

17|

Redis

“ ”

Skip list

Red-black tree

Redis

Sorted Set

Redis

“ ”

O(n)

down “ ”
down



%p

FYX]g

1000 10000

62

62

11

n

n

$$n/2$$
$$n/4$$
$$n/8$$

k

k-1

1/2

k
$$n/(2^k)$$

h

2

m

$$n/(2^h)=2$$
$$h = \log_2 n - 1$$
 $\log_2 n$ $O(m \cdot \log n)$

m

3

m=3

3

k-1

$$\begin{array}{cc} x & k \\ y & z \end{array} \quad 3$$
$$\begin{array}{cc} & y \\ y & z \end{array}$$
$$\begin{matrix} x & y \\ K-1 \end{matrix}$$
$$Z_3$$

y down

k

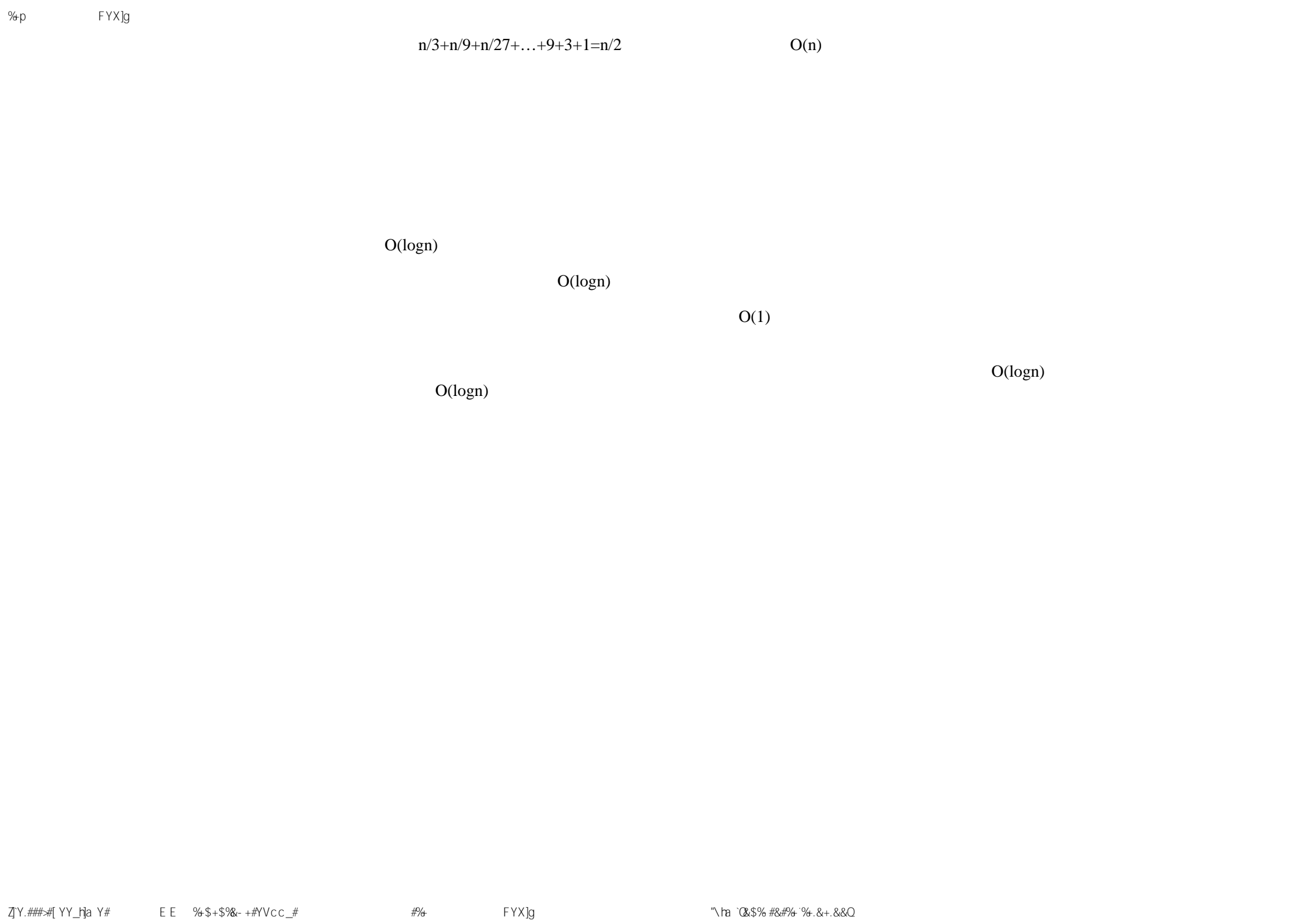
$$\frac{k-1}{3}$$
 $m=3$ $O(\log n)$

1

n/3

n/9

3



%p

FYX]g

AVL

“ ”

K

K

K

%p

FYX]g

GitHub

Redis

Java

GitHub

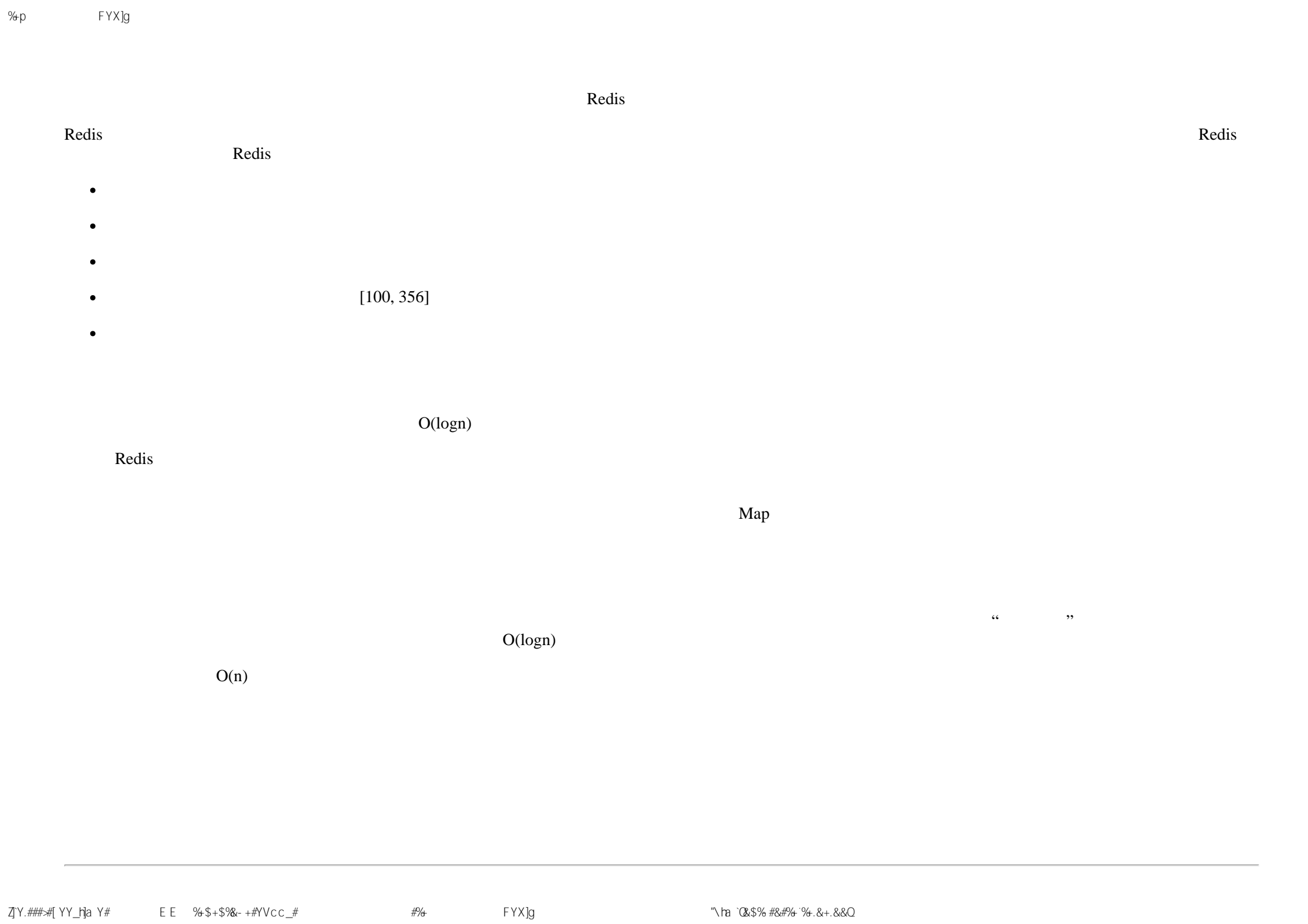
Z]Y.###>#[YY_hja Y#

E E %t\$+\$%&- +#YVcc_#

#/%t

FYX]g

"\ha `Q&\$% #&#/%`%t.&+.&&Q



m

k-

 $O(\log n)$

n-1

9

 $O(\log n)$

[9]

- "\ha `Q\$% #&#%+`%+.&+.&&Q

- Smallfly 2018-10-29 23:07:32

.....

[4]

2018-10-31 09:54:25

- kakasi 2018-11-12 15:11:20

github

Node

Index

Node

Index

Index

1 - level

[3]

2018-11-13 10:01:39

- MG 2018-12-25 09:59:25

Java

1. level:
2. update
3. forwards
4. maxlevel=1

[2]

- 2018-12-09 13:59:15

github

forward

forward[0]

forward[1]

head forward[levelCount-1]

head

forward

[2]

- Uper 2018-10-29 07:41:48

logn

[2]

- k 2018-11-20 15:57:57

n-2

n/2, n/4, ..., 2

log2(n/2)

$$S = a0(1-q^n)/(1-q), \quad a0 = n/2, \quad =\log2(n/2), q=1/2$$
$$S = n/2(1-2/n)/(1-1/2) = n-2 \quad [1 \quad]$$

- Pluto 2018-11-05 14:13:33

[1 \quad]

2018-11-06 09:45:30

- hugo 2018-10-31 09:39:18

[1 \quad]

2018-10-31 10:08:55

- kinghua 2018-10-29 23:28:18

Redis

redis

[1 \quad]

2018-10-31 09:53:01

redis

lru

- D _ M 2018-10-29 11:41:29

[1 \quad]

2018-10-29 19:14:50

- 2018-10-29 10:08:44

[1 \quad]

2018-10-29 19:17:04

- null 2018-10-29 10:07:04

re: 4 64

63

re: 62

%p FYX]g
4 61 63
62 63
[1]
2018-10-29 19:18:21