Design Rationale Extraction and Management

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Context & Problem

• Software development is a process that requires making several decisions.
• The logic behind these decisions, or the rationale represents very beneficial information.

• No end-to-end pipeline rationale extraction and management
• No representation that considers the historical evolution
• No generic/context-independent work
A motivating example

<table>
<thead>
<tr>
<th>Summary</th>
<th>Date</th>
<th>Description</th>
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<tbody>
<tr>
<td><code>oom</code>: give the dying task a higher priority</td>
<td>Aug 9 2010</td>
<td>Increase the dying task’s priority to the lowest real-time level such that it is scheduled sooner and can free its memory</td>
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<tr>
<td><code>memcg</code>: give current access to memory</td>
<td>Mar 23 2011</td>
<td>Within a <code>control group</code> of threads, increase the priority of a dying task,</td>
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<td>reserves if it’s trying to die</td>
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<td><code>oom-kill</code>: remove</td>
<td>Apr 14 2011</td>
<td>Threads with real-time priorities placed within the <code>cpu control group</code> could never run, causing the kernel to hang. The code from the previous two patches was therefore removed.</td>
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<td>boost_dying_task_prio()</td>
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<tr>
<td><code>mm, oom</code>: introduce oom reaper</td>
<td>Mar 25 2016</td>
<td>A kernel thread is used for recovering memory (reaping) from dying threads, to improve reliability(^a).</td>
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<td><code>mm</code>: introduce process_mrelease system call</td>
<td>Sep 2 2021</td>
<td>Introduce a mechanism such that a user process (such as the Android process manager) can request that the memory of a dying thread is reaped(^b).</td>
</tr>
</tbody>
</table>

\(^a\)See https://lwn.net/Articles/668126/.

\(^b\)See https://lwn.net/Articles/864184/.
The expected Result
Current challenges

• How to extract topics or concepts / a hierarchy of concepts ?
  • How to generate the topic's title?

• A context-independent/generic design decisions classifier ?
What's Next?

• Once we have the graph,
  • Consistency checking mechanism
  • A retrieval system
Help me make the next years of my life easier :) 

• These are initial steps for my PhD 

• Comments? 
• Ideas I could use ? 
• Critiques?