

**SCIENCE TOOLS' DPS:**  
**DISTRIBUTED SUPERCOMPUTING**  
**SINCE 1997**

- ◆ **Always Up, 24X7:** All controllable features are controllable live; No shutdowns to reconfigure. Yet, the system will remember its settings between shutdowns, so once you get the configuration you want, it will stay in place until explicitly changed. All system control commands are digitally signed to prevent spoofing.
- ◆ **Seamless Distributed Computing:** Any network-reachable system can participate in performing work, even over un-trusted networks.
- ◆ **Compile on the Fly:** The Administrator can choose to have the programs that implement processes compiled each time from source, or existing programs in the environment can be used. These existing elements are checked with a patented encryption technology to ensure they are unmodified before they are trusted.
- ◆ **The DaemonMaster™:** By managing all the DPS daemons on a single system, the DaemonMaster™ provides the Administrator a means to manage processing on all systems, no matter what node he/she is logged in on.
- ◆ **Automation:** Processing daemons, implemented as the DemandEngine™ and EagerEngine™, look for work to be done and automatically initiate processing.
- ◆ **Fault Tolerant, Restartable Processing:** If a process should fail, is interrupted, or decide it isn't really ready to run, the process may be restarted. In addition, should access to the meta-data system is interrupted, our system will attempt to discover what the problem is and restore any broken connections. The Administrator may configure delay times and minimum retries.
- ◆ **Defined Workflow:** Relationships between processes may be explicitly declared, thus creating a work-flow through parent-child relationships between processes.
- ◆ **Load Balancing:** Processing daemons which dequeue pending work may perform one process at a time, providing a natural limiting of resource utilization, or they may dequeue processes in parallel so processes run concurrently, consuming whatever resources exist.
- ◆ **Work-load Distribution:** Processes may be assigned to process-groups, and processing daemons that dequeue work may be assigned to particular process groups. This permits load balancing and configuring particular work to particular systems.
- ◆ **Rugged Survivalism:** The "detached" option permits processes to be detached from the parent daemon that dequeues them, thus allowing processing to continue even when a daemon may shutdown.

**Science Tool's**  
**Distributed Processing System™**

**Technical Specifications**

Please contact us for full details

**Requirements:**

Clients: Java™ from Sun Microsystems

Servers - the following RDBMSes are certified:

Informix	Postgres	DB2
Oracle	Sybase	

**Supported OS Platforms:**

Unix - All variants such as Linux, Solaris, etc.  
Windows - All variants after Windows98  
Macintosh - Yup That Too!

For systems which we have not yet certified, the availability of a suitable posix compliant C compiler is required (gcc preferred). And RDBMSs must have:

- SQL92 compliance
- JDBC driver
- "BLOB" support, or equivalent

**SuperComputing**  
with  
**Science Tools**

Introducing the  
**Distributed  
Processing  
System**

*COMPUTING AROUND  
THE WORLD*

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## Automate Processing

and create your own  
**SuperComputer**

with BigSur's

## Distributed Processing System

BigSur's DPS provides you the opportunity to automate your work and create your own super computing environments by harnessing systems together.

Cost-effective super-computing systems may be created using new computers, or any existing systems, including lower valued, fully depreciated ("scrap") nodes. Perhaps as important, and in stark contrast to other similar approaches, Science Tools' Distributed Processing System can join together a hetero-genous collection of systems.



Cooperating nodes can be anywhere so long as they're network reachable. They may be behind a firewall, they may be in daily service for some other purpose and they may be running virtually any modern operating system.

Network components such as high speed switches, NETWORK FILE SERVICES and encryption can be combined as desired to ensure that the resulting system meets performance and up-time expectations.



# Automation & Supercomputing with Science Tools' Distributed Processing System

## How It Works

The BigSur System™ has a meta-data oriented design and uses a distributed processing concept we call DPS to disseminate the workload to our **DemandEngine™** and **EagerEngine™** Daemons.

Each system starts a *daemon* which looks to a common meta-data repository to find work. When resources are available the client looks for work rather than a coordinator "looking" for a machine that is free. This allows the environment to be physically distributed and logically joined and coordinated.

The daemons may have their process-priorities set low so that they run in the background and use free cycles only when they exist. Thus, systems normally used for other purposes can participate while still keeping their DPS workload low.

## DPS - An Aid to Science

*Scientists have many one-of-a-kind machines with various hardware components running numerous operating systems and utilizing varying tools.*

While the scientific community is held together by common research interests, typical research projects are usually performed on different systems with no common way to communicate findings. Rather than writing your own one-off "glue", use BigSur to tie it all together

Because Science Tools' BigSur and DPS Systems are integrated, researchers now have a way to tie together their work better than ever before.

This allows the Scientific Community to concentrate on what it does best -  
**Science and Research.**

THE NETWORK BRINGS IT  
ALL TOGETHER



**YOU CAN CONTROL  
IT FROM A LAPTOP**

## Security

At Science Tools, we take Security *very seriously*. Our system uses many security techniques to ensure authorized users scarcely recognize that there's any security while the unauthorized are confronted with so many security details they don't have any idea how to attack the system.

- Encryption for untrusted networks.
- Environmental details are set explicitly by the Administrator, ensuring only they are used.
- Users have a single identity throughout and levels of trust are assigned depending on which system they have connected from.



THESE DEVELOPMENT  
MACHINES ARE  
SELDOM BUSY...LETS  
HARNESS THEM!

- Management commands to the DPS are digitally signed to prevent unauthorized action.
- A patent-pending named database connection technology protects database connection information.



Note that our "reverse direction" connectivity has helped researchers overcome security objections at the San Diego SuperComputing Center (SDSC).

Maybe we can help you too!

LET'S NOT FORGET THE ONE UNDER THE DESK