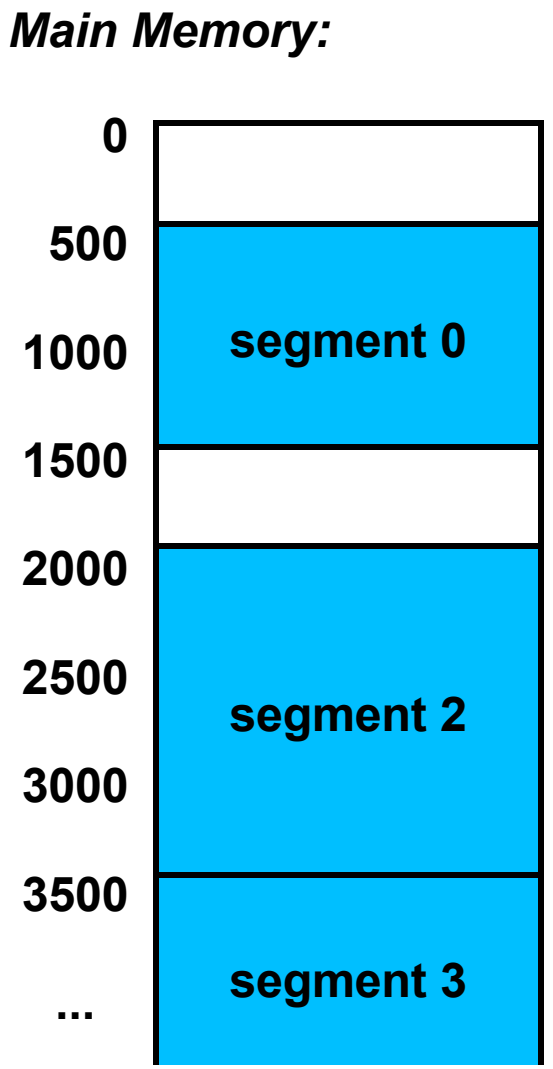
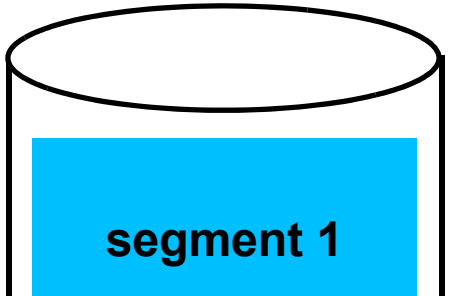
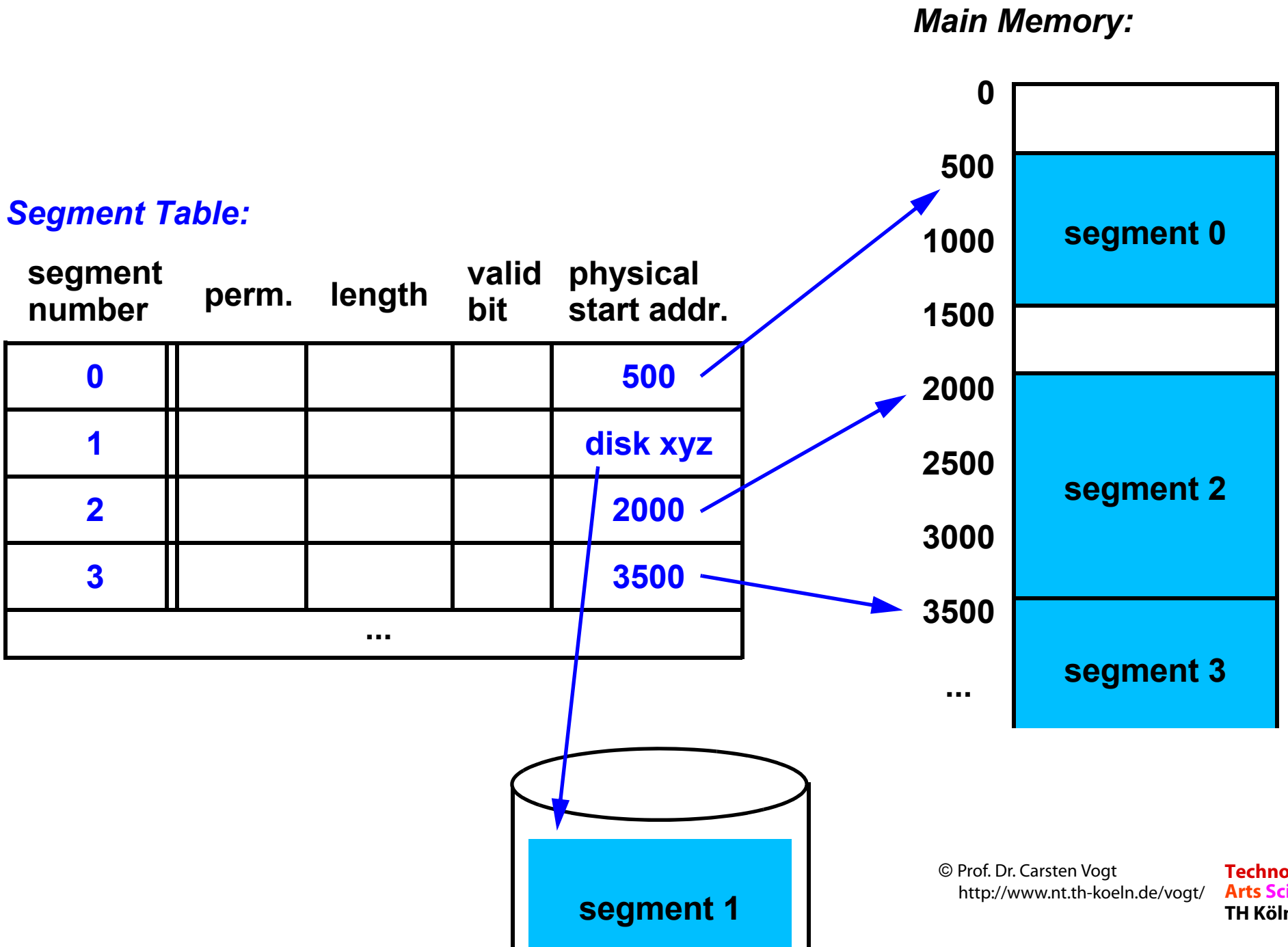
Segmented Virtual Memory: Address Mapping





Segmented Virtual Memory: Address Mapping

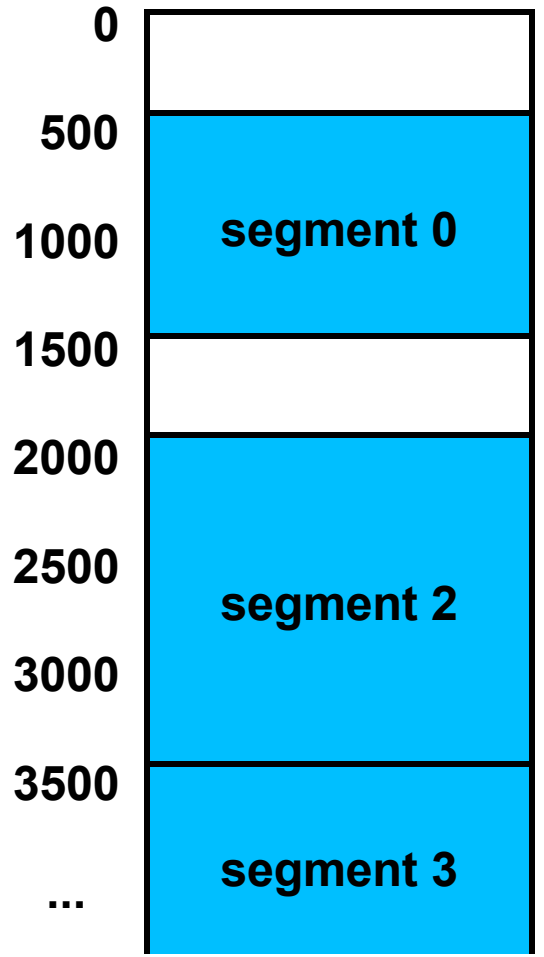


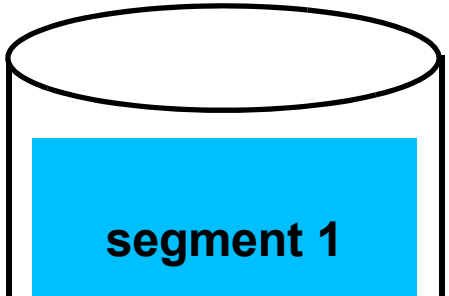
Segmented Virtual Memory: Address Mapping

Segment Table:

segment number	perm.	length	valid bit	physical start addr.
0	r	1000	1	500
1	rw	2000	0	disk xyz
2	rw	1500	1	2000
3	...	...	1	3500
...				

Main Memory:





Segmented Virtual Memory: Address Mapping – Calculation Example 1

operation ...

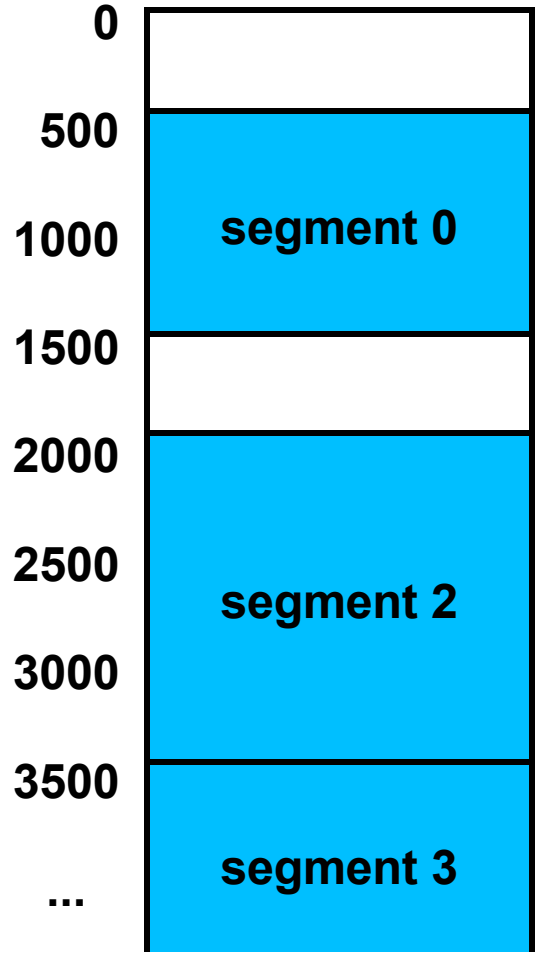
write segment 0, offset 800

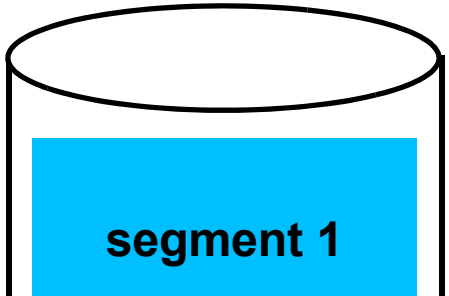
... with a virtual address

Segment Table:

segment number	perm.	length	valid bit	physical start addr.
0	r	1000	1	500
1	rw	2000	0	disk xyz
2	rw	1500	1	2000
3	...	...	1	3500
...				

Main Memory:





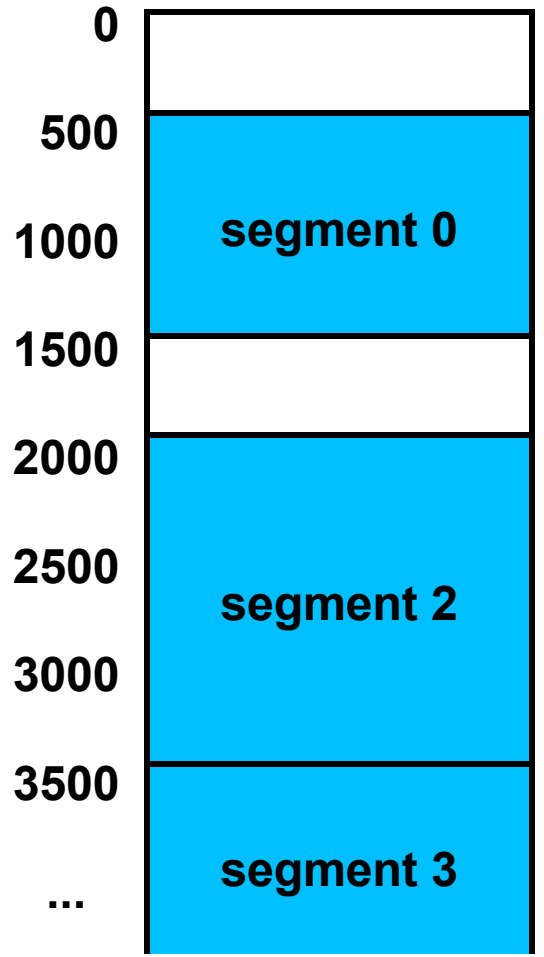
Segmented Virtual Memory: Address Mapping – Calculation Example 1

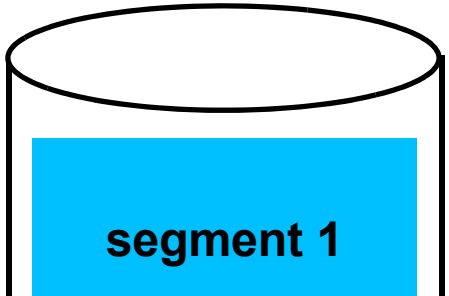
write segment 0, offset 800

Segment Table:

segment number	perm.	length	valid bit	physical start addr.
0	r	1000	1	500
1	rw	2000	0	disk xyz
2	rw	1500	1	2000
3	...	...	1	3500
...				

Main Memory:





Segmented Virtual Memory: Address Mapping – Calculation Example 1

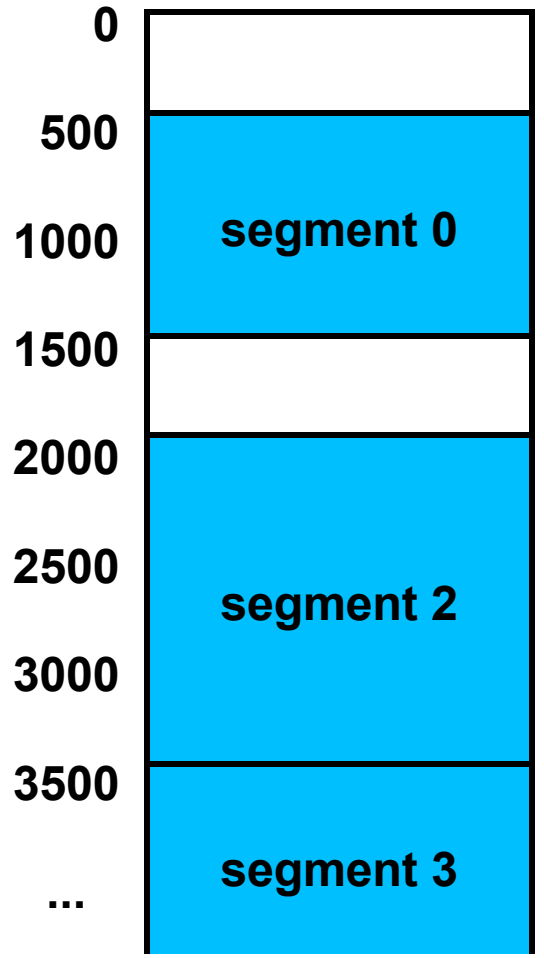
write segment 0, offset 800

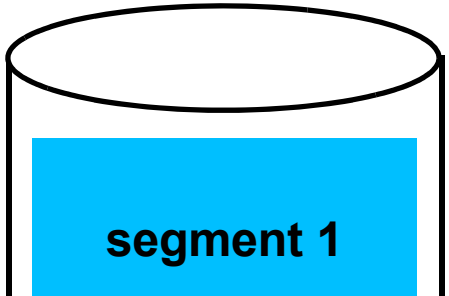
no write allowed → abort

Segment Table:

segment number	perm.	length	valid bit	physical start addr.
0	r	1000	1	500
1	rw	2000	0	disk xyz
2	rw	1500	1	2000
3	...	...	1	3500
...				

Main Memory:





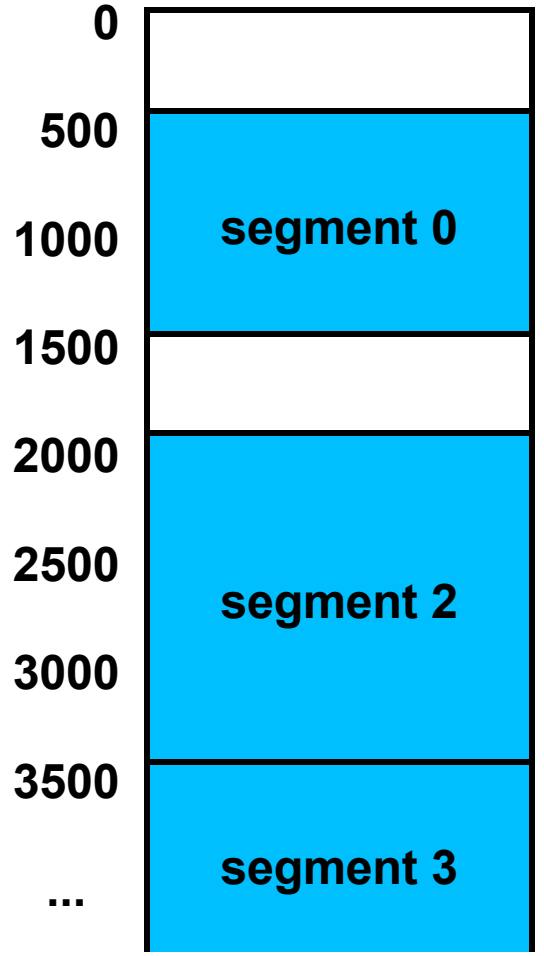
Segmented Virtual Memory: Address Mapping – Calculation Example 2

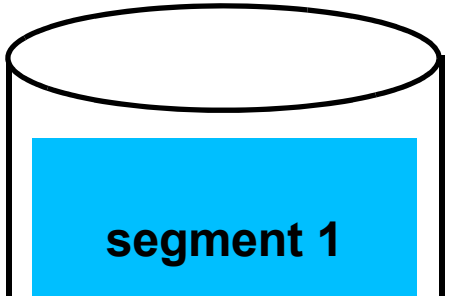
read segment 0, offset 1500

Segment Table:

segment number	perm.	length	valid bit	physical start addr.
0	r	1000	1	500
1	rw	2000	0	disk xyz
2	rw	1500	1	2000
3	...	...	1	3500
...				

Main Memory:





Segmented Virtual Memory: Address Mapping – Calculation Example 2

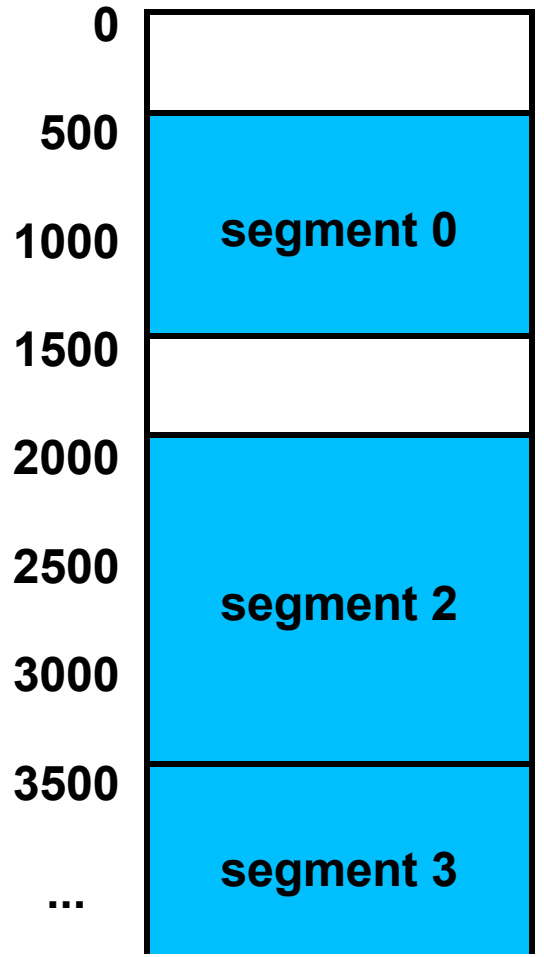
read segment 0, offset 1500

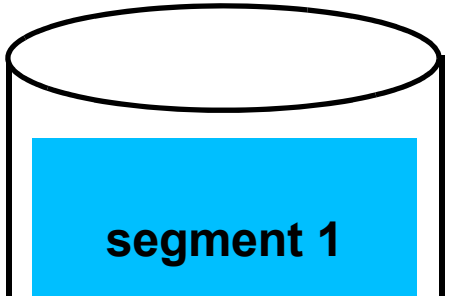
read allowed → ok

Segment Table:

segment number	perm.	length	valid bit	physical start addr.
0	r	1000	1	500
1	rw	2000	0	disk xyz
2	rw	1500	1	2000
3	...	...	1	3500
...				

Main Memory:





Segmented Virtual Memory: Address Mapping – Calculation Example 2

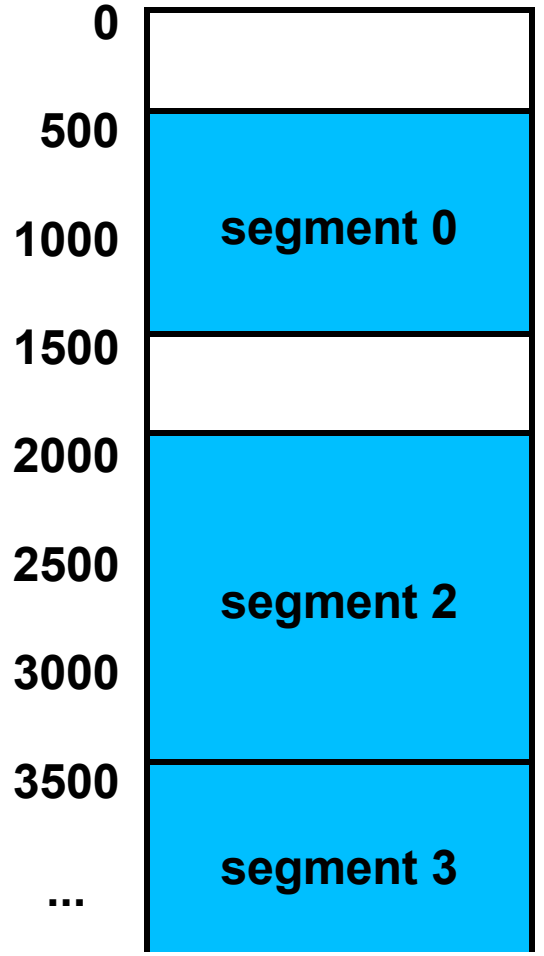
read segment 0, offset 1500

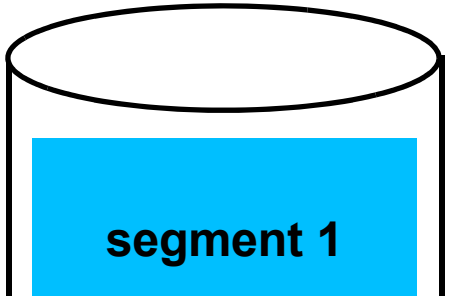
length exceeded → abort

Segment Table:

segment number	perm.	length	valid bit	physical start addr.
0	r	1000	1	500
1	rw	2000	0	disk xyz
2	rw	1500	1	2000
3	...	...	1	3500
...				

Main Memory:





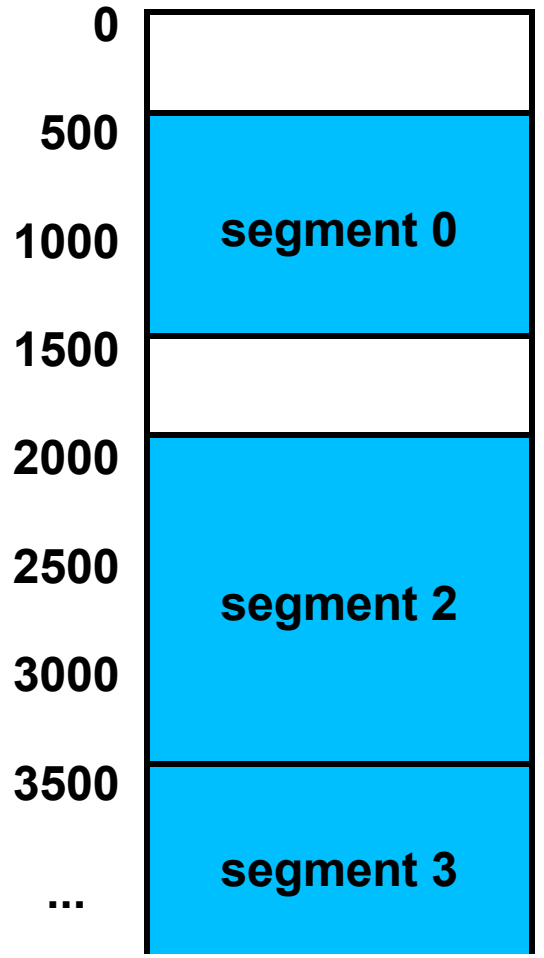
Segmented Virtual Memory: Address Mapping – Calculation Example 3

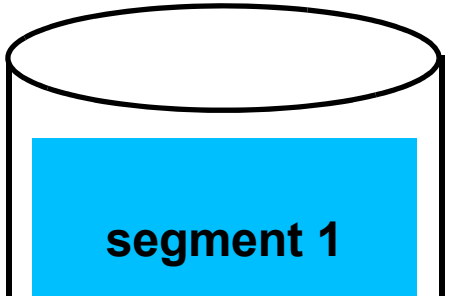
read segment 0, offset 800

Segment Table:

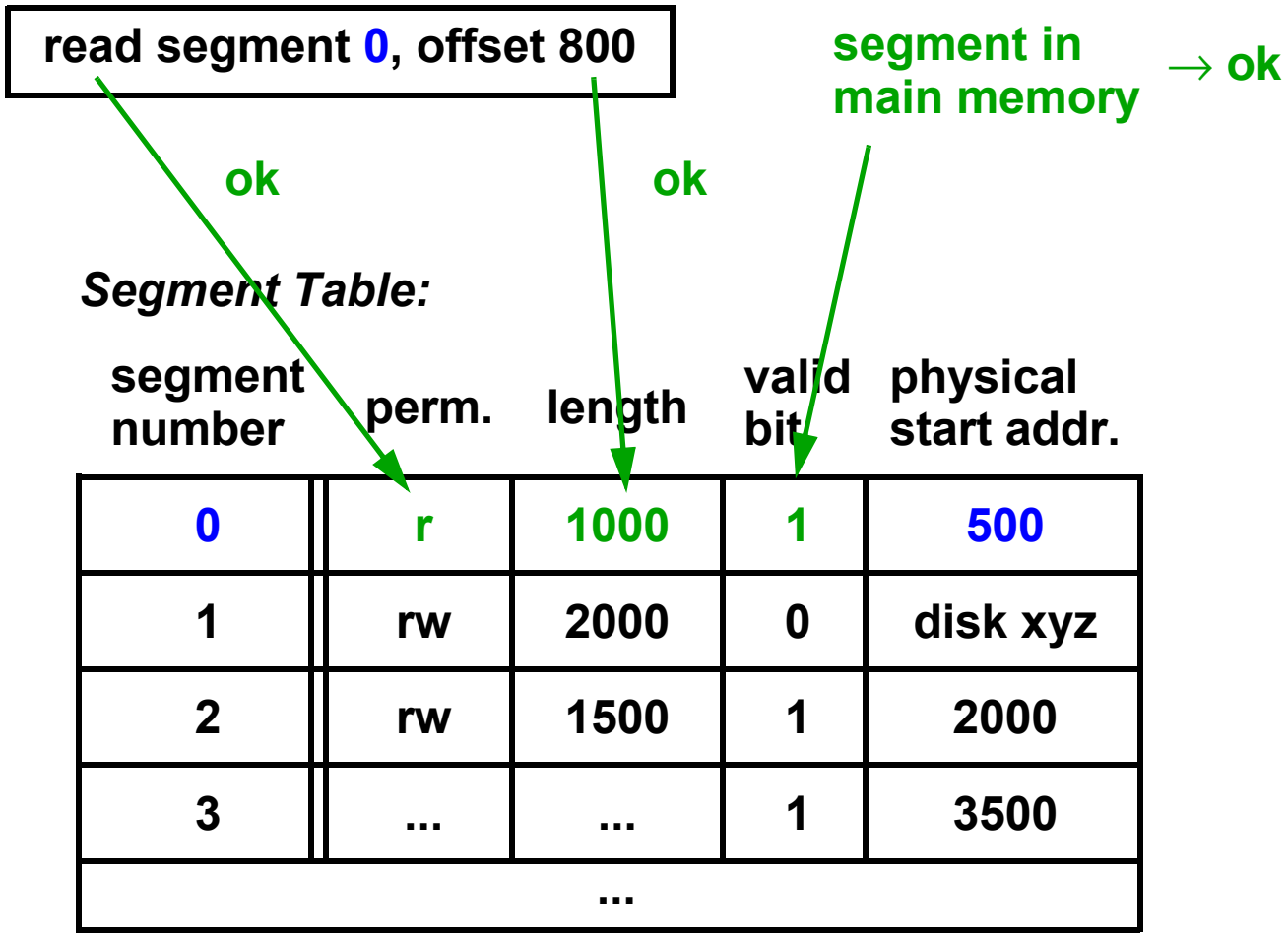
segment number	perm.	length	valid bit	physical start addr.
0	r	1000	1	500
1	rw	2000	0	disk xyz
2	rw	1500	1	2000
3	...	...	1	3500
...				

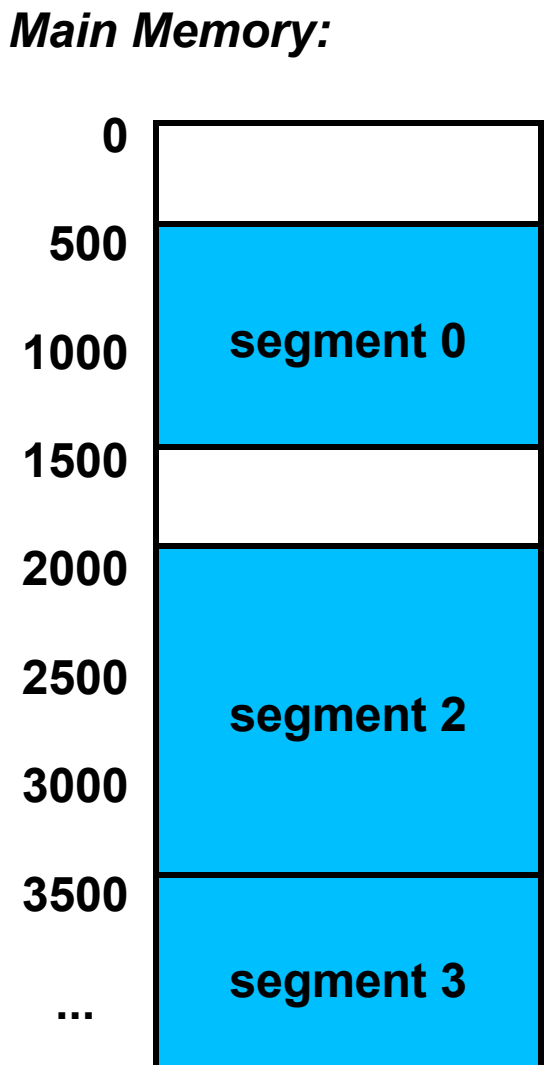
Main Memory:

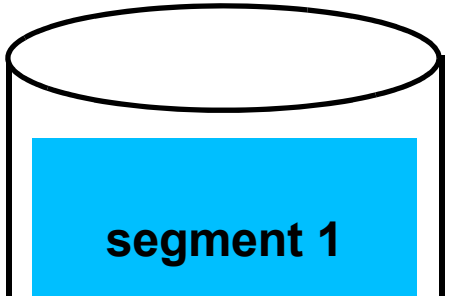




Segmented Virtual Memory: Address Mapping – Calculation Example 3







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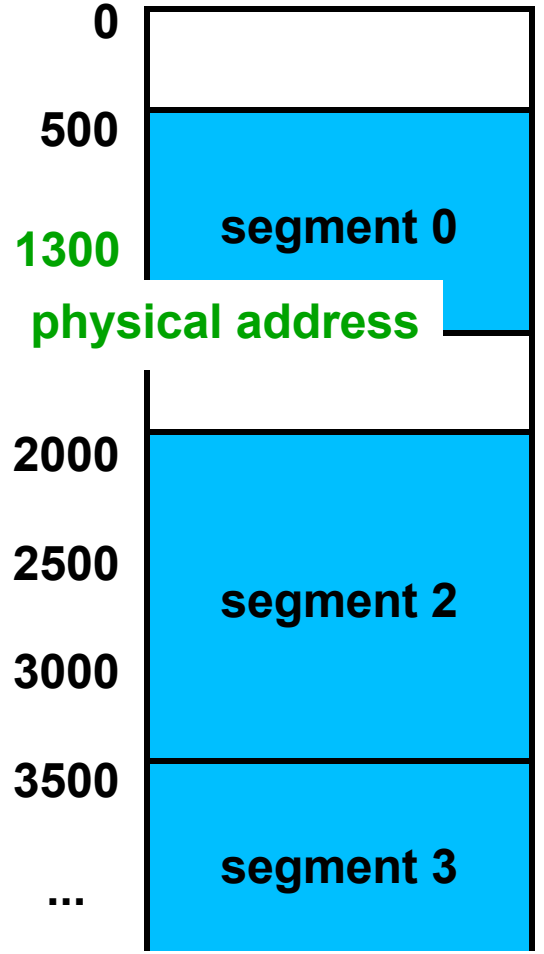
Segmented Virtual Memory: Address Mapping – Calculation Example 3

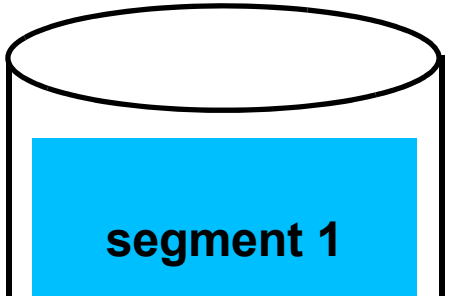
read segment 0, offset 800

Segment Table:

segment number	perm.	length	valid bit	physical start addr.
0	r	1000	1	500
1	rw	2000	0	disk xyz
2	rw	1500	1	2000
3	...	...	1	3500
...				

Main Memory:





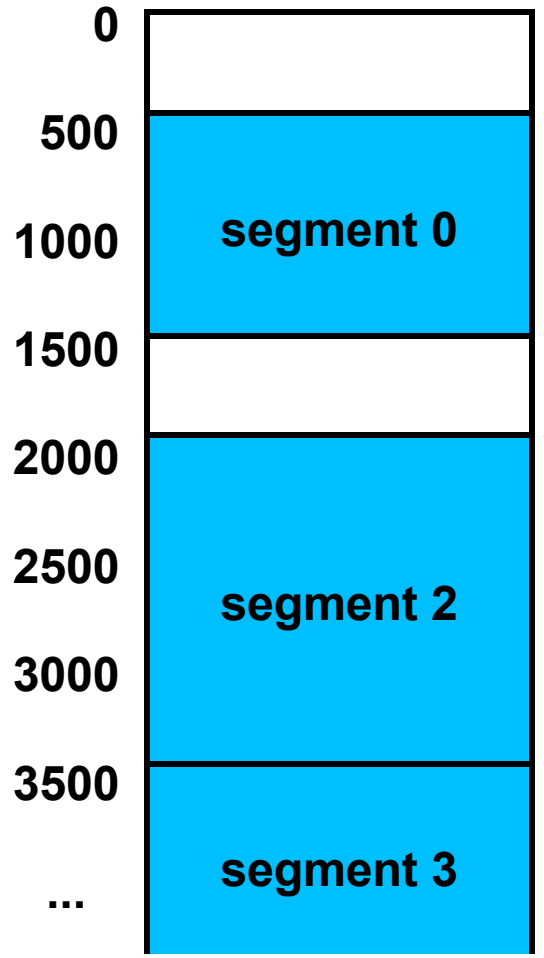
Segmented Virtual Memory: Address Mapping – Calculation Example 4

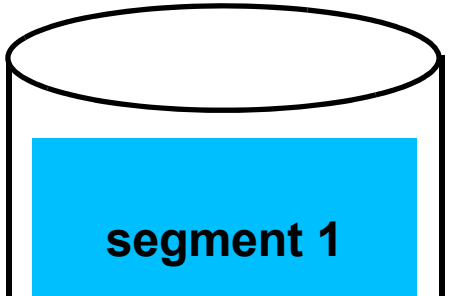
read segment 1, offset 800

Segment Table:

segment number	perm.	length	valid bit	physical start addr.
0	r	1000	1	500
1	rw	2000	0	disk xyz
2	rw	1500	1	2000
3	...	...	1	3500
...				

Main Memory:





Segmented Virtual Memory: Address Mapping – Calculation Example 4

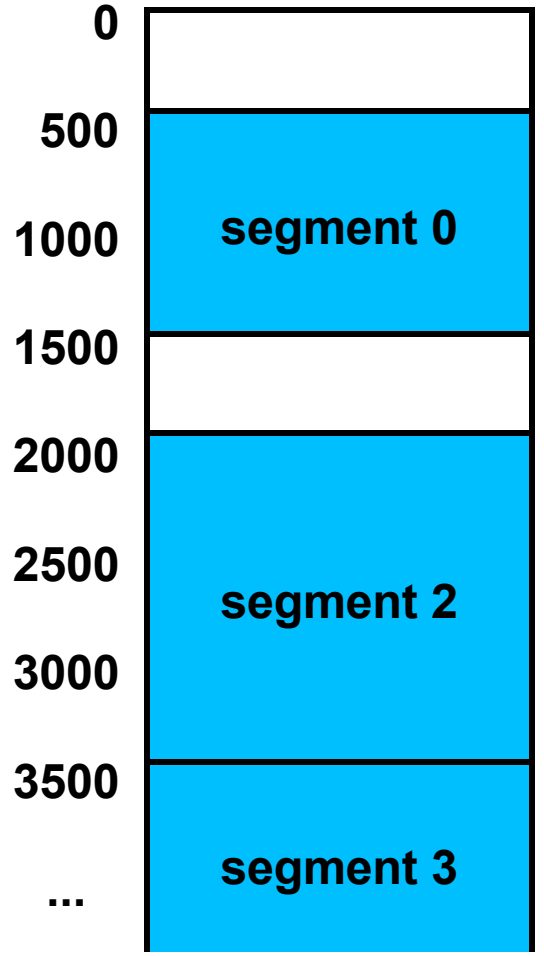
read segment 1, offset 800

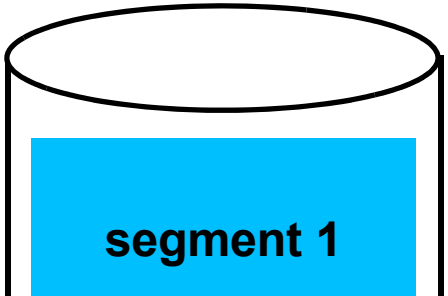
segment not in main memory

Segment Table:

segment number	perm.	length	valid bit	physical start addr.
0	r	1000	1	500
1	rw	2000	0	disk xyz
2	rw	1500	1	2000
3	...	...	1	3500
...				

Main Memory:





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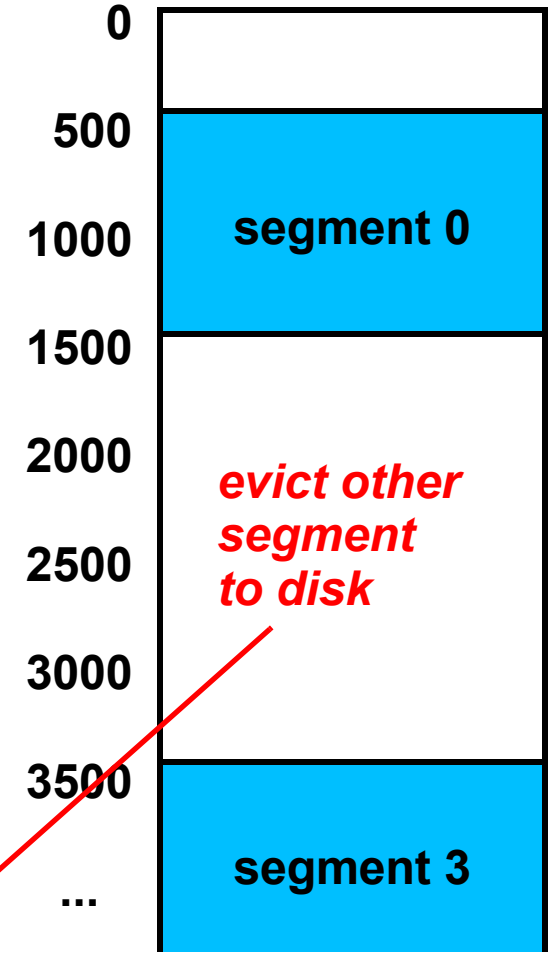
Segmented Virtual Memory: Address Mapping – Calculation Example 4

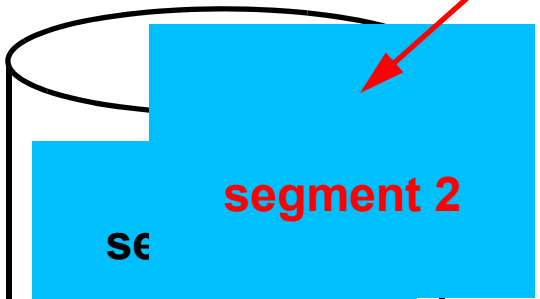
read segment 1, offset 800

Segment Table:

segment number	perm.	length	valid bit	physical start addr.
0	r	1000	1	500
1	rw	2000	0	disk xyz
2	rw	1500	0	disk abc
3	...	...	1	3500
...				

Main Memory:





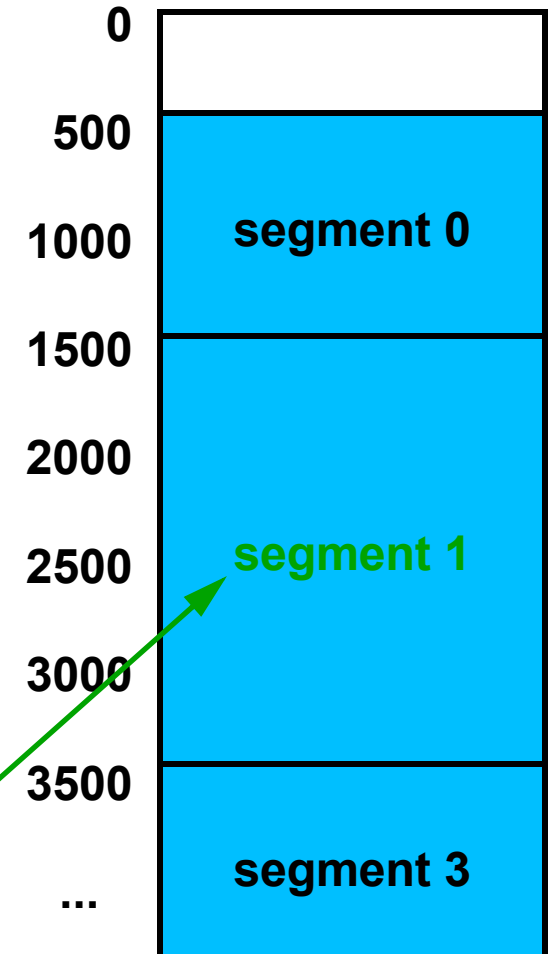
Segmented Virtual Memory: Address Mapping – Calculation Example 4

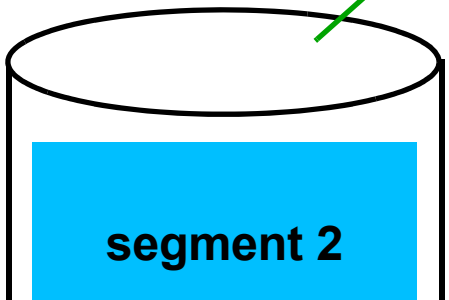
read segment 1, offset 800

Segment Table:

segment number	perm.	length	valid bit	physical start addr.
0	r	1000	1	500
1	rw	2000	1	1500
2	rw	1500	0	disk abc
3	...	...	1	3500
...				

Main Memory:





load segment into main memory

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Segmented Virtual Memory: Address Mapping – Calculation Example 4