SecureCache – A Secure Web Filtering and Caching Server System

Description

SecureCache is a secure web filtering and caching server system. It provides two major functions:

1) **web site filtering**: undesirable websites are denied while desirable websites are presented to users at the client computers;
2) **caching**: commonly used web contents are stored locally at SecureCache disk storage for speedy delivery of web pages.

Together, the two functions enhance the speed of Internet traffic by preventing access to undesirable websites and by changing the surfing behavior of users.

SecureCache is a server-based solution. All Internet traffic from computers to be monitored are directed to the SecureCache server.

Functionalities

SecureCache allows teachers/administrators to control access to public websites. A number of functionalities are available:

1) **Web-page Filtering (see Diagram 1)**: Filtering is done either by domains or words. SecureCache provides a list of undesirable websites such as porn or game sites. Domains accessed from the client computers that fall within the list of undesirable websites will be denied. Words entered in major search engines (such as Google, Bing, Yahoo, LiveSearch) will be validated. SecureCache is able to distinguish words and deny them if the words entered at the search engines produce undesirable websites in the results. For example, words such as “porn” or “pron” are denied since the search results are likely to produce pornographic websites. While the word “sex” will be denied, “sex education” will be allowed. Similarly, search for “breast” will be denied, search for “breast cancer” will be allowed.

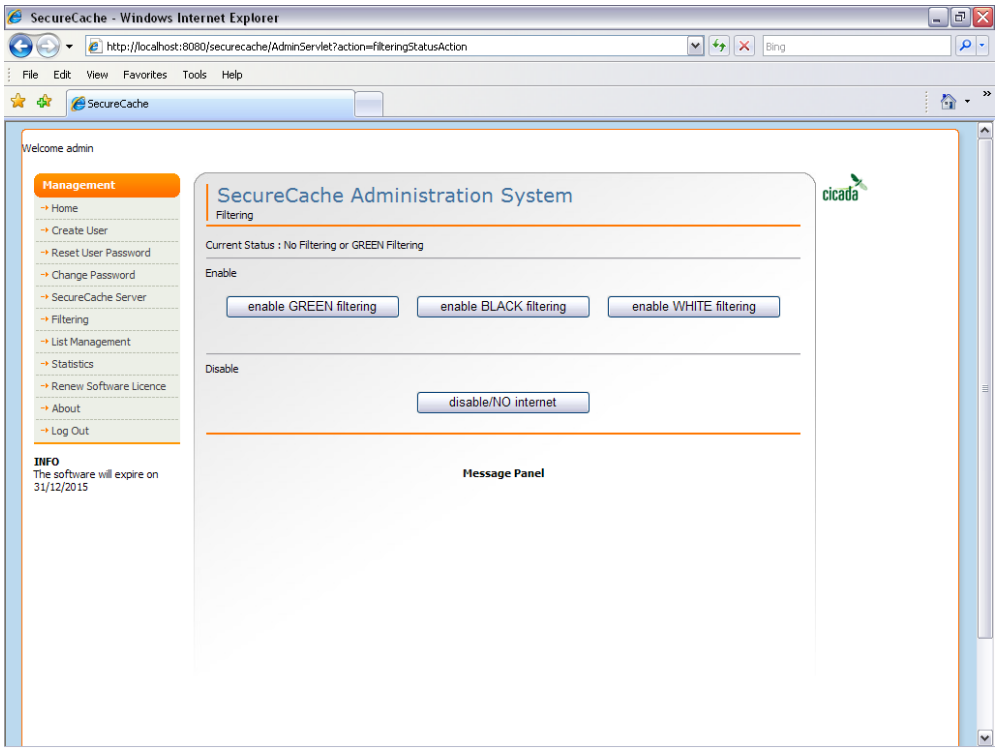

Diagram 1

2) **Types of Filtering**: SecureCache has three filtering setting: **Black filtering** (where undesirable websites are denied), **white filtering** (where a select group of domains are permissible while the rest are denied; this feature is very useful for conducting test/quiz/exam), **Green filtering or No filtering** (where all domains and words searched are allowed, this is useful for collecting data for analytics and statistical presentation). White filtering allows teachers/administrators to determine which websites students can go to - effectively barring students from going to websites that are not relevant to the lessons.

3) **Disable or No Internet**: SecureCache can also disable Internet, effectively preventing all client computers from accessing the Internet. Students will not be able to surf the web and will be forced to focus on the lessons teachers are conducting.

4) **List Management (see Diagram 2)**: Administrators have full control over the list of domains and words for filtering purposes. They can add domains and words that they deem undesirable. A search feature allows administrators to find if a word or domain has already been included in the list.

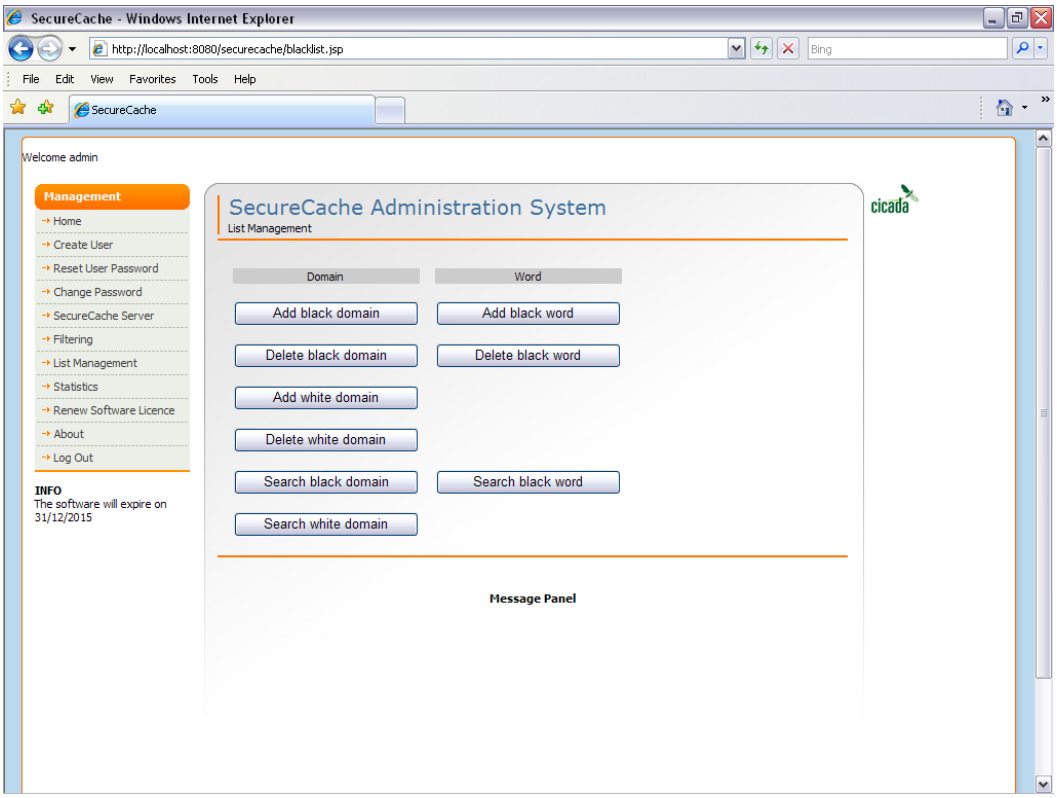

Diagram 2

5) **User Management (see Diagram 3 and 4)**: Administrators can add as many users as they prefer. These user accounts can be assigned to teachers.

6) **Statistics (see Diagram 5)**: SecureCache logs all website accesses including domains and words. Information on top 100 blacklisted domains and words visited within a certain period of the day and night can be presented.

7) **Web-based Administration**: Administrators manage SecureCache via a web-based administration console. This provides for easy access to the administration of SecureCache.

8) **Caching**: SecureCache comes with a high-performance caching mechanism that ensures often visited websites are kept locally at the SecureCache server - effectively reducing Internet traffic and enhancing bandwidth.

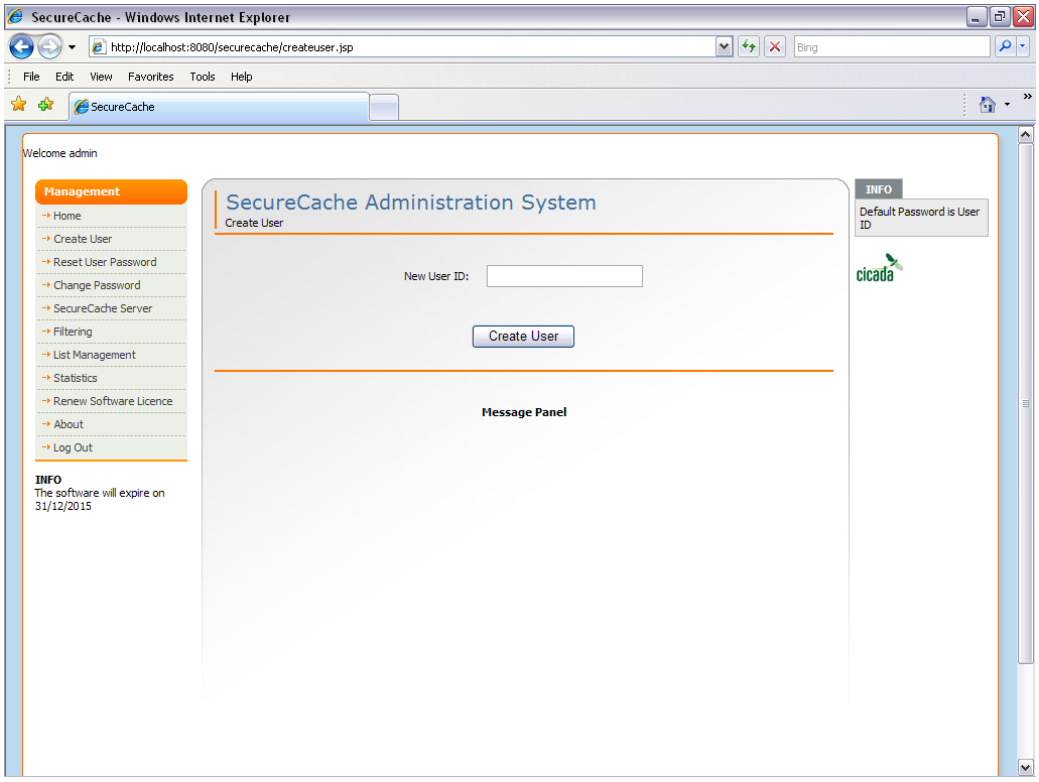

Diagram 3

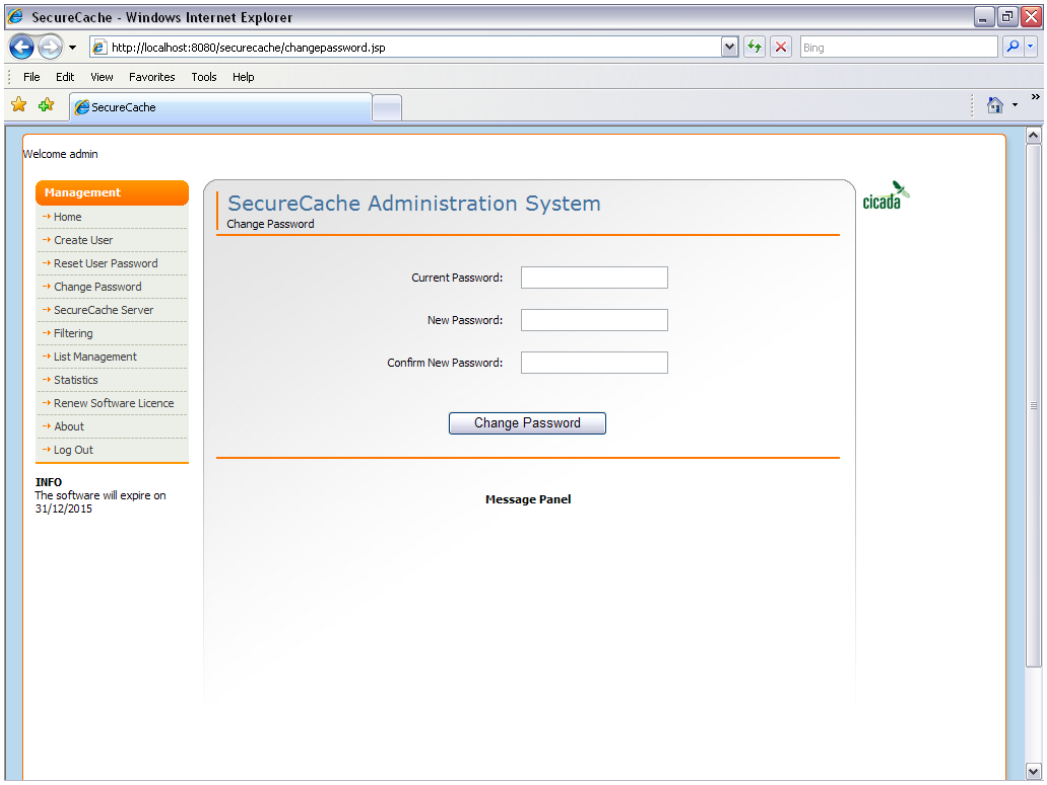

Diagram 4

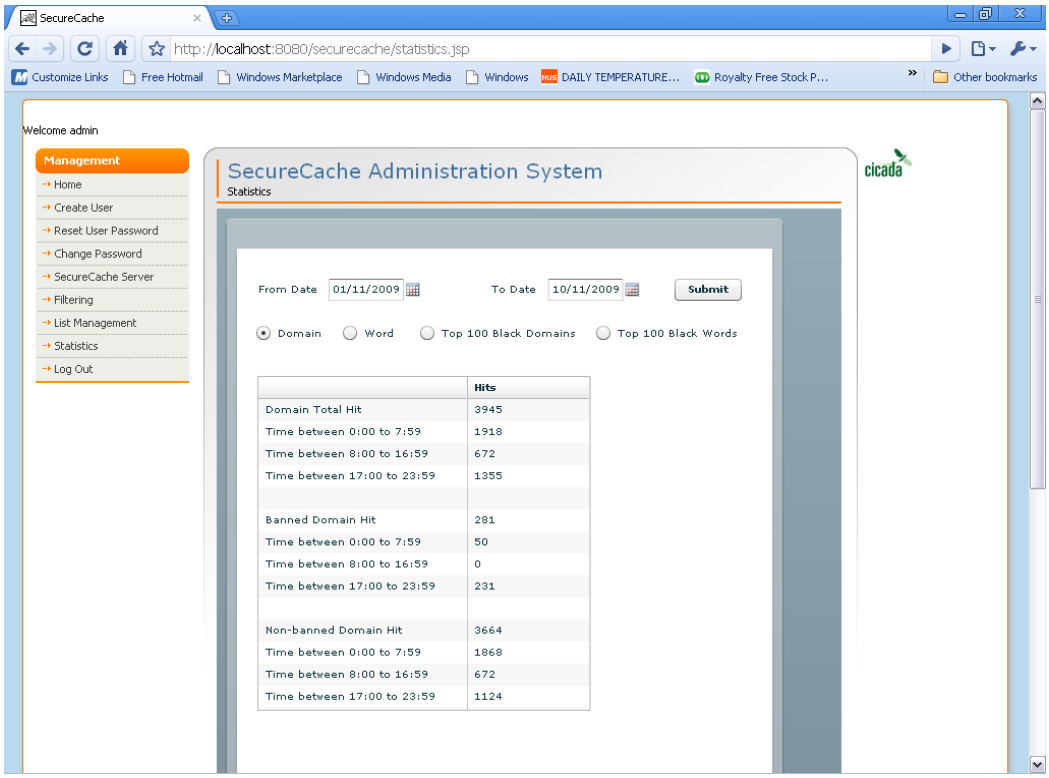

Diagram 5

Benefits

1) **Manage distractions**: Teachers spent much time managing distractions in computer classroom when students visit other sites that are not related to their work. With SecureCache, teachers have better control over the use of computers in Internet accesses in the computer laboratories. Teachers can also disable Internet accesses, forcing students to focus on their lessons.
2) **Increase speed of Internet access**: SecureCache reduces the download of unessential materials from the web, thereby increasing the effectiveness of Internet bandwidth. When students are aware of the filtering of their undesirable Internet accesses, visits to these websites are greatly reduced thus freeing valuable Internet bandwidth.
3) **Prevents perversion of young minds**: SecureCache blocks accesses to all porn sites preventing students from accessing undesirable contents. This leads to the building of good moral characters.
4) **White domains filtering prevents cheating during exams**: White domain filtering allows teachers to restrict website accesses to only those specified by the teachers. With white domain filtering, computers in the laboratories can be used to conduct exams and prevents cheating.
5) **Analytics and Statistics**: SecureCache comes with an elaborate analytics tool that shows the websites students visit using the computers in the school and the time periods students visited the sites. With this information, teachers can control the behavior of the students using the filtering feature of SecureCache.

Connectivity

SecureCache is installed as a server within the organizational network or computer lab. It is designed as a ***proxy*** connected to the organizational firewall and router on one end and to a switch on the

other. The switch connects all computers that need to be monitored to SecureCache. All HTTP accesses will be diverted to SecureCache (see Diagram 6). With a transparent proxy, administration is easy with no setting required at the client computers.

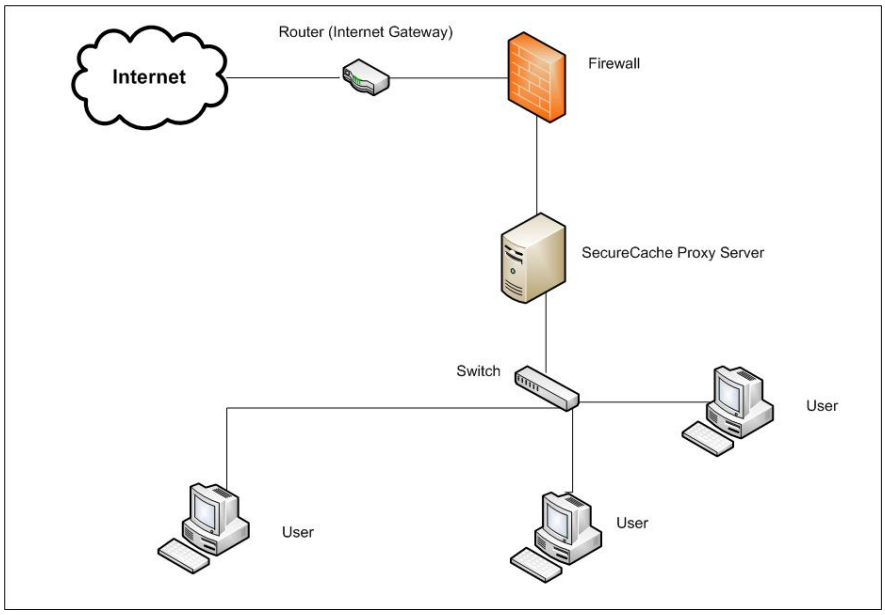

Diagram 6

Recommended Hardware Specification

1. Desktop computer
2. minimum 1GB RAM
3. 1 unit of hard-disk-drive of about 10GB, non-hotplug
4. Display Monitor
5. 1 unit optical 2-Button with scroll Mouse - USB
6. 1 unit Full Size Keyboard – USB
7. at least 1 unit of network card
8. Windows XP Professional or Linux Server-based Operating System