

***TITLE INSURANCE FOR IPv4 ADDRESSES***

*Internet Protocol version (IPv4) addresses are in demand and in short supply. To the extent that IPv4 addresses are available for purchase on a grey market basis, it is far from certain what exactly is being conveyed in those transactions. Attorneys from Thermopylae Ventures LLC and Andrews Kurth LLP survey the situation, suggesting the need for a new form of title insurance to protect participants in the IPv4 grey market transactions.*

**Transactional Insurance for the 'Grey Market' in Internet Addresses**

**By Richard A. Blunk, Benjamin Setnick and Shy Blick**

Each device connected directly to the Internet needs a globally unique number—or “address”—in order to operate. The vast majority of the Internet addresses currently in use were among the fixed supply of about 3.5 billion usable addresses made available pursuant to Internet Protocol version 4 (the “IPv4 addresses”). In the early days of the Internet, most in the Internet community believed that this number would be sufficient to accommodate reasonably foreseeable future demand. Believing it to be the most efficient way to deal with regional needs (such as differing absorption rates), the management of IPv4 addresses was allocated among five Regional Internet Registries (the “RIRs”), which are individually responsible for North America, Europe, Asia-Pacific, Latin America and Africa. Unfortunately, both of these beliefs have proven to be incorrect. RIR allocations among the five global regions have recently resulted in constraining the availability of addresses in some areas while others have a surplus.

Setting aside these regional concerns, global demand—driven in large part by the Internet of Things, big data, mobile computing and the growing reliance on the cloud—continues to grow exponentially. Unfortunately, most of the RIRs have no remaining inventory of general use Internet addresses that could be issued into their respective areas of responsibility. Africa—currently the only RIR with remaining inventory—will be depleted very soon. Many fear that, without the availability of this precious resource, the future growth and continuing operation of the Internet could be substantially harmed.

To be sure, there are ongoing initiatives that seek to address this supply and demand imbalance. For example, efforts to enhance the functionality of the currently deployed IPv4 addresses continue apace. This approach, however, has had limited success for various technological reasons that are beyond the scope of this article. Other technologists advocate migrating away from the IPv4 standard to Internet Protocol version 6 (“IPv6”), a protocol that provides an almost unimaginably large number of discrete Internet addresses. Proponents of the latter approach claim that complete migration to IPv6 is both inevitable and a prerequisite to the continued growth and functional integrity of the Internet.

Migration to IPv6 is frequently described as an example of the classic “chicken or the egg” dilemma: Its true value will only be realized when its global adoption reaches a point—frequently described as the “tipping point”—at which previous IPv6 adoption and the costs and challenges of future adoption present a compelling financial and technological case to make the switch. However, with an estimated 6 percent current global adoption rate, substantial differences in regional adoption, and continuing financial and technical challenges, we seem to be well shy of this “tipping point.” No one can definitively state if, or

when, this ultimate migration will occur. Some experts note that many companies will continue to use IPv4 and IPv6 in combination (the so-called “dual stacking” approach), thereby extending the period during which IPv4 addresses will remain in demand.

## License Versus Property Rights

Historically, the RIRs made allocations to Internet service providers or directly to ultimate users, but otherwise prohibited or severely restricted the subsequent transferability of those allocations. One common way in which the RIRs tried to enforce these limitations was to require that addresses be returned to the RIR before a later assignment to someone else. However, as with so many other commodities, the market has developed alternative methods to consummate transactions between those who have excess IPv4 addresses and those that are in need of them.

***Similar to title insurance for real estate transactions, a new type of insurance product could mitigate risks posed by “grey market” purchases of IPv4 addresses.***

Many of the RIRs now grudgingly condone a few general types of transfers such as mergers and acquisitions. In an additional effort to remain relevant, the RIRs now also promote use of their own market clearing protocols for these transactions and have even created listing services to facilitate them. They

have done so in part because it enables the RIR to record the deal and subsequent assignment in its records and to ensure the transferee agrees to the RIR policies. All well and good perhaps, but the recipient in almost all transactions consummated under this approach must expressly acknowledge that it has no property rights in those IPv4 Internet addresses other than a revocable license—not unlike the use of a telephone number—from the applicable RIR. Those that seek additional addresses solely for their own current or projected use—without any thought to a future ability to monetize—appear reasonably satisfied with the “license approach.” The North American RIR, for example, is a strong advocate of the license approach even though it seems willing to acknowledge its unwillingness to require such a return.

Prior to the establishment of the RIRs, the Internet Assigned Numbers Authority (IANA) directly allocated many IPv4 addresses to individual users. Actors who may want to directly control their IP addresses—possibly with the desire to monetize them at some time in the future—might lose important rights by consummating a transaction through an RIR that has adopted the license approach. These players typically focus on IPv4 addresses that were issued before the establishment of the RIRs and never involved in a transaction cleared through a RIR—most commonly referred to as “legacy IPv4 addresses.”

Following Microsoft's 2011 purchase of this type of “asset” from the Nortel bankruptcy at a transaction price of \$11.25 per address (\$7.5M in aggregate purchase price), various organizations, such as the National Science Foundation, and other commentators have claimed that legacy IPv4 addresses are “property” that can be bought, owned, managed and sold. Since the Nortel/Microsoft transaction, blocks of legacy IPv4 addresses have also been sold in several other noteworthy bankruptcies at prices ranging from \$9 per address (the Teknowledge Canadian bankruptcy) to \$12.00 per address price (Borders' sale to software provider Cerner). Various market participants peg \$15 per address as the going rate even though the United Kingdom government recently sold 150,000 legacy IPv4 addresses to a Norwegian firm at a \$6.20 per address transaction price.

The benefits under the property-rights approach should be self-evident. Sellers are able to monetize unneeded resources and participants are able to transact without RIR interference and without much disclosure of terms. While certainly not without critics (such as the North America RIR), this “property-rights approach” seems to be gaining some momentum in Europe and Asia as evidenced by the formation of IPv4 brokerage firms by various well-respected companies such as Hilco Global. With respect to legacy IPv4 addresses, the property rights approach is much more persuasive than the license approach, and has been endorsed—with some reservations—by third parties, including the National Science Foundation and some federal courts. Given the growing acceptance of transfers between RIRs, the grey market may continue to grow.

Unlike the Nortel/Microsoft transaction, the terms of most other grey market transactions are not publicly available even though three RIRs publish some information regarding all transfers made within their respective regions. As a result, it is very difficult to accurately gauge the size of this fragmented, opaque, and unsystematic trading market. One commentator concluded that roughly 1.9 billion IPv4 addresses (or approximately 44 percent of the entire IPv4 address pool) are legacy IPv4 Internet addresses. Based upon this and other available data, the overall value of the current grey market has been estimated to be as high as between \$5 and \$8 billion. While one may discount some of these numbers and other benefits extolled by IPv4 broker “puffery,” it is clear that the grey market is potentially very large. Theoretically, it should also have additional upside potential to the extent the current supply and demand imbalance remains, dual

stacking continues to be used in the migration to IPv6 and the IPv6 “tipping point” has not been reached.

## **Grey Market Transactions**

As in all markets, sellers in the grey market try to get as much cash at closing without any subsequent post-transaction obligations or constraints. Buyers, on the other hand, want to get as much control, confirmation of title and upside as possible on the best terms, including by paying little, if any, cash at closing. Various structures—such as the use of options, rights of first refusal, long-term leases, letters of agency, and assignable purchase and sale contracts—have been used in these transactions. Other transactions have involved the use of installment payments and phased delivery, seller or third-party financing, and the issuance of credits to the seller in order to offset the purchase of other unrelated services from the buyer.

Many grey market participants typically reach their conclusion on the state of title for—and the exclusive right of the seller to register—these legacy IPv4 addresses by relying on the registries maintained by the RIRs. However, these registries are frequently incorrect and out of date. Alternatively, the purchaser may get some comfort on these issues by reviewing other available technologies, such as the use of reverse DNS, a system that links IP addresses to Internet domains. The buyer may have legal recourse against the seller under the representations and warranties regarding title and the exclusive right to register the subject addresses that may be contained in the asset purchase agreement and/or against the seller's lawyer to the extent that its legal opinion affirms the effect of the transfer. In some cases, the buyer may also have recourse against the IPv4 broker that issued an “opinion” that the buyer acquired title in a transaction facilitated by such broker.

In many instances, it is unclear whether such brokers have sufficient net worth for these statements to have any meaningful value. In addition, any legal opinion delivered in support of such a transaction would most likely have so many caveats, exclusions and assumptions that it would not provide any supplemental confirmation. Regardless of the availability of any third party comfort on the effect of the transaction, savvy purchasers will review various technical matters—such as routing history and whether any of the addresses are included in lists of known squatters or hijackers—as part of their due diligence.

This situation is similar to other areas of law—such as real-estate and corporate law—in one key respect. In corporate acquisitions and sales, for example, it is not uncommon for the seller's representations and warranties regarding title to the subject assets be supported by so-called “representations and warranties” insurance. No substantial real-estate purchase, sale or related financing transaction would close without title insurance pursuant to which the insurer agrees to defend the purchaser's title to the transferred assets subject to express exclusions and other coverage-limiting provisions.

## **Title Insurance for IPv4 Transactions**

Like these types of insurance coverages, a new type of insurance product for IPv4 transactions could address these same concerns without being an absolute, unqualified confirmation of the transfer. It is only meant to provide a better-funded, independent source that will base its decision to issue coverage on the status of title or the exclusive right to register the subject address since seller affirmation of this latter conclusion such to gaining transaction in the market. This decision would be underwritten based upon the carrier's own review of available title records—whether the RIR registries, the lists of transferred address blocks published by the North American, Asia-Pacific and European RIRs or reverse DNS—as currently relied upon by participants in the grey market. Whether the carrier is able to exclude errors in such registries—such as those caused by a failure to register previous grey market transactions—must certainly be an initial focus for the carrier.

As a new type of insurance product, other key preliminary issues must be resolved, such as the carrier's cost and methodology to validate this opportunity, underwriting protocol and marketing issues as well as the amount the carrier could charge in premiums in order to recoup its start-up and ongoing costs while still providing for an appropriate risk-adjusted return on such investment.

The scope of actual coverage will likewise require thoughtful analysis of the following points:

- *Named Insured*: Only the purchaser, its affiliates (thereby enabling the purchaser to transfer addresses within its corporate structure without losing this protection) and/or successors as well?
- *Covered Loss*: Is it only the loss of the right to use an otherwise fully operational IPv4 legacy address after a judicial determination of ownership or does it also include the loss of use of that address that might arise without such a final judicial ruling?

- *Carrier's Responses to a Covered Loss:*

- Assuredly, the carrier must provide the insured with a defense in connection with a covered loss, which presumably may also enable the carrier to settle with the challenger on acceptable terms.
- The larger question is what other options may be available to the carrier. For example, would the carrier have the contractual right to either
  - pay insured the lesser of (A) the amount of chosen coverage less retention or (B) the actual damages sustained by the insured (perhaps calculated as the lost profits caused by the service outage between the time the subject legacy IPv4 address became unavailable for use until the time that loss was identified and then promptly remedied);
  - replace legacy IPv4 address by purchasing a new legacy IPv4 address in the grey market or by issuing the insured one of the legacy IPv4 address that Carrier retains for such replacements and/or in its investment account; and/or
  - replace the functionality of lost legacy IPv4 address through other than available technological means.

As with all insurance policies, this new product would also include carefully crafted exclusions that would address the following key concerns:

- sea-change events in the global governance and/or operation the Internet (e.g., the elimination of the RIRs and the concentration of their authority into a newly organized entity that perform similar roles on a global basis);
- the adoption of the license approach as the law in the country of the seller and/or the buyer or the choice of law included in the transactional documents;
- traditional force majeure exclusions, but now expressly including significant Internet outages;
- pre-coverage actions or events other than earlier grey market transactions involving the covered addresses;
- any subsequent inability to actually route the subject legacy IPv4 address and/or the impact on its usage by the insured if attacked by hijackers or squatters;
- intentional acts of the insured that negatively affect the right of the insured to use the subject legacy IPv4 addresses;
- prior knowledge of the insured of defects in title that could reasonably be expected to cause, facilitate and/or lead to a covered loss;
- security interests in the subject addresses and the effect of subsequent foreclosure; and
- any governmental and/or quasi-governmental actions, including the imposition of assessments and/or taxes, which may impose encumbrances on the subject addresses.

Since no similar insurance product is presently available to support legacy IPv4 transactions in this way, it seems logical to assume that the willingness of a well-financed, independent third party to provide confirmation of title and/or the exclusive right to register—even if subject to these types of reasonable exclusions and other limitations—should be embraced by the grey market as a manner to address this key transactional concern. Indeed, the availability of such a spot-on product could conceivably expand the size of the grey market, ultimately becoming as critical to consummating such transactions as title insurance is to real estate matters and representation and warranty coverage is in corporate transactions.

## **Conclusion**

It is impossible to know for certain how long the current supply/demand imbalance in available Internet addresses will continue to exist. Even if the insurance product discussed in this article is properly structured,

priced and marketed, it is possible that continued improvements to the functionality of IPv4 addresses could close the window sooner than expected. However, the much more frequently cited pacing item is the date by which IPv6 deployment has reached the “tipping point.” Predictions of that date have been notoriously inaccurate—ranging from 2021 to 2044— and the current global adoption rate is quite low.

This tipping point seems to be quite a while in the future, but even while the transition to IPv6 continues its glacial pace, the Internet will most likely continue to need IPv4 addresses under the dual-stacking approach, and the grey market will continue to seek better assurance that the intent of the parties that are involved in such trading is accomplished. Opportunity awaits for technologically astute carriers.

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