



## ClearReplica 12.1 is here!

ClearReplica is a custom add-on to IBM Rational's ClearCase product. It was designed as a low cost feature-rich alternative solution to ClearCase Multisite. ClearReplica includes many of the replication features of ClearCase Multisite as well as additional features. With ClearReplica you can not only replicate whole VOBs as with Multisite, but can also replicate "portions" of VOBs (by directory or branch), replicate multiple VOBs in to single VOBs, single VOBs to multiple VOBs and replicate VOBs to other VOBs within the same ClearCase region. These options allow more flexibility to create on-line backup VOBs and staging or distribution VOBs.

Use ClearReplica for geographically distributed development teams or use it for provide a hot backup to recover lost versions in a fraction of the time. Use ClearReplica to automatically distribute code or binaries located in a directory in a VOB without having to use the bandwidth of replicating the whole VOB. Replicate portions of the VOB to teams all over the world or across the hall.

### *Summary of ClearReplica Features:*

**ClearReplica is cost effective.** Multisite is licensed per user of a replicated VOB so the cost increases when user and VOB usage grows, replicating a single VOB with Multisite that has 100 users in "Atlanta" and 30 users in "India" requires 130 licenses of Multisite, to start. ClearReplica is licensed per "location" so two licenses of ClearReplica and ClearTrigger are needed (one of each at each site). Doubling the number of users of Multisite replicated VOBs doubles the cost of "replication", while doubling the number of users of ClearReplica replicated VOBs adds no additional cost. *For replication to "backup" or "read only" sites no ClearReplica or ClearTrigger license is needed at the receiving site so in this instance the cost of replication is even smaller.*

**ClearReplica allows control over what data is replicated.** ClearReplica allows you to replicate the whole VOB, just a portion of the VOB or just a single file, you can even replicate by branch or selected labels. In addition, you can replicate portions of many VOBs in one or more locations and place them together on a single VOB in another location. Replicate just the final product to a client form the development VOB without having to replicate "development" or create a separate VOB just to replicate the product. And you know your data is secure with all packets being encrypted before they are sent.

**ClearReplica has "Deployment" capabilities.** You can use ClearReplica to automatically deploy from ClearCase VOB to regular flat file systems on both local and remote machines across the globe. The destination machines do not need ClearCase or even a static IP. Updates are automatically deployed to machines they are network connected regardless of their IP address.

**ClearReplica has relaxed mastership.** Users of ClearReplica VOBs can actually work on the "same" branch in different replicas and see each other changes immediately. Now any of the "replica" sites can make an element because there is no "mastership" to get in the way of either site changing the /main branch to make new elements. Push to a web server across the country or a "backup server across the wall". A developer can access the "hot backup" VOB to restore a version they just accidentally deleted in the "production" VOB.

**ClearReplica has intelligent packet delivery and auto recovery mechanisms.** Before ClearReplica "ships" a packet to a location it gets confirmation from that location of the last successful packet processed. ClearReplica automatically adjust and send all requested data "since" the last confirmed successful delivery. Dropped or lost packets are automatically recovered. Perform off-line maintenance on your VOB without worrying about missing packets other locations sent you, all changes will be sent automatically, the first time the locations can communicate. All ClearReplica packets are encrypted and compressed.

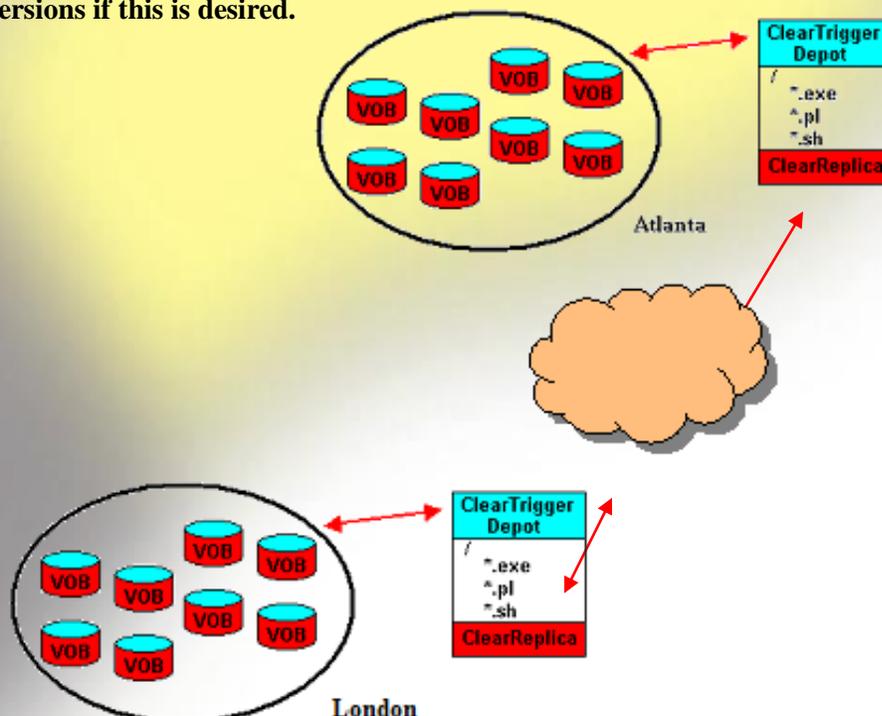
## What is ClearReplica “replication”?

ClearReplica “replication ” is different than Multisite replication so it is important to know the differences. Multisite replicates all data in the VOB (minus triggers) while ClearReplica “replication” concentrates on the element “versions” and the metadata attached or required to replicate it. Rather than overview each product it is easier to explain examples.

**Metadata types:** In ClearReplica, when metadata types (i.e. branch, labels, attributes) are created at one site, the metadata is also created at other sites. The metadata type can be manipulated (locked, unlocked, redefined or renamed) at either site if desired.

**Mastership of branches:** In ClearCase Multisite branch types are “mastered” by a replica, such that other replicas cannot make changes on that branch. Though in general it is a good practice not to use the same branch between sites, it does lead to situation where only one site can make new elements. In ClearReplica this restriction is relaxed. Though it is still recommended that geographically disjoint development teams still do not share a branch it is still possible when needed and any “replica” can now make an element.

**Creating and removing elements, branches or versions:** In ClearCase Multisite only the “mastering” replica can create or remove elements. With ClearReplica any “replica” can make a new element because there is no mastership to get in the way. With ClearReplica any “replica” can also remove an element as well, initially from their “replica” but also from remote replicas if allowed by that replica site. In ClearReplica “destructive” actions are not by default replicated, this allows ClearReplica “hot backup VOBs” to retain their usefulness (after all the reason to have a “hot backup replica” is to recover the data that you just lost in the “production replica”). However, each receiver can be separately configured to accept or ignore remote request to remove elements, branches or versions if this is desired.



## ClearReplica Overview

**ClearReplica** is a custom add-on to IBM Rational Software ClearCase product. It serves to provide a means of providing geographically disjoint development as a less expensive alternative to ClearCase Multisite. ClearReplica provides many of the replication features of ClearCase Multisite as well as additional features. With ClearReplica you can replicate whole VOBs, replicate “portions” of VOBs, replicate a “single file” in a VOB or even replicate based on branch filters; you can also replicate multiple VOBs in to single VOBs, single VOBs to multiple VOBs and replicate VOBs to other VOBs within the same ClearCase region. These options allow more flexibility to create on-line backup VOBs and staging or distribution VOBs.

ClearReplica is licensed differently than ClearCase Multisite in that ClearReplica License cost is not a factor of how many VOB are replicated or how many users use those VOBs. ClearReplica is licensed per location, therefore is cost the same to replicate one VOB with one user from Atlanta to India as it does to replicate 100 VOBs with 300 users in Atlanta to India. **Sites can in many instances replace hundreds of Multisite licenses with one or two ClearReplica Licenses.** You simply need one license at each site if development is performed at both sites, or a single license at one site if the off site is just for backups or disaster recovery. This relaxed licensing result in huge upfront cost savings over traditional Multisite.

ClearReplica requires that ClearTrigger 12.10 or higher is installed at the sending and receiving site; again an unlicensed version of ClearTrigger will suffice at the receiving site if no development is performed on the receiving VOB there.

Some restrictions that exist in ClearCase Multisite are relaxed in ClearReplica. For instance, developers can work on the “same” branch at both locations for there is no Multisite mastership restriction. Geographically disjoint development teams can still work on separate branches and this is still the recommended method.

Use ClearReplica for geographically distributed development teams or use it for provide a hot backup to recover lost versions in a fraction of the time. Use ClearReplica to automatically distribute code or binaries located in a directory in a VOB without having to use the bandwidth of replicating the whole VOB. Replicate portions of the VOB to teams all over the world or across the hall. Simply install and configure ClearReplica on top of a ClearTrigger installation and get started!

## ClearReplica Advantages over ClearCase Multisite

**ClearReplica** was designed as a low cost, but still feature-rich alternative solution to ClearCase Multisite so there are specific concerns of current and perspective Multisite users that were addressed. Some of them are outlined here:

### **Cost and licensing – cost of entry**

*ClearReplica is much more cost effective.* Multisite is licensed per user of a replicated VOB so the cost increases when user and VOB usage grows, replicating a single VOB with Multisite that has 100 users in “Atlanta” and 30 users in “India” requires 130 licenses of Multisite, to start. ClearReplica is licensed per “location” so two licenses of ClearReplica and ClearTrigger are needed (one of each at each site). Doubling the number of users of Multisite replicated VOBs doubles the cost of “replication”, while doubling the number of users of ClearReplica replicated VOBs adds no additional cost.

### **Replication Flexibility**

*ClearReplica allows more control over what is data is replicated.* Multisite allows an organization to replicate a whole VOB from one ClearCase region to another region. ***ClearReplica allows you to replicate the whole VOB, a portion of the VOB, just a single file, or even replicate select branches if desired.*** No more chewing up corporate bandwidth replicating the entire development VOB when you actually desire to give the offsite location access to just a few directories. With ClearReplica you can actually “replicate” portions of *many* VOBs in one or more locations and place them together on a *single* VOB in another location. Replicate more often knowing you are only replicating the portion of the VOB you request get replicated. Now you can replicate to a partner/vendor the pieces from 20 VOBs and present the data to them as a single VOB. Replicate just the final product to a client from the development VOB without having to replicate “development” or create a separate VOB just to replicate the product.

### **“Deployment” Capabilities**

*Use ClearReplica “deploy” from ClearCase VOBs to regular flat file systems on local machines or remote machines around the world.* ClearReplica “deployment” only requires the license at the “shipper” site. Now updates to a ClearCase VOB can be pushed as regular directories on countless machines making deployment of documents, web pages, patches, registry updates or even ClearCase triggers a snap. ClearReplica produces logs of what is sent and received so you know what has been deployed.

### **“Replication/Deployment” Triggers**

*Use ClearReplica “Replication Triggers” to automatically run scripts before or after either sending or receiving “Replication” packets.* Now you can use any in-house script to perform custom logging, send email notification, install/execute deployed files, lock VOBs or even redirect packets by just adding a ClearReplica replication trigger. ClearReplica has *pre\_ship, post\_ship, pre\_receive* and *post\_receive* triggers help you manage your distributed environment. No more checking log files for certain events, have them email you when events happen or have ClearReplica automatically perform the post deployment scripts. The machines deployed to do not even need to have ClearCase installed.

**“Replication” and “Deployment” capabilities to disconnected machines or those without a static IP address**  
*ClearReplica facilitates the transfer of ClearReplica data between two ClearReplica servers that do not have direct access to each other, but share access to one or more machines between them that can be used as a ClearReplica 'proxy' machines. The machines used in the transfer that are not actually the source or destination ClearReplica Server constitute the 'proxy chain' of machines. ClearReplica can also facilitate the transfer of data between machines that do not have a static IP address (i.e. salesman laptops) so that*

either “replication” or “deployment” data can be sent to those machines anytime they are connected to the web.

**Nearly free “disaster recovery”, “backup sites” or “distribution hubs”**

*ClearReplica “replication” to read-only VOB sites only requires a license at the “shipper” site.* ClearReplica requires the ClearTrigger and ClearReplica software at both the “shipper” and the “receiver”, but if you are just replicating to the offsite location and no development is performed there, ClearReplica Licensing is relaxed at the “receiver” site. Push to a web server across the country or a “backup server across the hall”. ***Backup hundreds of VOBs to several locations or across the hall with only ONE ClearReplica license.*** Developers can access the “backup” VOB to see a version accidentally deleted in the “production” VOB and get the version without burdening the corporate IT department.

**Confirmation of packet delivery (automatic packet recovery)**

Before ClearReplica “ships” a packet to a location it gets **confirmation** from that location of the last successful packet processed. ClearReplica automatically adjust and send all requested data “since” the last confirmed successful delivery. ***Dropped or lost packets are automatically recovered.*** Packets do not hang in the shipping bay waiting for you to reset epoch counters. Perform off-line maintenance on your VOB without worrying about missing packets other locations sent you, all changes will be sent automatically, the first time the location can communicate.

**Relaxed Mastership**

*ClearReplica has relaxed mastership.* Users of ClearReplica VOBs can actually work on the “same” branch in different replicas and actually see each other changes immediately. Now any of the “replica” sites can make an element because there is no mastership to get in the way of either site changing the /main branch to make the new element.

**Automatic data encryption**

All data packets sent via ClearReplica are encrypted and compressed.

**Additional Peer-to-Peer Encryption**

All data is by default encrypted using an internal ClearReplica Data Encryption key so that only ClearReplica can decrypt ClearReplica data packets (perfect for closed or otherwise private networks). Additional encryption can be enabled that requires the sender and receiver to agree on a generated encryption key known only to the Sender and Receiver, thus allowing for the secure transportation of packets across open, public or 3rd party networks or even thought the use of 3rd party courier services. Even those with ClearReplica cannot decrypt the packet without the Peer-to-Peer encryption key.

**Works with multiple Transport Mechanisms**

No need to open additional ports in your firewall. ClearReplica can work with any transport protocol.

**Works with ClearCase Lite**

You can replicate VOBs created on a ClearCase Lite server if you need replication, but are not ready to upgrade to ClearCase from ClearCase Lite.

**Heterogeneous Replication between sites**

You can replicate between ClearCase sites that use different versions of ClearCase or have ClearCase at different feature levels.

**Relaxed Replica Management**

You can stop “sending” or “receiving” VOB packets at any time without having to “remove replica” a site can “opt-out” of replication at any time without having to coordinate with other replicas or worry about braking other replicas because you had mastership of shared data. You can “opt-in” at any later time and quickly get back in sync or just choose to continue from the current point.

**Parallel and distributed shippers and receivers**

You can run multiple ClearReplica Shippers or Receivers in parallel, even across distributed machines from heterogeneous architectures.

**Receiver-side control of replicated rmtime -brtype**

ClearReplica receiver directories can be configured accept or ignore cleartool rmtime -brtype request from remote sites.

**Receiver-side control of replicated rmtime -lbtype**

ClearReplica receiver directories can be configured accept or ignore cleartool rmtime -lbtype request from remote sites.

**Receiver-side control of replicated rmtime -attype**

ClearReplica receiver directories can be configured accept or ignore cleartool rmtime -attype request from remote sites.

**Receiver-side control of replicated rmelem**

ClearReplica receiver directories can be configured accept or ignore cleartool rmelem request from remote sites. The receiver directories can be configured to: ignore all remote rmelem requests, accept only remote rmelem –file request, accept only rmelem –directory request or accept all remote rmelem request.

**Receiver-side control of replicated rmbranch and rmver**

ClearReplica receiver directories can be configured accept or ignore cleartool rmbranch or rmver request from remote sites.

**Receiver-side control of replicated lock/unlock:lbtype, brtype and attypes**

ClearReplica receiver directories can be configured accept or ignore cleartool lock/unlock label type, branch type or attribute type request from remote sites.

**Receiver-side control of replicated lock/unlock request for elements and branch instances**

ClearReplica receiver directories can be configured accept or ignore cleartool lock/unlock request for elements or branch instances from remote sites.

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## Facts

**ClearReplica** was developed to minimize the cost of ClearCase VOB “replication” and tackle some of the limitation of ClearCase Multisite. ClearReplica attacks the cost of “replication” on two fronts: Upfront cost avoidance and maintenance/hidden cost avoidance. ClearReplica is licenses per “location” not per VOB or users, so adding to the replicated VOB total or adding users to those VOB does not increase the cost of replication. With less licenses to buy, there is less upfront cost and less annual license costs. Because of ClearReplica’s ability to replicate a “portion” of a VOB there is also less corporate bandwidth used and therefore less bandwidth leasing cost (not to mention the productivity gains of a lightly loaded and therefore “faster” network). Furthermore, when “replicating” to “backup only” or “distribution only” location, no license is needed at the “receiving” site. Purchase ClearReplica for the “development” site and “replicate” to any number “backup” or “distribution” site with no additional cost. Add in the ability to “replicate” VOB portions, “replicate” within the same region (or even VOB) and the ability to work on the same branch and ClearReplica is a clear win.



System Requirements	
Supported Operating Systems	ClearCase Supported Operating Systems
Required Software	ClearCase 3.2.1 or higher. ClearTrigger 12.10 or higher

License Requirements	
Minimum License Requirements	Most companies will need only 1-2 licenses for each “development” site. One for UNIX (if ClearCase is accessed from UNIX) and one for Windows (if ClearCase is accessed from Windows). No license is required for “backup-only” locations or “deployed to” locations.
License Fee	Refer to <a href="#">A Better Solution, Inc. – ClearReplica Pricing</a>

Feature Matrix	Supported in ClearReplica	Supported in native ClearCase Multisite
Fixed Cost per “development” location (limitless VOB/users)	X	
No cost per “backup only” or “read only” location	X	
Ability to replicate a whole VOB	X	X
Ability to replicate a portion of a VOB or single file	X	
Ability to replicate based on label and label pattern filters for a VOB	X	
Ability to replicate based on branch and branch pattern filters for a VOB	X	
Ability to replicate to sites using different versions of ClearCase or different ClearCase feature levels.	X	
Ability to replicate to a different ClearCase region	X	X
Ability to replicate to the same ClearCase region	X	
Ability to replicate within the same VOB	X	
Ability to automatically deploy to non ClearCase file-system	X	
Replicate ClearCase Lite VOBs	X	
Automatic packet recovery	X	
Automatic packet encryption/compression	X	
Ability to work on the same branch in different locations	X	
Meta-data is only replicated when used not when defined	X	
Ability to add elements from all locations	X	(limited)
On-demand opt-in or opt-out replication/deployment	X	
Ability to replicate/deploy to client with a dynamic IP address	X	
Replication/Deployment automation triggers	X	
Allows for multiple shippers and receivers to run in parallel – even across distributed machines from heterogeneous architectures.	X	
Ability to control whether rmtime –lbrtype, -brtype, -attype is replicated or not	X	
Ability to control whether or not rmemem, rmbranch or rmver is replicated or not	X	
Ability to control whether or not the locking/unlocking of label, branch or attribute types or the locking or unlock of elements or branches is replicated or not	X	
Ability to control whether or not cleartool symbolic links are replicated or not	X	
Ability to control whether or not cleartool label, branch or attribute information is received or not	X	

To read more about ClearReplica, visit [http://www.abs-consulting.com/products\\_clearreplica.shtml](http://www.abs-consulting.com/products_clearreplica.shtml)