

Serveradministration++

Michael Prokop <mika@grml.org>

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- Slide 8: <http://digg.com/>
- Slide 9: <http://sysadmin.com.au/>
- Slides 27, 31, 32, 33: <http://www.sxc.hu/>
- Slides 39, 118: <http://www.dilbert.com/>
- Slide 42: <http://www.cacti.net/>
- Slides 52, 60, 61: <http://code.google.com/apis/chart>
- Slide 67: <http://www.amd.co.at/>
- Slide 86: <http://en.wikipedia.org/wiki/System/360>
- Slide 105: <http://www.supermicro.com/>
- Slide 115: <http://blog.koehtopp.de/>
- Slides 123, 125: <http://www.amazon.at/>

Oh, please contact me before suing me. Thanks.
The rest is my own stuff.



About me

I'm Michael Prokop, born in Klagenfurt and living in Graz/Austria. I'm the core developer of grml, a Debian based Linux Live-CD. I'm a system administrator and IT consultant. My tenure at TU Graz ends in June 2008, so if anybody knows of interesting places to work in/around Graz please let me know. I enjoy good music and playing the drums. I love reading books. Currently I'm writing a book (ISBN://978-3937514604).

Contact

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Installation?

Easy

Cheap

Maintenance?



The modern Sysadmin

To Control To Organise To Protect To Optimise To Plan

Change Management

Problem Management

Production Management

Asset Management

Facilities Management

Network Management

Server Management

Software Management

Data Management

Data Security

Business Continuity Planning

Performance Planning

Process Automation

Capacity Planning

Technology Planning

Systems Administration Body of Knowledge
-- sysadmin.com.au

Know your tools

Different systems?

mika@fuchsiatard: ~

root@remote-upgrade ~ %

mika@fuchsiatard: ~

root@remote-fix ~ %

mika@fuchsiatard: ~

root@remote-config ~ %

mika@fuchsiatard: ~

mika@local ~ %

LVM

RAID

...is NO Backup!

Stable Devices?

UUIDs

Evaluate

Have a testbed

Use the right tool
for the right job

Read
Documentation

Get the best out
of your daily
tools

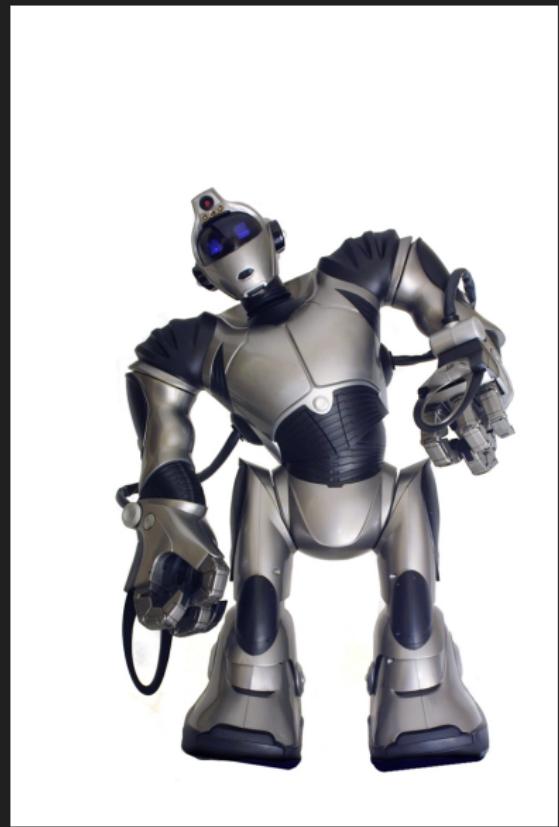
Use version
control.

Everywhere

/etc (mercurial,
etckeeper)

Repetitive?

Automation!



Prefer Open Source

Do NOT use
tools you can't
handle

Don't use a tool
just because
everyone does

PHP





MySQL

Insert \$TOOL



Invest in your
know-how

Be interested

Study

Learn

Forever



Anticipate

Monitor your infrastructure

Nagios®

General

- [Home](#)
- [Documentation](#)

Monitoring

- [Tactical Overview](#)
- [Service Detail](#)
- [Host Detail](#)
- [Hostgroup Overview](#)
- [Hostgroup Summary](#)
- [Hostgroup Grid](#)
- [Servicegroup Overview](#)
- [Servicegroup Summary](#)
- [Servicegroup Grid](#)
- [Status Map](#)
- [3-D Status Map](#)
- [Service Problems](#)
 - [Unhandled](#)
- [Host Problems](#)
 - [Unhandled](#)
- [Network Outages](#)

Show Host:

Comments

Downtime

- [Process Info](#)
- [Performance Info](#)
- [Scheduling Queue](#)

Reporting

- [Trends](#)
- [Availability](#)
- [Alert Histogram](#)
- [Alert History](#)
- [Alert Summary](#)
- [Notifications](#)
- [Event Log](#)

Configuration

- [View Config](#)

Current Network Status

Last Updated: Thu Mar 20 20:17:56 CET 2008
Updated every 90 seconds
Nagios® 3.0rc2 - www.nagios.org
Logged in as: nagiosadmin

[View History For All hosts](#)
[View Notifications For All Hosts](#)
[View Host Status Detail For All Hosts](#)

Host Status Totals

Up	Down	Unreachable	Pending
6	0	0	0

[All Problems](#) [All Types](#)

0 6

Service Status Totals

Ok	Warning	Unknown	Critical	Pending
9	1	0	0	3

[All Problems](#) [All Types](#)

1 13

Service Status Details For All Hosts

Host ↑\v	Service ↑\v	Status ↑\v	Last Check ↑\v	Duration ↑\v	Attempt ↑\v	Status Information
[REDACTED]	HTTP	OK	2008-03-20 20:16:05	0d 0h 1m 51s	1/4	HTTP OK HTTP/1.0 200 OK - 3724 bytes in 0.067 seconds
	SSH	OK	2008-03-20 20:17:20	0d 0h 0m 36s	1/4	SSH OK - OpenSSH_4.3p2 Debian-9 (protocol 2.0)
[REDACTED]	PING	OK	2008-03-20 20:16:18	0d 0h 20m 58s	1/4	PING OK - Packet loss = 0%, RTA = 1.17 ms
	HTTP	OK	2008-03-20 20:13:11	0d 0h 4m 45s	1/4	HTTP OK HTTP/1.1 200 OK - 11820 bytes in 0.136 seconds
[REDACTED]	SSH	PENDING	N/A	0d 0h 2m 32s+	1/4	Service check scheduled for Thu Mar 20 20:19:15 CET 2008
	HTTP	PENDING	N/A	0d 0h 2m 32s+	1/4	Service check scheduled for Thu Mar 20 20:21:11 CET 2008
[REDACTED]	Current Load	OK	2008-03-20 20:15:03	0d 0h 19m 32s	1/4	OK - load average: 0.22, 0.22, 0.25
	Current Users	OK	2008-03-20 20:14:50	0d 0h 18m 6s	1/4	USERS OK - 1 users currently logged in
	Disk Space	WARNING	2008-03-20 20:16:56	0d 0h 16m 41s	4/4	DISK WARNING - free space: / 2466 MB (21% inode=75%); /bfintrw 992 MB (100% inode=99%); /dev/9 MB (96% inode=99%); /dev/shm 992 MB (100% inode=99%); /igml 5712 MB (21% inode=93%); /home 4477 MB (18% inode=97%); /tmp 489 MB (97% inode=99%);
	HTTP	OK	2008-03-20 20:15:41	0d 0h 12m 15s	1/4	HTTP OK - HTTP/1.1 302 Found - 0.001 second response time
	Total Processes	OK	2008-03-20 20:15:41	0d 0h 17m 23s	1/4	PROCS OK: 148 processes
[REDACTED]	HTTP	OK	2008-03-20 20:16:32	0d 0h 1m 24s	1/4	HTTP OK - HTTP/1.1 302 Found - 0.131 second response time

13 Matching Service Entries Displayed

graphs

Graphs -> Tree Mode

Backbone - Annex

- Host: ANNEX-SW6509-MDF-SW1
- Host: ANNEX-SW3548-MDF-SW2
- Host: ANNEX-RT2600-COMCAST
- + Backbone - High School
- + Backbone - Middle School
 - Host: HS-SW3548-MDF-SW1
- + Backbone - Old High School
- + Backbone - WAN
- + Elementary Servers
- + Printers
- + Servers
 - Host: ADMIN01
 - Host: BACKUP01
 - Host: BORDER01
 - Host: CITRIX01
 - Host: GHOST01
 - Host: GRPWISE
 - Host: SPEC-ED
 - Host: WWW
- + Weather
- + Wireless Statistics

Presets: Last Day From: 2004-08-27 22:47 To: 2004-08-28 22:47

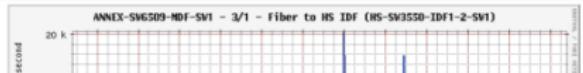
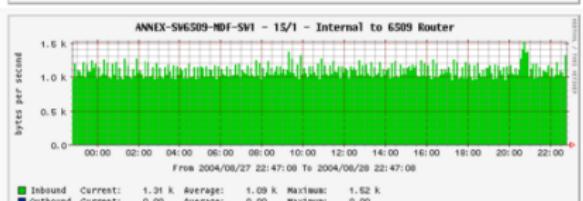
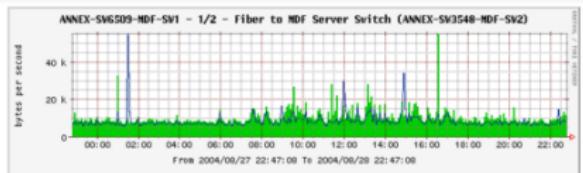
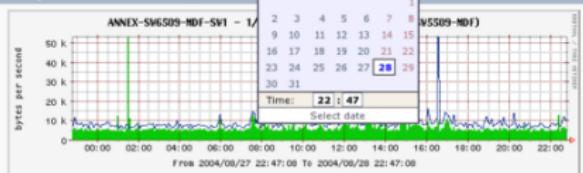
settings

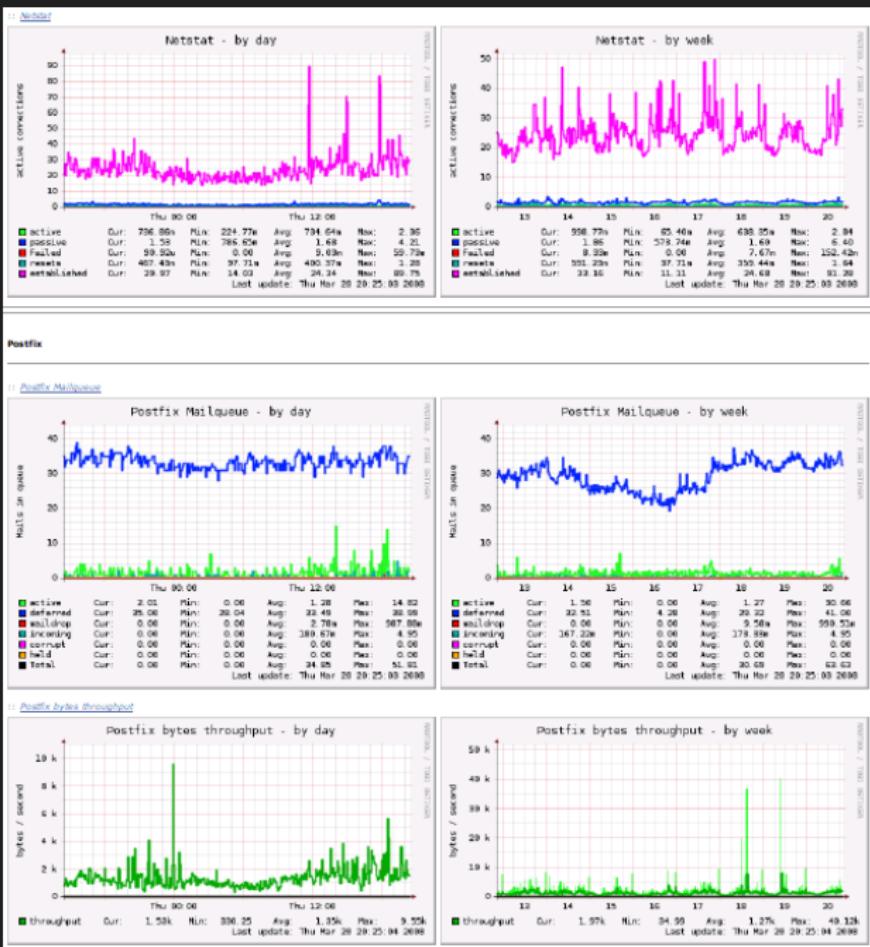


clear

Tree: Backbone - Annex -> Host: ANNEX-SW6509-MDF-SW1

Graph Template: Interface - Backbone Traffic





Monit Service Manager

Monit is running on [REDACTED] with *uptime*, 49d 22h 8m and monitoring:

System	Status	Load	CPU	Memory
[REDACTED]	Resource limit matched	[0.79] [0.62] [0.36] 28.1%us, 2.4%sy, 23.0%wa	60.1%	[623268 kB]

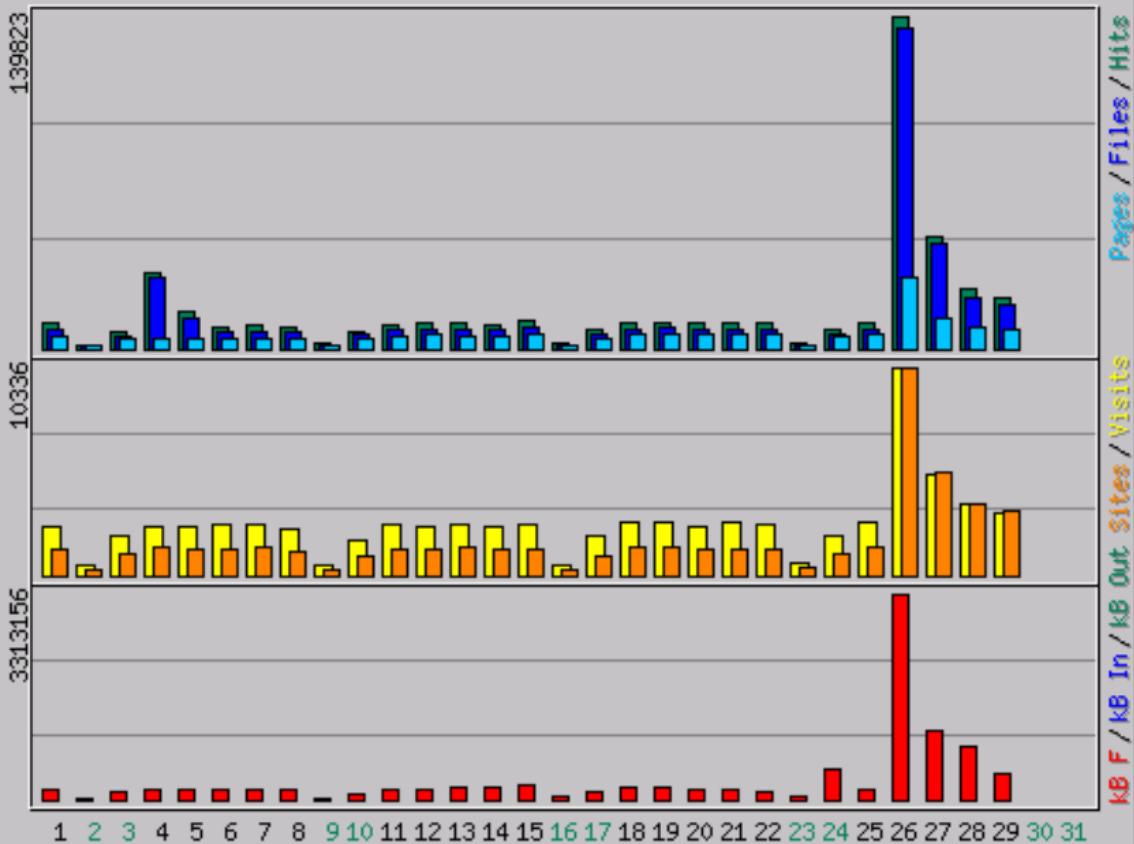
Process	Status	Uptime	CPU	Memory
mysqld	running	49d 22h 4m	0.0%	2.2% [22928 kB]
apache	running	17h 29m	0.7%	0.7% [7472 kB]
sshd	running	163d 8h 44m	0.0%	0.0% [832 kB]
postfix	running	4h 3m	0.0%	0.1% [1636 kB]

Monitor your business

Statistics?

12k hits/day?

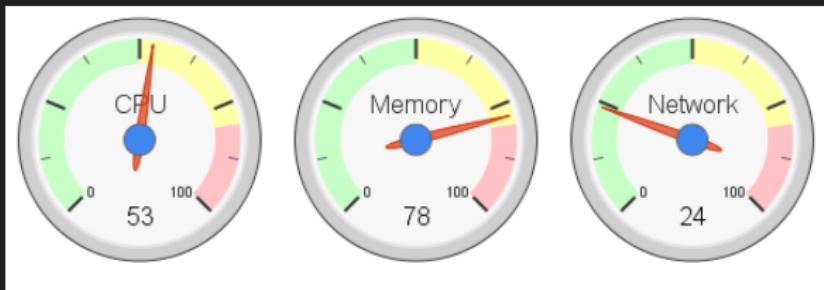
Daily usage for February 2008



140k hits/day!

Reason?

Use metrics!



Expect problems

Fix causes, not
symptoms.

Software breaks

Hardware breaks

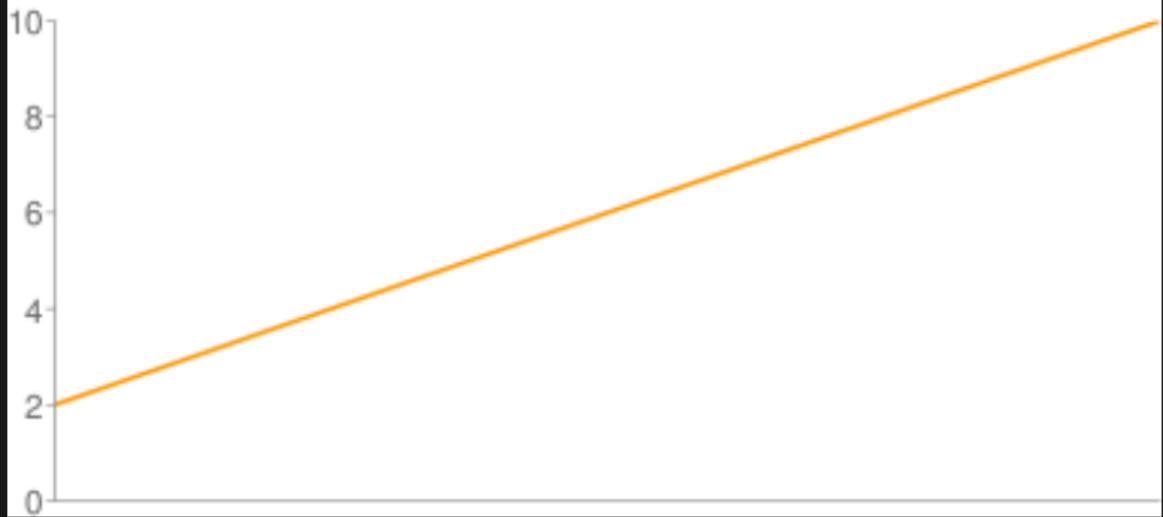
Design it

Don't trust any
benchmarks...

. . . you did not
fake yourself

Manufacturer

\$UNIT_OF_YOUR_CHOICE



Reality

\$UNIT_OF_YOUR_CHOICE



Don't deploy
what you can't
maintain

Testing happens
in staging, not in
production

Virtual Machines!



New



Settings



Delete



Start Discard



grml-devel

Powered Off



linux-iso

Powered Off



solaris

Powered Off



terminalserver-client

Powered Off



win_xp (frisch installiert)

Aborted

Details

Snapshots

Description

General

Name	grml-devel
OS Type	Linux 2.6
Base Memory	96 MB
Video Memory	8 MB
Boot Order	CD/DVD-ROM, Hard Disk
ACPI	Enabled
IO APIC	Disabled

Hard Disks

Primary Master test1.vdi [Normal, 2.00 GB]

CD/DVD-ROM

Image grml_1.1-lu.iso

Floppy

Not mounted

File Edit View Host VM Tabs Help

Power Off Suspend Power On Reset Snapshot Revert Full Screen Quick Switch

Inventory

fuchsiatard grml-forensic grml-test

fuchsiatard

State: Connected
Version: VMware Server 1.0.5

Commands

- Create a new virtual machine
- Open a virtual machine
- Edit host settings
- Switch to a different host

Help

The VMware Server Console lets you connect to virtual machines that run on VMware Server and GSX 3 systems. Each virtual machine is equivalent to a physical server with storage, networking, memory and devices. The VMware Server Console gives you full control over virtual machines, including keyboard, video and mouse interactivity.

Local host

```
root@g21-16i02r1-vnode01: /root
g21-16i02r1-vnode01:~# vzlist
   VEID      NPROC STATUS   IP_ADDR      HOSTNAME
    1003        46 running 10.10.153.10  flstaging-db
    1004        56 running 10.10.153.11  flstaging-web01
    1005        56 running 10.10.153.12  flstaging-web02
    100302      25 running 10.10.153.17  its-debuild64
    100303      27 running 10.10.153.18  its-debuild32
    100304       9 running 10.10.153.19  its-rss2mail01
    100305      10 running 10.10.153.20  its-munin01
    100308      30 running 10.10.153.33  its-baculatest01
    101001      50 running 10.10.153.31  rrw-devel-web01
    101101      17 running 10.10.153.37  mor-stag-web01
    201001      85 running 10.10.153.16  fst-devel-chat01
    201002      42 running 10.10.153.21  fst-stag-web01
    201003      53 running 10.10.153.22  fst-stag-web02
    201004     100 running 10.10.153.23  fst-stag-db01
    201005      59 running 10.10.153.24  fst-stag-admin01
    201006      23 running 10.10.153.29  fst-devel-nntp01
    201011     275 running 10.10.153.34  fst-stag-ikawsnew01
    201016     154 running 10.10.153.32  fst-devel-indexrev01
    201022      32 running 10.10.153.30  fst-devel-index01
    201023      63 running 10.10.153.36  fst-devel-web01
g21-16i02r1-vnode01:~#
```

Snapshots

Deployment + Rollout

Virtualisation?

Consolidation?

easy

great. . .

... but
dangerous!

Scale

Backup

Nobody wants
backup. . .

Everybody wants
restore!

Communicate

Document

Locate pitfalls

init scripts

Use templates!

Test rebooting

Apropos
reboot. . .

molly- guard



Document fix AND pitfall!

Rollout

Images vs.

FAI and
d-i-preseeding
plus
configuration

Configuration Management

cfengine

puppet

bcfg

Change Management

apt-listbugs

apt-listchanges

Patch Management

Server Migration

Failover

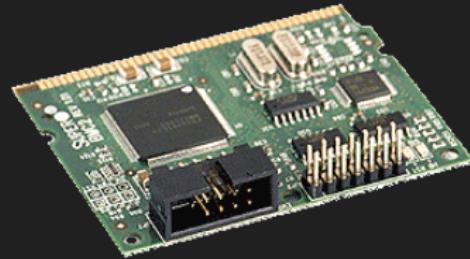
Loadbalancing

Infrastructure

Hardware

Remote Access

- Remote Cards (IPMI)
- Baseboard Management Controller (HP iLO, IBM RSA, Sun ALOM, Dell DRAC)
- network-compatible printers, scanner,...



UPS?

Logging

Log of a customer system...

```
cd /etc/apache2/mods-enabled
lrwxrwxrwx 1 root www-data 33 2007-09-28 15:23 \
auth_basic.load -> ../mods-available/auth_basic.load
lrwxrwxrwx 1 root www-data 33 2007-09-28 15:23 \
authn_file.load -> ../mods-available/authn_file.load
lrwxrwxrwx 1 root www-data 36 2007-09-28 15:23 \
authz_default.load -> ../mods-available/authz_default.load
```

sudo / sudoedit

central vs. decentral logging

Identity Management

Cluster Management

- bitcluster
- c3
- clusterssh
- dsh
- kanif
- keyboardcast
- konsole
- multixterm
- omnitty
- pconsole
- pdsh
- pssh
- taktuk

Admin's Rescue Set



- Network Cable (patch+crossover)
- Switch/Hub
- USB-Pen/disk(s)
- Magnetic Screwdriver
- Knife/Leatherman
- Whitemarker
- USB Cabel
- USB2Serial Adapter
- Blank CD-/DVDs
- Battery/Accu
- Ballpen
- Notepad
- Installation-CDs



BoFH



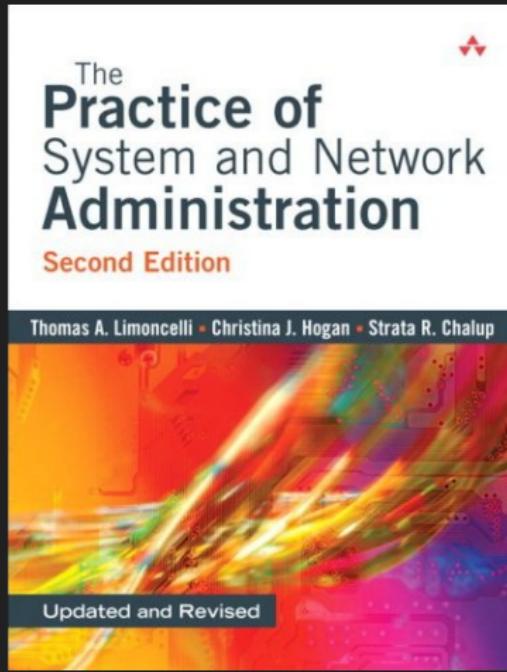
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Sysadmin dilemma

Important Systems?

Only the best
admins. . .

Learn of the
best!



Sysadmins bible:
The Practice of System and
Network Administration;
Limoncelli, Hogan and
Chalup

[Conferences](#)[Join/Renew](#)[Who We Are](#)[Contact Us](#)[;login:](#)

The Advanced Computing Systems Association

22nd Large Installation System Administration Conference (LISA '08)

November 9–14, 2008, San Diego, CA

Sponsored by [USENIX](#) and
[SAGE](#)

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[Overview](#)
[Organizers](#)

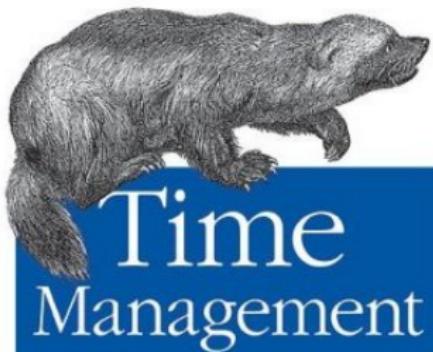
Join us in San Diego, CA, November 9–14, 2008, for the most in-depth, practical system administration training available.

The Large Installation System Administration Conference (LISA) has been the premier system administration conference for over 20 years. It offers an unparalleled opportunity to meet and mingle with the leading figures in the system administration industry. The goal of this conference is to provide attendees with the practical information they need to succeed in their jobs. Information is arranged in a "learn it today—use it tomorrow" format.

The theme for LISA '08 is "Real World System Administration."

Proceedings!

Stop Working Late and Start Working Smart



O'REILLY®

Thomas A. Limoncelli

Time Management for
System Administrators;
Thomas Limoncelli

Other Resources?

Appropriate Websites

RSS-Feeds

Be better than
your competitors!

Look beyond
your own nose

Murphy will keep
away! :)

The Admin Zen

Keep it up and running.

1. Know your [tools](#).
2. [Anticipate](#).
3. [Expect problems](#).
4. [Design it.](#)
5. [Scale](#).
6. [Backup](#).
7. [Communicate](#).
8. [Document](#).

[PDF](#) / [PNG](#) Printout

[Grml](#) - better save than sorry.

[About adminzen.org](#) | © 2008++ Michael Prokop



adminzen.org

Oh. . .

No changes on
Friday 4 o'clock!

:)

Serveradministration++

Thanks