IBM Education Assistant

IBM® Rational® ClearCase® MultiSite® V7

Exercise 1: Replicating and syncing a VOB

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Exercise 1: Replicating and syncing a VOB

Creating a new replica from the command line interface

The only option to replicate and sync VOBs in IBM Rational ClearCase is to create a replica through the command line interface. There is no GUI option to create replicas of VOBs.

1. Determine which VOB you need to replicate, and then change the directory into a view\VOB context.
2. Once in the view\VOB, you can run the **mkreplica -export** command. The mkreplica command has many switches. Some are required, and some are optional.
    a. When you create a new replica, it is important to note the versions of ClearCase at each site. A new replica *must* be created at an exporting site running the same or lower version of ClearCase as the receiving site. For example, site A is running ClearCase 2003.06.16, Site B is running 7.0.1.1. Replicas can only be created from Site A and shipped to Site B. The import will fail if the export was shipped in reverse from Site B to Site A.
    b. The **–workdir** switch is used to specify a temporary workspace which is deleted when the mkreplica finishes. This directory must not exist already or mkreplica will fail. The location specified must have enough free space that is at least the size of the VOB database directory plus the source pools.
    c. The **–maxsize** switch can be very useful to break the creation packets into smaller pieces. This switch is optional, and does not need to be specified. If you specify a maxsize, it is expressed as a number followed by a single letter. For example, 50m is 50 megabytes.
    d. You must then specify **–ship** or **–fship**. The –ship switch will store the replica creation packets in the store-and-forward bays of the host. The shipping server will process the packets at a later time. The –fship option forces the packets to be shipped immediately to a remote site.
    e. The **–sclass** switch is optional. This is to specify a custom storage class name that was created to ship packets. If the switch is not used, then the default class is used.
    f. **–out** can be entered and a packet name specified. This can be used to create packets with custom names. When this switch is used, the packets are not delivered automatically. A shipping order will need to be created for processing of the packets at a later time.
    g. **–pexpire** can be used to specify the time when the store-and-forward facility will stop trying to deliver a packet and generates a failure message.
    h. At the end of the command, the remote host name and new replica name must be specified in the format of hostname:replica.

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3. Run the **mkreplica –export** command from the exporting site. In this example (figure 1), the exporting site is San Diego:

Figure 1

```
M:\testview\IEA_Replica_Exercise>mt mkreplica -export -workdir C:\temp\MS_work -maxsize 10m -fship
Boston_server:Boston
Enabling replication in VOB.
Comments for "Boston":
.
Generating replica creation packet C:\Program
Files\Rational\ClearCase\var\shipping\ms_ship\outgoing\repl_original_11-Jun-08.19.09.47_4340_1
  - shipping order file is C:\Program
Files\Rational\ClearCase\var\shipping\ms_ship\outgoing\sh_o_repl_original_11-Jun-08.19.09.47_4340_1
Dumping database...
0 hyperlinks dumped.
1 oplog entries dumped.
45 events dumped.
1 locks dumped.
Dumper done.
Starting to copy dumped db files to replica creation packet.
Size: 1 (megabytes, rounded up),  File: C:\temp\MS_work\pass1_dump_file.
Size: 1 (megabytes, rounded up),  File: C:\temp\MS_work\pass2_dump_file.
Size: 1 (megabytes, rounded up),  File: C:\temp\MS_work\string_dump_file.
Finished copying db files.
Starting to copy pool files.
Finished copying pool files.
Attempting to forward/deliver generated packets...
  -- Forwarded/delivered packet C:\Program
Files\Rational\ClearCase\var\shipping\ms_ship\outgoing\repl_original_11-Jun-08.19.09.47_4340_1
```

The command shown above has created a new replica of the IEA_Replica_Excercise VOB named Boston and shipped it immediately to the Boston_server at the Boston site. A work directory of C:\temp\MS_work was used. Also, a max packet size of 10 megabytes was used to keep the size of the packets small.

NOTE: If the replica creation packets are lost in transit to their destination, new replica creation packets must be generated. This means that at the sending site, the old replica must be removed using the rmreplica command, as new packets cannot be regenerated.

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4. At the importing site, run the **mkreplica –import** command (figure 2). The mkreplica –import command has some switches that are required to be specified:

    b. The **–tag** switch must be used to create a tag for the new replica.

    c. The **–vob** switch is required, and specifies the location of the new VOB .vbs directory.

    d. Permissions and identity preserving switches can be specified at this time if the environment allows for it. If identity and permissions are not to be preserved, the **–npreserve** switch must be used.

    e. To complete the command, the full path to the replica creation packet must be specified. The packet is located in the incoming shipping bay on the host.

Figure 2

```
M:\>mt mkreplica -import -workdir C:\temp -tag \IEA_Replica_Exercise_Boston -vob
\\Boston_server\ccstg_c\VOBs\IEA_Replica_Exercise_Boston.vbs -preserve "C:\Program
Files\Rational\ClearCase\var\shipping\m
s_ship\incoming\repl_original_11-Jun-08.19.09.47_4340_1"
The packet can only be used to create replica "Boston"
  - VOB family is ab518f50.00dd4e5f.a872.f0:09:f2:3f:9b:28
  - replica OID is 62390bbe.8f1f44c8.9a7b.81:77:8b:b2:61:4a
Should I create this replica? [no] y
Comments for "Boston":
.
Processing packet C:\Program
Files\Rational\ClearCase\var\shipping\ms_ship\incoming\repl_original_11
-Jun-08.19.09.47_4340_1...
Loading database...
Dumped schema version is 54
45 events loaded.
72 pass 2 actions performed.
Loader done.
Registering VOB mount tag "\IEA_Replica_Exercise_Boston"...
mt: Warning: The family feature level for this VOB is currently 4. In order to take advantage of
VOB
 feature level enhancements, you must raise the family feature level of this VOB. See the
ClearCase
MultiSite documentation for instructions.
VOB replica successfully created.
Host-local path: Boston_server:C:\ccstg_c\VOBs\IEA_Replica_Exercise_Boston.vbs
Global path:     \\Boston_server\ccstg_c\VOBs\IEA_Replica_Exercise_Boston.vbs
VOB ownership:
  owner ASYLUM\mrbourge
  group ASYLUM\user
```

NOTE: The **syncreplica** command shown above was run with the **–preserve** switch that preserves identities and permissions. To preserve permissions only, use the **–perms_preserve** switch.

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5. To simulate synchronization, new oplogs must be generated. At the San Diego site, generate a new oplog by adding a new element to source control in ClearCase Explorer.

6. Run the lsepoch command to see the new oplogs that were generated (figure 3).

Figure 3

```
M:\testview\IEA_Replica_Exercise>mt lsepoch
For VOB replica "\IEA_Replica_Exercise":
Oplog IDs for row "Boston" (@ Boston_server):
 oid:62390bbe.8f1f44c8.9a7b.81:77:8b:b2:61:4a=0          (Boston)
 oid:c9556453.6f554de9.869e.70:32:a8:7b:f3:58=0          (original)
Oplog IDs for row "original" (@ San_Diego_server):
 oid:62390bbe.8f1f44c8.9a7b.81:77:8b:b2:61:4a=0          (Boston)
 oid:c9556453.6f554de9.869e.70:32:a8:7b:f3:58=11          (original)
```

NOTE: The original replica is named original until you rename it. To rename the replica, use the cleartool rename command:

```
M:\testview\IEA_Replica_Exercise>ct rename replica:original San_Diego
Renamed replica from "original" to "San_Diego".

M:\testview\IEA_Replica_Exercise>mt lsepoch
For VOB replica "\IEA_Replica_Exercise":
Oplog IDs for row "Boston" (@ Boston_server):
 oid:62390bbe.8f1f44c8.9a7b.81:77:8b:b2:61:4a=0          (Boston)
 oid:c9556453.6f554de9.869e.70:32:a8:7b:f3:58=0          (San_Diego)
Oplog IDs for row "San_Diego" (@ San_Diego_server):
 oid:62390bbe.8f1f44c8.9a7b.81:77:8b:b2:61:4a=0          (Boston)
 oid:c9556453.6f554de9.869e.70:32:a8:7b:f3:58=12          (San_Diego)
```

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7. Sync the San_Diego and Boston replicas using the multitool syncreplica command (figure 4).

Figure 4

```
M:\testview\IEA_Replica_Exercise>mt syncreplica -export -fship replica:Boston
Generating synchronization packet C:\Program
Files\Rational\ClearCase\var\shipping\ms_ship\outgoing\sync_San_Diego_11-Jun-
08.22.03.22_5368
Shipping order "C:\Program
Files\Rational\ClearCase\var\shipping\ms_ship\outgoing\sh_o_sync_San_Diego_11-Jun-
08.22.03.22_5368" generated.
Attempting to forward/deliver generated packets...
  -- Forwarded/delivered packet C:\Program
Files\Rational\ClearCase\var\shipping\ms_ship\outgoing\sync_San_Diego_11-Jun-
08.22.03.22_5368
```

NOTE: The above command was used with the **–fship** switch to ship the packet immediately. The **–ship** switch can also be specified with syncreplica in addition to the **–maxsize**, **–slcass,** and other switches.

8. Import the new packet at the Boston site (figure 5).

Figure 5

```
M:\>mt syncreplica -import -receive
Applied sync. packet C:\Program
Files\Rational\ClearCase\var\shipping\ms_ship\incoming\sync_San_Dieg
o_11-Jun-08.22.03.22_5368 to VOB
\\Boston_server\ccstg_c\VOBs\IEA_Replica_Exercise_Boston.vbs
```

The **syncreplica** command used above will import any sync packets that are found in the default shipping bay. If needed, the path to a specific packet can be specified to import. You can also specify a defined storage class using the –sclass switch.

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9. To ensure that both sites are up to date, run the lsepoch command from each site (figure 6).

Figure 6

```
M:\testview\IEA_Replica_Exercise_Boston>mt lsepoch
For VOB replica "\IEA_Replica_Exercise_Boston":
Oplog IDs for row "Boston" (@ Boston_server):
 oid:62390bbe.8f1f44c8.9a7b.81:77:8b:b2:61:4a=1          (Boston)
 oid:c9556453.6f554de9.869e.70:32:a8:7b:f3:58=12          (San_Diego)
Oplog IDs for row "San_Diego" (@ San_Diego_server):
 oid:62390bbe.8f1f44c8.9a7b.81:77:8b:b2:61:4a=0          (Boston)
 oid:c9556453.6f554de9.869e.70:32:a8:7b:f3:58=12          (San_Diego)
```

```
M:\testview\IEA_Replica_Exercise>mt lsepoch
For VOB replica "\IEA_Replica_Exercise":
Oplog IDs for row "Boston" (@ Boston_server):
 oid:62390bbe.8f1f44c8.9a7b.81:77:8b:b2:61:4a=0          (Boston)
 oid:c9556453.6f554de9.869e.70:32:a8:7b:f3:58=12          (San_Diego)
Oplog IDs for row "San_Diego" (@ San_Diego_server):
 oid:62390bbe.8f1f44c8.9a7b.81:77:8b:b2:61:4a=0          (Boston)
 oid:c9556453.6f554de9.869e.70:32:a8:7b:f3:58=12          (San_Diego)
```

NOTE: In the two outputs above, you can see that the Boston replica has one oplog that San Diego does not have. A sync packet will need to be generated from Boston to San Diego to keep both sites up to date.

You have successfully replicated and synced a VOB through the command line interface for IBM Rational ClearCase. For more information about IBM Rational ClearCase or IBM Rational ClearCase Multisite, visit http://www.ibm.com/software/rational.

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