

# Memory Profiler

PUG Challenge 2024 –09/18/2024

# // Our business



A single point of contact for a responsible service

# // Effectif

**344**

people (december 2024)

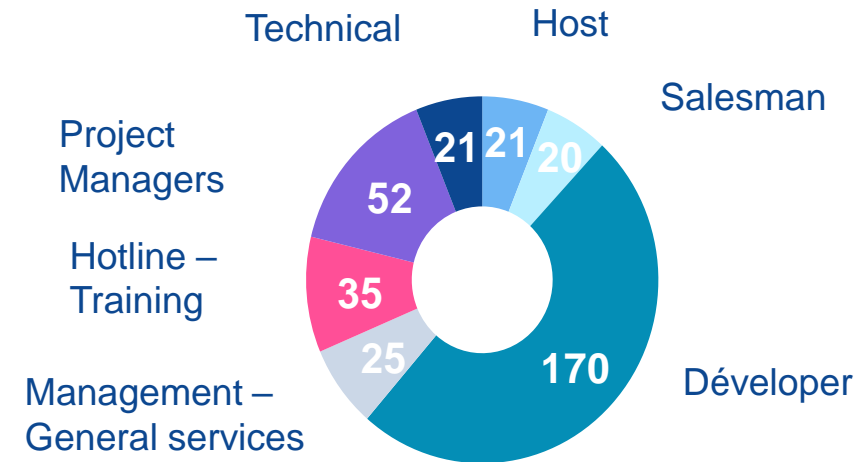
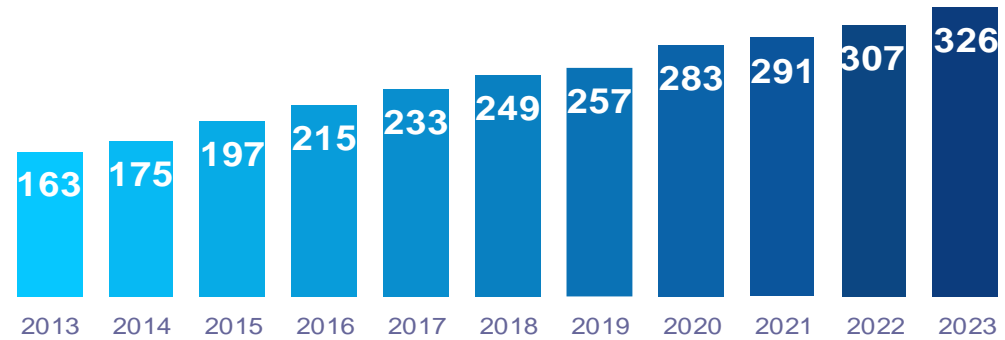
**36**

average age

**≈ 2 %**

people turnover

## Workforce





## // Proginov Datacenters

### / Proginov 1<sup>st</sup> french hosting publisher

- 2 Data Centers
- More than 3 500 servers
- 5 power generators
- Fire protection system
- Secure access with badge
- 3 telecom providers

### / Monthly connexions

- ~13 000 concurrent uses
- ~31 000 connections per month

## // Our ERP software

# PROGINOV // ERP Universe



## / Business solutions

- Commerce
- Industry
- Distribution
- Retail
- E-commerce
- Job-based Subcontracting
- Agro-food
- Clothing and Textile
- Construction and Civil Engineering
- Garages et Workshops
- Packaging
- Timber Trade
- Industrial Joinery
- Horticulture Industry
- Health

## // Who are we ?



Adrien FRAISSE  
[afraisse@proginov.com](mailto:afraisse@proginov.com)

- / **Progress developer and work for Proginov since 2012**
- / **In DevOps team since 2018**



Patrice PERROT  
[pperrot@proginov.com](mailto:pperrot@proginov.com)

- / **Progress developer since 2001**
- / **Optimize Progress sources since 2005**
- / **Work for Proginov since 2008**
- / **In team of Proginov DBA since 2010**

## // Summary

- / **What is a memory leak ?**
- / **How to detect memory leak currently ?**
- / **Design of the Memory Profiler by Progress**
- / **How it works**
- / **OEMP file (OpenEdge Memory Profiler)**
- / **How to activate Memory Profiler ?**
- / **Use cases of Memory Profiler**
- / **What progress has already presented**
- / **Improvements tracks**

# What is a memory leak ?



# // What is a memory leak ?

## / Increasing and uncontrolled memory occupancy caused by not freeing unused space

- Forget to delete objects or handles
- Cyclic references between objects
- Too many creation of objects or handles in loops

## / Example

```
METHOD PUBLIC CHARACTER GetCustomerLabel(INPUT pCustomerId AS INTEGER):
    DEFINE VARIABLE bufTable AS HANDLE NO-UNDO.
    DEFINE VARIABLE vLabel AS CHARACTER NO-UNDO.

    CREATE BUFFER bufTable FOR TABLE "customer".
    bufTable: FIND-FIRST("WHERE customer.id = " + STRING(pCustomerId), NO-LOCK).
    vLabel = STRING(bufTable::label).

    DELETE OBJECT bufTable.

    RETURN vLabel.

CATCH Err AS Progress.Lang.Error:
    MESSAGE "Error".
END CATCH.
END METHOD.
```

# // What is a memory leak ?

/ **32 bits sessions crash**

/ **Hard to analyze crashes (missing or inconclusive ProTrace)**

- StackTrace are different each time it crashes
- Random crash

/ **Analysis of the root cause of the crash made very difficult or even impossible**

/ **“Request for feedback” from Progress about Memory Leak tooling**

- Proginov answered and participated to the Beta test with its use cases

**How to detect memory leak currently ?**

## // How to detect memory leak currently ?

/ Comparison of the list of objects in memory at 2 different times

/ Starting with

- SESSION:FIRST-OBJECT
- SESSION:FIRST-DATASET
- SESSION:FIRST-DATA-SOURCE
- SESSION:FIRST-QUERY
- SESSION:FIRST-BUFFER
- SESSION:FIRST-PROCEDURE

/ Continuing the process already started

- SESSION:NEXT-SIBLING

# // How to detect memory leak currently ?

## / LOG-MANAGER data are made intelligible

- LOG-MANAGER:LOGFILE-NAME = [LOGFILE\_NAME].
- LOG-MANAGER:CLEAR-LOG( ).
- LOG-MANAGER:LOG-ENTRY-TYPES = "DynObjects.\*:4" .

Instantanés																		
Opération sur la mémoire																		
Stack Trace																		
Afficher les types... <input checked="" type="checkbox"/> Afficher uniquement les objets oubliés Trier par ordre d'occurrence <span style="float: right;">Afficher</span>																		
Heure	Identifiant de l'objet	Opération	Type de donnée	Type d'objet	Buffer/Table	Programme appelant	Procédure appelante	Ligne appelante										
> 16:47:18.958	37567	Created	Progress.Lang.Object	Core.CoreStackTrace		Core.CoreStackTrace	GetCurrent	30										
> 16:47:18.972	37733	Created	Progress.Lang.Object	Samples.Bob		d:\proginov\prowin\protemp\p27361_Untitled2.ped	CreateCustomers	76										
<table border="1"><thead><tr><th>Programme</th><th>Procédure</th><th>Ligne</th></tr></thead><tbody><tr><td>d:\proginov\prowin\protemp\p27361_Untit...</td><td>CreateCustomers</td><td>76</td></tr><tr><td>d:\proginov\prowin\protemp\p27361_Untit...</td><td></td><td>32</td></tr></tbody></table>										Programme	Procédure	Ligne	d:\proginov\prowin\protemp\p27361_Untit...	CreateCustomers	76	d:\proginov\prowin\protemp\p27361_Untit...		32
Programme	Procédure	Ligne																
d:\proginov\prowin\protemp\p27361_Untit...	CreateCustomers	76																
d:\proginov\prowin\protemp\p27361_Untit...		32																
> 16:47:18.976	37734	Created	Progress.Lang.Object	Samples.John		d:\proginov\prowin\protemp\p27361_Untitled2.ped	CreateCustomers	76										
> 16:47:18.979	37735	Created	Progress.Lang.Object	Samples.Dolly		d:\proginov\prowin\protemp\p27361_Untitled2.ped	CreateCustomers	76										
> 16:47:18.979	37736	Created	Progress.Lang.Object	Core.CoreStackTrace		Core.CoreStackTrace	GetCurrent	30										
> 16:47:18.997	37906	Created	Progress.Lang.Object	Samples.Order		d:\proginov\prowin\protemp\p27361_Untitled2.ped	CreateOrderBob	58										
> 16:47:18.999	37907	Created	Progress.Lang.Object	Samples.Product		d:\proginov\prowin\protemp\p27361_Untitled2.ped	CreateOrderBob	59										
> 16:47:19.001	37908	Created	Progress.Lang.Object	Samples.Order		d:\proginov\prowin\protemp\p27361_Untitled2.ped	CreateOrderJohn	64										
> 16:47:19.003	37909	Created	Progress.Lang.Object	Samples.Product		d:\proginov\prowin\protemp\p27361_Untitled2.ped	CreateOrderJohn	65										
> 16:47:19.004	37910	Created	Progress.Lang.Object	Samples.Order		d:\proginov\prowin\protemp\p27361_Untitled2.ped	CreateOrderDolly	70										
> 16:47:19.005	37911	Created	Progress.Lang.Object	Samples.Product		d:\proginov\prowin\protemp\p27361_Untitled2.ped	CreateOrderDolly	71										
> 16:47:19.008	37912	Created	Progress.Lang.Object	Samples.Product		d:\proginov\prowin\protemp\p27361_Untitled2.ped	CreateOrderDolly	72										
> 16:47:19.008	37913	Created	Progress.Lang.Object	Core.CoreStackTrace		Core.CoreStackTrace	GetCurrent	30										
> 16:47:19.018	38090	Created	Progress.Lang.Object	Core.CoreStackTrace		Core.CoreStackTrace	GetCurrent	30										

# Design of the Memory Profiler by Progress

# // Design of the Memory Profiler by Progress

## / Has to offer an integrated tool allowing memory analysis of an AVM

- When and where is the memory allocated?
- How much memory is allocated?
- How to target memory consumption points?
- How much memory is released?

## / Tim Sargent's breakout session at PUG Challenge 2022

- <https://www.youtube.com/watch?app=desktop&v=a-Rg27odVuE>

## / Backend can be activated in OE12.8

## / Frontend is under development by Progress

- Proginov develops its own frontend

## / PUG Session : ABL Memory Profiler: are you leaking? Memory!!

- By Sunil Jardosh
- Friday – 11.45 am

# How it works

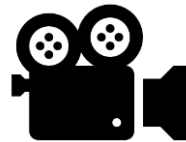


## // How it works

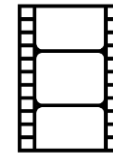
/ Activated for the whole session

/ Data written in .OEMP files (OpenEdge Memory Profiler)

/ Snapshot of memory at a given time



Data flow describing  
operations performed on  
memory



Series of snapshots taken at  
regular intervals

### / Ways to deal with

- Automatic mode with snapshot creation every X seconds
- Manual mode, with snapshots creation on demand
- Combining the 2 operating modes

# OEMP files

## // OEMP files

**/ File containing Profiling data generated during the session**

**/ File separated by snapshot by section**

**/ The file can be very large depending on session usage**

**/ small footprint on performance (less than 5%, ymmv)**

# How to activate Memory Profiler?

# // How to activate Memory Profiler?

## / Prowin.exe startup parameter

- -profileMemory *[PATH\_CONF\_FILE]*

**[PATH\_CONF\_FILE]** Specifies the path for Memory Profiler configuration file

## / Create a file at the location specified in **[PATH\_CONF\_FILE]** with the following content

```
report-dir [OEMP_DIR]  
cadence [NB_SECONDS]
```

**[OEMP\_DIR]** Specifies the OEMP files directory.

**[NB\_SECONDS]** Indicates the time between each snapshot in seconds. (0 => manual mode)

## / Create a manual snapshot

```
Using Progress.Profiler.* .  
MemoryProfiler:TakeSnapshot([LABEL]).
```

# Use cases of Memory Profiler (Development)

# // Use cases of Memory Profiler (Development)

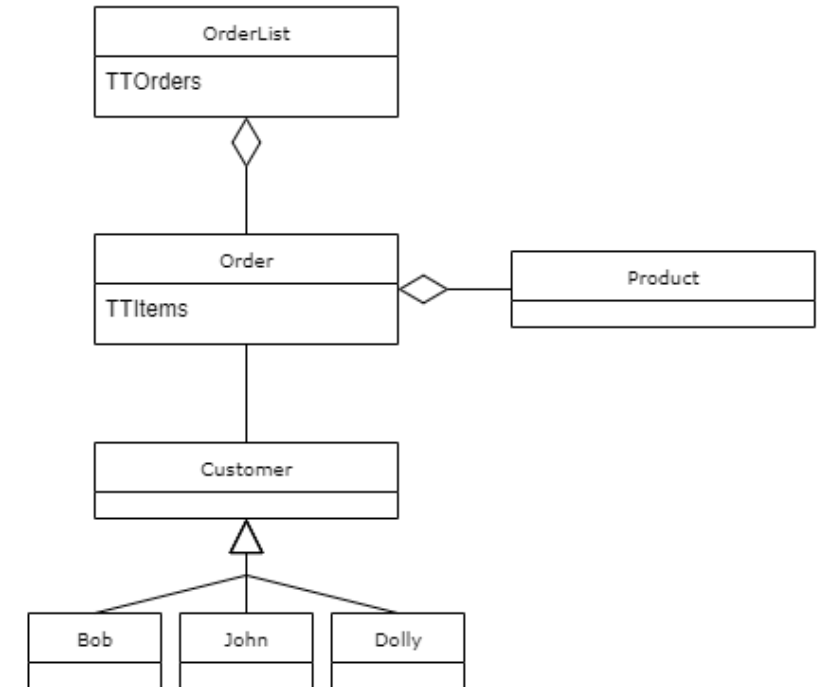
## / Analysis of a specific program

- Using manual mode
- Comparison of 2 snapshots or viewing a particular snapshot
- Checking the number of objects created and their weight
  - Allows you to limit the height of memory consumption peaks
- Check that any created object is destroyed
  - Helps avoid abnormally increasing process consumption over time

# // Use cases of Memory Profiler (Development)

## / Test case

- 3 customers (Bob, John and Dolly)
  - Classes Bob, John and Dolly which inherit from Customer
- a list of Orders
  - Class OrderList
  - Contains a Temp-Table TTOOrders
- An order by customer (Temp-Table TTItems)
  - Class Order
  - Contains a Temp-Table TTItems of the items of the order





## // Use cases of Memory Profiler (Development)



# // Use cases of Memory Profiler (Development)

## / Analysis of a Snapshot (Presented by data type)

DEMO

**VIEW 1 SnapShot**

SessionID: 153  
Start: 2024-05-22T10:17:13.409+02:00  
Pid: 3024  
SnapShotId: 6  
Time: 22/05/2024 10:17:17.861+02:00  
HMS: 00.00.04.452.543

**Type**  **Code block**

Sort by:  Nb obj  Memory used  Memory Scoped  Show selected type only Search:

Type	Nb Obj	Memory Used	Type	Name	Nb Obj	Memory Used	Memory Scoped	LifeTime (ms)	lifetime-SUM	lifen
Temp-table	25	144,480	OOABL Obj	Samples Order	3	9,888	70,728	1,501	4,502	
Procedure	7	102,560	OOABL Obj	Samples OrdersList	1	3,152	21,168	17,108	17,108	
Dynamic Temp-table	1	73,264	OOABL Obj	Samples.Product	4	8,960	8,960	0,492	1,969	
OOABL Obj	11	33,448	OOABL Obj	Samples.Bob	1	3,816	3,816	11,572	11,572	
Widget Pool	2	32,472	OOABL Obj	Samples.John	1	3,816	3,816	9,157	9,157	
Global Shared Temp-Table	1	4,496	OOABL Obj	Samples.Dolly	1	3,816	3,816	6,874	6,874	
OOABL Static Obj	1	2,112								
Dynamic Buffer	1	432								
OO Builtin	1	168								

**Details** Filter:  ALL  Type  Type and Det

Name	Type	Memory Used	Memory Scoped	Pool Allocation	Ao-ScopedTo	Ao-Handle	Ao-Linenum	Ao-ScrcId	Ao-TTTabId	Ao-UseCount	Ao-WidgetPoolId	platobj-Name	Ao-NodeId	come-from
Samples.Product	OOABL Obj	2,240	2,240	1,728		0	62	76	0	0	0		90	CreateOrderBob S
Samples.Product	OOABL Obj	2,240	2,240	1,728		0	68	76	0	0	0		99	CreateOrderJohn S
Samples.Product	OOABL Obj	2,240	2,240	1,728		0	74	76	0	0	0		108	CreateOrderDolly S
Samples.Product	OOABL Obj	2,240	2,240	1,728		0	75	76	0	0	0		108	CreateOrderDolly S

**Call Stack**  Nb Occ

Pos	N° ligne	Occur	Caller
1	40		? CreateOrderBob Samples\LauncherTestLeak (72)
2	4,754		? Samples\LauncherTestLeak (55)
3	4,582		? btn-test-1-choose S:\Prowin\ProLkSrc\pug2024\Main-launch.w (54)
4	4,704		? 62-USER-INTERFACE-TRIGGER S:\Prowin\ProLkSrc\pug2024\Main-launch.w (53)
5	0		? S:\Prowin\ProLkSrc\pug2024\Main-launch.w (1)

**Memory Evolution**

Start	End	Memory used	Tag Start	Tag End
6	6	2,240	Clear Orders	Clear Orders

# // Use cases of Memory Profiler (Development)

## / Analysis of a Snapshot

- 1 : Objects and handles families (TT, Procedure, ABLObj...)
- 2 : Detected datatypes (Sorted by selected family)
- 3 : Occurrence details (Sorted by selected family or selected datatype)
- 4 : Stacktrace creation of the selected occurrence
- 5 : Memory evolution by Snapshot.

## / Scoped Memory : Memory created per handle

DEMO

# // Use cases of Memory Profiler (Development)

## / Analysis of a Snapshot (Presented by code block)

DEMO

VIEW 1 Snapshot
— □ ×

**Informations**

SessionID: 153

Start: 2024-05-22T10:17:13.409+02:00

Pid: 3024

SnapshotId: 6

Time: 22/05/2024 10:17:17.861+02:00

HMS: 00:00:04.452.543

Type:  Type  Code block

Sort by:  Nb obj  Memory used  Memory Scoped  Only src (No code block) Search:

ID	Name	Nb Obj (ts)	Memory (ts)	Nb retained obj	Memory Scoped	Objet	srcmod
1	S:\Prowin\ProLkSrc\pug2024\Main-launch.w	1	13,088	6	177,328	S:\Prowin\ProLkSrc\pug2024\Main-launch.w	
12	adm2\contairn.p	1	38,624	20	101,744	adm2\contairn.p	
4	start-super-proc S:\Prowin\ProLkSrc\pug2024\Main-launch.w	0	0	4	80,232	S:\Prowin\ProLkSrc\pug2024\Main-launch.w	
73	Samples Order	3	9,888	6	70,728	Samples.Order	
55	Samples\LauncherTestLeak	1	2,264	4	37,992	Samples\LauncherTestLeak	
58	Samples.OrdersList	1	3,152	2	21,168	Samples.OrdersList	
5	adm2\smart.p	1	18,824	2	20,256	adm2\smart.p	
9	adm2\visual.p	1	14,400	1	14,400	adm2\visual.p	
2	adecomm/as-utils.w	1	6,976	2	11,472	adecomm/as-utils.w	
60	CreateCustomers Samples\LauncherTestLeak	0	0	3	11,448	Samples\LauncherTestLeak	

**Details**

Filter:  Tous  Src  Module

Name	Type	Memory Used	Memory Scoped	Pool Allocation	Ao-ScopedTo	Ao-Handle	Ao-Linenum	Ao-SrcId	Ao-TTabId	Ao-UseCount	Ao-WidgetPoolId	platojb-Name	Ao-NodeId	come from
ADMPProps	Dynamic Temp-table	73,264	73,264	73,032	6	0	2,125	0	0	0	0			1 S:\Prowin\ProLkSr
adecomm/as-utils.w	Procedure	6,976	6,976	6,632		0	27	2	0	0	0			1 S:\Prowin\ProLkSr
tt-propath	Temp-table	1,072	1,072	1,072	2	0	0	0	1	0	0			1 S:\Prowin\ProLkSr
ADMPProps	Dynamic Buffer	432	432	0		0	3,254	0	0	0	0			1 S:\Prowin\ProLkSr
	Widget Pool		73,264	664	2	0	59	0	0	0	0			1 S:\Prowin\ProLkSr

**Call Stack**  Nb Occ

Pos	N° ligne	Occurr.	Caller
1	0		? S:\Prowin\ProLkSrc\pug2024\Main-launch.w (1)

**Memory Evolution**

Start	End	Memory used	Tag Start	Tag End
6	6	73,264	Clear Orders	Clear Orders
5	6	73,264	Create Customers And Orders	Clear Orders
4	5	73,264	Create Empty OrderList	Create Customers And Order
3	4	73,264	Begin	Create Empty OrderList
2	3	73,264	_AUTO	Begin
1	2		_AUTO	_AUTO

PROG/NOV

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# // Use cases of Memory Profiler (Development)

## / Analysis of a Snapshot

- 1 : Code block list (RCode, procedures, methods)
- 2 : Handles and Objects created in the selected block

DEMO

# // Use cases of Memory Profiler (Development)

## / Leak analysis

DEMO

DIFF 2 Snapshots

SessionID: 152 Pid: 5124  
Start: 2024-05-22T10:17:20.326+02:00

Snapshot Begin: 3 => End: 8  
Time: 22/05/2024 10:17:24.513+02:00 => End: 22/05/2024 10:17:24.525+02:00  
HMS: 00:00:04.187.447 => End: 00:00:04.199.491

**Informations**

**Type**

Type Name	NbObj	ao-mentot
OOABL Obj	10	30.296
Temp-table	3	60.840
Reusable Obj Temp-Table	1	18.016
Reusable Obj	1	3.208

Sort by:  Nb obj  Memory used  Memory Scoped  Show selected type only

Type Name	det	NbObj	ao-mentot	MemUsed scopd	LifeTime (ms)	NbObj-1	Nb
OOABL Obj	Samples.Product	4	8.960	8.960	0.583		
OOABL Obj	Samples.Order	3	9.888	70.728	1.243		
OOABL Obj	Samples.Bob	1	3.816	3.816	6.624		
OOABL Obj	Samples.John	1	3.816	3.816	5.246		
OOABL Obj	Samples.Dolly	1	3.816	3.816	3.883		

**Details**

Filter:  Tous  Type  detail  ALL  Survivor  destroyed  New 4

AppObj-Name	AppObj-TypeName	Open ID	Open Tag	DEL ID	Del Tag	Ao-CreateHMSTime	oLc-DelHMSTime	Ao-Handle	Ao-Linum	Mem Used Diff	MemUsed scopd	Mem Used
Samples.Bob	OOABL Obj	5	Create Customers And Orders	9	_PreCleanup	00:00:04.192.911	00:00:04.199.535	22/05/2024 10:17:24.518	0	79	3.816	3.816
Samples.John	OOABL Obj	5	Create Customers And Orders	9	_PreCleanup	00:00:04.194.313	00:00:04.199.559	22/05/2024 10:17:24.520	0	79	3.816	3.816
Samples.Dolly	OOABL Obj	5	Create Customers And Orders	9	_PreCleanup	00:00:04.195.706	00:00:04.199.589	22/05/2024 10:17:24.521	0	79	3.816	3.816
Samples.Order	OOABL Obj	6	Clear Orders	9	_PreCleanup	00:00:04.197.169	00:00:04.199.531	22/05/2024 10:17:24.523	0	61	3.296	23.576
Samples.Order	OOABL Obj	6	Clear Orders	9	_PreCleanup	00:00:04.198.729	00:00:04.199.557	22/05/2024 10:17:24.524	0	67	3.296	23.576
Samples.Order	OOABL Obj	6	Clear Orders	9	_PreCleanup	00:00:04.199.049	00:00:04.199.587	22/05/2024 10:17:24.525	0	73	3.296	23.576
Samples.Product	OOABL Obj	6	Clear Orders	9	_PreCleanup	00:00:04.198.489	00:00:04.199.512	22/05/2024 10:17:24.524	0	62	2.240	2.240
Samples.Product	OOABL Obj	6	Clear Orders	9	_PreCleanup	00:00:04.198.871	00:00:04.199.541	22/05/2024 10:17:24.524	0	68	2.240	2.240
Samples.Product	OOABL Obj	6	Clear Orders	9	_PreCleanup	00:00:04.199.179	00:00:04.199.564	22/05/2024 10:17:24.525	0	74	2.240	2.240
Samples.Product	OOABL Obj	6	Clear Orders	9	_PreCleanup	00:00:04.199.318	00:00:04.199.572	22/05/2024 10:17:24.525	0	75	2.240	2.240

**Call Stack**  Nb Occ

Pos	N° ligne	Caller
1	35	1 CreateCustomers Samples\LauncherTestLeak (60)
2	4,767	1 Samples\LauncherTestLeak (55)
3	4,593	1 btn-test-2-choose S:\Prowin\ProLkSrc\pug2024\Main-launch.w (54)
4	4,704	1 63-USER-INTERFACE-TRIGGER S:\Prowin\ProLkSrc\pug2024\Main-launch.w (53)
5	0	1 S:\Prowin\ProLkSrc\pug2024\Main-launch.w (1)

**Memory Evolution**

Start	End	ao-mentot	Start Tag	End Tag	SnapshotID
5	5	3.816	Create Customers And Orders	Create Customers And Orders	22/05/202

# // Use cases of Memory Profiler (Development)

## / Leak analysis

- 1 : We can see 10 objects stand in memory although orders are no longer here
- 2 : Reusable Obj : Deleted objects cached for a future use. Help session performance
- 3 : The 10 objects are orders, customers and products
- 4 : For a more specific analysis, we decide to show only the objects created and not deleted between the 2 snapshots
- 5 : Order objects keep items with the TempTable TTProducts (scoped memory)

Level	AppObj-Name	AppObj-TypeName	Ao-MemoryUsed	MemoryUsed scoped	Ao-I
0	Samples.Order	OOABL Obj	3,296	23,576	
1	TTProducts	Temp-table	20,280	20,280	

DEMO

# Use cases of Memory Profiler (Production)



# // Use cases of Memory Profiler (Production)

## / Watching amount of memory usage through time

- Automated mode

## / Alerting

Non lus

Rechercher Fuite\_m

📧	DE	OBJET	REÇU
	PPerrot@proginov.com	Surveillance des Fuites mémoires PROGRESS	mar. 18/06/2024 14:13
	PPerrot@proginov.com	Surveillance des Fuites mémoires PROGRESS	mar. 18/06/2024 12:11
	PPerrot@proginov.com	Surveillance des Fuites mémoires PROGRESS	mar. 18/06/2024 10:38

📧 Répondre 📧 Répondre à tous 📧 Transférer

mar. 18/06/2024 14:55



Patrice Perrot

Surveillance des Fuites mémoires PROGRESS

À Patrice Perrot

Stratégie de rétention Suppression personnelle après 1 mois (31 jours)

Date d'expiration 19/07/2024

Bonjour,

Au cours de la demi-heure écoulée (jusqu'à 14:13), la mémoire utilisée par certaines sessions a atteint le seuil d'alerte.

Voici le détail :

- CONTEXTE	PROCESS	QUI	PID	MEMOIRE (Mo)	Architect	MACHINE
-	Prowin32	pnv_ppe	11028	517.4	NON	D4APP026

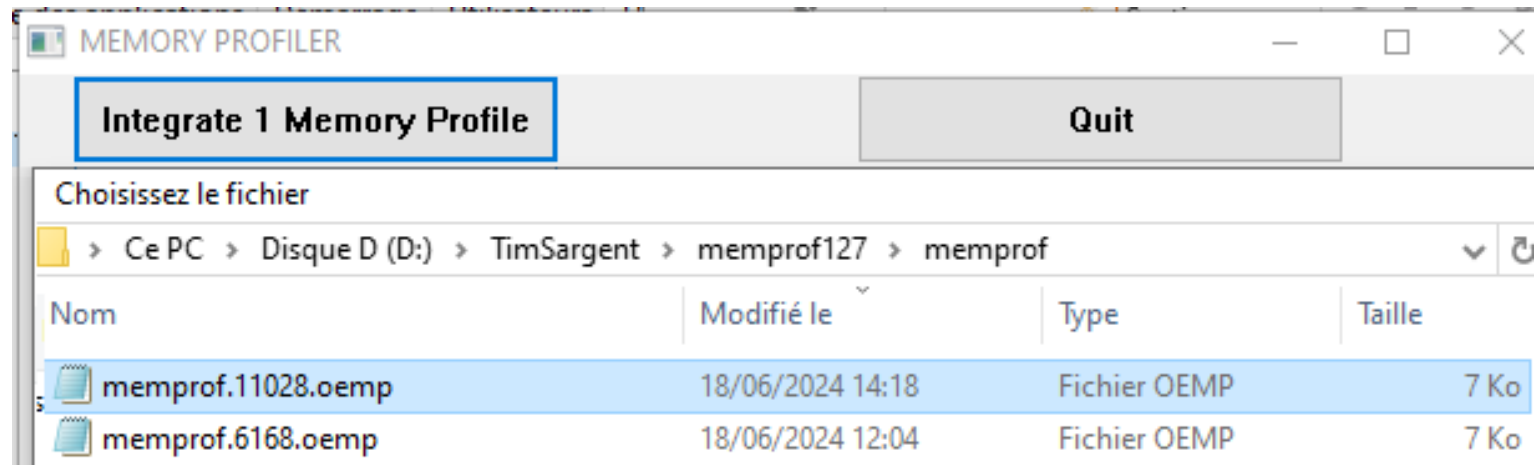
# // Use cases of Memory Profiler (Production)

## / Overconsumption of a session

Gestionnaire des tâches

Processus	Performance	Historique des applications	Démarrage	Utilisateurs	Détails	Services
Nom	PID	Statut	Description	Mémoire (...)		
OE prowin.exe	11028	En cours d'exécuti...	OpenEdge Graphical Client	564 832 Ko		
OE prowin.exe	20916	En cours d'exécuti...	OpenEdge Graphical Client	88 520 Ko		
OE prowin.exe	6168	En cours d'exécuti...	OpenEdge Graphical Client	40 180 Ko		
OE prowin.exe	26436	En cours d'exécuti...	OpenEdge Graphical Client	26 984 Ko		

## / Import of its OEMP file



# // Use cases of Memory Profiler (Production)

## / Naming the session

Memory Profiler

**Memory Profiler list**

Integrate new file Delete Sort by :  N° Session  Date New Name:

N° Session	Name	Nb SnapShot	Start at	PID	Session Id	APP memory tot (Avg)	Memory Profiler (Avg)
160	?	54	2024-06-18T14:18:46.947+02:00	11028	AVM-Client	104,648,915.815	820,680.000
159	?	226	2024-06-18T11:44:50.844+02:00	7996	AVM-Client	645,997,119.230	5,384,505.628
158	?	85	2024-06-18T11:19:16.396+02:00	16824	AVM-Client	2,714,705.553	177,461.082
156	bench-mark.3.p	19	2024-05-24T08:48:10.709+02:00	26200	AVM-Client	126,848.316	43,781.474
155	bech-mark.2.p	26	2024-05-23T17:59:34.903+02:00	24188	AVM-Client	156,896,249.769	969,613.231

## / Assign yourself to the session

Memory Profiler

**Memory Profiler list**

Integrate new file Delete Sort by :  N° Session  Date New Name:    Mine

N° Session	Name	Nb SnapShot	Start at	PID	Session Id	APP memory tot (Avg)	Memory Profiler (Avg)	CPU Profiler (Avg)
160	PNV_PPE D4appP026 (PROGI)	54	2024-06-18T14:18:46.947+02:00	11028	AVM-Client	104,648,915.815	820,680.000	608,887.074
159	?	226	2024-06-18T11:44:50.844+02:00	7996	AVM-Client	645,997,119.230	5,384,505.628	644,699.513
120	test Query	5	2024-04-23T16:09:10.703+02:00	23340	AVM-Client	8,435,792.000	160,731.200	792,221.800
110	test MBB	17	2024-03-07T09:33:34.640+01:00	34768	AVM-Client	55,859,654.412	3,261,298.824	19,075,057.000

# // Use cases of Memory Profiler (Production)

/ Load could take time (+ / - 1 minute)

VIEW Snapshot

### Informations

SessionID: 160  
Start: 2024-06-18T14:18:46.947+02:00  
Pid: 11028  
SnapShotId: 54  
Time: 18/06/2024 14:21:19.900+02:00  
HMS: 00:02:32.953.259

Type  Code block

Sort by :  Nb obj  Memory used  Memory Scoped  Show selected

ID	Name	Type	Name

### Details

Filter :  Tous  Src  Module

Name	Type	M	Id	Ao-TTabId	Ao-UseCount	Ao-Widg

Préparation en cours

**Memory Profiler**

- populate-tt
- ObjectLifeCycle 3,260/33,768

## // Use cases of Memory Profiler (Development)



# // Use cases of Memory Profiler (Production)

## / DEMO 1

DEMO

VIEW 1 Snapshot

**Informations**

SessionID: 160  
 Start: 2024-06-18T14:18:46.947+02:00  
 Pid: 11028  
 SnapshotId: 54  
 Time: 18/06/2024 14:21:19.900+02:00  
 HMS: 00:02:32.953.259

Type  Code block

Sort by:  Nb obj  Memory used  Memory Scoped  Show selected type only Search:

Type	Nb Obj	Memory Used	Type	Name	Nb Obj	Memory Used	Memory Scoped	LifeTime (ms)	lifetime-SUM	lfeitin
Dynamic Buffer	22,344	9,653,400	Dynamic Query	ped 1195->63	11,170	310,794,080	310,794,080	0.000		
Dynamic Query	11,170	310,794,080	Dynamic Buffer	Ship To	11,170	4,825,440	4,825,440	0.000		
OOABL Obj	72	396,200	Dynamic Buffer	State	11,170	4,825,440	4,825,440	0.000		
Temp-table	63	298,968	OOABL Obj	OpenEdge.Logging.Logger	5	34,600	34,600	0.000		
OOABL Static Obj	55	303,740	OOABL Obj	Root.Logging.RootLogger	5	28,840	28,840	0.000		
Widget Pool	19	81,168	OOABL Obj	Core.Framework.Logging.CoreDefaultLogWriter	5	16,360	16,360	0.000		
Reusable Obj	11	63,400	OOABL Obj	OpenEdge.Core.Util.BuilderRegistry	4	31,040	31,040	0.000		
Procedure	11	230,110	Widget Pool	RootLogge 318->110	4			0.000		
OO Static Temp-table	9	94,208	OOABL Obj	Dbg.Model.DebugMode.DbgToolkit	3	20,796	22,884	0.000		
DB Connection	6	847,792	Widget Pool	DbgToolkit 812->491	3		2,088	0.000		

**Details**

Filter:  ALL  Type  Type and Det

Name	Type	Memory Used	Memory Scoped	Pool Allocation	Ao-ScopedTo	Ao-Handle	Ao-Linenum	Ao-Scrid	Ao-TTTabId	Ao-UseCount	Ao-WidgetPoolId	platobj-Name	Ao-NodeId	come-from
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome
Dynamic Query		27,824	27,824	2,248	1,897	0	101	0	0	0	0			7,490 take_info_custome

**Call Stack**  Nb Occ

Pos	N° ligne	Occurr	Caller
1	63		?take_info_customer c:\na_poubelle\protemp\p80444_Untitled2.ped (1195)
2	22		?init-tt-item c:\na_poubelle\protemp\p80444_Untitled2.ped (1194)
3	701		?c:\na_poubelle\protemp\p80444_Untitled2.ped (1193)
4	3,600		?adecomm/_runtime.p (1171)
5	10,808		?ExecuteRun adeedit/_proedit.p (1166)
6	2,053		?RunFile adeedit/_proedit.p (1163)
7	12,590		?24-USER-INTERFACE-TRIGGER adeedit/_proedit.p (1162)
8	408		?adeedit/_proedit.p (1088)

**Memory Evolution**

Start	End	Memory used	Tag Start	Tag End
22	22	27,824	_AUTO	_AUTO

# // Use cases of Memory Profiler (Production)

## / DEMO 2 : Focus on points of interest

DEMO

Type  Code block

Sort by :  Nb obj  Memory used  Memory Scoped  Show selected type only Search:

Type	Nb Obj	Memory Used
Dynamic Buffer	22,344	9,653,400
Dynamic Query	11,170	310,794,080
OOABL Obj	72	396,200
Temp-table	63	298,968
OOABL Static Obj	55	303,740
Widget Pool	19	81,168
Reusable Obj	11	63,400
Procedure	11	230,110
OO Static Temp-table	9	94,208
DB Connection	6	847,792

Type	Name	Nb Obj	Memory Used	Memory Scoped
Dynamic Query	ped 1195->63	11,170	310,794,080	310,794,080
Dynamic Buffer	ShipTo	11,170	4,825,440	4,825,440
Dynamic Buffer	State	11,170	4,825,440	4,825,440
OOABL Obj	OpenEdge.Logging.Logger	5	34,600	34,600
OOABL Obj	Root.Logging.RootLogger	5	28,840	28,840
OOABL Obj	Core.Framework.Logging.CoreDefaultLogWriter	5	16,360	16,360
OOABL Obj	OpenEdge.Core.Util.BuilderRegistry	4	31,040	31,040
Widget Pool	RootLogge 318->110	4		
OOABL Obj	Dbg.Model.DebugMode.DbgToolkit	3	20,796	22,884
Widget Pool	DbgToolkit 812->491	3		2,088

Call Stack  Nb Occ

Pos	N° ligne	Occurr.	Caller
1	63	?	take_info_customer c:\va_poubelle\protemp\p80444_Untitled2.ped (1195)
2	22	?	init-tt-item c:\va_poubelle\protemp\p80444_Untitled2.ped (1194)
3	701	?	c:\va_poubelle\protemp\p80444_Untitled2.ped (1193)
4	3,600	?	adecomm/_runcode.p (1171)
5	10,808	?	ExecuteRun adeedit/_proedit.p (1166)
6	2,053	?	RunFile adeedit/_proedit.p (1163)
7	12,590	?	24-USER-INTERFACE-TRIGGER adeedit/_proedit.p (1162)
8	408	?	adeedit/_proedit.p (1088)

# // Use cases of Memory Profiler (Production)

## / DEMO 3 : Presented by code block

DEMO

VIEW 1 Snapshot

SessionID: 160  
 Start: 2024-06-18T14:18:46.947+02:00  
 Pid: 11028  
 SnapshotId: 54  
 Time: 18/06/2024 14:21:19.900+02:00  
 HMS: 00:02:32.953.259

Type:  Type  Code block

Sort by:  Nb obj  Memory used  Memory Scoped  Only src (No code block) Search: \_\_\_\_\_

ID	Name	Nb Obj (ts)	Memory (ts)	Nb retained obj	Memory Scoped	Objet	srcmod
1,193	c:\Na_poubelle\protemp\p80444_Untitled2.ped	1	5,664	2	320,453,248	c:\Na_poubelle\protemp\p80444_Untitled2.ped	
1,195	take_info_customer c:\Na_poubelle\protemp\p80444_Untitled2.ped	0	0	33,510	320,444,960	c:\Na_poubelle\protemp\p80444_Untitled2.ped	
165	c:\Na_poubelle\protemp\pbx07564\CrxBaseU.r	0	0	3	435,184	c:\Na_poubelle\protemp\pbx07564\CrxBaseU.r	
115	Private/PwinconXU	0	0	1	265,096	Private/PwinconXU	
1	x64\PROWIN	1	72,124	26	205,370	x64\PROWIN	
1,178	c:\Na_poubelle\protemp\p40635_Untitled3.ped	0	0	1	147,512	c:\Na_poubelle\protemp\p40635_Untitled3.ped	
502	Core.CoreServiceContainer	1	7,688	2	137,960	Core.CoreServiceContainer	
967	Core.CoreEntityBinder	1	37,120	1	131,976	Core.CoreEntityBinder	
367	OpenEdge.Core.Util.BuilderRegistry	4	31,040	6	103,616	OpenEdge.Core.Util.BuilderRegistry	
528	getService Core.CoreServiceContainer Core.CoreServiceContainer	0	0	19	102,456	Core.CoreServiceContainer	

Details

Filter:  Tous  Src  Module

Name	Type	Memory Used	Memory Scoped	Pool Allocation	Ao-ScopedTo	Ao-Handle	Ao-Linenum	Ao-Scrid	Ao-TTabId	Ao-UseCount	Ao-WidgetPoolId	platobj-Name	Ao-NodeId	come-from
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome
	Dynamic Query	27,824	27,824	2,248	1,897	0	101	0	0	0	0	0	7,490	take_info_custome

Call Stack  Nb Occ

Pos	N° ligne	Occurr.	Caller
1	63		?take_info_customer c:\Na_poubelle\protemp\p80444_Untitled2.ped (1195)
2	22		?init-item c:\Na_poubelle\protemp\p80444_Untitled2.ped (1194)
3	701		?c:\Na_poubelle\protemp\p80444_Untitled2.ped (1193)
4	3,600		?adecomm/_runcode.p (1171)
5	10,808		?ExecuteRun adeedit/_proedit.p (1166)
6	2,053		?RunFile adeedit/_proedit.p (1163)
7	12,590		?24-USER-INTERFACE-TRIGGER adeedit/_proedit.p (1162)
8	408		?adeedit/_proedit.p (1088)

Memory Evolution

Start	End	Memory used	Tag Start	Tag End
22	22	27,824	_AUTO	_AUTO



# // Use cases of Memory Profiler (Production)

/ DEMO 3 : Presented by code block => Zoom

DEMO

Type  Code block

Sort by :  Nb obj  Memory used  Memory Scoped  Only src (No code block) Search:

ID	Name	Nb Obj (its)	Memory (its)	Nb retained obj	Memory Scoped	Objet
1,193	c:\Va_poubelle\protemp\p80444_Untitled2.ped	1	5,664	2	320,453,248	c:\Va_
1,195	take_info_customer c:\Va_poubelle\protemp\p80444_Untitled2.ped	0	0	33,510	320,444,960	c:\Va_
165	c:\Va_poubelle\protemp\pbx07564\CnxBaseU.r	0	0	3	435,184	c:\Va_

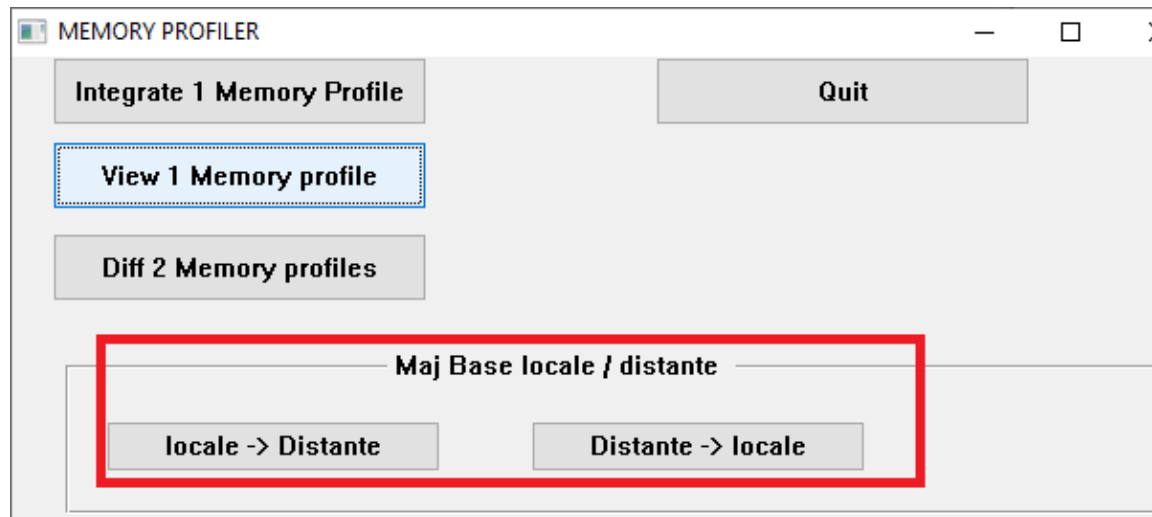
# Other use cases

## // Memory Profiler : Significant DB size

/ Local DB for personal analysis

/ Remote DB for shared analysis

/ Possibility to transfer between local and remote for one session



→ Better performance on local db connected with SELF

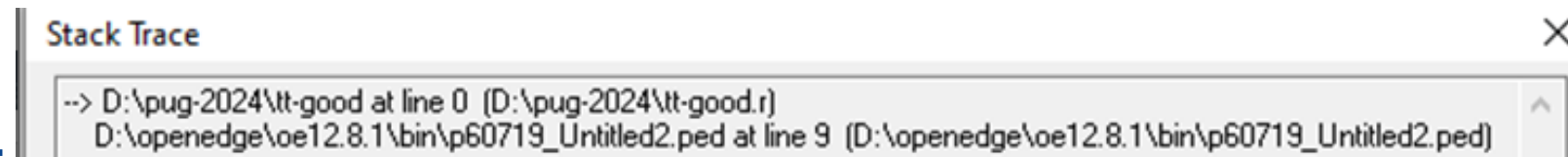
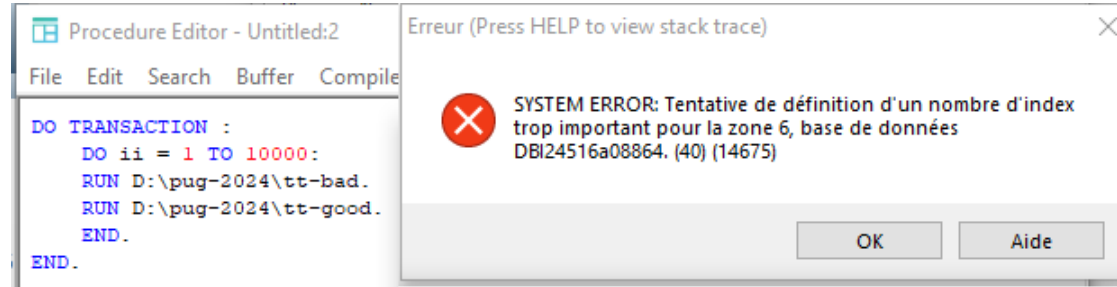
## // Use cases of Memory Profiler (Development)



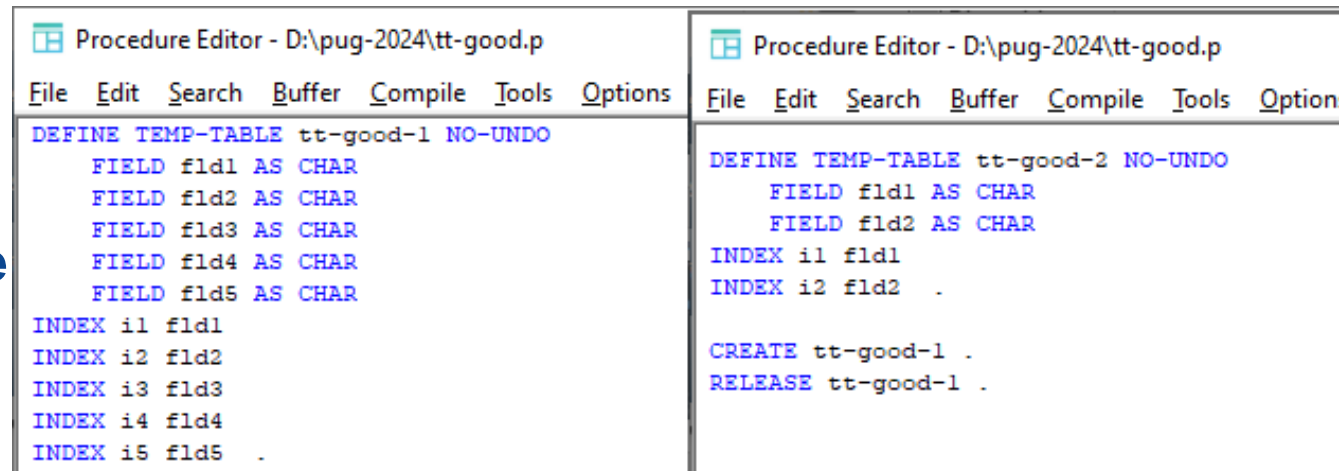
# // Memory Profiler : Out of its scope

/ Error 14675

DEMO



/ No infinite loop,

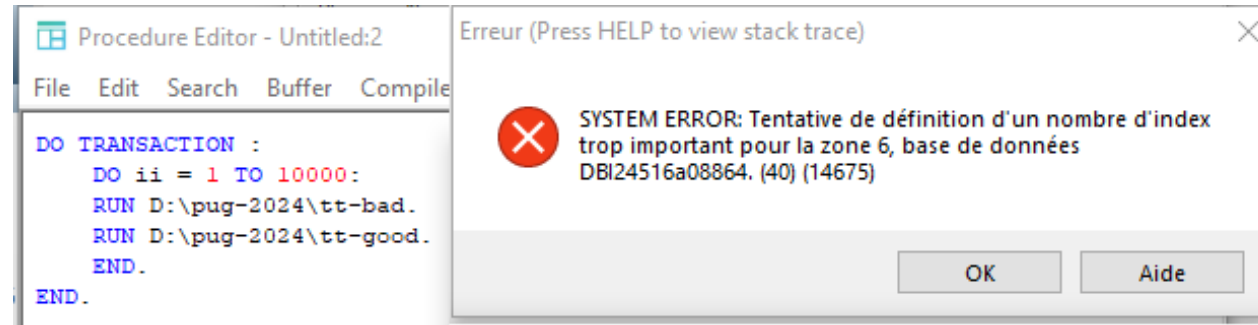



/ No issue

# // Memory Profiler : Out of its scope

## / Error 14675

DEMO



 protrace.28320.txt - Bloc-notes

**\*\* ABL Stack Trace \*\***

--> D:\pug-2024\tt-good at line 0 (D:\pug-2024\tt-good.r)

/ D:\openedge\oe12.8.1\bin\p60719\_Untitled2.ped at line 9 (D:\openedge\oe12.8.1\bin\p60719\_Untitled2.ped)

**\*\* Persistent procedures/Classes \*\***

Handle File Name

001015 D:\openedge\oe12.8.1\gui\adm2\containr.r

001013 D:\openedge\oe12.8.1\gui\adm2\visual.r

001010 D:\openedge\oe12.8.1\gui\adm2\appserver.r

001005 D:\openedge\oe12.8.1\gui\adm2\smart.r

001001 adecomm/as-utils.r

# // Memory Profiler : Out of its scope

DEMO

Type  Code block

Sort by :  Nb obj  Memory used  Memory Scoped  Show selected type only Search:

Type	Nb Obj	Memory Used	Type	Name	Nb Obj	Memory Used
Temp-table	6,573	14,636,536	Temp-table	tt-bad	6,550	14,567,200
Procedure	8	99,974	Temp-table	ttTranslate	1	5,264
Widget Pool	2	32,472	Temp-table	before_InstanceChildren	1	4,728

/ C

Call Stack  Nb Occ

Pos	N° ligne	Occurr.	Caller
1	8	?	D:\pug-2024\tt-bad (53)
2	4,753	?	S:\Prowin\ProLkSrc\pug2024\run-test-tt-with-compile.p (52)
3	4,589	?	Btn-Test-TT-Choose S:\Prowin\ProLkSrc\pug2024\Main-launch.w (51)
4	4,640	?	67-USER-INTERFACE-TRIGGER S:\Prowin\ProLkSrc\pug2024\Main-launch.w (50)

/ M

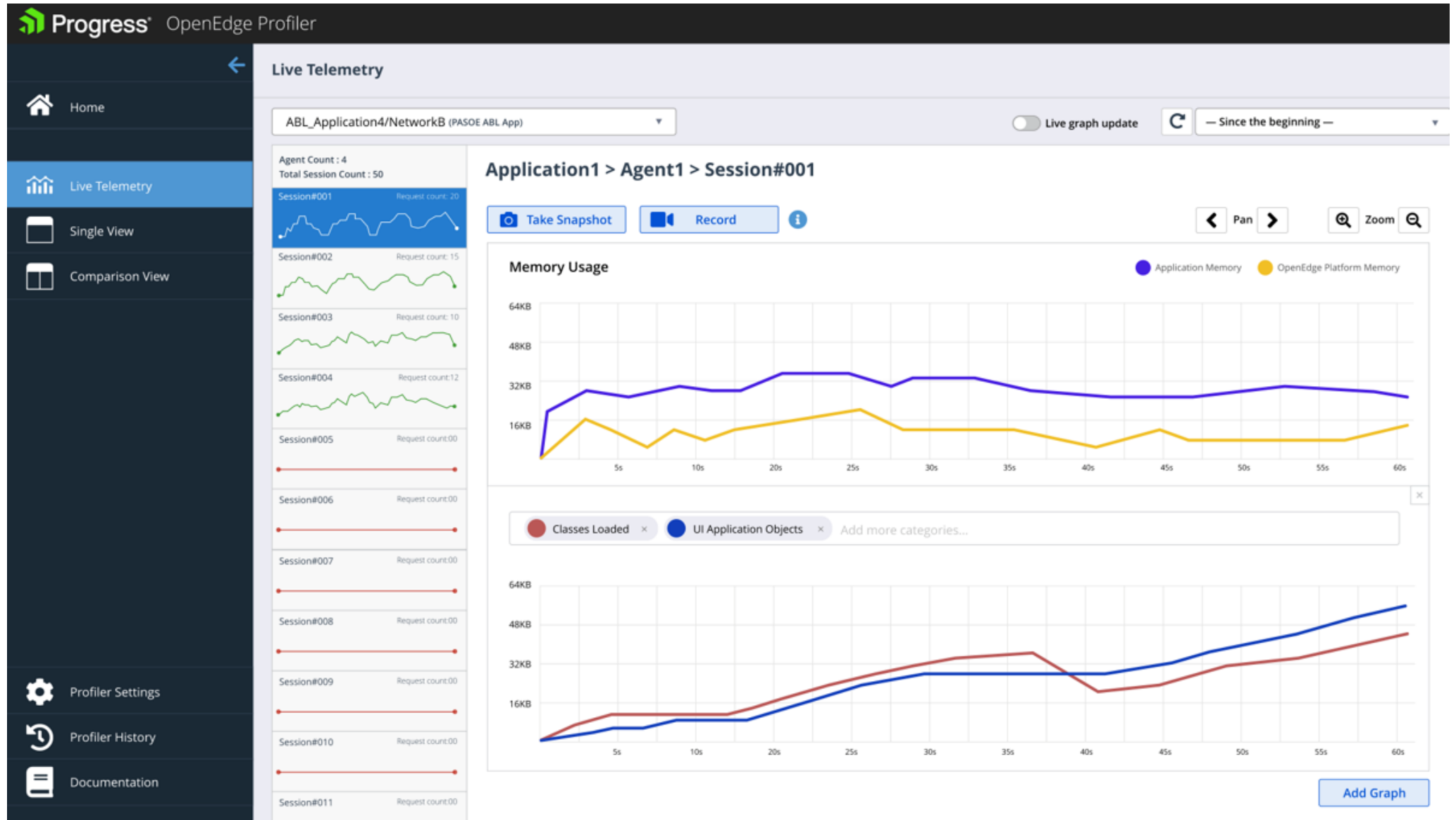
```
Procedure Editor - D:\pug-2024\run-test-tt-with-compile.p | Procedure Editor - D:\pug-2024\tt-bad.p
File Edit Search Buffer Compile Tools Options Help | File Edit Search Buffer Compile Tool
DO TRANSACTION
  DO ii = 1 TO 10000:
  RUN D:\pug-2024\tt-bad.
  RUN D:\pug-2024\tt-good.
  END.
END.

DEFINE TEMP-TABLE tt-bad
FIELD fld1 AS CHAR
FIELD fld2 AS CHAR
FIELD fld3 AS CHAR
FIELD fld4 AS CHAR
FIELD fld5 AS CHAR
INDEX i1 fld1
INDEX i2 fld2
INDEX i3 fld3
INDEX i4 fld4
INDEX i5 fld5
```

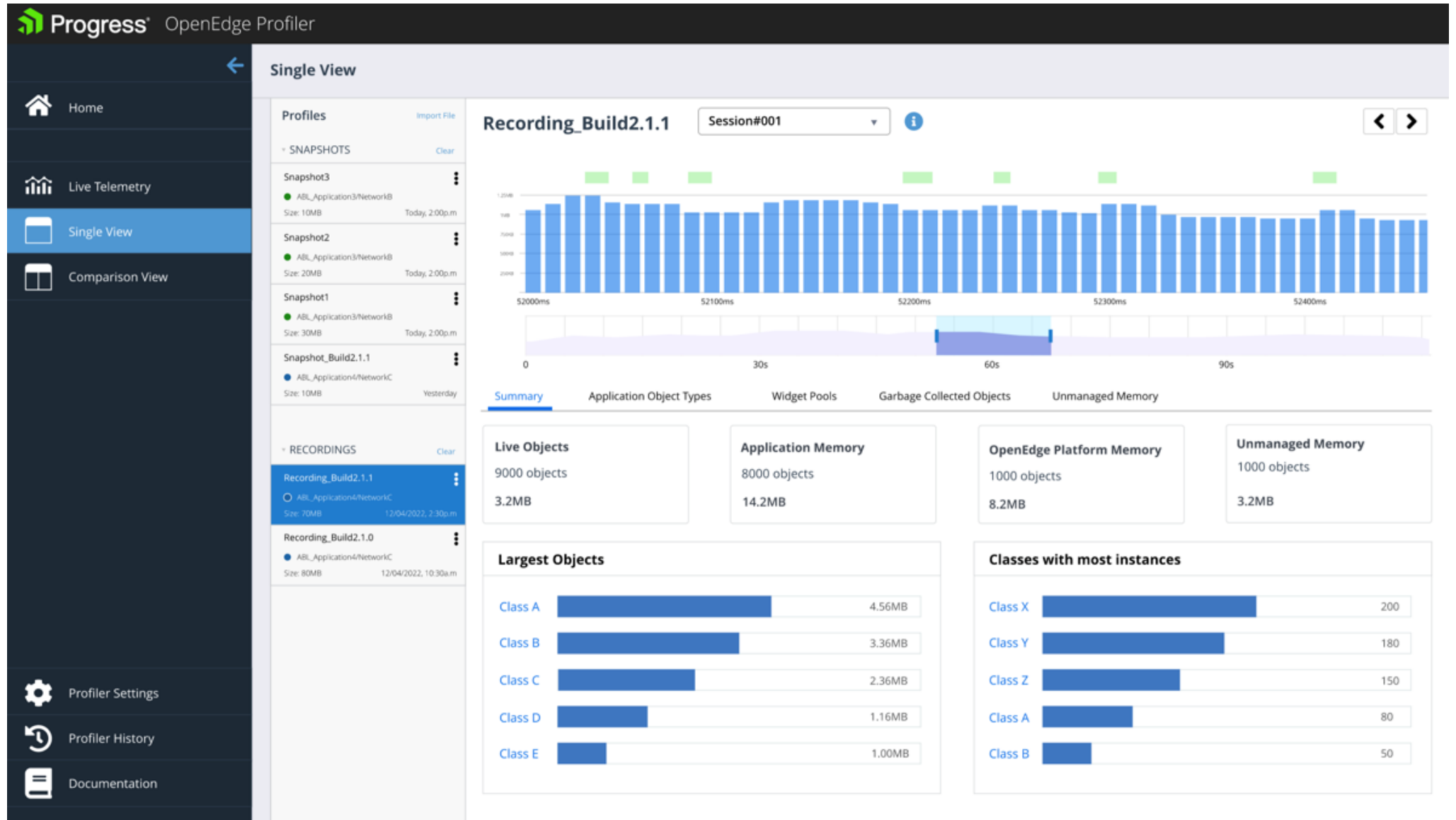
# What Progress already presented



# // What Progress already presented



# // What Progress already presented



# Improvement perspectives

## // Ours

/ **New UI**

/ **Develop new trend metrics based on several snapshots**

/ **Continuous integration of OEMP files**

/ **Formation of our development teams to Memory Profiler**

/ **Include memory profiler analysis in our quality process**

## // Those asked to Progress

### / Link memory consumption to object and not only to treenodes

- Could give a aggregation of the memory kept by every object

### / Enable exclusion of Progress system objects and handles

- Could hinder an analysis

### / Visualize object references

- Better understanding of the unefficiency of the garbage collector
- Allow the selection of orphan objects

### / During a differential analysis, propose subsets of objects (created, deleted, remaining)

- A object created and not deleted between 2 snapshots could pinpoint a leak

# Questions ?

## Agenda :

**PUG Session** : ABL Memory Profiler: are you  
leaking? Memory!! By Sunil Jardosh  
*Friday 11.45 am*



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