VistA Blood Establishment Computer Software (VBECS) Version 2.4.0

Technical Manual-Security Guide Version 1.0

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Department of Veterans Affairs
Enterprise Project Management Office

Table of Contents

Introduction

The main purpose of the VistA Blood Establishment Computer Software (VBECS) is to automate the daily processing of blood inventory and patient transfusions in a hospital transfusion service.

Unauthorized access or misuse of this system and/or its data is a federal crime. Use of all data, printed or electronic, must be in accordance with VA policy on security and privacy.

Do not change the system! The U.S. Food and Drug Administration classifies this software as a medical device. Unauthorized modifications will render this device an adulterated medical device under Section 501 of the Medical Device Amendments to the Federal Food, Drug, and Cosmetic Act. Acquiring and implementing this software through the Freedom of Information Act requires the implementer to assume total responsibility for the software and become a registered manufacturer of a medical device, subject to FDA regulations. Adding to or updating VBECS software without permission is prohibited.

VBECS Versioning

The VBECS version (see Figure 1) is derived by combining a three part version number from the VBECS application software (e.g., 2.4.0) with the revision letter of the VBECS database. The VBECS version can be found under the **Help**>**About** menu option in *VBECS* or selecting **Help** from the *VBECS Admin* main menu.

The **3-part version number** (e.g., 2.4.0) is incremented for application code changes, such as:
- Changes to any VBECS visual element or behavior (e.g., new menu options, larger font size)
- Windows operating system or virtualization upgrade.
- New features or changes to existing functionality.

When the 3-part version number is incremented, the revision letter resets to "A".

The **revision letter (i.e., A-Z)** is incremented for database-only changes, such as:
- Blood products added to or changed from VBECS's available product list
- Changes to any core VBECS data (e.g., available facilities, new printer driver)
- Database query logic changes or performance improvements.

All VBECS documentation will contain the 3-part version number and when applicable, include the revision letter.

Modifications to environmental settings can be made without affecting the VBECS version. Environment changes affect the underlying hardware or remote desktop experience, such as:
- Changing server RAM, CPU or hard drive capacity
- Changing the VBECS desktop wallpaper
- Changing Remote Desktop session limits

Figure 1: Example of VBECS Versioning
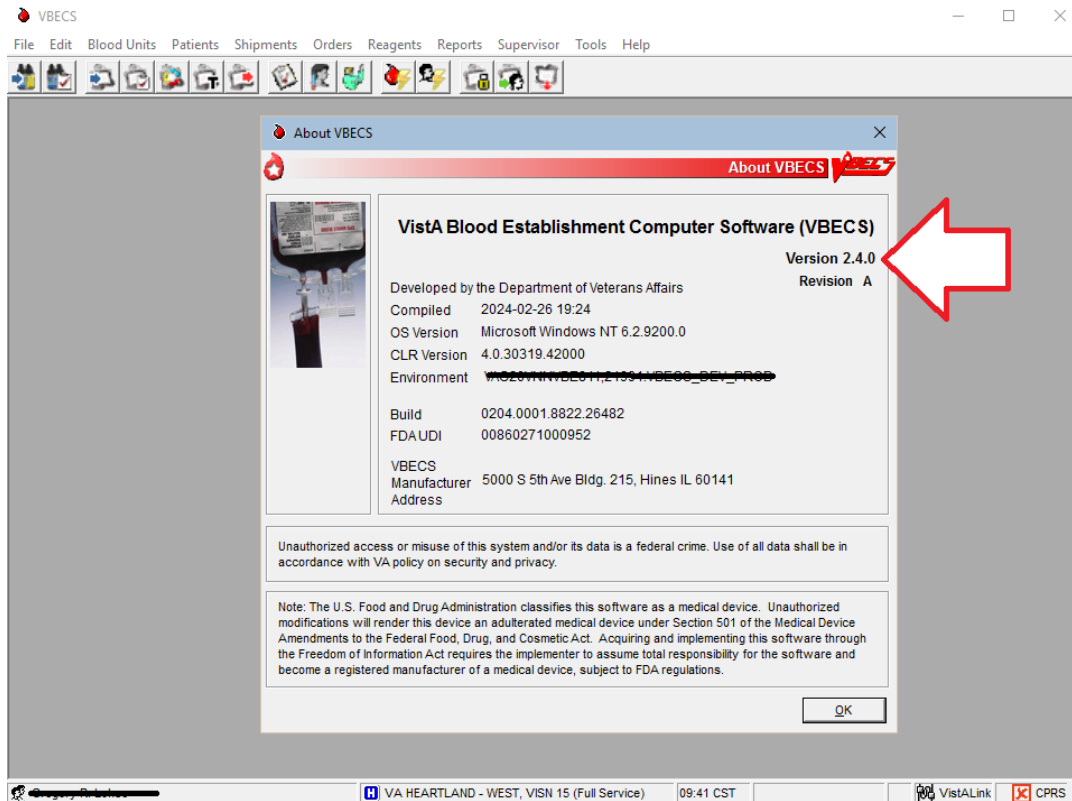
Related Manuals and Reference Materials

- *CPRS-VBECS Interface (OR*3.0*212) Release Notes April 2009*
- *Duplicate Record Merge: Patient Merge Technical Manual Version 7.3 April 1998 Revised December 2010*
- *Health Product Support Release of Products and Patches Guide V2.3 Updated: February 2014*
- *REDACTED*
- *Kernel Systems Manual Version 8.0, Chapter 1: Sign-On Security/User Interface, pp. 13–20*
- *PIMS V. 5.3 Technical Manual*
- *VBECS – <instrument> Configuration and Setup Guide*
- *VBECS 2.4.0 Admin User Guide*
- *VBECS 2.4.0 User Guide*
- *VistALink Version 1.5 Developer-System Manager Manual*, Chapter 6: Security Management, pp. 34–35

How This Technical Manual-Security Guide Is Organized

Outlined text is used throughout this guide to highlight warnings, limitations, and cautions:

> *Warnings, limitations, cautions*

Terms

In many instances, a user may scan a barcode or enter data manually (by typing). The term "enter" is used throughout this guide to mean "enter manually."

See the Glossary for definitions of other terms and acronyms used in this guide.

Figures and Tables

If you refer to figures and tables from the Technical Manual-Security Guide in your local policy and procedure documents, you may wish to use their titles only, without figure or table numbers: as the technical manual-security guide is updated, those numbers may change.

Appendices

The appendices contain reference materials.

Customer Support

Contact your **Local/Regional** Office of Information Technology (OIT) or Laboratory Information Manager (LIM) if you encounter VistA or CPRS connection problems and for training support **before** contacting the Service Desk (SD).

> **Please ensure local/regional VistA Support contact information is available at all times. If you experience an FDA reportable adverse event (patient death or serious injury) that VBECS may have caused or contributed to, contact the Service Desk directly to enter a ticket for Blood Bank software support.**

If the problem remains unresolved after local VistA triage, call the Service Desk (below) and specify the Affected Service be set as VBECS (VistA - Blood Establishment Computer Software)

Service Desk Contact

Call the Service Desk REDACTED.

Refer to the REDACTED VBECS SharePoint site for up-to-date information about contacting the Service Desk.

For troubleshooting error messages in VBECS similar to Contact Your System Administrator, contact the Service Desk.

VBECS Hardware

Each blood bank will have separate PRODUCTION and TEST instances of VBECS. The term "instance" is used to represent all system components needed to make VBECS work. Some multidivisional sites will share a VBECS instance, but VBECS does not have a consolidated database or data shared between all VBECS instances.

A VBECS instance requires:
- Application (App) server
- SQL database (hosted on a Microsoft SQL Server cluster)
- VistA
- Additional Required Peripherals (see Table 1)

The VBECS team is responsible for providing and maintaining the App and SQL Servers, which run as virtualized hardware in the Microsoft Azure Government (MAG) VA Enterprise Cloud (VAEC). The System Schematic diagram (Figure 2) describes the major system components of a VBECS instance:
- **Application Server (App Server)**: A Windows Server 2016 virtual machine and remote desktop session host.
  - A **Production instance** has two App servers, with one server always powered-on and a redundant identical server in a passive (powered-off) state. A second server provides decreased downtime during maintenance or system failure.
  - A **Test instance** only has one App server (always powered-on).
- **SQL Server Cluster**: Comprised of three Windows Server 2016 virtual machines, clustered using Microsoft Windows Failover Clustering software. This essentially results in three copies of every VBECS database for redundancy and maximum uptime.
- **User Workstations**: Users access the VBECS application using Remote Desktop Services.

Required Peripherals

The following table lists the additional hardware required to complete a fully functional VBECS instance. This hardware can be shared between TEST and PRODUCTION instances. Obtaining and maintaining this hardware is the responsibility of each blood bank.

Table 1: Additional Required Peripherals

Barcode Scanner	- Windows compatible - Scanner must be capable of interpreting Code 39, ISBT 128, and PDF-417 barcodes (optional) Scanner is capable of interpreting 2-D barcodes.
Report Printer	- Windows compatible - Laser quality - Capable of printing on at least 8.5" x 11" paper
Label Printer	- Thermal transfer - ZPL and ZPLII language supported **300 DPI print head** must print on 4" x 4" label stock
User Workstation	- Display should be set to at least 1024 x 768 resolution. *Resolutions smaller than this value will not be able to fit all VBECS screens in the remote desktop window without scrolling. - Speaker(s) to hear VBECS audio alerts - Personal Identity Verification (PIV) card reader

Figure 2: System Schematic
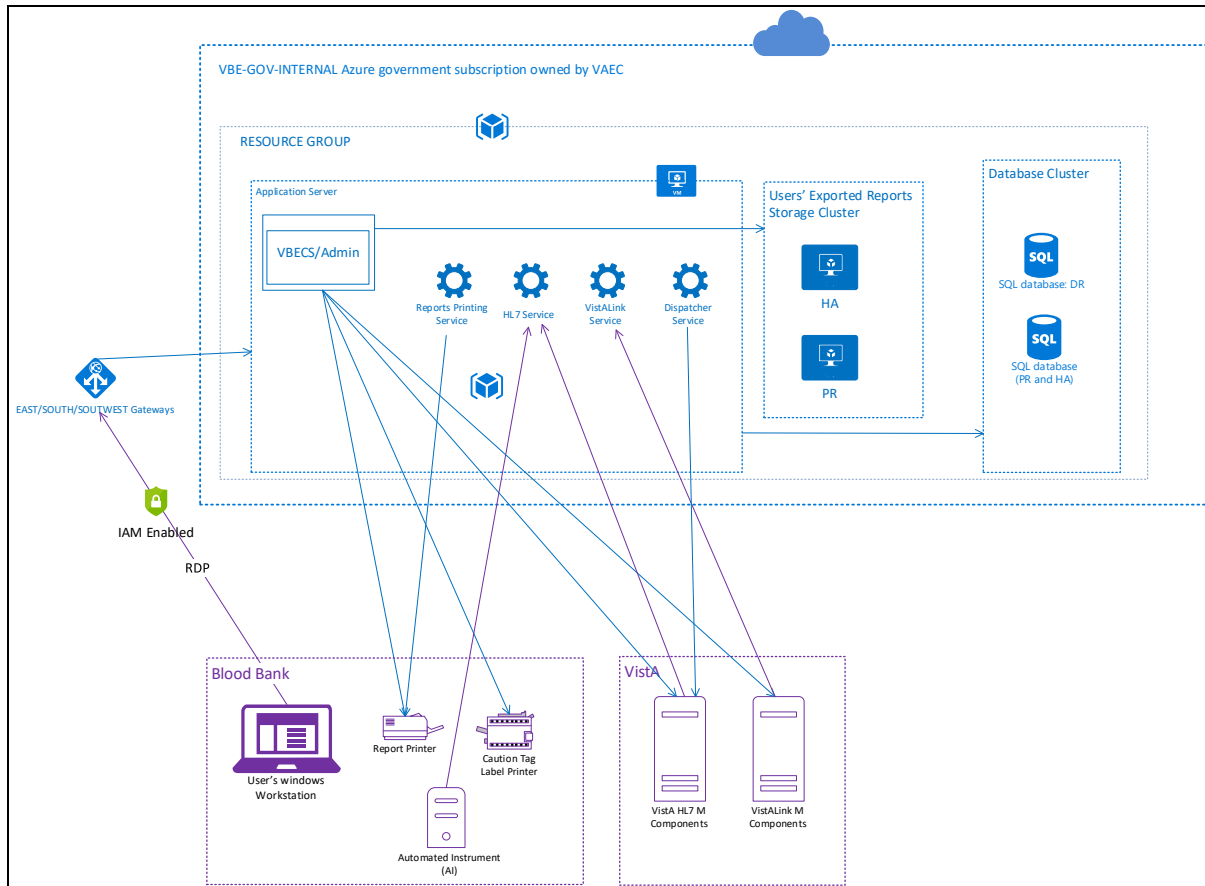
Printers

If you need assistance setting up, configuring, or troubleshooting your printers; contact your hardware vendor.

Report Printer

The VBECS team recommends Lexmark and HP printers, however any Windows compatible printer should work with VBECS. Refer to the *VBECS Admin User Guide* for details on adding a new printer. Since PRODUCTION and TEST are separate instances, any printer changes will need to be made in each instance.

Changing the IP address for your VBECS Report Printer

Refer to the *VBECS Admin User Guide* for more details and example screen prompts. You will need to repeat these steps in both your TEST and PRODUCTION instance.
1) Connect to your VBECS server, and launch VBECS Admin.
2) Select the *Edit Printer* option (VistA is not required).
3) Remove the existing VBECS printer.
4) Define a new VBECS printer, giving it the same name and driver but enter the new IP address.
5) Print a test page to ensure it is setup properly.

Label Printer

You may use any brand of label printer that meets the requirements listed in Table 1. Many label printers come with a standard 203 DPI print head and <u>must be</u> upgraded to a 300 DPI print head. If you purchased a new printer and tags are printing too big to fit on a label, the most likely cause is due to it having an incompatible print head.

Network and Port Requirements

Due to VA firewall rules, VBECS can only communicate with printers on port 9100. Make sure your label printer is configured on this port.

If any VBECS printer is on a protected VLAN, open a ticket with your local biomed team to permit traffic to your local VLAN from the VBECS Azure networks on TCP port 9100. Contact the VBECS team for a list of the VBECS Azure networks.

Changing the IP address for your Label Printer

If the IP address on your label printer changes or you install a new replacement label printer, you will need to update the IP address in the *Edit Division* menu option of the VBECS Admin software. All users will need to exit the VBECS software first before you will be allowed to make this change. You will need to update the IP address in both your TEST and PRODUCTION instance.

Upgrading a Label Printer Print Head

If you have a label printer with a 203 DPI print head, it may be possible and more cost effective to upgrade it to 300 DPI rather than buying a new printer. However, the print head is just one of the needed components. Please contact a vendor for a print head upgrade kit. These kits include the additional gears and parts that are required in order for the printer to get the full DPI from the print head.

Refer to the *VBECS Admin User Guide* for more details and example screen prompts.

Scanners

The VBECS team recommends Honeywell scanners, however other brands may suffice as long as they meet the requirements listed in Table 1. Most scanners should be able to scan barcodes from a computer display. However, if you experience issues scanning from computer displays, it could mean the barcode is too small or large; try zooming in/out of the document.

Configuring Scanners

For VBECS to properly interpret barcode scans, the scanner needs to be configured to prefix all barcode data with a tilde (~) and append all data with a TAB key. Configuring a scanner for use in VBECS is done by scanning special barcodes that instruct the scanner to send the tilde and TAB keys. If you have a new scanner or an existing scanner no longer works properly in VBECS, try scanning one of the configuration barcodes below and then proceed to the *Scanner Testing* section.

If you're experiencing scanner issues after trying out the configuration barcodes below, contact *Customer Support*.

Honeywell 4600

Scan Figure 3 to configure a Honeywell 4600 scanner and then validate it using the barcodes below. This configuration barcode may also work for other models.

Figure 3: Configuration Barcode for Honeywell 4600 (VBECS Settings)

Honeywell Xenon 1900 Series

Scan Figure 4 followed by Figure 5 to configure a Honeywell Xenon 1900 scanner. This approach may also work for other Xenon models.

Figure 4: Configuration Barcode for Honeywell Xenon 1900 Part 1 (Reset Scanner Defaults)

Figure 5: Configuration Barcode for Honeywell Xenon 1900 Part 2 (VBECS Settings)

Scanner Testing

A scanner that is configured for use in VBECS needs to add a tilde (~) prefix and a TAB suffix to all scans. To test your scanner, print this page or try scanning off the screen.

First, open Notepad on your workstation and click inside the blank document (the cursor should now be blinking in the whitespace).

- Test 1: Scan Figure 6. The text should read "~123456789" followed by a TAB.
- Test 2: Scan Figure 7. The text should read "~123456789" followed by a TAB.
- Test 3: Scan Figure 8. The text should read "~Testing" followed by a TAB.
- Test 4: Scan Figure 9. The text should read "~123456789" followed by a TAB.

If any of the tests failed, your scanner is not configured properly. Try using a different configuration barcode above or contact *Customer Support*.
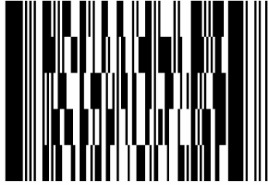
Figure 6: Code39 (Codabar) Test Barcode

Figure 7: ISBT 128 Test Barcode

Figure 8: PDF 417 Test Barcode

Figure 9: 2-D Data Matrix Test Barcode

Optional Peripherals – Automated Instruments

VBECS currently supports Echo, Erytra, ProVue and Vision instruments. These instruments perform testing on a specimen and send the test results and interpretations to a server running Data Innovations (DI) Instrument Manager (IM) software. The IM software wraps those results and interpretations into HL7 messages which are then sent to your VBECS app server. Consult the VBECS SharePoint site for documentation on configuring an instrument/IM for use with VBECS.

 VBECS does not communicate directly with an instrument. Instead, for your DI/IM server to successfully send instrument results to your VBECS Azure app server, the network pathway needs to be open. To deploy new DI/IM servers, or if your existing DI/IM servers are relocated, rebuilt, or assigned new IPs, contact the VBECS team as soon as possible to begin the firewall change process.

Firewall changes needed for DI/IM servers:
1. **National BPE change**:
   Provide the VBECS team with all of your DI/IM server IP addresses. They will use this information to create a BPE change request that will open ports between your DI/IM servers and the VBECS Azure networks. BPE Firewall changes can take up to two weeks to complete.
2. **Local ACL modification**:
   File a ticket with your local biomed team requesting an ACL modification to permit bidirectional traffic between your DI/IM servers and the VBECS Azure networks.

Remote Desktop

In simplest terms, Remote Desktop is Microsoft's client software that allows a user at one computer to connect to another computer. The VBECS software runs on a virtualized application (app) server running in MAG, which is only accessible using the Remote Desktop client.

Remote Desktop Shortcuts

The VBECS team has published Remote Desktop shortcuts for each VBECS instance. Each shortcut contains all the required configuration values to access the VBECS servers. Shortcuts can be found on the VBECS SharePoint page:
> REDACTED

The VBECS servers are addressed by DHCP (not static IP address), and therefore rely on DNS entries to correctly route network connections to the server.
- PRODUCTION shortcuts are configured to connect to a VBECS load balancer DNS entry. This load balancer routes all connections to the current active PRODUCTION app server.
- TEST shortcuts are configured to connect to a DNS entry which redirects to the single TEST app server.

In either instance, if the server's DHCP IP address changes, the DNS entry will continue to correctly route all network connections.

Do not modify the settings contained within VBECS remote desktop shortcuts unless instructed to do so by the VBECS Team. You may rename the shortcut if you like.

Do not create your own VBECS remote desktop shortcut, use the shortcuts provided.

Refer to the PIV Exemption information under REDACTED*;*

A video tutorial for downloading remote desktop shortcuts can be found by clicking REDACTED.

*To make a remote desktop shortcut available for all users of a workstation, it's recommended place the shortcut in the **C:\Users\Public\Desktop** folder on every lab workstation. However, this path is a protected system folder and only accessible to system administrators. Contact your local desktop IT support for assistance.*

Remote Desktop Logon Warnings

The first time you connect to remote computer you may see the message from Figure 10. Check the box next to "**Don't ask me again for connections to this computer**". If you see the warning from Figure 11, click **Yes**.

Figure 10: Example of an Ignorable Remote Desktop Warning
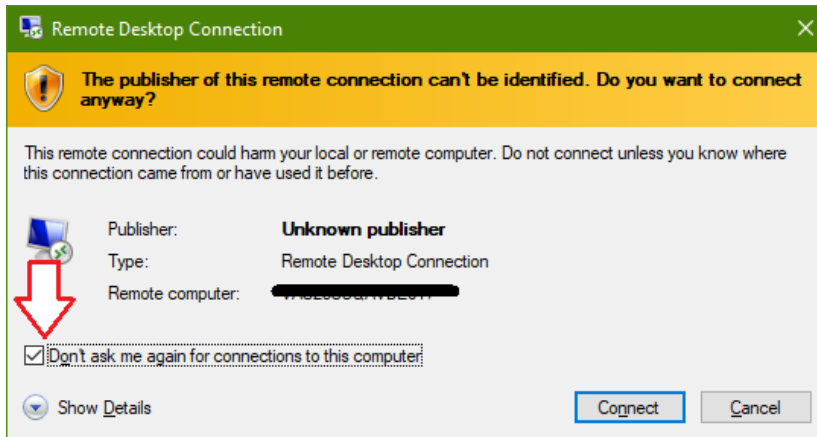
Figure 11: Example of Another Ignorable Remote Desktop Warning
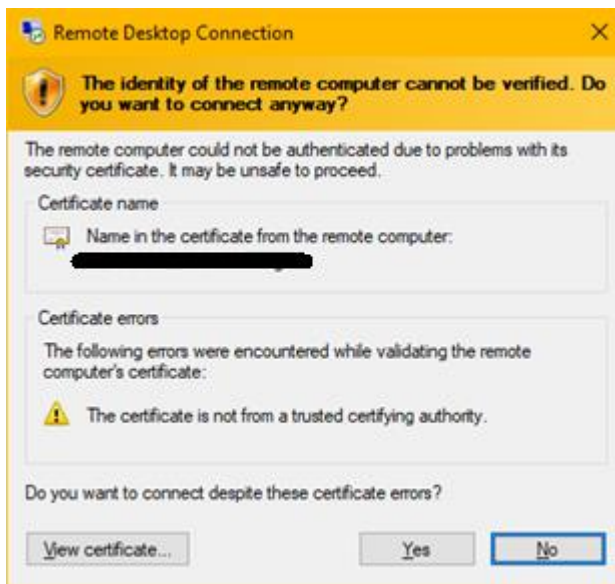
Remote Desktop Credentials

When starting a remote desktop connection to the VBECS server, watch the PIN/Password field (Figure 12):

- If you are connecting with your PIV, the field must read **PIN**. If the field reads **Password**, you have the wrong credential selected.
- If you're connecting with your Windows ID and password, the field must read **Password**. If the field reads **PIN**, you have the wrong credential selected.

To select a different credential, click the **More choices** link, which will expand the window and show you all available credentials. PIV credentials will have the [smart card icon] (smart card icon) and Windows credentials will have the [Windows user icon] (Windows user icon). If your Windows ID is not visible, select the "**Use a different account**" option. Do not check the **Remember me** box.

Figure 12: Example of Remote Desktop Credential Selection
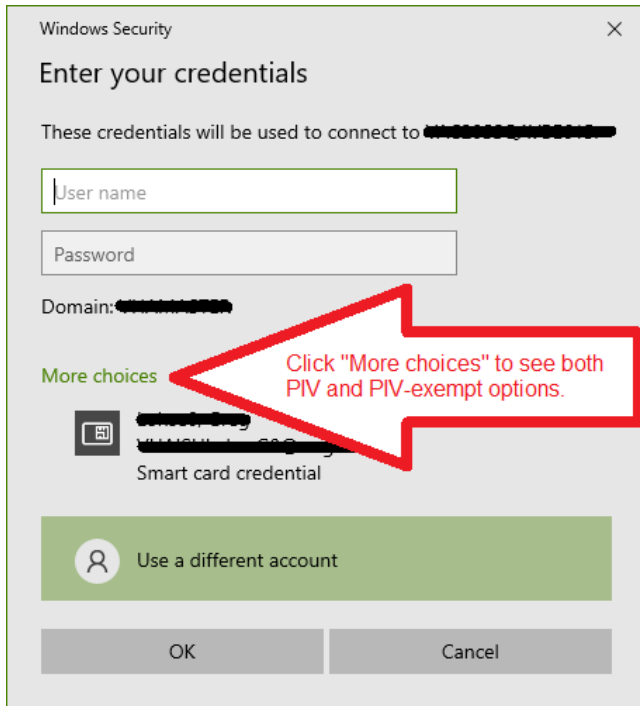
Remote Desktop Logon Troubleshooting

This section contains a list of several correctable errors you could receive while establishing your remote desktop connect to a VBECS app server.

The VAEC servers require that all users connecting to the server have AES 256-bit encryption enabled on their Active Directory user account. As of the writing of this document, the VA has not yet mandated this field be set on all accounts, so if you see the error displayed in Figure 13 contact *Customer Support* to request the **AES 256-bit encryption** option be set on your account.

Figure 13: Example of Missing Active Directory Encryption Alert
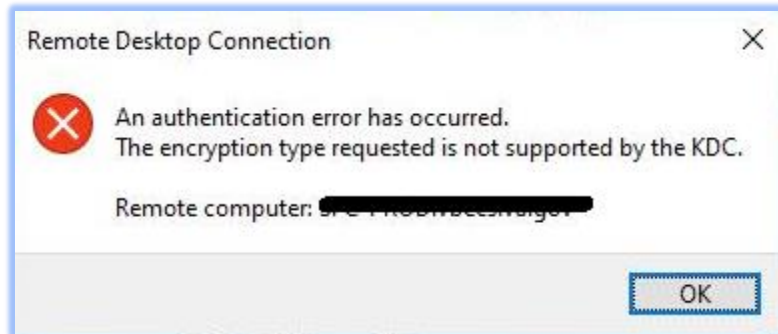
Each VBECS app server grants remote desktop permission to its blood bank's two VBECS user groups (see *VBECS Active Directory (AD)* Groups). If you receive the error displayed in Figure 14, then you most likely do not belong to one of your blood bank's VBECS user groups. If you've verified you belong to the proper group, contact *Customer Support*.

Figure 14: Example of Missing Active Directory Group Membership Alert
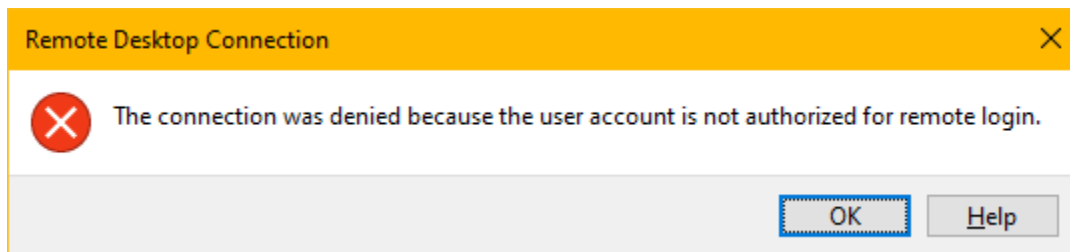
If you receive the error displayed in Figure 15, the Remote Desktop client was unable to contact the server you're trying to reach. There are a variety of possible causes this could occur, including:

- infrastructure disruption (brief or severe)
- server is rebooting (maintenance-related or Azure-initiated reboot)
- incorrect/corrupted Remote Desktop shortcut

In most cases, waiting a minute or two before trying again resolves the issue. To rule out a corrupted shortcut, replace your existing copy with a fresh one downloaded from SharePoint. If you are still receiving this error after trying these corrective measures, please contact *Customer Support.*

Figure 15: Example of Unreachable Server Alert
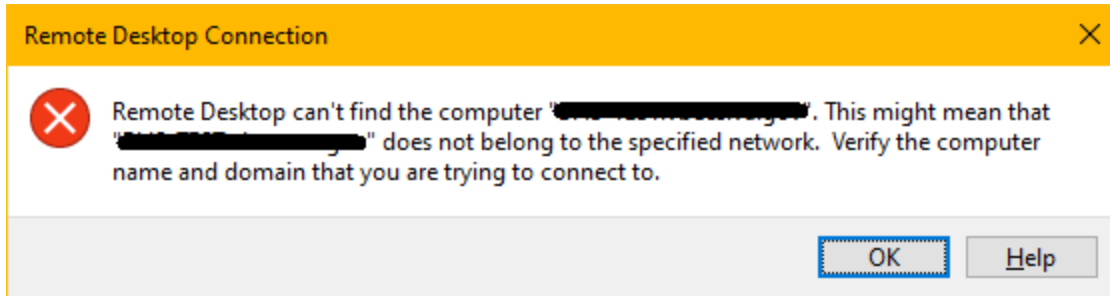
If your connection attempt fails (Figure 16) while displaying "Estimating connection quality", one underlying cause may be network latency between your workstation and the VBECS server (other workstations may work fine). Rebooting your workstation may resolve the issue; otherwise, move to another workstation (if you can) while the underlying issue resolves on its own. You may also contact *Customer Support* for further troubleshooting.

Figure 16: Example of Remote Desktop Timeout Alert
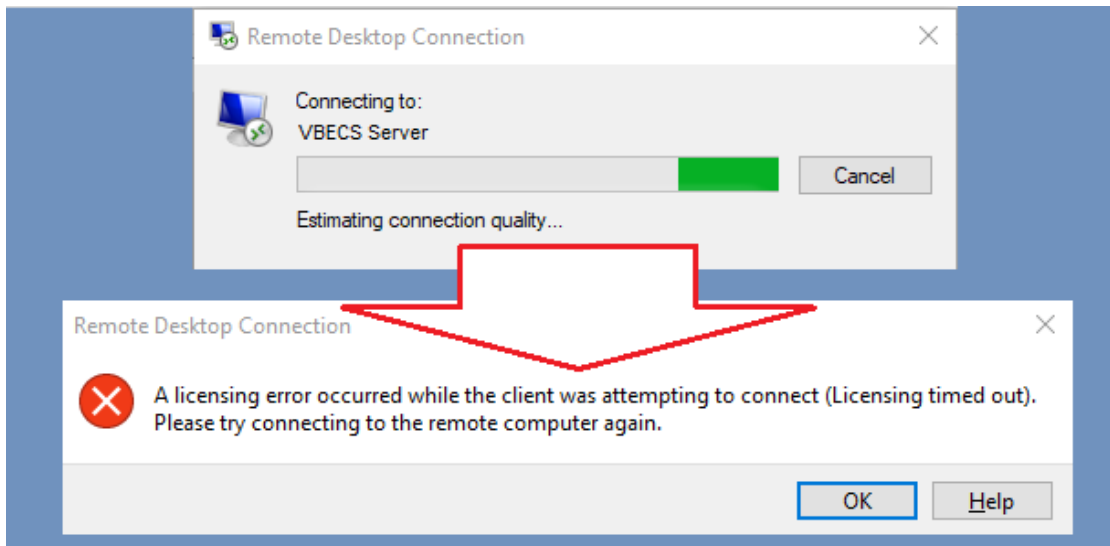
When connecting to the VBECS server, you may see the error "The requested key container does not exist on the smart card." (Figure 17). This can sometimes occur if there is a conflict between the local and remote server drivers. To resolve this issue, try waiting 5 minutes and attempting to connect again. If this does not resolve the issue, try removing and re-inserting your PIV card or finally, rebooting your workstation. If the problem persists, please contact *Customer Support*.

Figure 17: Example of Smart Card Key Container Alert

Remote Desktop Sessions

Connecting to a computer with Remote Desktop creates a session on the remote computer. Each VBECS user is allowed one session per VBECS instance. Trying to start a second session will simply reconnect you to your first session. You can switch workstations without losing your session. A session terminates when the user clicks the Sign Out desktop shortcut, or when a session times out (see next section).

Session example 1:
- From workstation A, you open a remote desktop connection to the VBECS app server.
- You start using VBECS.
- You move to workstation B without closing your remote desktop window on workstation A.
- From workstation B you open a remote desktop connection to VBECS.
- You'll see VBECS exactly where you left off on workstation A, but if you returned to workstation A you'd see the message from Figure 18. You can click **OK** to dismiss it.

Session example 2:
- From workstation A you open a remote desktop connection to the VBECS app server.
- You start using VBECS.
- You minimize the remote desktop window.
- From workstation A you open a new remote desktop connection to VBECS.
- You'll see VBECS exactly where you left off in the minimized window, but you'd also see the message from Figure 18. You can click **OK** to dismiss it.

Figure 18: Example of a Single Session Reminder Alert
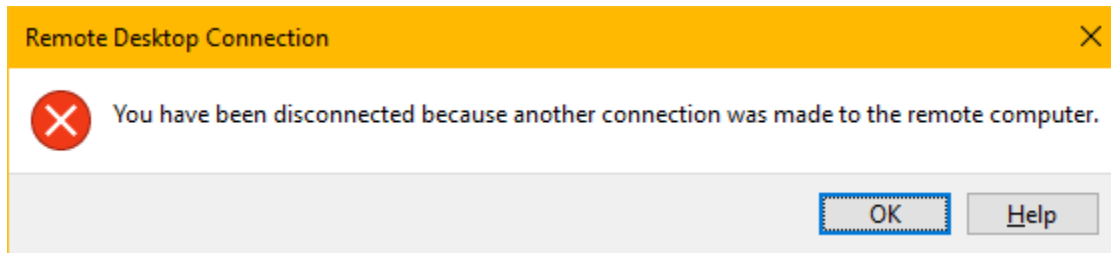
Since VBECS PRODUCTION and TEST are different instances, you can have a remote desktop window open to each at the same time. The sessions are independent and do not affect each other.

Session Time Limits

After starting a remote desktop session, it will remain "active" as long as it continues to receive user input (mouse movement, keystrokes, barcode scans, etc.). Once user input stops, the session becomes idle. After a session has been idle for 60 minutes, the message in Figure 19 is displayed in the remote desktop window. Pressing any key or clicking **OK** will reset the idle timer.

Figure 19: Example of Remote Desktop Idle Time Limit Alert
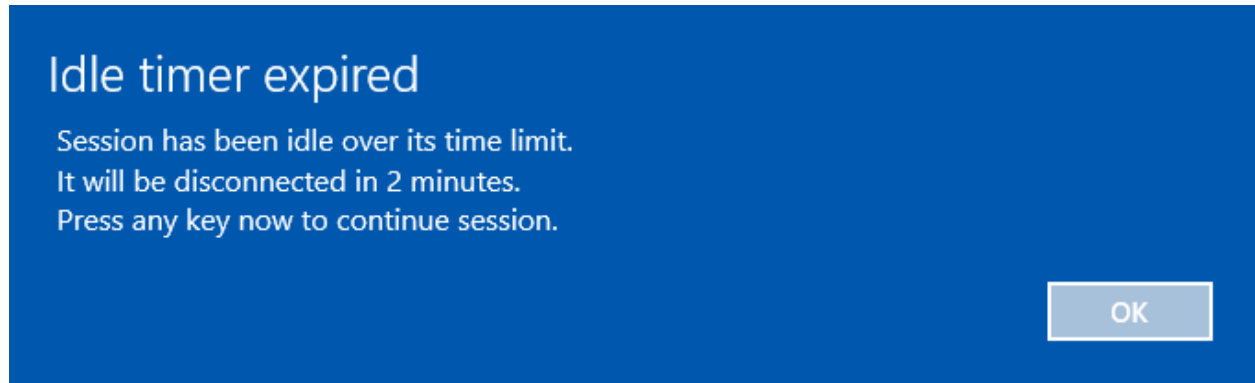
Failure to respond to the *Idle timer expired* message, will disconnect your session and display the message in Figure 20. You can reconnect to a disconnected session from any workstation and resume your work in VBECS where you left off. However, a disconnected session that is not reconnected within 60 minutes is terminated; all programs are closed, all unsaved work is lost, and the user is signed out of the server. No messages are displayed when a disconnected session is terminated.

Figure 20: Example of Remote Desktop Disconnected Alert
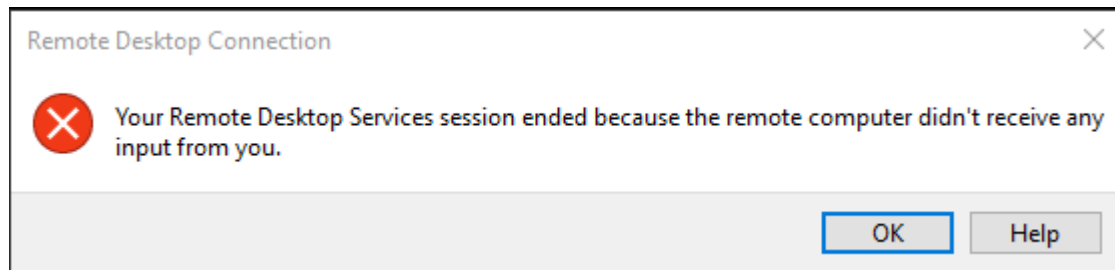
Session Disconnect vs Sign Out

When you are finished using VBECS or need to move to another workstation, you have two options: **Sign Out** or **Disconnect**.

Disconnecting from a Remote Desktop session closes the client connection; your running applications on the server remain running and no work is lost. Disconnected sessions can be reconnected-to from any workstation until the disconnected session times-out (see Section: *Session Time Limits*).

Signing out of a Remote Desktop session attempts to terminate the session and close all running applications.

If you click **Sign Out** with VBECS running but have no unsaved changes, the session will terminate. However, if you click **Sign Out** with VBECS running and unsaved changes, the server will protect you against data loss by presenting Figure 21.

If you have not responded within 30 seconds, the message will disappear and the sign out process is automatically canceled.

Figure 21: Example of Sign Out Preventing VBECS Data Loss
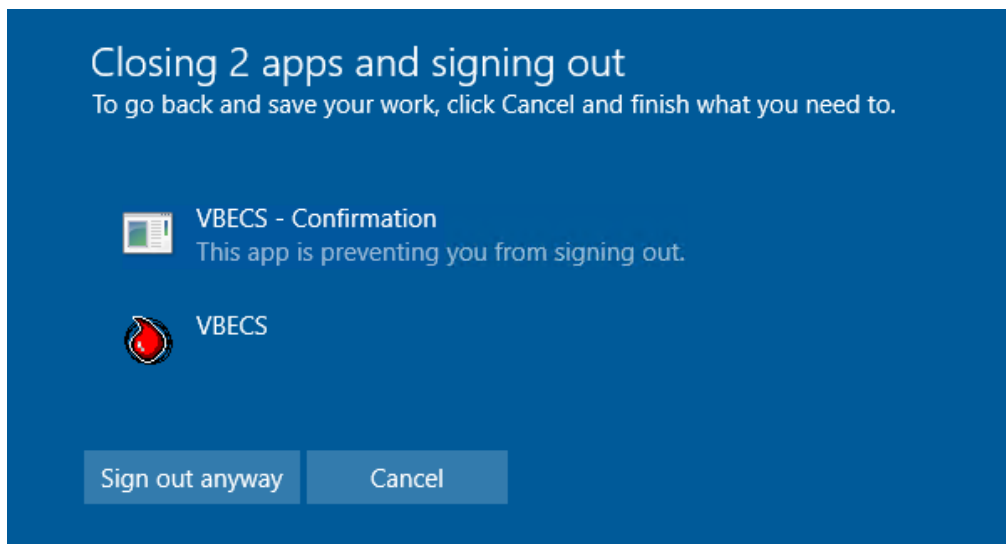
*Do not click the **Sign out anyway** button. Clicking this button causes Windows to forcibly close VBECS, which fails to properly release your record locks. See Section: Database Record Locks..*

To Sign out, click the **Sign Out** shortcut available on each app server desktop (Figure 22).

To Disconnect, click the **X** in the remote desktop window (Figure 22 and Figure 23).

Figure 22: Example of Remote Desktop in Windowed-Mode
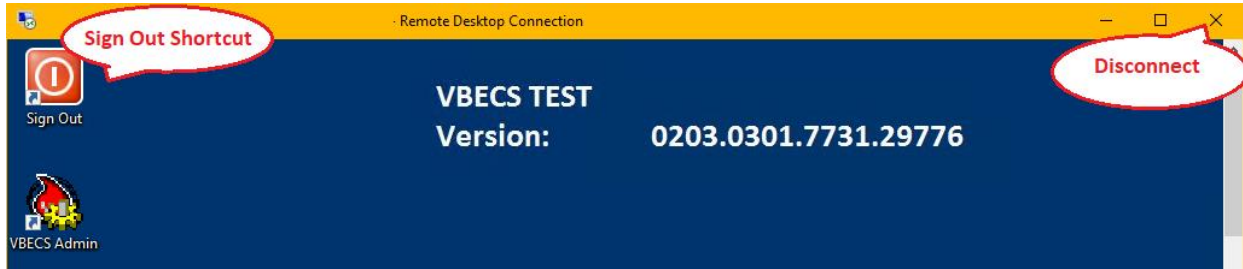
Figure 23: Example of Remote Desktop in Full Screen Mode

Removing your PIV card from the workstation will not disconnect your session.

*The VBECS team recommends using the **Sign Out** shortcut when you are not expecting to need VBECS for over an hour OR at the end of your shift.*

Unexpected Remote Desktop Disconnections

In addition to being able to manually disconnect your Remote Desktop session, it is possible that your session will disconnect for other reasons – typically network related. If this happens, you will have 60 minutes to reconnect to your session or it will terminate.

Depending on the underlying cause, your connection may try to re-establish itself for you. When this happens, you'll see a message similar to Figure 24. Allow the reconnections to try. If all attempts fail, try manually reconnecting using the VBECS Remote Desktop shortcut. If you're still unable to connect, contact *Customer Support*.

Figure 24: Example of a Disconnected Session Automatically Retrying to Connect
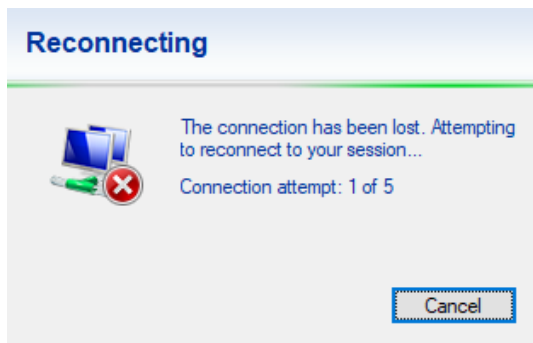
When an unexpected disconnection is more severe in nature, you'll see a message similar to Figure 25. Try reconnecting again with your VBECS remote desktop shortcut. Try reconnecting using the VBECS Remote Desktop shortcut. If you're unable to connect, contact *Customer Support*.

Figure 25: Example of an Unexpected Disconnected Session Alert
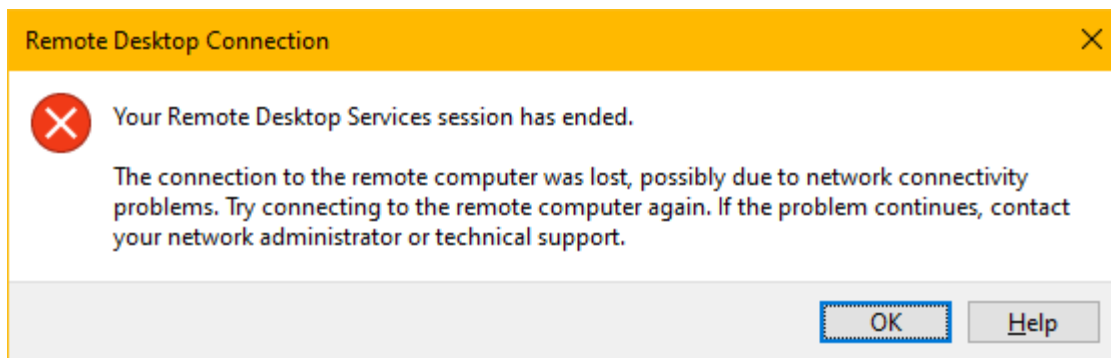
Remote Desktop Credentials – Lock Screen

Similar to the credential nuance mentioned with Remote Desktop login, if you find yourself at the VBECS server's lock screen (Figure 26), ensure you select the right credentials to login. Here, accounts are represented by icons:

- ⊡ - the smart card icon. Click this icon to login with your PIV credentials.

- 🔑 - the Windows user icon. Click this icon to login with your Windows ID and password.

If you don't see any of these icons, click the **Sign-in options** link.

Figure 26: Example of Remote Desktop Lock Screen
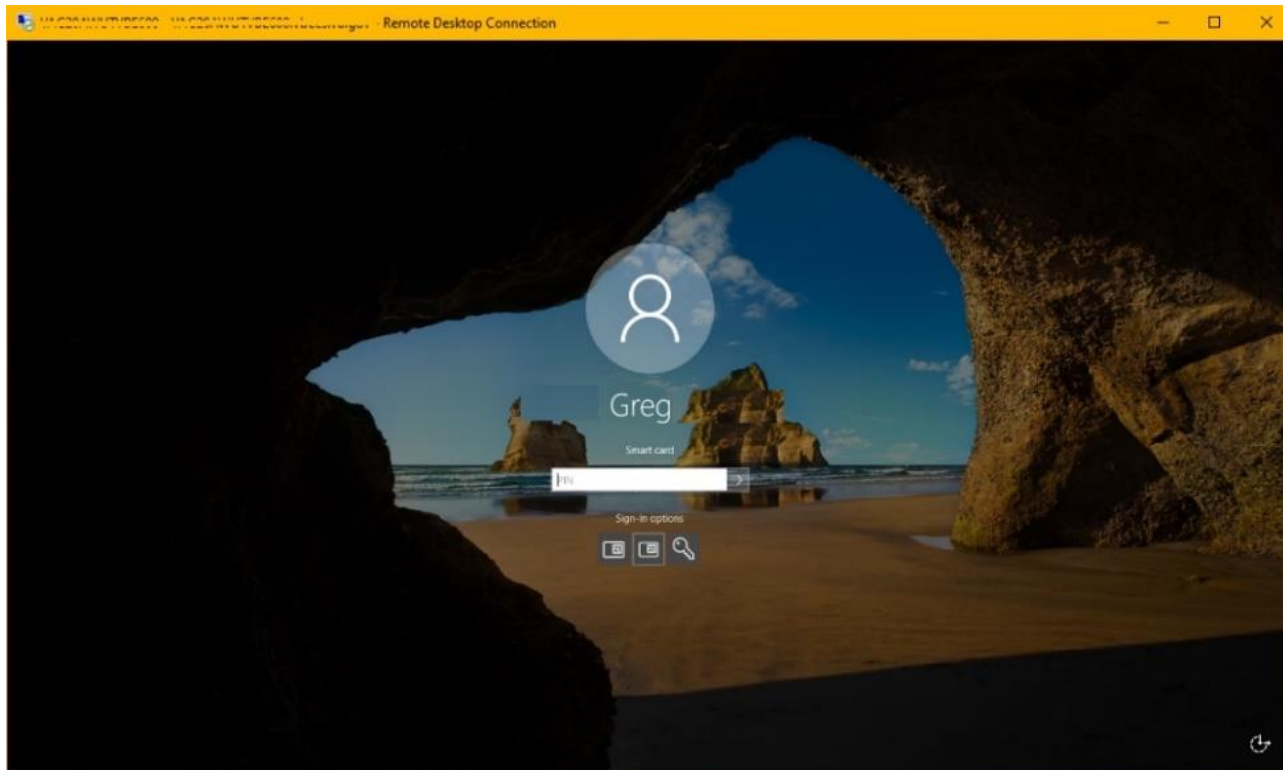
Remote Desktop Appearance and Workstation Scale Settings

Windows includes a feature (Figure 27) allowing you to increase the scale (magnification) of your workstation display. Windows may recommend (and set) this value larger than 100%, which causes your fonts and apps to get larger and are easier to read. However, VBECS fonts are not affected by this setting. What is affected are VBECS report on-screen previews; report fields may no longer line up correctly. Printed reports may be affected by this setting. Exported reports are unaffected by this setting.

Figure 27: Example of Windows Scale Setting That Affects VBECS Report Previews
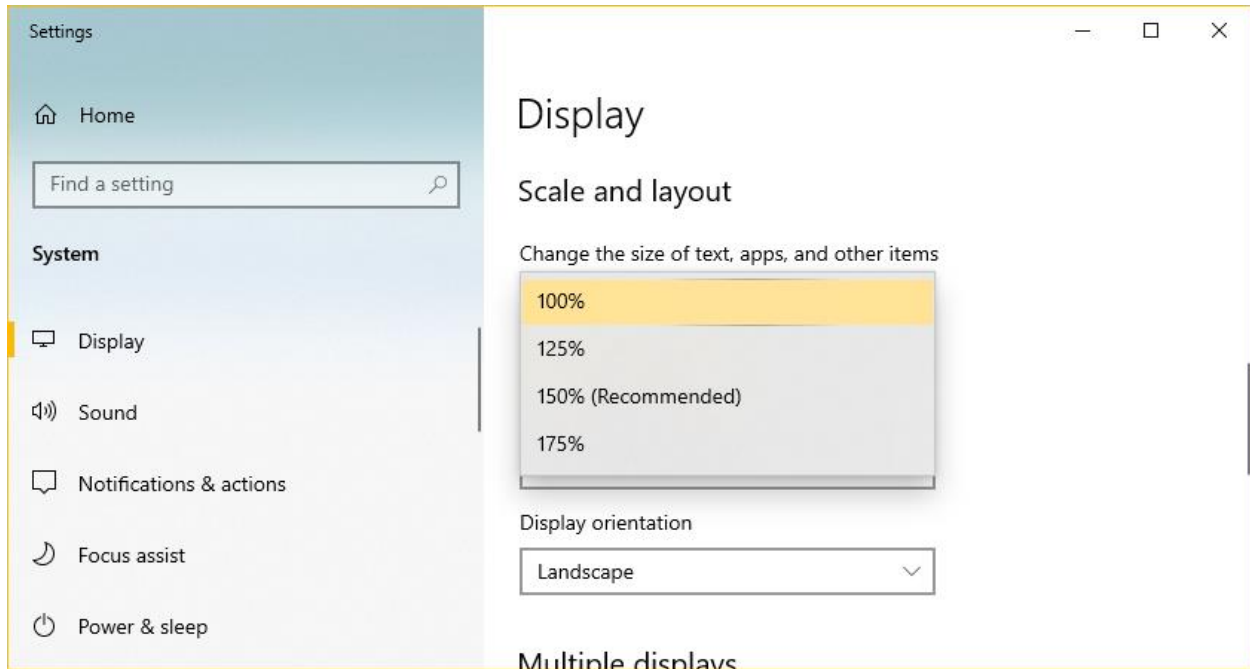
Remote Desktop Navigation

Most Windows functionality has been hidden from VBECS users to protect system integrity. However, if VBECS ever freezes or you cannot see the **Sign Out** desktop shortcut, you can try clicking the "Show Desktop" button, located in the lower-right corner of the Windows taskbar. Figure 28 shows a magnified representation of where to click.

Figure 28: Example of the Show Desktop Button

Remote Desktop Zooming

VBECS fonts are a fixed size but you can magnify use the Remote Desktop Zoom feature to make the fonts appear larger. Remote Desktop zooming is only enabled when the window is not in full-screen mode. To disable full-screen mode, double click anywhere on the remote desktop title bar. Once in non-full-screen mode, right-click on the title bar to show the remote desktop options and select Zoom and then a factor of your liking (Figure 29). To return to full screen mode you will first need to revert the Zoom back to 100%. Changing the zoom on a remote desktop window has no negative effect on VBECS report previews.

Figure 29: Example Setting Remote Desktop Zooming
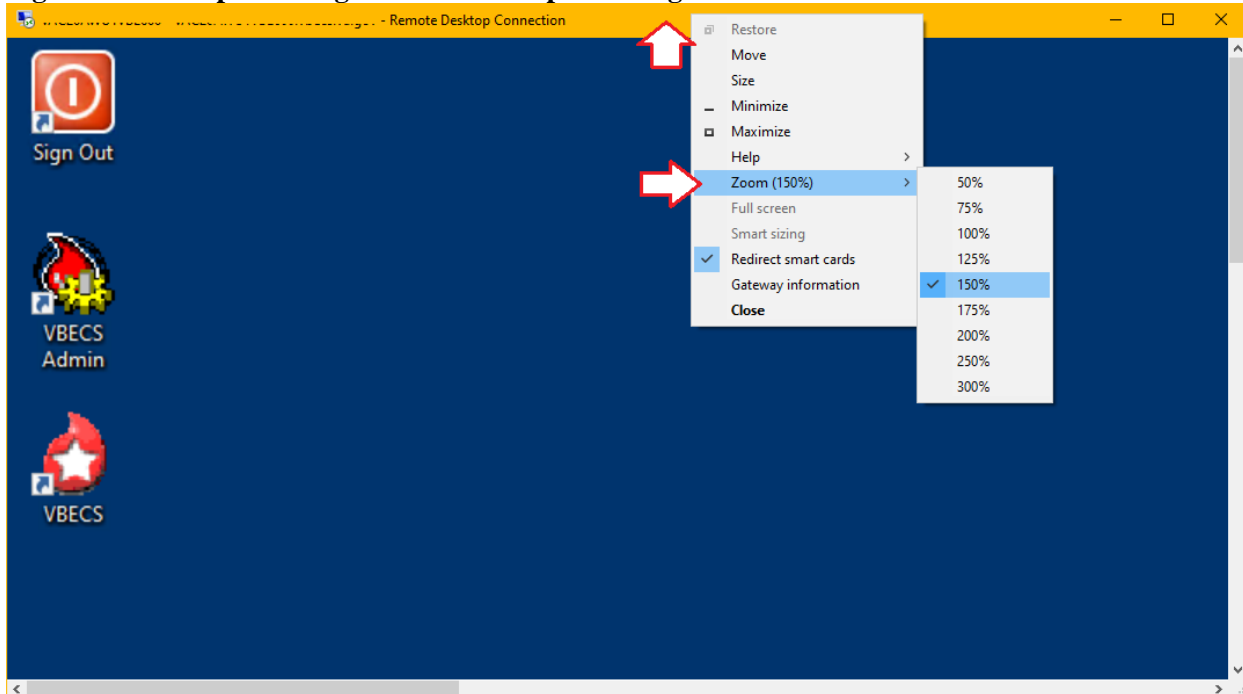
Exported Reports Network Share

For increased security, the VBECS application server blocks user access to the file system. As a result, exported reports are only accessible through network shares. Each VBECS instance has its own network share which means that TEST and PRODUCTION reports are saved to different locations. Only users with permission to VBECS Admin have the ability to create and delete folder on the network share, all other users have read-only access.

The VBECS Team has created shortcuts for each VBECS instance that can be saved on workstations for quick access to the exported report network share. These shortcuts can be found on the VBECS SharePoint page:
<mark>REDACTED</mark>

💡 *A video tutorial for downloading report share shortcuts can be found by clicking* <mark>REDACTED</mark>*.*

*To make a report share shortcut available for all users of a workstation, it's recommended place the shortcut in the **C:\Users\Public\Desktop** folder on every lab workstation. However, this path is a protected system folder and only accessible to system administrators. Contact your local desktop IT support for assistance.*

VBECS Server Maintenance

The VBECS servers must be updated regularly with security and software updates to enhance security and meet VA compliance. All software updates or changes affecting the VBECS servers are first tested by the VBECS team before being applied to blood bank test or production servers.

VBECS servers are not rebooted at a specific time but are instead rebooted at any time during a maintenance window. A maintenance window puts less stress on the Azure infrastructure which should result in faster reboot times. All VBECS servers will be rebooted twice each month. These maintenance windows take place during the weeks of the 2nd and 4th Tuesday of each month according to the schedule in Table 2. If a maintenance day falls on a VA observed holiday, the remaining maintenance schedule will shift forward one day. **Refer to Table 3 to see which maintenance window applies to your VBECS instance**. Additional reboots may occur for critical maintenance or security patches but connected users will always receive warning alerts (Figure 30) and minimal downtime.

Table 2: Maintenance Window Schedule

Environment	Tuesday	Wednesday	Thursday
PRODUCTION	10AM-1PM CST East region servers	10AM-1PM CST South region servers	10AM-1PM CST Southwest region servers
TEST	1PM-3PM CST East region servers	1PM-3PM CST South region servers	1PM-3PM CST Southwest region servers

Table 3: VBECS Server Regions

REDACTED

If you are unable to connect to your VBECS app server for more than 10 minutes during your server maintenance window (or ever), contact Customer Support.

What to Expect During Server Maintenance

PRODUCTION Maintenance

When your PRODUCTION server's maintenance begins, all disconnected sessions are terminated. However, any user with an open Remote Desktop client window will see warning alerts similar to Figure 30. Seeing one of these alerts means that your passive VBECS server is already running. You should switch to it as soon as possible by signing out and back in; the load balancer will route you to the correct server.

Please do not disconnect your session; instead, use the Sign Out shortcut (see the *Session Disconnect vs Sign Out* section). Maintenance warning alerts will be sent at 10, 5 and 1 minute prior to the server reboot.

Figure 30: Example of Server Maintenance Alert (Production Server)
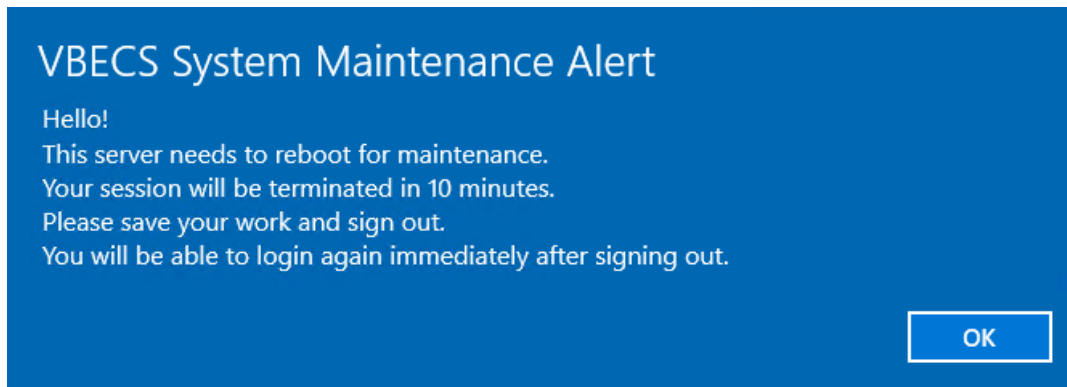
TEST Maintenance

Due to current limitations with the cloud, TEST environments will not receive warning alerts similar to Figure 30. TEST servers will reboot at some point during their maintenance window without warning, so plan accordingly. Test accounts will be completely unavailable while the server reboots; the expected downtime is between 5 and 30 minutes. Contact *Customer Support* if you are unable to access your TEST environment outside the maintenance window.

Anti-Virus Software and Virus Protection

Anti-virus software is required and running on all VBECS servers. The VA's Infrastructure Operations team determines which vendor's software to use, however the VBECS Team tests any updates on development servers before approving it for use on all VBECS servers.

VistA Maintenance Operations

Four HL7 Logical Links and one VistALink connection must be established and configured to establish proper communication with VBECS. The HL7 links are:

- OERR-VBECS
- VBECS-OERR
- VBECSPTU
- VBECSPTM

The VistALink connection configuration is the data that VistA will use to transmit data in XML format to VBECS. The following set of instructions will aid in the proper configuration of these links and ensure reliable communication between VistA and VBECS. These links must be configured during the initial installation of VBECS, and after any changes to the HL7 or VistALink configuration on VBECS. The settings should also be updated after the VistA Test account has been remirrored.

Set Up VBECS Outbound Logical Links

1) At the "Select HL7 Main Menu Option:" prompt, enter **Filer**.
2) Shut down the logical link.
3) At the "Select Filer and Link Management Options Option:" prompt, enter **Link Edit**.
4) At the "Select HL LOGICAL LINK NODE:" prompt, enter **OERR-VBECS** (Figure 31).

Figure 31: HL7 Logical Link Edit Menu Navigation

```
HL7 Main Menu
    Event monitoring menu ...
    Systems Link Monitor
    Filer and Link Management Options ...
    Message Management Options ...
    Interface Developer Options ...
    Site Parameter Edit

Select HL7 Main Menu Option: FILER


    SM     Systems Link Monitor
    FM     Monitor, Start, Stop Filers
    LM     TCP Link Manager Start/Stop
    SA     Stop All Messaging Background Processes
    RA     Restart/Start All Links and Filers
    DF     Default Filers Startup
    SL     Start/Stop Links
    PI     Ping (TCP Only)
    ED     Link Edit
    ER     Link Errors ...

Select Filer and Link Management Options Option: ED

Select HL LOGICAL LINK NODE: OERR-VBECS
```

5) Enter **Enabled** in the AUTOSTART field (Figure 32).
6) Move the cursor to the LLP TYPE field and press **Enter** (Figure 32).

Figure 32: HL7 Logical Link

```
                            HL7 LOGICAL LINK
-------------------------------------------------------------------------
NODE: OERR-VBECS
INSTITUTION:
DOMAIN:
AUTOSTART: ENABLED
QUEUE SIZE: 10
LLP TYPE: TCP
_____
_
COMMAND:                                          Press <PF1>H for help
Insert
```

7) In the "TCP/IP ADDRESS" field, enter the value contained from the "Computer Name" field of your VBECS remote desktop shortcut. **IP addresses cannot be used.**
8) In the "TCP/IP PORT" field, enter VBECS standard port numbers of 21993 for TEST and 21994 for PRODUCTION.
9) Set the "ACK TIMEOUT" field to **30**.
10) Set the "READ TIMEOUT" field to **30**.
11) Move the cursor to the "COMMAND:" prompt.
12) Enter **Close** to return to the previous screen.
13) At the "COMMAND:" prompt, enter **Save**.
14) Enter **Exit**.

Figure 33: TCP Lower Level Parameters: OERR-VBECS

```
                            HL7 LOGICAL LINK
-------------------------------------------------------------------------
                       TCP LOWER LEVEL PARAMETERS
                              OERR-VBECS

TCP/IP SERVICE TYPE: CLIENT (SENDER)
TCP/IP ADDRESS: <DNS from the VBECS remote desktop shortcut>
TCP/IP PORT: <21993 or 21994>

   ACK TIMEOUT: 30                    RE-TRANSMISION ATTEMPTS:
   READ TIMEOUT: 30                   EXCEED RE-TRANSMIT ACTION:
   BLOCK SIZE:                                  SAY HELO:

   STARTUP NODE:                                    PERSISTENT: NO
   RETENTION: 15                                    UNI-DIRECTIONAL WAIT:
_____
COMMAND:                                          Press <PF1>H for help
Insert
```

15) Repeat Steps 3 through 14 substituting "VBECSPTM" and "VBECSPTU" for "OERR-VBECS" when prompted for the logical link name to change the IP address and port numbers for the VBECSPTM and VBECSPTU logical links.

Set Up the VBECS Inbound Logical Link

1) At the "Select HL7 Main Menu Option:" prompt, enter **Filer**.
2) At the "Select Filer and Link Management Options Option:" prompt, enter **Link Edit**.
3) At the "Select HL LOGICAL LINK NODE:" prompt, enter **VBECS-OERR** (as shown for OERR-VBECS in Figure 31).
4) Enter **Enabled** in the AUTOSTART field (Figure 34).
5) Move the cursor to the LLP TYPE field and press **Enter** (Figure 34).

Figure 34: HL7 Logical Link

```
                           HL7 LOGICAL LINK
--------------------------------------------------------------------------
NODE: VBECS-OERR
INSTITUTION:
DOMAIN:
AUTOSTART: ENABLED
QUEUE SIZE: 10
LLP TYPE: TCP

_____
COMMAND:                                      Press <PF1>H for help
Insert
```

6) Blank out the "TCP/IP ADDRESS" field.
7) In the "TCP/IP PORT" field, enter the correct (unique) port number for your VistA. Unique port numbers are in the format **1mn93** for TEST and **1mn94** for PRODUCTION, where "mn" is the site specific "magic number". Regional support should be contacted for the correct port numbers.
8) Set the "ACK TIMEOUT" field to **30**.
9) Set the "READ TIMEOUT" field to **30**.
10) Set the "RE-TRANSMISSION ATTEMPTS" field to **10**.
11) Set the "EXCEED RE-TRANSMIT ACTION" field to **restart**.
12) Move the cursor to the "COMMAND:" prompt.
13) Enter **Close** to return to the previous screen.
14) At the "COMMAND:" prompt, enter **Save**.

15) Enter **Exit**.

Figure 35: TCP Lower Level Parameters: VBECS-OERR

```
                            HL7 LOGICAL LINK
--------------------------------------------------------------------------
                        TCP LOWER LEVEL PARAMETERS
                                VBECS-OERR

    TCP/IP SERVICE TYPE: SINGLE LISTENER
          TCP/IP ADDRESS:
            TCP/IP PORT: <1mn93 OR 1mn94>


     ACK TIMEOUT: 30                 RE-TRANSMISION ATTEMPTS: 10
    READ TIMEOUT: 30              EXCEED RE-TRANSMIT ACTION: restart
      BLOCK SIZE:                                  SAY HELO:

   STARTUP NODE:                                PERSISTENT: NO
      RETENTION:                        UNI-DIRECTIONAL WAIT:
_____
COMMAND:                                    Press <PF1>H for help
Insert
```

Start VistA HL7 Logical Links

1) Before data can be transmitted over the VBECS logical links, edit the link definitions as described above.
2) To turn on the new VBECS logical links, select **START/STOP LINKS [HL START]**.
3) Start the "OERR-VBECS" logical link.
4) Start the "VBECS-OERR" logical link.
5) Start the "VBECSPTM" logical link.
6) Start the "VBECSPTU" logical link.
7) Ensure that the VistA HL7 Link Manager is running; VBECS messaging cannot occur without it.
8) To check the status of the Link Manager (and, if necessary, restart it), access the **HL START/STOP LINK MANAGER** menu option.

Monitor VBECS HL7 Logical Links

Once two-way communication has been established, you can monitor the links.

1) Use the "System Link Monitor" to view the status of the VBECS Logical Links.
2) From the "HL7 Main Menu", select **System Link Monitor** (Figure 36).

Figure 36: HL7 System Link Monitor Menu Navigation

```
   HL7 Main Menu
      Event monitoring menu ...
      Systems Link Monitor
      Filer and Link Management Options ...
      Message Management Options ...
      Interface Developer Options ...
      Site Parameter Edit


   Select HL7 Main Menu Option: System Link Monitor
```

3) When a list of VistA HL7 links defined at your site appears, press **V** at the "Select a Command:" prompt (Figure 37).
4) At the "Select LINK MONITOR VIEWS:" prompt, enter **VBECS** (Figure 37).

Figure 37: System Link Monitor

```
                SYSTEM LINK MONITOR for <your site name>


             MESSAGES       DEVICE
     NODE      RECEIVED  PROCESSED   TO SEND    SENT       TYPE      STATE


     LA7V 657                          4         4         MM        Halting
     LL15VISN  105        105         394        105       NC        Shutdown
     MPIVA     0          0           322        0         NC        Shutdown
     NPTF      0          0           25         0         MM        Halting
     OERR-VBE  34         34          1019       1018      NC        Idle
     PSOTPBAA  28         28          52         28        NC        Shutdown
     VABAC     0          0           1          0         NC        Shutdown
     VAFAV     0          0           2          0         NC        Shutdown
     VAFHM     0          0           3          0         NC        Shutdown
     VAFRE     0          0           4          0         NC        Shutdown


     Incoming filers running => 1            TaskMan running
     Outgoing filers running => 1            Link Manager running
                                             Monitor OVERDUE

     Select a Command:
   (N)EXT  (B)ACKUP  (A)LL LINKS  (S)CREENED  (V)IEWS  (Q)UIT  (?) HELP: V


Select LINK MONITOR VIEWS: VBECS
```

5) A screen similar to Figure 38 appears.

Figure 38: System Link Monitor

```
              SYSTEM LINK MONITOR for <your site name>

              MESSAGES      DEVICE
   NODE       RECEIVED  PROCESSED  TO SEND   SENT      TYPE     STATE

   OERR-VBECS 0         0          0         0         NC       Idle
   VBECS-OERR 0         0          0         0         SS       Idle
   VBECSPTM   0         0          0         0         NC       Enabled
   VBECSPTU   0         0          0         0         NC       Enabled


   Incoming filers running => 1            TaskMan running
   Outgoing filers running => 1            Link Manager Running
                                           Monitor OVERDUE
   Select a Command:
 (N)EXT   (B)ACKUP   (A)LL LINKS   (S)CREENED   (V)IEWS   (Q)UIT   (?) HELP:
```

6) To exit the "System Link Monitor", at the "Select a Command:" prompt, enter **Q** to quit.
7) Refer to *Appendix A: Verify VBECS HL7 Interface Protocols* if errors are noted and the configuration of the HL7 links is in question.

> *The volume of HL7 traffic over these links depends on the number of daily CPRS Blood Bank orders and updates to the VistA clinical information at your site. These can be significant at large sites. Monitor the links closely the first few days after the installation and purge the HL7 log data (as appropriate) in accordance with your standard HL7 monitoring and purging procedures.*

Configure VBECS VistALink Links

1) Use the "Edit Parameter Values" option on the "GENERAL PARAMETER TOOLS" menu to edit the values for the VistALink connection to VBECS.
2) At the "Select Instance:" prompt, enter **LISTENER IP ADDRESS**.
3) At the "Value:" prompt, enter the value of the "Computer Name" field from the appropriate VBECS remote desktop shortcut. **IP addresses cannot be used**.
4) At the "Select Instance:" prompt, enter **LISTENER PORT NUMBER**.
5) At the "Value:" prompt, enter the VBECS VistALink listener port number: 21991 for TEST and 21992 for PRODUCTION.

6) Press **Enter** to exit the option.

Figure 39: VistALink Configuration

```
Select OPTION NAME: GENERAL PARAMETER TOOLS  XPAR MENU TOOLS    General
Parameter Tools


   LV      List Values for a Selected Parameter
   LE      List Values for a Selected Entity
   LP      List Values for a Selected Package
   LT      List Values for a Selected Template
   EP      Edit Parameter Values
   ET      Edit Parameter Values with Template
   EK      Edit Parameter Definition Keyword


Select General Parameter Tools Option: EP  Edit Parameter Values
                        --- Edit Parameter Values


Select PARAMETER DEFINITION NAME: VBECS VISTALINK

---------------- Setting VBECS VISTALINK  for Package: VBECS
Select Instance: LISTENER IP ADDRESS

Instance: LISTENER IP ADDRESS//    LISTENER IP ADDRESS
Value: <IP address>//  <"Computer Name" field value from the VBECS remote desktop
shortcut>
Select Instance: LISTENER PORT NUMBER

Instance: LISTENER PORT NUMBER  Replace    LISTENER PORT NUMBER
Value: 8000//     <21991 or 21992>
Select Instance:
```

Workload Data Transmission

VBECS workload data is recorded in VBECS when records that qualify as Workload Events are saved in VBECS. This data is extracted from VBECS to the VistA Laboratory workload recording system by way of a VistA scheduled task named **LR TASK NIGHT (NIGHTLY CLEANUP)**.

If VistA is not receiving VBECS workload, ensure the task is scheduled correctly in VistA.

This task is scheduled using the **SCHEDULE/UNSCHEDULE OPTIONS (XUTM SCHEDULE)** option.
Set the "**QUEUED TO RUN AT WHAT TIME**:" entry to just after midnight.
Set the "**RESCHEDULING FREQUENCY**:" to "1D", which indicates that the task should repeat daily.

Troubleshooting

Error on VBECS or VBECS Admin Launch

If you see the message depicted in Figure 40 it means that your VBECS environment is corrupted and your VBECS software version does not match the version expected in your VBECS database. This should never happen, so contact *Customer Support* immediately.

Figure 40: Example of Critical Software Mismatch Error
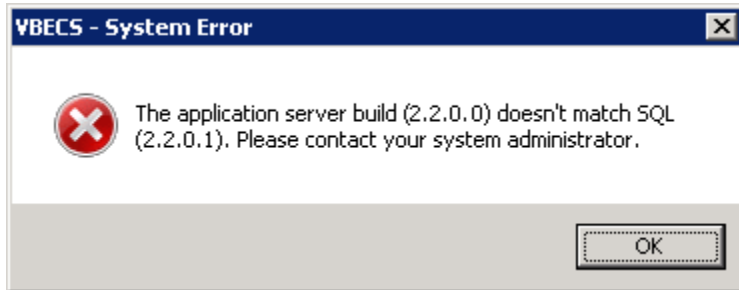
VBECS Application Interfaces

When the HL7 Listener service encounters an error parsing an HL7 message it generates an event description like the following:

VBECS Patient Update HL7 Parser: Error processing HL7 message:
Missing or invalid content in HL7 message:
ERR^MSH~1~12~203~

Upon troubleshooting an email message regarding an HL7 message, contact *Customer Support*. Due to PII and HIPAA constraints, patient information will not be sent over unencrypted email and the support personnel will need to manually retrieve this information from your VBECS server. Table 4 describes the possible error codes and problem descriptions.

Table 4: Troubleshooting Rejected VBECS HL7 Messages

Error Code	Description of Problem
100	Segment Sequence Error
101	Required Field Missing
102	Data Type Error
103	Table Value Not Found
200	Unsupported Message Type
201	Unsupported Event Code
202	Unsupported Processing ID
203	Unsupported Version Id
204	Unknown Key Identifier
205	Duplicate Key Identifier
206	Application Record Locked
207	Application Internal Error
208	Conflicting Processing Id

Table 5: Troubleshooting VBECS Application Interfaces

Source	Description of Problem	Possible Cause	Solution
VBECS: Order Alerts and Pending Order List	New orders or cancellations of existing orders in CPRS are not showing up in VBECS.	The **OERR-VBECS** HL7 Logical Link is not running on the VistA system.	Start the **OERR-VBECS** HL7 Logical Link.
		The **VBECS HL7 Listener** Windows service is not running or is hung on your VBECS app server.	Contact *Customer Support* to restart the **VBECS HL7 Listener** Windows service on your VBECS app server.
		Network connectivity issue	Contact *Customer Support* to troubleshoot possible network service disruptions or firewall issues.
		The HL7 message is missing patient name or one or more name components length(s) exceed(s) the VBECS maximum supported value.	VBECS responds to the new order request with an application reject (AR) acknowledgement message indicating Patient Name(s) not found in HL7 Message or Patient's Name(s) field size(s) exceed(s) VBECS maximum supported value. Rejected patient order messages due to invalid patient name message content are recorded on the Windows Event Log (Finding Application Log Entries from Email Alerts) and an email message containing the MSH segment of the rejected HL7 message.
VBECS Admin: Edit Division	New orders are not showing up in VBECS.	Order mappings to institutions within a division's configuration are not setup properly.	Map the missing CBOC facilities in the *Edit Divisions* menu option for *VBECS Admin*.
VBECS: Patient Update Alerts	VistA patient updates are not showing up in VBECS.	The Taskman scheduled option **VAFC BATCH UPDATE** is not scheduled to run or has not reached the time limit in the schedule.	Schedule the **VAFC BATCH UPDATE** option to run at the desired frequency (the recommended frequency is every 10 minutes) or use the option "One-time Option Queue" in the Taskman Management Options to start the task.
		The **VBECSPTU** HL7 Logical Link is not running on the VistA system.	Start the **VBECSPTU** HL7 Logical Link.
		The **VBECS HL7 Listener** Windows service is not running or is hung on your VBECS app server.	Contact *Customer Support* to restart the **VBECS HL7 Listener** Windows service on your VBECS app server.
		Network connectivity issue	Contact *Customer Support* to troubleshoot possible network service disruptions or firewall issues.

Source	Description of Problem	Possible Cause	Solution
		The HL7 message is missing the patient's name or one or more of the patient's name component length(s) exceed the VBECS maximum supported length.	Contact *Customer Support* to help identify which patient name component is causing the problem.
VBECS: Patient Merge Alerts	VistA Patient Merge events are not showing up in VBECS.	The **VBECSPTM** HL7 Logical Link is not running on the VistA system.	Start the **VBECSPTM** HL7 Logical Link.
		The **VBECS HL7 Listener** Windows service is not running or is hung on your VBECS app server.	Contact to restart the **VBECS HL7 Listener** Windows service on your VBECS app server.
		Network connectivity issue	Contact *Customer Support* to troubleshoot possible network service disruptions or firewall issues.
		The HL7 message is missing the patient's name or one or more of the patient's name component length(s) exceed the VBECS maximum supported length.	Contact *Customer Support* to help identify which patient name component is causing the problem.
VistA: HL7 System Link Monitor	The VistA HL7 System Link Monitor shows more MESSAGES TO SEND than MESSAGES SENT for the **OERR-VBECS** Logical Link and is hung in an "Open" state.	The **VBECS HL7 Listener** Windows service is not running or is hung on your VBECS app server.	Contact *Customer Support* to restart the **VBECS HL7 Listener** Windows service on your VBECS app server.
	The VistA HL7 System Link Monitor shows more MESSAGES TO SEND than MESSAGES SENT for the **VBECSPTU** Logical Link and is hung in an "Open" state.		
	The VistA HL7 System Link Monitor shows more MESSAGES TO SEND than MESSAGES SENT for the **VBECSPTM** Logical Link and is hung in an "Open" state.	Network connectivity issue	Contact *Customer Support* to troubleshoot possible network service disruptions or firewall issues.
CPRS: Orders Tab	CPRS does not display the correct status of a blood bank order after it was updated in VBECS.	The **VBECS HL7 Dispatcher** Windows service is not running or is hung on your VBECS app server.	Contact *Customer Support* to restart the **VBECS HL7 Dispatcher** Windows service on your VBECS app server.
		The **VBECS-OERR** HL7 Logical Link is not running.	Start the **VBECS-OERR** HL7 Logical Link.
		Network connectivity issue	Contact *Customer Support* to troubleshoot possible network service disruptions or firewall issues.

Source	Description of Problem	Possible Cause	Solution
CPRS: Blood Bank Order Dialog	CPRS displays "Not able to open port" message in Patient Information screen in Blood Bank Order Dialog.	The **VBECS VistALink Listener** Windows service is not running or is hung on your VBECS app server.	Contact *Customer Support* to restart the **VBECS VistALink Listener** Windows service on your VBECS app server.
		Network connectivity issue	Contact *Customer Support* to troubleshoot possible network service disruptions or firewall issues.
CPRS: Reports Tab, Blood Bank Report OR JLV Blood Bank Report widget	CPRS displays "----BLOOD BANK REPORT IS UNAVAILABLE----"	The **VBECS VistALink Listener** Windows service is not running or is hung on your VBECS app server.	Contact *Customer Support* to restart the **VBECS VistALink Listener** Windows service on your VBECS app server.
		Network connectivity issue	Contact *Customer Support* to troubleshoot possible network service disruptions or firewall issues.
		Incorrect PARAMETERS field settings in VistA (File #8989.5)	Verify the PARAMETERS file is set correctly. Refer to the *Configure VBECS VistALink Links* section.
CPRS: Blood Bank Order Dialog: Signing an Order	CPRS displays an "Error Saving Order" dialog screen with the text "The error, One or more orders to the VBECS system failed and are queued for later delivery."	A severe error occurred in the **VBECS HL7 Listener** Windows service, which failed to respond to CPRS properly.	Contact *Customer Support* to review the logs of the **VBECS HL7 Listener** Windows service on your VBECS app server.
		Network connectivity issue	Contact *Customer Support* to troubleshoot possible network service disruptions or firewall issues.
		If the IP address is not from the local VistA system, a rogue HL7 system is sending messages to the VBECS server.	Contact IRM to identify the location of the server with which the IP address is associated. Notify the site that the message is coming from the problem so that the messages can be routed to the correct location.
Automated Instrument	VBECS is not receiving messages sent from the instrument.	Network connectivity issue	Azure firewalls block all inbound (to-VBECS) traffic by default. Contact *Customer Support* to troubleshoot possible network service disruptions or firewall issues.
		The Automated Instrument interface is not enabled.	Enable the Automated Instrument interface in the *Edit Interfaces* menu option of *VBECS Admin*.

Scanner Problems

> ⚠️
> **After scanning a barcode, a ` (backtick character) character appears at the start of the output.**

Probable Cause
The **Caps Lock** is on**.**

Solution
Turn the **Caps Lock** off.

> ⚠️
>
> **After scanning a barcode, characters appear in the output that do not match the label being scanned. Often, these bad characters are not alphanumeric.**

Probable Cause
Network latency can cause data to become corrupted.

Solution
If the issue doesn't improve over time, you can try to add a delay to the characters sent by the scanner. Consult your scanner vendor or documentation to increase the intercharacter delay. Start with a small delay and gradually increase until the scanner is correctly rendering the data.

Database

Backups

VBECS databases are backed up daily using Microsoft's Azure Backup Service. This backup takes place at 4:00 AM (CST) and the data is saved to geo-redundant storage, which means it that three copies are made in both the primary and secondary storage regions to protect against drive failure. Backups are retained for 32 days.

Recovery

VBECS does not delete user-entered data. When a user invalidates or inactivates a record the record contains a status field which can be used to filter it from reports, but the record remains in the database. This is done to preserve the medical record for audit and protect against user error.
In the event of a catastrophic failure, a VBECS database can be recovered from a backup files, however all data entered after the backup file date, would need to be manually re-entered.

Database Record Locks

VBECS implements two record locking strategies for maximum protection against data editing collisions: optimistic and pessimistic. Neither locking strategy prevent reports or other read-only queries from running against the locked record.

Optimistic locking is controlled by the database. It prevents records from being updated if those records were changed since the record was retrieved for editing. This is less user friendly since a user isn't notified of a problem until they try saving their changes. This is VBECS's safety net in case Pessimistic locking logic fails.

Optimistic Locking Example (without Pessimistic locking in place):
User A selects a record for editing.
User B selects the same record for editing and makes their change quickly and saves.
User A makes their changes and receives an error indicating the record has already changed. They need to re-select the record and repeat their edits.

Pessimistic locking is controlled by VBECS application code and prevents a user from opening a record for edit if another user already has the same record open for edit.

Pessimistic Locking Example:
User A selects a record for editing. At this point VBECS locks the record.
User B attempts to select the same record for editing. VBECS displays an alert indicating that User A already has the record locked and prevents them from editing the record.

As long as a user is working on the data they have locked, the lock will stay active. However, if they switch to a different menu option or leave their workstation, their lock becomes **inactive** and an inactivity countdown begins.

The countdown value is defined by the *Lock Inactivity Timeout* field of the *Edit Divisions* menu in the *VBECS Admin* software (refer to the *VBECS Admin User Guide)*.
If an inactive lock's countdown reaches zero, the record lock is released.

Example: A division with a *Lock Inactivity Timeout* value of 10 minutes.
User A selects a record for editing. At this point VBECS locks the record.
User A stops using VBECS. The lock becomes inactive and a 10-minute inactivity countdown begins.

Option 1:
User A returns to VBECS before the countdown hits zero. The lock is again active, and the inactivity countdown stops.

Option 2:
User A returns to VBECS 11-minutes later. The lock is released, its menu option is closed, and the user needs to repeat their changes on that record. *VBECS does display a message to users when they have 60 seconds left on an inactivity countdown.

If a user Signs out of VBECS, any locks are released unless they use the "**Sign out anyway**" option (see Section: *Session Disconnect vs Sign Out*).

If a user Disconnects from VBECS, their locks remain and will begin their inactive countdown.

If VBECS has an unexpected shutdown or the user forcibly signs out of the server, record locks are not released. If this happens, there are 3 options available to release those locks:

- The user that owns the locks can restart VBECS. Starting VBECS releases any of the user's locks it finds which weren't released by pessimistic locking logic.
- Wait: locked records are automatically released by the database after 30 minutes.
- Contact *Customer Support* who can manually release the locks.

Security

VBECS contains sensitive data and performs a critical function, so it is critical to secure the system. It is important to secure the server from both users and malicious attacks from an individual who is trying to gain access to the system.

VBECS Active Directory (AD) Groups

To use the VBECS software, users must belong to the proper security groups. Each VBECS site has two AD security groups which grant them access to their app server only:

- One group that controls access to the VBECS software
  Naming convention: **vha*XXX*VbecsUsers**
- One group that controls access to the VBECS Admin software
  Naming convention: **vha*XXX*VbecsSupervisors**

To determine the name of your VBECS AD security groups, replace the *XXX* with your division's 3-digit *Site Code* found in *Table 3*.
For example, the site code for Hines is HIN; the two VBECS AD security groups would be *vhaHINVbecsUsers* and *vhaHINVbecsSupervisors*.

This groups are not managed by local OIT staff. Contact *Customer Support* to have staff added or removed from your VBECS AD security groups (refer to the SharePoint Getting Help page for instruction).

Glossary

Acronym, Term	Definition
AD	Active Directory. A directory service used to organize and manage domain objects such as computers, users, and security groups.
CPRS	Computerized Patient Record System.
DNS	Domain Naming System. Service that resolves network-joined computer names into IP addresses.
HL7	Health Level Seven.
LLP	Lower Layer Protocol.
MAG	Microsoft Azure Government. Name of the government subscription in the Microsoft Azure cloud.
PIV	Personal Identification Verification.
RDP	Remote Desktop Protocol.
SQL	Structured Query Language.
TCP/IP	Transmission Control Protocol/Internet Protocol.
VAEC	VA Enterprise Cloud. Term used to describe the VA computer systems contained within a commercial cloud.
VBECS	VistA Blood Establishment Computer Software.
VISN	Veterans Integrated Service Network.
XML	Extensible Markup Language.

Appendices

Appendix A: Verify VBECS HL7 Interface Protocols

This section can be used to verify the HL7 settings match initial VBECS installation values.

Set Up VBECS Protocol Definitions

1) From the 'HL7 Main" Menu, select **Interface Developer Options**.
2) Select **Protocol Edit**.
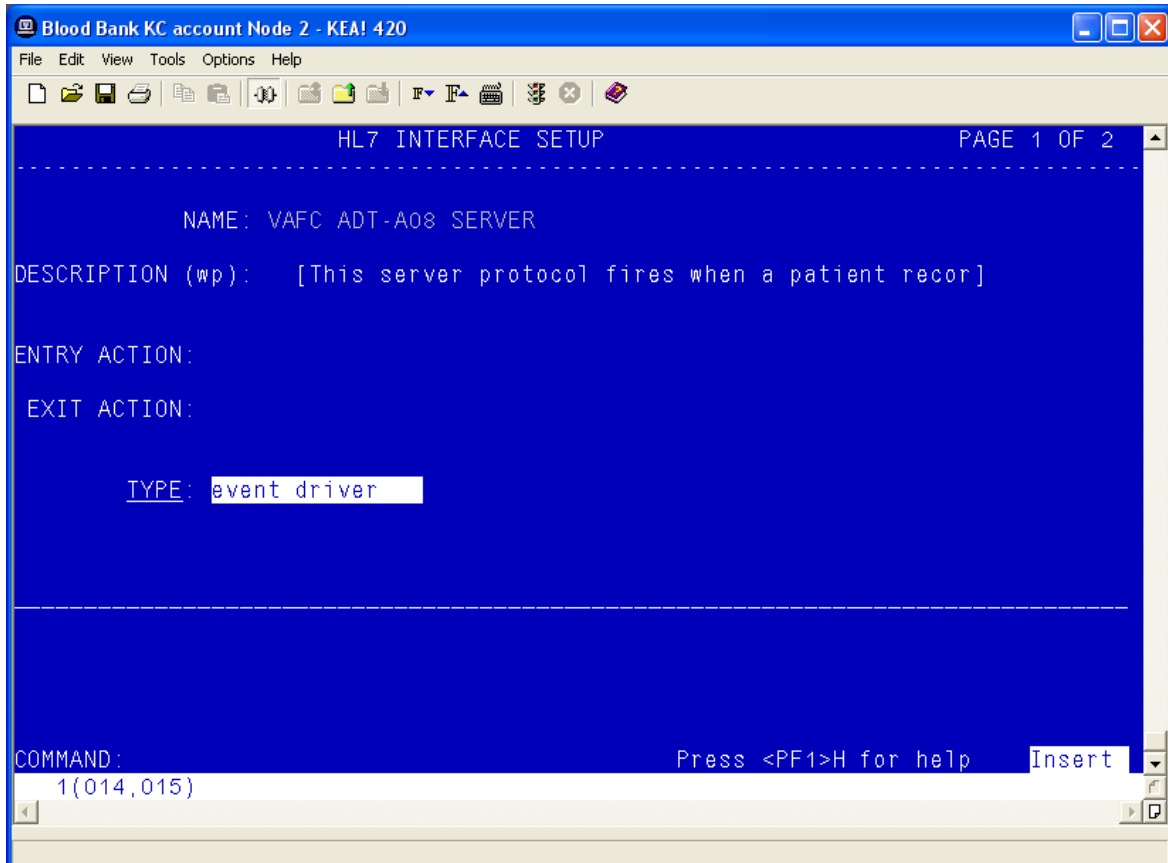
Figure 41: Example of HL7 Protocol Menu Navigation
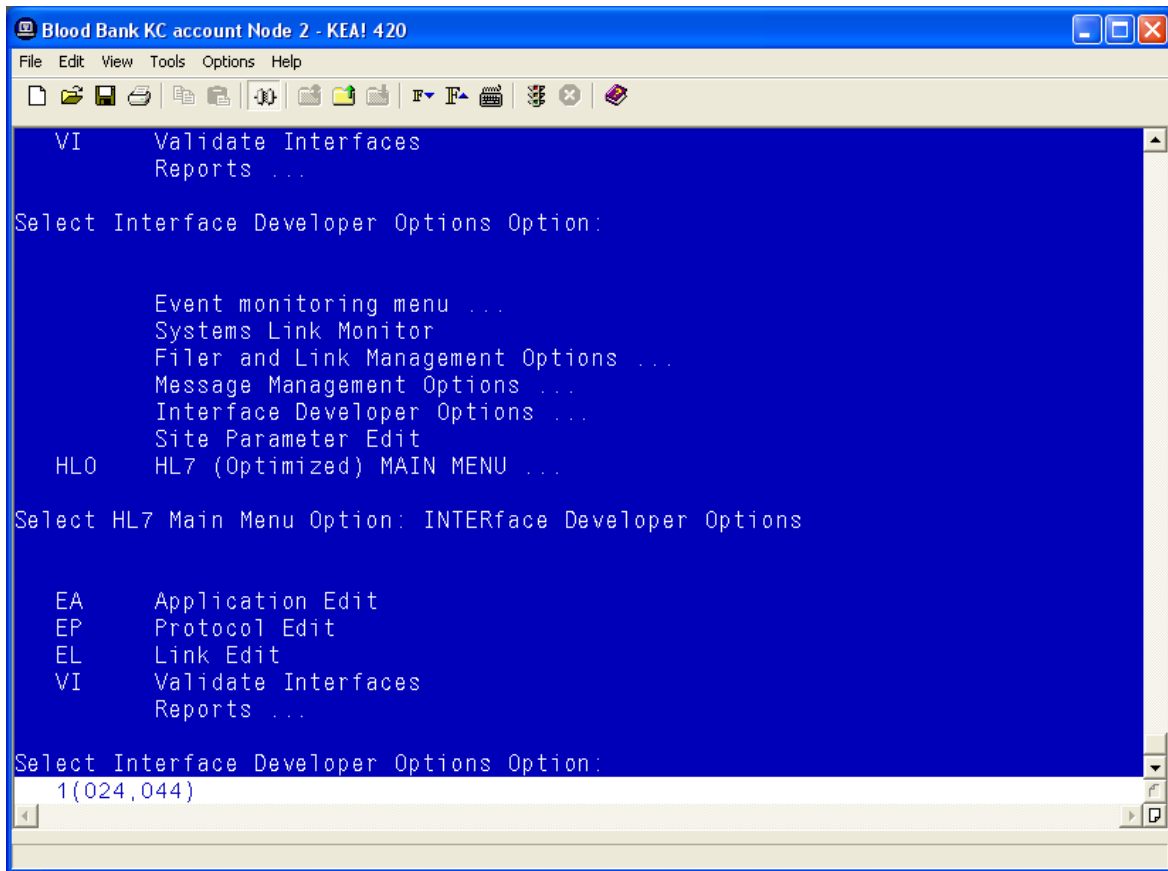
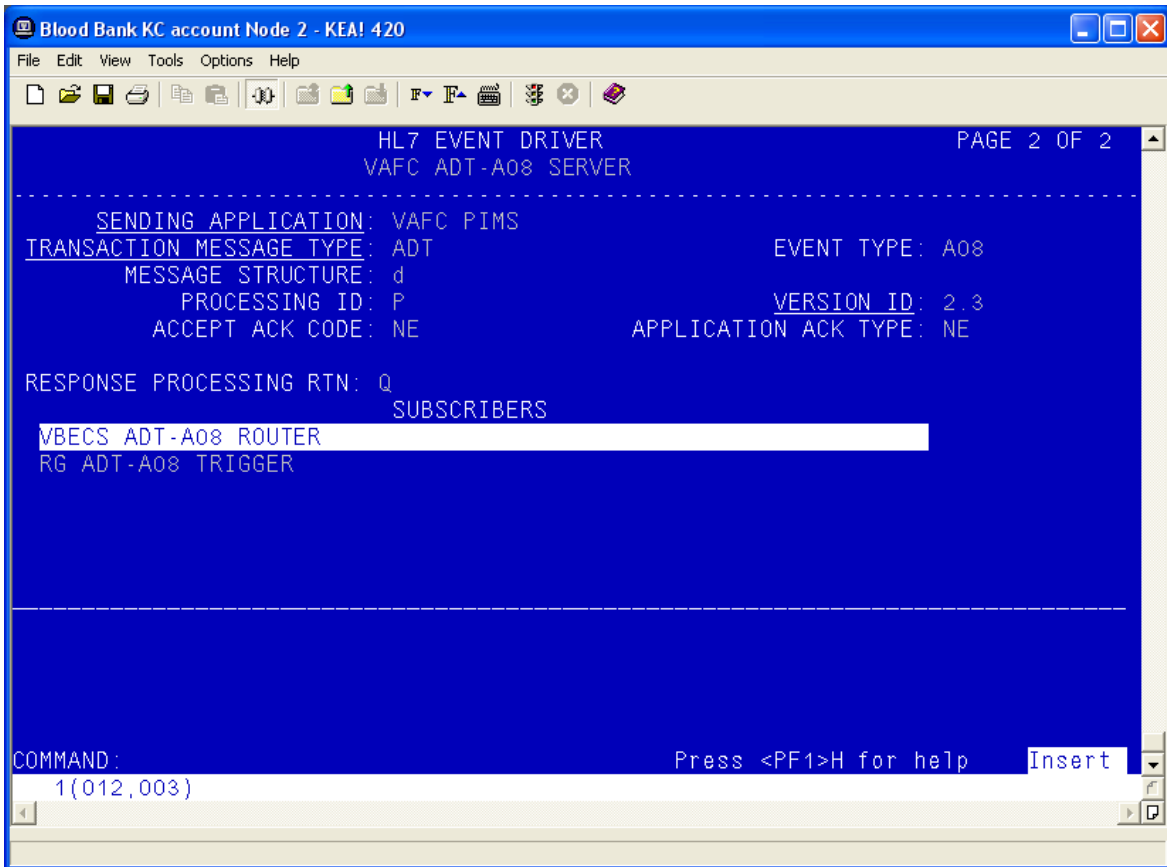## Patient Update Events

Edit VAFC ADT-A08 SERVER Protocol

1) Select Edit Protocol and enter **VAFC ADT-A08 SERVER**.
2) Move the cursor to the "TYPE" field and press **Enter**.

Figure 42: Example of HL7 Interface Setup

3) Move the cursor to below the last entry in the "SUBSCRIBERS" section.
4) Enter **VBECS ADT-A08 ROUTER** and press **Enter**.

Figure 43: Example of HL7 Event Driver

5) Accept the default settings in the sub-window.
6) Move the cursor to the "RECEIVING APPLICATION" prompt and verify that the entry is "VBECS ADT".
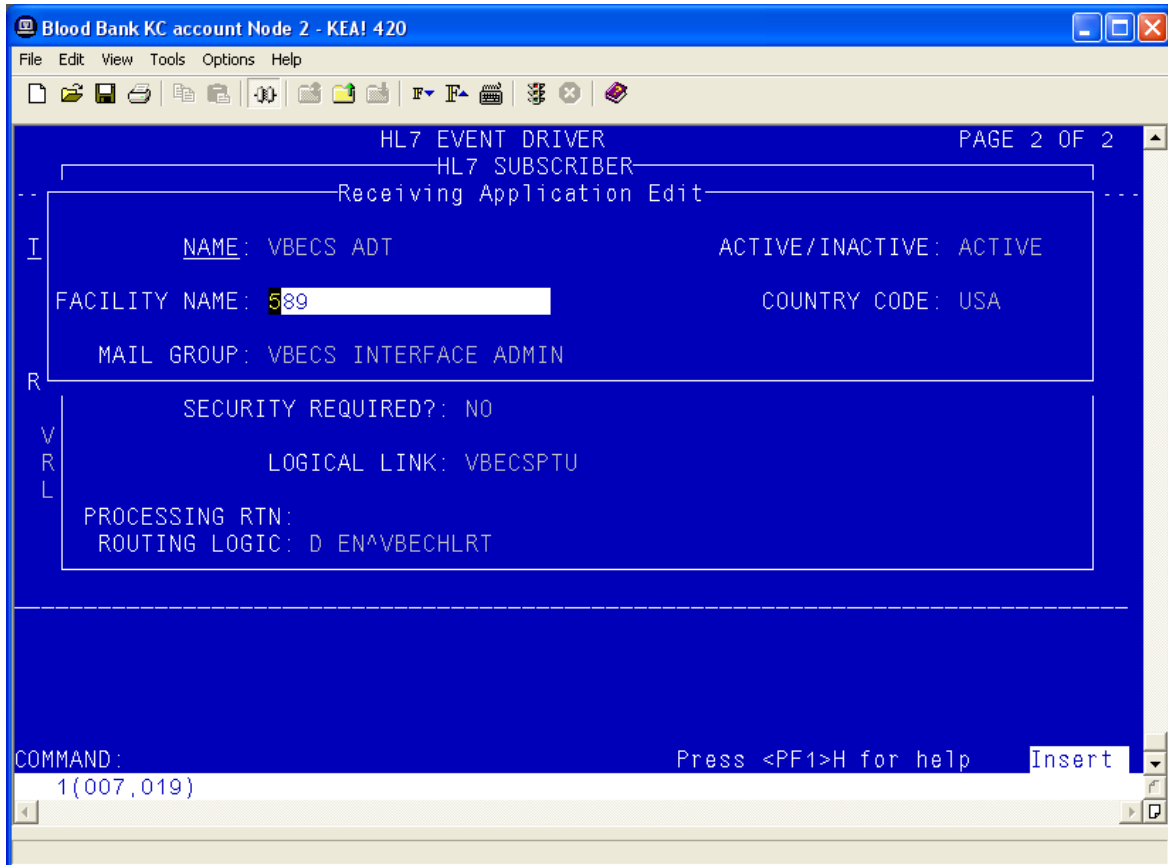7) Press **Enter**.

Figure 44: Example of HL7 Subscriber: VBECS ADT-A08 Router
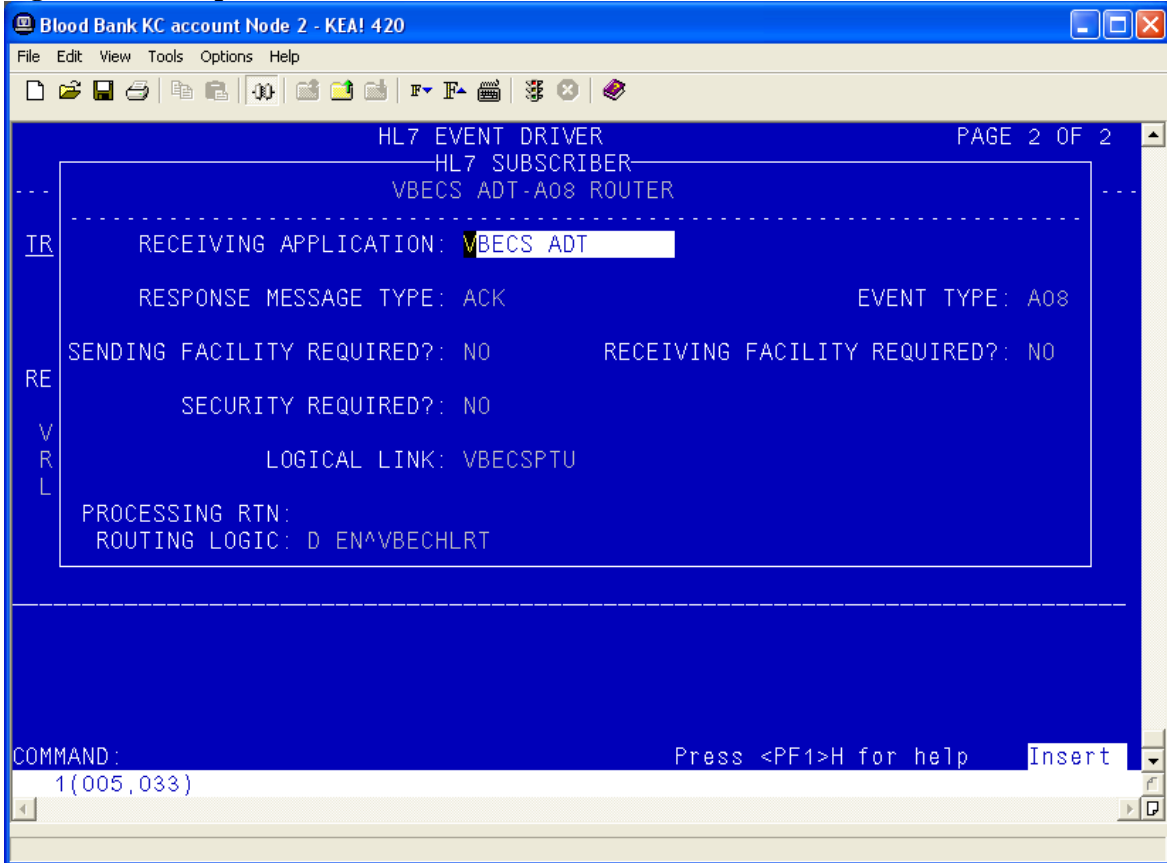
8) Move the cursor to the "FACILITY NAME" prompt and enter the station number of the primary division of the site.
9) Move the cursor to the "COMMAND" prompt.
10) Enter **Close** and press **Enter**.

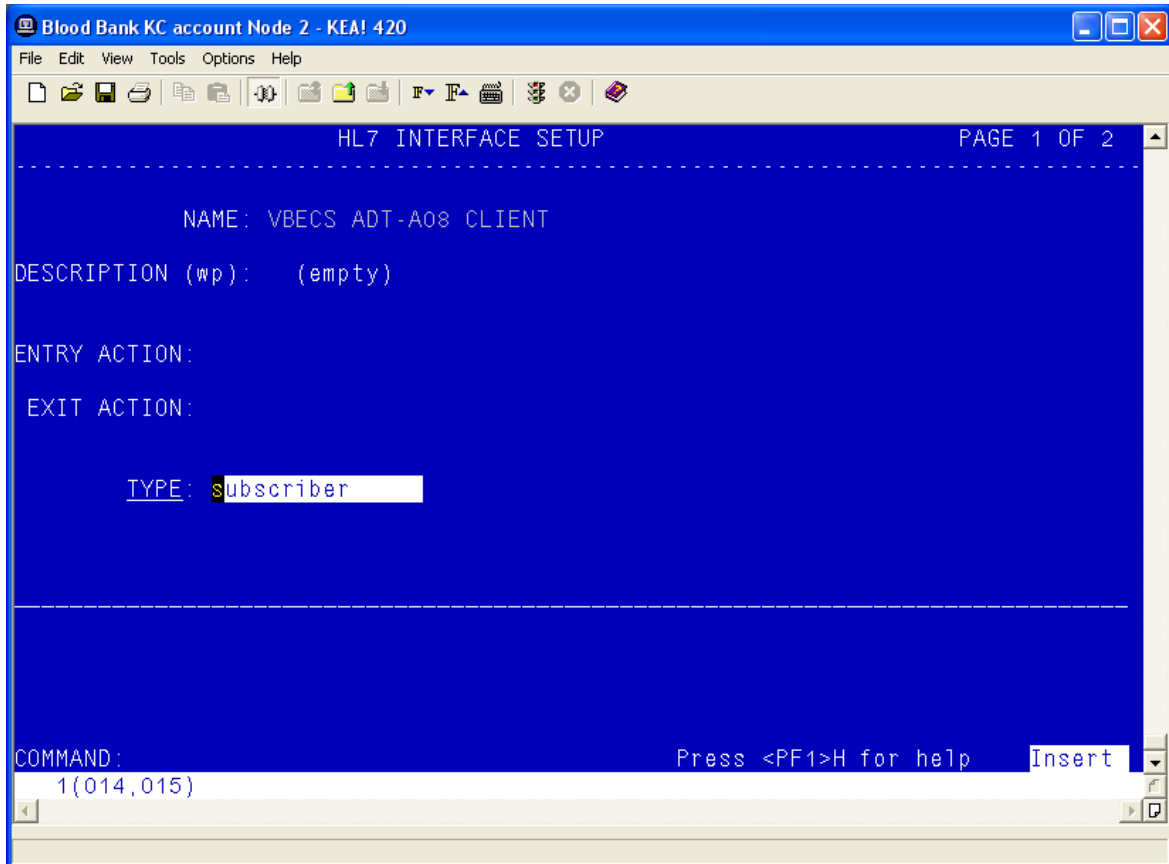**Figure 45: Example of HL7 Subscriber: VBECS ADT-A08 Router**

11) You will return to the previous screen (Figure 45). Move the cursor to the "COMMAND" prompt.
12) Enter **Save** and press **Enter**.
13) Enter **Exit** and press **Enter**.

VBECS ADT-A08 CLIENT
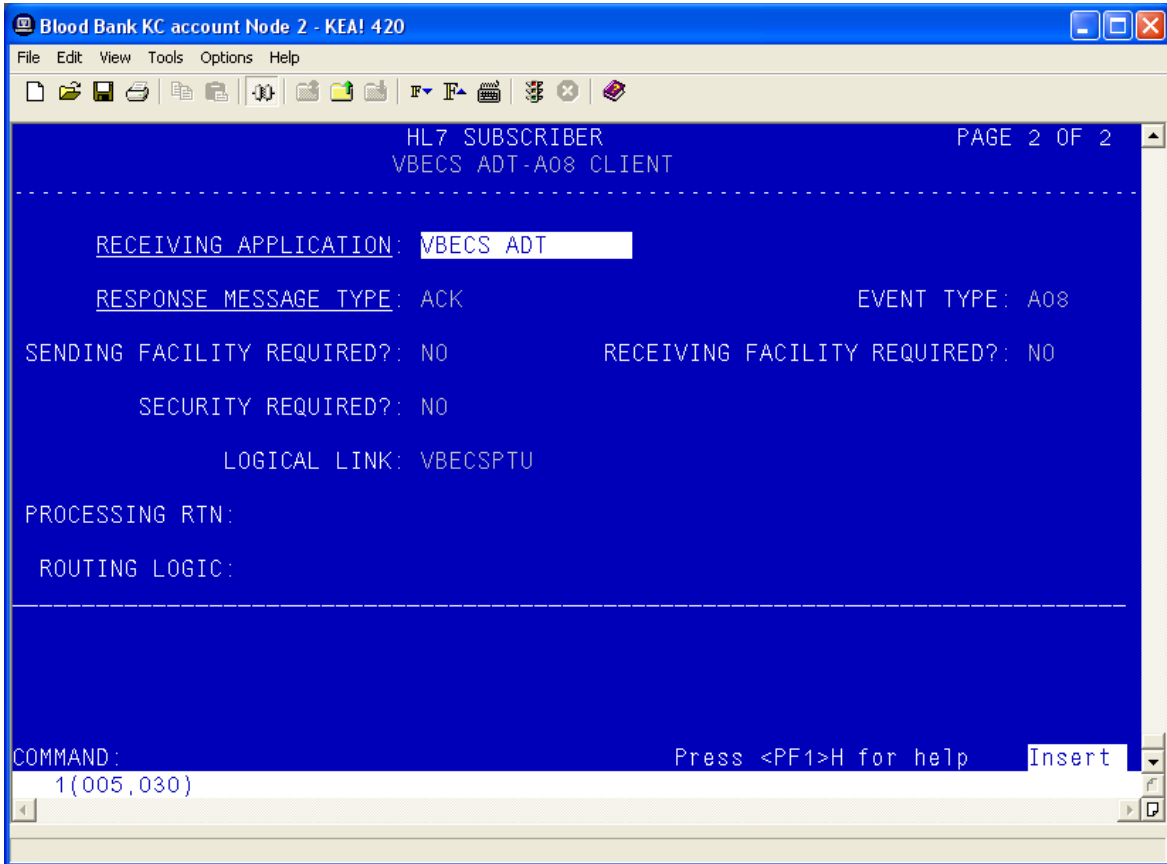
1) Select **VBECS ADT-A08 CLIENT**.
2) Move the cursor to the "TYPE" field and press **Enter**.

Figure 46: Example of HL7 Interface Setup

3) Move the cursor to the "RECEIVING APPLICATION" prompt and verify that the entry is "VBECS ADT".
4) Press **Enter**.

Figure 47: Example of HL7 Subscriber: VBECS ADT-A08 Client

5) Move the cursor to the "FACILITY NAME" prompt and enter the station number of the primary division of the site.
6) Move the cursor to the "COMMAND" prompt.
7) Enter **Close** and press **Enter**.
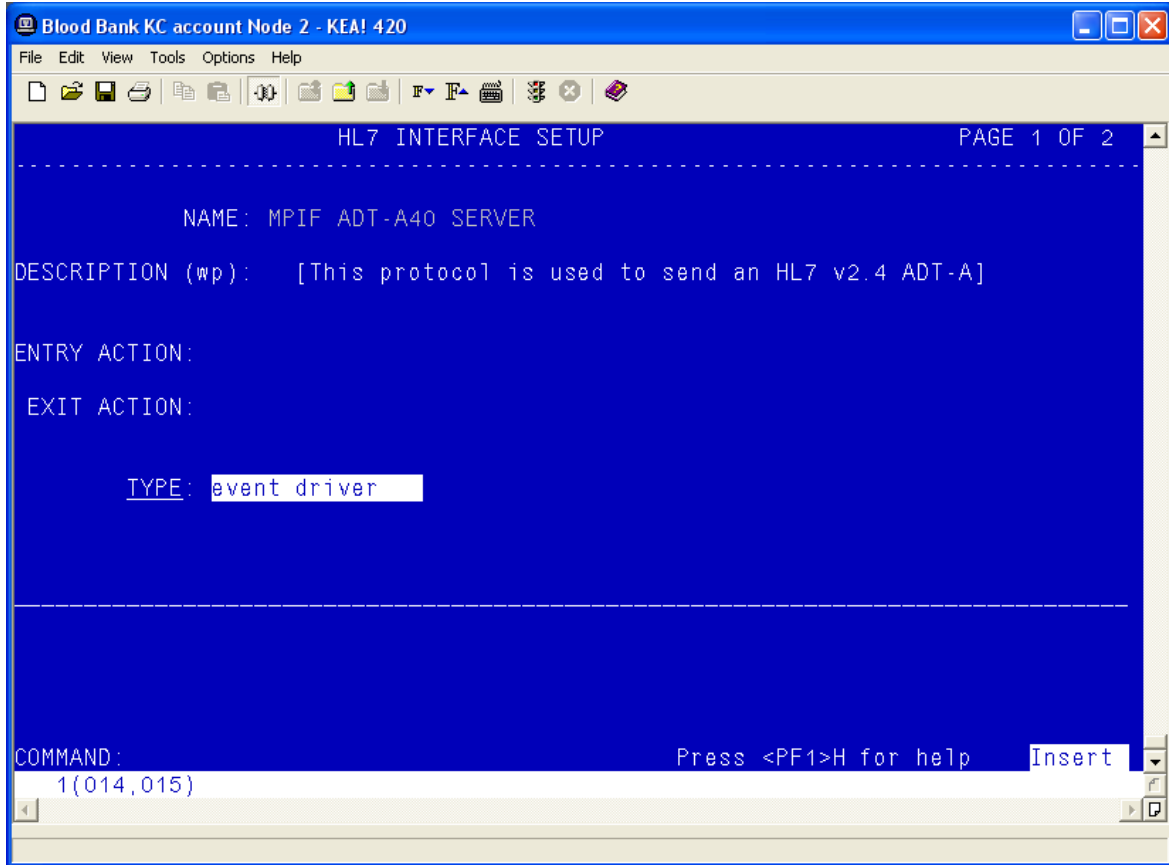
Figure 48: Example of Receiving Application Edit
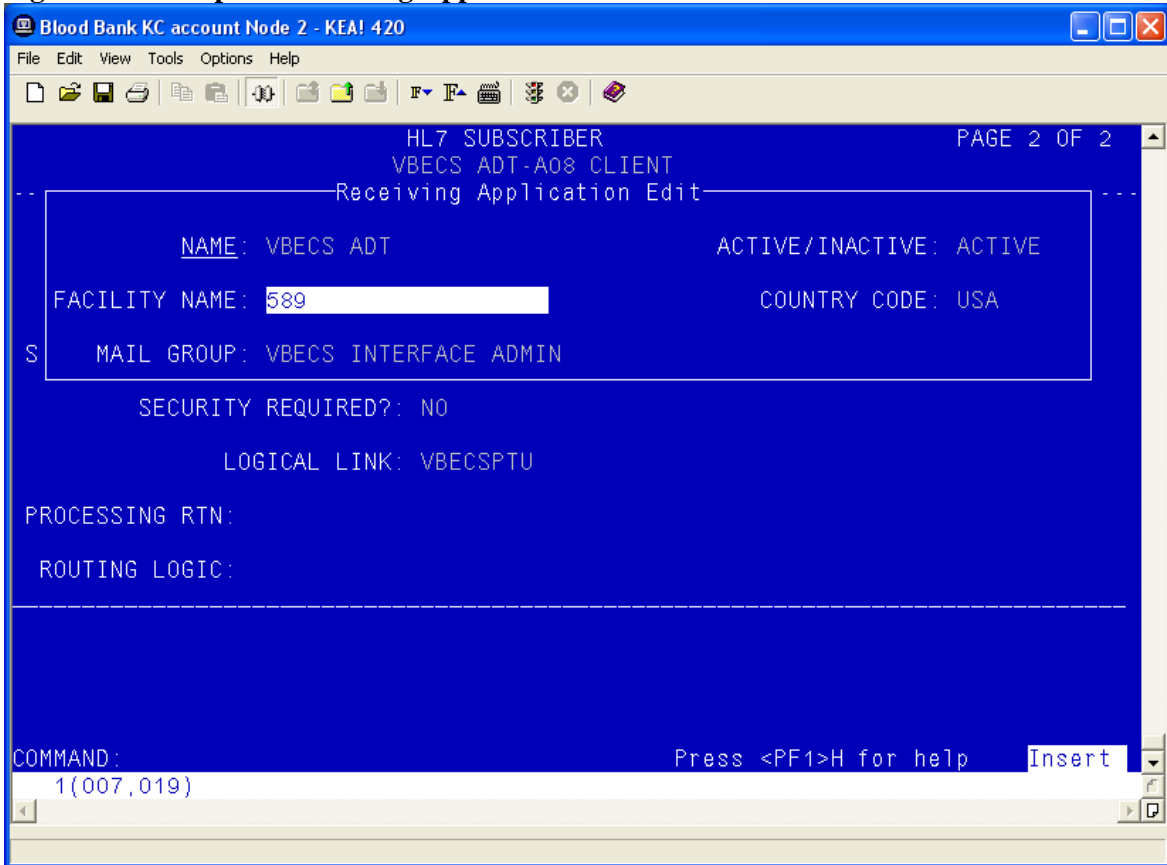
8) You will return to the previous screen (Figure 48). Move the cursor to the "COMMAND" prompt.
9) Enter **Save** and press **Enter**.
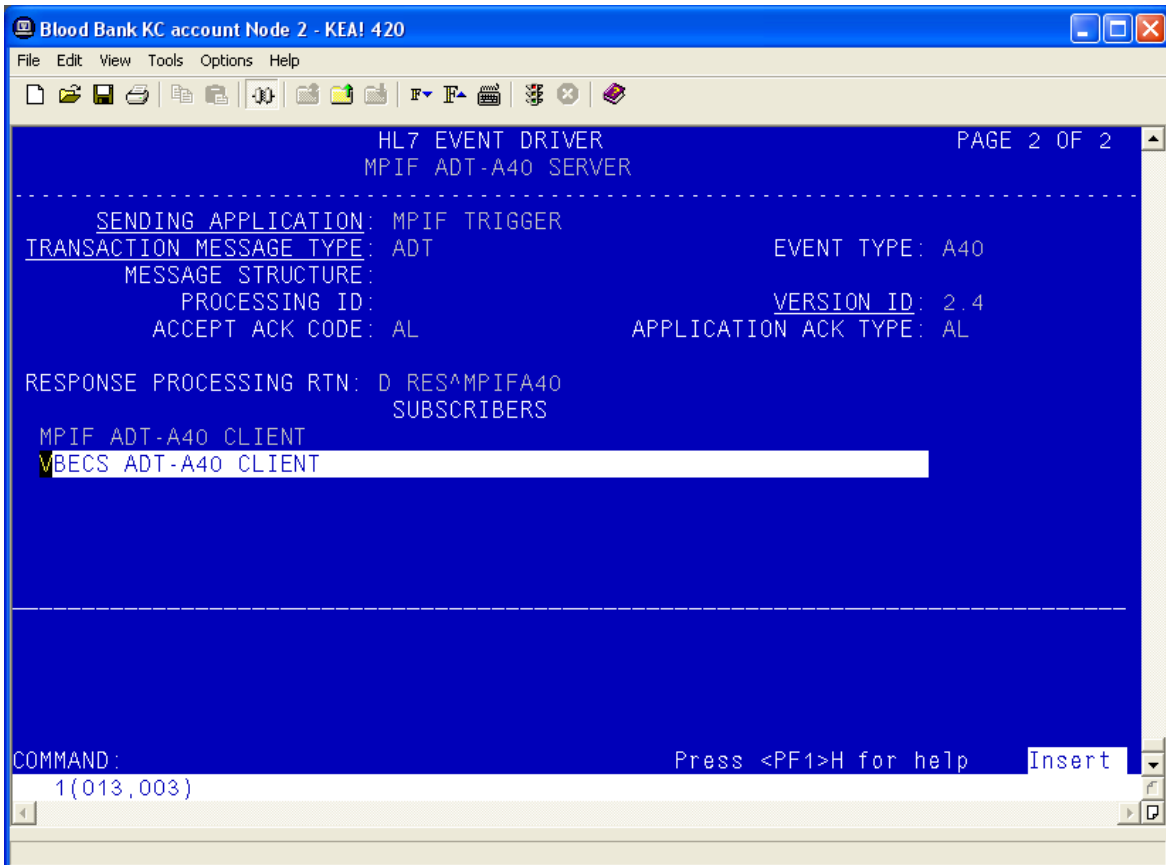10) Enter **Exit** and press **Enter**.

Patient Merge Events

1) Select **MPIF ADT-A40 SERVER**.
2) Move the cursor to the "TYPE" field and press **Enter.**

Figure 49: Example of HL7 Interface Setup

3) Move the cursor to below the last entry in the "SUBSCRIBERS" section.
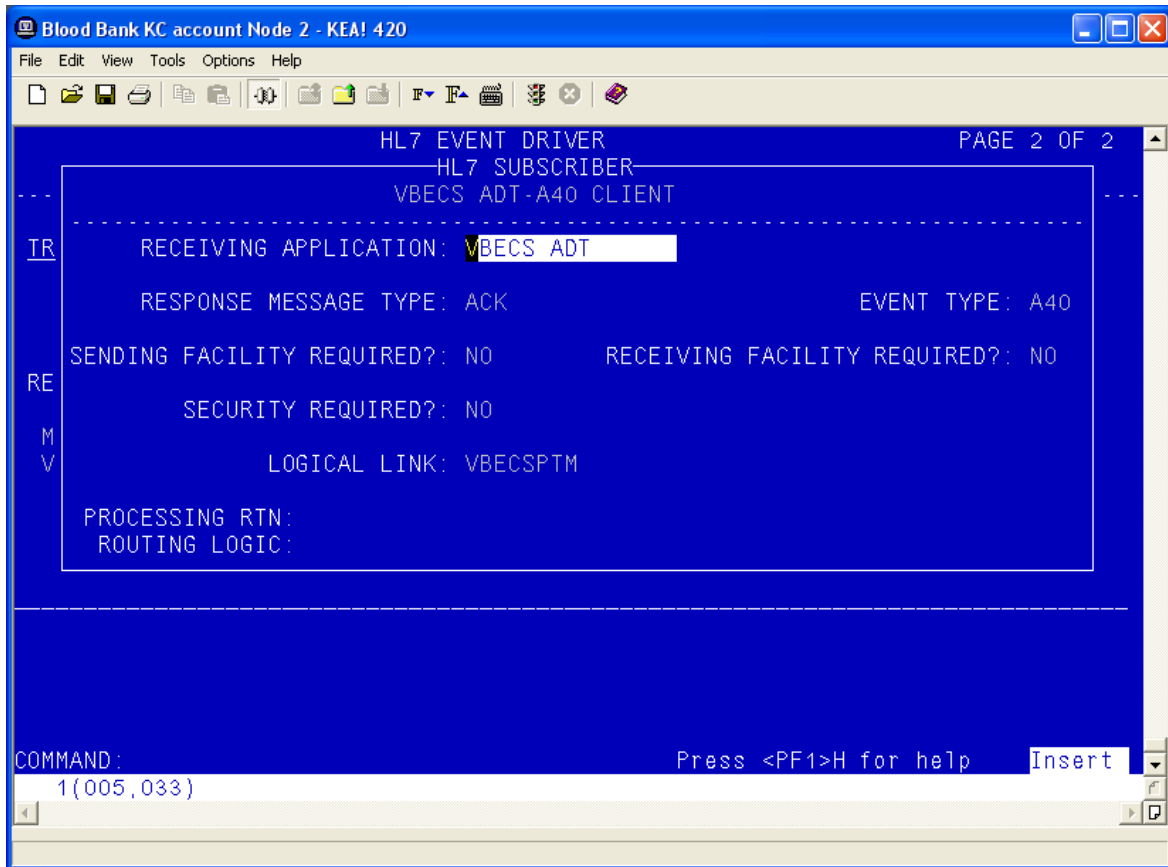4) Enter **VBECS ADT-A40 CLIENT** and press **Enter**.

Figure 50: Example of HL7 Event Driver: MPIF ADT-A40 Server

5) Accept the default settings in the sub-window.
6) Move the cursor to the "COMMAND" prompt.
7) Enter **Close** and press **Enter**.

8) You will return to the previous screen. Move the cursor to the "COMMAND" prompt.

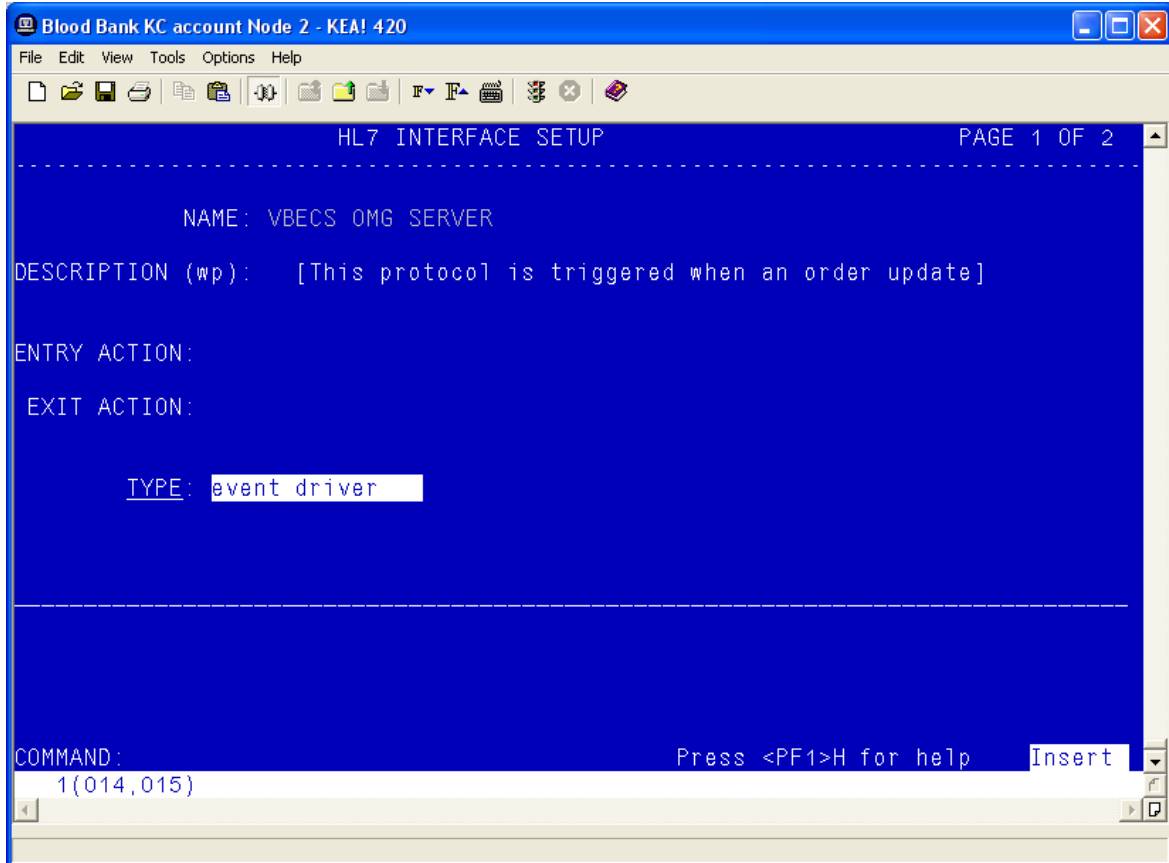**Figure 51: Example of HL7 Subscriber: VBECS ADT-A40 Client**

9) Enter **Save** and press **Enter**.
10) Enter **Exit** and press **Enter**.

Order Update Events

1) Select **VBECS OMG SERVER**.
2) Move the cursor to the "TYPE" field and press **Enter.**

Figure 52: Example of HL7 Order Update Setup

3) Move the cursor to below the last entry in the "SUBSCRIBERS" section.

4) Enter **VBECS OMG CLIENT** and press **Enter**.

Figure 53: Example of HL7 Event Driver: VBECS OMG Server
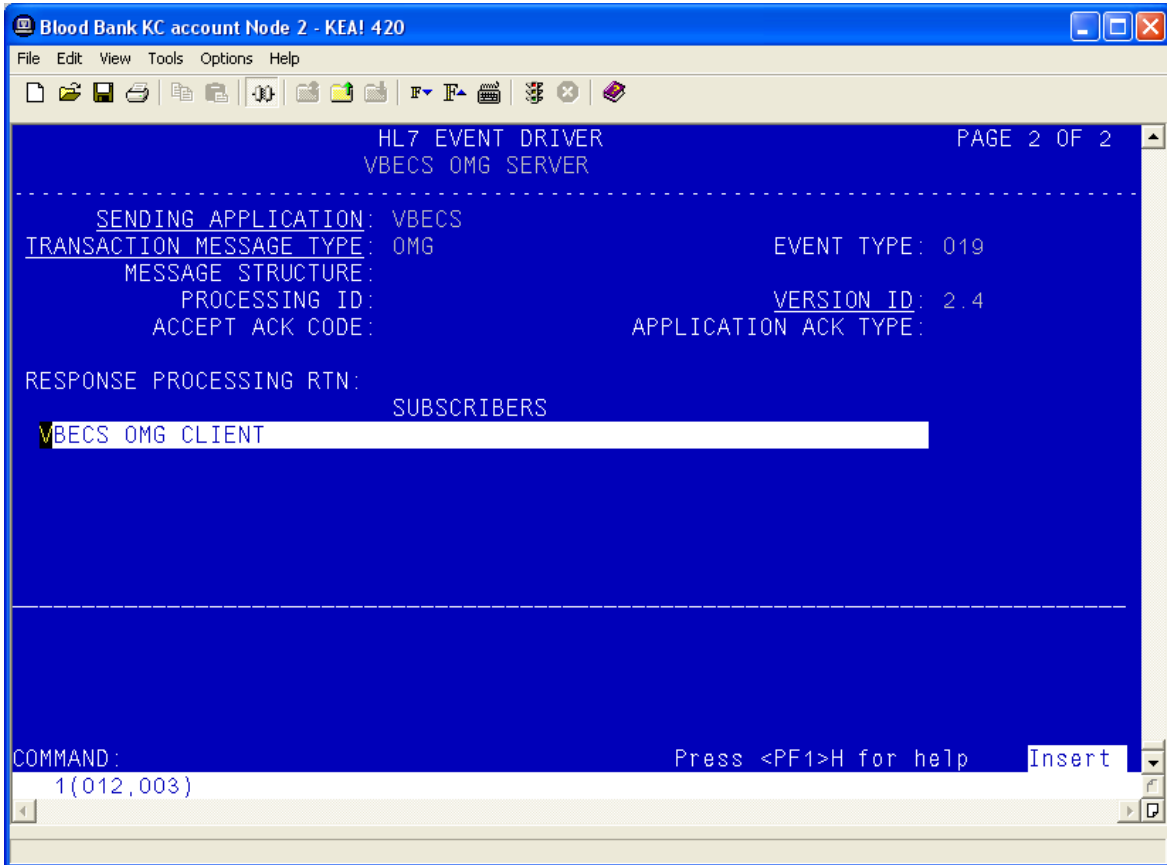
5) Verify that the Receiving Application is OERR.

Figure 54: Example of HL7 Event Driver: VBECS OMG Server

6) Move the cursor to the "COMMAND" prompt.
7) Enter **Close** and press **Enter**.
8) Move the cursor to the "COMMAND" prompt.
9) Enter **Save** and press **Enter**.
10) Enter **Exit** and press **Enter**.

Order Update Events (continued)

1) Select **VBECS OMG CLIENT**.
2) Move the cursor to the "TYPE" field and press **Enter.**
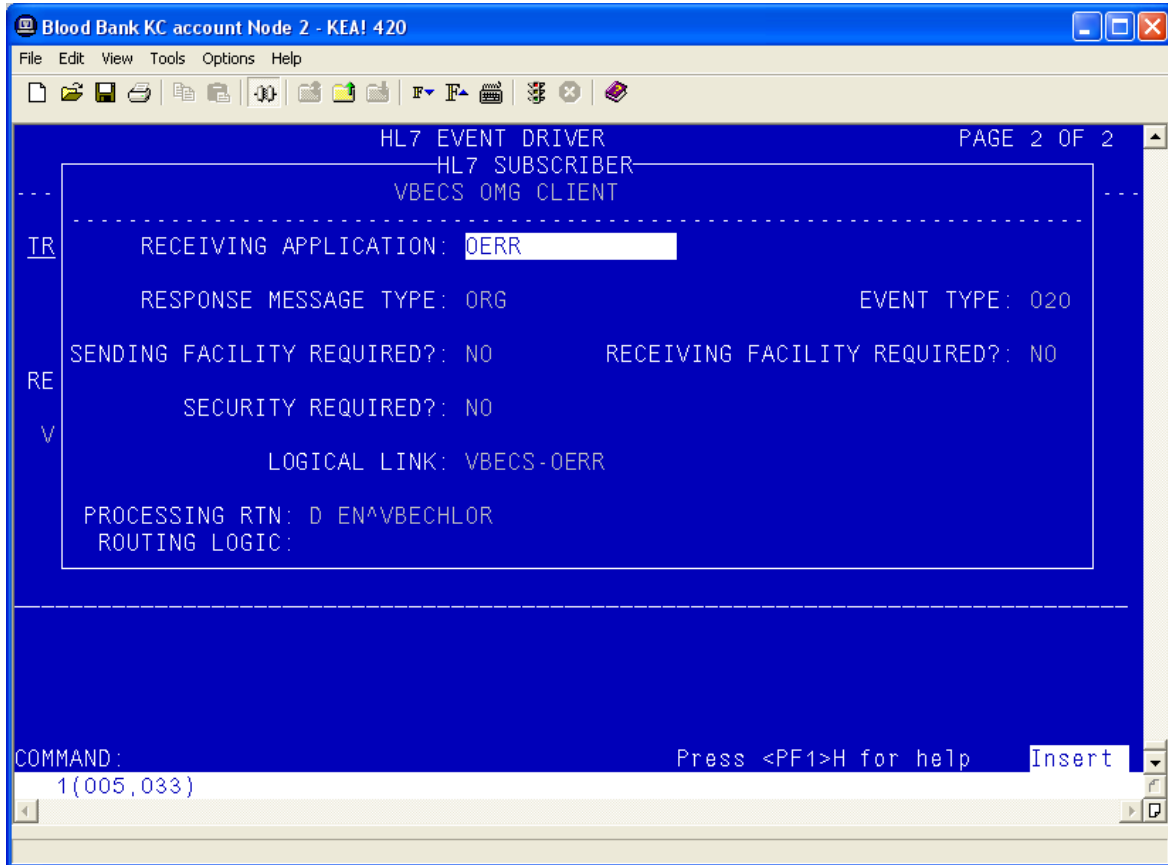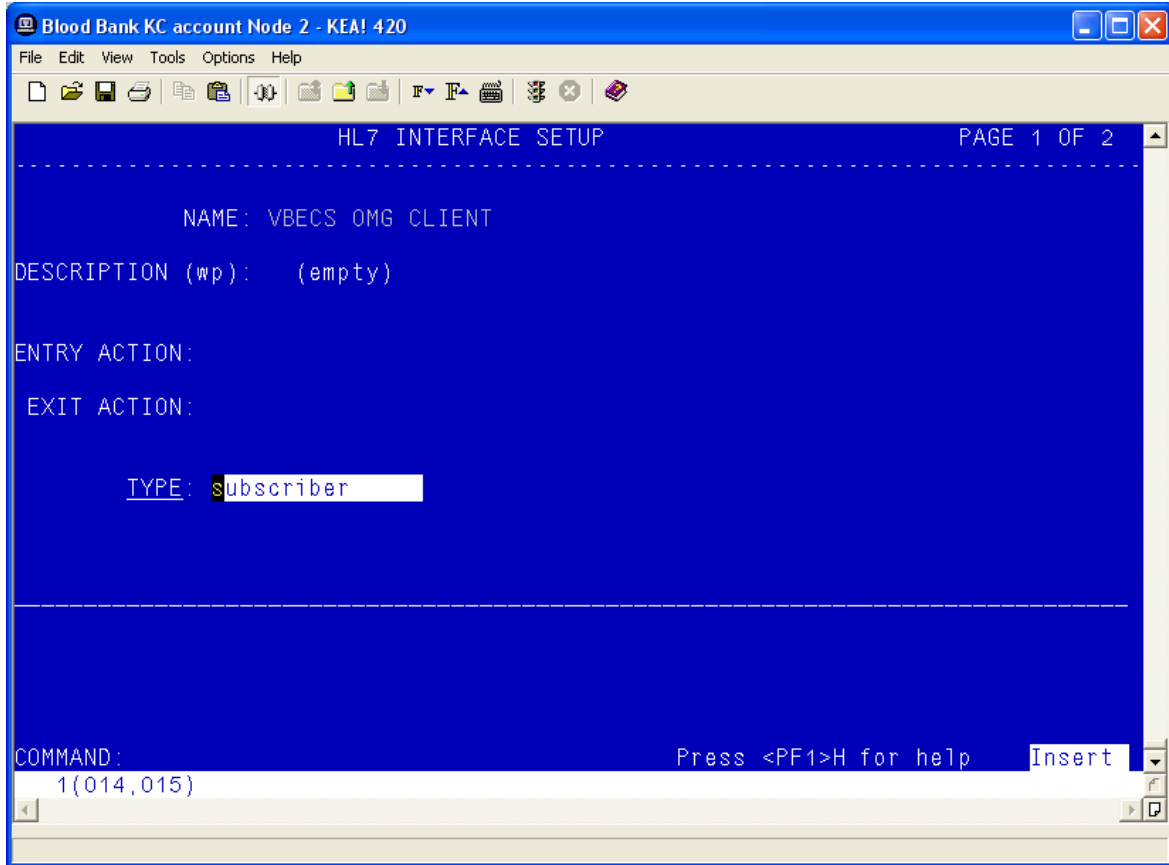
Figure 55: Example of HL7 Interface Setup

```
Blood Bank KC account Node 2 - KEA! 420
File  Edit  View  Tools  Options  Help

                    HL7 INTERFACE SETUP                    PAGE 1 OF 2
---------------------------------------------------------------------------

          NAME: VBECS OMG CLIENT

DESCRIPTION (wp):   (empty)


ENTRY ACTION:

 EXIT ACTION:


        TYPE: Subscriber




_____



COMMAND:                              Press <PF1>H for help      Insert
     1(014,015)
```

3) Verify that the Receiving Application is OERR and press **Enter**.

Figure 56: Example of HL7 Event Driver: VBECS OMG Client

4) Enter the correct Facility Name

Figure 57: Example of HL7 Subscriber: VBECS ADT-A40 Client
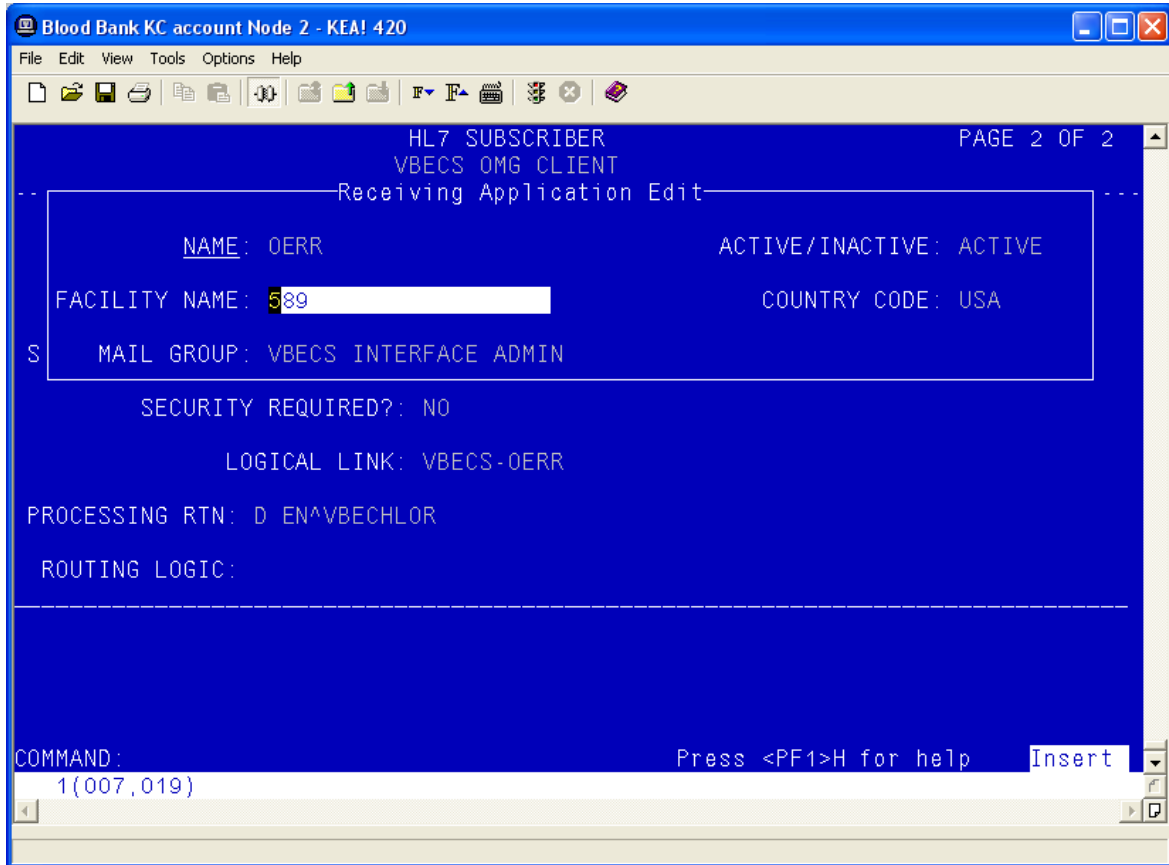
5) Move the cursor to the "COMMAND" prompt.
6) Enter **Close** and press **Enter**.
7) Move the cursor to the "COMMAND" prompt.
8) Enter **Save** and press **Enter**.
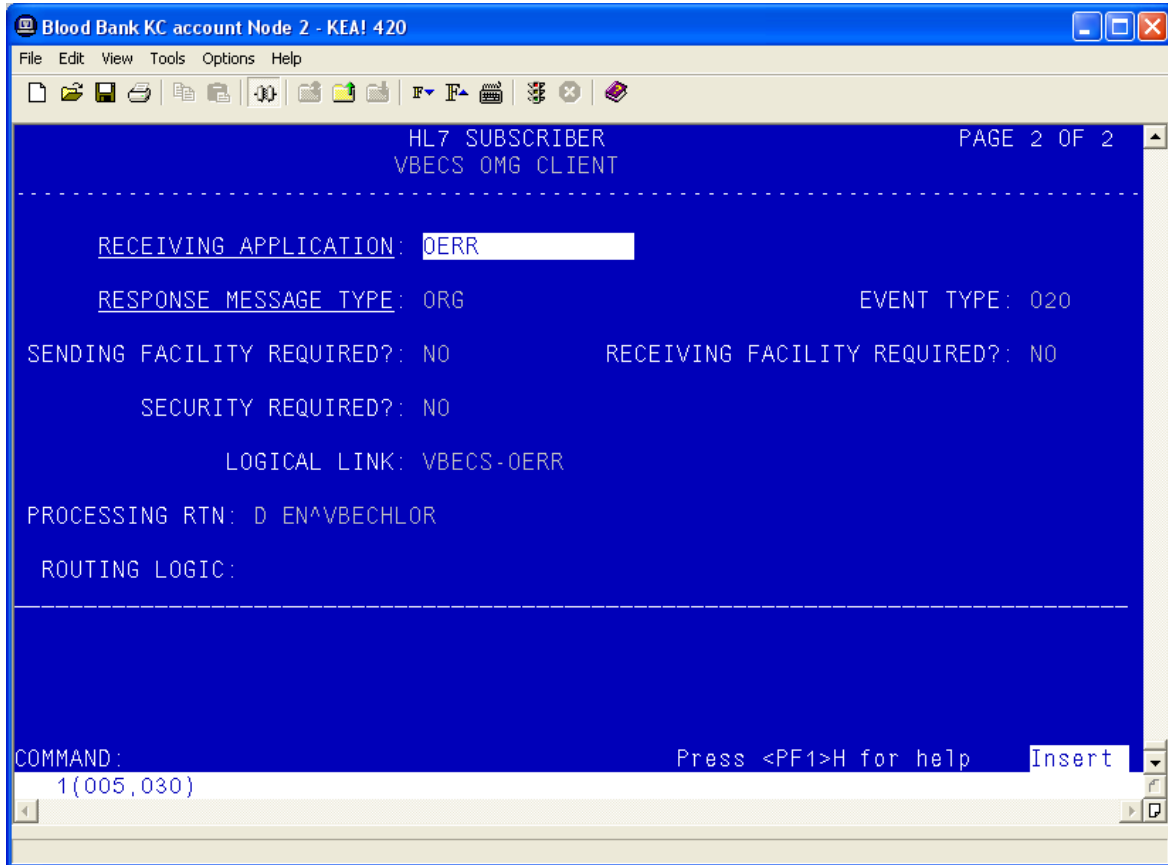9) Enter **Exit** and press **Enter**.

Appendix B: Laboratory Test File (#60)

Improper configuration of the VBECS related Laboratory tests may result in anomalies when ordering, resulting, or reporting workload for these tests. If any anomalies are noted, refer to this list for the proper configuration of these tests.

The Laboratory tests must be configured for your site. The appropriate INSTITUTION and ACCESSION AREA must be added using the "Edit cosmic tests" (LRDIECOSMIC) option. The TYPE field in Existing Blood Bank tests should be set to OUTPUT to prevent these tests from being ordered after VBECS has been installed.

Any of the diagnostic tests that will be ordered for Lab Collect (LC) must also have a LAB COLLECTION SAMPLE defined in addition to the COLLECTION SAMPLE. The LAB COLLECTION SAMPLE can be edited with the EDIT COSMIC TESTS (LRDIECOSMIC) option.

LABORATORY TEST File (#60)	
NAME: ABO/RH – LAB	TYPE: OUTPUT (CAN BE DISPLAYED)
SUBSCRIPT: BLOOD BANK	UNIQUE COLLECTION SAMPLE: YES
HIGHEST URGENCY ALLOWED: STAT	PRINT NAME: ABO RH
COLLECTION SAMPLE: BLOOD	
INSTITUTION: VA HEARTLAND – WEST, VISN 15	
ACCESSION AREA: BLOOD BANK	
INSTITUTION: COLUMBIA, MO VAMC	ACCESSION AREA: COBLOOD BANK
INSTITUTION: LEAVENWORTH VAMC	ACCESSION AREA: LEBLOOD BANK
INSTITUTION: TOPEKA, KS VAMC	ACCESSION AREA: TOBLOOD BANK
INSTITUTION: WICHITA VAMC	ACCESSION AREA: WIBLOOD BANK
NAME: ANTIBODY SCREEN – LAB	TYPE: OUTPUT (CAN BE DISPLAYED)
SUBSCRIPT: BLOOD BANK	UNIQUE COLLECTION SAMPLE: YES
HIGHEST URGENCY ALLOWED: STAT	PRINT NAME: AB SCRN
COLLECTION SAMPLE: BLOOD	
INSTITUTION: VA HEARTLAND – WEST, VISN 15	
ACCESSION AREA: BLOOD BANK	
INSTITUTION: COLUMBIA, MO VAMC	ACCESSION AREA: COBLOOD BANK
INSTITUTION: LEAVENWORTH VAMC	ACCESSION AREA: LEBLOOD BANK
INSTITUTION: TOPEKA, KS VAMC	ACCESSION AREA: TOBLOOD BANK
INSTITUTION: WICHITA VAMC	ACCESSION AREA: WIBLOOD BANK
NAME: CRYOPRECIPITATE – LAB	TYPE: OUTPUT (CAN BE DISPLAYED)
SUBSCRIPT: BLOOD BANK	UNIQUE COLLECTION SAMPLE: YES
HIGHEST URGENCY ALLOWED: STAT	PRINT NAME: CRYOPRE
COLLECTION SAMPLE: VBECS – NO SPECIMEN REQUIRED	
INSTITUTION: VA HEARTLAND – WEST, VISN 15	
ACCESSION AREA: BLOOD BANK	
INSTITUTION: COLUMBIA, MO VAMC	ACCESSION AREA: COBLOOD BANK
INSTITUTION: LEAVENWORTH VAMC	ACCESSION AREA: LEBLOOD BANK
INSTITUTION: TOPEKA, KS VAMC	ACCESSION AREA: TOBLOOD BANK
INSTITUTION: WICHITA VAMC	ACCESSION AREA: WIBLOOD BANK
NAME: DIRECT ANTIGLOBULIN TEST – LAB	TYPE: OUTPUT (CAN BE DISPLAYED)
SUBSCRIPT: BLOOD BANK	UNIQUE COLLECTION SAMPLE: YES
HIGHEST URGENCY ALLOWED: STAT	PRINT NAME: DAT
COLLECTION SAMPLE: BLOOD	
INSTITUTION: VA HEARTLAND – WEST, VISN 15	
ACCESSION AREA: BLOOD BANK	

LABORATORY TEST File (#60)	
INSTITUTION: COLUMBIA, MO VAMC	ACCESSION AREA: COBLOOD BANK
INSTITUTION: LEAVENWORTH VAMC	ACCESSION AREA: LEBLOOD BANK
INSTITUTION: TOPEKA, KS VAMC	ACCESSION AREA: TOBLOOD BANK
INSTITUTION: WICHITA VAMC	ACCESSION AREA: WIBLOOD BANK

NAME: FRESH FROZEN PLASMA – LAB	TYPE: OUTPUT (CAN BE DISPLAYED)
SUBSCRIPT: BLOOD BANK	UNIQUE COLLECTION SAMPLE: YES
HIGHEST URGENCY ALLOWED: STAT	PRINT NAME: FFP
COLLECTION SAMPLE: VBECS – NO SPECIMEN REQUIRED	
INSTITUTION: VA HEARTLAND – WEST, VISN 15	
ACCESSION AREA: BLOOD BANK	
INSTITUTION: COLUMBIA, MO VAMC	ACCESSION AREA: COBLOOD BANK
INSTITUTION: LEAVENWORTH VAMC	ACCESSION AREA: LEBLOOD BANK
INSTITUTION: TOPEKA, KS VAMC	ACCESSION AREA: TOBLOOD BANK
INSTITUTION: WICHITA VAMC	ACCESSION AREA: WIBLOOD BANK

NAME: OTHER – LAB	TYPE: OUTPUT (CAN BE DISPLAYED)
SUBSCRIPT: BLOOD BANK	UNIQUE COLLECTION SAMPLE: YES
HIGHEST URGENCY ALLOWED: STAT	PRINT NAME: VBOTHER
COLLECTION SAMPLE: VBECS – NO SPECIMEN REQUIRED	
INSTITUTION: VA HEARTLAND – WEST, VISN 15	
ACCESSION AREA: BLOOD BANK	
INSTITUTION: COLUMBIA, MO VAMC	ACCESSION AREA: COBLOOD BANK
INSTITUTION: LEAVENWORTH VAMC	ACCESSION AREA: LEBLOOD BANK
INSTITUTION: TOPEKA, KS VAMC	ACCESSION AREA: TOBLOOD BANK
INSTITUTION: WICHITA VAMC	ACCESSION AREA: WIBLOOD BANK

NAME: PLATELETS – LAB	TYPE: OUTPUT (CAN BE DISPLAYED)
SUBSCRIPT: BLOOD BANK	UNIQUE COLLECTION SAMPLE: YES
HIGHEST URGENCY ALLOWED: STAT	PRINT NAME: PLTLTS
COLLECTION SAMPLE: VBECS – NO SPECIMEN REQUIRED	
INSTITUTION: VA HEARTLAND – WEST, VISN 15	
ACCESSION AREA: BLOOD BANK	
INSTITUTION: COLUMBIA, MO VAMC	ACCESSION AREA: COBLOOD BANK
INSTITUTION: LEAVENWORTH VAMC	ACCESSION AREA: LEBLOOD BANK
INSTITUTION: TOPEKA, KS VAMC	ACCESSION AREA: TOBLOOD BANK
INSTITUTION: WICHITA VAMC	ACCESSION AREA: WIBLOOD BANK

NAME: RED BLOOD CELLS – LAB	TYPE: OUTPUT (CAN BE DISPLAYED)
SUBSCRIPT: BLOOD BANK	UNIQUE COLLECTION SAMPLE: YES
HIGHEST URGENCY ALLOWED: STAT	PRINT NAME: RED BLD
COLLECTION SAMPLE: VBECS – NO SPECIMEN REQUIRED	
INSTITUTION: VA HEARTLAND – WEST, VISN 15	
ACCESSION AREA: BLOOD BANK	
INSTITUTION: COLUMBIA, MO VAMC	ACCESSION AREA: COBLOOD BANK
INSTITUTION: LEAVENWORTH VAMC	ACCESSION AREA: LEBLOOD BANK
INSTITUTION: TOPEKA, KS VAMC	ACCESSION AREA: TOBLOOD BANK
INSTITUTION: WICHITA VAMC	ACCESSION AREA: WIBLOOD BANK

NAME: TRANSFUSION REACTION WORKUP – LAB	
TYPE: OUTPUT (CAN BE DISPLAYED)	SUBSCRIPT: BLOOD BANK
UNIQUE COLLECTION SAMPLE: YES	HIGHEST URGENCY ALLOWED: STAT
PRINT NAME: TRW	
COLLECTION SAMPLE: BLOOD	
INSTITUTION: VA HEARTLAND – WEST, VISN 15	
ACCESSION AREA: BLOOD BANK	
INSTITUTION: COLUMBIA, MO VAMC	ACCESSION AREA: COBLOOD BANK
INSTITUTION: LEAVENWORTH VAMC	ACCESSION AREA: LEBLOOD BANK

LABORATORY TEST File (#60)	
INSTITUTION: TOPEKA, KS VAMC	ACCESSION AREA: TOBLOOD BANK
INSTITUTION: WICHITA VAMC	ACCESSION AREA: WIBLOOD BANK
NAME: TYPE & SCREEN – LAB	TYPE: OUTPUT (CAN BE DISPLAYED)
SUBSCRIPT: BLOOD BANK	UNIQUE COLLECTION SAMPLE: YES
HIGHEST URGENCY ALLOWED: STAT	PRINT NAME: T&S
COLLECTION SAMPLE: BLOOD	
INSTITUTION: VA HEARTLAND - WEST, VISN 15	
ACCESSION AREA: BLOOD BANK	
INSTITUTION: COLUMBIA, MO VAMC	ACCESSION AREA: COBLOOD BANK
INSTITUTION: LEAVENWORTH VAMC	ACCESSION AREA: LEBLOOD BANK
INSTITUTION: TOPEKA, KS VAMC	ACCESSION AREA: TOBLOOD BANK
INSTITUTION: WICHITA VAMC	ACCESSION AREA: WIBLOOD BANK
NAME: WHOLE BLOOD – LAB	TYPE: OUTPUT (CAN BE DISPLAYED)
SUBSCRIPT: BLOOD BANK	UNIQUE COLLECTION SAMPLE: YES
HIGHEST URGENCY ALLOWED: STAT	PRINT NAME: WB
COLLECTION SAMPLE: VBECS – NO SPECIMEN REQUIRED	
INSTITUTION: VA HEARTLAND - WEST, VISN 15	
ACCESSION AREA: BLOOD BANK	
INSTITUTION: COLUMBIA, MO VAMC	ACCESSION AREA: COBLOOD BANK
INSTITUTION: LEAVENWORTH VAMC	ACCESSION AREA: LEBLOOD BANK
INSTITUTION: TOPEKA, KS VAMC	ACCESSION AREA: TOBLOOD BANK
INSTITUTION: WICHITA VAMC	ACCESSION AREA: WIBLOOD BANK

Index

C

D

G

H

I

M

O

P

R

S

V

W

Revision History

Date	Revision	Description	Author
04/10/24	1.0	VBECS 2.4.0 Rev A Modified VBECS 2.3.4 Technical Manual-Security Guide, Version 2.0 to create VBECS 2.4.0 Technical Manual-Security Guide, Version 1.0.	BBM team

This is the last page of the *VBECS 2.3.4 Technical Manual-Security Guide*.