

# TCO of requested Case Study

Credit Card (CC) Transaction for a Bank



Author: Kalashnikova Polina

# Description of the environment UC & required TPS

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## UC: Credit Card (CC) Transaction for a Bank

Every CC transaction requires:

- Checking the CC is valid,
- Checking the POS is valid,
- Checking the money amount is valid
  - That the specific CC is within single transaction limits, daily limits and monthly limits
  - If the CC is pre loaded CC, that there is sufficient money in the basket
- Check if the transaction is suspect
  - Run AI to warn or stop suspect transactions
- If the POS requires a second identification step, perform that step and check complete successfully,
- At the end of the transaction, issue OK or abort
- Store all the information about the transaction whatever is the exit status



# Sizing

The input provided is that the systems must support up to 1000 TPS

- Our input is that a x86 core is able to process 20 TPS\*
- Based on literature and what said previously, a LinuxONE core (aka IFL) is able to perform 10x TPS, therefore 200 TPS

		Workload (TPS)	Core per Server	Max Server Faults	HA Ratio															
		1.000	40	1	80%															
	Typical core Ratio	TPS by Core	# of Cores for workload TPS	HA cores	Prod cores	Dev % of Workload	Dev cores	Test % of Workload	Test cores	PreProd % of Workload	PreProd cores	DR active cores % of Prod+PreProd	DR cores	DR CBU (spare) cores	Tot # of Active cores	x86 to z Active Core ratio	Tot # of Active cores no DR	x86 to z Core ratio no DR	Tot # of cores	x86 to z Core ratio
x86	10	20	50	40	90	50%	25	50%	25	100%	50	100%	140		330	20,6	190	11,9	330	12,7
LinuxONE	1	200	5		5	50%	3,0	50%	3,0	100%	5			10	16		16		26	

*\*A precise sizing would require to know the x86 server and its config. Yet, as the differences of these servers would not impact the overall view, for simplification we adopt this approach*

## Technical Architectures for the two cases: inputs 1000 TPS

### Case 1:

x86 Server:

Rack server w Xeon Gold 6242 20C 3.10GHz (2 Chips, 40 Cores)

12 servers

330 cores

### Case 2:

LinuxONE Server

2 servers

16 cores (IFL)

and 10 spares (CBU)

### Site 1



Prod:	PreProd:	Dev:
3 servers	2 servers	1 servers
90 cores	50 cores	25 cores

### Site 2



Test:	DR:
1 servers	5 servers
25 cores	140 cores



1 LinuxONE with:

Prod:	Dev:	Spare:
5 cores	5 cores	5 CBU



1 LinuxONE with:

Pre-Prod:	Test:	Spare:
5 cores	5 cores	5 CBU

# TCO Comparison on 5 years

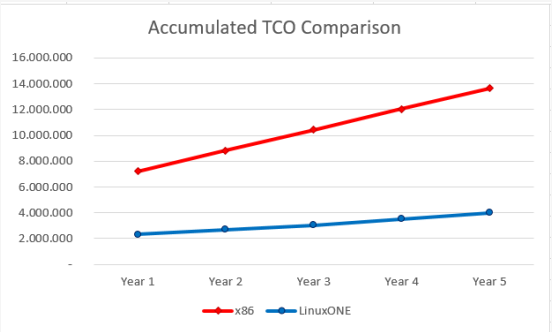
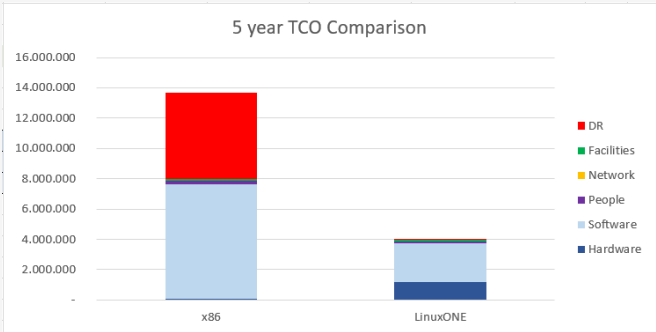
x86		Environments					
Rack server w Xeon Gold 6242 20C 3.10GHz (2 Chips, 40 Cores)		Prod	Dev	Test	PreProd/QA	DR	Tot by Comp
C o m p o n e n t s	Hardware	36.753	12.251	12.251	24.502	61.255	147.012
	Software	3.566.317	1.001.733	1.001.733	1.988.265	5.539.382	13.097.429
	People	200.000					200.000
	Network	20.580	6.860	6.860	13.720	34.300	82.320
	Space	13.000	1.127	1.127	2.253	13.000	30.507
	Electricity	23.652	7.884	7.884	15.768	39.420	94.608
Total by Env		3.860.302	1.029.854	1.029.854	2.044.508	5.687.357	13.651.875

LinuxONE		Environments					
		Prod	Dev	Test	PreProd/QA	DR	Tot by Comp
C o m p o n e n t s	Hardware	367.500	220.500	220.500	367.500	42.000	1.218.000
	Software	799.596	479.758	479.758	799.596	-	2.558.707
	People	100.000					100.000
	Network	8.575	5.145	5.145	8.575	-	27.440
	Space	22.750	13.650	13.650	22.750	-	72.800
	Electricity	5.187	3.112	3.112	5.187	-	16.598
Total by Env		1.303.608	722.165	722.165	1.203.608	42.000	3.993.545
						Savings =	71%

Above schemas summarize the TCO for the different environments on 5 years, for each cost component

-The savings with the LinuxONE platform is 51% vs the x86 equivalent platform

Below diagrams highlights the component contribution to total cost and cost per year that make the accumulated TCO



# x86 TCO Assumptions

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- **Hardware**

- ✓ Rack server w Xeon Gold 6242 20C 3.10GHz (2 Chips, 40 Cores)
- ✓ Acquisition cost: 12,5K€ -30% discount including 3 years Support
- ✓ Support for following years is 20% of purchase price

- **Network**

- ✓ 7000€ per Server -30% disc Maint@ 10% of PP from y2

- **People**

- ✓ One FTE covers 30 servers
- ✓ Average yearly fully loaded costs=100K€

- **Space**

- ✓ Fully loaded cost of Sq. meter=2.800€

- **Electricity**

- ✓ Cost per kWh=0,30€

- **Software**

- ✓ OS: subscription 2000€/year –20% disc per socket
- ✓ VM: license 5000€/socket -20% disc maint@ 20% of purchase price from y2
- ✓ Application Server: license 1062€/PVU -75% disc (70 PVU per core) maint@ 20% of purchase price from y2
- ✓ DB: license 14.000€ for 2 cores -75% disc maint@ 20% of purchase price from y2
- ✓ Data Replication Tools: subscription 3000€/year –75% disc per core
- ✓ Monitoring Tools: license @5.000€/server -40% disc. Maint@ 20% of PP from y2
- ✓ Security Tools: license @5.000€/server -40% disc. Maint@ 20% of from y2

# LinuxONE TCO Assumptions

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- **Hardware**

- ✓ LinuxONE servers configured as the example @ 725K€ for 3 years –30% disc
- ✓ Maint@ 10% PP from y4
- ✓ Support for following years is 20% of purchase price

- **Network**

- ✓ 14000€ per LinuxONE Server -30% disc
- ✓ Maint @ 10% of PP from y2

- **People**

- ✓ One FTE covers 30 servers
- ✓ Average yearly fully loaded costs=120K€

- **Space**

- ✓ Fully loaded cost of Sq. meter=2.600€

- **Electricity**

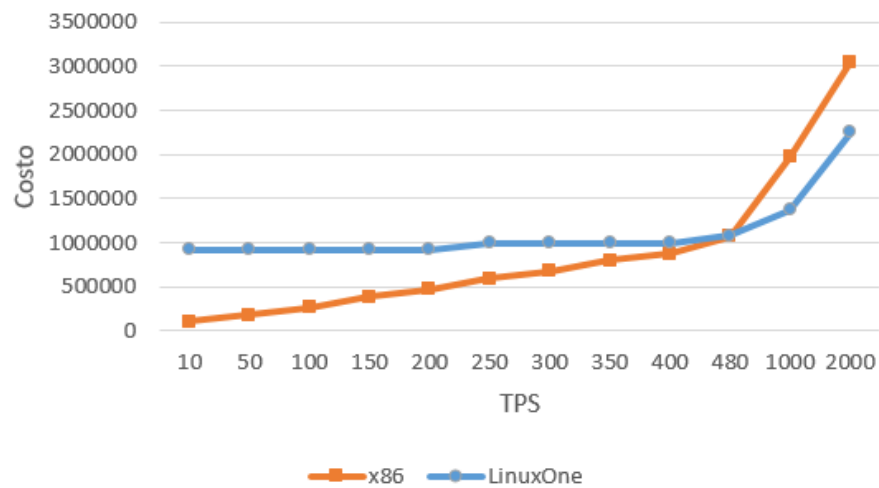
- ✓ Cost per kWh=0,10€

- **Software**

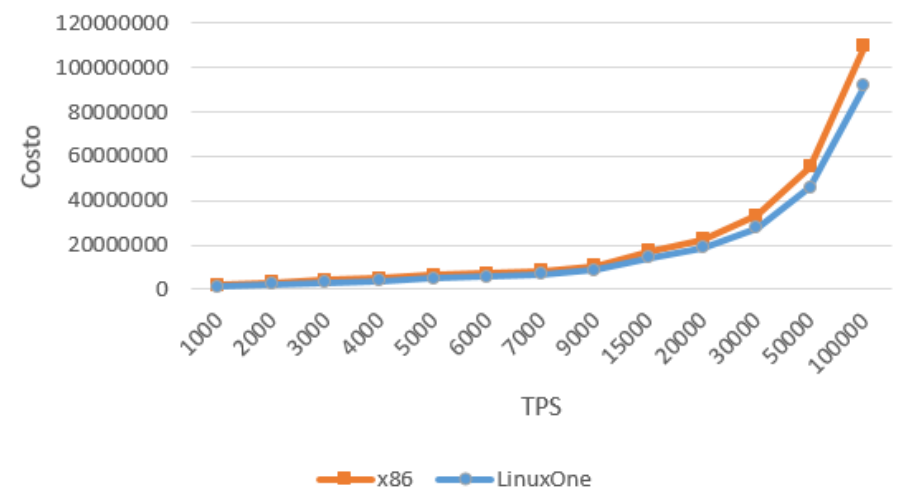
- ✓ OS: subscription 6000€/year –20% disc per socket
- ✓ VM: included in HW
- ✓ Application Server: license @100€/PVU -50% disc (120 PVU per core) maint @ 20% of purchase price from y2
- ✓ DB: license @40.000€ per cores -50% disc maint @ 20% of purchase price from y2
- ✓ Data Replication Tools: subscription 3000€/year –50% disc per core
- ✓ Monitoring Tools: license @5.000€/server -40% disc. Maint@ 20% of PP from y2
- ✓ Security Tools: license @5.000€/server -40% disc. Maint@ 20% of from y2

# How TCO changes with TPS

5 years TCO growth with TPS small workload



5 years TCO growth with TPS large workload





# Links

[Link to GitHub](#)

[Server configurator](#)

[Microsoft SQL Server pricing](#)

[Application server pricing](#)



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