Open Source
at
Swedish National Police Board

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Agenda

- Swedish National Police Board
- Background
- Existing and new IT-vendors
- IT-architecture
- Analysis methods - SWOT
- IT-costs over the next 5 years
- Savings
- Proof of Concept
- Decisions
- Q&A

The Swedish Police

Employees total:	25000
Policemen:	16900
IT Department:	535

IT within the Police

IT is used for:

- Incident Reporting
- Investigations
- Traffic surveillance
- Forensics
- Information exchange with other authorities

- Human Resource
- Economy

- IT-Service

Architecture:

Legacy:
- Mainframe
- Two-layer
- Three-layer

New:
- n-Layer Architecture based on the J2EE framework

Operation:
- 1 Main site
- 250 Unix servers
- 1 Mainframe (Unisys)
- 500+ Novell servers on 400 sites
- 20 000 Clients
- 500 Applications (instances)

Background

Why Open Source?

- Large costs of licences, support and maintenance
- Introduce of Open Standards
- Increase the freedom of choice
- Increase competition between vendors
- Minimize vendor lock-in
- TCO, Total Cost of Ownership
- ROI, Return of Investment

Open Source Roadmap

- Preliminary study
  - Started February 2006
  - Finished October 2006

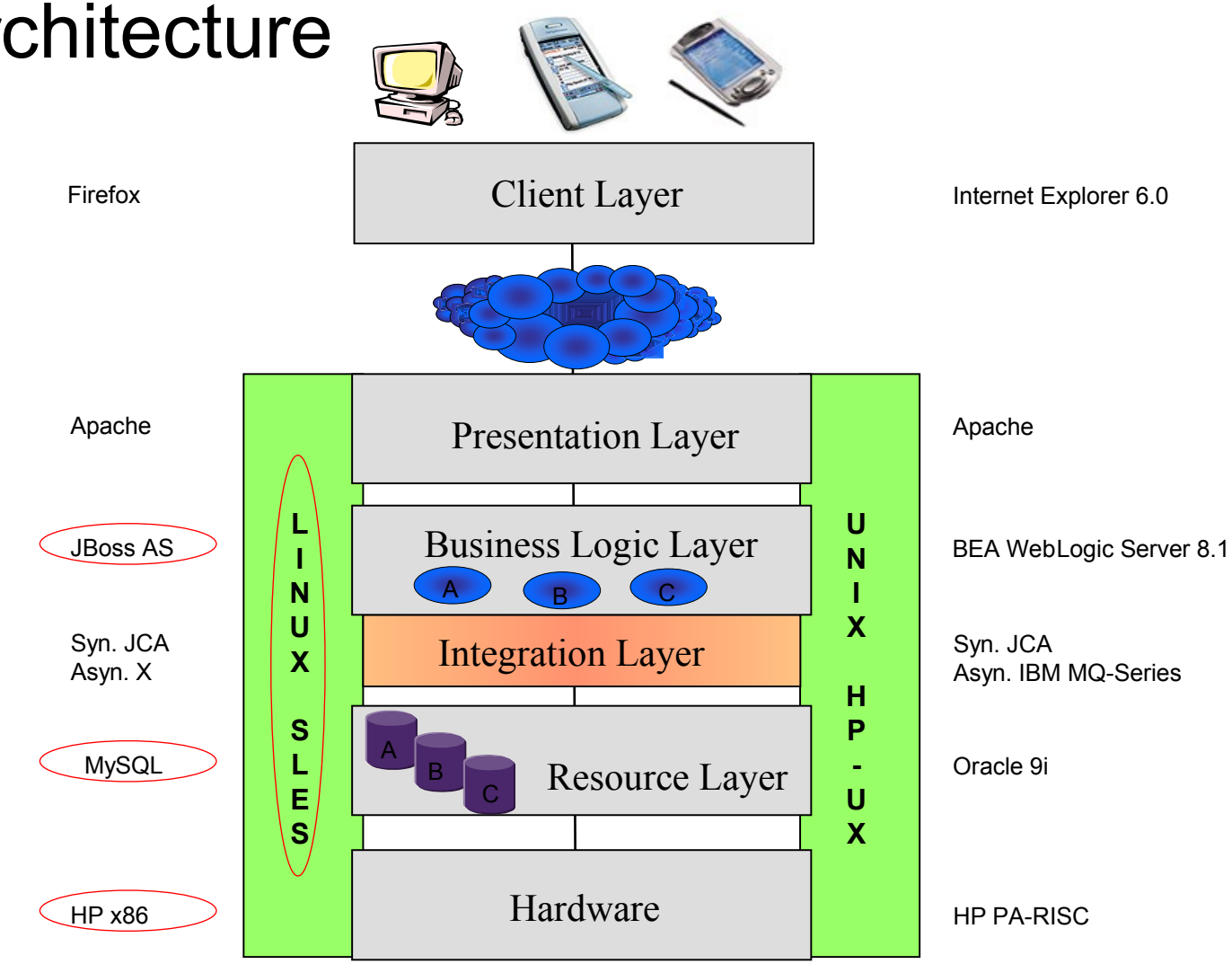
- Decisions from the head of the Swedish Police, November 2007

- Implementation project
  - Started Mars 2007
  - Operation decision, 12 of December 2007

Existing and new IT-vendors

Existing vendors	Products	New vendors
bea Think liquid.	Application Server	JBoss a division of Red Hat
ORACLE	Database	MySQL
HP-ux11i	Operation System	Novell
PA-RISC POWERED, intel Itanium 2 inside	CPU	AMD Opteron 64, intel Core 2 Quad inside

IT-Architecture



Rikspolisstyrelsen
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Workshops with SWOT analysis

- Strengths
- Weaknesses
- Opportunities
- Threats

Strengths	Weaknesses
Opportunities	Threats

The Swedish Police IT-costs, FY 2005

Operation cost (communication, PC, servers, licences, salaries)	€ 78,6 millions
Develop new and maintain old IT-systems, including salaries	€ 28,5 millions
Total:	€ 107 millions

The total budget for the Swedish Police was 2005 € 1,546 billions

and 6,9% was spent on IT

IT-costs over the next 5 years

Business as Usual	Cost	Notes
Microsoft	5 000 000 €	Purchase Microsoft Office Standard Edition 2003, 9 400 000 € with 3 years support
Novell	X X00 000 €	Renew contract for 25 000 employees
Oracle Enterprise Edition	X X00 000 €	New licences over the next 5 years
Oracle Enterprise Edition support	X X00 000 €	Support on existing licences over 5 years
Bea	X X00 000 €	New licences over the next 5 years
Bea support	X X00 000 €	Support on existing licences over 5 years
HW med HP-UX and Itanium	13 000 000 €	Investments in new servers over 5 years
HW support Itanium	6 500 000 €	Server support over 5 years
Total	**40 100 000 €**	
Cost per year	8 020 000 €	
Software	20 600 000 €	
Hardware	19 500 000 €	

IT-costs over the next 5 years

New environment based on Mixed Source	Cost	Notes
Microsoft	0 €	OpenOffice from Novell
Novell	X X00 000 €	Renew contract for 25 000 employees and OpenOffice support for 25 000 employees
MySQL 1/7	X XXX XXX €	60 servers for new projects
Oracle Enterprise Edition support	X X00 000 €	Support on existing licences over 5 years
JBoss 1/5	X XXX XXX €	126 CPU:s for new projects
Bea support	X X00 000 €	Support on existing licences over 5 years
HW with Linux and AMD/Intel x86 >1/2	5 850 000 €	Investments in new servers over 5 years
HW support AMD/Intel x86/Risc	4 355 000 €	Server support over 5 years
Total	**21 386 780 €**	
Cost per year	4 277 356 €	
Software	11 181 780 €	
Hardware	10 205 000 €	

IT-costs over the next 5 years

- Business as Usual 40.100.000 €
- New environment based on Mixed Source 21.386.780 €
- Savings:
  46% in software
  48% in hardware

- A Mixed Source solution can save € 18,7 millions over 5 years, that is € 3,7 millions per year
- The hardware and software infrastructure cost is today € 8 millions per year

€ 20 millions is equal with:

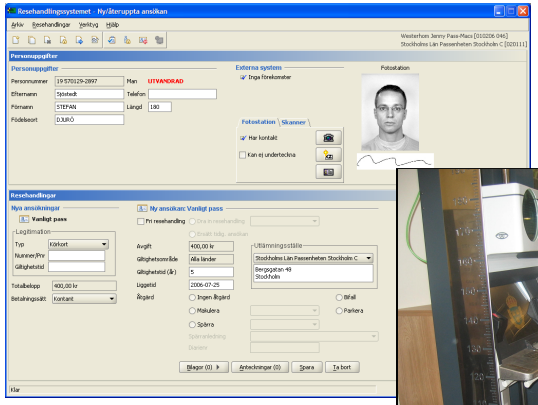
- 400 new police cars

- 70 new system developers over the next 5 years

Savings based on a picture system

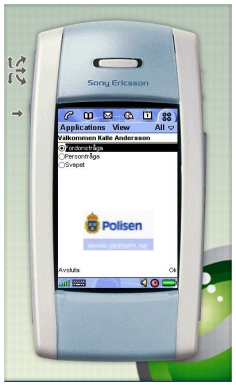
The PICTURE database is used for three different purpose:

- Store and search passport pictures
- Store pictures from digital cameras
- Common service for applications which need pictures



- Vehicle query
- Person query

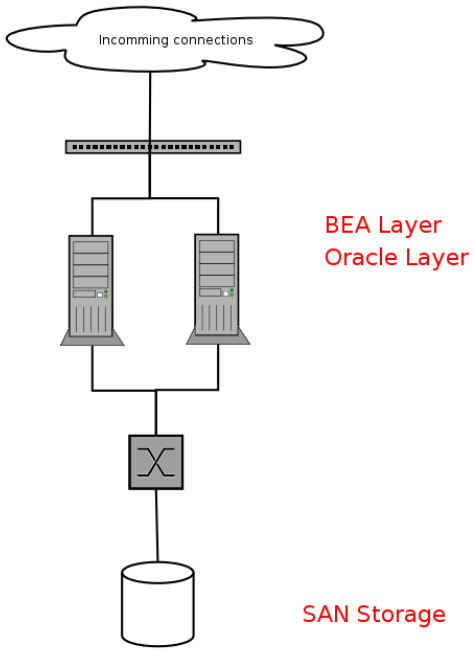
- Picture (from passport or driving licence)
- Name
- Social Security number



The PICTURE architecture today

- BEA WebLogic Server
- Oracle
- HP-UX
- HP PA-RISC

Current Solution



The Total Cost of Ownership over 3 years is 260.000€

Cost efficient PICTURE architecture

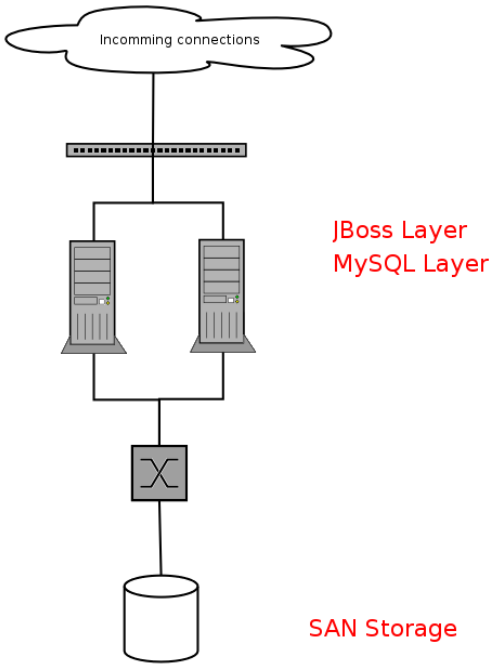
- Use commodity hardware based on x86-architecture

- Use:
  - JBoss Application Server 4.20, Application Server
  - MySQL Enterprise Server 5, database
  - Novell SLES, SUSE Linux Enterprise Server 10, Operation System

Cost efficient PICTURE architecture

- JBoss Application Server
- MySQL Enterprise Server
- SUSE Linux Enterprise Server
- HP x86

Proof of concept



The Total Cost of Ownership over 3 years is 70.300€, that is 190.000€ or 73% in savings

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Proof of Concept - PICTURE

The following combinations have been tested:

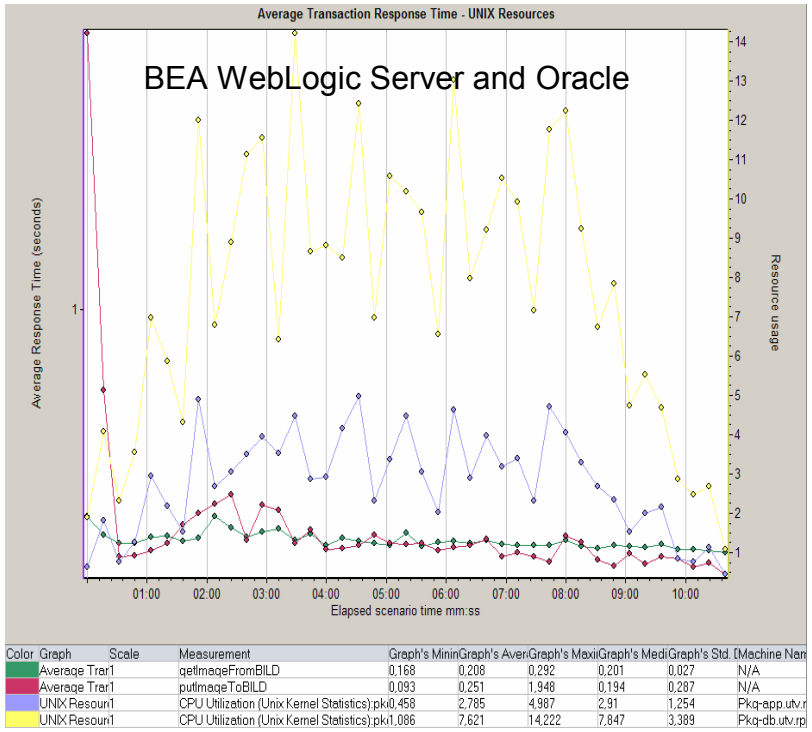
- BEA WebLogic Server - Oracle
- BEA WebLogic Server - MySQL
- JBoss Application Server - Oracle
- JBoss Application Server - MySQL
- Hardware:
  - 2 HP Proliant DL385
  - CPU: 2 AMD Dual-Core 2.8GHz
  - Memory: 16 GB
- Operation System:
  - SLES, SUSE Linux Enterprise Server 9 (x86_64) SP3

Benchmark with the PICTURE database

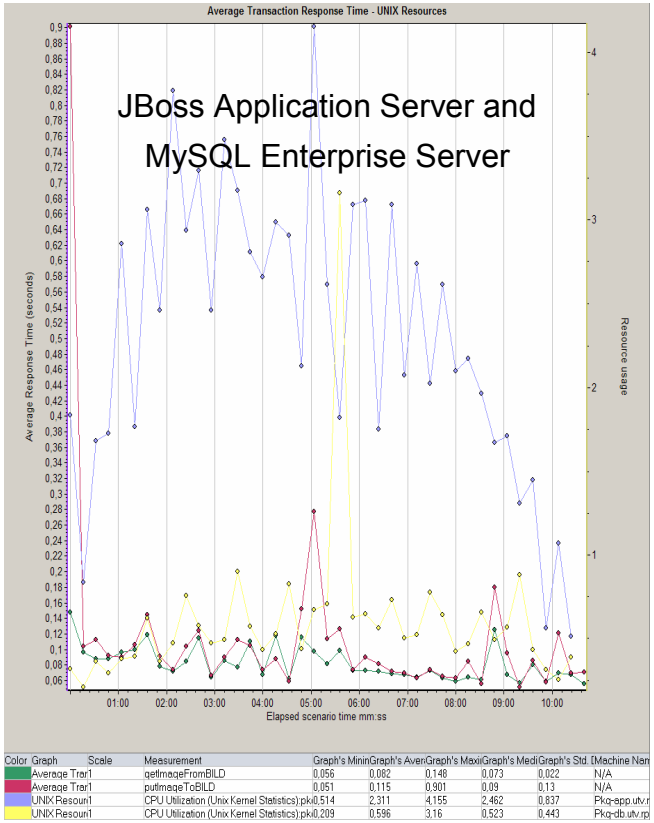
The traffic load of new passport application forms:

- Average load, number of new application forms per day 3.500
- Maximum load pike, last summer in June 10.000
- 10 times maximum load 100.000
- 100 times maximum load 1.000.000

Test results – PICTURE 10 times maximum load



Color	Graph	Scale	Measurement	Graph's Minin	Graph's Aver	Graph's Maxi	Graph's Medi	Graph's Std. D	Machine Nam
	Average Tran	1	getImageFromBILD	0,168	0,208	0,292	0,201	0,027	N/A
	Average Tran	1	putImageToBILD	0,093	0,251	1,948	0,194	0,287	N/A
	UNIX Resour	1	CPU Utilization (Unix Kernel Statistics):pki	0,458	2,785	4,987	2,91	1,254	Pkq-app.utv.r
	UNIX Resour	1	CPU Utilization (Unix Kernel Statistics):pki	1,086	7,621	14,222	7,847	3,389	Pkq-db.utv.rp



Color	Graph	Scale	Measurement	Graph's Minin	Graph's Aver	Graph's Maxi	Graph's Medi	Graph's Std. D	Machine Nam
	Average Tran	1	getImageFromBILD	0,056	0,082	0,148	0,073	0,022	N/A
	Average Tran	1	putImageToBILD	0,051	0,115	0,901	0,09	0,13	N/A
	UNIX Resour	1	CPU Utilization (Unix Kernel Statistics):pki	0,514	2,311	4,155	2,462	0,837	Pkq-app.utv.r
	UNIX Resour	1	CPU Utilization (Unix Kernel Statistics):pki	0,209	0,596	3,16	0,523	0,443	Pkq-db.utv.rp

- Both MySQL Enterprise Server and JBoss Application Server are much more CPU efficient than Oracle and BEA WebLogic Server

The need of education

- JBoss Application Server 4.20, Application Server
- MySQL Enterprise Server 5, Database
- Novell SUSE Linux Enterprise Server 10, Operation System

	Number of days	Education costs, €
JBoss Application Server	84	58.602
MySQL Enterprise Server	36	13.500
Novell SUSE Linux Enterprise Server	136	54.400
Total:	256	**126.502**

Decisions

- Use JBoss Application Server for all new IT-systems
- Use MySQL Enterprise Server for all new IT-systems
- Use Novell SUSE Linux Enterprise Server for all new IT-systems
- Use commodity hardware based on x86-architecture

  (AMD Opteron and Intel Xeon CPUs based on Dual Core technology)

Fact collection

- Internal resources:
  - 14 employees
- External IT-vendors:
  - 7 companies (new and old)
  - 14 people
- Analysts companies
  - Butler Group
  - Gartner Group
- Project Management:
  - RedBridge Inc.

Q&A?

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