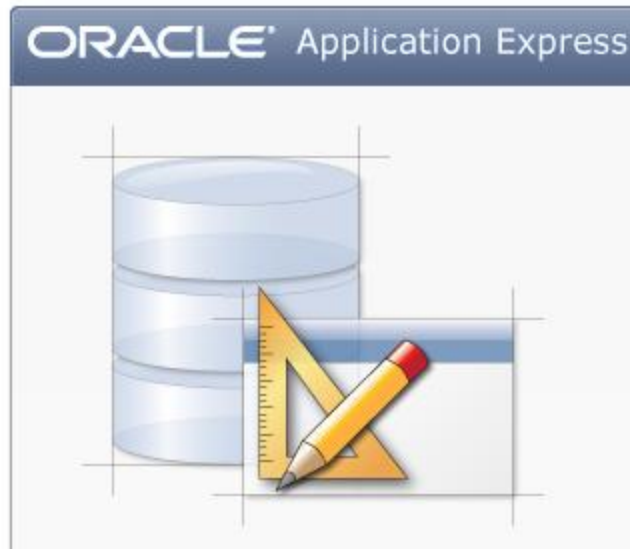


Introduction to Apex Collections

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Speaker Qualifications

- Josh Millinger, President, Niantic Systems, LLC
- CS degrees from UW-Madison, Johns Hopkins
- Former Oracle Sales Consultant and Founder of the Oracle Partner Technology Center
- 15+ Years of Oracle Web Development Experience
- Have Been Developing with and Teaching Apex Since Well Before It Was Even Released as a Product!
- Started with Excel Migration as first project
- Presenter at NYOUG, IOUG, ODTUG, Oracle OpenWorld

- Oracle Consulting with a Focus on Application Express
- Application Express Training
- Oracle Forms/Reports
- Discoverer
- Mentoring
- Forms/Reports to Apex Migration
- Customers in the Federal, Commercial, Healthcare, Higher Education, Financial, and Construction verticals

- Introduce Apex Collections
- Provide Use Cases
- Understand best practices
- Understand resources that are available
- Demonstrations
- Questions

What is a collection?

Collections enable you to temporarily capture one or more nonscalar values.

You can use collections to store rows and columns currently in session state so they can be accessed, manipulated, or processed during a user's specific session.

You can think of a collection as a **bucket** in which you temporarily ***store and name rows*** of information.

(Apex documentation)

Sounds like temporary tables!

- Temporary tables are useful constructs for short term data storage in database
 - Can be stored per session (on commit preserve rows)
 - Or per transaction
- They do NOT work with Apex
 - Any guesses why?

```
create global temporary table mytemptable (id number, name varchar2(100))  
on commit preserve rows;
```

```
create global temporary table mytemptable (id number, name varchar2(100))  
on commit delete rows;
```

Sounds like temporary tables!

- Temp tables only persist while a session is intact
- Data “disappears” once a session is disconnected
- Apex works in a stateless environment
 - Apache
 - APEX_PUBLIC_USER
 - New session for every page request, so data does not persist

- Use them when:
 - Need exists to store an unknown number of values
 - Need to persist data across page views
 - Data only to be specific to single session
- Benefits
 - Persistence across page views
 - Maintained at session level so they are secure
 - No extra DDL objects needed in schema
 - Maintained by the Apex Engine
- Cons
 - Attributes are not indexed
 - Often have to convert to numbers or dates
 - (Somewhat alleviated in Apex 4.0)

Collections

- Maintained in APEX_XXXXXX schema in tables
 - WWV_FLOW_COLLECTIONS\$
 - WWV_FLOW_COLLECTION_MEMBERS\$
- Referenced using the APEX_COLLECTIONS view
 - Only will find collections from your session
- Name of collection is user defined
- unique in application
- Session level objects
- Maintenance of Collection done using API:
 - APEX_COLLECTION (found in online doc)

```
select c001, c002 from apex_collections where collection_name='P50_ROWS'
```

- Shopping Cart
 - User selects object on products page
 - Selected products are referenced on Checkout Page
- Performance
 - Dashboard page with regions referencing same dynamic data
 - Data is generated from a long running query
 - Performance would otherwise be unacceptable
- Maintaining checkbox values across pages
- Get around Interactive Report Dynamic Query limitation

Collection

Member – (A row in the dataset)

Seq_id (numeric unique identifier per session)
C001 (column of varchar2 data)
C002
....
C050

Member – (A row in the dataset)

Seq_id
C001
C002
....
C050

Collections – During use

At any particular time there are several instances of a collection

User: Abby Session: 1234 Collection: P5_CART

<u>Seq Id</u>	<u>C001</u>	<u>C002</u>	<u>C003</u>	<u>C004</u>
1	A	B	C	d
2	J	Q	X	Y
3	Z	Z	Z	B

User: Barry Session: 789866 Collection: P5_CART

<u>Seq Id</u>	<u>C001</u>	<u>C002</u>	<u>C003</u>	<u>C004</u>
1	D	23	X	Z
2	d	dsf	Y	Z
3	34	2	Z	Z

User: James Session: 23455 Collection: P5_CART

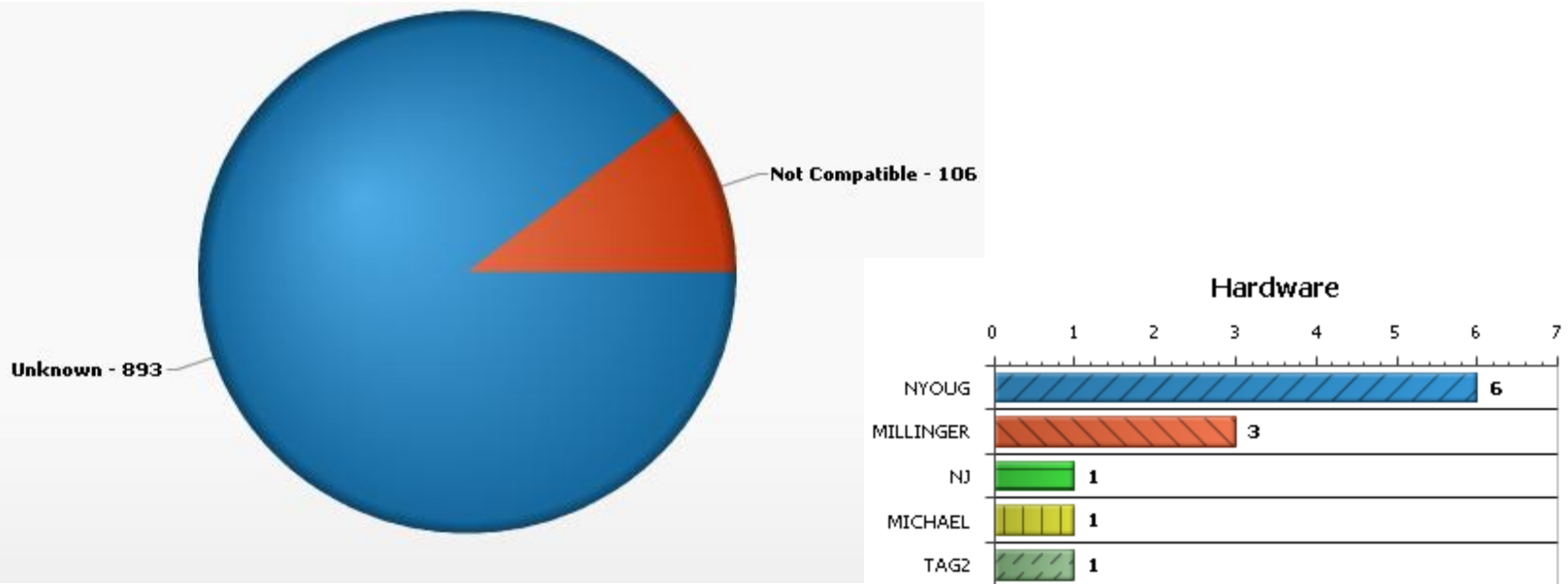
<u>Seq Id</u>	<u>C001</u>	<u>C002</u>	<u>C003</u>	<u>C004</u>
1			JM	DY
2	B	W	D	234
3	C	D	asdf	3d
5	D	ZD	2dsdf	fdf

- ADD_MEMBER Function
- ADD_MEMBERS Procedure
- COLLECTION_EXISTS Function
- COLLECTION_HAS_CHANGED Function
- COLLECTION_MEMBER_COUNT Function
- CREATE_COLLECTION Procedure
- CREATE_OR_TRUNCATE_COLLECTION Procedure
- CREATE_COLLECTION_FROM_QUERY Procedure
- CREATE_COLLECTION_FROM_QUERY2 Procedure
- CREATE_COLLECTION_FROM_QUERY_B Procedure
- CREATE_COLLECTION_FROM_QUERYB2 Procedure
- DELETE_ALL_COLLECTIONS Procedure
- DELETE_ALL_COLLECTIONS_SESSION Procedure
- DELETE_COLLECTION Procedure
- DELETE_MEMBER Procedure
- DELETE_MEMBERS Procedure
- GET_MEMBER_MD5 Function
- MERGE_MEMBERS Procedure
- MOVE_MEMBER_DOWN Procedure
- MOVE_MEMBER_UP Procedure
- RESEQUENCE_COLLECTION Procedure

- RESET_COLLECTION_CHANGED Procedure
- RESET_COLLECTION_CHANGED_ALL Procedure
- SORT_MEMBERS Procedure
- TRUNCATE_COLLECTION Procedure
- UPDATE_MEMBER Procedure
- UPDATE_MEMBERS Procedure
- UPDATE_MEMBER_ATTRIBUTE Procedure Signature 1
- UPDATE_MEMBER_ATTRIBUTE Procedure Signature 2
- UPDATE_MEMBER_ATTRIBUTE Procedure Signature 3
- UPDATE_MEMBER_ATTRIBUTE Procedure Signature 4
- UPDATE_MEMBER_ATTRIBUTE Procedure Signature 5
- UPDATE_MEMBER_ATTRIBUTE Procedure Signature 6
- APEX_WEB_SERVICE
- Index

Collections – Performance

Use Collections to improve performance on pages where same long running query needs to be run multiple times



- Interactive Reports ONLY work for STATIC queries

```
declare
  l_sql varchar2(100);
begin

  l_sql := 'select * from dual';

  return l_sql;
end;
```

2 errors have occurred ×
SQL statement needs to start with SELECT

Query cannot be parsed, please check the syntax of your query. (ORA-06550: line 1, column 8: PLS-00103: Encountered the symbol "" when expecting one of the following: begin function package pragma procedure subtype type use form current cursor The symbol "" was ignored. ORA-06550: line 2, column 22: PLS-00103: Encountered the symbol "" when expecting one of the following: begin function package pragma procedure subtype type use form current)

- Create collection using a process that runs before the report renders
- Use combination of:
 - apex_collection.create_collection_from_query_b
 - apex_collection.collection_exists
 - apex_collection.delete_collection

How can I see collection values during development time?

- Use Database Tool
 - SQL Developer
 - TOAD
- Create regions on page to conditionally display data
- Store data into log tables

- Additional attributes
 - N001 ... N005
 - D001 ...N005
 - BLOB
 - XMLTYPE
- Additional API calls
 - CREATE_COLLECTION_FROM_QUERY2
 - CREATE_COLLECTION_FROM_QUERYB2
- Various signatures UPDATE_MEMBER_ATTRIBUTE
- Now support bind variables in queries

- Online Help
 - API Reference
 - APEX_COLLECTION
- OTN Forum



QUESTIONS?

Collections

Thank You!

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