CABS Viewer ™

Carrier Access Billing System
BOS BDT File Format
and Reporting Utility

User Guide

Version 1.7.46.1

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CABS BOS BDT File Format and Reporting Utility User's Guide

Version 1.7.46.1

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Welcome

Thank you for using CABS Viewer, created by Lymeware Corporation. The CABS Viewer product is designed to help you enable your organization to efficiently format, organize and display CABS billing information which is crucial to many aspects of your business.

Most importantly, the CABS Viewer product allows CLECs and other service providers to seamlessly blend their CABS billing data in to whatever OSS or billing system currently in use. The instructions in this guide will introduce you to some basic carrier billing concepts and help you get familiar with the fundamentals of using your CABS Viewer product.

About this Guide

This guide is current with the details of operation for Lymeware's CABS Viewer, version 1.7.46.1. It is designed for users who are new to the CABS Viewer product or the areas of carrier billing management and PC applications generally.

The information in this guide describes how to use a PC and a command line interface to operate CABS Viewer in order to perform a broad range of billing data conversion and reporting tasks.

Readers are not required to have any programming or software development knowledge, but should be generally familiar with:

- The use of a personal computer,
- The use of a text editor such as Microsoft Wordpad, vi, or Vim
- Optionally the use of a spreadsheet program such as Microsoft Excel, StarOffice or OpenOffice,
- Optionally the use of an XML editor such as Altova XMLSpy, or XML Maker,
- Optionally the use of Internet browser software such as Microsoft Internet Explorer or Mozilla Firefox

Who Should Read this Guide?

This *CABS Viewer User Guide* provides information for two groups of users – conventional users who wish to generate and view CABS output formats; and administrators who need to install and configure the system as part of its initial implementation.

Introducing CABS Viewer

Our CABS Viewer product line enables organizations to efficiently format, organize, and display information on all aspects of their carrier access billing data. This same billing data, once in a usable form, can now be inserted in to databases, used in spreadsheets to generate reports, or imported into existing accounting or billing systems.

The major benefits of the CABS Viewer products are:

Choice of Platform Support:

- Supports the platforms you use; including Microsoft Windows, Sun Solaris, and several Linux distributions (including Red Hat Enterprise Linux)
- Operation is exactly the same, regardless of platform
- Simple to use and easy to operate

Enabling Downstream Billing Automation:

- CABS Viewer output can be easily shared and processed
- Filter and format CABS data to your billing system's exact input requirements
- Special CSV-database format for import into most common enterprise database management systems, including Oracle, DB2, Informix, MySQL, Sybase, and MS SQL Server.
- Valid well-formed XML can support many standard Telecom billing systems

Useful for Revenue Assurance:

- Create user-friendly output, easily manipulated with Microsoft Excel, OpenOffice Calc or several other spreadsheet products.
- CSV or XML data can support many standard Telecom billing systems

Display Custom Billing Reports:

- CABS Viewer output is very easy to manipulate using may script languages, including Perl, Python, and Ruby – all of which can natively read CSV and XML data for further downstream processing or reporting.
- Lymeware is also available to deliver customer-specified custom reports as an additional service.

Display Bill Presentment Data:

- CABS Viewer output can be used directly for end-user billing presentment, especially the HTML format.
- A custom CABS Viewer binary can be ordered with specific filters to display only the billing records and fields required to generate your end user bills, either printed or on-line.

CABS Viewer is built on established server technologies and widely supported data and industry specific standards, including:

- **CABS BOS BDT**, or Carrier Access Billing System Billing Output Specifications Billing Data Tape record formats and data presentment formats, the industry standard billing record transport format.

- **CSV**, or Comma Separated Value or comma-delimited format, for use with most spreadsheet products and a common database import format,

- **XML**, or Extensible Markup Language, for input to other billing or accounting systems or for further XSLT and XML processing, and

- **HTML**, Hypertext Markup Language, for display either locally or on a web server with any standard web browser

CABS Viewer is supported on the Linux, Solaris and Windows operating systems.

Getting Started with CABS Viewer

Before You Start

This guide assumes that the resources you need to access the system are available and that you are familiar with how to use them. If you are not sure whether your system meets the requirements or how to use required third-party tools (primarily a web browser), talk to your manager or system administrator.

Technical Requirements

Before you begin using the system, ensure that you have the appropriate software installed and configured on your system. All you will need is –

- **One of the following platforms running one of these operating systems:**
  - Red Hat Enterprise Linux 3 on Intel IA32/x86 platforms. Other Linux distributions may also be supported
  - Sun Microsystems Solaris 8 & 9 on UltraSPARC platforms
  - Microsoft Windows 2000 & XP on Intel IA32/x86 platforms
- **Optionally, a text editor running on your computer.**

  CABS Viewer text output can be viewed, modified or printed with a variety of text editors. The following editors are known to work with it:
  - Vim version 5.7 and higher - http://www.vim.org/
  - The vi text editor
  - Microsoft Notepad and Wordpad editors
- **Optionally, a spreadsheet program running on your computer.**

  CABS Viewer CSV output has been tested with and supports a variety of spreadsheet programs. The following programs are known to work with it:
  - OpenOffice version 1.1.4 and higher - http://www.openoffice.org/
  - StarOffice version 6.0 and higher - http://docs.sun.com/app/docs/coll/so7en
  - Microsoft Excel version 97 and higher – http://www.microsoft.com

- ThinkFree Office 3.0 - http://www.thinkfree.com

- **Optionally, an XML editor running on your computer.**

  CABS Viewer XML output has been tested with and supports a variety of XML editors, including:

  - Altova XMLSpy version 4.x and higher - http://www.altova.com/
  - Symbol Click XML Marker version 1.1 and higher - http://symbolclick.com/

- **Optionally, a current web browser running on your computer.**

  CABS Viewer HTML output has been tested with and supports a variety of browsers. The following browsers are known to work with it:

  - Mozilla version 1.7 and higher - www.mozilla.org/mozilla1.x
  - Firefox version 1.0 and higher - www.mozilla.org/firefox
  - Konqueror version 3.2 and higher - www.konqueror.org
  - Microsoft Internet Explorer version 5 and higher - www.microsoft.com/ie

  You may encounter problems if you try to access HTML reports generated by CABS Viewer using older web browsers like Internet Explorer 4 or Netscape 4.x. If you are unsure about which web browser version you are using, click Help > About… or similar options on the menu bar in your browser. The version number will be displayed.

- **Network access to a server that is running the CABS Viewer software.**

  Your system or network administrator will be able to provide you with an Internet address (URL) from which the system hosting the CABS Viewer product can be accessed, if necessary.

Installing CABS Viewer

The CABS Viewer product is available for

- Linux on ia32/Intel x86 (reference platform is Red Hat Enterprise Linux 3 x86 version),
- Sun Microsystems Solaris on UltraSPARC (reference platform is Solaris 9 SPARC version), and
- Microsoft Windows on ia32/Intel x86 (reference platform is Windows 2000 Service Pack 4 x86 version)

A typical CABS Viewer product installation consists of three actions:

1. Download the correct install package from the Lymeware website or request the correct package from Lymeware Sales,
2. Perform the platform specific package installation tasks (as detailed below),
3. Request and install the license key

The pre-installation checklist consists of:

- ❑ Print out this manual
- ❑ Acquire the root or Administrator password for the target machine
- ❑ Be sure the target machine has Internet access or download the install package on another Internet-enabled machine
- ❑ Complete the License Request form (see Appendix A)

Additionally, proceed to the correct platform installation section below.

Linux Package Installation

Linux users should download the RPM version of the CABS Viewer installation file, via FTP or HTTP. The specific URL to use will be provided by the Lymeware Sales staff.

This file can be installed with the RPM command (logged in as root):

```
rpm -i <rpmfile>
```

This will install the CABS Viewer files to `/opt/cabsviewer`.

Sun Solaris Package Installation

Solaris users should download the PKG version of the CABS Viewer installation file, via FTP or HTTP. The specific URL to use will be provided by the Lymeware Sales staff.

This file can be unpacked with GZIP and TAR and installed with the ADDPKG command (logged in as root):

```
gzip -dc <tar.gz_file> | tar xvf -; pkgadd -d. <pkgname>
```

This will install the CABS Viewer files to **`/opt/cabsviewer`**.

Microsoft Windows Package Installation

Windows users should download the EXE version of the CABS Viewer installation file, via FTP or HTTP. The specific URL to use will be provided by the Lymeware Sales staff.

This file can be installed by executing it (logged in as Administrator or a user with Administrator Group privileges). You should see a screen similar to the one shown in Figure 1.

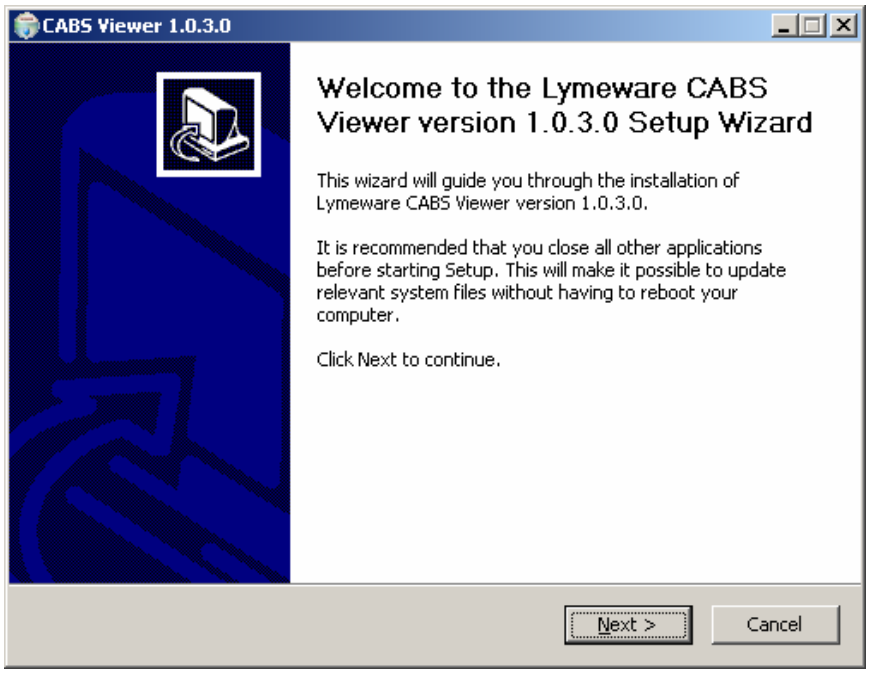


Figure 1: The Initial Windows Install window

Click on **Next** to continue the installation process or **Cancel** to exit the installation.

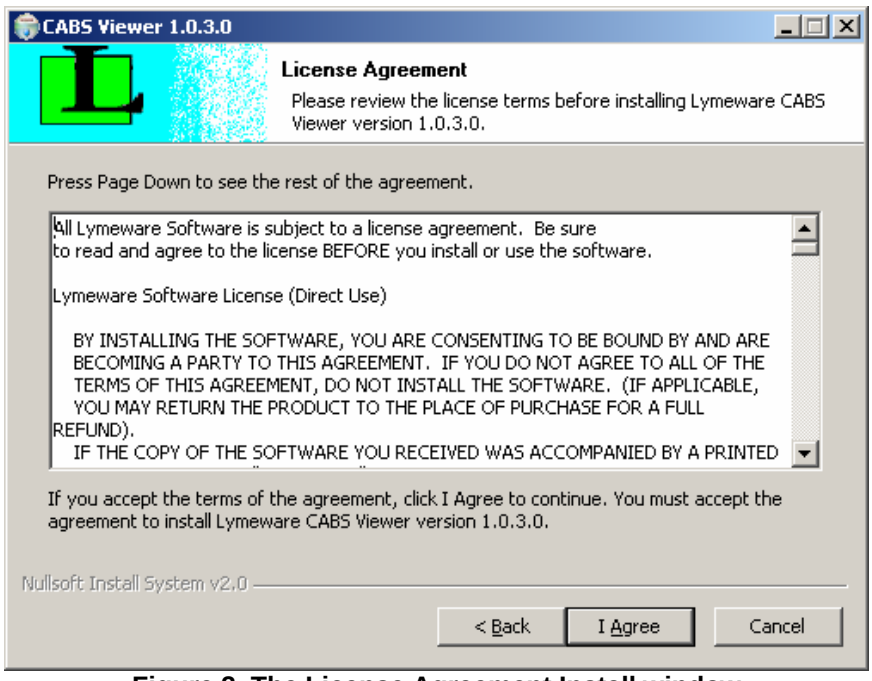


Figure 2. The License Agreement Install window

The license must be agreed to (click on the **I Agree** button) to continue installation.

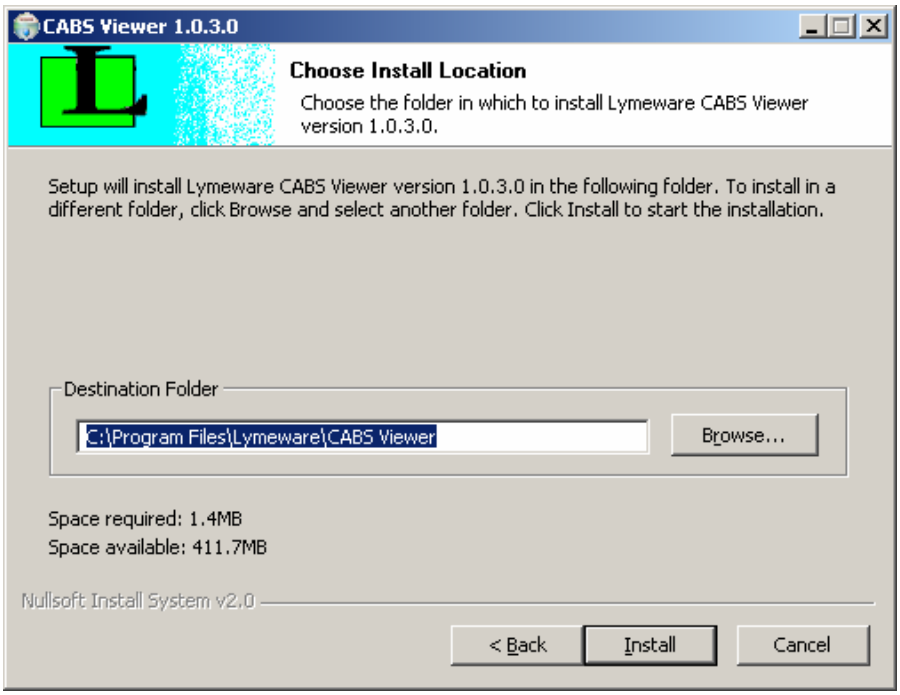


Figure 3. The Install Location window

The default install location may be changed here, but all examples in this manual assume that the default location is used. Press the **Install** button when ready to continue.

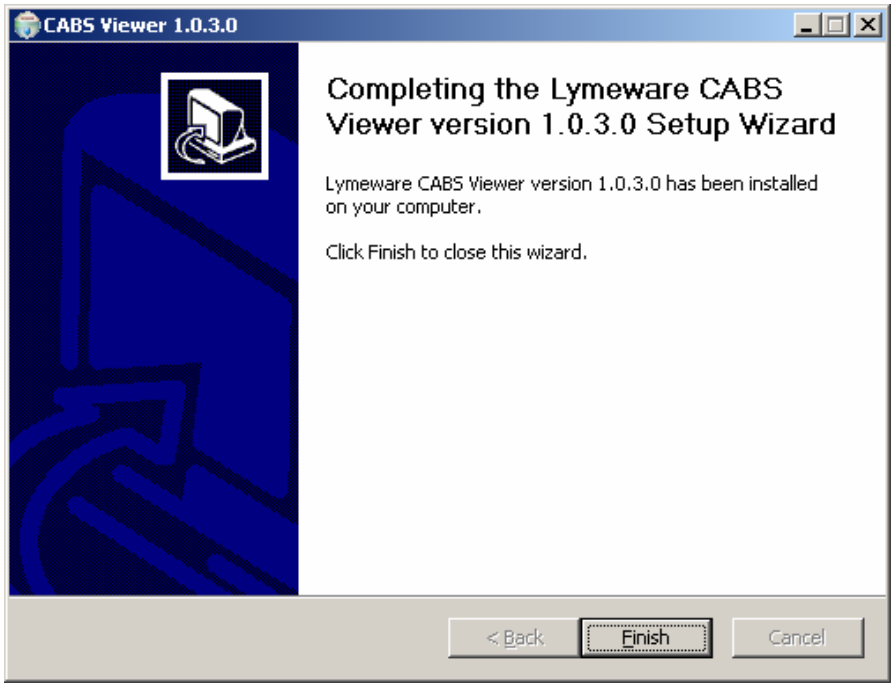


Figure 4. The Final Windows Install window

At this point, the CABS Viewer product has been successfully installed. Click the **Finish** button.

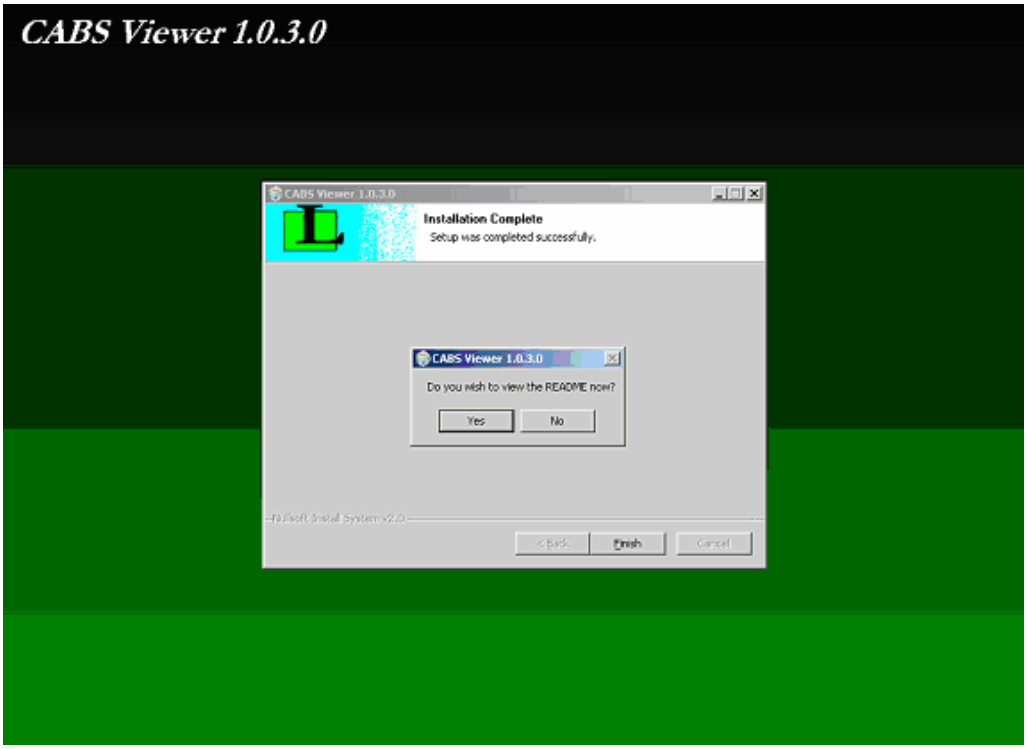


Figure 5. The Install Completion window

Finally, the user is presented with the choice to view the README file on installation exit. If the Yes button is selected then a Notepad window will open up with the CABS Viewer README text file contents. If the No button is selected then the install will just exit successfully.

Requesting a license key

All new users need to request a license key to operate CABS Viewer on any platform.

A specific license key file will be required to run the CABS Viewer program. Lymeware will supply this license file if the following information is supplied via email to Lymeware Sales (see Appendix A for the License Request form):

- Customer/Company Name:
- Product Name: **CABS Viewer**
- Platform: [either **Linux**, **Solaris**, or **Windows 2000/XP**]
- Target Machine IP Address:
- Target Machine Host ID: (only needed for Solaris machines)
- Contact Person:
- Contact Phone Number:
- Contact E-Mail Address:

A digital license request form is also available for completion and submission to Lymeware. The license file will be delivered to the Contact E-Mail Address. In all cases, regardless of platform, the license key should be renamed to **license.dat** and copied to the same location as the CABS Viewer binary (**cabsviewer** for Linux and Solaris or **cabsviewer.exe** for Windows).

A 30-day fully functional evaluation license is available from Lymeware's sales department. Lymeware Sales may be contacted at sales@lymeware.com.

About the CABS Viewer Product

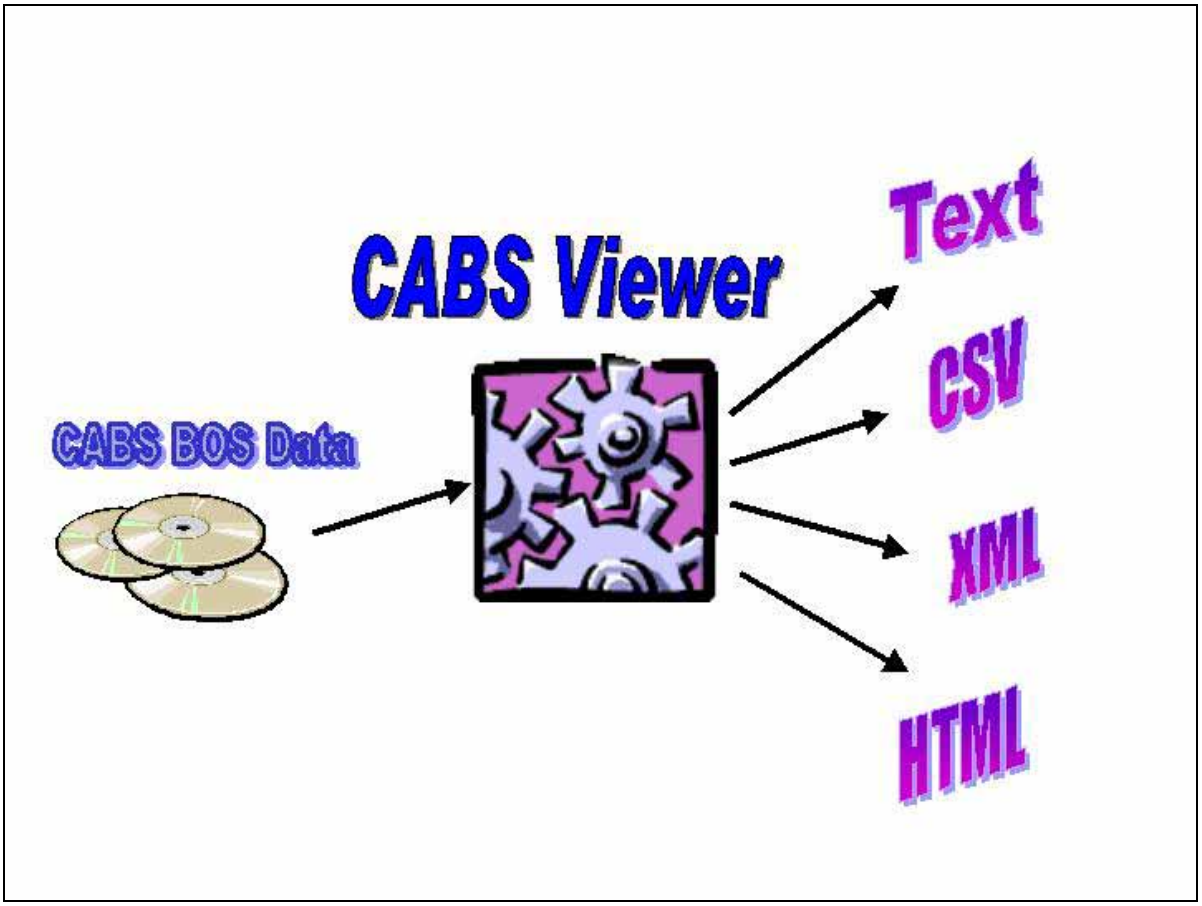


Figure 6. The CABS Viewer Data Flow Diagram

Functional Description

- Supports CABS BOS telecom industry standard file formats
- Runs on Windows 2000/XP, Linux or Solaris
- Generates verbose text (human readable) output format reports
- Generates CSV (comma delimited) output format for use in standard spreadsheet programs or DBMS data import
- Generates valid XML output format reports
- Generates HTML output format reports for use with many popular web browsers
- Designed to handle very large (50 to 500 megabyte) BOS input files
- Can generate a summary output report for CABS BOS input file analysis

Navigating the Output Formats

All of the output formats use the same basic layout – making it easy for you to move from one area of the output to the next. Figure 7 shows the common and **optional** elements of all output formats.

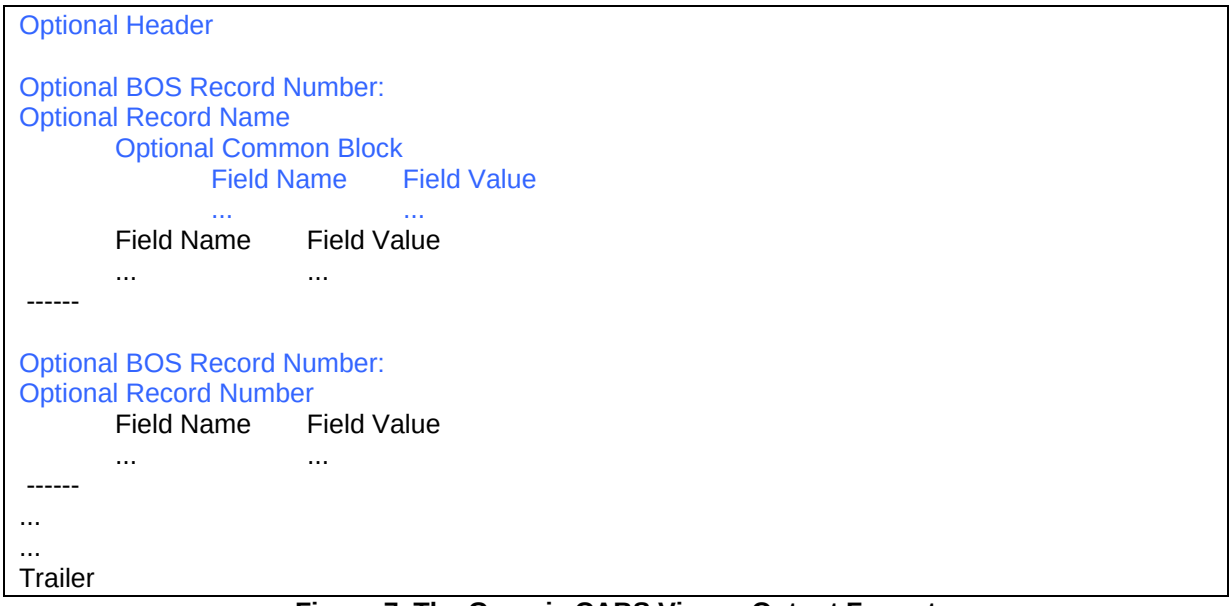


Figure 7. The Generic CABS Viewer Output Format

Figure 8 shows example CABS Viewer HTML output with the standard areas listed and described.

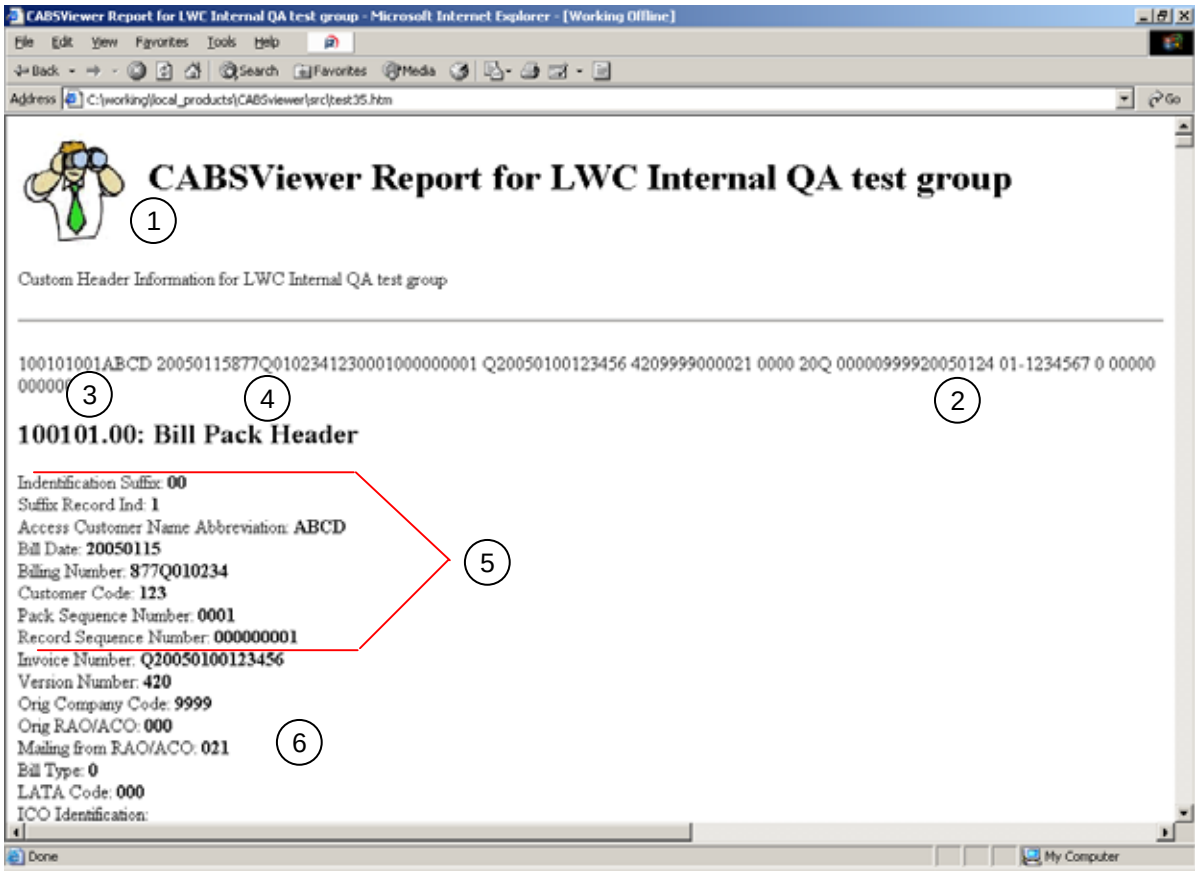


Figure 8. An HTML Output Format Example

Various key elements of the generic output format layout are highlighted on Figure 8, as follows:

1. Optional Header (displayed by default, not displayed with the `-q` or `--noheader`)
2. Optional Raw BOS Input Record (not displayed by default, display with `-r` or `--raw`)
3. Optional BOS Record Number (not displayed by default, displayed with `-n` or `--recno`)
4. Optional BOS Record Name/Description (not displayed by default, display with `-T` or `--types`)
5. Optional BOS Record Common Block (not displayed by default, display with `-C` or `--common`). The common block is repeated in each standard BOS record (only not in the file trailer record) and consists of the first nine (9) fields of each standard record.
6. Standard BOS field display, usually in the form of: <BOS Field Name>: <space><field value>

Tip

Not every output format will allow all display options to generate valid output. See the **Valid Options** table in each output section for specific command line options, which do support each specific output option.

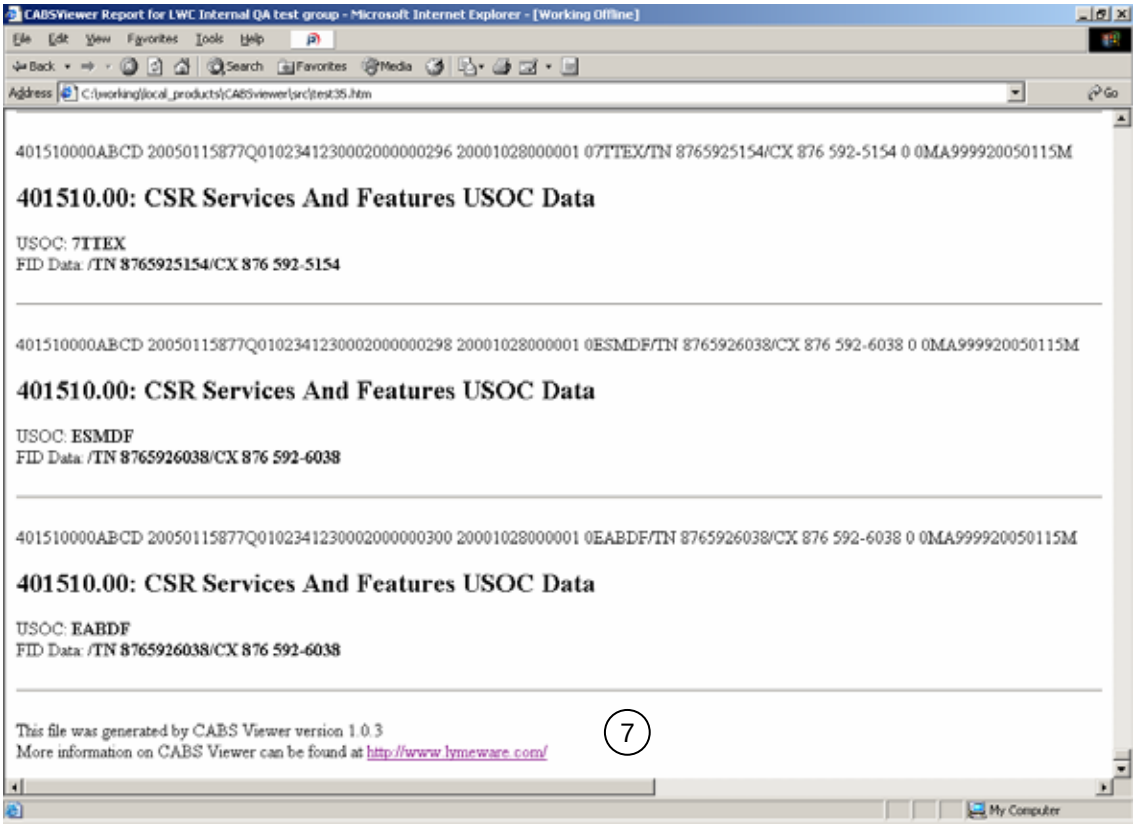


Figure 9. An HTML Output Format Example (continued)

7. The standard trailer

Using CABS Viewer

CABS Viewer From A Command Line

CABS Viewer is run from a command line (or DOS Box/Command Shell or Windows).

The most common form is:

```
cabsviewer <cabs_file>
```

The full form is:

```
cabsviewer [-b] [--bodyonly] [-c] [--csv] [-C] [--common] [-d]
[--debug] [-D] [--database] [-n] [--recno] [-N] [--number] [-o
FILE] [--output=FILE] [-q] [--noheader] [-r] [--raw] [-s] [--
summary] [-S] [--summarydetail] [-t] [--text] [-T] [--types]
[-u] [--uppercase] [-w] [--html] [-x] [--xml] [-v] [--version]
[-h] [--help] <cabs_file> [ <cabs_file> [ . . .] ]
```

Command Line Switch Descriptions

The following table describes each of the CABS Viewer command line switches. Note that in most cases there are multiple ways of specifying the same thing, e.g. **`-c`** and **`--csv`** are synonymous.

h

Command line option values, which contain spaces, should be surrounded by double quotes.

Switch	Description
`-b` `--bodyonly`	Display only the <BODY> section of HTML output format.
`-c` `--csv`	Set output format to CSV (comma-delimited format).
`-C` `--common`	Print common block for each BDT record.
`-d` `--debug`	Display debug messages to standard out (screen).
`-D` `--database`	Display CSV records in database format.

Table 1. Command Line Options

-n --recno	Display BDT record numbers.
-N --number	Number the displayable field labels.
-o FILE --output=FILE	Send output to FILE.
-r --raw	Display raw BDT records.
-q --noheader	Do not display output header.
-s --summary	Print a BDT summary report.
-S --summarydetail	Print a BDT summary detail report.
-t --text	Set output format to ASCII text (default).
-T --types	Display BDT Record type descriptors.
-u --uppercase	Force field descriptions to UPPERCASE.
-w --html	Set output format to HTML (webpage).
-x --xml	Set output format to XML.
-v --version	Print the version information.
-h --help	Display the usage message and exit..
-1 --billrecords	Display only the Billing records (10-XX-XX)
-3 --detailrecords	Display only the Detail Billing records (30-XX-XX)
-4 --csrrecords	Display only the Customer Service Records (CSR) records (40-XX-XX)

Table 2. Command Line Options (continued)

Command Examples

The following examples will be from a Windows platform, but the specific commands and command line options will be identical, regardless of the actual platform, you are using.

At the command shell prompt type:

```
cabsviewer test.cabs
```

The previous command will use `test.cabs` as the input CABS BDT file. The results will be sent to stdout or the screen. The format will be in text (default), with no raw, no types, no record numbers, and no summary.

```
cabsviewer --output=test.txt test.cabs
```

The previous command will also use `test.cabs` as the input CABS BDT file. The results will be saved in `test.txt`. The format will be in text (default), with no raw, no types, no record numbers, and no summary.

This next command is the same as the one above except the output format now will be comma-delimited (CSV).

```
cabsviewer --csv --output=test.csv test.cabs
```

This command is the same as the one above except using short command line options:

```
cabsviewer -c –o test.csv test.cabs
```

The next command will use `test.cabs` as the input CABS BDT file. The results will again be saved in `test.csv`. The format will be in CSV (comma delimited) format, and only the CSR (40-XX-XX) records will be displayed.

```
cabsviewer --csv -–csrrecords --output=test.csv test.cabs
```

The next command will generate a standard report in the XML format to the output file `text.xml`.

```
cabsviewer --xml --output=test.xml test.cabs
```

This command is the same as the last one above except using short command line options:

```
cabsviewer –x –o test.html test.cabs
```

The next command will generate a report with record numbers and record descriptions in the HTML format to the output file `text.html`.

```
cabsviewer --html ––recno ––types --output=test.html test.cabs
```

This command is the same as the last one above except using short command line options:

```
cabsviewer -w –r –T –o test.html test.cabs
```

The final example will generate a report with record numbers and record descriptions, but without HTML header or trailer elements, in the HTML format to the output file `text.htm`.

```
cabsviewer --html ––recno ––types ––bodyonly --output=test.htm
test.cabs
```

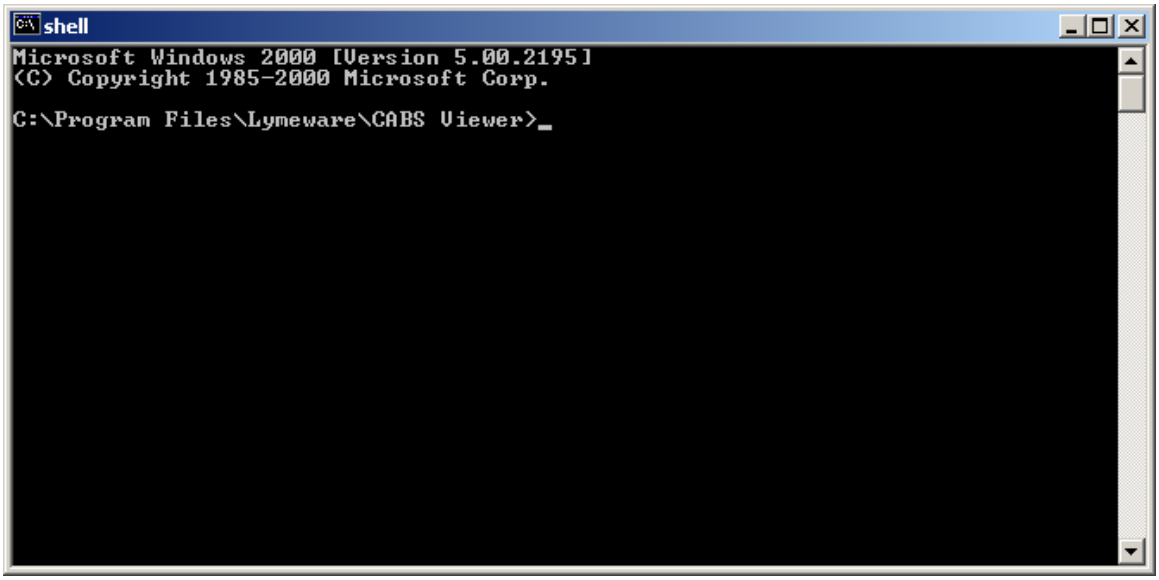


Figure 10. The Command Shell for CABS Viewer

On a Windows machine select **Start->Programs->Lymeware->CABS Viewer->shell** to open up a command shell in the CABS Viewer install directory (see Figure 10).

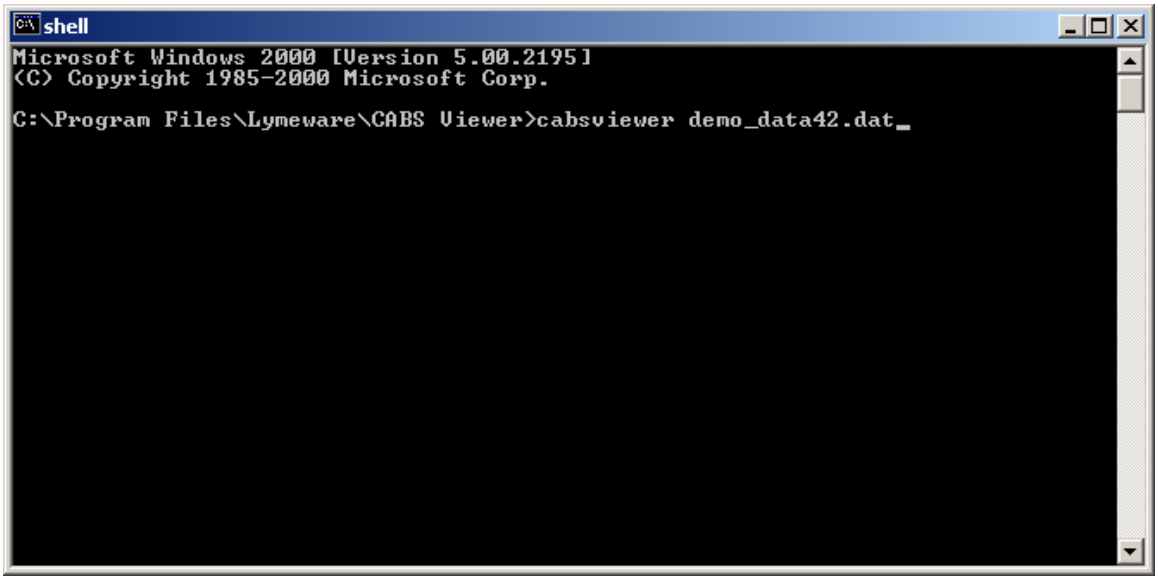


Figure 11. A Simple CABS Viewer Example

A simple example of running CABS Viewer on Windows is shown in Figure 11.

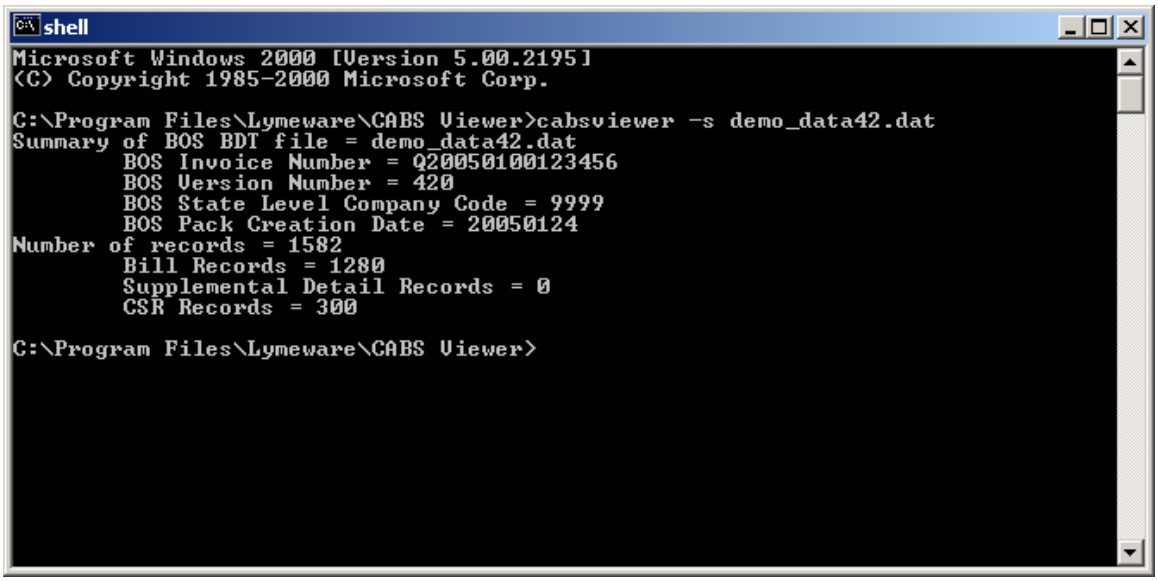


Figure 12. An Example of the Summary Output

A summary report (generated with a **-s** or **--summary** option) will list the following information for the specific CABS BOS input file:

- Invoice Number
- BOS Version
- State Level Company Code
- BDT File or Pack Creation Date

Tip

Not all BOS records may be supported by your version of CABS Viewer.

Contact Lymeware Sales for custom reports designed to your exact specifications.

It will also list the total number of BOS records found in the file and a breakdown by record category.

A summary detail report (generated with a **–S** or **--summarydetail** option) will list all of the above summary report information and a breakdown of the number of records by record number. This report can be very valuable in determining the types and majority of records in use and provided by the CABS carrier.

Output Formats

CABS Viewer's core functionality is the ability to:

- Parse CABS BOS data, and
- Save/Display this data in useful formats

CABS Viewer contains a huge database of all of the CABS BOS record formats and field definitions. It also contains standard record and field selection filters, as selected by Lymeware.

Custom output reports can be developed by Lymeware engineering filters in a custom binary or by additional post CABS Viewer processing.

The basic output formats are:

Text – can be read by any standard text editor or word processor,

CSV – can be imported into and processed by all standard spreadsheet programs,

Database – can be imported into many common database programs,

XML – can be processed by any program that can import XML, including several standard Telecom billing systems, and

HTML – can be displayed by any standard web browser

Lymeware can support other formats or modification of these standard formats as custom work.

The Text Output Format

The text output format is the default CABS Viewer format and is easily read and understood by most people. The output is simply a list of CABS BOS record blocks, each which displays all unfiltered fields (as field name / value pairs). The field name / value pairs are tab-delimited. The field names will be as located in the CABS BOS standard documents. The displayed values will be exactly as presented in your raw CABS BOS input files. The single exception to this rule is the presentation of numeric data values, which are encoded in the CABS BOS records. No other CABS BOS input file data values will be modified by the CABS Viewer product.

The specific definitions and particular usage of the BOS field names is explicitly defined in Telcordia Technologies' CABS Billing Output Specifications (BOS) standard documents (as listed in Appendix B).

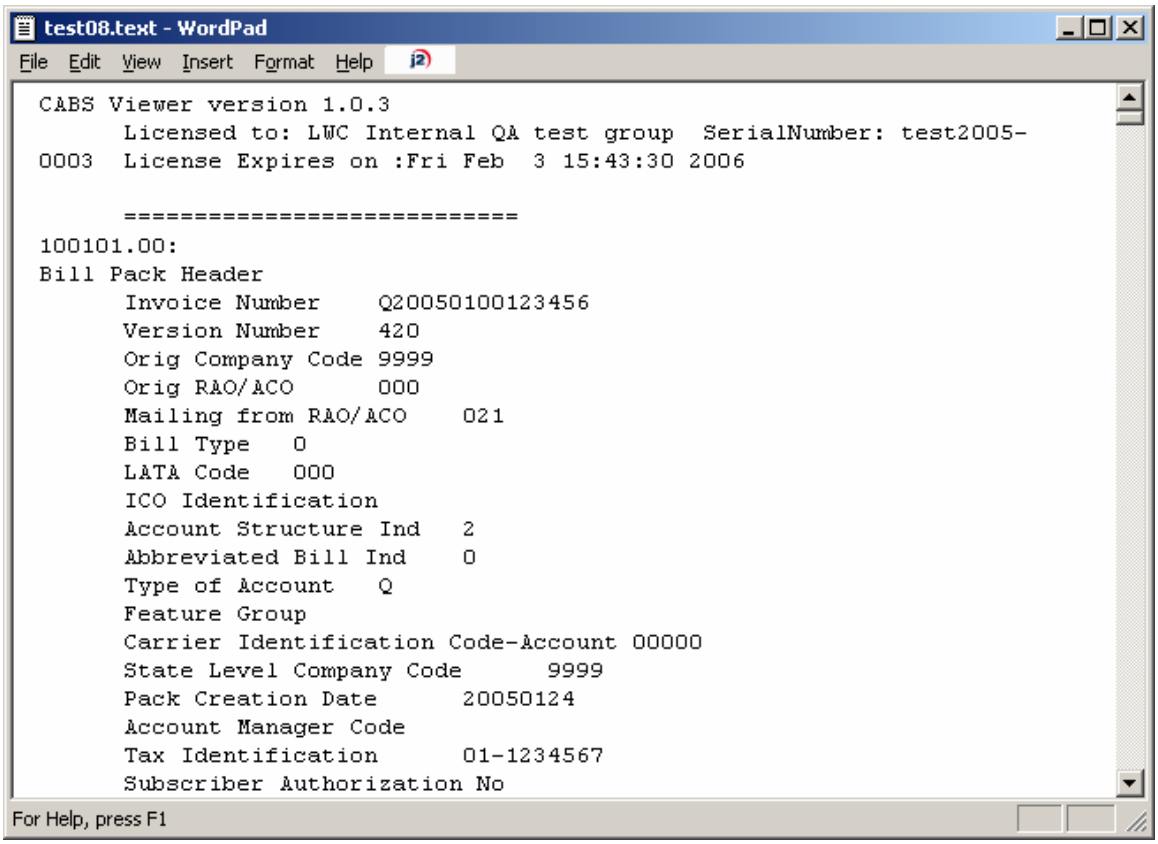


Figure 13: Standard Text Output Format

A standard text output is displayed in Figure 13. This example output file was generated with the `--recno` option (which displayed the "`100101.00`" record number) and the `--types` option (which displays the "`Bill Pack Header`" record name). This example does not show the "common

Note

In CABS Viewer record numbers are displayed as AABBCC.NN which translates in to a record ID of AA-BB-CC with a record ID suffix of NN in CABS BOS documents.

fields", which repeat the same exact data for each record. Display of the "common fields" is off by default.

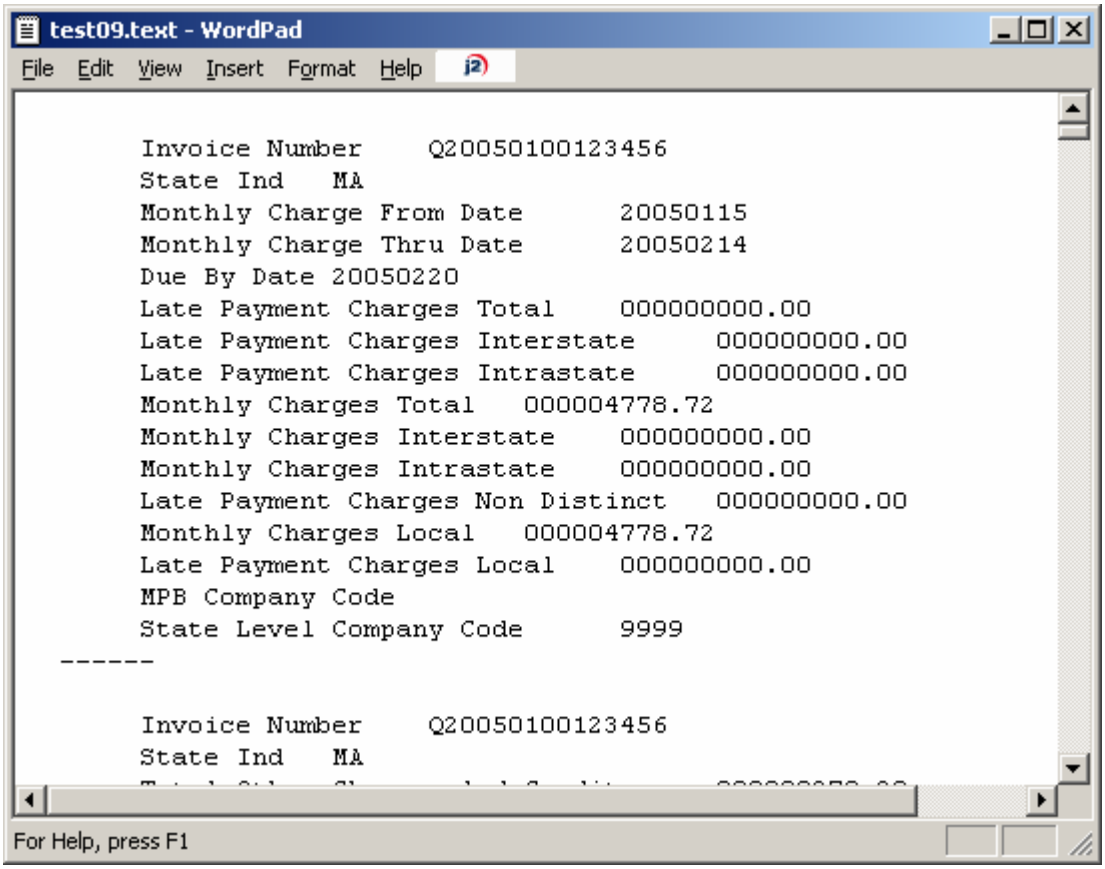


Figure 14: A Record Detail View (Text Format)

A Record Detail View in text format is shown in Figure 14. This file was generated without any command line options. This information is the high level summary of monthly charges for this company (State Level Company Code = 9999). Again, the specific definitions of each of the fields must be determined by the CABS BOS standards.

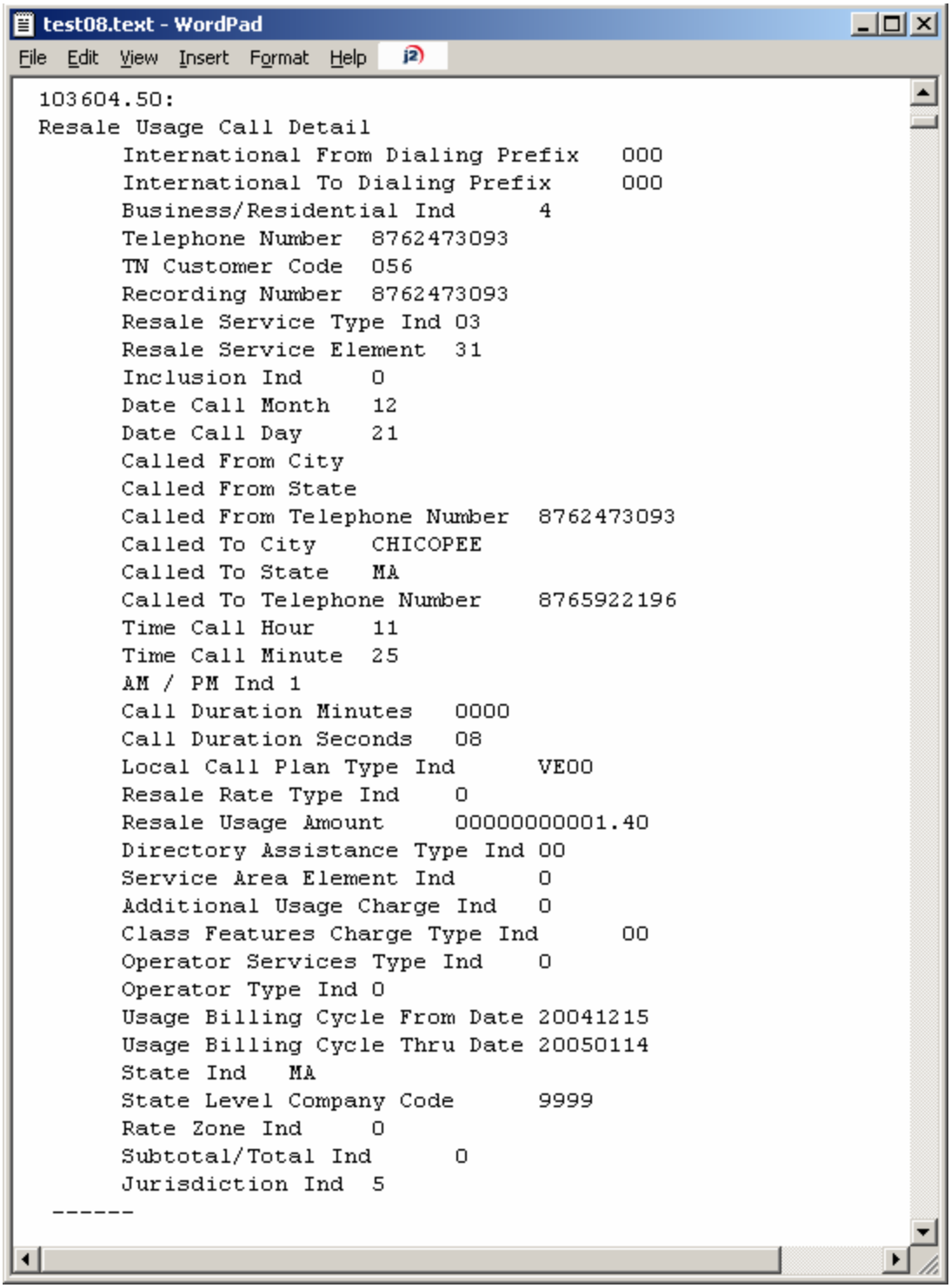


Figure 15: A Resale Call Usage Detail Record (Text Format)

Figure 15 shows a Resale Call Usage Detail Record in text format. This information is the detailed description of a single customer call. There are additional BOS indicator fields for this specific record that are filtered out by CABS Viewer.

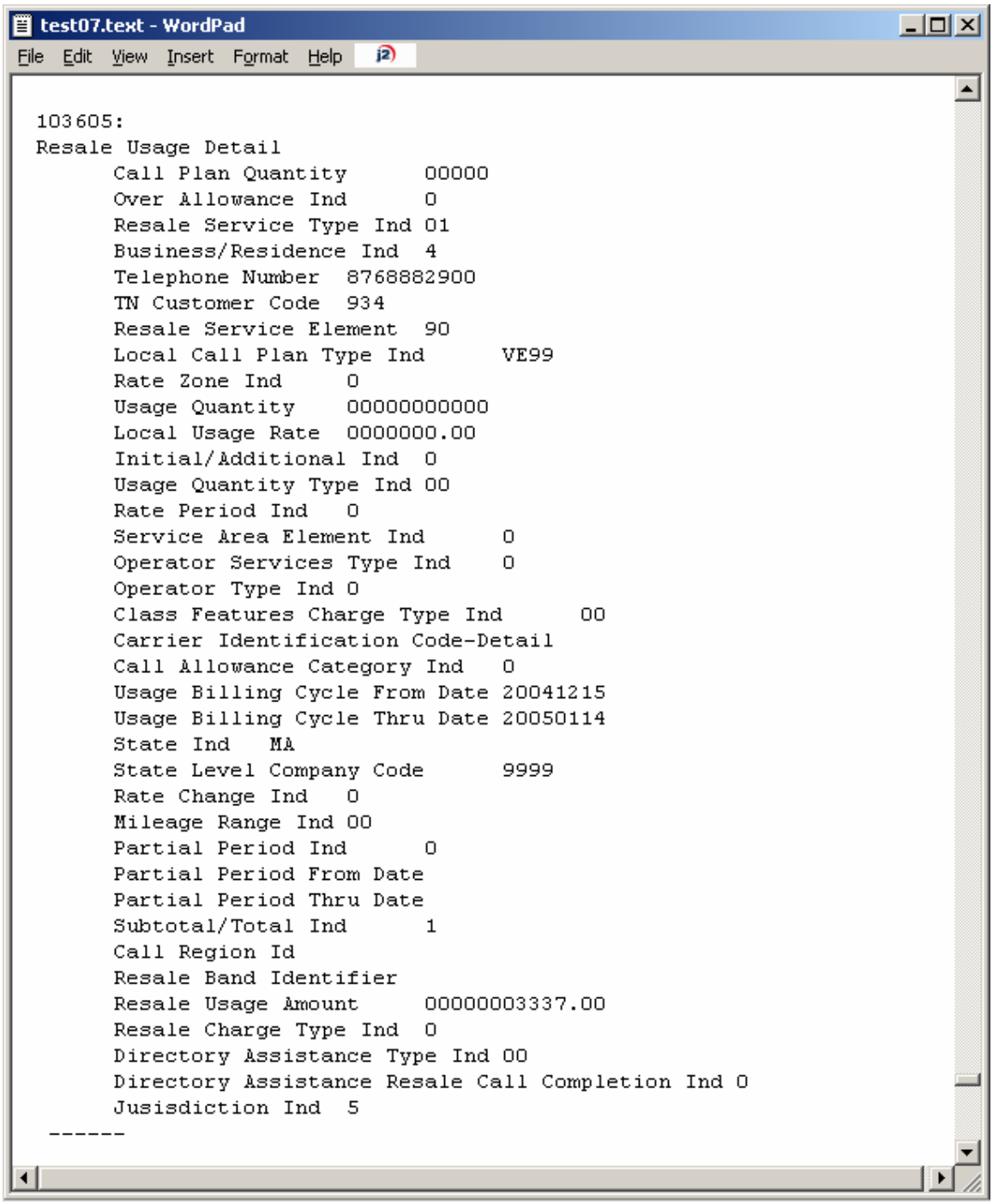


Figure 16: A Resale Usage Detail Record (Text Format)

Figure 16 shows a Resale Usage Detail Record or monthly summary by end user subscriber (originating telephone number) in text format.

Valid Text output format options

The following options will still generate valid Text output

--billrecords
--common
--csrrecords
--debug*
--detailrecords
--noheader
--number
--output
--raw
--recno
--summary**
--summarydetail**
--text
--types
--uppercase

The following options will not generate valid Text output

--bodyonly
--csv
--database
--debug*
--help
--html
--version
--xml

* Debug will generate valid output only if the `--output` option is used or stdout is redirected to a file. All debug data is written to stderr.

** A summary report is in text format but will not produce a valid text output format containing any CABS BOS values.

The CSV (Comma-Delimited) Output Format

Another output format that CABS Viewer supports is the Comma Separated Values (or CSV) file format.

CSV files can be opened by Microsoft Excel or OpenOffice Calc for viewing or by Notepad, Wordpad, and other text editors – and can easily be parsed as input files by most database software and spreadsheet products.

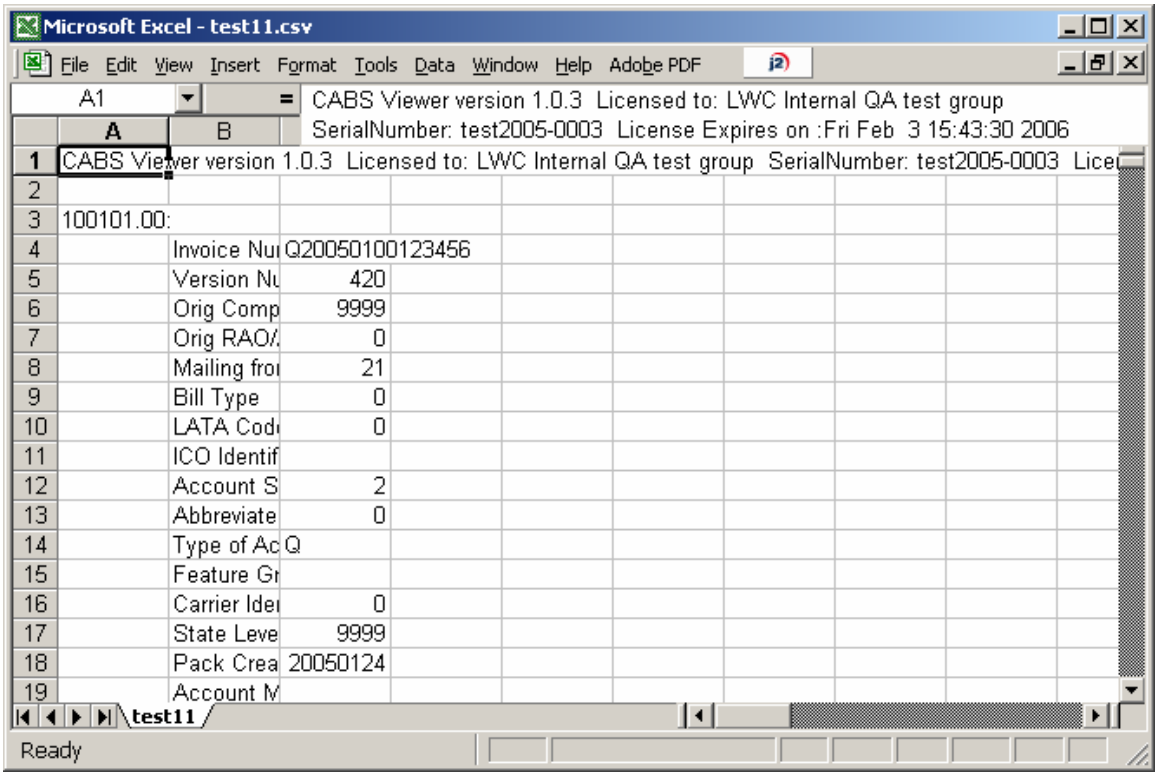
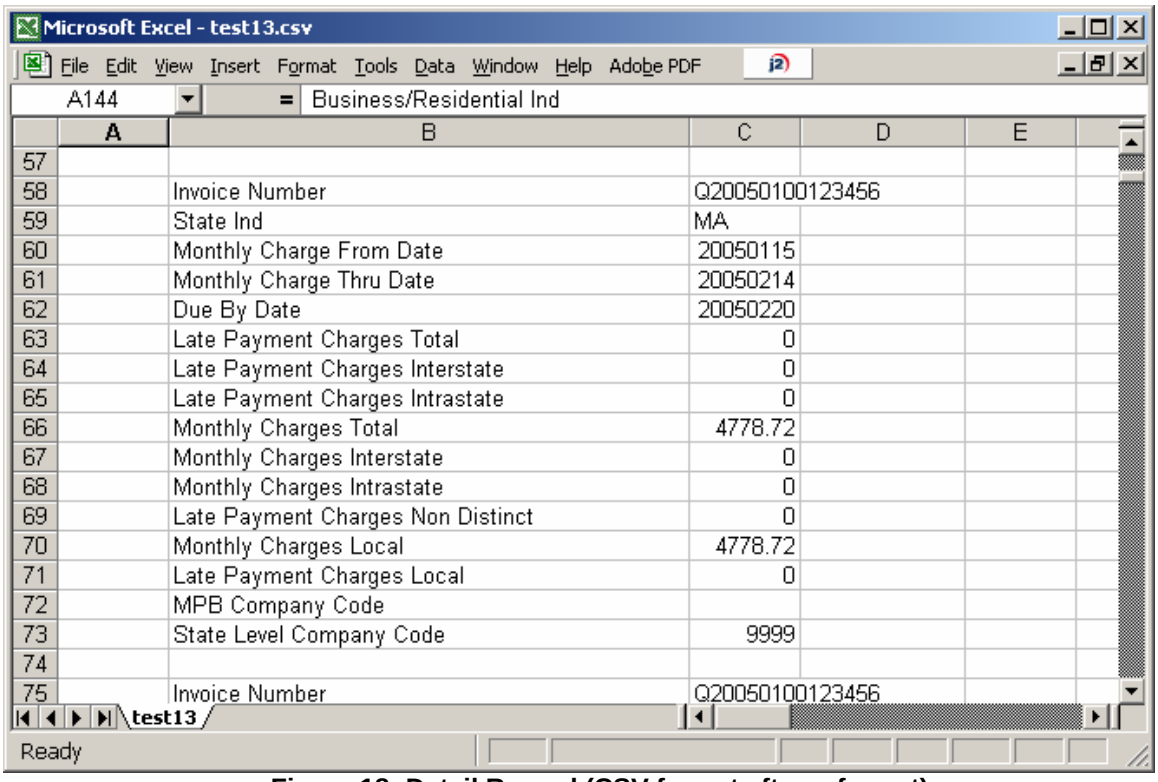


Figure 17: The Initial CSV Output Format

Figure 17 shows the initial view of a CSV output file as displayed by Microsoft Excel.

Basic formatting of column widths

The single downside of CSV as a spreadsheet format is that no formatting data is included within the CSV file. We suggest that the second (B) column be auto-sized to a reasonable width. Be sure to save the spreadsheet as a native spreadsheet format (like `.xls` for Excel format).



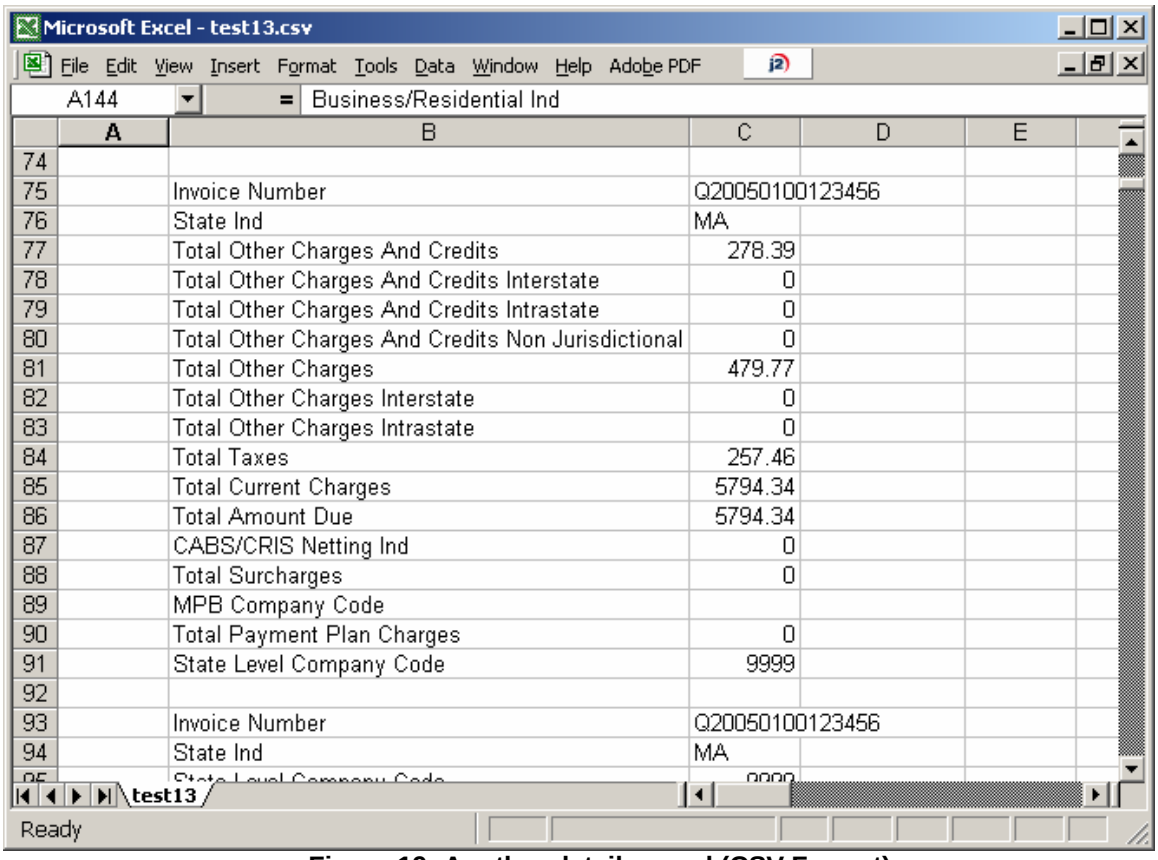
	A	B	C	D	E
57					
58		Invoice Number	Q20050100123456		
59		State Ind	MA		
60		Monthly Charge From Date	20050115		
61		Monthly Charge Thru Date	20050214		
62		Due By Date	20050220		
63		Late Payment Charges Total	0		
64		Late Payment Charges Interstate	0		
65		Late Payment Charges Intrastate	0		
66		Monthly Charges Total	4778.72		
67		Monthly Charges Interstate	0		
68		Monthly Charges Intrastate	0		
69		Late Payment Charges Non Distinct	0		
70		Monthly Charges Local	4778.72		
71		Late Payment Charges Local	0		
72		MPB Company Code			
73		State Level Company Code	9999		
74					
75		Invoice Number	Q20050100123456		

Figure 18: Detail Record (CSV format after reformat)

Figure 18 is an example of a standard CSV output file, after column B width had been auto-formatted for easier viewing.

The typical format for CSV BOS record field rows is:

```
<empty>   <Field Name>   <Field Values>
```



	A	B	C	D	E
74					
75		Invoice Number	Q20050100123456		
76		State Ind	MA		
77		Total Other Charges And Credits	278.39		
78		Total Other Charges And Credits Interstate	0		
79		Total Other Charges And Credits Intrastate	0		
80		Total Other Charges And Credits Non Jurisdictional	0		
81		Total Other Charges	479.77		
82		Total Other Charges Interstate	0		
83		Total Other Charges Intrastate	0		
84		Total Taxes	257.46		
85		Total Current Charges	5794.34		
86		Total Amount Due	5794.34		
87		CABS/CRIS Netting Ind	0		
88		Total Surcharges	0		
89		MPB Company Code			
90		Total Payment Plan Charges	0		
91		State Level Company Code	9999		
92					
93		Invoice Number	Q20050100123456		
94		State Ind	MA		

Figure 19: Another detail record (CSV Format)

Figure 19 is another example of a standard CSV output format. This CSV output displays the record in "row" format, the default CSV format for most BOS records.

CSV Column Format

Several CABS BOS records are displayed in CSV "column" format for ease of display. The specific records selected for this display format has been encoded in internal CABS Viewer filters. Lymeware can specially modify this selection and a custom CABS Viewer binary delivered upon request.

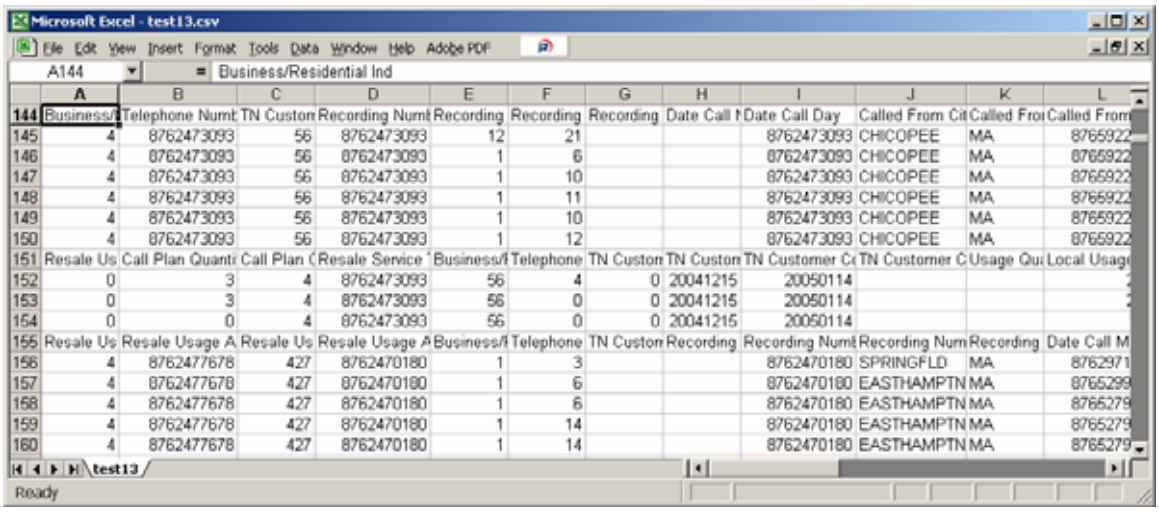


Figure 20: Resale Call Detail Usage Records (in CSV Column Format)

This example in Figure 20 shows how column format is displayed in CSV output format. In column format all record data is displayed in a single line.

CSV Database Format

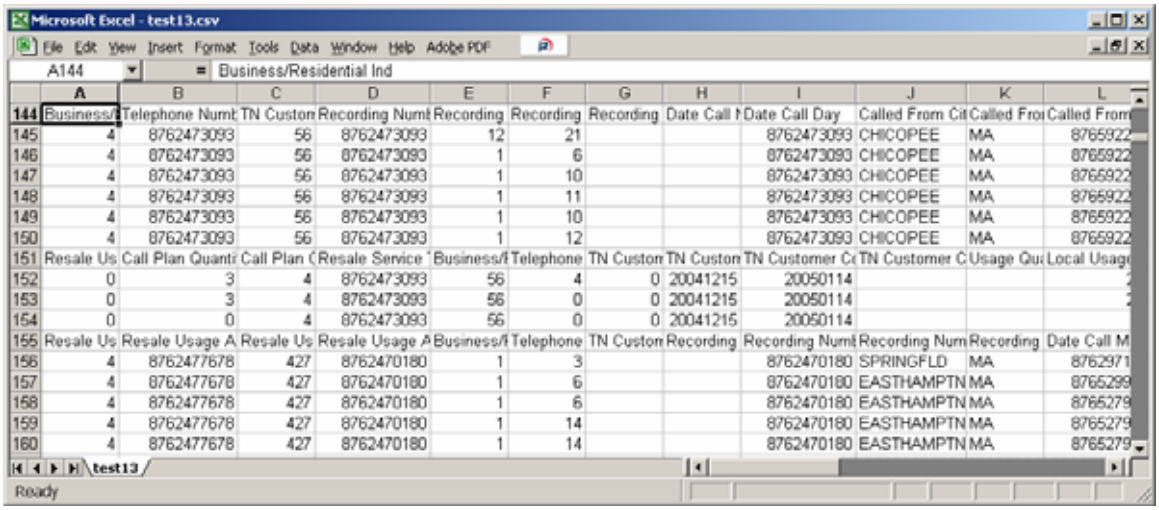


Figure 21: Resale Call Detail Usage Records (in CSV Database Format)

If the CSV output is used as import to a database, a special format (as displayed in Figure 21) should be used. This special format (selected by the **`-D`** or **`--database`** options) collapses the record number into the CSV row for each field displayed, and directly supports import to many major databases (including Microsoft Access, Microsoft SQL-Server, Oracle, MySQL, Informix, Sybase, and several others).

Currently the **–database** format builds a single CSV file, but a perl script is supplied which will spilt the single database file into multiple CSV files, one file for each

record type, each with a single header record (with field names), and all other records in the format:

Record Number, Index Record Number, <remaining CSV data>

Table 3. Standard Database Record Format

The Perl script is provided as a wrapper script, which calls the cabsviewer binary internally. It is used with the following options:

```
Usage: database_split [-hedvx] [-b <binary path>]
CABS_BOS_file [CABS_BOS_file [...]]

database_split-1.0.2

Process a CABS BOS input file and generates a split database
output format in multiple files, specifically for database
import use.
Display Options:
     -h  Help -- just display this message and quit.
     -d  Do display all debug messages to STDERR.
     -e  Display all invalid log entries on STDERR.
     -v  Verbose display (to STDERR) of each entry processed.
     -x  Display all requests of nonexistent files to STDERR.
Input Options:
     -b <binary path> Force the use of <binary path> for
        CABS Viewer binary location.
    ...  Process the sequence of CABS BOS files.
```

Valid CSV output format options

The following options will still generate valid CSV output

--billrecords
--common
--csrrecords
--csv
--database
--debug*
--detailrecords
--noheader
--number
--output
--recno
--types
--uppercase

The following options will not generate valid CSV output

--bodyonly
--debug*
--help
--html
--raw
--summary
--summarydetail
--text
--version
--xml

* Debug will generate valid output only if the `--output` option is used or stdout is redirected to a file. All debug data is written to stderr.

The XML Output Format

Extensible Markup Language (XML) is a simple, very flexible text format derived from SGML (ISO 8879). Originally designed to meet the challenges of large-scale electronic publishing, XML is also playing an increasingly important role in the exchange of a wide variety of data on the Web and elsewhere.

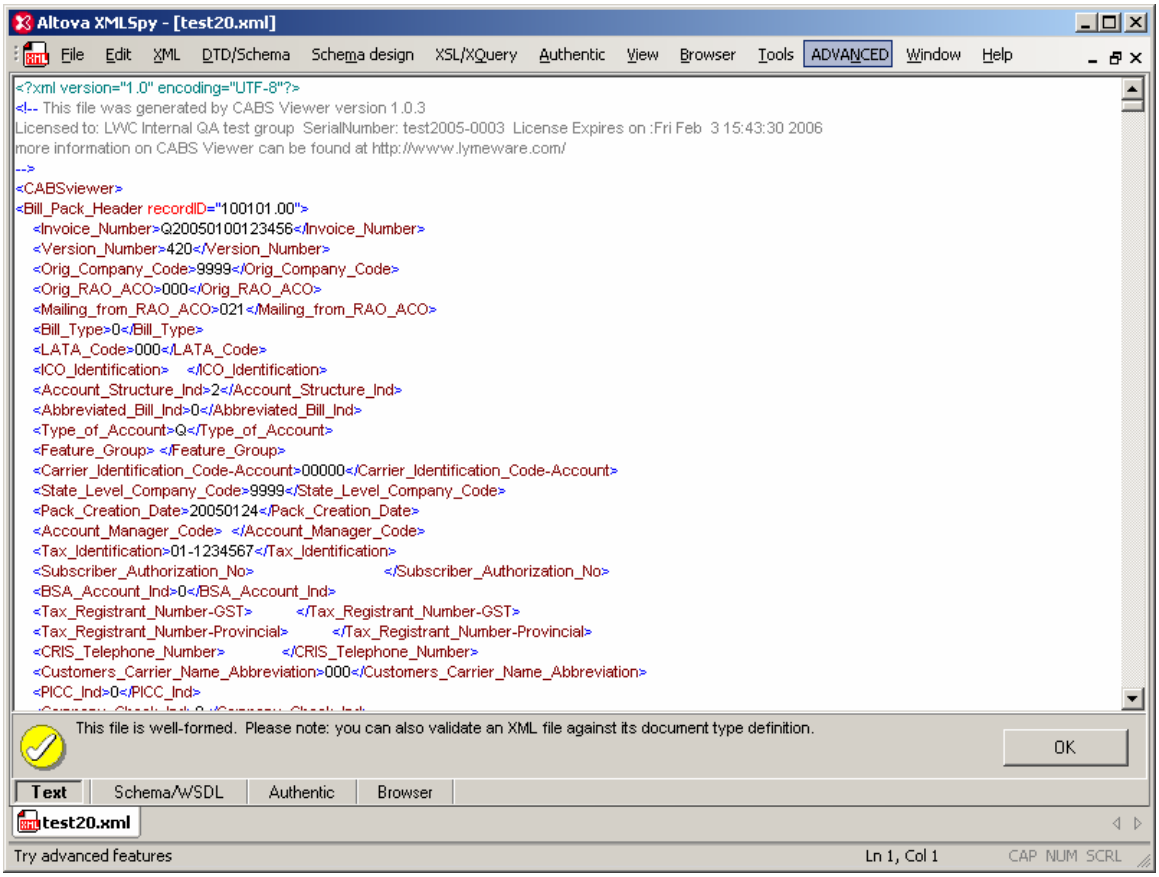


Figure 22: A "Well-Formed" Detail Record (XML Format)

Figure 22 shows a CABS Viewer XML output format file (as displayed by XMLSpy). Note the yellow check mark and the message "This file is well-formed." Well-formed XML is correctly formatted as per the XML standards.

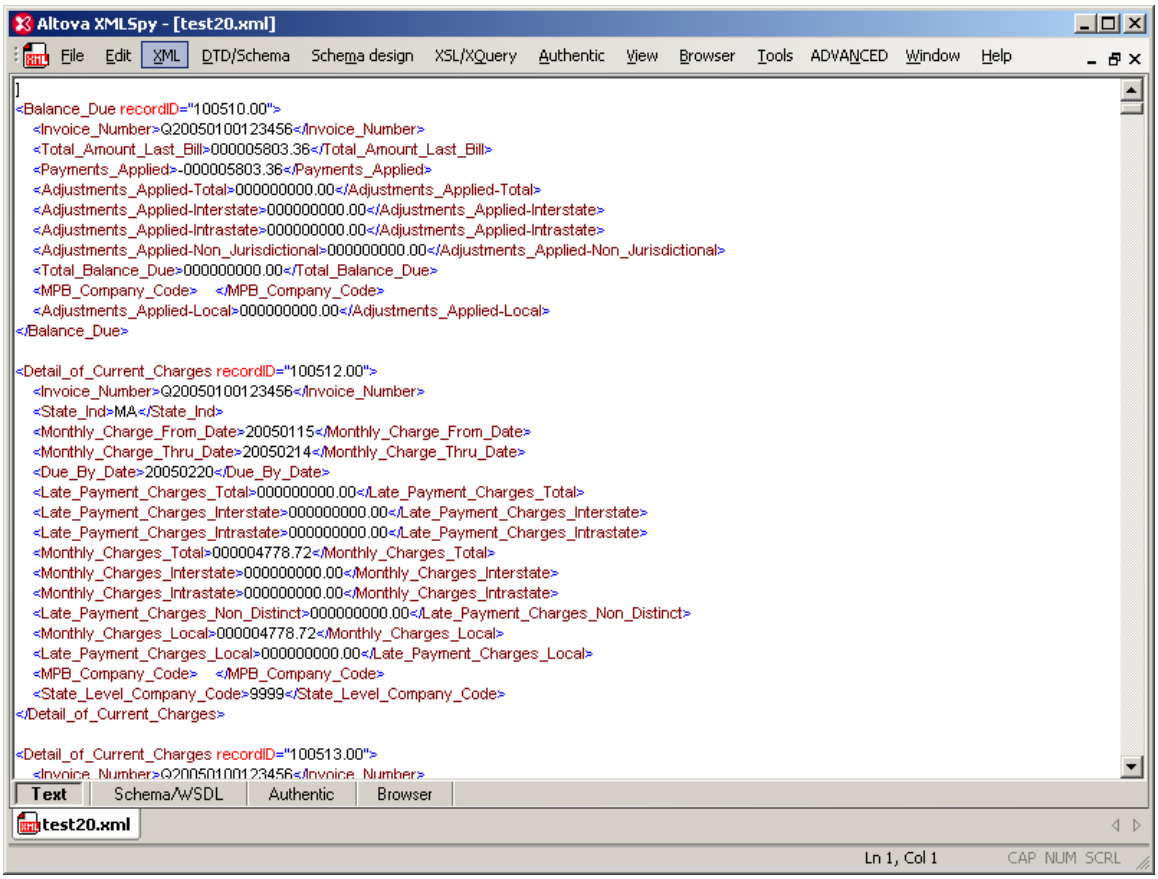


Figure 23: Detail Record (XML Format)

A Detail of Current Charges record in XML format is shown in Figure 23. This file was generated without any command line options. This information is the high level summary of monthly charges for this company (State Level Company Code = 9999).

XML Field Name to Tag Name Translations

CABS Viewer generates XML tag names on the fly from the BOS record field descriptions. Due to the nature of XML formatting, specific characters are not valid as tag name components. These translations are documented below:

Field Description Character	Tag Name Character
(space)	_ (underscore)
\ (back slash)	_ (underscore)
/ (forward slash)	_ (underscore)
< (less than)	_ (underscore)
> (greater than)	_ (underscore)
& (and sign)	_ (underscore)

Table 4. XML Tag Name Translations

Therefore the field description of "AM & PM Ind" is translated to "AM___PM_Ind".

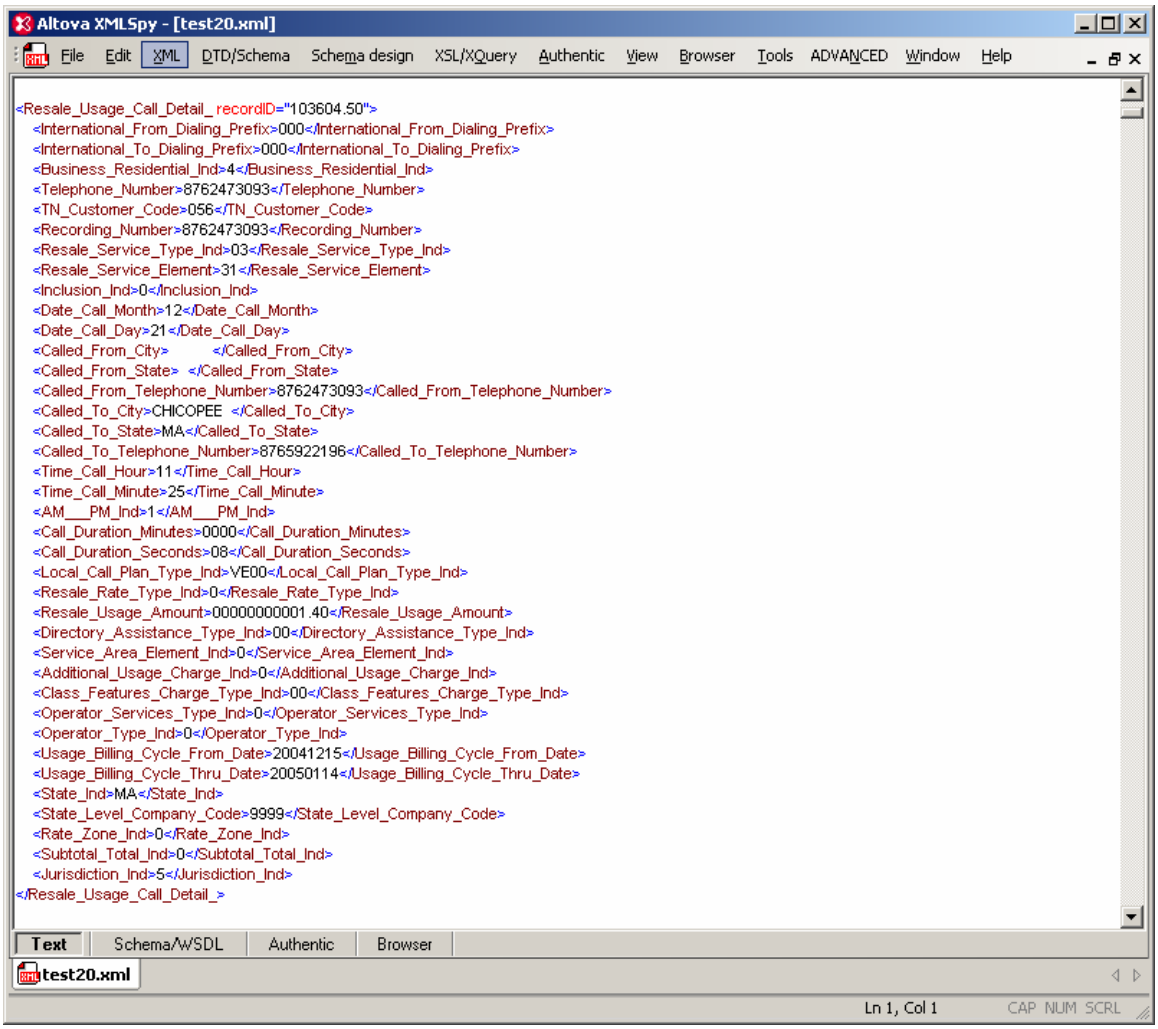


Figure 24: Resale Call Detail Usage Record (XML Format)

Figure 24 shows a Resale Call Usage Detail Record in XML format. This information is the detailed description of a single customer call. There are additional BOS indicator fields for this specific record that are filtered out by CABS Viewer.

Valid XML output format options

The following options will still generate valid XML output

--billrecords
--common
--csrrecords
--debug*
--detailrecords
--noheader
--number
--output
--uppercase
--xml

The following options will not generate valid XML output

--bodyonly
--csv
--database
--debug*
--help
--html
--raw
--recno
--summary
--summarydetail
--text
--types
--version

* Debug will generate valid output only if the `--output` option is used or stdout is redirected to a file. All debug data is written to stderr.

The HTML Output Format

The final output format CABS Viewer supports is HyperText Markup Language (HTML) version 4, the publishing language of the World Wide Web. In addition to the text, multimedia, and hyperlink features of the previous versions of HTML (HTML 3.2 [HTML32] and HTML 2.0 [RFC1866]), HTML 4 supports more multimedia options, scripting languages, style sheets, better printing facilities, and documents that are more accessible to users with disabilities. HTML 4 also takes great strides towards the internationalization of documents, with the goal of making the Web truly World Wide.

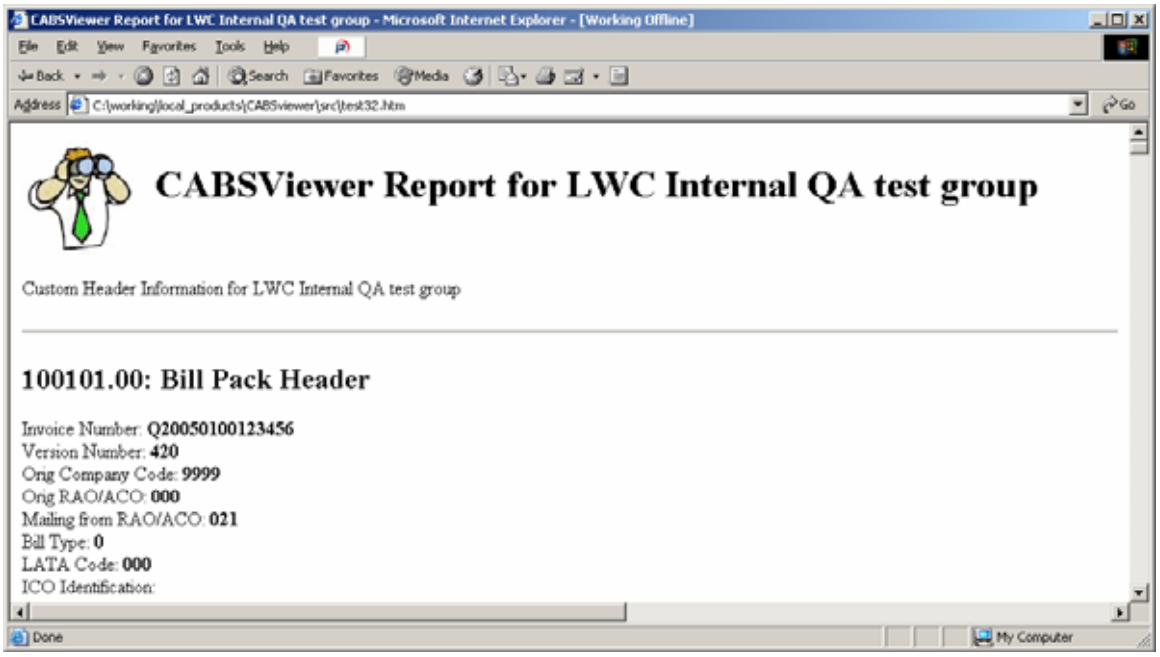


Figure 25: Example of HTML Output

Figure 25 is a standard example of CABS Viewer HTML output format. In this example the output file was generated with the `--recno` option (which displayed the "`100101.00`" record number) and the `--types` option (which displays the "`Bill Pack Header`" record name). This example does not show the "common fields", which repeat the same exact data for each record. Display of the "common fields" is off by default.

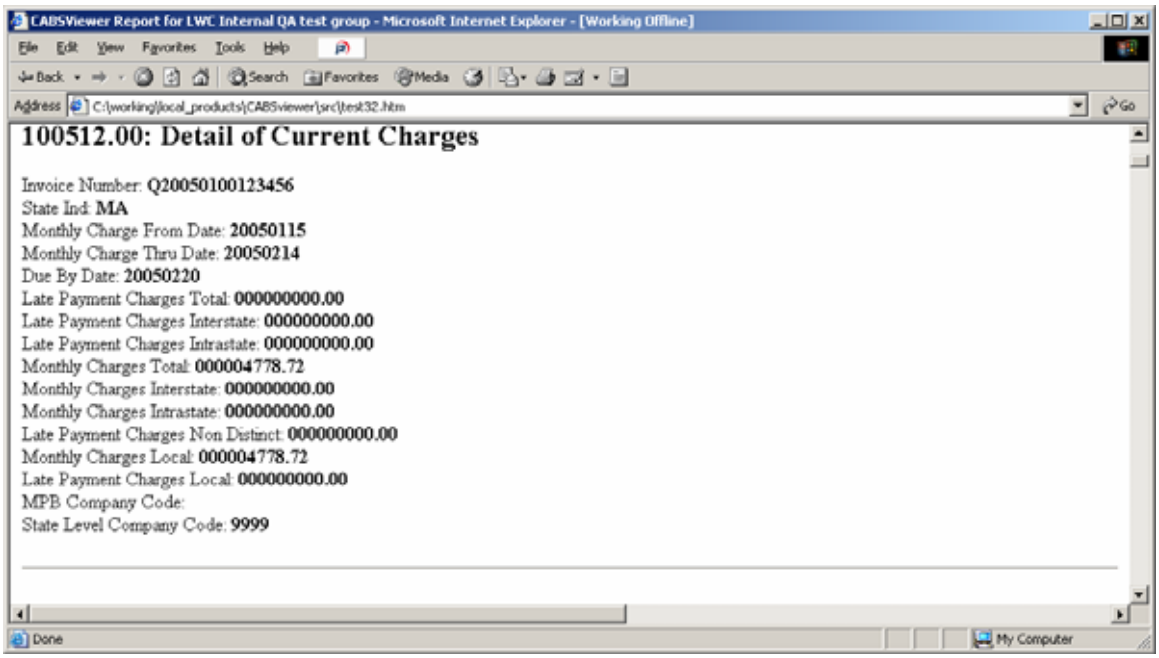


Figure 26: A Detail Record (HTML Format)

A Detail of Current Charges record in HTML format is shown in Figure 26. This file was generated without any command line options. This information is the high level summary of monthly charges for this company (State Level Company Code = 9999).

HTML Table Format

Several CABS BOS records are displayed in HTML "table" format for ease of display (similar to CSV's "column" format). The specific records selected for this display format has been encoded in internal CABS Viewer filters. The HTML output table format does use HTML table tags.

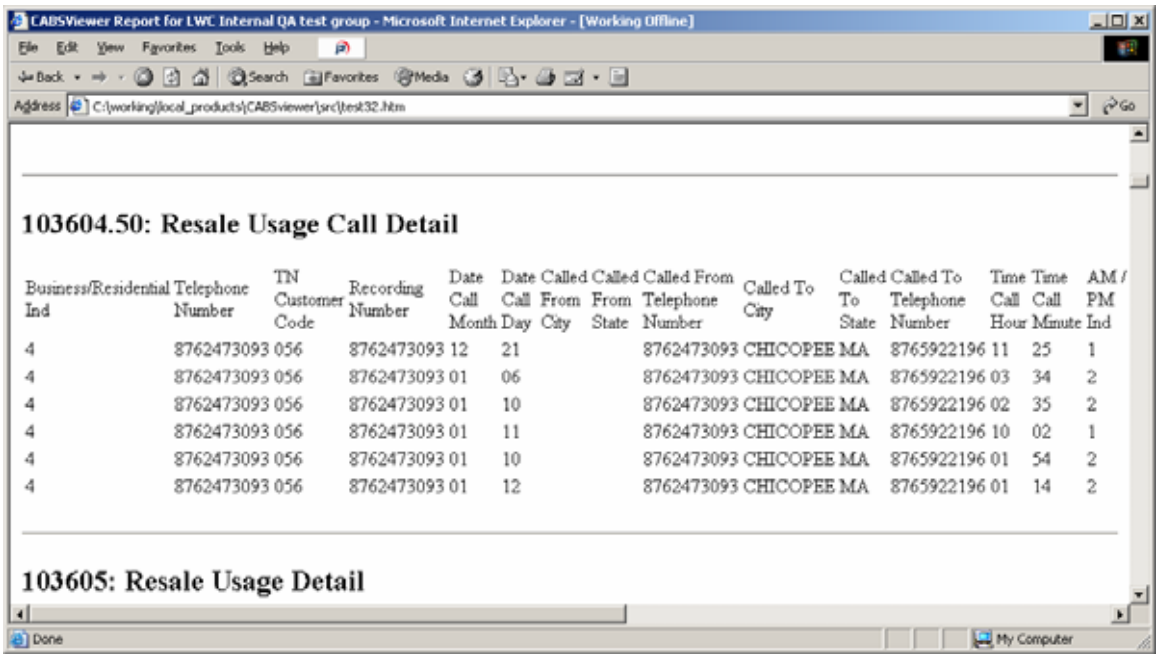


Figure 27: Resale Call Detail Usage Records (HTML Table Format)

This example in Figure 27 shows how table format is displayed in HTML output format. In table format all record data is displayed in a single line.

The --bodyonly Option

You may want to customize the HTML output data to a standard corporate template or display format. To facilitate this, the `-b` or `--bodyonly` option is provided. Typical html pages have the following format:

```
<html>
<head>
        <title> title </title>
        header tags and data
</head>
<body>
        CABS Viewer header
        body tags and data
        CABS Viewer trailer
</body>
</html>
```

Table 5. HTML Standard Format Outline

But with the `--bodyonly` option only the following HTML code will be generated:

```
        CABS Viewer header
```

body tags and data CABS Viewer trailer

Table 6. HTML Body-Only Format Outline

To allow the page to be correctly rendered, a HTML header and a HTML trailer portion will need to be provided.

Data, similar to this example, should be provided for the HTML header:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd"><html><head><title>CABSViewer
Report for LWC Internal QA test group</title></head><body><a
name="top"></a>
```

In addition, data, similar to this example, should be provided for the HTML trailer:

```
</BODY></HTML>
```

Valid HTML output format options

The following options will still generate valid HTML output

--billrecords
--bodyonly**
--common
--csrrecords
--debug*
--detailrecords
--html
--noheader
--number
--output
--raw
--recno
--types
--uppercase

The following options will not generate valid HTML output

--csv
--database
--debug*
--help
--summary
--summarydetail
--text
--version
--xml

* Debug will generate valid output only if the `--output` option is used or stdout is redirected to a file. All debug data is written to stderr.
** The `--bodyonly` option will generate valid HTML that will only comprise a portion of a valid page of HTML.

CABS Viewer Utilities

Utilities Overview

Although CABS Viewer can generate several output formats, some customers require additional functionality either to support their current processing stream or to generate specific required reports. Most processing stream requirements can be supported with wrapper scripts. A wrapper script is a (usually perl) script, which can do pre or post stream or data processing and directly call CABS Viewer from inside the script. Examples of two such processing stream scripts are illustrated below.

Lymeware has two methods of generating additional or custom reports:

- Wrapper scripts, or
- Customizing CABS Viewer directly

Wrapper scripts for custom reports

Lymeware (or any other Perl or script expert) can take the raw CABS Viewer output (in any of the selected output formats) and modify/filter/process the data and generate specialized reports. An example of such a script is below.

Customizing CABS Viewer internal filters

Lymeware can also take your custom report requirements and generate a custom CABS Viewer binary, with your requirements coded in to the internal filters. So, for example, if you only wanted to display **Resale Usage Call Detail** (10-36.04:50) Records and only the TN fields (**`Called From Telephone Number`** and **`Called To Telephone Number`** field values), this can be done. These specific records and fields can be un-filtered (and every other record and field can be filtered out) to create the report as needed.

Do contact Lymeware Sales if you have custom report needs. We can help.

Batch Processor

The CABS Viewer system can process a list of files but cannot rename all the output files to unique and recognizable (and match-able to the original input filenames) output filenames.

This simple CABS Viewer wrapper script allows a single directory, as the only required argument.

```
perl processBatch.pl [options] <directory>
```

This script will take any input CABS BOS BDT file (e.g. `cabs.bos`), process it and save the output in a file called `cabs.bos.out`.

```
Usage: processBatch [-hdv] [-b <binary path>] [-e <extension>]
 [-t <output format>] [-a <command line arguments>]
<CABS_BOS_directory>

processBatch-1.0.1

Process a single directory containing CABS BOS input files
(with default extension of .bos) and run CABS Viewer (with
args) on each.

Display Options:
     -h  Help -- just display this message and quit.
     -d  Do display all debug messages to STDERR.
     -v  Verbose display (to STDERR) of each entry processed.
Input Options:
     -b <binary path> Force the use of <binary path> for
        CABS Viewer binary location.
     -e <extension> Treat any files with this extension as
        an input file (default is .bos).
     -t <output format> can be one of the following:
        text, csv, xml, html or database
     -a <command line arguments> to pass to CABS Viewer
        for each file processed.

     <CABS_BOS_directory> full path to directory of BOS files.
```

Process an Entire Directory of Files

The CABS Viewer system can repeatedly process the contents of a single directory with the following utility. The only single requirement is that every CABS BOS BTD data file must have **`.bos`** as an extension. The resulting output files will have either **`.text`**, a **`.csv`**, a **`.xml`** or a **`.htm`** as extensions to the same base filename.

This simple CABS Viewer wrapper script allows a single directory, as the only required argument.

```
perl processDirectory.pl [options] <directory>
```

This script will poll the directory every 5 minutes for any new **.bos** files. Any processed **.bos** files will be renamed with a **.done** extension (so they will not be reprocessed on the next poll).

```
Usage: processDirectory [-hdv] [-b <binary path>] [-e
<extension>] [-t <output format>] [-a <command line
arguments>] <CABS_BOS_directory>

processDirectory-1.0.1

Process a single directory containing CABS BOS input files
(with default extension of .bos) and run CABS Viewer (with
args) on each, polling every 5 minutes.

Display Options:
     -h  Help -- just display this message and quit.
     -d  Do display all debug messages to STDERR.
     -v  Verbose display (to STDERR) of each entry processed.
Input Options:
     -b <binary path> Force the use of <binary path> for
        CABS Viewer binary location.
     -e <extension> Treat any files with this extension to
        an input file (default is .bos).
     -t <output format> can be one of the following:
        text, csv, xml, html or database
     -a <command line arguments> to pass to CABS Viewer
        for each file processed.

     <CABS_BOS_directory> full path to directory of BOS files.
```

A Custom Report

Lymeware can supply custom output report filters and formatters to produce specific required reports, including:

- FID/USOC reports,
- CSR Account reports,
- Detailed Usage reports,
- End User reports,
- And many others

An example of a custom report is the **genCSRreport** script. This report was requested by a CABS Viewer customer who wanted to have a specific Microsoft Excel output report format (as displayed in Figure 28). The report is generated with the following command:

```
perl genCSRreport.pl [options] <file>
```

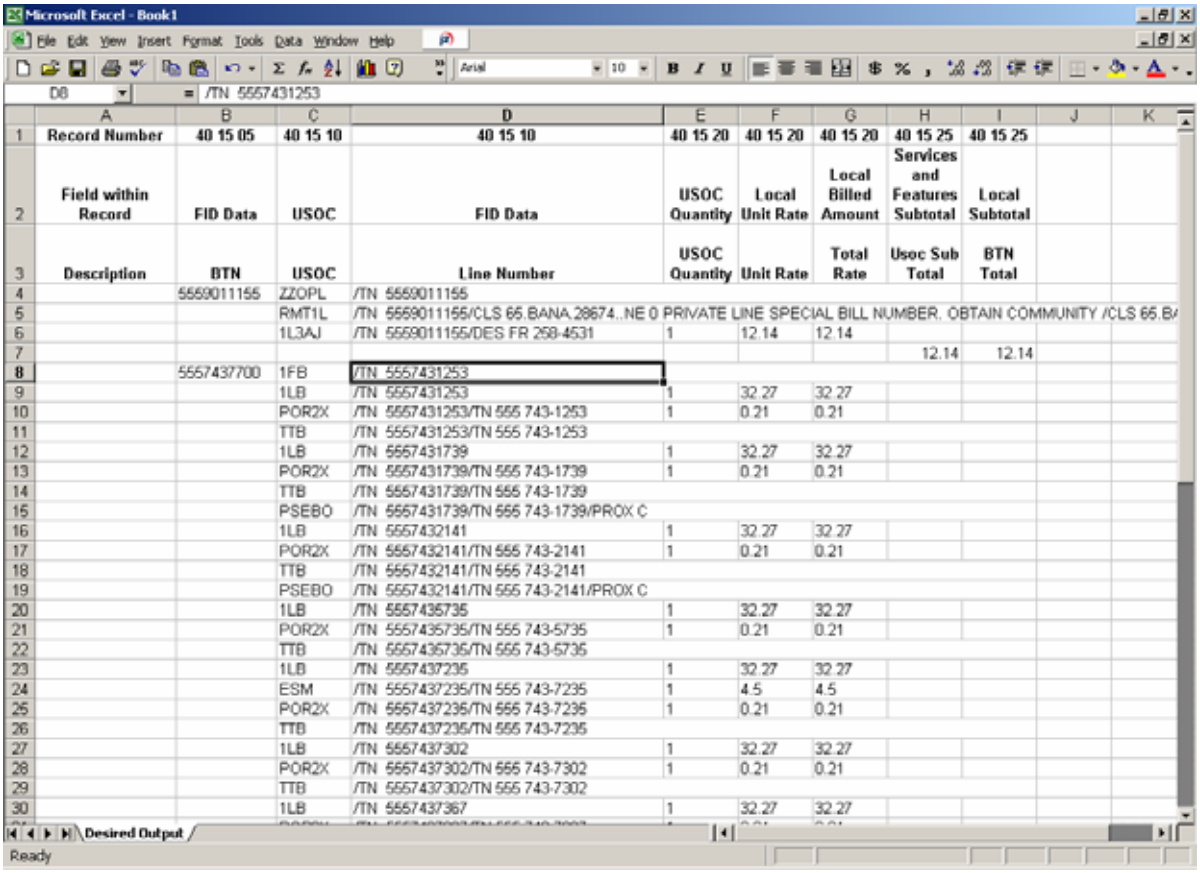
With a usage of the following:

```
Usage: genCSRreport [-hedvx] [-b <binary path>] CABS_BOS_file
[CABS_BOS_file [...]]

genCSRreport-1.0.1

Process a CABS BOS input file and output a CSR Report summary
in CSV format, specifically for Excel use.

Display Options:
     -h  Help -- just display this message and quit.
     -d  Do display all debug messages to STDOUT.
     -e  Display all invalid log entries on STDERR.
     -v  Verbose display (to STDERR) of each entry processed.
     -x  Display all requests of nonexistent files to STDERR.
Input Options:
     -b <binary path> Force the use of <binary path> for
        CABS Viewer binary location.
    ...  Process the sequence of CABS BOS files.
```



Microsoft Excel - Book1

File Edit View Insert Format Tools Data Window Help

D8 = /TN 5557431253

	A	B	C	D	E	F	G	H	I	J	K
1	Record Number	40 15 05	40 15 10	40 15 10	40 15 20	40 15 20	40 15 20	40 15 25	40 15 25		
2	Field within Record	FID Data	USOC	FID Data	USOC Quantity	Local Unit Rate	Local Billed Amount	Services and Features Subtotal	Local Subtotal		
3	Description	BTN	USOC	Line Number	USOC Quantity	Unit Rate	Total Rate	Usoc Sub Total	BTN Total		
4		5559011155	ZZOPL	/TN 5559011155							
5			RMT1L	/TN 5559011155/CLS 65.BANA.28674..NE 0 PRIVATE LINE SPECIAL BILL NUMBER. OBTAIN COMMUNITY /CLS 65.BA							
6			1L3AJ	/TN 5559011155/DES FR 258-4531	1	12.14	12.14				
7								12.14	12.14		
8		5557437700	1FB	/TN 5557431253							
9			1LB	/TN 5557431253	1	32.27	32.27				
10			POR2X	/TN 5557431253/TN 555 743-1253	1	0.21	0.21				
11			TTB	/TN 5557431253/TN 555 743-1253							
12			1LB	/TN 5557431739	1	32.27	32.27				
13			POR2X	/TN 5557431739/TN 555 743-1739	1	0.21	0.21				
14			TTB	/TN 5557431739/TN 555 743-1739							
15			PSEBO	/TN 5557431739/TN 555 743-1739/PROX C							
16			1LB	/TN 5557432141	1	32.27	32.27				
17			POR2X	/TN 5557432141/TN 555 743-2141	1	0.21	0.21				
18			TTB	/TN 5557432141/TN 555 743-2141							
19			PSEBO	/TN 5557432141/TN 555 743-2141/PROX C							
20			1LB	/TN 5557435735	1	32.27	32.27				
21			POR2X	/TN 5557435735/TN 555 743-5735	1	0.21	0.21				
22			TTB	/TN 5557435735/TN 555 743-5735							
23			1LB	/TN 5557437235	1	32.27	32.27				
24			ESM	/TN 5557437235/TN 555 743-7235	1	4.5	4.5				
25			POR2X	/TN 5557437235/TN 555 743-7235	1	0.21	0.21				
26			TTB	/TN 5557437235/TN 555 743-7235							
27			1LB	/TN 5557437302	1	32.27	32.27				
28			POR2X	/TN 5557437302/TN 555 743-7302	1	0.21	0.21				
29			TTB	/TN 5557437302/TN 555 743-7302							
30			1LB	/TN 5557437367	1	32.27	32.27				

Desired Output

Ready

Figure 28: CSR Report in Excel

How to Get Help

This chapter explains how to contact Lymeware Product Support if you need assistance with your CABS Viewer product.

Scope of Support Services

Lymeware Product Support can provide assistance and information for the following:

- Installing the CABS Viewer product
- CABS Viewer product questions
- Software revisions and upgrades
- Implementing a specific feature
- How to use the CABS Viewer product
- The status of your support call
- Requests for product enhancement

Unfortunately, we cannot assist you with problems involving the following, but we may be able to suggest a next step or another vendor to call:

- Your hardware
- Your operating system or other system software
- Your application or user-written programs
- Software not developed by Lymeware Corporation
- Scripts written by Lymeware consultants, partners, or other third parties

Try this first

Before you call Lymeware Product Support, use your software manuals (including this manual) to locate the section that documents the program or feature where you are having problems. The documentation may explain the software's behaviour or give you insight to help you solve the problem.

Contact Lymeware Product Support

Two e-mail addresses are available for CABS Viewer product support or to report a potential bug in the software or documentation. Please use the following addresses:

Support@lymeware.com for all technical inquires and problem reports, including documentation issues from customers with support contracts. Customers should include relevant contact details, including company name and phone number, in initial message to speed processing. Messages that are continuations of an existing problem report should include the problem report ID in the subject line. Customers without support contracts with Lymeware Corporation should not use this address, but should contact their distributor directly.

Bugs@lymeware.com for bug reports and documentation problems.

Bug reports on software releases are always welcome. These may be sent by any means, but e-mail to the bug reporting address listed above is preferred. Please send proposed fixes and successful workarounds with the report if possible. Additional useful information would include **CABS Viewer** software version, hardware description, operating system version and patches, screen dumps, relevant sections of logs and configuration files, and failed messages files. Any reports will be acknowledged, but further action is not guaranteed. Any changes resulting from bug reports may be included in future releases.

Appendix A - CONFIGURATION WORKSHEETS AND FORMS

This appendix contains worksheets that should be used to complete specific tasks during the installation, configuration and maintenance of your CABS Viewer product. The following table describes each worksheet.

License Request Form	This form is required for issuing of an evaluation or permanent license (required for product operation)
Problem Reporting Form	This form should be used for any problems encountered which can be reported back to Lymeware

Table 7. CABS Viewer Product Worksheets

These worksheets may be copied for use in maintaining your CABS Viewer product.

License Request Form

A specific license data file will be required to run your CABS Viewer product. Lymeware or your distributor will be able to supply a valid license file if the following information is supplied:

CABS Viewer License Request Form Version 1.3
For requesting a valid commercial or evaluation CABS Viewer product license
Customer specific information
Customer (Company) Name:
Lymeware Product Name: **CABS Viewer**
Lymeware Product Version:
Lymeware Product Options: **standard**
Target Machine IP Address:
Target Machine Host ID (only needed for Solaris):
Target Machine Make and Model:
Target Machine Operating System and Version:
Contact Person:
Contact Phone Number:
Contact E-mail Address:
This License Request Form may be faxed to Lymeware Corporation at (240) 218-7363 or the same information may be e-mailed to sales@lymeware.com.

The license file will be delivered to the Contact E-Mail Address. The license file must be installed in the CABS Viewer install directory as `license.dat` and must be owned by root.

CABS Viewer Problem Report Form

Version 1.1

For reporting CABS Viewer product problems
Customer specific information
Your Name:
Your Company Name:
Your Telephone Number:
Your E-mail Address:
Your CABS Viewer product version:
Your CABS Viewer platform:
Any software add-ons to your CABS Viewer system:
A detailed description of the problem:
The sequence of steps that led to the problem:
Actions you have taken to diagnose or resolve the problem:
This Problem Report Form may be faxed to Lymeware Corporation at (240) 218-7363 or the same information may be e-mailed to sales@lymeware.com.

Appendix B – CABS VIEWER REFERENCE DOCUMENTATION

Telcordia Technologies	Special Report SR-1868 CABS (Carrier Access Billing System) Billing Output Specifications - Volume 1 Paper Bill and CSR, Feb 2004
Telcordia Technologies	Special Report SR-1869 CABS (Carrier Access Billing System) Billing Output Specifications - Volume 1A - Codes and Phrases, Aug 2006
Telcordia Technologies	Special Report SR-1871 CABS (Carrier Access Billing Specifications) Billing Output Specifications - Volume 2 - Service Exhibits, Mar 2000
Telcordia Technologies	Special Report SR-1872 CABS (Carrier Access Billing System) Billing Outputs Specifications - Volume 3 Billing Data Tape, Aug 2006
Telcordia Technologies	Special Report SR-1873 CABS (Carrier Access Billing System) Billing Output Specifications - Volume 3A Billing Data Tape Edits, Aug 2006
Telcordia Technologies	Special Report SR-1874 CABS (Carrier Access Billing System) Billing Output Specifications - Volume 4 - Data Elements, Aug 2006
Telcordia Technologies	Document Store http://telecom-info.telcordia.com/site-cgi/ido/index.html
VIM	Vim User's Guide, http://vimdoc.sourceforge.net/
Microsoft	Excel User's Guide, http://www.microsoft.com/
Sun Microsystems	StarOffice Manuals, http://docs.sun.com/app/docs/coll/so7en
OpenOffice.org	OpenOffice User's Guides, http://download.openoffice.org/index.html
ThinkFree Office	ThinkFree Office User's Guides, http://www.thinkfree.com/
Altova	XMLSpy User's Guide, http://www.altova.com/
Microsoft	Internet Explorer 6.0 User's Guide, http://www.microsoft.com/
Mozilla.org	Mozilla User's Guide, http://www.mozilla.org/
Mozilla.org	Firefox User's Guide, http://www.mozilla.org/
Perl	Perl Documentation, http://www.perl.org/docs.html
ActiveState	ActivePerl Documentation, http://aspn.activestate.com/ASPN/Reference/
Red Hat	RPM User's Guide, http://www.redhat.com/docs/manuals/enterprise/

Table 8. Commercial or third party documentation used by this product or manual

Standards Identification	Standards Body	Standards Title and Publication Date
CSV	De facto	http://www.creativyst.com/Doc/Articles/CSV/CSV01.htm
XML	W3C	Extensible Markup Language (XML) 1.1 W3C Recommendation 04 February 2004 http://www.w3.org/TR/2004/REC-xml11-20040204/
HTML 3.2	W3C	HTML 3.2 Reference Specification W3C Recommendation 14-Jan-1997 http://www.w3.org/TR/REC-html32
HTML 4.0.1	W3C	HTML 4.01 Specification W3C Recommendation 24 December 1999 http://www.w3.org/TR/html401

Table 9. National, International, Internet, and Industry Standards used by this product

Appendix C – SAMPLE BOS DATA

The following file is an example of a standard CABS BOS BDT data file. A digital version of this file may be found under the CABS Viewer installation directory, under the **examples** directory.

A partial example of a CABS BOS Version 42 BDT file.

```
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0                                  00000 000000
100101010ABCD 20050115877Q0102341230001000000002            Q20050100123456             ABCD
100405000ABCD 20050115877Q0102341230001000000003            VERIZON CABS                    P.O. BOX 37210                  BALTIMORE, MD 21297-3210
00
100505001ABCD 20050115877Q0102341230001000000004            Q20050100123456
WWW.VERIZON.COM/WHOLESALE                                       888TISOC88NEB1
100505011ABCD 20050115877Q0102341230001000000005            NOTONE NETWORKS INC             ONE MAIN STREET
BOSTON                      MA  01011-9876
100505020ABCD 20050115877Q0102341230001000000006
100510000ABCD 20050115877Q0102341230001000000007                                  Q20050100123456
0000058033F0000058033O00000000000{0000000000{0000000000{0000000000{0000000000{    0000000000{
100512000ABCD 20050115877Q0102341230001000000008            Q20050100123456
MA2005011520050214200502200000000000{0000000000{0000000000{0000047787B0000000000{0000000000{0000000000{0000047787B0000000000{                    9999
100513001ABCD 20050115877Q0102341230001000000009            Q20050100123456
MA0000002783I0000000000{0000000000{0000000000{0000004797G0000000000{0000000000{0000002574F0000057943D0000057943D00000000000{    0000000000{     9999
100513010ABCD 20050115877Q0102341230001000000010            Q20050100123456 MA                    999900000002783I00000004797G
101505000ABCD 20050115877Q0102341230001000000011            Q20050100123456 20050118   PAYMENT RELATED ITEM
00000580330                                  0
101590000ABCD 20050115877Q0102341230001000000012
00000580330
102505000ABCD 20050115877Q0102341230001000000013            Q20050100123456
0000058033F0000058033O00000000000{0000000000{
102590000ABCD 20050115877Q0102341230001000000014
0000000000{
103005000ABCD 20050115877Q0102341230001000000015       000003        20041220C5TY1234Z                  0000                                0100
103010000ABCD 20050115877Q0102341230001000000016       000003          TN   8767362121                                        999SPFDMAWODS20100
103015001ABCD 20050115877Q0102341230001000000017
000003Z11MA99992004121520050115000000000000{0000000000{0000000000{0000000000{0000000000{0000000000{0000000000{999999999
0Q2005010012345620050115099900200
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000000{0000000000{                  000000000000{000000{40  00000000000000000000126
103016000ABCD 20050115877Q0102341230001000000019       000003Z11LABOR CHARGE - ONE TIME AND/OR FIRST 30      MINS AND/OR SUBSEQUENT 15 MINS
0
103025000ABCD 20050115877Q0102341230001000000020       000003MA99991
0000000000{0000002750{0000000000{0000002750{ 0
103005000ABCD 20050115877Q0102341230001000000021       000003        20041223D5SQ7051M   DISCONNECT7964  0000                                0100
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0Q2005010012345620050115099900200
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000000{0000000000{                  000000000000{000000{40  00000000000000000000126
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0
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0000000000{0000000033I0000000000{0000000033I 0
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0000002783I0000000000{0000002783I0000000000{0000000000{
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MA87659221961002100003 5           VE000000000000036{  0000000020041215200501 14MA9999005
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MA87659221960154200003 6           VE000000000000037{  0000000020041215200501 14MA9999005
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020041215200501 14MA99990000                0              000000000232{0000     5
103605000ABCD 20050115877Q0102341230001000000035       000000     00000000348762473093056 94VE0000000000000{00000000{           000000000
020041215200501 14MA99990000                1              000000000232{0000     5
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020041215200501 14MA99990000                2              0000000000230{0000     5
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MA87629711130437200000 3           VEF300000000000 10{  0000000020041215200501 14MA9999005
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8762470180EASTHAMPTNMA8765299088052920000 07          VEF300000000000 14{  0000000020041215200501 14MA9999005
103604500ABCD 20050115877Q0102341230001000000039       000004     000000 4876247767842787624701800331001 06
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```

```
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8762473249EASTHAMPTNMA876527970005352000019           VEF30000000000023{  000000002004121520050114MA9999005
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103604500ABCD 20050115877Q01023412300010000000143       000006     000000 487624776784278762473249033101229
8762473249EASTHAMPTNMA876527970003402000020           VEF30000000000024{  000000002004121520050114MA9999005
103604500ABCD 20050115877Q01023412300010000000144       000007     000000 487624776784278762473249033100110
8762473249EASTHAMPTNMA876527970005242000020           VEF30000000000024{  000000002004121520050114MA9999005
```

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```

Appendix D – INSTALLING PERL

The Perl scripting language is required for the included CABS Viewer utilities (as described in the ***CABS Viewer Utilities*** chapter), and different installation instructions are required depending on the host platform. A minimum Perl version of **5.6.x** is recommended for correct use.

Linux Perl Installation

Many of the Linux distributions (including Red Hat Enterprise Linux) have Perl preinstalled and will not need any special installation to use the included Perl scripts.

To test for this, type the following in a bash shell console:

```
perl –v
```

If Perl is correctly installed, a message similar to the following shall be returned:

```
This is perl, v5.8.6 built for linux-thread-multi-
64int

Copyright 1987-2004, Larry Wall

Perl may be copied only under the terms of either the
Artistic License or the GNU General Public License,
which may be found in the Perl 5 source kit.

Complete documentation for Perl, including FAQ lists,
should be found on this system using `man perl' or
`perldoc perl'.  If you have access to the Internet,
point your browser at http://www.perl.org/, the Perl
Home Page.
```

If Perl is not found using the above command, it may need to be installed. Our Linux reference platform (Red Hat Enterprise Linux 3) uses RPM (the Red Hat Package Manager) for product installation and management. Your specific Linux distribution may use other package managers. If not using Red Hat Linux and RPM then refer to your own distribution's package installation instructions.

If installing from Red Hat, perform the following tasks:

- Log in as root
- In a bash shell, run up2date:

```
up2date perl
```

This will install the latest version of Perl on your system.

Solaris Perl Installation

The newest versions of Solaris have Perl preinstalled and will not need any special installation to use the included Perl scripts.

To test for this, type the following in a shell window:

```
perl –v
```

If Perl is correctly installed, a message similar to the following shall be returned:

```
This is perl, v5.8.6 built for solaris-thread-multi-
64int

Copyright 1987-2004, Larry Wall

Perl may be copied only under the terms of either the
Artistic License or the GNU General Public License,
which may be found in the Perl 5 source kit.

Complete documentation for Perl, including FAQ lists,
should be found on this system using `man perl' or
`perldoc perl'.  If you have access to the Internet,
point your browser at http://www.perl.org/, the Perl
Home Page.
```

If Perl is not found using the above command, it may need to be installed. Solaris uses the PKG (Package) utilities for product installation and management.

Lymeware uses the www.sunfreeware.org web site for Solaris pre-packaged open source products. Surf to the site, select your specific

platform and Solaris version and download the binary package to your local Solaris machine.

Once downloaded, perform the following tasks:

- Log in as root
- In a ksh shell, run pkgadd with the following command:

```
pkgadd –d. <perl_pkg_name>
```

This will install the latest version of Perl on your system.

Windows Perl Installation

Lymeware recommends ActivePerl (from ActiveState www.activestate.com/) for Perl on all Windows platforms.

Perform the following tasks:

Go to http://activestate.com/Products/ActivePerl/ and select one of the three links at the bottom of the page. Eventually you will get to a page of download links and select a Windows MSI file (in the form of ActivePerl-5.N.N.NNN-MSWin32-x86-122208.msi).

Next, install the MSI file (using Microsoft Windows Installer 2.0+, available on the ActiveState website or the Microsoft website).

During the install do select **Enable PPM3 to send profile info to ASPN**, as this will allow you to easily update Perl CPAN packages and modules from within ActivePerl.

Appendix E - GLOSSARY

ANSI - American National Standards Institute.

ATIS - Alliance for Telecommunications Industry Solutions.

BDT - Billing Data Tape.

BOS - Billing Output Specifications, details the specific record and data element format of the CABS standard.

CABS – Carrier Access Billing System, a telecom carrier billing standard, supported by many of the major national and regional carriers.

CLEC – Competitive Local Exchange Carrier.

CSV – Comma Separated Values (also called command-delimited format) usually supported by spreadsheet programs and as import formats for many databases.

HTML – The Hyper Text Mark-up Language. The data format used to build and describe web pages.

ILEC – Incumbent Local Exchange Carrier.

International Standards Organization (ISO) - creates international standards, including cryptography standards.

Internet Engineering Task Force (IETF) – creates Internet standards, including security and network standards.

ITU-T - International Telecommunications Union - Telecommunications standardization sector.

OSS – Operational Support System. In the Telecommunications Industry the OSS is the sum of all in-house provisioning and billing systems and databases.

RBOC – Regional Bell (system) Operating Company. The pieces of AT&T created to provide Local telephone service. Often referred to as the "Baby Bells".

URL – Universal Resource Locator, typically a web browser address or location value.

XML – A open data format, defined by WC3 to allow data interchange between differing programs and platforms.

CABS Viewer User Guide

Please send suggestions or corrections to:

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www.lymeware.com