A Few Things To Consider Before Patenting Blockchain Tech

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The distributed ledger technology known as blockchain currently is the subject of numerous research projects, especially in the financial services and technology industries. Perhaps not surprisingly, many companies involved in these projects are filing patent applications to protect their innovations, both in the U.S. and abroad. In an August 2016 report, the World Economic Forum reported that more than 2,500 such patents had been filed in the past three years. It also is widely reported that many companies working in this space are leveraging software code that is governed by various open-source licenses. The variety of these licenses and the particular uses by companies of the code that is licensed under them raise a host of issues that, to the uninitiated, could result in significant consequences, including potentially an adverse impact on the ability to enforce any patents that are based on the used (or modified) code.

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This article provides an overview of these issues, including a basic description of blockchain technology, a review of the most popular open-source licenses being used in this space, and a summary of how those licenses might impact the enforceability of any patents based on the licensed code.

What Is a Blockchain?

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A blockchain can be defined as a distributed ledger taking the form of an electronic database that is replicated (that is, it is "distributed") on numerous nodes spread across an organization, a country, multiple countries, or the entire world. Records in a blockchain are stored sequentially in time in the form of blocks. Each block in the chain has a blockheader. A blockheader:

- contains the various source data, such as a list of the contents of the block (for example, transaction messages) and a time stamp as to when that list was created. Software allocates each blockheader a "hash." Hashing is the process by which a grouping of digital data is converted into a single number, a hash. The number uniquely identifies the source data (effectively a "digital fingerprint" of the source data), and the source data cannot be reverse engineered and recovered from it;

- includes a reference to the hash of the previous block in the chain. When a later block is added, it too will include a reference to the hash for the immediately preceding block. In order to change one block in the chain, it would be necessary to change every single block that came after it. This is because if any data in any block in the chain are later altered, this is immediately apparent to all participants of that blockchain, as that block's hash (and that of any subsequent block) will no longer correspond to the later block's record of that hash.

Although potential uses for a blockchain range from letters of credit, identity verification, provenance of paintings, and confirmation of the authenticity of automobile parts, the basis of the blockchain is software. Software developers have a variety of ways to create software, but one popular choice is through the use of open-source software.

Nearly every day now, the headlines describe the incredible amount of zeal being applied to, and the rush to capitalize on, this developing industry. Financial services companies in particular are making huge investments in blockchain technologies, are demonstrating a drive to have a product on a blockchain, are contemplating considerations of the regulatory environment, and are studying how it may disrupt financial services and related industries.

Although there has been a tremendous focus by companies on these issues, the concerns over protecting all of this investment and innovations have been, for many, pushed farther down the agenda, with many only now trying to determine the best approach to protecting what could be key assets of the company.

Open-Source Software — the Risks and the Rewards

"Open source" software is software whose source code (the human-readable part of the computer code) is made available to everyone, to use or to modify. The software is often provided free of charge. Open-source software is typically subject to a license agreement that describes how anyone can use the code, along with various disclaimers and — sometimes — additional restrictions. There are a large number of open-source licenses, ranging from simple half-page "AS IS"-type licenses to multiple-page licenses governing how to use the code and the effects on intellectual property that changing or distributing the source code can have.

Open-source licenses are sometimes referred to as "copyleft" licenses, because they are the opposite of copyright: They typically permit users to copy the software, to examine and modify the code, and to redistribute the software to others as long as the same terms are applied.

Open-source code is an attractive option for coders to use. It is frequently free; is available right now (upon downloading); has probably been reviewed by other people who have located and fixed at least some of the bugs; and is modifiable to meet any unique needs.

Of course, there are some disadvantages. Open source is not always very user friendly; it needs to be maintained just like any other software — who does a user call if a problem occurs? It creates additional security concerns because of its "public" nature (it may have been developed by numerous separate contributors, so that it may be impossible to verify the provenance of its components by due diligence); and it is commonly provided on "AS IS" basis (without intellectual property rights warranty or indemnity infringement comfort), raising certain legal risks (such as exposure to infringement claims).

Some open-source licenses (typically older versions) include terms that potentially have a so-called "viral effect" on a company's existing proprietary software. They can provide that, if a licensee wishes to convey or distribute a work that contains or is derived from the licensed open source software, the whole of the work (including, for example, the licensee's source code for proprietary software included in the work) has to be licensed out on the open-source terms. The "viral effect" amounts, at best, to a diminution in the value of intellectual property rights in the company's proprietary software, and, at worst, to a complete loss in their value. Because of uncertainties about when proprietary software may be affected in this way, many companies have segregated open-source software from their proprietary software. Another significant risk of open source software in relation to loss of a company's intellectual property rights, and one that is the focus of this article, arises from certain other limitations in the particular license that governs the use of the open source code. These limitations relate to patents.

There are many types of open-source software, and almost as many types of open source software licenses, including those licenses that developers write themselves. According to Black Duck Software, the top five most frequently used open-source software licenses are used in 78 percent of all open source projects. The top 5 are:

1. MIT license, 26 percent
2. GNU General Public License v2.0, 21 percent
3. Apache 2.0 license, 16 percent
4. GNU General Public License v3.0, 9 percent
5. BSD license, 6 percent

The specific terms of these five license agreements vary in a number of ways, but their treatment of a user's ability to patent the innovations stemming from their specific modifications to the source code (or combinations of those changes with the remaining code) can be substantial.

MIT and BSD

These two license agreements are short, half-page documents that freely permit use, redistribution, and changes to the licensed software. The licenses require the user to include a copy of the license and copyright notices, as well as a disclaimer of all warranties and damages. Based in copyright, these license agreements do not even mention patents.

Apache 2.0

Apache 2.0 does address patents, and perhaps in a fundamental way. Under this license agreement, anyone who intentionally submits any modifications or additions to the software to the licensor for inclusion in the work (a "contributor") automatically grants a patent license to all users for the contributor's patents that would be necessarily infringed by the contributions alone or in combination with the software. The Apache 2.0 license specifically includes in the patent license the right of the user "to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work." The Apache 2.0 license also states that, if a licensee institutes patent litigation (including counterclaims) alleging that either the work or a Contribution constitutes direct or contributory infringement of a patent, any patent licenses granted to that licensee under the open source license terminate as of the date the litigation is filed. Put simply, if a company obtains a patent based on its contribution, and then asserts that patent against another, the company may forfeit the use of the Apache 2.0 licensed code for itself.

A few points that patent holders may wish to consider in deciding whether to use Apache 2.0-licensed code:

- A "contribution" requires intentional submission of changes. Merely using the code should not constitute a "contribution."

- Running software on an Apache 2.0 server should not constitute a "contribution."

- Writing a new application using Apache 2.0 and providing the application to your customers may raise issues including the "license termination" of the Apache 2.0 license.

GNU General Public License v2.X

This license agreement became very popular because it is the license agreement used by the operating system Linux. It briefly addresses patents, by focusing on the potential conflicts between copyleft obligations and a patent license: The license agreement states that, if a licensor cannot comply with both the GPL 2.X license and any patent license, court judgment, etc., then that licensor cannot distribute the program governed by GPL v2.X. As such, if a licensor wanted to charge a royalty for its own and third-party patents licensed in code that was covered by GPL 2.X, the company would be prohibited from distributing the software to others because charging a patent royalty is inconsistent with the copyleft obligations of GPL 2.X.

The license agreement does permit developers to include a geographic restriction "if the distribution or use of the Program would be restricted in certain countries by patents or copyright interferences." The license agreement also permits the licensor to charge a fee to the licensee, but only for the physical act of transferring a copy of the software or for additional warranty protections.

With GPL v2.X:

- Creating a software program that simply runs on the Linux operating system usually should not trigger the copyleft provisions — including the patent license — under GPL v2.X.

- Dynamically linking a program to GPL v2.X software may trigger the copyleft provisions, and allow downstream users to use the code regardless of patent protection.

GNU General Public License v3.X

This license agreement is the next version of GPL v2.X. Unlike that earlier version, however, this license agreement is expressly hostile to patents: "Every program is threatened constantly by software patents. ... the GPL assures that patents cannot be used to render the program non-free." Somewhat similar to the Apache 2.0 License, GPL v3.X includes a broad patent license: "Each contributor grants you a non-exclusive, worldwide, royalty-free patent license under the contributor's essential patent claims, to make, use, sell, offer for sale, import and otherwise run, modify and propagate the contents of its contributor version." Unlike the Apache 2. License, GPL v3.X's copyleft provisions can be triggered by not only "conveying" (enabling someone else to make or receive copies) but by simply "propagating" ("do anything with it that, without permission, would make you directly or secondarily liable for infringement under applicable copyright law, except executing it on a computer or modifying a private

copy") the code.

Furthermore, if a licensor provides a GPL v3.X-covered work to someone else and permits that party to make or receive copies, and the licensor knowingly relies on a patent license but the source code "is not available for anyone to copy, free of charge and under the terms of this License," then the licensor must either make the source code available, deprive itself of the benefit of the patent license, or extend the patent license to downstream recipients.

With GPL v3.X, if the code is:

- simply used as a tool to help create blockchain software, and is not part of the completed code, then the software should not be affected by the GPL v3.X license, just as a chef's knives are not part of a meal a customer receives;

- actually part of blockchain software (like salt is incorporated into a meal), in light of the distributed nature of blockchain, using GPL v3.X would typically be a very risky choice for anyone intending to patent blockchain technology, because the licensor would almost always be "conveying" the code.

Conclusion

Any company wishing to apply for a patent relating to blockchain technology should be sure to check with the developers to determine which licenses the developer is using.

As a best practice, any company working on projects in the blockchain technology arena should review, or have a third party review, any code that is intended to be shared with third parties (customers, vendors, etc.). Otherwise, the company could spend a significant amount of time and money on a patent the benefit of which the applicable open source software license may require to be given away for free.

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