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Title:

802.16.1 MAC Simulation Tools: Recommendations

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Source:

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Venue:

802.16 Session #5, Richardson, TX; MAC Task Group: Evaluation and Modeling

Base Document:

802.16.1mc-00/06 <http://grouper.ieee.org/groups/802/16/mac/contrib/802161mc-00_06.pdf>

Purpose:

Consider the information presented for choosing MAC simulation/modeling tools

Notice:

Release:

IEEE Patent Policy:

MAC Simulation Tools: Recommendations

Brian Petry, 3Com

Purpose: Lend some of my experience to spur discussion of tool choices

(See document: 802.16mc-00/06)

Outline

- Requirements
- Two Tools
- Recommendations

Requirements

- Inexpensive
- Reliable, predictable
- Easy to use/maintain
- Simulate bearer services (mandatory and recommended)
- Discrete-event based

Requirements (cont.)

- Models built for networking
- Network-oriented traffic and error models (statistical, self-similar and trace-based)
- Existing network protocol models (layers and topologies)
- Good “upper layer” models built-in

Two Tools

- DARPA/VINT (Virtual Internetwork Testbed) Network Simulator (*ns)*

- NIST HFC/ATM Simulator

ns

- DARPA-funded maintenance
- Key VINT contributors/members: UCB, LBL, Xerox/PARC, USC/ISI
- Used by numerous commercial and academic entities for many network models
- Network-, IP-orientation (no ATM)
- UNIX/Linux and Windows
- I had a good experience with MAC layer modeling
- http://www-mash.cs.berkeley.edu/ns/

NIST HFC/ATM Simulator

- From the High-Speed Network Technology (HSNT) group at NIST, MD
- Based on the NIST/ATM Simulator
- For 802.14, TCP/IP & ATM/ABR models added (note error in 802.16mc-00/6)
- Limited support for other higher layers
- UNIX-based

Current NIST/HSNT Work

(from David Su, Nada Golmie)

- Helping 802.15 develop SDL specification
- Helping 802.15 analyze coexistence effects on MAC layers (e.g., 802.11 and 802.15)
- Evaluating tool choices for 802.15 work
- Will help 802.15 MAC performance analysis
- http://w3.antd.nist.gov

Recommendations

- At least start with the NIST Simulator
- An *ns*-based simulation would attract more attention by academia and industry
- Task group should consider “porting” ATM and HFC models to *ns*
- *ns* is “cool”

- *Any other ideas?*

Notes

- SDL tools for editing protocol specs may be used, in a limited fashion, for simulation and verification.
- Is ATM “good” for *ns*?
- Another “big” simulator: www.sssnet.org, Rutgers University

Notes (cont.)