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## Results

In all tests max windows/beans number was set to 2. Results shows, that if max number of view beans would be exceeded, view map size and related beans could be corrupted at different stages. In all cases when @WindowDisposed used, not needed beans are created.

Just for example on the productive screen we have obtained unnecessary footprint for 10 view beans when opening at the same time 30 windows and closing all later on (max allowed number was set to 20). It consumed around 50MB of unnecessary memory per session.

## Tests info

To perform tests following changes should be made in web.xml:

- numberOfLogicalViews reduced to make it easier for reproduction i.e. to 2:  

```
<context-param>  
    <param-name>com.sun.faces.numberOfLogicalViews</param-name>  
    <param-value>2</param-value>  
</context-param>
```
- While View scope beans map size is not in line with this parameter there is also necessity to add in web.xml following listener (it's class attached):  

```
<!-- SessionListener to shrink the size of the LRUMap for the JSF ViewScopedBeans. -->  
<listener>  
    <listener-class>test.view.scope.window.bean.SetActiveViewMapsSizeSessionListener</listener-class>  
</listener>
```

Following attached classes should be added to project:

- SetActiveViewMapsSizeSessionListener.java – listener to have same number of view beans as logical views
- ViewBean.java – view scope bean used for tests
- WindowsGlobalCounter.java – counter to track beans and it's number
- viewScopeWindowTest.xhtml – page for ViewBeans

While testing please open “viewScopeWindowTest.xhtml” according to presented below scenarios.

## JSF implementation (no @WindowDisposed)

For this test to check how session map looks without ICEFaces @WindowDisposed there is needed to remove @WindowDisposed annotation from ViewBean.java.

### 2 windows opened

As expected 2 beans were created:

- BEAN CREATED: 2c25269f  
@PostConstruct of: 1 -> 2c25269f
- BEAN CREATED: 1f1b8d27  
@PostConstruct of: 2 -> 1f1b8d27

### 3 windows opened

As expected 1st bean was destroyed while max number of active beans was exceeded. New one (3<sup>rd</sup>) created:

- **@PreDestroy of: 1 -> 2c25269f**
- BEAN CREATED: 5c9c9e16  
@PostConstruct of: 3 -> 5c9c9e16

Currently in map we do have beans 2 and 3 - OK.

Class Name	Objects	Shallow Heap	Retained Heap	Percentage
*StandardSession.*	<Numeric>	<Numeric>	<Numeric>	<Numeric>
org.apache.catalina.session.StandardSession	1	88	73,008	0.07%
java.util.concurrent.ConcurrentHashMap	1	64	72,744	0.07%
java.util.concurrent.ConcurrentHashMap\$Node[]	1	144	72,656	0.07%
java.util.concurrent.ConcurrentHashMap\$Node	8	256	72,048	0.07%
java.util.Collections\$SynchronizedMap	1	32	64,208	0.06%
com.sun.faces.util.LRUMap	1	64	64,176	0.06%
java.util.LinkedHashMap\$Entry	2	80	62,496	0.06%
javax.faces.component.UIViewRoot\$ViewMap	2	96	62,416	0.06%
java.util.HashMap\$Node[]	2	160	62,288	0.06%
java.util.HashMap\$Node	8	256	62,128	0.06%
com.sun.org.apache.xerces.internal.dom.DocumentImpl	2	272	61,504	0.06%
java.util.HashMap\$Node	2	64	368	0.00%
test.view.scope.window.bean.ViewBean	2	48	304	0.00%
<b>Total: 2 entries</b>				

  

Class Name	Shallow Heap	Retained Heap	Percentage
*StandardSession.*	<Numeric>	<Numeric>	<Numeric>
org.apache.catalina.session.StandardSession @ 0xe911d080	88	73,008	0.07%
java.util.concurrent.ConcurrentHashMap @ 0xe911d0d8	64	72,744	0.07%
java.util.concurrent.ConcurrentHashMap\$Node[32] @ 0xf27be170	144	72,656	0.07%
java.util.concurrent.ConcurrentHashMap\$Node @ 0xf0d9d248	32	64,240	0.06%
java.util.Collections\$SynchronizedMap @ 0xf0d9d228	32	64,208	0.06%
com.sun.faces.util.LRUMap @ 0xf0d9d1e8	64	64,176	0.06%
java.util.LinkedHashMap\$Entry @ 0xf0d9df80	40	31,248	0.03%
javax.faces.component.UIViewRoot\$ViewMap @ 0xf0d9d060	48	31,208	0.03%
java.util.HashMap\$Node[16] @ 0xf146d890	80	31,144	0.03%
java.util.HashMap\$Node @ 0xf27895d0	32	30,784	0.03%
java.util.HashMap\$Node @ 0xf1aca380	32	216	0.00%
java.util.HashMap\$Node @ 0xf243fa98	32	184	0.00%
test.view.scope.window.bean.ViewBean @ 0xf242c970	24	152	0.00%
java.lang.String @ 0xf243a740 1 -> 2c25269f	24	72	0.00%
java.lang.String @ 0xf242c9a8 2c25269f	24	56	0.00%
<b>Total: 2 entries</b>			
java.util.HashMap\$Node @ 0xf146d8e0	32	32	0.00%
java.util.HashMap\$Node @ 0xf1aca348	32	32	0.00%
<b>Total: 4 entries</b>			
java.util.HashMap\$EntrySet @ 0xf250f968	16	16	0.00%
<b>Total: 2 entries</b>			
java.util.LinkedHashMap\$Entry @ 0xf2f9a3b0	40	31,248	0.03%
javax.faces.component.UIViewRoot\$ViewMap @ 0xf2f99dd8	48	31,208	0.03%
java.util.HashMap\$Node[16] @ 0xf2f9d0d8	80	31,144	0.03%
java.util.HashMap\$Node @ 0xf337d070	32	30,784	0.03%
java.util.HashMap\$Node @ 0xf2fa25b8	32	216	0.00%
java.util.HashMap\$Node @ 0xf32ea7a8	32	184	0.00%
test.view.scope.window.bean.ViewBean @ 0xf32e4300	24	152	0.00%
java.lang.String @ 0xf32e5640 2 -> 1f1b8d27	24	72	0.00%
java.lang.String @ 0xf32e4338 1f1b8d27	24	56	0.00%
<b>Total: 2 entries</b>			
java.util.HashMap\$Node @ 0xf2f9d128	32	32	0.00%
java.util.HashMap\$Node @ 0xf2fa2580	32	32	0.00%
<b>Total: 4 entries</b>			
java.util.HashMap\$EntrySet @ 0xf32f6800	16	16	0.00%
<b>Total: 2 entries</b>			
java.lang.String @ 0xf2510428 clientSideElementUpdateDetermination:	24	120	0.00%
java.lang.String @ 0xf2760d28 javax_faces_developmentstage_messages	24	120	0.00%
java.lang.String @ 0xf25100b8 disableDefaultErrorPopups:	24	96	0.00%
java.lang.String @ 0xf25101a8 standardFormSerialization:	24	96	0.00%

### 3 opened windows, closed ALL from 3<sup>rd</sup> to 1<sup>st</sup>

After closing all windows from 3<sup>rd</sup> to 1<sup>st</sup> or even from 1<sup>st</sup> to 3<sup>rd</sup> map would still contain beans 2 and 3.

Class Name	Shallow Heap	Retained Heap	Percentage
.*StandardSession.*	<Numeric>	<Numeric>	<Numeric>
org.apache.catalina.session.StandardSession @ 0xfa120630	88	73,416	0.14%
java.util.concurrent.ConcurrentHashMap @ 0xfa120688	64	73,152	0.14%
java.util.concurrent.ConcurrentHashMap\$Node[32] @ 0xfa1206c8	144	73,064	0.14%
java.util.concurrent.ConcurrentHashMap\$Node @ 0xfa1227b0	32	64,280	0.12%
java.util.Collections\$SynchronizedMap @ 0xfa1227d0	32	64,248	0.12%
com.sun.faces.util.LRUMap @ 0xfa1227f0	64	64,176	0.12%
java.util.LinkedHashMap\$Entry @ 0xd6998290	40	31,248	0.06%
javax.faces.component.UIViewRoot\$ViewMap @ 0xd698c840	48	31,208	0.06%
java.util.HashMap\$Node[16] @ 0xd699b0e8	80	31,144	0.06%
java.util.HashMap\$Node @ 0xd757c020	32	30,784	0.06%
java.util.HashMap\$Node @ 0xd69a06d8	32	216	0.00%
java.util.HashMap\$Node @ 0xd74a9748	32	184	0.00%
test.view.scope.window.bean.ViewBean @ 0xd74a2e40	24	152	0.00%
java.lang.String @ 0xd74a4180 3 -> 5c9c9e16	24	72	0.00%
java.lang.String @ 0xd74a2e78 5c9c9e16	24	56	0.00%
<b>Total: 2 entries</b>			
java.util.HashMap\$Node @ 0xd699b138	32	32	0.00%
java.util.HashMap\$Node @ 0xd69a06a0	32	32	0.00%
<b>Total: 4 entries</b>			
java.util.HashMap\$EntrySet @ 0xd74b55c0	16	16	0.00%
<b>Total: 2 entries</b>			
java.util.LinkedHashMap\$Entry @ 0xfa122848	40	31,248	0.06%
javax.faces.component.UIViewRoot\$ViewMap @ 0xfa122870	48	31,208	0.06%
java.util.HashMap\$Node[16] @ 0xfa1228a0	80	31,144	0.06%
java.util.HashMap\$Node @ 0xfa1229e8	32	30,784	0.06%
java.util.HashMap\$Node @ 0xfa122910	32	216	0.00%
java.util.HashMap\$Node @ 0xfa122930	32	184	0.00%
test.view.scope.window.bean.ViewBean @ 0xfa122950	24	152	0.00%
java.lang.String @ 0xfa1229a0 2 -> 1f1b8d27	24	72	0.00%
java.lang.String @ 0xfa122968 1f1b8d27	24	56	0.00%
<b>Total: 2 entries</b>			
java.util.HashMap\$Node @ 0xfa1228f0	32	32	0.00%
java.util.HashMap\$Node @ 0xfa132800	32	32	0.00%
<b>Total: 4 entries</b>			
java.util.HashMap\$EntrySet @ 0xfa132820	16	16	0.00%
<b>Total: 2 entries</b>			
java.lang.String @ 0xfa124cf0 clientSideElementUpdateDetermination:	24	120	0.00%
java.lang.String @ 0xfa125ac8 javax_faces_developmentstage_messages	24	120	0.00%

Class Name	Objects	Shallow Heap	Retained Heap	Percentage
.*StandardSession.*	<Numeric>	<Numeric>	<Numeric>	<Numeric>
org.apache.catalina.session.StandardSession	1	88	73,416	0.14%
java.util.concurrent.ConcurrentHashMap	1	64	73,152	0.14%
java.util.concurrent.ConcurrentHashMap\$Node[]	1	144	73,064	0.14%
java.util.concurrent.ConcurrentHashMap\$Node	8	256	72,344	0.14%
java.util.Collections\$SynchronizedMap	1	32	64,248	0.12%
com.sun.faces.util.LRUMap	1	64	64,176	0.12%
java.util.LinkedHashMap\$Entry	2	80	62,496	0.12%
javax.faces.component.UIViewRoot\$ViewMap	2	96	62,416	0.12%
java.util.HashMap\$Node[]	2	160	62,288	0.12%
java.util.HashMap\$Node	8	256	62,128	0.12%
com.sun.org.apache.xerces.internal.dom.DocumentImpl	2	272	61,504	0.12%
java.util.HashMap\$Node	2	64	368	0.00%
test.view.scope.window.bean.ViewBean	2	48	304	0.00%
<b>Total: 2 entries</b>				
java.util.HashMap\$EntrySet	2	32	32	0.00%
<b>Total: 2 entries</b>				

## ICEFaces @WindowDisposed (reverse closing)

### 3 windows opened

Works similar as for JSF – OK:

- BEAN CREATED: 4a96a949

@PostConstruct of: 1 -> 4a96a949

- BEAN CREATED: 42e65ace

@PostConstruct of: 2 -> 42e65ace

- **@PreDestroy of: 1 -> 4a96a949** ok while we have exceeded max number of active windows

- BEAN CREATED: 3adaadd4

@PostConstruct of: 3 -> 3adaadd4

Class Name	Shallow Heap	Retained Heap	Percentage
*StandardSession.*	<Numeric>	<Numeric>	<Numeric>
org.apache.catalina.session.StandardSession @ 0xd9092388	88	73,248	0.09%
java.util.concurrent.ConcurrentHashMap @ 0xd90923e0	64	72,984	0.09%
java.util.concurrent.ConcurrentHashMap\$Node[32] @ 0xe267dec0	144	72,896	0.09%
java.util.concurrent.ConcurrentHashMap\$Node @ 0xe0cea7f8	32	64,280	0.08%
java.util.Collections\$SynchronizedMap @ 0xe0cea7d8	32	64,248	0.08%
com.sun.faces.util.LRUMap @ 0xe0cea798	64	64,176	0.08%
java.util.LinkedHashMap\$Entry @ 0xe2e24b20	40	31,248	0.04%
javax.faces.component.UIViewRoot\$ViewMap @ 0xe2e24548	48	31,208	0.04%
java.util.HashMap\$Node[16] @ 0xe2e275e8	80	31,144	0.04%
java.util.HashMap\$Node @ 0xe31d2ae0	32	30,784	0.04%
java.util.HashMap\$Node @ 0xe2e2cac8	32	216	0.00%
java.util.HashMap\$Node @ 0xe3146d08	32	184	0.00%
test.view.scope.window.bean.ViewBean @ 0xe3140868	24	152	0.00%
java.lang.String @ 0xe3141ba0 2 -> 42e65ace	24	72	0.00%
java.lang.String @ 0xe31408a0 42e65ace	24	56	0.00%
Total: 2 entries			
java.util.HashMap\$Node @ 0xe2e27638	32	32	0.00%
java.util.HashMap\$Node @ 0xe2e2ca90	32	32	0.00%
Total: 4 entries			
java.util.HashMap\$EntrySet @ 0xe3152e08	16	16	0.00%
Total: 2 entries			
java.util.LinkedHashMap\$Entry @ 0xe36311d0	40	31,248	0.04%
javax.faces.component.UIViewRoot\$ViewMap @ 0xe3625938	48	31,208	0.04%
java.util.HashMap\$Node[16] @ 0xe3633c98	80	31,144	0.04%
java.util.HashMap\$Node @ 0xe3a374b0	32	30,784	0.04%
java.util.HashMap\$Node @ 0xe3638fe0	32	216	0.00%
java.util.HashMap\$Node @ 0xe3971c00	32	184	0.00%
test.view.scope.window.bean.ViewBean @ 0xe396b760	24	152	0.00%
java.lang.String @ 0xe396ca98 3 -> 3adaadd4	24	72	0.00%
java.lang.String @ 0xe396b798 3adaadd4	24	56	0.00%
Total: 2 entries			

Class Name	Objects	Shallow Heap	Retained Heap	Percentage
*StandardSession.*	<Numeric>	<Numeric>	<Numeric>	<Numeric>
org.apache.catalina.session.StandardSession	1	88	73,248	0.09%
java.util.concurrent.ConcurrentHashMap	1	64	72,984	0.09%
java.util.concurrent.ConcurrentHashMap\$Node[]	1	144	72,896	0.09%
java.util.concurrent.ConcurrentHashMap\$Node	8	256	72,288	0.09%
java.util.Collections\$SynchronizedMap	1	32	64,248	0.08%
com.sun.faces.util.LRUMap	1	64	64,176	0.08%
java.util.LinkedHashMap\$Entry	2	80	62,496	0.08%
javax.faces.component.UIViewRoot\$ViewMap	2	96	62,416	0.08%
java.util.HashMap\$Node[]	2	160	62,288	0.08%
java.util.HashMap\$Node	8	256	62,128	0.08%
com.sun.org.apache.xerces.internal.dom.Doc	2	272	61,504	0.08%
java.util.HashMap\$Node	2	64	368	0.00%
test.view.scope.window.bean.ViewBean	2	48	304	0.00%
Total: 2 entries				

### 3rd and 2nd closed

Closing 3<sup>rd</sup> and 2<sup>nd</sup> window removes it from the map which is OK and works as specified by @WindowDisposed

- @PreDestroy of: 3 -> 3adaadd4
- @PreDestroy of: 2 -> 42e65ace

Class Name	Objects	Shallow Heap	Retained Heap	Percentage
*StandardSession.*	<Numeric>	<Numeric>	<Numeric>	<Numeric>
org.apache.catalina.session.StandardSession	1	88	78,960	0.10%
java.util.concurrent.ConcurrentHashMap	1	64	78,696	0.10%
java.util.concurrent.ConcurrentHashMap\$Node[]	1	144	78,608	0.10%
java.util.concurrent.ConcurrentHashMap\$Node	8	256	78,064	0.10%
java.util.Collections\$SynchronizedMap	1	32	63,976	0.08%
com.sun.faces.util.LRUMap	1	64	63,904	0.08%
java.util.LinkedHashMap\$Entry	2	80	62,224	0.08%
javax.faces.component.UIViewRoot\$ViewMap	2	96	62,144	0.08%
java.util.HashMap\$Node[]	2	160	61,984	0.08%
java.util.HashMap\$Node	8	256	61,824	0.08%
com.sun.org.apache.xerces.internal.dom.	2	272	61,568	0.08%
java.util.HashMap\$EntrySet	2	32	32	0.00%
java.util.HashMap\$KeySet	2	32	32	0.00%
<b>Total: 3 entries</b>				

## 1<sup>st</sup> remaining closed

Closing 1<sup>st</sup> window (actually outdated) triggers bean creation and places it in the session (even when not needed) – NOK.

- BEAN CREATED: 3017e45f  
@PostConstruct of: 4 -> 3017e45f

Class Name	Objects	Shallow Heap	Retained Heap	Percentage
*StandardSession.*	<Numeric>	<Numeric>	<Numeric>	<Numeric>
org.apache.catalina.session.StandardSession	1	88	48,328	0.06%
java.util.concurrent.ConcurrentHashMap	1	64	48,064	0.06%
java.util.concurrent.ConcurrentHashMap\$Node[]	1	144	47,976	0.06%
java.util.concurrent.ConcurrentHashMap\$Node	8	256	47,608	0.06%
java.util.Collections\$SynchronizedMap	1	32	33,408	0.04%
com.sun.faces.util.LRUMap	1	64	33,336	0.04%
java.util.LinkedHashMap\$Entry	2	80	33,248	0.04%
javax.faces.component.UIViewRoot\$ViewMap	2	96	33,056	0.04%
java.util.HashMap\$Node[]	2	160	32,912	0.04%
java.util.HashMap\$Node	6	192	32,752	0.04%
com.sun.org.apache.xerces.internal.dom.DocumentImpl	1	136	32,408	0.04%
test.view.scope.window.bean.ViewBean	1	24	152	0.00%
<b>Total: 2 entries</b>				

Class Name	Shallow Heap	Retained Heap	Percentage
*StandardSession.*	<Numeric>	<Numeric>	<Numeric>
org.apache.catalina.session.StandardSession @ 0xd9092388	88	48,328	0.06%
java.util.concurrent.ConcurrentHashMap @ 0xd90923e0	64	48,064	0.06%
java.util.concurrent.ConcurrentHashMap\$Node[32] @ 0xe267dec0	144	47,976	0.06%
java.util.concurrent.ConcurrentHashMap\$Node @ 0xe0cea7f8	32	33,440	0.04%
java.util.Collections\$SynchronizedMap @ 0xe0cea7d8	32	33,408	0.04%
com.sun.faces.util.LRUMap @ 0xe0cea798	64	33,336	0.04%
java.util.LinkedHashMap\$Entry @ 0xe2e24b20	40	32,736	0.04%
javax.faces.component.UIViewRoot\$ViewMap @ 0xe2e24548	48	32,696	0.04%
java.util.HashMap\$Node[16] @ 0xe2e275e8	80	32,616	0.04%
java.util.HashMap\$Node @ 0xe31d2ae0	32	32,440	0.04%
com.sun.org.apache.xerces.internal.dom.DocumentImpl @ 0xe4eca058	136	32,408	0.04%
java.util.HashMap\$Node @ 0xe2e27638	32	32	0.00%
java.util.HashMap\$Node @ 0xe2e2ca90	32	32	0.00%
java.util.HashMap\$Node @ 0xe2e2cac8	32	32	0.00%
Total: 4 entries			
java.util.HashMap\$EntrySet @ 0xe3152e08	16	16	0.00%
java.util.HashMap\$KeySet @ 0xe5288cd8	16	16	0.00%
Total: 3 entries			
java.util.LinkedHashMap\$Entry @ 0xe34c4bb0	40	512	0.00%
javax.faces.component.UIViewRoot\$ViewMap @ 0xe34c4590	48	360	0.00%
java.util.HashMap\$Node[16] @ 0xe34c4bf8	80	296	0.00%
java.util.HashMap\$Node @ 0xe5a99228	32	184	0.00%
test.view.scope.window.bean.ViewBean @ 0xe5a93750	24	152	0.00%
java.lang.String @ 0xe5a940c0 4 -> 3017e45f	24	72	0.00%
java.lang.String @ 0xe5a93788 3017e45f	24	56	0.00%
Total: 2 entries			
java.util.HashMap\$Node @ 0xe34c4c48	32	32	0.00%
Total: 2 entries			
java.util.HashMap\$EntrySet @ 0xe5ad1438	16	16	0.00%
Total: 2 entries			

## ICEFaces @WindowDisposed (FIFO closing)

### 3 windows opened

As previously works as expected.

- BEAN CREATED: 634cb7db  
@PostConstruct of: 1 -> 634cb7db
- BEAN CREATED: 5737f72e  
@PostConstruct of: 2 -> 5737f72e
- **@PreDestroy of: 1 -> 634cb7db**
- BEAN CREATED: 7a24fc45  
@PostConstruct of: 3 -> 7a24fc45

### 1st window closed

Closing 1<sup>st</sup> window (actually outdated) triggers 4<sup>th</sup> bean creation and places it in the session (even when not needed) – **NOK**. Currently windows for beans 2 and 3 opened but in map beans 3 and 4 presented.

- **@PreDestroy of: 2 -> 5737f72e**
- BEAN CREATED: 25dcf9a1  
@PostConstruct of: 4 -> 25dcf9a1

Class Name	Shallow Heap	Retained Heap	Percentage
*StandardSession.*	<Numeric>	<Numeric>	<Numeric>
org.apache.catalina.session.StandardSession @ 0x84314920	88	42,512	0.11%
java.util.concurrent.ConcurrentHashMap @ 0x84314978	64	42,248	0.11%
java.util.concurrent.ConcurrentHashMap\$Node[32] @ 0xd6b01ff0	144	42,160	0.11%
java.util.concurrent.ConcurrentHashMap\$Node @ 0x84a3d310	32	33,544	0.09%
java.util.Collections\$SynchronizedMap @ 0x84a3d330	32	33,512	0.09%
com.sun.faces.util.LRUMap @ 0x84a3d350	64	33,440	0.09%
java.util.LinkedHashMap\$Entry @ 0xd8091320	40	32,840	0.09%
javax.faces.component.UIViewRoot\$ViewMap @ 0xd80901f8	48	32,800	0.09%
java.util.HashMap\$Node[16] @ 0xd8094048	80	32,736	0.09%
java.util.HashMap\$Node @ 0xd84d5ae0	32	32,376	0.08%
java.util.HashMap\$Node @ 0xd8099528	32	216	0.00%
java.util.HashMap\$Node @ 0xd8449d50	32	184	0.00%
test.view.scope.window.bean.ViewBean @ 0xd8448290	24	152	0.00%
java.lang.String @ 0xd84495d0 3 -> 7a24fc45	24	72	0.00%
java.lang.String @ 0xd84482c8 7a24fc45	24	56	0.00%
Total: 2 entries			
java.util.HashMap\$Node @ 0xd8094098	32	32	0.00%
java.util.HashMap\$Node @ 0xd80994f0	32	32	0.00%
Total: 4 entries			
java.util.HashMap\$EntrySet @ 0xd8455e08	16	16	0.00%
Total: 2 entries			
java.util.LinkedHashMap\$Entry @ 0xd88ef590	40	512	0.00%
javax.faces.component.UIViewRoot\$ViewMap @ 0xd88ee7a8	48	360	0.00%
java.util.HashMap\$Node[16] @ 0xd88ef5d8	80	296	0.00%
java.util.HashMap\$Node @ 0xd91334d8	32	184	0.00%
test.view.scope.window.bean.ViewBean @ 0xd91323e8	24	152	0.00%
java.lang.String @ 0xd9132d58 4 -> 25dcf9a1	24	72	0.00%
java.lang.String @ 0xd9132420 25dcf9a1	24	56	0.00%
Total: 2 entries			
java.util.HashMap\$Node @ 0xd88ef628	32	32	0.00%
Total: 2 entries			
java.util.HashMap\$EntrySet @ 0xd916b7c8	16	16	0.00%
Total: 2 entries			
java.lang.String @ 0xd88eed10 e3ee6ae8-64f7-45fd-8080-21a5841b8de7	24	112	0.00%
Total: 2 entries			

### 3rd window closed

Closing 3<sup>rd</sup> window removes its bean – OK.

- @PreDestroy of: 3 -> 7a24fc45



Class Name	Shallow Heap	Retained Heap	Percentage
*StandardSession.*	<Numeric>	<Numeric>	<Numeric>
org.apache.catalina.session.StandardSession @ 0x84314920	88	45,336	0.12%
java.util.concurrent.ConcurrentHashMap @ 0x84314978	64	45,072	0.12%
java.util.concurrent.ConcurrentHashMap\$Node[32] @ 0xd6b01ff0	144	44,984	0.12%
java.util.concurrent.ConcurrentHashMap\$Node @ 0x84a3d310	32	33,376	0.09%
java.util.Collections\$SynchronizedMap @ 0x84a3d330	32	33,344	0.09%
com.sun.faces.util.LRUMap @ 0x84a3d350	64	33,272	0.09%
java.util.LinkedHashMap\$Entry @ 0xd8091320	40	32,672	0.09%
javax.faces.component.UIViewRoot\$ViewMap @ 0xd80901f8	48	32,632	0.09%
java.util.HashMap\$Node[16] @ 0xd8094048	80	32,552	0.09%
java.util.HashMap\$Node @ 0xd84d5ae0	32	32,376	0.08%
com.sun.org.apache.xerces.internal.dom.DocumentImpl @ 0xd98528b8	136	32,344	0.08%
java.util.HashMap\$Node @ 0xd8094098	32	32	0.00%
java.util.HashMap\$Node @ 0xd80994f0	32	32	0.00%
java.util.HashMap\$Node @ 0xd8099528	32	32	0.00%
<b>Total: 4 entries</b>			
java.util.HashMap\$EntrySet @ 0xd8455e08	16	16	0.00%
java.util.HashMap\$KeySet @ 0xd9c2f6a0	16	16	0.00%
<b>Total: 3 entries</b>			
java.util.LinkedHashMap\$Entry @ 0xd88ef590	40	512	0.00%
javax.faces.component.UIViewRoot\$ViewMap @ 0xd88ee7a8	48	360	0.00%
java.util.HashMap\$Node[16] @ 0xd88ef5d8	80	296	0.00%
java.util.HashMap\$Node @ 0xd91334d8	32	184	0.00%
test.view.scope.window.bean.ViewBean @ 0xd91323e8	24	152	0.00%
java.lang.String @ 0xd9132d58 4 -> 25dcf9a1	24	72	0.00%
java.lang.String @ 0xd9132420 25dcf9a1	24	56	0.00%
<b>Total: 2 entries</b>			
java.util.HashMap\$Node @ 0xd88ef628	32	32	0.00%
<b>Total: 2 entries</b>			
java.util.HashMap\$EntrySet @ 0xd916b7c8	16	16	0.00%
<b>Total: 2 entries</b>			
java.lang.String @ 0xd88eed10 e3ee6ae8-64f7-45fd-8080-21a5841b8de7	24	112	0.00%
<b>Total: 2 entries</b>			
java.util.HashMap\$Node[2] @ 0x84a3d390	24	24	0.00%
<b>Total: 3 entries</b>			
java.util.Collections\$SynchronizedSet @ 0xd80907d0	24	24	0.00%

## 2nd window closed

5<sup>th</sup> not needed bean created but final result is fine while all beans are removed.

- @PreDestroy of: 4 -> 25dcf9a1
- BEAN CREATED: 2c08e0e2  
@PostConstruct of: 5 -> 2c08e0e2
- @PreDestroy of: 5 -> 2c08e0e2

Class Name	Shallow Heap	Retained Heap	Percentage
.*StandardSession.*	<Numeric>	<Numeric>	<Numeric>
org.apache.catalina.session.StandardSession @ 0x84314920	88	48,072	0.13%
java.util.concurrent.ConcurrentHashMap @ 0x84314978	64	47,808	0.12%
java.util.concurrent.ConcurrentHashMap\$Node[32] @ 0xd6b01f	144	47,720	0.12%
java.util.concurrent.ConcurrentHashMap\$Node @ 0x84a3d31	32	33,176	0.09%
java.util.Collections\$SynchronizedMap @ 0x84a3d330	32	33,144	0.09%
com.sun.faces.util.LRUMap @ 0x84a3d350	64	33,072	0.09%
java.util.LinkedHashMap\$Entry @ 0xd89889e8	40	32,672	0.09%
javax.faces.component.UIViewRoot\$ViewMap @ 0xd89889e8	48	32,632	0.09%
java.util.HashMap\$Node[16] @ 0xd898b6b8	80	32,552	0.08%
java.util.HashMap\$Node @ 0xda1f4600	32	32,376	0.08%
com.sun.org.apache.xerces.internal.dom.LimitedSupportDocumentImpl @ 0xda1f4600	136	32,344	0.08%
java.util.HashMap\$Node @ 0xd898b708	32	32	0.00%
java.util.HashMap\$Node @ 0xd898fae8	32	32	0.00%
java.util.HashMap\$Node @ 0xd898fb20	32	32	0.00%
<b>Total: 4 entries</b>			
java.util.HashMap\$EntrySet @ 0xda154600	16	16	0.00%
java.util.HashMap\$KeySet @ 0xda1fa6a0	16	16	0.00%
<b>Total: 3 entries</b>			
java.util.LinkedHashMap\$Entry @ 0xd8981930	40	312	0.00%
javax.faces.component.UIViewRoot\$ViewMap @ 0xd8981930	48	160	0.00%
java.util.HashMap\$Node[16] @ 0xd8981958	80	112	0.00%
java.util.HashMap\$Node @ 0xd89819a8	32	32	0.00%
java.lang.String @ 0xd89810b0 2e056b07-702d-...	24	112	0.00%
<b>Total: 2 entries</b>			
java.util.HashMap\$Node[2] @ 0x84a3d390	24	24	0.00%
<b>Total: 3 entries</b>			
java.util.Collections\$SynchronizedSet @ 0xd80907d0	24	24	0.00%
java.util.LinkedHashMap\$LinkedKeySet @ 0xd80907e8	16	16	0.00%
<b>Total: 3 entries</b>			