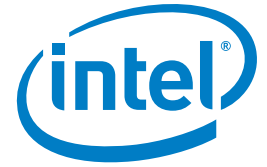


## CASE STUDY

Intel® Solid State Drives  
Enterprise Client/Mobility



# A Drive for Future Success

## Atos Origin pilot proves that Intel® Solid State Drives are more than a flash in the pan

Atos Origin is a leading international information technology (IT) services company, providing hi-tech transactional services, consulting, systems integration and managed operations to deliver business outcomes globally. The company's annual revenues are EUR 5.5 billion and it employs 50,000 people. Key to its continued success is the testing and adoption of new technologies that will benefit the company's clients. Consequently, it teamed up with Intel to test Intel® Solid State Drives (Intel® SSD) for laptop users, one of the first enterprise studies of this technology in Europe, the Middle East, and Asia.



CONSULTING > SOLUTIONS > OUTSOURCING

"Typically, when a computer comes to the end its life, in approximately three years, we dispose of it. But with Intel® SSDs, we discovered that potentially we can actually extend the life of the computer."

James McMahon,  
Product Manager, Adaptive Workplace,  
Atos Origin

### CHALLENGES

- **Value of Solid State Drives.** Atos Origin wanted to assess whether SSDs were more than a nice-to-have technology.
- **Quantifiable data.** The company wanted to establish both total cost of ownership and return on investment for SSDs.
- **Comparative assessment.** Atos Origin aimed to measure SSDs against traditional hard disk drives (HDDs).

### SOLUTIONS

- **Three-month pilot.** The company launched a three-month pilot with laptops using Intel X25-M 80GB High-Performance Solid-State Drive.
- **Evaluated against traditional HDDs.** The pilot measured the performance of Intel SSDs against existing Atos Origin laptops that used HDDs.
- **User groups.** Eight Intel SSD laptops were used, four for general office users and four for technical users.

### IMPACT

- **Re-image savings.** Tests showed Atos Origin could save up to 540 unproductive user and engineering hours each year that were currently spent re-imaging computers.
- **Fewer disk crashes.** The number of disk crashes each year could be reduced by a factor of three.
- **Huge savings.** The company could save at least 2,000 unproductive hours from fewer disk crashes and related economic benefits.

### Testing technology

SSDs are rapidly emerging as a new technology with the potential to change both client and data centre storage in the coming years. Because SSDs contain no moving parts, they are often cited as more reliable than traditional magnetic media drives, for example, spinning hard disk drives (HDDs). SSD proponents claim the risk of mechanical failure is near zero. They enable cost reductions and productivity increases while improving overall system responsiveness. They also consume much less power than a traditional HDD, translating into a cooler, quieter platform.

Atos Origin wanted to evaluate whether SSDs were more than a nice-to-have technology and whether they really did offer cost and productivity benefits, especially in an economic climate characterised by budgetary constraints. While it's not widely known, Intel® is a leader in developing SSD drives, producing them for servers, storage, workstations, laptops and desktop PCs. In fact, the development of memory products has been an a little known aspect of Intel's history and it has a valued pedigree in developing memory technologies. For example, a year after the company was founded in 1968, it launched its first successful product, the 3101 Schottky bipolar random access memory (RAM).

## A minimum saving of 2,000 unproductive hours a year

“We also discovered that Intel® SSDs are actually a lot greener than HDDs. They consume less energy, extend battery life and are generally more efficient.”

James McMahon,  
Product Manager, Adaptive Workplace,  
Atos Origin

“It’s clear to us that high-performing Intel X-25-M SSDs offer a viable, cost-effective alternative to traditional spinning HDDs. They provide better performance, extended battery life, greater reliability as well as reducing technical support costs.”

Mike Smith,  
Chief Technology Officer,  
Managed Operations,  
Atos Origin UK.

### Partnering with Intel

Atos Origin teamed up with Intel to run a pilot that would establish the efficacy of SSDs. Eight laptops were fitted with Intel® X25-M 80GB High-Performance Solid-State Drives (Intel® X-25-M SSD). Four laptops were given to technical users within Atos Origin and four to people who mainly used office applications. There were two main usage scenarios: would SSDs help deliver a better end-user experience in terms of battery life and performance? Could an SSD extend the use of a two-to-three-year-old laptop?

The laptops with Intel X-25-M SSDs were measured against Dell D620\* laptops that were approximately two years old, powered by Intel® Centrino® Core™2 Duo processor T7200 with 100GB 7200 RPM HDDs and 2GB of memory. Both sets of laptops were running the Microsoft Windows\* 7 operating system.

### Three-month pilot

The pilot ran for three months and Atos Origin, to meet its two overarching objectives, also wanted to determine total cost of ownership (TCO) and return on investment (ROI) for Intel® X-25-M SSDs by measuring cost savings and productivity gains. This included establishing success and reliability rates, the percentage of on-site calls for HDD failures, whether it’s greener to swap out an HDD for an Intel X-25-M SSD instead of replacing a PC, and whether the risk mitigation of data loss was enough of a driver to adopt Intel X-25-M SSDs.

The company believed it could establish possible cost reductions by reducing disk failures as the age of an HDD increases which in turn could lead to fewer disk-related issues and helpdesk calls. The company chalked out areas of potential productivity gains such as the time saved from reimaging a PC, reduced

start-up and shutdown times, increased battery life for mobile users, and improvements in searching for data stored on disk. It also wanted to consider whether there would be improvements from scanning disks and whether there would be fewer disk crashes and how this would translate into the cost of a disk crash when data is backed up and when data is lost.

The pilot revealed a range of benefits from Intel® X-25-M SSD use in laptops, for both users and IT departments. The most prominent were:

- An increase in battery life of between 55 to 65 minutes compared to an HDD
  - Thirty per cent reduction in start-up and shutdown times including hibernation
  - A 14x increase in random read/write disk activity, resulting in a 10 to 20 per cent improvement in overall PC performance. This also led to a 5 to 10x increase in activities such as data search in Windows or within a PST\* file via Microsoft Windows\* 2007
  - These improvements were evident on both Windows\* XP SP3 and Windows\* 7 RTM
- Similarly, Atos Origin noted a range of benefits for the IT department:
- A 30 per cent reduction in the time to reimage a PC compared with a HDD drive time of between 65 minutes to 45 minutes, using network distribution in both cases
  - Better reliability resulting in reduced user downtime, fewer support calls and fewer drive replacements
  - Faster installation of operating systems and applications, and faster end user data restoration
  - Increased battery life resulting in fewer replacements

## Better all round

In an average year, Atos Origin manages 5,850 devices internally, within the UK. The average device is 2.4 years old; the number of PCs reimaged in a year is 1,800; and the number of HDDs replaced each year is 200.

Using these annual averages, Atos Origin calculated that by using Intel® X-25-M SSDs it could save 540 unproductive hours per year for both computer user and engineers.

The company also calculated that an HDD crash cost the user a loss of 15 productive hours depending on circumstances, location and the data volume that is saved. Over a year, this equated to the loss of 2,000 to 3,000 productive hours each year. As a rider, however, if data is lost or failure happens at critical time, this figure could be significantly increased and difficult to fully quantify. For example, a doctor in a surgery could experience enormous difficulties if a computer HDD crashed, with the loss of prescription information, patient notes and drug directories. And these events do happen.

## Economic gains, time savings

Based on mean time between failures (MTBF) values of HDDs, that is the average time an HDD functions before failing, and the age of a HDD, Atos Origin estimated that by using Intel® X-25-M SSDs it could reduce the number of disk crashes each year by three times. In real-terms this could result in a minimum saving of 2,000 unproductive hours per year.

In summary, Atos Origin's pilot established:

- Significant productivity gains that offset the higher price of Intel X-25-M SSDs through reducing memory upgrade, replacement batteries, and overall power consumption
- Better system performance
- Improved battery life and reduced power consumption for laptops
- Potentially better reliability
- Decreased support costs and support time
- Reduced time for installing operating systems and applications
- Faster time to encrypt hard drives with full disk encryption solutions
- Eliminates the need for disk defragmentation software

The overall conclusion was that Intel X-25-M SSDs would bring significant operational and cost benefits for both Atos Origin and end users. However, a couple of significant issues also emerged during the pilot.

It was noted that some encryption products are not yet optimised to run on Intel X-25-M SSDs, diluting some of the benefits of the test. However, James McMahon, product manager, Adaptive Workplace, Atos Origin, said: "We estimate that as the market catches up with the benefits of Intel X-25-M SSDs, encryption products will naturally be developed to ensure optimal performance on this technology."

Another benefit is the Intel X-25-M SSDs are designed for long life. Intel has incorporated wear-leveling algorithms into the technology which essentially means that typical life-span is measured in hundreds of years. While clearly not meant to be used for this length of time, this design element does illustrate the robustness of this technology.

## Spotlight on Atos Origin

Atos Origin is a leading international information technology (IT) services company. It is also the Worldwide Information Technology Partner for the Olympic Games and has a client base of international companies across all sectors. Atos Origin is quoted on the Paris Eurolist Market and trades as Atos Origin, Atos Worldline and Atos Consulting. Its 'Adaptive Workplace' is an Atos Origin strategic offering and provides a full range of modular and flexible desk-top and end-user support services. These services allow the end user to work anywhere, anyplace, and at any-time and has already been successfully deployed at many clients worldwide enabling them to achieve cost reductions up to 40% on workplace management costs. Atos Origin currently manages more than 700,000 desktops and 20,000 servers".

[www.atosorigin.com/aws](http://www.atosorigin.com/aws)

"Intel® SSDs provide a significant decrease in support costs. They require less time to encrypt and potentially have a far longer life than HDDs."

James McMahon,  
Product Manager, Adaptive Workplace,  
Atos Origin

## OEM pricing

Another large issue was the cost of Intel® X-25-M SSDs. McMahon adds: "It's clear that some OEMs have understandably taken quite an aggressive stance with the price of SSDs because it is a new technology. In some cases they are three times as high as standard HDDs."

Even with SSD's double the price of HDDs, it's sometimes cheaper to buy a standard PC with an HDD and an additional Intel X-25-M SSD separately. However, that said the cost of data migration from a HDD to an Intel X-25-M SSD needs to be factored in to cost analysis and it's also likely that the market will naturally correct current pricing disparities.

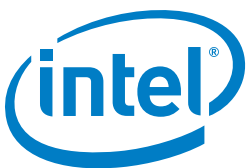
But McMahon points out: "The pilot using Intel X-25-M SSDs proved beyond any doubt that they are not only a valuable technology, but they also bring significant cost benefits. They potentially have a longer life and can extend the life of a traditional laptop by at least a year.

They last longer than HDDs, between two and three times. For example, a traditional SATA HDD has a life span of 0.5 million hours<sup>1</sup> yet Intel X-25-M SSD has an average life span of 1.2 million hours. This has all sorts of positive economic implications and we expect that it's only a question of time before Intel X-25-M SSDs are widely adopted in the industry."

Mike Smith, Chief Technology Officer, Managed Operations, Atos Origin UK, summarises: "It's clear to us that high-performing Intel X-25-M SSDs offer a viable, cost-effective alternative to traditional spinning HDDs. They provide better performance, extended battery life, greater reliability as well as reducing technical support costs. From an end-user point of view, the risk of losing data due to disk failure is vastly reduced which is very significant in itself. Equally importantly, they enable the extension of a computer by at least a year. In fact, other than the current OEM price range, it's difficult to fault them, and we actually expect cost to come down as the market corrects the prices."

<sup>1</sup> - Disk failures in the real world: What does an MTTF of 1,000,000 hours mean to you? Bianca Schroeder and Garth A. Gibson, Computer Science Department, Carnegie Mellon University. The paper points out that MTTF specified on datasheets ranges from 1,000,000 to 1,500,000 hours suggesting a nominal annual failure rate of at most 0.88%. However, in the field it discovered that annual disk replacement rates typically exceed 1% with 2-4% common and up to 13% observed on some systems.

Find a solution that is right for your organisation. Contact your Intel representative or visit the Reference Room at [www.intel.com/references](http://www.intel.com/references).



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