intel®

iNA955
iRMX™ NDS-II LINK

■ Transfers files between iRMX™86-based systems and the NDS-II NRM

■ Supports fast and reliable download into iRMX™86 target system

■ Supports Intel's 86/310, 86/330A, 86/380 systems

■ Configurable at nucleus level with iRMX™86 operating system

■ Operates through Ethernet communications controller and cable connected to NDS-II

■ Utilizes Ethernet technology with data transmission speeds at 10M bits per second

The iNA955/iRMX™ NDS-II LINK is a software package that allows an iRMX based system 86/310, 86/330A, or 86/380 system to be connected to an Intel Network Development System (NDS-II) network via an Ethernet coaxial cable or Intellink™ module.

iRMX system developers can use the Series II, III, IV and Model 800 for editing, compilation and debugging to develop, store, and manage software programs at the Network Resource manager. Using iNA955 these developers can download programs at Ethernet speeds from the Network Resource Manager into their target iRMX hosts for execution and system integration.

System developers can also use the iNA955 programmatic interface to develop their own application programs which run in the iRMX environment and interface with the NRM. This is a way for OEM developers to customize the operating environment to suit their own application.
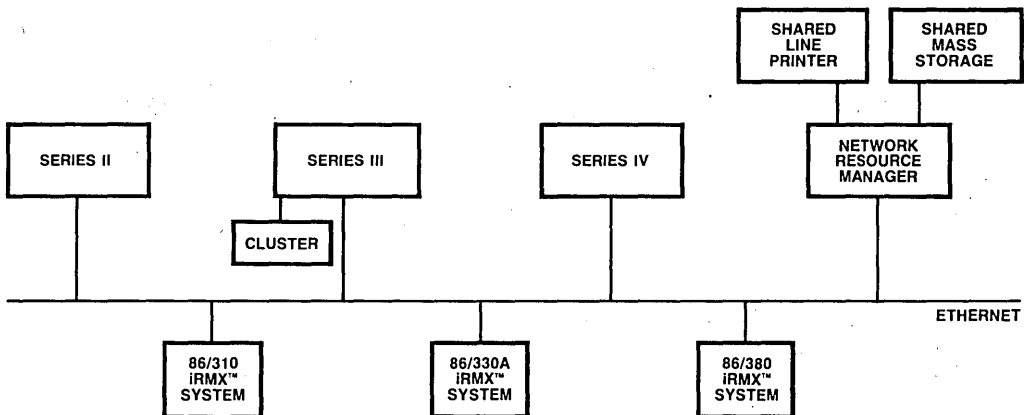

Figure 1. Example of NDS-II Configuration using the iRMX™ NDS-II LINK

NDS-II OVERVIEW

The NDS-II is a distributed processing local area network optimized for development of microcomputer-based products. It addresses the needs of both software and hardware engineers by providing the base environment for shared development tools plus the capacity for expansion.

An NDS-II network consists of an NRM which serves as the file server for a variety of Intel's development systems. These development systems include Series II, Series III, Series IV, and Model 800. By configuring iNA955 into an iRMX 86 system, an iRMX system can also be served by the NRM.

NDS-II's Network Resource Manager (NRM) manages all workstation requests for network resources. NRM tasks include service of workstation file requests, printer spooling, management of the distributed Hierarchical File System, the Distributed Job Control System and network maintenance functions such as user-name creation, file archival and system generation.

iNA955 provides a basic upload/download file transfer capability between an iRMX 86 system and the NRM. When used with an iSBC® 550 Ethernet controller, iNA955 allows users at iRMX 86 systems to move files between iRMX systems and the NRM, list directories at the NRM, delete or rename files at the NRM and copy files between two directories on the same NRM.

Access to files is accomplished using two interfaces:

A A CUSP interface which operates on the network file system in a manner similar to iRMX CUSPS which operate on local iRMX files under a full iRMX operating system.

B A programmatic interface which allows user programs running with a iRMX nucleus to access files at the NRM. These interfaces are similar to those present in UDI and EIOS.
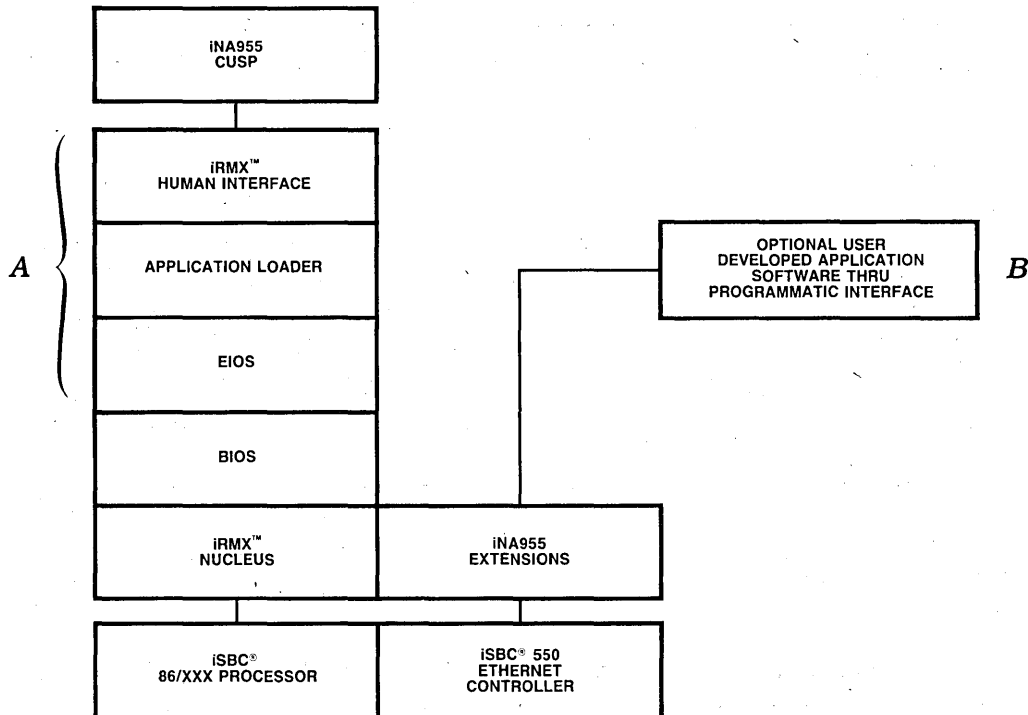

Figure 2. iNA955 Functional Diagram

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FUNCTIONAL DESCRIPTION

iNA955/iRMX NDS-II LINK consists of a program which runs on the system 86/3XX family of host computers. iNA955 executes under the iRMX 86 operating system and uses the local iRMX file system.

The iRMX-based host computers communicate with the NRM via iNA (Intel Network Architecture) which is based upon Ethernet communication protocols. These protocols are supplied by the iSBC550 board set which must be included in the iRMX host system since iNA955 uses the iSBC550 to communicate over Ethernet.

The following tables summarize the user commands and programmatic calls with their descriptions.

User Interface Commands	Function
NACCESS	examines/changes NRM file access rights
NCREATE	creates NRM directory
NDELETE	deletes NRM file
NDIR	examines NRM directory
NLOGOFF	logs off from NRM
NLOGON	logs on to NRM
NRCOPY	copies file from NRM to iRMX station
NNCOPY	copies NRM file to NRM file on the same NRM
RNCOPY	copies files from iRMX station to NRM
NRENAME	renames NRM file or directory

Programmatic Calls	Function
NQ$CHANGE$ACCESS	change access of file on the NRM
NQ$CREATE$DIR	create directory on the NRM
NQ$DELETE	delete file on the NRM
NQ$FILE$INFO	get information of file on the NRM
NQGETVIRTUAL$ROOT	get names of volumes at NRM accessible to user
NQ$LOGOFF	logoff user from the NRM
NQ$LOGON	logon user to the NRM
NQ$OPEN	open file at the NRM
NQ$READ	read contents of file at the NRM
NQ$READ$DIR$ENTRY$EXP	read expanded directory entry at the NRM
NQ$RENAME	rename file at the NRM
NQ$WRITE	write file to the NRM

Configuring iNA955

Like other iRMX systems iNA955 must be configured according to the system environment. To assist you in configuring your system, iNA955 comes with a configuration template. The file containing this template is contained on the release diskette. This template is designed to be self-explanatory.

The user has the option of integrating into his applications the iNA955 CUSPS. iNA955 CUSPS require the iRMX Human Interface to execute.

Physical Connections

The physical Ethernet connections can be made either through an "Intellink"™ module or through transceivers and the Ethernet cable. The Intellink module serves as an Ethernet local station concentrator. It allows workstations to be located up to 50 meters from the Intellink module and has 9 ports for connecting the NRM and workstations, and one port for connecting an Ethernet cable or other Intellink modules.

SPECIFICATIONS

Operating Environment

HARDWARE SUPPORTED

- System 86/310
- System 86/330A
- System 86/380

HARDWARE REQUIRED

- iSBC® 550 Ethernet Communication Controller Set

SOFTWARE REQUIRED

- iRMX™86 Operating System version 5.0
- NDS-II System software Release 2.5 or greater

Software Supplied

MEDIA

One 8 inch, single sided, double density iRMX™86 format diskette
One 5¼ inch, single sided, double density iRMX™86 format diskette

PROGRAMS

- iRMX/NDS-II LINK software linked into iRMX system library
- Examples of iRMX Integration Configuration utilities
- iSBC550 Diagnostics

DOCUMENTATION

- iNA955/iRMX NDS-II LINK Installation and User's Guide, Order Number 12256-001
- Complete NRM and Network operating manuals are included with the NDS-II systems
- iSBC550 Ethernet communications controller Hardware Reference Manual 121746.

ORDERING INFORMATION

Part Number	Description
iNA 955	iRMX/NDS-II Link
iSBC 550	Ethernet Communication Controller Set
iMDX 457	10 meter transceiver cable
iMDX 458	50 meter transceiver cable
iDCM 911-1	Intellink Module
iMDX 3015	Ethernet transceiver kit
iDMX 3016-1	25 meter Ethernet coaxial assembly
iMDX 3016-2	100 meter Ethernet coaxial assembly

Installation

On-site installation is included with the NDS-II Network Resource Manager. iNA955 is customer installable.