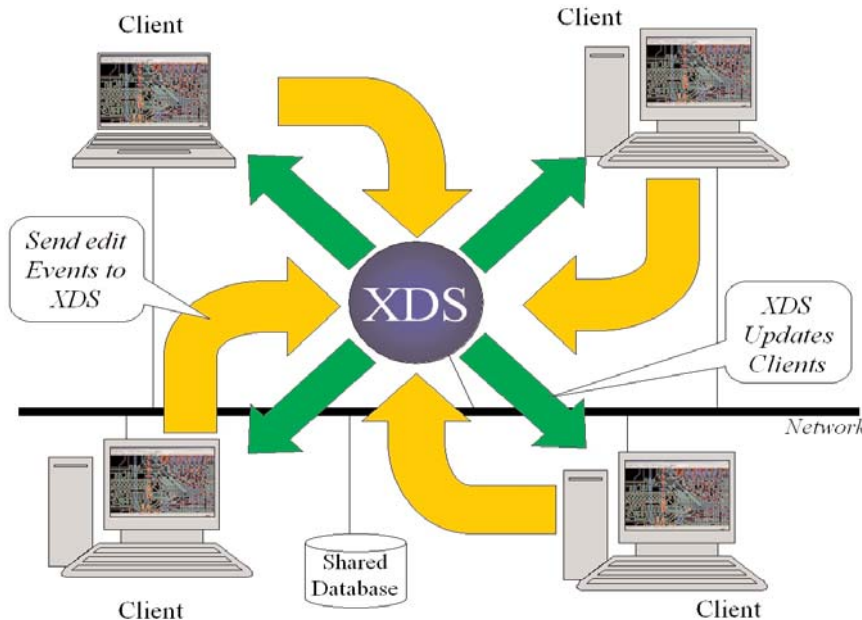


XtremeAR and XtremePCB

Design Cycle Time and Productivity Improvement through Better Resource Management

Resource Management

D A T A S H E E T



The Xtreme Design Session™ (XDS) manages all Xtreme Design Client™ (XDC) edits and continually sends updates to all team members. Each designer sees other edits in real time.

Major product benefits:

- Reduce PCB layout cycle time by 40-70%
- Ideal for large, complex designs or mixed technology (digital, analog, RF) designs where technology specialists can work in parallel
- Utilize local or globally dispersed design teams
- Manage layout, engineering and computing resources with flexibility
- No additional training required for Board Station RE or Expedition PCB users
- 10x faster autorouting of large PCBs utilizing up to 15 CPUs simultaneously

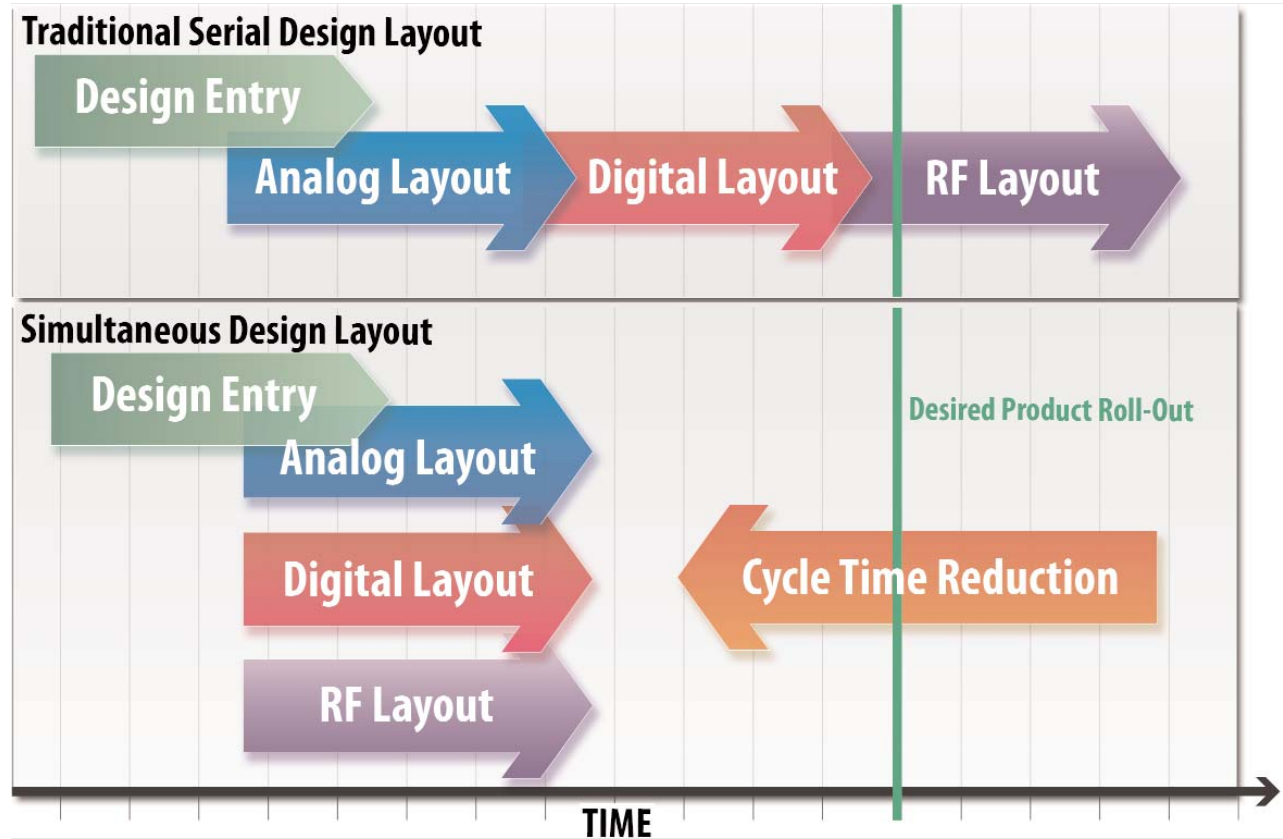
Introduction

In today's competitive electronics industry, there are many challenges that companies face. Chief among them is that PCB designs are increasing in complexity while the average life of a product is decreasing. Products, such as televisions, cell phones, network switches, laptop computers and even mil/aero computers have approximately half the product life they had five or ten years ago. Getting your product to market ahead of your competition can mean the difference between a successful product and one that may have great technology but misses its market window. Design cycle time plays a big part in determining a product launch schedule and the PCB layout part of this process is often called upon to make up for early design phase schedule slips.

Meeting time-to-market goals and hitting product opportunity windows ahead of the competition while efficiently implementing the latest and greatest technology are all challenges that companies are under increasing pressure to meet. Add to this the fact that companies have locations and design teams dispersed all over the world and it is easy to see how truly daunting this situation can be.

To address all of these challenges, companies need tools that can leverage their existing resources, both human and computer. These tools need to provide designers with the ability to:

- Communicate with each other in real-time from anywhere in the world
- Utilize multi-disciplined technology experts whenever needed
- Provide design collaboration and simultaneous design
- Utilize idle hardware to help route large, complex designs
- Allow designers to work on multiple projects without sacrificing productivity



XtremePCB enables designers, from multiple disciplines, to simultaneously layout PCBs resulting in significant design cycle time reduction.

True Simultaneous Design Methodology - Xtreme

Xtreme design technology, patented by Mentor Graphics, enables the most significant advance in design cycle time reduction and productivity improvement since the advent of computer aided design in the 1970's. To facilitate simultaneous design in the past, the PCB database had to be broken into partitions and then, after edits by designers, manually re-joined. This was a time consuming and error-prone process. Also, if the designer wanted to use an auto-router, again the auto-routing was executed on a single machine and let run for hours and days. Now, Xtreme design technology enables multiple design clients, connected on a LAN or WAN network, to simultaneously edit and update a common PCB layout database in real time. This eliminates the need to partition the design and maintains a consistent and centrally located database that always represents the latest status. The potential savings in design cycle time and increase in designer productivity with Mentor's products utilizing the Xtreme design technology represents a quantum improvement over classical design tools and processes.

Managing Resources - Xtreme

To meet aggressive time-to-market goals while using the most advanced technologies, electronics companies must effectively manage their resources, both human and computer. The ability to leverage designers, engineers and computers at anytime, from anywhere in the world, on a design is what is going to separate successful companies from their competitors.

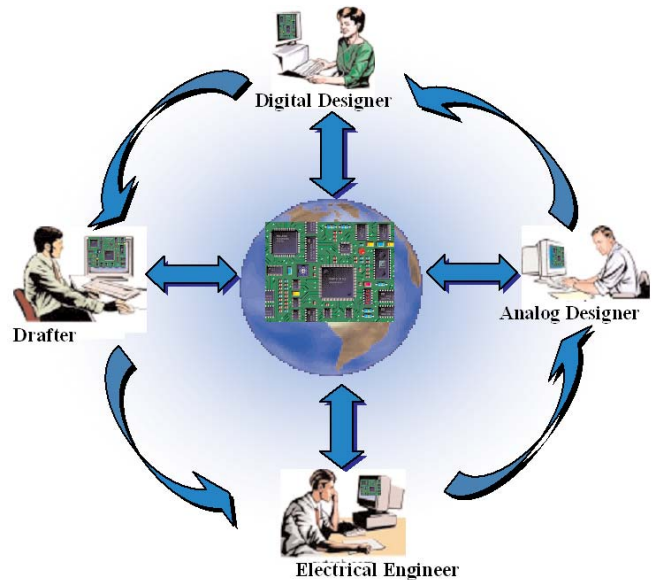
Mentor Graphics is helping companies tackle this challenge by providing tools that allow them to manage their resources for any size or type of design without regard for the physical borders that separate the independent parts of the design process. These tools, powered by Xtreme design technology, allow multiple designers to work collaboratively on a single design and also for multiple machines to complete complex batch operations. Design teams can take advantage of a full 24 hour day to work continuously on a design by teams dispersed around the globe, as well as leverage idle machines to complete PCB routing projects that once took days to complete.

Design Layout - XtremePCB™

The ability to utilize multiple designers and engineers on a complex PCB design has many benefits, including reductions in layout design cycle time and resource flexibility. With a truly collaborative team environment, supported by the XtremePCB application of Xtreme design technology, companies can facilitate a parallel process that was previously a serial one. Traditionally, designers worked on portions of a design and then passed them on to the next designer and so on until it was complete. This was done to take advantage of a designer's particular area of expertise, such as RF, digital or analog. Now, in a collaborative setting, companies can leverage a designer's area of expertise on a design simultaneously with other designers. This can reduce design times 40-70% with the number of designers working concurrently, as well as share the design tasks and pressure across the entire team.

In addition, with XtremePCB, designers can receive real-time reviews/guidance from other domain experts as the project goes forward without having to halt the design process. XtremePCB supports not only simultaneous placement and routing of the board but also simultaneous documentation, viewing and manufacturing data preparation. For example, a test engineer can be brought in to review a section of the design while other sections are still being worked on. Their input, without having to halt the design process, increases the chances for a successful PCB design revision and ultimately leads to fewer design iterations.

Along with the reductions in design cycle times, companies can now more effectively manage their resources in a collaborative environment. In the serial process, companies were more limited in how they assigned resources to work on a design. An RF expert would have to be scheduled to work on their portion of the design, while the other designers had to sit by and wait or if possible, work on another design layout. This often caused design over-run and wasted effort. In a collaborative environment, companies can assign their resources to work on a design whenever it is needed, pre-placement, ECOs, final stages, whenever. In all, up to 15 designers can work on a single design layout at one time and when a designer has finished their part of a design, they can move on to another one. This allows companies to pursue multiple design projects resulting in a positive increase in their bottom line.



XtremePCB allows multiple designers to access the same database from anywhere in the world, at anytime.

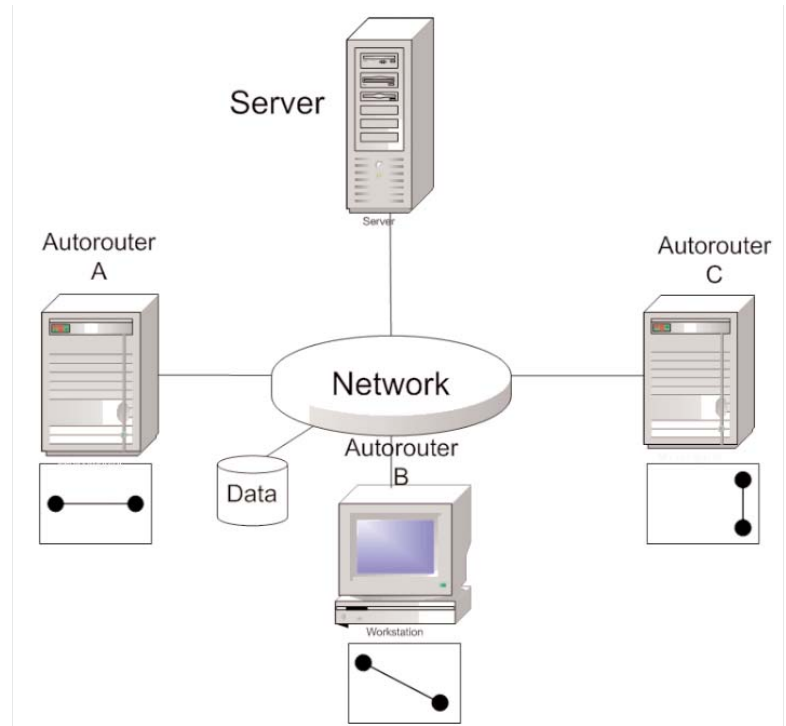
Edit Events and Resolving Conflicts

There are potential conflicts that could occur when multiple designers work on the same design, but XtremePCB manages client interaction automatically to avoid these conflicts. This allows designers the freedom to work anywhere in the design. Several methods are employed:

- Simultaneous object/action collisions - Design changes are automatically resolved through selection priority based on first-in-first-out principles. When a designer selects an object for editing, it becomes locked for all other clients.
- Protected areas - Designers may define a region to be protected, preventing other team members from making edits in that area.
- Conflict avoidance - Force fields can be displayed around the cursor to indicate the whereabouts of each client and prevent designers from working too close to each other. The more a designer works in an area the larger their force field becomes. As they move to a new location the force field reduces. Force fields can be enabled or disabled.

Distributed Autorouting - XtremeAR™

It's not just a company's design resources that benefit from a collaborative environment but their hardware resources as well. A company will often have machines, servers and individual computers, sitting idle during a location's off-hours. The ability to leverage these machines, whether located in the same site or across the world, to complete complex batch operations, such as routing, is something that wasn't available before. Now, utilizing XtremeAR, companies are able to incorporate a wide variety of geographically distributed computational resources and present them as a single, unified resource, solving large-scale compute and data intensive computing applications. With XtremeAR, designers can execute batch auto-routing on up to 15 processors, simultaneously reducing auto-routing times by up to 10x. This means that utilizing normally idle or inactive machines can reduce routing times on large, mostly digital boards from days to hours. The productivity and design cycle time savings are obvious. In addition, a designer can improve the performance and quality of a product by implementing several trial placement and routing scenarios and choosing the best one.



XtremeAR provides multiple CPUs to be utilized on the routing of a design regardless of location.

Unique Business Value

Operating in a strictly collaborative design environment provides a company with some unique benefits that other design processes cannot. These benefits not only affect the design teams but also the companies return on investment. They include:

- Simultaneous design and review on a common database
- Extremely fast and accurate autorouting on multiple heterogeneous platforms
- Dramatic design cycle time reductions
- Improved productivity and product quality/performance
- Added resource flexibility
- Easy plug & play setup

For more information, visit our website at www.mentor.com/xtreme

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