BANKING / INVESTMENTS \ ADVISORY

End-user Experience Monitoring with ZABBIX

by Jurijs Fedorenko

September 6, 2013

Who am I and What I do

September 6, 2013

Senior Systems Administrator at ABLV Bank, AS

- Riga Technical University graduate [IT Engineering / Programmer]
- Four years as DevOp at AS Latvenergo Energy Company
- Currently DevOp at ABLV Bank, AS
- ZABBIX Certified Specialist
- Virtualization systems
- Monitoring systems

ABLV Bank, AS

- Currently, ABLV Bank, AS is the largest independent private bank in Latvia.
- Founded on 17 September 1993.
- Representative offices of the Group in many CIS countries.
- ABLV Group includes ABLV Bank, AS and more than 20 subsidiary companies.
- 20 years of valuable experience.

What to monitor in Bank?

- Credit card systems
- Banking systems
- e-Banking systems
- Third party payment gateways
- Inter-branch links
- Clearing systems
- Client line / Call centre
- Databases
- Data warehouse
- Security systems

Our monitoring infrastructure - in numbers and facts

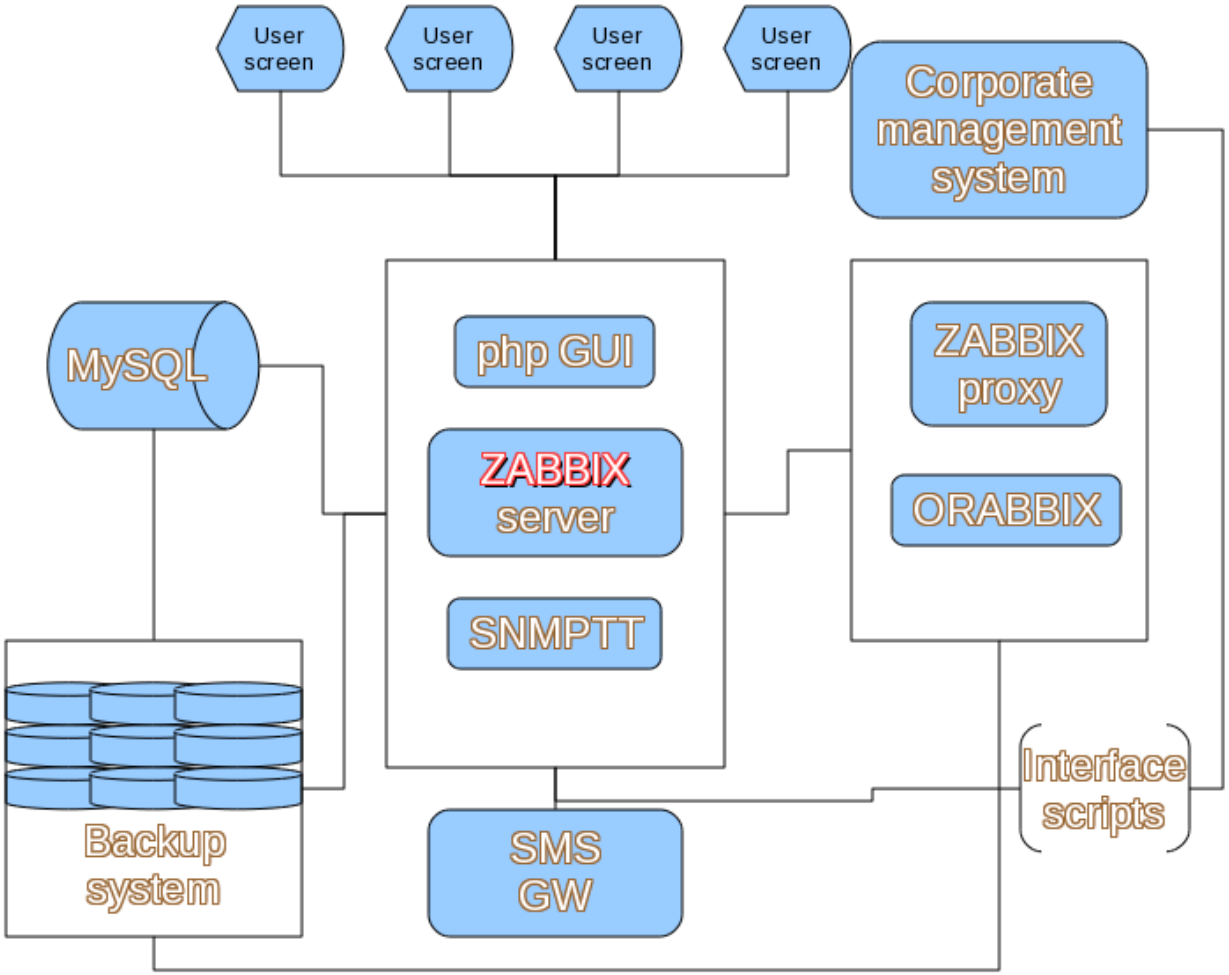
- Number of hosts 1150
- Number of items 38973
- Number of triggers 14014
- Number of users 106
- Values per second 578.81

- Test & Development environment
- ORABBIX + custom DB scripts
- Production ZABBIX server
- ZABBIX proxy
- SNMPTT

- Integration with service/project management system
- Automatic incident registering
- Automatic work order registering
- Reports for Enterprise Resource Planning

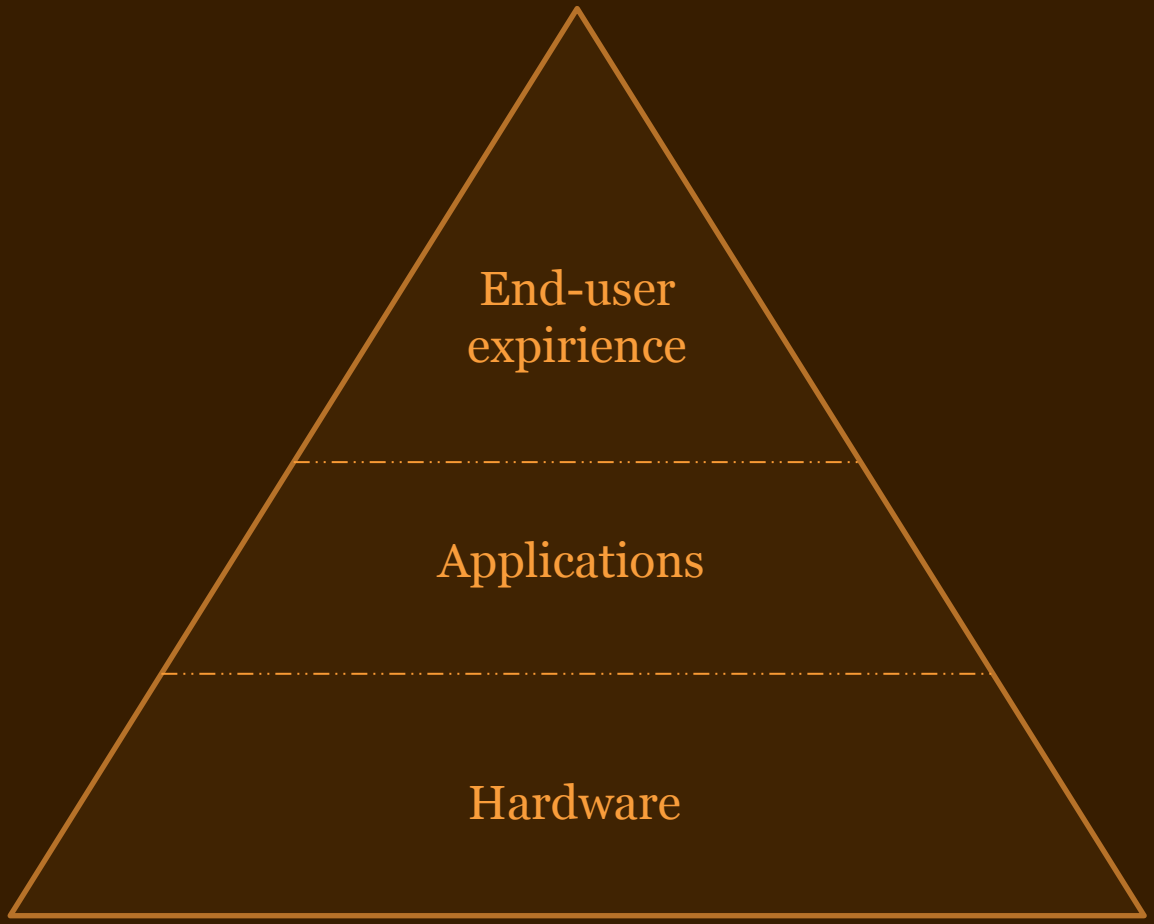
ZABBIX is taking part in resource management!

Our monitoring infrastructure - simplified



Vision

3 levels of monitoring



3 levels of monitoring

1. Infrastructure level monitoring.

- Server health
- Network devices
- Peripheral devices

2. Application level monitoring.

- Log files
- App. SNMP traps
- Running processes

3. End-user monitoring.

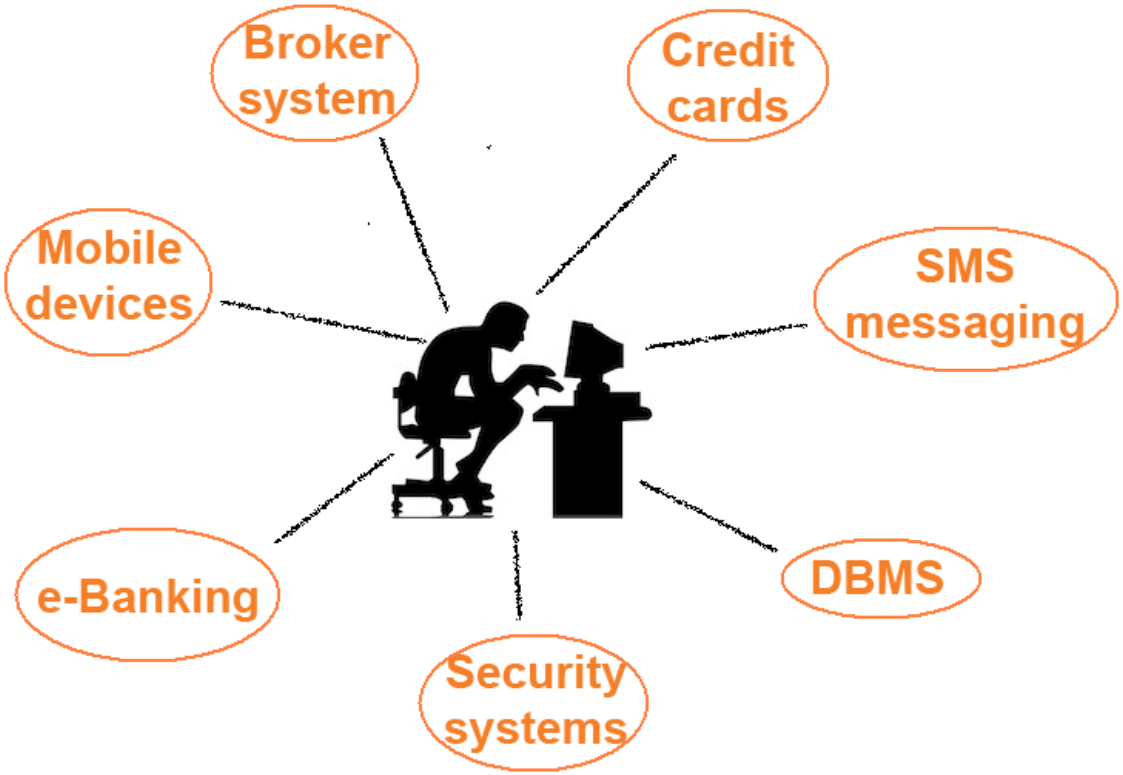
- ?

Problem

- Servers are up & running
- Applications are started
- Network – connected
- Users have access rights
- Service unavailable

– eg. we've ran out of licenses.

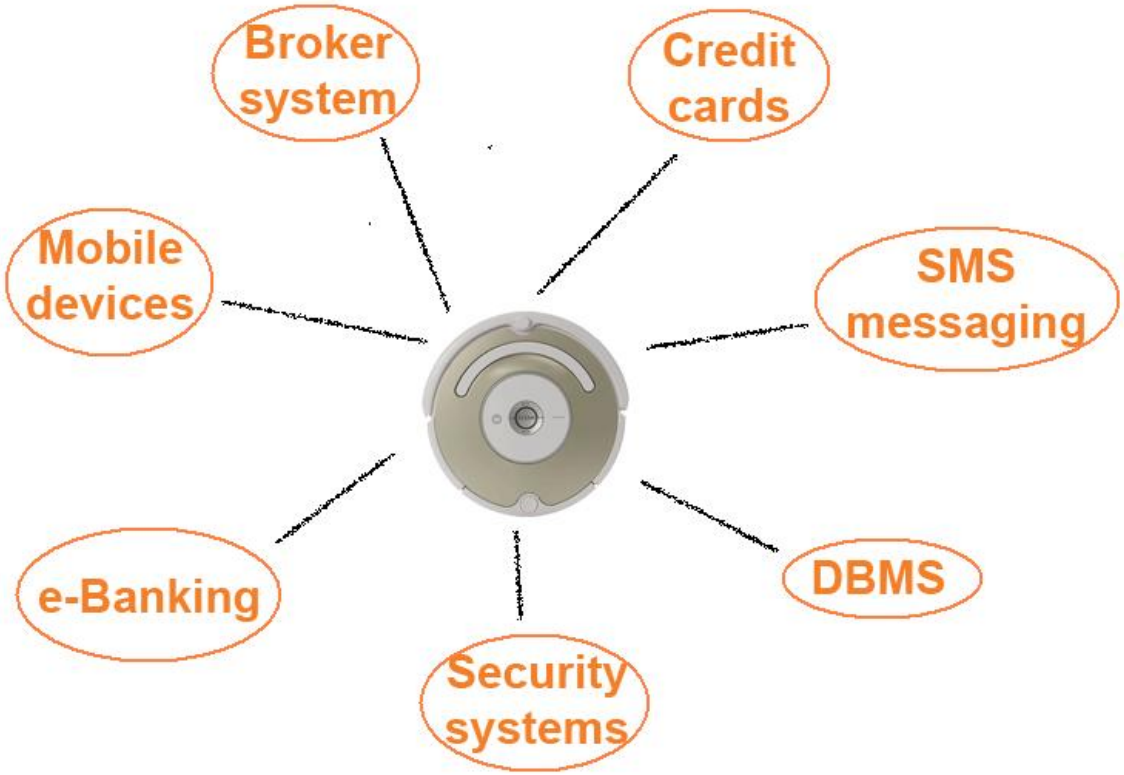
What is End-user monitoring?



Unique person

- Loves routine work
- Stress-resistant
- IT knowledge
- Low salary
- Insomnia
- Punctual
- Loyal

End-user monitoring must be a robot



System must be able to

- Run all the applications, that our users and clients are using
- Run applications from user's perspective
- Run on the same OS, platform, browser etc.
- Time every step, while running apps.
- Handle errors and non-standard situations
- Collect useful information about ocurred error
- Send collected data to ZABBIX
- Must be easy to implement
- Must be easy to maintain
- Must be quick to learn
- Notify administrators

Failed to find

- Expensive
- Complicated (learning & implementing)
- Overlaps functionality with ZABBIX
- Lacks integration capability
- Not customisable – just a built-in functionality
- Third party unable to deliver

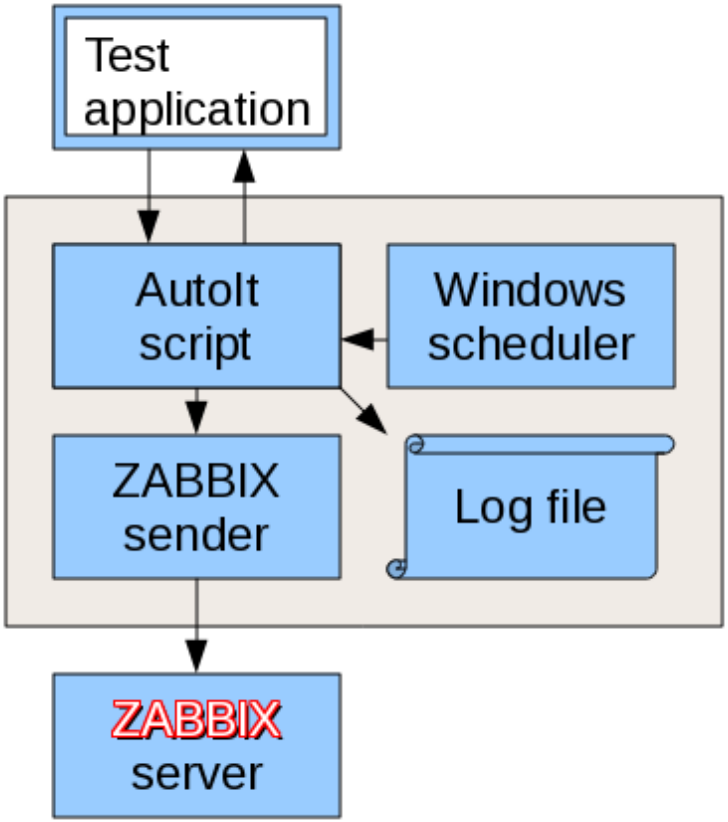
AutoIt key features

- Easy to learn BASIC-like syntax
- Simulate keystrokes and mouse movements
- Manipulate windows and processes
- Interact with all standard windows controls
- Create Graphical User Interfaces
- ~400 built-in functions
- Scripts can be compiled into standalone executables
- Obfuscation & Encryption
- Free of charge
- «Polished» and dependable product – first release in 1999
- COM support
- Regular expressions
- Directly call external DLL and Windows API functions
- Scriptable RunAs functions
- Well documented
- Large community-based support forums
- Digitally signed for peace of mind

AutoIt example

```
AutoItSetOption("PixelCoordMode", 2)
AutoItSetOption("MouseCoordMode", 0)

; Start timer
$startTime = TimerInit()
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

Run("mspaint.exe")

WinWaitActive("untitled - Paint")
AutoItSetOption("SendKeyDelay", 100)

Sleep(1000)
MouseClickDrag ( "left", 350, 400, 400, 300 )
MouseClickDrag ( "left", 400, 300, 450, 400 )
MouseClickDrag ( "left", 375, 350, 425, 350 )

Sleep(1000)

; Now quit by sending a "close" request to the paint
WinClose("untitled - Paint")

Sleep(500)
Send("n")

WinWaitClose("untitled - Paint")

;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
; Stop timer
$deltaTime = TimerDiff( $startTime )
$deltaTime = $deltaTime - 2500

; Send data to Zabbix
Run("C:\aaa\zabbix\zabbix_sender.exe -z zbx_srv -p 10051 -s autoit -k autoit_test -o " & $deltaTime)
Sleep(500)
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
; Finished!
```

End-user monitoring «pilot»



Pros

- Easy to script
- Has useful tools
- Good at «timing»
- Easy to integrate with ZABBIX
- Autonomous – no DB, no conf.
- Can detect non-standard situations

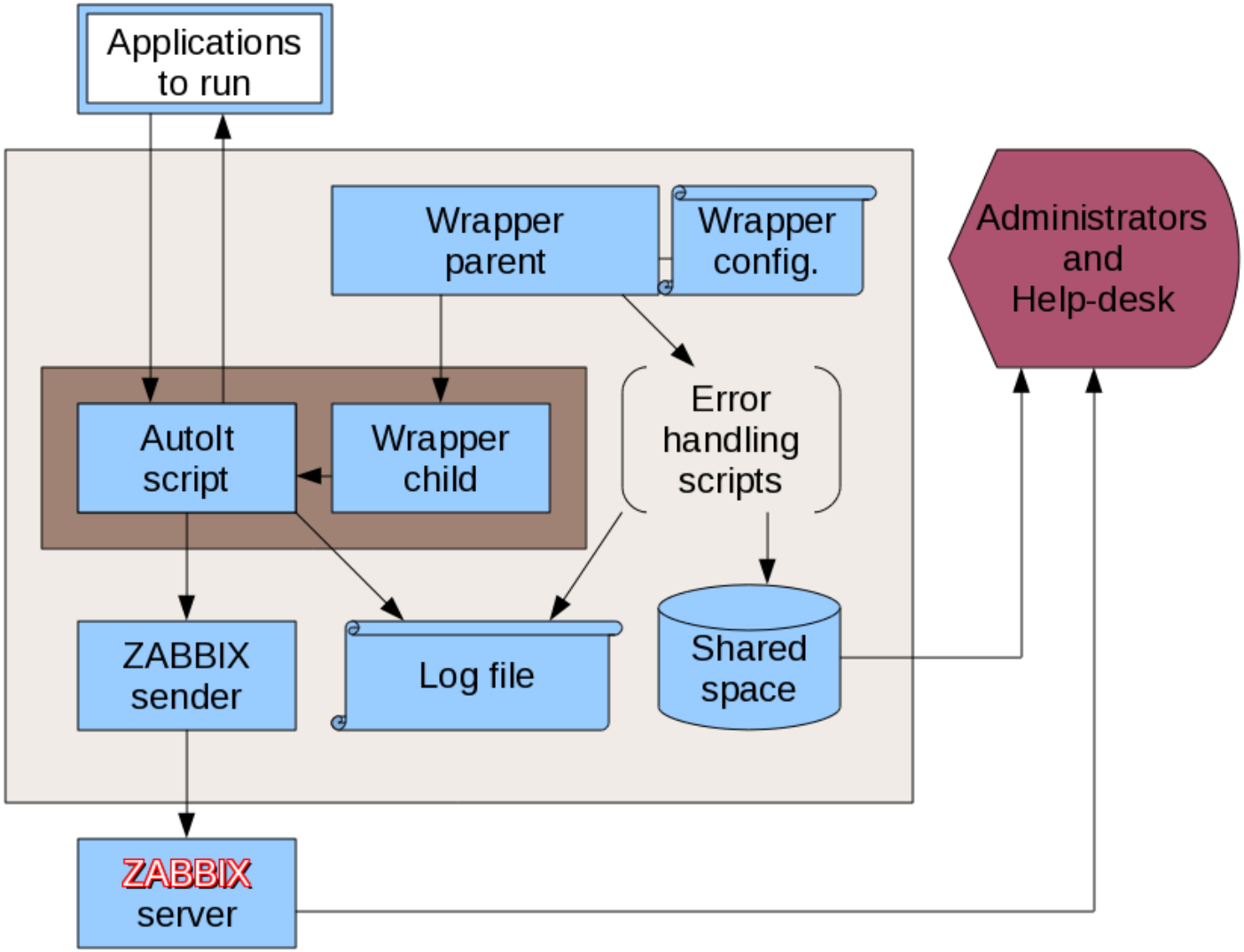
Cons

- Not able to notify
- No error handling mechanism
- Not enough debug information
- Unable to run multiple scenarios concurrently

Wrapper. Main duties

- Handle the list of executables and AutoIt scripts
- Set executing frequency
- Run scripts exclusively
- Run as Win service
- Debug information
- Scheduling
- Log file

End-user monitoring with wrapper

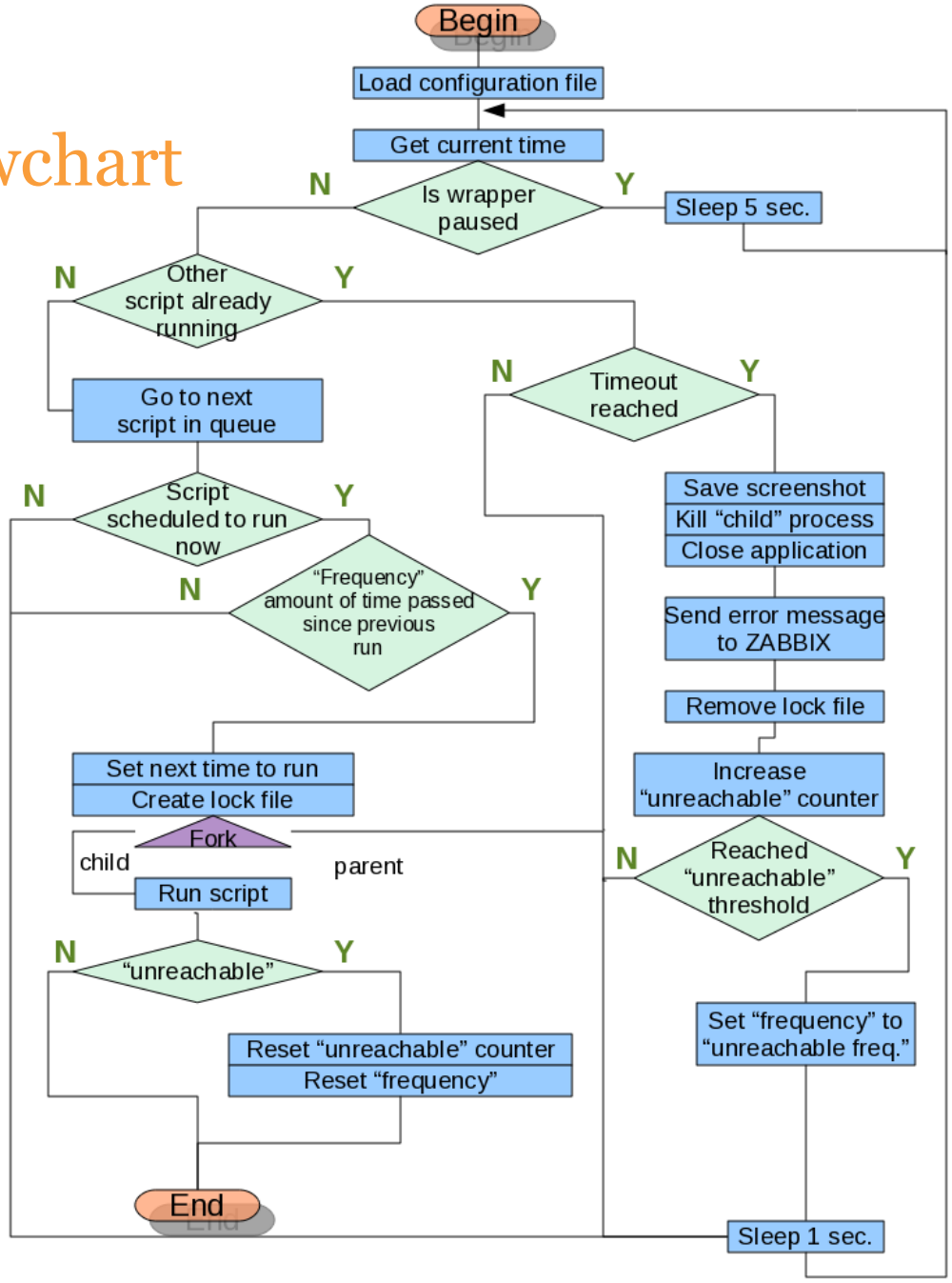


Wrapper. Key features

- Executing scripts exclusively
- Scheduling (1-7,00:00-23:59)
- Multiple scheduled periods for each script
- Set frequency for each period (eg. In weekdays run tests more frequently, than in weekends)
- Execute any command – not only AutoIt scripts (eg. sending 0 while idling)
- Set number of retries, before item becoming «unsupported»
- Set separate frequency for «unsupported» items

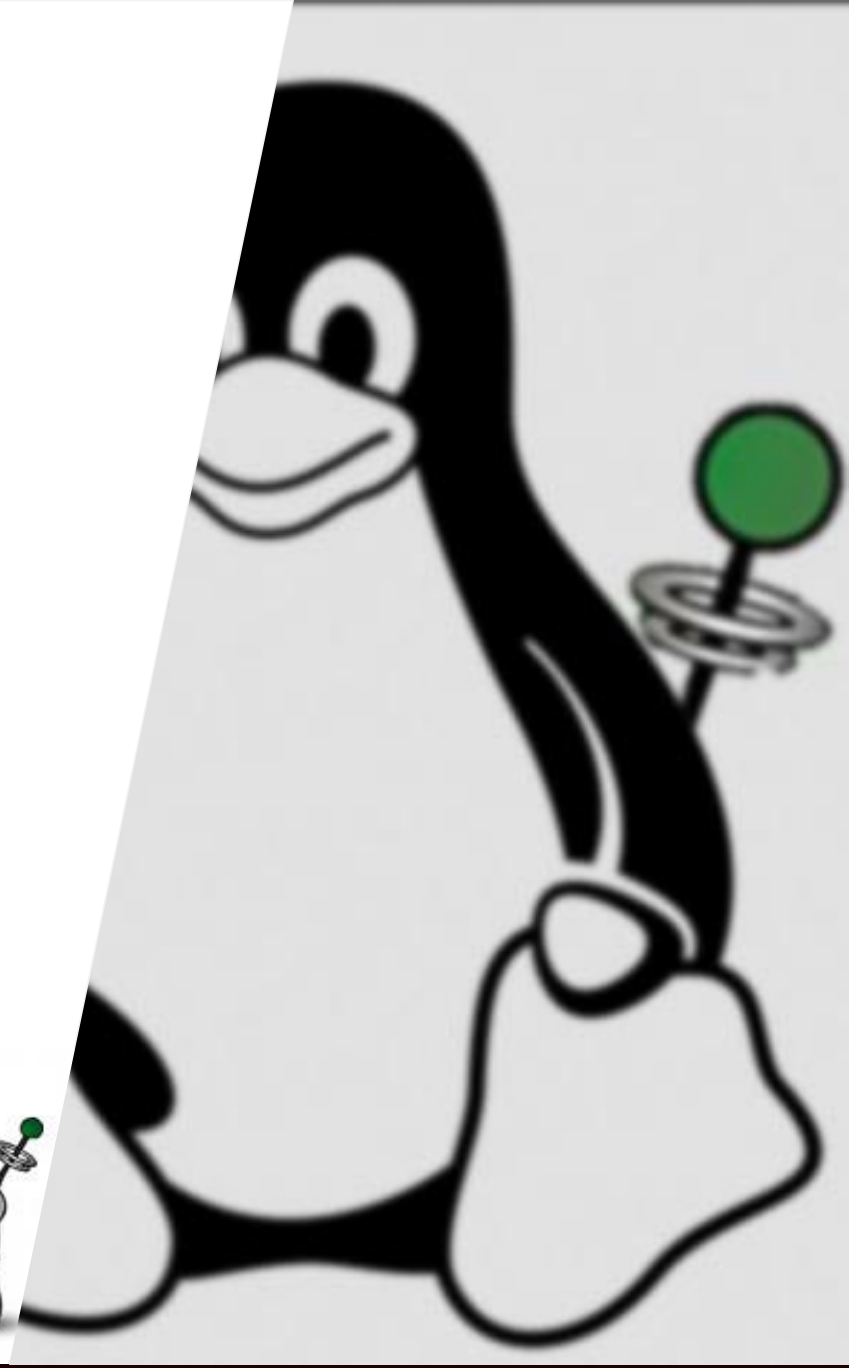
```
timeout=600
frequency=180
retryPenalty=60
unreachableTimeout=120
retryPenalty=60
unreachableTimeout=3600
#
# Comment lines must start with "#" - no leading spaces allowed!
# UserParameter=hostname;metric;\Path\to\executable;metricFrequency;timeout;retries;schedule([1-7]-[1-7],hh:mm-hh:mm)
#
UserParameter=hostname;metric;C:\Progra~1\AutoIt3\AutoIt3.exe C:\Scripts\test.au3;600;30;2;1-7,10:31-12:00
```

Wrapper flowchart



Tux has dogtail

- Dogtail is a GUI test tool
- Object oriented & procedural APIs
- Uses AT-SPI framework (supports GNOME & GTK+ applications)
- Written in Python (if you can do it in Python, you can do it in dogtail)
- Sniff – graphical representation of GUI elements in hierarchy
- Dogtail recorder – script recording and playback mechanism
- Alternative – LDTP (WinLDTP)



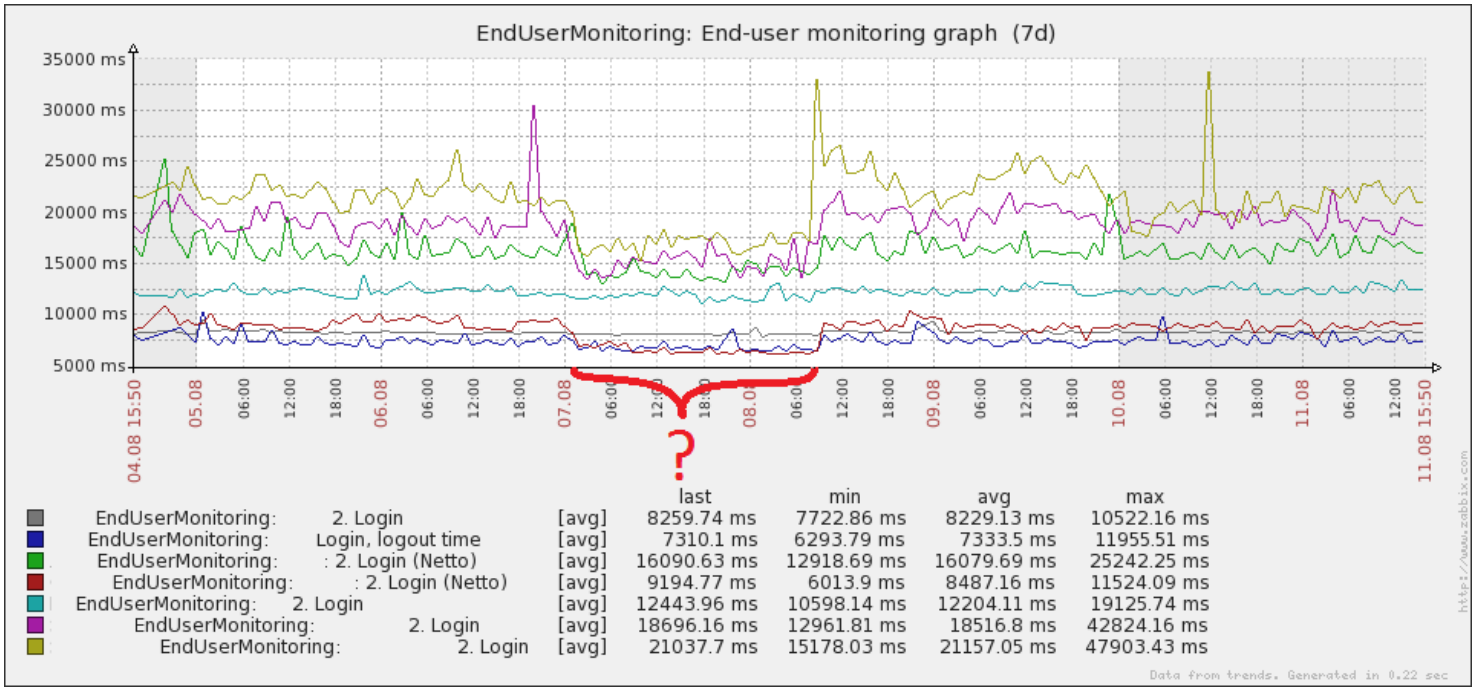
dogtail

taking your applications for a walk

Gain

Example 1 – VM migration

One morning we discovered, that there is «random» performance improvement in almost every system.
It looked like this:

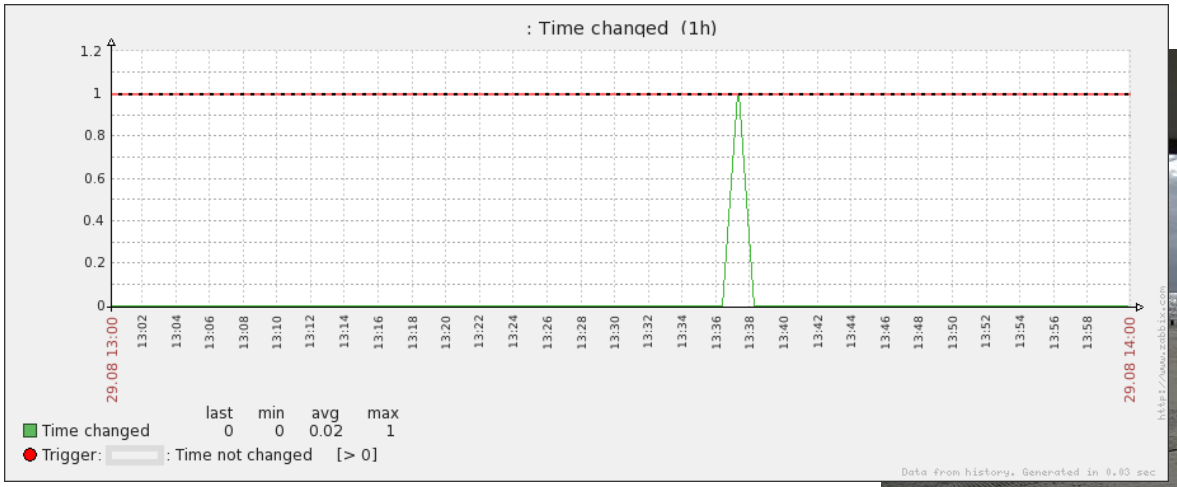


Few seconds – not worth mentioning?
5sec * 20app * 5x/d * 500emp * 250d/y * 5y =~10 years

Example 2 – from spy movies

Log in the surveillance system.
Move through the list of cameras.
Check, if date/time has changed.

*



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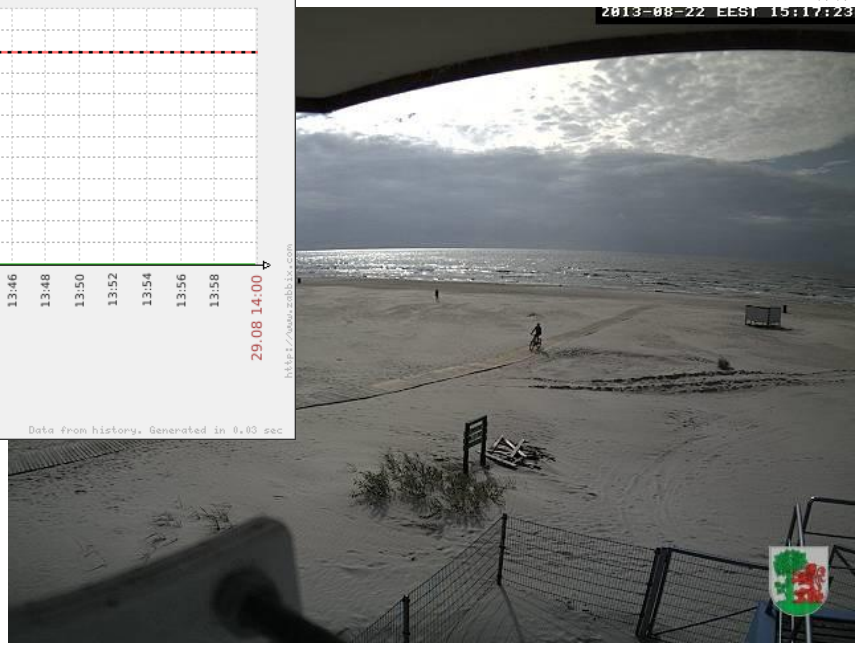

* Example created with private IP camera, with no relation to surveillance system of bank.

**Camera pic. used from site www.liepaja.lv.

Thank you!

Question session!*

*aka Q&A

P.S. Work hard, be kind, and amazing things will happen! /Conan O'Brien/