Title: Draft 5 Criteria for IEEE 802.16 Project on License-Exempt Coexistence

Document Number: 802.16le-04/03

Date Submitted: Sept. 1, 2004

Source:

Mariana Goldhamer Voice: +972 3 645 6241 marianna.goldhammer@alvarion.com

Chair – Study Group on LE Coexistence

Alvarion

21a HaBarzel Street, Tel Aviv, Israel

Venue:

Session #33: 30 August-2 Sept., 2004

Purpose:

Broad Market Potential

- Standards project authorized by IEEE 802 shall have a broad market potential.
- Specifically, it shall have the potential for:
  - Broad sets of applicability.
  - Multiple vendors and numerous users.
  - Balanced costs (LAN versus attached stations).

Broad Market Potential - answer

- IEEE 802 standards for wireless devices are widely implemented and widely used for numerous applications, such as local area networking, wireless internet hotspots, streaming video, and home networks. Tens of millions of LE systems have been deployed from multiple vendors and are operating in LE bands. New 802 standards are being proposed for operation in the LE bands such as the 802.16. Radio compatibility and coexistence among multi-vendor 802.16 based systems is an important aspect of these new systems to ensure acceptance in the marketplace.
- The goal of this project is to ensure that multi-vendor LE systems may be readily deployed in the LE bands without disruption to existing and newly deployed services. The uncertainty in the marketplace from concerns about inter-system interference will be significant and could decrease the market potential if a license-exempt spectrum sharing protocol is not implemented.
- Given that a base station in a point-to-multipoint network can serve many user stations, improved coexistence will support an increase in the number of attached stations and the cost of the equipment will therefore be effectively spread over more users. Typically it will represent a small fraction of the total investment in computing and telecommunications hardware.

Compatibility

- IEEE 802 defines a family of standards. All standards shall be in conformance with the IEEE 802.1 Architecture, Management and Interworking documents as follows: 802. Overview and Architecture, 802.1D, 802.1Q and parts of 802.1f. If any variances in conformance emerge, they shall be thoroughly disclosed and reviewed with 802. Each standard in the IEEE 802 family of standards shall include a definition of managed objects which are compatible with systems management standards.

Compatibility - answer

- The proposed standard will conform to the 802 Functional Requirements Document, in the same way that IEEE 802.16-2004 conforms with these documents.

Distinct Identity

- Each IEEE 802 standard shall have a distinct identity. To achieve this, each authorized project shall be:
  - Substantially different from other IEEE 802 standards.
  - One unique solution per problem (not two solutions to a problem).
  - Easy for the document reader to select the relevant specification.

Distinct Identity - answer

- No current wireless project addresses the issue of coexistence of different 802.16 compatible systems operating in the shared LE bands.
- The new standardized unique solution will address all the PHY modes defined in 802.16
- A separate chapter addressing LE coexistence will be provided, addressing the proposed modifications, to ease the readability of the standard.

Technical Feasibility

- For a project to be authorized, it shall be able to show its technical feasibility. At a minimum, the proposed project shall show:
  - a) Demonstrated system feasibility.
  - b) Proven technology, reasonable testing.
  - c) Confidence in reliability

Technical feasibility

- Ideas discussed in 802.16 LE Ad-Hoc and SG, show the technical feasibility of the proposed goal. Inter-system communication and the scheduled nature of the 802.16 systems may be the basics for achieving the spectrum sharing.
- The new protocols may use technologies already defined in 802.16 or implemented in other wireless systems.
- Commercial deployment of point-to-point and point-to-multipoint systems at millimeter-wave frequencies by carriers is evidence of proven reliability.

Economic Feasibility

- For a project to be authorized, it shall be able to show economic feasibility (so far as can reasonably be estimated), for its intended applications. At a minimum, the proposed project shall show:
  - Known cost factors, reliable data.
  - Reasonable cost for performance.
  - Consideration of installation costs.

Economic Feasibility - answer

- The economic feasibility of IEEE 802.16 wireless devices is well-documented.
- The device cost will not be affected by the new protocols.
- The operational costs will be lowered by including dynamic interference mitigation techniques in the 802.16 standards.