cadence®

Allegro Platform System Requirements

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Contents

Allegro Platform System Requirements

This document contains the recommended system requirements for Cadence® OrCAD® and Allegro® tools in release 17.4-2019.

Important

If you use a physical design product (Allegro PCB Editor, Allegro Package Designer Plus, or Allegro SI), be sure to read Graphics Requirements for Physical Design Products on page 14.

Important

All Linux platforms: To ensure that your system is configured with the correct operating system patches, run the `checksysConf` program. You can download `checksysConf` from Cadence Online Support.

CPU Core and RAM Requirement for Allegro Pulse

To run Allegro Pulse with System Capture, your system must have the following minimum configuration:

- Cores: Four or more
- RAM: 8GB or more

17.4-2019 Changes

Operating Systems No Longer Supported

As of release 17.4-2019, Cadence® OrCAD® and Allegro® products no longer support Windows 8, RHEL 5.x, and SLES 11.

Note: Cadence recommends that you upgrade to Windows 10 if you have a Windows 7 system because Microsoft will not support this operating system beyond January 2020 as per their announcement.

Microsoft Windows System Requirements

This section describes the system requirements for Microsoft® Windows® operating systems.

Because Cadence® OrCAD® and Allegro® products are integrated directly with Windows, hardware and peripherals supported by Windows are also supported by these Cadence products. A list of hardware and peripherals officially supported by Windows can be obtained from the Microsoft web page.

These products require updating certain Microsoft libraries in the Windows directory. You must install the Cadence software either using the desktop mode or client install. You may no longer be able to point to the Cadence software without installing.

Note: Once you install release 17.4-2019, you should only use the release 17.4-2019 version of the *switchversion* program to change releases. The installer always places this program at the top level of the Cadence hierarchy in the Windows *Start* menu.

Operating System	Windows 10 (64-bit) Professional and Entrprise, including Dark Theme mode; Windows Server 2012 (All Service Packs); Windows Server 2012 R2; Windows Server 2016. **Note:** Cadence Allegro and OrCAD products do not support Windows 10 Starter and Home Basic. In addition, Windows Server support does not include support for Windows Remote Desktop. Windows RT and Tablets/Phones, including Windows 10 Phone, are not supported. **Note:** 64-bit Windows require 64-bit Flex software dongle drivers if using dongle-based licensing.
Recommended Hardware	Intel® Core™ i7 4.30 GHz or AMD Ryzen™ 7 4.30 GHz with at least 4 cores **Note:** Faster processors are preferred. 16 GB RAM 50 GB free disk space (SSD drive is recommended) 1920 x 1200 display resolution with true color (at least 32bit color) A dedicated graphics card supporting OpenGL, minimum 2GB (with additional support for DX11 for 3D Canvas)

	Dual monitors (For physical design) Broadband Internet connection for some service Ethernet port/card (for network communications and security hostID) Three-button Microsoft-compatible mouse
Supported MATLAB Version	R2019A-64Bit (For the PSpice-MATLAB interface)

Microsoft SharePoint for Allegro Pulse

Cadence® Allegro® Pulse supports an interface to Microsoft SharePoint. Following are the requirements for SharePoint:

- Windows Server 2012 (64-bit)
- SharePoint Foundation 2013
- Microsoft SQL Server 2012 (64-bit)
- Following 64-bit browsers:
  - Microsoft® Internet Explorer® 11.0 on windows
  - Mozilla Firefox 52.0 ESR on Windows
  - Mozilla Firefox 52.0 on Linux
  - Google Chrome 58.0 on Windows

Using Spaces in File and Directory Names

Support for spaces in file and directory names applies only to Windows. Spaces in file or directory names are not supported on Linux platforms. Leading and trailing spaces in directory components are not supported.

Spaces in directory names are supported in the following areas:

- Program installation location (`C:\Program Files`)
- Default user home directory (`C:\Document and Settings\<`*user*`>`). If you set the `HOME` environment variable, you override the default.

- Default temporary directory (`C:\Document and Settings\<user>`). If you set the `TEMP` or `TMP` environment variable, you override the default.
- Your desktop directory (`C:\Document and Settings\<user>\Desktop`)
- Project location
- Library locations

Spaces in filenames are not supported when a filename is stored in the design. For example, symbols and padstack names are stored in the Allegro database where a space is not legal. Ancillary space support is based upon each installed application. Allegro® PCB Editor supports spaces in filenames for non-design files, that is, reports and text files.

Linux System Requirements

This section describes the system requirements for Linux.

Operating System	RHEL 6.5 (64-bit); RHEL 7.4 (64-bit); SLES 11 SP4 (64-bit); SLES 12 SP1 (64-bit)
Hardware	Intel® 64 (x64 or x86_64) compatible including i3/i5/i7 and r AMD Opteron™/Reyzen™ 8 GB (or greater) system memory 12 GB swap space 10 GB (or greater) available disk space TrueColor (65000 colors) required For information about graphics cards, see Graphics Requirements for Physical Design Products on page 14.
Window Manager	Gnome

Note: If you are running physical design/layout (back-end) tools, you must source

```
<cdsroot>/tools/bin/allegro_cshrc (tcsh/csh)
```

or

```
<cdsroot>/tools/bin/allegro_profile (sh/bash)
```

or integrate the equivalent Linux settings into your own environment files. It is not sufficient just to add installed tools to the `PATH` variable.

License Server Network Connection

In order to achieve good performance and to avoid problems from losing license access, all Cadence® software requires good network connection to the license servers and low latency:

- For adequate software performance and to avoid problems with dropped licenses, we recommend that network latency to the license server be no higher than `30ms`.
- Ideally, the license server latency should be close to `1ms`

Improving Performance on UNIX Systems

You may be able to greatly enhance your graphics performance on certain machines if you run both X and Cadence® products on the same machine.

To run X and Cadence products on the same machine, set the display variable to its local mode (type `setenv DISPLAY :0` at the command prompt). This lets the X protocol use shared memory instead of expensive TCP/IP transport.

Non-Native X Emulators

Cadence tools only support the XServer provided by the Linux vendors. Non-native X solutions such as Hummingbird, Exceed, and so on are not supported. VNC to non-native X solutions is also not supported.

Virtual Environment Support

Cadence® OrCAD® and Allegro® release has several products that require access to high performance graphic hardware. These applications rely on direct access, via drivers, to the capabilities of high-end graphics cards to display, render, and manipulate images on the screen. Products exist in both the Virtualization and Remote desktop areas that may or may not emulate these hardware functions. If these products emulate these graphical hardware functions, performance of the Cadence software will likely be poor. If these products do not emulate the APIs (Application Programming Interfaces) of the graphics hardware, the software will not function.

The Cadence advanced graphics programs list OpenGL as a requirement. To achieve best performance and quality you must download the latest graphics adapters provided by the hardware vendor of the card. The following is a list of the programs that require access to accelerated graphics adapters to operate:

- Allegro PCB Editor
- Allegro Package Designer Plus (APD+)
- SigXplorer
- Allegro Free and Plus viewers

The above listed products offer the ability to disable advanced graphics. This can be done temporarily by using the `-noopengl` command line argument or permanently by specifying

`set disable_opengl` in the local Allegro `env` file. Running with OpenGL disabled will disable certain advanced product functionality, such as 3D view modes and transparency.

While the applications will most likely install and operate in these environments, it has been demonstrated that performance is poor and advanced capabilities, such as 3D viewing may not work. Use of the graphical applications in these environments is not recommended and subject to these restrictions and caveats:

- The products are not supported in a virtual or remote desktop environment. You can use these environments at your own risk.
- Performance may be so poor as to be unacceptable. Functionality that is based on advanced graphics hardware may not work.
- Cadence will attempt to address issues reported in this environment but they must be reproduced on a supported workstation running in a non-virtual or non-remote desktop environment.

Finally, certain remote meeting products such as Microsoft NetMeeting do not properly display these applications. You should migrate to a remote meeting product where this is supported (for example, Microsoft Live Meeting) or run the Cadence software with the advanced graphics disabled.

File Server Support

The installed products support loading the software on centralized file servers. The operating system used by a file server does not have to appear on the platform support matrix as long as the system is just used as a file server. For example, you can utilize a file server running Windows 2005 (Windows) and this will be supported. If the file server is used for other purposes such as a license server, this function will need to meet the platform requirements.

The following network file system protocols are supported:

- Linux: NFS and local files systems (ext versions and NTFS). For local systems, FAT or other Linux file systems are not recommended. Mounting CIFS file systems on Linux is not supported.
- Windows: SMB/CIFS. While open source Samba software provides SMB/CIFS, Samba itself is not supported due to its many variations. Although Samba shares are used without problem in many enterprises, you need to duplicate tool problems in a supported environment.

Graphics Requirements for Physical Design Products

Most physical design products (such as PCB Editor, APD+, and SI, but not Allegro® PCB Router or SigXplorer) offer enhanced graphics via OpenGL. Schematic editors or front-end programs do not require OpenGL.

To use OpenGL as a graphics drawing option, your system must meet the following requirements:

- A modern computer purchased within the last couple of years.
- A dedicated graphics card (motherboard-based) with hardware OpenGL support or an Intel 945 class graphics card. A recommended 2GB dedicated (not shared) video RAM and a 128-bit bus interface. We also recommend that the card be workstation certified. A high-end motherboard based graphics solution delivers acceptable performance for most designs. This is one area where spending a bit for quality improves productivity.
- A minimum of 1 GB system memory.
- Installation of the latest graphics patches from the graphics card vendor.

Important

As with most graphics support, you must ensure that the appropriate drivers are installed and properly configured on your system. If you use older versions, you may see glitches with the display of objects, poor performance, and other problems. In the case of Windows Vista, only DirectX is available from the initial installation, so you must obtain new drivers before you attempt to run the tools. Make sure that video cards for Linux have Linux drivers available.

Remote graphics are not supported. Examples include:

- Windows terminal services such as Citrix
- VNC based programs
- Remote X programs (for example: Hummingbird)
- Thin client solutions

  If using Remote X clients they need to support OpenGL.

All tools require at least 65000 colors. We no longer support 256- color mode (also known as 8-plane mode in the X window world). Linux Xservers must be configured to use the TrueColor model.

Only the 2D mode is supported. OpenGL requires higher level graphics cards for best performance. On AIX platforms, OpenGL requires TrueColor 24 bit graphic settings, and will not display all colors if the system defaults are 8 bit color.

OpenGL is enabled by default. You can disable it using the environment variable `disable_opengl` in the OpenGL category of the User Preferences Editor dialog box.

Planning Hardware Purchases for Physical Design Products

The Cadence® OrCAD® and Allegro® product family includes products, such as for schematic capture and library design. These place higher demands on disk access and do not tend to need the fastest CPU available. However, most Allegro physical design or back-end products are CPU and memory-bound— especially true of the following back-end products: Allegro PCB Editor, PCB Router, APD, and PCB SI. Therefore, Cadence recommends a faster CPU for these products.

Allegro products use both integer and floating point, so select a configuration that provides ample processing power in both areas. When choosing a machine, purchase one with the highest CPU rating. Because vendors are de-emphasizing their CPU clocking, use the vendors' chip-naming convention. Alternatively, use a performance benchmark measurement. For example, the SPEC site (`http://www.spec.org`) lists the hardware results from multiple vendors.

If two systems have comparable ratings, purchase the system with the larger Level 2 cache, even if its ratings are slightly slower. Buying a top-end CPU usually also brings a system with the latest motherboard, bus architecture, and RAM hardware.

In the Windows environment, if the machine is recommended for gamers, it meets the needs of high-end physical implementation design. The exception to this rule is that for Allegro products, you do not need dedicated sound cards. A dedicated graphics card is recommended over a motherboard-based graphics card because motherboard cards share memory and bus access with the CPU.

Buy enough memory so you are not paging during your work. One gigabyte is a good starting point for average PCB designs but you may need to raise the total if you plan on auto-routing, signal integrity work, or multi-board simulation. A rule of thumb is to take a recently completed board, and your memory requirement would be:

```
Memory requirements = 1000 Megs + (Design_Size_on_disk * 10)
```

then round up to the next half gigabyte.

Example: If you have a 50 MB board, then you would need 2 GB of memory.

If you plan on using centralized Cadence® software, design, or library storage, a 100 Mbs network connection is recommended.

Some of the products take advantage of multi-processors; at least four processors recommend (this can be either separate cores, multi-cores or hyperthreading).

- On Windows, the second chip can remove the performance penalty that is imposed by Virus checkers, inventory management, IP Protection and other overhead software that can be found installed on modern Windows systems. In this area, the Intel HT technology can help with Windows “overhead” processing.
- On UNIX systems, graphics programs will achieve better performance due to the nature of the X-windows architecture. The additional CPUs also will allow you to run background processes, such as auto-routers and simulators.

In the Intel CPU world, Intel, Xeons and AMD chips typically leapfrog each other on which is the top performer.

If you are considering a laptop computer, look at the “workstation replacement” laptops, even though they are heavier and have less battery life than more conventional laptops.

Finally, when purchasing a new system, look at your future needs and not your current requirements.

Additional Recommendations for Allegro Package Designer Plus Products

The Cadence 3D Design Viewer requires an OpenGL-compliant video card (128 MB recommended minimum video memory).

IC-Package co-design capability is available only on the Linux platforms. Likewise, since this capability works with the Innovus-based IC floor-planning technology, you should plan that systems running this capability have sufficient disk and memory space for the Innovus-based and Allegro portions of the applications, as well as sufficient disk space for the IC portions of your system designs.

Most back-end programs such as Allegro® PCB Editor, Allegro Package Designer, SigXp and SI but not SPECCTRA, offer the OpenGL drawing capability. Front-end programs, such as Design Entry HDL and OrCAD® Capture, do not require OpenGL capability.

To use OpenGL as a graphics display option, your system needs to meet the following requirements:

- A modern computer purchased within the last couple of years.
- A dedicated graphic card is recommended for the OpenGL based products.

  In smaller form-factor hardware such as notebooks, many motherboard based graphic controllers now deliver good to excellent performance for most designs. For the best performance, a dedicated graphics card is still recommended.
- Apply the latest graphics patches from the graphics card vendor or PC supplier.

Note: On Linux, all products require at least true color (65000 colors). 256 color mode (also know as 8 plane mode in the X window world) is not supported. Linux Xservers must be configured to use the TrueColor model.

Compiler Requirements

Microsoft Windows

Compiler:	Visual Studio Professional 2015 Update 3
Required Compiler Options:	64-bit compiler 8 byte structure alignment (`-Zp8`) multi-thread dll (`-MD`) cdecl calling convention (`-Gd`) string pooling (-GF) Use -EHs

Linux

Compiler:	gcc/g++ 6.3.0
Required Compiler Options:	Position independent code 64 bit compiler (`-m64 -fPIC`)
Required DLL Linker Options	-fPIC -shared

Managing Licenses

All the tools support the use of an `options` file, which you can use to restrict user access and manage licensing beyond the limits of the license file. To have products return their licenses to the license pool when they are idle, the tools let you add a TIMEOUT line, which sets a maximum amount of time (in seconds) that a license can remain inactive, to the `options` file. The queuing argument of the NOLOG line in the options file, however, is not supported.

For more information about licensing and the `options` file, refer to the Cadence License Manager document.

Frequently Asked Questions

This document contains the frequently asked questions (FAQ) about requirements and performance. To view the answer to any question, click on that question from the list below.

What will happen if disk minimums are not met?

Answer: The Cadence installer does a comparison between the disk space requirements of the products you choose and the available disk space on the target partition and will refuse to install if free space requirements is not met. Use custom install to select the required products instead of installing the entire product set to complete installation with less disk space requirement.

The minimum requirements we specify includes both installation and some user working space.

Can you specify a true memory hard limit where Allegro applications will not run?

Answer: No, this is impossible since there are many factors involved. We have a calculator latter in this document that helps in estimating memory requirements based upon design size and tool functionality you plan on using but 8GB (64bit OS) will satisfy almost all users.

Can you be more specific on memory requirements?

Answer: Depends, for physical design the rule of thumb is to take the disk size of a completed board and triple it to learn your basic memory requirements. Then you give the OS its due (say 2MB) and that is your basic memory requirements. Of course, if you do SI simulations or run GRE you need a lot more memory.

Given how cheap memory is today, I would just use 8 GB on Windows 10 and allocate Virtual memory at least twice your physical. If the system is memory rich, the OS can use additional memory to give the system a smoother overall feel by keeping running programs in memory and caching frequently accessed files.

Will adding more memory improve Allegro performance?

Answer: No, Allegro programs do not look at the amount physical memory to adjust performance. If Allegro programs are not paging then adding addition memory will not improve performance. The programs assume that the OS can satisfy memory requests. It is the OS' job to manage, via virtual memory, a program's memory requirements. When the OS can no longer satisfy a memory request, we typically give a low memory warning and exit. Failure of Cadence products is not typically due to lack of memory.

What other things may impact performance?

Answer: Slow performance can be due to:

- rogue programs, use a process manager and sort by CPU time to ensure no unwanted programs are consuming CPU cycles.
- On Windows, a mis-configured virus checker may be that cause.
- Presence of IP protection software. These programs can cause delays in accessing files. Due to the number of files accessed by our schematic tools, the delays can be especially noticeable with these tools.
- With schematic editors, if accessing designs or libraries overall the network WAN/LAN latency or congestion may be an issue. Also check if the file server is overloaded.
- For physical tools design set-up may be an issue so run Performance Advisor found under the Database Check command

Will multiple core/CPUs improve Allegro application performance?

Answer: Almost everyone can benefit from having two processing units (this can be obtained via multi-core, multi-CPU or HyperThreading configurations). For physical design (brd or mcm), four processing units is recommended but for dense designs or complex constraint rules more then four will units will improve performance. For DRC, high-end SI Analysis tools and GRE, eight or more processing units is recommended.

Why is my Graphics Performance slow?

Answer: Check that you meet our minimum graphics requirements. A dedicated graphics card is always best since motherboard based solutions frequently share memory with the slower CPU RAM. In addition, verify that your graphics driver software is up to date.

What do I do if I experience menu glitches when using the nonopengl option?

Answer: If you experience menu glitches with PCB Editor, Package Designer Plus (APD+), or SigXplorer when running `-nonopengl` command line option:

1. Check if `SaveUnders` and `backingstore` options are off, which is the default for many Linux systems. To check, run this command: `xdpyinfo | grep back`.
2. Change the default settings by running the configure program: `xorg -configure`.

You need root access.

3. Edit the Devices section of /etc/X11/xorg.conf and set `backingstore` and `SaveUnders` to `true` and `on` respectively. Use the following command to edit xorg.conf

   ```
   sudo vi /etc/X11/org
   ```

   Following is a sample of the changes for `backingstore` and `SaveUnders`:

   ```
   Section "Device"
   Identifier "Videocard0"
   Driver "nvidia"
   #added to fix menu glitches
   Option "backingstore" "true"
   Option "SaveUnders" "on"
   EndSection
   ```

4. Reboot your system as root (`sudo reboot`).

Some menus display with shifts when I use multiple monitors. What should I do?

Answer: Multiple monitors are supported, and two monitors are recommended for the physical design tools, Allegro PCB Editor and Allegro Package Designer Plus. However, if you have multiple monitors with different resolution or settings, you might see menu shifts or pop-up menus on right-click appearing in a different monitor.

To avoid menu shift:

- Make one of the high-resolution monitors the primary display. For example, avoid setting the laptop screen as the primary display.
- Do not move the application from one display to another with differing resolutions/font scaling settings.
- Start the application on the monitor it is intended to be used