

# Open season

As the widespread adoption of Android has shown, consumer technology companies are increasingly turning to various open source software platforms to boost their competitive advantage. At the same time, open source developers are recognising the benefits of IP protection

By **Jack Ellis**

Google's Linux-based open source operating system Android is capturing market share in the mobile device space at a rate that no rival platform can match. It first outstripped Apple's iOS – its closest competitor – in the first quarter of 2010. Since then, it has left the rest of the industry in its dust, with around 70% of the world's smartphones running on Android by the end of 2012.

For Keith Bergelt, CEO at Open Invention Network – a defensive aggregator of Linux patents (see box-out on page 61) – Android's meteoric rise has little to do with the fact that its technology is inherently better than Apple's iOS, or any of the other mobile operating platforms out there. "It's not that Apple has run out of creative steam," he says. "Rather, it's the modality for invention and innovation facilitated by open source that is allowing Android to outpace iOS. Apple's ability to innovate in a siloed model is so much less, because in an open model there are more minds to tap, more creativity is flowing – and that is what Google is harnessing with Android."

Bergelt stresses the importance of understanding open source as a methodology rather than as any one particular technology. "Open source is a way of inventing and

creating through collaborative development," he says. "It allows you to bring bright people together around a particular technology challenge, who can cooperate to create something anew. Therefore, the level of novelty you get in an open source environment is far greater compared to what is possible in one solitary company."

Open source development in the software space is based on the premise that – with a few conditions – source code is made freely available for anyone to use and modify. The lack of proprietary rights has led many companies to view it more as a threat than as an opportunity for generating value.

## Why open source?

Red Hat is publicly traded on the New York Stock Exchange and recorded revenues of US\$1.13 billion last year. Its core business is the provision of an enterprise-focused version of Linux along with ongoing technical support services. The company stands testament to the commercial potential of open source. "Typically, we provide infrastructure software such as operating systems and middleware to corporate clients, which include around 80% of the Fortune 500 companies," says Rob Tiller, Red Hat's vice president and assistant general counsel with responsibility for intellectual property. He believes that Red Hat's customers benefit directly from the fact that its products are the result of open source development. "One of the main reasons our customers choose Red Hat is for the quality of our product," he says. "That quality arises from the open source method of production, which emphasises collaboration with the most knowledgeable and talented architects and developers all over the world and results in software that is without peer."

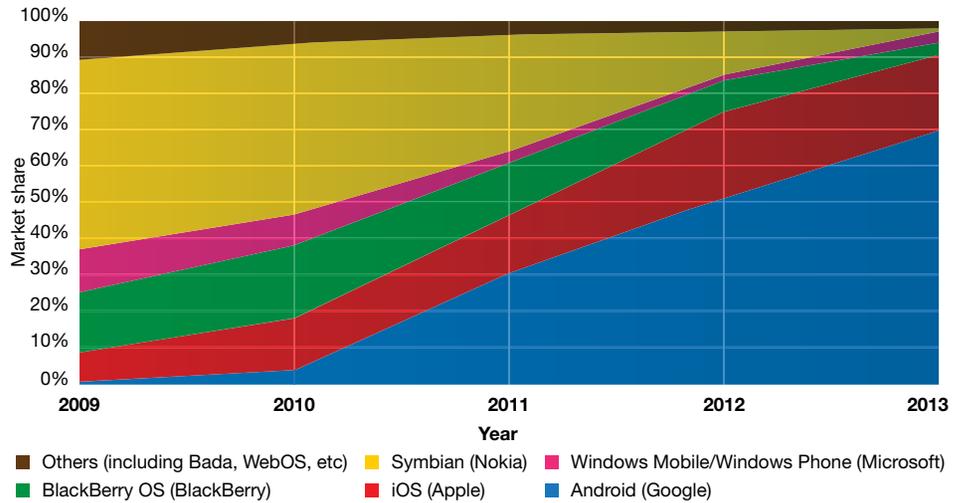
Open source licences use the principles of copyright law in order to allow an

extended, inclusive group of parties to contribute to a single project. For example, the Linux kernel – which forms the basis of Red Hat’s core products, as well as Google’s Android – is distributed to developers using the GNU General Public Licence (GPL), which entitles licensees to use, alter and redistribute the code contained within the kernel on the condition that any modifications are made available to others under the same terms. “That means that the next person down the line who cares to distribute must make the code available under the GPL, and the next person after that, and so on,” explains Tiller. “What you have is a cascading effect, so that with each generation of distributions you have more modification, more improvements and more code available under the GPL for others who use that code. The result is a kind of software commons that anyone is free to use, provided that they are willing to satisfy the conditions of the licence.”

Open source development can therefore create immense value for companies by providing the keys to an extended knowledge pool. “It gives a company access to more advanced technology than would otherwise be available to it, and enables it to participate in a more virulent form of the innovation process than is possible in a closed model,” says Bergelt. “Furthermore, the opportunity for technology developed in an open source environment to grow and morph is far greater.” Participants in open source projects not only benefit from the improvements that they make to the technology – they also enjoy the improvements made by all of the other participants, too.

This means that innovation occurs at a much faster rate in an open source environment – and as software companies have increasingly recognised this potential, open source technologies have been progressively adopted throughout the software industry and those adjacent to it. “Software-enabled hardware businesses – mobile handsets, 3D printing and so many others – these businesses cannot advance without the constant flow of new ideas and creativity that open source offers,” says Bergelt. “Linux is so pervasive today that it is practically impossible to make a credit card transaction, buy train tickets, control air traffic or trade on the stock exchanges without it playing some role.” The average person on the street has no idea that Linux is everywhere and that they are using it on a daily basis, he says; but they are. “And as a result, even companies that are clearly into proprietary models are increasingly being forced to develop around Linux to

Figure 1. Global smartphone operating system market



Source: Gartner

enable interoperability, which they need so that consumers can plug and play that proprietary technology with the open platform it has to play on.”

**The drive for differentiation**

As the pace of technological development has increased, so too has the demand for interoperability between different devices, meaning that the same fundamental software is becoming commonplace across a range of devices offered by different manufacturers. Bergelt suggests that the focal point of innovation has shifted as a result. “What is happening now is that invention activities are taking place much higher in the technology stack,” he says. “So if you look at mobile companies over the past 10 years or so, you see that there is a lot less innovation at the base software layer and most of the innovation is at the middleware layer up into the application environment.”

The need for standardisation at the fundamental level has created a situation where many companies can benefit from cooperation with one another. “Because the smartphone business is somewhat commoditised, there is an explicit recognition among companies that they need to collaborate lower in the stack,” Bergelt explains. “That allows them to differentiate higher in the stack – and this will determine the unique features and functions that they build into their products and that make them competitive.”

This has created the perfect setting for open source to thrive, as it can provide myriad market participants with a head start and accelerate time to market.



**Keith Bergelt, CEO, Open Invention Network, pictured at last year's IPBC China**

"Incorporating open source into your strategy does not mean that you must abandon the notion of patenting or protecting your inventions"

"Software developers today find themselves in a world where there are already millions upon millions of lines of code and many of the fundamental problems have effectively been solved," says Tiller. "This means that they are going to be trying to address new problems that have arisen – and open source means that instead of trying to reinvent the wheel, they can more easily make use of existing software and innovate forward from there."

#### Open and closed

While open source technology on its own offers little opportunity for adopters to differentiate from one another, companies can build on the foundations it offers to compete. In some cases, it might be appropriate to protect this built-on innovation as intellectual property – giving the company a chance to further enhance its competitiveness and close out its rivals.

"This is not a debate about open or closed," says Bergelt. "Both can live very happily in the same environment. Patent-rich companies can, and do, pursue open source very aggressively." He highlights the example of IBM, which – despite holding one of the largest patent portfolios in the world and being perhaps the most successful high-tech enterprise in history in terms of generating value from intellectual property – has more developers working around Linux than any other company.

And Big Blue is far from alone. "It's an increasingly common trend," Bergelt adds. "Many companies that support proprietary technologies are also supporting open source technologies."

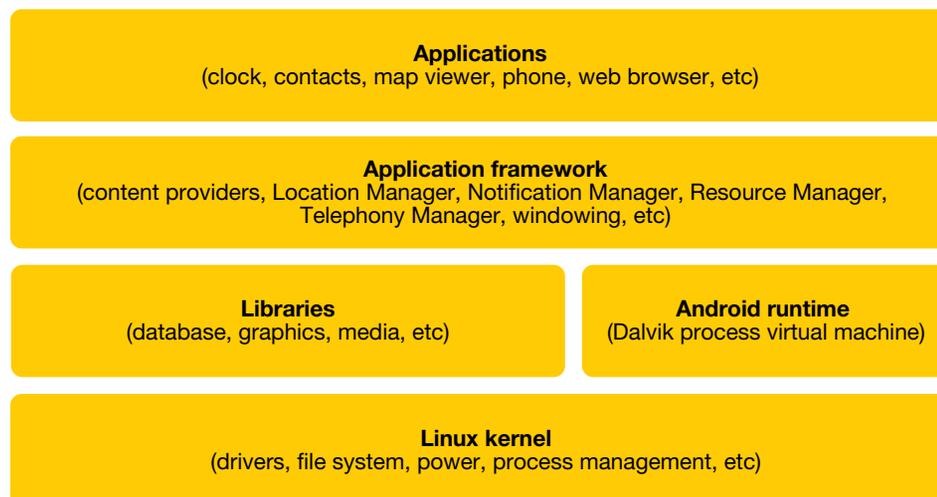
But those that do decide to embrace a combined approach, incorporating both proprietary and open source elements, face difficult questions when it comes to deciding which innovations should be protected as intellectual property and which should be left open. There are technical, legal and strategic business considerations to be made. "The choices are not obvious," says Bergelt. "However, incorporating open source into your strategy does not mean that you must abandon the notion of patenting or protecting your inventions in some other way." On the contrary, it means that businesses can be more selective about where they patent based on what is important to them in the marketplace and what their differentiators are: "If you are a maker of smartphones, you need to think, 'Why is the user buying our device? What is unique about it? And what are the things we should protect as IP?'"

To get the best out of an open and closed model, a cross-functional team should be established to develop a holistic IP strategy that takes open source aspects of the business into account. "The IP manager needs to work in collaboration with the software development lead and the business head in order to make decisions around what technology is going to be controlled as proprietary and what is going to be open," suggests Bergelt. "There are often many, many different licences required to maintain compliance with open source project restrictions. This means there needs to be extensive cataloguing and monitoring of where you have received certain code from and where it fits into your products." He points to the emergence of a new class of IP professional within organisations that combines a strategic approach to IP management with legal knowledge and expertise in open source licensing. "These individuals are highly creative and central to the development of IP strategies that incorporate open source," he states. "These are a unique group of people who have the ability to bridge multiple worlds of legal, business and IP, and who also understand the market and have links to the open source community."

Eileen Evans, Hewlett-Packard's (HP) vice president and associate general counsel for cloud computing and open source, is one of those individuals. She has previously worked for Sun Microsystems, where she was involved in the open source release

Figure 2. **Android software stack**

This diagram outlines the software architecture behind the Android operating system. Increasing commoditisation at the kernel layer means that competing operating system developers and device manufacturers are focusing on trying to differentiate higher in the software stack at the application and application framework layers, particularly in terms of look and feel and graphical user interface.



In February 2013 it emerged that LG had agreed to buy certain assets from Hewlett-Packard (HP) relating to the WebOS operating system, which the US company had acquired when it purchased Palm in 2010. The deal demonstrates what can be achieved if open source is an integral part of a wider IP strategy.

According to a HP press release, LG will acquire source code, engineering staff, documentation and websites associated with WebOS, which it plans to use as the operating system for its smart television products. The Korean company will also obtain licences to HP patents that originally belonged to Palm.

HP has struggled to recoup any significant value from its US\$1.2 billion buyout of Palm. It initially planned to roll out WebOS across its full consumer product range. But the company had a tough time competing in the crowded wireless device marketplace and eventually decided to shift its strategic focus to software services. In August 2011 it announced its intention to spin off its Personal Systems business and discontinue WebOS products. Not long afterwards, HP opted to

open up the operating system's source code – which had originally been proprietary – to the wider software development community. “Since we weren't making WebOS devices anymore, we were trying to find a way to really maximise the value of the assets we had acquired from Palm – including some really interesting IP,” says Michael Thacker, a spokesperson for HP. “One of the early decisions we made was that we wanted to increase the value of the operating system for the whole community, and therefore we decided to make it open source.”

HP would have had to spend large amounts of money over a long period of time if it had wanted to maintain WebOS as a proprietary asset and continue to develop it internally. But by making the code open source, it has been able to leverage the collective expertise and manpower of software engineers outside the company. As a result, improvement, modification and adaptation can happen far more rapidly than if they were attempted in-house. LG – which has indicated that it will keep the software open source – will also enjoy these benefits; and at the same time it has the opportunity to

get its smart television products to market more quickly by incorporating what is effectively a 'ready-made' operating system.

Furthermore, there is the potential for HP to receive ongoing revenue from the WebOS ecosystem. It has retained ownership of patents that cover technology relevant to the software and has licensed these to LG. “If LG is successful with leveraging WebOS on their smart TV products, there is an opportunity that those patent licences can be a revenue stream for HP,” Thacker explains. By holding on to the patents, the US company also keeps the option of licensing them to other parties or selling them on.

By embracing open source, HP has been able to add value to WebOS, making it more attractive to prospective buyers. At the same time, it keeps patents that could prove to be a source of future revenue. HP may not be able to make back all of the US\$1.2 billion it paid for Palm; but by recognising the possibilities of both open source and proprietary business models, it has been able to create value from its purchase.

of the previously proprietary Solaris operating system, and drafted the Common Development and Distribution Licence that is now used to distribute it. Evans has responsibility for open source legal and strategic matters at HP, and her team was recently spun out of HP's IP department to create a separate function. However, this has not diminished the level of interaction and cooperation between the two. “We have a very close working relationship with people in the IP function, and in particular with the patent organisation,” she says. “We continue to have an extremely tight alignment and we see open source as highly synergistic with our IP strategy.”

Evans emphasises the advantages that come with open source participation. “The great thing is that it allows HP to benefit from these wonderful technologies being developed by others,” she says. “And we also recognise that HP benefits from making our contributions back into that system – not least because we don't necessarily want to have to maintain a separate fork of a project as proprietary by not contributing back.”

Nevertheless, Evans acknowledges that open source development can sometimes lead to innovations that a company might prefer to protect as its own intellectual property, rather than offering them on open source licence terms. “There certainly are situations where we will hold things back for differentiation value,” she says. In the past, the cordoning off of technologies resulting from open source development as proprietary IP would have been anathema to the wider open source community. But attitudes towards patents, copyrights and other IP rights have shifted. “Looking back

at where open source was 10 or 15 years ago, the dominant mindset seemed to be that a developer was a bad citizen of the open source community if they didn't contribute all of their work back into the community,” Evans claims. “But there is a much stronger recognition now that it is acceptable, and even beneficial, that companies should leverage open source in such a way that allows them to differentiate and protect in some areas, while contributing back where there is commoditisation.”

Evans suggests that there is greater realisation that large corporations can continue making significant investments in open source only if there is potential for them to differentiate. “They are funding the vast majority of the development out there,” she says. “If companies had to contribute everything they developed back as open source, then at some point there would be less of an incentive for these companies to participate.”

#### On the defence

But even for companies that are fundamentally opposed to the patenting of software, patents have become a critical asset. Red Hat's patent policy states that it “has consistently taken the position that software patents generally impede innovation in software development and... are inconsistent with open source/free software”; but at the same time it is “forced to live in the world as it is”, where some companies amass extensive collections of software patents and may decide to use them offensively.

As a result, Red Hat has developed a fairly extensive patent portfolio with the



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prime purpose of defending the non-patented open source elements at the core of its products from assertions by third-party patent holders. “We do not attempt to patent any of the features and functionalities of our software with a view to preventing others from using them,” explains Tiller. “We believe again that some of the most talented software engineers anywhere in the world are working on making our products as strong and as competitive as they can possibly be, and we try to pursue and secure that innovation under the auspices of the applicable open source licences.” But patents are nonetheless an important part of Red Hat’s business model. “We hold patents only in case of an act of aggression on open source or Linux,” Tiller continues. “When we have an opportunity to grow our patent portfolio with important innovations, we primarily seek to strengthen our portfolio in a way that is likely to deter and discourage those who might otherwise be inclined to engage in patent aggression.”

Another way of utilising patents defensively is by contributing them to a pool such as that offered by OIN. As Red Hat is a member of OIN, its portfolio – which includes home-grown patents and applications, as well as assets acquired in the marketplace – is cross-licensed with those of other members and licensees of the pool.

### Pooling resources

Red Hat was one of the founders of the Open Invention Network (OIN) back in November 2005, along with IBM, Novell, Philips and Sony. NEC also later became a member, with Canonical (which distributes Ubuntu Linux) and Google subsequently signing up as associate members. Some of these companies have faced lawsuits alleging that their open source development around Linux amounted to IP infringement.

OIN was set up as a single purpose defensive patent pool to protect companies developing around Linux from attacks. In February this year it signed up its 500th licensee – and that base is continuing to grow as more companies take a stake in open source. Beyond building and maintaining the patent pool, OIN also pursues other activities to further protect its ecosystem. “We work to identify patents which are potentially threatening to Linux,” says CEO Keith

Bergelt. “Where possible, we look for prior art and attempt to limit the claim scope of those potentially threatening patents. We are also involved in identifying prior art on recently published patent applications, so that the US Patent and Trademark Office is best armed to deal with those.”

Through its Linux Defenders programme, OIN also tries to encourage open source developers to use IP law to their advantage. “Generally, the open source community has traditionally been antagonistic towards the idea of patenting,” Bergelt explains. “Our Defensive Publication Programme allows it to have a vehicle which produces what is essentially a structured form of prior art that can be used as a deterrent.” The protection offered by defensive publications also comes at a far smaller cost than filing for a patent, which could make it favourable to small companies and sole programmers.

### Brands and brains

While committed to using its patents for exclusively defensive purposes, Red Hat also possesses other intangibles that it can leverage to enhance differentiation and increase competitiveness.

One such asset that it can deploy to add value to its business is its extensive tech know-how. “Our company serves highly sophisticated business customers that have IT demands which require extremely reliable solutions,” says Tiller. “Our software, in almost every case, is open source and could be obtained at essentially no cost. But in addition to that, we can provide our customers with training, updates, bug fixes and any other kind of support that they might need in connection with it.”

Red Hat’s brand is also crucial to the success of its open source business model. “Our trademark is integral to what we do, because it protects the Red Hat brand,” says Tiller. “We have built up our brand over a long period of time and today it is an incredibly valuable asset for us.” The company’s core product – Red Hat Enterprise Linux – is just one of a great many commercially and freely available Linux distributions. “But the fact that our Linux product is labelled as Red Hat Enterprise Linux provides our customers with a sign of reliability and value,” Tiller continues. “And it is trademark law that makes that possible, since no one else is permitted to put out Red Hat Enterprise Linux apart from us. In that sense, the IP system is a very important part of our business.”

Evans further points out that it is not just companies programming around open source, but also the open source modality itself, that can reap the rewards of powerful branding. Brand in open source can be viewed from two vantage points, she says. First, open source technologies such as Linux and OpenStack have their own brands. “Being affiliated with these is highly valuable for a company like HP,” she says. Second, the original developers of a platform, who are seeking greater adoption and exposure, recognise that they can add significant value if they get an industry heavyweight such as HP associated with it. “That can take an open source project to the next level, because it can lend a certain level of credibility by having a big corporate name behind it,” Evans says.

### A new paradigm?

This collaborative ethos is a far cry from the past, when the battle lines between the open source community and the major software

companies were starkly drawn. “Ten or 15 years ago, open source was largely driven by individuals who were doing this on their own time,” says Evans. “But there has been a significant shift in the ecosystem where today most of the developers working on open source are actually employed by large companies.” Bergelt agrees that this new dynamic has helped to dissolve many of the tensions and preconceptions that previously existed. “From an organisational behaviour and process management standpoint, large companies have become more nimble in accommodating diverse personalities and diverse cultures,” he says. “In changing their cultures and integrating open source into the fabric of the way they do things, large companies which were traditionally proprietary are changing from the inside out.”

Bergelt suggests that the open source participation of corporate technology brands – as well as growing acceptance of the traditional IP system among the open source community – is indicative of a new paradigm in the high-tech industry. “The days are gone when you could have an

## Action plan



With increasing commoditisation in fields such as operating system software, companies can benefit from adopting open source elements as part of their broader IP strategy:

- By considering which areas of innovation are commoditised, companies can determine where open source technologies may provide ready solutions. This can free up resources to focus on innovating in areas which are most likely to present opportunities for marketplace differentiation.
- By concentrating patenting activities in such areas, companies can further differentiate themselves.
- Even for companies that are dedicated to open source development, patents can provide an effective deterrent against litigation from competitors and non-practising entities.
- Brands, trademarks and know-how can be crucial differentiators for products which are highly commoditised and based on widely available open source technology.
- It is important to have a cross-departmental team – including leaders from IP, corporate and product development – to make decisions regarding which innovations to protect as company IP and which to release as open source.
- An increasing number of IP professionals combine expertise in IP value creation strategy and open source licensing.

operating system that was purely controlled or distributed by one company,” he argues. “Now you need to have openness to allow for new versioning to occur at an accelerated rate. So I think it is rapidly becoming the case that businesses can no longer ask themselves, ‘Should we participate in open source?’ Because if they’re not, they are doing a disservice to their employees, to their shareholders and to their consumers, and their overall likelihood of success is diminished dramatically.” **iam**

Jack Ellis is a reporter for IAM

# THE BEST SOLOIST

However impressive its virtuosity and extraordinary its performance, a soloist will never convey all of a symphony's subtleties the way a great orchestra does. In an orchestra individuals harmoniously dialogue into a unity that elevates single contributions to achieve collective excellence.

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