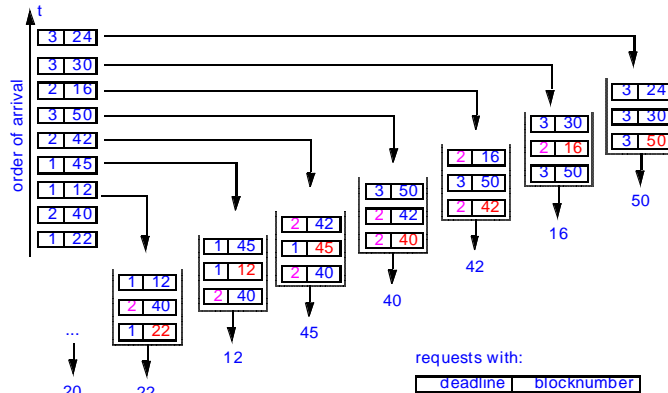# Earliest Deadline First (EDF) Disk Scheduling

- Real-time scheduling algorithm
- Read block for stream with nearest deadline
- Most often applied as a preemptive scheduling scheme
- May result in:
  - Excessive seek time and
  - Poor throughput

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Scan-EDF Disk Scheduling

SCAN:

- Move disk head always between disk edges (BIdirectional)
- Read next requested block in disk movement direction
- Compromise between optimization of seek times and response times
- data in the middle of the disk has better access properties

SCAN-EDF

- Combines advantages of:
  - SCAN (seek optimization) with
  - EDF (real-time aspects)
- Method:
  - Requests with earlier deadlines are served first
  - Among requests with same deadline, requests are served by track location
    - Increase efficiency by modifying deadlines

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SCAN-EDF

Properties
➢ **apply EDF**
➢ **for all requests with same deadline apply SCAN**

t

3	24
3	30
2	16
3	50
2	42
1	45
1	12
2	40
1	22

1	12
2	40
1	22

1	45
2	40
1	22

2	42
2	40
1	45

3	50
2	42
2	40

2	16
3	50
2	40

3	30
2	16
3	50

16

40

42

45

22

12

...

downwards 20

Deadline 1

Deadline 2

3
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Group Sweeping Scheduling

To reduce disk arm movements, the set of n streams is divided in to g groups. Groups are served in fixed order
➢ **Form groups**
  ❖ **with deadlines lying closely together**
  ❖ **or in round robin manner (in general)**
➢ **Apply SCAN to each group**

| deadline | blockno. |

3.4	24
3.3	30
2.0	16
3.3	50
2.2	42
1.2	45
1.4	12
2.4	40
1.1	22

deadline 1.1

deadline 2.0

deadline 3.3

1.4	12
1.2	45
1.1	22

2.0	16
2.2	42
2.4	40

3.4	24
3.3	30
3.3	50

scan

scan

scan

| 12 | 22 | 45 |

| 42 | 40 | 16 |

| 24 | 30 | 50 |

group 1

group 2

group 3

t

4
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