SYSTEM 2000® Web Interface to CICS®
Administrator's Guide
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Chapter 1: Introduction

The SYSTEM 2000 Web interface to CICS provides direct access to SYSTEM 2000 databases via the internet. With internet or intranet access SYSTEM 2000 users can take advantage of the extensive GUI capabilities of desktop computers.

The Web SCF interface enables you to access SYSTEM 2000 databases by using product-supplied HTML interfaces. All functionality provided in the 3270 interface, with the exception of the Command Editor, is provided in the Web interface. A GUI gives the end-user powerful features that are easy to use. Point-and-click functionality and easy scrolling to view output are just two of the advantages. The need for paging and PF keys has been eliminated. All output is sent to the browser, eliminating constant interaction with the mainframe to view the next or the previous page.

With CICS TS 1.3 and above, IBM supplies a built-in Web server, which allows client access from the Web to the mainframe without a mainframe Web server. Rather than entering CICS directly from TCP/IP there is an option to enter through a Web server such as the WebSphere Application Server on OS/390. Clients on a true internet rather than an intranet may want this option for additional security.

In addition to database access, Web support includes the following applications:

1. Operator Communication
2. User Status Display
3. User Maintenance
4. Statistics

A separate application, Web Maintenance, allows DBAs to monitor and control Web access.

Chapter 2: System Setup and Installation Considerations

CICS Requirements

Some key installation elements are addressed here but for a comprehensive explanation refer to the appropriate CICS Web Support manual. Software requirements are CICS TS 1.3 (or above) and OS/390 Version 2.5 (or above).

CICS must be started with TCPIP=YES in the SIT. TCPIP=YES specifies that TCP/IP services are to be activated at CICS startup. A new CICS resource type called TCPIPSERVICE allows for the management of TCP/IP ports and IP addresses. Refer to your CICS Resource Definition Guide for details about defining this resource.

The SYSTEM 2000 CICS Web interface is composed entirely of Web-aware programs. All HTML responsibilities are handled by SYSTEM 2000. HTML is read from the browser and the appropriate HTML response is sent back to the browser. Templates are used to build these HTML responses. The templates must reside in a PDS identified by a DD statement in the CICS JCL. DFHHTML is the default ddname. These templates are defined via a new resource type called DOCTEMPLATE.

All SYSTEM 2000 required definitions are in source module S2KCSD. If a ddname other than DFHHTML is desired then the DOCTEMPLATE definitions must be modified to point to the chosen ddname. In addition to HTML these templates contain JavaScript code to manage screen layouts and button functions.

S2KCUSE Parameters for Timeouts and Output Limits

Two Web parameters have been added to S2KCUSE: S2KWTIM and S2KWMLN.

S2KWTIM is the amount of time in minutes that a Web user can be inactive before being considered timed out. Module S2KWEBTO will free control blocks and it will terminate users still in the interface who have timed out. Allowable values are 0-999 minutes. The default is 30 minutes. A value of zero

disables timeout processing but is not recommended, because control blocks will not be freed. Sites with a large number of Web users may want a short timeout value, such as 10 minutes, because a long timeout value with many users can tie up a significant number of control blocks.

Once your SYSTEM 2000 session has initialized its SYSTEM 2000 storage and returned a form to the Web browser, it may never be invoked again because the Web user abandons the session. Similarly, a user may complete a task but fail to properly exit SYSTEM 2000. A large number of idle Web sessions in CICS can lead to storage problems, so a timeout mechanism to purge inactive Web users is provided. Program S2KWEBTO begins execution at the first Web transaction. It scans SYSTEM 2000 control blocks for timestamp information maintained for every Web user. Users inactive for a set period of time, specified in S2KWTIM, are terminated and the resources freed.

S2KWMLN is the maximum number of lines of output that SYSTEM 2000 sends to the browser after processing input commands. This prevents unnecessary network traffic and tie-ups. Allowable values are 500 to 9,999 lines. The default is 2000.

Note: Sites with a large number of Web users may need to increase the S2KCUSE parameter *MAXTERM* to reflect the number of expected Web users.

Browser Requirements

The SYSTEM 2000 Web interface functions under Internet Explorer and Netscape. You should have installed at least version 4.0 of Internet Explorer and version 6.0 of Netscape, and security settings must allow JavaScript to execute and cookies to be written.

Your Web browser must be set to refresh the cache file each time a web page is loaded.

In Internet Explorer go to: Tools→Internet Options→ and then click the General tab. Choose Temporary Internet Files and click Settings. Then check the button "Every visit to the page".

In Netscape go to: Edit→Preferences→Advanced→Cache and then check the "Every time I visit the page" setting.

JavaScript

JavaScript is a scripting language written into SYSTEM 2000 Web pages to help manage and control the pages. JavaScript is a Netscape product and it executes in Internet Explorer as well. SYSTEM 2000 uses JavaScript for simple functions such as cursor placement and editing forms data, and for more complex functions such as button manipulation. One of the main uses of JavaScript is for the retrieval and writing of cookies. Screen customization data and certain forms data are saved by using cookies. User JavaScript functions may be added for such things as security and customization.

Note: JavaScript can contain non-display characters such as left and right brackets.

Cookies

SYSTEM 2000 uses cookies to maintain customized session information and retain prior SCF and operator commands. If values other than the defaults are used for session customization such as Screen Width, Maximum Output Lines or Case, a cookie is created.

In order to minimize the number of cookies created, session cookies are set to expire after one hour. Prior Command cookies, which are created when the first SCF or operator command is sent to CICS, are set to expire after 12 hours. The following JavaScript variables kept in HTML template S2KWHEAD can be modified to control when cookies will expire, and the number of commands that will be retained.

cookExph -- the number of hours before Prior Command cookies expire. The default is 12.

numCmds -- the number of prior commands that will be retained. Oldest commands are deleted as necessary. The default is 20.

Note: Browsers sometimes limit the number of cookies that can be created. SYSTEM 2000 will not create more than five cookies.

Security

In a Web environment there is no principal facility such as the terminal. As a result, the normal signon process (transaction CESN) cannot be used. All transactions run under the alias transaction specified in the URL (CWBA). This alias transaction normally runs under the default userid specified in the SIT (unless modified in an exit).

For more restrictive access you can have different alias transactions, as long as they have at least the same security as CWBA. If an alias transaction other than CWBA is used, then HTML templates must be modified accordingly, because they have relative URLS with transaction CWBA as the default.

CICS does provide sample programs for obtaining a userid, as well as HTTP Basic Authentication Sample Programs. Each site must examine its own security requirements and determine what is needed. Encryption and authentication techniques, although beyond the scope of this discussion, can be employed for additional security.

Stateless Environment and Web Userids

The Web was originally designed for "stateless" communication between client and server. Its function was basically information retrieval only. With the advent of forms programming, the need arose for maintaining or saving information about the state of processing across invocations of the Web server.

SYSTEM 2000 maintains state processing in a Web environment by assigning each user a unique userid on initial invocation of the interface. This userid is maintained for the life of the browser and is used to

uniquely identify each Web user to SYSTEM 2000. Unless the browser window has been closed or a timeout has occurred a new userid is *not* required. This userid does not preclude the use of a security package userid. Access to CICS resources can be restricted with RACF userids and HTTP Basic Authentication.

Chapter 3: Invoking SYSTEM 2000 Applications

URL Setup

Unlike 3270 terminals where transaction codes are entered to invoke the desired interface, a URL is required.

To access the SYSTEM 2000 Web Menu enter the appropriate URL in one of the following formats:

entered directly from TCP/IP:

    //S2KCUST.MVS.COM:8080/CICS/CWBA/*web-aware program*

entered from an OS/390 server:

    //S2KCUST.MVS.COM:99/ADVCICS/CICS/CSMI/*web-aware program*

where

- S2KCUST.MVS.COM is the name of the system on which your CICS is running. You can also use the TCP/IP address of S2KCUST.MVS.COM.
- 8080 is the port number assigned to CWS (see TCPIPSERVICE).
- 99 is the port number assigned to the OS/390 server.
- ADVCICS is your CICS applid.
- CICS is the converter name but it is interpreted as meaning that no converter is required.
- CWBA is the name of the alias transaction provided by CICS Web support.
- CSMI is the name of a mirror transaction.
- *web-aware program* is the name of the SYSTEM 2000 program to be executed.

The required Web-aware program is S2KWEBD.

SYSTEM 2000 Web Interface Menu

When you open a browser window and enter the URL as described above, you will see the Web interface menu shown below. The unique userid at the top of the page is maintained for the life of the browser window, and it is used to identify each SYSTEM 2000 Web user. The userid consists of a unique number prefixed with either WD for the database access application, or WO for the operator communication application. This initial menu should be invoked only once per browser session; all subsequent navigation in the Web interface is done using the Application Menu pull-down box.
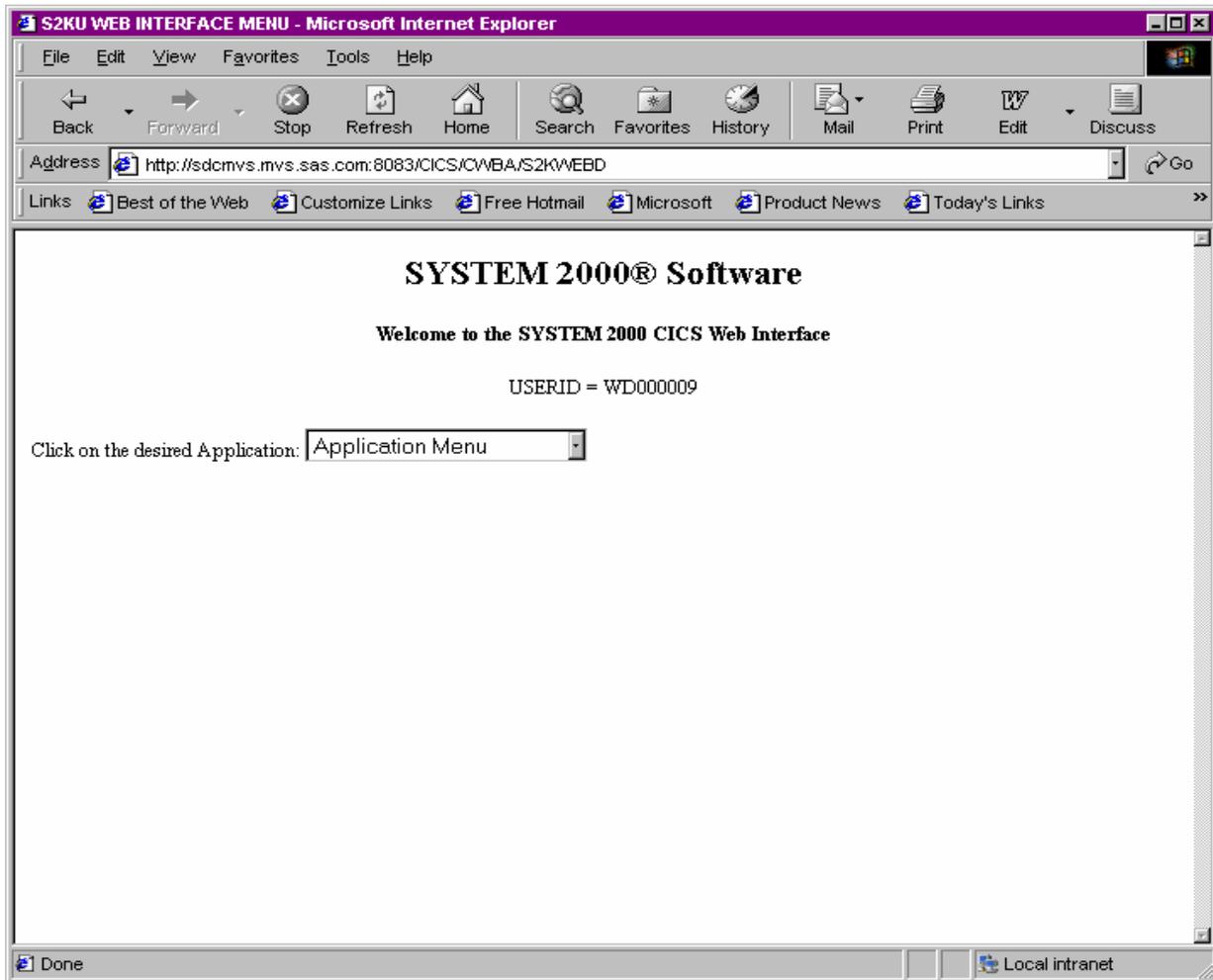
Note: When you create a bookmark for the Web interface, make one for this initial Application Menu only, and not the sign-on screen or any other screens, or you will get an error -- see S2KWERR in Chapter 5.

Database Access − Sign-on SYSTEM 2000

To begin database access from the initial Web interface menu window, you can select the Sign-on SYSTEM 2000 option. If you are already in a SYSTEM 2000 application, select the Sign-on SYSTEM 2000 option from the pull-down Application Menu. The sign-on screen looks like this:
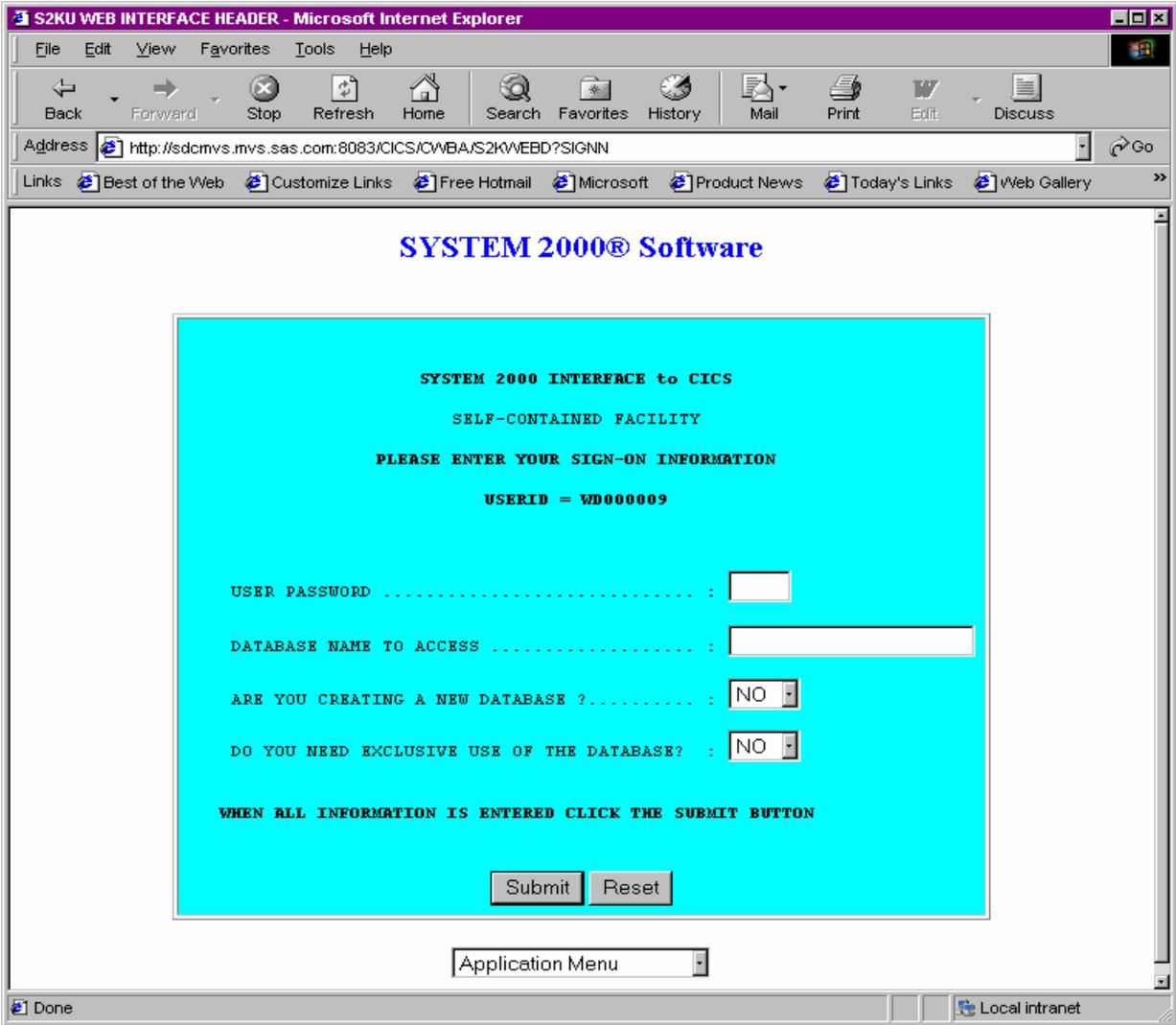
The Web sign-on screen is similar to the 3270 S2KU transaction screen described in Chapter 2 of the *SYSTEM 2000 Interface to CICS* manual. Pull-down menus and buttons are supplied for user convenience. After the required information is entered you click on the Submit button to transf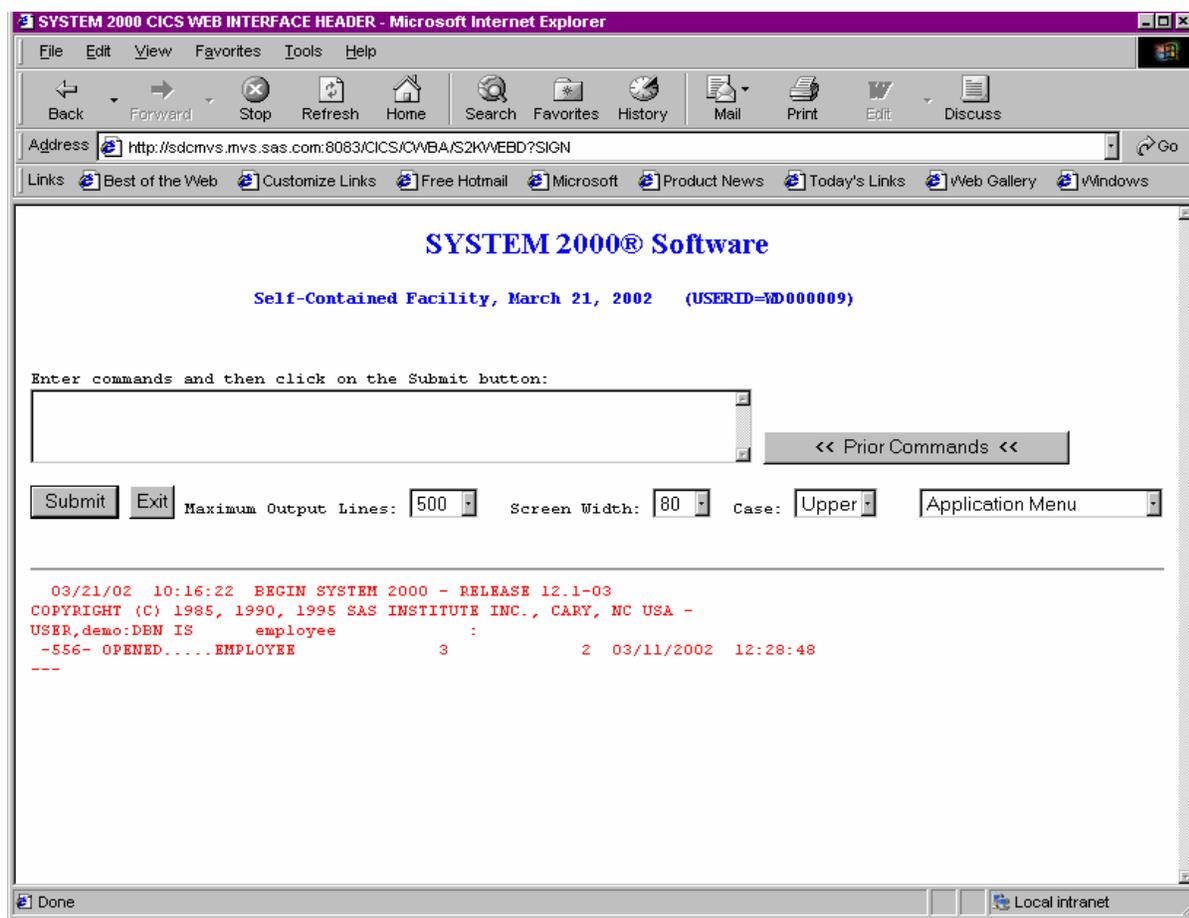er data (known as a "form" in HTML terms) to CICS. To clear the data in the form and restore the original values click on the Reset button. After sign-on the following screen will be displayed in your browser:

Type in your SCF commands and click on the Submit button. To exit, click on the Exit button. Three additional buttons let each user customize the session. These values can be changed as often as needed.

1. Maximum Output Lines -- user can specify the number of lines sent from SYSTEM 2000 to the browser. Note that this value will not override the S2KWMLN value specified in S2KCUSE.

2. Screen Width -- user can change screen width from the default of 80.

3. Case -- user can change the default case (upper) to mixed.

One additional button, Prior Commands, allows the user to view and select previous commands for editing and submission.

Note: Any **USER,** command or set of commands containing **USER,** will not be displayed in the Prior Commands window.

You may leave the SCF session to begin another application such as User Status Display or Operator Communication by clicking on the desired option on the Application Menu pull-down. To resume the SCF session click on the Resume SCF option on the Application Menu pull-down.

Database Access − Exit SYSTEM 2000

When you click on the Exit button or when you issue the EXIT: command, your SYSTEM 2000 session is ended. Although your SYSTEM 2000 session has ended you are still active in the Web interface. You may choose another application or even sign back onto SYSTEM 2000 by simply clicking on the desired application in the Application Menu pull-down. Any commands issued on the same screen before the EXIT are processed. The screen you see looks like this:
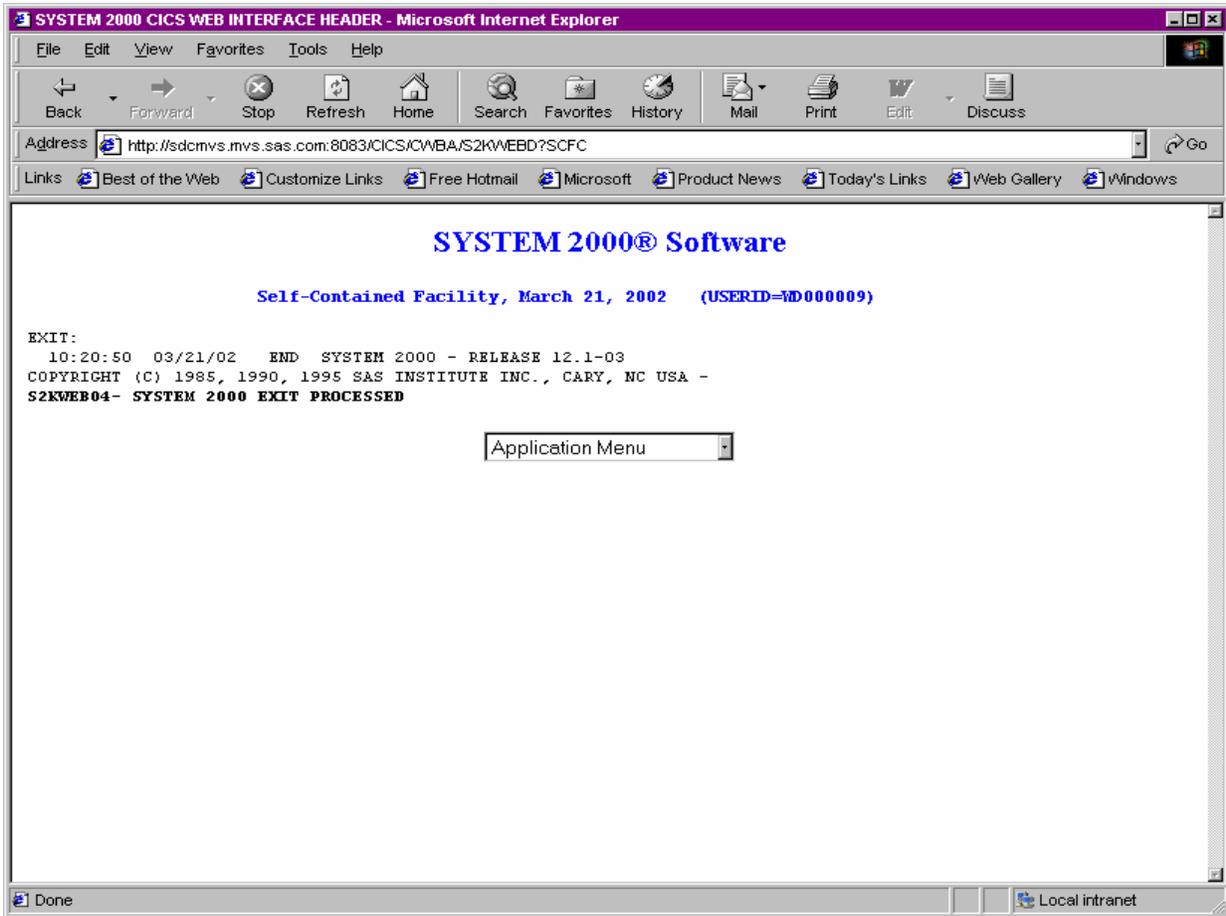
User Exits

The following user exits are invoked by using the EXEC CICS LINK PROGRAM command. The exits must be stand-alone command-level programs. The link to the exits contains a common area defined by

macro S2KWCOM (Assembler) or S2KWCOMC (COBOL) on your SOURCE library. See Chapter 5 on User Exits in the *SYSTEM 2000 Interface to CICS* manual for information about addressing the COMMAREA.

S2KWEBU1 -- Monitor the input in its unedited form. Input is in the format that is received from TCP/IP. Input includes the forms method, URL, various HTTP headers and forms data in name/value pairs. Data is in unescaped format. Fields relevant to this exit are

```
S2KWMSGA        input message address

S2KWMSGL        input message length
```

S2KWEBU2 -- Monitor or modify the input message in its edited form. The input message has had all HTTP/HTML dependencies removed from it and is ready to be passed to Multi-User software. Fields relevant to this exit are

```
S2KWMSGA        edited input message address

S2KWMSGL        edited input message length
```

S2KWEBU3 -- Monitor or modify the User request Block (URB). The field relevant to this exit is S2KWURB.

Operator Communication

To begin Operator Communication, click on the Operator Communication (S2OP transaction) option on the initial Web interface menu screen, or if you are already in a SYSTEM 2000 application, click on Operator Communication on the Application Menu pull-down. The Operator Communication screen looks like this:
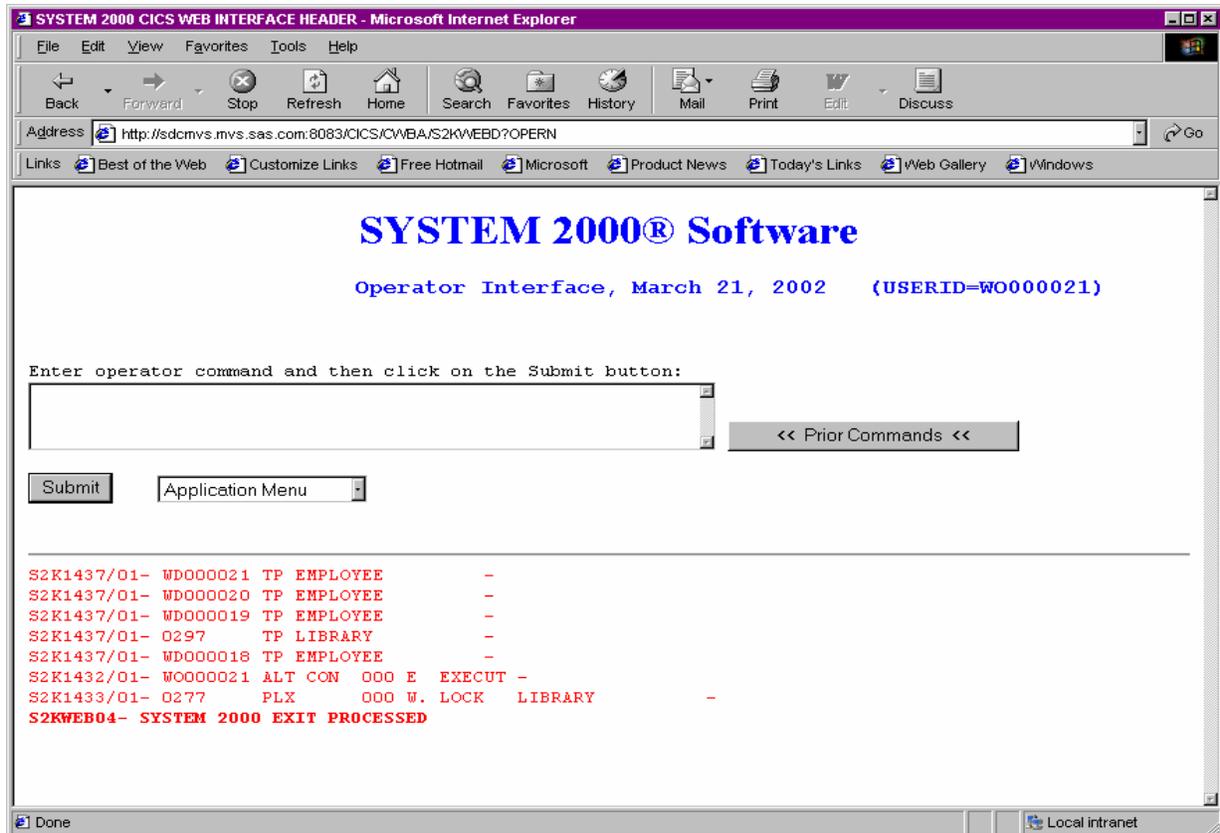
Enter a SYSTEM 2000 operator command and click on the Submit button. Prior operator commands can be viewed and edited for submission by clicking on the Prior Commands button. For further information see the description of transaction S2OP in the *SYSTEM 2000 Interface to CICS* manual.

User Status

To obtain User Status information click on the User Status option on the initial Web interface menu screen, or if you are already in a SYSTEM 2000 application, click on the User Status option on the Application Menu pull-down. The User Status screen looks like this:
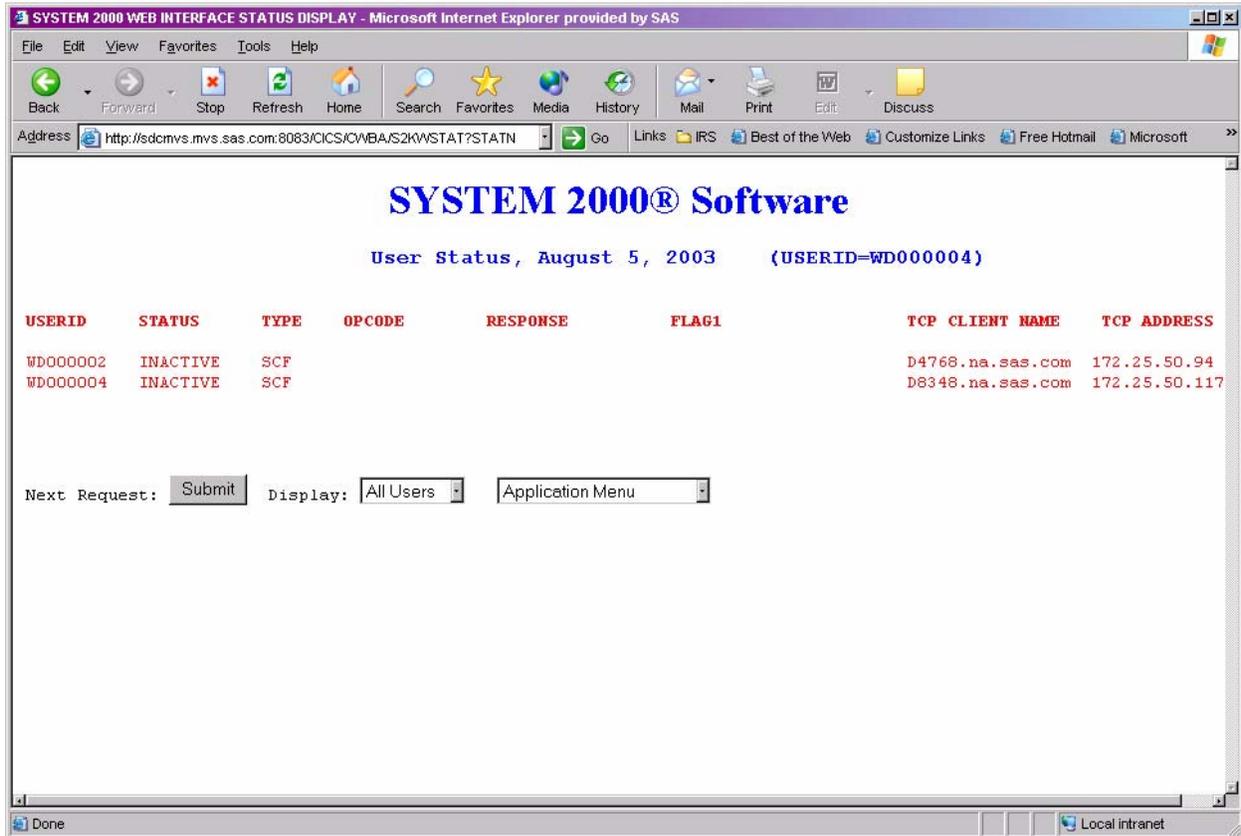
The User Status Display shows PLEX or SCF user status. The default is All Users. The Display pull-down menu allows the user to control which users to view. For further information see the descriptions of 3270 transactions LALL, LPLX and LSCF in the *SYSTEM 2000 Interface to CICS* manual. Two fields have been added for Web users:

TCP CLIENT NAME is the client's name as the Domain Name Server knows it.

TCP ADDRESS is the client's TCP/IP address in character format.

To refresh the current status, click on the Submit button.

User Maintenance

To obtain the User Status Maintenance screen click on the User Maintenance option on the initial Web interface menu screen, or if you are already in a SYSTEM 2000 application, click on the User Maintenance option on the Application Menu pull-down.
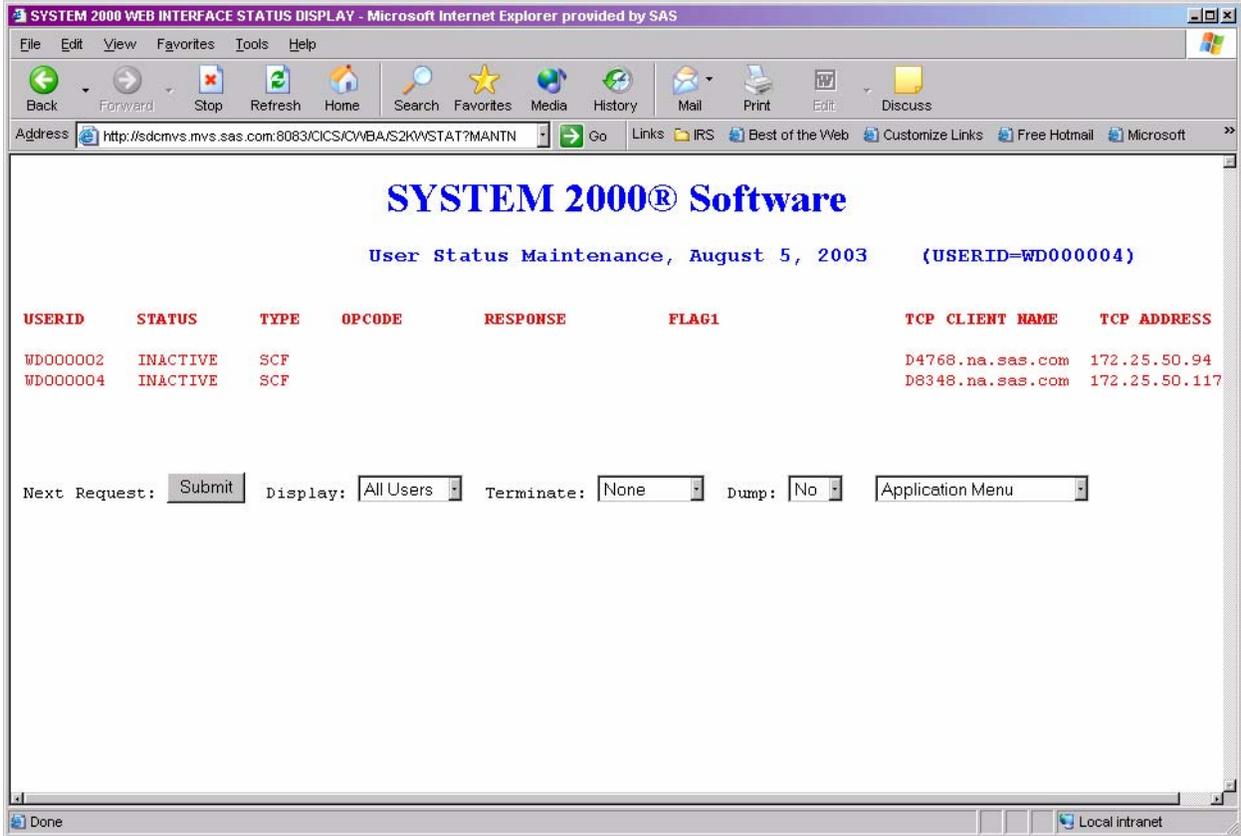
User Status Maintenance allows the user to terminate SCF and PLEX users in the interface. See the CICS interface transactions TALL, TPLX and TSCF for a description of functionality. The Terminate button allows you to select what user or users should be terminated. The Dump button produces a dump if Yes is selected. See the CICS interface Dump transaction for an explanation of what CICS areas are dumped. User Status Maintenance provides system type functions and as so should be restricted to qualified users. This screen will function identical to User Status Display if the terminate button defaults to a value of None and the Dump button defaults to No.

Statistics and Logging

To obtain statistics and logging information, click on the Statistics option on the initial Web interface screen, or, if you are already in a SYSTEM 2000 application, click on the Statistics option on the Application Menu pull-down. The Interface/CICS Statistics screen looks like this:
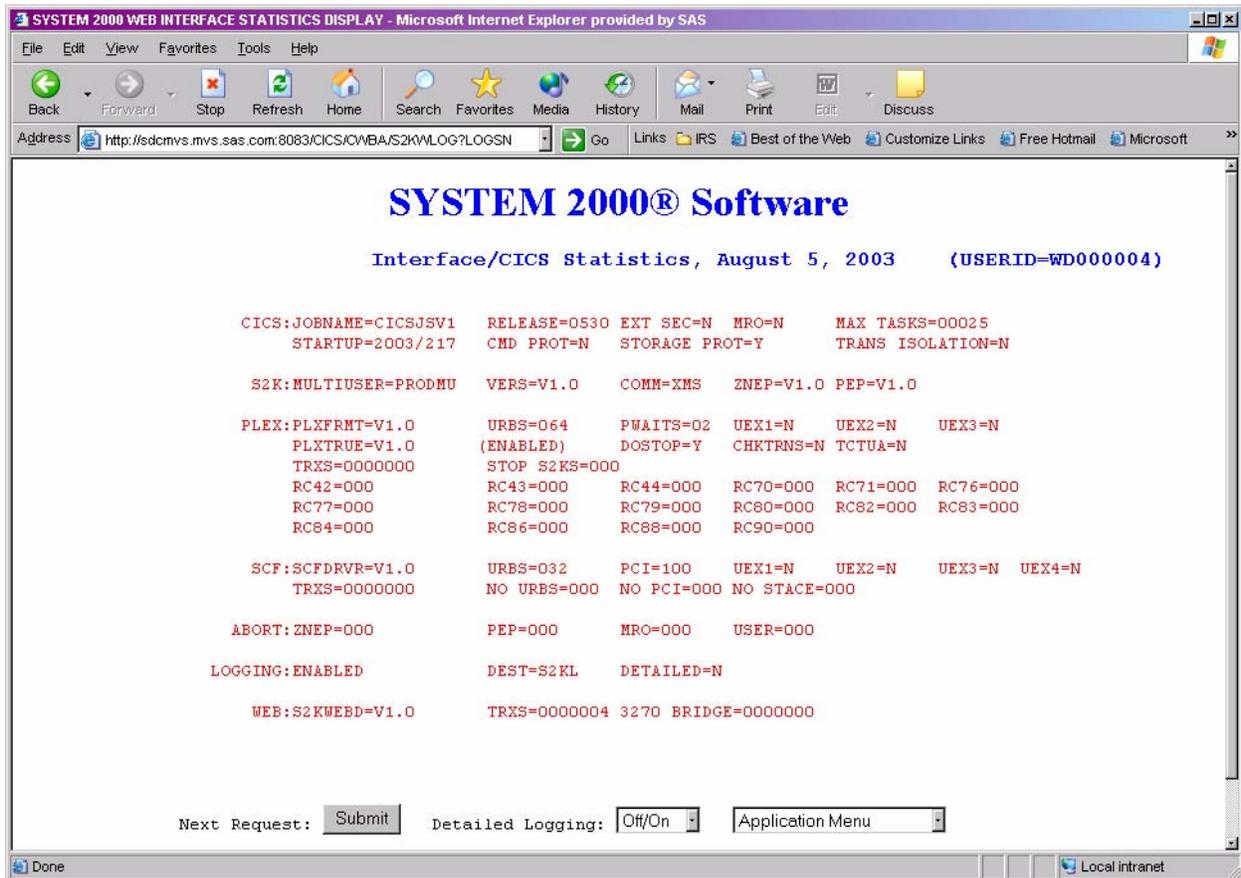
Statistics and logging provide the user with interface and CICS statistics that have been recorded by the SYSTEM 2000 CICS event logging feature. For further information see the description of 3270 transaction S2KL in the *SYSTEM 2000 Interface to CICS* manual. The Detailed Logging button allows the user to turn logging on and off.

Exit Web Interface

The Application Menu pull-down contains an Exit Web option. When you click on it all Web resources, including Userid, are released. This is the recommended way to end your Web session. Closing your browser without exiting the interface does not free up resources and can cause system degradation. SCF session resources are also released if a user is signed onto database access and has not already exited SYSTEM 2000. The Web Interface Status screen is confirmation of a successful exit.
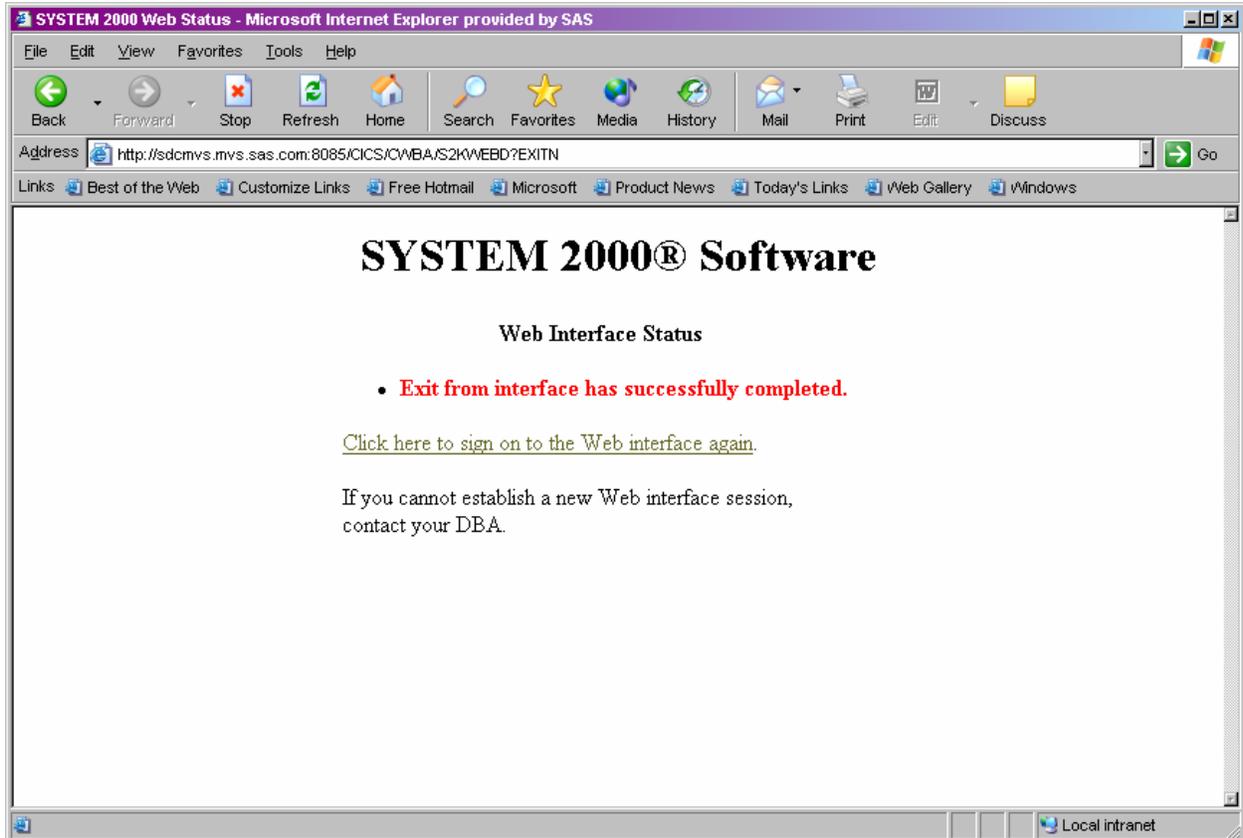
Note: The Application Menu pull-down for the SCF application does not contain an Exit Web option. An Exit button already exists to exit SYSTEM 2000. Once you have exited SYSTEM 2000 you can then exit the Web interface.

Chapter 4: Web Maintenance

Web Maintenance is a DBA utility and is not part of the Web application package. For security reasons it has its own URL. To obtain the Web Maintenance screen enter the appropriate URL in the format described in "URL Setup" in Chapter 3. The *web-aware program* is S2KWMAIN.
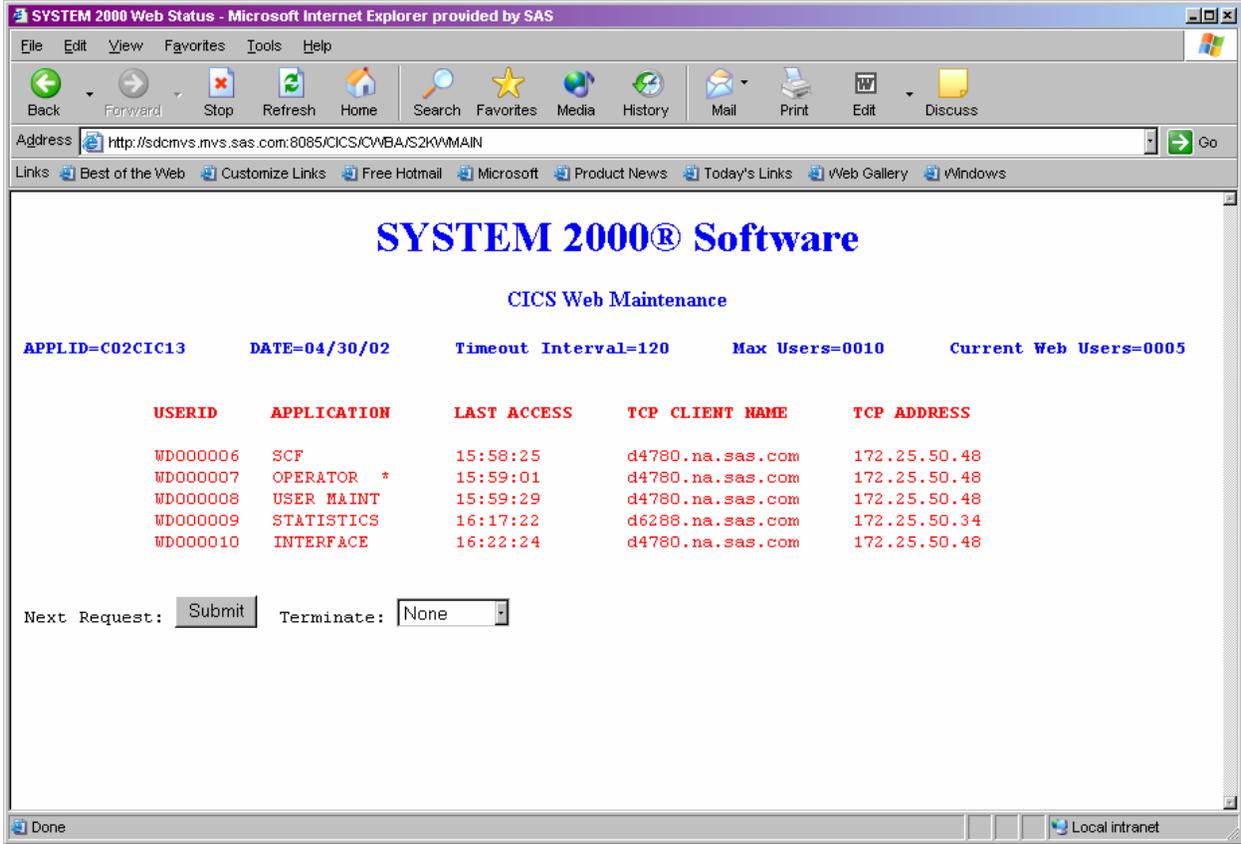
The Web Maintenance screen shows all users currently signed onto the Web interface. Other information includes the current application and the time of last access. A Terminate button lets you remove Web users from the interface and free their resources. For example, a Web user who closed the browser without first exiting the interface is a candidate for termination. If a Web user is signed onto SYSTEM 2000 when terminated, an abort request is sent to SYSTEM 2000 to perform abort processing and free up Multi-User resources.

Note: A " * " in the APPLICATION column indicates that a user is signed onto SYSTEM 2000.

Chapter 5: Messages and Codes

S2KWEBD

```
S2KWEB01- S2K TP BUSY… NO URBS AVAILABLE- TRY AGAIN

S2KWEB02- COMMUNICATION ERROR ENCOUNTERED. UNABLE TO CONTINUE, RC =

    RC04  =  MULTI-USER TP NOT ACTIVE
    RC08  =  INVALID SVC REQUEST CODE
    RC12  =  INVALID URB FOR THIS CALL
    RC16  =  NO SUCH SVC RETURN CODE
    RC20  =  USER FOUND/NOT FOUND IN SVC TABLE
    RC24  =  MULTI-USER TP BUSY … TRY AGAIN
    RC28  =  IRA SPACE NOT AVAILABLE FOR USER
    RC32  =  ERROR ACCESSING S2KCOM FILE

S2KWEB03- SYSTEM 2000 BUSY, PLEASE TRY AGAIN

S2KWEB04- SYSTEM 2000 EXIT PROCESSED

S2KWEB05- ERROR ENCOUNTERED IN SYSTEM 2000, UNABLE TO CONTINUE, RC =

    RC04  =  REQUEST CANCELLED - S2K TP BEING QUIESCED
    RC08  =  TP TERMINAL TABLE IS FULL
    RC12  =  USER ALREADY ACTIVE IN MULTI-USER
    RC16  =  USER LOGON PREVIOUSLY STARTED
    RC20  =  DISCREPANCY IN URB ADDRESS
    RC24  =  UNKNOWN ERROR

S2KWEB06- -800-  SYSTEM 2000 ERROR CODE  ----

S2KWEB07- USER NO LONGER ACTIVE, PLEASE SIGN-ON
```

S2KWSTAT

```
S2KWST01- *** NO USERS FOUND ***

S2KWST02- *** REQUESTED DUMP PROCESSING COMPLETE ***
```

S2KWERR

Shown below are the three Web interface status screens you can receive if your session times out, your URL is invalid, or the max users limit is reached. If the S2KWERR screen can't be displayed, it means an unknown error condition has occurred and either an S2KW abend dump or a CICS transaction dump is taken to aid in problem determination. In either case you will get your browser's error screen.

SYSTEM 2000 Web Error - Microsoft Internet Explorer

File   Edit   View   Favorites   Tools   Help

Back   Forward   Stop   Refresh   Home   Search   Favorites   History   Mail   Print   Edit   Discuss

Address   http://sdcmvs.mvs.sas.com:8083/CICS/CWBA/S2KWEBD?SIGNx   Go

Links   Best of the Web   Customize Links   Free Hotmail   Microsoft   Product News   Today's Links   Web Gallery

SYSTEM 2000® Software

Web Interface Error

- **The address in the address bar is spelled incorrectly, or you attempted to change the displayed address.**

Click here to sign on to the Web interface again.

If you cannot establish a new Web interface session, contact your DBA.

Local intranet

SYSTEM 2000 Web Error - Microsoft Internet Explorer

File   Edit   View   Favorites   Tools   Help

Back   Forward   Stop   Refresh   Home   Search   Favorites   History   Mail   Print   Edit   Discuss

Address   http://sdcmvs.mvs.sas.com:8083/CICS/CWBA/S2KWEBD   Go

Links   Best of the Web   Customize Links   Free Hotmail   Microsoft   Product News   Today's Links   Web Gallery

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Web Interface Error

- **You have reached the max users limit.**

Click here to sign on to the Web interface again.

If you cannot establish a new Web interface session, contact your DBA.

Local intranet