Milo Medin
Senior Vice President, Engineering and Chief Technology Officer
@Home Network

Milo Medin is Senior Vice President of Engineering and CTO, overseeing the development of @Home Network s high-speed backbone. @Home's performance-engineered scaleable network removes Internet "traffic jams" and enables true end-to-end management. In addition, the Network employs replication and caching technologies that dramatically improve network efficiency.

Prior to joining @Home Network, Medin served as project manager at the NASA Ames Research Center. During his tenure, he directed the NASA National Research and Education Network project that, in combination with partners at Lawrence Livermore National Lab, deployed a high speed national ATM infrastructure connecting major supercomputing and data archiving centers. He also supervised the primary west coast Internet interconnect network. In addition, he pioneered the global NASA Science Internet project, providing network infrastructure for science at more than 200 sites in 16 countries and 5 continents, including Antarctica, and initially helped establish the TCP/IP protocol as an industry standard.

@HOME NETWORK

WRITTEN STATEMENT OF MILO MEDIN
SENIOR VICE PRESIDENT FOR ENGINEERING AND CHIEF TECHNOLOGY
OFFICER
@HOME NETWORK
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Overview

At Home Corporation ("@Home" or "the Company") is a leading provider of Internet services over the cable television infrastructure and leased digital telecommunications lines to consumers and businesses. @Home's primary offering, the @Home service, allows residential subscribers to connect their personal computers via cable modems to a new high-speed Internet backbone network developed and managed by the Company. This service enables subscribers to receive the "@Home Experience," which includes Internet service over hybrid fiber co-axial ("HFC") cable, at transmission speeds of up to 100 times faster than typical dial-up connections, "always on" connection, and rich multimedia programming through an intuitive graphical user interface. The content foundation of the @Home Experience is provided by the Company's @Media group, which aggregates content, sells advertising to businesses and will provide premium services to @Home subscribers.

For businesses, the Company's @Work services provide end-to-end managed connectivity for Internet, intranet and extranet solutions over a variety of transport media including the cable infrastructure and leased digital telecommunications lines. In addition, @Work is developing a next generation platform to support networked business applications and other value-added data networking solutions. In order to accelerate deployment of the @Work connectivity solutions into major U.S. metropolitan areas, the Company established a strategic relationship with Teleport Communications Group, Inc. ("TCG") the country's largest competitive local exchange carrier ("CLEC") in April 1997, to provide co-location facilities and local telecommunication circuits for @Work's infrastructure and subscriber connectivity. By combining the @Home broadband network with cable, telephone and technology relationships, @Work provides a foundation for nationwide delivery of network-based business applications and other value-added data networking services.

@Home has entered into distribution arrangements for the @Home service with Tele-Communications, Inc. ("TCI"), Cablevision Systems Corp. ("Cablevision"), Comcast Corporation ("Comcast), Cox Enterprises, Inc. ("Cox"), Rogers Cablesystems Limited ("Rogers"), Shaw Cablesystems Ltd. ("Shaw"), Marcus Cable Operating Company, L.P. ("Marcus") and InterMedia Partners IV L.P. ("InterMedia") (collectively, the "Cable Partners"), whose cable systems pass approximately 50 million homes in North America. As of March 31, 1998 approximately 5.5 million of these homes were currently passed by upgraded two-way HFC cable, and @Home believes that the Cable Partners will complete the upgrade of systems passing a majority of their homes within five years. As of April 30, 1998, @Home had launched its service through its Cable Partners in portions of 27 cities and communities in the United States and Canada, including those listed below, and had approximately 100,000 cable modem subscribers.

TCI	Comcast	Cox
Arlington Heights, IL	Baltimore, MD	Hampton Roads, VA
Fremont, CA	Detroit, MI	Hartford, CN
Hartford, CT	Orange County, CA	Omaha, NE
Seattle, WA	Philadelphia, PA	Orange County, CA
	Sarasota, FL	Phoenix, AZ
	Union, NJ	San Diego, CA
Rogers	Shaw	InterMedia
Toronto	Calgary	Nashville, TN

Vancouver   Toronto

@Home was founded in March 1995 and currently has approximately 400 employees. @Home is based in Redwood City, California.

@Home Service

The Company's primary offering is the @Home service, a comprehensive Internet solution that leverages the two-way HFC cable television infrastructure and the Company's technological and programming capabilities to provide the @Home Experience, which the Company believes is the most compelling consumer Internet experience currently available. By connecting via a cable modem to the @Home broadband network through the local cable infrastructure, subscribers to the @Home service can achieve peak data transmission speeds of 2 to 5 Mbps (2,000 Kbps to 5,000 Kbps), which is over 100 times faster than the peak data transmission speed of a 28.8 Kbps dial-up modem. This high bandwidth is critical for sophisticated multimedia applications, broadband advertising, online commerce and interactive games. The @Home service offering also includes standard Internet service provider ("ISP") functionality, including Web page hosting for subscribers, and the ability to create and manage multiple email accounts. In addition, the two-way cable infrastructure is "always on," providing instantaneous access to the Internet and eliminating the need for a time consuming dial-up procedure using the telephone network.

@Home's programming services, provided by the @Media group, enhance the @Home Experience by aggregating high-quality and compelling multimedia content from the Internet into an intuitive graphical user interface. The home page for the @Home Experience (the "@Home Page") provides the user with access to an array of multimedia content "Channels," powerful tools and Web-based applications designed specifically to take advantage of @Home's broadband network architecture. The Company believes that the @Home Page broadens the appeal of online services beyond technology enthusiasts to the mass market by simplifying navigation, increasing the subscriber's knowledge of Internet resources, presenting compelling high-bandwidth content (such as animated graphics, near-CD-quality audio and video clips), and stimulating persistent usage with timely, dynamic, highly sought-after data streams. The @Home Page includes a variety of tools to obtain information quickly and easily. For example, the "How Do I" section, which is one click from the @Home Page, provides users with a variety of step-by-step solutions to such tasks as making plane reservations and checking movie schedules. The @Home Experience also permits @Home subscribers to access online services, purchase software and engage in multiplayer gaming and interactive shopping.

The @Home service is currently offered to consumers in the United States for flat monthly fees generally ranging from $35 to $55, including a cable modem provided by the Cable Partner. Installation of the @Home service is provided by the Cable Partner at prices generally ranging from $75 to $175. Upon installation, each new subscriber's personal computer is configured for the @Home Experience with @Home client software, which provides access to the @Home Page. In addition to making the Internet considerably easier to access for consumers, the @Home client software offers advertisers and content providers a rich and consistent client environment for delivering multimedia advertising, content and applications. The Company is currently developing the capability to deliver the @Home Experience to televisions via set-top boxes connected to the cable infrastructure, and thereby meet the needs of a broader market of non-computer users.

@Work Services

For businesses, @Work services provide end-to-end managed connectivity for Internet, intranet and extranet solutions over a variety of transport media including the cable infrastructure and leased digital telecommunications lines. In addition, @Work is developing a next generation platform to support networked business applications and other value-added data networking solutions. In order to accelerate deployment of @Work's connectivity solutions in metropolitan areas throughout the United States, the Company has established a strategic relationship with TCG, the country's largest CLEC, to provide targeted co-location and local telephone circuits for infrastructure and subscriber connectivity. The Company currently offers two services: @Work Internet and @Work Remote.

@Work Internet. The @Work Internet service delivers dedicated, high-speed, end-to-end

managed Internet connectivity to commercial enterprises over leased digital telecommunications lines and HFC cable. The @Work Internet service offers telecommunications dedicated access options at peak data transmission speeds ranging from 56 Kbps to 45 Mbps. These solutions are priced competitively vis-à-vis existing alternatives. The telco-based @Work Internet service is currently available in numerous metropolitan markets including Chicago, Los Angeles, New York, Orange County, San Diego, San Francisco, Seattle, and Washington, D.C.

In February 1998, @Home and Cox announced the availability of the @Work Internet service via Cox's HFC cable infrastructure in Orange County, Phoenix, and San Diego. Businesses in these markets that are passed by two-way HFC cable can connect directly to the @Work Internet service. The @Work Internet HFC service is a shared bandwidth solution that offers peak data transmission speeds of 2 to 5 Mbps downstream using the @Home broadband network.

@Work Remote. The @Work Remote Service is the Company's first Virtual Private Networking ("VPN") solution. This solution provides a secure, high speed method for corporations to extend their Local Area Networks ("LANs") to telecommuters and branch offices via the cable infrastructure. In November 1997, @Home announced a non-exclusive agreement with TCI, Cox and Comcast to develop, deploy and market @Work Remote in areas served by these Cable Partners. The @Work Remote service also includes the network equipment and software needed to connect the corporate LAN securely to the @Home broadband network via high-bandwidth local telephone circuits. @Work Remote users will be able to gain secure access to all of their corporate LAN resources 24 hours a day, seven days a week. @Home offers virtual private network capability between branch offices and corporate headquarters.

@Media Services and Technologies

The @Media group sells advertising and, in partnership with content providers, packages advertising-supported content and facilitates online transactions and services for @Home subscribers. Advertisers and content providers can utilize @Media technologies that enable them to exploit the high-bandwidth, multimedia capabilities of the @Home broadband network. The @Media group sells advertising through several advertising formats including banners, half-banners, and the "B*box," a broadband audio/video advertising space. With the B*box, advertisers are not constrained by the Web banner paradigm and can broaden their creative presentation using video clips, audio and animation. Advertisers have the ability to enhance their message by using multimedia tools and technologies such as Flash, Quicktime Video, and Real Audio. Current advertisers include Proctor & Gamble, Clorox, Toyota and Unilever.

In addition to receiving advertising fees, the @Media programming services provide a variety of revenue sources. Examples of @Media programming services include:

>*Real-Time News and Entertainment Services.* Continuously-updated headlines delivered in the News, Sports and Finance @Home channels, and video clips presenting top stories, sports highlights and movie previews. Current @Media partners include Bloomberg, CNN Interactive, The NBA and E! Online.

>*Enhanced Search and Directory Services.* Leading search and directory services integrated into the @Home Page. @Home shares in the advertising revenue generated from these services. Current @Media partners include BigBook, Excite, Infoseek, Switchboard, WhoWhere, Yahoo! and Zip2.

>*Digital Audio Services.* Near-CD-quality audio on various music, talk and event channels (e.g. jazz, rock and 24-hour sports talk) via @Home's TuneIn service. Users can simultaneously listen to TuneIn and browse the Internet. Current @Media partners include CNET Radio, Net Radio, SportsLine and The DJ.

>*Software Purchase with Real-Time Downloading.* Purchase and download software titles at speeds substantially faster and with greater reliability than a typical dial-up modem. @Home has partnered with Release Software to create the "SoftwareNow" store. In addition to faster than normal download speeds, SoftwareNow gives @Home users multiple, unique purchase options including a "Try-Before-Buy" option and rental software.

>*High-Speed Multiplayer Gaming.* Download and play popular Internet games against other online players, delivered via the @Home Games channel. Because the @Home Network combines high speed with very low latency, it is an excellent environment for high-quality game play. The Company has already co-located game servers on the network backbone and is currently developing the capability in conjunction with SegaSoft to offer multiplayer online games to @Home subscribers.

Interactive Shopping. Evaluate and purchase goods via an interactive multimedia shopping experience. Current @Media partners include Amazon.com, BUYDIRECT, N2K, PC Connection and Reel.Com.

The @Home Broadband Network
The Company designed the @Home broadband network on the premise that sustainable, high-performance Internet access requires a new, scalable architecture to alleviate Internet bottlenecks and to enable true end-to-end network management capabilities. Residential subscribers access the network primarily through high-speed cable modems, which attach to their personal computers via a standard Ethernet connection, while businesses can also connect through CLEC telecommunications networks. The three key principles of @Home's network strategy are moving data closer to the user, end-to-end network management and "always-on" service.

Moving Data Closer to the User. The @Home broadband network utilizes caching and replication technologies to move the information that a subscriber requests close to the subscriber. Local caching reduces backbone network traffic, enabling the @Home broadband network to overcome a fundamental weakness of the Internet¾duplicative data transfers. For example, when a subscriber downloads a video clip from a Web site, the user must "pull" data across the Internet from that Web site to the user's ISP and finally to the user's computer. If the user's neighbor requests the same video clip from that Web site, the neighbor must pull the same data across a similar path. In contrast, @Home's approach would move the video clip over its high-speed backbone only once in a given geographic area and retain it in a local cache near the user's home where it could be accessed by every subscriber within that area without retransmission over the backbone. This approach of building intelligence into the network fabric allows us to trade-off compute power and storage against network transport, allowing us to deliver very high performance to our subscribers at a much lower price point than the equivalent "dumb" network.

End-to-End Network Management. End-to-end network management is achieved through @Home's proactive network quality, service and performance management systems. The @Home broadband network provides visibility from the Company's servers (or content partners' servers) across the backbone and all the way to the subscriber's home. Because the @Home broadband network is centrally managed, the Company can dynamically identify and enhance network quality, service and performance, or address issues before they affect the user experience. Also, this end-to-end management allows us to deploy advanced network technologies such as IP multicast and Quality of Service (QoS), which would otherwise not be feasible to deploy across multiple network operators with today's technology.

"Always On" Service. The @Home broadband network is "always on", unlike switched technologies such as dial-up and Integrated Services Digital Network ("ISDN") technologies. The user is always connected to the Internet as long as their computer and cable modem are on. This eliminates the need for a time-consuming connection process, as with a dial-up service, and changes the way the customer uses the Internet.

Proximate users share high-bandwidth access (much like corporate LANs) and may limit the effective bandwidth that is available to a given subscriber at a given time. However, this shared connection is particularly efficient and well suited to the sporadic nature of Internet traffic, where browsing tends to consume bandwidth in discrete bursts intermixed with periods of inactivity. As subscriber penetration increases, the cable operator has multiple cost-effective alternatives to increase capacity, including allocating additional 6 MHz channels for the @Home service or reducing the number of subscribers sharing a given bandwidth by adding nodes, with each node serving a smaller number of subscribers over the same fiber-optic infrastructure.

The primary components of the @Home broadband network are the Company's high-speed private national backbone, RDCs, regional networks, headends (including caching servers), network connections and cable modems and the Network Operations Center. See attached diagram.

> *Private National Backbone.* @Home operates its own private national backbone, which consists of a network of high-speed asynchronous transfer mode ("ATM") communications services that the Company leases to connect its RDCs and regional networks with content providers and the Internet. These services currently operate at a speed of 45 Mbps and can be upgraded to 155 Mbps or higher. This backbone can be viewed as a high-speed "parallel Internet" that connects via @Home's routers to the

Internet at multiple network access points ("NAPs") with "Tier-One" peering status, which permits the Company to exchange Internet traffic with other nationwide ISPs. @Home peers with both national backbone operators and also smaller operators where such peering would bypass congested parts of the public Internet, and/or improve performance for our users accessing content from these networks. @Home believes that robust inter-connectivity between backbone operators is critical for the overall success of the Internet, and has a fairly broad peering policy.

Regional Data Centers. The RDCs act as service hubs for defined geographic areas, such as major metropolitan areas, providing key services, including email, news groups and chat facilities, to subscribers, managing network performance proactively, replicating content and applications, and providing a cost-efficient infrastructure to cache and multicast data throughout a region and to house local content and subscribers' Web pages. @Home uses "high availability" servers from Sun Microsystems, Inc. in its RDCs for these mission-critical activities. The Company had deployed RDCs in 19 geographic areas as of December 31, 1997. The Company estimates that to provide the @Home service throughout North America it will need to deploy between 40 and 50 RDCs.

Regional Networks. The regional networks consist of network routers and switches that interconnect @Home's RDCs and its national backbone to multiple cable headend facilities at speeds of 45 Mbps to 155 Mbps. These networks generally take advantage of cable operators' fiber optic infrastructures that are normally used to transport cable television signals from a consolidated master headend facility to other headends within a region. This approach often allows @Home to avoid the high cost of leasing conventional high-speed communication services from local telephone companies when deploying high-speed connectivity in a region.

Headends. The cable system headends are connected to each RDC through the regional network. In order to move data as close to the subscriber as possible and to avoid repetitive transmission of the same data, the headends employ high-performance caching servers that store frequently accessed content locally, thereby greatly reducing the amount of data transmission (and corresponding transport costs) in higher layers of the network. In addition, local caching servers can compile far more comprehensive usage data than is normally attainable on the Internet, which can be used for network troubleshooting, tuning performance and tailoring the @Home service.

Network Connections. The last leg of the network connection is from the headend to the consumer over a cable operator's HFC cable system. Multiple fiber optic lines carry the signal from the headend out to cable "nodes" in each neighborhood, which in turn connect through traditional coaxial cable to the home. These fiber optic nodes typically service from 300 to 2,000 homes in a relatively modern cable system. In such a system, each television channel requires 6 MHz of the 450-750 MHz of total system capacity. Downstream transmission of the @Home service utilizes a similar channel. Upstream transmission, however, utilizes a frequency range not used for traditional broadcast by cable systems. This range is more prone to interference than downstream channels, which effectively limits the peak upstream transmission speed. To date, virtually all @Home Network deployments have been done on "2-way" or reverse activated plant. We believe that this gives our users the best performance and "always-on" connectivity, while reducing cost to us. While it is possible to use a telephonic return solution, it is clearly inferior to a 2-way approach in terms of user satisfaction and network cost effectiveness (due to the cost of the telephony modem pool's trunks back to the PSTN).

Cable Modems. In the home, a cable modem connects to the cable television coaxial wiring and attaches to the user's personal computer via standard Ethernet connections. While peak data transmission speed of a cable modem depends on the specific model and can approach 10 - 27 Mbps downstream and 0.7 - 10 Mbps upstream, the performance that subscribers actually experience is often constrained by the capacity of their personal computers, the capacity of the server being accessed, and the type of network architecture utilized. The North American cable industry has recently adopted a set of interface specifications for hardware and software to support the delivery of data services utilizing interoperable cable modems. @Home believes that these specifications, together with the agreement that the Company entered into with Intel

Corporation in July 1997 relating to the development of "plug and play" modems, will facilitate the growth of the cable modem industry and the availability of lower cost interoperable cable modems through retail channels.

Network Operations Center @Home provides end-to-end network management through its Network Operations Center (the "NOC"). The NOC uses advanced network management tools and systems to monitor the network infrastructure on a 24 x 7 basis, enhancing its ability to address performance bottlenecks before they affect the user experience. From the NOC, the Company can manage the @Home broadband network from end-to-end, including the backbone, RDCs, regional networks, headend facilities, servers and other components of the network infrastructure to the user's home.

Competition

The markets for consumer and business Internet services and online content are extremely competitive. @Home's most direct competitors in this market are Internet service providers ("ISPs"), national long distance carriers, local exchange carriers, wireless service providers, online service providers (such as America Online Inc.) and Internet content aggregators. Many of these competitors are offering technologies that will attempt to compete with @Home's high-speed data service offerings. Such technologies include Integrated Services Digital Network ("ISDN") and ADSL. In January 1998, Compaq Computer Corporation, Intel Corporation, Microsoft Corporation, other technology companies and numerous telecommunication providers announced an initiative to develop a simplified version of ADSL, referred to as "ADSL Lite", that reduces the complexity and expense of installing the service. While commercial tests of this simplified version of ADSL are not expected until the end of 1998, this initiative has the potential to accelerate the deployment of ADSL services and pose a competitive threat to @Home.

Conclusion

@Home appreciates this opportunity to appear before the FCC. We would be happy to provide you with any additional information on the @Home network and the services we provide.