

# LKST for SH updates 200601 - Features of Iktstlogtools-



Lineo Solutions, Inc

## Former presentations

- **LKST for SH** ... Plenary Meeting, Jan. 2005

- Port to SH (points, period), Visual DEMO



- **Let's Get Start with LKST/SH**

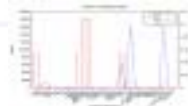
... Int'l Technical Jamboree, Jun. 2005

- Porting Updates (syscalls, exceptions on 2.6.8.1/2.6.9)

- Study (LKST vs LTT Hookpoints) & Tutorials (Iktstlogtools)

- **Cooperative works**

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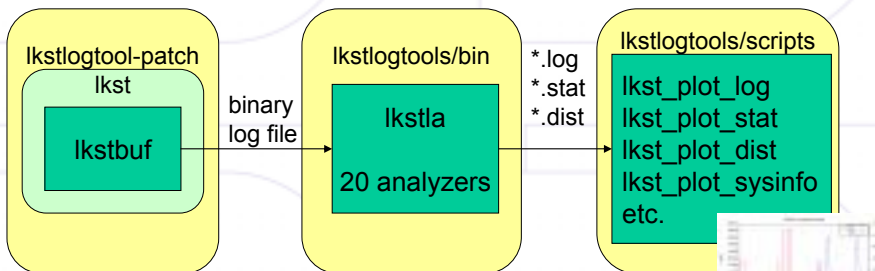


# TOC Today

- **lkstlogtools**
  - Analyze system --- Lkst & lkstlogtools
  - Status
  - lkstla, its features
  - Analysis example

# Analyze System

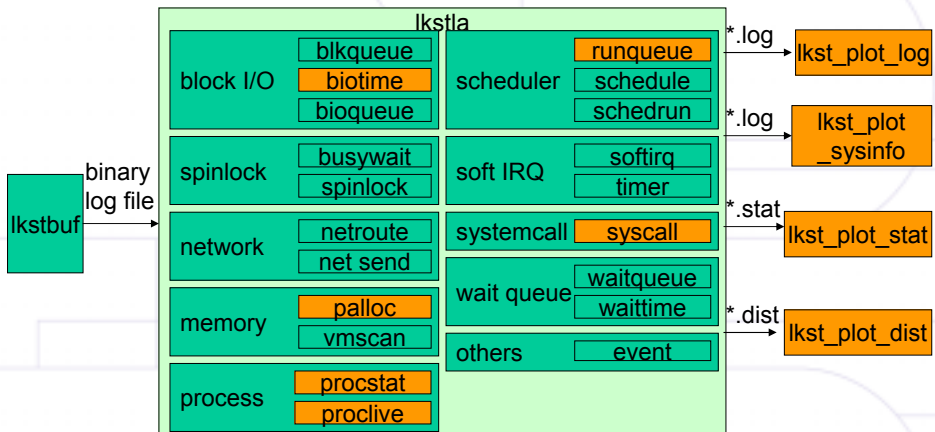
- LKST ... Tracing Processing
- lkstlogtools ... Postprocessing
  - developed by LKST Core Team

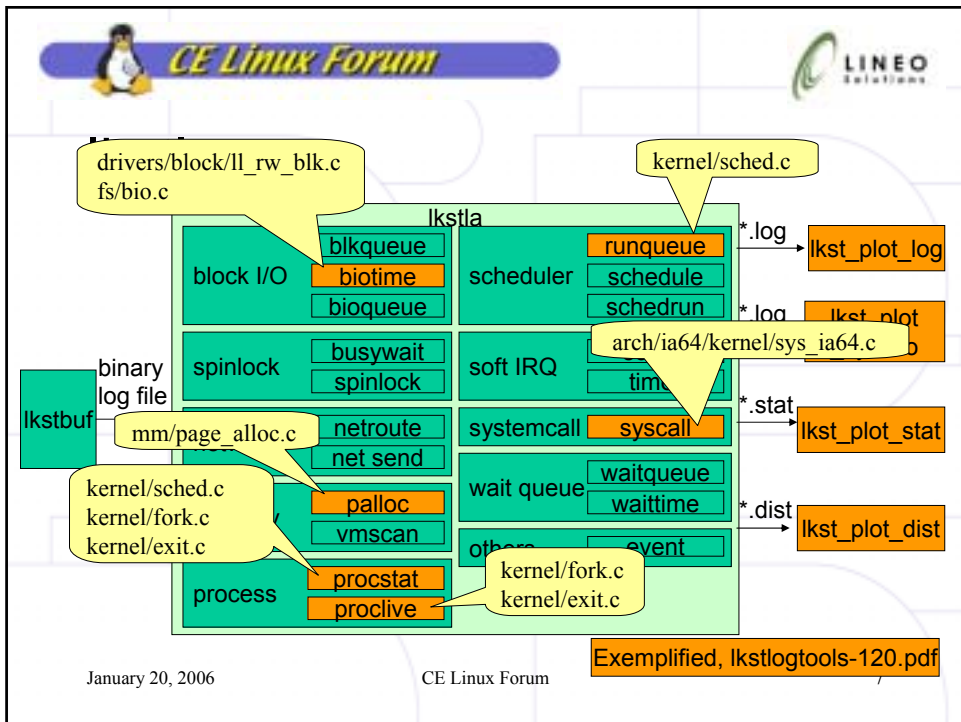


# lkstlogtools status

- **Sourceforge.jp/projects/lkst**
  - Latest Tarball ... lkst-2.3.1.tar.gz (2005-10-08)
    - lkst 2.3.1, lkstlogtools 1.2.0 + patchset for 2.6.12 (lkst-2.3.1/patches/2.6.12)
  - Document ... lkstlogtools-120.pdf (2005-10-08) ... In Japanese
- **Reference Model**
  - X86 (Fedora Core2)
  - Kernel 2.6.9/ 2.6.12 + lkst 2.2.1 / 2.3 / 2.3.1
- **For SH arch**
  - 2.6.8.1 + lkst 2.2.1 ... kernel + lkst driver

# lkstla





# lkstla features

```
# lkstla -l biotime [options] lkstlog.bin
```

- Analyzers (31 in lkstlogtools 1.2.0 / 20 in 1.1.0)
- Format ... log (time series), stat (Statistical), dist (Distribution)
- Key & Options
  - Key is a parameter defined per an analyzer
    - Ex. biotime has block device number followed by read(0)/write(1) flag
  - Options ... Event Filter Group
    - Event Key Filter/ PID Filter/ CPUID Filter, etc.
- Useful References
  - lkstlogtools-120.pdf
  - “man lkstla”

January 20, 2006 CE Linux Forum 8

# lkstla and maskset

- **Analyzer Requires Events hooked**
  - Ex. Biotime uses BIO\_MAKE\_REQ/ BIO\_END\_IO
  - event handlers' value SHOULD be 0x01 (default is 0xff)
- **Refer to Detailed Specification**
  - Lkstlogtools-120.pdf, 3.1.5 (pp.26-41)
  - Confer: Event handler and corresponding source code
    - <http://prdownloads.sourceforge.jp/lkst/12318/lkst-events-2.1.pdf>
    - include/linux/lkst\_etypes.h
    - include/asm/lkst\_etype.h

# lkstla Output

Lkstla output

- **log format**

```
BIO processing time analyzer
type kdevice-rw start[sec] blockio-time
80800000 00800000-WR 1137600969.764500856 0.000262563
80800000 00800000-WR 1137600969.764502552 0.001132937
```

**stat format**

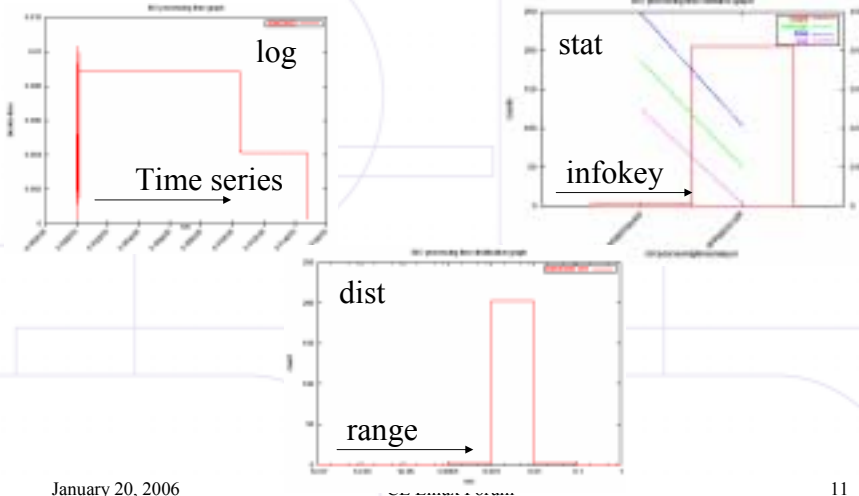
```
BIO processing time analyzer
type kdevice-rw count average max
min total
00800000 00800000-RD 2 0.018518420 0.024668706
0.012368133 0.037036839
80800000 00800000-WR 206 0.005016572 0.010287795
0.000262563 1.033413742
```

- **dist format**

```
BIO processing time analyzer
type kdevice-rw less-than-min 0.000000100 0.000001000
0.000010000 0.000100000 0.001000000 0.010000000 0.100000000
1.000000000 more-than-max
00800000 00800000-RD 0 0 0 0
0 0 0 2 0 0
0 0
```



# Plot Representation



# Analysis Example exception (1/2)

1. **Configure Maskset as ...**
  - Event Handler values = 0x01 for
    - Exception entry (mandatory)
    - process\_wakeup, context\_switch, exception exit (useful)
2. **Collect binary log ...**
  - So that the fault traced in *binary\_log*
3. **Check ...**
  - Arg3 of `exception_entry` "exception address if exist" equals `objdump` result?
    - Exception address : `lkstbuf print -r -f binary_log`
    - `Objdump : sh4-linux-objdump -S tgt_program`

## Analysis Example exception (2/2)

- **lkst binary log**
  - event type=exception entry  
cpu=00, pid=00000400  
time=Sat Jan 01 00:00:00.416770020 2000  
arg1=0x8c019ba0 00000000 : exception-handler address edi  
arg2=0x00000100 00000000 : error code esi  
arg3=0x0040046e 00000000 : exception address if exist
- **objdump for target program**
  - 00400460 <main>:  
40046c: 0b e1       mov    #11,r1  
40046e: 12 22       mov.l  r1,@r2  
400470: 04 7e       add    #4,r14  
400472: e3 6f       mov    r14,r15  
400474: f6 6e       mov.l  @r15+,r14

## Summary

- **lkstlogtools**
  - Analyze system reviewed
  - Current Status introduced
  - Features of **lkstla** with Analyses examples

Thanks!