

Welcome

802.N-WEST

**The IEEE 802 Study Group on
Broadband Wireless Access**

Orlando, FL • January 13, 1999

Roger Marks

National Wireless Electronic Systems Testbed

N-WEST

N-WEST is:

- **a coordinated project of two agencies of the U.S. Department of Commerce:**
 - **NIST (National Institute of Standards and Technology**
 - **NTIA (National Telecommunications & Information Administration)**
- **a pro-active effort to accelerate development of the broadband wireless industry by encouraging voluntary standards**
- **a measurement testbed at the Boulder Labs of NIST & NTIA**
- **a united effort of over 50 Supporting Companies to develop voluntary standards**
- **on the Web at <http://nwest.nist.gov>**

N-WEST Philosophy

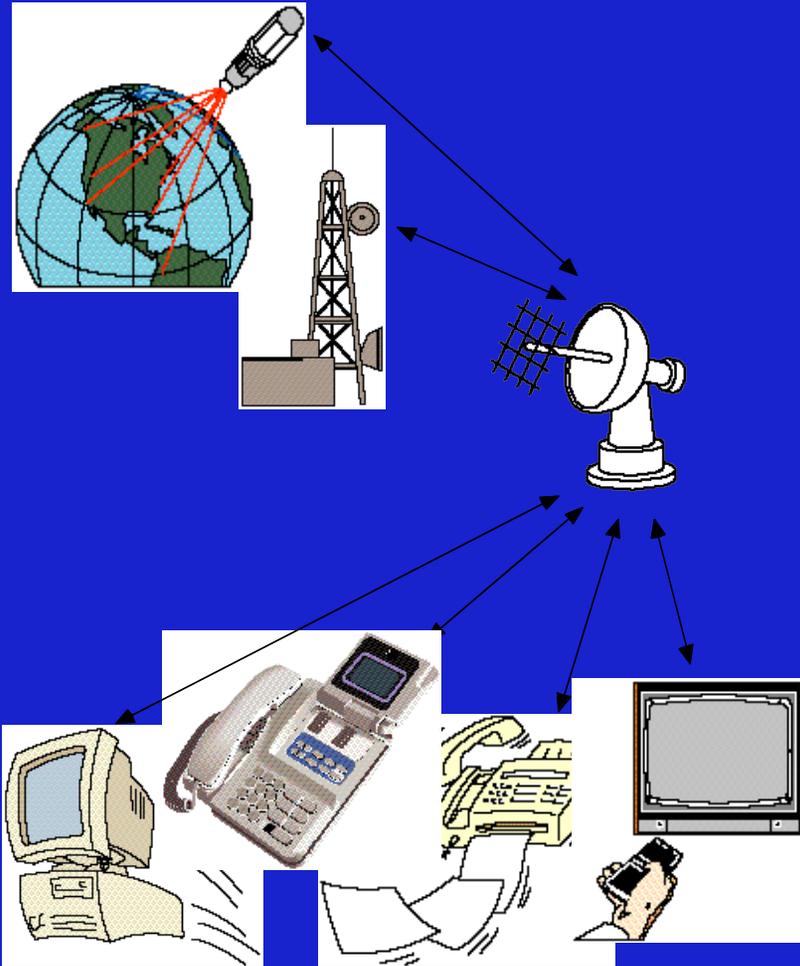
Goal:

**Accelerated Commercialization
of Broadband Wireless Access Systems**

Mechanism:

- ↳ **equipment cost reduction (esp. at customer end)**
 - ↳ **mass production**
 - ↳ **standardization**
 - ↳ **voluntary industry standards bodies (IEEE)**
 - ↳ **unbiased measurement support**
(U.S. Dept. of Commerce: NIST and NTIA)

Broadband Wireless Communications



Broadband Wireless Systems

- fixed (non-mobile) customer premises units
- base stations either:
 - fixed terrestrial
 - in orbit (LEO or GEO satellites)
 - in stratosphere (airplanes or blimps)
- broadband data into businesses, homes, etc.
 - ATM, TCP/IP, digital video, telephony
- potentially inexpensive and economically competitive with wired broadband
- The time is right for action:**
 - **no standards**
 - **spectrum auctions in 1998 and 1999**

N-WEST History in Brief

- **April 3, 1998**
 - **N-WEST Web Site went on-line (<http://nwest.nist.gov>)**
- **July 24, 1998**
 - **Strategy Session attended by 10 people in Boulder**
- **August 9-10, 1998**
 - **Kickoff Meeting attended by 45 people**
- **August 9-12, 1998**
 - **1998 IEEE Radio and Wireless Conference (RAWCON'98) attended by 300 people**
- **November 9-10, 1998**
 - **Second meeting, at 802 Plenary (41 people)**
 - **802 approved Executive Committee Study Group on BWA**
- **January 13-15, 1999**
 - **First Study Group meeting (>54 people)**

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 bidders. In a lunch address at Rawcon, National Telecommunication & Information Administration head Larry

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-

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

51 N-WEST Supporting Companies

- **Industry Associations**
 - Cellular Telephone Industry Assn.
 - Wireless Communications Assn.
- **License Holders**
 - Antilles Wireless Cable TV Co.
 - Charles Brinkman
 - Formus Communications, Inc.
 - US WEST Adv. Technologies
 - WinStar Communications, Inc.
 - WNP Communications, Inc.
- **Systems Equipment Providers**
 - 3Com Corporation
 - ADC Telecommunications
 - Alcatel Network Systems
 - Belstar Systems Corp.
 - Ensemble Communications
 - Ericsson Inc.
 - Intraplex
 - Lucent Technologies
 - Motorola Inc.
 - NEC America, Inc.
 - Netro Corporation
 - Nortel Networks
 - P-COM
 - Philips Broadband Networks
 - Spike Technologies, Inc.
 - WaveCom Electronics Inc.
 - WaveSpan Corporation
 - Wavtrace
- **Subsystems (radios, modems, ...)**
 - AMP M/A-COM
 - BroadBand Wireless Inc.
 - CircuitPath Network Systems
 - ETM Electromatic
 - Hewlett-Packard Co.
 - Integrity Communications
 - Millitech Corporation
 - Raychem Corp.
 - Raytheon Systems Company
 - SiCOM, Inc.
 - Stanford Wireless Broadband Inc.
- **RF Semiconductors**
 - Fujitsu Compound Semiconductor
 - Harris Semiconductor
 - Sanders, A Lockheed Martin Co.
- **Test and Measurement**
 - Anritsu Company
- **Consultants/R&D/Misc.**
 - Bellcore
 - C&W Systems, Ltd.
 - E B Systems Limited
 - EDX Engineering, Inc.
 - Hardin & Associates, Inc.
 - Illinois Institute of Technology
 - LCC International Inc.
 - MLJ, Inc.
 - Technical Strategy Associates
 - WFI

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 Corporation

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 Tadros, Triton Network Systems

Keith Bromberg, Director of Wireless Marketing, WaveSpan Corporation

Roland Svensson, Technical Director, Wavtrace

Andrew Kreig, President, Wireless Communications Association International

Tutorial: "Broadband Wireless Access Technology and Standards"

November 9, 1998

- **N-WEST BWA Standardization Efforts**
 - **Roger Marks, N-WEST**
- **Status and Evolution of the BWA Marketplace**
 - **James Schellenberg, CTO, Nortel**
Broadband Wireless Access
- **BWA Standardisation: A European View**
 - **David Palmer, Philips Broadband Networks**
- **BWA: What to Standardize**
 - **Leland Langston, Raytheon Systems Co.**
- **Key Issues in an LMDS Air Interface**
 - **Rami Hadar, CEO, Ensemble**
Communications

Speakers

November 10, 1998

- **Paul Khanna, Hewlett-Packard**
- **Al Petrick, Harris Corp.**
- **Jim Mollenauer, Technical Strategy Assoc.**
- **Jamshid Khun-Jush, Ericsson**
(Vice Chair, BRAN)
- **George Hendry, Stanford Wireless Broadband**
- **Hady Salloum, Bellcore**
- **Sanjay Moghe, ADC Telecommunications**
- **Edmar Camargo, Fujitsu Compound Semiconductor**
- **John Liebetreu, SiCOM**

Task Groups

- **System Requirements and Interoperability Task Group**
 - **Chair: Jay Klein, Ensemble Communications**
- **IF Interface Task Group**
 - **Chair: Jack Van der Star, Belstar Systems**
 - **Secretary: Erol Yurtkuran, Integrity Communications**

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.

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**

Milestone 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

- first PAR approval by 802 Executive Committee

June 4, 1999

- submit second PAR to 802 Executive Committee

Plans for this Week

- **Meeting on Wednesday, Thursday, Friday**
- **Joint Session with BRAN HIPERACCESS**
- **This Week's Deliverables**
 - **PAR on LMDS**
 - **committee structure**
 - **leaders**
 - **relationship with BRAN HA**