



## High available systems with Heartbeat2

### Историята на един новобранец

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## Agenda

- 1. High Availability**
  - 2. Download & Install**
  - 3. Basic Architecture**
  - 4. V1 -> V2 Interoperability**
  - 5. Setup**
  - 6. Example configuration explained**
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## Download & Install

<http://linux-ha.org>

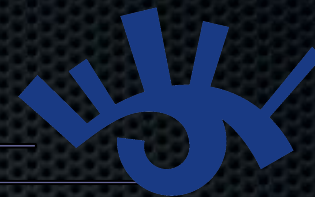
**rpm (SuSE, Fedora, CentOS, RHEL, Debian)**  
**rpm -Uvh \***

**tar.gz**

<http://clusterlabs.org/mw/Install>

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## What Can HA Clustering Do For You?

- **It cannot achieve 100% availability – *nothing can.***
  - HA Clustering designed to recover from single faults
  - It can make your outages very short
    - From about a second to a few minutes
  - It is like a Magician's (Illusionist's) trick:
    - When it goes well, the hand is faster than the eye
    - When it goes not-so-well, it can be reasonably visible
  - A good HA clustering system adds a "9" to your base availability
    - 99->99.9,      99.9->99.99,      99.99->99.999,    etc.
  - **Complexity is the enemy of reliability!**
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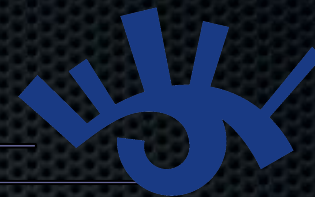


## Lies, Damn Lies, and Statistics

99.99999%	3s
99.9999%	30 sec
99.999%	5 min
99.99%	52 min



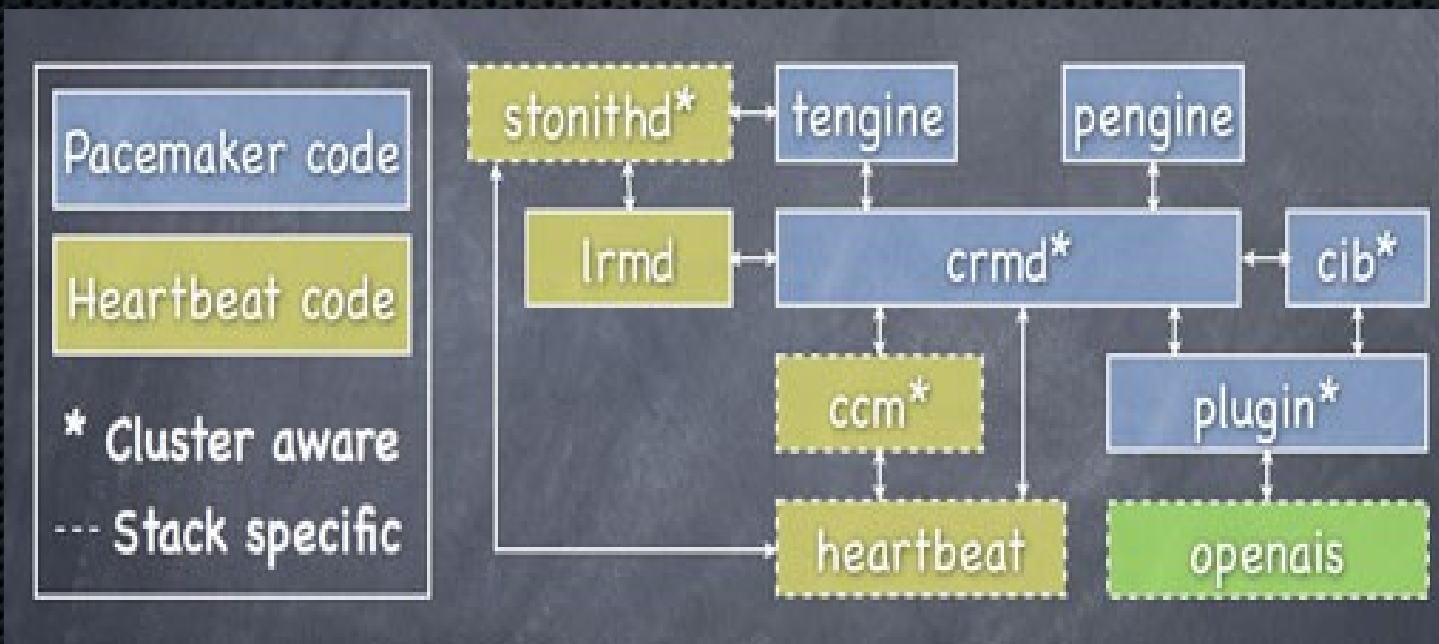
# HA Systems with Heartbeat 2



## Basic Architecture

**With Heartbeat 1 everything was simple**

**With Heartbeat 2 not so much....**





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Pacemaker - not a fork of Heartbeat

OpenAIS - Application Interface Specification  
of Service Availability Forum

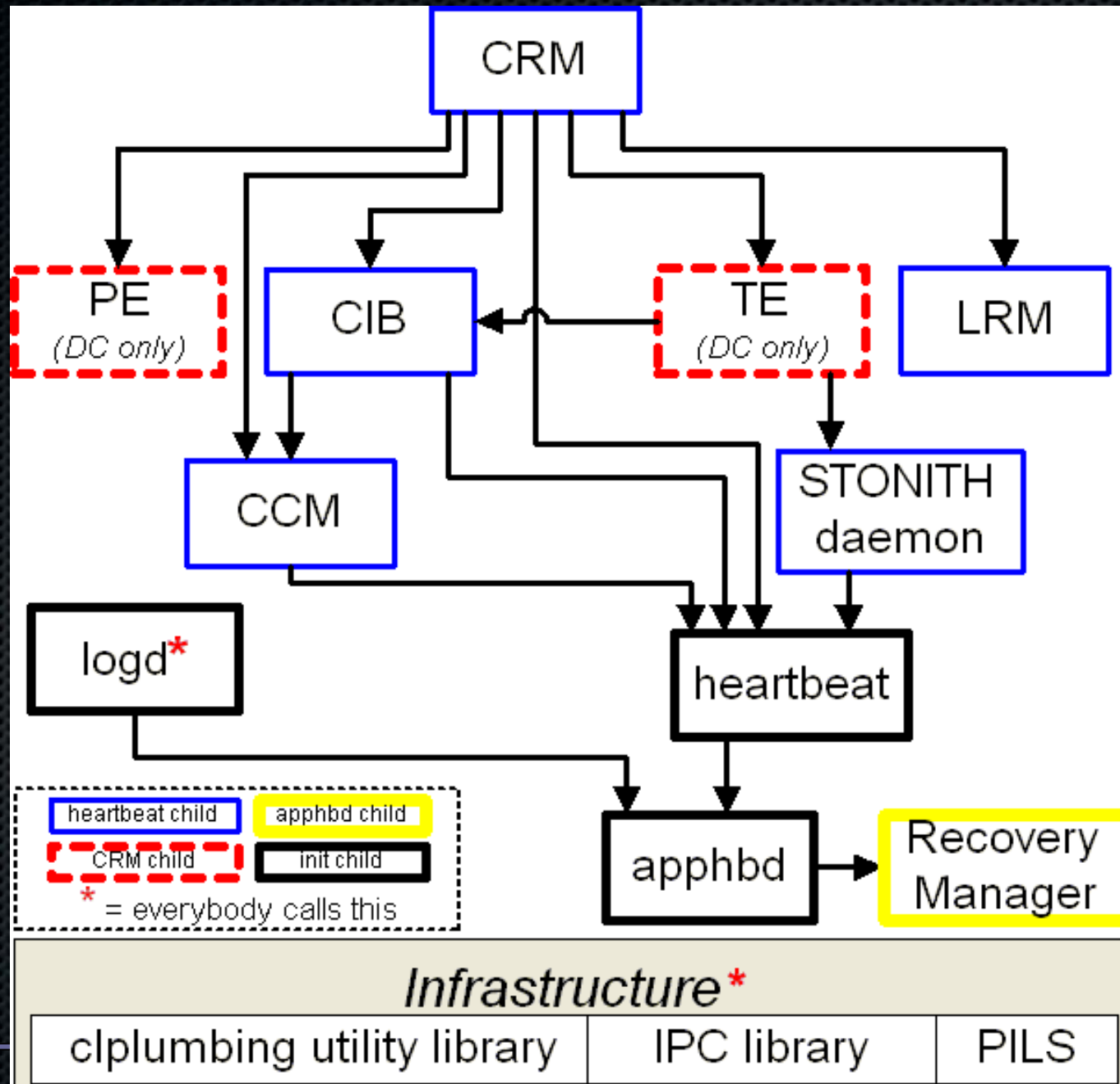
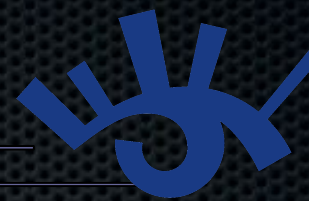
OCF - Open Cluster Framework

LSB - Linux Standard Base

heartbeat - Heartbeat V1 scripts

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# HA Systems with Heartbeat 2

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heartbeat

CRM - Cluster Resource Manager

CIB - Cluster Information Base

PE - CRM Policy Engine

TE - CRM Transition Engine

LRM - Local Resource Manager

CCM - Consensus Cluster Membership

Stonith Daemon - provides node reset services

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logd - non-blocking logging daemon

apphbd - application level watchdog timer service

Recovery Manager - application recovery service  
Infrastructure

- PILS - Plugin and Interface Loading System

- IPC - Interprocess Communication

- Cluster "plumbing" library

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# SETUP

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```
[root@lb ha.d]# cat /etc/ha.d/authkeys
auth 1
1 md5 In controlers we trust! In memory we fail!
#2 sha1 HI!
#3 md5 Hello!
```

```
[root@lb ha.d]# cat haresources
lb 10.9.0.1 lvs mon
```

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# SETUP

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```
[root@lb ha.d]# cat /etc/ha.d/ha.cf
keepalive 2
deadtime 10
hopfudge 1
baud 19200
udpport 694
ucast eth1 10.4.0.2
use_logd yes
conn_logd_time 60
crm respawn
node lb
node web1
```

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# SETUP

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```
[root@lb ha.d]# cat /etc/logd.cf
debugfile /var/log/ha-debug
logfile /var/log/ha-log
logfacility daemon
entity logd
useapphbd no
sendqlen 256
recvqlen 256
```

**LAST:**

**/var/lib/heartbeat/crm/cib.xml**

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# SETUP

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```
[root@lb ha.d]# cat /etc/logd.cf
debugfile /var/log/ha-debug
logfile /var/log/ha-log
logfacility daemon
entity logd
useapphbd no
sendqlen 256
recvqlen 256
```

## **LAST:**

**`/var/lib/heartbeat/crm/cib.xml`**

```
# crm_verify -LV
# ciblint -L
```

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