

ATMS GOING THE LINUX WAY

WHITE PAPER ON LINUX OS BASED ATMS FROM VORTEX ENGINEERING

Automated Teller Machines (ATMs), in more than fifty years of existence, have undergone numerous changes, which have helped in enriching the relationship between the banks and their customers. The ATMs which started out as cash dispensing machines have come a long way in disrupting the way customers interact with banks. Throughout the evolution of the ATM, one element which has undergone minimal change, is the operating system (OS). Since the demise of OS2, ATMs across the world have without exception run the MS Windows OS.

One of the biggest concerns with Windows OS has been the periodic version changes that occur, on an average, once in 3 years. Each such upgrade, also translates into additional costs in procurement of new software licences and frequently, expensive hardware upgrades/replacements to the ATM, due to the additional processing capacity required. In some cases, it also results in the bank having to replace ATM itself, as the high cost of the upgrade of an old ATM, makes it economically worthwhile to procure a new ATM.

The table 1.0 below lists the upgrades to the Windows OS over the last decade

OPERATING SYSTEM	END OF MAINSTREAM SUPPORT	END OF EXTENDED SUPPORT
WINDOWS XP - SP3	APRIL 14, 2009	APRIL 8, 2014
WINDOWS VISTA - SP2	APRIL 10, 2012	APRIL 11, 2017
WINDOWS 7 - SP1	JANUARY 13, 2015	JANUARY 14, 2020
WINDOWS 8 (8.1)	JANUARY 9, 2018	JANUARY 10, 2023
WIN 10 ENTERPRISE 2015 WIN 10 IoT ENTERPRISE 2015	OCTOBER 13, 2020	OCTOBER 14, 2025

Table - 1.0

With 3 million ATMs in operation globally and 10% of them coming up for upgrade or replacement (by a conservative estimate) every year, the magnitude of this task in terms of execution & funding for the banks who run these ATM networks cannot be underestimated. This cycle of periodic investments to upgrade ATM hardware & software has pushed the industry to explore & develop alternative options. These alternatives include Linux variants, Android etc.

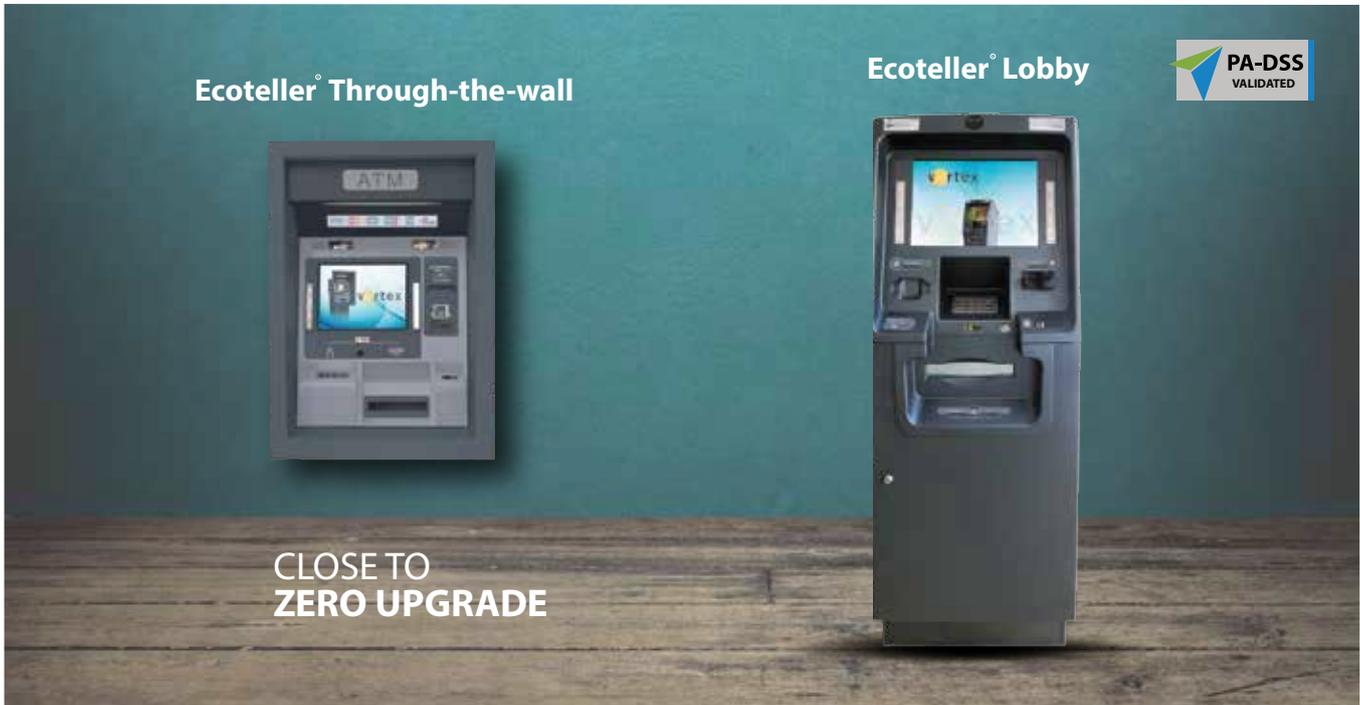
ALTERNATIVES TO WINDOWS BASED ATMS

One of the most viable alternatives is to use an ATM operating system based on Linux. Linux OS brings the following value proposition to the customers.

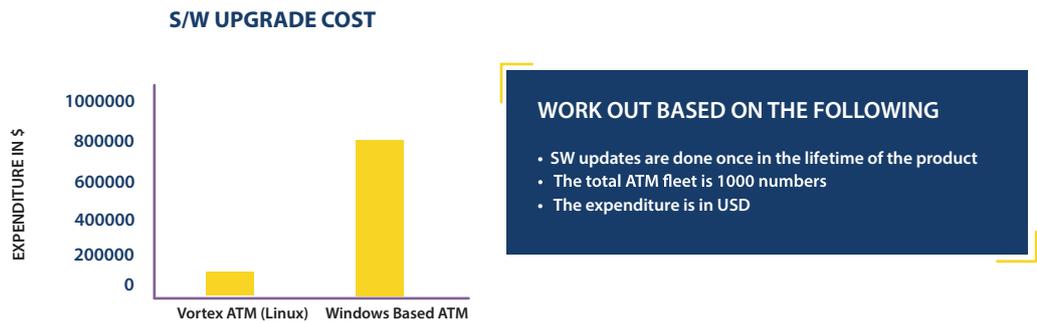
- Open source software supported by a vibrant community
- Close to zero upgradation cost, with no hardware upgradation needed
- Not resource intensive, resulting in very minimal specifications for CPU, RAM and HDD
- A thin client hardware with a minimal software stack opening up doors to cloud hosting
- Lower power consumption and thus minimal CO2 emission, contributing to a greener environment
- Hardened OS which is secure and reliable due to the inherently superior security model

LINUX OS BASED ATMS FROM VORTEX

Vortex Engineering has successfully developed and deployed ATMs that operate with Linux OS. Low power consuming Ecoteller series of ATMs from Vortex run on SWAVE Terminal application software, which has been developed based on Linux OS. Vortex has developed SWAVE based on Linux Debian distribution. Debian's versatile package list offers a comprehensive support to the ATM's application, security and hardware interface requirements. Vortex has used a trimmed down version of Debian requiring only the Linux Kernel with a minimalist set of applications and system services. Because of this, Vortex Ecoteller ATMs are able to operate with a minimum processor specification, contributing to a well optimized specification for the ATM CPU and RAM, with no compromise on the functionality requirements. This also contributes to lower power consumption. Vortex SWAVE is based on Debian official distribution, which is "Free Software" and supported by a vibrant open source community.



Debian upgrades are mainly focused on improving the security and performance. Every main release for Debian, which is usually once in 2 to 3 years, has an extended support period of 5 years. These upgrades do not require any hardware change, resulting in close to zero upgradation costs. The Chart given below represents the difference in the upgrade costs between Linux OS based Vortex ATMs and ATMs based on Windows OS.



The SWAVE terminal application software is equipped with robust security features, which offer a comprehensive security to the ATM terminal against a host of cyberattacks. SWAVE is a hardened application that runs on Debian OS and is equipped with a host of security features like User/Application/Hardware access control, Transport Layer Security, Whitelisting, Host pairing and Hard Disk Encryption. The security updates are more comprehensive and is swiftly done, which helps in defending the ATMs against the various malware attacks.

Vortex SWAVE Terminal application software is PA-DSS 3.2 validated and currently runs over Debian 8. The SWAVE kernel is EMV level 2 certified by EMVCo. Along with the PA-DSS validated and EMV certified application, Ecoteller series of ATMs are packaged with robust terminal security solutions that provide a comprehensive security against the logical attacks that are directed towards the ATMs.

Equipped with a fully secure Linux based OS and a low power consuming ATM architecture, Ecoteller series of ATMs are helping the banks reach out to their customers in a more safe, secure and economical way. Vortex has deployed over 7000 ATMs globally, which run on the Linux OS based SWAVE terminal application. This is a testament to the fact that the industry has accepted Linux based ATMs and shows the trust the banks and the partners have in the Ecoteller series of ATMs.