Time to Glean
MAC for Linux, history and the future

July 25, 2008

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Kentaro Takeda  
Tetsuo Handa

NTT DATA CORPORATION
Welcome
to my BoF of “MAC for Linux: Time to Glean”

I am project manager of TOMOYO Linux, but this is *not* a TOMOYO Linux BoF
This BoF

• looks in the history of Linux MAC: (Mandatory Access Control)
  • As Smack had been added as 2\textsuperscript{nd} in-tree module, it might be a good time to stop by and look what have passed
  • I tried to find information from the LSM ml archive during the period December 2003 to June 2008
Please Don’t ...

• Ask me if this is worth spending time (I’ve already spent my time ...)

• Get mad on me if the result is not what you want (we can’t tell what we find until we dig)
Where to look at?

• ML archive has the information
• Whole LKML seems to be too much ...
• LSM mailing list archive should be a modest place for resort
How to glean?

• Downloaded LSM message archive from gmane.org during the period of December 3, 2003 through June 30, 2008

• Plenty of nice tools are available
  – ruby, perl, sort, uniq ... (joy of computing)

• Used Excel and Numbers occasionally for saving time purpose
Welcome aboard!

Let’s start digging

Is this free?

Of course, it’s open source!
Can You Guess?
Can You Guess?

1. How many messages has been posted during December 3, 2003 - June 30, 2008?
Can You Guess?

1. How many messages has been posted during December 3, 2003 - June 30, 2008?

2. How many threads were there?
Can You Guess?

1. How many messages has been posted during December 3, 2003 - June 30, 2008?

2. How many threads were there?

3. How big is the downloaded mbox file?
Answer

6545 messages
978 threads
55MB
LSM traffic
each month
sum up
LSM activities at a glance

- each month
- sum up
3 Peaks

- Peaks should have reasons
- Let’s take a look at each peaks
April 2006

- [RFC][PATCH 0/7] fireflier LSM for labeling sockets based on its creator (owner) Torok Edwin
- [RFC][PATCH 0/11] security: AppArmor - Overview Tony Jones
- RE: [ANNOUNCE] Release Digsig 1.5: kernel module for run-time authentication of binaries Makan Pourzandi
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- [ANNOUNCE] ISSI is porting PitBull Foundation and LX to Linux using the LSM Mikel L. Matthews
- [2.6 patch] remove the Root Plug Support sample module Adrian Bunk
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June 2007

- [AppArmor 00/45] AppArmor security module overview John Johansen
- [AppArmor 00/44] AppArmor security module overview John Johansen
- Re: implement-file-posix-capabilities.patch Serge E. Hallyn
- [RFC] TOMOYO Linux Toshiharu Harada
- [TOMOYO 0/9] TOMOYO Linux security module. Kentaro Takeda
- [RFD 0/4] AppArmor - Don't pass NULL nameidata to vfs_create/lookup/permission IOPs John Johansen
- What kind of feature does New LSM security model need? Kazuki Omo
- [PATCH 1/1] file caps: update selinux xattr hooks Serge E. Hallyn
- Re: [TOMOYO 5/9] Memory and pathname management functions. Albert Cahalan
- [PATCH 1/1] file capabilities: get_file_caps cleanups Serge E. Hallyn
- [RFC][Patch 1/1] IBAC Patch Mimi Zohar
- [PATCH] [RFC] security: add hook inode_post_removexattr Hawk Xu
- [PATCH 1/1] file capabilities: introduce cap_setfcap Serge E. Hallyn
- Re: [AppArmor 01/41] Pass struct vfsmount to the inode_create LSM hook Pavel Machek
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- [TOMOYO 00/15](repost) TOMOYO Linux - MAC based on process invocation history. Kentaro Takeda
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- [RFC 0/2] getsecurity/vfs_getxattr cleanup Daved P. Quigley
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- [PATCH] Version 4 (2.6.23-rc8-mm2) Smack: Simplified Mandatory Access Control Kernel Casey Schaufler
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- [PATCH 1/2 -mm] capabilities: clean up file capability reading Serge E. Hallyn
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People

“It is people that writes and reads messages”
People

“It is people that writes and reads messages”

It is also people that fight and argue (and reject)
LSM top 20 contributors

- Casey Schaufler
- James Morris
- John Johansen
- Chris Wright
- Paul Moore
- Tetsuo Handa
- Crispin Cowan
- Andrew G. Morgan
- Greg KH
- Valdis.Kletnieks
- Kentaro Takeda
- Pavel Machek
- Tony Jones
- Andreas Gruenbacher
- KaiGai Kohei
- Ahmed S. Darwish
- Kylene Jo Hall
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Dec-03 Mar-04 Jun-04 Sep-04 Dec-04 Mar-05 Jun-05 Sep-05 Dec-05 Mar-06 Jun-06 Sep-06 Dec-06 Mar-07 Jun-07 Sep-07 Dec-07 Mar-08 Jun-08
Men of wisdom ("cc"ed ranking)
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- Stephen Smalley
- Chris Wright
- Casey Schaufler
- James Morris
- Serge E. Hallyn
- Andrew Morton
- David Howells
- Christoph Hellwig
- Andreas Gruenbacher
- Al Viro
- John Johansen
- Trond Myklebust
- Linus Torvalds
- Andrew G. Morgan
- Crispin Cowan
- Greg KH
- Eric Paris
- Tony Jones
- Tetsuo Handa
- Arjan van de Ven
Which ML cc-ed most
Which ML cc-ed most

- linux-security-module ML (self)
- linux-kernel ML
- linux-fsdevel ML
- selinux ML
- netdev ML
- fireflier-devel ML
- linux-audit ML
Threads
(not threats)
What is thread?
What is thread?
What should we look at for threads?

1. Life time (how many days)
2. Number of messages
3. Number of people posted their opinions to the thread
Long lived threads 10

[PATCH 0/3] exporting capability name/code pairs (final#2)
[PATCH] capabilities: implement per-process securebits
[PATCH] Implement file posix capabilities
[PATCH 2/2-v2] NFS: use new LSM interfaces to explicitly set mount options
AppArmor FAQ
Mediating send_sigurp
[PATCH 00/28] Permit filesystem local caching [try #2]
[AppArmor 00/41] AppArmor security module overview
[AppArmor 00/45] AppArmor security module overview
[PATCH 1/1] security: introduce fs caps
## Long lived threads

**subject** | from | start | end | days | people | messages
---|---|---|---|---|---|---
[PATCH 0/3] exporting capability name/code pairs (final#2) | KaiGai Kohei | 2008/02/24 | 2008/05/15 | 82 | 7 | 32
[PATCH] capabilities: implement per-process securebits | Andrew G. Morgan | 2008/02/18 | 2008/04/27 | 70 | 3 | 7
[PATCH] Implement file posix capabilities | Serge E. Hallyn | 2006/11/27 | 2007/01/24 | 59 | 5 | 9
[PATCH 2/2-v2] NFS: use new LSM interfaces to explicitly set mount op | Eric Paris | 2008/03/05 | 2008/04/30 | 57 | 3 | 6
Mediating send_sigurg | Stephen Smalley | 2004/08/27 | 2004/10/19 | 54 | 2 | 12
[PATCH 00/28] Permit filesystem local caching [try #2] | David Howells | 2007/12/05 | 2008/01/23 | 50 | 8 | 126
[AppArmor 00/41] AppArmor security module overview | John Johansen | 2007/04/12 | 2007/05/30 | 49 | 24 | 176
[AppArmor 00/45] AppArmor security module overview | John Johansen | 2007/05/14 | 2007/06/26 | 44 | 22 | 236
[PATCH 1/1] security: introduce fs caps | Serge E. Hallyn | 2006/11/08 | 2006/12/19 | 42 | 6 | 30
[PATCH] Updated BSD Secure Levels Patch | Michael Halcrow | 2003/12/03 | 2004/01/10 | 39 | 2 | 2
[PATCH 3/7] SLIM main patch | Kylene Jo Hall | 2006/09/12 | 2006/10/20 | 39 | 3 | 8
[RFC] [Stacking v4 3/3] Cleaned up stacker patch | Serge E. Hallyn | 2004/12/03 | 2005/01/06 | 35 | 3 | 8
Linux Security "Module" Framework (Was: LSM conversion to static interface) | Simon Arlott | 2007/10/24 | 2007/11/26 | 34 | 26 | 89
Problem of attaching a security structer to sock in 2.6.4!! | Yuan Chunyang | 2004/05/17 | 2004/06/14 | 29 | 6 | 10
Average thread life

3.76 days
[RFC][PATCH 0/7] fireflier LSM for labeling sockets based on its creator (owner)
[RFC][PATCH 0/11] security:AppArmor - Overview
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AppArmor FAQ
Re: implement-file-posix-capabilities.patch
Re: Linux Security *Module* Framework (Was: LSM conversion to static interface)
### Popular threads 20

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<td>[RFC] Introduce generalized hooks for getting and setting inode seccctx</td>
<td>David P. Quigley</td>
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How crowded is the room?
Crowded threads
Crowded threads
how many people joined the party?

2.45 per thread on the average
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how many “no-children” threads?

470 (48%)

this includes SPAM messages
Time to determine “important” threads

• “How?” is the question

• My version of completely fair formula :-)
  
  • Give points to threads ranked 1-20 according to the rank (1st thread gets 20, 20th one gets 1)

  • Apply for 3 aspects (days/people/messages), so the perfect thread get 60 points
Example

<table>
<thead>
<tr>
<th>days</th>
<th>people</th>
<th>messages</th>
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<tr>
<td>8th</td>
<td>4th</td>
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<th>rank-days</th>
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<td>21 - 8 = 13</td>
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total point is $13 + 17 + 18 = 48$
Results

• LSM ml top 10 important threads are ...

Good, boy.
Show me the list.
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## LSM important threads 10

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- 4 LSM related (including 1 for Smack)
- 1 for TOMOYO
- 5 out of 10 belong to AppArmor
TOMOYO, AppArmor and Smack

2003-12

2007

2008-6

??
Close up (After 2007)
AppArmor, Smack and TOMOYO
which is which?

past

now

guess!
guess!
guess!
AppArmor, Smack and TOMOYO

which is which?

past

now
AppArmor, Smack and TOMOYO
which is which?

past

now

guess!
AppArmor, Smack and TOMOYO. Which is which?
AppArmor, Smack and TOMOYO
which is which?
Summary

• Numbers of messages passing by every day

• We always have a lot of things to do and it’s hard to stop by and think about the past

• I felt we were doing kind of waste and that was a major motivation of this attempt

• Despite of the amount time I spent, I don’t really think I found out something quite new ...

• There should be more wise way to extract valuable information from the past