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I. Introduction

My name is Kevin Fink and I am the co-founder and chief technology officer of N2H2, Inc, a publicly-traded company based in Seattle, Washington. I would like to thank the COPA Commission for the opportunity to tell you more about N2H2 and our approach to Internet filtering.

Specifically, I will focus on:

1) An Overview of N2H2's Market Presence.
2) N2H2's Principles of Internet Content Management.
3) How Our Technology Supports Our Principles
4) Closing Thoughts on Future Advances in the Filtering Industry.

II. An Overview of N2H2's Market Presence

N2H2 is a leading Internet infrastructure company specializing in filtering, Internet management and content delivery services for schools, home and work. While expanding now into the corporate and home markets, the company has built its reputation on its presence in the K-12 education market. We combine advanced Internet technology and human review to make the Web more meaningful to 12 million student users over an established network of more than 1,500 Internet appliances in the U.S., Canada, Australia, U.K., Japan, Germany, Mexico, Chile, Bermuda, India and China.

N2H2 is trusted by:

- Over four times as many schools as the next closest competitor (Quality Education Data, 5/99);
- Over 58 percent of school districts with server-based Internet filtering;
- Over 15,000 schools and libraries;
- Statewide networks in Ohio, Tennessee, Maine, Iowa, Idaho, Arkansas and Wisconsin, as well as major school systems in Los Angeles, Baltimore, Boston, Brooklyn, Bronx, Long Island, Dallas, Calgary, Seattle, Stockton, Tampa and many more;
- Over 75 percent of Australian schools.

III. N2H2's Principles of Internet Content Management

At its core, N2H2 is a technology company that answers a demand in the marketplace. We have no ideological axe to grind. We simply try to develop the best possible technology solutions by listening to our customers' needs. In building and improving our services, three market-driven principles guide the process:

1) We focus on choice, customization and control.

This is paramount. We do not keep a "blacklist" of sites and force that list on customers. We allow customers to choose their Internet content. While the Internet explosion is creating exciting new opportunities for education, entertainment and commerce, issues still abound:

- Parents, teachers and employers want the power to choose what Internet content is safe, productive, relevant and/or bandwidth friendly.

- What is considered acceptable or productive Internet content for children and employees varies with every geography, organization, culture and household.
- Privacy issues abound that limit the public's confidence to freely communicate or conduct business over the Internet.

2) We strive to deliver the most sophisticated and accurate database.

We use artificial intelligence and proactive human review to continually add to and maintain our multi-million-entryURL database.

3) ***We offer a complete, comprehensive service solution***.

We strive for a "turn-key" solution. Our goal is to become transparent to the user and hassle-free for the system administrator.

IV. How Our Technology Supports Our Principles

1. We focus on choice, customization and control.

Our content management solutions are based upon choices that empower customers with the ability to create the customized Internet they want.

Feature #1: We separate URLs into categories and allow our customers to choose which categories are appropriate for their network.

To deliver the Web that our customers want, we need to offer flexibility in what is blocked. We provide them with an extensive database of URLs that have been marked as belonging to one or more of over 30 content categories (e.g., pornography, sites that

promote hate speech, job search sites). Customers may choose to enable or disable content from each of these categories. It's up to the customer to make that decision, although we will provide advice and examples based on our extensive experience with Internet filtering. We have worked with customers over the past five years to build more than 200 customized configurations.

Communities (i.e. schools) define themselves by the things they allow and disallow. N2H2's filtering strategy supports this time-honored process of community self-definition. Initially, we protect our children from items we don't allow and as they grow up and become mature participants in the community, children take increasingly greater responsibility for defining the community. This shift is reflected in the evolution of a filtering system's major role from safety to productivity as students move from kindergarten through the 12th grade.

Feature #2: We offer "exception" categories.

Customers have the opportunity to customize their Internet experience based on content context. For example, copies of The Starr Report, include the "History" exception to sex categories. A school that wanted to block access to most sex sites, but allow access to those of historical significance, including the Starr Report, has the ability to do that. Another often-used exception category is "Text-Only", which many public libraries use to tailor their Internet access policies to match their policies on access to literature. The "Text-Only" category allows them to block sites with pornographic imagery but allow textual erotica. Other exception categories include "Education", "For Kids", "Medical", and "Moderated".

Feature #3: We allow local overrides.

Customers have the ability to add URLs to or delete URLs from their server's database. It only affects that particular customer's database. For example, if a particular school wanted to allow access to a site giving graphic detail on the Holocaust but wanted to continue to block other sites containing graphic imagery, they could add that particular site to their override database.

2. We strive to deliver the most sophisticated and accurate database.

N2H2's content review process has created the world's largest proprietary Internet filtering database through artificial intelligence and human review.

Feature #1: Automated agents continually seek out candidate sites.

These agents use artificial intelligence to identify and prioritize sites that appear to be relevant to one or more of the categories that we track. They run continuously on a distributed network of over 70 servers, pulling data directly off of the World Wide Web, as well as from Usenet postings, electronic mail, Inktomi's URL database, domain name registration databases, and many other sources.

Feature #2: We use human review to categorize the candidate sites.

Artificial intelligence alone is insufficient to accurately categorize websites. Our Website Analysis Team consists of over 100 people who receive extensive training. They review the content that has been identified by the automated agents and assign categories to each website or portion of a website. They divide each site into

sufficiently granular portions to guarantee that each individual page is assigned the correct category or categories.

Feature #3: We leverage our vast feedback loop.

All of the more than 12 million Internet users on our filtering system have the ability to notify us of potentially uncategorized or miscategorized content. If any user locates a web page that they feel should or should not be accessible, they can easily send that URL to the N2H2 Website Analysis Team for review. N2H2 has made this feature easy to access by literally millions of users with a single click from the Block Page or Resource Bar™. This has the effect of expanding our effective review staff from hundreds to potentially millions of people, all working together to build an accurate map of the Internet's content.

3. ***We offer a complete, comprehensive service solution***.

N2H2's Internet Filtering Solution is delivered via a carrier-quality, interoperable, open-architecture system.

Feature #1: We provide automatic nightly updates.

Each night, we update the URL database on each of the more than 1500 servers in our network. Although most of these servers are located on our customers' premises, our systems update them automatically. This keeps the database current without requiring anything of our customers.

Feature #2: We continually monitor and maintain our network of filtering servers.

N2H2's support staff uses a sophisticated system to continually monitor and maintain our network of servers. Each server is

continuously monitored for availability and proper performance, and support staff are notified immediately of any issues. In addition, each server is automatically maintained via both internal and remote systems.

Feature #3: N2H2 expert technical support is available 24 hours a day, seven days a week.

In addition to continually monitoring our network of servers, N2H2 support staff are available 24 hours a day, seven days a week to help all of our customers. Because of their extensive networking experience, they are often able to quickly diagnose and provide fixes for customer issues that turn out to be peripheral to our servers. Although not part of our contractual obligations, we feel that our customers are our partners in providing safe, relevant, and productive Internet access, and helping them towards this end is part and parcel of our service.

V. Closing Thoughts on Future Advances in the Filtering Industry

Internet filtering has progressed significantly since its introduction in the early days of the World Wide Web. The first filtering was implemented entirely on client computers, which limited the sophistication of the filtering and the security of the solution. The next wave of products moved to a server-based approach, which offered significantly more sophisticated, and thus accurate, filtering and an extremely secure solution. By centralizing control, however, some individual control was lost.

The next wave of filtering solutions, which are just coming on the market today, will diverge into two paths, depending on the network's requirements. Solutions geared towards ISPs, libraries,

and other networks used by large numbers of individuals with specific access needs will use a hybrid approach which will offer the power and security of server-based filtering along with the customizability of client software.

Solutions geared towards corporations, government agencies, schools, and other networks used by groups of users will continue to use a server-based approach, and will become more integrated into overall network architectures. They will work closely with routers, switches, firewalls, and other network hardware components. They will also become integrated with network management systems, so that network policy will be managed at a single point.

In both cases, filtering systems will continue to rely more and more heavily on hybrid approaches, leveraging the intelligence and perception of human reviewers with the speed and tirelessness of computers. These solutions will use artificial intelligence for the tasks which humans aren't well suited to, like individually reviewing every product in an e-commerce database, and human intelligence for tasks which computers aren't well suited to, like differentiating between pictures of the Mona Lisa and pictures of "Mona's Mountains".

URL databases will also continue to become larger, more targeted, and more accurate. When N2H2 began assembling our URL database in 1995, we had two categories: "naughty" and "nice", which were used for all of our customers, whether they were kindergarten classes or 12t^{h-}grade libraries. We added additional lists to accommodate different types of users, then moved to a category-based approach where our customers could build exactly the lists they needed. We continually add categories as our customers indicate the need for additional precision, as well as adding additional customization features such as local override databases and per-user category selection.

In general, filtering systems will become easier to manage and more accurate in their implementation of network policies. They will continue to evolve to keep pace with the evolution of the content they seek to categorize and the access they seek to control. They will also extend beyond "blocking" to offer more direction and help to users who are trying to find particular pieces of content.

Now and in the future, these systems will help to encourage safe, knowledgeable, confident, and productive use of the World Wide Web. N2H2 is working hard to ensure that we remain focussed on satisfying our customer's needs, staying on the forefront of technology and service to allow them to take full advantage of all the Internet has to offer.

Thank you for your time.