

Enea LINX Performance Benchmarks

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Introduction

Purpose

This document contains benchmark data for Enea LINX on a variety of platforms and in a variety of configurations.

Revision History

Revision	Author	Date	Description of purpose for new revision
1	Mike Christofferson	2006-03-10	First revision

Type of Benchmarks Performed

There are two types of benchmarks performed – taken from the standard TIPC benchmarking programs that come with the standard TIPC distribution on SourceForge.net. These are 1) Latency and 2) Throughput. Latency measures the round-trip time for a single message to be sent and returned (to sender). Throughput measures the max data transfer rate at 100 CPU utilization of messages sent to a receiver (who discards them).

LINX is a cross-platform IPC service, currently ported to both Linux and Enea's OSEck (for DSP's). Therefore benchmark tests are provided for:

1. Linux-Linux
2. Linux-OSEck
3. OSEck-OSEck

The exact hardware configuration for each test is detailed in the sections below that contain the benchmarks.

In the Linux-Linux case, some additional data is provided. TIPC is a competing protocol to LINX, so for convenience, TIPC benchmarks are compared to LINX, and for both inter-node communications and intra-node communications. "Inter-node" refers to communications between two applications on different CPU's, and "Intra-node" refers to communications between two applications on the *same* CPU.

Performance Benchmarks

Linux-Linux Benchmarks

LINX revision: "Pre-release", 2006-02-10

TIPC revision: 1.5.09, Dec 16, 2005

CPU: GDA RMC G8500 (MPC 8540 PowerQUICC III processor, at 666MHz)

Inter-Node Benchmarks

Interconnect: Gigabit Ethernet (TSEC on GDA8540) with DLINK DGS-1216T Gigabit Ethernet switch

Latency Test		
Packet Size (bytes)	LINX (uSec/packet)	TIPC (uSec/packet)*
64	43	46
256	53	56
1024	90	94
4096	183	216
16384	529	613
65536	1935	2113

Throughput Test		
Packet Size (bytes)	LINX (uSec/packet)	TIPC (uSec/packet)*
64	24	30
256	24	32
1024	28	34
4096	58	106
16384	200	318
65536	748	1156

*- LINX has a traffic adaptation algorithm that adjusts the Gigabit hardware for maximum performance – i.e. disables interrupt coalescing for low traffic load to minimize latency, and enables it for high traffic load to maximize throughput. TIPC does not have a traffic adaptation algorithm, so TIPC was measured with Gigabit Ethernet interrupt coalescing disabled. If interrupt coalescing were enabled, then TIPC had about 10x worse latency (order of magnitude) and about 6% better throughput figures.

Intra-Node Benchmarks

Latency Test		
Packet Size (bytes)	LINX (uSec/packet)	TIPC (uSec/packet)
64	12	14
256	13	16
1024	16	19
4096	28	34
16384	131	147
65536	548	578

Throughput Test		
Packet Size (bytes)	LINX (uSec/packet)	TIPC (uSec/packet)
64	6	7
256	7	9
1024	8	10
4096	19	23
16384	68	78
65536	276	284

Linux-OSEck Benchmarks

LINX revision: "Pre-release", 2006-02-10

Linux CPU: GDA Technologies RMC G8500 - MPC 8540 PQIII at 666 MHz

OSEck CPU: Surf Communications Surftrider 812 PTMC - Quad TI C6412 DSP board

Interconnect: 100 Mbit Ethernet (Klin DGA-SW800 Ethernet switch)

Note: Maximum packet size on OSEck (DSP) is 16K bytes

Latency Test	
Packet Size (bytes)	LINX (uSec/packet)
64	118
256	241
1024	737
4096	1474
16384	3607

Throughput Test	
Packet Size (bytes)	LINX (uSec/packet)
64	30
256	32
1024	84
4096	336
16384	1356

OSEck-OSEck Benchmarks

LINX revision: "Pre-release", 2006-02-10

OSEck CPU: Surf Communications Surftrider 812 PTMC - Quad TI C6412 DSP board

Interconnect: 100 Mbit Ethernet (Klin DGA-SW800 Ethernet switch)

Note: Maximum packet size on OSEck (DSP) is 16K bytes

Latency Test	
Packet Size (bytes)	LINX (uSec/packet)
64	71
256	138
1024	402
4096	1005

Throughput Test	
Packet Size (bytes)	LINX (uSec/packet)
64	24
256	36
1024	86
4096	340

Corporate Headquarters

P.O. Box 1033
Skalholtsgatan 9
SE-164 21 Kista, Sweden
Phone: +46 (0)8 507 140 00
Email: info@enea.se
Web : www.enea.com

US Headquarters

2635 North First Street
Suite 118
San Jose, CA 95134
Phone: 408-323-9480
Toll-free: 866-844-7867
Email: info@enea.com
Web: www.enea.com

Asian Headquarters

1-4-2 Kanda
Ogawa-machi, Chiyoda-ku
Tokyo, Japan
Phone: +81 3 5207 6167
E-mail: osesales_jp@enea.se
Web : www.enea.com



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