

# Windows PV Driver - Case for Graduation

This document makes the case for graduation for the [Windows PV Driver project](#) (which became an incubation project in June 2014). The criteria follow those outlined in [xenproject.org/governance.html](#)

## Graduation Review

The review is initiated by the project lead and follows the rules outlined in "Requesting Reviews, Reviews and Voting". In essence the project lead makes a pitch to the community, why the project should graduate. A project must fulfil the following requirements before it can graduate:

- It follows the principles of openness, transparency and meritocracy
- It has delivered at least one functioning release of what it is aiming to deliver
- It has a public code line which shows active development and has mechanisms to accept patches (and a history of accepting patches)
- It has a public mailing list that is active (as we get more experience we will add some guidelines)
- It has a mechanism for users to raise bugs and for developers to work on bugs
- It has an active developer community (as we get more experience we will add some guidelines). But things to look for are number of maintainers, different organisations involved, number of users, etc.
- It has a project leadership team that resolves conflicts and participates in cross-project decision making
- It adheres to the Xen Project governance as outlined in this document, or documents areas where the sub-project differs

Other items to look at during the review (depending on project are):

- It has an up-to-date wiki and a core and group of people maintaining it
- It publishes regular builds and tests
- It promotes itself at events and on the blog

According to our governance, mature subprojects, must also document their development process. Projects can deviate from the default as outlined in [xenproject.org/governance.html](#), but needs to document deviations.

The following section highlights, how the Graduation Review is initiated:

## Requesting Reviews, Reviews and Voting

**Requesting Reviews:** Project Proposal and Graduation Reviews are requested by the (prospective) project lead of the project by contacting the community manager providing the necessary documentation. An archivation review can be requested by any maintainer of a mature project or by the Xen Project community manager. The community manager will then publish relevant material on the respective mailing lists.

This document is the outcome of the engagement between Paul Durrant (project lead) and Lars Kurth (community manager).

## Development Process and Deviations from the default

Roles are in line with the default: the project has maintainers as described in the MAINTAINERS file of each git repository.

The Project Leadership Team is made up of maintainers and committers with Paul Durrant the project lead and Ben Chalmers and Owen Smith being committers. The team follows the conventions - in particular those related to decision making - laid out in the governance document.

There is no security team, which is not a requirement.

The project follows a mailing list base review process, with DCO and a review-then-commit pattern: an example can be found [here](#).

In summary: the project completely follows, and has been doing so since inception, the conventions of the Hypervisor project, which are the default.

## Openness, Transparency, Meritocracy

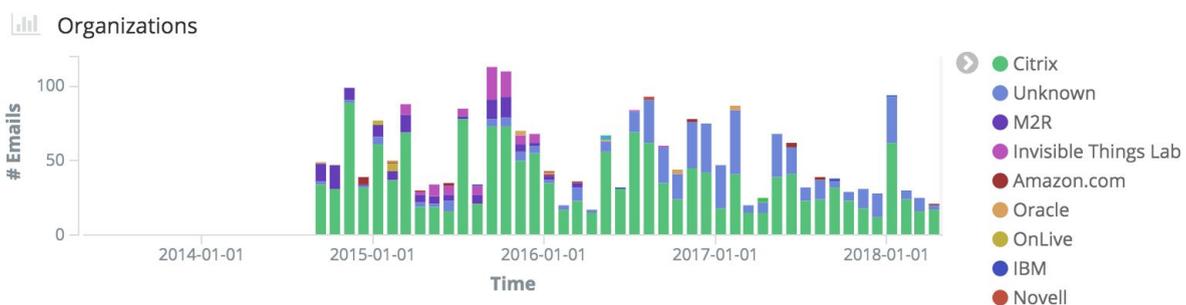
Development of drivers is done in the open. That is, patch series are sent to the mailing list for consideration before being applied to the code base. Subscription to the list is open to anyone and comments from all subscribers are considered. Project decisions and personnel decisions (such as nomination new maintainers) are made on the public mailing list.

## Codeline, Mailing Lists, Bugs

There are several git repositories which are accessible from [xenbits.xenproject.org/gitweb/?a=project\\_list;pf=pvdrivers/win](https://xenbits.xenproject.org/gitweb/?a=project_list;pf=pvdrivers/win)

<b>Project</b>	<b>Description</b>	<b>Owner</b>	<b>Last Change</b>
<a href="#">pvdrivers/win/tools.git</a>	Unnamed repository; edit this...	Paul Durrant	13 months ago
<a href="#">pvdrivers/win/xenbus.git</a>	Windows PV Bus Driver	Paul Durrant	12 days ago
<a href="#">pvdrivers/win/xencons.git</a>	Windows PV Console Driver	Paul Durrant	7 weeks ago
<a href="#">pvdrivers/win/xenhid.git</a>	Windows PV HID Device Driver	Paul Durrant	2 months ago
<a href="#">pvdrivers/win/xeniface.git</a>	Windows PV Interface Driver	Paul Durrant	12 days ago
<a href="#">pvdrivers/win/xennet.git</a>	Windows PV Network Device...	Paul Durrant	2 months ago
<a href="#">pvdrivers/win/xenvbd.git</a>	Windows PV Storage Host Adapte...	Paul Durrant	13 days ago
<a href="#">pvdrivers/win/xenvif.git</a>	Windows PV Network Class Driver	Paul Durrant	3 hours ago
<a href="#">pvdrivers/win/xenvkbd.git</a>	Windows PV Keyboard/Mouse...	Paul Durrant	2 months ago

Technical discussions happen on [win-pv-devel@](#) : below can a list of major participants can be found. Traffic on the list is stable, which given the maturity of the project, is expected.



Bugs are raised on [win-pv-devel@](#) (or sometimes on [xen-devel@](#) or [xen-users@](#)), and then addressed using the Hypervisor workflow.

## Build, Tests & Releases

Development builds of the Win PV Drivers are built by a Jenkins server when *new patches are pushed into the repo* and build output can be found at [xenbits.xen.org/pvdrivers/win/](#)

Development builds are not subject to automated test through OSSTEST. However Citrix runs regular and very comprehensive automated testing on the latest [xenbits.xen.org/pvdrivers/win/](#) stable branches (plus a small additional series of branding related patches). Citrix also logo certifies the drivers distributed with XenServer and is therefore motivated to make sure the source is maintained to a high standard such that logo testing can be performed at short notice.

Amazon also have experienced Windows driver developers and do extensive automated and manual tests on their own builds of the driver code. They have provided useful feedback as well as some patches to fix issues that they have discovered in testing.

The project has delivered [several releases](#):

8.1.0: Released 2016-07-25

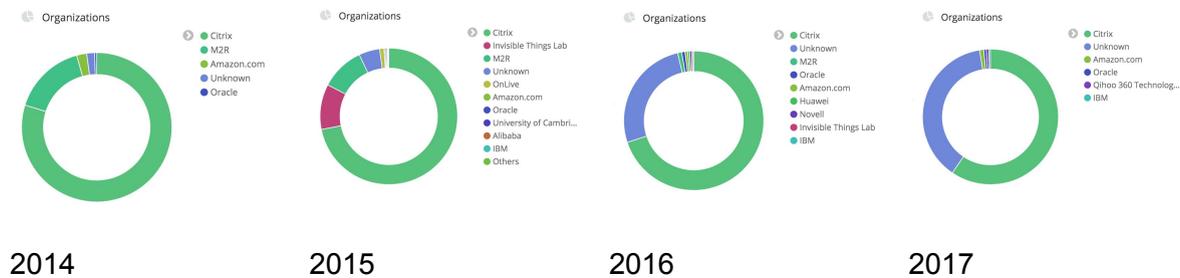
8.2.0: Released 2017-02-28

8.2.1: Released 2018-04-23

Releases follow the same approach as in the Hypervisor project, with stable branches in git repositories, release candidates and final releases. Releases follow approximately an annual cadence.

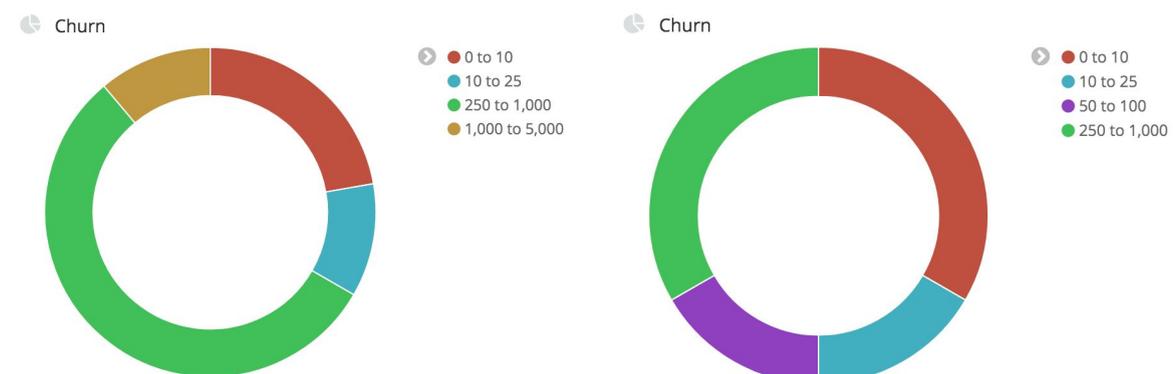
## User and Developer Communities

**User community** engagement on the mailing list has steadily increased since the creation of the project, as the graphs below show



In 2014 and 2015, traffic came from a few major vendors (who most likely adopted the drivers in their products which likely correlates to a spike of questions from specific vendors). From 2016 most questions have been driven by community members which we could not map to specific organizations. Interestingly, engagement with individuals (rather than organisations) has increased in parallel with the project delivering signed drivers. This indicates increasing adoption: unfortunately, we do not have usage confirmation by any organizations besides AWS, Citrix and Invisible Things Labs (Qubes OS) are using our drivers.

**Developer community** engagement has grown from 0% to 4% by vendors outside of Citrix, primarily submitting bug fixes. This is not surprising given the maturity and stability of these drivers, which does not create a high need to make contributions to upstream. The biggest contributions have come from ITL and AWS, as the diagram below shows.



ITL: change of around 6 K SLOK

AWS: change of around 1 K SLOK

## Events, Blogs

The team presents about new developments and blogs whenever there are major new developments: on average 1-2 per year.

## Summary/Recommendation

Assessment by Lars Kurth, Community Manager:

*Given the maturity of the drivers and thus limited need to fix issues or develop new features, I would recommend to graduate the project. The project has shown increased user engagement, adoption and delivered several releases which is consistent with a **mature project**. I have no objections on grounds of process adherence, values and developer community diversity and **propose to the project leadership teams of other mature projects to agree to graduate the Windows PV Driver subproject.***

**Recommendations:** *Given that **Windows PV Drivers** development today depends on 3rd party testing, I would like to recommend a public discussion whether some testing of **Windows PV Drivers** in OSSTEST is feasible and desirable.*