



THE IBM INFORMIX V.14.10.XC6 DEEP DIVE STARTS AT 10 AM CDT

PLEASE MUTE YOUR AUDIO DEVICE, THANKS!





International
Informix
Users Group

IBM Informix v.14.10.xC6 Technical Deep Dive Webcast series

Session 2: IHQ and backup from RS secondaries

Carlton Doe
World Wide Informix team
cdoe@us.ibm.com

IIUG Virtual event

October 5 - 7, 2021

- Three half days of hour-log technical sessions, keynotes, and tutorials
- NEW v.14.10 badge exam will be available as part of your paid registration
- Registration information coming soon
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IBM INFORMIX V.14.10.XC6 - INFORMIX HQ 1.5.0

v.2



Agenda

- Changes to start and stop script functionality
- Test connection
- Schema Manager enhancements
- ISAM error reporting
- Incident reporting and other enhancements

Changes to the start and stop script

Changes to the start and stop script

- Starting with IHQ 1.2.0, a shell script that makes starting, stopping and managing server and agent services was introduced
 - With 1.4.0, there have been numerous changes to the functionality
- First, in addition to a Windows and c shell (most Unixs/Linuxs) script there is now a Korn shell version of the script for AIX

```
Ifmx: pwd
/opt/IBM/informix/14_10/hq
Ifmx:
Ifmx: ls -x
agent.log4j.xml          h2db.mv.db              h2db.trace.db
informixhq-agent-example.properties  informixhq-agent.jar    informixhq-agent.log
informixhq-agent.properties          InformixHQ.bat          InformixHQ.ksh ←
informixhq-server-example.properties informixhq-server.jar    informixhq-server.log
informixhq-server.properties         InformixHQ.sh           server.log4j.xml
Ifmx:
```


Changes to the start and stop script

- Using the `help` option displays the new format for the command options

```
Ifmx: InformixHQ.sh help
Command: InformixHQ
This command starts/stops InformixHQ Server and Agent.

Syntax:
InformixHQ [startserver|startagent] [encoding=<value>] [jvmmemx=<value>] [jarfile=<value>] [propfile=<value>]
InformixHQ [stop <processid>]
InformixHQ [list]

startserver      : Starts InformixHQ Server service
startagent       : Starts InformixHQ Agent service
stop             : Stops InformixHQ Server/Agent service with processId
list             : Lists InformixHQ running processes
encoding (Optional) : Default value is utf-8
jvmmemx (Optional)  : JVM's default value will be used If not specified
jarfile (Optional)  : Default is informixhq-server.jar for startserver option and informixhq-agent.jar for startagent option.
                    : For user provided filename, it must contain keyword 'informixhq' and it should end with .jar
propfile (Optional) : Default is informixhq-server.properties for startserver option and informixhq-agent.properties for startagent option.
                    : User can provide any custom name to properties file

Ifmx:
```

- All the parameters are now lower rather than mixed case
- The ability to “name” a process for identification within a listing has been removed because AIX doesn’t support process naming
 - For example in 1.2.0 . . . startServer i_svr_1 encod.

Changes to the start and stop script

- Using the `help` option displays the new format for the command options

```
Ifmx: InformixHq.sh help
Command: InformixHq
This command starts/stops InformixHq Server and Agent.

Syntax:
InformixHq [startserver|startagent] [encoding=<value>] [jvmmemx=<value>] [jarfile=<value>] [propfile=<value>]
InformixHq [stop <processid>]
InformixHq [list]

startserver      : Starts InformixHq Server service
startagent       : Starts InformixHq Agent service
stop             : Stops InformixHq Server/Agent service with processId
list             : Lists InformixHq running processes
encoding (Optional) : Default value is utf-8
jvmmemx (Optional)  : JVM's default value will be used If not specified
jarfile (Optional)  : Default is informixhq-server.jar for startserver option and informixhq-agent.jar for startagent option.
                    : For user provided filename, it must contain keyword 'informixhq' and it should end with .jar
propfile (Optional) : Default is informixhq-server.properties for startserver option and informixhq-agent.properties for startagent option.
                    : User can provide any custom name to properties file

Ifmx:
```

- You can rename the jar and properties files and pass those new file names to the script with the `jarfile` and `propfile` parameters
 - Note - the jar file name must still contain `informixhq` in it and have a `.jar` suffix

Changes to the start and stop script

- Using the `help` option displays the new format for the command options

```
Ifmx: InformixHq.sh help
Command: InformixHq
This command starts/stops InformixHq Server and Agent.

Syntax:
InformixHq [startserver|startagent] [encoding=<value>] [jvmmemx=<value>] [jarfile=<value>] [propfile=<value>]
InformixHq [stop <processid>]
InformixHq [list]

startserver      : Starts InformixHq Server service
startagent       : Starts InformixHq Agent service
stop             : Stops InformixHq Server/Agent service with processId
list             : Lists InformixHq running processes
encoding (Optional) : Default value is utf-8
jvmmemx (Optional)  : JVM's default value will be used If not specified
jarfile (Optional)  : Default is informixhq-server.jar for startserver option and informixhq-agent.jar for startagent option.
                    : For user provided filename, it must contain keyword 'informixhq' and it should end with .jar
propfile (Optional) : Default is informixhq-server.properties for startserver option and informixhq-agent.properties for startagent option.
                    : User can provide any custom name to properties file

Ifmx:
```

- The properties file no longer must have a `.properties` suffix to it
 - For example, in 1.2.0 for multiple agents you had to name the files `informixhq-agent-1.properties`, `informixhq-agent-2.properties` etc., now you can name them `agent.properties_1`, `agent.prop_2` or what ever you want
 - The property file name is returned in the `list` output as illustrated next to distinguish services to stop

Changes to the start and stop script

- Using the `help` option displays the new format for the command options

```
Ifmx: InformixHq.sh help
Command: InformixHq
This command starts/stops InformixHq Server and Agent.

Syntax:
InformixHq [startserver|startagent] [encoding=<value>] [jvmmemx=<value>] [jarfile=<value>] [propfile=<value>]
InformixHq [stop <processid>]
InformixHq [list]

startserver      : Starts InformixHq Server service
startagent       : Starts InformixHq Agent service
stop             : Stops InformixHq Server/Agent service with processId
list             : Lists InformixHq running processes
encoding (Optional) : Default value is utf-8
jvmmemx (Optional)  : JVM's default value will be used If not specified
jarfile (Optional)  : Default is informixhq-server.jar for startserver option and informixhq-agent.jar for startagent option.
                    : For user provided filename, it must contain keyword 'informixhq' and it should end with .jar
propfile (Optional) : Default is informixhq-server.properties for startserver option and informixhq-agent.properties for startagent option.
                    : User can provide any custom name to properties file

Ifmx:
```

- There is a `list` option that displays the active IHQ processes on the server with its configuration file

```
Ifmx: InformixHq.sh list
ProcessId Name Jar Properties
5385 java informixhq-server.jar informixhq-server.properties
5882 java informixhq-agent.jar informixhq-agent.properties

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


Changes to the start and stop script

- Using the `help` option displays the new format for the command options

```
Ifmx: InformixHq.sh help
Command: InformixHq
This command starts/stops InformixHq Server and Agent.

Syntax:
InformixHq [startserver|startagent] [encoding=<value>] [jvmmemx=<value>] [jarfile=<value>] [propfile=<value>]
InformixHq [stop <processid>]
InformixHq [list]

startserver      : Starts InformixHq Server service
startagent       : Starts InformixHq Agent service
stop             : Stops InformixHq Server/Agent service with processId
list             : Lists InformixHq running processes
encoding (Optional) : Default value is utf-8
jvmmemx (Optional)  : JVM's default value will be used If not specified
jarfile (Optional)  : Default is informixhq-server.jar for startserver option and informixhq-agent.jar for startagent option.
                    : For user provided filename, it must contain keyword 'informixhq' and it should end with .jar
propfile (Optional) : Default is informixhq-server.properties for startserver option and informixhq-agent.properties for startagent option.
                    : User can provide any custom name to properties file

Ifmx:
```

- The default locale encoding is still `utf-8` which might or might not work for your instance environments
 - If it doesn't, make sure to include the `encoding=xxxxxx` clause in your start commands

```
Ifmx: InformixHq.sh startserver encoding=en_us819
```

Changes to the start and stop script

- One quick note on starting the IHQ server and agent(s)
 - An XML configuration file (`server.log4j.xml`) should (but doesn't necessarily have to) exist in the HQ directory
 - If it does, the startup messages displayed earlier appear when starting IHQ processes
- If the file is moved, deleted, renamed so it's not "available", some logging messages will appear when starting services
 - This indicates the configured file is missing
 - The services will start correctly and function properly

```
informix@LP1-AP-51927916:/log4js_test$ ./InformixHQ.sh startserver
2021-04-21 16:09:22,536 main INFO Log4j appears to be running in a Servlet environment, but there's no log4j-web module available. If you want better web container support, please add the log4j-web JAR to your web archive or server lib directory.
2021-04-21 16:09:22,541 main INFO Log4j appears to be running in a Servlet environment, but there's no log4j-web module available. If you want better web container support, please add the log4j-web JAR to your web archive or server lib directory.

INFO: Please use list command to verify the process.

informix@LP1-AP-51927916:/log4js_test$
```

Changes to the start and stop script

- The stop process has been changed and improved as well
 - A processID and not a service name is used
 - The script now checks to make sure the processID is actually an IHQ process and aborts if it isn't

```
Ifmx: InformixHQ.sh list
ProcessId  Name  Jar  Properties
5385 java informixhq-server.jar informixhq-server.properties
5882 java informixhq-agent.jar informixhq-agent.properties

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

- Attempting to stop an incorrect processID produces this error

```
Ifmx: InformixHQ.sh stop 5386
ERROR: Process 5386 is not one of the running InformixHQ processes.
INFO: Use list option to see InformixHQ processes.
```

Changes to the start and stop script

- Otherwise, when the correct processID is used, the IHQ service (agent or server) is stopped

```
Ifmx: InformixHQ.sh stop 5882
SUCCESS: The process with PID 5882 has been terminated.

Ifmx:
Ifmx: InformixHQ.sh list
ProcessId  Name  Jar  Properties
5385 java informixhq-server.jar informixhq-server.properties

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

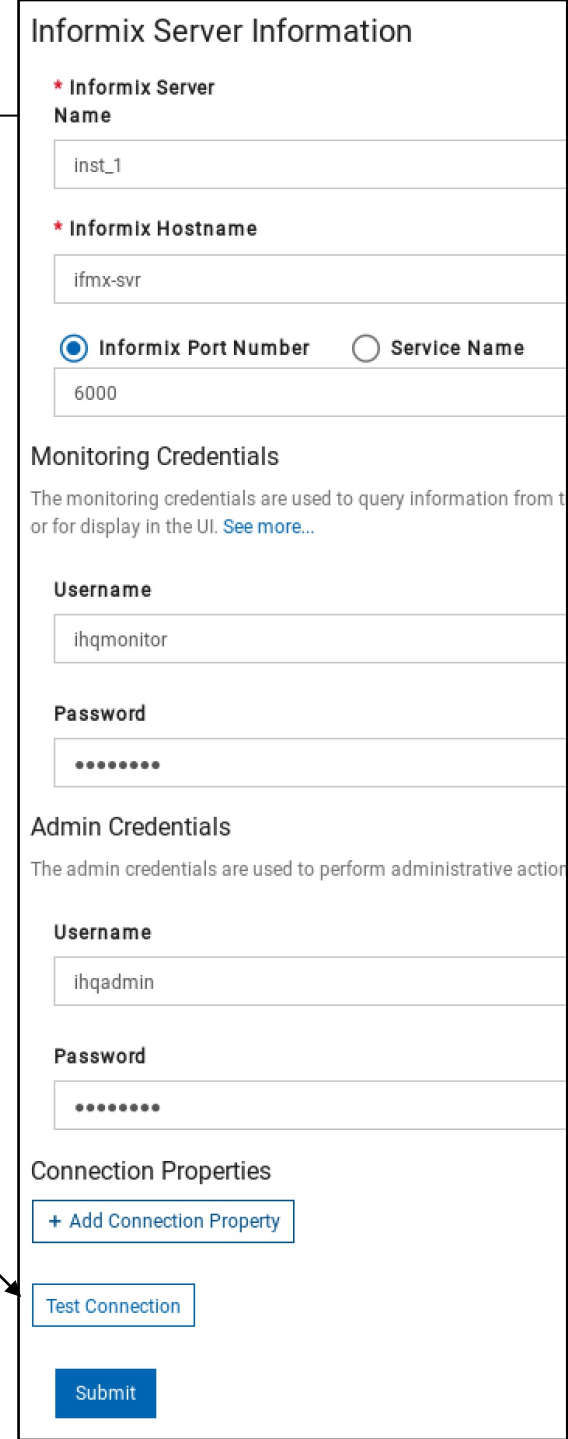
Ifmx:
```




Test connection and agent connection properties

Test connection, agent connection properties

- Several enhancements have been made to defining and operating instance connections
 - First is the ability to test the validity of the instance definition as well as the monitor and administration credentials
 - After entering instance connection information, a **Test Connection** button becomes active



The screenshot shows a web form titled "Informix Server Information". It contains several sections for configuration:

- * Informix Server Name**: A text input field containing "inst_1".
- * Informix Hostname**: A text input field containing "ifmx-svr".
- Informix Port Number** (selected with a radio button) and **Service Name** (unselected): A text input field containing "6000".
- Monitoring Credentials**: A section with a description "The monitoring credentials are used to query information from t or for display in the UI. [See more...](#)". It includes a **Username** field with "ihqmonitor" and a **Password** field with masked characters ".....".
- Admin Credentials**: A section with a description "The admin credentials are used to perform administrative action". It includes a **Username** field with "ihqadmin" and a **Password** field with masked characters ".....".
- Connection Properties**: A section containing a "+ Add Connection Property" button, a "Test Connection" button (highlighted by an arrow from the left), and a "Submit" button at the bottom.

Test connection, agent connection properties

- If you enter incorrect server or port information, an error is returned

✖ Could not connect to Informix: jdbc:informix-sqli://ifmx-svr:6000: sysmaster. Socket connection to server (ifmx-svr:6000) failed. Check your server is reachable from this client on the host:port specified.

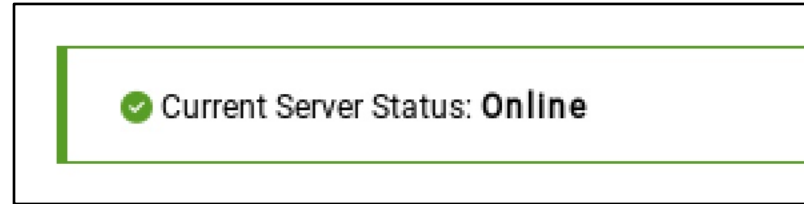
- If you make a mistake with either the monitor or administration credentials, the error indicates which ID has the problem

✖ Could not connect to Informix: jdbc:informix-sqli://ifmx-svr:60000: sysmaster. Incorrect password or user com.informix.asf.IfxAASRemoteException: ihqmonitor@localhost[ifmx-svr] is not known on the database server.

✖ Could not connect to Informix: jdbc:informix-sqli://ifmx-svr:60000: sysmaster. Incorrect password or user com.informix.asf.IfxAASRemoteException: ihqadmin@localhost[ifmx-svr] is not known on the database server.

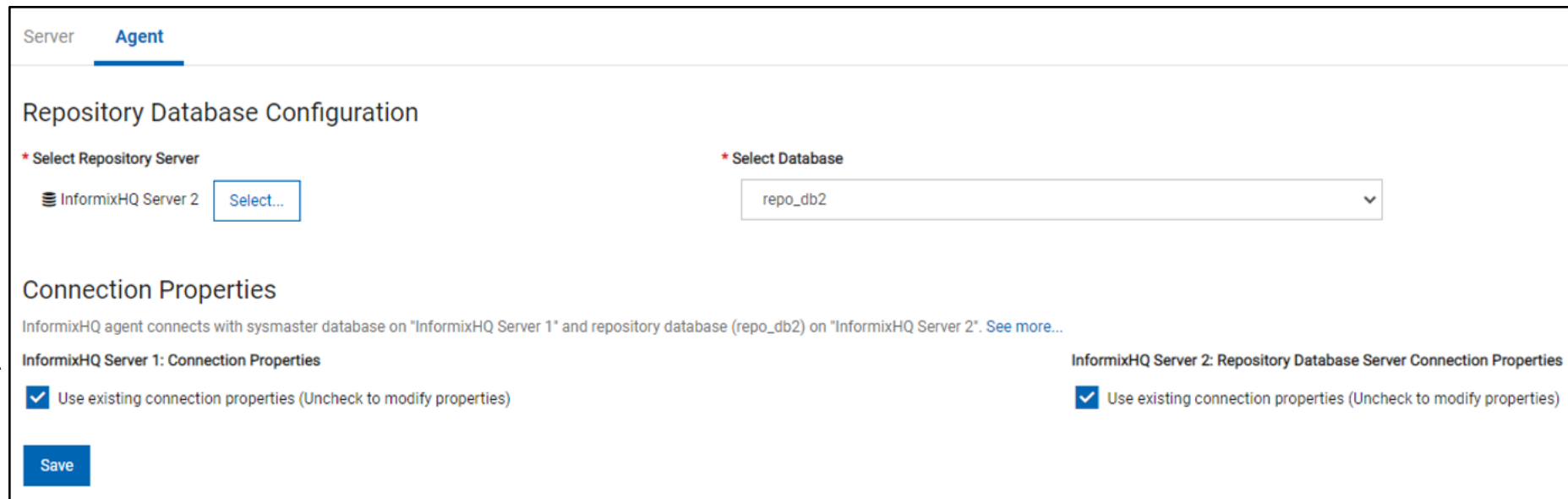
Test connection, agent connection properties

- If everything is properly configured, a successful connection message is returned and you can add the instance to the group



Test connection, agent connection properties

- The ability to define specific connection properties for both the server and agent processes has existed for quite a while
 - In IHQ 1.5.0, the agent property configuration has moved to the Agent setup page
- You can use the same properties as the server or modify them as needed for that specific instance agent
 - When unchecked, the server properties are copied to the agent and are available for modification



The screenshot displays the 'Agent' tab of the 'Repository Database Configuration' page. It includes a 'Select Repository Server' dropdown with 'InformixHQ Server 2' selected, a 'Select Database' dropdown with 'repo_db2' selected, and a 'Connection Properties' section. The 'Connection Properties' section contains two sub-sections: 'InformixHQ Server 1: Connection Properties' and 'InformixHQ Server 2: Repository Database Server Connection Properties'. Both sub-sections have a checked checkbox labeled 'Use existing connection properties (Uncheck to modify properties)'. A 'Save' button is located at the bottom left. An arrow points from the left margin to the 'InformixHQ Server 1: Connection Properties' section.

Server Agent

Repository Database Configuration

* Select Repository Server

InformixHQ Server 2 [Select...](#)

* Select Database

repo_db2

Connection Properties

InformixHQ agent connects with sysmaster database on "InformixHQ Server 1" and repository database (repo_db2) on "InformixHQ Server 2". [See more...](#)

InformixHQ Server 1: Connection Properties

☒ Use existing connection properties (Uncheck to modify properties)

InformixHQ Server 2: Repository Database Server Connection Properties

☒ Use existing connection properties (Uncheck to modify properties)

[Save](#)

Test connection, agent connection properties

- Similarly, if the IHQ repository database is located in a remote instance, you can specify connection properties for that instance / database
 - When unchecked, the existing properties are copied to the agent and are available for modification

Server **Agent**

Repository Database Configuration

* Select Repository Server

InformixHQ Server 2 [Select...](#)

* Select Database

repo_db2

Connection Properties

InformixHQ agent connects with sysmaster database on "InformixHQ Server 1" and repository database (repo_db2) on "InformixHQ Server 2". [See more...](#)

InformixHQ Server 1: Connection Properties

☒ Use existing connection properties (Uncheck to modify properties)

InformixHQ Server 2: Repository Database Server Connection Properties

☒ Use existing connection properties (Uncheck to modify properties)

[Save](#)

Test connection, agent connection properties

- Using this option, you can
 - Specify different communication encryption keystore paths if necessary
 - Define other parameters as needed

Server

Agent

Repository Database Configuration

* Select Repository Server

InformixHQ Server 2 Select...

* Select Database

repo_db2 ▼

Connection Properties

InformixHQ agent connects with sysmaster database on "InformixHQ Server 1" and repository database (repo_db2) on "InformixHQ Server 2". [See more...](#)

InformixHQ Server 1: Connection Properties

☐ Use existing connection properties (Uncheck to modify properties)

SSLCONNECTION	true	✖
SSL_TRUSTSTORE	~/document/informix_ssl/keystore.jks	✖
SSL_TRUSTSTORE_PASSW	✖

+ Add Connection Property

InformixHQ Server 2: Repository Database Server Connection Properties

☐ Use existing connection properties (Uncheck to modify properties)

SSLCONNECTION	true	✖
SSL_TRUSTSTORE	~/informix/ssl/agent.jks	✖
SSL_TRUSTSTORE_PASSW	✖

+ Add Connection Property

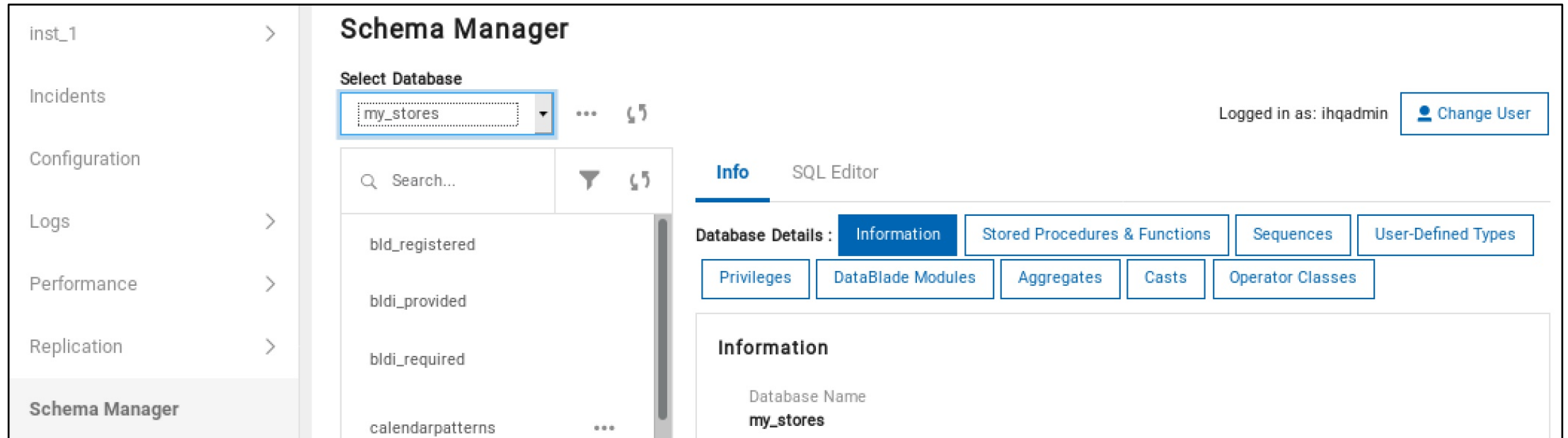
Save



Schema Manager enhancements

Schema manager

- With IHQ 1.2.0, there was a significant overhaul of the IHQ Schema Manger component
 - A lot of new and very useful functionality was added



- In IHQ 1.5.0, there are new cosmetic and functional enhancements

Schema manager

- For example, selecting a database within Schema Manager used to display information in a columnar format requiring you to scroll up and down the window to find information
 - Now the information is readily available in a tabular format

Schema Manager

Select Database

my_stores

...

↺

Q Search...

▼

↺

sysaggregates

...

sysams

...

sysattrtypes

...

sysautolocate

...

sysblobs

...

syscasts

...

syschecks

...

Logged in as: ihqadmin

Change User

Info

SQL Editor

Database Details :

Information

Stored Procedures & Functions

Sequences

User-Defined Types

Privileges

DataBlade Modules

Aggregates

Casts

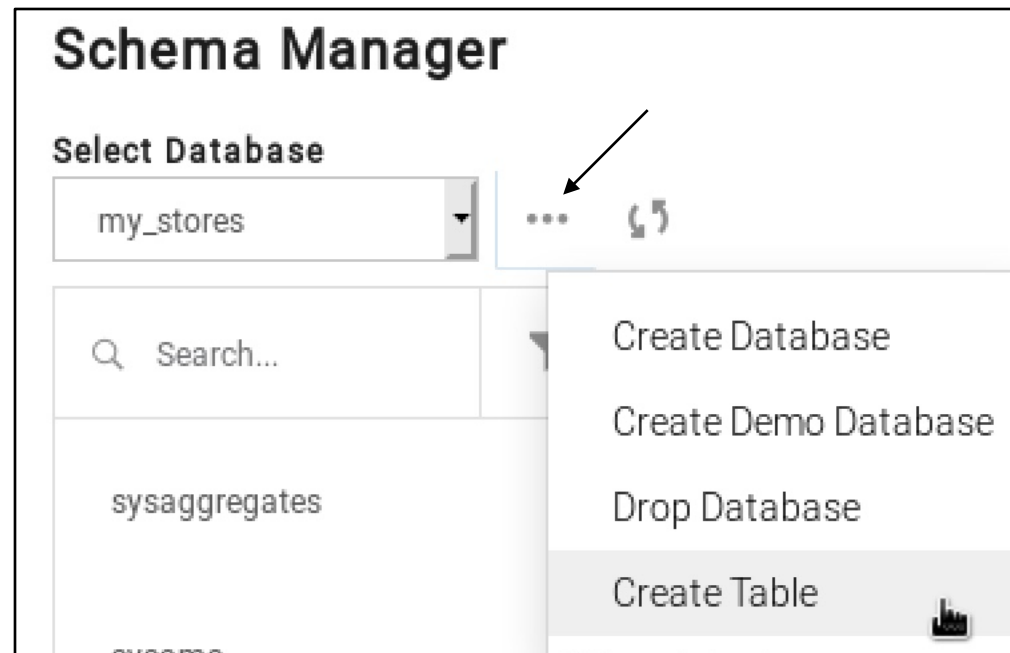
Operator Classes

Information

Database Name	Owner	Created Date	Dbpace
my_stores	Informix	2020-02-05	data_space_1
Logging Mode	Locale	Space Occupied	Case Sensitive
Unbuffered	en_US.819	3.83 MB	Yes
GLS	Load Tasks	Unload Tasks	
Disabled	0	0	

Schema manager

- A new **Create Table** option is now available from the switch by the database dropdown
 - It is both intelligent and fully featured
 - Intelligent — you can go back to make changes preserving other configured values rather than having to cancel and restart
 - Fully featured — it provides options for almost any table configuration you need



Schema manager

- As the creation process occurs, hovering over a field displays basic documentation for that field

Create Table

* Table Name: my_test_tab

* Table Owner: informix

Table Type: Standard

Table Columns: No columns defined.

☐ Table Check Constraint

Cancel Next

Specify whether the table is standard (logging), raw (non logging), or external with fixed-length records or delimited fields.

- You can create standard, raw or externally stored tables

Table Type

Standard

Raw

External Fixed

External Delimited

External Informix

Schema manager

- When adding columns, almost any data type can be selected including JSON/BSON
 - You can also enforce a check constraint on values as well as null / not null

Add Columns

* **Column Name**
col_1

Default Value
NULL

☐ **Column Check Constraint**

☐ **Table Check Constraint**

Select Data Type
INTEGER
BIGINT
BIGSERIAL
BLOB
BOOLEAN
BSON
BYTE
CHAR
CLOB
DATE
DATETIME
DECIMAL
FLOAT
INTERVAL
JSON
LIST
LONGVARCHAR
LVARCHAR
MONEY
MULTiset

☒ **Allow Null Values**

Close **Add**

Cancel **Next**

Schema manager

- Once all the columns are added, the next screen provides the ability to add primary, unique or foreign key constraints

Primary Key

*** Primary Key Name**

No columns available.

Foreign Key

No foreign key defined.

Add

Unique Key

No unique key defined.

Add

Back

Advance Table Options

View SQL

Cancel

Schema manager

- Clicking the **Advanced Table Options** button allows you to specify extent sizing, update statistics parameters, table lock mode, index storage configuration and other options

Table Advance Options

Lock Mode ☐ Page ☒ Row

Table Options

- | | |
|--------------------------------------------------------------------------|---------------------------------------------------------------|
| <input type="checkbox"/> Row versions columns (VERCOLS) | <input type="checkbox"/> Primary key columns for ER (ERKEY) |
| <input type="checkbox"/> Conflict resolution columns for ER (CRCOLS) | <input type="checkbox"/> Selective row-level auditing (AUDIT) |
| <input type="checkbox"/> Consistency checking columns for ER (REPLCHECK) | <input type="checkbox"/> Automatic compression (COMPRESSED) |

Auto Update Statistics Options

Specify the minimum change threshold: ☒ Use the system setting ☐ Set the threshold

Enter the Extent Size or use Extent Size Estimator

Extent Size Estimator

Expected number of rows

Growth Rate

Estimate

Extent Size(KB)

First Extent

Next Extent

Index Storage Options

☒ Follow the table storage scheme ☐ Specify the storage scheme

Back

View Query & Create

Cancel

Schema manager

- At almost every step, you can select an option to see the raw creation statement to verify the table creation statement based on choices made
 - You can either create the table or move back to make changes then create
 - If you move back, your selections are saved, you don't have to restart again

View Query (Review the SQL statement that creates the table)

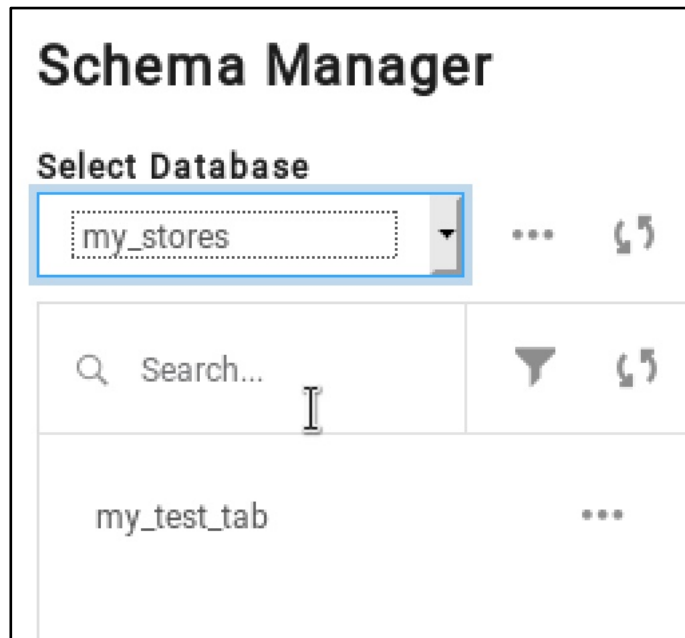
```
CREATE STANDARD TABLE 'informix'.my_test_tab
(
  col_1 INTEGER DEFAULT NULL,
  col_2 VARCHAR(25) DEFAULT NULL
)

;

ALTER TABLE 'informix'.my_test_tab LOCK MODE(row);
```

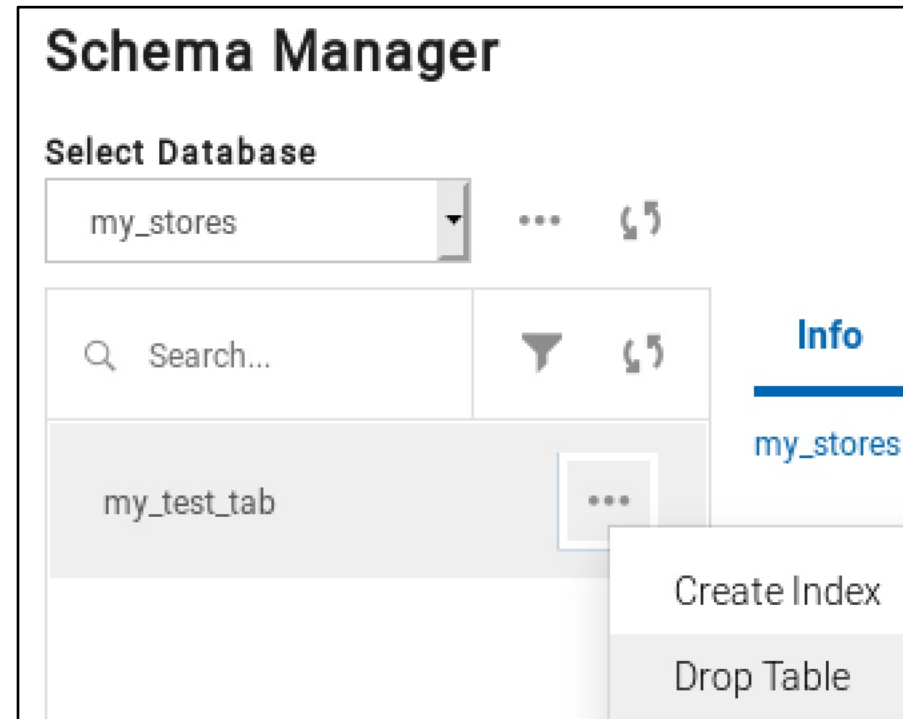
Schema manager

- There is field level verification at each step of the process instead of at the end to identify errors early and quickly
 - For example, the `my_test_tab` table was created, I get a field-level verification error if I attempt to create another table with the same name



Schema manager

- There is now a **Drop table** option as well

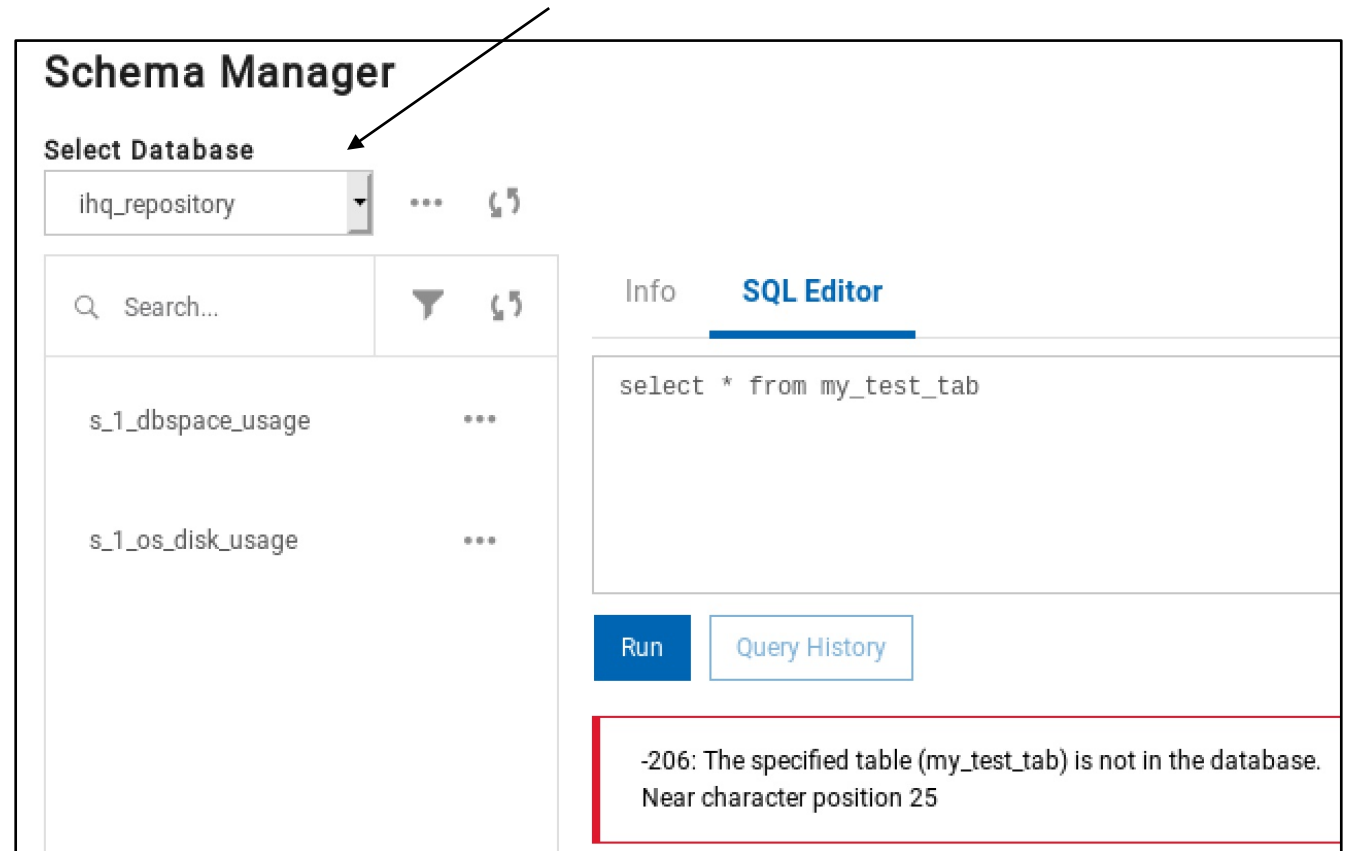




ISAM error reporting

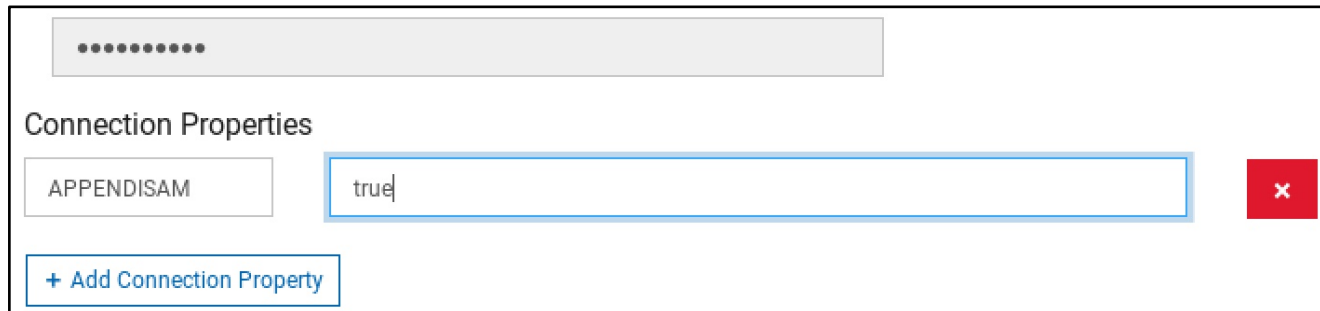
ISAM error reporting

- As illustrated briefly earlier in the presentation, the **Add Connection Property** button can append parameters that affect how IHQ operates
 - One of this is whether or not ISAM errors are returned when executing SQL operations through the **SQL Editor**
- For example, the `my_test_tab` table exists in the `my_stores` database
 - I try to select from it but am connected to the incorrect database
 - The query fails as expected with basic error information returned



ISAM error reporting

- To include the ISAM error, add the `APPENDISAM = true` property to the instance connection, click **Save**, then re-execute the query

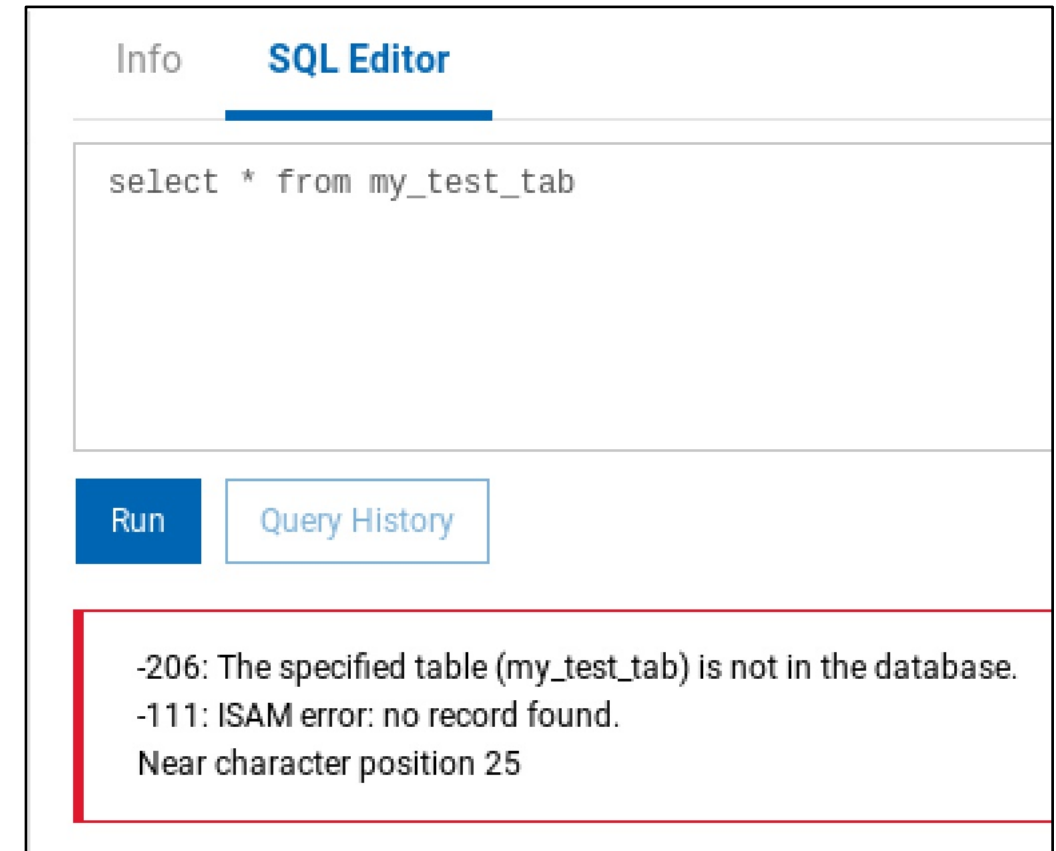


.....

Connection Properties

APPENDISAM true

+ Add Connection Property



Info **SQL Editor**

```
select * from my_test_tab
```

Run Query History

-206: The specified table (my_test_tab) is not in the database.
-111: ISAM error: no record found.
Near character position 25

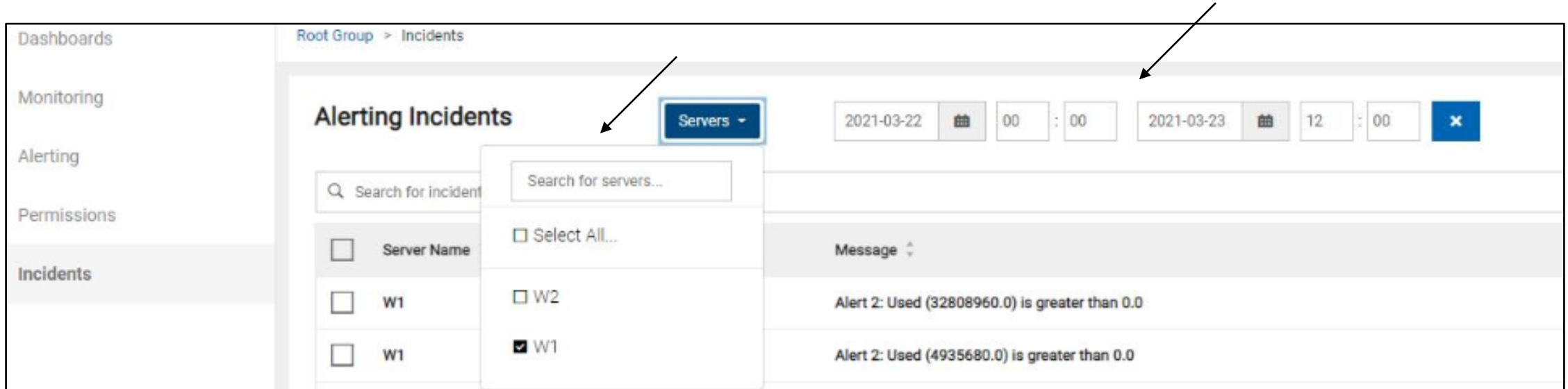
- Granted, this is a basic query but more complicated operations will benefit from the additional information



Incident reporting and other enhancements

Incident reporting and other features

- The **Incidents** menu option has been enhanced as well
 - You can filter by instance
 - You can filter by date and time range
 - Incident results are collated into well defined page ranges enabling easier access to sub-sets of data
 - You can acknowledge and/or dismiss notifications by group or range
 - Automatic suppression of repeating incidents with the same value to reduce clutter



Incident reporting and other features

- The **Incidents** menu option has been enhanced as well
 - A list of specific incidents / incident types, scattered among the pages can be viewed in a consolidated list using the **show selected only** option



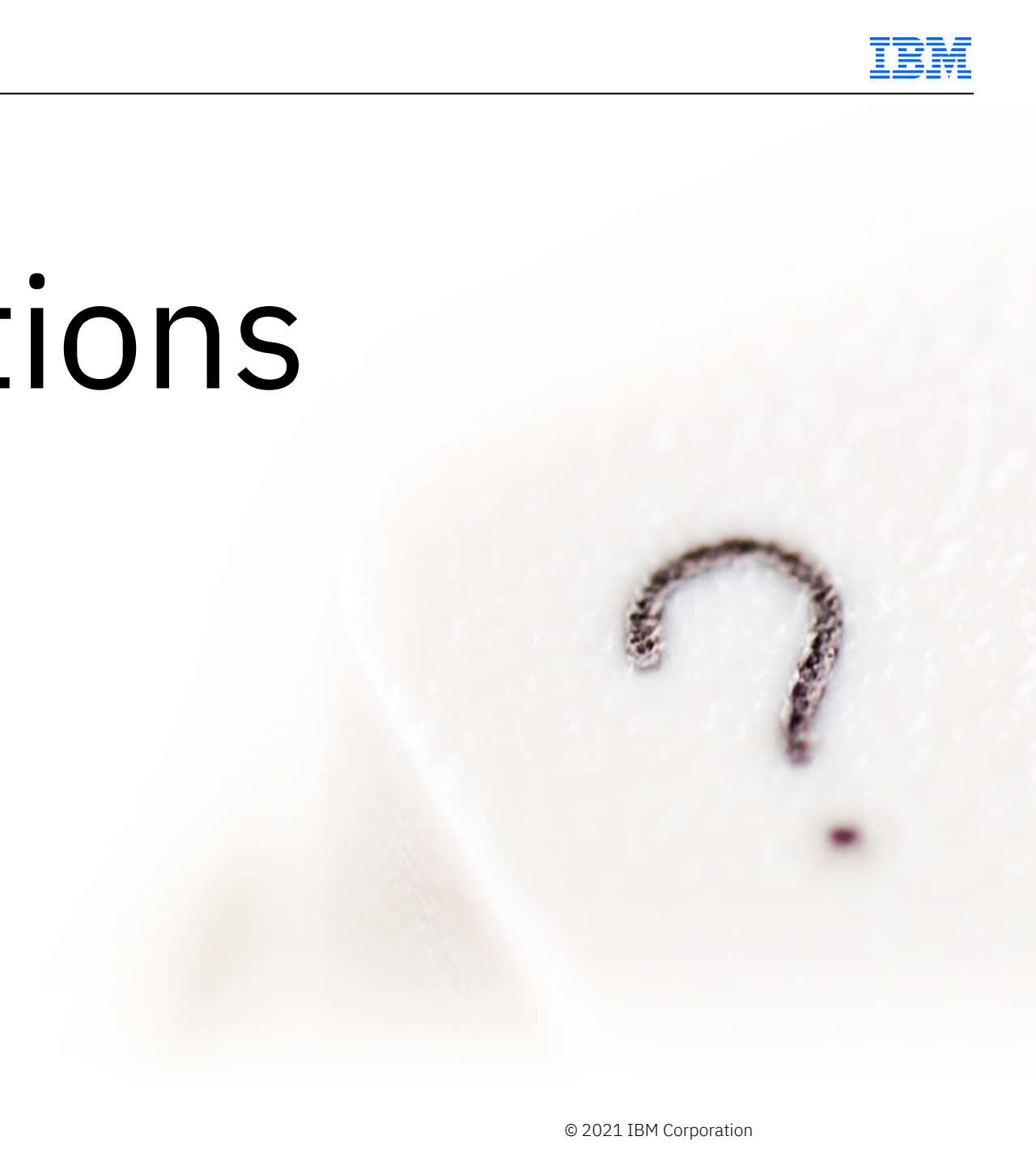
The screenshot displays the 'Alerting Incidents' interface. At the top, there's a breadcrumb 'Root Group > Incidents'. Below it, a toolbar includes a 'Servers' dropdown, date pickers for 'From Date' and 'To Date' (both set to HH:MM), and a search bar. On the right, it shows '10 of 10 incident(s) selected' with a checked checkbox for 'Show selected only', a trash icon, and an 'Acknowledge' button. An arrow points to the 'Show selected only' checkbox. Below the toolbar is a table with three columns: 'Server Name', 'Message', and 'Time'. The table contains three rows of incident data, all for 'DMC_2021'.

✓	Server Name ▾	Message ▾	Time ▲
✓	DMC_2021	Session Alert: Number of Sessions (9.0) is greater than 1.0	11 minutes ago
✓	DMC_2021	Session Alert: Number of Sessions (13.0) is greater than 1.0	12 minutes ago
✓	DMC_2021	Session Alert: Number of Sessions (13.0) is greater than 1.0	14 minutes ago

Incident reporting and other features

- The Java logging mechanism has been changed to `log4j2` which is the latest logging framework
 - It is from this logging mechanism that the server / agent startup error message is coming from
 - As already mentioned, development is working to suppress that warning
- All open source libraries have been upgraded to the latest available
- All potential vulnerabilities reported by white source scan have been addressed
- Other user reported defects have been addressed

Questions



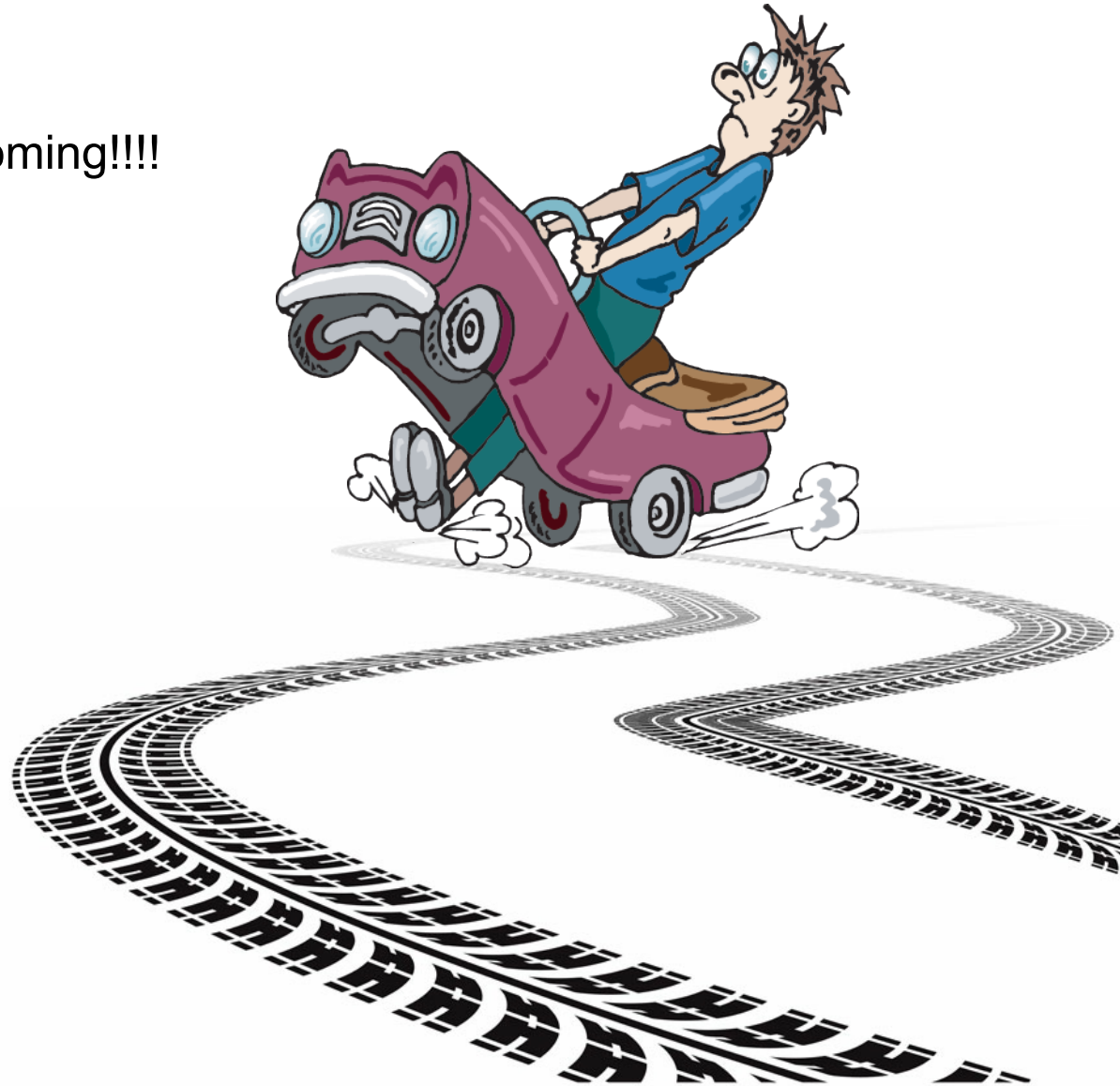
IBM INFORMIX V.14.10.XC6 - RSS BACKUPS

v.1a



Technical correction

- Hold on just a minute!
 - Technical correction coming!!!!



Technical correction

- In the first xC6 webcast I said that system changes occurred requiring an outage to H/A and ER clusters to upgrade
 - I gave instructions that indicated a full H/A cluster outage was required for the upgrade
 - This was not *entirely* correct
- You can also leverage the offline secondary conversion functionality released with Informix v.14.10.xC4



Technical correction

- To migrate an H/A cluster to xC6 you can follow my earlier instructions
OR
 - Install xC6 binaries on all servers in a separate directory
 - Update all configuration files with correct values
 - Create / update SLAs to use secondary instances, if the SLAs exist
 - Turn off FOC if enabled in the Connection Manager / Primary
 - So the cluster doesn't convert to a new primary in the next step
 - Turn off the cluster primary
 - Secondaries can still process queries but DML is blocked
 - Update Primary paths to use xC6 binary, restart instance, let it upgrade and come on-line
 - Secondaries will not reconnect due to version conflict rules
 - Primary begins processing transactions
 - One at a time, turn off each secondary instance, update paths, restart secondary instance
 - It will upgrade and reconnect to primary automatically
 - Re-set FOC and SLAs
- This way, partial cluster functionality is always available during the upgrade



RSS Backups

- The ability to backup an H/A cluster from a node other than the cluster primary has been a customer request dating back many years
- With Informix v.14.10xC6 it is now possible — from an RS secondary
- There are two use cases for this technology and, depending on the use case, different instance configuration settings and operations are required
 - I want to backup my cluster / primary from the RS secondary
 - All backups occur here, instance *and* logical log
 - aka “cluster” mode
 - I want a localized backup *in addition to* the instance/cluster backup occurring on the primary
 - Why?
 - Maybe to decrease the time to create another secondary instance close by
 - It takes too long to transfer from the primary
 - A bunker backup of your backups
 - aka “local” mode

RSS Backups

- Both `ontape` and `ON-Bar` backups are supported
- Backups can occur on RS secondary nodes with or without `UPDATABLE_SECONDARY` enabled
 - That said, development does have guidance on this parameter setting
 - Turning it on (1) enables the execution of the `onsmsync` utility
 - Synchronizes the RS `sysutils` / boot file with the primary instance copies
- Backups can occur on RS nodes with `DELAYED_APPLY` configured however
 - The backup process is funky
 - Best practice, do not back up from RS nodes with `DELAYED_APPLY`

RSS Backups

- To enable RS backups, the `BAR_SEC_ALLOW_BACKUP $ONCONFIG` parameter must be set
 - It is NOT included in `$ONCONFIG` at this time
 - It is NOT dynamically tunable, an instance restart required
 - Potential values
 - 0 — RS backups are disabled
 - 1 (one) — “local” RS backup mode, no updates to the `sysutils` database for ON-Bar operations
 - 2 (two) — “cluster” RS backup mode, `sysutils` database is updated for ON-Bar operations
- The `sysutils` database is not intended to be updated by more than one ON-Bar location
 - Doing so will lead to corruption
 - Do not set `BAR_SEC_ALLOW_BACKUP` to 2 and run OnBar backups on the primary and RS secondary
 - Let the Informix process handle any changes to this database

RSS Backups

- Executing RS backups has an impact on the `LTAPEDEV` parameter
 - When executing in local mode (`BAR_SEC_ALLOW_BACKUP = 1`)
 - `LTAPEDEV` (primary) is unchanged so log backups are triggered and execute on the primary by full logical logs
 - `LTAPEDEV` (RSS / HDR) is set to `/dev/null` since they aren't used
 - Obviously if one of these nodes is promoted to primary, `LTAPEDEV` must be updated so log backups occur
 - When executing in cluster mode (`BAR_SEC_ALLOW_BACKUP = 2`)
 - `LTAPEDEV` (primary / HDR) are set to `/dev/null` since they aren't used
 - `LTAPEDEV` (RSS) is set to a valid value so log backups are triggered and execute on the RS by full logical logs

RSS Backups

- Executing RS backups has an impact on the ability to have non-logged objects in your instance or database(s)
 - RS backups are blocked if these objects exist:
 - 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
- But wait, I thought everything had to be logged to be in an H/A cluster?
 - Not true
 - You can have non-logged SLOBspaces and SLOBs on the primary
 - A backup from the primary works without an issue
 - According to development, even if the SLOBspace is non-logged, in an H/A cluster (only) the objects are logged therefore sent to the secondaries as well
 - To support failover continuity without data loss
 - Non-logged databases or raw tables can exist as well but they don't get replicated to the secondaries
 - These get backed up on the primary

RSS Backups

- Finally, executing RS backups may have an impact on the RS `DBSPACE TEMP` parameter
 - In a properly configured primary instance there is at least one temp dbspace as well as a temp SLOBspace
 - The spaces are listed in `$ONCONFIG`
 - Since cluster secondary instances are “clones” of the primary, the same temp spaces *should* be configured in all the secondary instances
 - In truth, they aren’t required
 - Boo! Hiss! Create them!!! 😊
- When executing RS backups (local or cluster), at least one temp dbspace **MUST** be properly configured
 - Exist and configured with default page size in `$ONCONFIG`
 - Supports caching of modified pages during the backup operation

RSS Backups

- Before continuing, let's talk about temporary objects in a H/A cluster
 - When an explicit temp table is created, you can specify with logging (default) or `with no log`, an explicit extra step
 - STRONGLY recommend using the `with no log` syntax
 - If left to default (logging), the temp tables are created in `rootdbs`
 - `with no log` creates them in the `DBSPACETEMP` spaces
- Trying to create logged temp tables in `rootdbs` is NOT supported for H/A cluster secondary instances and becomes an issue if the secondary is used for operations
 - As a result, the `TEMPTAB_NOLOG` parameter should be set to 1 (one) on secondary instances supporting operations
 - This parameter forces all temp tables to be non-logged and created in `DBSPACETEMP` spaces
 - See next slide for new, xC6 functionality
- Currently, this parameter value is NOT being validated within secondary instances
 - Can operations occur?
 - Yes but you run the risk of getting -140 ISAM errors at any time

RSS Backups

- New functionality in xC6 — `TEMPTAB_NOLOG = 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



RSS Backups

- For the purposes of the examples which follow, here is the active H/A cluster

```
Inst_1: onstat -g cluster

IBM Informix Dynamic Server Version 14.10.FC6DE -- On-Line (Prim) -- Up 00:39:3
-- 234176 Kbytes
2021-04-13 17:24:14

Primary Server:inst_1
Current Log Page:19,95
Index page logging status: Enabled
Index page logging was enabled at: 2021/04/12 17:52:07

Server ACKed Log      Applied Log   Supports      Status
      (log, page)    (log, page)  Updates
inst_2 19,95          19,95        No            SYNC(SDS),Connected,Active
inst_3 19,95          19,95        Yes           NEAR_SYNC(HDR),Connected,On
inst_5 0,0            0,0          No            ASYNC(RSS),Disconnected,Defined
inst_4 19,95          19,95        Yes           ASYNC(RSS),Connected,Active

Inst_1.
```

inst_1 - primary

inst_2 - SD secondary

inst_3 - HDR secondary

inst_4 - RS secondary

inst_5 - RS secondary
for DELAYED_APPLY
operations (not
active)

RSS Backups

- Example #1 - local mode from `inst_4`
 - LTAPEDEV is set to `/dev/null`
 - `BAR_SEC_ALLOW_BACKUP = 1`
 - The instance is restarted

```
LTAPEDEV          /dev/null
# LTAPEDEV /opt/IBM/informix/backup/
LTAPEBLK          32
```

```
### RS backup option
BAR_SEC_ALLOW_BACKUP 1
```

- The backup timestamps on the primary and RS nodes are identical

<pre>Validating PAGE_1ARCH & PAGE_2ARCH... Using archive page PAGE_2ARCH. Archive Level 0 Real Time Archive Began 04/13/2021 17:36:27 Time Stamp Archive Began 0xfaf7a Logical Log Unique Id 19 Logical Log Position 0x75018 DR Ckpt Logical Log Id 19 DR Ckpt Logical Log Pos 0x221018 DR Last Logical Log Id 19 DR Last Logical Log Page 545 DR Last Mode Change 7 Primary mode Inst_1: Inst_1: █</pre>	<pre>Chunk offset 0 (p) Chunk size 5000 (p) Number of free pages 268 DBspace number 7 Validating PAGE_1ARCH & PAGE_2ARCH... Using archive page PAGE_2ARCH. Archive Level 0 Real Time Archive Began 04/13/2021 17:36:27 Time Stamp Archive Began 0xfaf7a Logical Log Unique Id 19 Logical Log Position 0x75018 DR Last Mode Change 0 Inst_4: █</pre>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

RSS Backups

- An `ontape` backup is attempted but fails
 - Why? There's a non-logged space in the instance
 - Not that backup error message helps you understand this

```
Inst_4: ontape -s -L 0  
Archive failed - (-83380) An archive checkpoint could not be completed in the secondary server.
```

```
Program over.
```

```
Inst_4:
```

```
Inst_4:
```

```
Inst_4: finderr -83380
```

```
-83380  An archive checkpoint could not be completed in the secondary server.
```

An archive checkpoint was attempted on a secondary server but we failed. Possible causes include the `LOG_STAGING_DIR` configuration parameter not being set, or not receiving a checkpoint from the primary server within the time interval specified by the `BAR_CKPSEC_TIMEOUT` configuration parameter

ACTION

Check the online message log for more information and correct the problem.

If the checkpoint timed out you can increase the value of the `BAR_CKPTSEC_TIMEOUT` configuration parameter.

RSS Backups

- Checking the instance log provides an accurate reason why the backup failed

```
18:02:52 The storage space, 'slob_space', is preventing the backup on the secondary server.  
18:02:53 (-83380) An archive checkpoint could not be completed in the secondary server.  
Informix:
```

- There are two non-logged SLOBspaces in the instance

```
IBM Informix Dynamic Server Version 14.10.FC6DE -- Updatable (RSS) -- Up 00:37:17 -- 234176 Kbytes  
2021-04-13 18:34:14
```

Dbspaces								
address	number	flags	fchunk	nchunks	pgsize	flags	owner	name
4595d028	1	0x20801	1	1	2048	NL BA	informix	rootdbs
45a76470	2	0x801	2	1	2048	NL BA	informix	data_space_1
45a766b0	3	0x801	3	1	2048	NL BA	informix	log_space
45a768f0	4	0x2001	4	1	2048	N TBA	informix	work_space
45a76b30	5	0x8801	5	1	2048	NLSBA	informix	slob_space
45a76d70	6	0xa001	6	1	2048	N UBA	informix	slob_temp
4696c028	7	0x28801	7	1	2048	NLSBA	informix	no_log_space
7 active 2047 maximum								

RSS Backups

- Both spaces are dropped
 - Since they are smart objects, a backup is required to complete the operation
 - A fake backup is executed
 - The backup timestamps are updated on both the primary and RS instances and are identical

Validating PAGE_1ARCH & PAGE_2ARCH...		Number of free pages		102347
Using archive page PAGE_1ARCH.		DBspace number		6
Archive Level	0	Validating PAGE_1ARCH & PAGE_2ARCH...		
Real Time Archive Began	04/13/2021 18:39:31	Using archive page PAGE_2ARCH.		
Time Stamp Archive Began	0xfd0cd	Archive Level	0	
Logical Log Unique Id	19	Real Time Archive Began	04/13/2021 18:39:31	
Logical Log Position	0x24a018	Time Stamp Archive Began	0xfd0cd	
DR Ckpt Logical Log Id	19	Logical Log Unique Id	19	
DR Ckpt Logical Log Pos	0x24e198	Logical Log Position	0x24a018	
DR Last Logical Log Id	19	DR Last Mode Change	0	
DR Last Logical Log Page	590	Inst_4:		
DR Last Mode Change	7	Primary mode		
Inst 1:				

RSS Backups

- Another RS `ontape` backup is executed, this time successfully
 - The backup timestamp on the RS is different than the primary because it reflects when the RS pages were backed up

```
Inst_4: 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:

19
```

```
Program over
Inst_4: Validating PAGE_1ARCH & PAGE_2ARCH...
        Using archive page PAGE_2ARCH.

Archive Level                0
Real Time Archive Began      04/13/2021 18:39:31
Time Stamp Archive Began     0xfd0cd
Logical Log Unique Id        19
Logical Log Position         0x24a018

DR Ckpt Logical Log Id       19
DR Ckpt Logical Log Pos      0x252018
DR Last Logical Log Id       19
DR Last Logical Log Page     594
DR Last Mode Change          7
inst 1: █
```

```
Validating PAGE_1ARCH & PAGE_2ARCH...
        Using archive page PAGE_1ARCH.

Archive Level                0
Real Time Archive Began      04/13/2021 18:42:45
Time Stamp Archive Began     0xfd18f
Logical Log Unique Id        19
Logical Log Position         0x252018

DR Last Mode Change          0
Inst_4: █
```


RSS Backups

- Just to verify that the utility doesn't matter, an ON-Bar backup is created using the PSM
 - The difference in backup timestamps continues

```
Inst_4: onbar -b -w
Inst_4:
```

Validating PAGE_1ARCH & PAGE_2ARCH... Using archive page PAGE_2ARCH.	DBspace number 6
Archive Level 0	Validating PAGE_1ARCH & PAGE_2ARCH... Using archive page PAGE_1ARCH.
Real Time Archive Began 04/13/2021 18:39:31	Archive Level 0
Time Stamp Archive Began 0xfd0cd	Real Time Archive Began 04/13/2021 18:50:10
Logical Log Unique Id 19	Time Stamp Archive Began 0xfd1b2
Logical Log Position 0x24a018	Logical Log Unique Id 19

RSS Backups

- Just to verify another non-logged restriction, a raw table is created in the database and a RS backup attempted
 - Yes, it fails with a message in the instance log indicating why

```
----- stores@inst_1
```

```
create raw table foo
(col1 int,
 col2 varchar(12)
);
```

```
Inst_4: ontape -s -L 0
```

```
Archive failed - (-83380) An archive checkpoint could not be completed in the secondary server.
```

```
Program over.
```

```
Inst_4:
```

```
Inst_4: tail -f /opt/IBM/informix/logs/inst4.log
```

```
12:44:48 Booting Language <spl> from module <>
```

```
12:44:48 Loading Module <SPLNULL>
```

```
12:44:48 Checkpoint Completed: duration was 0 seconds.
```

```
12:44:48 Wed Apr 14 - loguniq 21, logpos 0x19018, timestamp: 0x1121a9 Interval: 131
```

```
12:44:48 Maximum server connections 0
```

```
12:44:48 Checkpoint Statistics - Avg. Txn Block Time 0.000, # Txns blocked 0, Plog used 34, Llog used 0
```

```
12:44:49 The raw table 'stores':'foo' is preventing the backup in the secondary server.
```

```
12:44:50 (-83380) An archive checkpoint could not be completed in the secondary server.
```

```
□
```

```
Table created.
```




RSS Backups

- Example #2 - cluster mode backup from inst_4
 - Primary LTAPEDEV is set to /dev/null
 - RS BAR_SEC_ALLOW_BACKUP = 2 and LTAPEDEV is set to a valid value
 - The instance is restarted

```
### RS backup option
BAR_SEC_ALLOW_BACKUP 2
```

```
# LTAPEDEV /dev/null
LTAPEDEV /opt/IBM/informix/backup/
LTAPEBLK 32
```

- The backup timestamps on the primary and RS nodes are identical

Validating PAGE_1ARCH & PAGE_2ARCH...
Using archive page PAGE_1ARCH.

Archive Level0

Real Time Archive Began04/14/2021 13:02:48

Time Stamp Archive Began0x1136cc

Logical Log Unique Id21

Logical Log Position0xa7018

DR Ckpt Logical Log Id21

DR Ckpt Logical Log Pos0xbd018

DR Last Logical Log Id21

DR Last Logical Log Page189

DR Last Mode Change7

Inst_1: ☐

Primary mode

DBspace number0

Validating PAGE_1ARCH & PAGE_2ARCH...
Using archive page PAGE_1ARCH.

Archive Level0

Real Time Archive Began04/14/2021 13:02:48

Time Stamp Archive Began0x1136cc

Logical Log Unique Id21

Logical Log Position0xa7018

DR Last Mode Change0

Inst_4: ☒

RSS Backups

- An RS ontape and an ON-Bar backup is executed
 - Both execute successfully
 - However the reserved page timestamps are not synchronized after either operation
 - Again, it reflects when the RS pages were backed up

Validating PAGE_1ARCH & PAGE_2ARCH...		Number of free pages		102347
Using archive page PAGE_2ARCH.		DBspace number		6
Archive Level	0	Validating PAGE_1ARCH & PAGE_2ARCH...		
Real Time Archive Began	04/14/2021 13:02:48	Using archive page PAGE_1ARCH.		
Time Stamp Archive Began	0x1136cc	Archive Level	0	
Logical Log Unique Id	21	Real Time Archive Began	04/14/2021 13:32:37	
Logical Log Position	0xa7018	Time Stamp Archive Began	0x1137ac	
DR Ckpt Logical Log Id	21	Logical Log Unique Id	21	
DR Ckpt Logical Log Pos	0xc7018	Logical Log Position	0xc7018	
DR Last Logical Log Id	21	DR Last Mode Change	0	
DR Last Logical Log Page	199	Inst_4:		
DR Last Mode Change	7	Primary mode		
Inst_1:				



RSS Backups

- What about the logical logs?
 - With the primary `LTAPEDEV = /dev/null` and `RS BAR_SEC_ALLOW_BACKUP = 2` and `RS LTAPEDEV` is set to a valid value

inst_1 primary

address	number	flags	uniqid
45a92f88	9	U---C-L-	21
4587bf80	12	U-B-----	10
4595df38	13	U-B-----	11
4595dfa0	14	U-B-----	12
45a76050	15	U-B-----	13
45a760b8	16	U-B-----	14
45a76120	17	U-B-----	15
45a76188	18	U-B-----	16
45a761f0	19	U-B-----	17
45a76258	20	U-B-----	18
45a762c0	21	U-B-----	19
45a76328	22	U-B-----	20
12 active, 12 total			

inst_4 RS

address	number	flags	uniqid
45a92f88	9	U---C-L-	21
4587bf80	12	F-----	0
4595df38	13	F-----	0
4595dfa0	14	F-----	0
45a76050	15	F-----	0
45a760b8	16	F-----	0
45a76120	17	F-----	0
45a76188	18	F-----	0
45a761f0	19	U-B-----	17
45a76258	20	U-B-----	18
45a762c0	21	U-B-----	19
45a76328	22	U-B-----	20
12 active, 12 total			

RSS Backups

- Several logical logs are “rolled” from the primary

```
Inst_1: onmode -c ; onmode -l;  
Inst_1: onmode -c ; onmode -l;  
Inst_1: onmode -c ; onmode -l;
```

- The primary “sees” them as backed up and available but the RS sees them as used, requiring backup

inst_1 primary

inst_4 RS

address	number	flags	uniqid	address	number	flags	uniqid
45a92f88	9	U-B-----	21	45a92f88	9	U-----	21
4587bf80	12	U-B-----	22	4587bf80	12	U-----	22
4595df38	13	U-B---L-	23	4595df38	13	U-----L-	23
4595dfa0	14	U---C---	24	4595dfa0	14	U---C---	24
45a76050	15	U-B-----	13	45a76050	15	F-----	0
45a760b8	16	U-B-----	14	45a760b8	16	F-----	0
45a76120	17	U-B-----	15	45a76120	17	F-----	0
45a76188	18	U-B-----	16	45a76188	18	F-----	0
45a761f0	19	U-B-----	17	45a761f0	19	U-B-----	17
45a76258	20	U-B-----	18	45a76258	20	U-B-----	18
45a762c0	21	U-B-----	19	45a762c0	21	U-B-----	19
45a76328	22	U-B-----	20	45a76328	22	U-B-----	20
12 active, 12 total				12 active, 12 total			

RSS Backups

- A continuous logical log backup is started on the RS
 - The logs are backed up and the RS logical log information is updated

```
Inst_4: ontape -c

Performing continuous backup of logical logs.

File created: /opt/IBM/informix/backup/inst4_Log0000000021
File created: /opt/IBM/informix/backup/inst4_Log0000000022
File created: /opt/IBM/informix/backup/inst4_Log0000000023
```

address	number	flags	uniqid
45a92f88	9	U-B-----	21
4587bf80	12	U-B-----	22
4595df38	13	U-B---L-	23
4595dfa0	14	U---C---	24
45a76050	15	F-----	0
45a760b8	16	F-----	0
45a76120	17	F-----	0
45a76188	18	F-----	0
45a761f0	19	U-B-----	17
45a76258	20	U-B-----	18
45a762c0	21	U-B-----	19
45a76328	22	U-B-----	20
12 active 12 total			

RSS Backups

- Activity occurs on the primary, in this case creating the `stores` database in logged mode
 - It executes successfully though in being created, multiple logical logs are used
 - They are backed up on the RS secondary as expected

On the primary

```
Inst_1: dbaccessdemo stores -dbspace data_space_1 -log
DBACCESS  Demonstration Database Installation Script

Dropping existing stores database ....

Creating stores database ....

Lockmode set.

Database created.
```

address	number	flags	unique
45a92f88	9	U-B-----	21
4587bf80	12	U-B-----	22
4595df38	13	U-B-----	23
4595dfa0	14	U-B-----	24
45a76050	15	U-B---L-	25
45a760b8	16	U-B-----	26
45a76120	17	U-B-----	27
45a76188	18	U-B-----	28
45a761f0	19	U-B-----	29
45a76258	20	U-B-----	30
45a762c0	21	U-B-----	31
45a76328	22	U---C---	32
12 active, 12 total			

RSS Backups

- Logical log activity on the RS while the `stores` database was built on the primary
 - Full logical logs are backed up

```
Inst_4: ontape -c

Performing continuous backup of logical logs.

File created: /opt/IBM/informix/backup/inst4_Log0000000021
File created: /opt/IBM/informix/backup/inst4_Log0000000022
File created: /opt/IBM/informix/backup/inst4_Log0000000023
File created: /opt/IBM/informix/backup/inst4_Log0000000024
File created: /opt/IBM/informix/backup/inst4_Log0000000025
File created: /opt/IBM/informix/backup/inst4_Log0000000026
File created: /opt/IBM/informix/backup/inst4_Log0000000027
File created: /opt/IBM/informix/backup/inst4_Log0000000028
File created: /opt/IBM/informix/backup/inst4_Log0000000029
File created: /opt/IBM/informix/backup/inst4_Log0000000030
n
File created: /opt/IBM/informix/backup/inst4_Log0000000031
```

address	number	flags	uniqueid
45a92f88	9	U-B-----	21
4587bf80	12	U-B-----	22
4595df38	13	U-B-----	23
4595dfa0	14	U-B-----	24
45a76050	15	U-B---L-	25
45a760b8	16	U-B-----	26
45a76120	17	U-B-----	27
45a76188	18	U-B-----	28
45a761f0	19	U-B-----	29
45a76258	20	U-B-----	30
45a762c0	21	U-B-----	31
45a76328	22	U---C---	32
12 active, 12 total			



RSS Backups

- Other RS backup nuances - On-Bar
 - As mentioned earlier, when `BAR_SEC_ALLOW_BACKUP = 2` (cluster mode) and a backup occurs, `sysutils` on the primary and RS are updated as expected

inst_1 primary

inst_4 RS

----- sysutils@inst_1 -----

```
act_aid      4
act_oid      1
act_type     5
act_status   0
act_start    2021-04-14 15:51:31
act_end      2021-04-14 15:51:33
```

```
act_aid      4
act_oid      2
act_type     5
act_status   0
act_start    2021-04-14 15:51:31
act_end      2021-04-14 15:51:34
```

```
act_aid      4
act_oid      3
act_type     5
act_status   0
act_start    2021-04-14 15:51:31
act_end      2021-04-14 15:51:34
```

```
act_aid      4
act_oid      4
act_type     5
act_status   0
act_start    2021-04-14 15:51:31
act_end      2021-04-14 15:51:34
```

12 row(s) retrieved.

----- sysutils@inst_4 -----

```
act_aid      4
act_oid      1
act_type     5
act_status   0
act_start    2021-04-14 15:51:31
act_end      2021-04-14 15:51:33
```

```
act_aid      4
act_oid      2
act_type     5
act_status   0
act_start    2021-04-14 15:51:31
act_end      2021-04-14 15:51:34
```

```
act_aid      4
act_oid      3
act_type     5
act_status   0
act_start    2021-04-14 15:51:31
act_end      2021-04-14 15:51:34
```

```
act_aid      4
act_oid      4
act_type     5
act_status   0
act_start    2021-04-14 15:51:31
act_end      2021-04-14 15:51:34
```

12 row(s) retrieved.

RSS Backups

- Other RS backup nuances - On-Bar
 - When BAR_SEC_ALLOW_BACKUP = 1 (local mode) and a backup occurs, no sysutils updates occur on either instance
 - The ixbar file is updated however
 - Notice the timestamps
 - This has restore implications

```
Inst_4: more ixbar.4
.
.
inst_4 rootdbs      R  1 4 0 0 29 2021-04-14 15:51:31 1
inst_4 data_space_1 ND 1 4 0 0 30 2021-04-14 15:51:31 1
inst_4 slob_space   ND 1 4 0 0 32 2021-04-14 15:51:31 1
inst_4 log_space    CD 1 4 0 0 31 2021-04-14 15:51:31 1
inst_4 rootdbs      R  1 0 0 0 36 2021-04-14 15:55:19 1
inst_4 data_space_1 ND 1 0 0 0 37 2021-04-14 15:55:19 1
inst_4 slob_space    ND 1 0 0 0 39 2021-04-14 15:55:19 1
inst_4 log_space     CD 1 0 0 0 38 2021-04-14 15:55:19 1
```

inst_1 primary

sysutils@inst_1

act_aid 4
act_oid 1
act_type 5
act_status 0
act_start 2021-04-14 15:51:31
act_end 2021-04-14 15:51:33

act_aid 4
act_oid 2
act_type 5
act_status 0
act_start 2021-04-14 15:51:31
act_end 2021-04-14 15:51:34

act_aid 4

12 row(s) retrieved.

inst_4 RS

sysutils@inst_4

act_aid 4
act_oid 1
act_type 5
act_status 0
act_start 2021-04-14 15:51:31
act_end 2021-04-14 15:51:33

act_aid 4
act_oid 2
act_type 5
act_status 0
act_start 2021-04-14 15:51:31
act_end 2021-04-14 15:51:34

act_aid 4
act_oid 3
act_type 5
act_status 0
act_start 2021-04-14 15:51:31
act_end 2021-04-14 15:51:34

act_aid 4
act_oid 4
act_type 5
act_status 0
act_start 2021-04-14 15:51:31
act_end 2021-04-14 15:51:34

12 row(s) retrieved.



RSS Backups

- What about restoring from an RS backup? Is it possible and to which nodes and under what conditions?
 - Yes you can restore from an RS backup but there are nuances
 - Whether you use `ON-Bar` or `ontape` affects the process

RSS Backups

- With `ontape`
 - Copy the instance and logical log backup files to the target server
 - Change the file names to match the naming convention specified by the `IFX_ONTAPE_FILE_PREFIX` environment variable for the target instance, if set
- From here, you can
 - Execute a full restore to create a standalone instance or an instance to participate in an ER cluster
 - Will need to perform a data sync ER operation however
 - Execute a physical restore to create an HDR or RS secondary to link (or re-link) the node [into | back into] the cluster

RSS Backups

- With `ON-Bar` the process is slightly more complicated
 - Were the backups created in local or cluster mode?
 - In cluster mode, `sysutils` is synchronized across the cluster
 - You may / probably will have to copy (and rename) the `ixbar` file to the target server for a cold restore
 - You may have to update the storage manager system for that server to use the backup objects created on another instance
 - In local mode
 - You need to copy (and rename) `ixbar` to the target server
 - If the instance is partially available, execute `onsmsync` to update the `sysutils` database with `ixbar` information
 - For a cold restore, just use the `ixbar` file directly
 - You may have to update the storage manager system for that server to use the backup objects created on another instance
- With access to the backup objects and either an updated `sysutils` database or the `ixbar` boot file, you can
 - Execute cold, warm or partial restores as allowed by `On-Bar`

Questions



Grazie धन्यवाद *Merci* ありがとうございます *Obrigado* 多谢
ITALIAN HINDI FRENCH JAPANESE BRAZILIAN PORTUGUESE SIMPLIFIED CHINESE

Thank You

多謝 Gracias Спасибо நன்றி ശതപദി Dankе شكراً
TRADITIONAL CHINESE SPANISH RUSSIAN TAMIL THAI GERMAN ARABIC