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THE OPEN SOURCE ALTERNATIVE

OPEN SOURCE: A COMPLEMENTARY APPROACH
BY GUY DE PANAFIEU, CHAIRMAN AND CEO

PAGE 2



THE ADVANTAGES OF OPEN SOURCE
FOR THE ENTERPRISE

PAGES 3/4/5



THE MARRIAGE OF THE INTERNET AND OPEN SOURCE:
THE SAME CULTURE AT THE SAME TIME

PAGE 6



INFORMATION SYSTEM SECURITY:
AN OPEN SOURCE ADVANTAGE

PAGE 7



POINTS OF VIEW

“LINUX IS MADE FOR THE ENTERPRISE,
BUT THE ENTERPRISE DOES NOT YET KNOW IT...”

INTERVIEW WITH JEAN-PIERRE LAISNÉ, AFUL

(ASSOCIATION OF FRENCH-SPEAKING USERS OF LINUX AND OPEN SOURCE SOFTWARE)

PAGE 8



“LINUX HAS NOW PASSED ITS CONCEPT PERIOD,
AND IS ENTERING INTO ITS APPLICATION PERIOD”

INTERVIEW WITH YUN PENG WANG, MINISTRY OF THE INFORMATION INDUSTRY

PAGE 9



BULL AND OPEN SOURCE:
E-BUSINESS INFRASTRUCTURE AND EXPERT SERVICES

PAGE 10



Number
12



Open Source: a complementary approach

BY GUY DE PANAFIEU, CHAIRMAN AND CEO

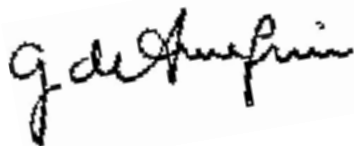
Open Source Software has now emerged as a credible alternative model for the development and diffusion of software tools and solutions, particularly at the level of IT infrastructure. Over 25% of the servers sold worldwide in 2000, according to market analysts, function with Linux, the Open Source operating system.

For an enterprise or a public administration, Open Source represents a complementary approach to the traditional proprietary model of the software industry, offering greater flexibility and vendor independence. Given the recognised advantages of Open Source, but also the possible risks, the involvement of senior managers is recommended and this dossier is intended to contribute to their reflection in this domain.

Bull, in line with its long-standing commitment to open standards, has made significant investments in Open Source solutions on its platforms, and has developed a solid expertise in this domain. This editorial gives me the occasion to share with you a few points, based on this experience, which merit attention.

- *The first point concerns the choice of areas for the application of Open Source solutions. While the credibility of Open Source is well established in the domain of IT infrastructure, its use for business-critical applications does require appropriate verification.*
- *Next, the skills that are necessary in-house for Open Source solutions should be identified and planned, taking into account the organisation's intention to use the solution as it is, or to adopt it to specific requirements.*
- *Finally, the quality of external support services should be carefully verified. Well-established Open Source products benefit from a strong level of support, which may not be available for less popular products.*

I hope this dossier will be useful for your reflections.



THE ADVANTAGES OF OPEN SOURCE FOR THE ENTERPRISE

OPEN SOURCE: A REVOLUTION IN THE IT INDUSTRY

The reign of “de facto” standards has marked the evolution of IT

For decades, the attempt to achieve standards by consensus has rarely succeeded, usually giving way to “de facto” standards. Between the era when each computer manufacturer had its own operating system, incompatible with those of competitors, and the age of Microsoft, with the “de facto” Windows monopoly, enterprises and administrations have had limited room for manoeuvre when developing their information systems. This dominant role of the “de facto” standard has resulted in more or less rigid technical frameworks being put in place, although it is undeniable that at the same time real technological progress has been made to the benefit of customers.

The construction of technological monopolies could continue and expand (particularly in the areas of ERP, CRM and databases), even more so as information systems become increasingly the assembly of components. The business model of the IT industry, especially in the domain of software, is founded on this reality. This means that many integrators work with the big software publishers (ISVs) to provide their customers with packaged applications: the ISVs get the licence fees, the integrators get paid for service provision. Faced with this equilibrium of interests, the question is whether customers gain in quality and cost of solutions, and in durability and reliability, what they lose in freedom. It is in this context that the emergence of Open Source Software (OSS) should be understood.

Open Source: the emergence of a new vision

It would be a mistake to limit the phenomenon of Open Source to the concept of free software, because this would overlook a cultural and social revolution in the world of information technology. To understand the scope of this revolution we need

to go back to 1984, and the creation of the Free Software Foundation by Richard Stallman, which over the years would unite a community of developers such as Brian Behlendorf, designer of Apache (an Open Source Web server), or Linus Torvalds, creator of the Open Source Linux operating system derived from Unix. Many other designers joined this new kind of fraternity whose key values are liberty and emulation, in opposition to the traditional model of the industry, perceived as being too rigid.

In contrast with commercial software, distributed in binary executable form that cannot be modified by customers, OSS solutions are distributed in the form of source code, which can be tuned and if necessary tailored to the needs of the user. The GPL (General Public Licence), which regulates most OSS software, specifies that the source code may be changed so long as the modifications are published and the authors are acknowledged. In this way it preserves the rights of the author by giving him or her the means of controlling what becomes of the software. Today it is estimated that there are over 11,000 OSS solutions, of which 3,900 are dedicated to servers and middleware. The offering is competitive in the area of Internet servers, e-mail and firewalls, network directories and cache servers, but it has more difficulty in domains such as databases, application servers and office software. It is still largely absent from vertical and mission-critical applications and on workstations, although an important breakthrough could be made in the next three years, notably with Star Office from Sun. At the same time, the OSS community is starting to attack integrated enterprise management suites and CRM tools, with projects such as Open ERP and Free ERP.

Many experts, including for example IDC, foresee a large increase in the use of OSS solutions. Today the number of Linux users is estimated to reach more than 10 million, and 27% of servers sold worldwide in 2000 functioned under Linux, an

THE OPEN SOURCE ALTERNATIVE

increase of 24% over 1999. All sectors are involved: banks, Internet and telephone operators, public administrations, insurance companies and manufacturers. Users recognise in Linux, in particular, the advantage of speed of deployment: for example, Hill House Hamond, the second largest insurance broker in Great Britain, was able to deploy 250 Linux servers in its branches in a month, with no on-site assistance. Another argument: the absence of a licence fee reduces costs. According to a spokesman at the Ministry of Culture in France, the migration of small servers to Linux has allowed a 30 to 50% reduction in total operating costs. Developing countries are particularly sensitive to this cost factor. The advantages in terms of security and confidentiality are also considerable: many administrations, such as the Ministry of Armies and the Foreign Ministry in Germany, have already chosen to turn to Linux. In fact, access to the source

code brings security guarantees that commercial products cannot offer: for example, the assurance that there is no spy programme or hidden "back door".

The ability to take greater control of the information system

The success met by Open Source naturally attracts criticism: the lack of guarantee, a poor vision of future developments, and above all the risk of fragmentation of the offering. On this point, the OSS community has organised itself. For example, the publication of the Linux Standard Base (LSB), the technical specification describing the software code shared by all distributions, allows increased interoperability between the different versions of Linux. This initiative of the Free Standards Group avoids what happened in the past in terms of

OPEN SOURCE APPLICATIONS THAT RUN ON LINUX SERVERS

Application	% of Respondents
Internet/Intranet	78.3 %
File and print	57.6 %
Software development	56.9 %
Email/messaging, workgroup collaboration	56.7 %
Systems management	32.6 %
Data warehousing/datamart	19.9 %
Scientific/engineering/CAD/CAM	12.2 %
Enterprise applications (e.g., ERP, CRM, HR)	7.5 %
Real-time process control	6.0 %

Source : IDC survey, 2001

incompatibility of the different commercial versions of Unix. Critics also put forward the idea that the availability of source code to users contravenes the respect of intellectual property. In this respect, the European Patent Office is studying a draft directive making the system of patents applicable to software, an initiative that has caused high emotions within the Free Software Foundation Europe. It is still early to assess the impact of such a decision on the evolution of Open Source. Of course, the stakes are economic: Open Source has created a new model which destabilises the existing relations between businesses and software publishers and challenges the principle of an annuity from commercial standards, in favour of real added value from service providers and the members of the development community. On the other hand, the system of copyrights that presently governs the creation of software does not provide for recourse in case of contention concerning the use of certain functions.

Senior Managers are still not very interested in the expansion of Open Source and the advantages that it could offer to their enterprises, which is certainly regrettable given the significance of these advantages. The OSS model of programming is now recognised as very effective for developing high quality software, by the simple fact that it stimulates competition within the development community. In this, there is real value creation: OSS solutions are often more stable, more durable, more open and can be adapted as needed, while commercial software packages offer very little flexibility. For obvious financial reasons, leading software publishers will limit the number of developers even while they are trying to extend the functionalities of their product, hence the existence of faults and bugs.

For information system managers, Open Source facilitates greater control of their systems, without penalising the users. In addition to this new-found liberty, Open Source can reinforce the possibility of personalising the infrastructure of the information system in line with the strategy of the enterprise. This greater control of course has a price: the need to train the IT teams in new techniques, and more fundamentally, in a new way of thinking.

TEN QUESTIONS FOR USING OPEN SOURCE SOFTWARE (OSS)

1. What are the advantages of OSS for the enterprise?

In addition to cost savings and quality products, the enterprise has greater control over the building blocks of its system and more flexibility to tune them to its specific needs.

2. Which are the areas today where OSS is ready for enterprise use?

In the infrastructure area, with Web, Cache, Mail, File/Print solutions, OSS is becoming the 'de facto' standard.

3. In which areas should one be careful?

For mission critical transaction systems, especially where scalability is an issue.

4. What level of support can be expected for Linux?

For Linux and basic infrastructure OSS products, large Linux distributors offer various levels of support agreements. If they can't fix a problem, they escalate to the OSS community.

5. What about support in the other cases?

The support quality depends on the importance of the OSS solution and the number of developers. For the most popular ones (e.g. Apache Web server), product quality is high and support works quickly and efficiently.

6. What needs to be considered in terms of licensing an OSS solution?

There are a number of OSS license models that differ in terms of intellectual property rights, handling of derivations and distribution. The model of the specific solution should be verified in order to understand the implications.

7. What skills are needed to work with OSS?

For using an OSS solution as is, standard Unix administration skills are sufficient.

8. For an OSS solution used as is, what about evolution?

The roadmap of the solution is the responsibility of each 'project leader'. Usually communicated over the project's Web site, it incorporates the developers' vision as well as user demands.

9. If an OSS solution is modified, how can product quality and stability be ensured?

In this case, the enterprise or the integrator who implemented the solution becomes fully responsible. Standard project management should be applied, as with any 'in-house' development.

10. Does OSS software pose a higher security risk?

On the contrary, it is more difficult to implement "back doors". In addition, the advantage of OSS is that many more experts are able to find and fix potential security holes. If an incident occurs, OSS often delivers much quicker fixes than proprietary software providers.

The marriage of the Internet and Open Source: the same culture at the same time

If there is one domain in which Open Source has achieved recognition and credibility, it is the Internet. In this way, the Open Source Web server, Apache, born in 1995, has become a standard, recognised as the leading product in its category, and used today within 3.5 million websites. Moreover, systems that function under Linux already represent the majority of servers on the Internet. As an Internet server, Linux can provide everything (e-mail, network directory, Web...) with reliability at least equal if not superior to that of the commercial operating systems.

Many examples confirm the success of Open Source on the Internet. Google, one of the main search engines, uses Linux for the 4,000 servers in its “server farm”, with multiple machines ensuring the distribution of workload and redundancy in case of failure. It is the same with France Telecom which chose to use Web servers with Linux and Apache for its search engine, Voila. Opera, the new Open Source browser, is being adopted by more and more manufacturers, notably due to its compatibility with numerous operating systems.

If certain operators hesitate and choose “classic” products, notably for the more critical applications, with a strong requirement for reliability and high availability, some implementations show that Open Source can bring the needed level of guarantee. Thus, in France, the tax administration (DGI) has started an operation of dematerialisation of tax exchanges. This means that it must be possible via the Internet for the taxpayer to fill out and check his or her tax declaration, and for the agents of the tax administration to access this declaration. This requires an open architecture, made up of standard components, that facilitates these exchanges. The DGI has thus put into place 850 Web servers under Apache, with access to an Oracle database. The operating system supports the mission critical functions of the server and plays an essential role in the homogenisation of the architecture.

This success of Open Source plays a large part in the motivation of the technical staff of Internet Service Providers (ISP), who have found in Open Source the possibility to fully express their competence, independently of its recognised strengths: reliability, low failure rate, easy installation

and reduced costs. There is, in effect, a strong cultural connection between the world of the Internet and that of Open Source: freedom of circulation of information and sharing of ideas. This convergence of vision and spirit becomes stronger as the major players in the world of IT no longer hesitate to solicit the worldwide community of developers. Without the Internet, it would have been impossible for the community to exchange and collaborate on the development of Open Source software.

Other factors explain this relationship. The emergence of the Internet represented a major opportunity, not only to develop new functions of the information system, but above all to achieve the dream of general interoperability of data, of interfaces, of communications. To appreciate the magnitude of this change and the resulting dynamics, one must look back several years. Computer specialists debated at length around the following question: is it the specification of the interface of a given function that creates the “standard”, or is it the implementation of the function? Some judged it a “debate of intellectuals”. In fact, this judgement was false, as this question expressed a major challenge: the capacity to favour the interoperability of information systems in a universe that has become necessarily heterogeneous by the multiplication both of technologies and of the needs of enterprises. The response that emerged is that of a particular implementation and hence a “de facto” standard. Open Source certainly follows the same logic, but in counter-balancing the negative effects, by the exchange of the source code. This is why Open Source is fundamentally an accelerator of progress.

Information system security: an Open Source advantage

Information system security has always been a major preoccupation for senior managers. Especially with the opening up of IT systems and the continuing expansion of the Internet. This need to protect the information capital of businesses and public administrations is reinforced today by obligations in terms of legal responsibility. In France for example, the new Penal Code introduces an offence of breach of security for personal information. A business or administration can thus be reproached for a lack of vigilance and of protection of personal data, in the case of an intrusion, for example in the domain of electronic payments. This responsibility cannot be taken lightly when we realise that around 60% of companies worldwide have been victims of at least one case of fraud in their information systems.

To guarantee a high level of security, many conditions must be combined. The first is certainly to have a precise knowledge of the weaknesses in the system, which implies a considerable familiarity with the elements of security for the operating systems, firewall and various applications. All too often, from a lack of transparency, IT managers can only leave it up to the sense of responsibility and ethics of their suppliers. However, experience shows that in pushing the investigations, certain products have revealed traps: "back doors", for example, or spying tools, which inform the software publisher about the behaviour of the customer. This explains why more and more users are reluctant to use certain products.

Faced with this lack of transparency, Open Source offers the immense advantage of being able to access and evaluate the source code and thus to assess the risks of the different operating systems and software that are used. The collective examination, affected by the community of developers for example, brings a solid guarantee of the management of the security keys in the code, but without this knowledge of the code allowing access to the keys. The enterprise is therefore able to define its own security arrangements according to its particular needs, allowing a better integration between applications and security tools. This is why the Open Source community has done more for security than many software publishers put together.

Since the adaptation of security arrangements to take account of technological developments is never finished, the enterprise has to equip itself with the means of managing this continuous evolution.

The OSS community also moved to design and develop security applications for IT infrastructures, together with intruder detection tools, which are dedicated to network surveillance and easily downloadable. As an operating system, Linux also offers many configurable tools, whose use is facilitated by a very full script and which even offers the possibility of configuring a firewall. The mobilisation of the community also allows rapid reaction to virus infection attempts, as has recently been the case for Linux.

The fact that the community makes available free applications, in the area of security, reinforces the idea that it is possible today to build an open infrastructure that is secured and administered using Open Source components. In fact, whether at the level of connectivity functions, application infrastructure, front and back office application integration, Groupware and exchanges, or resource administration, there is a vast catalogue of tools which allow a company or administration to manage the evolution of its information system, with a level of control which ensures the best possible security conditions.

POINTS OF VIEW

“Linux is made for the enterprise, but the enterprise does not yet know it...”

INTERVIEW WITH JEAN-PIERRE LAISNÉ, CONSULTANT AND CO-FOUNDER OF AFUL (ASSOCIATION OF FRENCH-SPEAKING USERS OF LINUX AND OPEN SOURCE SOFTWARE)

How do you perceive the penetration of Open Source Software, and in particular Linux, in the business world?

Many enterprises use Open Source Software, often without knowing it. After all, the protocol TCP/IP, on which the rapid expansion of the Internet is based, is built on open source software that has existed for the last 30 years. In fact, Open Source is a reality that stands out more and more, as numerous advantages regarding quality and security are recognised. As for Linux, its critics underestimate its power of penetration within enterprises and administrations. Moreover, the majority of software publishers, like Oracle, Sybase, Informix, now have a Linux platform to produce mission-critical applications. SAP offers a version of SAP R3 that includes Adabas, an Open Source database from Software AG. Indeed, the multiplicity of Linux distributions could have led to some confusion. But that changed with the introduction of the Linux Standard Base project, along with the effort of harmonisation that began three years ago.

What main advantages can enterprises and administrations get out of Linux?

There are many, both in terms of security, quality and durability of the applications, and in terms of cost. But the main advantage lies in the control of the information system, as this constitutes a strategic element for the business and this is why its control represents a major imperative for General Management. Moreover, from one end of the chain to the other, applications are distributed more and more and also made available on the Internet implying the use of open standards. It must also be noted that there are at least three operating systems in place within the computer network of the enterprise: the proprietary system for the mainframe, a Unix system and an NT system. One of the main assets of Linux is being able to serve as a bridge between these three systems and allowing them to open to other technologies simply and securely. Certainly, one cannot maintain that Linux has identical functions to the operating systems of the large systems, but more and more, it does come

closer. Linux is made for the enterprise, but the enterprise does not yet know it...

Is there not a cultural hesitation of General Management towards Open Source?

General Management is sensitive to notions of productivity, durability and costs, while the IT Manager is concerned more with quality and control. The “free” nature of Open Source, which can moreover contribute to confusion, works in disfavour of OSS, as people traditionally attach value to something that has a price. From then on, it seems more “serious” for General Management and IT Managers to rely on the image of large manufacturers or major players in the IT world. What’s more, there is a certain suspicion towards a community of developers perceived as being longhaired and bearded on the fringe of the traditional commercial world. Indeed, it is legitimate for General Management to ask themselves about the functioning of communities of developers and about this concept of co-operative work. But they need to understand the advantage of Open Source, technically and economically, which is to concentrate hundreds of technicians on a single problem, which a commercial software editor could never do, for reasons of cost.

What advantages will the IT Manager be able to get out of Open Source?

The monolithic aspect of certain products, like ERP packages, is starting to put off certain managers. Everything is becoming rigid and there is less possibility of differentiation from competitors. Open Source offers the IT Managers the ability to regain control of the information system in order to better achieve this differentiation. But on the other hand, the teams must be retrained to the new logic of available source code, hence an investment that must be made. But the cost must be put into context, since it only takes one or two days to train a Unix engineer on Linux, and only about a week for an NT engineer.

“Linux has now passed its concept period, and is entering into its application period”

INTERVIEW WITH YUN PENG WANG, PRESIDENT, MANAGEMENT INSTITUTE.
MINISTRY OF THE INFORMATION INDUSTRY.

What are the main advantages of Open Source Software?

- Its new functions, which meet the requirements of both industry and enterprise customers. Open Source Software can be used to build Web servers, e-mail servers, Network Directory, Proxy, File/Print servers, etc. The key advantage of Open Source software, however, lies in its very low price and excellent price/performance ratio.
- Its fast technical update, as the maintenance is done by experts all over the world. They are devoted to the system stability, security and performance. Compared with traditional commercial software, its bug fixes can be rapidly distributed via the Internet.
- Its powerful customisation. It can be conveniently customised to meet customer requirements. The traditional commercial software cannot compare.

Will Open Source lead to more innovation in the IT market?

In fact, the creative Open Source approach encourages numerous software developers to launch themselves into their work, bringing their expertise into play. By now there are many new products appearing, with some of them being used in other finished products. For example, embedded Linux is a major player in the market for digital videotape recorders, due to its high proficiency, security and price/performance.

How do you perceive the impact of Open Source on the software industry?

Open Source Software breaks through the traditional business model of commercial software and introduces its own totally new model. By adopting new technology and products, instead of being concerned with company profits and costs, Open Source Software is continuously satisfying user and market requirements. From this point of view, Open Source Software represents a new market trend. In fact, the famous operating system vendor Microsoft recently issued its source code of Windows XP to ISV's.

How do you see the future of Open Source software in terms of acceptance by users?

Linux is a representative of Open Source Software. Linux has now passed its concept period, and is entering into its application period. Each major Linux vendor focuses on many aspects, including how to improve integration, providing an easy-to-use system with simple system management. They also aim to continuously provide enterprises and industry users with initiatives and applications in order to meet their real business requirements. In the coming future, we can forecast Linux will get more and more market acceptance.

What will be the role of Open Source software in China? Is China contributing to the Open Source phenomenon?

Open Source software brings an excellent opportunity for China and many developing countries to develop their own licensed software, especially in government, military and mission-critical industries. China has many experts devoted to software development, who are increasingly contributing to the growing development of source code, especially in localisation. What they have done greatly promotes the standardisation of Linux.

Are you using Open Source? What would you advise to companies choosing Open Source?

Yes, we are using Linux for some training and teaching purposes. I would advise companies choosing Open Source to first choose a very good consulting company, as Open Source in business-critical applications may suffer some compatibility problems with high-end Unix servers, Oracle, etc. So a good system consultant will be able to help through it.

How do you see the impact of Open Source on future Ministry projects?

I agree that Open Source has a bright future in some of our Ministry projects. But in the near future, it may be too early for companies to put it in critical applications. I think the best chance for it to develop, both in terms of technology and market share, should be in the area of some governmental administration applications. In this domain, its advantages are very clear.

Bull and Open Source: e-business infrastructure and expert services

Since 1983, Bull has been one of the first IT companies in the world to commit unequivocally to standards and contribute to their development, in order to offer customers open, interoperable and competitive solutions. Open Source Software, by its very nature, is an integral part of this value proposal and, here too, Bull commits and contributes.

An offering for e-business infrastructure

Bull has invested heavily in Linux and has ported it on all its open servers. For the group, Linux is a major operating system for the implementation of Web infrastructure solutions. It is therefore an integral part of Bull's "net.infrastructure" offering which leverages technical and commercial cooperation to offer the best technology and solutions.

■ Easy to deploy servers

Bull works closely with **Red Hat** and **MandrakeSoft** in order to facilitate the implementation and the deployment of the most popular Web infrastructure solutions.

The Bull EXPRESS5800 range features certification and a factory "pre-load" option for both distributions, allowing the quick and easy set-up of Web, Mail, Cache, Firewall and File/Print servers. To ensure high availability and load balancing for Web infrastructures, Bull works closely with **Alinka**. Alinka Orange is a leading Linux clustering solutions, providing unique ease of management along with comfortable system management and software distribution functionalities.

■ **A fully integrated solution with Oxyan**, allowing a small or medium enterprise, or a branch office of a larger company, to implement immediately the permanent connection of its internal network to the Internet, in complete security.

■ **Solutions for e- and m-commerce** with JonAS, the Open Source application server EJB/Java/XML of **Evidian** and Enhydra of **Lutris Technologies**, a very high performance server, particularly for m-commerce (WAP).

■ **The powerful content management solution** for dynamic Web servers and large Intranets of **Roxen Internet Software**.

■ **Intensive calculation servers:** Bull, together with **Red Hat** and **MandrakeSoft** has optimised Linux on the Intel® Itanium™ architecture of its new Escala IL servers, allowing simulation or intensive calculation applications to benefit from exceptional floating point performance and from the memory size of these servers at extremely competitive prices. Bull is currently testing this type of solution in its Grenoble laboratories and its experts advise and propose complete solutions to customers.

A significant contributor to the Open Source movement

Bull contributes to the development of new technologies and solutions, notably with JonAS, the EJB (Enterprise Java Bean) application server of its software subsidiary Evidian. With over 40,000 downloads, JonAS has been integrated into a large number of applications developed by many enterprises.

A complete offering of expert services

With a set of services equivalent to those offered for its other systems, Bull facilitates the risk-free deployment of Web infrastructure solutions based on Linux.

Bull offers to Linux users a complete range of services, from platform preparation before delivery to system management.

These services include architecture consulting, integration of applications and new technologies, infrastructure and application support together with technology watch to help customers to make their choices. Once the implementation is finished, the Group proposes support 24h/24h.

The Linux Hot Line gives customers direct access to experts in the principal Linux environments and associated software (Apache, Samba, messaging, databases, etc.).

Customers thus benefit from expertise and skills unmatched in Europe for development, integration and deployment of high availability open systems and of Open Source solutions, with the support of Bull's International Unix/Linux Centre of Expertise and its High Availability Services.

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