AWAKE’s PXI Status
System Overview
Current Status

Production
• Runs under windows
  • Ethernet driver requirement
• High CPU usage (due partially to Windows background services + updates)
• We need to rely on CTRp for the timing purposes
• Stability issue (can work for 4 days then suddenly crash)

In Development
• Linux RT
• Compatible with CERN and BE/CO infrastructure
• 50% reduction in CPU usage (~30%)
• Reduced RT Jitter
  • No need for the CTRp anymore
• Stable and deterministic
LINUX RT on PXI

Preliminary tests

All tests are made at 10 Hz, with an Image extraction at 1 Hz. Using the current Laser Room camera set up.

<table>
<thead>
<tr>
<th></th>
<th>Linux RT</th>
<th>Windows</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Usage [%]</td>
<td>~ 29%</td>
<td>70 - 95%</td>
</tr>
</tbody>
</table>
What’s next ?

• Short term solution: Move back to Pharlap
  ➢ no NAS at 10 Gbps (NI 8238 not compatible with this OS)
  ➢ Real-Time benefits

• Long term solution: Move to LINUX RT
  ➢ NAS at 10 Gbps
  ➢ NAS communication similar to 2 Linux machines (no overhead)
  ➢ Real-Time benefits

<table>
<thead>
<tr>
<th></th>
<th>Linux RT</th>
<th>Pharlap</th>
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<tbody>
<tr>
<td>Burst Mode*</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Real-Time</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

* Raw Images at 10 Hz streamed to the NAS, using the 10 Gbps card.
2020/21 Moving forward

- EN-SMM Support
- Camera burst mode
  - Requires Linux RT
  - NFS (NAS) storage
- Diagnostics tools?
- Connection management