

Testing – but not your Patience

Erik Stenman

Kreditor

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Säljande betalningslösningar

Creative Payment Solutions

Testing - but not your Patience

- Experience of testing from a fast moving start up.
- Encouraging testing in a small company.
- Testing through the whole software life cycle.
- Our testing tool chain.
- **Automate “everything”.**
- **Make test results visible.**



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Kreditor

- Founded in 2005.
- We provide payment solutions to internet shops in Scandinavia.
- We have over 3000 shops as our customers.
- Largest sites in Scandinavia as customers.
- We need to be online 24/7.
- We have a competitive market and need to continuously introduce new features and services.

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Testing is Important...

- We have very short **time to market**, for simple changes the time from idea to finished integration can be less than one hour.
- It is crucial for us to have a **testing process** which guarantees:
 - That it works.
 - That it is **used**.
 - **Always**.
- ★ “Everyone” agrees that testing is important...

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... still, “no one” does it.

- To few developers do enough testing.
- “Software developers talks a lot about tools. They evaluate quite a few, buy a fair number, and use practically none.”*

* Fact 7: “Facts and Fallacies of Software Engineering”, Glass

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How to Encourage Testing

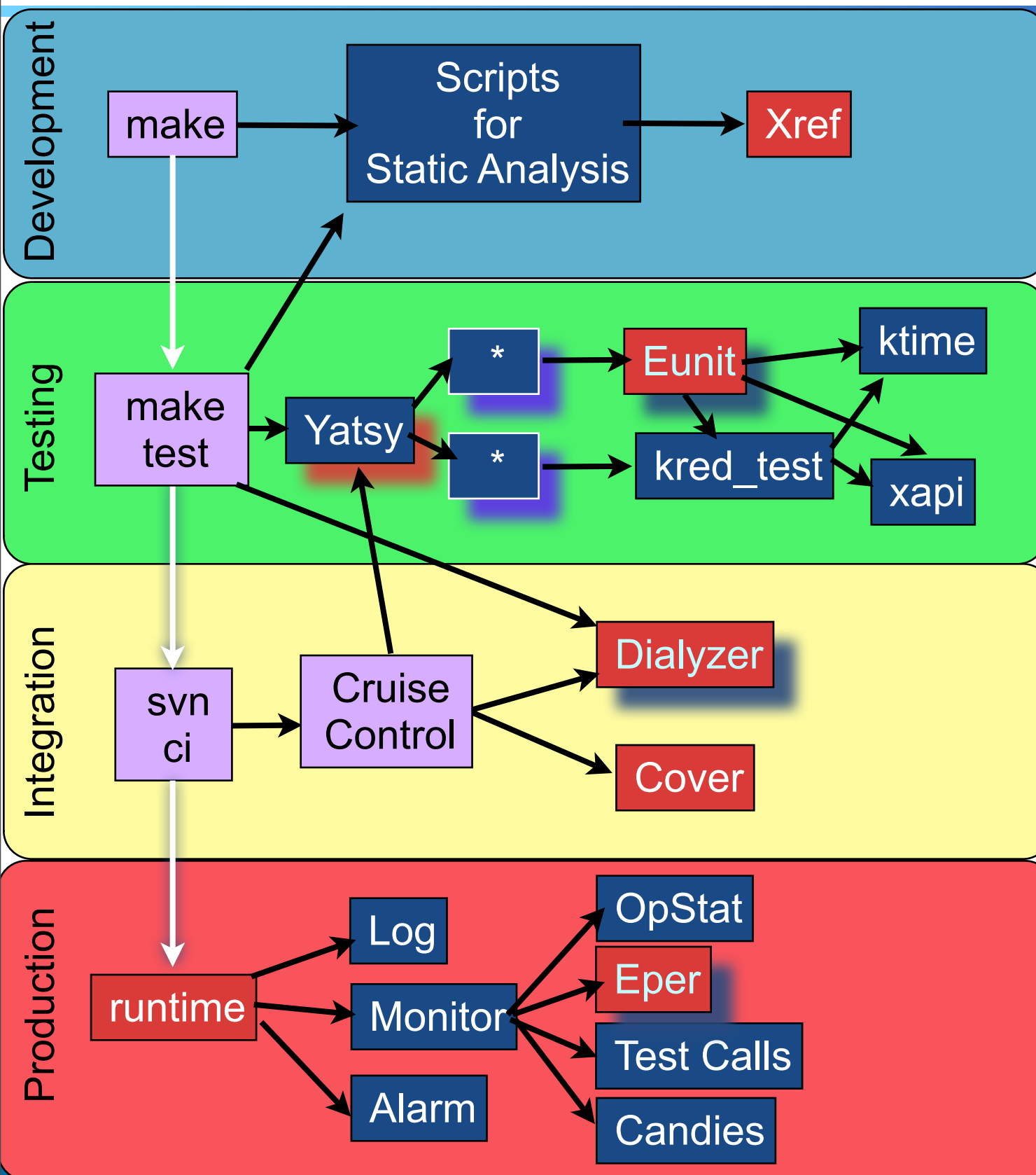
- Testing should not be a pain–“The process should not test your patience”.
- Build a culture of testing.
- **Automate** everything that can be automated.
- Make the results **highly visible**.



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Our Testing Tool Chain



Key:

→ Invocation



Workflow

Open source component

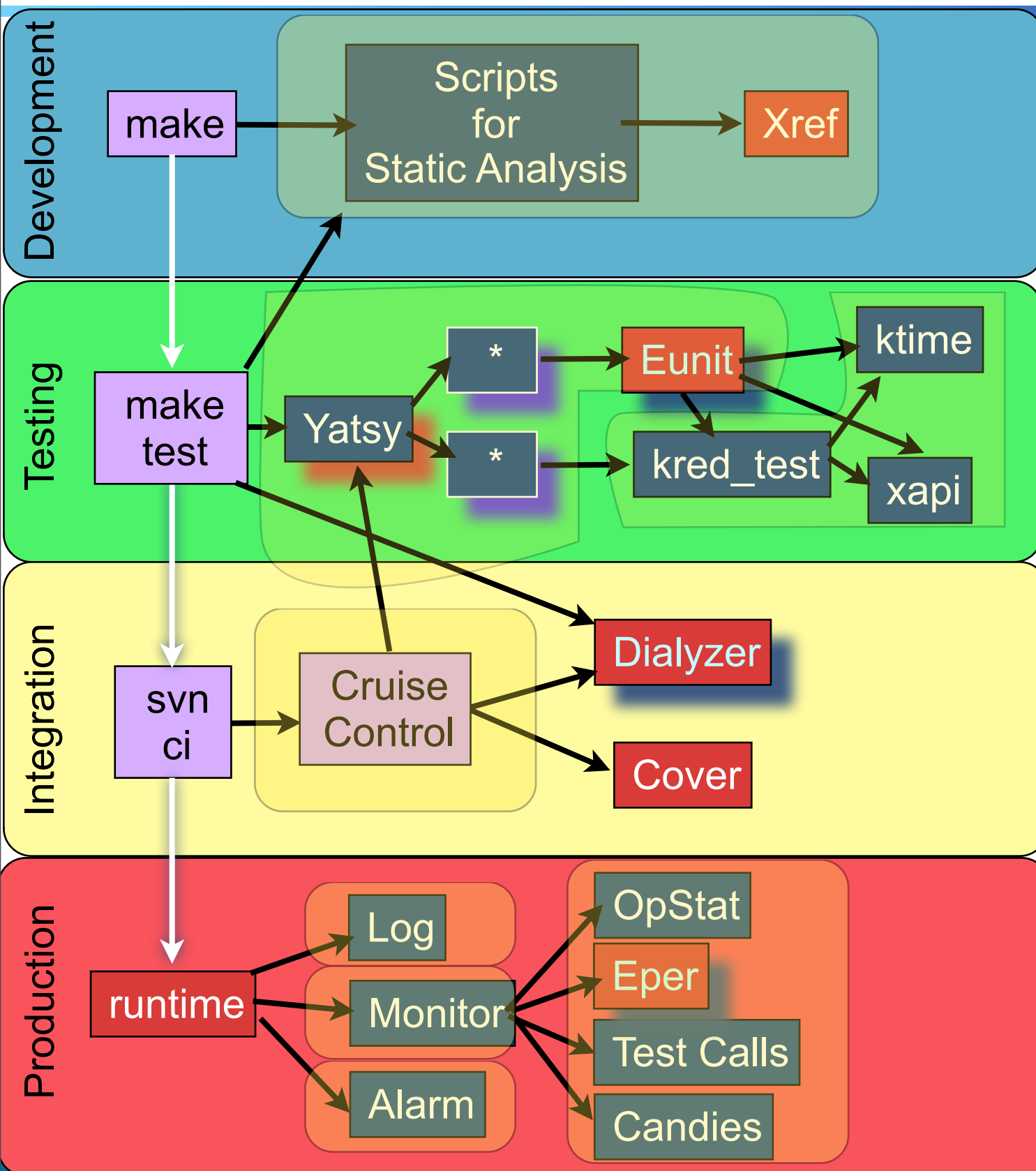
Erlang OTP component

Standard component
with Kreditor developers

Kreditor component

* Individual test suites and test cases

Our Testing Tool Chain



Key:

→ Invocation



Workflow

Open source component

Erlang OTP component

Standard component
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Kreditor component

* Individual test suites and test cases

OR

Safaride betainingslösingar

Static Analysis

- Scripts (make, sed, awk, .sh, etc)
- Coding standards
 - Simple stuff: 80 chars lines
 - Dangerous stuff:
 - Don't use mnesia, erlang:now, export_all etc
- Xref
 - No calls to undefined functions
 - No unused exports
 - Exceptions: excluded by attribute -ignore_xref([F,A]).

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Regression Testing

- Yatsy
 - Simpler version of OTP test framework.
 - Open source on google code.
- Eunit
 - (You should have been at EF in SF.)
- Writing new test cases
 - **This is the tricky part!**
 - Not automated.
 - A number of libraries to help.

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Support Libraries 1: kred_test

- Initialising DB with:
 - Customers (e-commerce sites, sellers)
 - End customers (buyers)
 - Transactions
 - Etc

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Support Libraries 2: ktime

- Replaces erlang:now, date, calendar.
- Works with Gregorian seconds.
- **Implements virtual time.**
- Makes it possible to jump in time.
- We have test cases that tests events three years into the future.

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Support Libraries 3: xapi

- Functions for generating traffic.
- Not much more to say...
 - Just one of those things you really need.

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Cruise Control (CC)

- Open Source: <http://cruisecontrol.sourceforge.net/>
- At every check in:
 - Does a check out
 - Incremental build
 - Runs most test suites
- At night:
 - Does a clean check out
 - Does a clean build
 - Runs all tests
 - + Cover
 - + Dialyzer

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Cruise Control

- Kenneth Lundin*
16.45 Non-Destructive Arrays
Richard Carlsson and Dan Gudmundsson
17.00 How to program efficiently with Binaries and Bit Strings
Per Gustafsson
17.30 Bus transport to the **ErLounge**

There is no conference fee but registration is necessary, however **the EUC is oversubscribed and we are unable to receive further registrations.**

The EUC takes place in Ericsson's conference centre in Älvsjö. Please see directions [here](#).

[Hotell Älvsjö](#) offers rebate rates from November 7 to November 9 for EUC participants. Don't forget to mention "Erlang".

Some [hints](#) from last year's EUC for visitors to Stockholm. We will organise a small sight-seeing tour around Stockholm on the evening of November 7 for foreign visitors.

An Obfuscated Programming Competition will be held in conjunction with the EUC where the goal is to write the most obfuscated Erlang program. More information is available [here](#) and the Jury consists of Joe Armstrong, Richard Carlsson and Jan Henry Nystrom.

The EUC will end traditionally by a kindly sponsored **ErLounge**.

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corelatus

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QuviQ

Sjöland & Thyselius

ERICSSON



Training and Consulting

synapse mobile networks s.a.

Mobile  Arts

Marcus Arendt Aktiebolag



Done

N 1 unknown service

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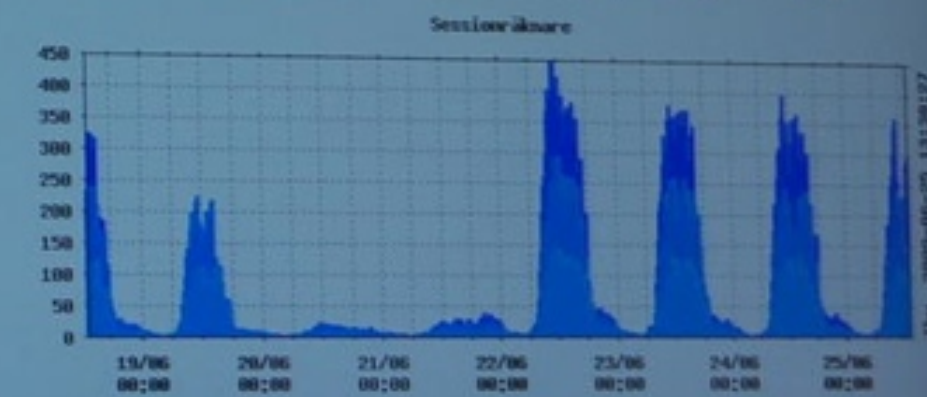
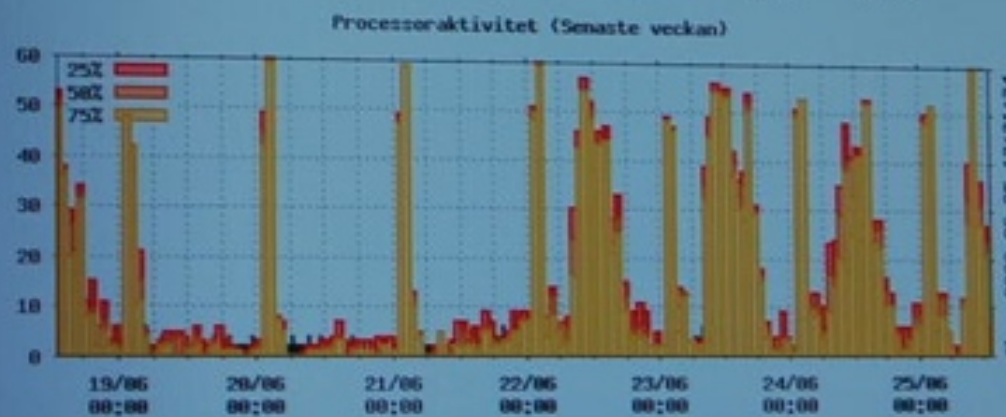
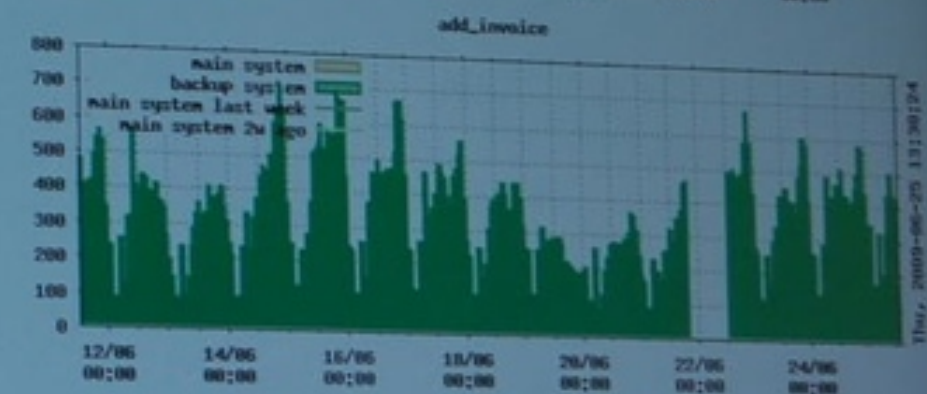
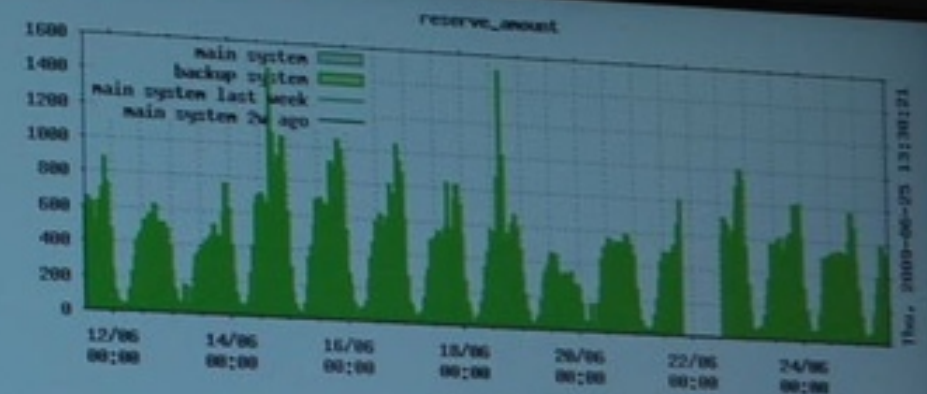
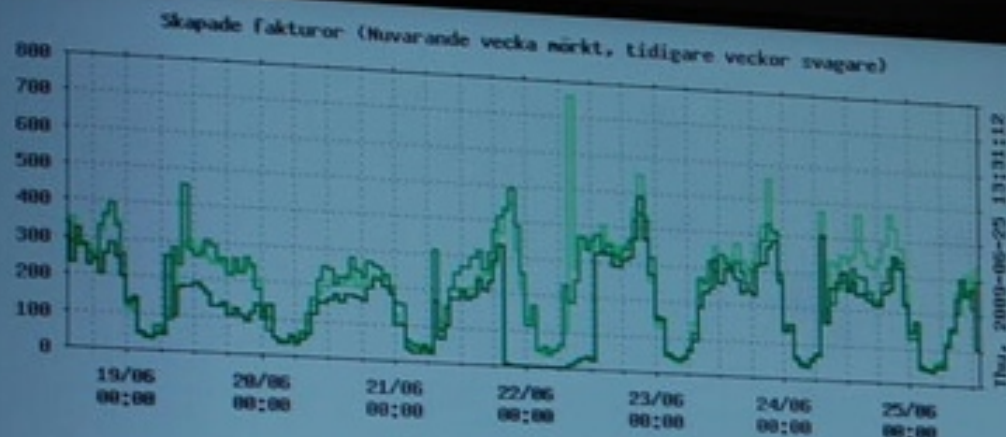
Log

- Write all important event to some log.
 - Httpc: All outgoing requests.
 - Xmlrpc: All decoded incoming requests.
 - Estore: Interface calls from customers.
 - Logic24: Events triggered by night run.
 - Debug: Temporary logging.
 - Fix: One shot fixes.
- Available through GUI.
- Available after test suites.
- Log rotate on live system
- Backup of all logs (faster than rotate)

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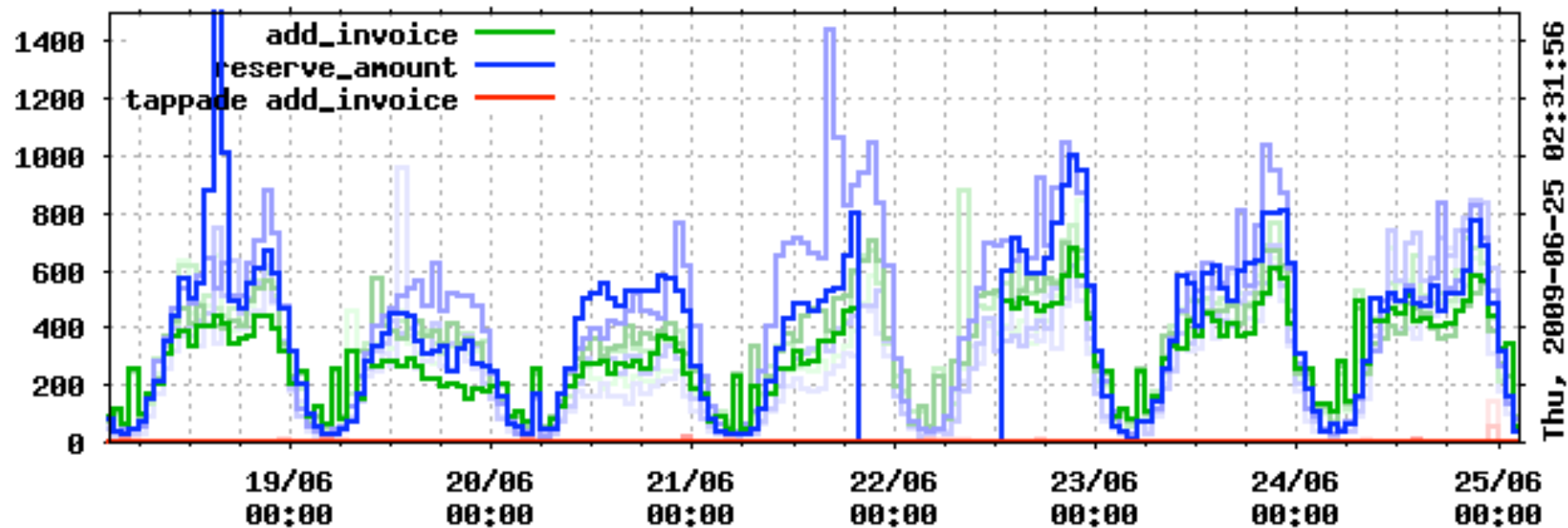
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Monitor 1: OpStat

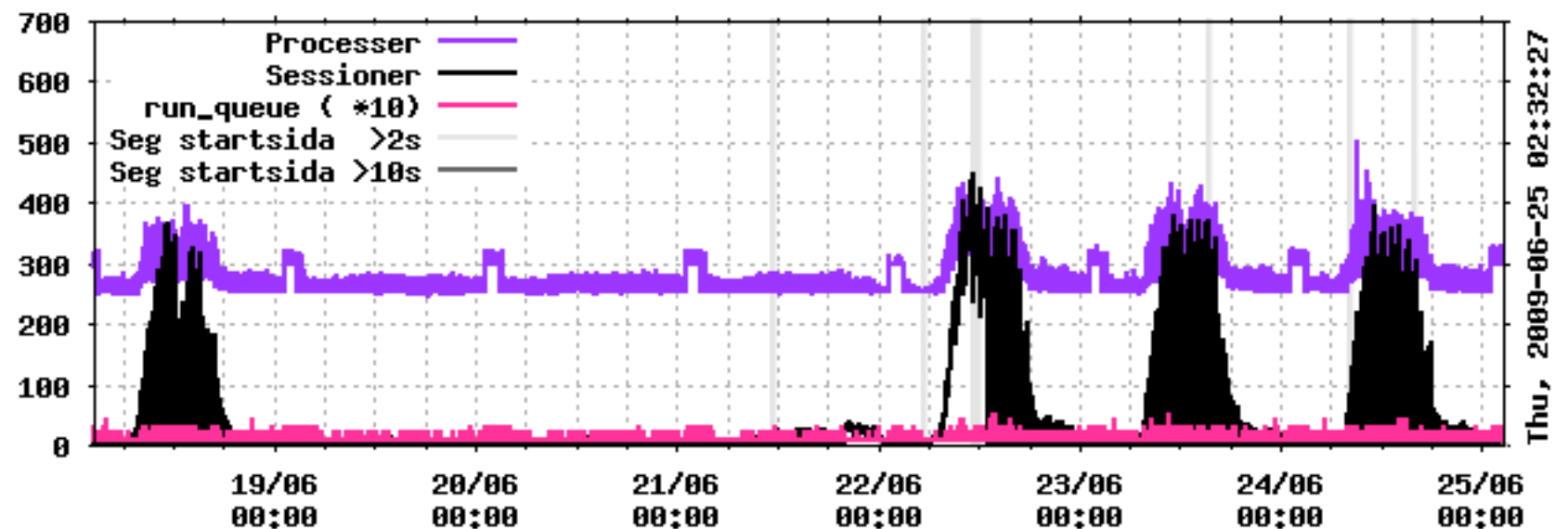


Monitor 1: OpStat

En vecka, tre jämförande veckor i bakgrunden (per timme)



Last (En vecka)

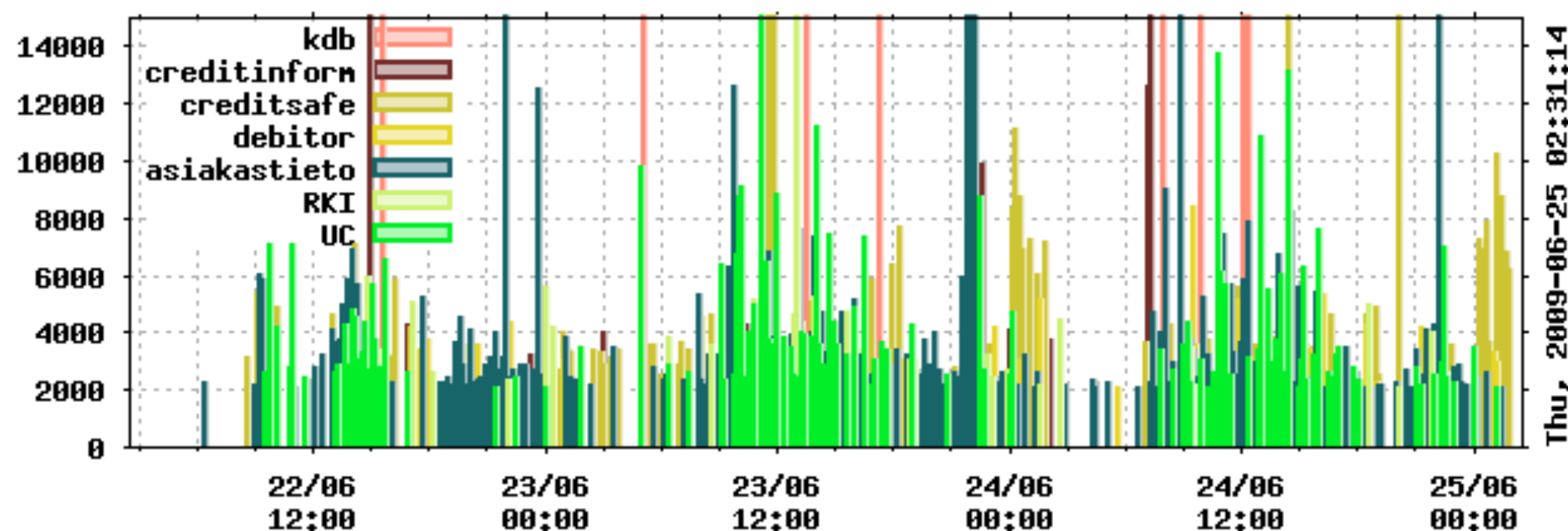


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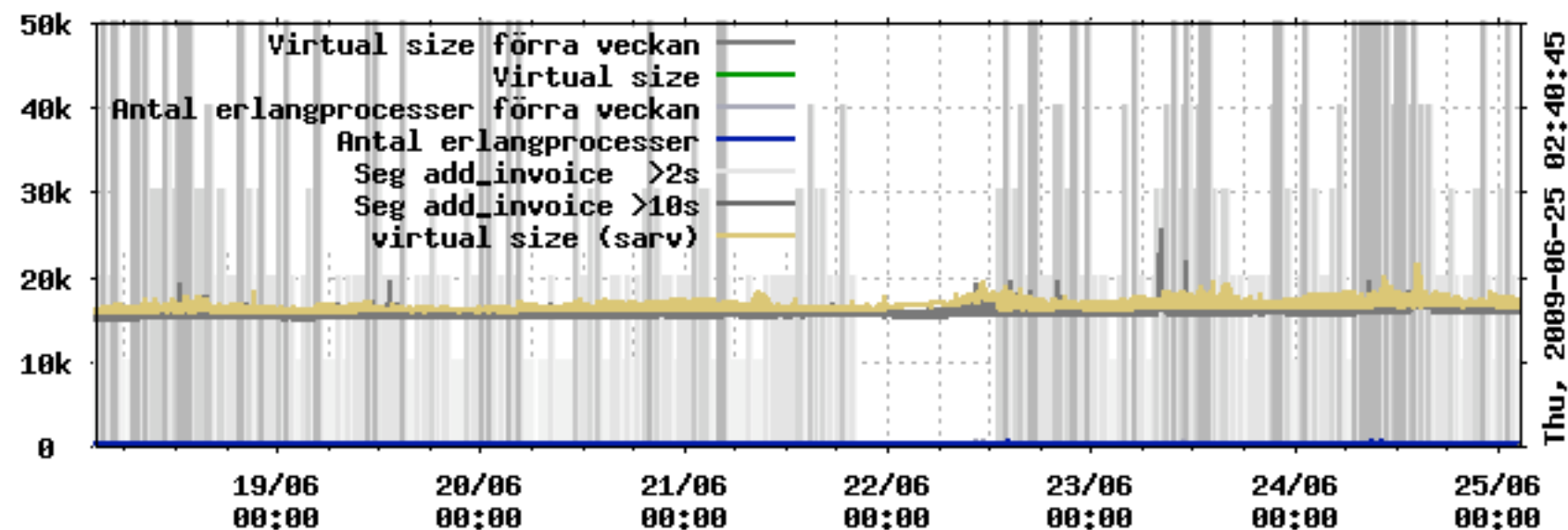
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Monitor 1: OpStat

timeouts today



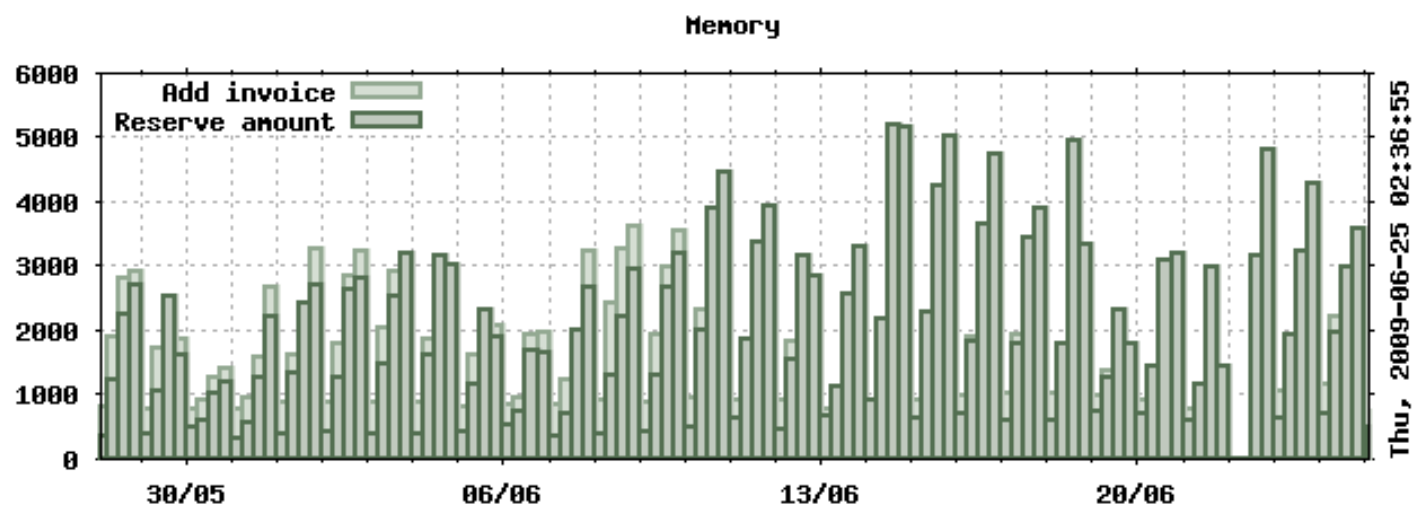
Mal's minnesstatus (En vecka)



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Monitor 1: OpStat



Apply Settings Apply & Hide Settings Move Up Move Down Copy Diagram Delete Diagram

Diagram

Title Memory

Time 4w

Min 0

Max

Scale Integer

Graph (Furthest Back)

Delete Graph

guldax
lax
mal
sarv

address_not_approved.tick
asiakastiето_soap_request.ms
bcheck_soap_request.ms
cpu.percent
creditinform_soap_request.ms
creditsafe_soap_request.ms
debitor_soap_request.ms
eid_allowed_diff.orediff
httpc_connect_timeout.timeout
inv_created.invno
inv_created_dk.eid
inv_created_fi.eid
inv_created_no.eid
inv_created_se.eid
kdb_transaction_timeout.timeout

Title Add invoice

Color 7a9f7f

Filter

Freq 6h

Ago

Type Boxes

Graph (Topmost)

Delete Graph

guldax
lax
mal
sarv

xmlrpc_kreditor.add_invoice.ms
xmlrpc_melt_subscription.ms
xmlrpc_method.name.ms
xmlrpc_mk_addr.ms
xmlrpc_mk_addr.result
xmlrpc_mk_address.ms
xmlrpc_mk_address_se.ms
xmlrpc_mk_goods.ms
xmlrpc_mk_goods_flags.ms
xmlrpc_mk_goods_flags.result
xmlrpc_periodic_cost.ms
xmlrpc_periodic_cost.result
xmlrpc_periodic_cost_result.result
xmlrpc_periodic_cost_rpc.ms
xmlrpc_reserve_amount.ms

Title Reserve amoun

Color 3a5f3f

Filter

Freq 6h

Ago

Type Boxes

Add Graph

Help: Select one or more machines from whose logfile is to be display in this graph. If you select more than one machine, then the contents of the logs will be added together.

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Monitor 2: eper

- Open Source project by Mats Cronqvist
- Eper is a loose collection of Erlang Performance related tools.
- Kreditor uses:
 - gperf - a graphical performance monitor; shows CPU, memory and network usage
 - redbug- similar to the OTP dbg application, but safer, better etc.

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Monitor 3: Candies

- Customer side API-module:
 - Times calls to Kreditor Online.
 - Sends, through UDP:
 - ID
 - Function name
 - Result
 - Time
 - Digest
- Server Side
 - Collect Information
- Like stealing candies from a baby
- Candies == Customer ANalysis & Diagnostics ~~Erlang~~ (pErl) Server

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Monitor 4: Test Calls

- External

- Access website
- Perform API calls
- On error:
 - Send email
 - Send sms

- Internal

- The same thing
- + Ping
- + Light Siren

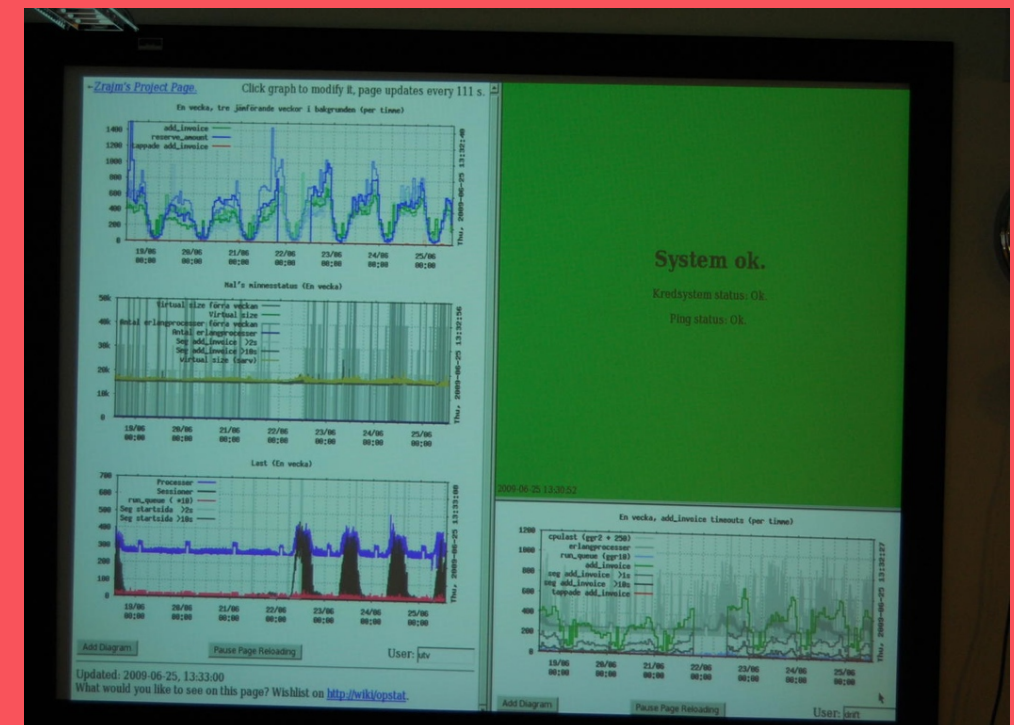


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Alarm

- Send alarms for extraordinary events
 - Exceptions
 - Process exits
 - Developer controlled
 - “This shouldn’t happen!”
- Several levels
 - Info: email
 - Warning: email
 - Critical: email + sms
 - Panic: email + sms + light siren



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More Testing

- Design testing: prototypes
- GUI testing: manual
- Load testing
- Performance testing
- Statistical business logic
 - Test acceptance ratio when changing credit policy
- Randomised testing of customer behaviour
- Experimenting with QuickCheck for DB consistency - (Erlang Workshop)

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Conclusion

- We can't afford buggy code.
- We are still too small to have a large test department.
- Developers need to test.
- **Automate as much as possible.**
- **Make testing visible.**
- **Make testing easy and fun.**



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