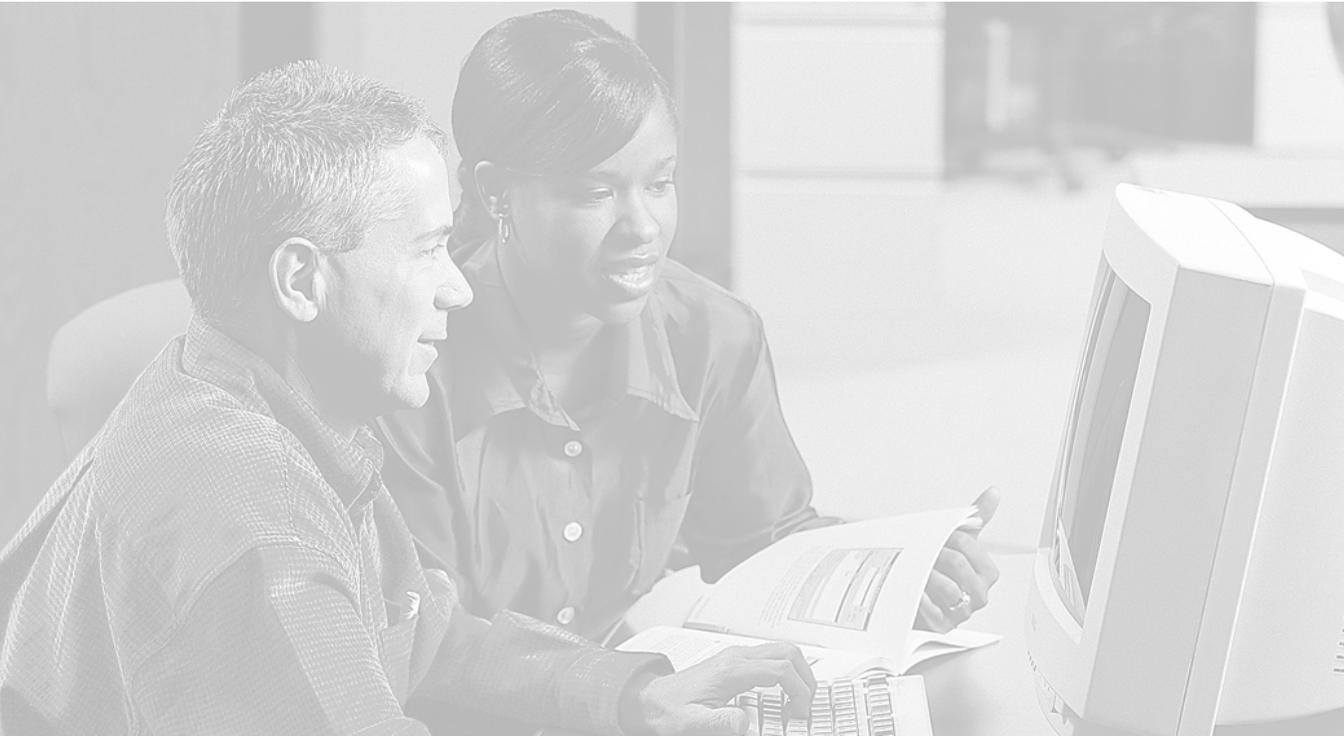


# Cincom

## **VisualWorks®**

Release Notes 7.2.1

P46-0106-08



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**Cincom Systems, Inc.**

**55 Merchant Street**

**Cincinnati, Ohio 45246**

**Phone: (513) 612-2300**

**Fax: (513) 612-2000**

**World Wide Web: <http://www.cincom.com>**

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# 1

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## Introduction to VisualWorks 7.2

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These release notes outline the changes made in the version 7.2 release of VisualWorks. Both Commercial and Non-Commercial releases are covered. These notes are not intended to be a comprehensive explanation of new features and functionality nor are they intended to be used in lieu of the product documentation. Refer to the VisualWorks [documentation](#) set for more information.

For late-breaking information on VisualWorks, check the Cincom Smalltalk website at <http://www.cincom.com/smalltalk>. For a growing collection of recent, trouble-shooting tips, visit <http://www.cincomsmalltalk.com:8080/CincomSmalltalkWiki/Trouble+Shooter>.

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## Product Support

### Support Status

Basic support policies for the current release are described in the licensing agreement. As a product ages, its support status changes. To find the support status for any version of VisualWorks and Object Studio, refer to this web page:

<http://www.cincomsmalltalk.com:8080/CincomSmalltalkWiki/Cincom+Smalltalk+Platform+Support+Guide>

### Product Patches

Fixes to known problems may become available for this release, and will be posted at this web site:

<http://www.cincomsmalltalk.com/CincomSmalltalkWiki/VW+Patches>

## ARs Resolved in this Release

The Action Requests (ARs) resolved in this release are listed in: [fixed\\_ars.txt](#).

Additional ARs may be discussed in individual sections of these release notes.

Outstanding ARs and limitations are noted throughout these release notes, as appropriate.

---

## Items Of Special Note

### SGI VM delayed

Due to licensing issues, delivery of the SGI virtual machine has been delayed for a few weeks from the initial release. It will be made available as soon as possible.

### Internationalization

A major effort has been made to complete the internationalization of the code. The base and all components now use UserMessages where they had Strings. Refer to “[Internationalization](#)” in chapter 2 for more information.

### Class, Name Space, and Shared Variable Creation Dialogs

Definition dialogs have been added for creating class, name space, and shared variables. These provide a number of conveniences, including the selection of superclasses and containing name spaces.

The original definition templates are still available for use, and are still required for modifying definitions.

---

## Known Limitations

While a large number of ARs (Action Requests) have been addressed in this release, a number remain outstanding.

Known Limitations sections are provided throughout this document, pertaining to specific product areas.

## Store

(AR 46654) If the ChangeList contains a change to a bundle structure that moves a package from a bundle, replaying the change causes the package to be unloaded.

## Initializing Shared Variables

(AR 44594) In 7.1, a number of inconsistencies were reported in how classes and shared variables are initialized when loading code from the several storage options. Most of these are now corrected, reducing the matrix to the following table, which summarizes cases where loading is correct (✓) and incorrect (✗).

	Parcel		Package			Class
	Save	FileOut	Source	Binary	FileOut	FileOut
New class with initialize method	✓	✓	✓	✓	✓	✓
Existing class with new initialize method	✓	✓	✓	✗	✓	✓
Overridden class initializer	✓	✓	✓	✗	✓	✓
Shared variable in class with initializer	✓	✓	✓	✓	✓	✓
Shared variable in namespace with initializer	✓	✓	✓	✓	✓	✓

This problem is recognized, and will be corrected in the next release.

## Limitations listed in other sections

- GUI: [Known Limitations](#)

# 2

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## VW 7.2 New and Enhanced Features

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This section describes the major changes in this release.

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### Virtual Machine

#### bin/ Directory Organization

In 7.1, debug and assert engines were moved into **extra/** subdirectories under each platform. For this release, they are in **debug/** and **assert/** subdirectories, respectively.

#### Compressed images

Loading compressed image files is now supported on all VisualWorks 7.2 virtual machines.

To create a compressed image, load the Image Compression parcel (**packaging/ImageCompression.pcl**), then select **File → Compress Image File** in the Launcher.

For the API to access the compression library, see “[ZLib Compression Streams](#)” below.

#### Dynamically loadable user primitives

The engines support plug-ins by providing for dynamically loadable user primitive code. This is done using a pragma modeled after the Squeak implementation. Additional information will be made available on a wiki page, accessible from the [Cincom Smalltalk Developers](#) page.

The Windows engines are organized differently as a result. A very small **vwnt.exe** executable (57 KB) now loads the bulk of the virtual machine code from a DLL, **vwntoe.dll**.

Creating DLLs that use the virtual machine API has now changed slightly on Windows and MacOS 8/9. Refer to the wiki page for details.

## Close VW on Windows shutdown

Added in 7.1 but not noted was a change that allows VW to exit when Windows shuts down. This was previously prevented.

Windows shutdown events are delivered to the VisualWorks image as a QuitSystem event. By default this simply results in ObjectMemory being sent quit. This can have a bad effect in some cases, such as if an external resource (e.g., a database) is open and abruptly cut off. There are a couple of ways to handle this.

- You can put a dependent on ObjectMemory and have an update method that watches for #aboutToQuit (which would also be triggered every time the image is quit).
- You can modify InputState>>#send:eventQuitSystem: to provide some special hook only invoked on an exit event.
- Instead of modifying #send:eventQuitSystem:, you can add your own quit method to InputState, such as #send:myEventQuitSystem:, and then at system startup, you can go to InputState.EventDispatchTable and put your own message at position 19.

Alternatively, you can revert to the old behavior and block VisualWorks from exiting. By default, the InputState class method setDispatchTableForPlatform registers true with the acceptQuitEvents object. To prevent VisualWorks from being prematurely shut down, set this to false instead.

## Itanium on HP-UX

The HP-UX engine appears to function on Itaniums running HP-UX-11i, running in dynamic translation mode, but does so very slowly. Consequently, we *do not* support VisualWorks on this platform at this time.

If you do want to run on the HP-UX Itanium, then you should use the maximum available code cache, either by using the `-z 16m` flag, or by doing:

```
ObjectMemory sizesAtStartup: #(1.0 1.0 1.0 1.0 14.0 1.0 1.0)
and snapshotting.
```

---

## Base system

### Internationalization

In 7.2, many literal strings in the system code have been converted to `UserMessages`, in order to make it possible to translate the system's UI into other languages (such as German or Japanese) without modifying the source code.

As a result of this, occasionally you may ask system code for some piece of information which you expect to be a `String`, such as the label of a window, and get back a `UserMessage` instead. `UserMessages` do not currently understand all of the messages that `Strings` do, and so when you use the returned value, you may get an error. This can be solved by sending the return value `asString` before using it, if you know that it will always be either a `String` or a `UserMessage`.

If you want to start converting your own literal strings to `UserMessages`, so that your code can be translated into other languages, see especially chapter 2 of the *Internationalization Guide*. Remember that not all system code (and probably not all of your own code) will be expecting to be passed `UserMessages` in place of strings, so sometimes you may need to send your `UserMessage` an `asString` message before passing it to another method.

### Line end detection

(AR 46063) In 7.1, we introduced the provisional `#adoptContentsLineEndConvention` so that users can tell streams to adopt the line end convention of the stream that they are reading. In 7.2, this has been replaced with `#lineEndAuto`. So, if you had code that relied on the provisional code you should convert over to use the `#lineEndAuto` now. For example if you had code like:

```
someStream lineEndTransparent.  
someStream adoptContentsLineEndConvention
```

this should now be replaced with:

```
someStream lineEndAuto.
```

### PostScript support configuration

To simplify PostScript printing configuration, support has been added to enable color printing and to set the landscape orientation. A page has been added to the Settings Manager, **Printing** → **PostScript Settings**, to set these options:

**Color printing** - Enable color printing to PostScript printers that implement PostScript Level 2. If you attempt to print PostScript generated for such a printer on a Level 1 printer, you will not get any output.

**Invert landscape position** - Rotate landscape orientation 180 degrees.

In addition, a few changes have been made to font and character support:

- The unicode for the Euro has been added to the supported character set for PostScript printing.
- The following fonts are not generally supported by PS 3 printers, and so have been removed:
  - Helvetica-Light
  - Helvetica-Black
  - Helvetica-BlackOblique
  - Helvetica-LightOblique

There are also a number of font families that are supported by PS 3 printers but are not included in the VisualWorks PostScript font set. These can be purchased by the user and installed using the PSFontPrinting goodie.

## Implemented #= and #hash in Method

(AR 45300) There were cases where two instances of Message, though equivalent, appeared unequal. The solution was to implement #= and #hash in Message.

This change may conceivably break customer's subclasses of Message, since instances of those subclasses, which were formerly not =, may now be = without paying attention to instance variables that the subclass added to Message. For example, if MessageSend had not already implemented #=, and inherited the new implementation from Message, then two MessageSends that have the same selector and arguments would be = even if they had different receivers.

## ZLib Compression Streams

The zlib library is included in the object engine to enable image decompression on loading. ZLibInterface provides the interface to the library. GZipReadStream and GZipWriteStream use ZLibInterface to provide the ability to decompress or compress a stream.

Load the Compression-ZLib parcel, in the Application Development group in the Parcel Manager, to access this functionality. The API classes are DeflateStream and GZipWriteStream for writing, and InflateStream and GZipReadStream for reading. Using these uses the usual internal stream protocol.

Browse the code comments for examples.

---

## GUI Development

### GUI Painter Tab ordering

Tab-ordering and Z-ordering (back to front) in the UI Painter have been confusing, but have now been made consistent. Moving a widget “back” puts it earlier in the tab order; moving it forward puts it later in the tab order. Tab order is still top to bottom, as the widgets are shown in the GUI Painter Tool widget list.

### New cursor

(AR 46100) A new pointing finger cursor has been added and may be accessed as follows:

Cursor fingerPointer

### Trigger event lookup optimization

(AR 46007) When looking up events, the event triggering and accessing methods of Object always use at:ifAbsent:. However, it is known that this lookup can be very slow when there are no events registered for the receiver. To improve speed, simple tests have been added to skip lookup when the receiver event table is nil.

### New selection widget contents setters

(AR 45331) SelectionInList and MultiSelectionInList have two new methods that may be used to set their contents: setList:selecting: and refreshList:. The list, dataset, tab control, and notebook widgets derive their models from either SelectionInList and MultiSelectionInList. Any of these widgets may have their contents and selection both set at once by sending setList:selecting: to its model. When used, setList:selecting: attempts to keep a selection visible and seemingly immobile during a change in list. Similarly, the refreshList: message will update a list and attempt to keep the first selection held over of items in the new list visible and seemingly immobile. The new example parcels RefreshSelectionList and SetSelectionList demonstrate these methods.

## Known Limitations

### Sawfish and MultiProcUI

We have seen a problem with a window regaining focus, when running under the Sawfish window manager on Linux. There is no known work-around, other than selecting the window.

---

## Tools

### Class, Name Space, Shared Variable creation dialogs

When you select **Class** → **New** → **Class**, **Class Extension**, **Name Space** or **Shared Variable**, you are now presented with a dialog for creating the item, rather than a blank template. These are described in the *Application Developer's Guide*, but are also pretty self-explanatory.

The templates are still available and can be used. For the class template, select a category, parcel or package, then edit the displayed template as before. For a shared variable, select a class or name space and a protocol for the variable, and click the **Shared Variable** tab. For a name space, copy and paste a name space definition into the code pane and edit it.

The **Class** → **New** → **Class Extension...** item (available when Store is loaded) prompts for a class and then creates an extension of that class in the current package. Note that in the previous versions of VisualWorks, this item used to create an extension of the current class in the package selected by the user. The new behavior is consistent with that of the other items of that menu. The old behavior is now available as the menu item **Class** → **Extend in Package...** .

The **Class** → **New** → **Class...** command is also available as a toolbar button.

### Find dialogs

Find dialogs have been enhanced to provide a filtered list of options (e.g., classes or methods) based on initial entries in the input field. The filtering is not case-sensitive.

## Advanced Tools

### Profiler updates

Some updates were made in 7.1 to prepare for future enhancements, such as headless, distributed profiling. These changes are now reflected in the *Advanced Tools User's Guide*.

### Benchmarks

The benchmarks browser has been modernized, with the transcript integrated into the test selector.

---

## WebService

### SOAP Header support

Headers are now supported for SOAP messages, and is described in the *Web Service Developer's Guide*. No automatic handling for headers is provided yet.

---

## Net Clients

### HttpURL change

The behavior of `HttpURL>>readStream` has been changed to return a `ByteString` (AR46533). To return a `ByteArray`, use `HttpURL>>binaryReadStream`.

---

## Security

### New Document

This release includes a new document covering VisualWorks security features, the *VisualWorks Security Guide*.

## New namespace and directory

The library is becoming large and mature enough to be granted status of a stand-alone component. The algorithms it provides are applicable far beyond networking protocols, so we have moved all the code into a new namespace called Security. All the parcels have also been moved to a new directory, **security/**.

## Hashes

There have been significant changes in the implementation of hash algorithms, including their public APIs. The effort was motivated by a desire to support “running” hash computations, in which data is handed in piece by piece, rather than all at once. (These are usually referred to as “Update” and “Final” operations in other libraries.)

This required an extensive refactoring of the hash algorithms, which also allowed us to add implementation of SHA256 with very little effort and should make implementation of additional SHA versions (384 and 512) much simpler as well. In that process MD5 was sped up almost three times, but the speed increase on SHA-1 algorithm was insignificant. All the algorithms were cleaned up to generate no garbage, with the exception of register backups for final digest value computation. That could be eliminated as well, but since that is fully under control of the developer it seems unnecessary. This should make the implementation scale better when processing large amounts of data. The code of the algorithms was updated to match the specification descriptions as much as possible (instance variable names, selectors, etc.).

The API is now split into two layers. The higher level (protocol “services”) provides methods that allow to obtain the digest with a single message. It is very similar to the old API, except that we have deprecated the former “integer” bias and opened up the byte-oriented API. Because the algorithms are strictly byte oriented, creating large integers first and then converting them back to byte arrays is usually unnecessary. Since most callers seem to prefer a byte-oriented API as well, we decided to use the unprefix #hash\* selectors for that. The original integer oriented API is now prefixed with #integer, that is, the selectors are of the form #integerHash\* and will most likely be phased out (protocol “deprecated”). The old #byteHash\* methods are also preserved in the “deprecated” protocol to provide backward compatibility.

The lower level API (protocol “services-basic”) is derived from the popular Update/Final scheme used by other crypto libraries, except that in our case the “Final” phase is embedded into the call for obtaining the digest value, #digest. This makes the API simpler. Moreover, it allows us to

support intermediate calls for a digest value before all the data is processed. It eliminates the common limitation that once you call `Final`, you can't call `Update` anymore. With our implementation you can mix `updates` and `digests` freely. We used `digest` for the result message because `hash` would conflict with the standard `hash` message. That is also why we added `digestSize` as a preferred form to `hashSize`, although the latter is preserved for backward compatibility. We also added another constant accessor `blockSize` answering the size of basic processing unit of the algorithm, and enabled the accessors on the class side as well, so that one does not have to create a hash instance to get at the constants. The API also includes `messageLength` to obtain current bit size of the data that was already provided to the hash algorithm, and `reset` which allows you to reinitialize and reuse the algorithm for new hash computation.

Finally, we've also added support for algorithm "cloning." `Hash>>copy` now allows you to clone a hash computation in progress. This is useful when you have multiple chunks of data with the same initial part. You can hash the initial part just once, then clone the hash and continue with multiple instances from there.

## Public Key Ciphers

We have also made a significant progress reconciling the APIs of our public key ciphers and making them more accessible. Ciphers are now separated into `SymmetricCipher` (secret key) and `AsymmetricCipher` (public key) hierarchies. RSA, DSA and DH algorithms are now subclasses of `AsymmetricCipher` with a common API for encryption and signing abstracted out. The key elements of the API are:

accessing

- `publicKey/publicKey`:
- `privateKey/privateKey`:

encryption

- `encrypt`:
- `decrypt`:

signing

- `sign`:
- `verify:of`:

Having DH in the AsymmetricCipher hierarchy, even though it marks most of the common API as `#shouldNotImplement`, is mostly a proclamation of the nature of the algorithm, reinforced by the `#privateKey/#publicKey` accessors. However the true API of the algorithm are messages `#computePublicValue` and `#computeSharedSecretUsing`: representing the two stages of DH negotiation. Message `#computePublicKey` was renamed to `#computePublicValue` to match `#computeSharedSecretUsing`: better and to reduce the conflict with the `#publicKey/#privateKey` messages.

Common aspects of `DSAKeyGenerator` and `RSAKeyGenerator` were abstracted out into the `KeyGenerator` superclass, providing unified API for instance creation protocol, key accessors, flushing, etc.:

instance creation

- `keySize`:
- `keySize:random`:
- `keySize:random:primalityTest`:

services

- `publicKey`
- `privateKey`
- `flush`

Finally, the RSA and DSA keys were reconciled in the `EncryptionKey` hierarchy.

Overall we hope that the `AsymmetricCipher`, `KeyGenerator` and `EncryptionKey` hierarchies, along with their comments, will make the use of public key ciphers clearer as the `SymmetricCipher` hierarchy hopefully already does. This is covered in the new [Security Guide](#) as well.

All the obsolete message selectors are retained in the “deprecated” protocol for backward compatibility. Any class renames concern abstract classes so they should not have much impact on user code.

---

## Opentalk

### Load Balancing

Opentalk Load Balancing, issued as a preview in previous releases and retracted in release 7.1, has been reissued as product in the 7.2 release. The load balancing facility provides components for constructing most synchronous unicast load balancing architectures. It implements client-

side reference wrappers, that support message retry and redirection, a generic load balancing client, load balancers and server-side load monitors of several types, a range of distribution, load data transfer, and server group update mechanisms, an extensible hierarchy of load definitions, a generic load balancing server, and supporting classes. The code of the Opentalk Load Balancing facility is commented, and extensively documented in chapter 7 of the *Opentalk Communication Layer Developer's Guide*.

### Known Limitations

The Opentalk Load Balancing facility possesses three major limitations:

- It is now restricted to use with the Opentalk STST TCP protocol.
- Message redirection now entails remarshaling.
- Limited but adequate support for multiple balancers is provided for only a subset of the supported architectures and configurations.

A more complete list of limitations, including minor infelicities, is presented in the documentation.

---

**Note:** The VisualWave load balancer has not yet been rewritten to fall under the framework provided by Opentalk Load Balancing.

---

### Starting and stopping

The starting and stopping sequences of Opentalk components were refactored and extended. The #start and #stop operations were each broken into three phases: #preStart, #doStart, and #postStart, and #preStop, #doStop, and #postStop. These phases trigger events of the same name. The original #starting: and #stopping: events are no longer triggered, but can be trivially revived using #doStart and #doStop handlers. The messages #startRequest and #stopRequest are deprecated; use #start, #stop instead. The message #shutDown is deprecated as well; use #doStop instead.

### Concurrent connection limits

To accommodate web server load patterns we've introduced configurable limits on the number of concurrent connections. This change concerns ConnectionOrientedAdaptors in a following way. There are two limit values, a soft "lowerConnectionLimit" and a hard "upperConnectionLimit".

It is assumed that “lowerConnectionLimit” is less than “upperConnectionLimit”. When a new connection is added and current number of connections exceeds “lowerConnectionLimit”, the adaptor triggers a #reachingConnectionLimit:with: event. When the number reaches “upperConnectionLimit” a #reachedConnectionLimit:with: event is signaled and the listener process is suspended. When a closing connection is being removed and the current number of connections exceeds “lowerConnectionLimit” a #leavingConnectionLimit:with: event is triggered. When the number reaches “lowerConnectionLimit” a #leftConnectionLimit:with: is triggered and the listener process is resumed. Both connection limits are configurable. The configuration parameters are called #lowerConnectionLimit and #upperConnectionLimit. Current defaults are set to 1000 (upper) and 900 (lower).

Within the limit zone, we have added a delay after each accept, which progressively grows as the number of connections approaches the upper limit. The growth is bounded by a configurable parameter called maxAcceptDelay (milliseconds). The default is set to 10ms. These delays can be turned off by setting maxAcceptDelay to 0. This is added into the reachingConnectionLimit:with: event.

We've also added an error handler in ConnectionListener to protect socket accept and connection creation. The error handler invokes #handleListenerError: message which in turn triggers a #listenerError:in: event. The later message takes the listener itself as a parameter, which is handy when one needs to restart the listener in case of error.

## RemoteObject printing

By default, RemoteObjects used to print their host name. This entails an expensive reverse DNS lookup that may freeze the image for a couple of minutes. So, the default printing of RemoteObjects was changed to use the host address. The class variable PrintUsingHostAddress maintains a Boolean, that controls the employed printing strategy.

## New message events

Two somewhat new events were introduced at the generic level of RemoteMessages. The event #evaluatingMessage:in: is triggered for every incoming message, that is, for every request coming into a server and for every reply coming back to the client. If there is an error during evaluation, an #evaluatingMessage:in:failedBecause: event is triggered.

Note that it is possible to signal an Error in an `#evaluatingMessage:in:` handler and thus prevent evaluation of an incoming request. This capability was introduced to support our current approach to message redirection, and in anticipation of supporting like mechanisms in SOAP header processors and CORBA interceptors.

---

## Application Server

### New Opentalk-Based Server Classes

Probably the most significant change in this version is the integration of the Opentalk and Application Server HTTP serving capabilities. When creating a server, the names of the possible server classes have changed, with `WaveIPRequestBroker` replacing `IPWebListener` and `WaveHTTPRequestBroker` replacing `TinyHTTPServer`. This change should be transparent to existing applications, but provides access to some new underlying facilities, as well as unifying the two separate HTTP serving components.

### Use of New Settings Framework

With this release, application server settings are no longer in a separate settings window, but integrated with the other VisualWorks settings, using the facilities introduced in VW 7.1. Settings can be accessed interactively either using the "Web Settings" launcher menu, which will give a browser only on that sub-group of settings, or from the main settings browser.

### New Settings File Format

The use of the new settings framework also means that settings are saved, like the other VisualWorks settings, in a new XML-based format. This replaces the format previously used in the `.vwaverc` files, although the new system will still read the old file format. Note that this does not yet replace all of the other configuration files. For example, the Web Toolkit `.INI` files for configuring web sites remain in their previous form for the moment.

### New Load-Handling Improvements and Settings

With the use of the Opentalk HTTP server we have introduced a number of new settings for dealing with heavy load situations. In particular, it is possible to configure the server to limit the maximum number of simultaneous connections, and to introduce an optional delay between accepts. In a situation where the server is flooded with connections, this can help reduce the effect of the listener starving the processes which

are actually servicing requests. It is also possible to configure the priority of the listening and serving processes. These options are configurable using the settings mechanism described above. In addition to these changes, there has been a certain amount of performance optimization done, primarily in removing slow dynamic lookups of class names at runtime.

## **Adjusted Default Memory Sizes**

After considerable performance tuning and load handling, and to accommodate modern machine capabilities, we have adjusted the default memory sizes. In particular, for dealing with large numbers of connections we have increased the size of the spaces for new objects, and increased the size of LargeSpace by a very large factor (250 times the default, 50MB total). This helps the garbage collector deal with the large number of socket buffers in use. The maximum total memory has been increased to 160MB, with the growth regime upper bound remaining at 2/3 of that value. For production use, it is recommended that you evaluate performance of your own application and available memory, and adjust these parameters accordingly. All of these values can be adjusted from the new settings windows or files, although it is worth noting that memory sizes at startup will only take effect after an image save and restart, and thus cannot be usefully set in the startup file).

## **Load Balancer Using Opentalk**

The Load Balancer has been switched to use Opentalk rather than DST as its underlying communications mechanism. This eliminates the requirement to have DST loaded when using the load balancer, reducing footprint.

## **GIF Encoding by Default**

With the expiration of the GIF-related patents, the system now defaults to GIF encoding for VisualWave's dynamically generated bitmaps.

## **Fixed Problem with Defaulting to Production Mode**

In the last release, with the unification of the previous Wave Server and Wave Developer components, the entire system would always come up in production mode by default (as Wave Server did). This could be confusing, particularly to new users. The system now defaults to Debug mode.

## Fixes for New Window Opening Types

Some of the new options for window opening policies (e.g. cascading) would cause walkbacks if you tried to open those windows as VisualWave applications. This has now been corrected.

## Documentation for Perl Gateway

The Perl gateway, which was introduced with VW 7.1, now has documentation in the *Server Configuration Guide*. This gateway is now the recommended way to initially configure a server, as it is easy to install and performs well.

## ISAPI Error Propagation

The way in which the ISAPI gateway reports errors has been improved. It reports an error page uniformly if the hostmap file cannot be found. It also handles more exceptions internally and writes them to the IIS log, rather than passing them up to IIS, which could treat them as an error caused by the DLL and terminate the process.

## Possible Issues with IIS on Windows XP

We have observed some issues with the gateways using IIS on current versions of Windows XP. It appears that IIS is attempting to validate the full path of a request that uses a virtual directory, regardless of the settings. This does not appear to affect usage with a full path (e.g., `.../scripts/cgi2vw.exe/...`), and is not specific to a particular gateway.

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## Documentation

This section provides a summary of the main documentation changes.

### Advanced Tools Guide

- Incorporated changes to the Profiler chapter
- Updated for changes to Benchmarks chapter

### Application Developer's Guide

- Documentation of new Settings Manager usage (ch 1) and framework (ch 14).

### COM Connect Guide

No changes.

### **Database Application Developer's Guide**

- Removed obsolete OracleOR chapter (formerly chapter 10)
- Miscellaneous updates

### **DLL and C Connect Guide**

- Documentation of support for MacOS X
- Miscellaneous updates.

### **DST Application Developer's Guide**

No changes.

### **GUI Developer's Guide**

- Restored brief discussion of model/view separation to chapter 2.
- Major revision to chapter 4, "Adapting Domain Models to Widgets."
- Restored information from the old Business Graphics guide to the Charts Widget description in chapter 9.
- Updated discussion of the List Widget in chapter 9.

### **Internationalization Guide**

Miscellaneous updates.

### **Internet Client Developer's Guide**

- Information added on international characters in messages and headers.
- Secure Socket Layer chapter removed and included in the Security Guide.
- Miscellaneous updates

### **Opentalk Communication Layer Developer's Guide**

- Moved Opentalk-SOAP chapter to *Web Service Developer's Guide*
- Added new chapter on Opentalk Load Balancing support.
- Miscellaneous updates

### **Plugin Developer's Guide**

No changes.

### **Security Guide**

New document.

**Source Code Management Guide**

- Added information on PostgreSQL configuration
- Other minor additions

**Walk Through**

No changes.

**Web Application Developer's Guide**

No changes.

**Web GUI Developer's Guide**

No changes.

**Web Server Configuration Guide**

- Load Balancer Documentation updated for use of OpenTalk
- Documentation for use of Perl gateway
- Miscellaneous changes

**Web Service Developer's Guide**

- Added discussion of SOAP Header support.
- Additions to chapter 3, on WSDL.
- Additions to chapter 5, "Building Web Service Servers."

**TechNotes**

The following documents in the TechNotes directory have been updated:

**VisualWorks ByteCode Set**

- Updated and released as Technical Note

**VisualWorks Memory Management**

- Documentation of Object Engine memory management and garbage collection.
- Added guidelines for tuning large-memory applications.

## Goodies

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### Default Package Namespaces

The DefaultPackageNamespaces parcel, in the **goodies/parc** directory, allows a package to specify a default namespace, using the #namespace property. If it does so, then

- class/namespace definitions default to that namespace rather than to Smalltalk
- class extensions defined in the package are compiled in the scope of that namespace, rather than the namespace of the class. This can greatly reduce the need for qualified names in class extension methods.

Note that, as with all goodies, this is unsupported code, and may still have issues in unusual situations.

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## Deprecated Features

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By deprecating certain features, we remove them from the system. These are made available for a limited time as parcels in the **obsolete/** directory, to provide you the opportunity to port applications away from using the features before they are removed altogether. This directory is on the default parcel path.

---

### GUI

#### **PseudoEvent removed**

(AR 46219) The class PseudoEvent and all its references has been removed. In a polling control environment instances of this class were used to wake up the window controller without waiting for a host event to arrive. In the new MultiProcUI control environment introduced in VW 7.1 dispatching instances of PseudoEvent were unnecessary and the time consumed to process it wasted since it was ignored. Application developers are advised to remove any reference of PseudoEvent or sends of #pseudoEvent or #isPseudoEvent in their control code when migrating to this release.

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## Preview Components

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Several features are included in a **preview** and available on a “beta test” basis. This is a renaming of the directory from prior releases, and reflects looser criteria for inclusion, allowing us to provide pre-beta quality, early access to forthcoming features. Several are described in the following sections. Browse the directory contents for last minute inclusions.

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### DotNETConnect

DotNETConnect is a VisualWorks add-on that allows you to integrate Microsoft .NET components, defined in the .NET Common Language Runtime (CLR) libraries, into a VisualWorks application. This additional capability makes it easier for VisualWorks programmers to develop applications that coordinate well with other .NET applications.

DotNETConnect was developed by Georg Heeg eK and is licensed to Cincom.

For additional information, refer to the documentation in [preview/DotNetConnect/Delivery/Doc/DotNETConnect.pdf](http://preview/DotNetConnect/Delivery/Doc/DotNETConnect.pdf).

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### Unicode Support for Windows

Extended support for Unicode character sets is provided as a preview, on *Windows 2000 and later* platforms. Support is restricted to the character sets that Windows supports.

The parcels provide support for copying via clipboard (the whole character set), and for displaying more than 33.000 different characters, without any special locales.

The workspace included in `preview/unicode/unicode.ws` is provided for testing character display, and displays the entire character set found in Arial Unicode MS.

First, open the workspace; you'll see a lot of black rectangles. Then load `preview/unicode/AllEncodings.pcl` and instantly the workspace will update to display all the unicode characters that you have loaded. You can copy and paste text, for example from MS Word to VW, without problems.

If there are still black rectangles, you need to load Windows support for the character sets. In the Windows control panel, open **Regional and Language Options**. (Instructions are for Windows XP; other versions may differ slightly.) Check the **Supplemental language support** options you want to install, and click **OK**. The additional characters will then be installed.

To write these characters using a Input Method Editor (IME) pad, load the `UnicodeCharacterInput.pcl`.

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## New GUI Framework (Pollock), Beta 3

Pollock remains in preview in 7.2.

### Background

Over the last several years, we have become increasingly dissatisfied with both the speed and structure of our GUI frameworks. In that time, it has become obvious that the current GUI frameworks have reached a plateau in terms of flexibility. Our list of GUI enhancements is long, supplemented as it has been by comments from the larger VisualWorks communities on `comp.lang.smalltalk` and the VWNC list. There is nothing we would like more than to be able to provide every enhancement on that list, and more.

But, the current GUI frameworks aren't up to the job of providing the enhancements we all want and need, and still remain maintainable. In fact, we are actually beyond the point of our current GUI frameworks being reasonably maintainable.

This is not in any way meant to denigrate the outstanding work of those who created and maintained the current GUI system in the past. Quite the opposite, we admire the fact that the existing frameworks, now over a decade old, have been able to show the flexibility and capability that have allowed us to reach as far as we have.

However, the time has come to move on. As time has passed, and new capabilities have been added to VisualWorks, the decisions of the past no longer hold up as well as they once did.

Over the past several decades, our GUI Project Leader, Samuel S. Shuster, has studied the work of other GUI framework tools including, VisualWorks, VisualAge Smalltalk, Smalltalk/X, Dolphin, VisualSmalltalk, Smalltalk MT, PARTS, WindowBuilder, Delphi, OS/2, CUI, Windows, MFC, X11, MacOS. He has also been lucky enough to have been privy to the “private” code bases and been able to have discussions with developers of such projects as WindowBuilder, Jigsaw, Van Gogh and PARTS.

Even with that background, we have realized that we have nothing new to say on the subject of GUI frameworks. We have no new ideas. What we do have is the tremendous body of information that comes from the successes and failures of those who came before us.

With that background, we intend to build a new GUI framework, which we call Pollock.

## High Level Goals

The goals of the new framework are really quite simple: make a GUI framework that maintains all of the goals of the current VisualWorks GUI, and is flexible and capable enough to see us forward for at least the next decade.

To this general goal, we add the following more specific goals:

- The new framework must be more accessible to both novice and expert developers.
- The new framework must be more modular.
- The new framework must be more adaptable to new looks and feels.
- The new framework must have comprehensive unit tests.

Finally, and most importantly:

- The new framework must be developed out in the open.

## Pollock

The name for this new framework has been code named Pollock after the painter Jackson Pollock. It's not a secret. We came up with the name during our review of other VisualWorks GUI frameworks, most directly, Van Gogh. It's just our way of saying we need a new, modern abstraction.

## **Pollock Requirements**

The high level goals lead to a number of design decisions and requirements. These include:

### **No Wrappers**

The whole structure of the current GUI is complicated by the wrappers. We have SpecWrappers, and BorderedWrappers, and WidgetWrappers, and many more. There is no doubt that they all work, but learning and understanding how they work has always been difficult. Over the years, the wrappers have had to take on more and more ugly code in order to support needed enhancements, such as mouse wheel support. Pollock will instead build the knowledge of how to deal with all of these right into the widgets.

### **No UIBuilder at runtime**

The UIBuilder has taken on a huge role. Not only does it build your user interface from the specification you give it, it then hangs around and acts as a widget inventory. Pollock will break these behaviors in two, with two separate mechanisms: a UI Builder for building and a Widget Inventory for runtime access to widgets and other important information in your user interface.

### **New Drag/Drop Framework**

The current Drag/Drop is limited and hard to work with. It also doesn't respect platform mouse feel aspects, nor does it cleanly support multiple window drag drop. Pollock will redo the Drag/Drop framework as a state machine. It will also use the trigger event system instead of the change / update system of the current framework. Finally, it will be more configurable to follow platform feels, as well as developer extensions.

### **The Default/Smalltalk look is dead**

We will have at the minimum the following looks and feels: Win95/NT, Win98/2K, MacOSX and Motif. We will provide a Win2K look soon after the first production version of Pollock.

### **Better hotkey mapping**

Roel Wuyts has been kind enough to give permission allowing us to use his MagicKeys hot key mapping tool and adapt it for inclusion in the base product. Thank you Roel.

### **XML Specs**

We will be providing both traditional, array-based, and XML-based spec support, but our main format for the specifications will be XML. We will provide a DTD and tools to translate old array specifications

to and from the new XML format. Additionally, in Pollock, the specs will be able to be saved to disk, as well as loaded from disk at runtime.

### **Conversion Tools**

With the release of the first production version of the Pollock UI framework (currently projected for 7.3), we will also produce tools that will allow you to convert existing applications to the new framework. These tools will be in the form of refactorings that can be used in conjunction with the Refactoring tools that are an integral part of VisualWorks, as well as other tools and documentation to ease the developer in transitioning to the new framework.

### **Unit Tests**

Pollock will, and already does, have a large suite of unit tests. These will help maintain the quality of the Pollock framework as it evolves. The tests are in the PollockTesting parcel. To load this parcel, you must have both the Pollock and SUnit parcels loaded.

### **New Metaphor**

The Pollock framework is based on a guiding metaphor; “Panels with Frames, with Agents and Artists.” More on that below.

### **Automatic look and feel adaptation**

In the current UI framework, when you change the look and/or feel, not all of your windows will update themselves to the new look or feel. In Pollock, all widgets will know how to automatically adapt themselves to new looks and feels without special code having to be supplied by the developer. This comes “free” with the new “Panels with Frames, with Agents and Artists” metaphor.

## **The New Metaphor: Panels with frames, agents, and artists**

In Pollock, a *pane*, at its simplest, is akin to the existing *VisualComponent*. A pane may have subpanes. Widgets are kinds of panes. There is an *AbstractPane* class. A *Window* is also a kind of pane, but it will remain in its own hierarchy so we don't have to reinvent every wheel. Also, the *Screen* becomes in effect the outermost pane. Other than those, all panes, and notably all widgets, will be subclassed in one way or another from the *AbstractPane*.

A *frame* has a couple of pieces, but in general can be thought of as that which surrounds a pane. One part of a frame is its layout, which is like our existing layout classes, and defines where it sits in the enclosing pane. It may also have information about where it resides in relation to sibling panes and their frames.

A border or scroll bar in the pane may “clip” the view inside the pane. In this case, the frame also works as the view port into the pane. As such, a pane may be actually larger than its frame, and the frame then could provide the scrolling offsets into the view of the pane. The old bounds and preferred bounds terminology is gone, and replaced by two new, more consistent terms: visible bounds and displayable bounds. The visible bounds represents the whole outer bounds of the pane. The displayable bounds represents that area inside the pane that is allowed to be displayed on by any subpane. For example, a button typically has a border. The visible bounds is the whole outer bounds of the pane, while the displayable bounds represents the area that is not “clipped” by the border.

Another example is a text editor pane. The pane itself has a border, and typically has scroll bars. The visible bounds are the outer bounds of the pane, and the displayable bounds are the inner area of the text editor pane that the text inside it can be displayed in. The text that is displayed in a text editor, may have its own calculated visible bounds that is larger than the displayable bounds of the text editor pane. In this case, the Frame of the text editor pane will interact with the scroll bars and the position of the text inside the pane to show a view of the text.

Artists are objects that do the drawing of pane contents. No longer does the “view” handle all of the drawing. All of the `displayOn:` messages simply get re-routed to the artist for the pane. This allows plugging different artists into the same pane. For instance, a `TextPane` could have a separate artist for drawing word-wrapped and non-word-wrapped text. A `ComposedTextPane` could have one artist for viewing the text composed, and another for XML format. Additionally, the plug-and-play ability of the artist allows for automatically updating panes when the underlying look changes. No longer will there be multiple versions of views or controllers, one for each look or feel. Instead, the artists, together with agents, can be plugged directly into the pane as needed.

Agents interact with the artists and the panes on behalf of the user. Now, if this sounds like a replacement of the Controller, you're partially correct. In the Pollock framework, the controllers will have much less “view” related behavior. Instead, they will simply be the distributors of events to the agent via the pane. This means that our controllers, while they'll still be there, will be much more stupid, and thus be much less complex and less coupled to the pane. Like the artist, the agent is pluggable. Thus, a `TextPane` may have a read-only agent, which doesn't allow modifying the model.

## Other notes of interest

The change/update mechanism will be taking a back seat to the TriggerEvent mechanism. The ValueModel will remain, and Pollock will be adding a set of TriggerEvent based subclasses that will have changed, value: and value events. Internal to the Pollock GUI, there simply will not be a single place where components will communicate with each other via the change/update mechanism as they do today. While they will continue to talk to the model in the usual way, there will be much less chatty change/update noise going on.

The ApplicationModel in name is gone. It was never really a model, nor did it typically represent an application. Instead, a new class named UserInterface replaces it. This new class will know how to do all things Pollock. Conversion tools will take existing ApplicationModel subclasses and make UserInterface subclasses.

A new ScheduledWindow class (in the Pollock namespace) with two subclasses: ApplicationWindow and DialogWindow. The ScheduledWindow will be a full-fledged handler of all events, not just mouse events like the current ScheduledWindow. The ApplicationWindow will be allowed to have menus and toolbars, the ScheduledWindow and DialogWindow will not. The ApplicationWindow and DialogWindow will know how to build and open UserInterface specifications, the ScheduledWindow will not. Conversely the UserInterface will only create instances of ApplicationWindow and DialogWindow.

## So, What Now?

The work on Pollock has already started. In the VisualWorks 7 distribution, we provided a very basic beta framework. The goal of the first beta was very simple: a window that has a label and an icon, and a button that has a label and an icon. Beta 2 was included in VisualWorks 7.1, and had several of the basic widgets done: InputField, TextEdit, CheckBox, RadioButton and ListBox.

VisualWorks 7.2 includes Beta 3, which adds DropDownList, Menu, Grid (Table/Dataset combination), DialogWindow, Toolbar, TreeView and TabControl.

The first production release will have all of the remaining widgets done and complete. All of the tools, including a GUI Painter, will be completed. Additionally, tools and utilities will be provided for converting existing GUIs to run on Pollock. Pollock will co-reside in the image along side the existing GUI framework. This is hoped to be included in VisualWorks 7.3.

After that, it's on to migrating our own tools and browsers to Pollock. Followed in time by the obsoleting of the old GUI framework to a compatibility parcel.

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## Opentalk SNMP

SNMP is a widely deployed protocol that is commonly used to monitor, configure, and manage network devices such as routers and hosts. SNMP uses ASN.1 BER as its wire encoding and it is specified in several IETF RFCs.

The Opentalk SNMP preview partially implements two of the three versions of the SNMP protocol: SNMPv1 and SNMPv2. It does so in the context of a framework that both derives from the Opentalk Communication Layer and maintains large-scale fidelity to the recommended SNMPv3 implementation architecture specified in IETF RFC 2571.

### Usage

#### Initial Configuration

Opentalk SNMP cares about the location of one DTD file and several MIB XML files. So, before you start to experiment, be sure to modify 'SNMPContext>>mibDirectories' if you have relocated the Opentalk SNMP directories.

#### Broker or Engine Creation and Configuration

In SNMPv3 parlance a broker is called an “engine”. An engine has more components than a typical Opentalk broker. In addition to a single transport mapping, a single marshaler, and so on, it must have or be able to have

- several transport mappings,
- a PDU dispatcher,
- several possible security systems,
- several possible access control subsystems,
- a logically distinct marshaler for each SNMP dialect, plus
- an attached MIB module for recording data about its own performance.

So, under the hood, SNMP engine configuration is more complex than the usual Opentalk broker configuration. You can create a simple SNMP engine with

```
SNMPEngine newUDPAtPort: 161.
```

But, this is implemented in terms of the more complex method below. Note that, for the moment, within the code SNMP protocol versions are distinguished by the integer used to identify them on the wire.

```
newUdpAtPorts: aSet
| oacs |

oacs := aSet collect: [ :pn |
    AdaptorConfiguration snmpUDP
        accessPointPort: pn;
        transport: ( TransportConfiguration snmpUDP
            marshaler: ( SNMPPMarshalerConfiguration snmp ) ) ].

^(( SNMPEngineConfiguration snmp )
    accessControl: ( SNMPAccessControlSystemConfiguration snmp
        accessControlModels: ( Set
            with: SNMPAccessControlModelConfiguration snmpv0
            with: SNMPAccessControlModelConfiguration snmpv1 ) );
    instrumentation: ( SNMPInstrumentationConfiguration snmp
        contexts: ( Set with: (
            SNMPContextConfiguration snmp
                name: SNMP.DefaultContextName;
                values: ( Set with: 'SNMPv2-MIB' ) ) );
        securitySystem: ( SNMPSecuritySystemConfiguration snmp
            securityModels: ( Set
                with: SNMPSecurityModelConfiguration snmpv0
                with: SNMPSecurityModelConfiguration snmpv1 ) );
        adaptors: oacs;
        yourself
    ) new
```

As you can see, it is a bit more complex, and the creation method makes several assumptions about just how you want your engine configured, which, of course, you may change.

## Engine Use

Engines are useful in themselves only as lightweight SNMP clients. You can use an engine to send a message and get a response in two ways. The Opentalk SNMP Preview now supports an object-reference based usage style, as well as a lower-level API.

## OR-Style Usage

If you play the object reference game, you get back an Association or a Dictionary of ASN.1 OIDs and the objects associated with them. For example, the port 3161 broker sets up its request using an object reference:

```
| broker3161 broker3162 oid ref return |

broker3161 := SNMPEngine newUdpAtPort: 3161.
broker3162 := self snmpv0CommandResponderAt: 3162.
broker3161 start.
broker3162 start.
oid := CanonicalAsn1OID symbol: #'sysDescr.0'.
ref := RemoteObject
    newOnOID: oid
    hostName: <aHostname>
    port: 3162
    requestBroker: broker3161.
^return := ref get.
```

This expression returns:

```
Asn1OBJECTIDENTIFIER(CanonicalAsn1OID(#'1.3.6.1.2.1.1.0'))->
  Asn1OCTETSTRING('VisualWorks®, Pre-Release 7 godot
  mar02.3 of March 20, 2002')
```

Object references with ASN.1 OIDs respond to get, set:, and so forth. These are translated into the corresponding SNMP PDU type, for example, a GetRequest and a SetRequest PDU in the two cases mentioned.

## Explicit Style Usage

You can do the same thing more explicitly the following way, in which case you will get back a whole message:

```
| oid broker1 entity2 msg returnMsg |

oid := CanonicalAsn1OID symbol: #'1.3.6.1.2.1.1.0'.
broker1 := SNMPEngine newUdpAtPort: 161.
entity2 := self snmpv1CommandResponderAt: 162.
broker1 start.
entity2 start.
msg := SNMPAbstractMessage getRequest.
msg version: 1.
msg destTransportAddress: ( IPsocketAddress hostName: self
    localHostName port: 162 ).
msg pdu addPduBindingKey: ( Asn1OBJECTIDENTIFIER value: oid ).
returnMsg := broker1 send: msg.
```

which returns:

```
SNMPAbstractMessage.GetResponse[1]
```

Note that in this example, you must explicitly create a request with the appropriate PDU and explicitly add bindings to the message's binding list.

## Entity Configuration

In the SNMPv3 architecture, an engine does not amount to much. It must be connected to several SNMP 'applications' in order to do useful work. And 'entity' is an engine conjoined with a set of applications. Applications are things like command generators, command responders, notification originators, and so on. There are several methods that create the usually useful kinds of SNMP entities, like

```
SNMP snmpv0CommandResponderAt: anInteger
```

Again, this invokes a method of greater complexity, but with a standard and easily modifiable pattern. There are several examples in the code.

## MIBs

Opentalk SNMP comes with a small selection MIBs that define a subtree for Cincom-specific managed objects. So far, we only provide MIBs for reading or writing a few ObjectMemory and MemoryPolicy parameters. A set of standard MIBs is also provided. Note that MIBs are provided in both text and XML format. The Opentalk SNMP MIB parser required MIBs in XML format.

If you need to create an XML version of a MIB that is not provided, use the 'snmpdump' utility. It is a part of the 'libsmi' package produced by the Institute of Operating Systems and Computer Networks, TU Braunschweig. The package is available for download through <http://www.ibr.cs.tu-bs.de/projects/libsmi/index.html>, and at <http://rpmfind.net>.

## Limitations

The Opentalk SNMP Preview is raw and has several limitations. Despite them, the current code allows a user, using the SNMPv2 protocol, to modify and examine a running VW image with a standard SNMP tool like ucd-snmp. However, one constraint should be especially noted.

### Port 161 and the AGENTX MIB

SNMP is a protocol used for talking to devices, not applications, and by default SNMP uses a UDP socket at port 161. This means that in the absence of coordination between co-located SNMP agents, they will

conflict over ownership of port 161. This problem is partially addressed by the AGENTX MIB, which specifies an SNMP inter-agent protocol. Opentalk SNMP does not yet support the AGENTX MIB. This means that an Opentalk SNMP agent for a VisualWorks application (only a virtual device) must either displace the host level SNMP agent on port 161, or run on some other port. Opentalk SNMP can run on any port, however many commercial SNMP management applications are hard-wired to communicate only on port 161. This places limitations on the extent to which existing SNMP management applications can now be used to manage VisualWorks images.

---

## Opentalk

The Opentalk preview provides extensions to 7.2 and the Opentalk Communication Layer. It includes a preview implementation of SNMP, a remote debugger and a distributed profiler. The load balancing components formerly shipped as preview components in 7.0 is now part of the Opentalk release.

For installation and usage information, see the readme.txt files and the parcel comments.

### SNMP

SNMP is described in the previous section.

### Distributed Profiler

The profiler has not changed since the last release and works only with the old AT Profiler, shipped in the `obsolete/` directory.

### Opentalk Remote Debugger

This release includes an early preview of the Remote Debugger. Its functionality is seriously limited when compared to the Base debugger, however its basic capabilities are good enough to be useful in many cases. The limitations are mostly related to actions that open other tools. For those to work, we have yet to make the other tools remotable as well.

The remote debugger is contained in two parcels.

The Opentalk-Debugger-Remote-Monitor parcel loads support for the image that will run the remote debugger interface. The monitor is started by sending:

#### RemoteDebuggerClient startMonitor

Once the monitor is started, other images can “attach” to it. The monitor will host the debuggers for any unhandled exceptions in the attached images.

To shutdown a monitor image, all the attached images should be detached first and then the monitor should be stopped, by sending:

#### RemoteDebuggerClient stopMonitor

The Opentalk-Debugger-Remote-Target parcel loads support for the image that is expected to be debugged remotely. To enable remote debugging this image has to be “attached” to a monitor, i.e., to the image that runs the remote debugger UI. Attaching is performed with one of the “attach\*” messages defined on the class side of RemoteDebuggerService. Use detachMonitor to stop forwarding of unhandled exceptions to the remote monitor image.

A packaged (possibly headless) image can be converted into a “target” during startup by loading the Opentalk-Debugger-Remote-Target parcel using the `-pc1` command line option. Additionally it can be immediately attached to a monitor image using an `-attach [host] [:port]` option on the same command line. It is assumed that the Base debugger is in the image (hasn't been stripped out) and that the prerequisite Opentalk parcels are also available on the parcel path of the image.

---

## SocratesEXDI and SocratesThapiEXDI

SocratesXML support at the EXDI level is included with this release in the `preview/database/` directory, in the SocratesEXDI and SocratesThapiEXDI parcels. The code is still under study and development for full release at a later time.

Currently this code supports:

- Supports MindSpeed 5.1 and SocratesXML 1.2.0 across Windows, Solaris and HPUX platforms.
- The SocratesXML API allows threaded calls, through thread safe drivers.
- All SocratesXML types (except MONETARY), collections and object references (OID) supported.
- Both placed and named input parameter binding is supported though SocratesXML only supports placed input binding.

## Installation

### SocratesXML 1.2.0

To install under Solaris and HPUX, simply load the SocratesEXDI parcel.

For Windows you must manually install the **1880.016.map** file. Do this by executing the external interface initialization code below and selecting the **1880.016.map** file:

```
SocratesInterface userInitialize
SocratesThapiInterface userInitialize
```

The class instance variable build defines the current build of the external interface classes on Windows platforms and can be ignored for the other platforms. The default value is set to 1881.016 on parcel loading.

### MindSpeed 5.1

To install under Solaris and HPUX, simply load the SocratesEXDI parcel.

For Windows you must manually install the 1690.014.map file. Do this by executing the external interface initialization code below and selecting the 1690.014.map file when prompted:

```
SocratesInterface userInitialize
SocratesThapiInterface userInitialize
```

The class instance variable build defines the current build of the external interface classes on Windows platforms and can be ignored for the other platforms. The default value is set to '1881.016' on parcel loading.

## Data Interchange

The Socrates database type to Smalltalk class mapping is given in table 1 below. Table 2 defines the mapping for database collection types.

The Socrates EXDI automatically converts Socrates database types to/from instances of concrete Smalltalk classes. Database bit types (BIT, VARBIT) are mapped to a new Smalltalk class BitArray. This class provides efficient uni-dimensional access to a collection of bits.

Table 1 - Socrates scalar type to Smalltalk class mappings

Socrates Data type	Smalltalk Class
BIT, VARBIT	BitArray
CHAR, NCHAR, VARCHAR (STRING), VARNCHAR	String
DATE	Date

Table 1 - Socrates scalar type to Smalltalk class mappings

Socrates Data type	Smalltalk Class
DOUBLE	Double
FLOAT	Float
INTEGER, SHORT, SMALLINT	Integer
NULL	UndefinedObject
NUMERIC	FixedPoint, LargeInteger
TIME	Time
TIMESTAMP	Timestamp

Table 2 - Socrates collection type to Smalltalk class mappings

Socrates Collection Data type	Smalltalk Collection Class
LIST, SEQUENCE	OrderedCollection
MULTISET	Array
SET	Set

Socrates support for heterogeneous collection maps naturally onto Smalltalk collections and is fully supported within in the limits defined by the SocratesXML C API.

For this release collections will be fetched and written in their entirety.

## Reference Support

The Socrates EXDI provides transparent support for database object references, Socrates OIDs (similar to the SQL Ref data type).

A Socrates OID is represented by a lightweight Smalltalk object (class SocratesOID) that contains sufficient information to uniquely identify the database object across all accessible database servers. SocratesOID instances are not related to active database connections and so can exist outside the normal database server connection scope. SocratesOIDs can be instantiated back into live database objects (represented by instances of class SocratesObject) via an appropriate active connection i.e. one connected to the original database server.

## Object Support

The Socrates EXDI provides access to raw Socrates database objects through instances of class `SocratesObject`. `SocratesObject` instances are intimately connected to the Socrates database server and so their scope is that of the underlying database connection.

A key feature of `SocratesObject` is high-level support for server side method (function) invocation. Simple server methods can be supported directly; methods with multiple or non-standard return values must be explicitly coded by the developer using in-built method invocation support methods. This typically involves defining a Smalltalk class (as a subclass of `SocratesObject`) to represent the target server class. This new class will be the place holder for both class and instance server method wrappers. All Smalltalk wrapper methods are defined as instance methods irrespective of whether they represent class or instance methods in the server. The Smalltalk wrapper methods are coded to extract the returned value(s) from the original method argument list, free any resources and returning the extracted value(s). The Smalltalk GLO hierarchy provides numerous examples of simple and complex wrapper methods.

## GLOs

The Socrates EXDI supports LOB as a subset of the capabilities provided by `SocratesXML` GLOs. The Socrates EXDI implements the LOB interface through the `SocratesGLO` class hierarchy. `SocratesGLOs` provide a stream-like access to GLO data. All GLO subclasses have been modeled, i.e. audio, image and `mm_root` hierarchies. Each modeled subclass implements the majority of class and instance server side methods as Smalltalk methods. The user can easily add/extend this functionality by modeling any user-defined subclasses and server side methods.

The initial release of Socrates EXDI supports read-only support for Socrates GLOs.

---

## Virtual Machine

### IEEE floating point

The engine now supports IEEE floating-point primitives. The old system used IEEE floats, but would fail primitives that would have answered an IEEE **Inf** or **NaN** value. The new engine does likewise but can run in a mode where the primitives return **Inf**s and **NaN**s rather than fail.

Again due to time constraints the system has not been changed to use this new scheme and we intend to move to it in the next release. In the interim, candidate code is provided as a goodie, and the engine can be put in the new mode by a `-ieee` command line option.

## OE Profiler

The OEProfiler, an engine-level pc-sampling profiler now supports profiling native methods in the nmethod zone. The image-level code (`goodies/parc/OEProfiler.pcl`) is still only goodie quality but we hope to integrate properly these facilities with the Advanced Tools profilers soon.

---

## GLORP

GLORP (Generic Lightweight Object-Relational Persistence) is an open-source project for mapping Smalltalk objects to and from relational databases. While it is still missing many useful properties for such a mapping, it can already do quite a few useful things.

GLORP is licensed under the LGPL(S), which is the Lesser GNU Public License with some additional explanation of how the authors consider those conditions to apply to Smalltalk. Note that as part of this licensing the code is unsupported and comes with absolutely no warranty. See the licensing information accompanying the software for more information.

Cincom currently plans to do a significant overhaul of the current database mapping facilities in Lens, using GLORP as one component of that overhaul. GLORP is included in preview as an illustration of what these future capabilities might include.

Included on the CD is the GLORP library, its test suite, some rudimentary user-provided documentation, and some supplementary parcels. For more information, see the `$VISUALWORKS/preview/glorp` directory. Note that one of these includes a preliminary mapping to the Store database schema.

---

**Warning:** This is UNSUPPORTED PREVIEW CODE. While it should be harmless to use this code for reading, use of this code to write into a Store database MAY CAUSE LOSS OF DATA.

---

# A

---

## Updates for VisualWorks 7.2.1

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VisualWorks 7.2.1 is a “patch” release, consisting mainly of fixes to problems we found with 7.2. There are also a couple of features being moved from preview into full supported product.

With only a few exceptions, documentation has not been updated for this release. These release notes cover the essential changes and additions.

For late-breaking information on VisualWorks, check the Cincom Smalltalk website at <http://www.cincom.com/smalltalk>. For a growing collection of recent, trouble-shooting tips, visit <http://www.cincomsmalltalk.com:8080/CincomSmalltalkWiki/Trouble+Shooter>.

---

### ARs Resolved in this Release

The Action Requests (ARs) resolved in this release are listed in: [fixed\\_ars.txt](#).

Additional ARs may be discussed in individual sections of these release notes.

Outstanding ARs and limitations are noted throughout these release notes, as appropriate.

## Supported Platforms

### IBM AIX

The AIX platforms supported are misrepresented in the *7.2 Installation Guide*. The correct information is:

- AIX workstation with PowerPC processor
- AIX release 5.0 and later
- CD-ROM drive (for installation)

### Microsoft Windows CE

VisualWorks for hand-held devices with x86-compatible and ARM/XScale-compatible processors running WinCE 4.0 or better remains in preview.

See ["Microsoft Windows CE"](#) below for further information.

---

## Database

### ODBC Result Set Behavior Change

VisualWorks 7.2.1 includes enhancements to the ODBC connect to allow multiple result sets returned from an EXDI session. This has introduced a behavioral change that cause some usages, which previously worked, to fail with the current version.

In particular, because a session can now return multiple result sets, the session does not automatically disconnect after all results have been extracted from the first result set (even if there is only one). You must either continue to send `#answer` to the session until the `#noMoreAnswers` result is received, or explicitly send either `#disconnect` or `#cancelAnswerSet` to the session. This was the correct usage under ODBC before, but previous versions have automatically disconnected the session once the last result was extracted.

This may be a backward-compatibility issue for some applications. In particular, code that reused sessions (prepared statements) without emptying/disconnecting them after the previous use may receive "Invalid Cursor State" or "Unable to Execute SQL" errors.

To restore the old behavior, you can add back in the following method. Note, however, that this will disable some of the new extended features, by making it impossible, for example, to retrieve multiple result sets from a single session. The better solution is to correct your code.

```
ODBCSession>>answerStreamDismissed
    "Close the cursor and discard pending results."

    self freeStatementExternal: #SQL_CLOSE.
    super answerStreamDismissed.
    self handleAutoCommit
```

## ODBC SQL Processing

Facilities have been added ODBC EXDI to execute, store, and call SQL queries, and to capture OUTPUT parameters and return values.

When using stored procedures, the return codes and output parameters are sent in the last packet from the server and are not available before the result sets are exhausted.

For example, in these two code samples, the first uses a prepare: message to define a query, defining a stored procedure.

```
| connection sess answer |
connection := ODBCConnection new.
connection username: 'sa'.
connection environment: 'jazzbo'.
connection connect: ''.
sess := (connection getSession).

sess prepare: 'CREATE PROCEDURE TestParm9 @aZIP int,
              @OutParm int OUTPUT AS
              SELECT au_lname FROM pubs.dbo.authors where zip = @aZIP
              SELECT @OutParm = 88
              RETURN 99
              '.
sess execute.
answer := sess answer.
sess disconnect.
connection disconnect.
```

This second example calls the stored procedure, by sending a preparePROC: message, and retrieves the return values and OUTPUT parameters from their locations in the answer.

```
| connection sess answer |
connection := ODBCConnection new.
connection username: 'sa'.
connection environment:'jazzbo'.
connection connect: ''.
sess := (connection getSession).

sess preparePROC: '{ ? = call TestParm9(?, ?)}'. "This works"

sess bindVariable: 0 at: 1.
sess bindValue: 94025 at: 2.
sess bindVariable: 1 at: 3.
sess execute.
answer := sess answer.
[answer = #noMoreAnswers] whileFalse:
    [(answer isKindOf: ExternalDatabaseAnswerStream)
     ifTrue: [ Transcript show: (answer upToEnd printString); cr]
     ifFalse: [ Transcript show: answer printString; cr].
    answer := sess answer].

Transcript show: 'Return Value = ', (sess bindVariableAt: 1) printString; cr.
Transcript show: 'OUTPUT param = ', (sess bindVariableAt: 3) printString; cr.
sess disconnect.
connection disconnect.
```

---

## GUI Development

Over 45 GUI related bug fixes are incorporated in VW 7.2.1. The highlights of these fixes are summarized below.

### Windows faithful menus

Care has been taken to fix several details with the Windows look policy for menus so that submenus open or close, position, or highlight items correctly according to cursor placement and keyboard action. The result is a faithful Windows menu "feel."

### Datasets

Keyboard navigation errors when scrolling to the top, bottom, or by page for a multi-select dataset have been eliminated. PluggableAdaptors as well as AspectAdaptors and BufferedValueHolders may now be used to access the value of a dataset column. For Mac users, the <Alt> key may now be used to select a dataset column in the UIPainter canvas.

## Dialogs

Damage "holes" occasionally left in a window following closure of a dialog have finally been resolved without unnecessarily updating all the window's contents. Two dialog process problems have been fixed. The first is a dialog process termination problem that would leave an image unresponsive to keyboard or mouse. The second is a dialog process interruption and resumption issue with the debugger that would leave the dialog window initially damaged or, if the debugger was terminated, closed but scheduled.

## Reduced window updates upon opening

In this release multiple updates after opening a window such as a browser has been eliminated or reduced.

## Cursor

The cursor no longer changes to a normal pointer just because it is moved to a new window.

## TreeViews

TreeViews in dialogs may now show text emphasis with node labels. Refreshing the root node of a TreeModel will also now update the expansion icons for unexpanded nodes.

## UIPainter

Copying then pasting a widget to the UIPainter canvas can lead to a widget selection out of sync in the canvas and tree. Two problems that can occur in this state have been corrected in 7.2.1. First, attempting to edit and accept a property in this state would lead to an exception. Second, a bug would rearrange tab order of grouped widgets after editing a property. These are now both fixed.

Finally, a subcanvas now opens according to its initial setting for enablement or visibility in a canvas. Before now it would always open as active and visible even if set to be disabled or invisible.

## Fly-by Help

Fly-by help now works on disabled views.

Since you control the enabling/disabling of views, note that you can also change the help by sending #helpText: message to the view, changing the text possibly to indicate why it is disabled.

Note that in connection with this fix, the method `#isMouseEnterExitOrMoveEvent` was renamed to `#isMotionEvent`.

---

## Web Services

### Marshaling/Unmarshaling nil

In 7.2, the marshaling mechanism did not create an XML element when the corresponding value was nil. Instead, the element was just skipped.

Conversely, when an element such as

```
<number type="xsd:integer" xsi:nil="true"/>
```

was deserialized the number to zero, not nil.

In 7.2.1 we introduce a new implementation to optionally process nil element values. It is optional at this time, in order to provide transparent backward compatibility with 7.2.

To turn on the new nil marshaling, evaluate:

```
XMLObjectMarshalingManager useInlineType: true
```

Also, the XML element must be described with the attribute `nillable="true"`. The initial default value of the nillable attribute is false, but can be changed to true by evaluating:

```
XMLObjectMarshalingManager nillableDefault: true
```

Then the nillable attribute does not need to be explicitly set. Of course, explicitly setting the nillable attribute overrides the default.

When these two conditions, the `useInlineType:` and `nillable` attributes set to true, marshaling will create the XML element

```
<number type="xsd:integer" xsi:nil="true"/>
```

for a nil attribute value, and unmarshal this element to nil.

If an element with a nil value is unmarshalled with the nillable attribute set to false, a procedable `NilValueNotAllowed` exception is raised.

---

## Security

A regression was introduced in VW7.2, concerning secure hash functions AR 47235), which is corrected in 7.2.1.

Generated digest value for data of certain sizes were wrong, causing the hashes to use wrong padding for data with size of  $(x * \text{blockSize} - 9)$ . Block size is 64 for both MD5 and SHA.

This affected both MD5 and SHA released in VW7.2. This problem would usually manifest itself as an intermittent error in normal use, and was seen as a "bad\_record\_mac" failure in SSL communications.

---

## Application Server

### More Descriptive Server Names in Server Console

The server classes used in the VisualWorks Application Server changed in version 7.2 to be Opentalk Based rather than a custom implementation. This caused some confusion because the names in the Server Console reflected the new names but some references still referred to Tiny HTTP Server.

In this release the names have been changed to be a description of the type of Server, and not to directly reflect the class names. The new descriptions are

- **Smalltalk HTTP Server (TinyHTTP)**, corresponding to the previous TinyHTTP or WaveHTTPRequestBroker, and
- **External Web Server (IPWebListener)**, corresponding to IPWebServer or WaveIPRequestBroker.

### Remove "Built With Cincom Smalltalk" Trailer

The Web Toolkit used to append an HTML comment to all SSP pages. This was a problem when serving server pages whose content type was not text/html, so it has been removed.

### Change Expiry, Content-Type Headers

WebToolkit by default set the HTTP expiry headers to immediate expiration for all content types. This is appropriate for dynamic content but not for serving static files. Static files now have a 1-day default expiry

time. The semantics of the expires variable and of the expiresAbsolute(:) methods in Response have also been corrected. Finally, we no longer attempt to set a default charset on non-text MIME types.

## **Tutorial Links Updated**

The links to the tutorial and updates have been corrected and internationalized to be able to point to different tutorials in different languages. SimpleFileUploadServlet is now provided as an example.

There is an example of handling multi-part forms and file upload now included with the base WebToolkit. It was previously part of internal tests, but is now provided with the product.

## **Smarter Caching of MissingServlet**

Previously, if a servlet was "not found" it would continue to return a not found result even if the error was corrected (e.g. by adding the class). This is because the MissingServlet response was cached. A full cache flush was required in order to see the new servlet. Changed so that this is no longer cached if we are in Debug mode.

## **Changes to Accessing Protocol for HttpSession, HttpApplication, Request**

The attributeAt: and related operations are now usable for sessions and applications as well as for requests, making it possible to treat them polymorphically. attributeAt:ifPresent: now behaves like the basic system's at:ifPresent:, allowing zero or one arguments. In addition, the any<\*>ValueAt: and getParameter: methods in Request now also allow ifNone: forms. Finally, there are new convenience methods application and webSite on HttpSession and ServletContext.

## **Validation for Avoiding Recursive Logical Names**

Logical names are simple string substitutions, so it was easy to create a logical name that would recursively translate itself, e.g., MyClass -> /servlet/MyClass. This release adds logic to detect a logical name being applied more than once in the translation of a single URL.

## **VisualWave/WebToolkit Dependencies**

Some facilities relied on the presence of VisualWave, particularly in error reporting. If run in a Web Toolkit image without VisualWave loaded, these could fail. The partitioning has been adjusted to address the known problems in this area, although it is entirely possible that new ones will be

discovered. As part of this, a number of the previously VisualWave-specific settings have now been made common between VisualWave and WebToolkit.

## Removed "encoding" Method from Internal Streams

This was added to increase polymorphism, but is no longer used, and causes a problem for the XML parser, which depends on the absence of this method.

## SubRequest>>attributes Now Includes Parent Attributes

Previously it would return only those attributes defined on the request itself, not from an original request (via an include:response: or forward:response: method).

## Bean Tag Semantic Changes/Fixes

A bug in findAttribute:ifAbsent:, which erroneously sent #value to the result. The method beanNamed:ifPresent: returned self if there was no entry. This is now changed to return nil. The UseBean tag did not properly evaluate its body, and expressions within the body could not refer to the bean value. Those expressions are now legal. For example,

```
<jsp:usebean id="stuff" class="ExampleObject">
  <% stuff a: 6.%></jsp:usebean>
```

Note that assignment to the bean variable is not permitted; however, the result of the expression can be used to replace the bean. This is most useful for simple types (which normally wouldn't be allowed as beans, but this isn't Java, so why not). So, for example,

```
<jsp:usebean id="stuff" class="SmallInteger"><%3%></jsp:usebean>
<%=stuff%> <jsp:getProperty name="stuff" property="yourself"/>
```

The rule for this replacement is that the result will be used if it matches the class in the UseBean expression, unless that class is Object.

## Improved Handling of Memory Emergencies in a Development Image

The 7.2 server memory policy's reaction to an emergency low-memory situation would effectively disable a development image by suspending all user processes, including the window managers. This has now been changed to shut down the listeners, use some of the PDP process pausing facilities to fork the error notifier so that it doesn't disable the low-space loop, and to resume window manager processes if running headfull.

Note that if there is a runaway user interface process, it will almost certainly crash. However, in a server context that is considered less likely and can be fairly easily stopped with **ctrl-y** before it becomes a memory emergency. If running headless, the response will be to shut down the listeners, log an error, and then exit the image. Once the listeners have been shut down, there is little that can be done to rescue a headless image.

## **Server Memory Policy Default Usage**

Some of the memory policy values set in settings could be ignored by the `ServerMemoryPolicy`, which would use its own defaults instead. This has now been corrected.

## **Change Port of a Running Server**

It is now possible to change the port of a running server.

## **Server Creation when using MacOSX Look**

The server console could walkback when creating a new server when the MacOS X look was in use. This has been corrected.

## **VisualWave Subcanvasses Were Not Built if the Client Was nil**

VisualWave subcanvasses would fail to build if the client of the subcanvas was nil. This was a regression and has now been corrected.

---

## **Preview**

### **Microsoft Windows CE**

Virtual machines for Microsoft Windows CE are intended for use on CE devices as an application deployment environment. Typically, an application is developed in a standard development environment, and prepared for deployment on a CE device. The image, VM, and any supporting files, are then copied to the CE device and executed.

VisualWorks has been successfully tested on the following hardware:

- Simpad SLC with StrongARM-SA-1110, Windows CE .NET Version 4.0
- skeye.pad with StrongARM-SA-1110, Windows CE .NET Version 4.1
- HP iPAQ H2210 with Intel PXA255 XScale, Windows Pocket PC 2003 (Windows Mobile 2003)

- Tatum WebPAD with Geode GXm, Windows CE .NET Version 4.10

There are, however, limitations. Refer to “[Known limitations](#)” below for details.

## Distribution contents

There are two directories with virtual machines for the different processors:

- **preview\WinCE\cearm** – for StrongARM and XScale processors,
- **preview\WinCE\ce86** – for Pentium-compatible processors like the Geode.

Each directory contains three executables and a DLL:

- **vwntoe.dll** – the DLL containing the virtual machine.
- **vwnt.exe** – the GUI stub exe which is normally used to run GUI applications. It uses **vwntoe.dll**.
- **vwntconsole.exe** – the console stub executable which is normally used to run console applications. It uses **vwntoe.dll**.
- **visual.exe** – the single virtual machine, which is used for single-file executable packaged applications.

The assert and debug subdirectories contain versions of these executables with asserts turned on for debugging. The debug engines are not optimized and so can be used with the Microsoft eMbedded Visual C++ debugger. Refer to the engine type descriptions in the *Application Developer's Guide*, Appendix C, for further information.

## Prerequisites

Windows CE VMs require a few additions to the standard image. These are provided in the parcel **ce.pc1**. On the PC, prior to the deployment to your CE machine, load this parcel into your image.

This parcel contains two major changes:

- A new SystemSupport subclass for CE – This is necessary because the name of the DLLs differs from other Windows versions and they contain different versions of the called functions. For example, only Unicode versions of most functions are provided and some convenience functions are missing.
- A new filename subclass, CEFilename – CE does not have a "current working directory" concept, so only absolute paths are supported. Therefore CEFilename stores the current directory and expands relative paths into absolute paths.

## **Developing an Application for CE**

In general, developing an application for deployment on a CE device is the same as for any other application. The notable differences have to do with screen size, especially on small PDA-type devices, and filename handling, because CE does not use file volumes or disk drive letters.

Before beginning development, load the CE parcel (ce.pcl) into the development image. The changes it makes only take effect when the image is installed on the CE device, so you can develop as usual on your standard development system.

### **Filenames**

WinCE does not use relative file paths or volume (disk) letters. This is transparent during development, because the CEFilename class handles converting all paths to absolute paths when the application is deployed on a CE device. No special development restrictions need to be observed.

### **DLL names**

Similar, DLL names are modified appropriately when installed on a CE device.

### **Window sizes and options**

CE devices come in a variety of screen sizes. For the larger devices, with a screen size of 640x400, the limitations are not extreme. However, on the smaller devices, such as a Pocket PC with a screen size of 240x320, the size greatly affects your GUI and application design.

As a deployment environment, you generally should have all development tools, such as browsers closed, and possibly removed from the system, though this is not required.

However, when testing and debugging it is convenient to have all of these development resources available, and this can present serious difficulties.

Also, especially for smaller devices, select an appropriate opening position for the GUI, in the canvas settings. Opening screen center is generally a safe choice.

### **Input devices**

The input side limitations are also worth mentioning. Typically you only have a touch sensitive screen and a pen for it. There is no keyboard, hence no modifier keys. You have no mouse buttons where VisualWorks prefers to have three. So moving the pen somewhere always implies a pressed button. You can open the 'soft input panel', i.e. a small window

with a keyboard in it. But it is not really comfortable to enter longer texts this way and this window needs some of your valuable screen space. So whenever you expect textual input, you should leave some free room for the keyboard. (At 240x320, a full screen work space contains 10 lines of text plus title bar, menu bar, tool bar buttons and the status bar at the bottom. The Keyboard window covers the lines 8 to 10 and the status bar.)

The CE parcel adds code which interpretes holding the pen for approx 1.3 seconds as a right button press to open the operate context menu. This behaviour can be turned on and off in the look and feel section of the settings window. On pocket PC, but not on the CE web pads, users are trained to expect this behaviour.

### **.NET access**

While WinCE .NET uses the features of the Microsoft .NET platform, the DotNETConnect preview does not support their use.

### **Deploying on a CE Device**

Load the CE parcel (`$(VISUALWORKS)\bin\winCE\CE.pcl`) into your development image. This provides the features described above (see “Prerequisites”).

Deployment preparation is, otherwise, the same as usual, though there may be practical considerations. On many devices

### **Starting VisualWorks on CE**

There are several ways to start VisualWorks on Windows CE:

- In the command shell, execute:

```
visual [options] visual.im
```

(Not all CE environments have a command shell interface.)

- Double-click on **visual.exe**. This starts VisualWorks with the default image, **visual.im**.

By default, the vm attempts to open an image with the same name as the vm and in the same directory. So, you can rename the the vm to match your image name and execute it in this way.

- Double-click on an image file. This works only if the **.im** extension is associated with VisualWorks in the registry of the CE device.

If you are developing on the CE device, you can evaluate this expression in a workspace:

```
WinCESystemSupport registerVisualworksExtension
```

- If you have packaged the vm and image as a single executable file (e.g. using ResHacker provided in the **packaging/win** directory), you can simply run the executable.
- Create a short-cut to read e.g.

"My Documents\vwnt" "My Documents\visual.im"

The default CE Windows explorer can be used to create associations by copying an existing short-cut (e.g., Control panel), renaming it, and editing its properties. On CE machines that lack the standard explorer, you can find free tools to edit associations.

## Known limitations

### Sockets

- Non-blocking calls are not yet supported.
- Conversion of hostnames to IP addresses, service names to ports, etc., is not implemented. Use addresses instead, e.g., 192.109.54.11 instead of www.cincom.com.

### File I/O

- File locking does not exist on CE (prim 667)
- Delete, rename, etc., do not work on open files (prim 1601,1602,..)
- " \ asFilename fileSize " fails with FILE\_NOT\_FOUND\_ERROR.

### Windows and Graphics

- Animation primitives not working properly (prims 935-937)
- Only full circles are supported by the OS; arcs and wedges are converted to polylines
- No pixmap <-> clipboard primitives

### User primitive

- As yet there is no support for user primitives or primitive plugins.

## MQ-Interface

A new preview package has been included, which provides an interface for WebSphere MQ using the shared libraries provided by IBM. WebSphere MQ is a message base communication system by which two or more application can exchange messages through a queue. This package allows you to access this API from a VisualWorks application.

Refer to MQ API.doc for information.

## DotNETConnect

The DotNETConnect preview has been updated, with a few enhancements.

### Installation

The contents of the 7.2 DotNETConnect parcel are now in the DotNETConnectDevelopment and DotNETConnectRuntime parcels. This allows to add the development component to an image that has the runtime component already loaded.

### Namespaces

In the 7.2 version, all classes from one assembly were installed in one namespace. As of 7.2.1, the namespace hierarchy of .NET is reflected by the same hierarchy in Smalltalk.

The .NET class System.Runtime.Remoting.Channels corresponds to a VisualWorks class DotNET.System.Runtime.Remoting.Channels. This way ambiguities between two classes with the same name can be resolved.

Therefore the target namespace should be the same for all assemblies (preferably Smalltalk.DotNET). The DotNETCreationWizard automatically uses this namespace; the name space chooser has been removed from the settings dialog.

This is the opposite of the 7.2 versions one namespace per assembly recommendation!

### Type of Returned Objects

DotNETConnect tries to return an object of the actual class of the return value. For example, in

```
ArrayList new Add: 'Hallo123'; Item: 0
```

the method Item: returns the string 'Hallo123' even though the method is declared to return System.Object. So, no cast-to-real-type is necessary, unlike the case in C# and C++.

Sometimes this is not possible, for example if the object is a member of a private class. Then the return type is used instead.

### Events

In 7.2.1 it possible to subscribe to .NET events. See the chapter "Using .NET events in VisualWorks."

## Pollock

The Pollock preview has been updated.

Note that a few simple examples are available in the open and the vw-dev repositories. Load the Pollock-Examples bundle.

Also, initial drafts of two chapters, on building a GUI interface programmatically in Pollock and on interfacing to a domain, are included with this release, in the `preview/Pollock/doc` subdirectory.

Also, Sam posts suggestions in his blog:

<http://www.cincomsmalltalk.com/userblogs/pollock/blogView>

## Glorp

Glorp is a third-party, open-source project that is provided under terms specified by LGPL. Refer to the file COPYING.TXT for the full license.

This release includes an updated version of Glorp, corresponding to version 0.3.62 in the public Store repository. This has many new features since version 7.2. This is still a preview and is unsupported and missing many important features. Among the most significant additions in this version are:

- optimistic locking
- composite keys
- resolving insert order at the row level, rather than just the table level
- filtered reads (query optimization)
- queries can now return cursors
- additional cache policies, including a timed proxy mechanism that's quite neat.
- support for Oracle array binding on insert and for grouping multiple statements together on a line for databases without array binding.
- pre-allocation of sequence numbers. For databases that don't use identity columns we can get all the sequence values we need in one go rather than one-by-one.
- renamed "criteria" to "whereClause" in queries and "mappingCriteria" to "join" in mappings.
- renamed PrimaryKeyExpression to Join

- allowed any kind of mapping to use a link table. This makes the one-to-many/many-to-many distinction obsolete. Most methods on those classes have been moved to the superclass.
- added subselects, created using `anySatisfy:` or `noneSatisfy:`.
- minimal (absolutely minimal) mutual exclusion on query execution
- database-specific functions
- the ability to use functions in more places
- added `unionAll:` and `minus:/except:` on queries
- support for mapping to "imaginary" tables, where an object can be defined by the existence of one or more joins (e.g. `StoreClassExtension`)
- support for mapping to a group of rows (e.g. `StoreVersionlessPundle`).
- changes to VW proxies to make them both transparent and debuggable, a tricky business
- removed some bug fixes to Oracle that should now be fixed in VW 7.2.1.
- added a new layer of meta-description, the `ClassDescription`. This gives us a formal way of modelling the classes, rather than having that information be implied in the mappings. This means that the code to create most mappings is greatly reduced.
- changed the way mappings are created and initialized to use this information. Note that the old syntax is still supported.
- direct comparisons to objects now supported. e.g. `where: [:each | each = anObject]`, or `where: [:each | each thing isNIL]`. (Note that `isNil` may be optimized away).
- basic mapping of one form of dictionary
- changes to the argument block of ad hoc mappings
- allow `retrieve:` of a to-many relationship
- allow mappings to pseudo-variables. These can be used to simplify queries, but don't actually read anything.
- added glorp-specific exception classes (a couple)
- changes for compatibility with GNU Smalltalk
- some improvements (though not enough yet) to blob and clob types.

- various bug fixes and performance enhancements

Many thanks to the various contributors. Particular thanks in this release to David Pennell for optimistic locking, Michael Lucas-Smith and Anthony Lander for the timed proxies, Andrei Sobchuck, Boris Popov, Radoslav Hodnicak and Andre Tibben for bug finding, fixing, and feature suggestions. Victor Metelista and Anthony Boris for work on DB2 and VisualAge that isn't integrated here yet. Paolo Bonzini for porting to GNU Smalltalk, and many others for their contributions.

## Faster Store Replication

The StoreForGlorpVWUI parcel provides a user interface for replicating packages and bundles between Store repositories. This is based on a Glorp schema for mapping a Store repository. It provides some advantages over the existing StoreReplication goodie, the primary one being that it is much faster in most circumstances, particularly against a remote repository. In addition, it provides some fairly sophisticated filtering of the things to be replicated and runs in the background rather than tying up the primary Store connection.

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**Caution:** This is unsupported, prerelease software. It has so far been tested only against Oracle and Postgres repositories and is known not to work on SQL Server due to case sensitivity issues. An error in this code could seriously damage a Store repository. Be extremely careful, and make sure that your repositories are well backed-up.

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## XML Schema Support

The release note (7.0) that XSchema was promoted to product at that time was premature, and it remains in preview. To use XML schema support, load the XSchema parcel, **preview/parcels/XSchema.pcl**.

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## Known Limitations

### Unicode preview

Unicode support for Windows remains in preview. Note that this support requires Windows 2000 or later, and works best on Windows XP. This limitation was not noted previously.

