

WYLE TEST REPORT NO. T56285-01

APPENDIX A.9

SOURCE CODE REVIEW REPORT

32 pages including cover page

Unisyn OpenElect Voting System Ver. 1.0 Software Report Summary

This review covers the Unisyn voting system software. The review involved evaluation of its compliance with the Election Assistance Commission (EAC) 2005 Voluntary Voting System Guidelines (VVSG). This evaluation included, but was not limited to, the following considerations:

Readability	How straightforward and apparent was the design?
Understandability	How complicated was the code to implement it?
Modularity	How well was the code divided into logical, functional units?
Robustness	How well does the code handle error conditions or unexpected inputs?
Security	Does the code protect the integrity of voting data at all times?
Maintainability	How easy would it be to extend, fix, or modify this code in the future?
Consistency	Was the design of the code coherent throughout?
Documentation	Does the code contain useful and frequent comments?
Usability	Does the code inform the user about progress or errors?
Flow control	Are control constructs and entry/exit points logical and controlled?

The technical reports detail specific instances where it was felt that the code fell short in some areas being reviewed, and lists directories, file names, line numbers, and notes to notify the maintainers of the standards violations.

1. Initial Observations

The submitted source code consisted of files organized by functionality into major subdirectories: BallotLayout, Common, ElectionManager, ElectionServer, OCSInstaller, RegKeyBuilder, SoftwareServer, Tabulator, TabulatorClient, TabulatorReports, TabulatorService, Validator, Scripter, OVO, and OVI. The project was written in Java. Some modules included SQL statements and there was one cpp file.

2. Summary Assessment Findings

In general, review of the source code modules comprising the submitted Unisyn voting system software found that most of the code was written and commented to EAC 2005 VVSG standards. The majority of anomalies discovered during the review process consisted of issues dealing with comments, which is discussed in more detail below. Other deviations from the standards include:

- Non-conforming variable names (either one character names, names not differing by more than one character, or non-descriptive names);
- Non-permissible source code constructs (e.g., multiple exits from loops);
- Source code lines that exceeded the maximum allowed length;
- Instances of over five levels of indented scope;
- Cases of no message upon exit;
- Exceptions thrown without a comment to describe where it is caught.
- Incomplete file reference in module header.
- Incorrect revision history in module header.
- Incorrect units called in module header.
- Non-uniform commenting style.

The following observations are intended to provide a summary of the most common commenting problems identified during the source code review.

- i. Module Purpose
 - a. The purpose is more cryptic than descriptive, lacking detail, and using generic terms that can be applied to source code other than the module it is attempting to describe;
 - b. Poor language skills and/or spelling is used, which makes it very difficult to follow the intent of the comment.
- ii. Variable Comments
 - a. The most common problem with variable comments is the comment does not provide a clear description of how the variable is being used in the code.
 - b. Variables holding SQL statements are often too generic, lacking detail.
- iii. Inline Comments
 - a. The reviewed source code contains many inline comments, which is very good; however, at times it appeared that inline comments were inserted into the source code merely for the exercise of it and not to provide additional information or description;
 - b. Many problems identified with inline comments had to do with the comments being too cryptic or lacking in detail;
 - c. The comments were often lacking a clear description of what the source code is doing.

3. Code Review Process

The source code went through several iterations of standards violations being identified by Wyle and Unisyn attempting to bring the code up to standards. Code changes were made during the code review process that also had to be brought up to standards. All identified standards violations of the code, were corrected during this process.

4. Source Files

BallotLayout

```
\---com
  +---ballot
  | +---constants
  | |   BallotCodes.java
  | |   Command.java
  | |   Text.java
  | |
  | +---datacache
  | |   CandidateCache.java
  | |   CardDefinition.java
  | |   ContestCache.java
```

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```
| | ContestGroup.java
| | ContestGroupCache.java
| | ParentCache.java
| |
| +---db
| | BallotDBCColumns.java
| | DBBackupTask.java
| | DBConstants.java
| | DBKeys.java
| | DBRestoreTask.java
| | DBRows.java
| | DBTables.java
| | DBTranslations.java
| |
| +---export
| | ElectionXMLUtil.java
| | ExportWorker.java
| |
| +---generator
| | BallotGenerator.java
| | BallotStyleBuilder.java
| | Contest.java
| | FormatBallotStyle.java
| | InsertBallotStyle.java
| |
| +---gui
| | AddEditCandidatePanel.java
| | AddEditContestPanel.java
| | AddEditDistrictPanel.java
| | AddEditDistrictType.java
| | AddEditHeader.java
| | AddEditInstructionsPanel.java
| | AddEditMeasurePanel.java
| | AddEditPartyPanel.java
| | AddEditPrecinctPanel.java
| | BallotDesktop.java
| | BallotPreferences.java
| | ContestCellRenderer.java
| | DistrictPanel.java
| | DistrictPrecinctAssignmentPanel.java
| | DistrictTypePanel.java
| | EditTranslationsPanel.java
| | ElectionBallotPanel.java
| | ElectionContestPanel.java
| | ElectionDisplayContainer.java
| | ElectionHomePanel.java
| | ElectionIcon.java
| | ElectionReportsPanel.java
| | GroupAssignmentPanel.java
| | IntegerTextField.java
| | LanguageAssignmentPanel.java
| | PartyPanel.java
| | PrecinctDistrictAssignmentPanel.java
| | PrecinctPanel.java
| | PreferenceDisplay.java
| | SetupPanel.java
```

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```
|
| +---menu
| | BallotMainMenu.java
| | ElectionFrameMenu.java
| | UnisynPermissionPanel.java
| | UnisynSingleSelectionModel.java
| | UpdateListener.java
|
| +---report
| | +---ballotproof
| | | BallotProofData.java
| | | BallotProofTask.java
| |
| | +---ballots
| | | BallotStyleData.java
| | | CandidateBean.java
| | | ContestBean.java
| | | IDMarkBean.java
| | | JasperBallotParameters.java
| | | PreviewBallotWorker.java
| | | PrintBallotsUtil.java
| |
| | +---electionproof
| | | ElectionProofData.java
| | | ElectionProofReportTask.java
| | | ElectionRecordBean.java
| |
| | \---precinct
| | | PrecinctDistrictReportTask.java
|
| +---tools
| | AlphaNumericValidator.java
| | BallotParty.java
| | BallotPartyList.java
| | BallotUtil.java
| | BarcodeUtil.java
| | NumberFieldListener.java
| | UnicodeUtil.java
|
| \---widget
| | UnisynTabbedPane.java
|
| | +---combo
| | | DistrictComboBox.java
| | | DistrictTypeComboBox.java
| | | ElectionTypeComboBox.java
| | | LanguageComboBox.java
| | | PartyComboBox.java
|
| | \---dialog
| | | AddContestDialog.java
| | | AddElectionDialog.java
| | | AddGroupAssignmentsDialog.java
| | | AddGroupTranslationDialog.java
| | | AddSplitDialog.java
| | | AddTranslationDialog.java
```

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```
|      DateChooser.java
|      ExportDialog.java
|      ReorderContestsDialog.java
|      ReorderPrecinctsDialog.java
|
+---props
|   db.src
|
\---unisyn
    +---reports
    |   PrintUtil.java
    |
    \---worker
        UnisynBaseWorker.java
        WorkerException.java
        WorkerStatus.java
```

Common

```
\---com
  \---unisyn
    +---beans
    |   BallotBean.java
    |   BallotStyleBean.java
    |   CandidateBean.java
    |   CandidateOrderBean.java
    |   ContestBean.java
    |   ContestOrderBean.java
    |   DistrictBean.java
    |   DistrictTypeBean.java
    |   ElectionBean.java
    |   Field.java
    |   FieldValidator.java
    |   LanguageBean.java
    |   PartyBean.java
    |   PrecinctBean.java
    |
    +---crypto
    |   Cryptor.java
    |   CryptorException.java
    |   CryptoUtil.java
    |   EncryptDecryptFactory.java
    |   Hex.java
    |   UnisynKey.java
    |
    +---db
    |   DBUtil.java
    |   ElectionFileCom.java
    |   MySQLDBCom.java
    |   UnisynDBCom.java
    |   UnisynDBFactory.java
    |
    +---exception
    |   ApplicationException.java
    |
```

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```
+---gui
| | LogPanel.java
| | UnisynAbout.java
| | UnisynButton.java
| | UnisynCheckBox.java
| | UnisynComboBox.java
| | UnisynDesktop.java
| | UnisynDesktopPane.java
| | UnisynDisplay.java
| | UnisynDisplayContainer.java
| | UnisynIcon.java
| | UnisynIconManager.java
| | UnisynMsgDialog.java
| | UnisynPanel.java
| | UnisynPasswordDialog.java
| | UnisynProgressBar.java
| | UpdatePasswordDialog.java
| |
| +---list
| |   ParentChildCellRendererer.java
| |   UnisynList.java
| |   UnisynListModel.java
| |   UnisynReorderListModel.java
| |
| +---task
| |   SwingWorker.java
| |   UnisynTask.java
| |
| \---users
|   AddEditUserPanel.java
|   UserConstants.java
|   UserPanel.java
|
+---logger
|   AppLog.java
|   AuditCodes.java
|   LogData.java
|   LogFinder.java
|   LogReader.java
|   LogWeeder.java
|   SimpleLogger.java
|
+---menu
|   UnisynCheckBoxMenuItem.java
|   UnisynFrameMenuBar.java
|   UnisynMainMenu.java
|   UnisynMenu.java
|   UnisynMenuBar.java
|   UnisynMenuItem.java
|
+---registration
|   RegistrationKeyDialog.java
|   RegistrationKeyMgr.java
|
+---reports
| | JasperReportTask.java
```

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```
| | JasperSaveReportTask.java
| | PrintScreenTask.java
| | UnisynViewer.java
| |
| \---standalone
|     DBPasswordDialog.java
|     StandAloneSaveReportTask.java
|     StandAloneUnisynViewer.java
|     UnisynStandAloneReport.java
|     UpdatePasswordDialog.java
|
| +---security
|     UnisynPermission.java
|     UnisynPermissionGroup.java
|     UnisynPermissionPanel.java
|     UnisynPermissions.java
|     UnisynPermissionSet.java
|     UnisynSingleSelectionModel.java
|     UnisynUserSession.java
|     UpdateListener.java
|
| +---ssl
| | +---client
| | | UnisynClientTrustManager.java
| | | UnisynSecureClientSocketFactory.java
| | |
| | \---server
| |     SSLCertificateManager.java
| |     UnisynServerTrustManager.java
| |     UnisynSSLServer.java
|
| +---systemtools
| | CDDrive.java
| | DriveUpdateHandler.java
| | DriveUpdateListener.java
|
| +---tools
| | ZipFileEntryBean.java
| | ZipFileReader.java
|
| +---util
| | BuildInfo.java
| | ChecksumCRC32Mgr.java
| | Constants.java
| | ConvertUtil.java
| | CopyUtil.java
| | CustomComboBox.java
| | DateUtil.java
| | DisplayConstants.java
| | DisplayFormat.java
| | DisplayObject.java
| | ElectionManifest.java
| | EncResourceBundle.java
| | EncryptedStatusFile.java
| | FileFilter.java
| | GenericBean.java
```


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```
| GenericComparator.java
| GenericCompEntry.java
| Hex.java
| IString.java
| JSizePasswordField.java
| JSizeTextArea.java
| JSizeTextField.java
| PreferenceNotSetException.java
| Preferences.java
| PropertyManager.java
| SpringUtilities.java
| Status.java
| StreamGobbler.java
| TagNames.java
| TransactionStatus.java
| UniqueApp.java
| UnisynConstants.java
| UnisynUtil.java
| UploadProperties.java
| ZipProcessor.java
|
| \---xml
|   XMLElementInfo.java
|   XMLFileDecryptor.java
|   XMLFileDef.java
```

ElectionManager

```
\---com
  +---em
  | +---db
  | |   DBColumns.java
  | |   DBConstants.java
  | |   DBName.java
  | |   ElectionBackup.java
  | |
  | +---gui
  | |   ApplicationPreferences.java
  | |   BallotPreviewContainer.java
  | |   CloseButtonPanel.java
  | |   ContestOptionPanel.java
  | |   ElectionDisplayContainer.java
  | |   ElectionHomePanel.java
  | |   ElectionIcon.java
  | |   ElectionOptionsPanel.java
  | |   ElectionPasswordDialog.java
  | |   EMDesktop.java
  | |   LanguageComboBox.java
  | |   LogViewWindow.java
  | |   OverwriteDialog.java
  | |   PasswordFieldListener.java
  | |   PreferenceDisplay.java
  | |   ReportsPanel.java
  | |   ScreenConstants.java
  | |   SoundDisplayPanel.java
  | |   TextButton.java
```

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```
| | | TextPermissionButton.java
| | | tpause.gif
| | | tplay.gif
| | | tplayh.gif
| | | UserManagementPanel.java
| | | UserManagementPasswordDialog.java
| | | ViewNotLoadedFilesDialog.java
| | | ViewNotLoadedSoundFilesDialog.java
| | |
| | +---task
| | | BackupTask.java
| | | BuildElectionFilesTask.java
| | | LoadElectionTask.java
| | | RestoreTask.java
| | | UploadFilesTask.java
| | | UploadSoundFilesTask.java
| | |
| | \---tmgmt
| | | Directory.java
| | | FileManager.java
| | | LogParser.java
| | | TMDisplayContainer.java
| | | TMMaintenancePanel.java
| | |
| | +---loader
| | | CheckElectionHandler.java
| | | ElectionXMLHandler.java
| | | ImportElectionHandler.java
| | | LoadElection.java
| | | LoaderUtil.java
| | | Validator.java
| | |
| | +---menu
| | | ElectionFrameMenu.java
| | | EMMainMenu.java
| | | ExportMenuItem.java
| | | OpenElectionMenu.java
| | |
| | +---reports
| | | AudioReportTask.java
| | | BallotPreviewTask.java
| | | BallotProofTask.java
| | | MaintenanceUsersReportTask.java
| | |
| | \---data
| | | BallotDataSource.java
| | | MaintenanceUsersDataSource.java
| | | SoundDataSource.java
| | |
| | \---tools
| | | Codes.java
| | | ElectionMgr.java
| | | ElectionQueryMgr.java
| | |
| | +---beans
| | | BallotImageBean.java
```

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```
| | ContestUndervoteBean.java
| | ElectionMessageBean.java
| | ElectionProfileBean.java
| | OEUserPasswordBean.java
| | TranslationBean.java
| | UserBean.java
|
| +---encrypt
| | EncryptedElectionZipCreator.java
| | PasswordAndOVOSFileEncryptor.java
|
| +---export
| | AdminLogZipCreator.java
| | BallotStyleDataFiles.java
| | BallotZipCreator.java
| | OutputFile.java
| | SoundZipCreator.java
| | ZipCreator.java
|
| \---util
| | BallotType.java
| | BlobUtil.java
| | ContestXMLFile.java
| | ContestXMLFiles.java
| | DataVerification.java
| | ElectionStateMgr.java
| | ElectionXMLFile.java
| | ElectionXMLTag.java
| | ElectionXMLUtil.java
| | ImageUtil.java
| | ManifestPropertiesFile.java
| | OutputXMLFile.java
| | OVOCPropertiesFile.java
| | OVOSPropertiesFile.java
| | PasswordAndKeyGenerator.java
| | PasswordPropertiesFile.java
| | PlayThread.java
| | PrecinctXMLFile.java
| | PrecinctXMLFiles.java
| | SoundPlayer.java
| | SoundUtil.java
| | SoundZipFactory.java
| | TranslationUtil.java
|
| \---props
| | db.src
| | text_en.src
| | uploadsystem.src
```

ElectionSever

```
\---com
| +---es
| | +---gui
| | | ActivityPanel.java
| | | DeleteLogDialog.java
```

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```
| | | ElectionConfirmDialog.java
| | | ESDesktop.java
| | | LogDeleteTask.java
| | | LogViewPanel.java
| | | MenuCommand.java
| | | OVOCViewPanel.java
| | |
| | +---model
| | |   ActiveMachineModel.java
| | |   LogModel.java
| | |   ModelFactory.java
| | |
| | \---task
| |   LoadElectionTask.java
| |
| +---menu
| |   ESMainMenu.java
| |
| +---parser
| |   ElectionBean.java
| |   ElectionBeanXMLHandler.java
| |   ElectionXMLParserFactory.java
| |
| +---tools
| |   AuditTrail.java
| |   ESCodes.java
| |   FileTool.java
| |
| +---util
| |   Config.java
| |   ElectionCDBean.java
| |   ESLogMgr.java
| |   ESUtil.java
| |   LogFileUtil.java
| |
| \---www
|   WebServer.java
|
\---props
  db.src
  permissions.src
```

OCSInstaller

```
\---com
  +---images
  |   BallotLayout.gif
  |   ElectionManager.gif
  |   ElectionServer.gif
  |   SoftwareServer.gif
  |   TabulatorClient.gif
  |   TabulatorMonitor.gif
  |   TabulatorReports.gif
  |
  \---unisyn
    \---installer
```

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```
| ApplicationIcon.java
| InstallerDesktop.java
| InstallPanel.java
|
+---task
|   InstallApplicationTask.java
|   ListApplicationTask.java
|
\---util
    InstallUtil.java
    ReleaseProperties.java
    StreamGobbler.java
```

RegKeyBuilder

```
\---com
  \---unisyn
    \---admin
      BuildRegKey.java
      BuildUtil.java
      EncodeData.java
      EncryptReports.java
```

SoftwareServer

```
\---com
  +---loader
  |   +---db
  |   |   DBCom.java
  |   |   DBFactory.java
  |   |   ReleaseFileCom.java
  |   |
  |   +---gui
  |   |   ActivityPanel.java
  |   |   DeleteLogDialog.java
  |   |   FilesViewPanel.java
  |   |   LoaderDesktop.java
  |   |   LogDeleteTask.java
  |   |   LogViewPanel.java
  |   |   MenuCommand.java
  |   |   ReleaseKeyDialog.java
  |   |
  |   +---model
  |   |   ActiveMachineModel.java
  |   |   LogModel.java
  |   |   ModelFactory.java
  |   |
  |   \---task
  |       LoadSoftwareTask.java
  |
  +---logger
  |   LogFinder.java
  |   LogWeeder.java
  |   SimpleLogger.java
  |
  +---menu
```

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```
| | LoaderMainMenu.java
| |
| +---parser
| | ReleaseBean.java
| | ReleaseCDBean.java
| | ReleaseZipFactory.java
| | ScriptBean.java
| | ScriptParser.java
| |
| +---tools
| | AuditTrail.java
| | FileTool.java
| | LoaderCodes.java
| |
| +---util
| | Config.java
| | LoaderLogMgr.java
| | LoaderUtil.java
| | LogFileUtil.java
| | RequestMessage.java
| |
| \---www
| | Service.java
| | WebServer.java
| |
| \---ssl
| | HttpsService.java
| |
| \---props
| | db.src
| | permissions.src
```

Tabulator

```
\---com
| +---images
| | activity_blk.gif
| | activity_grn.gif
| | activity_off.gif
| | activity_red.gif
| | activity_ylw.gif
| |
| +---props
| | db.src
| | text_en.src
| | uploadsystem.src
| |
| \---tabulation
| | +---ballot
| | | BallotConverter.java
| | | ReadData.java
| | | ReaderVote.java
| | |
| | +---beans
| | | Ballot.java
| | | BallotBean.java
```

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```
| CandidateBean.java
| CandidateRCVResult.java
| ContestBean.java
| ContestRCVResult.java
| RCVResultBean.java
| RCVSelectionBean.java
| RCVVoteBean.java
| SelectionBean.java
| VoteBean.java
|
+---db
| DBConstants.java
| DBKeys.java
| DBName.java
| DBTables.java
| ElectionBackup.java
|
+---gui
| | ActivityLight.java
| | ElectionIcon.java
| | PreferenceDisplay.java
| | RCVParameterPanel.java
| | RCVTabPanel.java
| | RunPanel.java
| | ScreenConstants.java
| | TabulationDesktop.java
| | TabulationDisplayContainer.java
| | TabUploadPanel.java
| |
+---combobox
| | RunComboBox.java
| | RunTypeComboBox.java
| | VoteScopeComboBox.java
| | VoteTypeComboBox.java
| |
+---dialog
| | AddManualEntryDialog.java
| | AddSessionDialog.java
| | ContestSelectionDialog.java
| | ManualElimDialog.java
| | OverwriteDialog.java
| | ParamDialog.java
| | RCVTallyContestSelectionDialog.java
| |
+---manual
| | AdjustmentDisplayObject.java
| | AdjustmentPanel.java
| | CandidateDisplayPanel.java
| | CandidateManualEntryPanel.java
| | ManualEntryAdjustment.java
| | ManualEntryPanel.java
| |
\---util
| TabulationPreferences.java
|
+---load
```

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```
| | BackupElectionResultTask.java
| | DeleteElectionTask.java
| | LoadElectionFromArchiveTask.java
| | LoadElectionTask.java
| | LoadPrecinctVoterCountTask.java
| |
| +---util
| |   ElectionLoader.java
| |   ElectionMgr.java
| |   ElectionQueryMgr.java
| |   ScreenConstants.java
| |   TabulatorCodes.java
| |
| \---xml
| |   ElectionInputXMLHandler.java
| |   ElectionInputXMLParser.java
| |   ElectionInputXMLValidator.java
| |   ElectionXMLTag.java
| |   ElectionXMLUtil.java
| |
| +---menu
| |   TabulationMainMenu.java
| |
| +---rcvtab
| |   GroupVoteBean.java
| |   RCVTABTask.java
| |   RCVTally.java
| |   VoteCounter.java
| |   VoteFileHandler.java
| |
| +---reports
| |   CrosstabDataEntryBean.java
| |   CrosstabMainEntryBean.java
| |   RCVDData.java
| |   RCVReportTask.java
| |
| \---util
| |   Constants.java
| |   FileUtil.java
| |   RunDisplayObject.java
| |   TabulatorStatus.java
| |   Toolbox.java
```

TabulatorClient

```
\---com
+---images
|   activity_blk.gif
|   activity_grn.gif
|   activity_off.gif
|   activity_red.gif
|   activity_ylw.gif
|
+---props
|   db.src
|   permissions.src
```


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```
| text_en.src
| uploadsystem.src
|
\---tc
+---fileutil
| FileManager.java
| TabulatorStatus.java
| TransportedFile.java
| TransportedFileSet.java
| TransportMedia.java
| UploadStatus.java
|
+---gui
| | ActivityLight.java
| | ActivityPanel.java
| | ScreenConstants.java
| | Standards.java
| | TabStatusPanel.java
| | TCDesktop.java
| | TextField.java
| | UPLoadColor.java
| | UploadedMachineList.java
| | VoteUploadScreen.java
| |
| \---task
| | LoadElectionTask.java
| |
+---menu
| TCMainMenu.java
|
\---util
| DateUtility.java
| Validate.java
```

TabulatorReports

```
\---com
+---props
| db.src
| text_en.src
|
\---tabulation
+---db
| DBConstants.java
| DBKeys.java
| DBName.java
|
+---gui
| | ElectionIcon.java
| | PreferenceDisplay.java
| | RunPanel.java
| | ScreenConstants.java
| | TabReportsDesktop.java
| | TabReportsPanel.java
| | TabulationDisplayContainer.java
| |
```

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```
| +---combobox
| |   RunComboBox.java
| |
| +---dialog
| |   ContestSelectionDialog.java
| |   OverUnderContestDialog.java
| |   SSOVContestSelectionDialog.java
| |
| \---util
| |   TabulationPreferences.java
| |
+---menu
| |   TabulationMainMenu.java
| |
+---reports
| |   Constants.java
| |   CrosstabDataEntryBean.java
| |   CrosstabMainEntryBean.java
| |   KeyValue.java
| |   TabReportUtil.java
| |
| +---overunder
| |   OverUnderData.java
| |   OverUnderReportTask.java
| |
| +---sov
| |   SOVData.java
| |   SOVReportTask.java
| |
| +---ssov
| |   SSOVData.java
| |   SSOVReportTask.java
| |
| +---summary
| |   ElectionSummaryData.java
| |   ElectionSummaryReportTask.java
| |
| +---tabresult
| |   TabResultData.java
| |   TabResultReportTask.java
| |
| \---voteturnout
| |   VoterTurnoutData.java
| |   VoterTurnoutReportTask.java
| |
\---util
|   Constants.java
|   ElectionLookup.java
|   ParentCache.java
|   PrecinctCache.java
|   RunDisplayObject.java
```

TabulatorService

```
\---com
  +---props
```

Unisyn OpenElect Voting System, Ver. 1.0
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```
| db.src
| uploadsystem.src
|
\---unisyn
  \---tabserver
    | BaseDBServlet.java
    | IsAliveServlet.java
    | IsUpdatedServlet.java
    | RegistrationServlet.java
    | UploadServlet.java
    |
    +---db
    |   DBKeys.java
    |   DBName.java
    |
    +---parser
    |   TallyFileDBParser.java
    |
    \---util
        Constants.java
        TabServiceUtil.java
        TabVoteFile.java
```

OVI

```
\---com
  \---unisyn
    +---cast
    | | CastDriver.java
    | |
    | \---card
    |   BallotSlipCastDriver.java
    |   PrintBallotSlip.java
    |   PrintBallotWorker.java
    |
    +---common
    | | CommandConstants.java
    | | NumberConstants.java
    | | SystemConstants.java
    | |
    | +---audio
    | | LoopPlayer.java
    | | MP3Player.java
    | | SoundConstants.java
    | |
    | +---datawriter
    | | +---counter
    | | | ProtectCounter.java
    | | |
    | | +---data
    | | | PropertyReader.java
    | | |
    | | +---loader
    | | | CheckElectionMenuItem.java
    | | | CheckElectionResultPanel.java
    | | | CheckElectionWorker.java
```

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```
| | | ElectionLoader.java
| | | ElectionLoaderFactory.java
| | | ElectionManager.java
| | | HttpDownloadManager.java
| | | LoadElectionMenuItem.java
| | | LoadElectionWorker.java
| | | LoaderConstants.java
| | | NewElectionBean.java
| | | SoundZipFactory.java
| | | UnisynClientTrustManager.java
| | | UnisynSecureClientSocketFactory.java
| | |
| | | \---logger
| | |   AuditTrail.java
| | |   ILogXML.java
| | |   ILogXMLFactory.java
| | |   LogData.java
| | |   LogMenuItem.java
| | |   LogParseListener.java
| | |   LogReader.java
| | |   LogXML.java
| | |   LogXMLFactory.java
| | |   LogXMLFile.java
| | |   SimpleLogger.java
| | |
| | | +---encryption
| | |   ApplicationEncryptDecryptFactory.java
| | |   Cryptor.java
| | |   CryptoUtil.java
| | |   ElectionEncryptDecryptFactory.java
| | |   Hex.java
| | |   UnisynFileReader.java
| | |   UnisynKey.java
| | |
| | | +---exception
| | |   ApplicationException.java
| | |   CryptorException.java
| | |   ValidationException.java
| | |
| | | +---gui
| | |   DisplayTarget.java
| | |   MultipageDisplay.java
| | |   NavigatorButton.java
| | |   NumberInputPanel.java
| | |   PasswordKeyboard.java
| | |   ScreenTitleLabel.java
| | |   TouchMenuItem.java
| | |   TouchMenuTarget.java
| | |   UnisynTouchPanel.java
| | |   WrappedColumnPanel.java
| | |
| | | +---interfaces
| | |   Displayable.java
| | |   Navigatable.java
| | |   Protected.java
| | |   Selectable.java
```

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```
| | UnisynKeys.java
| |
| +---listener
| |   RXTXSerialPortListener.java
| |
| +---nav
| |   DefaultKeyNavigator.java
| |   UnisynKeyListener.java
| |   UnisynKeyNavigator.java
| |
| +---print
| | \---jpos
| |   FixListener.java
| |   PrintUtil.java
| |   TSP700II.java
| |   UnisynPOSPrinter.java
| |   UnisynPOSPrinterImpl.java
| |
| +---util
| | | BuildFile.java
| | | CheckStatus.java
| | | ChecksumCRC32Mgr.java
| | | ComBean.java
| | | Constants.java
| | | EncryptedStatusFile.java
| | | FontUtil.java
| | | INIFile.java
| | | ObjectFactory.java
| | | Status.java
| | | SystemCodes.java
| | | TextManager.java
| | | Toolbox.java
| | | UnicodeUtil.java
| |
| | \---zip
| |   ZipFileEntryBean.java
| |   ZipFileExtractor.java
| |   ZipFileReader.java
| |   ZipProcessor.java
| |
| +---widgit
| |   Bookend.java
| |   ClockLabel.java
| |   CustomToggleButton.java
| |   DisplayTextPanel.java
| |   FormatCodes.java
| |   MultilineZoomLabel.java
| |   RoundedHeader.java
| |   SelectedLabel.java
| |   ThreeDButton.java
| |   UnisynSet.java
| |   ZoomButton.java
| |   ZoomLabel.java
| |
| +---worker
| |   UnisynBaseWorker.java
```

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```
| | WorkerStatus.java
| |
| +---xml
| | ParserFactory.java
| |
| \---xmlfile
| | XMLSplitFile.java
| |
+---election
| | ElectionConstants.java
| | IntegrityCheckWorker.java
| |
| +---data
| | CandidateBean.java
| | ContestBean.java
| | ElectionBean.java
| | ElectionTitleBean.java
| | LanguageBean.java
| | PartyBean.java
| | PartyDescriptionBean.java
| | PrecinctBean.java
| | SessionBean.java
| |
| \---reader
| | BallotCardXMLHandler.java
| | ContestBeanXMLHandler.java
| | ElectionBeanXMLHandler.java
| | ElectionXMLParserFactory.java
| | PrecinctBeanXMLHandler.java
| |
\---ovi
| | ApplicationConstants.java
| | ColorConstants.java
| | OVI.java
| |
| +---data
| | BallotCard.java
| | CandidateData.java
| | ContestData.java
| | PartyData.java
| | SessionData.java
| |
| +---gui
| | HardwareCheck.java
| | OVConstants.java
| | OVIMain.java
| |
| +---admin
| | ChangeCloseTimeMenuItem.java
| | ChangeCloseTimePanel.java
| | checkbox_disabled.gif
| | CloseMenuItem.java
| | CloseMenuReport.java
| | ConfirmSpecialSession.java
| | disabled_selected.gif
| | DisplayAdminMenu.java
```

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```
| | InfoMenuItem.java
| | ManualPrecinctInput.java
| | ResetTrainingMenuItem.java
| | selected.gif
| | SpecialSessionItem.java
| | unselected.gif
| |
| | +---diagnostics
| | | DiagnosticsAdminAudio.java
| | | DiagnosticsAudio.java
| | | DiagnosticsAudioList.java
| | | DiagnosticsAudioListElection.java
| | | DiagnosticsColorDisplay.java
| | | DiagnosticsHeadphones.java
| | | DiagnosticsKeyboard.java
| | | DiagnosticsMenuItem.java
| | | DiagnosticsPrinter.java
| | | DiagnosticsSelectLanguage.java
| | | DiagnosticsSipPuff.java
| | | DiagnosticsTouchscreen.java
| | |
| | | +---maintenance
| | | | MaintenanceMenuItem.java
| | | | PrintTestDeckWorker.java
| | | | TestDeckMenuItem.java
| | | | TestDeckPanel.java
| | | |
| | | \---user
| | | | ConfirmCancelBallot.java
| | | | ConfirmContinueSession.java
| | | | ConfirmOpenVoting.java
| | | | DisplayBallot.java
| | | | DisplayInstructions.java
| | | | DisplayMessage.java
| | | | DisplayProgress.java
| | | | DisplaySummary.java
| | | | SelectBallot.java
| | | | SelectLanguage.java
| | | | SelectParty.java
| | | | STSelectParty.java
| | | | WriteInKeyboard.java
| | | |
| | | +---nav
| | | | BallotKeyNavigator.java
| | | | KeyboardNavigator.java
| | | | SingleKeyNavigator.java
| | | | SummaryKeyNavigator.java
| | | |
| | | +---reports
| | | | ReportFactory.java
| | | | Reports.java
| | | | ReportViewer.java
| | | |
| | | +---util
| | | | CanPositionComparator.java
| | | | ContestBeanOrderComparator.java
```

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```
| ContestOrderComparator.java
| MaintLogin.java
| MediaRecovery.java
| RankContestValidator.java
|
+---widget
| ContestDisplay.java
| ContestSummaryDisplay.java
| LanguageSelectButton.java
| MeasureTextPanel.java
| PartySelectButton.java
| SelectableCandidateDisplay.java
|
\---worker
| DefaultCloseWorker.java
| DefaultOpenWorker.java
| PopulateBallotWorker.java
```

OVO

```
\---JNI
| scandllinterface.cpp
```

```
+---Common
| \---com
| | \---unisyn
| | | +---ballot
| | | | BallotConverter.java
| | | | ReadData.java
| | | | ReaderVote.java
| | | |
| | | +---beans
| | | | AuditTrailBean.java
| | | | Ballot.java
| | | | BallotBean.java
| | | | CandidateBean.java
| | | | CardDef.java
| | | | CastBean.java
| | | | ComBean.java
| | | | ContestBean.java
| | | | ContestBeanGroup.java
| | | | ElectionBean.java
| | | | ElectionSessionBean.java
| | | | ElectionTitleBean.java
| | | | IBeanXML.java
| | | | LanguageBean.java
| | | | LocationPosition.java
| | | | LocationValue.java
| | | | NewElectionBean.java
| | | | ParameterDef.java
| | | | PartyBean.java
| | | | PartyContainer.java
| | | | PartyDescriptionBean.java
| | | | PersonVoteContainer.java
| | | | PrecinctBean.java
| | | | PrecinctBeanGroup.java
```


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```
| | PrecinctVoteCount.java
| | SelectionBean.java
| | StartupStatus.java
| | SystemStatus.java
| | TabCandidateBean.java
| | TabContestBean.java
| | TabPrecinctBean.java
| | TabPrecinctBeanGroup.java
| | TabulationBean.java
| | TabulationHeaderBean.java
| | VoteBean.java
| | ZipFileEntryBean.java
|
| +---crypto
| | Cryptor.java
| | CryptoUtil.java
| | Hex.java
| | UnisynKey.java
|
| +---exception
| | ApplicationException.java
| | CryptorException.java
| | ElectionException.java
| | PostMortemException.java
| | ValidationException.java
| | VoteWriterException.java
|
| +---util
| | BuildFile.java
| | CheckStatus.java
| | ChecksumCRC32Mgr.java
| | Constants.java
| | ElectionEncryptDecryptFactory.java
| | EncResourceBundle.java
| | IDebug.java
| | ILogXML.java
| | ILogXMLFactory.java
| | LogData.java
| | SimpleLogger.java
| | Status.java
| | SystemCodes.java
| | Toolbox.java
| | Txt2ImgFactory.java
| | UnisynFileReader.java
| | ZipFileReader.java
| | ZipProcessor.java
|
| \---xmlfile
| | XMLSplitFile.java
|
+---Help Files
| | help-files.bat
| |
| \---com
| | \---unisyn
| | \---oc
```

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```
|      \---application
|      | \---help
|      |   adminfunctions_en.html
|      |   adminfunctions_en.properties
|      |   closevoting_en.html
|      |   closevoting_en.properties
|      |   diagnostics_en.html
|      |   diagnostics_en.properties
|      |   mainscreen_en.html
|      |   mainscreen_en.properties
|      |   password_en.html
|      |   password_en.properties
|      |   shutdown_en.html
|      |   shutdown_en.properties
|      |   startup_en.html
|      |   startup_en.properties
|      |   summary_en.html
|      |   summary_en.properties
|
```

+---OC

```
| \---com
|   +---props
|   |   text_en.src
|   |
|   | \---unisyn
|   |   +---client
|   |   | \---reader
|   |   |   AbstractReaderClient.java
|   |   |   ReaderClient.java
|   |   |   VoterScreenMsgs.java
|   |   |
|   |   +---oc
```

```
|   |   | +---application
|   |   | | | AccuracyTest.java
|   |   | | | AccuracyTestButton.java
|   |   | | | AccuracyTestScreen.java
|   |   | | | AddPrecincts.java
|   |   | | | AddPrecinctScreen.java
|   |   | | | AdminLog.java
|   |   | | | AdminMenuBase.java
|   |   | | | AdminMenuButton.java
|   |   | | | AdminMenuScreen.java
|   |   | | | ChangeCloseTime.java
|   |   | | | CheckLoadElection.java
|   |   | | | CleanFiles.java
|   |   | | | CleanFilesScreen.java
|   |   | | | ClientStartup.java
|   |   | | | ClockLabel.java
|   |   | | | CloseVoting.java
|   |   | | | CloseVotingButton.java
|   |   | | | Diagnostics.java
|   |   | | | DisplayTest.java
|   |   | | | ErrorScreen.java
|   |   | | | FixPrinter.java
|   |   | | | Global.java
|   |   | | | LoadElection.java
```

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```
| | | LoadElectionButton.java
| | | LoadElectionDialog.java
| | | MachineInfoButton.java
| | | MachineInfoScreen.java
| | | MaintenanceButton.java
| | | MaintenanceMenu.java
| | | MaintenancePswdScreen.java
| | | OCStrings.java
| | | OC_INI.java
| | | PasswordScreen.java
| | | PasswordValidate.java
| | | PrecinctCardScreen.java
| | | PrecinctEntryScreen.java
| | | PrintAuditTrail.java
| | | PrintTest.java
| | | ProgressScreen.java
| | | ReaderOptions.java
| | | ReaderTest.java
| | | ResponseHandler.java
| | | RunSession.java
| | | ScreenStateListener.java
| | | SelectSessionDialog.java
| | | Shutdown.java
| | | ShutdownBaseScreen.java
| | | ShutdownScreen.java
| | | StartupPanel.java
| | | StartupScreen.java
| | | TimerDialog.java
| | | TouchTest.java
| | | TrainingOptions.java
| | | TrainingReset.java
| | | ViewTally.java
| | | VoterScreen.java
| | |
| | | \---summary
| | |     ContestSummaryDisplay.java
| | |     DisplaySummary.java
| | |     MultipageDisplay.java
| | |     WrappedColumnPanel.java
| | |
| | | +---printer
| | |     PCL.java
| | |     PrinterConstants.java
| | |     PrintReaderErrors.java
| | |     PrintReceipt.java
| | |     PrintTally.java
| | |     PrintVote.java
| | |
| | | +---reader
| | |     Driver.java
| | |     DriverStatusMonitor.java
| | |     IDataStream.java
| | |     LogFile.java
| | |     ObservableObject.java
| | |     ReaderConstants.java
| | |     ReaderDriver.java
```

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```
| | | ReaderStatusMonitor.java
| | |
| | | \---pdiscanner
| | |     PDIScanner.java
| | |     ScanDLLInterface.java
| | |
| | | \---util
| | |     ApplicationButton.java
| | |     ApplicationScreen.java
| | |     BigBevelBorder.java
| | |     ButtonPanel.java
| | |     button_admin.gif
| | |     button_admin_disabled.gif
| | |     button_admin_down.gif
| | |     checkbox_disabled.gif
| | |     ColorUtil.java
| | |     DataField.java
| | |     DataLabel.java
| | |     DataStream.java
| | |     disabled_selected.gif
| | |     Editor.java
| | |     EditorField.java
| | |     EmptyButton.java
| | |     ExitButton.java
| | |     FontUtil.java
| | |     GridPanel.java
| | |     HelpButton.java
| | |     IButton.java
| | |     IDataInputByteArray.java
| | |     IDataInputStream.java
| | |     IDataOutputByteArray.java
| | |     IDataOutputStream.java
| | |     IDialog.java
| | |     IKey.java
| | |     InfoDialog.java
| | |     IPanel.java
| | |     IRadioButton.java
| | |     IScrollPane.java
| | |     IString.java
| | |     KeyboardPanel.java
| | |     Keypad.java
| | |     KeypadPanel.java
| | |     KeyPanel.java
| | |     LabeledField.java
| | |     NumberKeypad.java
| | |     OKDialog.java
| | |     OSService.java
| | |     Parameter.java
| | |     ProgressBar.java
| | |     Screen.java
| | |     selected.gif
| | |     SendButton.java
| | |     ServiceName.java
| | |     SPanel.java
| | |     Standards.java
| | |     StatusPanel.java
```

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```
|
|
|   TallyUtil.java
|   TextIcon.java
|   TextPanel.java
|   TextScreen.java
|   ThreeDButton.java
|   unselected.gif
|   YesNoDialog.java
|   ZoomButton.java
|
| \---printer
|   | IPrinter.java
|   | PrintManager.java
|   |
|   \---citizen
|       CitizenPOSPrinter.java
|       CitizenPrinterPCL.java
|
| \---OS
|   \---com
|       \---unisyn
|           \---os
|               +---beans
|                   | OSElectionBean.java
|                   |
|               +---crypto
|                   | OSCryptor.java
|                   |
|               +---logreader
|                   | LogParseListener.java
|                   | LogReader.java
|                   | LogXML.java
|                   | LogXMLFactory.java
|                   | LogXMLFile.java
|                   |
|               +---service
|                   | | AuthorizePrecinct.java
|                   | | BallotBeanXMLHandler.java
|                   | | BallotFactory.java
|                   | | CallHandler.java
|                   | | CloseVotingProcess.java
|                   | | ContestBeanXMLHandler.java
|                   | | Counters.java
|                   | | ElectionBeanXMLHandler.java
|                   | | ElectionInfoFactory.java
|                   | | ElectionXMLParserFactory.java
|                   | | OCLogin.java
|                   | | OCService.java
|                   | | OCTallyUtil.java
|                   | | PrecinctBeanXMLHandler.java
|                   | | PrecinctService.java
|                   | | SoundZipFactory.java
|                   | | UnmountUSB.java
|                   | |
|                   | \---electionmanager
|                   |     ElectionLoader.java
|                   |     ElectionLoaderFactory.java
```

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```
| ElectionManager.java
| IElectionLoader.java
|
+---tab
| CandidatePartyCount.java
| ParseVotesFile.java
| PrecinctCandidate.java
| PrecinctContest.java
| PrecinctPartyCount.java
| PrecinctTally.java
| ReadTallyFile.java
| TabConstants.java
| TabHelper.java
| TabPrecincts.java
| Tabulation.java
| Tally.java
|
+---util
| | AuditTrail.java
| | CanPositionComparator.java
| | ContestOrderComparator.java
| | HttpDownloadManager.java
| | OSConstants.java
| | TagNames.java
| | TransactionID.java
| | UnisynSecureClientSocketFactory.java
| | ZipFileExtractor.java
| |
| \---state
| | ControlCenter.java
| | StatusGroup.java
| |
\---votewriter
| VoteParseListener.java
| VoteWriter.java
| VoteXML.java
| VoteXMLFile.java
| VoteXMLFileListener.java
| XMLParseListener.java
```

TOOLS

```
+---Scripter
| +---Build
| | build.cmd
| | build_dir.properties
| | scripter_build.xml
| |
| +---Deploy
| | paths.xml
| | run.cmd
| |
| \---Source
| | \---com
| | | \---unisyn
```

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```
|
|   \---scripter
|       +---ap
|           |   Scripter.java
|           |
|           +---crypto
|               |   ChecksumCRC32Mgr.java
|               |   CryptoUtil.java
|               |   Status.java
|               |
|           \---fileutil
|               |   DLLFile.java
|               |   DownloadFile.java
|               |   PasswordFile.java
|               |   PathEntryName.java
|               |   PathnameFile.java
|               |   ReleaseFile.java
|               |   ScriptFile.java
|               |   SourceFile.java
|
| \---Validator
|   +---Build
|       |   build.cmd
|       |   build_dir.properties
|       |   library.bat
|       |   validator_build.xml
|
|   +---Deploy
|       |   |   run
|       |   |
|       |   \---lib
|   \---Source
|       \---com
|           +---props
|               |   text_en.src
|               |
|           \---unisyn
|               \---validator
|                   +---ap
|                       |   DisplayPanel.java
|                       |   FileHandler.java
|                       |   HttpDownloadManager.java
|                       |   OfflineDisplayPanel.java
|                       |   OnlineDisplayPanel.java
|                       |   PasswordScreen.java
|                       |   ShutdownButton.java
|                       |   ShutdownScreen.java
|                       |   UnisynSecureClientSocketFactory.java
|                       |   Validator.java
|                       |   ValidatorScreen.java
|                       |   VStrings.java
|                       |
|                   +---crypto
|                       |   CryptorException.java
|                       |   CryptoUtil.java
|                       |   UnisynKey.java
|                       |
|                   |
```

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```
+---fileutil
|   DLLFile.java
|   DownloadFile.java
|   LogFile.java
|   ScriptFile.java
|   TemporaryFile.java
|
\---util
    BuildFile.java
    ButtonPanel.java
    Constants.java
    DataField.java
    DataLabel.java
    DataStream.java
    Editor.java
    EditorField.java
    EmptyButton.java
    EncResourceBundle.java
    GridPanel.java
    IPanel.java
    IScrollPane.java
    IString.java
    KeyboardPanel.java
    Keypad.java
    KeyPanel.java
    LabeledField.java
    MachineUtil.java
    NumberKeypad.java
    Screen.java
    SendButton.java
    Standards.java
    Status.java
    SystemCodes.java
    ThreeDButton.java
    VColor.java
```