



The case for moving to Debian stretch or Ubuntu 18.04

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13	This document provides the analysis and rationale for migrating to Debian as	
14	the projects upstream distribution. This change was completed in late-2018 and	
15	as such all releases since v2019 have been based on Debian.	

16 **Why was Apertis based on the Debian/Ubuntu**
17 **ecosystem**

18 At the beginning of Apertis, a few platforms were considered for the base of
19 Apertis: MeeGo, Tizen, OpenEmbedded Core, Debian and Ubuntu. A choice
20 of Debian/Ubuntu ecosystem was based on Debian being ‘one of the oldest and
21 largest (most inclusive of OSS packages), and one of the first Linux distribu-
22 tions to feature an ARM port’, providing ‘a very solid distribution baseline’
23 and ‘a high degree of robustness against the involvement or not of individual
24 contributing companies’, while Ubuntu bases on Debian but adds value impor-
25 tant for Apertis (see below). Another point against the other alternatives (e.g.
26 OpenEmbedded Core) was that Collabora and Bosch have already invested into
27 Open Build System infrastructure, while Yocto/OpenEmbedded has its own
28 build infrastructure and tools not compatible with OBS.

29 Another important point was that Collabora employed and continues to em-
30 ploy many Debian package maintainers, who contribute to key OSS middleware
31 packages within both the Debian and Ubuntu projects directly, which presented
32 a serious benefit over other alternatives.

33 Why was Ubuntu taken as the direct upstream 34 rather than Debian

35 When the decision to use Ubuntu was taken, Ubuntu had several benefits over
36 Debian. Especially taking into account the initial goal of having an update
37 cycle of around 6 month of the baseline platform.

38 Debian only releases once every 2 to 2.5 years, while Ubuntu does release every
39 6 months with every 4th of those being a long-term support release. This
40 means that the only way of doing a refresh every 6 months based directly on
41 Debian would mean creating a snapshots of Debian testing, stabilising that and
42 providing security support for it. Doing that purely for Apertis would of course
43 require a significant amount of resources, but more importantly, it is essentially
44 what Ubuntu is already doing. This made Ubuntu more suitable as a baseline
45 for a 6 month update cycle.

46 Furthermore, the Linaro initiative used Ubuntu as a reference distribution for
47 all of their validation of hardware enablement. Linaro and Canonical engineers
48 actively integrated the latest work from Linaro and SoC vendors, including
49 Freescale, into Ubuntu. By using Ubuntu as a base Apertis could benefit from
50 and build on this work.

51 At the time, Ubuntu was the *de facto* upstream of AppArmor, this included
52 patched kernels to enable latest features (D-Bus mediation, socket mediation,
53 ptrace mediation, etc.) as well as changes to individual packages to improve
54 their apparmor profiles.

55 What has changed

56 While doing two base platform refreshes every year has been successful, the
57 users of Apertis weren't actually set up to follow in such a fast cycle. On top
58 of that the non-LTS releases of Ubuntu limited their security support cycle
59 from 18 months after release to only 9 months after release. In other words the
60 upgrade window since the start of the Apertis project went from around one year
61 after a platform refresh to only *3 months* after each platform refresh before the
62 upstream security support end. Such a short time-frame is not achievable with
63 the required updates and validation that are required before a major product
64 rollout.

65 Due to the policy changes, it was decided to base the Apertis platform on LTS
66 versions rather than refreshing on each version, utilising the longer security
67 support period on these LTS releases. Apertis was last rebased onto the Ubuntu
68 16.04 LTS release (codenamed "Xenial Xerus").

69 Ubuntu and Linaro are no longer collaborating together as they were. Linaro
70 are now supporting various boards using a Debian based release, directly con-
71 tributing to Debian and no longer supporting Ubuntu.

72 The infrastructure required by Apparmor has matured to the point where the
73 features used by Apertis have been upstreamed and as such Apertis is no longer
74 tied to Ubuntu in this regard.

75 **Debian Stretch**

- 76 • Benefits
 - 77 – Debian is a community project, with no single company driving its
 - 78 development
 - 79 – Maintenance of components we rely on is not tied to Canonical’s
 - 80 commercial strategies
 - 81 – Security support for at least 5 years since the initial stretch release
 - 82 via the Debian LTS project
 - 83 – More direct contribution path for package changes done for Apertis
 - 84 since they can go directly into the main upstream distribution
 - 85 – Debian stable and security updates tend to be more conservative and
 - 86 stable making it easier to track over time
 - 87 – Debian provides a backports repository for packages where a version
 - 88 newer than that in the stable release might be of interest
- 89 • Risks
 - 90 – Debian does not use a strict 2-years release cycle. Thus the Apertis
 - 91 platform update cycle also cannot be strictly time-based when using
 - 92 Debian

93 **Ubuntu 18.04**

- 94 • Benefits
 - 95 – Ubuntu has a strict time-based release cycle of a new LTS every two
 - 96 years
 - 97 – Ubuntu also has a 6-months regular release cycle (with very limited
 - 98 support) should the decision to use LTS version be revised
- 99 • Risks
 - 100 – Ubuntu is bound to the health, technical and commercial strategy
 - 101 of Canonical. Canonical has shifted its focus several times in recent
 - 102 years which has resulted in numerous changes not aligned to the
 - 103 goals of Apertis. Canonical has also introduced their own technolo-
 - 104 gies rather than utilising ‘upstream’ technologies a number of times,
 - 105 for example Mir vs. Wayland and Snappy vs. Flatpak. Some of
 - 106 these choices have had an impact when utilising Ubuntu packages in
 - 107 Apertis, requiring extra work to be performed (e.g. disabling Mir).
 - 108 – Ubuntu’s stable releases can have more aggressive updates to certain
 - 109 packages, which can destabilise things for Apertis as well as requiring
 - 110 extra support effort
 - 111 – Ubuntu’s main support is around a subset of Debian packages avail-
 - 112 able in the Ubuntu’s *main* repository. A more complete set of pack-
 - 113 ages can be found in Ubuntu’s *Universe* repositories, however these

114 tend to get less attention, and basically only provide as much support
115 as Debian provides
116 – On-going support of Ubuntu depends on the commercial success of
117 Canonical

118 **Impact of move**

119 **Will the rebase process take longer if we move to Debian** 120 **instead of the next Ubuntu LTS release?**

121 When Apertis tracked non-LTS Ubuntu releases, rebases were performed every
122 six months following each release. Every rebase took about two months to
123 complete. As a part of a rebase procedure, the following tasks needed to be
124 completed:

- 125 • Fork Apertis in preparation of a new release
- 126 • Set up Merge-our-Misc to track the latest Ubuntu release
- 127 • Repeat until there are no build failures:
 - 128 – Accept automatic merges produced Merge-our-Misc
 - 129 – If there are no automatic merges, process pending manual merges
 - 130 – If new packages break the builds, fix them

131 Since Apertis no longer pulls changes from regular Ubuntu releases, it is quite
132 behind the future release which is set to be an LTS. The delta between Apertis
133 and the current Ubuntu is about the same size as between Apertis and Debian,
134 and will take similar time to process. Regardless of the decision to stay with
135 Ubuntu or move to Debian, the following work will need to be done:

- 136 • Switch to the latest versions of GCC and rebuild all packages with them
- 137 • Rebase all packages to their newer versions from either Ubuntu 18.03 or
138 Debian stretch, for each component
- 139 • Review Apertis changes to the packages updated upstream, potentially
140 dropping them if they are no longer relevant
- 141 • Switch to the latest Java version for the SDK, dropping Apertis patches
142 fixing build failures with the older Java version Apertis shipped

143 According to our estimation, the difference in the amount of time needed to
144 perform that work is going to be negligible.

145 **Ubuntu does validation, this would be missing if we move** 146 **to Debian?**

147 We understand that Ubuntu does some hardware validation testing of standard
148 Ubuntu configurations (which we do not use) against hardware from their part-
149 ners who pay for it (<https://certification.ubuntu.com/>). The vast majority of
150 the functionality that such tests will focus on are related to kernel functionality.
151 Since we do not for the most part use the Ubuntu kernel and target different

152 hardware, these tests do not seem relevant in our use case and thus we do not
153 lose anything by moving to Debian.

154 **Do we lose anything by moving to Debian?**

155 We believe that we do not lose anything other than the strict time-based release
156 cycle by moving from Ubuntu to Debian. However, we feel that this is now
157 less important given we are now syncing on just Ubuntu LTS releases (every 2
158 years), and with Debian release cycle tending to a 2 year release cycle this is
159 not believed to be problematic.

160 **Recommendations**

161 Collabora recommends rebasing on Debian Stretch for Apertis 18.06 and on-
162 wards. Most of the benefits of basing on Ubuntu have gone away since the
163 original decision was taken in late 2011, while the projects dynamics have also
164 changed to better suit a Debian based distribution. Basing on Debian rather
165 than Ubuntu, would move Apertis closer to it's ultimate upstream (as Ubuntu
166 is also a downstream of Debian) cutting out a middle-man, which currently
167 brings very little to the table as described above. This also may make the pro-
168 cess of upstreaming appropriate package changes more efficient, reducing the
169 maintenance overhead in Apertis.