Clearing the Cloud

Best of Open Systems and Cloud for hotel business optimisation

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Foreword

Open Source Software has been around for decades. Despite early scepticism, particularly from some corporate technologists, today Open Systems are making significant inroads into enterprises. It's nothing short of a revolution in the IT industry. And it is a revolution that almost every major business will need to embrace, at least to some degree, over the medium term.

Open Systems are a key part of the relationship between proprietary systems and full public cloud and in some cases, part of the journey towards full cloud computing.

This paper will describe Open Source Software and Amadeus' approach which uses open systems to offer its customers the benefits of cloud computing without any of the associated risks such as a lack of audit and compliance traceability whilst Amadeus' Erding data centre is designed to minimise the risks to critical guest services essential to the lifeblood of the hotel.

The paper derives much of its content from the recently launched, *Open for business*, a report authored by Professor Jim Norton and sponsored by Amadeus but ***Clearing the Cloud*** looks specifically at Open Source Software and its role in delivering the benefits of cloud computing without the risk in the context of the hotelier.

Clearing the Cloud; *Best of Open Systems and Cloud for hotel business optimisation* will examine the very specific IT challenges to hoteliers and the suitability of Open Source Software to meet those challenges focusing in on the benefits of innovation, cost-efficiency, security and the ability to scale and respond quickly. There are other benefits to the IT provider that trickles down to the customer too, such as lower total cost of ownership, the ability to attract highly skilled and talented staff, quicker access to new technology developments and access to a global community for quick problem resolution. These are not to be overlooked.

Whether you are a hotelier battling with unwieldy legacy systems, trying to reduce costs across your IT systems or looking for that something extra to gain competitive advantage, this paper illustrates how Open Systems can enable you to get the best from your business.

We hope you will find the paper interesting and will feel empowered to open your business.

Jeff Edwards,
Head of Global Hotel Business
Amadeus IT Group

Introduction

Cloud computing and virtualisation are two of the most talked about technology trends today but the lessor discussed shift towards open source software also deserves its time in the spotlight as it has made the aforementioned developments possible.

"**Open Systems**" refers to a class of systems which are built using Open Source Software (OSS) standards and that offer a good level of portability and independence from the hardware platforms on which they operate as opposed to closed and proprietary mainframe systems, often referred to as 'legacy systems'.

The concept of Open Systems dates back to the late 1960s and early 1970s, as the first steps were taken to link computer systems together across communications networks. Networking developments took place in the defence / academic world which led to what we call the internet today and the public telecommunications operator world. Open Systems Interconnection (OSI) reference model was later created because both worlds used different protocols.

Once open solutions were available for networking, attention turned to the attached computer systems. The question now was could the software, both operating system and applications, be made more independent of the particular hardware platform or vendor used? This led to the development of Unix, the most widely recognised precursor of today's open operating systems, namely Linux.

The question of whether an operating system is open or closed is not straightforward. The reality is that most practical implementations lie somewhere on the spectrum between these two extremes. Many current systems draw on the Unix/Linux legacy whilst arguably now being closed. Examples include the Apple operating systems OSX and iOS, Oracle Solaris and Blackberry BBX. Others build in their own proprietary additions for example IBM's AIX and HP's UX. Still others remain very largely open such as Google's Android.

"**Virtualisation**" is again a development first introduced in the 1970s. A single mainframe computer could run many separate instances of the same operating system at the same time under the control of a "hypervisor" which has generated major benefits with single machines supporting multiple virtual servers. Further to virtualisation, the final step to create "**cloud computing**" was the development of the technique known as "orchestration". This allows many virtual machines to be managed across a range of physical hardware. As load increases for a particular application, further virtual machines can be started automatically and, if necessary further physical systems assigned to support these in-demand virtual machines and applications.

As long as the predictions for the growth of cloud computing remain, the topic will continue to be one of the most popular trends discussed and debated but it will still be the developments in Open Source Software that drive this technology and its consequential growth.

Amadeus' approach to Open Systems and Cloud

As the use of open operating systems and applications has matured, they have increasingly been applied in business critical applications.

They are at the heart of almost all web based e-commerce and social networking systems. They are being adopted in the most demanding transaction processing environments, such as that provided by Amadeus IT Group, the largest transaction processor in the travel industry. Such applications were previously the exclusive reserve of very highly specialised mainframe-based systems.

Amadeus has always taken a progressive approach, wanting to offer the benefits but not the risk of cloud. The decision, at the beginning, to base Amadeus' architecture on a community system shared by airlines and travel agencies continues to make the difference today.

Amadeus' Open Systems are like LEGO bricks. They provide the ability to easily build and reshape solutions to meet changing traveller needs. Amadeus has pioneered the use of these Open Systems across its business for this purpose and runs multi-tenant applications connected to hundreds of thousands of terminals in 195 countries which provide evermore powerful functional solutions in a shorter timeframe, as you would expect of a cloud computing approach.

Amadeus has always used the latest technology to build its Global Distribution System (GDS) and IT solutions for airlines and hotels, encouraging the use of standards. It has always continued to invest to retain cutting edge technology, which boasts the following attributes:

Today, 96% of Amadeus technology operates on the latest Open Systems technologies, and Amadeus is on target to operate completely on open systems far ahead of its competition.

(Source: Amadeus, 2012)

- **High performance IT infrastructure** based on commodity hardware to host application servers and databases, based on Linux. Very limited and decreasing usage of Transaction Processing Facility (TPF) system.
- **Open standards**. Widely supported and consensus-based standards for its key interfaces with the external world. Amadeus is a strong supporter and contributor of OpenTravel as an example.
- **Modern architecture**. Efficient and modular Service Oriented Architecture system to leverage and re-use Amadeus components across applications; easy to change and scale out.
- **Modern languages**. C++ or Java; easy to maintain.
- **Modern network**. Backbone of optical fibre; secured IP protocols.

Amadeus is unique in that it owns both the software and the infrastructure that powers its solutions. No other provider can boast this. It gives Amadeus much more control over security and resilience; benefits which it can pass on to customers.

Amadeus Hotel Platform is an excellent example of a platform conceived from an Open Systems approach and developed with the proliferation of cloud computing in mind. The platform is a centralized hotel management solution built around one comprehensive database. Available as a Software-as-a-Service (SaaS) model, it combines central reservation system, above-property management solution, call centre, distribution to any channel, e-commerce, m-commerce and business intelligence into one fully integrated platform. It can also interface with Amadeus' Revenue Management solution or any other third party application.

Amadeus' Data Centre – at the heart of business success

From a business standpoint, one of the main perceived risks to outsourcing is a network outage, which is not something hotels can risk as business critical guest service systems are the lifeblood of hotel operations.

Amadeus' Erding Data Centre is designed to minimise the risk of failure with:

- multiple independent data centres and server rooms within the same complex
- back-up generators that have three days of diesel supply in the event of a power outage
- four separate major telecoms links from multiple suppliers to prevent network failure
- two separate fibre channels, provided by two distinct providers and travelling over two physically separate routes
- server and network architecture designed to ensure there is no single point of failure
- a water well to provide cooling means in permanence
- multiple firewalls at every level, plus the latest security patches and virus protection

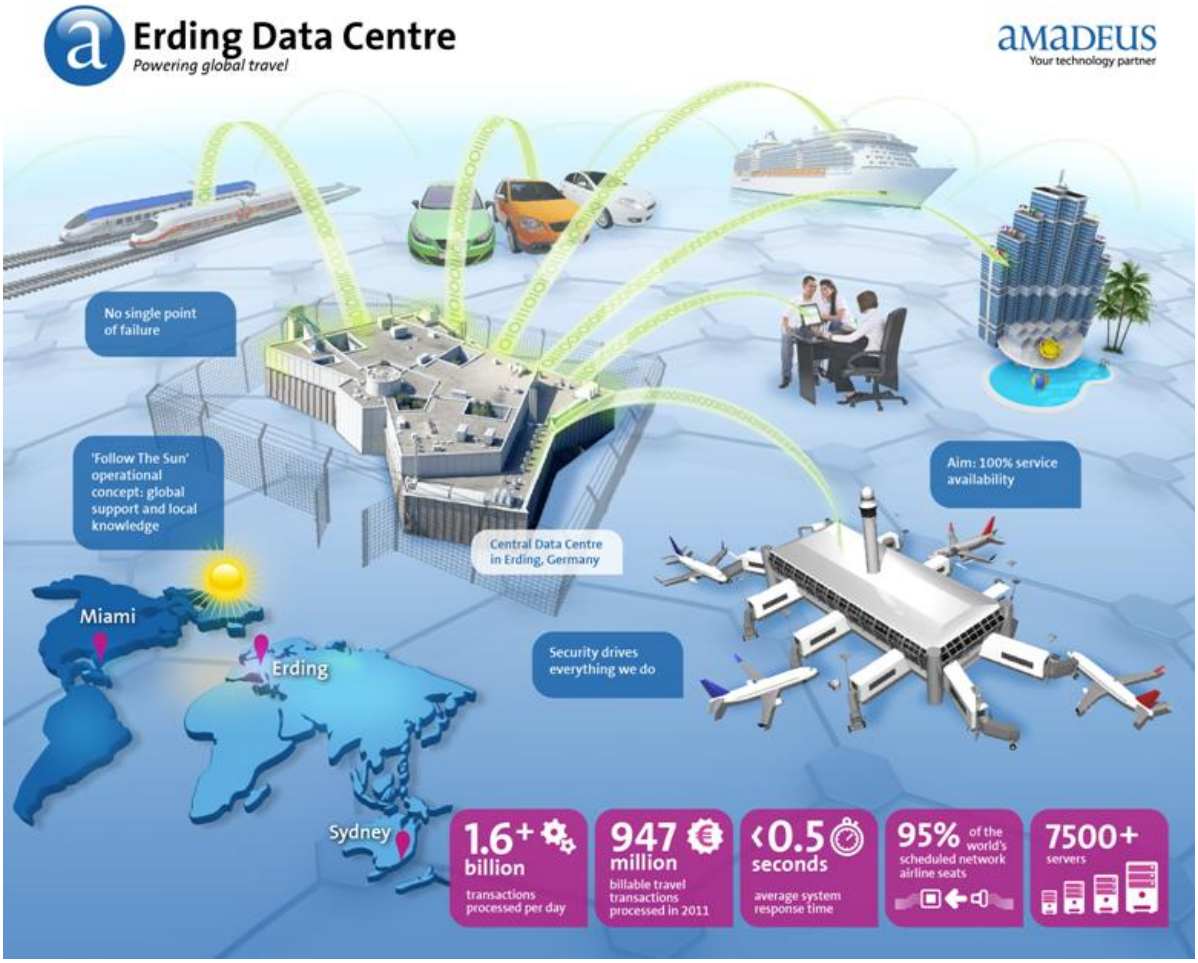
Amadeus' Data Centre in Erding is one of the largest civil Data Centres in the world and boasts 5 petabytes of storage (1 petabyte is equal to 1 million gigabytes).

To put that into context, if you shoot 100 photos a day for 80 years at 5 Mb per photo, you'd still have 985,000 gigabytes free.

(Source: Amadeus, 2011)

In the unlikely event that the main Data Centre in Erding is unavailable due to a major disaster, Amadeus also maintains a separate disaster recovery site over 40 kilometres away.

Finally, Amadeus' Erding Data Centre meets the internationally recognised generic information security standard - ISO 17799, has been awarded ISO 9001:2000 and has been awarded the prestigious "Energy-efficient Enterprise" certification by TÜV Süd in September 2010.



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Clearing the Cloud: how the fast-paced hotel industry can benefit

Today's hotelier is dealing with legacy systems, ever increasing demands from their customers and prospective customers at both their physical and online sites as well as managing business expansion, often involving overseas sites. Like in any business, technology has a profound effect on the bottom line as the gateway for booking and the internal system for revenue management, central reservations and more. Thus, hoteliers require a robust system and an IT provider who understands both that system and the hotelier's business. This section will describe the benefits of an Open Systems approach through the lens of **innovation, cost-efficiency, security, scalability** and **responsiveness** in the hotel industry.

Today's focus on customer engagement and the influence of burgeoning social networks places huge demands on immediacy of response. The hotel industry experiences large changes in demand driven by more savvy guests who have access to much more information online than previously. Fast business growth and seasonal spikes in the sector further adds to demand levels. Access to a wide range of cost-effective development tools, the ability to scale rapidly and access to a global community of shared knowledge, all benefits of an open approach, can help the hotelier meet these demands.

Business organisations use a plethora of current and legacy systems all at different stages of their lifecycle and this has never been more true than in the case of the hotelier. Many hotel chains operate through legacy systems that offer rich, but outdated and rigid, functionality and stable operating environments but they are also unwieldy, have high overheads, and are difficult to modernise. Hotel technologies are also fragmented, with hoteliers often having to utilize separate systems for different functions. For example, properties may have to manually manipulate multiple inventory systems and databases with little integration between the systems. The ability, through Open Systems, to draw on a very extensive range of standards and interfaces shared and developed over 20 years can be a key differentiator.

Innovation without the R&D budget

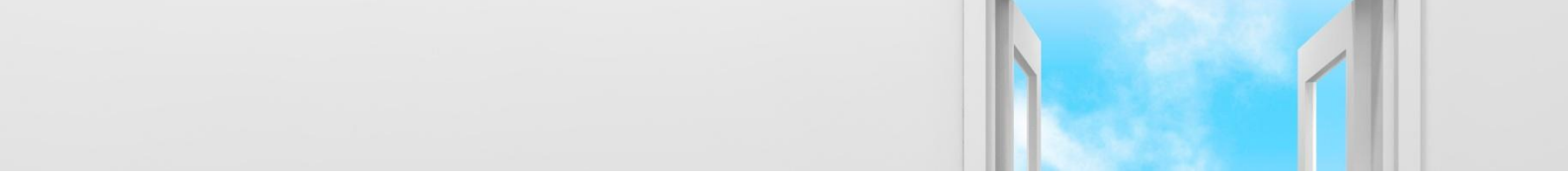
A generation has now grown up with the internet and open source. They want to work with these systems and tools rather than the closed and proprietary approaches that are frequently seen as more limiting. As per "Moore's Law", developments in software and systems are prolific and it is only the open source community, with its millions of software architects, analysts, designers and programmers, that offers the rapid access required to both keep up and take advantage.

The combination of Open Source Software, Open Systems interoperability and open standards has created a self-reinforcing community of shared research and development and a pooling of creative ideas. This leads to a stream of innovative applications for test and development, with those showing promise quickly adopted. By embracing an Open Systems approach, hoteliers are able to join this community and take advantage of the benefits.

Hoteliers, with chains operating 24/7 across continents, cultures and time zones, require technology that can efficiently reach consumers directly, is constantly evolving with the trends, integrated, scalable, cost-efficient and hides complexity. Open Systems allows Amadeus to offer this whilst tailoring the technology to hoteliers' specific needs which in turn allows the hotelier to focus on their growth strategies.

IT: a never-ending and costly battle for hoteliers

For hoteliers, there are always decisions to be made and all with a price tag: how and when to install, download or upgrade? Any one of these takes time, resource and money, whether paying someone to go around to each unit and install new software, wasting bandwidth when downloading one of the seemingly endless updates to programs and operating systems, replacing entire batches of hardware or halting operations. Not only does this have an immediate cost on operations, but it also severely impacts the time-to-market of new business functions.



With Open Source Software, the battle can be won. Open Source Software is generally free to obtain rather than being subject to the licence fee normally charged for access to proprietary software. With virtualised Open Systems, hoteliers can benefit from Infrastructure-as-a-service (IaaS) ultimately, like turning the tap on or flicking a switch, this means you can pay only for what you use. There are no installs, downloads or upgrades. A change to the centrally delivered system is online instantly, for everyone in the network. The system is constantly enhanced without the hotelier having to lift a finger, whether the hotel is in Asia or South America.

The combination of virtualised Open Systems plus sophisticated orchestration leads to the concept of purchasing computing capability as a utility – i.e. cloud computing. This model allows hotel groups, and all businesses, to move from a capital expenditure (CAPEX) model, in which you buy the full system from end-to-end, to an operational model (OPEX) providing access to the latest systems without the upfront expenditure.

Open is as secure as closed

People have perceived that open source could be less secure than closed source. There remains no broad agreement in computer security circles as to whether open visibility of source code contributes to, or detracts from, system security. Access to the code is clearly helpful to an attacker, but in the same way extensive public review and correction of the code can minimise the avenues for attack and offer more rapid identification and blocking of successful attacks.

Trust in “security by obscurity” though does seem misplaced in the proprietary world, as the code is not obscure to insiders. Furthermore, full visibility of code helps to ensure that no “backdoors” or surprises are hidden away.

In Amadeus’ latest report authored by Jim Norton, he believes that on balance Open Systems are by no means less secure than closed proprietary systems.

It’s an ever-changing world: hoteliers must be able to scale, and quickly

Open Systems and Amadeus architects’ knowhow inherently allow for scalability and this is crucial for delivering service to all relevant channels to the modern hotelier, in particular internet traffic which can vary wildly. The ‘look-to-book’ ratio is increasing exponentially for the industry as travellers search for hotel products online, often from various travel sites, looking for the right combination of services and price.

This places great strain on the hotel chain’s technology infrastructure and it can be felt even more when there’s a live promotion.

Your hotel chain is distributed on a new successful channel. Traffic to your system increases 100-fold.

Did your IT department know about the new channel going live?
Are they able to cope with the demand to your online services?
What online experience is your prospective guest having?
Will they try again later if they can’t book now?
Will they question your credibility and choose somewhere more robust?
What will your distribution partner think?
How will your competitors react?
Can you add up the total cost to your business, real and potential?

Open Systems accommodates such peaks and troughs by making resources available as needed. System can expand and contract, without creaking or cracking and there is no longer the need to buy extra hardware, upgrade software or hire new people. Open Systems allows the hotelier to respond quickly and scale up or down, as appropriate.

Conclusion

This paper has explained the background and the technology behind an Open Systems approach and the best of cloud, described Amadeus' heritage in this area and identified the key benefits to the hotel industry. At Amadeus, we believe that Open Source Software has the power to foster greater innovation, support increased agility to industry and consumer shifts and reduce costs in the travel sector. Furthermore, we believe it's not just a technology issue but a business one and that it's the right approach for a hotelier who is looking to:

- gain increased competitive advantage by delivering new products and services to market quickly
- compete more effectively with online brands by harnessing new online initiatives around search and shopping
- benefit from the collective power of the developer community whilst allowing them the means to scale quickly
- reduce costs associated with closed proprietary systems in terms of maintenance and licence fees by up to 20 per cent

At Amadeus, we're advanced on our journey to implementing an open architecture across our business and *Amadeus Hotel Platform* is just one example of it, benefiting the hotel industry. Amadeus invests heavily in Research and Development (R&D), totalling over €340 million in 2011, and is ranked by the European Commission in first place in Europe for total R&D investment in the computer services category and in the area of travel and tourism.

For more information about ***Clearing the Cloud*** please contact: **hospitalitymarketing@amadeus.com** or visit: **www.amadeus.com/hotelit**

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