Adding functionality to PDP-11 applications with serial line front-ends.
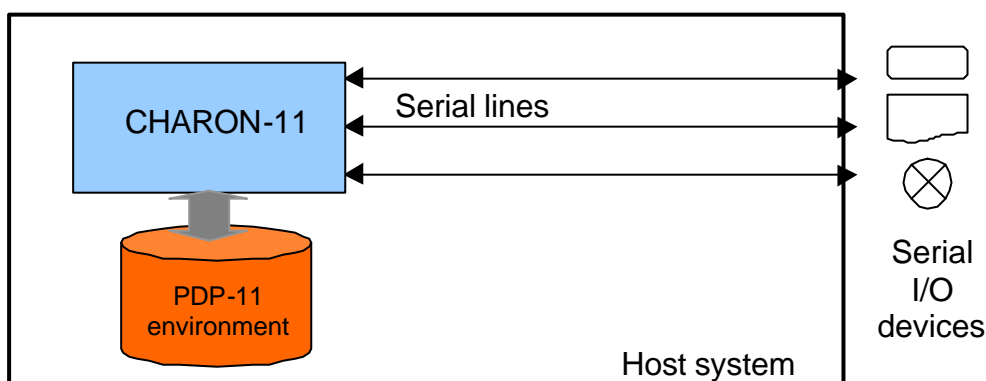
Introduction.

CHARON-11 is a software emulator which executes unmodified PDP-11 operating systems and applications. Many PDP-11 applications use serial lines to print data, display output on terminals or control industrial subsystems. CHARON-11 is designed to add or modify functionality to such applications, even where it is impossible or undesirable to modify the original PDP-11 code. This permits for instance the replacement of process I/O hardware without discarding the original application, replacement of hardware subsystems like the KMC-11 or providing management information from a shopfloor system to an SAP application.

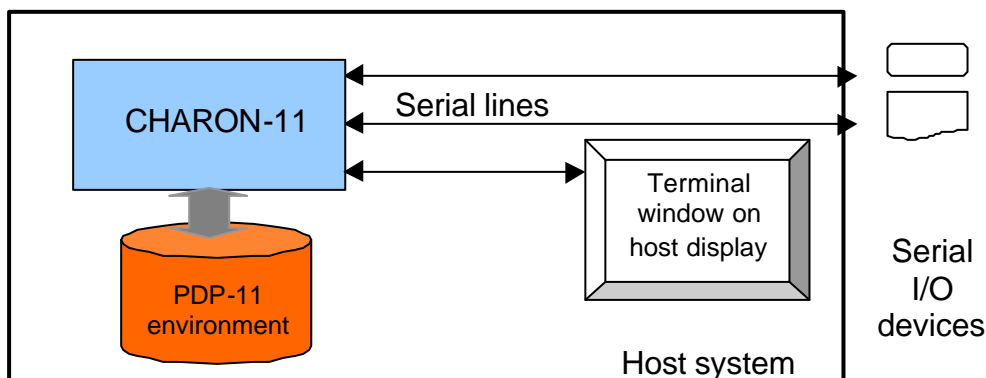## Re-routing serial lines to host applications.

In conventional operation, the serial lines of the emulated PDP-11 hardware are connected by CHARON-11 to the physical serial I/O ports of the host system, with for example the following entry in the configuration file:

load   DL11   YLA
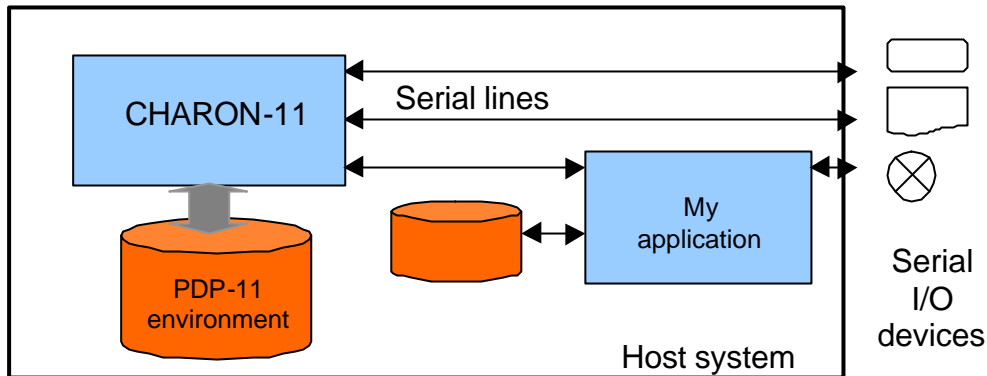**set   YLA   line="COM1:"**

The picture below shows how the emulated serial lines can alternatively be connected to the CHARON-11 terminal emulator:

load   DL11   YLA
set   YLA   line="run terminal"

Since the emulated serial line interface in CHARON-11 is in fact one side of a pipe, one can connect this pipe to a user written task on the host system instead of the usual COM port. The CHARON-11 emulator automatically invokes such task during the scanning of the configuration file:

load   DL11   YLA
set   YLA   line="run c:\my_application.exe"

An example of such a user task could be the adaptation of a PLC protocol to a new device, or the replacement of a KMC-11 I/O processor, which handles the DDCMP protocol emulation for a number of serial lines. Since the host system CPU is typically 10 – 50 times as fast as the original CPU these additional tasks require comparatively little additional system resources.

This mechanism can also be used to connect the existing PDP-11 application to newer applications on the host system with minimal effort. For example, one could add to a manufacturing application under RSX11-M a small user task collecting workflow information and writing it to a serial port. A user written task on the host system can capture this information, reformat it, combine it with other data and send it to the central SAP system for further processing. (For high bandwidth transfers of such nature, CHARON-11 also provides a pseudo device, the QQ11-N host connector. Using the QQ11-N requires PDP-11 assembly language programming, however).

Programming example

The programming example **TTPRINT** is a simple print utility to send data from a CHARON-11 serial line to the default printer of a Windows NT host system with for example the following entry in a configuration file:

load   DL11   YLA
set   YLA   line="run ttprint –lines 48"

The source code can be downloaded as TTPRINT.ZIP from the "downloads" area of the CHARON-11 web site at http://www.charon-11.com.

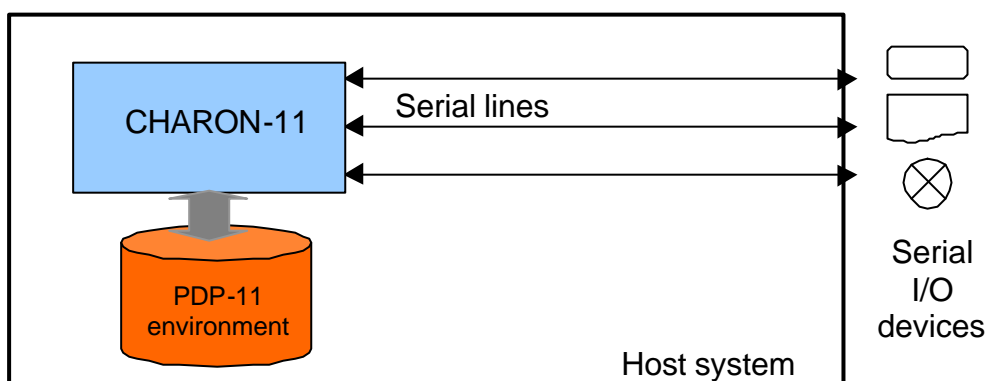# Adding functionality to PDP-11 applications with serial line front-ends.

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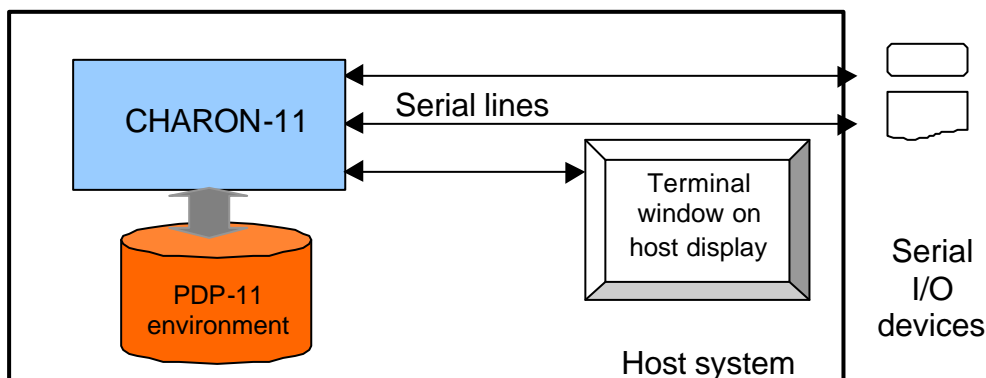
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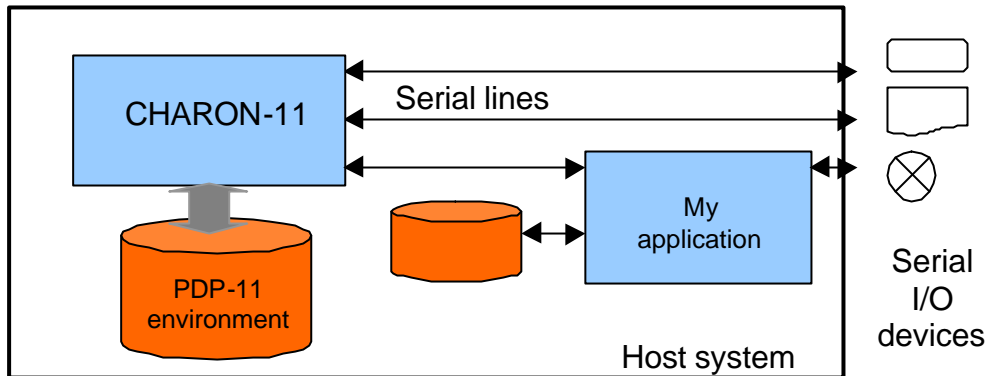

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