

WHAT'S NEW IN IBM INFORMIX V.14.10.FC8

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v.1



Agenda

- A bit of news
- Critical migration / upgrade procedures
 - H/A cluster
 - IHQ
- Internal Java updates
- Enhancement to backup from RS secondaries
- Additional Read Ahead enhancements
- IHQ 2.1
- Announcements

- Appendix

A quick bit of news

- Getting access to CSDK and JDBC packages has historically been a problem
- All of the available CSDK and JDBC packages have been migrated to the Informix Trials and Download site
 - Will reside along with the Developer Edition and time-limited engine packages

https://www.ibm.com/resources/mrs/assets?source=ifxids&lang=en_US

- About 255 packages from 4.10 and 4.50 were moved over
- The International Language Support module was uploaded as well (v.3.50.MC7)

Critical migration / upgrade processes

Migration / upgrade processes

- While in-place migration to FC8 from earlier releases is possible, there are some critical steps that must be followed for
 - H/A clusters using the Connection Manager
 - In-place is only possible from FC7w1 to FC8
 - There is a different workflow as well
 - IHQ environments
 - From any earlier Informix / IHQ environment to FC8

H/A Cluster with Connection Managers

H/A clusters with the Connection Manager

- In Informix v.12.10.xC5, the rolling upgrade functionality was introduced for intra-version upgrades that preserves uptime
 - This supports fixpack to fixpack upgrades
 - For example, xC4 to xC5 or xC5 to xC6
 - You can NOT go from xC4 to xC6
 - This functionality can NOT be used to roll back a version
 - The lowest level supported was Informix v.12.10.xC4 going to xC5
- Informix v.14.10.xC4 introduced off-line secondary conversion for HDR and RS secondary instances for major upgrades
 - You still have to take the instances off-line to convert but you don't have to rebuild the secondary instances
 - This supports a wider range of movement between Informix versions

H/A clusters with the Connection Manager

- With Informix v.14.10.FC7, it became possible to make `sysmaster` database changes during a regular fix pack upgrade
 - Development intends on using this to make minor enhancements and changes as needed
- With Informix v.14.10.FC8 some systemic changes occurred requiring rebuilding of the system databases
- The process explained herein allows you to migrate an H/A cluster with Connection Manager running FC8 while maintaining most database services
 - At a specific point
 - DDL operations from a secondary are blocked but DML operations are allowed
 - The primary goes into single user mode blocking all access to make systemic changes
- Note — trying to test this with Developer Edition will fail
 - When the new primary is migrating to FC8 and rebuilding the system databases, there are too many connections to the instance
 - Developer Edition only allows 25 connections at a time

H/A clusters with the Connection Manager

- FC7W1 and FC8 are installed in separate directories including the new version of the CSDK

| | |
|---|---|
| <pre> Inst_1_7: dbaccess -version Program Name: dbaccess Build Version: 14.10.FC7WE Build Number: N180 Build Host: njdc-lxibm01 Build OS: Linux 3.10.0-693.el7.x86_64 Build Date: Mon Nov 1 15:27:13 CDT 2021 Build Timestamp: 2021-11-01T15:03:52-05 GLS Version: glslib-7.00.FC6 </pre> | <pre> Inst_1_8: dbaccess -version Program Name: dbaccess Build Version: 14.10.FC8WE Build Number: N169 Build Host: njdc-lxibm01 Build OS: Linux 3.10.0-693.el7.x86_64 Build Date: Tue Apr 5 20:19:26 CDT 2022 Build Timestamp: 2022-04-05T18:04:21-05 GLS Version: glslib-7.00.FC6 </pre> |
|---|---|

| | |
|--|---|
| <pre> Inst_4_7: esql -version Program Name: esqlc Build Version: 4.50.FC7 Build Number: N178 Build Host: njdc-lxibm01 Build OS: Linux 3.10.0-693.el7.x86_64 Build Date: Sat Oct 23 09:02:25 CDT 2021 Build Timestamp: GLS Version: glslib-7.00.FC6 </pre> | <pre> Inst_1_8: esql -version Program Name: esqlc Build Version: 4.50.FC8 Build Number: N169 Build Host: njdc-lxibm01 Build OS: Linux 3.10.0-693.el7.x86_64 Build Date: Tue Apr 5 18:54:47 CDT 2022 Build Timestamp: GLS Version: glslib-7.00.FC6 </pre> |
|--|---|

H/A clusters with the Connection Manager

- I have a basic H/A cluster running 14.10.FC7W1 with an HDR and RS secondary
 - Two CM agents are active

This script displays the Informix version and instance status of each instance in the cluster

```

Inst_1
IBM Informix Dynamic Server Version 14.10.FC7WE -- On-Line (Prim) -- Up
2022-09-02 11:11:36

Inst_3
IBM Informix Dynamic Server Version 14.10.FC7WE -- Updatable (Sec) -- U
2022-09-02 11:11:36

Inst_4
IBM Informix Dynamic Server Version 14.10.FC7WE -- Updatable (RSS) -- U
2022-09-02 11:11:36

```

```
Inst_1_7: onstat -g cluster
```

```
IBM Informix Dynamic Server Version 14.10.FC7WE -- On-Line (Prim) -- Up 00:19:45 --
2022-09-02 11:19:01
```

```
Primary Server:inst_1
Current Log Page:9,174
Index page logging status: Enabled
Index page logging was enabled at: 2022/09/02 10:59:23
```

| Server | ACKed Log (log, page) | Applied Log (log, page) | Supports Updates | Status |
|--------|--------------------------|----------------------------|---------------------|---------------------------------|
| inst_3 | 9,174 | 9,174 | Yes | NEAR_SYNC(HDR),Connected,On |
| inst_5 | 0,0 | 0,0 | No | ASync(RSS),Disconnected,Defined |
| inst_4 | 9,174 | 9,174 | Yes | ASync(RSS),Connected,Active |

```
Inst_1_7:
Inst_1_7:
Inst_1_7: onstat -g cmsm
```

```
IBM Informix Dynamic Server Version 14.10.FC7WE -- On-Line (Prim) -- Up 00:19:58 --
2022-09-02 11:19:13
```

```
Unified Connection Manager: ha_cmsm_1 Hostname: localhost
```

```

CLUSTER          ha_1    LOCAL
Informix Servers: inst_1,inst_3,inst_4
SLA                Connections  Service/Protocol  Rule
oltp                0            60002/onsoctcp    DBSERVERS=primary
catalog            0            60003/onsoctcp    DBSERVERS=HDR,SDS

```

```
Failover Arbitrator: Active Arbitrator, Primary is up
ORDER=SDS,HDR,RSS PRIORITY=1 TIMEOUT=5
```

```
Unified Connection Manager: ha_cmsm_2 Hostname: localhost
```

```

CLUSTER          ha_2    LOCAL
Informix Servers: inst_1,inst_3,inst_4
SLA                Connections  Service/Protocol  Rule
reports            0            60004/onsoctcp    DBSERVERS=RSS

```

```
Failover Arbitrator: Failover is enabled
ORDER=SDS,HDR,RSS PRIORITY=2 TIMEOUT=5
```

H/A clusters with the Connection Manager

- First, I stop the CMs using the FC7W1 CSDK and restart them using FC8
 - Only CSDK v.4.50.FC8 and later has the logic to handle the required `sysmaster` rebuild gracefully
 - You can see them using the FC7 environment but not FC8 at this time because there isn't an active FC8 instance

```
Inst_1_7: oncmsm -k ha_cmsm_1
Shut down Connection Manager ha_cmsm_1
Inst_1_7:
Inst_1_7: oncmsm -k ha_cmsm_2
Shut down Connection Manager ha_cmsm_2
Inst_1_7:
Inst_1_7: onstat -g cmsm

IBM Informix Dynamic Server Version 14.10.FC7WE --
2022-09-02 11:20:57
```

```
Inst_1_7:
```

```
Inst_1_8: oncmsm -c $INFORMIXDIR/etc/oncmsm_1.cfg
Connection Manager started successfully
Please check IBM Informix Connection Manager log file: /opt/IBM/informix/logs/oncmsm_1.log
Inst_1_8:
Inst_1_8: oncmsm -c $INFORMIXDIR/etc/oncmsm_2.cfg
Connection Manager started successfully
Please check IBM Informix Connection Manager log file: /opt/IBM/informix/logs/oncmsm_2.log
Inst_1_8:
Inst_1_8: onstat -g cmsm
shared memory not initialized for INFORMIXSERVER 'inst_1'
Inst_1_8:
```

H/A clusters with the Connection Manager

- Second, turn off the RS secondary (`inst_4`), copy the `$ONCONFIG` and other instance configuration files to FC8 and restart the instance under FC8
 - It comes up and re-joins the cluster

```

Inst_4_8: oninit
Warning: The IBM Informix Dynamic Server Workgroup Edition license restriction limits
the total shared memory size for this server to 33554432 KB. The
maximum allowable shared memory will be set to this size. (SHMTOTAL)
Warning: Parameter's user-configured value was adjusted. (MAX_PDQPRIORITY)
Warning: This parameter has been discontinued. (GSKIT_VERSION)
Inst_4_8:
Inst_4_8: onstat -g cluster

IBM Informix Dynamic Server Version 14.10.FC8WE -- Updatable (RSS) -- Up 00:00:22 -- 234
2022-09-02 12:57:55

Primary Server:inst_1
Index page logging status: Enabled
Index page logging was enabled at: 2022/09/02 10:59:23

Server ACKed Log      Supports      Status
      (log, page) Updates
inst_4 9,644         Yes          ASYNC(RSS),Connected,Active

```

H/A clusters with the Connection Manager

- With an active FC8 instance, you can look at the CM agents using FC8 code

```

Inst_4_8: onstat -g cmsm

IBM Informix Dynamic Server Version 14.10.FC8WE -- Updatable (RSS) -- Up 00:01:24 -
2022-09-02 12:58:57
Unified Connection Manager: ha_cmsm_2                Hostname: localhost

CLUSTER          ha_2      LOCAL
Informix Servers: inst_1,inst_3,inst_4
SLA              Connections  Service/Protocol  Rule
reports         0           60004/onsoctcp   DBSERVERS=RSS

Failover Arbitrator: Failover is enabled
ORDER=SDS,HDR,RSS PRIORITY=2 TIMEOUT=5

Unified Connection Manager: ha_cmsm_1                Hostname: localhost

CLUSTER          ha_1      LOCAL
Informix Servers: inst_1,inst_3,inst_4
SLA              Connections  Service/Protocol  Rule
oltp             0           60002/onsoctcp   DBSERVERS=primary
catalog         0           60003/onsoctcp   DBSERVERS=HDR,SDS

Failover Arbitrator: Active Arbitrator, Primary is up
ORDER=SDS,HDR,RSS PRIORITY=1 TIMEOUT=5

Inst_4_8:

```

H/A clusters with the Connection Manager

- Checking the instance status confirms `inst_4` is running FC8

Script running against FC7W1 environment

```
This script displays the Informix version and instance status of each instance in the cluster
```

```
Inst_1
```

```
IBM Informix Dynamic Server Version 14.10.FC7WE -- On-Line (Prim) -- Up
2022-09-02 13:00:24
```

```
Inst_3
```

```
IBM Informix Dynamic Server Version 14.10.FC7WE -- Updatable (Sec) -- Up
2022-09-02 13:00:24
```

```
Inst_4
```

```
shared memory not initialized for INFORMIXSERVER 'inst_4'
```

```
Inst_1 7: □
```

Script running against FC8 environment

```
This script displays the Informix version and instance status of each instance in the cluster
```

```
Inst_1
```

```
shared memory not initialized for INFORMIXSERVER 'inst_1'
```

```
Inst_3
```

```
shared memory not initialized for INFORMIXSERVER 'inst_3'
```

```
Inst_4
```

```
IBM Informix Dynamic Server Version 14.10.FC8WE -- Updatable (RSS) -- Up
2022-09-02 13:00:44
```

```
Inst_4 8: █
```

H/A clusters with the Connection Manager

- The `inst_4 / RS` instance is still part of the cluster

```
Inst_1_7: onstat -g cluster

IBM Informix Dynamic Server Version 14.10.FC7WE -- On-Line (Prim) -- Up 02:03:43
2022-09-02 13:02:59

Primary Server:inst_1
Current Log Page:9,708
Index page logging status: Enabled
Index page logging was enabled at: 2022/09/02 10:59:23

Server ACKed Log      Applied Log  Supports    Status
      (log, page)  (log, page)  Updates
inst_3 9,708          9,708        Yes          NEAR_SYNC(HDR),Connected,On
inst_5 0,0            0,0          No           ASYNC(RSS),Disconnected,Defined
inst_4 9,708          9,708        Yes          ASYNC(RSS),Connected,Active

Inst_1_7:
```

```
Inst_4_8: onstat -g cluster

IBM Informix Dynamic Server Version 14.10.FC8WE -- Updatable (RSS)
2022-09-02 13:03:08

Primary Server:inst_1
Index page logging status: Enabled
Index page logging was enabled at: 2022/09/02 10:59:23

Server ACKed Log      Supports    Status
      (log, page)  Updates
inst_4 9,708        Yes          ASYNC(RSS),Connected,Active

Inst_4_8: █
```

H/A clusters with the Connection Manager

- At this point, DDL from the secondary is blocked though DML is allowed

Attempt to create a table from the RS on FC8

```
----- stores@inst_4  
  
create table my_tab  
(col1 smallint,  
 col2 char(12));  
  
  
Table created.
```

The Primary (FC7) instance doesn't have the table

```
Inst_1_7:  
Inst_1_7:  
Inst_1_7:  
Inst_1_7:  
Inst_1_7: dbschema -d stores -t my_tab  
  
DBSCHEMA Schema Utility          INFORMIX-SQL Version 14.10.FC7  
  
  
  
  
  
  
  
  
  
  
No table or view my_tab.  
Inst 1 7: □
```


H/A clusters with the Connection Manager

- DDL operations on the primary (FC7) are replicated to secondaries
 - DML from secondaries are allowed

```

----- stores@inst_1 -----
create table my_tab_2
(col1 smallint,
 col2 char(12) );

Table created.

----- stores@inst_4 -----
call_type      ext_customer  stock
catalog        items         tab
classes        manufact     warehouses
cust_calls     my_tab 2
customer       orders
employee       state
  
```

```

----- stores@inst_4 -----
insert into my_tab_2 values (1, "first row")
  
```

```

----- stores@inst_1 -----
col1 col2
1 first row
  
```

H/A clusters with the Connection Manager

- Third, continue with the next secondary, `inst_3`, an HDR
 - Turn it off under FC7, move configuration files to FC8 then restart under FC8

```
Inst_3_7:
Inst_3_7: onmode -ky
Inst_3_7:
Inst_3_7: █

Inst_3_8:
Inst_3_8: oninit
Warning: The IBM Informix Dynamic Server Workgroup Edition license restriction limits
the total shared memory size for this server to 33554432 KB. The
maximum allowable shared memory will be set to this size. (SHMTOTAL)
Warning: Parameter's user-configured value was adjusted. (MAX_PDQPRIORITY)
Warning: This parameter has been discontinued. (GSKIT_VERSION)
Inst_3_8:
Inst_3_8: onstat -

IBM Informix Dynamic Server Version 14.10.FC8WE -- Updatable (Sec) -- Up 00:00:36
-- 234176 Kbytes
2022-09-02 13:14:59
```

H/A clusters with the Conne

- As before, the FC7 code doesn't "see" the instance but it is still connected to the cluster
 - The reason the FC7 code can't "see" the instances is because the `.infos.instname` file is no longer available in its `etc` directory
 - It's now in the FC8 directory

This script displays the Informix version and instance status of each instance in the cluster

Inst_1

```
IBM Informix Dynamic Server Version 14.10.FC7WE -- On-Line (Prim) -- Up 02:19:4
2022-09-02 13:19:02
```

Inst_3

```
shared memory not initialized for INFORMIXSERVER 'inst_3'
```

Inst_4

```
shared memory not initialized for INFORMIXSERVER 'inst_4'
```

Inst_1_7:

```
Inst_1_7: onstat -g cluster
```

```
IBM Informix Dynamic Server Version 14.10.FC7WE -- On-Line (Prim) -- Up 02:19:5
2022-09-02 13:19:09
```

```
Primary Server:inst_1
```

```
Current Log Page:11,7
```

```
Index page logging status: Enabled
```

```
Index page logging was enabled at: 2022/09/02 10:59:23
```

| Server | ACKed Log (log, page) | Applied Log (log, page) | Supports Updates | Status |
|--------|--------------------------|----------------------------|---------------------|---------------------------------|
| inst_3 | 11,7 | 11,7 | Yes | NEAR_SYNC(HDR),Connected,On |
| inst_5 | 0,0 | 0,0 | No | ASYNC(RSS),Disconnected,Defined |
| inst_4 | 11,7 | 11,7 | Yes | ASYNC(RSS),Connected,Active |

H/A clusters with the Connection Manager

- Fourth, move `inst_1` (primary) to FC8
 - Normally, I'd use the graceful method of `onmode -d make primary inst_3` to make `inst_3`, the HDR the cluster primary
 - Under FC7 you get this error
 - The FC7 code can't "see" the `inst_3` FC8 instance

```
Inst_1_7: onmode -d make primary inst_3
Alias/Servername not found
Inst 1 7:
```

- Trying under FC8, using the `inst_3` or any of the secondary instance environments, results in this error and message in the instance message log since FC8 can't "see" the `inst_1` instance to turn it off

```
Inst_1_8: onmode -d make primary inst_3
Miscellaneous Error Occured
onmode: Please check the message log for errors.
Inst 1 8:
log used 2, Llog used 0

14:38:08 Skipping failover callback.
14:38:08 DRAUTO=3 and CMSM detected an active primary in the MACH11 cluster
```

H/A clusters with the Connection Manager

inst_3 instance log

- Since the graceful method doesn't work, turn off `inst_1` (FC7) using `onmode -ky`
 - The `inst_3` (FC8) instance begins to transition to primary based on the FOC rules defined in the primary and executed by the Connection Manager running FC8

```

Inst_1_7: 13:59:44 Maximum server connections 5
Inst_1_7: 13:59:44 Checkpoint Statistics - Avg. Txn Block Time 0.000, # Txns blocked 0, Plog used 30, Llog used 0
Inst_1_7: 13:59:45 DR: Receive error
Inst_1_7: onmode -ky 13:59:45 dr_secrcv thread : asfcode = -25582: oserr = 11: errstr = : Network connection is broken.
Inst_1_7: 13:59:45 System error = 11.
Inst_1_7: 13:59:45 DR ERR set to -1
Inst_1_7: 13:59:45 SMX thread is exiting
Inst_1_7: 13:59:45 SMX thread is exiting
Inst_1_7: 13:59:45 SMX thread is exiting
Inst_1_7: 13:59:45 DR: Terminating redirected write subsystem due to server disconnect.
Inst_1_7: 13:59:45 All open redirected transactions will be rolled back.
Inst_1_7: 13:59:46 Updates from secondary currently not allowed
Inst_1_7: 13:59:46 DR: Turned off on secondary server
Inst_1_7: 13:59:50 Encountered problem processing update on secondary : Cannot create new proxy session
Inst_1_7: 13:59:50 Encountered problem processing update on secondary : Cannot create new proxy session
Inst_1_7: 13:59:50 Encountered problem processing update on secondary : Cannot create new proxy session
Inst_1_7: 13:59:50 Encountered problem processing update on secondary : Cannot create new proxy session
Inst_1_7: 13:59:50 Encountered problem processing update on secondary : Cannot create new proxy session
Inst_1_7: 13:59:50 Encountered problem processing update on secondary : Cannot create new proxy session
Inst_1_7: 13:59:50 Encountered problem processing update on secondary : Cannot create new proxy session
Inst_1_7: 13:59:50 SCHAPI: Issued Task() or Admin() command "task( 'ha make primary force', 'inst_3' )".
Inst_1_7: 13:59:50 Skipping failover callback.
Inst_1_7: 14:00:03 Logical Recovery has reached the transaction cleanup phase.
Inst_1_7: 14:00:03 Checkpoint Completed: duration was 0 seconds.
Inst_1_7: 14:00:03 Fri Sep 2 - loguniq 11, logpos 0x54018, timestamp: 0x5ffa0 Interval: 81

14:00:03 Maximum server connections 5
14:00:03 Checkpoint Statistics - Avg. Txn Block Time 0.000, # Txns blocked 0, Plog used 2, Llog used 1

14:00:03 0 Uncommitted Transactions Rolled Back.
14:00:03 Logical Recovery Complete.
14:00:03 Performance Advisory: Based on the current workload, the physical log might be too small to
accommodate the time it takes to flush the buffer pool.
14:00:03 Results: The server might block transactions during checkpoints.
14:00:03 Action: If transactions are blocked during the checkpoint, increase the size of the
physical log to at least 716800 KB.
14:00:03 Performance Advisory: The physical log is too small for automatic checkpoints.
14:00:03 Results: Automatic checkpoints are disabled.
14:00:03 Action: To enable automatic checkpoints, increase the physical log to at least 716800 KB.
14:00:03 Quiescent Mode
14:00:03 Checkpoint Completed: duration was 0 seconds.
14:00:03 Fri Sep 2 - loguniq 11, logpos 0x56018, timestamp: 0x5ffc6 Interval: 82

14:00:03 Maximum server connections 5
14:00:03 Checkpoint Statistics - Avg. Txn Block Time 0.000, # Txns blocked 0, Plog used 4, Llog used 2

```

H/A clusters with th

- As part of the new primary under FC8, the system databases in `inst_3` are rebuilt
 - The instance does go into single user mode while this happens
 - These changes are logged and replicated to the other secondary(s) in the cluster so they get updated to the new version as well

```

14:00:03 Maximum server connections 5
14:00:03 Checkpoint Statistics - Avg. Txn Block Time 0.000, # Txns blocked 0, Plog used 4, Llog used 2

14:00:03 B-tree scanners enabled.
14:00:03 DR: Reservation of the last logical log for log backup turned on
14:00:03 DR: new type = primary, secondary server name = inst_1
14:00:03 DR: Trying to connect to secondary server = inst_1
14:00:03 DR: Cannot connect to secondary server
14:00:03 DR: Turned off on primary server
14:00:03 SCHAPI: dbScheduler/dbWorker are getting created in another thread
14:00:03 Starting BldNotification
14:00:03 smx creates 2 transports to server inst_4
14:00:03 Peer node inst_4 has version 131077
14:00:03 RSS Server inst_4 - state is now connected
14:00:03 setting version information for inst_4 131077
14:00:03 HDR TIMEOUT - log buffers being sent to inst_4

14:00:04 On-Line Mode
14:00:04 Converting/Rebuilding 'sysmaster' database ...
14:00:04 The server must temporarily switch to single user mode in order to
convert the sysmaster database.
14:00:04 Single-User Mode.
14:00:04 CM:Session for Connection manager ha_cmsm_2 terminated
14:00:04 CM:Session for Connection manager ha_cmsm_1 terminated
14:00:04 Defragmenter cleaner thread now running
14:00:04 Defragmenter cleaner thread cleaned:0 partitions
14:00:04 SCHAPI: adu_insert_cmd_results() Prepare Error: INSERT INTO command_history ( cmd_ret_msg, cm
_user, cmd_hostname, cmd_executed, cmd_ret_status ) VALUES (?, ?, ?, ?, ?)
14:00:04 listener-thread: err = -1834: oserr = 0: errstr = Sysmaster Rebuild Disabling Client Connectio
s: System database rebuild in progress

14:00:04 listener-thread: err = -1834: oserr = 0: errstr = : System database rebuild in progress

14:00:05 Checkpoint Completed: duration was 0 seconds.
14:00:05 Fri Sep 2 - loguniq 11, logpos 0x5b018, timestamp: 0x600a6 Interval: 83

```

H/A clusters with the Connection Manager

- After the `sysmaster` rebuild is complete, the instance returns to online mode allowing connections and modifications to occur

```
14:00:13 'sysmaster' database successfully converted/rebuilt
14:00:13 On-Line Mode
14:00:13 SCHAPI: Started dbScheduler thread.
14:00:13 Auto Registration is synced
14:00:13 SCHAPI: Started 2 dbWorker threads.
14:00:14 CM:Connection manager ha_cmsm_2 registered with the server
14:00:16 CM:Connection manager ha_cmsm_1 registered with the server
14:00:21 DB: Connect request to secondary server
```

H/A clusters with the Connection Manager

- Looking at the cluster definition from FC8, `inst_3` is the new primary, as expected
 - Interestingly, `inst_1` is pre-defined as the HDR secondary
 - This makes it easy to re-introduce the instance to the cluster

```

Inst_3_8: onstat -g cluster

IBM Informix Dynamic Server Version 14.10.FC8WE -- On-Line (Prim) -- Up 00:53:2
2022-09-02 14:07:46

Primary Server:inst_3
Current Log Page:12,1978
Index page logging status: Enabled
Index page logging was enabled at: 2022/09/02 10:59:23

Server ACKed Log      Applied Log   Supports    Status
      (log, page)    (log, page)  Updates
inst_1 11,83          0,0          No          NEAR_SYNC(HDR),Disconnected,Off
inst_5 0,0            0,0          No          ASYNC(RSS),Disconnected,Defined
inst_4 12,1978        12,1978     Yes         ASYNC(RSS),Connected,Active
  
```


H/A clusters with the Connection Manager

- Fifth, move the `inst_1` environment to FC8
 - Since it was turned off gracefully, with a full checkpoint into the cluster, it is logically consistent with the cluster at least to that moment in time
 - You can use a physical instance restart and it will re-link into the cluster
 - It comes in as read-only instance as opposed to updatable as the original HDR (`inst_3`)
 - The `updatable_secondary $ONCONFIG` parameter was not modified to “on” prior to instance start in the FC8 `$ONCONFIG`

```
Inst_1_8: oninit
Warning: The IBM Informix Dynamic Server Workgroup Edition license restriction limits
the total shared memory size for this server to 33554432 KB. The
maximum allowable shared memory will be set to this size. (SHMTOTAL)
Warning: Parameter's user-configured value was adjusted. (MAX_PDQPRIORITY)
Warning: This parameter has been discontinued. (GSKIT_VERSION)
Inst_1_8:
Inst_1_8:
Inst_1_8: onstat -

IBM Informix Dynamic Server Version 14.10.FC8WE -- Read-Only (Sec) -- Up 00:00:29 -- 2
2022-09-02 14:27:02
```

H/A clusters with the Connection Manager

- Looking at the instances, they are all on FC8 now

```
This script displays the Informix version and instance status of each
instance in the cluster

Inst_1

IBM Informix Dynamic Server Version 14.10.FC8WE -- Read-Only (Sec) -- Up
2022-09-02 14:30:29

Inst_3

IBM Informix Dynamic Server Version 14.10.FC8WE -- On-Line (Prim) -- Up 0
2022-09-02 14:30:29

Inst_4

IBM Informix Dynamic Server Version 14.10.FC8WE -- Updatable (RSS) -- Up
2022-09-02 14:30:29
```

H/A clusters with the Connection Manager

- Sixth, swap primary back to `inst_1`
 - Use `onmode -ky` to turn off `inst_3`, `inst_1` auto-registers it as an HDR, then execute a physical restart on `inst_3` and re-link into the cluster

```

Inst_3_8: oninit -PHY
Warning: The IBM Informix Dynamic Server Workgroup Edition license restriction limits
the total shared memory size for this server to 33554432 KB. The
maximum allowable shared memory will be set to this size. (SHMTOTAL)
Warning: Parameter's user-configured value was adjusted. (MAX_PDQPRIORITY)
Warning: This parameter has been discontinued. (GSKIT_VERSION)
Inst_3_8:
Inst_3_8:
Inst_3_8: onstat -

IBM Informix Dynamic Server Version 14.10.FC8WE -- Fast Recovery -- Up 00:00:13 -- 234
2022-09-02 14:46:06

Inst_3_8:
Inst_3_8:
Inst_3_8: onmode -d secondary inst_1
Inst_3_8:
Inst_3_8: onstat -

IBM Informix Dynamic Server Version 14.10.FC8WE -- Updatable (Sec) -- Up 00:00:59 -- 2
2022-09-02 14:46:51

Inst 3 8:

```

H/A clusters with the Connection Manager

- Now the cluster is back to its original state, but all upgraded to the new FC8 system databases

```

Inst_1_8: onstat -g cluster

IBM Informix Dynamic Server Version 14.10.FC8WE -- On-Line (Prim) -- Up 00:21:
2022-09-02 14:47:52

Primary Server:inst_1
Current Log Page:13,178
Index page logging status: Enabled
Index page logging was enabled at: 2022/09/02 10:59:23

Server ACKed Log      Applied Log  Supports   Status
      (log, page)    (log, page) Updates
inst_3 13,178        13,178     Yes        NEAR_SYNC(HDR),Connected,On
inst_5 0,0           0,0        No         ASYNC(RSS),Disconnected,Defined
inst_4 13,178        13,178     Yes        ASYNC(RSS),Connected,Active

Inst_1_8:

```



IHQ

Migration / upgrade processes - IHQ

- With Informix V.14.10.FC8, IHQ moves its internal database from v.1.6.3 (FC7) to v.2.0+
 - The full feature list of what's in IHQ v.2.0+ is covered later
- In the FC8 release, IHQ v.2.0 is distributed
 - IHQ development strongly recommends downloading and using IHQ v.2.1 instead
 - It is available on FixCentral
- After downloading, copy them into `$INFORMIXDIR/hq` and replace the existing server and agent files
 - This assumes FC7 and FC8 are installed in different directories

```
Inst_1_8: cp informixhq-server-2.1.0.jar informixhq-server.jar
Inst_1_8:
Inst_1_8: cp informixhq-agent-2.1.0.jar informixhq-agent.jar
Inst_1_8:
```

Fix Central

Help

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tips

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Information Management, Informix Server (14.10.FC8, Linux 64-bit,x86_64)

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| | |
|---------------|-----------|
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interim fix: informixhq-agent-2.1.0

informixhq-agent-2.1.0

The following files implement this fix.

↓ [informixhq-agent-2.1.0.jar](#) (4.19 MB)

interim fix: informixhq-server-2.1.0

informixhq-server-2.1.0

The following files implement this fix.

↓ [informixhq-server-2.1.0.jar](#) (25.1 MB)

Migration / upgrade processes - IHQ

- In the move to v.2.0+, the underlying H2 database is upgraded
 - The database stores IHQ user and other IHQ configuration information
 - When IHQ is started for the first time, the database files are created in `$INFORMIXDIR/hq`

```
-rw-r--r--. 1 informix informix 5521 Nov 30 10:47 agent_properties.inst
-rw-----. 1 informix informix 573440 Dec  2 12:29 h2db.mv.db
-rw-----. 1 informix informix      0 Nov 30 15:21 h2db.trace.db
-rw-r--r--. 1 informix informix 5522 Oct 23  2021 informixhq-agent-exam
```

- This database does NOT support in-place migration, a manual process is required
- BEST PRACTICE — install FC8 in a different directory than FC7 (or earlier), perform the IHQ migration

Migration / upgrade processes - IHQ

- If an in-place IHQ upgrade is attempted, either by
 - Copying the older H2 database into the FC8 directory and turning on IHQ
 - Performing an in-place Informix binary install and starting with the new binary on the older H2 database

It will fail

- You may possibly compromise the existing data in the database requiring recreating all IHQ administrative and other objects!
- The best workflow is to
 - Install FC8 in a separate directory as already mentioned
 - Download and copy the IHQ 2.1 server and agent `.jar` files to the FC8 directory
 - Overwrite the existing files
 - Copy the H2 database file into the FC8 directory
 - Move the IHQ properties files over
 - Execute the H2 database migration command discussed next
 - Start IHQ with new binary and database

Migration / upgrade processes - IHQ

- Assuming there is a FC7 and FC8 directory, and you've copied the older H2 database and properties files into the FC8 directory, along with the IHQ 2.1 jar files, the following command migrates the 1.6.3 (or earlier) database to the 2.1 version:

```
java -cp fc8_dir/informixhq-server.jar  
com.informix.hq.server.h2.upgrade.H2Upgrade fc7_dir/informixhq-server.jar
```

where

- fc8_dir* is the fully pathed location of the FC8 IHQ directory (e.g. `/opt/IBM/informix/14_10_fc8/hq`)
 - fc7_dir* is the fully pathed location of the FC7 IHQ directory (e.g. `/opt/IBM/informix/14_10_fc7/hq`)
- Note: this could be a very long string to execute
 - I found in testing trying to use “\” to split the command into 2 lines caused the command to fail

```
Inst_1_8: java -cp /opt/IBM/informix/14_10_8/hq/informix-server.jar com.informix.hq.server.h2.upgrade.H2Upgrade \  
> /opt/IBM/informix/14_10_7/hq/informix-server.jar  
Error: Could not find or load main class com.informix.hq.server.h2.upgrade.H2Upgrade
```

Migration / upgrade processes - IHQ

- If the `encrypt.enable`, `encrypt.algorithm`, or `encrypt.password` H2 database properties are set in FC7, the location of the IHQ server properties file must be attached to the command
 - This is usually the same location as the IHQ directory

```
java -cp fc8_dir/informixhq-server.jar  
com.informix.hq.server.h2.upgrade.H2Upgrade fc7_dir/informixhq-server.jar  
prop_dir
```

where

- *fc8_dir* is the fully pathed location of the FC8 IHQ directory (e.g. `/opt/IBM/informix/14_10_fc8/hq`)
 - *fc7_dir* is the fully pathed location of the FC7 IHQ directory (e.g. `/opt/IBM/informix/14_10_fc7/hq`)
 - *prop_dir* is the fully pathed location of the IHQ server properties file
- Ideally, you'd copy the database property file into the FC8 directory as well

Migration / upgrade processes - IHQ

- Once the migration is complete, copy the server and agent properties files from the old location to the new location if you haven't done so already

- You can start the new version of IHQ

- A real life example

- The FC7 directory

```
Informix: ls -l hq
total 30044
-rw-r--r--. 1 informix informix 1852 Nov 30 10:47 agent.log4j.xml
-rw-r--r--. 1 informix informix 1618 Nov 30 10:47 agent.logback.xml
-rw-r--r--. 1 informix informix 5521 Nov 30 10:47 agent_properties.inst1
-rw-r--r--. 1 informix informix 5521 Nov 30 10:47 agent_properties.inst2
-rw-r--r--. 1 informix informix 5521 Nov 30 10:47 agent_properties.inst3
-rw-r--r--. 1 informix informix 5521 Nov 30 10:47 agent_properties.inst4
-rw-r--r--. 1 informix informix 5521 Nov 30 10:47 agent_properties.inst5
-rw-r--r--. 1 informix informix 5521 Nov 30 10:47 agent_properties.inst6
-rw-r--r--. 1 informix informix 5521 Nov 30 10:47 agent_properties.inst7
-rw-r--r--. 1 informix informix 5521 Nov 30 10:47 agent_properties.inst8
-rw----- 1 informix informix 573440 Dec  2 12:29 h2db.mv.db ←
-rw----- 1 informix informix 0 Nov 30 15:21 h2db.trace.db
-rw-r--r--. 1 informix informix 5522 Oct 23 2021 informixhq-agent-example.properties
-rw-r--r--. 1 informix informix 4354990 Oct 23 2021 informixhq-agent.jar
-rw----- 1 informix informix 68992 Dec  2 15:43 informixhq-agent.log
-rwxr-xr-x. 1 informix informix 7144 Oct 23 2021 InformixHQ.bat
-rwxr-xr-x. 1 informix informix 8667 Oct 23 2021 InformixHQ.ksh
-rw-r--r--. 1 informix informix 9654 Oct 23 2021 informixhq-server-example.properties
-rw-r--r--. 1 informix informix 25316165 Oct 23 2021 informixhq-server.jar
-rw----- 1 informix informix 296976 Dec  2 16:12 informixhq-server.log
-rwxr-xr-x. 1 informix informix 8669 Oct 23 2021 InformixHQ.sh
-rw-r--r--. 1 informix informix 1856 Nov 30 10:47 server.log4j.xml
-rw-r--r--. 1 informix informix 1664 Nov 30 10:47 server.logback.xml
-rw-r--r--. 1 informix informix 9692 Nov 30 10:47 server.properties
Informix: █
```

Migration / upgrade processes - IHQ

- The FC8 directory

```
Informix: ls -l /opt/IBM/informix/14_10_8/hq
total 30048
-rw-r--r--. 1 informix informix      2120 Apr  5 20:19 agent.log4j.xml
-rw-r--r--. 1 informix informix      5522 Apr  5 20:19 informixhq-agent-example.properties
-rw-r--r--. 1 informix informix 4391687 Apr  5 20:19 informixhq-agent.jar
-rwxr-xr-x. 1 informix informix     18856 Apr  5 20:19 InformixHQ.bat
-rwxr-xr-x. 1 informix informix     15549 Apr  5 20:19 InformixHQ.ksh
-rw-r--r--. 1 informix informix      9654 Apr  5 20:19 informixhq-server-example.properties
-rw-r--r--. 1 informix informix 26291879 Apr  5 20:19 informixhq-server.jar
-rwxr-xr-x. 1 informix informix     15594 Apr  5 20:19 InformixHQ.sh
-rw-r--r--. 1 informix informix      2031 Apr  5 20:19 server.log4j.xml
Informix: █
```

Migration / upgrade processes - IHQ

- Download the IHQ 2.1 agent and server .jar files and copy them into the hq directory
 - Overwrite the existing agent and server files with the IHQ v.2.1 files

```
Inst_1_8: cp informixhq-server-2.1.0.jar informixhq-server.jar
Inst_1_8:
Inst_1_8: cp informixhq-agent-2.1.0.jar informixhq-agent.jar
Inst_1_8:
```

```
Inst_1_8: ls -l *.jar
-rw-rw-r--. 1 informix informix 1775801 Aug 30 16:26 h2-1.4.192.jar
-rw-rw-r--. 1 informix informix 2543012 Aug 30 16:26 h2-2.1.214.jar
-rw-r--r--. 1 informix informix 4391357 Sep  8 10:30 informixhq-agent-2.1.0.jar
-rw-r--r--. 1 informix informix 4391357 Sep  8 10:52 informixhq-agent.jar
-rw-r--r--. 1 informix informix 26319564 Sep  8 10:30 informixhq-server-2.1.0.jar
-rw-r--r--. 1 informix informix 26319564 Sep  8 10:52 informixhq-server.jar
Inst_1_8:
```

Migration / upgrade processes - IHQ

- First, copy the IHQ database then the properties files from the FC7 directory to the FC8 directory

```
Inst_1_8: pwd
/opt/IBM/informix/14_10_8/hq
Inst_1_8:
Inst_1_8: cp ../../14_10_7/hq/h2* .
Inst_1_8:
Inst_1_8: ls -l
total 30608
-rw-r--r--. 1 informix informix    2120 Apr  5 20:19 agent.log4j.xml
-rw-----. 1 informix informix  573440 Aug 30 11:23 h2db.mv.db ←
-rw-----. 1 informix informix      0 Aug 30 11:23 h2db.trace.db
-rw-r--r--. 1 informix informix    5522 Apr  5 20:19 informixhq-agent-example.properties
-rw-r--r--. 1 informix informix  4391687 Apr  5 20:19 informixhq-agent.jar
-rwxr-xr-x. 1 informix informix   18856 Apr  5 20:19 InformixHQ.bat
-rwxr-xr-x. 1 informix informix   15549 Apr  5 20:19 InformixHQ.ksh
-rw-r--r--. 1 informix informix    9654 Apr  5 20:19 informixhq-server-example.properties
-rw-r--r--. 1 informix informix 26291879 Apr  5 20:19 informixhq-server.jar
-rwxr-xr-x. 1 informix informix   15594 Apr  5 20:19 InformixHQ.sh
-rw-r--r--. 1 informix informix    2031 Apr  5 20:19 server.log4j.xml
Inst_1_8:
Inst_1_8: █
```

Migration / upgrade processes - IHQ

- Now the server and agent properties files

```

Inst_1_8: cp ../../14_10_7/hq/server.properties .
Inst_1_8:
Inst_1_8: cp ../../14_10_7/hq/agent_properties.inst* .
Inst_1_8:
Inst_1_8: ls -l
total 30684
-rw-r--r--. 1 informix informix    2120 Apr  5 20:19 agent.log4j.xml
-rw-r--r--. 1 informix informix    5521 Aug 30 11:33 agent_properties.inst1
-rw-r--r--. 1 informix informix    5521 Aug 30 11:33 agent_properties.inst2
-rw-r--r--. 1 informix informix    5521 Aug 30 11:33 agent_properties.inst3
-rw-r--r--. 1 informix informix    5521 Aug 30 11:33 agent_properties.inst4 ←
-rw-r--r--. 1 informix informix    5521 Aug 30 11:33 agent_properties.inst5
-rw-r--r--. 1 informix informix    5521 Aug 30 11:33 agent_properties.inst6
-rw-r--r--. 1 informix informix    5521 Aug 30 11:33 agent_properties.inst7
-rw-r--r--. 1 informix informix    5521 Aug 30 11:33 agent_properties.inst8
-rw-----. 1 informix informix 573440 Aug 30 11:23 h2db.mv.db
-rw-----. 1 informix informix      0 Aug 30 11:23 h2db.trace.db
-rw-r--r--. 1 informix informix    5522 Apr  5 20:19 informixhq-agent-example.properties
-rw-r--r--. 1 informix informix 4391687 Apr  5 20:19 informixhq-agent.jar
-rwxr-xr-x. 1 informix informix   18856 Apr  5 20:19 InformixHQ.bat
-rwxr-xr-x. 1 informix informix   15549 Apr  5 20:19 InformixHQ.ksh
-rw-r--r--. 1 informix informix    9654 Apr  5 20:19 informixhq-server-example.properties
-rw-r--r--. 1 informix informix 26291879 Apr  5 20:19 informixhq-server.jar
-rwxr-xr-x. 1 informix informix   15594 Apr  5 20:19 InformixHQ.sh
-rw-r--r--. 1 informix informix    2031 Apr  5 20:19 server.log4j.xml
-rw-r--r--. 1 informix informix    9692 Aug 30 11:32 server.properties ←
Inst_1_8:

```


Migration / upgrade processes - IHQ

- Then execute the migration command

```
Inst_1_8: java -cp /opt/IBM/informix/14_10_8/hq/informixhq-server.jar com.informix.hq.server.h2.upgrade.H2Upgrade
/opt/IBM/informix/14_10_7/hq/informixhq-server.jar
Backup of old h2db file is completed successfully, now old h2db file name is h2db_old.mv.db.
Alter process executed successfully.
Data export process executed successfully.
Data import process executed successfully.
Clean-up for import and export process completed successfully.
Inst_1_8:
```

Migration / upgrade processes - IHQ

- With the database migrated, start the IHQ server

```
Inst_1_8: pwd
/opt/IBM/informix/14_10_8/hq
Inst_1_8:
Inst_1_8: InformixHQ.sh startserver encoding=en_us819 propfile=server.properties

INFO: Please use list command to verify the process.

Inst_1_8:
Inst_1_8: InformixHQ.sh list

    PID USER      COMMAND
    5788 informix java -Dfile.encoding=en_us819 -jar informixhq-server.jar server.properties

INFO: In case, process is not listed after startserver/startagent command, please check the log files.

Inst_1_8:
```

- Instance agents can be started as well

Migration / upgrade processes - IHQ

- But what if FC8 is installed on top of FC7 (or earlier), is it possible to upgrade IHQ?
 - Yes but it is a manual process of updating the IHQ database and other operations
 - Not covered at this time
 - See the appendix at the end of this presentation

Questions



Internal Java update

Internal Java update

- The Java environment currently bundled with Informix has been upgraded to 8.0.7
 - The exception is HP-UX which is using 8.0.6.30
- See the *Announcements* section later for news about the bundled JRE

Questions



Changes to RSS backups

Changes to RSS backups

- In Informix 14.10.FC6, a much sought after feature was introduced - the ability to backup from a secondary
 - It gave you the option to move the I/O and other (negligible) overhead associated with an instance backup from the primary to a RS node
- With FC6, you could execute `ontape` and `ON-Bar` backups in one of two modes
 - Local** — a copy of the local instance for local instance use
 - Cluster** — backups of logical logs as well as cluster occurred here
 - Updates occurred to the `sysutils` database and `IXBAR` file on the primary
 - Could be used to restore the primary**
- Required setting the `BAR_SEC_ALLOW_BACKUP` parameter to one of three potential values

** see next slide

Changes to RSS backups

- There were caveats or conditions for this functionality to work
 - No unlogged objects in the instance
 - Non-logged SLOBspace
 - Raw table in a logged database
 - Non-logged database in an instance
 - Non-logged SLOB in the database, even if stored in a logged SLOBspace
- Set the then new `TEMPTAB_NOLOG` parameter to 2
 - Support for automatic switching of logged temp table support when a node moves from secondary to primary status
 - Prior to this setting, if a secondary node became primary, the original `NOLOG` setting persisted and logged temp table support was not available
 - Now it will change as the node's role changes from secondary to primary



Changes to RSS backups

- So what's new in FC8?
 - “Cluster” backups are no longer allowed, just local
 - There are no updates to `sysutils` or the `ixbar` file
 - If the instance has non-logged objects the backup *can* occur
 - Requires setting a new, non-dynamic parameter and restarting the instance
 - Since non-logged objects are not replicated, it means the backup is not complete
 - Informix is now enforcing that the `LTAPEDEV` parameter is the same throughout the cluster
 - In the past, the primary could have one value and secondary another value
 - It allowed the creation of “cluster” backups from the secondary
 - Primary was set to `/dev/null` while RS had “real” values
 - The primary didn't try to trigger a logical log backup
 - As a result, you needed to review the tape parameters if the node was promoted to primary to ensure backups actually occurred
 - Now, if they are different, the secondary will not come online

Changes to RSS backups

- So what's new in FC8?
 - The `BAR_SEC_ALLOW_BACKUP` now only supports
 - 0 (zero) — backups blocked on the RS instance
 - 1 (one) — backups supported on the RS instance
 - “Local” mode only, no updates to `sysutils` or `IXBAR` file
 - To enable RS backups with non-logged objects, set the `ARCHIVE_UNLOGGED_OBJECTS` parameter and restart the instance
 - FYI - it was originally improperly documented as (`ARCHIVE_NOLOG_OBJECTS`)
 - Potential values
 - 0 (zero) — backups blocked if non-logged objects exist
 - 1 (one) — quiet mode, backups allowed though a general message that the backup contains non-logged objects and may not be fully consistent is written to the message log
 - 2 (two) — verbose mode, backups allowed and each non-logged object found is written to the instance log along with the general message that the backup contains non-logged objects and may not be fully consistent

Changes to RSS backups

- As previously mentioned, these parameters apply to `ontape` and `ON-Bar` backup operations
- My test cluster has non-logged SLOBspaces as well as a raw table

```
Inst_4_8: onstat -d
IBM Informix Dynamic Server Version 14.10.FC8WE -- Updatable (RSS) -- Up 00:01:04 -- 234176 Kbytes
2022-09-06 13:31:32

Dbspaces
address          number  flags      fchunk  nchunks  pgsize  flags  owner  name
4596b028         1      0x801      1       1        2048   NL BA  informix rootdbs
45aa3de8         2      0x801      2       1        2048   NL BA  informix data_space_1
4596bdc8         3      0x801      3       1        2048   NL BA  informix log_space
4596cbf0         4      0x2001     4       1        2048   N TBA  informix work_space
45a86050         5      0x8801     5       1        2048   NLSBA  informix slob_space
45a86290         6      0xa001     6       1        2048   N UBA  informix slob_temp
 6 active, 2047 maximum
```

```
Chunks
address          chunk/dbs  offset  size  free  bpages
4596b268         1 1 0 50000 36590
4611f028         2 2 0 102400 100046
46120028         3 3 0 102400 32347
46121028         4 4 0 102400 102347
46122028         5 5 0 25600 23802 23802
                Metadata 1745 1298 1745
46123028         6 6 0 102400 -1 -1
 6 active, 32766 maximum
```

```
inst_4_8: dbschema -d stores -t rawtab
DBSCHEMA Schema Utility      INFORMIX-SQL Version 14.10.FC8
{ TABLE "informix".rawtab row size = 2 number of columns = 1
create raw table "informix".rawtab
(
  coll smallint
);
revoke all on "informix".rawtab from "public" as "informix";
```

Changes to RSS backups

- With the `ARCHIVE_UNLOGGED_OBJECTS` parameter = 0
 - Backup is blocked

```
Inst_4_8: ontape -s -L 0
Archive failed - (-83380) An archive checkpoint could not be completed in the secondary server.

Program over.
Inst_4_8:
Inst_4_8:

16:22:48 The storage space, 'slob_space', is preventing the backup on the
          secondary server.
16:22:49 (-83380) An archive checkpoint could not be completed in the secondary server.
```

Changes to RSS backups

- With the `ARCHIVE_UNLOGGED_OBJECTS` parameter = 1
 - Backup is allowed with a general message in the instance log

```
Inst_4_8: ontape -s -L 0
100 percent done.
File created: /opt/IBM/informix/backup/inst4_L0

Please label this tape as number 1 in the arc tape sequence.
This tape contains the following logical logs:

18

Program over.
```

```
15:55:24 WARNING: This archive contains unlogged objects such as raw tables
or BLOBspace blobs and is therefore incomplete because these objects
are not fully replicated. If restored from this archive these objects
will be internally inconsistent and must be recreated before they
can be used.
15:55:25 Level 0 Archive started on rootdbs, data_space_1, log_space, slob_space
15:55:26 Archive on rootdbs, data_space_1, log_space, slob_space Completed.
15:56:17 Logical Log 18 Complete, timestamp: 0xb3f9c.
15:56:23 Checkpoint Completed: duration was 0 seconds.
```


Changes to RSS backups

- With the `ARCHIVE_UNLOGGED_OBJECTS` parameter = 2
 - Backup is allowed with more detailed messages in the instance log

```
15:57:35 Checkpoint Statistics - Avg. Txn Block Time 0.000, # Txns blocked 0, Plog u
d 0
15:57:35 The storage space, 'slob_space', which contains
           partially-replicated objects, would normally prevent a backup on the
           secondary server.
15:57:35 The raw table 'stores':'rawtab' would normally prevent
           a backup on the secondary server.
15:57:35 These restrictions have been overridden by the user.
15:57:35 WARNING: This archive contains unlogged objects such as raw tables
           or BLOBspace blobs and is therefore incomplete because these objects
           are not fully replicated. If restored from this archive these objects
           will be internally inconsistent and must be recreated before they
           can be used.
15:57:36 Level 0 Archive started on rootdbs, data_space_1, log_space, slob_space
15:57:37 Archive on rootdbs, data_space_1, log_space, slob_space Completed.
```



Changes to RSS backups

- Regardless of the `ARCHIVE_UNLOGGED_OBJECTS` parameter value, restoring the backup prints messages in the instance log that the backup is not complete

```
Inst_4_8: ontape -r
Restore will use level 0 archive file /opt/IBM/informix/backup/inst4_L0. Press Return to

Archive Tape Information

Tape type:      Archive Backup Tape

16:43:21
Backup is incomplete, it contain RAW objects backup, restore it at your own risk
16:43:28
Backup is incomplete, it contain RAW objects backup, restore it at your own risk
16:43:28 Parameter's user configured value was adjusted. (MAX_PRIORITY)
```

Questions



Additional Read Ahead Enhancements

Additional Read Ahead Enhancements

- A quick refresher — in FC7 the `onstat -g rah` output was enhanced to include new sections

General information on current conditions

Requests in the queue

What each of the daemons are working on

Read ahead while in system recovery

```
Inst_1_7: onstat -g rah
IBM Informix Dynamic Server Version 14.10.FC7DE -- On-Line
2021-12-02 15:20:31

Read Ahead

# Qs                1
# RA Daemon Threads 1
# Requests          361
cur. queued         0
max. queued         2
max. indiv. Q len  2
# Continued         0
# Memory Failures   0
Way Behind          0
Daemon Frees        0
Last Thread Add     12/02/2021.12:27:37

Active Read Ahead Queues

Active Read Ahead Daemons

Recovery ReadAhead Statistics
```

Additional Read Ahead Enhancements

- The enhanced `onstat -g rah` output

Read ahead by partition, segmented into categories: data reads, index reads etc.

| Partition ReadAhead Statistics | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------|---------|----------|-----------|-------|---------|------|-----|-------|---------|------|-----|-------|---------|------|-----|-----------------|------|-----|-------|----------------|----------|-------|-----|-------------|---------|------|-----|---|
| partnum | Buffer | | hit ratio | Data | | | | Index | | | | I/D | | | | LogRec/PageList | | | | Last_Committed | | | | Partn_Pages | | | | |
| | bfcread | dskreads | | #reqs | pagecnt | nios | eff | #reqs | pagecnt | nios | eff | #reqs | pagecnt | nios | eff | npages | nios | eff | #reqs | #used | #resched | #fail | eff | #reqs | pagecnt | nios | eff | |
| 0x100004 | 17001 | 42 | 99 | 0 | 0 | 0 | 0 | 8 | 8 | 0 | 0 | 1 | 23 | 20 | 86 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0x100005 | 23465 | 113 | 99 | 0 | 0 | 0 | 0 | 19 | 5 | 1 | 20 | 25 | 32 | 5 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 0x100006 | 1056 | 54 | 94 | 1 | 49 | 37 | 75 | 1 | 0 | 0 | 0 | 5 | 5 | 1 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 0x100007 | 519 | 31 | 94 | 0 | 0 | 0 | 0 | 8 | 7 | 6 | 85 | 5 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 0x100008 | 161 | 5 | 96 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 0x100009 | 1447 | 20 | 98 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 4 | 48 | 12 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 0x10000a | 400 | 3 | 99 | 1 | 1 | 1 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 0x100013 | 667 | 135 | 79 | 0 | 0 | 0 | 0 | 1 | 19 | 18 | 94 | 1 | 110 | 109 | 99 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

Read ahead by thread, segmented into categories: data reads, index reads etc.

| Thread ReadAhead Statistics | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------|---------|----------|-----------|-------|---------|------|-----|-------|---------|------|-----|-------|---------|------|-----|-----------------|------|-----|-------|----------------|----------|-------|-----|-------------|---------|------|-----|---|
| tid | Buffer | | hit ratio | Data | | | | Index | | | | I/D | | | | LogRec/PageList | | | | Last_Committed | | | | Partn_Pages | | | | |
| | bfcread | dskreads | | #reqs | pagecnt | nios | eff | #reqs | pagecnt | nios | eff | #reqs | pagecnt | nios | eff | npages | nios | eff | #reqs | #used | #resched | #fail | eff | #reqs | pagecnt | nios | eff | |
| 0 | 2624 | 146 | 94 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 56 | 188 | 146 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 132 | 129 | 97 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 59 | 53556 | 871 | 98 | 1 | 38 | 13 | 34 | 12 | 60 | 0 | 0 | 13 | 14 | 1 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 57 | 11890 | 458 | 96 | 4 | 20 | 18 | 90 | 23 | 86 | 38 | 44 | 25 | 300 | 153 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 58 | 59858 | 762 | 98 | 0 | 0 | 0 | 0 | 17 | 26 | 1 | 3 | 14 | 19 | 4 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

Additional Read Ahead Enhancements

- Part of what was introduced in FC7 was the data used to calculate how effectiveness was measured

| Partition ReadAhead Statistics | | | | | | | | |
|--------------------------------|---------|----------|-------|-------|---------|------|-----|----|
| | Buffer | | hit | Data | | | | |
| partnum | bfcread | dskreads | ratio | #reqs | pagecnt | nios | eff | # |
| 0x100004 | 17001 | 42 | 99 | 0 | 0 | 0 | 0 | 8 |
| 0x100005 | 23465 | 113 | 99 | 0 | 0 | 0 | 0 | 19 |
| 0x100006 | 1056 | 54 | 94 | 1 | 49 | 37 | 75 | 1 |
| 0x100007 | 519 | 31 | 94 | 0 | 0 | 0 | 0 | 8 |
| 0x100008 | 161 | 5 | 96 | 0 | 0 | 0 | 0 | 0 |
| 0x100009 | 1447 | 20 | 98 | 0 | 0 | 0 | 0 | 1 |
| 0x10000a | 400 | 3 | 99 | 1 | 1 | 1 | 100 | 0 |
| 0x100013 | 667 | 135 | 79 | 0 | 0 | 0 | 0 | 1 |

49 pages needed but only 37 in R/A cache so R/A effectiveness is lower

1 pages needed, was in R/A cache so R/A effectiveness is perfect

Additional Read Ahead Enhancements

- New in FC8 are two additional, totals columns for thread and partition activity
 - These can be used to gauge R/A effectiveness across the object

| Partn_Pages | | | | Total RA Pages | |
|-------------|---------|------|-----|----------------|------|
| #reqs | pagecnt | nios | eff | read | used |
| 0 | 0 | 0 | 0 | 23 | 20 |
| 0 | 0 | 0 | 0 | 29 | 8 |
| 0 | 0 | 0 | 0 | 54 | 39 |
| 0 | 0 | 0 | 0 | 3 | 0 |
| 0 | 0 | 0 | 0 | 2 | 0 |
| 0 | 0 | 0 | 0 | 34 | 2 |
| 0 | 0 | 0 | 0 | 1 | 1 |
| 0 | 0 | 0 | 0 | 131 | 32 |
| 0 | 0 | 0 | 0 | 8 | 4 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 7 | 5 |
| 0 | 0 | 0 | 0 | 6 | 1 |
| 0 | 0 | 0 | 0 | 32 | 24 |
| 0 | 0 | 0 | 0 | 1 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 |
| 0 | 0 | 0 | 0 | 1 | 1 |

Total Read is the number of pages put into the cache

RA Read is the number of pages used from the cache

Ideally you want these two numbers to be as similar as possible. Can use this to fine tune R/A parameters.

Additional Read Ahead Enhancements

- New in FC8 is the re-introduction of the R/A threshold field in the `AUTO_READAHEAD` config parameter as well as session environment variable
 - If the value is < 50 , the next batch is requested later in the processing sequence allowing more of the existing batch to be used
 - > 50 , the batch is requested earlier

```
Inst_5_8: onstat -g cfg full auto_readahead
```

```
IBM Informix Dynamic Server Version 14.10.FC8WE -- On-Line -- Up 00:00:20 -- 234176 Kbytes
2022-09-08 14:27:46
```

```
Configuration Parameter Info
```

| id | name | type | maxlen | units | rsvd | tunable |
|----|----------------|--------|--------|-------|------|---------|
| 85 | AUTO_READAHEAD | STRUCT | 513 | | * | * |

```
default : 1,128
onconfig: 1,128,25
current : 1,128,25
```

Description:

Use the `AUTO_READAHEAD` configuration parameter to control the automatic read-ahead mode of the database.

number of pages read ahead at a time. Range: 4-4096. Default: 128.

The third component, which is also optional, is a threshold--a whole number percentage (1-100). The next batch of pages will be requested once this percentage of the current batch remains unprocessed by the reader. Default: 50. <50 == request next batch later. >50 == request next batch earlier.

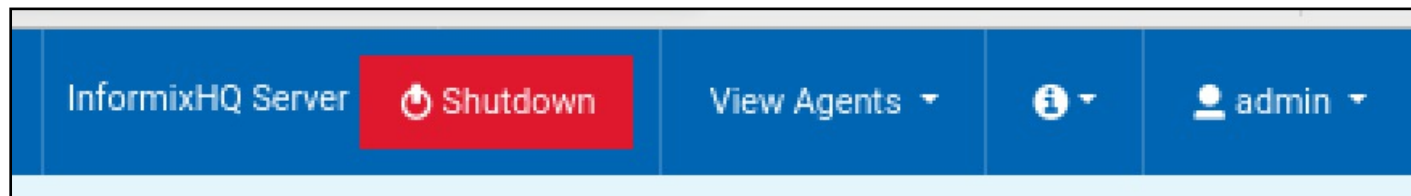
Questions



IHQ 2.1

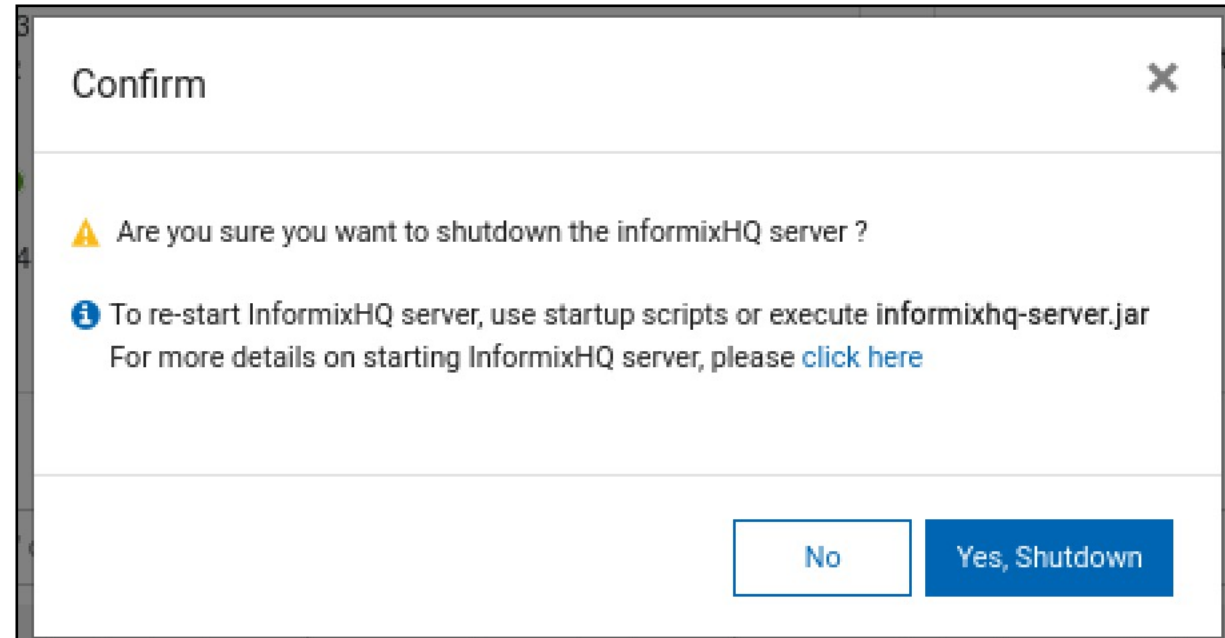
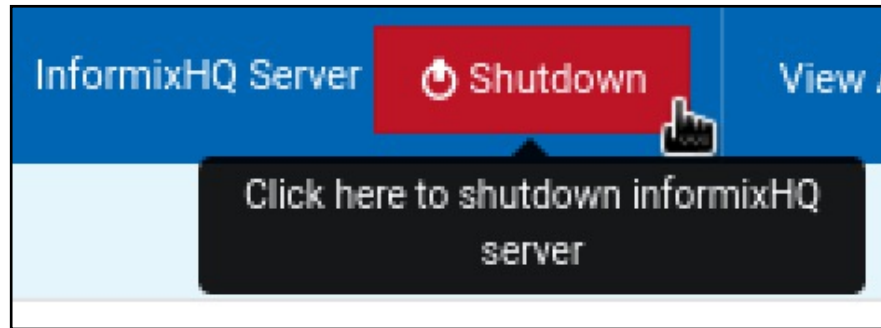
IHQ 2.1

- With the major systemic changes to the H2 database and the migration process discussed earlier, the IHQ tool has moved to v.2.0+ with a number of changes and bug fixes
 - As discussed in the IHQ migration section, FC8 distributes IHQ v.2.0 but development recommends upgrading to IHQ v.2.1
- To begin, the administration interface offers more options than previously available at the command line
- When logged in as an IHQ administrative user, two new options are available on the tool header:



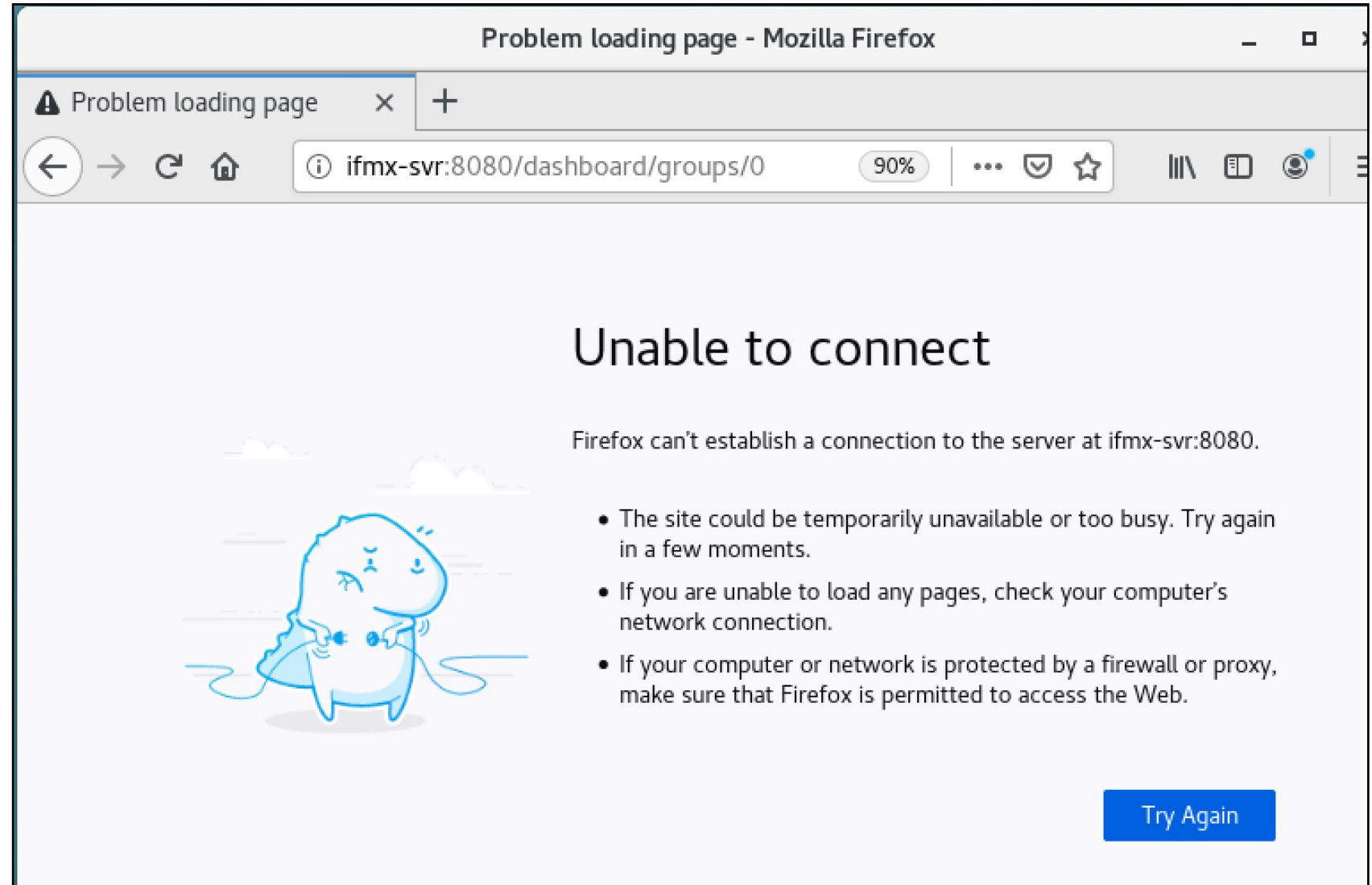
IHQ 2.1

- As the button implies, the **Shutdown** option will shutdown the IHQ server process



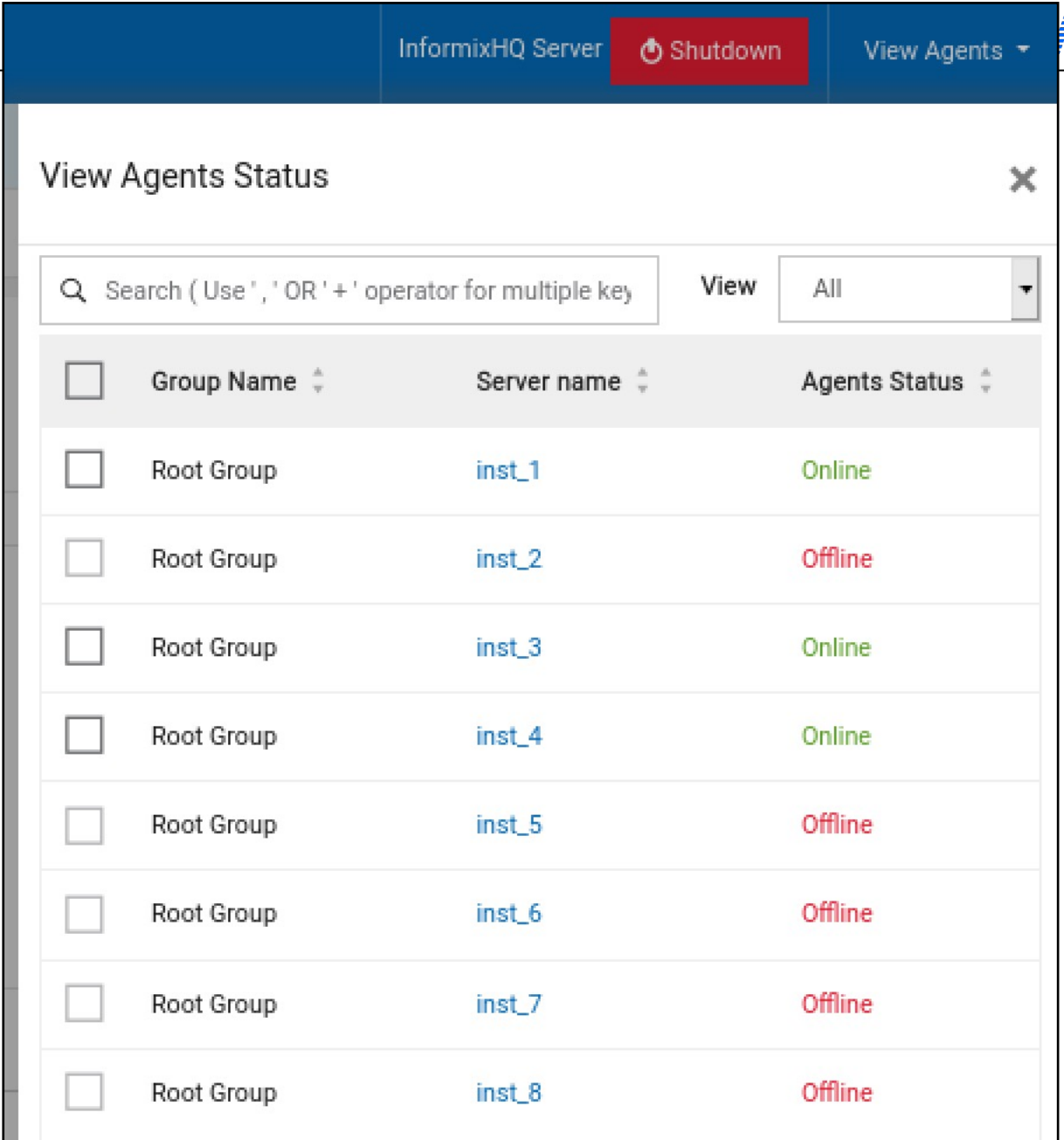
IHQ 2.1

- The browser will refresh as part of the server shutdown operation
 - Since there is no active IHQ server, an error is returned



IHQ 2.1

- The second new option is the ability to view and partially administer IHQ agents



InformixHQ Server Shutdown View Agents

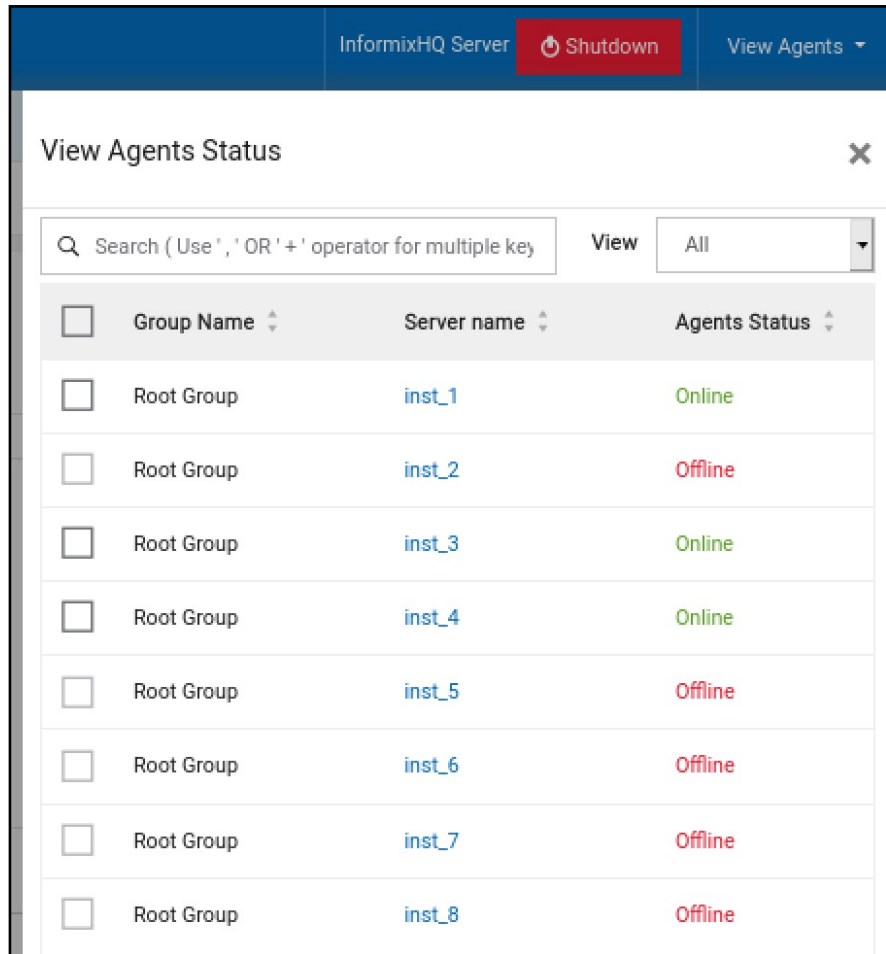
View Agents Status

Search (Use ' , ' OR ' + ' operator for multiple key) View All

| <input type="checkbox"/> | Group Name | Server name | Agents Status |
|--------------------------|------------|-------------|---------------|
| <input type="checkbox"/> | Root Group | inst_1 | Online |
| <input type="checkbox"/> | Root Group | inst_2 | Offline |
| <input type="checkbox"/> | Root Group | inst_3 | Online |
| <input type="checkbox"/> | Root Group | inst_4 | Online |
| <input type="checkbox"/> | Root Group | inst_5 | Offline |
| <input type="checkbox"/> | Root Group | inst_6 | Offline |
| <input type="checkbox"/> | Root Group | inst_7 | Offline |
| <input type="checkbox"/> | Root Group | inst_8 | Offline |

IHQ 2.1

- You can filter which agents are displayed in the **View** dropdown

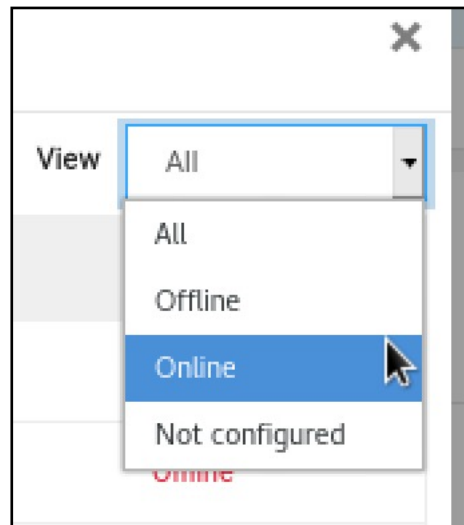


InformixHQ Server Shutdown View Agents ▾

View Agents Status ×

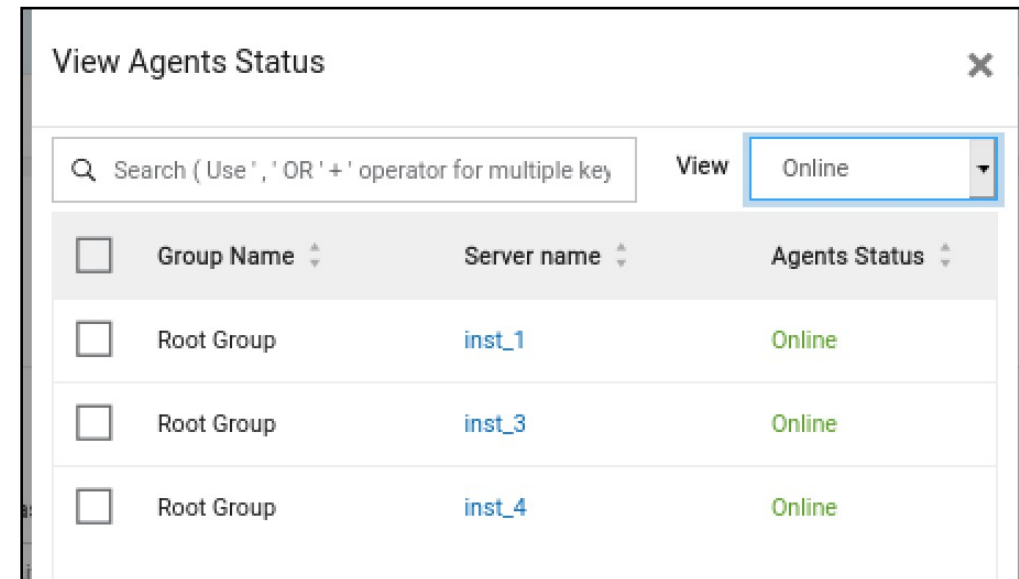
Search (Use ', ' OR ' + ' operator for multiple key) View All ▾

| <input type="checkbox"/> | Group Name ▾ | Server name ▾ | Agents Status ▾ |
|--------------------------|--------------|---------------|-----------------|
| <input type="checkbox"/> | Root Group | inst_1 | Online |
| <input type="checkbox"/> | Root Group | inst_2 | Offline |
| <input type="checkbox"/> | Root Group | inst_3 | Online |
| <input type="checkbox"/> | Root Group | inst_4 | Online |
| <input type="checkbox"/> | Root Group | inst_5 | Offline |
| <input type="checkbox"/> | Root Group | inst_6 | Offline |
| <input type="checkbox"/> | Root Group | inst_7 | Offline |
| <input type="checkbox"/> | Root Group | inst_8 | Offline |



View All ▾

- All
- Offline
- Online
- Not configured



View Agents Status ×

Search (Use ', ' OR ' + ' operator for multiple key) View Online ▾

| <input type="checkbox"/> | Group Name ▾ | Server name ▾ | Agents Status ▾ |
|--------------------------|--------------|---------------|-----------------|
| <input type="checkbox"/> | Root Group | inst_1 | Online |
| <input type="checkbox"/> | Root Group | inst_3 | Online |
| <input type="checkbox"/> | Root Group | inst_4 | Online |

IHQ 2.1

- Clicking on the agent's instance name takes you directly to that agent's setup window
 - There is an option to shutdown the agent from this window

View Agents Status ✕

View
All

| <input type="checkbox"/> | Group Name | Server name | Agents Status |
|--------------------------|------------|-------------|---------------|
| <input type="checkbox"/> | Root Group | inst_1 | Online |

Root Group > inst_1 > Setup

Setup

Server
Agent

Repository Database Configuration

*** Select Repository Server**

inst_1
Select...

*** Select Database**

ihq_repository

Connection Properties

InformixHQ agent connects with sysmaster and repository database (ihq_repository) on same server (in

inst_1: Connection Properties

Use existing connection properties (Uncheck to modify properties)

Save

Agent Status

The agent is online.

Shutdown agent

IHQ 2.1

- Clicking the box in front of one or more agents enables you to shutdown those agent(s) in a single unit of work instead of one by one from their set up page

View Agents Status Shutdown Agents ✕

i 1 agents selected.

Search (Use ', ' OR ' + ' operator for multiple key) View Online

| <input type="checkbox"/> | Group Name | Server name | Agents Status |
|-------------------------------------|------------|-------------|---------------|
| <input checked="" type="checkbox"/> | Root Group | inst_1 | Online |
| <input type="checkbox"/> | Root Group | inst_3 | Online |
| <input type="checkbox"/> | Root Group | inst_4 | Online |

Confirm ✕

⚠ Are you sure you want to shutdown the Agent?

No Yes, Shutdown

InformixHQ Server Shutdown View Agents ✕

View Agents Status

Search (Use ', ' OR ' + ' operator for multiple key) View Online

| <input type="checkbox"/> | Group Name | Server name | Agents Status |
|--------------------------|------------|-------------|---------------|
| <input type="checkbox"/> | Root Group | inst_3 | Online |
| <input type="checkbox"/> | Root Group | inst_4 | Online |



IHQ 2.1

- A major beneficial change occurred in the logging of errors and general information
 - Previously, Java stack traces were automatically logged creating very, very large and confusing log files
- In IHQ 2.1, the stack traces are enabled at the default `INFO` level
 - Only the relevant and important descriptive information is logged at this level
 - The file sizes are much smaller and easier to parse
 - Users can manage to what degree and detail is logged through the `DEBUG` and `TRACE` options in the log configuration file (`server.log4j.xml` and `agent.log4j.xml`)



IHQ 2.1

- Several changes were made to the `InformixHQ.bat/sh/ksh` utility
 - First is the ability to filter the `list` output by keyword to refine the result set
- While my test environment doesn't have that many IHQ objects, keyword refinement reduces the command output to just what I want to see

```
Inst_1_8: InformixHQ.sh list

  PID USER      COMMAND
 25094 informix java -Dfile.encoding=en_us819 -jar informixhq-server.jar server.properties
 25369 informix java -Dfile.encoding=en_us819 -jar informixhq-agent.jar agent_properties.inst1
 25479 informix java -Dfile.encoding=en_us819 -jar informixhq-agent.jar agent_properties.inst3
 25577 informix java -Dfile.encoding=en_us819 -jar informixhq-agent.jar agent_properties.inst4

INFO: In case, process is not listed after startserver/startagent command, please check the log

Inst_1_8: InformixHQ.sh list inst1

  PID USER      COMMAND
 25369 informix java -Dfile.encoding=en_us819 -jar informixhq-agent.jar agent_properties.inst1

INFO: In case, process is not listed after startserver/startagent command, please check the log

Inst_1_8:
```

IHQ 2.1

- Next are changes to the stop server and stop agent CLI commands
 - In earlier versions, the processID of the server or agent was required to stop it
 - Required executing a `list` command to find it / them then an action for each processID

```
InformixHQ [startserver|startagent] [  
InformixHQ [stop <processid>]  
InformixHQ [list]
```

- In v.2.1, stopping either the server or agents is interactive
 - For example, agents using the new `stopagent` keyword

```
Inst_1_8: InformixHQ.sh stopagent  
  
INFO: This command has found 3 agent process(es).  
  
    PID USER      COMMAND  
25369 informix java -Dfile.encoding=en_us819 -jar informixhq-agent.jar agent_properties.inst1  
25479 informix java -Dfile.encoding=en_us819 -jar informixhq-agent.jar agent_properties.inst3  
25577 informix java -Dfile.encoding=en_us819 -jar informixhq-agent.jar agent_properties.inst4  
  
Please Press:  
0: exit  
1: terminate all  
2: terminate one by one  
  
Please enter one of the above options [0/1/2]:
```


IHQ 2.1

- Obviously, selecting `terminate all` shuts down all the listed agents
 - Selecting the `one by one` option displays each agent and gives you the option to terminate or skip to the next agent

```
1: terminate all
2: terminate one by one

Please enter one of the above options [0/1/2]:2

      PID USER      COMMAND
25369 informix java -Dfile.encoding=en_us819 -jar informixhq-agent.jar agent_properties.inst1

Please press:
0: exit
1: terminate
2: move next

Please enter one of the above options [0/1/2]:
```

IHQ 2.1

- Similarly, the `stopserver` option displays the active IHQ server process and the options to quit or terminate the server

```
Inst_1_8: InformixHQ.sh stopserver

INFO: This command has found 1 server process(es).

      PID USER      COMMAND
 25094 informix java -Dfile.encoding=en_us819 -jar informixhq-server.jar server.properties

Please Press:
0: exit
1: terminate

Please enter one of the above options [0/1]:
```

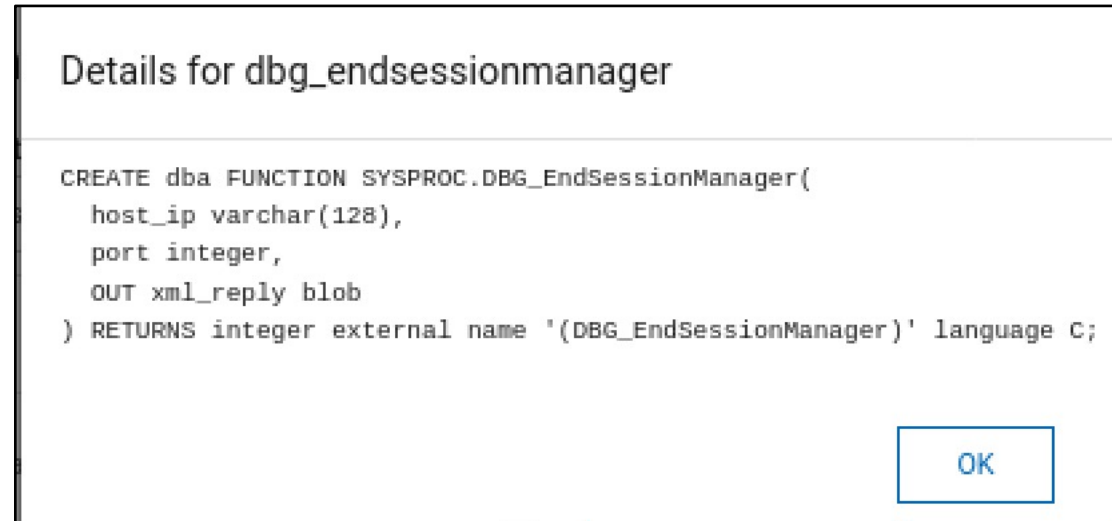
- For compatibility sake, you can still use the legacy `stop processID` command to stop agents or the server

```
startagent      : Starts InformixHQ Agent service
stop            : Stops InformixHQ Server/Agent service with processId
stopserver     : Stops InformiHQ Server process
```



IHQ 2.1

- Some user friendly interface enhancements are introduced
 - The output from the **Schema Manager:Stored Procedures & Functions** options are now formatted to easier reading and understanding



```
Details for dbg_endsessionmanager

CREATE dba FUNCTION SYSPROC.DBG_EndSessionManager(
    host_ip varchar(128),
    port integer,
    OUT xml_reply blob
) RETURNS integer external name '(DBG_EndSessionManager)' language C;
```

OK

IHQ 2.1

- The **Storage:Logs** option which displays information about instance logical logs has more details in a user friendly view including
 - The current log
 - Log usage
 - Hovering over a graph displays the numeric percentage
 - Backup status of logs

The screenshot displays the 'Logical Logs' interface. At the top, there are tabs for 'Logical Logs' and 'Current Log', along with 'Add Log' and 'Switch Log' buttons. The main content is a table with the following columns: Number, Unique ID, Size, % Used, Location, Last Filled, Notes, Backed Up, and Fill Rate. The table contains four rows of log data. The third row (Number 15) is highlighted as the 'Current' log. A tooltip shows '33%' for the '% Used' column of this row. The 'Backed Up' column shows a green checkmark for the first two rows and a red 'X' for the last two. Navigation buttons (First, Previous, 1, Next, Last) and a 'Rows per page' dropdown (set to 20) are visible at the bottom.







| Number | Unique ID | Size | % Used | Location | Last Filled | Notes | Backed Up | Fill Rate |
|--------|-----------|---------|--------|----------|---------------------|--------------------|-----------|---------------|
| 13 | 11 | 9.77 MB | | 3_20053 | 2022-09-07 12:47:37 | Used and Backed up | ✓ | 2.62 KB/SEC |
| 14 | 12 | 9.77 MB | | 3_25053 | 2022-09-07 15:49:22 | Used and Backed up | ✓ | 939.008 B/SEC |
| 15 | 13 | 9.77 MB | | 3_30053 | Not Full | Used and Current | ✗ | N/A |
| 16 | 0 | 9.77 MB | | 3_35053 | Not Full | Newly Added | ✗ | N/A |

IHQ 2.1

- The **Storage:Spaces view as chunks** window now provides the ability to copy the chunk path for any given chunk

Chunks View as ▾ + Add Chunk ↻

🔍 Search space or path (Use ', ' OR ' + ' operator for multiple keyword search).

| Number ↕ | Space ↕ | Status | % Used ▾ | Size ↕ | Extendable | Read Time ↕ | Write Time ↕ | Reads ↕ | Writes ↕ | Path ↕ | |
|----------|-----------|--------|---|----------|------------|-------------|--------------|---------|----------|-----------|---|
| 3 | log_space | ● | <div style="width: 70%; height: 10px; background-color: #0070C0; border: 1px solid #0070C0;"></div> | 200 MB | ✖ | 0.064 | 12.88 | 469 | 13908 | logspace |     |
| 1 | rootdbs | ● | <div style="width: 20%; height: 10px; background-color: #0070C0; border: 1px solid #0070C0;"></div> | 97.66 MB | ✖ | 21.468 | 12.002 | 3256 | 6858 | rootspace |   |

Copy path

- In this test system, there is an H/A cluster running inside one VM so *relative* rather than *absolute* chunk paths must be used
 - In a “normal” system, the full path to the chunk device or symlink is displayed which can be copied
 - For example: `/opt/IBM/informix/devices/inst_1/logspace`

Questions



Announcements

Announcements

- The FC8 release included a number of announcements of changes made and changes to come
- HP-UX
 - Informix stated that support for HP-UX will stop “soon”
 - This is due to the vendor’s end-of-life cycle on the product in December 2025
 - Informix will be removing support for HP-UX in future V.12 and V.14 fix packs
 - There isn’t a definite date yet when that will happen
 - It’s reasonable to assume it will occur in 2023 or early 2024
 - HP-UX will NOT be a supported port in the V.Next release scheduled for mid 2023
 - The Informix team is ready and willing to help customers needing to migrate from HP-UX to another supported platform
 - `cdr migrate server` and other migration tools are available as well as service partners

Announcements

- Removal of the embedded JRE
 - With the release of V.14.10, Informix required a Java Runtime environment at 1.8 or higher to install
 - That notwithstanding, the engine still had an internal JRE which it used for Java UDRs and other internal processes
 - In the very near future, the internal JRE (found in `$INFORMIXDIR/extend/krakatoa/jre`) will be removed
 - You will be required to set `JAVA_HOME` to the JRE you installed for installation and other Java-based processing
 - With this change, you can manage the Java level for your environment and install patches / upgrades according to your needs and requirements

Announcements

- Removal of Communication Support Modules
 - Future Informix releases will no longer contain the Encryption Communication Support Module (ENCCSM) nor the Generic Security Services Communication Support Module (GSSCSM)
 - These use older, less secure encryption protocols and methods
 - Informix moved to TLS for communication security

- Older TLS versions are now disabled
 - Transport Layer Security is the standard for securing network-based communication
 - Support for older versions, specifically 1.0 and 1.1 has been removed
 - You must use versions 1.2 (default) or 1.3

- IBM GSKIT to be replaced by IBM Global Security Kit (GSKit)
 - Future Informix releases will no longer contain IBM Global Security Kit (GSKit)
 - Communication security will be implemented using Transport Layer Security (TLS) and Key Stores or Remote Keystores (RKS) such as Amazon, Google or KMIP

Correction — Apparently the GSKit is NOT being removed contrary to what was said in the webcast

Questions



Appendix

Migration / upgrade processes - IHQ

- If FC8 is installed on top of an earlier binary, there is no “old_dir” and “new_dir” for the upgrade command to work against
 - You will have to manually execute each step of the migration process
- Note — if encryption is enabled in the IHQ server properties files, there are some variations to the examples that follow
 - See the documentation for more details
- First, after shutting down IHQ, make a copy of the H2 database file(s) and store them somewhere for safekeeping
- Second, download the required components and move them into position
 - Since the command requires two databases, you need to download an earlier version as well as the current version of the databases
 - Specifically h2 versions 2.1.214 and 1.4.192
 - Go to <https://mvnrepository.com/artifact/com.h2database/h2>



H2 Database Engine

A fast SQL database that can run embedded or a server mode with support for transactions, encryption, full search, etc. Storage can be disk-based or in-memory.

| | |
|-------------------|--|
| License | EPL 1.0 MPL 2.0 |
| Categories | Embedded SQL Databases |
| Tags | embedded database sql h2database |
| Ranking | #59 in MvnRepository (See Top Artifacts) #1 in Embedded SQL Databases |
| Used By | 7,366 artifacts |

- Central (134)
- WSO2 Dist (2)
- Redhat GA (10)
- Nuiton (1)
- ICM (1)

| Version | Vulnerabilities | Repository | Usages | Date |
|---------|-----------------|------------|--------|--------------|
| 2.1.x | | | | |
| 2.1.214 | | Central | 262 | Jun 14, 2022 |
| 2.1.212 | | Central | 242 | Apr 10, 2022 |
| 2.1.210 | | Central | 434 | Jan 17, 2022 |
| 2.0.206 | 1 vulnerability | Central | 135 | Jan 04, 2022 |

| | | | | |
|---------|-------------------|---------|-----|--------------|
| 1.4.193 | 3 vulnerabilities | Central | 463 | Oct 31, 2016 |
| 1.4.192 | 3 vulnerabilities | Central | 388 | May 26, 2016 |

Migration / upgrade processes - IHQ

- In the FC8 release, IHQ v.2.0 is distributed
 - IHQ development strongly recommends downloading and using IHQ v.2.1 instead
 - It is available on FixCentral
- After downloading, copy them into `$INFORMIXDIR/hq` and replace the existing server and agent files

```
Inst_1_8: cp informixhq-server-2.1.0.jar informixhq-server.jar
Inst_1_8:
Inst_1_8: cp informixhq-agent-2.1.0.jar informixhq-agent.jar
Inst_1_8:
```

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interim fix: informixhq-agent-2.1.0

informixhq-agent-2.1.0

The following files implement this fix.

↓ [informixhq-agent-2.1.0.jar](#) (4.19 MB)

interim fix: informixhq-server-2.1.0

informixhq-server-2.1.0

The following files implement this fix.

↓ [informixhq-server-2.1.0.jar](#) (25.1 MB)

Migration / upgrade processes - IHQ

- Download and copy the H2 jar files into the IHQ directory

```
Informix: pwd
/home/informix/Downloads
Informix:
Informix: ls -l
total 4220
-rw-rw-r--. 1 informix informix 1775801 Aug 30 16:10 h2-1.4.192.jar
-rw-rw-r--. 1 informix informix 2543012 Aug 30 16:09 h2-2.1.214.jar
Informix:
Informix: cp * /opt/IBM/informix/14_10_8/hq/
Informix:
```

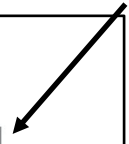
```
rw-r--r--. 1 informix informix 5521 Aug 30 11:33 agent_properties.inst8
-rw-rw-r--. 1 informix informix 1775801 Aug 30 16:26 h2-1.4.192.jar
-rw-rw-r--. 1 informix informix 2543012 Aug 30 16:26 h2-2.1.214.jar
-rw-----. 1 informix informix 573440 Aug 30 16:25 h2db.mv.db
-rw-----. 1 informix informix 0 Aug 30 16:25 h2db.trace.db
-rw-r--r--. 1 informix informix 5522 Apr 5 20:19 informixhq-agent-example.properties
-rw-r--r--. 1 informix informix 4201607 Apr 5 20:19 informixhq-agent.jar
```

Migration / upgrade processes - IHQ

- Third, create the database schema change file
 - This is a simple SQL file
 - Create it in the IHQ directory

```
ALTER TABLE IF EXISTS users ALTER COLUMN ID SET NOT NULL;
ALTER TABLE IF EXISTS users ADD PRIMARY KEY (ID);
ALTER TABLE IF EXISTS informix_servers ALTER COLUMN ID SET NOT NULL;
ALTER TABLE IF EXISTS informix_servers ADD PRIMARY KEY (ID);
ALTER TABLE IF EXISTS informix_server_groups ALTER COLUMN ID SET NOT NULL;
ALTER TABLE IF EXISTS informix_server_groups ADD PRIMARY KEY (ID);
ALTER TABLE IF EXISTS alerting_incidents ALTER COLUMN ID SET NOT NULL;
ALTER TABLE IF EXISTS alerting_incidents ADD PRIMARY KEY (ID);
```

```
-rw----- . 1 informix informix 573440 Aug 30 16:25 h2db.mv.db
-rw----- . 1 informix informix 0 Aug 30 16:25 h2db.trace.db
-rw-rw-r-- . 1 informix informix 515 Aug 30 16:42 ihq_migrate.sql
-rw-r--r-- . 1 informix informix 5522 Apr 5 20:19 informixhq-agent-exa
-rw-r--r-- . 1 informix informix 4201687 Apr 5 20:19 informixhq-agent-ia
```



Migration / upgrade processes - IHQ

- Fourth, execute the migration script then export the data to import into the new database
 - Alter the database

```
java -cp <ihq_path>/h2-1.4.192.jar org.h2.tools.RunScript -url jdbc:h2:./h2db -  
script migratescript.sql
```

- where

- `ihq_path` is replaced with the fully pathed location of the IHQ directory where the old database, recently downloaded files and migration script are located
- `migratescript.sql` is replaced with the name of database alteration script you created

```
Inst_1_8:  
Inst_1_8: java -cp /opt/IBM/informix/14_10_8/hq/h2-1.4.192.jar org.h2.tools.RunScript -url jdbc:h2:./h2db  
-script ihq_migrate.sql  
Inst_1_8:
```

Migration / upgrade processes - IHQ

- Export the database data to a file
 - A zip file called `h2db.zip` is created though you can probably call it whatever you want

```
java -cp <ihq_path>/h2-1.4.192.jar org.h2.tools.Script -url jdbc:h2:./h2db -script  
h2db.zip -options compression zip
```

- where
 - `ihq_path` is replaced with the fully pathed location of the IHQ directory where the old database, recently downloaded files and migration script are located

```
Inst_1_8:  
Inst_1_8: java -cp /opt/IBM/informix/14_10_8/hq/h2-1.4.192.jar org.h2.tools.Script -url jdbc:h2:./h2db  
-script h2db.zip -options compression zip  
Inst_1_8:  
Inst_1_8: ls -l *zip  
-rw-rw-r--. 1 informix informix 11908 Aug 30 17:00 h2db.zip  
Inst_1_8:
```

Migration / upgrade processes - IHQ

- Fifth, “archive” the original database in order to create the new one
 - Use the `mv` command to rename the file
 - Again, you can use any name that is convenient

```
mv h2db.mv.db h2db_old.mv.db
```

```
-rw-----. 1 informix informix 573440 Aug 30 16:53 h2db.mv.db
-rw-----. 1 informix informix      0 Aug 30 16:25 h2db.trace.db
-rw-rw-r--. 1 informix informix  11908 Aug 30 17:00 h2db.zip
Inst_1_8:
Inst_1_8: mv h2db.mv.db h2db_old.mv.db
Inst_1_8:
Inst_1_8: ls -l h2*
-rw-rw-r--. 1 informix informix 1775801 Aug 30 16:26 h2-1.4.192.jar
-rw-rw-r--. 1 informix informix 2543012 Aug 30 16:26 h2-2.1.214.jar
-rw-----. 1 informix informix  573440 Aug 30 16:53 h2db_old.mv.db
-rw-----. 1 informix informix      0 Aug 30 16:25 h2db.trace.db
-rw-rw-r--. 1 informix informix  11908 Aug 30 17:00 h2db.zip
Inst_1_8:
```

Migration / upgrade processes - IHQ

- Sixth, create the new database and insert the data previously exported

```
java -cp <ihq_path>/h2-2.1.214.jar org.h2.tools.RunScript -url  
jdbc:h2:./h2db -script fname.zip -options compression zip FROM_1X
```

- where

- `ihq_path` is replaced with the fully pathed location of the IHQ directory where the old database, recently downloaded files and migration script are located
- `fname.zip` is the name of the data export file you created
 - Examples use `h2db.zip`

```
Inst_1_8:  
Inst_1_8: java -cp /opt/IBM/informix/14_10_8/hq/h2-2.1.214.jar org.h2.tools.RunScript -url jdbc:h2:./h2db  
-script h2db.zip -options compression zip FROM_1X  
Inst_1_8:  
Inst_1_8: ls -l h2db*  
-rw-rw-r--. 1 informix informix 57344 Aug 31 15:24 h2db.mv.db  
-rw-----. 1 informix informix 573440 Aug 30 16:53 h2db_old.mv.db  
-rw-----. 1 informix informix 0 Aug 30 16:25 h2db.trace.db  
-rw-rw-r--. 1 informix informix 11908 Aug 30 17:00 h2db.zip  
Inst_1_8: █
```

Migration / upgrade processes - IHQ

- At this point you can start the IHQ server and agents
- You can clean up the extraneous files

```
Inst_1_8: cd $INFORMIXDIR/hq
Inst_1_8:
Inst_1_8: InformixHQ.sh startserver encoding=en_us819 propfile=server.properties

INFO: Please use list command to verify the process.

Inst_1_8:
Inst_1_8: InformixHQ.sh list

  PID USER      COMMAND
  4708 informix java -Dfile.encoding=en_us819 -jar informixhq-server.jar server.pr
operties

INFO: In case, process is not listed after startserver/startagent command, please
check the log files.

Inst_1_8: □
```



InformixHQ



Questions

