

BOSaNOVA Secure

User Guide



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BOSaNOVA Secure CONFIGURATION AND ADMINISTRATION

BOSaNOVA Secure includes several modules or components to help you configure, administer, and customize the software. These are:

- **The Administrator**
Use to set and maintain overall parameters, see p. 3
- **The TCP/IP Configurator**
Use to define the TCP/IP connection, proxy servers, and ports, see p. 6
- **The Emulation Configurator**
Use to define emulation sessions, see p. 9
- **The BOSaNOVA Emulation**
The environment in which you run your host applications, see p. 13
- **MorphExpress**
A tool that converts your host screen into a GUI screen, see p. 42
- **Printer Driver Editor**
Use to customize the printer driver, see p. 44
- **Data Transfer Function**
A 32-bit Windows utility for transferring data in either direction between a PC and a host, see p. 47
- **Remote Command**
Send an AS/400 CL command to a host system from a PC, see p. 53

BOSaNOVA Secure DESCRIPTION

BOSaNOVA Secure combines TN5250E display emulation with DTF software in a package that is specifically designed for direct BOSaNOVA-to-AS/400 or iSeries connectivity.

BOSaNOVA Secure includes the following program modules:

- Display/Printer Emulation provides TN5250E display and printer emulation
- Printer Driver Editor enables you to customize the printer driver
- DTF (Data Transfer Functions) is a 32-bit Windows utility for transferring data between a BOSaNOVA Secure and its host

BOSaNOVA Secure Features

- supports up to 32 simultaneous display and/or printer emulation sessions
- includes MorphExpress for converting host screens to true GUI screens without changing the host application
- supports Text Assist
- supports 3477FC devices (132-column display with color)
- supports PC and Terminal styles for keyboards, allowing you to work with either a 101/102-key keyboard or 122-key keyboard
- supports the Euro symbol
- includes comprehensive keyboard mapping and customization, using Shift, Caps Lock, Alt, Ctrl, function keys, etc.
- includes Print Preview, which displays print output before sending the print job to the physical printer
- includes Printer Session Properties, for modifying printer session settings
- includes customizable “floating” toolbars and Internet Explorer-type toolbar buttons
- supports user-definable macros
- includes BOSaNOVA EHLLAPI/DDE Interface 32, which sets a standard IBM EHLLAPI-style interface for enhancing interaction between host sessions and Windows applications

THE ADMINISTRATOR

The Administrator provides an overall view of various parameters relating to your installation of BOSaNOVA Secure. The Administrator also enables you to run certain administrative procedures.

Opening the Administrator

To open the Administrator:

1. Click the Windows Start button.
2. Select **All Programs** > **BOSaNOVA Secure**.
3. Select  Administrator .

The top pane of the Administrator uses a Windows-style tree structure to display the parameters and installed modules. To use this structure:

- An item preceded by a **plus sign (+)** contains nested items. Click the plus sign to expand the item (display the nested folders).
- An item preceded by a **minus sign (-)** is already fully expanded. Click the minus sign to collapse that part of the tree.
- Names of parameter sets appear in black, while the current status values appear in blue. Values always appear in arrow brackets (< >).
- When you select a parameter set or installed module in the top pane, the buttons and controls that configure or run that parameter set or module appear in the bottom pane.

Installation Parameters

When Installation Parameters, in the top pane of the Administrator, is expanded, the following parameters are displayed:

Product Version

The installed version of BOSaNOVA Secure. Technical Support ask for this number if you contact them for help.

Installation Type

Standalone for BOSaNOVA Secure.

Installation Path

The path to which BOSaNOVA Secure is installed.

Installation Set

The set number.

Product ID

The BOSaNOVA Secure product ID. Technical Support will ask for this number if you contact them for help.

Administrative Parameters

When Administrative Parameters in the top pane of the Administrator is expanded, the following parameters are displayed:

Host Language/Country

The host keyboard ID (language), the host EBCDIC code page used, and the EBCDIC/ASCII translation table that is used. These values were defined when you installed BOSaNOVA Secure.

Euro Support is enabled from the Host Language/Country parameter. If you select this option and your Windows system and the host are set to support the euro symbol, BOSaNOVA Secure uses euro symbol-compliant keyboard type and code page IDs when allocating a session and EBCDIC/ANSI and ANSI/EBCDIC tables with euro symbol support. If your host or Windows system do not support the euro symbol, do *not* select this checkbox. See “Euro Symbol Support” on page 44 for details on system requirements, changes, and patches.

License

Displays the license type.

Connectivity

When Connectivity, in the top pane of the Administrator, is expanded, the following parameter is displayed:

Connection Type

TCP/IP

Run

(This button is disabled for the TCP/IP connection type.)

Configure

Click to open the TCP/IP Configurator to configure the connection.

Installed Modules

Expand **Installed Modules** to view all currently installed BOSaNOVA Secure components. Choices made during installation determine which modules exist.

Display/Printer Emulation

Click **Configure** to run the Emulation Configurator. Use the Emulation Configurator to change the parameters that control the look and operation of BOSaNOVA Secure's emulation.

DTF

DTF is a 32-bit Windows utility for transferring data between a client and its host. (See "DTF (Data Transfer Function)" on page 47.)

Diagnostics

If you contact Technical Support with a problem, they may ask you to provide them with special files to help them solve it. This process is explained in "Traces and Screen Captures" on page 55.

Expand Diagnostics in the Administrator display tree to display the following parameter:

- **Troubleshooting Information**

Click **Collect Technical Information** to open the User Information dialog box; fill in the information requested to create the information file (default Bsinfo.bts).



You must close all sessions before accessing Diagnostics.

THE TCP/IP CONFIGURATOR

Use the TCP/IP Configurator to configure parameters for your BOSaNOVA Secure to host communication. The TCP/IP Configurator opens automatically when you start BOSaNOVA Secure. You can access it any time to change parameters.

Starting the TCP/IP Configurator

1. Close all sessions.
2. From the Start menu, select **All Programs** ➤ **BOSaNOVA Secure**.
3. Click  **Administrator**.
4. Expand **Connectivity** in the top pane.
5. Click **Connection Type**.
6. In the bottom pane, click **Configure**. The TCP/IP Configurator is displayed.

Using the TCP/IP Configurator

Configurator parameters are divided between two tabs, Basic and Advanced.

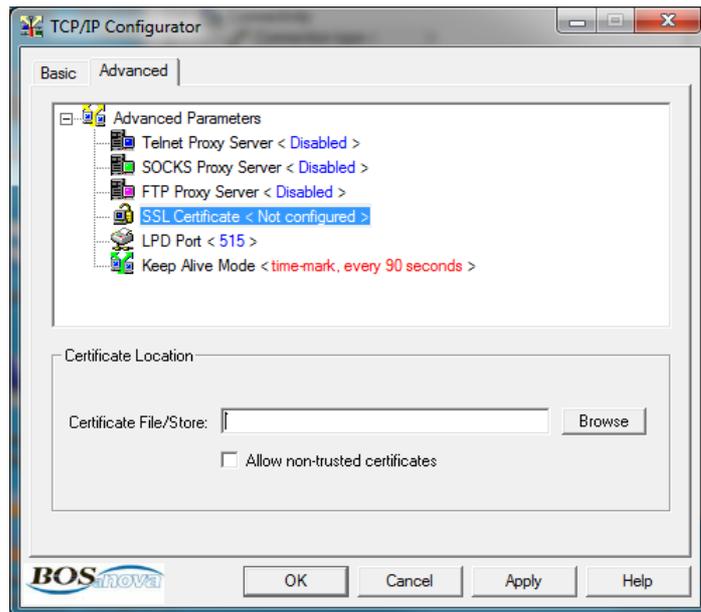
Basic

Use the Basic tab to add, modify, or delete host systems and to define security parameters.

For a detailed explanation of the TCP/IP Configurator Basic tab:

1. Open the online Help.
2. Click **Contents**.
3. Expand the **Components** book.
4. Select **The TCP/IP Configurator**.
5. In the Basic section of that topic click **Details**. The topic entitled Basic Tab (TCP/IP Configurator) is displayed.

Advanced Tab



Use this tab to set advanced parameters for the TCP/IP connection.

The **top pane** of the Advanced Tab uses a Windows-style tree structure to display the parameters. To use this structure:

- An item preceded by a **plus sign (+)** contains nested items. Click the plus sign to expand the item (display the nested folders).
- An item preceded by a **minus sign (-)** is already fully expanded. Click the minus sign to collapse that part of the tree.
- The names of the parameter sets appear in black, while the current status values appear in blue. Values always appear in arrow brackets (< >). When you change a parameter, it appears in red until you click **OK**.
- When you **select** a parameter set in the top pane, the buttons and controls that configure or run that parameter set appear in the **bottom pane**.

Select a parameter in the top pane and use the dialog box that appears in the bottom pane to define or modify the connection.

For a detailed explanation of the TCP/IP Configurator Advanced tab:

1. Open the online Help.
2. Click **Contents**.
3. Expand the **Components** book.
4. Select **The TCP/IP Configurator**.
5. In the Advanced section of that topic click **Details**. The topic entitled Advanced Tab (TCP/IP Configurator) is displayed.

The Advanced tab includes the following parameter sets:

- **Telnet Proxy Server**
Use this parameter set to define or modify the connection to the Telnet proxy server.
- **SOCKS Proxy Server**
Use this parameter set to define or modify the connection to the SOCKS proxy server.
- **FTP Proxy Server**
Use this parameter set to define or modify the connection to the FTP proxy server.
- **LPD Port**
Use this parameter set to define or modify the LPD port.
- **Keep Alive Mode**
When enabled, Keep Alive Mode maintains a connection between an idle emulation session and the AS/400. In the event of a connection failure, or after an AS/400 IPL procedure, Keep Alive Mode often helps reconnect the emulation. The following options are available:
 - **None**
Keep Alive Mode is disabled.
 - **No-op**
One of two minor buffers which track communication between the client and the AS/400. This buffer can identify both idle sessions and disconnected sessions. Enter the interval, measured in seconds, between signals.
 - **Time-mark**
We recommend this setting, the second of two minor buffers which track communication between the client and the AS/400. This buffer can identify both idle sessions and disconnected sessions. Enter the interval, measured in seconds, between signals.
- **SSL Certificate**
Use this parameter set to identify the SSL Certificate. This parameter is available only when running BOSaNOVA Secure.
Allow non-trusted certificates to encrypt the content of the traffic but disregard verification of the recipient.

THE EMULATION CONFIGURATOR

Use the Emulation Configurator to change the parameters that control the look and operation of the BOSaNOVA Secure emulation and to define sessions.



*You can access the Emulation Configurator while the emulation is running, but you can **not** add or change sessions while sessions are open.*

Starting the Emulation Configurator

When the Emulation is closed:

1. From the Start menu, select **All Programs** ➤ **BOSaNOVA Secure**
2. Click  **Administrator**.
3. Select **Display/Printer Emulation** in the top pane.
4. Click **Configure** in the bottom pane.

From the Emulation

- Click  from the emulation toolbar, or
- Select **File** ➤ **Run Configurator** from the emulation menu bar.

Using the Emulation Configurator

Configurator parameters are divided between two tabs, Sessions and Advanced Properties.

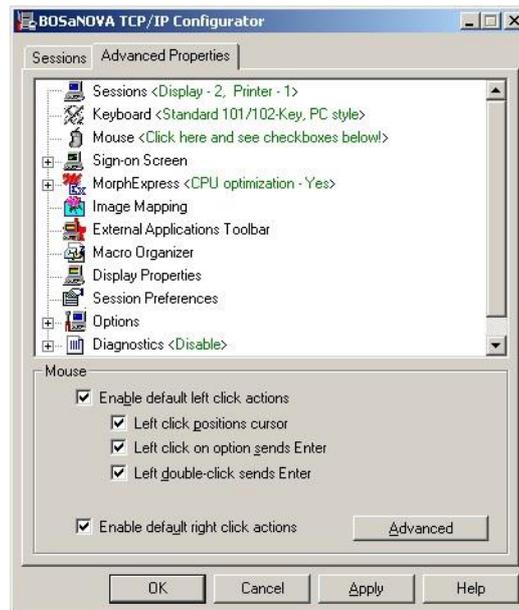
Sessions Tab

For adding, modifying, or deleting display and printer emulation sessions. For BOSaNOVA Connect, SSL is enabled via this tab.

For a detailed explanation of the Sessions tab:

1. Open the online Help.
2. Click **Contents**.
3. Expand the **Components** book.
4. Select **The Emulation Configurator**.
5. In the Sessions section of that topic click **Details**. The topic entitled Session Tab is displayed.

Advanced Properties Tab



Use this dialog box to add, modify, or delete display and printer emulation sessions, as well as for defining sets of global parameters.

For a detailed explanation of the parameter sets on the Advanced Properties tab:

1. Open the online [Help](#).
2. Click **Contents**.
3. Expand the **Components** book.
4. Select **The Emulation Configurator**.
5. In the Advanced Properties section of that topic click **Details**. The topic entitled Advanced Properties Tab is displayed.

The Advanced Properties tab includes the following parameter sets:

- **Sessions**
This parameter lists the number of display and printer emulation sessions currently defined. In the bottom section, you can add a new session or remove all the sessions.
- **Keyboard**
This set displays the type and style of the keyboard. You can change the keyboard style and type and other customization options.
- **Mouse**
Use this branch to select from the available mouse functions.

- **Sign-on Screen**
This set contains parameters for defining what actions BOSaNOVA Secure takes at the host sign-on screen.
- **MorphExpress**
This set contains parameters for defining the way the GUI elements appear on the screen.
- **Image Mapping**
Image Mapping defines the graphics that will be displayed on a session's screen.
- **External Applications Toolbar**
This toolbar is used to run programs from a display session.
- **Macro Organizer**
The Macro Organizer interface displays a list of existing macros and buttons for managing the macros. Use the Macro Organizer to add, edit, order, import, export, etc. host session macros.
- **Display Properties**
Use this dialog box to set color schemes, map host attributes to different colors, and define GUI controls.
- **Session Preferences**
Use this dialog box to define parameters that affect the display session environment such as the display font and ruler type.
- **Options**
This set contains parameters for setting various emulation options.
- **Diagnostics**
This set contains parameters for running diagnostic traces or recording screens for troubleshooting.

Diagnostics

If you contact Technical Support with a problem, they may ask you to provide them with special files to help them solve it. This process is explained in “Traces and Screen Captures” on page 55.

Expand Diagnostics in the Administrator display tree to display the following parameter:

- **Troubleshooting Information**

Click **Collect Technical Information** to open the User Information dialog box; fill in the information requested to create the information file (default Bsinfo.bts).



You must close all sessions before running Diagnostics.

SECURE SOCKETS LAYER (SSL)

BOSaNOVA Secure provides SSL asymmetric encryption and server authentication with self-signed certificates thereby ensuring secure display and printer sessions across TCP/IP networks. This chapter describes how to set up the iSeries and the Windows based PC to enable SSL.

Overview

When information is sent over the Internet or Intranet, several security risks exist.

- Eavesdropping
The information remains intact but its privacy is compromised.
- Modification
The original information is changed or replaced and then sent to the recipient.
- Impersonation
The information passes to a person who poses as the intended recipient.

The Secure Sockets Layer (SSL) protocol safeguards against these threats. Confidentiality and integrity are guaranteed through asymmetric encryption. Authentication is provided through digital certificates.

Asymmetric encryption, also known as public key cryptography, is an encryption method that uses a two-part key: a public key and a private key. To send an encrypted message, the recipient's public key is used. To decrypt the message, the recipient uses the private key.

A certificate is an item of information that binds the details of an individual or organization to their public key. There are two types of certificates:

- Certificate issued by a Certificate Authority
A Certificate Authority (CA) is a third party, trusted by both communicating parties, that is responsible for both the contents and ownership of a certificate. The certificate is signed with the CA's private key. This guarantees its authenticity and integrity. There are several well-known CA companies including VeriSign, Inc. and Thawte, Ltd.
- Self-signed Certificate
A certificate where the Issuer and Subject are the same.

When a server sends its certificate to a client, the process is called *server*

authentication. When a client sends a certificate to a server, the process is called *client authentication.*

SSL prerequisites

The following are the SSL software prerequisites on the iSeries:

- IBM Digital Certificate Manager (DCM), option 34 of OS/400 (5722-SS1)
- TCP/IP Connectivity Utilities for iSeries (5722-TC1)
- IBM HTTP Server for iSeries (5722-DG1). To use the HTTP server to use the DCM, be sure you have the IBM Developer Kit for Java (5722-JV1) installed. By default on the iSeries, this product provides the iSeries HTTP Administration Server, which has a link to the Digital Certificate Manager from the administration server's initial page. If you need to start this administration server, enter the following Start TCP Server command from a 5250 session:
`STRTCPSVR SERVER(*HTTP) HTTPSVR(*ADMIN)`
- The IBM Cryptographic Access Provider product, 5722-AC3 (128-bit). The bit size for this product indicates the maximum size of the secret material within the keys that can be used in cryptographic operations. The size allowed for a key is controlled by the export and import laws of each country. A higher bit size results in a more secure connection.
- Client Encryption product, 5722-CE3 (128-bit). BOSaNOVA Secure needs this product in order to establish the secure connection.

Creating the System Certificate

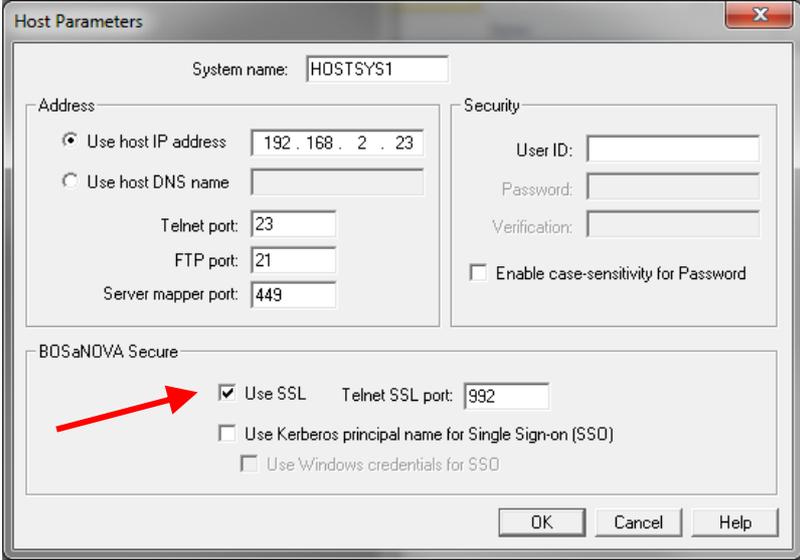
The Digital Certificate Manager (DCM) is used to create the system certificate that will be used for SSL authentication.

For IBM documentation concerning the creation of a self-signed certificate, and other SSL issues, see chapter 4 of the IBM Redbook entitled "iSeries Access for Windows V5R2 Hot Topics: Tailored Images, Application Administration, SSL, and Kerberos" available from the following web site:

<http://www.redbooks.ibm.com/abstracts/sg246939.html?Open>

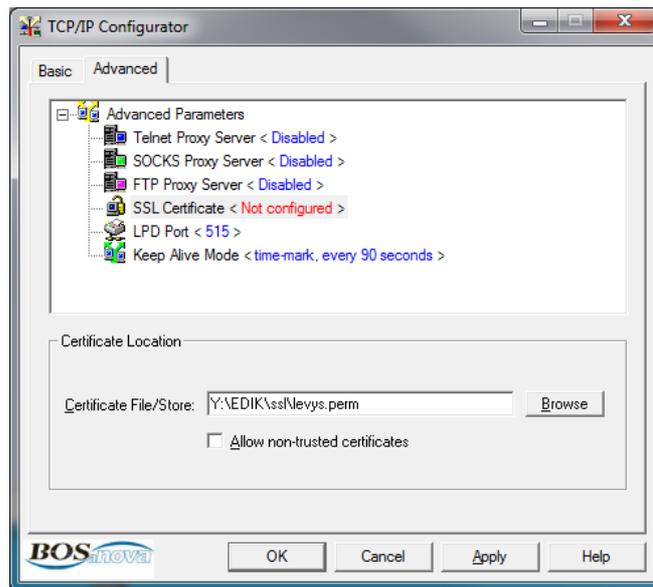
Configuring SSL in BOSaNOVA Secure

1. Ensure that the Telnet server and host servers on the iSeries server are configured to use SSL.
2. Ensure that the certificate is available on the computer. The certificate can either be downloaded, copied, or made available via the local network.
3. Click the Windows **Start** button.
4. Select **Programs** ➤ **BOSaNOVA Secure**.
5. Select  **Administrator** .
6. Expand **Connectivity** in the top pane and click **Connection Type**.
7. In the bottom pane, click **Configure** to open the TCP/IP Configurator.
8. Select the **Basic** tab.
9. Either:
 - Select an existing system and click **Change**, or
 - Click **Add** to add a new system. The parameters available on the Host Parameters dialog box are explained in the online Help topic named Add New System/Host Parameters.
10. Select the **Use SSL** checkbox.



The image shows a screenshot of the "Host Parameters" dialog box. The "System name" field is set to "HOSTSYS1". Under the "Address" section, "Use host IP address" is selected with the IP address "192.168.2.23". Other ports listed are Telnet port: 23, FTP port: 21, and Server mapper port: 449. The "Security" section has empty fields for "User ID:", "Password:", and "Verification:", and an unchecked checkbox for "Enable case-sensitivity for Password". In the "BOSaNOVA Secure" section, the "Use SSL" checkbox is checked, and a red arrow points to it. The "Telnet SSL port" is set to 992. Other options in this section are "Use Kerberos principal name for Single Sign-on (SSO)" and "Use Windows credentials for SSO", both of which are unchecked. At the bottom, there are "OK", "Cancel", and "Help" buttons.

11. Select the **Advanced** tab.
12. Select **SSL Certificate**.



13. Enter the full path to the certificate or click **Browse** to locate the file.
14. Select either:
 - **Certificate File (extension *.cer)**
A Certificate File is a certificate that has not been reformatted. If you select a Certificate File, BOSaNOVA Secure will reformat the file and will automatically change the .cer extension to the .pem extension.
 - **Certificate Store (extension *.pem)**
A certificate store is a certificate formatted for use in BOSaNOVA Secure.
15. Click **Open**. The path of the *.pem file is displayed in the field.
16. Click **OK**.

THE BOSaNOVA EMULATION

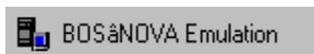
The BOSaNOVA emulation is the environment in which you run your host applications. The host application appears in a window with optional toolbars, customizable macros and display enhancements.

Starting BOSaNOVA Secure

To start BOSaNOVA Secure:

1. Click **Start**.
2. Select **All Programs** ➤ **BOSaNOVA Secure**.

3. Select



In addition, you can start BOSaNOVA Secure automatically by adding it to the Windows Startup folder. To do this, place a shortcut to the BOSaNOVA TCP/IP Display Emulation (Bsmdemul.exe in your BOSaNOVA TCP/IP folder) in your Startup folder (Start Menu ➤ Programs ➤ StartUp).

Opening a Display or Printer Emulation Session

After starting BOSaNOVA Secure, to begin working, open a display session or printer session:

- Click the desired icon.
 - The icon:  indicates a display session.
 - The icon:  indicates a printer session.
- Select **Sessions** ➤ **Activate Session** and select the desired session.
- Select **Sessions** ➤ **Activate All** to activate all sessions.
- If you selected **File** ➤ **Save Workspace** the last time you closed BOSaNOVA Secure, then you can select **File** ➤ **Restore Workspace** to automatically reopen all sessions.



*All defined sessions that are not currently open are listed according to session name in **Session** ➤ **Activate Sessions**. A session with no session name defined is listed by its number and device model type; for example, **Session_2 3477**.*

Display Emulation Sessions

A truncated image of a display emulation screen is shown below:

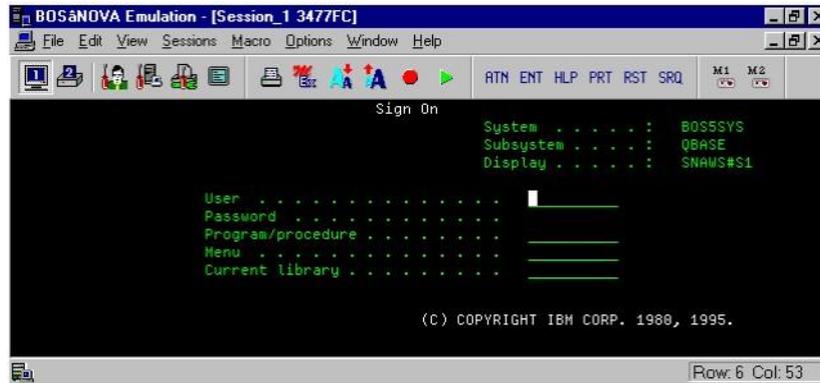


Figure 1: BOSaNOVA Display Emulation Session

Display Emulation Toolbar Buttons

Some of these buttons must be selected before they are displayed. See “Customizing Toolbars” on page 39.

Icons on the Sessions Toolbar	
	Shows the active emulation session (when selected).
	Shows the active printer session (when selected).
	Shows the All Sessions window. This window displays all configured sessions and is especially helpful when more than 8 sessions are configured.
	Runs the Administrator.
	Runs the Emulation Configurator.
	Displays Print Screen setup.
	Opens the DTF Open Profile window. Use this window to create or open a profile or a profile list.

	Toggles between a normal display screen and full-screen mode. In full-screen mode, the display screen appears larger and without the Windows menu, status, and task bars.
	Opens the Macro Organizer in narrow format.
Icons on the General Toolbar	
	Places a tab after each line of text in the Windows clipboard. This is useful for pasting text into host fields because the tab causes the next line to be pasted into the next input field.
	Copies each line within the screen or selected area as a single line with a carriage return. When pasted back into an emulation screen, the individual lines can then be entered into host fields by selecting Edit Paste Tab or Edit Paste Field Exit .
	Performs a Print Screen.
	Runs the emulation session in GUI mode (MorphExpress), which display menus, buttons, frames, tables and other Windows interface features.
	Decreases the font size in the active display session.
	Increases the font size in the active display session. The font is increased in height first, then in width. When Autosize Font is enabled, the minimum font size is redefined.
	Records a macro: everything entered at the keyboard (characters, symbols, or command keys) is recorded. Recording continues until the macro is stopped. <i>Note!</i> <i>While you are recording, a two-button toolbar displays Pause and Stop buttons.</i>
	Plays the selected pre-recorded macro.
	Displays all attributes in active display session.
	Click to cycle through ruler types: none, horizontal, vertical, and crosshairs.
	Click to toggle ruler On and Off. (When ruler is On, its style will be the recent selected style).



Icons on the Host Operations Toolbar	
	A sample of the functions on the Host Operations toolbar.
Icons on the Macros Toolbar	
	Green arrows with the recorded macro's name. Only 20 macros fit on the toolbar.
Icons on the External Applications Toolbar	
	Opens the program associated with the icon. You choose the programs that are available from this toolbar.

Background Bitmaps in a Display Emulation

A picture in BMP format can be assigned as a background to a display emulation session.

1. From the display emulation session menu bar, select **Options** ➤ **Background bitmap**.
2. Enter the following parameters:
 - **Path to bitmap file**
Enter the path of the BMP file or browse to select it.
 - **Displaying picture**
The choices, Tile, Center, or Stretch, indicate the placement of the graphic on the screen. View the appearance of each in the Sample window.
 - **Input field's background style**
The choices, Opaque background or Inverse, define whether or not there is contrast between input fields and the background picture. If neither of these are chosen, the input field is transparent.
 - **Set the picture as background**
Select the checkbox to display the picture. Clear the checkbox to save the settings but hide the picture.
 - **Session**
The settings in this dialog box can be applied to a single session or all sessions. Select a defined session from the dropdown list.
3. Click **OK** to apply the changes and close the dialog box, **Cancel** to close the dialog box without applying the changes, or **Apply** to make the changes and leave the dialog box open for additional changes.

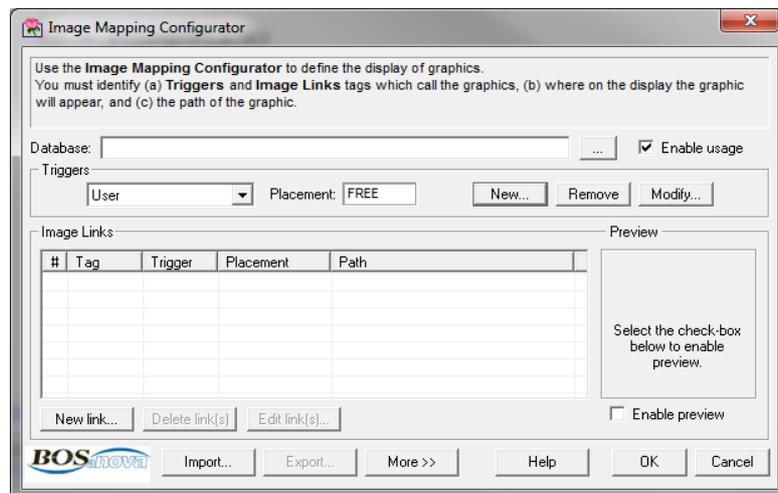
Image Mapping in a Display Emulation

Image Mapping defines the graphics that will be displayed on a session's screen.



To hide the mapped images, right-click anywhere in the display session screen. From the popup-menu, select **Hide Mapped Image(s)**.

1. Access the **Emulation Configurator**.
2. Select the **Advanced Properties** tab.
3. Select **Image Mapping** in the top pane.
4. Click **Run Image Mapping Configurator** in the bottom pane.



5. In the **Configuration File** field, define the path to the file containing the Image Mapping data. The file ends with the suffix **.IMM**.
6. Define one or more **Trigger**. A trigger is a word, appearing on the screen, which prompts BOSaNOVA to search for image links.
 - a. Click **New**. The New Trigger dialog box is displayed.
 - b. Enter a word which appears on the session screen.
 - c. Only clear the “Trigger can be located ...” checkbox if you must define exactly where on the screen the trigger appears. Otherwise, leave the checkbox selected.
 - d. Click **OK**.
7. Define the image link.
 - a. Click **New**. The New Image Link dialog box is displayed.

- b. Enter the tag of the link. (A tag is a word, appearing on the screen, which indicates which image to display.) The tag reappears in the popup menu, and if possible, should be unique.
- c. Select the trigger associated with the tag.



When both the trigger and the tag appear, the image will be displayed.

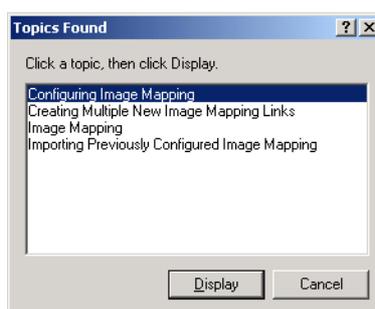
- d. Enter the path to the image.
 - e. Define the placement and size of the image.
 - f. Click **OK**. The New Image Link dialog box closes and the new image link appears in the table of image links.
8. To preview the image link:
 - a. Select **Enable Preview**.
 - b. Select the image link from the table.
 9. Click **OK**.
 10. To view the new image mapping, close all sessions and restart BOSaNOVA Secure.

Additional Image Mapping Procedures

The following Image Mapping Procedures are documented only in the online Help:

- Creating Multiple New Image Mapping Links
- Importing Previously Configured Image Mapping

To view these procedures, see the online Help. From the Index, select the **image mapping** entry. The Topics Found window includes links to these procedures.

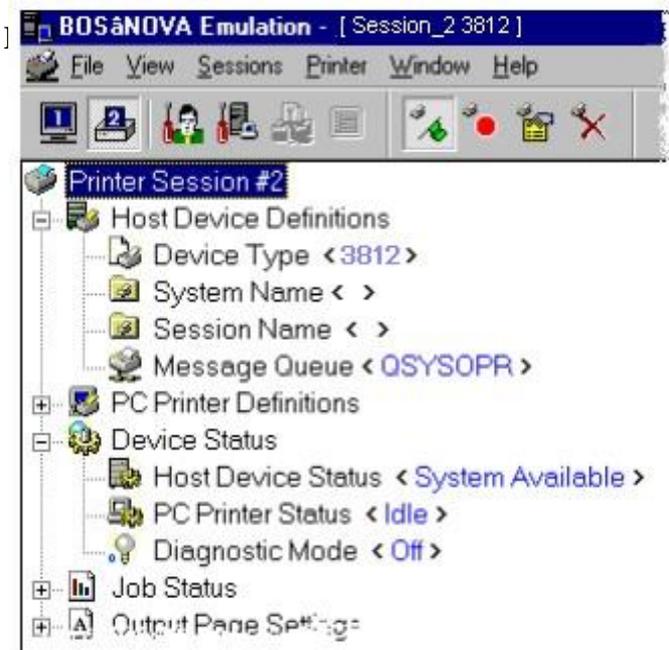


Printer Emulation Sessions

BOSaNOVA Secure uses a Windows-style tree structure to display printer sessions and their status information. The following diagram shows a sample printer session status screen.



If a parameter is not applicable to your connection type, it appears blank.



Printer Emulation Toolbar Buttons

In a Printer Emulation session, only the Sessions and the Printer Session toolbars can be displayed.

Icons on the Sessions Toolbar	
	Shows the active emulation session (when selected).
	Shows the active printer session (when selected).
	Shows the All Sessions window. This window displays all configured sessions and is especially helpful when more than 8 sessions are configured.
	Runs the Administrator.

	Runs the Emulation Configurator.
	Displays Print Screen setup.
	Opens the DTF Open Profile window. Use this window to create or open a profile or a profile list.
	Toggles between a normal display screen and full-screen mode. In full-screen mode, the display screen appears larger and without the Windows menu, status, and task bars.
	Opens the Macro Organizer in narrow format.
Icons on the Printer Toolbar	
	Starts the printer. If the print queue has been paused or stopped, this resumes printing.
	Stops the printer, including any jobs currently in the print queue. A host error message will appear, indicating that the print queue has been stopped. Jobs in the queue remain there; ready jobs are re-leased once the Start button is pressed or Printer Start is selected.
	Opens Printer Session Properties, for viewing or setting print job parameters.
	Cancels the current job in the print queue. Other jobs will continue.

Accessing Printer Session Properties

You cannot change values directly on the screen. Make changes in the Printer Session Properties dialog box. Access the dialog box in one of three ways:

- In a print emulation screen, right-click to display the popup menu and select **Properties**.
- From the print emulation menu bar, select **Printer > Properties**
- From the printer emulation toolbar, click 

General Tab

This tab contains parameters defining the printer driver and job timeout settings.

- **Print Test Page**
Sends a test page to the local printer. The print session emulates a host print device, but the output is directed to a PC printer.
- **Printer Driver**
BOSaNOVA Secure enables you to print using your default Windows printer driver or to bypass Windows printing by defining your own custom printer driver.
- **Timeout Settings**
The default job timeout is 10 seconds. This is the maximum amount of time that can elapse between buffers received from the host. If no buffer is received within this time period, BOSaNOVA Secure assumes that the end of the print job has occurred. During troubleshooting, you may need to increase this number. To restore the default value, click **Set Default Timeout**.

Previous Job Attributes Tab

Displays the attribute values of the most recent host print job in the left pane and corresponding local printer settings (converted from the host attributes by the BOSaNOVA printer emulation) in the right pane. For details, see *Printer Session Properties* in online Help.

Page Setup Tab

For setting parameters such as CPI, LPI, page orientation, paper size, and paper source. For details, see *Printer Session Properties* in online Help.



If your screen display is not clear, click the + or – box in front of an entry several times to refresh the screen.

Diagnostic Tab

Contains parameters for running diagnostic mode. This is for troubleshooting print problems. For details, see “Traces and Screen Captures” on page 55.

Advanced Tab

See *Printer Session Properties* in online Help for more information.

Custom Driver Considerations

In order to decide whether to use the default Windows driver or a custom driver, you must understand how BOSaNOVA Secure handles print jobs.

When using the Windows driver, a data buffer (ASCII or EBCDIC) arrives at the Windows driver. It is then output as a graphics buffer to the printer queue. Each output buffer is approximately 40K.

When using a custom driver, a data buffer arrives at the custom driver. It is then output as the same strings (ASCII or EBCDIC) plus commands for that printer driver. This output is then routed to the Windows driver, where it again is output to the printer queue as data strings plus printer commands. Because no graphic processing is involved, each buffer is approximately 3K.

If you are printing straight ASCII text, for example, and require speed and high throughput, you might consider using a custom driver. Custom drivers can be modified using the Printer Driver Editor.

Copying Between Sessions or Applications

Most Windows applications use the Windows Clipboard to transport text, graphics, and other data. You can also use the Clipboard to copy data from a session into another session or another application.



*For a detailed explanation of all Copy > Paste options, open the **online Help**, click **Contents**, expand the **How to ...** book, and select **Copy-and-Paste**.*

1. In an active display emulation session, use the mouse to mark the on-screen text you want to copy.
2. To copy:
 - select one of the copy methods from the Edit menu (Copy Continuous, Copy by Line, or Copy Bitmap), or
 - press <Ctrl+C>, or
 - click  on the toolbar.
3. If you are copying to a different session or application, switch to the other session or application.
4. Before pasting the copied text, use the mouse to position the cursor at the insertion point.
5. To paste:
 - select one of the paste methods from the Edit menu (Paste Continuous, Paste Tab, or Paste Field Exit), or
 - press <Ctrl+V>, or
 - click  on the toolbar.



The data copied into the Windows Clipboard will remain there until replaced by the next copy action.

Switching Between Emulation Sessions

You can switch (or toggle) between open display and printer emulation sessions using the toolbar, the menu bar, or the keyboard.

From the Toolbar

Click the display session button (for example, ) or the printer session button (for example, ) to switch to that session.

From the Menu Bar

Select the Window menu. The bottom of the menu lists all the open display and printer emulation sessions. A check appears next to the currently-active session (on top session). You can switch to another session by selecting it from this list.

From the Keyboard

In Windows, press <Ctrl>+<F6> or <Ctrl>+<Tab> to switch to the next open emulation session.

- Press the mapped PC key for “Jump to Next Session” (default <Alt>+<PageUp>).
- You can remap this key in the Mapping Editor. (See “Customizing the Emulation Keyboard” on page 30.)
- Set the Session Toggle Key Combination:
 - i. From the menu bar, select **Options** > **Keyboard Customization**.
 - ii. Under Session Toggle Key Combination, select **No key** (for no toggle key combination) or <Alt+Num> or <Ctrl+Num>.
 - iii. Check that Num Lock is on.
 - iv. To switch to another session, press Alt or Ctrl (depending which combination you selected in step 2) and press the session number on the numeric keypad. The session changes when you release both keys.

Using Macros

Macros are strings of keystrokes (characters, symbols, or command keys) entered at the keyboard and saved for repeated use. They provide a simple way to enter repetitive command data into a host session screen.



You will not be able to use macros from another emulation product; you must re-record the desired macros in BOSaNOVA Secure.

Recording a Macro

To record a macro, you must be in a display emulation session (see “Opening a Display or Printer Emulation Session” on page 13).

1. Click  from the toolbar or select **Macro** ➤ **Record Macro**.
2. Enter any keystrokes for the macro. As soon as you begin recording, this popup Record toolbar appears. It contains only the Pause and Stop buttons. 
3. Stop recording by clicking  or selecting **Macro** ➤ **Stop Macro**. The Record popup toolbar closes and the Save Macro As dialog box appears.



If you exit the emulation before stopping record mode, the recorded key sequences are lost.

4. Enter a logical name for the macro and click **Save**. When you reopen the Macro Organizer, the newly recorded macro appears in the list.



If you record a macro with a key sequence that is already in use, the new key sequence automatically replaces the existing one.

Viewing a Macro

1. From the emulation menu bar, select **Macro** ➤ **Macro Organizer**. The Macro Organizer opens.
2. Select a macro from the list.
3. Click **View**. The macro commands and text strings are displayed in the Macro Viewer.
4. Click **OK** to return to the Macro Organizer.

Playing a Macro



To play a macro, you must be in a display emulation session.

There are two ways to play macros from the Sessions toolbar:



1. Click . The Macro Organizer opens in Narrow format.
2. Double-click a macro. The macro plays and the Macro Organizer remains *open*.



1. Click . A list of macros is displayed.
2. Click a macro. The macro plays and the list *closes*.

To play macros from the Macro menu:

- a. Select **Macro** ➤ **Play Macro**. A list of all defined macros is displayed.
- b. Select a macro from the list.

To play a macro from Macros toolbar:

click the desired macro button.



Deleting a Macro

1. Select **Macro** ➤ **Macro Organizer**. The Macros Organizer opens.
2. Select a macro from the list and click **Remove**.
3. Confirm the delete action by clicking **Yes**.
4. Click **Close** to close the dialog box.

The Macro Organizer and Macro Editor

There are two versions of the macro organizer. The full version, lists all the macros and has buttons for adding and modifying the macros. Some modifications can be done with the abridged version, but its main advantage is that it stays on top even when the focus is changed to another window.

With the Macro Organizer, you can manage and modify recorded macros in an easy-to-use interface. The Macro Organizer interface displays a list of existing macros on the left side and buttons for managing the macros on the right side.

The Macro Editor provides a convenient way for adding, removing, or substituting macro commands or text strings in a selected macro. The Macro Editor displays the text strings and commands of the selected macro in the order they were recorded or entered in the Macro Organizer. For details, refer to online Help.

Closing a Session

To close a session:

- close the session window by clicking the Close button () at the far right of the title bar, or
- select **Sessions** ➤ **Close Session** and select the desired session

To close all sessions, select **File** ➤ **Exit**.



All open sessions appear in the Close Session cascade menu and are listed according to session name. A session with no session name defined is listed by its number and device model type; for example, Session_2 3477.

Stopping an Emulation Session

When you close the BOSaNOVA emulation, all sessions will be closed. To do this:

- Select **File** ➤ **Exit**, or
- Click  on the window title bar.

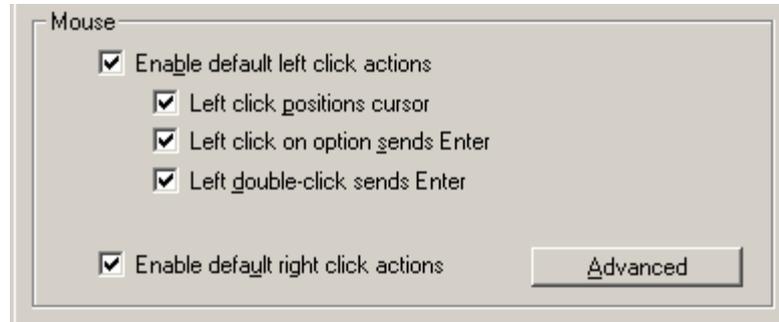


*If you log out of the host session without closing your host application, the session may remain active at the host side even if BOSaNOVA Secure is closed. To prevent this, select **Check for sign-on screen on exit** in Sign-on Screen in the Advanced Properties tab in the Emulation Configurator. This displays a warning if you try to close a session when the host Sign-on screen is not the current screen.*

CUSTOMIZING THE EMULATION MOUSE

BOSaNOVA Secure includes several options for mouse customization.

1. Open the **Emulation Configurator**.
2. Select the **Advanced** tab.
3. Select **Mouse**. The following options are displayed in the bottom pane:



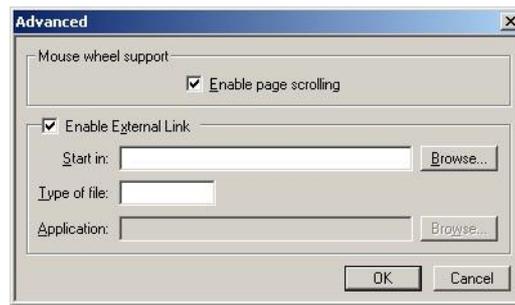
4. Select or clear the following checkboxes:
 - **Enable default left click actions**
 - **Left click positions cursor**
When selected, clicking the left mouse button once moves the cursor to the current mouse location on the screen.
 - **Left click on option sends Enter**
When selected, if a display option is selected, clicking the left mouse button once enters the option number onto the command line and adds an <Enter>.



Before left-clicking, the cursor must be located on the command line.

- **Left double-click sends Enter**
When selected, double-clicking the left mouse button anywhere on the screen adds an <Enter> onto the command line.
- **Enable right click popup menu**
When selected, right clicking in a session causes a popup menu to be displayed.

5. Click **Advanced** to open the following dialog box:



- **Mouse wheel support**

When Enable page scrolling is selected, use the mouse wheel to scroll up and down a screen.

- **Enable External Link**

If selected, the External Link option enables the user to treat any text field on the display session screen as either the name of a document file, the name of a folder, or an Internet address.

For detailed instructions concerning enabling and using the External Link feature, see the online Help. From the Index, select the **external link** entry



Enable External Link is disabled if Enable right click popup menu is cleared.

6. Click **OK** to apply the changes and close the dialog box, **Cancel** to close the dialog box without applying the changes.

CUSTOMIZING the EMULATION KEYBOARD

Accessing Keyboard Customization

- From an emulation session, select **Options** ➤ **Keyboard Customization** from the emulation menu bar.
- From the Administrator:
 - a. In the top pane, select **Installed Modules** ➤ **Display Emulation**; in the bottom pane, click **Configure**.
 - b. Select the **Advanced Properties** tab. In the top pane, select **Keyboard**; in the bottom pane, click **Keyboard Customization**.

Customizing Your Keyboard

1. From the Advanced Properties tab in the Emulation Configurator, select **Keyboard**.
2. In Keyboard style, select **Terminal** or **PC** (that is, the style of the keyboard you use).
3. In Keyboard type, select the keyboard you are using from the list: BOS 122-Key, BOScom 122 PC, or the Standard 101/102-key keyboard. (The BOScom 122 PC keyboard does not require installation of a driver.)
4. To view the default keyboard settings, click **Keyboard Customization**.



If the default keyboard settings are appropriate, which is the case for most users, go to step 6 (to check host settings). If, however, you want to change these settings, continue with step 5.

5. To change the default keyboard settings, set the following parameters (for details, see *Keyboard Customization* in online Help):

Keyboard Mapping Name

The only three PC keyboard options on the list are BOS 122-key, BOScom 122 PC and the Standard 101/102-key keyboard. Select the type of keyboard you have.



*The following parameters apply to **all** the keyboard mappings in the list; therefore, if you change a parameter, it changes in all the listed keyboard mappings, not just the selected one.*

Keyboard Locks

You can override these default Terminal or PC-style keyboard mappings:

- Select **Shift Lock or Caps Lock**. On a terminal-style keyboard, <Caps Lock> works like a terminal <Shift Lock> and remains in place until the <Shift> key is pressed
- **Set Num Lock at session startup**: when selected, this sets <Num Lock> when you open a session. On a terminal-style keyboard, the numeric keypad is always numeric whether or not <Num Lock> is selected.

Enter and Field Exit

Select the keystrokes for Enter and Field Exit. There are two choices:

- <Field exit>=Enter; <Enter>=Right Ctrl (terminal-style keyboard defaults)
- <Field exit>=Right Ctrl; <Enter>=Enter

Word Processor Key Combination

If you are using Office Vision Text Assist, select the key combinations used for text editing functions (<Alt>+<Key> or <Ctrl>+<Key>). These key combinations are not usually supported by Windows (they perform different functions in Windows). Selecting a key combination enables BOSaNOVA Secure to support your text editing functions. If you are not using Text Assist, select **None** to improve system performance.

Session Toggle Key Combination

No key, or Alt+Num, or Ctrl+Num.

Key Sound

Select **Enable** to hear a click when pressing a key.

Modern right to left

For Hebrew data entry: select **Enable** to enter characters from right to left (Not by pushing the characters).

6. To view the current Host-to-PC keyboard mapping, click **Edit** to open the Mapping Editor (see *Mapping Editor* in online Help).



If the default Host-to-PC keyboard mappings are appropriate, which is the case for most users, go to step 12. If, however, you want to change these mappings, continue with step 7.

7. In Categories, select a host action category (Characters on PC and Host keyboard, Emulation controls, Host function keys, Host operations, Macros, or Numeric pad keys).
8. Select an action from the [Host actions list] edit box. (The title on this edit box is the category you selected in Categories.) The PC key to which that host action is currently mapped appears in PC Key and is highlighted (blue border) on the keyboard display.

9. On the keyboard display, delete the current mapping of the highlighted key by left-clicking it.
10. Remap the selected host action by left-clicking the new key to which you want to map it. This opens Mapping for PC key. Click the button with the desired key combination (Norm, Shift+, Ctrl+, or Alt+). If this key combination is already mapped, you are prompted to change the existing mapping. Click **Yes** to accept the change and return to Mapping Editor. The new mapping appears in PC Key.



You can remap from a PC key to a host action by right-clicking the key you want to map. The popup menu displays the current mapping of the selected PC key combinations: Norm, Shift+, Ctrl+, and Alt+. Follow the cascading menus to delete the current mapping or to remap the key combination to a different host action.

11. When done, click **Save As**. This opens “Keyboard mapping will be saved as”. In Name, type a name for your customized keyboard mapping. In Description, you can type a more detailed description of this mapping. Click **OK** to save the keyboard mapping.
12. When you have finished, click **OK** to save the keyboard mapping. Continue to click **OK** in each dialog box to save the changes and close the dialog box until you exit the Emulation Configurator. The keyboard changes take effect as soon as you return to the emulation.

Mapping Editor

Use the Mapping Editor dialog box to define which host actions map to which PC key combinations.

- To map from host actions to PC keys, use the edit boxes at the top of the dialog box and left-click.
- To map from PC keys to host actions, use the keyboard display and right-click.



All the following parameters apply to the selected keyboard mapping name that appears in square brackets [] in the title bar of the Mapping Editor dialog box.

Categories

Select one of the following categories:

Characters on PC and Host keyboard

This category includes all the keys for letters, numbers, and symbols.

Emulation controls

This category includes emulation actions such as <Jump to next host session> and <Play macro>.

Host function keys

This category includes the host command keys such as <Cmd1>.

Host operations

This category includes host actions such as <Attn>, <Clear>, and <Field +>.

Macros

This category includes recorded host macros such as <Sign off> and <Sign on as QUSER>.

Numeric pad keys

This category includes the numbers on the numeric keypad.

[Host Actions List]

The title of this middle edit box changes according to the category you selected in Categories. This edit box lists all the host action options in the selected category. Select the host action you want to map to a PC key.

PC Key

Displays the PC key (or keys) to which the selected host action is currently mapped.

Keyboard display: The keyboard in the bottom half of the dialog box, displays the current mapping of the keyboard mapping name shown on the title bar of the popup dialog box. Right-click a key: it will be highlighted by a blue border. The popup dialog box shows the key to which the selected host action is currently mapped. From the keyboard display, you can perform the following functions:

- Display the current mapping of any key by holding the cursor over it for a few seconds.
- Delete the current mapping of the highlighted key by left-clicking it.
- Remap the selected host action by left-clicking the new key to which you want to map it. This opens Mapping for PC key.
- Remap from a PC key to a host action by **right-clicking** the key you wish to map. The popup menu displays the current mapping of the highlighted PC key combinations: <Norm>, <Shift>, <Ctrl>, and <Alt>. Follow the cascading menus to delete the current mapping or to remap the key combination to a different host action.

OK

Not available when you select **Standard 101/102-key** or **122-key** keyboards; when you customize and save the new mapping, you can then view this customized keyboard mapping without making any changes and click **OK**.

Save As

To save a customized keyboard mapping, click **Save As** and give the keyboard mapping a name; you can also add a more detailed description of the keyboard mapping (optional).

Cancel

If you do not want to change the keyboard mapping or if you made changes to the mapping that you do not want to save, click **Cancel**.

Mapping for PC Key

In the Mapping Editor, select a host operation from the list at the top of the Editor. When you left-click a key in the Mapping Editor, you open a Mapping for PC key dialog box. The key you clicked appears in square brackets [] in the title bar and the host operation you selected appears in angle brackets (< >) in the first line.

Map the host operation you chose to one of the key-combination buttons displayed in the Mapping for PC key dialog box:

- <Norm> maps the selected host action to the normal key character.
- <Shift>+... maps the selected host action to <Shift> + the key character.

- **Ctrl>+...** maps the selected host action to <Ctrl> + the key character.
- **<Alt>+...** maps the selected host action to <Alt> + the key character.

Deleting a Keyboard Mapping

You can remove a customized keyboard mapping from the Keyboard Mapping Name list by deleting it. If you want to remove it from the list, but not erase it, first Export it to a file (see “Exporting a Keyboard Mapping” directly below). Then you can Import it later if necessary.



You cannot delete 122-Key or Standard 101/102-Key keyboards as they are the standards from which you map your customized keyboards.

1. Open the Keyboard Customization dialog box (see “Accessing Keyboard Customization” on page 30).
2. In Keyboard mapping name, select a customized keyboard mapping.
3. Click **Delete** to remove the keyboard mapping and return to Keyboard Customization.
4. Click **OK** to save the changes and exit the Emulation Configurator.

Exporting a Keyboard Mapping

You can save a keyboard mapping to a file and send it to others on the network.

1. Open the Keyboard Customization dialog box (see “Accessing Keyboard Customization” on page 30).
2. In Keyboard mapping name, select a customized keyboard mapping.
3. Click **Export** to open the Save As dialog box.
4. In File name, enter the Keyboard mapping name. In Save as type, select **Keyboard mapping files (*.kbm)**. Click **Save** to save the file and return to the Keyboard Customization dialog box.
5. Click **OK** to exit the dialog box.

Importing a Keyboard Mapping

You can open a keyboard mapping that has been saved to a file (for example, by the system administrator). You can also make changes to it.

1. Open the Keyboard Customization dialog box (see “Accessing Keyboard Customization” on page 30).
2. In Keyboard mapping name, select a customized keyboard mapping.
3. Click **Import**; locate the file and click **Open**. The customized keyboard mapping opens directly in Mapping Editor.



The imported keyboard mapping overrides the keyboard type and style settings for all the keyboard mappings listed in Keyboard Mapping Name. If you need to change these settings, see “Customizing Your Keyboard” on page 30.

4. Make any changes and click **Save As** to save the new mapping.
5. Enter the new customized keyboard mapping name and click **OK**. Click **OK** to accept the changes and to exit the Emulation Configurator.

CUSTOMIZING the EMULATION TOOLBARS

There are seven toolbars in BOSaNOVA Secure. Select **View > Toolbars** to open the Toolbar dialog box to define which toolbars are displayed and which buttons they contain.

The toolbars below are shown as they would appear when “floating” (that is, when they have been dragged into the emulation screen area). When toolbars appear under the menu bar, they do not have titles.



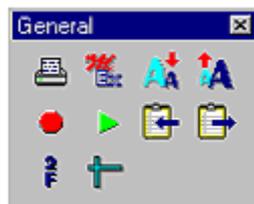
All toolbar functions are duplicated in menu items or by keyboard hotkeys. You can display toolbars with visible borders or in the style used by Microsoft Internet Explorer (where a button has a visible border only when the mouse cursor is on the button). Select the kind of borders you want in the Toolbar dialog box.

Sessions



Contains a button for each defined session plus buttons for accessing the Emulation Configurator and Print Screen setup, running ATF, and toggling between full-screen and normal display mode.

General



Contains buttons for performing a print screen, changing fonts, playing macros, displaying print attributes, and changing the ruler cursor style.

Printer



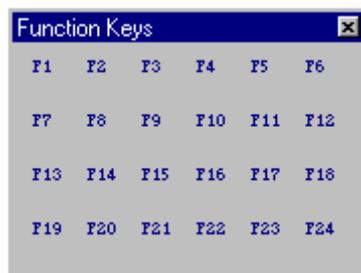
(Appears only if the in-focus session is a printer emulation session.) Contains buttons for starting and stopping print jobs.

Host Operations



Contains buttons of these common host commands.

Function Keys



Contains buttons for function keys.

Macros



Contains buttons of all defined macros. If no macros have been recorded, this toolbar will not appear.

External Applications



Contains buttons of all programs that can be opened from the display session. For detailed instructions, see the online Help. From the Index, select the **external application toolbar** entry.

Customizing Toolbars

1. From the emulation, select **View** ➤ **Toolbars**.
2. Select the toolbar you want to modify and click **Customize**. This opens the Customize Toolbar dialog box (for details, see *Customizing Toolbars* in online Help).
3. Customize the toolbar:
 - To add a button, select it in the Available Buttons table on the left side of the dialog box, and click **Add**.
 - To remove a button, select it in the Toolbar Buttons table on the right side of the dialog box, and click **Remove**.
 - To display a small popup help message over interface elements when the cursor rests on them for a few seconds, select **Show Tooltips**.
 - To display toolbars in the same style used by the Microsoft Internet Explorer; that is, a button has no visible border until the mouse cursor rests on it, select **Set MSIE Style**.
4. When you have made all changes, click **Close** to return to the Toolbar dialog box.



*Changes are not saved until you click **OK** in the Toolbars dialog box. This saves the changes and returns you to the emulation. Click **Reset** to return the values to the previously saved settings.*

5. Click **OK** to save the changes and close the Toolbars dialog box. The modifications appear as soon as that toolbar is displayed.

Arranging Toolbar Buttons

You can arrange the order of buttons in toolbars in two ways.

- From the Customize Toolbar dialog box:
 - a. Select **View** ➤ **Toolbars**.
 - b. Select a toolbar and click **Customize** to open the Customize Toolbar dialog box (for details, see *Arranging Toolbar Buttons* in online Help).
 - c. Select a button in Toolbar Buttons (on the right side of the dialog box), and click **Move Up** or **Move Down** to reposition it. Toolbar buttons are arranged according to the order in which they appear in the Toolbar Buttons table.
 - d. When you have finished, click **Close**.
 - e. Click **OK** in the Toolbars dialog box to save the changes and return to the emulation screen.
- On the toolbar:
 - a. <Alt>-click a toolbar button (that is, click a toolbar button with the left mouse button while holding down the <Alt> key).
 - b. Drag the button to a new location on the toolbar and release the mouse.
 - c. If you drag the button off the toolbar, it will be removed; to restore it, go back to the Customize Toolbar dialog box.

Moving Toolbars

Windows supports “floating toolbars”: that is, you can click-and-drag toolbars to different places on your screen.

- Click a toolbar and drag it onto the session area. When you release the mouse button, the toolbar changes into a toolbox. The buttons remain arranged in the same order.
- Click a toolbar and drag it to the bottom of the session area. When you release the mouse button, the toolbar is displayed at the bottom of the screen.
- Click a toolbar and drag it to either side of the session area. When you release the mouse button, the toolbar is displayed vertically at the side of the screen.

EMULATION VIEWING OPTIONS

You can control various viewing options in BOSaNOVA Secure:

- To determine which toolbars are displayed, select **View** ➤ **Toolbars** in the emulation menu bar. This opens the Toolbars dialog box.
- To display the status bar, select **View** ➤ **Status Bar** in the emulation. If a check appears next to this menu item, the status bar appears at the bottom of the display session screen. To turn it off, click again.
- To convert the host display to a Windows style display, select **View** ➤ **MorphExpress** in the emulation. MorphExpress changes the look of the display session, converting it into a true GUI application.



MorphExpress only appears in the View menu if a display session is active

HOTKEYS

BOSaNOVA Secure supports the following hotkeys:



The hotkey examples given here are for 101/102 keyboards only.

- <Alt> + <Page Up> jumps from one session to another
- <Alt> + <Insert> toggles between a full screen and a split screen for the present session
- <Alt> + <Page Down> cycles between the different ruler cursor styles
- <Alt> + <F3> starts recording a macro
- <Alt> + <F5> starts playing a macro
- <Alt> + <F8> toggles between Test mode (in which host attributes are displayed) and normal mode
- <Alt> + <Print Scrn> performs a print screen to the local PC printer

MORPHEXPRESS

MorphExpress is an automated tool that converts your original host screen into a GUI screen by:

- analyzing host screens
- automatically detecting commands and menus and converting them from plain text to GUI buttons
- adding panels and graphic elements
- converting subfiles into tables, and options into buttons

Displaying the MorphExpress Screen

Click  on the toolbar to toggle between the GUI display and your previous color scheme choice (Color or Mono).

The original (non-MorphExpress) color tables are always saved.

Configuring MorphExpress

1. From the Advanced Properties tab in the Emulation Configurator, select **MorphExpress** in the top pane and click **GUI Customize** in the bottom pane to open GUI Logic Configuration (for details, see *Configuring MorphExpress* in online Help).
2. Set the parameters to define the way MorphExpress recognizes and converts screen elements.
3. Click **OK** in each dialog box to save the changes and close the dialog box until you exit the Emulation Configurator. The changes take effect as soon as you return to the emulation screen.

Customizing GUI Controls

1. From the Advanced Properties tab in the Emulation Configurator, select **Display Properties** in the top pane and click **Display Properties** in the bottom pane to open the Display Properties dialog box.
2. In Display Mode, select **MorphExpress** and click **Customize** to open the MorphExpress Options dialog box, where you define how the controls look.
3. Make changes and click **OK**. Click **OK** in each dialog box to save the changes and close the dialog box until you exit the Emulation Configurator. The changes take place automatically in **all** display sessions.

Customizing GUI Colors

1. From the Advanced Properties tab in the Emulation Configurator, select **Display Properties** in the top pane and click **Display Properties** in the bottom pane to open the Display Properties dialog box.
2. Under Display Mode, select **MorphExpress**; under Color scheme name, select the palette from the dropdown list.
3. Select a background color for controls from the BackColor dropdown palette.
4. Select a background color for input fields from the BackColor dropdown palette. (Using a contrasting color helps make input fields more noticeable.)
5. Click **Apply** to make the changes. You can see how the selections look in the sample (the top half of the dialog box). When you are satisfied with the color schemes, click **OK** to close the Emulation Configurator.

MISCELLANEOUS

PDE (Printer Driver Editor)

The application named Printer Driver Editor is a part of BOSaNOVA Secure. PDE enables you to modify custom printer drivers. For details, refer to online Help.

Euro Symbol Support

The euro is the single currency of the European Monetary Union that was adopted by 11 member states on 1 January 1999. These are Belgium, Germany, Spain, France, Ireland, Italy, Luxembourg, the Netherlands, Austria, Portugal and Finland. For more information see the Euro Web site (<http://europa.eu.int/euro>) run by the European Commission.

There are now fonts, keyboard types, and code pages that add the euro symbol character. For euro symbol support to function correctly in your applications, both the host and Windows must be configured for euro symbol support. Check your host and Windows configuration for euro symbol support and select **Euro support** in the Administrator (in **Administrative parameters** ➤ **Host language/country**). If your host and/or Windows are not configured for euro support, deselect **Euro support** to use the old code page.

Host Requirements

AS/400 Release (Version)	Group PTF Number	Info APAR Number
V3R2M0	SF99205	II11523
V4R1M0	SF99206	II11523
V4R2M0	SF99207	II11523
V4R3M0	SF99208	II11523

Changes Required for Euro Symbol Support

The character ID for all countries was changed from 697 to 695. The following table contains the required code changes by country:

Country	Old KBDTYPE and CCSID (code page)	New (Euro) KBDTYPE and CCSID (code page)	Euro EBCDIC	Euro ANSI
Austria/Germany	AGB 237	AGE 1141	0x9F	0x80
Belgium	BLI 500	BLM 1148	0x9F	0x80
Canadian French	CAI 500	CAM 1148	0x9F	0x80
Denmark	DMB 277	DME 1142	0x5A	0x80
France (azerty)	FAB 297	FAE 1147	0x9F	0x80
Finland/Sweden	FNB 278	FNE 1143	0x5A	0x80
Italian	ITB 280	ITE 1144	0x9F	0x80
Netherlands	NEB 037	NEE 1140	0x9F	0x80
Norway	NWB 277	NWE 1142	0x5A	0x80
Portugal	PRB 037	PRE 1140	0x9F	0x80
Spain	SPB 284	SPE 1145	0x9F	0x80
Switzerland/French	SFI 500	SFM 1148	0x9F	0x80
Switzerland/German	SGI 500	SGM 1148	0x9F	0x80
United Kingdom	UKB 285	UKE 1146	0x9F	0x80
United States/Canada	USB 037	USE 1140	0x9F	0x80

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DTF (DATA TRANSFER FUNCTION)

Introduction to DTF

DTF (Data Transfer Functions) is a 32-bit Windows utility for transferring data in either direction between a BOSaNOVA Secure and a host.

Data transfers are managed by file transfer profiles. These are files with an **.h2p** (host-to-PC) or **.p2h** (PC-to-host) extension that contain information about the data and how it is to be transferred, e.g., the source and destination paths, the transfer type, and conversion information.

After you create a DTF profile, you have a number of options to use for transferring the data: DTF interface (interactive mode), DTF background mode, Profile lists (batch mode), and the Scheduler. In addition, the Send utility provides a tool for transferring strings and running script files in display sessions via HLLAPI.

DTF contains four components:

- The DTF Wizard helps you create new DTF profiles.
- The DTF interface displays DTF profiles in a Windows-like tree structure. In the DTF interface, you can:
 - View profiles and profile lists
 - Create profiles
 - Change profile parameters
 - Change profile lists
 - Run data transfers in interactive mode. (See also *Running DTF in Background Mode*, in online Help.)
- The Scheduler lets you define automated transfers to run on a specified schedule or as triggered by a dynamic event.
- The Send utility lets you send strings or commands to the host.

With DTF, you can create a list of profiles and then run these multiple transfers in background mode.

If you have used ATF for data transfer, you will be familiar with many of the terms and procedures in DTF. For information about **new** terminology and procedures in DTF, see *Tips for ATF Users*, in online Help.

For details about running data transfers, refer to the online Help.

The DTF Wizard

Use the DTF Wizard to create a new DTF profile. A DTF profile contains information about the data and how it is to be transferred. The parameters that appear in the wizard depend on the host type and transfer direction (host-to-PC or PC-to-host) you selected in DTF Open Profile. For details about each step in the DTF Wizard, click **Help** in the wizard screen.

The DTF Interface

The DTF interface displays the selected data transfer profile or profile list. It provides all the controls for creating DTF profiles and profile lists, viewing the host file, and running data transfers.

Menu Bar

Use the menus in the menu bar to perform all the functions available in DTF.

Toolbar

Use the buttons on the toolbar to perform many of the common functions found in the menus. ToolTips define the buttons.

Panes

The **top pane** of the DTF interface uses a Windows-style tree structure to display the parameters of the displayed profile or profile list.

To use this structure:

- If an item has a **plus sign (+)** next to it, it contains nested items. Click the plus sign to expand the item (display the nested folders).
- If an item has a **minus sign (-)** next to it, it is already fully expanded and all the nested items are displayed. Click the minus sign to collapse that part of the tree.
- The names of the parameter sets appear in black; current status values appear in blue. Values always appear in <brackets>.
- When you select a parameter set in the top pane, buttons and controls for defining or changing that parameter set appear in the **bottom pane**.



To access online Help for the displayed dialog box, press *F1*, click , or select **Help** ➤ **Context-sensitive Help**.

The parameters are divided into the following categories:

General

Host type, transfer direction, transfer type, code page conversion information.

Host

Information for finding and identifying the source or destination on the host and for defining how the transferred data will be written on the host.

PC

Information for finding and identifying the source or destination on the PC and for defining how the transferred data will be written on the PC.

Advanced

Advanced parameters affecting the data transfer.

The Scheduler

With the Scheduler, you can run tasks automatically, according to the time and other conditions. You can choose to run file transfers at set periods of time, or based on certain **string triggers** which occur on the host emulation screen.

You can schedule to send strings or run script files via the Send utility. You can schedule other Windows applications to run in conjunction with file transfers.

Create a task using the Scheduler Wizard, which prompts you for all required information.

The Scheduler Interface

The Scheduler interface resembles the DTF interface, with a top pane containing a tree structure of all created tasks and their parameters.

The Menus

The Scheduler menu bar contains the following menus:

File

create new, open, close, save, and hide Scheduler.

Task

suspend and resume tasks. Also contains Options for setting the frequency and intervals of the scheduled tasks.

Log

display details and write log to a file.

Help

displays this online Help topic.

The Toolbar

The following toolbar contains the basic tools for working with tasks.



Scheduler Wizard

With the Scheduler, you define data transfer tasks to be run automatically. You can choose to run file transfers at set periods of time, or based on certain **string triggers** which occur on the host emulation screen. You can schedule to send strings or run script files via the Send utility. You can schedule other Windows applications to run in conjunction with file transfers. Use the Scheduler Wizard to define the tasks.

For details about each step in the Scheduler Wizard, click **Help** in the specific wizard screen.

In the first screen, enter a **description**.



This is the name of the DTF task that will appear in the Scheduler list, so we recommend using a descriptive name that will help you remember the purpose of the task.

The Send Utility

The Send utility is a BOSaNOVA application for sending a simple string from the BOSaNOVA Secure to a specified position on a specified display session or for processing a script file via the specified display session.

A simple string is a string which will be sent to the specified display session either at the current cursor position or another specified position.

A script file is a series of statements (commands) to be processed. The statements must follow a specific syntax and must be terminated with a carriage return/line feed combination (also referred to as EOL, or End-of-Line).

For details about Send syntax and usage, refer to online Help.

REMOTE COMMAND

Introduction

With BOSaNOVA's Remote Command Utility, you can send an AS/400 CL command (or commands) to a host system from a BOSaNOVA client.

Syntax

BSRMTCMD *command* [*//system*] /z

or

BSRMTCMD /I [*drive*][*path*]*filename* [/q] [*//system*] [/z]

Parameters



Parameters appearing in the above syntax in [brackets] are optional.

- *command*
The AS/400 CL command, with parameters. This is the command to be sent and executed on the specified AS/400 host system.
- /I
Read commands from the specified file; the filename (and optional path) must be separated from the /I by a space.
- *filename*
The name of the file containing the AS/400 commands. The file must be a text file with only one command per line. If the filename is a long name containing a space, you must quote the entire filename—including the full path—in apostrophes (').
- /Q
When using the /I parameter (sending commands from a batch file), any error occurring appears on the BOSaNOVA client screen, prompting you to select **Y** or **N** (to continue or not). The /Q parameter suppresses all error messages and assumes **Y** whenever an error occurs.
- *//system*
Name of the system on which the commands are to be run. If not defined, the default system name is used.
- /Z
If selected, all messages other than error messages are suppressed.

- **/?** or **/H**
Displays help. (Using the command BSRMTCMD without any parameters also displays help.)

Examples

Example 1

In this example, the AS/400 CL command CRTLIB BOSTEST (create a library called “Bostest”) was sent to the default host.

```
rmtcmd crtlib bostest
```

Example 2

In this example, the file Tuesday.txt, located on drive D: in the folder \Remote, was sent to the host Mainsys.

```
BSRMTCMD /I D:\Remote\tuesday.TXT //mainsys
```

Example 3

Here is a sample command file as used in Example 2, above:

```
crtlib bosctest  
chkobj bsrrr
```

TROUBLESHOOTING

Printer Session

In a printer session, if you selected **Current Windows Driver** (General tab) and you saved print output in ASCII format (Diagnostics tab ➤ Save to ASCII file), do *not* click **Collect Technical Support Information** because the resulting file may be too large.

Euro Support

For euro symbol support to function correctly in your applications, both the host and Windows must be configured for euro symbol support. If you receive a euro symbol support error, check your host *and* Windows configuration for euro symbol support and select **Euro support** in the Administrator (in **Administrative parameters** ➤ **Host language/country**). If your host and/or Windows are not configured for euro symbol support, deselect **Euro support** to use the old code page. For details, see “Euro Symbol Support” on page 44.

Traces and Screen Captures

When you experience problems with an emulation session, Technical Support may request that you provide them with files to help them solve the problem. Prepare files, as follows:

1. To help debug a problem, you may be asked to record a trace (*.trc or *.bts files) or create a screen captures (*.scn files). This is done from the Emulation Configurator (Advanced Properties ➤ Diagnostics). In addition, you may be asked to record a print output (*.asc or *.ebc files) from printer emulation sessions.
2. Then, send the technical information file (default name is: Bsinfo.bts) from the Administrator (Diagnostics ➤ Troubleshooting Information). The technical information file *automatically* includes all *.trc, *.scn, *.bts, *.asc, and *.ebc files created.

Recording a Telnet Trace

Record a Telnet Trace when you have problems with an display emulation session.

To record a trace:

1. Close all applications.
2. In the Emulation Configurator, select the **Advanced Properties** tab.
3. Expand Diagnostics and select **Record Telnet Trace** in the top pane.
4. In the bottom pane, select **Record Telnet Trace** and specify a filename and location.
5. Create screen captures, if required (see the next section).
6. Run an emulation. Make sure you run the TCP/IP trace on the first session only!
7. When the error occurs again, close the emulation. Trace data is written to the file specified in step 4, above.
8. Prepare the information file for Technical Support; see “Preparing the Information File” on page 57.

Screen Capture

Playback Recorded Screens

If selected, you must specify the playback file (see *Record Screens for Playback*, below) or use the dropdown list of the last four previously stored files.

Record Screen for Playback

Creates a file with “snapshots” of the display session screens. Enter the filename (default Demo.scn), using the extension .scn. The file is automatically created in the BOSaNOVA Secure installation folder (or another folder, if defined).



***Record** only works for the first (display) session; **Playback** can be run during any display session. The screens are played back in the same sequence in which they were recorded.*

To record a screen capture:

1. Close all open sessions.
2. In the Emulation Configurator, select the **Advanced Properties** tab.

3. Expand Diagnostics and select **Screen capture** in the top pane.
4. In the bottom pane:
 - a. Select **Record screen for playback**.
 - b. If you don't want the screen grabs to be written to Demo.scn, browse for another file; note that *all* screen captures will be recorded in the file selected.
 - c. Click **OK**.
5. Continue at step 6 ("Run an emulation") in the previous section. Note that each screen that is opened when you run the emulation will be captured and placed in the file selected in 4b, above.

From a Printer Session

1. In an open Printer session, right-click.
2. Select Properties.
3. Select the **Diagnostics** tab.
4. Select **Activate Diagnostic Mode** and select the output option.
5. Prepare the information file to send to Technical Support for analysis; see Preparing the Information File, directly below.

Preparing the Information File



*Make sure that you have created **all** the trace files and screen captures required by Technical Support before preparing the information file.*

1. Close all sessions.
2. Run the Administrator.
3. In the top pane, expand Diagnostics and select **Troubleshooting information**.
4. In the bottom pane, click **Collect Technical Information** to open the User Information dialog box (for details, see *Collecting User Information*, below).
5. Complete the information and save the user information file (default name Bsinfo.bts).
6. The user information file automatically includes all trace and screen captures. Send the file (as an e-mail attachment) to Technical Support for analysis.

Collecting User Information

Use this dialog box to collect diagnostic information in the Administrator and to collect printer troubleshooting information in **Printer Session Properties > Diagnostic**.

The information you enter in these fields will be written to a text file when you click **OK**. The default file is Bsinfo.bts in the BOSaNOVA Secure installation folder. Include this file along with the trace (dump) files or recorded screens for Technical Support.



The file also automatically includes other information, depending on the origin (Administrator or Printer Session Properties). When run from the Administrator, data about your system, all defined sessions, and EBCDIC to ANSI translation tables, are automatically captured and added to the file. When run from Printer Session Properties, a subset of this information is captured (system information plus the specific printer session only).

Name

By default, the name you used when installing BOSaNOVA Secure will be used. You can change this.

Company

By default, the company name you used when installing BOSaNOVA Secure will be used. You can change this.

Address

Enter your full mailing address, including the postal code and country.

Phone Number

Enter a daytime phone number where we can reach you.

E-mail Address

(If available)

Tech Support Call #

This number will be provided by Technical Support. Make sure to include it so that your diagnostic files can be properly tracked.

Host Type

Enter your host type (AS/400, System/36, AS/36, etc.).

Host OS Version

Enter the complete version number of your host operating system.

Description

Describe the problem carefully. Under what circumstances does the problem occur? Are you able to duplicate it? Have you made any changes to your connectivity hardware or software that could contribute to this?

Contacting Technical Support

Before Contacting Technical Support:

1. Refer to the appropriate topic in the Troubleshooting sections. The problem may be something you can solve on your own.
2. If you can't solve the problem by yourself, run the Administrator. In the top pane, expand **Diagnostics** and select **Troubleshooting information**. In the bottom pane, click **Collect Technical Information** to open the User Information dialog box. Fill in the form before contacting Technical Support. If contacting us via fax, include a printout of this form; otherwise, have it handy when you call us.

ERROR MESSAGES

Many of the error messages in BOSaNOVA Secure are self-explanatory; they include possible causes of the problem and suggest solutions. When multiple solutions are suggested, always try them in the order presented. If the solutions do not work or if you do not understand the message, contact Technical Support.

Error Codes

All BOSaNOVA Secure error messages have the following syntax: *xxxnnn* where *xxx* is three-letter code for the error category (that is, which the software is responsible for the error), and *nnn* is a three-digit code for the particular error.

Error Categories

The following codes are used:

- ADM Administrator errors; p. 63
- TPC TCP/IP Configurator errors; p. 64
- BPC Emulation Configurator errors; p. 66
- EML Display emulation errors and errors that occur in the printer session list window; p. 67
- BSV Message or text errors; p. 68
- KRN Kernel engine errors; p. 73

In addition, there are WinSock Return Codes; p. 74



If you encounter an error that is not self-explanatory and is not listed below, contact BOSaNOVA Technical Support.

Administrator Errors (ADM)

ADM01	<p>Error: Wrong password verification.</p> <p>Cause: In MS SNA Server configuration, the password verification you entered is incorrect.</p> <p>Action: Enter the correct password verification.</p>
ADM02	<p>Error: Unable to load library <library name>.</p> <p>Cause: The load library is missing or was deleted.</p> <p>Action: Check that the library path is correct. Rerun the Administrator.</p>
ADM03	<p>Error: Cannot execute <filename>. File not found.</p> <p>Cause: The executable file is not correctly installed.</p> <p>Action: Check that you have selected the appropriate operation to perform.</p>
	<p>The following Administrator errors have no error code numbers:</p> <p>Error: You must enter the host alias name.</p> <p>Cause: The host alias name parameter is undefined.</p> <p>Action: Define the host alias name.</p> <p>Error: Wrong TCP/IP number: value can't be zero.</p> <p>Cause: A TCP/IP address segment is zero.</p> <p>Action: Define the correct AS/400 IP address, making sure that no address segment is zero.</p> <p>Error: Wrong TCP/IP number: value must not exceed 255.</p> <p>Cause: The host TCP/IP address is incorrectly set in the Administrator.</p> <p>Action: In the Administrator, select Connectivity ➤ Connection Type ➤ TCP/IP and define the correct TCP/IP address.</p>

TCP/IP Configurator Errors (TPC)

TPC001	Error: Unable to save Registry parameters.
TPC002	Error: Password verification is incorrect.
TPC003	Error: Unable to read Registry parameters.
TPC004	Error: Incorrect system name.
TPC005	Error: Registry for the system <system name> is corrupted. Restart Windows. If this doesn't help, contact BOSaNOVA Technical Support.
TPC006	Error: Unable to read parameter <parameter name> from the Registry. Restart Windows. If this doesn't help, contact Technical Support.
TPC007	Error: Parameter <parameter name> in the Registry is invalid. Restart Windows. If this doesn't help, contact Technical Support.
TPC008	Error: Parameter <parameter name> must be defined.
TPC009	Error: Unable to read parameter <parameter name> of the system <system name> from the Registry. The default value will be used.
TPC010	Error: Parameter <parameter name> of the system <system name> in the Registry is invalid. The default value will be used.
TPC011	Error: Unable to load <filename>. Action: Check if this file exists. Contact Technical Support.
TPC012	Error: Parameter <parameter name> is invalid.
TPC013	Error: Unable to read <parameter name> parameters from the Registry. The default values will be used.
TPC014	Error: Unable to read Default Templates from the Registry. Restart Windows. If this doesn't help, contact Technical Support.
TPC020	Error: The maximum number of systems (n) is already defined.

TPC021	Error: The system name <system name> has been assigned to another system. This system name must be unique.
TPC023	Error: No system defined. Define at least one system. Action: In the TCP/IP Configurator, Basic tab, define at least one system.
TPC024	Error: Unable to read key <registry key> from the Registry. Restart Windows. If this doesn't help, contact Technical Support.
TPC026	Error: The system name <system name> has been assigned to more than one system. This system name must be unique.

Emulation Configurator Errors (BPC)

BPC001	Error: Registry x corrupted. Cause: This key is missing from the Registry or is incorrectly defined. Action: Run Setup; in Setup, select Update and Revert Registry .
BPC002	Error: Unable to load <module name>. Cause: The module is missing or has been deleted. Action: Rerun Setup; in Setup, select Update and Update Executable Files .
BPC003	Error: Error using DLL <DLL name>. Cause: Internal error. Action: Contact Technical Support.
BPC004	Error: x memory allocation failure! Cause: Not enough Windows resources. Action: Close other applications; if this doesn't help, restart Windows.
BPC005	Error: Unknown product ID has been detected. Cause: The Registry was corrupted. Action: Run Setup; in Setup, select Replace or install to a new directory.
BPC006	Error: Key x not valid. Cause: The Registry was corrupted. Action: Run Setup; in Setup, select Update and Revert Registry .

Display Emulation Errors (EML)

EML1	Error: Failed to create toolbar.
EML2	Error: Initialization failed.
EML3	Error: The application is already running.
EML4	Error: Unable to open session.
EML5	Error: Registry access denied.
EML7	Error: Unable to close session.
EML8	Error: Configuration parameter error.
EML9	Error: Unable to disconnect from the kernel.
EML10	Error: Unable to load emulation font.
EML11	Error: Registry corrupted. x key or value doesn't exist.
EML12	Error: Unable to start printer emulator process.
EML13	Error: Unable to execute printer command.
EML14	Error: Memory allocation error.
EML15	Error: Invalid macro name length. The name must be between 1 and < n > characters long.
EML16	Error: Keyboard Processing: Passed parameters (HostCom: x) are wrong. ReturnStatus: x .
EML17	Error: Unable to run Configurator x .

Message or Text Errors (BSV)

BSV001	<p>Error: Unable to open Registry Key.</p> <p>Cause: This key is missing from the Registry or is incorrectly defined.</p> <p>Action: Check that Regedit.exe exists in the Windows folder. Then run Setup; in Setup, select Update and Revert Registry.</p>
BSV002	<p>Error: Incorrect function call in Administrator mode.</p> <p>Cause: Internal error.</p> <p>Action: Contact Technical Support.</p>
BSV003	<p>Error: Unable to retrieve <i>x</i> value from <i>y</i> Registry Key.</p> <p>Cause: This key is missing from the Registry or is incorrectly defined.</p> <p>Action: Check that Regedit.exe exists in the Windows folder. Then run Setup; in Setup, select Update and Revert Registry.</p>
BSV004	<p>Error: There is no installation Registry Key.</p> <p>Cause: This key is missing from the Registry or is incorrectly defined.</p> <p>Action: Check that Regedit.exe exists in the Windows folder. Then run Setup; in Setup, select Update and Revert Registry.</p>
BSV005	<p>Error: Unable to save <i>x</i> value into <i>y</i> Registry Key.</p> <p>Cause: This key is missing from the Registry or is incorrectly defined.</p> <p>Action 1: Check that Regedit.exe exists in the Windows folder. Then run Setup; in Setup, select Update and Revert Registry.</p> <p>Action 2: Contact Technical Support.</p>

Driver Errors (BCD)

BCD001	Error: Internal error BCD001, code <i>x</i> . Cause: Internal error. Action: Contact Technical Support.
BCD002	Error: GetProcAddress failed: <i>x</i> . Cause: You may have an old version of the library file. Action: Run Setup; in Setup, select Update and Update Executable Files .
BCD003	Error: Unable to load library filename (code <i>x</i>) Cause: The library file is missing or incorrect. Action: Run Setup; in Setup, select Update and Update Executable Files .
BCD004	Error: Unable to open installation registry key (code <i>x</i>). Cause: Internal error. Action: Contact Technical Support.
BCD005	Error: Unable to retrieve <i>x</i> value from <i>y</i> registry key (code <i>x</i>). Cause: Internal error. Action: Contact Technical Support.
BCD006	Error: Can't allocate memory. Close unused applications or restart Windows. Cause: Insufficient memory. Action 1: Close all unnecessary applications. Action 2: Restart Windows.
BCD007	Error: Unable to open registry key (code <i>x</i>). Cause: Internal error. Action: Contact Technical Support.

BCD008	<p>Error: Unable to create Data or Keyboard events.</p> <p>Cause: This is an internal Windows error.</p> <p>Action: Restart Windows.</p>
BCD009	<p>Error: Unable to create Decode or Keyboard threads.</p> <p>This is an internal Windows error.</p> <p>Action: Restart Windows.</p>
BCD010	<p>Error: Unable to establish a connection to the host. Check that the connection type is defined correctly in the Administrator.</p> <p>Cause: The connection type is wrong or incorrectly configured.</p> <p>Action: Correct the connection type in the Administrator (Connectivity ➤ Connection type)</p>
BCD012	<p>Error: Cannot start session. Check session parameters (system name, session name, etc.).</p> <p>Cause 1: Session parameters are incorrect.</p> <p>Action: Check the session parameters in the Emulation Configurator (Sessions tab).</p> <p>Cause 2: This session name is already active on the AS/400.</p> <p>Action: Change the session name in the Emulation Configurator (Sessions tab).</p>
BCD044	<p>Error: Version of <filename> file does not correspond to version of BSCLDRV.DLL file.</p> <p>Cause: The version of this file is too old and cannot be connected to Bscldrv.dll.</p> <p>Action: Run Setup; in Setup, select Update and Update Executable Files.</p>
BCD052	<p>Error: Unable to open trace file <filename>.</p> <p>Cause: The emulation is trying to create a file in a write-protected folder.</p> <p>Action: Define another trace folder in the Emulation Configurator (Advanced Properties tab ➤ Diagnostics ➤ Record APPC Trace).</p>

BCD060	<p>Error: Unable to start connection to host.</p> <p>Cause: The connection supplier is not connected to the AS/400.</p> <p>Action: Check the status of the connection supplier.</p>
BCD070	<p>Error: Failed to load <filename>.</p> <p>Cause: The file is damaged or does not exist.</p> <p>Action 1: Check the file's status.</p> <p>Action 2: Run Setup; in Setup, select Update and Update Executable Files.</p>
BCD071	<p>Error: Some WinSock functions not found.</p> <p>Cause: The Wsock32.dll file is corrupted or is an older version that no longer works.</p> <p>Action: Install a new version of the TCP/IP protocol.</p>
BCD072	<p>Error: Error received from WinSock.</p> <p>Cause: This is a WinSock error; if the WinSock error is 11001 or 11004, this may be caused by the session configuration. The Local Control Point name of the AS/400 was defined as System Name, which is correct for an APPC connection but not for TCP/IP; refer to <i>WinSock Return Codes</i>, p. .</p> <p>Action 1: Remove System Name from the session configuration or change it to an IP address or name defined in your TCP/IP network for the AS/400. See Basic, p. .</p> <p>Action 2: Use a name defined in the Hosts file in the Windows folder.</p>
BCD073	<p>Error: Too many open files</p> <p>Cause: Too many applications are currently open.</p> <p>Action: Close all unnecessary applications.</p>
BCD074	<p>Error: Access denied.</p> <p>Cause: The Telnet trace folder is write-protected.</p> <p>Action: Define another trace folder in the Emulation Configurator (Advanced tab ➤ Diagnostics).</p>

BCD075	<p>Error: Sector not found.</p> <p>Cause: Internal error.</p> <p>Action: Contact Technical Support.</p>
BCD076	<p>Error: General failure.</p> <p>Cause: This is an internal emulation error.</p> <p>Action: Contact Technical Support.</p>
BCD077	<p>Error: Network access denied.</p> <p>Cause: This is an internal emulation error.</p> <p>Action: Contact Technical Support.</p>
BCD078	<p>Error: Failed to open file.</p> <p>Cause: The Telnet trace folder is write-protected.</p> <p>Action: Define another trace folder in the Emulation Configurator (Advanced tab ➤ Diagnostics).</p>

Kernel Engine Error Messages (KRN)

KRN001	Error: Internal error KRN001, code x.
KRN002	Error: Unable to load dynamic link library (DLL).
KRN003	Error: GetProcAddress failed: x
KRN004	Error: Application provided invalid callback function address(es).
KRN005	Error: Maximum number of session exceeded.
KRN006	Error: Can't initialize synchronization object.
KRN007	Error: Can't open file.
KRN008	Error: File contains incorrect data format.
KRN009	Error: Can't retrieve driver data.
KRN010	Error: Can't allocate memory.
KRN011	Error: Unable to continue: the application wasn't initiated.

WinSock Return Codes

Each WinSock return code (listed by its Hex value) is presented with a brief description. For some codes, a cause and suggested action are provided.

10004	Error: Interrupted system call.
10009	Error: Bad file number.
10013	Error: Permission denied.
10014	Error: Bad address.
10022	Error: Invalid argument.
10024	Error: Too many open files. Cause 1: Too many WinSock applications are running simultaneously. Action: Close unnecessary applications. Cause 2: An application opens and closes sockets frequently but does not close them properly. Action: Restart the application.
10035	Error: Operation would block.
10036	Error: Operation now in progress.
10037	Error: Operation already in progress.
10038	Error: Socket operation on nonsocket.
10039	Error: Destination address required. Cause: The destination address is missing. Action: Define the host destination address in the Administrator (Connectivity ➤ Connection Type ➤ Configure).
10040	Error: Message too long.

10041	Error: Protocol wrong type for socket.
10042	Error: Bad protocol option.
10043	Error: Protocol not supported.
10044	Error: Socket type not supported.
10045	Error: Operation not supported on socket.
10046	Error: Protocol family not supported.
10047	Error: Address family not supported by protocol family.
10048	Error: Address already in use. Action: Do not run two TCP/IP applications of the same type on the same machine. Remove all TCP/IP applications and restart BOSaNOVA TCP/IP.
10049	Error: Cannot assign requested address. Cause: The destination address is missing. Action: Define the host destination address in the Administrator (Connectivity ➤ Connection Type ➤ Configure).
10050	Error: Network is down. Action: Check that your WinSock protocol stack, network driver, and network interface card configuration exist. Reinstall BOSaNOVA Secure.
10051	Error: Network is unreachable. Action: Try to ping the destination AS/400 to see if you get the same results. Check that the destination address is correct. Check that you have a router configured in your network system. Perform a trace to determine where the failure occurs along the route between your host and the destination AS/400. If this doesn't work, contact your network administrator.

10052	<p>Error: Net dropped connection or reset.</p> <p>Cause: The network dropped the connection.</p> <p>Action: Ping the remote host. If it does not respond, it might be off-line or there may be a network problem along the way. If it does respond, this problem might be temporary (in which case, try to reconnect) or the server application might have terminated (in which case, ask your system administrator to restart the server).</p>
10053	<p>Error: Software caused connection abort.</p> <p>Cause: The software aborted the connection.</p> <p>Action: Ping the remote host. If it does not respond, it might be off-line or there may be a network problem along the way. If it does respond, this problem might be temporary (in which case, try to reconnect) or the server application might have terminated (in which case, ask your system administrator to restart the server).</p>
10054	<p>Error: Connection reset by peer.</p> <p>Cause: Connection reset by AS/400.</p> <p>Action: If your network system supports commands that report statistics, check the number of TCP RST packets or port unreachable CMP packets received. See <i>Error 10053</i>, above.</p>
10055	<p>Error: No buffer space available.</p> <p>Cause: There is a shortage of resources on your system, which can occur if you are trying to run too many applications simultaneously.</p> <p>Action: Close all unnecessary applications and restart BOSaNOVA Secure.</p>
10056	<p>Error: Socket is already connected.</p>
10057	<p>Error: Socket is not connected.</p>
10058	<p>Error: Cannot send after socket shutdown.</p>
10059	<p>Error: Too many references, cannot splice.</p>

10060	<p>Error: Connection timed out.</p> <p>Action: Check the following: that the destination's alias name is defined as a valid IP address; use the Hosts file or Host.sam to define alias names. If you used a host name, did it resolve to the correct address? Can you ping that host? Do you have a router configured? Is the router up and running? Check your subnet mask. If you do not have the proper subnet mask, your network system could treat local addresses as remote addresses. If this doesn't work, contact your network administrator.</p>
10061	<p>Error: Connection refused.</p> <p>Cause: Connection refused by the AS/400 (either you tried to connect to the wrong host or the server application you are trying to contact is not executing).</p> <p>Action: In the Administrator (Connectivity ➤ Connection Type ➤ Configure), right-click Run Ping. Check the AS/400 address you are using. If you used a host name, check that it resolves to the correct address.</p>
10062	<p>Error: Too many levels of symbolic links.</p>
10063	<p>Error: File name too long.</p>
10064	<p>Error: Host is down.</p>
10065	<p>Error: No route to host.</p> <p>Cause: No route to the AS/400.</p> <p>Action: Try to ping the destination host to see if you get the same results. Check that the destination address is the one you wanted to go to. Check whether you have a router configured in your network system. Perform a trace route to try to determine where the failure occurs along the route between your host and the destination host. Contact your network administrator.</p>
10066	<p>Error: Directory not empty.</p>
10067	<p>Error: Too many processes.</p>
10068	<p>Error: Too many users.</p>
10069	<p>Error: Disk quota exceeded.</p>

10070	Error: Stale NFS file handle.
10071	Error: Too many servers of remote in path.
10091	Error: Network subsystem is unavailable. Action: Check that Wsock32.dll file comes from the same vendor as your underlying protocol stack. To do so, select Wsock32.dll from the Explorer (in Windows > System), right-click, and select Properties > Version .
10092	Error: WINSOCK.DLL version out of range. Cause: Wrong WinSock DLL version. Action: You must have WinSock DLL version 1.1.
10093	Error: Successful WSASStartup() not yet performed. Cause: The network subsystem is wrongly configured or inactive. Action: Contact your network administrator.
10101	Error: Session was disconnected; socket error.
11001	Error: Host not found. Action: Check that your name server(s) and/or host table are configured. If you are using name server(s), check whether the server AS/400 is running.
11002	Error: Non-authoritative AS/400 found. Action: Check that your name server(s) and/or host table are configured. If you are using name server(s), check whether the server AS/400 is running.
11003	Error: Non-recoverable query error. Action: Check that your name server(s) and/or host table are configured. If you are using name server(s), check whether the server AS/400 is running.
11004	Error: Valid name, but no data of that type. Action: Check that your name server(s) and/or host table are configured. If you are using name server(s), check whether the server AS/400 is running.