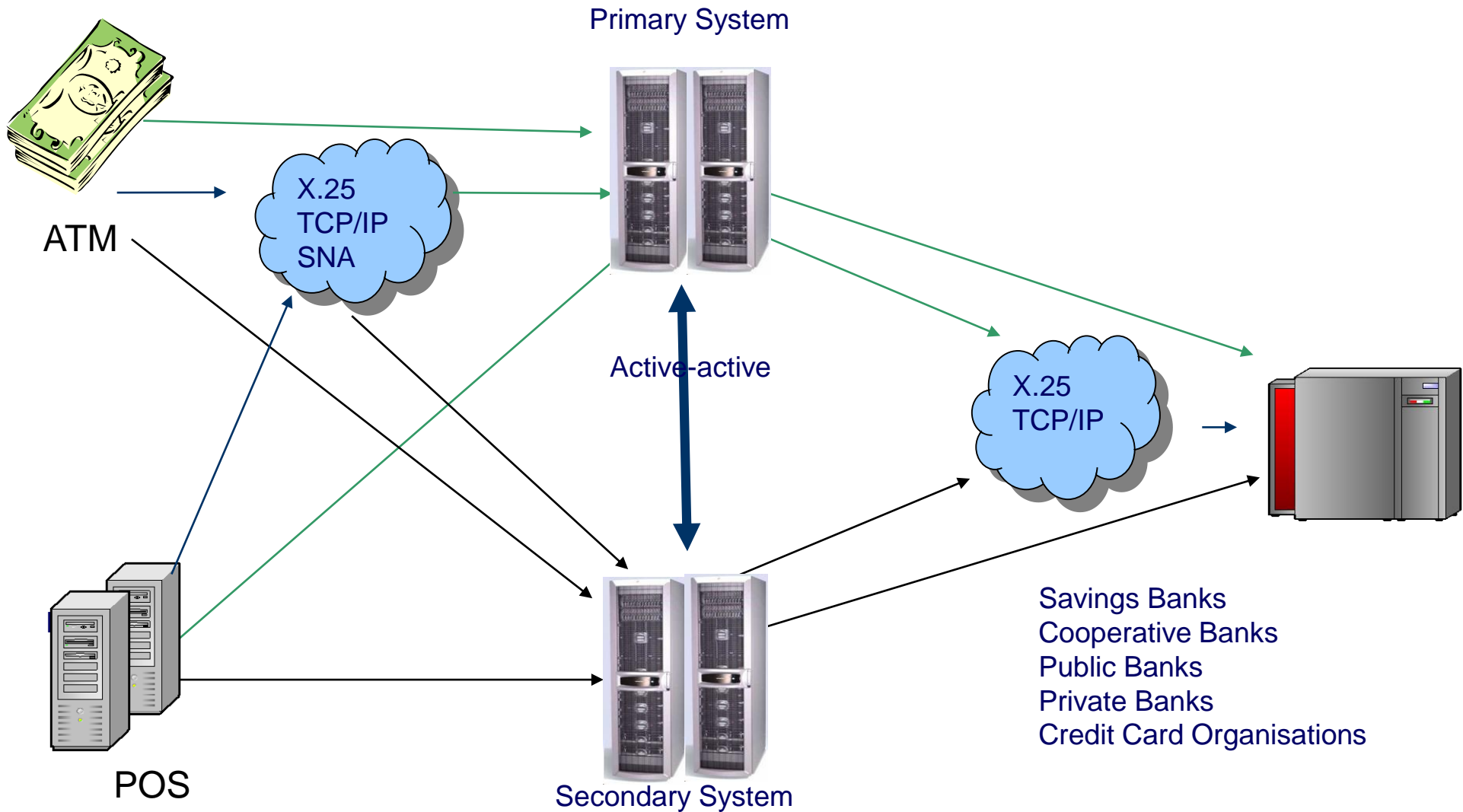- Migrating the applications

Finalist
2004-2009

Winner
2010

# Bank-Verlag

- Founded in 1961 as the publishing house of the magazine „Die Bank".

- Running on IBM Systems /1 and /370 the first Authorisation Center in Germany for ATM-transactions was created at the Bank-Verlag in 1986.

- In 1988 authorisation was migrated to a Tandem NonStop (today HPE NonStop) system creating the first active-active application using IBM/370 and Tandem NonStop.

- 2005 we have been the very first to move to Integrity NonStop

- 2010 the secondary datacentre was moved to a new location without any noticeable outage

- 2012 we replaced the NS1600 by NB54000

# The authorisation application on the I-systems

Primary System

X.25
TCP/IP
SNA

ATM

Active-active

X.25
TCP/IP

POS

Secondary System

Savings Banks
Cooperative Banks
Public Banks
Private Banks
Credit Card Organisations

# New challenges

- Bank-Verlag had a cooperation with another authorisation center on NonStop

- The cooperation resulted in outsourcing the other authorisation center to Bank-Verlag

- This nearly doubled the transaction load

- The existing secondary I-system (2 processors with 2 cores each)  would not be able to take this load alone during peek-times

- Additional diskspace would be necessary shortly

- So we had to upgrade the existing I-systems or migrate to X-systems.

- The X.25 lines were already running on Irene-boxes

- The only problem would be the one remaining SNA-customer

# The decision

- We had long discussions with HPE about the possible solutiions

- The existing systems were running of of service, QA and development in early 20018, the production systems in 2019

- Upgrading the old systems was not an option.

- So either replace the old I-hardware with new hardware or migrate to X

- New I-hardware would be a kind of dead end

- In addition new I-hardware would be more expensive than migrating to X

- Our SNA-customer decided to move the application to TCP/IP

# Ordering and arrival

- The new systems were configured similar to the old systems

- The NB54000 was replaced by NS X7 systems

- The NS1200 QA and development systems were replaced by NS X3

- Systems were ordered and the 2 NS X3 arrived end of June 2017

- First tests were done and as expected the systems were significantly faster than the old NS1200

- First programs were migrated without any problems

# The production systems

- Both production systems were announced for end of July 2017

- Unfortunately this was just before the school holidays started

- The very day of the delivery came and we started with the primary production system

- As usual the system arrived in a big and massive wooden box

- The wooden box war removed and the system was brought to the datacenter

- The next system was the secondary system and is was unloaded at the secondary datacenter

- The wooden box was removed and …

# Back to 2005

- Does anybody remember these pictures?

- This was the very first Itanium-based system delivered to a customer during the early adopter phase

- The customer was Bank-Verlag and the system fell from the truck during transport

- That had never happened before

- Because of that HPE is now shipping the systems protected with massive woooden boxes

# Back to the secondary system

- The wooden box was removed

- Unfortunately the system inside was not the one produced for Bank-Verlag

- According to HPE this was the first time something like this happened

- It seems that Bank-Verlag is specialized on things that „never happened before"

- The system was repacked and HPE had to find our system

- The good news was that the factory had just mixed up 2 systems

- So just the 2 systems had to be exchanged

- Unfortunately this exchange lasted about 2 months and the delivery was announced only a week before the system arrived

# Consequences of the delay

■ Original planning was going into production in October 2017

■ The date of delivery of the secondary system was not known uuntil 1 weel before the delivery

■ It did not make sense for the application team to start to work on the migration of the application before the delivery

■ They did not want to maintain I- and X-versions of the programs until the planning was fixed

■ In addition the application team had a lot of work with new functionalities of the authorisation application

■ So we decided to do the migration in 2018

# Planning of the migration

- During previous migrations we never changed the system names and node numbers

- This time the new systems would get new names

- During previous migrations we had always migrated the data by simply copying the disks

- Now we neded another solution

- For the non-audited files we decided to simply use PAK and UNPAK as a first step and use the same way for the files changed after the initial copy

- For the audited files RDF was the way to choose

- Only problem with RDF was that some of the data on the secondary system was maintained via RDF from the primary system.

# Replicating the audited tables

- Do a backup with „NOSQLDATA" and create the tables on the new system

- Configure RDF for the necessary replications

- Do an initial load on the tables of the new system

- A 1.5TB table with 32 partitions was loaded in single partitions

- The load of the index of that table was significantly faster than on the I-system (hours iinstead of days)

- Maintaining the data via RDF proved as an easy and reliable way.

# Migrating Bank-Verlag's monitoring tool and other tools

- Compile the programs on the NonStop itself

- Small problem: X.25 and SNA are no longer suppported -> remove SPI interfaces

- No other changes to the SPI-interfaces

- Old systems had G4SA controllers, new system has CLIMs (but no SPI for that)

- Very few changes required

- The results were as expected: Sources are compatible

- Other tools like our BROWSER tool were just compiled and ran

# Migrating the authorisation application

- The programs are maintained using NSDEE.

- Visual Inspect on NonStop itself is no longer supported

- NSDEE ist slightly different

- For most programs it was just a recompile

# Migrating the authorisation application

- Sometimes the X-system acts different from the I-system.

- Comparing 2 variables and one of the variables is a null pointer is handled diffferently:

    - The I-system just says „not equal"

    - The X-system produces an abend

- According to the application people the startup of the NSDEE-based visual inspect is extremely slow

- But finally all programs were available on the X-system and the move to the X-system could start

# Starting the authorisation application

- Remember: Data was still duplicated via RDF

- The application should take over

- The first X-system should act as a passive third system together with the 2 active I-systems.

- The appplication is able to work with up to 8 active systems, 6 active + 2 passive systems have been real live before

- RDF was stopped at midnight

- The application was configured to start the application-based replication at midnight

# Starting the authorisation application (2)

- The appplication took over

- Data was replicated to the X-system as expected

- A few days later we did the same thing with the primary production system

- Now the application war running on 2 systems in active and on 2 systems in passive mode

- We were ready for taking the X-systems to active mode

# Starting the real production on the secondary X-system

- The maintenance window was announced to the customers

- At 10:30 pm on Saturday the active application on the secondary I-system was stopped

- We exchanged the IP-adresses between X-system and I-system, so the X-system had the addresses the I-system had before and vice versa.

- The active appplication on the X-system was started frontend-process by frontend-process with lots of checking and after about an hour everything was started and the application was performing without any problem

- Afterwards the application on the secondary I-system was started in passive mode

- Everything worked without problems

# Starting the real production on the primary X-system

- Again the maintenance window was announced to the customers

- And than everything went similar to the task with the secondary system

- The primary system is performing most of the batch processing

- So there was some additional work with checking the batch processing

- Afterwards we had 2 active X-systems and 2 passive I-systems.

# Migrating our web application

- The secure ITP-webserver does not start without creating a key before

- Configuring webserver and Tomcat was the same as on the I-system

- The application itself was copied to the X-system without any change

- We really like the performance

## Some experiences with the new systems

- A report needing a couple of minutes on the I-system is started and the TACL-prompt returns nearly immediately

- Guy thinks „must have gone wrong" and repeats the same thing with the same result

- Report succeeded, the system is much faster than the I-system

- Especially the SSDs are really fast

# The very last step: Goodbye to the I-systems

- I-systems were halted

- We removed the disks so there was no need to do a cleanup

- The disks are destroyed

- Fortunately our monitoring tool keeps track of the serial numbers, so the whole procedure is ok for the security management and the auditor

# Any questions???

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