# cādence®

# Allegro® Platform
# System Requirements

**Product Version 16.6**
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# Contents

# Allegro® Platform System Requirements

This document contains the recommended system requirements for Cadence Silicon-Package-Board (SPB) tools, Release 16.5.

> *Important*
>
> If you use a physical design product (Allegro PCB, APD, Allegro SI or Cadence SiP), be sure to read Graphics Requirements for Physical Design Products on page 13.

> *Important*
>
> All UNIX/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.

# Microsoft Windows System Requirements

This section describes the system requirements for Windows.

Because Cadence Silicon-Package-Board (SPB) products are integrated directly with Windows, hardware and peripherals supported by Windows are also supported by the Cadence SPB products. A list of hardware and peripherals officially supported by Windows can be obtained from the Microsoft web page.

SPB 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 16.6, you should only use the 16.6 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.

| | |
|---|---|
| **Platform ID** | wint |
| **Operating System** | Windows XP Professional (SP3 or later) 32-bit; Windows 7 Enterprise, Ultimate, or Home Premium (32-bit and 64-bit); Windows Vista Enterprise, Business, Ultimate, or Home Premium (SP2 or later) (32-bit and 64-bit); Windows 2008 Server (32-bit and 64-bit); Windows 8 Consumer, Pro or Enterprise (64-bit). |
| | **Note:** Cadence SPB and OrCAD products do not support Windows XP 64-bit, Windows 7 Starter and Home Basic, and Windows Server 2003. In addition, Windows Server support does not include support for Windows Remote Desktop. |
| **Recommended Software** | Microsoft® Internet Explorer® 7.0 or later |
| **Minimum Hardware** | Intel® Pentium® 4 or AMD Athlon XP 2000+ |
| | 4 GB RAM |
| | Virtual memory at least twice physical memory |
| | 50 GB free disk space |
| | 1,024 x 768 display resolution with true color (16bit color) |
| | Broadband Internet connection for some service |
| | Ethernet card (for network communications and security hostID) |

|                         | Three-button Microsoft-compatible mouse |
|-------------------------|------------------------------------------|
| **Recommended Hardware** | Intel® Core™ 2 Duo 2.66 GHz or AMD Athlon 64 X2 5200+ |
|                         | For best performance, use a 64-bit capable CPU chip and a 64-bit version of Windows 7. |
|                         | 4 GB RAM (32bit OS) and 8 GB RAM (64bit OS) |
|                         | 500 GB free disk space |
|                         | 1,280 x 1024 display resolution with true color (at least 32bit color) |
|                         | A dedicated graphics card |
|                         | For physical design dual monitors |
|                         | Broadband Internet connection for some services |

## 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 UNIX 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 SPB application. Allegro PCB Editor supports spaces in filenames for non-design files. Files that fall into this category are reports and text files.

# Linux System Requirements

This section describes the system requirements for Linux.

| | |
|---|---|
| **Platform ID** | lnx86 |
| **Operating System** | RHEL 5.5 (64-bit) SP2; RHEL 6.0 (64-bit), SLES 10 (64-bit) SP2, and SLES 11 (64-bit) SP2 |
| **Hardware** | Intel P4 compatibles (includes AMD Opteron$^{TM}$), Intel P4 EMT and AMD Athlon$^{TM}$ |
| | 4 GB (or greater) system memory |
| | 8 GB swap space |
| | 10 GB (or greater) available disk space |
| | TrueColor required |
| | For information about graphics cards, see Graphics Requirements for Physical Design Products on page 13. |
| **Window Manager** | Gnome |

**Note:** If you are running SPB back-end tools, you must source

```
<cdsroot>/tools/pcb/bin/cshrc (tcsh/csh)
```

          or

```
<cdsroot>/tools/pcb/bin/profile (sh/bash)
```

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

# Solaris SparcSystem Requirements

This section describes the system requirements for Solaris.

| | |
|---|---|
| **Platform ID** | sun4v |
| **Operating System** | Solaris 10 |
| **Hardware** | Sun UltraSparc or better. |
| | 4 GB (or greater) system memory |
| | 8 GB swap space |
| | 10 GB (or greater) available disk space |
| | TrueColor required |
| | For information about graphics cards, see <u>Graphics Requirements for Physical Design Products</u> on page 13. |
| **Window Manager** | Common Desktop Environment (CDE) or Gnome |

# IBM AIX System Requirements

This section describes the system requirements for IBM AIX.

| | |
|---|---|
| **Platform ID** | ibmrs |
| **Operating System** | AIX 6.1 |
| **Hardware** | POWER3 and PC_604 |
| | **Note:** Cadence SPB no longer supports Power2 and older machines. Run the `lsattr -El proc0` command to check the CPU type; it should return a value containing the processor types listed above. |
| | 4 GB (or greater) system memory |
| | 8 GB swap space |
| | 10 GB (or greater) available disk space |
| | TrueColor required |
| | For information about graphics cards, see <u>Graphics Requirements for Physical Design Products</u> on page 13. |
| **Window Manager** | Common Desktop Environment (CDE) |
| | Backingstore needs to be enabled in the following manner: |
| | 1. Login as root. |
| | 2. Edit /usr/lpp/X11/defaults/xserverrc |
| | 3. Change the following line: |
| | EXTENSIONS = "" |
| | to read |
| | EXTENSIONS = "-bs" |
| | 4. Reboot your machine. |

# 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 SPB products on the same machine.

To run X and Cadence SPB 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.

# Displaying UI Dialog Boxes Correctly

If the secondary (child) dialog boxes disappear behind the main UI of Allegro PCB Editor, you need to modify the window manager to keep child windows on top.

■  For Solaris

   The typical window manager default configuration is

   `secondariesOnTop:False`

   ❑  If you run CDE, add the following to your `~/.Xdefaults` file

      `DTwm*secondariesOnTop:True`

   ❑  If you want to restrict this behavior to certain programs, add the following to your `~/.Xdefaults` file

      `DTwm*<program>*secondariesOnTop:True`

      For example:

      `DTwm*Allegro*secondariesOnTop:True`

Add an entry to the file for each program. When finished, restart the window manager.

# Non-Native X Emulators

Cadence tools only support the XServer provided by the OS platform vendors (Sun, Linux, and AIX). Non-native X solutions such as Hummingbird, Exceed, etc., are not supported. VNC to non-native X solutions is also not supported.

# Virtual Environment Support

Cadence SPB 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.

Due to the restrictions inherent with virtual and remote desktop environments, Cadence does not test, certify, or support any of the graphical applications in any virtual environment. Virtual environments include, but are not limited to: Citrix, VMware, and Hyper-V. Remote desktop environments include but are not limited to: Remote Desktop (Windows), Hummingbird (Windows), Remote X Desktop (Linux and UNIX), and VNC based products (Windows and Linux/UNIX).

The Cadence advanced graphics programs list OpenGL as a requirement. To achieve best performance and quality users 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

- APD

- SiP Layout

- SigXp

- 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 by permanently setting the `set disable_opengl` in the user's local Allegro env file. Running with OpenGL disabled will disable certain advanced product functionality such as 3D view modes and transparency.

While our 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 SPB graphical applications in these environments is not recommended and subject to these restrictions and caveats:

- Cadence SPB products are not supported in a virtual or remote desktop environment. Customers use these environments at their 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's NetMeeting do not properly display these SPB applications. Users should migrate to a remote meeting product where this is supported (example, Microsoft Live Meeting) or run the Cadence software with the advanced graphics disabled.

# File Server Support

SPB supports 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) or Solaris 8 (UNIX) 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 our platform requirements.

SPB supports the following network file system protocols:

■ UNIX/Linux: NFS

■ Windows: SMB/CIFS. While open source Samba software provides SMB/CIFS, SPB does not support Samba itself due to its many variations. Many customers run Samba shares without problems but you will need to duplicate tool problems in a supported environment.

# Graphics Requirements for Physical Design Products

Most physical design products (such as Allegro PCB Editor, APD, SiP, and SI, but not Allegro PCB Router or SigXplorer) offer enhanced graphics via OpenGL. 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 minimum of 128 MB dedicated (not shared) video RAM and a 128-bit bus interface (256 MB or more is recommended). 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.

<img> *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 SPB 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 (for example: SunRays)

■ Remote X clients (for example: Sun to Sun)

As of Release 16.0, all SPB tools require at least 65000 colors. We no longer support 256-color mode (also known as 8-plane mode in the X window world). Unix/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 Solaris and 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 SPB product family includes products such as 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 back-end products are CPU and memory-bound—especially true of the 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.

While SPB products do not require 64-bit CPUs, our tools perform better on the 64-bit architectures. Note that all modern CPUs are now 64-bit capable. The exception is that we do not support the Intel Itanium chip.

Some SPB products take advantage of multi-processors; we recommend at least 4 processors (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, 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. You will have better performance using a 64-bit-capable chip over a 32-bit-only CPU (excluding the Intel IPF chip).

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 and SiP Products

The Cadence 3D Design Viewer (standard in SiP, optional add-on for APD) requires an OpenGL-compliant video card (128 MB recommended minimum video memory).

As of Release 16.0, IC-Package co-design capability (available in Package Designer XL and SiP) is available only on the Solaris and Linux platforms. Likewise, since this capability works with the Encounter-based IC floor-planning technology, you should plan that systems running this capability have sufficient disk and memory space for the Encounter-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, APD, SiP Layout, SigXp and SI but not SPECCTRA, offer the OpenGL drawing capability. Front-end programs (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 UNXI/Linux, all SPB products now require at least true color (65000 colors). SPB no longer support 256 color mode (also know as 8 plane mode in the X window world). Unix/Linux Xservers must be configured to use the TrueColor model.

# Compiler Requirements

**Microsoft Windows**

| | |
|---|---|
| Compiler: | Visual Studio.Net 2005 |
| Required Compiler Options: | 32 bit compiler |
| | 8 byte structure alignment (-Zp8) |
| | multi-thread dll (-MD) |
| | cdecl calling convention (-Gd) |

**Sun Solaris**

| | |
|---|---|
| Compiler: | Studio 12 |
| Required Compiler Options: | 32 bit compiler |
| | 8 byte structure alignment (-dalign) |
| | multi-threaded (-D_REENTRANT) |
| | Position independent code (-KPIC) |
| Required DLL Linker Options: | multi-threaded (-mt) |

**Sun Sol86**

| | |
|---|---|
| Compiler: | Sun Studio 12 |
| Required Compiler Options: | 32 bit compiler |
| | 8 byte structure alignment (-dalign) |
| | multi-threaded (-D_REENTRANT) |
| | Position independent code (-KPIC) |
| Required DLL Linker Options: | multi-threaded (-mt) |

**Linux**

| | |
|---|---|
| Compiler: | gcc/g++ 4.1.2 |

| Required Compiler Options: | 32 bit compiler |
| | position independent code (-m32 `-fPIC`) |
| Required DLL Linker Options: | `-fPIC -shared` |

**IBM AIX**

| Compiler: | VA 7.0 |
| Required Compiler Options: | 32 bit compiler |
| | language level support (`-qlanglvl=extended:redefmac`) |
| | C++ name mangling (`-qnamemangling=v5`) |
| Required DLL Linker Options: | `-brtl -G` |

# Managing Licenses

All SPB 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, SPB 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?

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

■ Can you be more specific on memory requirements?

■ Will adding more memory improve Allegro performance?

■ What other things may impact performance?

■ Will multiple core/CPUs improve Allegro performance?

## What will happen if disk minimums are not met?

*Answer:* Nothing, the Cadence installer still 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. The minimum requirements, we specify includes both installation and some user working space.

## Can you specify a true memory hard limit where Allegro 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 4GB (32bit OS) and 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 (lets 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 3GB on XP and 8 GB on Windows 7 64bit and allocate Virtual memory at least twice your physical. Since Allegro programs are 32bit program, the most memory we can address is 4GB. But 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 SPB 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 insure no unwanted programs are consuming CPU cycles.

- On Windows, a mis-configured virus checker may be that cause.

- 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.

- On Windows, presence of a IP protection tool may slow access to files.

- 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 performance?

*Answer:* Almost everyone can benefit from having 2 processing units (this can be obtained via multi-core, multi-CPU or HyperThreading configurations). For physical design (brd, mcm or sip), 4 processing units is recommended but for dense designs or complex constraint rules more then 4 will units will improve performance. For high-end SI Analysis tools, 8 or more processing units is recommended.