IPv6 implementation in LTSI

Jun 3rd, 2016
Yuki Machida
Fujitsu Computer Technologies Limited
$ whoami

- Yuki Machida, Fujitsu Computer Technologies Ltd.
- Embedded Linux Developer

- In-House Embedded Linux Distributor of Fujitsu
- Our Distribution includes LTSI Kernel and is built with Yocto Project
- Our Distribution is used for
  - Server System Controller, Storage System, Network Equipment, Printer etc.
IPv6 stack has a lot of Changes

- Number of Changes of IPv6 Stack (-- net/ipv6)

<table>
<thead>
<tr>
<th>range</th>
<th>commit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.14 → 3.15</td>
<td>65</td>
</tr>
<tr>
<td>3.15 → 3.16</td>
<td>44</td>
</tr>
<tr>
<td>3.16 → 3.17</td>
<td>81</td>
</tr>
<tr>
<td>3.17 → 3.18</td>
<td>107</td>
</tr>
<tr>
<td>3.18 → 3.19</td>
<td>76</td>
</tr>
<tr>
<td>3.19 → 4.0</td>
<td>58</td>
</tr>
<tr>
<td>4.0 → 4.1</td>
<td>108</td>
</tr>
<tr>
<td>4.1 → 4.2</td>
<td>71</td>
</tr>
<tr>
<td>4.2 → 4.3</td>
<td>115</td>
</tr>
<tr>
<td>4.3 → 4.4</td>
<td>134</td>
</tr>
<tr>
<td>4.4 → 4.5</td>
<td>60</td>
</tr>
<tr>
<td>4.5 → 4.6</td>
<td>67</td>
</tr>
</tbody>
</table>
Updated specification of IPv6 was proposed

- RFC 2460 and RFC 6145 are updated for Security Issue.

- This Specification was further updated to version 6 (confirmed at Jun 3rd).

https://tools.ietf.org/id/draft-ietf-6man-deprecate-atomfrag-generation-00.txt
Supported updated spec, but Interoperability is lost

- A patch that support updated specification added at 3.19.

```
commit 9d289715eb5c252ae15bd547cb252ca547a3c4f2
Author: Hagen Paul Pfeifer <hagen@jauu.net>
Date:   Thu Jan 15 22:34:25 2015 +0100

ipv6: stop sending PTB packets for MTU < 1280

Reduce the attack vector and stop generating IPv6 Fragment Header for paths with an MTU smaller than the minimum required IPv6 MTU size (1280 byte) - called atomic fragments.

See IETF I-D "Deprecating the Generation of IPv6 Atomic Fragments" [1] for more information and how this "feature" can be misused.

```

- LTS-4.1 hasn’t complied RFC1981 (Path MTU Discovery for IPv6)
How to implement IPv6 Stack in LTSI

- **Best choice of LTSI is user can select one.**
  - To backported Implementation from Mainline.
  - To rollback to implementation of 3.18.

- **Second choice is**
  - To rollback to implementation of 3.18.
    - or
  - To continue to use implementation of 4.1.
shaping tomorrow with you