



BreezeNET® B

Concatenation in Version 3.1

September 2005
DN0849-2

Date	Document Name	Document Number
12 September 2005	BNET B Concatenation in Version 3.1	DN0849-2
Written By: Yossi Artzi		No. of pages: 7
Title: Product Experts		Rev: A
Approved By:		Name:
Product Experts Director		Ulik Broida
R&D Product Manager		Ronen Shabo
Product Line Manager		Lior Mishan

© Copyright 2005 Alvarion Ltd. All rights reserved.

The material contained herein is proprietary, privileged, and confidential and owned by Alvarion or its third party licensors. No disclosure thereof shall be made to third parties without the express written permission of Alvarion Ltd.

Alvarion Ltd. reserves the right to alter the equipment specifications and descriptions in this publication without prior notice. No part of this publication shall be deemed to be part of any contract or warranty unless specifically incorporated by reference into such contract or warranty.

Alvarion[®], BreezeCOM[®], WALKair[®], WALKnet[®], BreezeNET[®], BreezeACCESS[®], BreezeMANAGE[™], BreezeLINK[®], BreezeCONFIG[™], BreezeMAX[™], AlvariSTAR[™], MGW[™], eMGW[™], WAVEXpress[™], MicroXpress[™], WAVEXchange[™], WAVEView[™], GSM Network in a Box and TurboWAVE[™] and/or other products and/or services referenced here in are either registered trademarks, trademarks or service marks of Alvarion Ltd.

All other names are or may be the trademarks of their respective owners.

Limitation of Liability:

(a) Alvarion shall not be liable to the purchaser or to any third party, for any loss of profits, loss of use, interruption of business or for any indirect, special, incidental, punitive or consequential damages of any kind, whether arising under breach of contract, tort (including negligence), strict liability or otherwise and whether based on this agreement or otherwise, even if advised of the possibility of such damages.

(b) To the extent permitted by applicable law, in no event shall the liability for damages hereunder of alvarion or its employees or agents exceed the purchase price paid for the product by purchaser, nor shall the aggregate liability for damages to all parties regarding any product exceed the purchase price paid for that product by that party (except in the case of a breach of a party's confidentiality obligations).

Contents

Scope	1
Introduction.....	1
The Concatenation Process.....	1
Maximum Frame Length.....	2
Performance & Throughput	3
Backward Compatibility	4

Scope

The purpose of this document is to describe the functionality of the concatenation feature in firmware version 3.1.

Introduction

The concatenation feature was first introduced in version 3.0 where concatenation of up to two Ethernet packets into a single concatenated “wireless” packet was possible. In version 3.1 the system is able to concatenate up to eight packets while utilizing a larger wireless packet.

Frames transmitted over the wireless medium are bridged to or from the Ethernet, and therefore are restricted to the maximum Ethernet size of 1518 bytes. When employing concatenation, the transmitter can bundle up to eight Ethernet packets into a single wireless LAN packet. This larger packet enhances the efficiency of the wireless channel, enhancing system capacity and link throughput.

The Concatenation Process

The actual concatenation is performed by the system as follows:

- Each Ethernet packet destined for transmission to the wireless is marked as having the potential to be concatenated.
- When a unit attempts to transmit the packet, it checks if the wireless medium is “clear” for transmission. If the wireless medium is clear, the unit immediately transmits the packet.
- If the wireless medium is currently occupied, the unit checks if the buffer of the potentially available packets for concatenation holds additional packets:
 - **If the concatenation buffer is empty and the medium is occupied**, the packet is kept for maximum 10msec. After 10msec, the packet is sent to the wireless medium.
 - **If the TX (queue) buffer holds another packet** the packet is concatenated with the packet in the buffer, as long as the **concatenated size is no larger than 2200 bytes**.

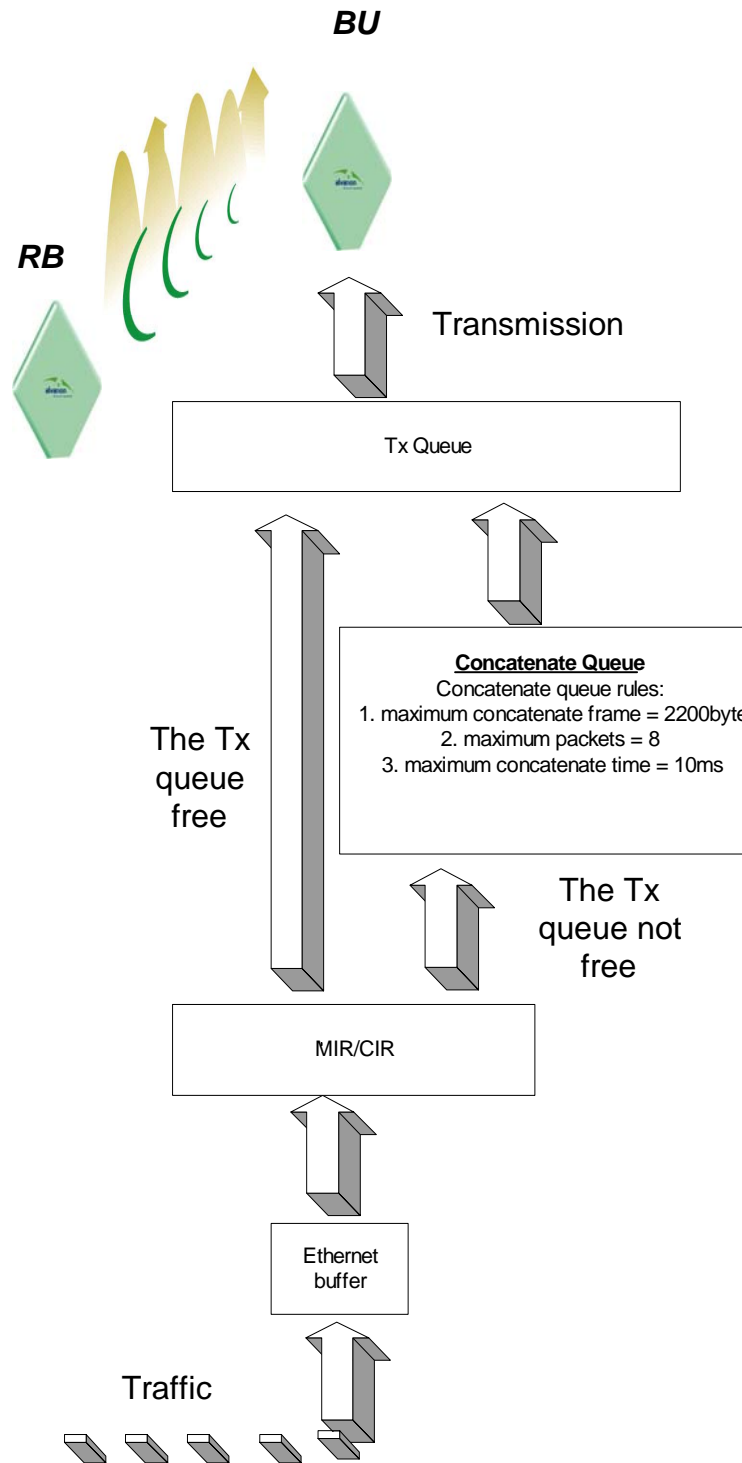


Figure 1: Concatenation Transmission Flow Control

Maximum Frame Length

The maximum frame length is 2200 bytes for units with hardware revision 'A', 'B', and 'C'.

Performance & Throughput

Table 1 shows performance (throughput) with concatenation mode enabled (up to 8 packets) in different hardware and firmware versions.

Table 1: UDP Performance and Throughput

Packet Size [Bytes]	BNB28 Release 3.0 [Mbps]	BNB28 Release 3.1 [Mbps]
384	9.928704	12.383232
512	13.197312	16.375808
768	19.709952	22.14912

NOTE

BNB concatenation buffer is 2200 bytes for both H/W revision C and B. Therefore, BNB performance is identical for H/W revisions B and C.

The throughput tests were conducted in a lab using a UDP traffic generator and with the following system configuration:

Burst mode – Enable
Concatenation – Enable
WEP – Disable
AES – Enable.



Backward Compatibility

The following table summarizes the concatenation process when using different hardware and firmware versions.

Table 2: Hardware and Firmware Revisions

HW Revision	Software Release	Packet size [Bytes]	Maximum Number of Concatenated packets
A/B/C	Under 3.0	No concatenation	No concatenation
A/B/C	3.0	2200	2
A /B/C	3.1	2200	8