Proposal for

Executive Committee Study Group
on
Broadband Wireless Access

IEEE 802 Executive Committee Meeting
Albuquerque, NM
November 12, 1998

Dr. Roger B. Marks

Director

National Wireless Electronic Systems Testbed

National Institute of Standards and Technology

United States Department of Commerce

Chair, Standards Coordinating Committee

IEEE Microwave Theory and Techniques Society

Definition of Scope

The Broadband Wireless Access (BWA) networks considered are those which:

- use wireless links with microwave or millimeter wave radios

- use licensed spectrum (typically)

- are metropolitan in scale

- provide public network service to fee-paying customers (typically)

- use a point-to-multipoint architecture with stationary rooftop or tower-mounted antennas

- provide efficient transport of heterogeneous traffic with QoS support

- are capable of broadband transmissions (>2 Mbit/s)

This defines a project unique in 802.

Backers

- IEEE Microwave Theory and Techniques Society
  - will support IEEE Standards effort

- U. S. Department of Commerce
  - standards "push" and laboratory support
    - U. S. National Institute of Standards and Technology
    - U. S. National Telecommunications and Information Administration

- 802.06: Chair helped draft this proposal

- 802.11: Chair, Vice Chair, and Secretary helped draft this proposal

- 45 Supporting Companies
  - including trade associations:
    - Wireless Communications Association International
      » BWA association, over 250 members
    - Cellular Telecommunications Industry Association

45 N-WEST Supporting Companies

- **Industry Associations**
  - Wireless Communications Assn.
  - Cellular Telephone Industry Assn.
- **License Holders**
  - WNP Communications, Inc.
  - US WEST Adv. Technologies
  - Formus Communications, Inc.
  - Antilles Wireless Cable TV Co.
  - Charles Brinkman
- **Systems Equipment Providers**
  - Lucent Technologies
  - Nortel Networks
  - Ericsson Inc.
  - Alcatel Network Systems
  - NEC America, Inc.
  - ADC Telecommunications
  - 3Com Corporation
  - P–COM
  - WaveSpan Corporation
  - Netro Corpopration
  - Ensemble Communications
  - Belstar Systems Corp.
  - Intraplex
  - Philips Broadband Networks
  - Wavtrace

- **Subsystems (radios, modems, ...)**
  - Hewlett-Packard Co.
  - AMP M/A–COM
  - Raytheon Systems Company
  - Stanford Wireless Broadband Inc.
  - Integrity Communications
  - BroadBand Wireless Inc.
  - Raychem Corp.
  - ETM Electromatic
  - SiCOM, Inc.
  - Millitech Corporation
  - CircuitPath Network Systems
- **RF Semiconductors**
  - Harris Semiconductor
  - Fujitsu Compound Semiconductor
  - Sanders, A Lockheed Martin Co.
- **Test and Measurement**
  - Anritsu Company
- **Consultants/R&D/Misc.**
  - Bellcore
  - C&W Systems, Ltd.
  - Hardin & Associates, Inc.
  - LCC International Inc.
  - EDX Engineering, Inc.
  - E B Systems Limited
  - Illinois Institute of Technology
  - Technical Strategy Associates

Industry Interest

Attendance
- 10 at July 24, 1998 Strategy Session
- 45 at August 9-10, 1998 Kickoff Meeting
- 41 at November 9, 1998 802 Plenary
  - 5 regular 802 participants
  - 8 from outside U.S.

Active Participation
- 5 Speakers at November 9 Tutorial
- 11 Speakers at November 10 Meeting
  (no overlap with Tutorial Speakers)

Observer Interest
- nearly 400 subscribers to email newsletter

likely to have Broad Market Potential

Wireless camps' goal: affordable systems

Open-systems push sweeps broadband

By Loring Wirbel

COLORADO SPRINGS, COLO. — Hustling to infuse life into a market perceived as pricey and arcane, proponents of broadband wireless services came to the IEEE Radio & Wireless Conference (Rawcon) last week with strategies for pushing standardization and, by extension, lower-cost, more-accessible systems.

Proponents of millimeter-wave broadband systems are still smarting from the lukewarm response to the FCC's 28-GHz auctions, which raised a less-than-stellar $570 million from a smaller-than-expected pool of carriers. In a lunch address at Rawcon, National Telecommunication & Information Administration head Larry

N-West's Marks: Nod for NIST as 'facilitator.'

Irving told local multipoint distribution service (LMDS) developers that they are perhaps the last great hope for "last-mile" broadband services. But much is riding on their ability to get the cost out of their systems.

"I have seven separate wireless systems in my household, but I'm still stuck with 56k in my wireline service," Irving said. "If we had 'calling party pays,' I'd give up my wireline phone completely tomorrow, because you guys will be giving me broadband data service a lot faster than my wireline phone company."

A new report from Allied Business Intelligence (Oyster Bay, N.Y.) states that the mul-

Attendance at November 10, 1999 Meeting

Sanjay Moghe, Director, Broadband Wireless Access Hardware Engineering, ADC Telecommunications
George Fishel, Manager, Information Technology Standards, AMP Inc.
Zev Bogan, Senior Principal Engineer, mm Wave Products, AMP Inc.
Hady Salloum, Director, Broadband Access, Bellcore
Jack Van der Star, Chief Technical Officer, Belstar Systems Corp., Canada
James Plante, Vice President, Business Development, Belstar Systems Corp.
Reza Ahy, President & CEO, BNA Systems
Ray Sanders, Chairman, CircuitPath Network Systems
Rami Hadar, Chief Executive Officer, Ensemble Communications
Jay Klein, Chief Technical Officer, Ensemble Communications
Carlton O'Neal, Vice President, Marketing and Sales, Ensemble Communications
Jamshid Khun-Jush, Radio Access, Ericsson Eurolab Deutschland GmbH, Germany
Asif Rahman, Product Manager, Wireless Broadband Access Group, Ericsson Inc.
Clifford Vaughan, Director of Marketing, High Speed Products, Fujitsu Compound Semiconductor, Inc.
Al Petrick, Senior Manager/Strategic Marketing, Wireless Products, Harris Corporation
Amarpal Khanna, Manager, Advanced Development, Wireless Infrastructure Division, Hewlett-Packard Company
Erol Yurtkuran, Senior RF Engineer, Integrity Communications
John Tremblay, Wireless Products Manager, Intraplex, Inc.
Shigeyuki Asami, Assistant Manager, Mitaka Laboratory, Japan Radio Co., Ltd., Japan
Charles Brand, Chairman and CEO, LogiMetrics
Roger Pandanda, MCS Corporation
Wayne Pleasant, Assistant Vice President, Millitech Corporation
Robert Pham, Sr. Systems Engineer, Radio Communications Systems/Public Networks, NEC America, Inc.
Eli Pasternak, Chief Scientist, Netro Corpopration
Jung Yee, Manager-Wireless Product Development, Newbridge Networks Corp., Canada
Jan Hakegard, Guest Researcher, Advanced Network Technologies Division, NIST
Roger Marks, Director, N-WEST, NIST
Ignatius Lam, Sr. Manager, Product Marketing, Nortel Broadband Wireless Access
James Schellenberg, Chief Technical Officer, Nortel Broadband Wireless Access, Canada
Hongming An, Senior RF Engineer, Nortel Networks Broadband Wireless Access, Canada
Imed Frigui, Nortel Networks, Canada
Imtiaz Bahadur, Product Manager, P-COM
David Palmer, Product Manager, Line of Business Wireless, Philips Broadband Networks, UK
J. Leland Langston, Technical Director, Broadband User Equipment, Raytheon Systems Company
John Liebetreu, Director, Product Development Engineering, SiCOM, Inc.
George Hendry, President, Stanford Wireless Broadband Inc.
James Mollenauer, President, Technical Strategy Associates
George Todros, Triton Network Systems
Keith Bromberg, Director of Wireless Marketing, WaveSpan Corporation
Roland Svensson, Technical Director, Wavtrace
Andrew Kreig, President, Wireless Communications Association International

Business Case for Broadband Wireless Standards

"Subassembly and chip manufacturers simply cannot supply the performance that millimeter wave system manufacturers desire at a price which is feasible for significant penetration into the consumer market today."

"LMDS may be closest to achieving this goal, but its *lack of a unified standard and lack of commitment to significant volumes will inhibit further price declines*."

- "Millimeter Wave 1998: Broadband Wireless and Automotive Radar Markets, Opportunities & Forecasts," Allied Business Intelligence (quotes from August 11, 1998 press release)

Specific Output of Study Group

(1) PAR for specification of interoperable LMDS system
("LMDS" = Local Multipoint Distribution Service)
  – for March, 1999 802 approval

(2) PAR on coexistence of BWA with other RF systems and extention to other BWA frequency bands, with goal of worldwide applicability
  – for July, 1999 802 approval

Schedule

November 12, 1998
- approval of Study Group

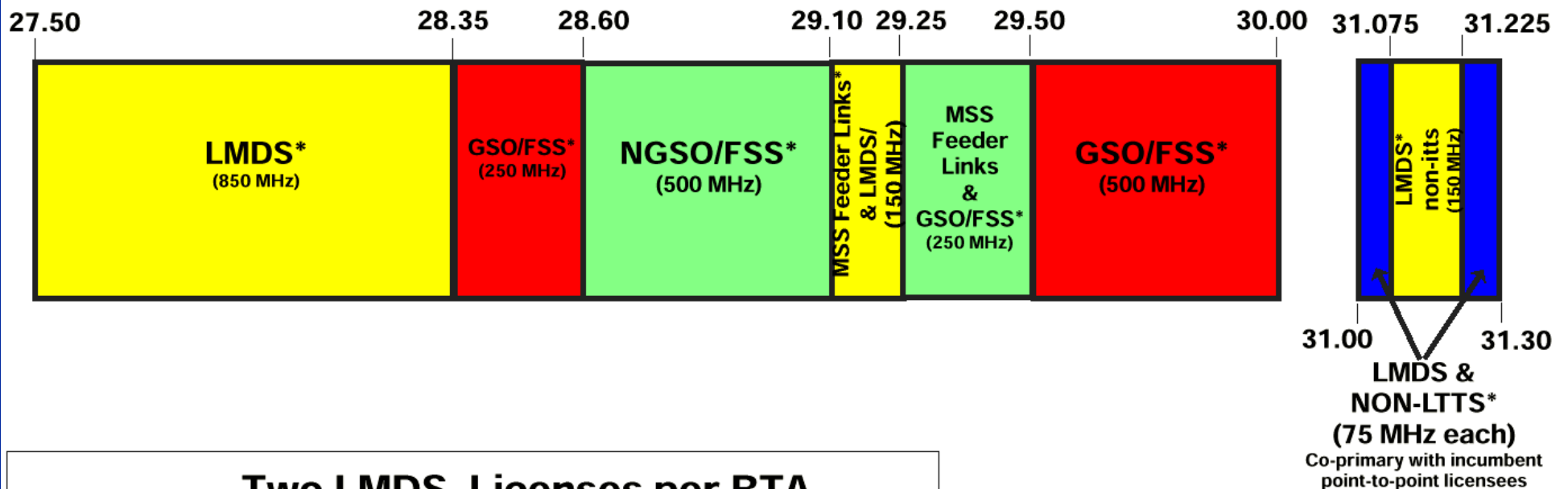**January 12-15, 1999**
- interim meeting
  - with 802.11 and ETSI BRAN

February 5, 1999
- submit LMDS PAR to 802 Executive Committee

March 11, 1999
- PAR approval by 802 Executive Committee

LMDS-Like Spectrum Worldwide

ITU SG8 "Broadband Wireless Access" Bands

31.8 - 33.2 Post

GHz