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🚦 Performance/Feature Comparisons of Emacs Shells/Terminals

Emacs Shell/Feature	eshell	shell	ansi-term	term	vterm	Comment
Relative speed comparison: Execute "ls -lFGO" inside /usr/local/bin/ . (Execution times in seconds for several attempts at the same command).	• 2.448571 • 4.247726 • 2.550193 • 2.631693 • 2.510235 • 4.220897	• 2.514221 • 2.472229 • 2.514438 • 2.468948 • 2.765349	• 6.169079 • 5.431559 • 5.493072 • 5.398879 • 5.435839	• 5.586079 • 5.531138 • 5.519672 • 5.227298 • 5.526750	• 0.065568 • 0.073241 • 0.053149 • 0.048021 • 0.060560 • 0.109644	Tested the execution time of listing a directory that has 861 entries (mostly symlinks), a /usr/local/bin on a macOS computer.
Special installation/configuration Notes					**term shell-side configuration**	Read configuration/installation notes for the specific shell.
Toggle terminal mode to allow editing navigation	Standard Emacs keys always available for navigation but cursor keys used by the terminal for history.	Not available: **always in Emacs editing mode**.	out: **C-x C-j** in: **C-c C-k**	out: **C-x C-j** in: **C-c C-k**	out: **C-c C-t** in: **C-c C-t**	It is best to have 2 modes to use applications inside the terminal and have keys to switch between the "*pure terminal mode*" and Emacs navigation mode.
Escape Sequences and colouring works	Implement its own, does not render everything applications support.	Partially. Escape sequences work partially but other type of colouring does not.	Yes	Yes	Yes	
Shell prompt definition support (PS1)		Yes, but tput expressions to boldface prompt does not work.	Yes	Yes	Yes but requires code in shell configuration	Although vterm requires extra configuration that also provides extra functionalities.
clear works	Almost: clears the screen but leaves cursor at the bottom of the window.	No (problem with escape sequences)	Yes	Yes	Yes	
Support bash aliases	No but supports its own.	Yes	Yes	Yes	Yes	
F1-F12 keys available to terminal. • Yes: available to terminal. • No: used by Emacs only.	No	No	No	No	Yes	When the F1-F12 keys are used by terminal they can be used by applications that use them. They are, however not available to Emacs until you toggle the terminal mode off (using the keys identified in the second row above (eg. **C-c C-t** for vterm.)
History via cursor keys	Yes	• Not supported by cursors (which move point) • But supported by using CTRL key allowing with the cursor keys.	Yes	Yes	Yes	
Advantage	Implemented in Emacs Lisp, available in all environments even on non-*nix like Windows.				Best speed I have on my system, and pure terminal control.	For fast operations on something that is close to a real terminal, **vterm** is the best available on *nix platforms as far as I can tell at the moment (April 2020). The **eshell** is useful to perform operations on platforms where Unix-like utilities are not available and where you want to use Emacs lisp code. It integrates with Emacs functionality, standing on its own.
Can run scripts (interpret shebang line)	No. But can run script if the interpreter is specified explicitly.	Yes	Yes	Yes	Yes	
Runs other REPLs	Yes, as long that the shell is an executable on the PATH. It does not support bash alias that are sometimes used to launch shells.	Was able to use python, clisp, iex, but not LFE: it launched Erlang REPL instead. iex was coloured properly.	Yes, with colouring.	Yes, with colouring.	Yes, good speed, supports colouring. Use **C-c C-c** for Control-C, **C-c C-g** for Control-G	Again here, the best shell to run another real from the command line is vterm. However, it's also possible to run these REPLs from within Emacs. Using them from within another shell allows using one quickly or testing.
Can run Emacs Lisp commands	Yes	No	No	No	Yes	Some shells allow mapping keys to Emacs Lisp command code.
Interact with Emacs from the shell	Yes, using elisp code	No	No	No	Yes, with special escape sequences for message passing.	
Ability to write keyboard macros that interact wit h a shell	As the following columns show, the shell is the most flexible standard shell in term of ability to execute commands with any key bindings and can easily be used for keyboard macro that compose shell commands. The eshell is similar but you need to use Emacs Lisp syntax.					
Emacs Shell/Feature	**eshell**	**shell**	**ansi-term**	**term**	**vterm**	**Comment**
Can yank text in shell	• Linux: Yes • macOS: Yes	• Linux: Yes • macOS: Yes	• Linux: No • macOS: No	• Linux: No • macOS: No	• Linux: Yes • macOS: Yes	
Can navigate out of buffer with commands with Esc key prefix	• Linux: Yes • macOS: Yes	• Linux: Yes • macOS: Yes	• Linux: No • macOS: No	• Linux: No • macOS: No	• Linux: Yes • macOS: Yes	This is the same as being able to execute any commands that use an **Esc** key prefix.
Can navigate out of buffer with commands with <f1> key prefix	• Linux: Yes • macOS: Yes	• Linux: Yes • macOS: Yes	• Linux: Yes • macOS: Yes	• Linux: Yes • macOS: Yes	• Linux: No • macOS: No	This is the same as being able to execute any commands that use any function key as key prefix.