

Market Analysis

2.4GHz High Rate Physical Layer Interoperability with

Existing 802.11 (1 and 2Mbps) Physical Layers

Al Petrick

Kent Rollins

Harris Semiconductor

email: apetrick@harris.com

email: krollins@harris.com

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Introduction

The following paper describes marketing research methods and decision processes used to determine the important factors for purchasing high rate wireless LAN products. This paper focuses on 10Mbps data connectivity, the importance of IEEE802.11 standards based solutions and interoperability. Information and results are shared throughout the paper and is provided as reference material for the 2.4GHz high rate physical layer selection process.

Focus Groups and Surveys

As part of exploratory marketing research, both focus groups and telephone questionnaire survey methods were used to gather primary qualitative data. In June 1997 Harris Semiconductor conducted eight (8) focus groups in four metropolitan cities across the US. The cities included San Francisco-California, Dallas-Texas, Boston-Massachusetts, and Cleveland-Ohio. The focus groups were conducted by an outside consulting group specializing in high technology studies. Two (2) one (1) hour focus group sessions were held per city. Each focus group consisted of approximately fifteen (15) people. The focus group sessions were professionally moderated and controlled. The focus groups targeted end-users and MIS managers working in the small office home office (SOHO) market segment. Each of the participants were pre-screened and had some knowledge of LAN and wireless LAN technology. The end-users were those who had a compelling need for wireless and fit into a special class known to many of us as the mobile professional. This mix of end-users used both laptop and desktop PCs and their jobs dependent on data connectivity and mobility in and out of the office.

Determining the compelling need for wireless LAN technology in the office and optimum data rate was the primary objective of the study. If standards based solutions were important to the participants, a short description of IEEE802.11 wireless LAN standard was given to those not familiar. Imaginative examples of wireless LANs including both Ad-Hoc and distributed network infrastructure operating at 1-2Mbps were highlighted. The participants were also given a choice between wireless RF spread spectrum and infrared optional devices.

As an alternative method to focus groups, a questionnaire survey was conducted. Harris designed the survey and pre-test the survey and gathered 130 responses from internal personnel. The survey consisted of twenty (20) questions. The questions probed on applications, technology, standard based solutions and demographics. The survey was conducted in June 1997 and targeted the same class of participants used in the focus group studies. The sample population size was 250 participants, all randomly selected across the US. Evening telephone sessions was chosen as the method for gathering data on the questionnaire. An outside professional marketing research firm was used to collect the data.

Focus Group and Survey Questions

The questions selected for the focus group studies and questionnaires were designed to determine the important factors driving the end-users decision for wireless LAN technology in the office. The survey focused on fifteen (15) key questions. They included: killer applications, remote printing of data files, faxes, software support, range of wireless connectivity, data security, cost of a WLAN card, laptop battery life, sharing peripherals, end-users preferred choice of data rate, Interoperability between OEMs, Interoperability and backward compatibility with existing standards i.e., IEEE802.11, and wireless modem access. The fifteen questions were rated on a scale from one (1) Not Important to five (5) Very Important.

Test Results and Analysis

After reviewing the results from the eight (8) focus groups, we concluded 10Mbps was the preferred data rate. The majority associated this data rate with Ethernet wired LAN technology. The aggregate throughput at 10Mbps was inconclusive. The only comment was "Ethernet like". A discussion on interoperability backward compatibility with existing standards based infrastructure like IEEE802.11 was very important preferred by the majority. Data rate fall back (gear shifting) from 10Mbps down to either 1Mbps or 2Mbps guaranteed continuous data connectivity. The majority felt it was important to be connect at a lower data rate rather than not being connected at all. The participants found it acceptable to have two (2) wireless LAN cards, one for frequency hop 802.11 networks and the other for direct sequence 802.11 networks. However a third product supporting only a 10Mbps network without interoperability was not desired.

After sorting and analyzing the questionnaire data, analysis showed similar conclusions. Range was important, the respondents indicated that data connectivity between a PC and a peripheral is less than 100 feet in SOHO environments. This rating is illustrated in figure 1.0. After scaling the 15 questions, from Not Important to Very Important, the calculated mean score narrowed the importance criteria to five (5) key decision factors. They include: 1) Intranet access 2) File printing 3) Range and coverage 4) Cost of a WLAN 5) Interoperability with existing standards. These factors are illustrated in Figure 2.0. The ten others exhibited a mean score which was less than or equal to 3.25. Using mean score analyze, we focused on those scores that fell in the bins between (4-5). The scores between (4-5) where those with the highest degree of importance in the making process..

Desired Distance Between PC and Peripheral

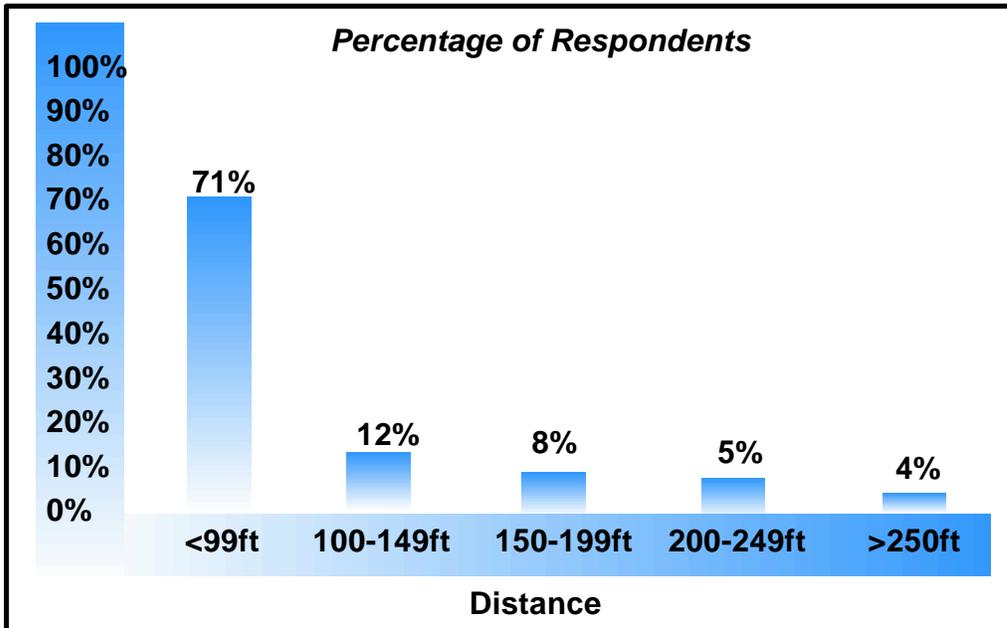


Figure 1.0

Top Five (5) Importance Factors In Decision for Purchasing 10Mbps WLANs

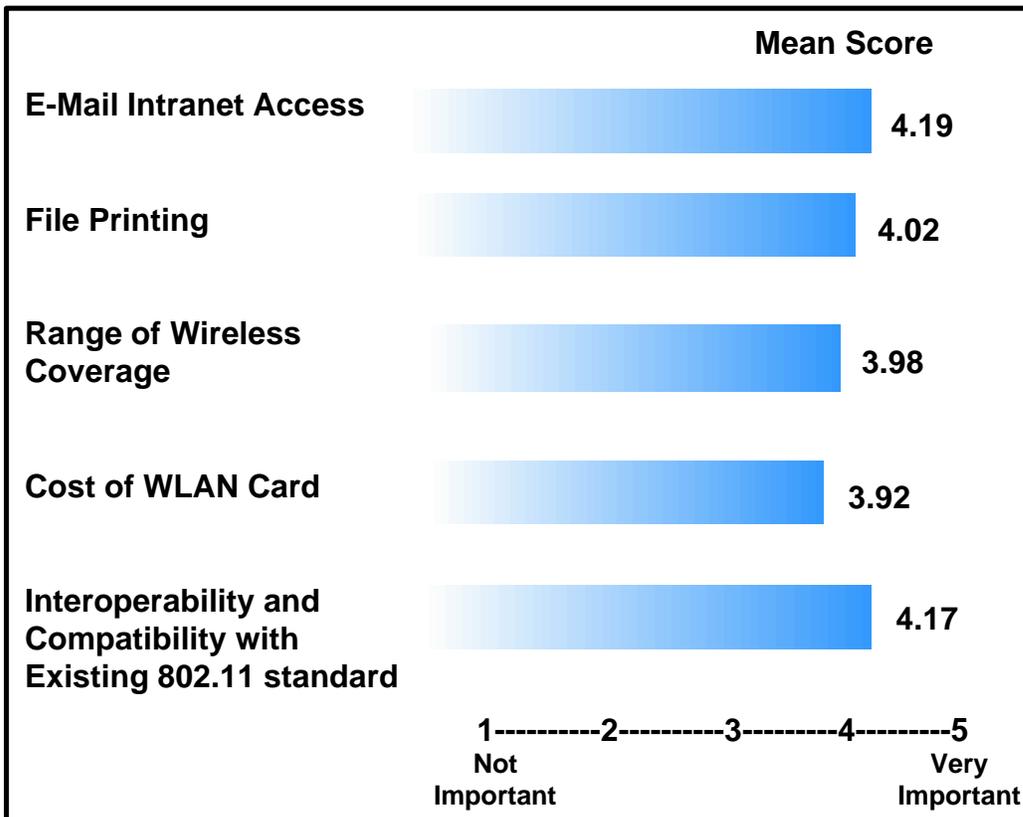


Figure 2.0

Conclusions and Recommendation

This paper described the evaluation process used by Harris Semiconductor for determining the critical factors for purchasing a WLAN product in the SOHO environment. Two classical marketing research methods were used to gather the data. It was clear from the results that a high rate standards based solution was needed in the marketplace. It was also concluded that interoperability between OEM products and interoperability with the existing IEEE802.11 infrastructure was highly desirable.

At this point in time, we do not enforce the issue of interoperability and backward compatibility, but *recommend* that we keep an open mind, analyze and discuss how (we) as a standards body can make interoperability reality. We believe achieving this goal will better serve the needs of the wireless LAN market and ensure a sound standard looking forward.