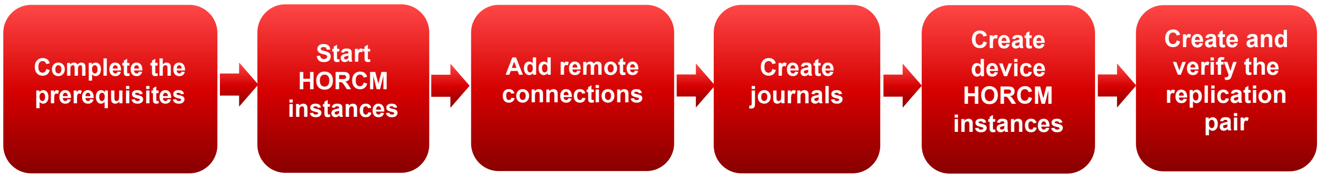
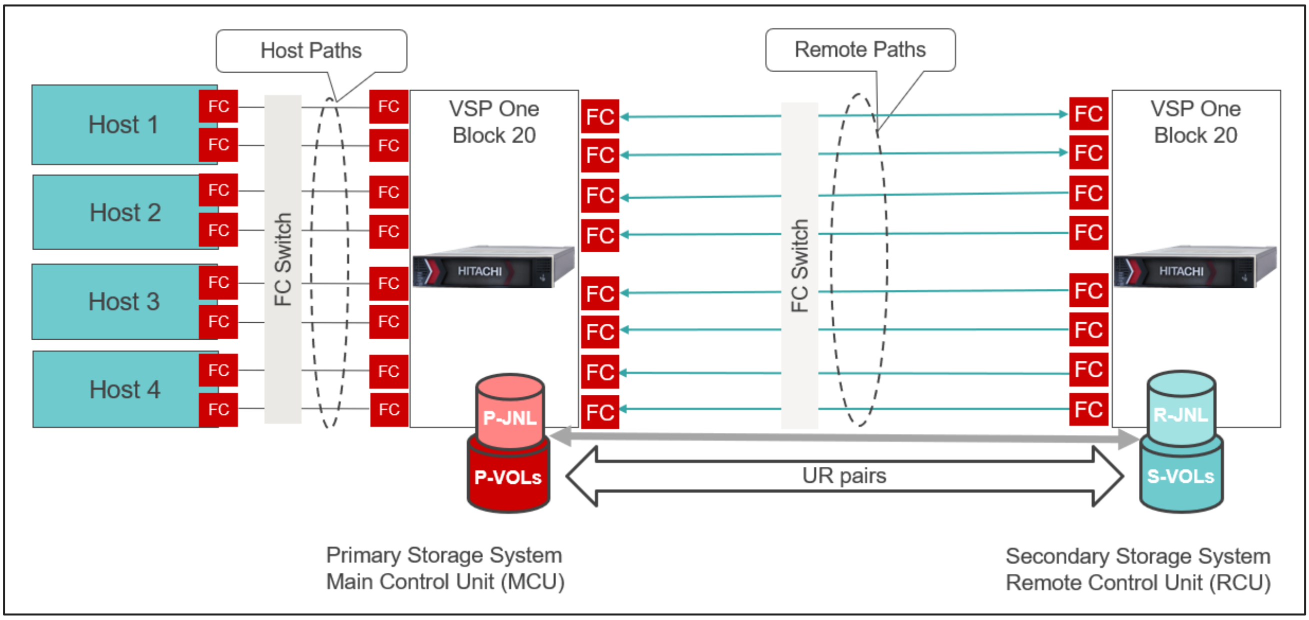
Deploy Universal Replicator using Command Control Interface

Universal Replicator (UR) helps recover processing operations during a disaster. It copies data asynchronously from primary volumes (P-VOLs) at the main data center to secondary volumes (S-VOLs) at a remote site.

Get started with these simple steps on how you can deploy UR using Command Control Interface (CCI):





Step 1: Complete the prerequisites

- Install CCI on a server with connectivity to both storage systems. As a registered user, download CCI from the Support site: Support | Hitachi Vantara.
- Configure two Hitachi Open Remote Copy Manager (HORCM) instances: one for the primary (for example, HORCM0) and one for the secondary (for example, HORCM1). Configuration files (`horcm0.conf` and `horcm1.conf`) should define the storage systems and port.
- Provision the data volumes and volumes for journals on the designated pools in both storage systems.
- Establish Fibre Channel (FC) zoning or IP network connectivity between the Main Control Unit (MCU) and Remote Control Unit (RCU).
- Make sure you have sufficient privileges to run replication commands in CCI.

Step 2: Start HORCM instances

1. Start the HORCM instances for both primary and secondary storage systems on the CCI server:

```
horcmstart <#>
```

Example:

```
horcmstart 0 1
```

2. Log in to the HORCM instances:

```
raidcom -login -IH<#>
```

Example:

```
raidcom -login -IH0
raidcom -login -IH1
```

where 0 and 1 refer to the primary and secondary instances respectively.

Step 3: Add remote connections

1. Create a replication path from the primary storage system to the secondary storage system:

```
raidcom add rcu -cu_free <secondary serial#> <id> <pid> -mcu_port <port#> -rcu_port
<port#> - IH0
```

Example:

```
raidcom add rcu -cu_free  <secondary_serial#> M8  1 -mcu_port CL1-A -rcu_port CL1-C
-IH0
```

2. Create a replication path from the secondary storage system to the primary storage system:

```
raidcom add rcu -cu_free <primary serial#> <id> <pid> -mcu_port <port#> -rcu_port
<port#> - IH1
```

Example:

```
raidcom add rcu -cu_free <primary_serial#> M8 1 -mcu_port CL2-C -rcu_port CL2-A -
IH1
```

where,

<id>: Specifies the storage system type.

<pid>: Specifies the path group ID.

-mcu_port <port#>: Specifies the port number of the MCU, for example, CL5-A

-rcu_port <port#>: Specifies the port number of the RCU.

Step 4: Create journals

Define journals on both storage systems. For example, define a journal with journal ID 0 on volume with volume ID 256:

1. On the primary storage system:

```
raidcom add journal -journal_id 0 -ldev_id 256 -IH0
```

2. On the secondary storage system:

```
raidcom add journal -journal_id 0 -ldev_id 256 -IH1
```

3. (Optional) Modify the journal copy size. Specifying a larger value can reduce the copy time, but it may negatively impact I/O performance.

- Medium speed:

```
raidcom modify journal -journal_id 0 -mirror_id <mu#> -copy_size 3
```

- High speed:

```
raidcom modify journal -journal_id 0 -mirror_id <mu#> -copy_size 15
```

where mu# specifies the Mirror ID, which can be 0, 1, 2, or 3.

Step 5: Create device HORCM instances

1. Create primary and secondary HORCM instances to define pair volumes. Edit the primary and secondary HORCM instances with four data volumes (0, 1, 64, and 65) and two UR device groups (ur0 and ur1).

   Primary HORCM (horcm10.conf)

```
HORCM_MON

#ip_address     service     poll(10ms)  timeout(10ms)

localhost       10582         3000        3000


HORCM_CMD
#\\.\IPCMD-<CCI server IP address>-<CCI port number>
\\.\IPCMD-172.23.x.x-31001

HORCM_LDEV
#Device-Group Device Name Array-Serial-Number   Device
ur0           dev0        512345               0
ur0           dev0        551234               1
ur1           dev1        555123               64
ur1           dev1        545512               65


HORCM_INST
#Dev-Group IP-Address      Service
ur0       localhost       10622
ur1       localhost       10622
```

   Secondary HORCM (horcm11.conf):

```
HORCM_MON
#ip_address     service     poll(10ms)  timeout(10ms)
localhost       106222        3000        3000

HORCM_CMD
#\\.\IPCMD-<CCI server IP address>-<CCI port number>
\\.\IPCMD-172.23.y.y-31001


HORCM_LDEV
#Device-Group Device Name Array-Serial-Number   Device
ur0           dev0        312345               0
ur0           dev0        354321               1
ur1           dev1        323451               64
ur1           dev1        334512               65

HORCM_INST
#Dev-Group  IP-Address      Service
ur0         localhost       10582
ur1         localhost       10582
```

2. Start the HORCM instances:

```
horcmstart 10 11
```

Step 6: Create and verify the replication pair

1. Initiate the replication pair with the journal and device group:

   ```
   paircreate -g <devicegroup> -d <vol> -vl -f async -jp <pjnlg> -js <sjnlg>
   ```

   For example, `paircreate -g ur0 -d dev0 -vl-f async -jp 0 -js 0 -IH10`

   where,

   `-g:` Specifies a group name defined in the configuration definition file. The command is run for a specified group.

   `-d:` Specifies paired logical volume name defined in the configuration definition file. When this option is specified, the command is run for the specified paired logical volume.

   `-vl`: Specifies the local volume as the primary volume.

   `-f async`: Ensures asynchronous replication.

   `-jp 0`: Master journal ID (primary).

   `-js 0`: Restore journal ID (secondary).

2. Wait for the pair creation to complete:

   ```
   pairevtwait -g <devicegroup> -s pair -t 86400 -IH10
   ```

3. Check the replication status:

   ```
   pairdisplay -g <devicegroup> -fxce -IH10
   ```

4. Verify the PAIR status to confirm that synchronization has completed successfully.

```
C:\HORCM\etc>pairdisplay -IH10 -g urdemo -fcxe
Group   PairVol(L/R) (Port#,TID, LU),Seq#,LDEV#.P/S,Status,Fence,   %,P-LDEV# M CTG JID AP EM       E-Seq# E-LDEV# R/W QM DM P PR
urdemo  002e_3030(L) (CL1-A-5, 1,   1)745545    2e.SMPL  ---- ------,----- ----- -   -   -  -  -         -       - -/- -  -  - -
urdemo  002e_3030(R) (CL6-B-1,18,2007)745595  3030.SMPL  ---- ------,----- ----- -   -   -  -  -         -       - -/- -  -  - -
urdemo  002f_301e(L) (CL1-A-5, 1,   2)745545    2f.SMPL  ---- ------,----- ----- -   -   -  -  -         -       - -/- -  -  - -
urdemo  002f_301e(R) (CL6-B-1,18,   0)745595  301e.SMPL  ---- ------,----- ----- -   -   -  -  -         -       - -/- -  -  - -

C:\HORCM\etc>paircreate -IH10 -g urdemo -vl -f async -jp 2 -js 2

C:\HORCM\etc>pairdisplay -IH10 -g urdemo -fcxe
Group   PairVol(L/R) (Port#,TID, LU),Seq#,LDEV#.P/S,Status,Fence,   %,P-LDEV# M CTG JID AP EM       E-Seq# E-LDEV# R/W QM DM P PR
urdemo  002e_3030(L) (CL1-A-5, 1,   1)745545    2e.P-VOL COPY ASYNC ,   27  3030 -   1   2  2  -         -       - -/- -  S  N -
urdemo  002e_3030(R) (CL6-B-1,18,2007)745595  3030.S-VOL COPY ASYNC ,-----    2e -   1   2  2  -         -       - -/- -  S  N -
urdemo  002f_301e(L) (CL1-A-5, 1,   2)745545    2f.P-VOL PAIR ASYNC ,    0  301e -   1   2  2  -         -       - -/- -  S  N -
urdemo  002f_301e(R) (CL6-B-1,18,   0)745595  301e.S-VOL PAIR ASYNC ,    0    2f -   1   2  2  -         -       - -/- -  S  N -

C:\HORCM\etc>pairdisplay -IH10 -g urdemo -fcxe
Group   PairVol(L/R) (Port#,TID, LU),Seq#,LDEV#.P/S,Status,Fence,   %,P-LDEV# M CTG JID AP EM       E-Seq# E-LDEV# R/W QM DM P PR
urdemo  002e_3030(L) (CL1-A-5, 1,   1)745545    2e.P-VOL PAIR ASYNC ,    0  3030 -   1   2  2  -         -       - -/- -  S  N -
urdemo  002e_3030(R) (CL6-B-1,18,2007)745595  3030.S-VOL PAIR ASYNC ,    0    2e -   1   2  2  -         -       - -/- -  S  N -
urdemo  002f_301e(L) (CL1-A-5, 1,   2)745545    2f.P-VOL PAIR ASYNC ,    0  301e -   1   2  2  -         -       - -/- -  S  N -
urdemo  002f_301e(R) (CL6-B-1,18,   0)745595  301e.S-VOL PAIR ASYNC ,    0    2f -   1   2  2  -         -       - -/- -  S  N -

C:\HORCM\etc>pairevtwait -IH10 -g urdemo -s pair -t 9999
pairevtwait : Wait status done.

C:\HORCM\etc>_
```

Summary

Universal Replicator is an asynchronous data replication solution designed for business continuity and disaster recovery across distances. It uses disk-based journaling to replicate changed data from the primary storage system to the secondary storage system, maintaining data consistency with minimal impact on the performance of the primary storage system.

References

- Universal Replicator User Guide
- Command Control Interface Command Reference
- Universal Replicator Best Practices