



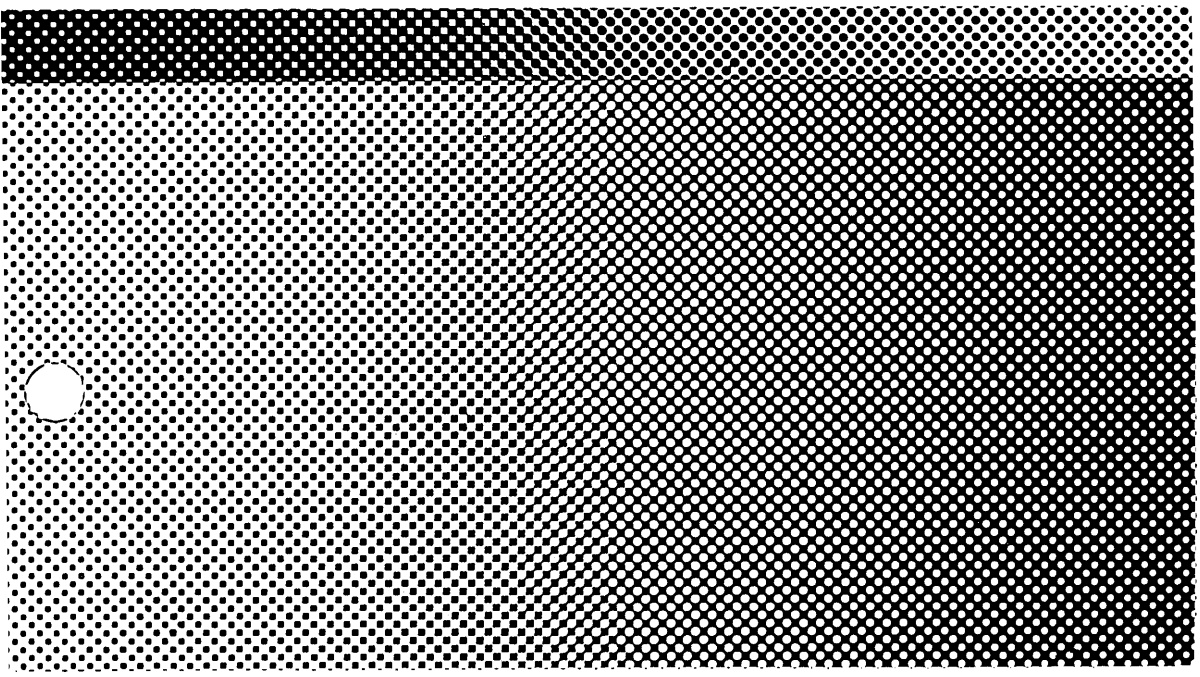
AT&T

AT&T SNA/RJE Emulator+
Product Overview



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AT&T SNA/RJE Emulator+ Product Overview



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Introduction

The AT&T SNA/RJE Emulator+ is a networking software product that allows you to use your 3B Computer to communicate with an IBM-compatible host system. Implemented in the C programming language, and running under the UNIX System V operating system, the AT&T SNA/RJE Emulator+ emulates an IBM 3770 Systems Network Architecture (SNA) Remote Job Entry (RJE) workstation. RJE workstations are designed to send and receive large volumes of data over a communication line.

IBM 3770 workstations support three categories of input device (card reader, console keyboard, and diskette), and three categories of output device (card punch, printer, and diskette). Each category obeys its own formatting rules. The IBM 3770 workstation reads data from an input device, does the appropriate formatting and blocking for that device, and sends the data over the communication line. Conversely, it accepts data from the communication line, does the appropriate formatting and blocking, and routes the data to the output device specified by the user.

The AT&T SNA/RJE Emulator+ uses the same categories of input and output device as the IBM 3770 workstation. But instead of using input and output devices, the AT&T SNA/RJE Emulator+ reads data from and writes data to disk files, which act as virtual input and output devices. The AT&T SNA/RJE Emulator+ also formats and blocks input and output data in the same way as an IBM 3770 workstation. This provides the user with a convenient means of transferring files from one computer system to another.

Features

The AT&T SNA/RJE Emulator+ emulates the IBM 3776 or 3777 Model 3 and 4 workstations, which are multiple logical unit (MLU) devices.

All important features of these devices are emulated, including:

- Support of up to six logical units by each 3770 physical unit. This means that each emulated 3770 workstation can be configured to support up to six sessions with a host.
- Multi-user capabilities; several users can submit jobs to the host concurrently.
- Space and data compression or expansion with truncation of trailing blanks for both inbound and outbound data streams. (The host application must specify the use of compression in the BIND command.) If compression is specified, consecutive space and data characters are removed before data are transmitted, and re-inserted when data are received, thus increasing throughput.
- Decompression of host-to-terminal data streams using a compaction table generated at the host and sent to the workstation over the data link. Compaction is used by the host to compress certain pairs of contiguous characters (defined in the compaction table) into a single byte for transmission, thereby increasing throughput. The 3770 workstation can receive compacted data and decompact it using the compaction table.
- Concatenation of data from more than one source into a single input stream to the host.
- Transparent and nontransparent communications over the data link.
- Point-to-point and multi-point communications.
- Operation as a single logical unit device.

In addition to supporting all the standard features of an IBM 3770 workstation, the AT&T SNA/RJE Emulator+ offers these enhancements:

- The Emulator+ reads and writes to virtual I/O devices.
- The Emulator+ can assign 48 output destinations per session. (The IBM 3770 workstation can assign only six.)

- The Dynamic Routing feature allows the user to route the output of his job to the directory or file of his choice.
- Commands to invoke RJE functions may be submitted from the user's terminal or issued from a C program written by the user that uses the Application Program Interface (API) feature.
- The AT&T SNA/RJE Emulator+ software can be configured to run two 3770 workstations using one SDLC communications link to the host. This feature is known as dual-identity SDLC. It may be implemented by defining two 3770 physical units in the configuration file used by the SNA Controller (one component of the Emulator+ software). The line must also be properly configured at the host as a multi-drop line with two station addresses, one for each physical unit.

The Emulator+ is also designed to run concurrently with the AT&T 3270 Emulator+, operating in an SNA environment. Assuming the AT&T 3270 Emulator+ Release 2.0.0 has been installed on the 3B Computer, the dual-identity SDLC feature allows a 3270 workstation and a 3770 workstation to operate simultaneously over one SDLC link to the host. To do this, the SNA Controller, a component of both software packages, must be configured with one 3270 physical unit and one 3770 physical unit, and the line must be configured at the host as a multi-drop line with a station address corresponding to each physical unit.

For information on configuring a 3270 physical unit for the SNA Controller, refer to the *AT&T 3270 Emulator+ System Administrator's Guide*. (Note that the AT&T SNA/RJE Emulator+ and the AT&T 3270 Emulator+ can also be run independently using separate SDLC links.)

System Components

The AT&T SNA/RJE Emulator+ consists of two major components:

- The SNA Controller
- The SNA/RJE Emulator

The following sections describe these components in detail.

The SNA Controller

The SNA Controller functions are executed by the **SNA** process and the **sdlc** program.

- The **SNA** process emulates the SNA functionality of an IBM cluster controller. It provides support for all protocols associated with the Path Control, Transmission Control (or Connection Point Manager), Session Control, and Data Flow Control layers of SNA. The **SNA** process can be configured to emulate multiple physical units.
- The **sdlc** program emulates the link-level SDLC protocols as implemented on the cluster controller. In addition to interfacing to the **SNA** process, the **sdlc** program manages an SDLC I/O line driver. The **sdlc** program can be configured to handle either one or two SDLC stations on a line. Each station corresponds to a physical unit in the **SNA** process.

SNA and **sdlc** are started by the System Administrator when he executes the **startsna** command. The **SNA** process communicates with **sdlc** using a UNIX system device driver. When **startsna** is executed, **sdlc** is downloaded and started on its own processor on the ISC board; then the **SNA** process establishes the paths of communication between them.

NOTE

The SNA Controller software component is common to both the AT&T SNA/RJE Emulator+ Release 1.0.0 and the AT&T 3270 Emulator+ Release 2.0.0.

The SNA/RJE Emulator

The following processes execute the SNA/RJE Emulator functions:

- The **dc3770** process is the central process in the 3770 RJE system. The **dc3770** process emulates the job processing functions and the data communication functions (including space and data compression or expansion, decompaction, and transparency) of an IBM 3770 workstation. The System Administrator starts the **dc3770** process by executing the **dc3770** command.
- The dispatcher process, **disptch**, routes output to a file or directory specified by the user.
- The **rje** process is the user interface to the **dc3770** process. The user starts the **rje** process when he enters **rje** commands to invoke various RJE functions such as sending job files, canceling jobs, and displaying the local job queue.

User-Host Communication

The user interface process, **rje**, and the **dc3770** process communicate via a pipe (referred to as the "rje pipe") that is named when the **dc3770** process is started. The rje pipe name associated with each **dc3770** process must be unique.

The **dc3770** process communicates with the **SNA** process through another uniquely named pipe (referred to as the "sna pipe") that is named when the **SNA** Controller processes are started. The **SNA** process communicates with the **sdlc** program, which in turn communicates with the host via an SDLC link.

Figure 1 illustrates the communication path from the user to the host.

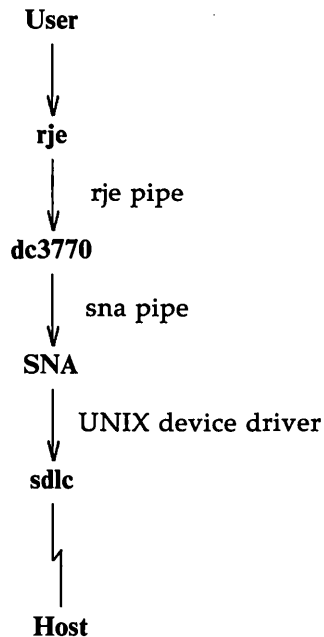


Figure 1: User-to-Host Communication Path

Conversely, data from the host follows the same path in reverse to the **dc3770** process. When the **dc3770** process receives the data, it gives the data a name and places it in its output directory. If the automatic routing feature is in effect, the output is then routed to the proper user destination by the **disptch** process. Figure 2 illustrates the communication path from the host to the user.

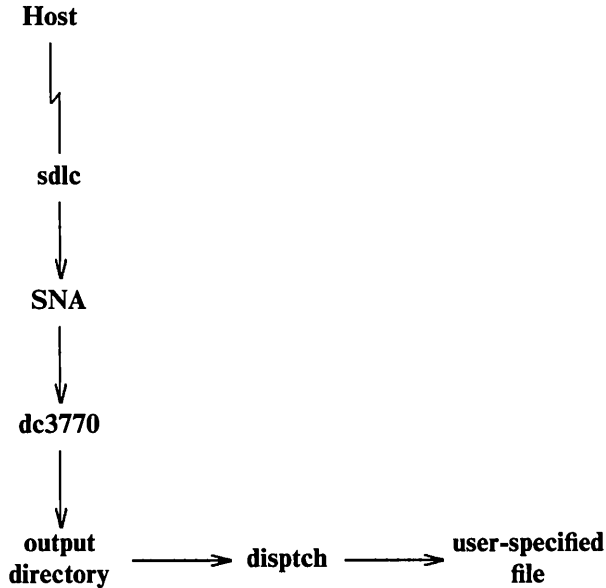


Figure 2: Host-to-User Communication Path

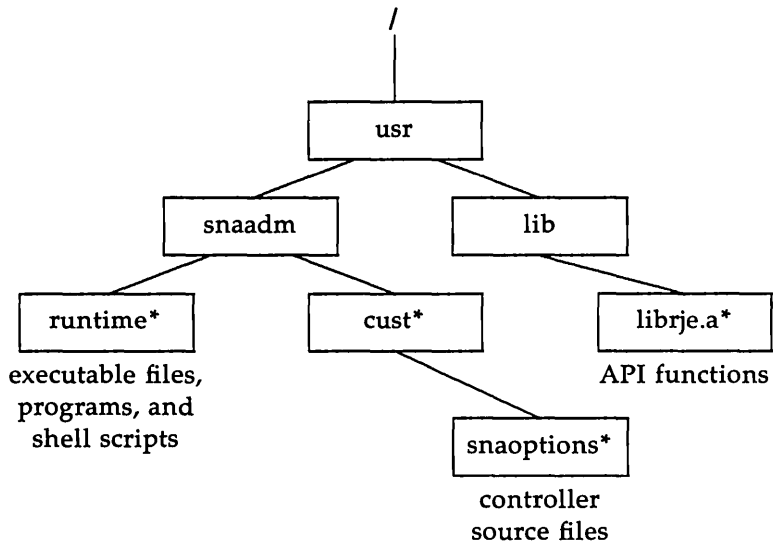
System Layout

The System Administrator must create an SNA Administrator's login directory before installing the AT&T SNA/RJE Emulator+ software. (Although the login directory may be assigned any name, throughout this document it is called `/usr/snaadm`.) All the AT&T SNA/RJE Emulator+ software is installed under this directory except for the Application Program Interface (API) library functions, which are installed under the directory `/usr/lib/librje.a`.

The AT&T SNA/RJE Emulator+ software installation program creates the following directories under `/usr/snaadm`:

- A directory called **runtime**. For ease of operation, executable files, shell scripts, utilities, and customization files are collected into this directory.
- An SNA Controller configuration directory called **cust/snaoptions**. Source files used to customize the SNA Controller for various host configurations are placed in this directory.

Figure 3 shows the structure of the directories and files used by the AT&T SNA/RJE Emulator+ software.



* Directories installed by the AT&T SNA/RJE Emulator+

Figure 3: Directories Used by the AT&T SNA/RJE Emulator+

Operating Requirements

AT&T 3B Computer

The AT&T SNA/RJE Emulator+ is intended for use on an AT&T 3B Computer. The 3B2 Computer must be equipped with an Intelligent Serial Controller (ISC) board. The ISC board should be installed following the procedures in the *AT&T 3B2 Computer Intelligent Serial Controller Manual*. (A separate ISC board is required for each active communication line to a host.) The 3B5 and 3B15 Computers must be equipped with an Input/Output Accelerator (IOA) processor and a Synchronous Data Link (SDLI).

The 3B Computer connects to the host using the switched telephone network or a non-switched (leased or private) line and a synchronous modem. The host connects to the communication line through a communications controller, data adapter unit, or transmission control unit that is attached to the line using a modem that is compatible with the modem used by the 3B Computer.

Terminal Requirements

The AT&T SNA/RJE Emulator+ works with any ASCII terminal supported by the AT&T 3B Computer.

Software Requirements

The AT&T SNA/RJE Emulator+ is designed to run under UNIX System V Release 2.0 and all subsequent releases. The ISC board and the ISC Board Utilities package must be installed before the AT&T SNA/RJE Emulator+ software package is installed. Installation of the AT&T SNA/RJE Emulator+ software package modifies the kernel to include a driver for the ISC board. The UNIX system utility program `/etc/pump` must be available for use in downloading the ISC board.

Documentation

AT&T SNA/RJE Emulator+

- *AT&T SNA/RJE Emulator+ User's and System Administrator's Guides* (select code 308-012)
- *AT&T 3B2 Computer AT&T SNA/RJE Emulator+ Release Notes* (select code 308-008) This Product Overview is generic (for the 2/5/15), but there are 2 Release Notes.
- *AT&T 3B5/15 Computer AT&T SNA/RJE Emulator+ Release Notes* (select code 308-009)

AT&T 3270 Emulator+

- *AT&T 3270 Emulator+ 3B2 System Administrator's and Application Programmer's Guides* (select code 308-331)
- *AT&T 3270 Emulator+ 3B5/15 System Administrator's and Application Programmer's Guides* (select code 308-332)
- *AT&T 3270 Emulator+ User's Guide* (select code 308-330)
- *AT&T 3270 Emulator+ Product Overview* (select code 308-001)
- *AT&T 3270 Emulator+ 3B2 Release Notes* (select code 308-002)
- *AT&T 3270 Emulator+ 3B5/15 Release Notes* (select code 308-335)

Intelligent Serial Controller

- *AT&T 3B2 Computer Intelligent Serial Controller Manual* (select code 305-531)

UNIX System V

- Documents describing UNIX System V are available from the Customer Information Center (see below).

IBM SNA Documentation

- *Systems Network Architecture Concepts and Products (GC30-3072).*
- *Systems Network Architecture Technical Overview (GC30-3073).*
- *Systems Network Architecture Reference Summary (GA27-3136).*

Ordering AT&T Documentation

AT&T documentation may be ordered by calling the AT&T Customer Information Center (CIC) at:

1-800-432-6600 (toll free within the continental United States)

or by writing to:

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