

**NAME**

**loader** - kernel bootstrapping final stage

**DESCRIPTION**

The program called **loader** is the final stage of FreeBSD's kernel bootstrapping process. It is responsible for bringing the kernel, kernel modules and other files into memory. It creates a set of sh(1) like environment variables that are passed to the kernel. It executes boot scripts written in one of several interpreters. Together with the scripts, it controls the booting process and interaction with the user.

It provides a scripting language that can be used to automate tasks, do pre-configuration or assist in recovery procedures. This scripting language is roughly divided in two main components. The smaller one is a set of commands designed for direct use by the casual user, called "builtin commands" for historical reasons. The main drive behind these commands is user-friendliness. The larger component is the scripting language built into the boot loader. FreeBSD provides three different interpreters: Forth, Lua and Simple. The Forth loader is based on an ANS Forth compatible Forth interpreter based on FICL, by John Sadler. The Lua loader is a full Lua interpreter from <https://www.lua.org/>. The Simple loader only interprets a list of builtin commands without any control structure.

During initialization, **loader** will probe for a console and set the *console* variable, or set it to serial console ("comconsole") if the previous boot stage used that. If multiple consoles are selected, they will be listed separated by spaces. Then, devices are probed, *currdev* and *loaddev* are set, and *LINES* is set to 24. Finally, an interpreter specific file will be executed.

**BUILTIN COMMANDS**

The commands common to all interpreters are described in the loader\_simp(8) "BUILTIN COMMANDS" section.

**BUILTIN ENVIRONMENT VARIABLES**

The environment variables common to all interpreters are described in the loader\_simp(8) "BUILTIN ENVIRONMENT VARIABLES" section.

**SEE ALSO**

libsa(3), loader.conf(5), tuning(7), boot(8), btxld(8), loader.efi(8), loader\_4th(8), loader\_lua(8), loader\_simp(8)

**HISTORY**

The **loader** first appeared in FreeBSD 3.1. The **loader** scripting language changed to Lua by default in FreeBSD 12.0.

**AUTHORS**

The **loader** was written by Michael Smith <msmith@FreeBSD.org>.

FICL was written by John Sadler <john\_sadler@alum.mit.edu>.

Warner Losh <imp@FreeBSD.org> integrated Lua into the tree based on initial work done by Pedro Souza for the 2014 Google Summer of Code.