



GemStone Update

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GEMTALK
SYSTEMS

Part 1

GemTalk the Company

Our History

- 1982 – 2026 = 44 Years of Continuous Operation !
 - Founded as Servio Logic Corporation
 - First Version of GemStone Shipped: 1986
 - Name Changed from Servio to GemStone: 1995
 - Acquired by Brokat: July 2000
 - Management buyout: June 2001
 - Acquired by VMware: May 2010
 - Acquired by GemTalk Systems: May 2013
 - Acquired by Emergence Software: April 2026

GemTalk's New Owner

- Emergence Software (www.emsoft.com)
- Private Equity
 - ...but not your typical private equity.
 - Emergence buys companies to own forever, not to “flip”
 - Believes in the power of Smalltalk!



GemTalk's New CEO

- Kit Merker
 - Microsoft
 - Google (Kubernetes)
 - Jfrog



GemStone Powered Business

Financial and Trading Vertical

JPMorganChase 

Kapital is the world leading derivatives trading and management system – since 1993



ICE is the world's fastest growing electronic trading exchange – since 1994

momentum

MMI Holdings – Financial portfolio management system. – since 1995



Lifeware – Cloud-based insurance management solutions – since 2000

Guava®

Guava – Financial & treasury Software – since 1998

GemStone Powered Business

Manufacturing Vertical



Works application for semiconductor manufacturing
– since 1991



Semiconductor manufacturing software – since 1998



HVAC software – since 2012



Adhesives Manufacturing – since 1997

GemStone Powered Business

Telecommunications Vertical



CONDIS – Inventory and cable management – since 1993



Telecom Service Provisioning for Argentina – since 2004



Telecom Workflow Management – since 2013

GemStone Powered Business

Government Vertical



Canada Border Services Agency
Agence des services frontaliers du Canada

Border Security – since 1996



Norwegian Directorate
of Immigration

Visa Processing – since 2004



Dutch Agricultural Institute – agriculture data collection
– since 1998

GemTalk VARs & Partners



CCK. Financial Solutions.



GemTalk In the Community...

- **Conferences and Groups**

- Pharo Consortium (Industrial Member)



- ESUG (Platinum Sponsor)



- FAST (Platinum Sponsor)



GemTalk Team Changes

■ Hired

- Dr. Andres Valloud (Core Server / VM)
- Annette Brown (Tech Support)
- Bryan Hall (DevOps)
- Steven Baker (Rowan)
- Jonathan Mason (Grail Project)
- Dr. John Foster (Intern)
- Sean Eckard (Sales)
- Kevin Kutchner (Marketing)
- Anna Stafaniv (Intern)
- 10 Pines (Grail Project)

■ Retired

- Dale Henrichs
- Daljit Singh

The GemTalk Team





Part 2

GemStone Software: A Lightning Tutorial

**How Many Have A Good
Feel For What
GemStone Is?**

**How Many Have Actually
Used GemStone ?**

So What Is This GemStone Thing?

- A solution to the limitations of traditional Smalltalk:
 1. Object space limited to one VM.
 2. Object space limited to one host.
 3. Object space limited to available RAM.
 4. Object changes (since last image save) lost when VM exits.

Welcome To The World Of GemStone!

- Object space visible to thousands of VMs on thousands of machines.
- Object space limited by disk, not RAM.
- Object changes managed by ACID transactions
 - Atomic
 - Consistent
 - Isolated
 - Durable
- Object changes guaranteed persistent once committed.

Key Features Of GemStone

- Scalability
 - Billions of objects
 - Thousands of users.
 - Thousands of machines.
 - Thousands of transactions per second.
 - Terabytes of data.

Key Features Of GemStone

- Concurrency
 - Multiple user sessions.
 - Built-in database transactions.
 - Commit
 - Abort
 - Continue
 - Optimistic Concurrency
 - Reduced Conflict Collections
 - Pessimistic Concurrency
 - Object-level read/write locks.
 - Namespaces
 - Shared and private.

Key Features Of GemStone

- Security
 - Object-level security.
 - User, group, world permissions.
 - Login Security
 - User-id / Password
 - Single-Sign-On (GSSAPI / Kerberos)
 - LDAP
 - PAM
 - X509 Certificate
 - Administrative Privileges
 - #GarbageCollection
 - #OtherPassword
 - #SystemControl

Key Features Of GemStone

- 100% Smalltalk (*“It’s turtles, all the way down”*)
 - All objects, all the time.
 - Classes, methods, blocks, exceptions.
 - ANSI Smalltalk compliant

Key Features Of GemStone

- Very Large Collection Support
 - Collections of millions of objects.
 - Optimized searches using b-tree Indexes:
 - Equality Indexes ($a = b$)
 - *AllEmployees detect:{:each| each.lastName = 'Ducasse' }*
 - Identity Indexes ($a == b$)
 - *AllEmployees select:{:each| each.countryOfOrigin == #France }*

Key Features Of GemStone

- Interfaces to Other Smalltalks
 - VisualWorks® - GemBuilder for VisualWorks®
 - VA Smalltalk® - GemBuilder for VA Smalltalk®
 - Pharo – tODE, GsDevKit, Sparkle, gt4Gemstone
 - Jade / Jadeite (Dolphin, open source)
- Interfaces To Other Languages
 - C/C++ - GemBuilder for C
 - Java – GemBuilder for Java
- Interfaces to Relational Databases
 - Oracle – GemConnect for Oracle
 - Postgres – GemConnect for Postgres (open source)
 - Sybase – GemConnect for Sybase (open source)

GemStone/S 64 Platforms

- Object Server (Database)
 - Linux:
 - x86_64 (Intel / AMD)
 - aarch64 (ARM)
 - Apple MacOS:
 - M1, M2,... (Apple Silicone)
 - Oracle Solaris: x86_64
 - IBM: AIX PowerPC 64 bit
- Object Clients
 - All of the above, and:
 - Microsoft Windows 10,11

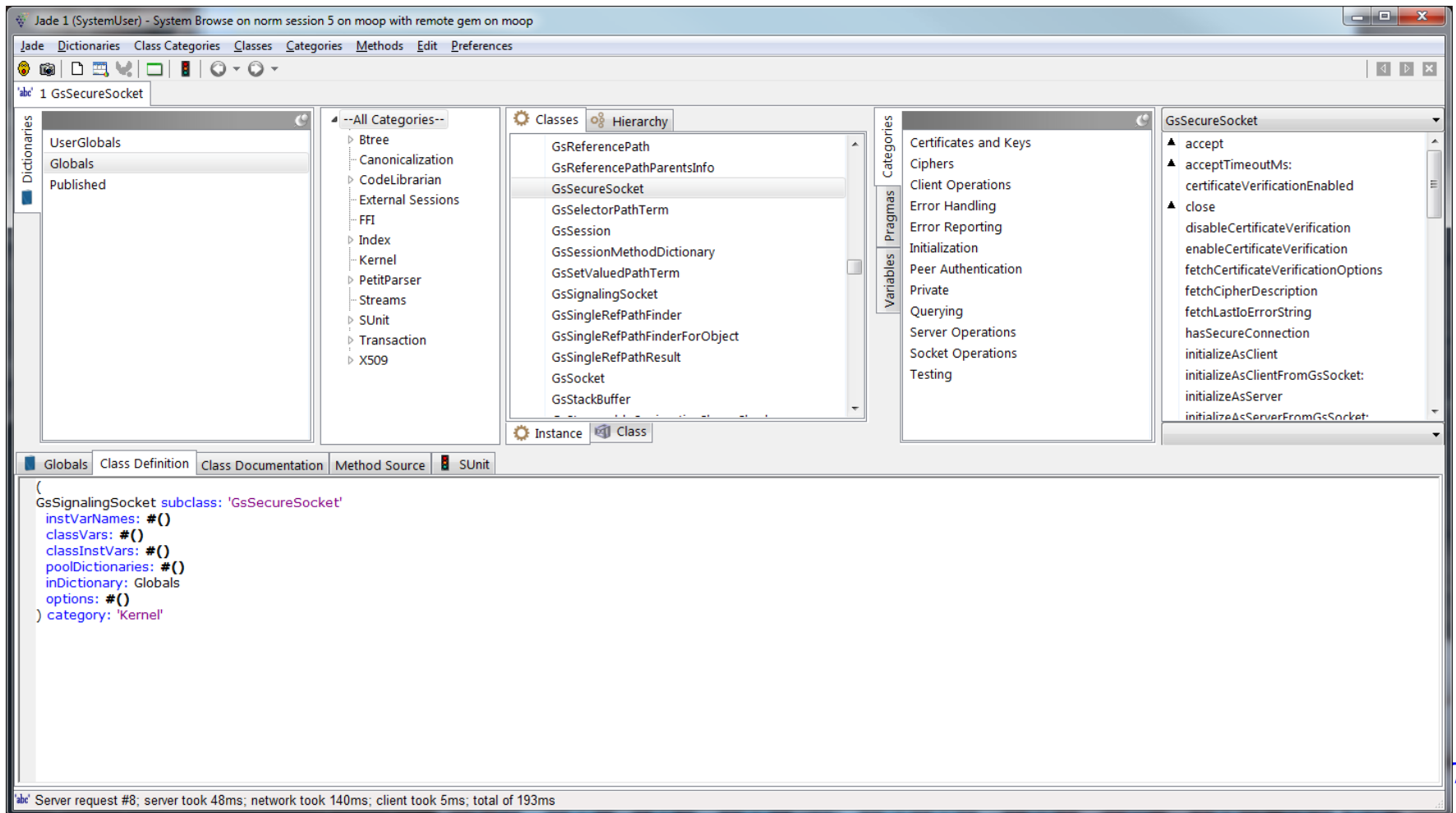
GemBuilder for Smalltalk (GBS) Platforms

- Cincom® VisualWorks® 8.4.3, 9.3.1, 9.4.1
 - MS Windows 10/11
 - Linux 32/64 bit
- Instantiations VA Smalltalk™ 11.0.1, 10.0.2, 8.6.3
 - MS Windows 10/11

Jade IDE

- Open source IDE for all versions of GemStone
- Written in Dolphin Smalltalk by James Foster
- MS Windows only
- Supports all versions of GemStone
- Free of charge
- Rich set of tools
 - Browsers
 - Inspectors
 - Debuggers
- <https://github.com/jgfoster/Jade>

Jade System Browser



The screenshot displays the Jade System Browser interface, titled "Jade 1 (SystemUser) - System Browse on norm session 5 on moop with remote gem on moop". The interface includes a menu bar (Jade, Dictionaries, Class Categories, Classes, Categories, Methods, Edit, Preferences) and a toolbar. The main area is divided into several panes:

- Dictionaries:** A list of dictionaries including UserGlobals, Globals, and Published.
- Categories:** A tree view showing various system categories like Btree, Canonicalization, CodeLibrarian, External Sessions, FFI, Index, Kernel, PetitParser, Streams, SUnit, Transaction, and X509.
- Classes:** A list of classes including GsReferencePath, GsReferencePathParentsInfo, GsSecureSocket (selected), GsSelectorPathTerm, GsSession, GsSessionMethodDictionary, GsSetValuedPathTerm, GsSignalingSocket, GsSingleRefPathFinder, GsSingleRefPathFinderForObject, GsSingleRefPathResult, GsSocket, and GsStackBuffer.
- Categories (Right):** A list of categories for GsSecureSocket, including Certificates and Keys, Ciphers, Client Operations, Error Handling, Error Reporting, Initialization, Peer Authentication, Private, Querying, Server Operations, Socket Operations, and Testing.
- GsSecureSocket:** A detailed view of the GsSecureSocket class, showing its methods and attributes.

The bottom pane displays the class definition for GsSecureSocket:

```
(
  GsSignalingSocket subclass: 'GsSecureSocket'
  instVarNames: #()
  classVars: #()
  classInstVars: #()
  poolDictionaries: #()
  inDictionary: Globals
  options: #()
) category: 'Kernel'
```

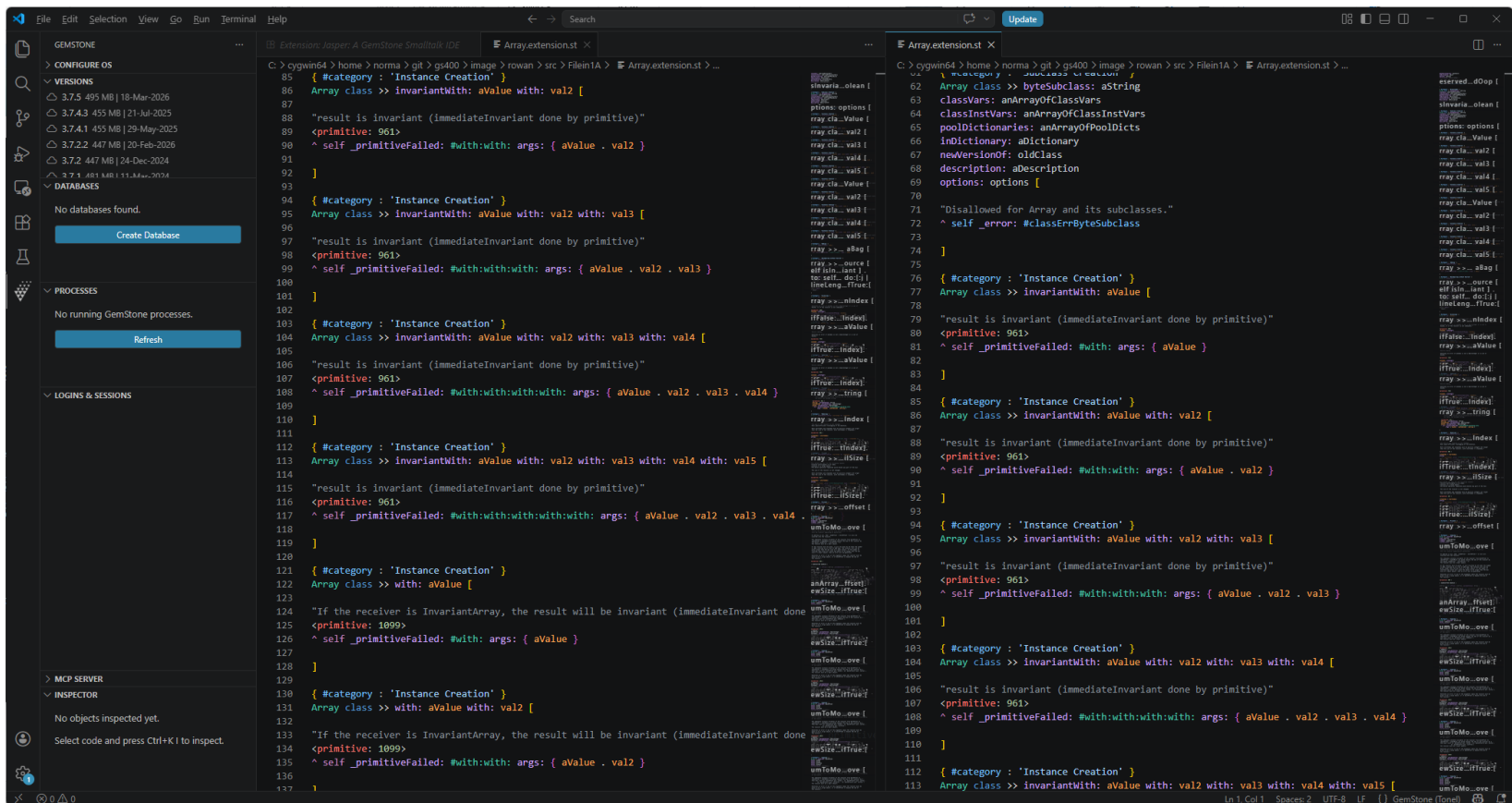
The status bar at the bottom indicates: "Server request #8; server took 48ms; network took 140ms; client took 5ms; total of 193ms".

Jadeite IDE

- Fork of the Jade project
- Currently in development at GemTalk for a customer in Europe
- Support for source code control with Rowan and Git
- Support for Tonal file format
- Migration tools from other SCM systems

Jasper IDE

- Plug in to VisualStudio Code
- Successor to Jade



```

85 { #category : 'Instance Creation' }
86 Array class >> invariantWith: aValue with: val2 [
87
88 "result is invariant (immediateInvariant done by primitive)"
89 <primitive: 961>
90 ^ self _primitiveFailed: #with:with: args: { aValue . val2 }
91
92 ]
93
94 { #category : 'Instance Creation' }
95 Array class >> invariantWith: aValue with: val2 with: val3 [
96
97 "result is invariant (immediateInvariant done by primitive)"
98 <primitive: 961>
99 ^ self _primitiveFailed: #with:with:with: args: { aValue . val2 . val3 }
100
101 ]
102
103 { #category : 'Instance Creation' }
104 Array class >> invariantWith: aValue with: val2 with: val3 with: val4 [
105
106 "result is invariant (immediateInvariant done by primitive)"
107 <primitive: 961>
108 ^ self _primitiveFailed: #with:with:with:with: args: { aValue . val2 . val3 . val4 }
109
110 ]
111
112 { #category : 'Instance Creation' }
113 Array class >> invariantWith: aValue with: val2 with: val3 with: val4 with: val5 [
114
115 "result is invariant (immediateInvariant done by primitive)"
116 <primitive: 961>
117 ^ self _primitiveFailed: #with:with:with:with:with: args: { aValue . val2 . val3 . val4 . val5 }
118
119 ]
120
121 { #category : 'Instance Creation' }
122 Array class >> with: aValue [
123
124 "If the receiver is InvariantArray, the result will be invariant (immediateInvariant done by primitive: 1099)"
125 <primitive: 1099>
126 ^ self _primitiveFailed: #with: args: { aValue }
127
128 ]
129
130 { #category : 'Instance Creation' }
131 Array class >> with: aValue with: val2 [
132
133 "If the receiver is InvariantArray, the result will be invariant (immediateInvariant done by primitive: 1099)"
134 <primitive: 1099>
135 ^ self _primitiveFailed: #with:with: args: { aValue . val2 }
136
137 ]
  
```

GemStone/S Licensing Models

- Community Editions
 - Free (as in beer) for any use (including commercial)
- Perpetual
 - Buy once, own it forever
- Annual Subscription
 - Pay annually, cancel any time.
- Value Added Reseller (VAR)
 - Percentage of royalties

GemStone Community Edition

	Starter	Limited	Full	Extended SPC	Extended CPU	Extended Full
License Kind	Perpetual	Subscription	Subscription	Subscription	Subscription	Subscription
Cores	2	2	2	2	4	4
SPC	1 G	2 G	2G	4G	2G	4G
Gems	10	20	Unlimited	Unlimited	Unlimited	Unlimited
Disk	10G	50G	Unlimited	Unlimited	Unlimited	Unlimited
Development DB	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited
Production DB	1	2	Unlimited	Unlimited	Unlimited	Unlimited
Tech Support	Community	Community	5 tickets	10 tickets	10 tickets	20 tickets
Price	Free	Free	\$1500/yr	\$3000/yr	\$3000/yr	\$6000/yr
Distribution	With Product	Email addr	Sales	Sales	Sales	Sales

Support Models

- Web Support (24 x 7)
 - <https://techsupport.gemtalksystems.com>
 - Help requests processed 8 am – 5 pm Pacific Time
- Emergency 24 x 7 Support
 - Available for a premium
 - GemTalk provides an emergency phone number
 - Call back to the customer within 15 minutes
- Mailing Lists
 - GLASS – Open source projects: Seaside / GLASS / tODE
 - GemStone Smalltalk – GemStone-specific
 - Sign up at:
 - <https://lists.gemtalksystems.com/mailman/listinfo/>



GEMTALK
SYSTEMS

Part 3

Roadmap

Recent GS/64 Server Releases

- Version 3.7.x
 - 3.7.5: May 2026
 - 3.7.4.3: July 2025
 - 3.7.4.1: May, 2025
 - 3.7.3: January, 2025
- Coming Soon
 - 3.7.6: Q3-2026

Version 3.7.5

- ParallelDo Framework
 - Map/Reduce for Large Jobs
 - Multiple worker gems
 - Multiple hosts
 - Automatic exception handling
 - Automatic Transaction Conflict Handling

Version 3.7.6

- Many Bug Fixes:
 - Faster Hot Standby Failover
 - VM GC SEGV

Version 4.0.0

- New Indexing System
 - Indexing on large Unordered Collections
 - IdentitySet, IdentityBag, etc
 - Improved Parallel Index Creation
 - 400% Faster

Version 4.0.0

- Post Quantum Cryptography (PQC) Support
 - New quantum-resistant algorithms in OpenSSL 3.5
 - ML-KEM (encrypt/decrypt)
 - ML-DSA (sign/verify)
 - Available for:
 - Secure Extents
 - Secure Tranlogs
 - Secure Backups

Version 4.0.0

- Expanded JSON Web Token (JWT) Support
 - Replaces existing X509 security framework
 - Replaces host user / host password credentials

Version 4.0.0

- Improved Numeric Calculation Performance
 - Target Classes: Fraction & SmallFraction
 - Specifically:
 - Numerators / Denominators which are LargeIntegers

Version 4.0.0

- MCP Server for GemStone
 - MCP = Model Context Protocol
 - Gateway for connecting to AI
 - Summer Intern Project underway

Version 4.0.0

- Project GRAIL Changes
 - Python Access to GemStone/S

Version 4.1 and Beyond...

- OPT Virtual Machine
 - State of the art VM / GC
 - Does not copy/move objects
 - Optimizing ST Compiler
 - Talk to Martin for details
- Threaded FFI

Version 4.1 and Beyond...

- QUIC Network Protocol Support
 - New encrypted network protocol based on UDP.
 - Designed to replace TCP.
 - To be investigated once OpenSSL fully supports QUIC
- Improved Key Rotation with Hot Standbys
 - Support key rotation on both primary and secondary DB in 1 step.

Questions?

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