



RealNetworks

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RealNetworks is a streaming-media software firm located in Seattle, Washington. The firm's streaming software products enable multimedia content developers and others to stream both audio and video content over the Internet and Intranets to end-users.¹ End users, in turn, can view this content with the firm's "player" software, known as RealPlayer. Within three years of its founding, the firm has managed to create a strong demand for its streaming server software products and become a leader in this important segment. Many aspects of its business model are currently being imitated by competitors.

The firm permits users to download its RealPlayer software for free at its Web site, <http://www.real.com>. With over 40,000 downloads a day, the firm claims that over 18 million RealPlayers have been distributed globally. Recently, the firm signed an exclusive licensing agreement with Microsoft Corporation, the world's dominant PC software firm, to bundle RealPlayer with every copy of their Internet Explorer that Microsoft distributes. Microsoft's Internet Explorer is the world's second most popular Internet browser software, after Netscape's Navigator. However, despite its rapid growth and well-entrenched position, top management at RealNetworks faces a host of challenges.

This case discusses the genesis of RealNetworks, its rapid growth and approach to competition in the audio and video streaming on the Internet and Intranet markets. It highlights the issues faced by the firm as its top management formulates its strategy to continue its rapid growth in the face of different uncertainties and challenges.

¹ Streaming technology enables the transmission and playback of continuous "streams" of multimedia content, such as audio and video, over the Internet and Intranets and represents a significant advancement over earlier technologies.

COMPANY BACKGROUND

Founded in April 1994 RealNetworks (formerly known as Progressive Networks) has quickly established itself as a pioneer and industry leader in the delivery of real-time audio and video content over the Internet. The firm was the brainchild of Rob Glaser, a former Microsoft executive. Early in 1994, Rob was toying with the idea of using interactive multimedia technology to create a “cable channel focused on politics and culture.” Robert Reid, who has chronicled the early growth of the Web and Rob Glaser’s contributing role in its evolution, points out that:

The notion of interactive television (ITV) was by then [early 1994] all the rage. Many smug pundits were even viewing the PC as downright dowdy. For his part, Rob was at first agnostic about whether to use ITV or the PC as the medium for his half-formed vision. Then he encountered Mosaic—a ‘total epiphany,’ he remembers. He almost immediately concluded that ‘interactive TV was going to be stillborn,’ and that ‘the whole mechanism that Mosaic had used to bootstrap itself, A, was a big deal in its own right, and B, once established, itself could be used as a bootstrapping mechanism for other stuff.’ That *other stuff*, or rather some of it, turned out to be RealAudio.²

According to a report in *The Wall Street Journal*: “Mr. Glaser sank about \$1 million of his own money into a start-up that would first produce software for compressing and transmitting sound. With additional funding from friends such as Lotus founder Mitch Kapor, RealAudio 1.0 quickly made its debut in April 1995.”³ It had been exactly one year since Rob founded RealNetworks.

Despite some disdain from the Internet elite, because of the tinny sound which created an unsatisfying experience, RealAudio 1.0 broke the Web’s sound barrier. Soon, however, the product began to win industry favor. Notes Reid:

RealAudio debuted on the Web on April 10, 1995, along with content from ABC News, National Public Radio (NPR), and others. Tiny Progressive was soon covered by such publications as *The New York Times*, *The Wall Street Journal*, and *The Economist*. *USA Today* characterized RealAudio as ‘The technology of the ‘20s meeting the technology of the ‘90s,’ while *Time* [Magazine] meanwhile assured the image-conscious that ‘Glaser’s system is not just for geeks.’⁴

Within a month, Netscape, the world’s largest browser-software firm, began shipping RealAudio as part of its Navigator browser software. By August of that year, RealNetworks had sold its server products to several large Internet media companies including Starwave, Ziff-Davis, and ABC News.

Just months later in October 1995, the firm released a newer and more advanced version of its server and player (RealAudio 2.0) products. The firm’s player software won the Internet World Magazine’s “Outstanding Software Product of the Year” award in April of 1996. By September of 1996, the firm released yet another version, this time RealAudio 3.0. Shortly thereafter Prodigy, a leading Online Service Provider, began bundling the firm’s player software with its custom browser. Although there were a handful of other firms providing audio-streaming solutions, none matched the rapid growth of RealNetworks.

Having established itself as a leading provider of audio-streaming software, the firm turned its attention to video streaming. According to a report in *Wired*:

In December 1995, while attempting to vacation in Hawaii, Glaser got some email from a two-person San Francisco company, FreeVu, which had an Internet videoconferencing tool under development. Glaser took a

² R. Reid, *Architects of the Web*. NY:Wiley, pp. 77.

³ A Web pioneer does a delicate dance with Microsoft, *The Wall Street Journal*, February 12, 1998.

⁴ Reid, p. 79.

look, was impressed, and persuaded FreeVu's principals to sign on as Progressive employees. RealVideo's development effort had begun.⁵

In February of 1997, the firm released a product that combined video and audio streaming, RealPlayer 4.0. At this time however, unlike when audio-only player was released, there were several video-streaming providers Xing Technologies, VDOnet, Vosaic and VXtreme who already marketed products on the World Wide Web (WWW). Recognizing this, Rob signed an exclusive licensing agreement with Microsoft to bundle RealPlayer with Internet Explorer. With such an agreement, the firm has had little difficulty in achieving a dominant position in video streaming on the Internet.

In September 1997, the firm changed its name from Progressive Networks to RealNetworks and filed for an initial public offering (IPO). The IPO was undertaken to raise capital to continue to fund further product development. During this period, the firm also introduced its fifth major upgrade of its server (RealSystem) and player (RealPlayer) software.⁶ On October 3, 1997 the firm went public on the NASDAQ Stock Exchange with a 3.5 million-share offering. The stock opened at \$12.50 per share and then moved higher to \$19 per share before settling around \$16. Net proceeds for the offering were approximately \$38.5 million. The stock has remained healthy throughout the fall of 1997, despite the slump in over-the-counter stocks of other Internet companies. Within a three-month time period, Rob had successfully partnered with Microsoft, launched a major upgrade of the product system, and had taken RealNetworks public.

With frequent product upgrades, RealNetworks has garnered widespread support and won many industry awards. For example, writing about its latest product upgrade, Allen Weiner, an analyst with Dataquest, notes that the firm has demonstrated superiority in all areas of streaming:

With the release of RealSystem 5.0, RealNetworks is taking the streaming media market by storm...RealNetworks' emphasis on innovation, coupled with its cross-platform architecture, incredible brand recognition and majority market share, continues to place it at the forefront of the streaming media market."⁷

Most importantly, RealNetworks has managed to compile an impressive list of companies that use its server software to transmit multimedia content over the Internet. This list includes all three major US television networks (NBC, ABC and CBS), two major long-distance telephone carriers, the United States Senate, and many of the biggest companies in the music industry, including SONY. In just four years since its founding, RealNetworks has produced over eight product varieties and has grown to over 350 employees. For 1997, the firm as a whole reported total revenue of \$32.7 million, an increase of 134% from \$14.0 million in 1996. However, the net loss was \$11.2 million for 1997, compared to \$3.8 million for the previous year (see **Exhibit 1**).

PRODUCTS, MARKETS, AND COMPETITION

RealNetworks competes in two different markets—the Internet and the Intranet markets. The potential Internet customers include the Web site creators and the end users that access those Web sites. The potential Intranet customers include all businesses that have internal networks that connect employees.

⁵ R. Reid, Real Revolution. *Wired*, Issue 5.10, October 1997.

⁶ When the firm releases a new product, it releases both the server and player versions simultaneously. For example, the most recent product released by the firm is the RealSystem 5.0. Customers can acquire either the server or player version of the new software. The new RealVideo servers are always backward compatible with older server products and can stream audio only, or video *and* audio content.

⁷ RealSystem 5.0 Experiences Rapid Market Adaptation, *RealNetworks Press Release*, December, 1997

The Internet Market

Core Products The firm's core products include: the RealPlayer and RealSystem server software. The RealSystem server software allows developers to display, or "stream," video content to viewers via the Internet. The RealPlayer software enables individuals to view a video clip being "streamed" from a server. The player software can be downloaded for free directly from the firm's Web site. The firm also offers RealPlayer Plus, an enhanced version for \$29. This version includes several easy to use features including memory buttons that are not included in the free version. It can be purchased separately in a retail software store or purchased bundled with products such as modems. It can also be downloaded and paid for directly from RealNetworks.

When using the RealSystem product, customers have the choice of either streaming video "live" or "on-demand." In order to stream video on-demand to Internet end-users (viewers), a customer or developer must take three steps. First, using the RealPublisher tool that is included with the RealSystem software she converts the video content into digital-video file. Special video-editing equipment not included with the RealSystem software is needed for this process. Second, the customer uploads this file on to a server computer that end-users can reach. When end-users link to the server using a browser with RealPlayer software (a plug-in) properly installed, the player software will automatically begin streaming the video from the server on to the viewer's computer.⁸

As noted before, the most recent product release from RealNetworks is RealSystem 5.0. This version includes capabilities that were not part of earlier products (see **Exhibit 2**). Since its release in the fourth quarter of 1997, the number of Web pages using streaming media has grown by 50%. According to industry experts about 80% of those Web pages now use RealAudio, RealVideo or RealFlash content.

Despite the growing popularity of video streaming, the quality of the video streamed over the Internet does not compare to that of broadcast TV.⁹ Although the quality of the streaming video has improved with each new product release, the video images still look jerky when customers use a 28.8 Kbps modem to access such content. But for customers who use higher-bandwidth access lines such as an ISDN connection, the video quality is markedly better.

Other Products and Services In addition to selling software products, the firm offers a range of consulting services. These services include training sessions on (a) how to set up and administer the firm's server software, and (b) creating RealAudio and RealVideo content. For large customer installations, the RealNetworks consulting staff often assist in re-designing the customer's information systems to best adapt and incorporate its streaming technology. Although some of the consulting services offered by the firm are free, many are fee-based and charges for such services vary with individual client requirements.

An additional source of revenue for the firm is its content aggregation and hosting business on the Internet. On the firm's Web site, customers can view different types of content (audio or video)

⁸ The approach used for streaming media live is similar. The difference between live streaming and on-demand streaming is that the content is converted to streaming format as it is being created. For example, a customer could stream a live video of a conference speaker. To view the speech, a person would have to be at his or her computer at the same time of the actual presentation. Live streaming media content can be recorded for on-demand viewing at a later time.

⁹ Television video (using NTSC standards) has a basic rate of roughly 100 megabits per second. Encoding this signal at 100 Kbs implies a compression ratio of 1000:1. By comparison, audio is typically compressed at a rate of roughly 15:1. Clearly, the process of video compression is challenging. Solutions typically involve dramatically reducing (sub-sampling) the size and frame rate of the images. However, such tactics induce visual artifacts in the reconstructed images. Artifacts are noticeable differences between the original images and the encoded images that can be identified and characterized.

assembled on many different Web properties. Although many are by managed by RealNetworks, some of them are owned and maintained by others. But all of these sites are hosted by RealNetworks (see **Exhibit 3** for a detailed list). By combining different sites, the firm hopes to demonstrate the capability and superior quality of its streaming technology solutions (relative to its competitors), provide exclusive access to interesting multimedia content to Web surfers, and generate revenues from advertisement sales based on the sites' ability to attract traffic. Finally, the firm operates a virtual store called RealStore, where customers can purchase products such as content-creation utilities, training videos, modems, and other software products.

Competitive factors in this market include: (a) the quality and reliability of software; (b) features provided for creating, editing and adapting multimedia content; (c) the ease of use and interactive user features provided as part of the system; (d) issues pertaining to scalability and cost per user; and (e) compatibility with the user's existing network components and software systems.

Customers The firm's Internet customers can be broadly segmented into two groups: server and player customers. These two segments can be further divided by customer requirements. For the player segment, there are three basic types of customers—beginner/light users, experienced/light users and advanced users. Beginner/light users are interested in a viewing solution that is easy to install and use. These customers are likely to choose the \$29 RealPlayer Plus product over the free version distributed by the firm. This is because this “plus” version includes a manual that provides installation and set-up instructions. The more experienced/light users are likely to choose the free version of the RealPlayer product. Finally, the advanced users, may or may not choose the Plus product depending on how much they value the extra features offered by that version relative to competitor products.

The Internet server customers can be divided into the following five specific segments that include:

- Media Companies. These include companies such as *The Wall Street Journal*, CBS, Fox News, and Warner Brothers who create content and fund parts of the infrastructure for delivering that content.
- Commercial Web Site Developers. They include businesses with Web sites that are used for revenue generation. Examples include Yahoo!, Lands' End and numerous others. Some of these sites generate revenue via transactions, while others focus on generating advertising revenues based on the traffic attracted to the sites.
- Non-Commercial Web Site Developers. These are firms that operate Web sites to distribute information. Examples include government agencies, schools, and private clubs that could potentially include streaming content on their sites.
- Internet Service Providers (ISPs). ISPs are the businesses that sell access to the Internet. In addition to access, ISPs often offer Web site development and management services to their customers. These types of businesses may wish to offer their customers streaming capabilities and thus purchase streaming server products directly from RealNetworks.
- Streaming Service Providers. Some businesses exist solely to develop and manage sites with streaming content. US-West Enterprise Networking and Digital Nation are examples of “hosting” service businesses.

As of December 1997 there were an estimated 40 million Internet users in the world. According to NetRatings, a market research firm, by the year 2000 this number is expected to grow to 200 million. In January of 1998, a little over 21% of all US households had access to the Internet. Of these, about a quarter had signed up only in the preceding six months. Hence, the size of the potential consumer market for the firm's products is growing rapidly, but so is the competition.

Competition The market for software and services for the Internet (and Intranet) is relatively new, constantly evolving, and becoming intensely competitive. In a broad sense, audio and video streaming technology faces competition from traditional media such as TV and radio broadcasting, and storage devices such as VCRs and CD-ROMs. A major limitation of current streaming technology

is its inability to deliver the video quality similar to that of broadcast TV. Hence, these existing alternatives limit the immediate market potential for streaming products. However, the appeal of streaming media is its potential to deliver multimedia content directly to users *on-demand*.

RealNetworks' direct competitors include companies such as Microsoft, VDOnet Corporation, Xing Technology Corporation, VivoActive Software, Inc., and Vosaic LLC. All of these companies currently offer products and services that are similar to RealNetworks' (see **Exhibit 4** for third-party reviews of the products). Additionally, there exist a large number of potential competitors such as media companies and browser developers that may aggressively pursue this market.

A competitive threat that RealNetworks faces is the likely integration of streaming software with other widely used applications. Although Microsoft currently ships its Internet Explorer browser software with a RealNetworks' media player, it has announced that future versions of its Operating Systems will include a built in streaming-viewer product. For example, a product labeled "Windows Media Player" is expected to be included in forthcoming Windows '98. Furthermore, Microsoft has also announced plans to release a server product for video and audio streaming, known as SiteServer. It intends to provide its player and server products for free. Although some Web-browsers already include a "media player" component, industry observers predict that all Web-browsers will include a streaming-media viewer in the near future.

RealNetworks' products also compete, to a lesser degree, with non-streaming audio- and video-delivery technologies such as AVI and QuickTime, and indirectly with delivery systems such as Macromedia's Flash. Flash marketed by Macromedia Inc., a leading producer of animation and multimedia authoring software, is a product used for delivering text-based training content on the Internet.

The Intranet Market

Products There are two basic products targeted at Intranet customers: the server, and player products. Businesses interested in streaming video and audio content can purchase both the server and player as a bundle. Such bundles are available in five configurations. The low-end solution bundle is free, offering the ability to stream 10-video clips at one time. This product is called the Intranet Solution RealServer 5.0. The second bundle, the RealSystem Intranet Solution IS100, allows for 100-simultaneous streams and is priced around \$5000. It offers features not available in the free version. The third bundle, the IS600, is priced at \$25,000 and supports 600 streams. The two largest bundles, the IS2500 and the IS7500, support 2500 and 7500 streams and cost \$50,000 and \$100,000 respectively. These prices are for annual licensing fees. In addition to the licensing fees, customers have the option to purchase support and upgrade contracts ranging from \$2,000 to \$40,000 depending on the bundle purchased initially.

Customers Although there are many types of businesses buying solutions from RealNetworks, the firm targets companies with an Intranet. Intranets are private-computer networks that use Internet technology to connect employees within the firm. Specifically, they focus on businesses that: (a) can afford a \$50,000 solution, and (b) frequently create multimedia content for company-wide dissemination. Many businesses recognize the benefits of streaming multimedia content to employees in many different locations nationally and globally. RealNetworks promotes two streaming video applications for such firms:

- **Corporate Communications.** Businesses can use RealVideo and RealAudio to distribute company-wide information. For example, the Boeing Corporation uses RealVideo to provide employees with the latest information on their company, products, and industry. Boeing estimates that it saved nearly a million dollars in 1997 on replication and distribution costs of multimedia content alone.

- **Training.** Businesses can use RealVideo to stream training material to employees. Such video training modules can be viewed *on-demand* by employees in different locations. For example, General Electric uses RealVideo to create video-based interactive product training programs for new employees. Such programs are distributed over the firm's Intranets.

RealNetworks sells RealSystem Intranet solution products directly to customers. For large customers, RealNetworks has outside account executives and consultants available to visit the customers on-site. These account executives and consultants study the customers' requirements before making a recommendation.

Competition VDOnet Corp., Xing Technologies, and Microsoft compete with RealNetworks in the Intranet market. All three competitors have streaming-video products targeted at businesses with corporate networks. The technologies offered by VDOnet and Xing Technologies are designed specifically for higher-speed networks, and thus are more of a threat to RealNetworks in the Intranet market than in the Internet market.¹⁰

APPROACH TO COMPETITION

Rob Glaser's objective is to build RealNetworks into a "leading media streaming company, providing software and services that enable the delivery of a broad range of multimedia content over the Internet and Intranet, thereby facilitating the evolution of the Internet into a mass communications and commerce medium." He, along with his top management team, plans to achieve this objective by: (a) making the "Real" brand name ubiquitous on the Internet and corporate Intranets; (b) developing and fostering alliances and partnerships to promote multimedia streaming; (c) shaping industry standards for streaming; and (d) funding technological innovation regarding streaming technology to stay ahead of the competition.

Brand Ubiquity

From its inception, RealNetworks has chosen to offer its RealPlayer software to individuals free-of-charge. RealNetworks has done so to promote the widespread adoption of its client (player) software and to speed-up the acceptance of the Internet as a mass-communications medium for streaming multimedia content. Any person with a PC and an Internet connection could download a free copy of the firm's player software to view and listen to video and audio clips. Notes Rob:

Our belief has always been that we benefit tremendously by pursuing the most rapid and broadest paths to growing the streaming-media market. . . . You can expect us to continue to be oriented towards ubiquity.¹¹

Notes Reid:

The genesis of Rob's decision to give away his client software lay in his decade...[of experience at]... Microsoft. There he learned that if you make your business beholden to making money from the initial-use client software, the result could be easily be that Microsoft would just sort of suck away your core business, either by putting a feature in Windows, or by aggregating a set of things like with Office.¹²

According to Reid, although Rob's business model appears similar to that pioneered by the Netscape Corporation, it was in no way inspired by it. Indeed, Rob settled on this model months before the

¹⁰ One major difference between Intranet and Internet customers is the speed of transmission. The transmission between an Intranet server and a player is usually much faster. This is because businesses have network connections for their employees' computers that are faster than the modems typically used for home computer users. Faster transmission of data means that video clips are less distorted.

¹¹ G. Welz and J. Carl, Progressive Networks' CEO Talks About RealVideo, *Web Week*, March 17, 1997.

¹² Reid, p. 79.

Navigator, Netscape's browser software even shipped.¹³ Recalls Rob: "I was really struck by the fact that if you look at the long-term survivors against Microsoft—Novell, Oracle, even Intuit...they didn't try to make all their money on initial-use client software. They made their money on a mix of things."¹⁴ To encourage free RealPlayer downloads and RealPlayer Plus sales, the firm advertises heavily on the Internet. RealNetworks also promotes its brand name with many public relations activities.

As mentioned earlier, Rob Glaser and his firm have managed to attract the attention of many mainstream journalists from newspapers and magazines including *The New York Times*, *The Wall Street Journal*, *USA Today*, *Time*, and *Wired*. Also, the firm's products have garnered many awards at industry trade shows, thus increasing the firm's visibility. So it is not surprising that Rob claims with confidence that, "Our 'Real' brand is one of the most widely recognized brands on the Internet."

Alliances and Partnerships

Under Rob's leadership RealNetworks has formed numerous partnerships and alliances. It has signed development partnerships with others to ensure that its products work well when integrated with their technologies. When using a streaming media solution, server customers in particular are mixing this technology with hardware and software products bought from others. For example, the firm partnered with Microsoft to ensure the RealPlayer and RealSystem products work in Windows 95 and Windows NT environments. RealNetworks has also partnered with Sun Microsystems, the makers of the Solaris Operating Systems to ensure that its products will operate smoothly in an Unix environment. The firm also makes its products compatible with machines that use the Macintosh Operating System. Additionally, the firm has agreements with Macromedia Inc., the largest provider of animation-editing software, to transmit animated material over the Internet.

The firm also partners with technology companies to create combined services. In August of 1997, for example, RealNetworks signed a joint venture agreement with MCI and launched the *Real Broadcast Network*. This pilot service, created by combining the RealSystem technology with MCI's world-wide Internet network infrastructure, offers broadcasting services for content developers to deliver tens of thousands of video streams simultaneous on the Internet. MCI, which owns a significant portion of the Internet infrastructure (or backbone), has upgraded its infrastructure to facilitate rapid streaming. This was done by strategically placing RealNetworks splitter and multicast technology throughout its network. Such devices eliminate bottlenecks by allowing computer users to access a video/audio feed from the closest of MCI's nine US locations. RealNetworks and MCI are targeting media companies and Fortune 1000 companies that might use this service for internal employee training or to post new product announcements on the Web. ABC News' on-line service, for example, used the service to broadcast audio and video clips accompanying a text story of the 1997 UPS strike. Other customers include Atlantic Records, ESPN, and Home & Garden Television.¹⁵ The service costs up to \$8,500 a month. The cost is much higher for continuous broadcasting.

Shaping Evolving Industry Standards

The firm's efforts have also focused on shaping industry standards regarding streaming technology and protocols. An aspect of the firm's rapidly evolving marketplace is the trend towards open standards and protocols for streaming software. Until recently, only users with a RealNetworks' viewer could watch video and audio clips streamed from the firm's server products. RealNetworks has also joined other important industry players (e.g., Microsoft and Sun Microsystems) in their efforts

¹³ R. Reid, Real Revolution. *Wired*, Issue 5.10, October 1997.

¹⁴ R. Reid, *Architects of the Web*, p. 80.

¹⁵ MCI and Progressive Team Up; Microsoft to Acquire Vxtreme, *The Wall Street Journal Interactive Edition*, August 10, 1997

to set protocol, transmission and compression standards. For example, RealNetworks and Microsoft have taken special efforts to define the industry standards for streaming products. Their goal is to ensure that any server software can send streams (audio and video) to any player. Emphasizing the need for common standards, Microsoft's soon-to-be-released Windows Media Player will be able to play streams from RealNetworks' server software. At that time, the NetShow, a Microsoft server product, will play video streaming from RealNetworks' server products. Similarly, RealPlayers could play video streaming from Microsoft's NetShow server.

On July 21, 1997 Microsoft acquired a 10% nonvoting minority stake in RealNetworks for \$30 million. However, Microsoft's new NetShow product is a direct competitor to RealVideo, RealNetworks' video-streaming software. The two companies declared that the partnership was necessary if an industry standard was going to be formed. Rob, in discussing this merger with Microsoft, comments:

We see a real pathway forward to turn the Internet into a mass medium. We have worked successfully with Microsoft in the past, and this agreement brings our relationship to a new level. The ultimate goal is for Microsoft's and Progressive's streaming formats to become fully compatible, allowing all on-line audio and video broadcasts to be interpreted by both companies' players.

Notes Rich Tong, a Microsoft vice president: "The user only wants it to work....So it is good business to work with RealNetworks to set standards for compatibility and expand the market for all of us."¹⁶

Several of the streaming technologies that RealNetworks has developed have been submitted to Internet standards committees for review. Although none of these standards have been completely accepted by the players in the industry at this time, many are highly favored.¹⁷ The firm aggressively pursues the acceptance of these standards so that industry recognition as well as more market share may be forthcoming. However, because of RealNetworks' 80% market share, its approach to streaming has become the de-facto industry standard.

Technological Innovation

Every time a competitor releases a new product the industry observers quickly rush to compare the product to RealNetworks' products. Hence, frequent product upgrades and improvements were necessary to stay ahead of competition. The firm devotes a substantial portion of its resources to developing new products and product features, expanding and improving its fundamental streaming technology, and strengthening its technological expertise. For example, during the fiscal year ended December 31, 1996, and the six months ended June 30, 1997, the firm spent 34% and 41% of its total net revenues on research and development activities. As of August 1997, the firm had 90 employees, or 32% of its workforce, engaged in research and development activities. RealNetworks' executives note that the firm must hire additional skilled software engineers to further its research and development efforts. Given its small size, such efforts are increasingly straining the firm's resources and capabilities.

¹⁶ *The Wall Street Journal*, February 12, 1998.

¹⁷ The firm has adopted RTSP (Real Transport Streaming Protocol), a proposed protocol for standardizing the control and delivery of streaming media over the Internet. The firm claims that RTSP is a unified standard for broad range of media data types and is intended to promote a greater level of interoperability among various streaming media solutions. RTSP is built on top of a number of other Internet standard protocols such as HTTP, TCP/IP and Real Transport Protocol, and is complementary with ASF, a file format for streaming media that does not specify a method of client-server interaction. RTSP provides the client-server specification necessary to stream ASF and other file types. According to RealNetworks their proposed RTSP protocol was submitted to the IETF in October 1996 and this protocol was supported by over 40 companies.

Part of RealNetworks' R&D strategy is to hire the brightest, most experienced developers and executives in the world (see **Exhibit 5** for list of executives hired to assist Rob in managing RealNetworks). Notes Rob Glaser,

In an industry where intellectual capital is the primary asset of the firm, the people you hire can make or break the firm. Developers must be constantly nurtured and trained in order to turn out new technology at the speed of light.

CHALLENGES GOING FORWARD

As the top management of RealNetworks' look to the future, they are faced with several new challenges.

Bandwidth Constraints

The growth of the streaming-video market is hampered by bandwidth constraints of the Internet and WWW. Most home users access the WWW using 28.8 kbps or slower modems. At these low-transmission speeds, users cannot play video without distortion. However, industry experts predict that this situation is likely to change as Internet Service Providers (ISPs) and telecommunications firms such as MCI and AT&T upgrade their infrastructure to provide customers with technologies that enable greater bandwidth to WWW surfers. Also, the increasing use of technologies such as ISDN telephone lines, cable modems and direct-broadcast satellite services may help alleviate the current bandwidth constraints.

However, more troubling is the fact that a majority of Web surfers are unwilling to pay for content (print, video or audio) offered on the Internet. Although a few exceptions such as *The Wall Street Journal Interactive* exist, a majority of the content providers were still unable to convert traffic on their Web sites into paying members.

Balancing Competition and Cooperation

Despite its large market share, RealNetworks still faces significant threats from Microsoft and others. Earlier it was noted that Microsoft acquired a minority stake in RealNetworks. A surprising aspect of this agreement was that Microsoft also licensed the RealAudio and RealVideo 4.0 programming code for an additional \$30 million (see **Exhibit 6** for details of this agreement). Such a close relationship between RealNetworks and Microsoft has left many industry analysts wondering whether the firm might end up in the situation of trying to make money on technology that Microsoft gives away for free. Rob viewed the situation as follows:

If we don't execute well, it could turn out to be a bad deal. ... But face it—if we don't execute well, we would have been in just as much trouble without the deal. And if we do execute—if we keep driving our standards forward independently and remain at the forefront of the market and the technology—it'll turn out to be an amazing deal. There are pitfalls. But if you want a sure thing, you should take a job at the post office, right?¹⁸

On August 5, 1997, just 15 days after the Microsoft-Real Networks partnership announcement, Microsoft purchased V Xtreme, one of RealNetworks' biggest competitors on the Internet. Microsoft plans to use the acquired technology to further develop its products in this segment. For example, Microsoft is expected to release NetShow, its streaming server product later this year. Earlier in November of 1997 Microsoft had announced that it would include its streaming server software for free with all Microsoft NT server product.

¹⁸ R. Reid. Real Revolution. *Wired* (Online version), Issue 5.10, October, 1997.

The Department of Justice, along with several industry analysts, has expressed concerns about such tactics. It has been suggested that Microsoft is effectively trying to drive its streaming competitors out of the server business. Notes Alan Weiner, an analyst with a Dataquest Inc.:

Microsoft is taking dead aim at RealNetworks in terms of the dominance of the streaming video market. As the pipes get fatter, streaming media servers will be the backbone to serve all kinds of content in the future. It's important to establish dominance now.¹⁹

To many analysts it is unclear whether RealNetworks can compete successfully with Microsoft's free and heavily marketed NetShow product. However, a recent report in *The Wall Street Journal* indicated that:

[Microsoft] may decide to charge for the latest version of NetShow coming out this year, which would be good for RealNetworks. Microsoft will also continue to bundle RealNetworks' player software with Microsoft browser, which is good for RealNetworks. And the day after RealNetworks' Sun deal, Microsoft announced an agreement with RealNetworks' server software, also good for RealNetworks.²⁰

Continuing to Innovate

It is in this uncertain environment that RealNetworks has begun planning yet another upgrade of its player and server software. The firm hopes that by incorporating new capabilities, such as animation, ad-insertion, and pay-per-view features, it can maintain its dominant position for streaming software. However, such product enhancements cost money, which leads to the firm's most important challenge the need to focus on improving firm profitability so that acceptable financial returns may be forthcoming to its new stockholders.

Despite rapid growth, RealNetworks remains unprofitable. The firm posted a \$12 million deficit for the year ending 1997 and is unlikely to show a profit until the end of 1999."²¹ With continuous losses, it is unclear whether the firm can continue to fund the future product developments. Compounding this issue is the ever-increasing cost of developing new upgrades to its existing software. Further, finding sophisticated talent in an increasingly tight labor market is expensive.

As the novelty aspect of the Internet passes, it is likely that customers may demand better quality video streaming. The cost of funding new product developments to further advance streaming technology and add features is becoming expensive. In such an environment, management must decide whether a focus on winning market share can continue to be a viable strategy. Some at RealNetworks concede that the firm may have to look for partners to undertake joint-product development efforts in the future.

In light of these uncertainties facing the firm, Rob Glaser and his top management team have to decide whether a shift in strategy is necessary.

¹⁹ A. Orr, Microsoft, Sun ride down stream, *The ZDNet News Channel On-line*, January 26, 1998

²⁰ *The Wall Street Journal*, February 12, 1998

²¹ RealNetworks beats estimates, but Investors send stock lower, *The Wall Street Journal*, January 30, 1998.

Exhibit 1
Summary Consolidated Financial Data

	PERIOD FROM	YEAR ENDED		NINE MONTHS ENDED	
	FEBRUARY 9, 1994 (INCEPTION) TO DECEMBER 31, 1994	DECEMBER 31,		SEPTEMBER 30,	
		1995	1996	1996	1997
(IN THOUSANDS, EXCEPT PER SHARE DATA)					
STATEMENT OF OPERATIONS DATA:					
Total net revenues.....	\$ --	\$ 1,812	\$14,012	\$ 8,274	\$22,417
Total cost of revenues.....	--	62	2,185	969	4,609
Gross profit.....	--	1,750	11,827	7,305	17,808
Operating loss.....	(545)	(1,595)	(4,016)	(2,475)	(9,759)
Net loss.....	(545)	(1,501)	(3,789)	(2,315)	(8,575)
Pro forma net loss per share(1).....			\$ (0.14)		\$ (0.32)
Shares used to compute pro forma net loss per share(1).....			27,779		28,315

	DECEMBER 31, 1996	SEPTEMBER 30, 1997	
		ACTUAL	AS ADJUSTED(2)
(IN THOUSANDS)			
BALANCE SHEET DATA:			
Cash, cash equivalents and short-term investments.....	\$ 19,595	\$67,648	\$108,529
Working capital.....	16,893	50,762	91,643
Total assets.....	26,468	84,372	125,253
Redeemable, convertible preferred stock.....	23,153	49,278	--
Shareholders' equity (deficit).....	(3,320)	(8,089)	82,070

(1) For an explanation of pro forma net loss per share and the number of shares used to compute pro forma net loss per share, see Note 1 of Notes to Consolidated Financial Statements.

(2) As adjusted to give effect to the (i) conversion of all outstanding shares of Series A Common Stock, Series B Common Stock, Series C Common Stock, Series A Preferred Stock, Series B Preferred Stock, Series C Preferred Stock and Series D Preferred Stock into Common Stock and Series E Preferred Stock into Special Common Stock, in each case on closing of the offering; (ii) sale by the Company of the 3,000,000 shares of Common Stock offered hereby at the initial public offering price of \$12.50 per share; (iii) application of the estimated net proceeds of the offering; and (iv) issuance of 998,058 shares of Common Stock upon exercise of outstanding warrants at an average exercise price of \$6.97 per share (for an aggregate of \$6,956,000). Excludes up to 3,709,305 shares of Special Common Stock (representing additional cash and shareholders' equity of up to \$50,001,431) issuable on exercise of the Series E Warrant.

Source: RealNetworks Prospectus, November 21, 1997.

Exhibit 2

Major Features of RealSystem 5.0.

The major features in the newly released software include:

- Animation. In addition to streaming videos and audio messages, customers could stream animation clips, such as cartoons and computer aided drawing (CAD) sequences. Animation sequences can be synchronized with RealAudio.
 - Ad Insertion and Rotation. Moving advertisements can appear along with any video or animation sequence. If a viewer uses their mouse to click on the advertisement, they could be sent to the advertiser's Web site.
 - User Registration and Tracking. For Web site creators who wish to offer video and audio streams to select viewers only, the server software can detect who is making the request, and track usage. This is particularly useful to Web site developers who wish to charge a fee for viewing content.
 - Fast Modem Optimization. The 5.0 RealVideo system is designed for optimal use with the fast 56.6 Kbps modems that have recently appeared on the market.
-

The RealSystem 5.0-server software is priced at \$700 to \$21,000 depending on how many streams can be sent at one time. The lower-priced products targets customers who want to make audio and video available on their web site. The more expensive line of professional server products targets ISPs, commercial web developers and content providers. The firm also offers a free trial version of the server software that streams to 60 viewers at one time allowing customers to try the software before purchase. This free software can be downloaded directly from RN's Web site.

Exhibit 3

Content Offerings at the RealNetworks

The firm's offerings include:

Timecast is a guide to RealAudio and RealVideo content and programming information. The site provides links to over 2500 Web sites, including over 500 radio and televisions stations where customers can view multimedia content created using RealNetworks' software products.

MusicNet is a preview site featuring over 1,000 songs from nearly 400 artists. The site is organized in ten categories.

Daily Briefing is Internet's first personalized, on-demand audio and video newscast. It allows customers to design their own custom streaming media newscasts from over 35 short programs in the areas of news, sports, entertainment, weather and business/technology, and to receive custom newscasts daily. Daily Briefing providers include NBC News, The Weather Channel, CBS/SportsLine and Warner Bros. Inc.

Film.com, the leading source of professional movie reviews on the Internet, with 60+ critics. The site provides in-depth information about, and streaming media clips of, movies including reviews and previews.

LiveConcerts.com is Web site that is operated in cooperation with House of Blues. It offers for live streamed music concerts, album previews, and archives containing streaming music. It also provides up-to-date concert schedules.

Web Active a Web site that focuses on providing voice to progressive political and social opinion, news, and activism on the Internet.

Real Planet, an international guide to RealAudio and RealVideo content with ongoing features of events from around the globe.

**Exhibit 4
Streaming Software Competitors**

Company	Streaming Video Product	Server Price	Excerpts from Product Reviews
RealNetworks	RealVideo 5.0	\$650 and up	“With RealSystem 5.0, RealNetworks continues the pattern of innovation started in 1994 when the company introduced multimedia to the Internet with RealAudio. RealSystem 5.0 features creative advanced functionality that will soon prove invaluable to high-volume video producers. At the same time, Real, facing competitive pressure from Microsoft's free product, NetShow, is offering free streaming audio and video to lower-volume producers who don't need the special features offered by RealSystem 5.0.” <i>From PC Magazine October 10, 1997</i>
Microsoft Corp.	NetShow 2.0	Free	“It's very much a work in progress, offering average-quality video, a server with network-utilization safeguards, and a well-featured but slightly irritating player. It's all free, too.” <i>From PC Magazine, October 7, 1997</i>
VDOnet Corp.	VDOLive 2.1	\$299 and up	“If you're looking for a stable, server-based technology for your intranet, consider VDOnet's VDOLive 2.1. This veteran of the nascent streaming-video market offers high-quality video and a wide array of configuration options, including the ability to limit network use by user number or stream count. Only the higher quality of RealVideo's and VivoActive's video and the better functionality of RealVideo make those products stand out above VDOLive. And if you're on a budget, you'll be pleased with VDOLive's price.” <i>From PC Magazine, October 7, 1997</i>
VivoActive Software, Inc.	VivoActive 2.0	\$695	“For users who don't want to worry about server maintenance, VivoActive Software's VivoActive 2.0 is an inexpensive, high-quality, serverless technology that emphasizes ease of use and simplicity over a mass of features. VivoActive 2.0 has no server component, so VivoActive can't protect network utilization by limiting users or video-transfer bandwidth. With a total implementation cost of \$695 for an unlimited number of streams, VivoActive is an ideal, inexpensive choice for smaller companies.” <i>From PC Magazine, October 7, 1997</i>
Vosaic LLC	Media Suite 1.04	\$150 and up	“Although a promising entry in the streaming-video market and particularly adept at high-motion video, Vosaic MediaSuite 1.04 ultimately can't compete with such products as RealVideo or VDOLive on most intranet applications. Vosaic ranked near the bottom on our talking-head tests, and though the server, player, and encoder are functional, they're not as polished or feature-rich as those of other systems. You don't have to pay for the server, but at \$150 per stream, Vosaic's technology is still relatively expensive.” <i>From PC Magazine, October 7, 1997</i>
Xing Technology Corp.	Streamworks 3.0	\$3000 and up	“StreamWorks 3.0.252 produces high-quality video at high bandwidths but doesn't scale down well, resulting in last-place finishes on our jury tests. The \$3,000 price for 50 seats is reasonable, but you probably shouldn't consider StreamWorks unless you transmit the bulk of your videos at bandwidths of 256 Kbps or higher.” <i>From PC Magazine October 7, 1997</i>

Exhibit 5

RealNetworks' Top Management Team

ROB GLASER, Chairman & CEO. Rob Glaser is founder and CEO of RealNetworks (Nasdaq: RNWK), the leader in streaming media products and services for the Internet. Since 1995, RealNetworks has played a pioneering and leadership role in media delivery over the Internet through its RealAudio, RealVideo, RealPlayer, and RealSystem products. Mr. Glaser is a member of several non-profit boards and committees including, most recently, his appointment by President Clinton to the Advisory Committee on Public Interest Obligations of Digital Television Broadcasters. Prior to founding RealNetworks, Mr. Glaser spent 10 years at Microsoft Corporation, most recently as vice-president, Multimedia and Consumer Systems at Microsoft Corporation where he brought to market successful pioneering products in the areas of multimedia, computer networking and desktop applications.

BRUCE JACOBSEN has served as President and Chief Operating Officer of the firm since February 1996 and as a Director since August 1997. From April 1995 to February 1996, Mr. Jacobsen was Chief Operating Officer of Dreamworks Interactive, a joint venture between Microsoft and Dreamworks SKG, a partnership among Steven Spielberg, Jeffery Katzenberg and David Geffen. From August 1986 to April 1995, Mr. Jacobsen was employed at Microsoft in a number of capacities, including General Manager of the Kids/Games business unit. Mr. Jacobsen graduated summa cum laude with Honors from Yale University and holds a M.B.A. from Stanford University.

MARK KLEBANOFF has served as Chief Financial Officer of the firm since June 1996. From May 1992 to June 1996, Mr. Klebanoff was Vice President of Finance and Operations of Industrial Systems, Inc., a client/server process information management software vendor, which merged with Aspen Technology, Inc. in 1995. From 1989 to 1992, Mr. Klebanoff worked in a number of general management capacities for the Japanese trading company Itochu Corporation. Mr. Klebanoff holds a B.A. from Yale University and a Masters degree from the Yale School of Management.

LEN JORDAN has served as Senior Vice President -- Media Systems of the firm since January 1997. From November 1993 to November 1996, Mr. Jordan was employed at Creative Multimedia, Inc., a developer and publisher of CD-ROM/Internet products in a number of capacities, most recently as President. From September 1989 to November 1993, Mr. Jordan was employed at Central Point Software, Inc., a utility software publisher. Mr. Jordan graduated magna cum laude from the Eccles School of Business at the University of Utah with B.S. degrees in Finance and Economics.

PHILLIP BARRETT has served as Senior Vice President -- Media Systems of the firm since January 1997 and from November 1994 to January 1997 as Vice President -- Software Development. From March 1986 to October 1994, Mr. Barrett was a Development Group Manager at Microsoft, where he led development efforts for Windows 386, Windows 3.0 and Windows 3.1. Mr. Barrett holds an A.B. in Mathematics from Rutgers University and an M.S. in Computer Sciences from the University of Wisconsin, Madison.

MARIA CANTWELL has served as Senior Vice President -- Consumer and E-Commerce of the firm since July 1997. From April 1995 to July 1997, Ms. Cantwell served as Vice President -- Marketing of the Company. From February 1995 to April 1995, Ms. Cantwell was a consultant to the Company. From 1992 to January 1995, Ms. Cantwell served as a member of the 103rd Congress. Ms. Cantwell holds a B.A. in Public Administration from Miami University.

JAMES HIGA has served as Vice President -- Asia/ROW of the firm since September 1996. From January 1989 to August 1996, Mr. Higa was the Director for Asia/Pacific for NeXT Software, Inc. From 1986 to 1989, Mr. Higa served as Director of Product Marketing at Apple Japan, Inc. Mr. Higa holds a B.A. in Political Science from Stanford University.

JOHN ATCHESON has served as Vice President -- Media Publishing of the firm since January 1997. From March 1990 to May 1996, Mr. Atcheson was President and Chief Executive Officer of MNI Interactive, Inc., a developer and distributor of consumer interactive services. Mr. Atcheson holds a B.A. from Brown University and an M.B.A. from the Stanford Graduate School of Business.

KELLY JO MACARTHUR has served as Vice President and General Counsel of the firm since October 1996. From January 1995 to March 1996, Ms. MacArthur served as General Counsel and Director of Business Affairs for Compton's NewMedia, Inc., which was acquired by Learning Co., Inc. in 1996. From July 1989 to December 1994, Ms. MacArthur was an attorney at Sidley & Austin. Ms. MacArthur graduated summa cum laude from the University of Illinois at Champaign-Urbana and holds a J.D. from Harvard Law School.

ERIK MORIS has served as Vice President -- Marketing of the firm since August 1997. From April 1997 to July 1997, Mr. Moris served as a Product Manager for the Company. From September 1996 to April 1997, Mr. Moris was a consultant to the Company. From May 1995 to August 1996, Mr. Moris was employed at Microsoft, where he managed advertising for the Windows 95 launch and was Group Manager for the Internet Platform and Tools Division. From 1985 to 1994, Mr. Moris was a Senior Vice President at McCann-Erickson Advertising. Mr. Moris holds a B.A. in Communications and Business from Western Washington University.

JEFF LEHMAN has served as Vice President -- Advertising Sales of the firm since October 1997. From September 1985 to September 1997, Mr. Lehman was employed by Ziff-Davis/Softbank in a number of Vice President, Director, and other publishing positions. Mr. Lehman graduated cum laude from The University of Central Florida with a B.S.B.A. and an M.B.A. with Honors.

PHILIP ROSEDALE has served as Vice President -- Media Systems of the firm since October 1997. From February 1996 to October 1997, Mr. Rosedale served as General Manager, Software Development of the Company. From June 1986 to February 1996, Mr. Rosedale was founder and Chief Executive Officer of Automated Management Systems, a developer and marketer of software applications. Mr. Rosedale graduated cum laude from the University of California, San Diego with a B.S. in Physics.

Exhibit 6
Details of RealNetworks' Relationship Agreement with Microsoft

In June 1997, the firm entered into a strategic agreement with Microsoft, pursuant to which RealNetworks granted Microsoft a nonexclusive license to substantial elements of the source code of the firm's RealAudio/RealVideo Version 4.0 technology, including its basic RealPlayer and elements of its EasyStart Server products, and related trademarks.

Under the agreement, Microsoft may sublicense its rights to the RealAudio and RealVideo Version 4.0 technology to third parties under certain circumstances. The agreement also provides for substantial refunds to Microsoft under prescribed circumstances that are solely within the firm's control. The amount of these refunds diminishes over time. The firm may not assign its obligations under the agreement without Microsoft's consent. Microsoft is obligated to distribute the firm's RealPlayer Version 4.0 for a defined term as long as the firm's player supports certain Microsoft architectures.

RealNetworks also agreed to work with Microsoft and several other companies to author and promote ASF as a standard file format for streaming media. The agreement also requires the firm to provide Microsoft with engineering consultation services, certain error corrections and certain technical support over a defined term.

In connection with the agreement, Microsoft also purchased a minority interest in the firm. Microsoft currently offers its own streaming media product, NetShow. Additionally, Microsoft recently acquired VXTreme, a direct competitor of the firm in the market for streaming media software. Microsoft also owns a minority interest in VDOnet, a direct competitor of the firm in the market for streaming video software.
