

! Planned Downtime Announcement



September 25, 2021 – There will be a two-hour planned downtime on Sunday September 26th, starting at 6:00 pm CEST (12:00 pm ET; 9:00 am PT). Please save your work.

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Odata \$batch processing part 2

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This is the 2nd part of this Odata \$batch processing chapter. [Click here for Odata \\$batch processing part 1](#)

So far we have seen :

- 1) The default behavior of a change set within a \$batch .
- 2) How the change set can contain only one operation and where each change set is treated as single LUW

3) In order to have more than one operation in a change set, SAP GW framework provides a defer mode. This will change the default processing mode. This is done by flagging defer mode = X in changes et begin method.

For defer mode:

- 1) Method CHANGESET_BEGIN is redefined with cv_defer_mode = abap_true
- 2) Method CHANGESET_PROCESS is redefined to have logic to create material + extend material to the plant
- 3) All operations in a changeset is treated as one LUW

\$batch Use case 8: Change set in defer mode

Below \$batch request has 2 change sets:

Change set C01 – 1 POST (for material creation) and 1 PUT (material update)

Change set C02 – 1 POST and 1 PUT

```

1  --batch_B01
2  Content-Type: multipart/mixed;boundary=changeset_C01
3                                     Start changeset C01
4  --changeset_C01
5  Content-Type: application/http
6  Content-Transfer-Encoding: binary
7
8
9  POST MaterialSet HTTP/1.1
10 sap-context-accept: header
11 Content-Type: application/json
12 Accept: application/json
13
14 {
15     "Matnr"      : "",|
16     "MatlDesc"   : "Demo test material 1",
17     "IndSector"  : "M",
18     "MatlType"   : "ZHAL",
19     "MatlGroup"  : "0ZZ000",
20     "BaseUom"    : "PCE",
21     "Created_On" : "2020-08-01T00:00:00"
22 }

```

```

24
25 --changeset_C01
26 Content-Type: application/http
27 Content-Transfer-Encoding: binary
28
29
30 PUT MaterialSet(Matnr='DEMO_01') HTTP/1.1
31 sap-context-accept: header
32 Content-Type: application/json
33 Accept: application/json
34
35 {
36     "Matnr"      : "DEMO_01",
37     "MatlDesc"   : "Description change 01 for DEMO_01"
38 }
39
40 --changeset_C01-- End changeset C01
41
42

```

Change set C01

```

43 --batch_B01
44 Content-Type: multipart/mixed;boundary=changeset_C02
45                                     Start changeset C02
46 --changeset_C02
47 Content-Type: application/http
48 Content-Transfer-Encoding: binary
49
50
51 POST MaterialSet HTTP/1.1
52 sap-context-accept: header
53 Content-Type: application/json
54 Accept: application/json
55
56 {
57     "Matnr"      : "",
58     "MatlDesc"   : "Demo test material 2",
59     "IndSector"  : "M",
60     "MatlType"   : "ZHAL",
61     "MatlGroup"  : "0ZZ000",
62     "BaseUom"    : "PCE",
63     "Created_On" : "2020-08-01T00:00:00"
64 }

```

```

65
66
67 --changeset_C02
68 Content-Type: application/http
69 Content-Transfer-Encoding: binary
70
71
72 PUT MaterialSet(Matnr='DEMO_02') HTTP/1.1
73 sap-context-accept: header
74 Content-Type: application/json
75 Accept: application/json
76
77 {
78     "Matnr"      : "DEMO_02",
79     "MatlDesc"   : "Description change 01 for DEMO_02"
80 }
81
82 --changeset_C02-- End changeset C02
83
84
85 --batch_B01--

```

Change set C02

Response:

```

1  --D509FF298A9DA11348CF5911C55C62710
2  Content-Type: multipart/mixed; boundary=D509FF298A9DA
3  Content-Length: 1234
4
5  --D509FF298A9DA11348CF5911C55C62711
6  Content-Type: application/http
7  Content-Length: 867
8  content-transfer-encoding: binary
9
10 HTTP/1.1 201 Created
11 Content-Type: application/json
12 Content-Length: 637
13 location: https://cimd437.hsec. .com
14 dataserviceversion: 2.0
15
16 {
17   "d": {
18     "__metadata": { ...
19   }
20 }
21
22
23   "Matnr": "179",
24   "MatIDesc": "Demo test material 1",
25   "IndSector": "M",
26   "MatlType": "ZHAL",
27   "MatlGroup": "0ZZ000",
28   "BaseUom": "PCE",
29   "Created_On": "/Date(1596240000000)/",
30   "Navg_To_Plant": {
31     "__deferred": {
32       "uri": "https://cimd437.hse
33     }
34   }
35 }
36 }
37 --D509FF298A9DA11348CF5911C55C62711

```

C01 POST response

```

38 Content-Type: application/http
39 Content-Length: 71
40 content-transfer-encoding: binary
41
42 HTTP/1.1 204 No Content
43 Content-Length: 0
44 dataserviceversion: 2.0
45
46
47 --D509FF298A9DA11348CF5911C55C62711--
48

```

C01 PUT response

```

49 --D509FF298A9DA11348CF5911C55C62710
50 Content-Type: multipart/mixed; boundary=D509FF298A9
51 Content-Length: 1234
52
53 --D509FF298A9DA11348CF5911C55C62711
54 Content-Type: application/http
55 Content-Length: 867
56 content-transfer-encoding: binary
57
58 HTTP/1.1 201 Created
59 Content-Type: application/json
60 Content-Length: 637
61 location: https://cim437.hsec.emea
62 dataserviceversion: 2.0
63
64 {
65   "d": {
66     >   "__metadata": {...
70   },

```

```

65   "d": {
66     >   "__metadata": {...
70   },
71   "Matnr": "180",
72   "MatlDesc": "Demo test material 2",
73   "IndSector": "M",
74   "MatlType": "ZHAL",
75   "MatlGroup": "0ZZ000",
76   "BaseUom": "PCE",
77   "Created_On": "/Date(1596240000000)/",
78   "Navg_To_Plant": {
79     "__deferred": {
80       "uri": "https://cim437.hsec
81     }
82   }
83 }
84 }

```

C02 POST response

```

85 --D509FF298A9DA11348CF5911C55C62711
86 Content-Type: application/http
87 Content-Length: 71
88 content-transfer-encoding: binary
89
90 HTTP/1.1 204 No Content PUT status
91 Content-Length: 0
92 dataserviceversion: 2.0
93
94
95 --D509FF298A9DA11348CF5911C55C62711--
96
97 --D509FF298A9DA11348CF5911C55C62710--
98

```

C02 PUT response

\$batch Use case 9: Default processing vs Deferred processing

Deferred processing is meant to achieve performance gain. Allows more than one operation in a change set (single LUW). Let's compare the time between default & deferred processing.

To check the time consumed in postman, add header parameter "sap-statistics = true"

Below request for default processing mode contains:

1) Two retrieve operations and

2) Two change sets as below:

C01 contain 1 POST operation

C02 contain 1 PUT operation

Request:


```
1 |--batch_B01 Start batch
2 Content-Type: application/http
3 Content-Transfer-Encoding: binary
4
5
6 GET MaterialSet(Matnr='DEMO_02')?$expand=Navg_To_Plan HTTP/1.1
7 sap-context-accept: header
8 Content-Type: application/json
9 Accept: application/json
10
11
12 --batch_B01
13 Content-Type: application/http
14 Content-Transfer-Encoding: binary
15
16
17 GET MaterialSet(Matnr='DEMO_03') HTTP/1.1
18 sap-context-accept: header
19 Content-Type: application/json
20 Accept: application/json
21
22
```

C01 GET request


```

23 --batch_B01
24 Content-Type: multipart/mixed;boundary=changeset_C01
25                                     Start changeset C01
26 --changeset_C01
27 Content-Type: application/http
28 Content-Transfer-Encoding: binary
29
30
31 POST MaterialSet HTTP/1.1
32 sap-context-accept: header
33 Content-Type: application/json
34 Accept: application/json
35
36 {
37     "Matnr"      : "",
38     "MatlDesc"   : "Demo test material",
39     "IndSector"  : "M",
40     "MatlType"   : "ZHAL",
41     "MatlGroup"  : "0ZZ000",
42     "BaseUom"    : "PCE",
43     "Created_On" : "2020-08-01T00:00:00"
44 }
45
46
47 --changeset_C01-- End changeset C01

```

```

48
49
50 --batch_B01
51 Content-Type: multipart/mixed;boundary=changeset_C02
52                                     Start changeset C02
53 --changeset_C02
54 Content-Type: application/http
55 Content-Transfer-Encoding: binary
56
57
58 PUT MaterialSet(Matnr='DEMO_04') HTTP/1.1
59 sap-context-accept: header
60 Content-Type: application/json
61 Accept: application/json
62
63 {
64     "MatlDesc"   : "Change description DEMO_04"
65 }
66
67 --changeset_C02-- End of changeset C02
68
69
70 --batch_B01-- End batch

```

C01 POST & C02 PUT request

Response is as below:

```

1  --0774A35AE0B5769DE15D58C567FFD4CF0
2  Content-Type: application/http
3  Content-Length: 1035
4  content-transfer-encoding: binary
5
6  HTTP/1.1 200 OK
7  Content-Type: application/json
8  Content-Length: 938
9  dataserviceversion: 2.0
10
11 {
12   "d": {
13     "__metadata": { ...
17

```

```

17   },
18   "Matnr": "DEMO_02",
19   "MatlDesc": "Description change 01 for DEMO_02",
20   "IndSector": "M",
21   "MatlType": "FERT",
22   "MatlGroup": "0ZZ000",
23   "BaseUom": "PCE",
24   "Created_On": "/Date(1595714400000)/",
25   "Navg_To_Plant": {
26     "results": [
27       {
28         >   "__metadata": { ...
32         },
33         "Matnr": "DEMO_02",
34         "Werks": "US90",
35         "Profit_Center": "U94"
36       }
37     ]
38   }
39 }
40 }
41  --0774A35AE0B5769DE15D58C567FFD4CF0

```

GET response

```

42 Content-Type: application/http
43 Content-Length: 737
44 content-transfer-encoding: binary
45
46 HTTP/1.1 200 OK
47 Content-Type: application/json
48 Content-Length: 640
49 dataserviceversion: 2.0
50
51 {
52   "d": {
53     "_metadata": { ...
54   },
55   "Matnr": "DEMO_03",
56   "MatlDesc": "DEMO_03",
57   "IndSector": "M",
58   "MatlType": "FERT",
59   "MatlGroup": "0ZZ000",
60   "BaseUom": "PCE",
61   "Created_On": "/Date(1596232800000)/",
62   "Navg_To_Plant": { ...
63 }
64 }
65 }
66 }
67 }
68 }
69 }
70 }
71 }

```

```

72 --0396D6C37149265A22369CAFE02920A00
73 Content-Type: multipart/mixed; boundary=0396D6C371492
74 Content-Length: 1033
75
76 --0396D6C37149265A22369CAFE02920A01
77 Content-Type: application/http
78 Content-Length: 865
79 content-transfer-encoding: binary
80
81 HTTP/1.1 201 Created
82 Content-Type: application/json
83 Content-Length: 635
84 location: https://cimd437.hsec.er...com
85 dataserviceversion: 2.0
86
87 {
88   "d": {
89     "_metadata": { ...
90   },
91   "Matnr": "277",
92   "MatlDesc": "Demo test material",
93   "IndSector": "M",
94   "MatlType": "ZHAL",
95   "MatlGroup": "0ZZ000",
96   "BaseUom": "PCE",
97   "Created_On": "/Date(1596240000000)/",
98   "Navg_To_Plant": { ...
99 }
100 }
101 }

```

C01 POST response

```

101 >      "Navg_To_Plant": { ...
105      }
106    }
107  }
108  --0774A35AE0B5769DE15D58C567FFD4CF1
109  Content-Type: application/http
110  Content-Length: 71
111  content-transfer-encoding: binary
112
113  HTTP/1.1 204 No Content PUT status
114  Content-Length: 0
115  dataserviceversion: 2.0
116
117
118  --0774A35AE0B5769DE15D58C567FFD4CF1--
119
120  --0774A35AE0B5769DE15D58C567FFD4CF0--
121

```

C01 PUT response



The time taken is :

KEY	VALUE
content-type ⓘ	multipart/mixed; boundary=0396D6C37149265A22369CAFE02920A00
content-length ⓘ	716
dataserviceversion ⓘ	2.0
sap-statistics ⓘ	total=395,fw=128,app=267,gwtotal=395,gwhub=71,gwrfcoh=0,gwbe=57,gwapp=267,gwnongw=0,gwbe
sap-server ⓘ	true

**GW Total = GW Hub + GW Backed + data provider application
395 ms = 71 + 57 + 267**






Time taken for default processing mode

Looking at tcode /IWFND/TRACES, we see the GW time taken is 395 milliseconds (ms)

Configuration Performance Trace Payload Trace					
 Request URI Today <-> All Traces					
Performance Trace: Client 5) User 300000001					
Status	Service Call Info	Method	Proc. Time	Appl. Time	Non-GW Time
	/sap/ZDEMO_SAMPLE_BATCH_MATPLANT_SRV/\$batch	POST	395	267	0


Frontend trace

Average Times (in milliseconds)						
No. of Requests	Processing Time	SAP GW Hub Syst...	RFC and Network ...	SAP GW Backend ...	Application	Non-GW
1	395	71	0	57	267	0

Detail (Time in milliseconds)								
Exp...	Namesp...	Service Name	Location	Operation Name	Level	Destination	Processing Time	SAP GW Backend Framework Ov
	/SAP/	ZDEMO_SAM...	Hub System	BATCH	1		395	
	/SAP/	ZDEMO_SAM...	Hub System	PROCESS_BATCH	2	RFC Bypa...	0	
	/SAP/	ZDEMO_SAM...	Local BEP	PARALLELIZE_QUERIES	3			
	/SAP/	ZDEMO_SAM...	Local BEP	READ_ENTITY	4		0	
	/SAP/	ZDEMO_SAM...	Local BEP	READ_ENTITY	4		0	
	/SAP/	ZDEMO_SAM...	Local BEP	PROCESS_CHANGESET	3			
	/SAP/	ZDEMO_SAM...	Local BEP	CHANGESET_BEGIN	4		0	
	/SAP/	ZDEMO_SAM...	Local BEP	CREATE_ENTITY	4		0	
	/SAP/	ZDEMO_SAM...	Local BEP	CHANGESET_END	4		0	
	/SAP/	ZDEMO_SAM...	Local BEP	PROCESS_CHANGESET	3			
	/SAP/	ZDEMO_SAM...	Local BEP	CHANGESET_BEGIN	4		0	
	/SAP/	ZDEMO_SAM...	Local BEP	UPDATE_ENTITY	4		0	
	/SAP/	ZDEMO_SAM...	Local BEP	CHANGESET_END	4		0	

Frontend trace details

Another good Gateway statistics tool (tcode /IWFND/STATS) will show the overall results as below:


Request URI
Summarize
Performance Trace
Hub System Statistics
Backend System Sta

Request Statistics

Li	Cli	Ex	Name	Service	V	Operation	Processing Time in ms	Hub Overhead in ms	Backend Overhead in ms	Application Time in ms	RFC O
6	990		/SAP/	ZDEMO	1	batch	395	71	57	267	0
7			/SAP/	ZDEMO	1	batch-update	0	0	0	30	0
8			/SAP/	ZDEMO	1	batch-create	0	0	0	232	0
9			/SAP/	ZDEMO	1	batch-read entry	0	0	0	1	0
1			/SAP/	ZDEMO	1	batch-read entry	0	0	0	5	0

Gateway Statistics tool

More details on GW performance & measuring time can be found [here](#).

Moving to the defer mode processing. The change set begin and change set process methods are implemented as mentioned before. Let's run earlier operations now in defer mode.

Request:

```
1 |--batch_B01 Start batch
2 Content-Type: application/http
3 Content-Transfer-Encoding: binary
4
5
6 GET MaterialSet(Matnr='DEMO_02')?$expand=Navg_To_Plan HTTP/1.1
7 sap-context-accept: header
8 Content-Type: application/json
9 Accept: application/json
10
11
12 --batch_B01
13 Content-Type: application/http
14 Content-Transfer-Encoding: binary
15
16
17 GET MaterialSet(Matnr='DEMO_03') HTTP/1.1
18 sap-context-accept: header
19 Content-Type: application/json
20 Accept: application/json
21
22
```

GET request


```

23 --batch_B01
24 Content-Type: multipart/mixed;boundary=changeset_C01
25                                     Start changeset C01
26 --changeset_C01
27 Content-Type: application/http
28 Content-Transfer-Encoding: binary
29
30
31 POST MaterialSet HTTP/1.1
32 sap-context-accept: header
33 Content-Type: application/json
34 Accept: application/json
35
36 {
37     "Matnr"      : "",
38     "MatlDesc"   : "Demo test material",
39     "IndSector"  : "M",
40     "MatlType"   : "ZHAL",
41     "MatlGroup"  : "0ZZ000",
42     "BaseUom"    : "PCE",
43     "Created_On" : "2020-08-01T00:00:00"
44 }
45
46

```

```

47 --changeset_C01
48 Content-Type: application/http
49 Content-Transfer-Encoding: binary
50
51
52 PUT MaterialSet(Matnr='DEMO_04') HTTP/1.1
53 sap-context-accept: header
54 Content-Type: application/json
55 Accept: application/json
56
57 {
58     "MatlDesc"   : "Change description 1 DEMO_04"
59 }
60
61 --changeset_C01-- End of changeset C01
62
63
64 --batch_B01-- End batch

```

C01 POST & PUT request

Response :

```

1  --0774A35AE0B5769DE15D58C567FFD4CF0
2  Content-Type: application/http
3  Content-Length: 1035
4  content-transfer-encoding: binary
5
6  HTTP/1.1 200 OK
7  Content-Type: application/json
8  Content-Length: 938
9  dataserviceversion: 2.0
10
11 {
12   "d": {
13     "__metadata": { ...
17

```

```

17   },
18   "Matnr": "DEMO_02",
19   "MatlDesc": "Description change 01 for DEMO_02",
20   "IndSector": "M",
21   "MatlType": "FERT",
22   "MatlGroup": "0ZZ000",
23   "BaseUom": "PCE",
24   "Created_On": "/Date(1595714400000)/",
25   "Navg_To_Plant": {
26     "results": [
27       {
28         >   "__metadata": { ...
32       },
33       "Matnr": "DEMO_02",
34       "Werks": "US90",
35       "Profit_Center": "U94"
36     ]
37   }
38 }
39 }
40 }
41  --0774A35AE0B5769DE15D58C567FFD4CF0

```

GET response

```

42 Content-Type: application/http
43 Content-Length: 737
44 content-transfer-encoding: binary
45
46 HTTP/1.1 200 OK
47 Content-Type: application/json
48 Content-Length: 640
49 dataserviceversion: 2.0
50
51 {
52   "d": {
53     "_metadata": { ...
54   },
55   "Matnr": "DEMO_03",
56   "MatlDesc": "DEMO_03",
57   "IndSector": "M",
58   "MatlType": "FERT",
59   "MatlGroup": "0ZZ000",
60   "BaseUom": "PCE",
61   "Created_On": "/Date(1596232800000)/",
62   "Navg_To_Plant": {
63     "_deferred": { ...
64   }
65 }
66 }
67
70 }
71 }
72 --0774A35AE0B5769DE15D58C567FFD4CF0

```

```

73 Content-Type: multipart/mixed; boundary=0774A35AE0B5769DE15D58C567FFD4CF1
74 Content-Length: 1232
75
76 --0774A35AE0B5769DE15D58C567FFD4CF1
77 Content-Type: application/http
78 Content-Length: 865
79 content-transfer-encoding: binary
80
81 HTTP/1.1 201 Created
82 Content-Type: application/json
83 Content-Length: 635
84 location: https://cimd437.hsec. .com:843
85 dataserviceversion: 2.0
86
87 {
88   "d": {
89     "_metadata": { ...
90   },
91   "Matnr": "284",
92   "MatlDesc": "Demo test material",
93   "IndSector": "M",
94   "MatlType": "ZHAL",
95   "MatlGroup": "0ZZ000",
96   "BaseUom": "PCE",
97   "Created_On": "/Date(1596240000000)/",
98   "Navg_To_Plant": { ...
99 }
100 }
101 }
102 --0774A35AE0B5769DE15D58C567FFD4CF1

```

GET & C01 POST response

```

101 >      "Navg_To_Plant": { ...
105      }
106    }
107  }
108  --0774A35AE0B5769DE15D58C567FFD4CF1
109  Content-Type: application/http
110  Content-Length: 71
111  content-transfer-encoding: binary
112
113  HTTP/1.1 204 No Content PUT status
114  Content-Length: 0
115  dataserviceversion: 2.0
116
117
118  --0774A35AE0B5769DE15D58C567FFD4CF1--
119
120  --0774A35AE0B5769DE15D58C567FFD4CF0--
121

```

C01 PUT response

The time taken is:

KEY	VALUE
content-type ⓘ	multipart/mixed; boundary=0774A35AE0B5769DE15D58C567FFD4CF0
content-length ⓘ	709
dataserviceversion ⓘ	2.0
sap-statistics ⓘ	total=249,fw=52,app=197,gwttotal=249,gwhub=30,gwrfcoh=0,gwbe=22,gwapp=197,gwnongw=0,gwbewa
sap-server ⓘ	true

GW Total = GW Hub + GW Backend + data provider application
249 ms = 30 + 22 + 197

Time taken for defer mode

Default behavior processing took 395 ms.

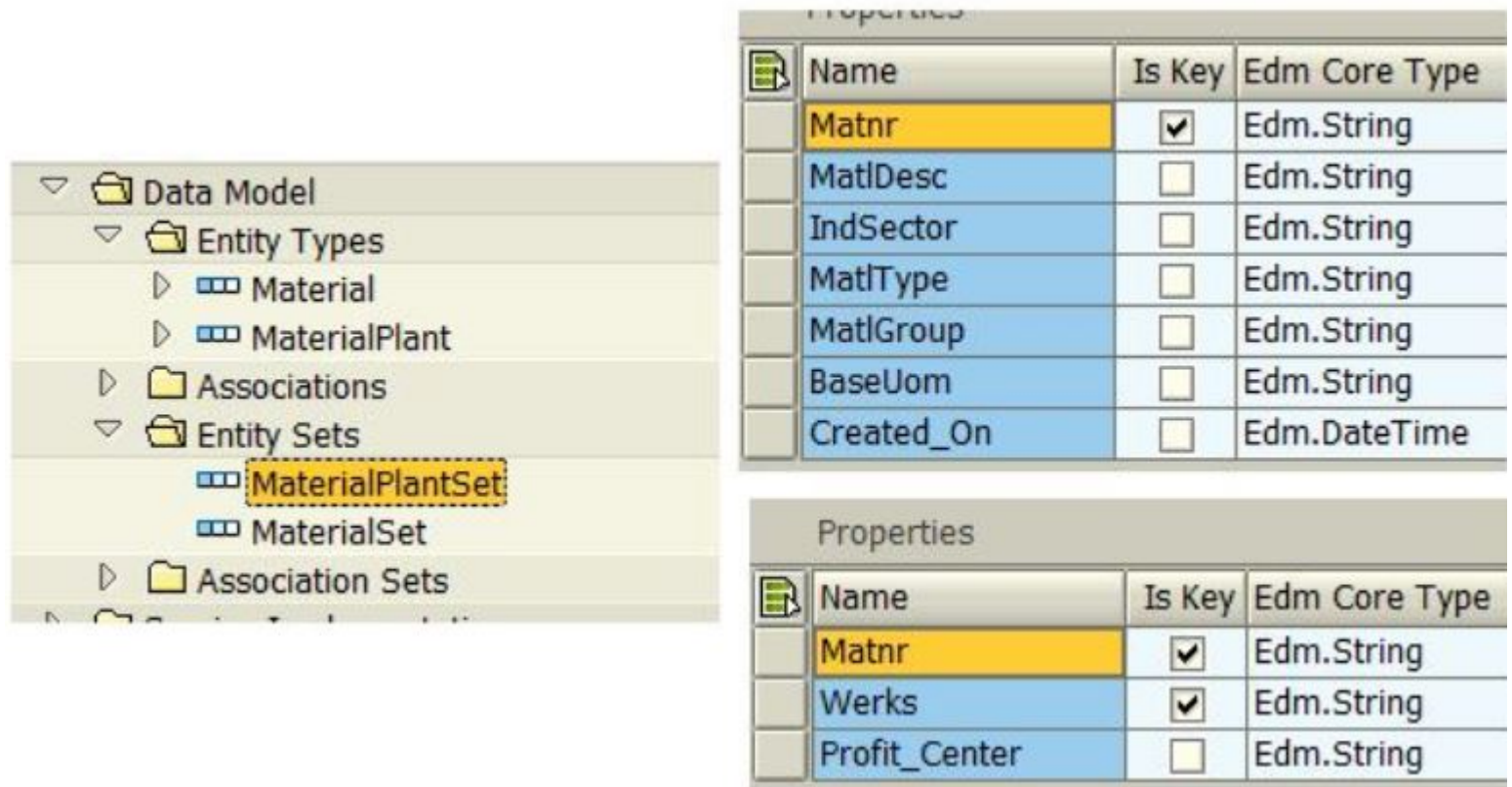
Deferred processing mode took 249 ms.

We see a performance gain factor of around 36%. The performance also depend on other factors like : system + network resources. For more number of operations, the deferred processing will have good performance due to its single LUW handling for a change set

\$batch Use case 10: Content-ID usage

If there are multiple operations, one operation can refer to another using Content-ID reference instead of using entity key which may not be known at run time.

Say for example in our model, we have been using MaterialSet and MaterialPlantSet.



The screenshot shows an OData model editor. On the left is a tree view of the 'Data Model' containing 'Entity Types' (Material, MaterialPlant), 'Associations', 'Entity Sets' (MaterialPlantSet, MaterialSet), and 'Association Sets'. 'MaterialPlantSet' is highlighted. On the right are two 'Properties' tables. The top table lists properties for 'MaterialPlantSet' with 'Matnr' as the key. The bottom table lists properties for 'MaterialSet' with 'Matnr' and 'Werks' as keys.

Name	Is Key	Edm Core Type
Matnr	<input checked="" type="checkbox"/>	Edm.String
MatlDesc	<input type="checkbox"/>	Edm.String
IndSector	<input type="checkbox"/>	Edm.String
MatlType	<input type="checkbox"/>	Edm.String
MatlGroup	<input type="checkbox"/>	Edm.String
BaseUom	<input type="checkbox"/>	Edm.String
Created_On	<input type="checkbox"/>	Edm.DateTime

Name	Is Key	Edm Core Type
Matnr	<input checked="" type="checkbox"/>	Edm.String
Werks	<input checked="" type="checkbox"/>	Edm.String
Profit_Center	<input type="checkbox"/>	Edm.String

Odata model

Now if MaterialSet has a POST operation. Say MAT1 is newly created out of it. If I we were to run a POST on MaterialPlantSet for the newly generated MAT1, the MaterialPlantSet need to know about the newly created material at

runtime. That is achieved through Content-ID referencing.

```
3 POST MaterialSet HTTP/1.1
4 sap-context-accept: header
5 Content-Type: application/json
6 Accept: application/json
7
8 {
9     "Matnr" : "",
10    "MatlDesc" : "Demo test material",
11    "IndSector" : "M",
12    "MatlType" : "ZHAL",
13    "MatlGroup" : "0ZZ000",
14    "BaseUom" : "PCE",
15    "Created_On" : "2020-08-01T00:00:00"
16 }
```

Material No. is known at runtime

```
18 POST MaterialPlantSet HTTP/1.1
19 sap-context-accept: header
20 Content-Type: application/json
21 Accept: application/json
22
23 {
24     "Matnr" : "",
25     "Werks" : "US90",
26     "Profit_Center" : "U94"
27 }
```

Material No. is known at runtime

Runtime relation between operation

Using Content-ID the 2nd operation can refer to the material generated in the 1st operation. Let's run the example.

Content-ID can be used only in defer mode ie where more than one operation are present within a change set.

```

1  --batch_B01
2  Content-Type: multipart/mixed;boundary=changeset_C01
3
4          Start changeset C01
5  --changeset_C01
6  Content-Type: application/http
7  Content-Transfer-Encoding: binary
8
9  |
10 POST MaterialSet HTTP/1.1
11 sap-context-accept: header
12 Content-Type: application/json
13 Accept: application/json
14 Content-ID: X10
15 {
16     "Matnr"      : "",
17     "MatlDesc"   : "Content-ID reference test",
18     "IndSector"  : "M",
19     "MatlType"   : "ZHAL",
20     "MatlGroup"  : "0ZZ000",
21     "BaseUom"    : "PCE",
22     "Created_On" : "2020-08-01T00:00:00"
23 }
24
25

```

```

25
26 --changeset_C01
27 Content-Type: application/http
28 Content-Transfer-Encoding: binary
29
30
31 POST $X10/Navg_To_Plant HTTP/1.1
32 sap-context-accept: header
33 Content-Type: application/json
34 Accept: application/json
35
36 {
37     "Matnr"      : "",
38     "Werks"      : "US90",
39     "Profit_Center" : "U94"
40 }
41
42
43 --changeset_C01-- End changeset C01
44
45
46 --batch_B01--

```

Content-ID request

Response :


```

1  --EE91A7824B8579677641263AE80513990
2  Content-Type: multipart/mixed; boundary=EE91A7824B857967
3  Content-Length: 1851
4
5  --EE91A7824B8579677641263AE80513991
6  Content-Type: application/http
7  Content-Length: 889
8  content-transfer-encoding: binary
9
10 HTTP/1.1 201 Created
11 Content-Type: application/json
12 Content-Length: 642
13 location: https://cimd437.hsec. ....com:84
14 dataserviceversion: 2.0
15 content-id: X10
16
17 {
18   "d": {
19     >   "_metadata": { ...
20     },
21     "Matnr": "347",
22     "MatlDesc": "Content-ID reference test",
23     "IndSector": "M",
24     "MatlType": "ZHAL",
25     "MatlGroup": "0ZZ000",
26     "BaseUom": "PCE",
27     "Created_On": "/Date(1596240000000)/",
28     "Navg_To_Plant": { ...
29   }
30 }
31 >   "Navg_To_Plant": { ...
32   }
33 }
34
35   }
36 }
37 }
38 --EE91A7824B8579677641263AE80513991
39 Content-Type: application/http
40 Content-Length: 665
41 content-transfer-encoding: binary
42
43 HTTP/1.1 201 Created
44 Content-Type: application/json
45 Content-Length: 411
46 location: https://cimd437.hsec
47 dataserviceversion: 2.0
48
49 {
50   "d": {
51     >   "_metadata": { ...
52     },
53     "Matnr": "347",
54     "Werks": "US90",
55     "Profit_Center": "U94"
56   }
57 }
58
59 }
60 }
61 --EE91A7824B8579677641263AE80513991--
62
63 --EE91A7824B8579677641263AE80513990--
64

```

Content-ID response

When the framework calls CHANGESSET_BEGIN, we see it has collected two change set operations along with the Content-ID references

The screenshot shows the SAP ABAP IDE with the `CHANGESET_BEGIN` method selected. The code in the editor is:

```

1 METHOD /iwbsp/if_mgw_appl_srv_runtime~
2
3 "- defer mode
4 cv_defer_mode = abap_true.
5

```

Below the code, the `IT_OPERATION_INFO` table is displayed with the following data:

Row	ENTITY_TYPE [CStr]	ENTITY_SET [CString]	ACTION_NAME [CStr]	OPERATION_TYPE [C(2)]	CONTENT_ID [CString]	CONTENT_ID_REF [CString]
1	Material	MaterialSet		CE	X10	
2	MaterialPlant	MaterialPlantSet		CE		X10

The Local Variables and Parameters window shows the following variables:

Variable Name	Val.	Val.	Table
IT_OPERATION_INFO	[2x6(44)]		Standard Table
CV_DEFER_MODE	X		C(1)
ME	{0:172*\CLASS=ZCL_ZDEMO...		Ref

Debug – CHANGESET_BEGIN method

Alert Moderator

Further when CHANGESET_PROCESS is called, the two operations are executed.

Assigned tags

NW ABAP Gateway (OData)

OData

SAP Gateway

[/IWBE/IF MGW APPL SRV RUNTIME-CHANGESET PROCESS](#)

\$batch

\$batch changeset process

CRUD operations using BATCH in gateway

The screenshot shows the SAP ABAP IDE with the `CHANGESET_PROCESS` method selected. The code in the editor is:

```

1 METHOD /iwbsp/if_mgw_appl_srv_runtime~changeset_p
2

```

Below the code, the `IT_CHANGESET_REQUEST` table is displayed with the following data:

Row	OPERATION...	OPERATION...	REQUEST_CONTEXT [Reference]	ENTRY_PROVIDER [Reference]	CONTENT_ID [CSt...	CONTENT_ID_REF [CString]	REQUEST_HEADERS
1	CE	1	->{0:199*\CLASS=/IWBE/CL...	->{0:175*\CLASS=/IWBE/CL_M...	X10		Standard Table
2	CE	2	->{0:216*\CLASS=/IWBE/CL...	->{0:205*\CLASS=/IWBE/CL_M...		X10	Standard Table

The Local Variables and Parameters window shows the following variables:

Variable Name	Val.	Val.	Table
IT_CHANGESET_REQUEST	[2x11(88)]		Standard Table
CT_CHANGESET_RESPONSE	[0x3(24)]		Sorted Table
ME	{0:172*\CLASS=...		Ref
<LV_VALUE>			

2 create operation

Debug – CHANGESET_PROCESS method

[View more...](#)

Content-ID use will useful with scenarios like Sales Order header/Item or more like Purchase order/Item.

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Hope the concepts will be clear and will prove beneficial to those using \$batch requests. Thank you.

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3 Comments

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Pavel Lazhbanau

September 16, 2020 at 2:41 pm

Hi Sujin

Good overview!

Like 0 | Share



S. Appukuttan

February 3, 2021 at 11:22 am

Thank you

Like 0 | Share



Sooraj Manjery

August 25, 2021 at 9:09 am

Hi,

Can you please have a look at the below query?

<https://answers.sap.com/questions/13464045/odata-delete-triggering-separately-in-batch-operat.html>

Thanks,

Sooraj

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