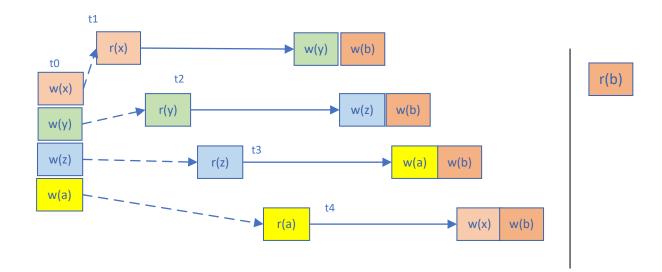
c→commit a→abort+理由になったtx bd→boundary r→read flag対象のtx w→write flag対象のtx

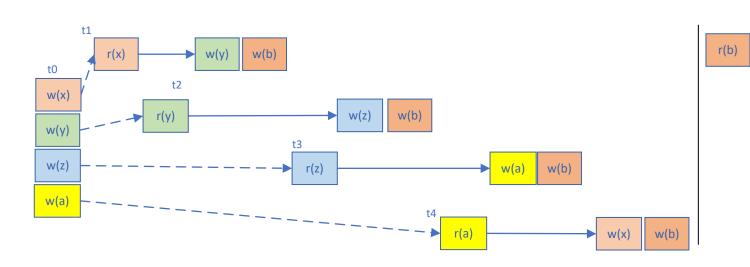


write_crown

cascading_4tx_cycled

	oc	c4	occí	3ltx1	occ2 oc		0CC ⁻	lltx1 c2	ltx1	эсс3	occ2	2ltx2	occ ⁻		ltx1oc	c2ltx1
t1	occ	С	occ	a:t4	occ	С	occ	С	LTX	c bd1	OCC	a:t4	occ	a:t4	LTX	c bd1
t2	occ	a:t1	occ	С	occ	a:t1	LTX	c bd2	occ	a:t1	occ	С	LTX	c bd2	occ	a:t1
t3	occ	С	occ	С	LTX	c bd3	occ	a:t2	occ	С	LTX	c bd3	occ	a:t2	occ	С
t4	occ	a:t3	LTX	c bd4	occ	a:t3	occ	С	occ	a:t3	LTX	c bd3 r:t3	LTX	c bd4	LTX	c bd4
read b	t	3	t	3	t	1	t	4	t	3	t	2	t	4	t	3
	occ oc		ltx10		ltx2d	осс2	occ ⁻	Iltx3	ltx1oc	:c1ltx2	ltx2oc	c1ltx1	ltx3d	occ1	lt:	< 4
t1	occ	С	LTX	c bd1	LTX	c bd1	occ	a:t4	LTX	c bd1	LTX	c bd1	LTX	c bd1	LTX	c bd1
t2	LTX	c bd2	осс	a:t1	LTX	c bd1 r:t1	LTX	c bd2	occ	a:t1	LTX	c bd1 r:t1	LTX	c bd1 r:t1	LTX	c bd1 r:t1
t3	LTX	c bd2 r:t2	LTX	c bd3	occ	a:t2	LTX	c bd2 r:t2	LTX	c bd3	occ	a:t2	LTX	c bd1 r:t2	LTX	c bd1 r:t2
t4	occ	a:t3	occ	a:t3	occ	С	LTX	c bd2 r:t3	LTX	c bd3 r:t3	LTX	c bd4	occ	a:t3	LTX	a bd1 r:t2 w:t1
read b	t	1	t	3	t	4	t	2	t	3	t	4	t	1	t	1

ex write_crown.cascading_4tx_cycled.occ2ltx1occ1



write_crown

cascading_3tx_cycled

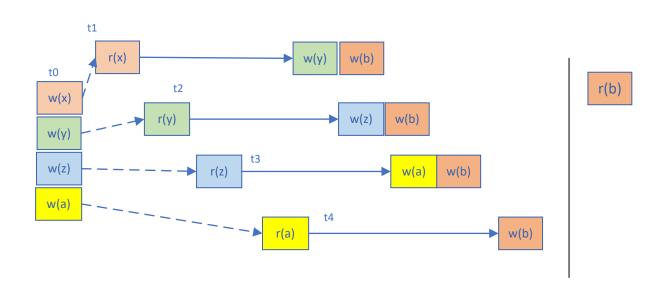
	ос	c4	ဝငင်	Bltx1	occ2 oc		occ ¹		ltx1c	осс3	occ2	2ltx2	occ1		ltx1oc	c2ltx1
t1	occ	С	occ	a:t4	occ	С	occ	С	LTX	c bd1	occ	a:t4	occ	a:t4	LTX	c bd1
t2	occ	a:t1	occ	C	occ	a:t1	LTX	c bd2	occ	a:t1	occ	С	LTX	c bd2	occ	a:t1
t3	occ	С	occ	a:t2	LTX	c bd3	occ	a:t2	occ	C	LTX	c bd3	occ	a:t2	occ	С
t4	occ	a:t3	LTX	c bd4	occ	a:t3	occ	С	occ	a:t3	LTX	c bd3 r:t3	LTX	c bd4	LTX	c bd4
read b	t	3	t	2	t	1	t	4	t	3	t.	2	t [,]	4	t	3
	occ1		ltx1d		ltx2d	occ2	occ1	lltx3	ltx1oc	c1ltx2	ltx2oc	c1ltx1	ltx3d	occ1	ltx	« 4
t1	occ	C	LTX	c bd1	LTX	c bd1	occ	a:t4	LTX	c bd1	LTX	c bd1	LTX	c bd1	LTX	c bd1
t2	LTX	c bd2	occ	a:t1	LTX	c bd1 r:t1	LTX	c bd2	occ	a:t1	LTX	c bd1 r:t1	LTX	c bd1 r:t1	LTX	c bd1 r:t1
t3	LTX	c bd2 r:t2	LTX	c bd3	occ	a:t2	LTX	c bd2 r:t2	LTX	c bd3	occ	a:t2	LTX	c bd1 r:t2	LTX	c bd1 r:t2
t4	occ	a:t3	осс	a:t3	осс	С	LTX	c bd2 r:t3	LTX	c bd3 r:t3	LTX	c bd4	occ	a:t3	LTX	a bd1 r:t2 w:t1
read b	t	1	t	3	t [,]	4	t	2	ť	3	t.	4	ť	1	ť	

write_crown

cascading_3tx_1epoch_per_1ope_cycled

	ос	с4	occi	Bltx1	0002 00		000°		ltx10	эсс3	occi	2ltx2	occ ⁻		ltx1oc	c2ltx1
t1	осс	С	occ	С	occ	С	occ	С	LTX	c bd1	occ	С	occ	С	LTX	c bd1
t2	occ	a:t1	occ	a:t1	occ	a:t1	LTX	c bd2	occ	a:t1	occ	a:t1	LTX	c bd2	осс	a:t1
t3	occ	С	occ	С	LTX	c bd3	occ	a:t2	occ	С	LTX	c bd3	occ	a:t2	occ	С
t4	occ	a:t3	LTX	c bd:4	occ	a:t3	осс	С	occ	a:t3	LTX	c bd3 r:t3	LTX	c bd4	LTX	c bd4
read b	t	3	t	3	t	3	t	4	t	3	t	3	t.	4	t	3
			1		1		 				1		1		1	
	occ1		ltx1d		ltx2d	осс2	occ ⁻	Iltx3	ltx1oc	c1ltx2	ltx2oc	c1ltx1	ltx3d	occ1	lt	×4
t1			1		ltx2d	c bd1	occ.	Iltx3	ltx1oc	c1ltx2 c bd1	ltx2oc	c1ltx1 c bd1	ltx3d	c bd1	LTX	c bd1
t1 t2	ос	c1	ltx1d	с		С				С		С		С		С
	OCC	c1 c	ltx1c	c bd1	LTX	c bd1 c bd1	occ	С	LTX	c bd1	LTX	c bd1 c bd1	LTX	c bd1 c bd1	LTX	c bd1 c bd1
t2	OCC LTX	c c c bd2 c bd2	LTX OCC	c bd1	LTX	c bd1 c bd1 r:t1	OCC	c c bd2	LTX	c bd1 a:t1	LTX	c bd1 c bd1 r:t1	LTX	c bd1 c bd1 r:t1	LTX	c bd1 c bd1 r:t1 c

ex write_crown.cascading_3tx_1epoch_per_1ope.occ2ltx1occ1

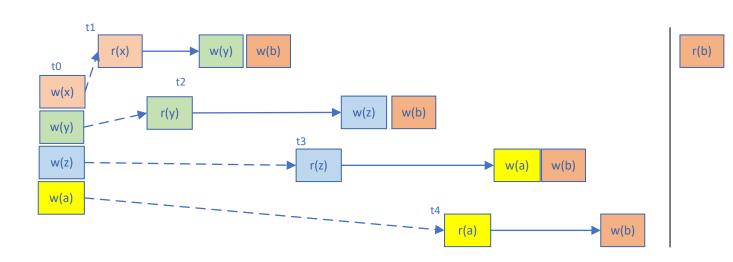


write_crown

cascading_4tx_uncylced

	oc	:c4	occi	Bltx1	occ2 oc		occ1	lltx1 c2	ltx1d	эсс3	occ2	2ltx2	occ1		ltx1oc	c2ltx1
t1	occ	С	occ	O	occ	С	occ	С	LTX	c bd1	occ	С	occ	C	LTX	c bd1
t2	occ	a:t1	occ	a:t1	occ	a:t1	LTX	c bd2	occ	a:t1	occ	a:t1	LTX	c bd2	occ	a:t1
t3	occ	С	occ	C	LTX	c bd3	occ	a:t2	occ	C	LTX	c bd3	occ	a:t2	occ	С
t4	occ	a:t3	LTX	c bd4	occ	a:t3	occ	С	occ	a:t3	LTX	c bd3 r:t3	LTX	c bd4	LTX	c bd4
read b	t	4	t	3	t	1	t	4	t	3	t	1	t	1	t:	3
	occ oc		ltx1d		ltx2d	occ2	occ1	Iltx3	ltx1oc	c1ltx2	ltx2oc	c1ltx1	ltx3d	occ1	ltɔ	< 4
t1	occ	С	LTX	c bd1	LTX	c bd1	occ	С	LTX	c bd1	LTX	c bd1	LTX	c bd1	LTX	c bd1
t2	LTX	c bd2	осс	a:t1	LTX	c bd1 r:t1	LTX	c bd2	occ	a:t1	LTX	c bd1 r:t1	LTX	c bd1 r:t1	LTX	c bd1 r:t1
t3	LTX	c bd2 r:t2	LTX	c bd3	occ	a:t2	LTX	c bd2 r:t2	LTX	c bd3	occ	a:t2	LTX	c bd1 r:t2	LTX	c bd1 r:t2
t4	occ	a:t3	occ	a:t3	occ	С	LTX	c bd2 r:t3	LTX	c bd3 r:t3	LTX	c bd4	occ	a:t3	LTX	c bd1 r:t3
read b	t	1	t	3	t	4	t	1	t	3	t	4	t	1	ť	1

ex write_crown.cascading_4tx_uncycled.occ2ltx1occ1



write_crown

cascading_3tx_uncycled

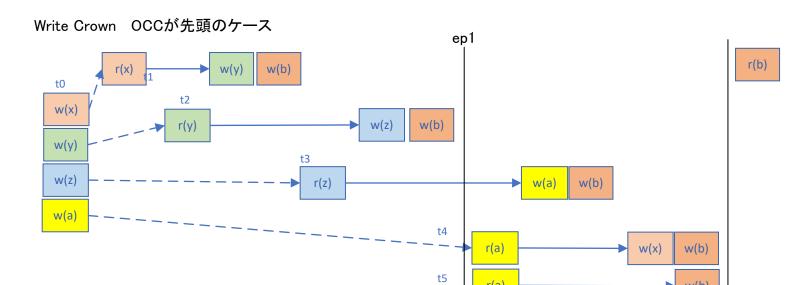
	ос	с4	occi	Bltx1	occ2 oc		occ1		ltx1c	осс3	occ2	2ltx2	occ1		ltx1oc	c2ltx1
t1	occ	С	occ	С	occ	С	occ	С	LTX	c bd1	occ	С	occ	С	LTX	c bd1
t2	occ	a:t1	occ	С	occ	a:t1	LTX	c bd2	occ	a:t1	occ	a:t1	LTX	c bd2	occ	a:t1
t3	occ	С	occ	a:t2	LTX	c bd3	occ	a:t2	occ	С	LTX	c bd3	occ	a:t2	occ	С
t4	occ	a:t3	LTX	c bd4	occ	a:t3	occ	С	occ	a:t3	LTX	c bd3 r:t3	LTX	c bd4	LTX	c bd4
read b	t.	4	t	2	t	1	t	4	t	3	t	1	t	1	t	3
	occ1		ltx1d		ltx2d	occ2	occi	ltx3	ltx1oc	c1ltx2	ltx2oc	c1ltx1	ltx3d	occ1	ltx	< 4
t1	occ	С	LTX	c bd1	LTX	c bd1	occ	С	LTX	c bd1	LTX	c bd1	LTX	c bd1	LTX	c bd1
t1 t2	OCC		LTX		LTX		OCC	c c bd2	LTX		LTX		LTX		LTX	
		c		bd1		bd1 c bd1		С		bd1		bd1 c bd1		bd1 c bd1		bd1 c bd1
t2	LTX	c c bd2	occ	a:t1	LTX	c bd1 r:t1	LTX	c bd2 c bd2	occ	bd1 a:t1	LTX	c bd1 r:t1	LTX	c bd1 r:t1 c bd1	LTX	bd1 c bd1 r:t1 c bd1

write_crown

cascading_3tx_1epoch_per_1ope_uncycled

	oc	с4	occi	3ltx1	0002 00		occ [°]	lltx1 c2	ltx10	осс3	occi	2ltx2	occ ⁻		ltx1oc	c2ltx1
t1	occ	С	occ	С	occ	С	occ	С	LTX	c bd1	occ	С	occ	С	LTX	c bd1
t2	occ	a:t1	occ	a:t1	occ	a:t1	LTX	c bd2	occ	a:t1	occ	a:t1	LTX	c bd2	occ	a:t1
t3	occ	С	occ	С	LTX	c bd3	occ	a:t2	occ	С	LTX	c bd3	occ	a:t2	occ	C
t4	occ	a:t3	LTX	c bd4	occ	a:t3	occ	С	occ	a:t3	LTX	c bd3 r:t3	LTX	c bd4	LTX	c bd4
read b	t	3	t	3	t	3	t	4	t	3	t	3	t	4	t	3
											•				•	
	occ oc		ltx10		ltx2c	occ2	occ'	1ltx3	ltx1oc	c1ltx2	ltx2oc	c1ltx1	ltx3d	occ1	ltx	×4
t1					ltx2d	c bd1	occ	Iltx3	ltx1oc	c1ltx2 c bd1	ltx2oc	c1ltx1 c bd1	ltx3d	c bd1	LTX	c bd1
t1 t2	oc	c1	ltx10	c c		С				С		С		С		С
	OCC	c1 c	ltx10	c bd1	LTX	c bd1 c bd1	occ	С	LTX	c bd1	LTX	c bd1 c bd1	LTX	c bd1 c bd1	LTX	c bd1 c bd1
t2	OCC LTX	c c c bd2 c bd2	LTX OCC	c bd1	LTX	c bd1 c bd1 r:t1	OCC	c c bd2	LTX	c bd1 a:t1	LTX	c bd1 c bd1 r:t1	LTX	c bd1 c bd1 r:t1 c	LTX	c bd1 c bd1 r:t1

ex write_crown.cascading_all_3tx_1epoch_per_1ope.occ2ltx1occ1

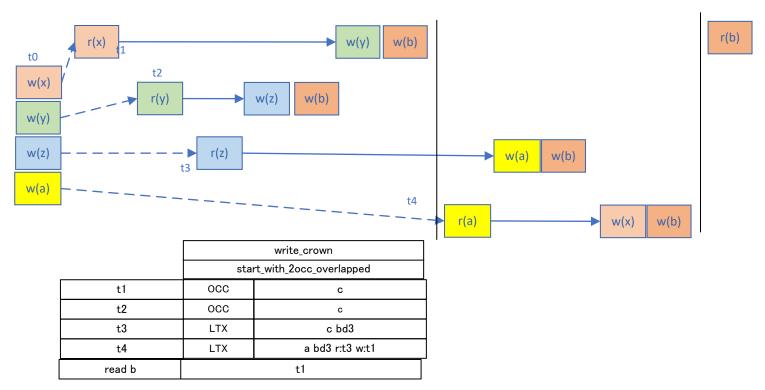


r(a)

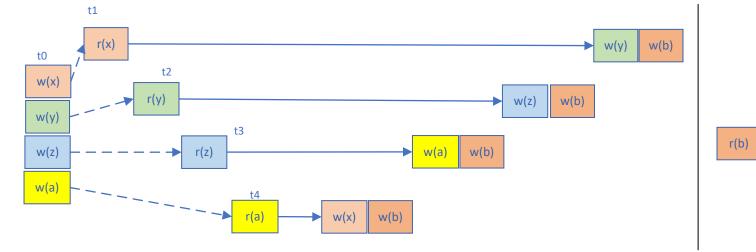
w(b)

		write_crown
	st	tart_with_occ_cascading
t1	occ	С
t2	LTX	c bd:2
t3	LTX	c bd2 r:t2
t4	LTX	a bd2 r:t3 w:t1
t5	LTX	c bd2 r:t3
read b		t1

Write Crown OCCが先頭のケースでオーバーラップする



Write Crown overlapped_all_4tx_cycled



write_crown

overlapped_4tx_cycled

	ос	c4	occi	3ltx1	occ2		000°		ltx1d	эсс3	occ2	2ltx2	occ ⁻		ltx1oc	c2ltx1
t1	occ	a:t4	occ	a:t4	occ	С	occ	a:t4	LTX	c bd1	occ	a:t4	occ	a:t4	LTX	c bd1
t2	occ	С	occ	С	occ	С	LTX	c bd2	occ	a:t1	occ	С	LTX	c bd2	occ	a:t1
t3	occ	С	occ	С	LTX	c bd3	occ	a:t2	occ	С	LTX	c bd3	occ	a:t2	occ	С
t4	occ	С	LTX	c bd4	occ	a:t3	осс	С	occ	С	LTX	c bd3 r:t3	LTX	c bd4	LTX	c bd4
read b	t	2	t	2	t	1	t	4	t	3	t	2	t	4	t	3
	0CC ⁻		ltx10		ltx20	occ2	occ ⁻	1ltx3	ltx1oc	c1ltx2	ltx2oc	c1ltx1	ltx3d	occ1	ltx	×4
t1	1		I		ltx20	c bd1	occ occ	1ltx3 a:t4	ltx1oc	c lltx2	ltx2oc	c1ltx1 c bd1	ltx3d	c bd1	LTX	c bd1
t1	oc	c1	ltx1d	c c		С				С		С		С		С
	OCC	c c	ltx10	c bd1	LTX	c bd1 c bd1	occ	a:t4	LTX	c bd1	LTX	c bd1 c bd1	LTX	c bd1 c bd1	LTX	c bd1 c bd1
t2	OCC LTX	c c bd2	LTX OCC	c bd1	LTX	c bd1 c bd1 r:t1	OCC	a:t4 c bd2 c	LTX	c bd1	LTX	c bd1 c bd1 r:t1	LTX	c bd1 c bd1 r:t1	LTX	c bd1 c bd1 r:t1

write_crown

w
overlapped_4tx_with_epoch_cycled

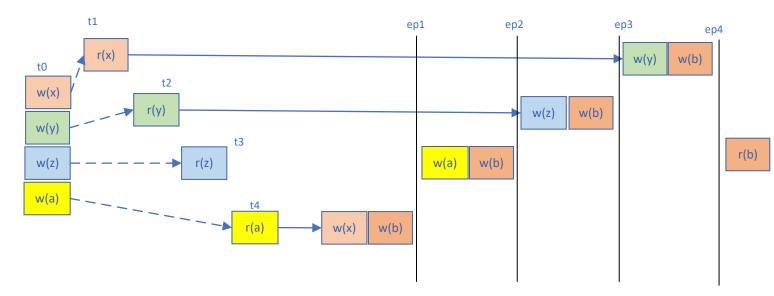
occ2ltx1 occ1ltx1 occ1ltx1 occ3ltx1 occ2ltx2 occ4 ltx1occ3 ltx1occ2ltx1 occ1ltx1 occ1 occ2 С occ t1 occ a:t4 occ a:t4 occ occ LTX a:t4 occ a:t4 LTX С a:t4 bd1 bd1 t2 OCC occ LTX occ a:t1 occ LTX OCC С occ С a:t1 С bd2 bd2 occ occ LTX LTX occ t3 С С OCC a:t2 OCC С a:t2 occ С bd3 bd3 OCC LTX occ t4 С occ a:t3 occ С С LTX bd3 LTX LTX read b t2 t1 t4 t3 t2 t4 t3 go:t2/t3 go:t2/t3 go:t1/t2/t3go:t2 go:t1/t3 go:t2/t3 go:t2 go:t1/t3 w:NA w:NA w:NA w:NA w:t4 w:NA w:NA ep1 /w:NA /w:NA /w:NA /w:NA /w:NA /w:t3 /w:NA /w:NA go:t1/t2 go:t2 go:t2 go:t2 go:t1 go:t2 go:t2 go:t1 w:NA w:NA w:NA w:NA w:NA w:NA w:NA w:NA ep2 /w:NA /w:NA /w:NA /w:NA /w:NA /w:NA /w:NA /w:NA go:NA go:NA go:NA go:t1 go:t1 go:NA go:NA go:t1 w:NA ер3 w:NA w:NA w:NA w:NA w:NA w:NA w:NA /w:NA /w:NA /w:NA /w:NA /w:NA /w:NA /w:NA /w:NA

	occ1		ltx1c		ltx2c	сс2	occ1	ltx3	ltx1oc	c1ltx2	ltx2oc	c1ltx1	ltx3c	occ1	ltx	:4
t1	occ	a:t4	LTX	c bd1	LTX	c bd1	occ	a:t4	LTX	c bd1	LTX	c bd1	LTX	c bd1	LTX	c bd1
t2	LTX	c bd2	occ	a:t1	LTX	c bd1 r:t1	LTX	c bd2	occ	a:t1	LTX	c bd1 r:t1	LTX	c bd1 r:t1	LTX	c bd1 r:t1
t3	LTX	c bd2 r:t2	LTX	c bd3	occ	a:t2	LTX	c bd2 r:t2	LTX	c bd3	occ	a:t2	LTX	c bd1 r:t2	LTX	c bd1 r:t2
t4	occ	a:t3	occ	a:t3	occ	С	LTX	c bd2 r:t3	LTX	c bd3 r:t3	LTX	c bd4	occ	a:t3	LTX	a bd1 r:t2 w:t1
read b	t	2	t	3	t	4	t	2	t	3	t	4	t	1	t	1
	go:t	2/t3	go:t	1/t3	go:t	1/t2	go:t	2/t3	go:t	1/t3	go:t	1/t 2	go:t1/	′t2/t3	go:t1/	′t2/t3
ep1		NA		NA	w:l			:t4		t4		NA	1:w		w:	
	-	:NA	 	:NA		:NA		r:t3	 	:t3		:NA	/w:		/w	
	⊩—∸	:t2	— <u> </u>	:t1	go:t			:t2	go			1/t2	go:t		go:t	
ep2	-	:t3 /:t2		NA :NA	w:l			3/t4 3/t2		NA :NA		NA :NA	w: /w		w:t3	
	├ ──	:NA		::NA ::t1	go			NA	y w		go		go		/ W.L go	_,
ep3		NA NA		NA	go w:			NA NA		NA		t2	go w:t2		w:t2/	
Сро		:NA		:NA	/w			:NA	ļ	:NA	/w		/w:t			/t2/t3

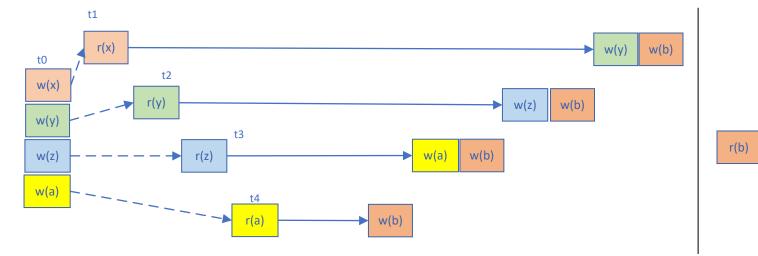
on going tx =go waiting tx = w waited tx = /w

OCCはできるだけ early abortさせている

Write Crown overlapped_all_4tx_with_epoch_cycled



Write Crown overlapped_all_4tx



write_crown

overlapped_4tx_uncycled

	ос	c4	occí	Bltx1	occ2		000	lltx1 c2	ltx1	эсс3	occ2	2ltx2	occ1		ltx1oc	c2ltx1
t1	occ	С	occ	С	occ	С	occ	С	LTX	c bd1	occ	С	occ	a:t4	LTX	c bd1
t2	occ	С	occ	С	occ	С	LTX	c bd2	occ	a:t1	occ	С	LTX	c bd2	occ	a:t1
t3	occ	С	occ	С	LTX	c bd3	occ	a:t2	occ	С	LTX	c bd3	occ	a:t2	occ	С
t4	occ	С	LTX	c bd4	occ	a:t3	occ	С	occ	С	LTX	c bd3 r:t3	LTX	c bd4	LTX	c bd4
read b	t	1	t	1	t	1	t	1	t	3	t	1	t.	4	tí	3
	•						l		L							,
	occ1		ltx10		ltx2d	occ2	occ	1ltx3	ltx1oc	:c1ltx2	ltx2oc	c1ltx1	ltx3d	occ1	lt>	×4
t1	1		I		ltx20	c bd1	occ.	1ltx3	ltx1oc	c1ltx2 c bd1	ltx2oc	c1ltx1 c bd1	ltx3d	c bd1	LTX	c bd1
t1	ос	c1	ltx10	c c		С				С		С		С		С
	OCC	c1 c	ltx10	c bd1	LTX	c bd1 c bd1	occ	С	LTX	c bd1	LTX	c bd1 c bd1	LTX	c bd1 c bd1	LTX	c bd1 c bd1
t2	OCC LTX	c c c bd2 c bd2	LTX	c bd1	LTX	c bd1 c bd1 r:t1	OCC	c c bd2	LTX	c bd1 a:t1	LTX	c bd1 c bd1 r:t1	LTX	c bd1 c bd1 r:t1	LTX	c bd1 c bd1 r:t1

write_crown
overlapped_4tx_with_epoch_uncycled

	ос	с4	occi	Bltx1	occ2 oc		occ1		ltx1d	осс3	occ2	ltx2	occ1		ltx1oc	c2ltx1
t1	осс	С	осс	С	осс	С	осс	С	LTX	c bd1	осс	С	осс	С	LTX	c bd1
t2	осс	С	occ	С	occ	C	LTX	c bd2	осс	a:t1	occ	С	LTX	c bd2	occ	a:t1
t3	осс	С	осс	С	LTX	c bd3	occ	a:t2	осс	С	LTX	c bd3	осс	a:t2	occ	С
t4	occ	С	LTX	c bd4	occ	a:t3	occ	С	occ	С	LTX	c bd3 r:t3	LTX	c bd4	LTX	c bd4
read b		4		LTX bd4						_						,
read b	t t	I	t1		t	1	t	1	t	3	t	1	t	1	tí	3
Toda b		r /t2/t3		t2/t3		1 /t2/t3	go:t			3 1/t3		1 ′t2/t3	go:t		go:t1	
ep1	go:t1/		go:t1/			/t2/t3		1/t2	go:t		go:t1/			1/t2		1/t3
	go:t1/ w:l	/t2/t3	go:t1/	/t2/t3	go:t1/ w:l	/t2/t3	go:t	1/t2 NA	go:t w:l	1/t3	go:t1/	′t2/t3	go:t	1/t2 NA	go:t1	I/t3 NA
	go:t1/ w:l	/t2/t3 NA	go:t1/ w: /w	/t2/t3 NA	go:t1/ w: i /w:	/t2/t3 NA	go:t w:l	1/t2 NA	go:t w:l	1/t3 NA :NA	go:t1/ w: /w	′t2/t3 t4	go:t [°] w: ľ	1/t2 NA NA	go:t1 w:N	1/t3 NA NA
	go:t1/ w:l /w: go:t	/t2/t3 NA :NA	go:t1/ w: /w go:t	/t2/t3 NA :NA	go:t1/ w: i /w:	/t2/t3 NA NA NA 1/t2	go:t w:l	1/t2 NA NA NA 1/t2	go:t w:l /w:	1/t3 NA :NA	go:t1/ w: /w	/t2/t3 t4 ::t3 1/t2	go:t` w:l /w:	1/t2 NA NA 1/t2	go:t1 w:N /w:	I/t3 NA NA :t1
ep1	go:t1/ w:l /w: go:t w:l	/t2/t3 NA :NA 1/t2	go:t1/ w: /w go:t	/t2/t3 NA :NA 1/t2	go:t1/ w:l /w: go:t w:l	/t2/t3 NA NA NA 1/t2	go:t w:l /w: go:t	1/t2 NA NA 1/t2 NA	go:t w:l /w: go w:l	1/t3 NA :NA :t1	go:t1/ w: /w go:t	/t2/t3 t4 ::t3 1/t2	go:t w:f /w: go:t	1/t2 NA NA 1/t2 NA	go:t1 w:N /w:	I/t3 NA NA Et1
ep1	go:t1/ w:l /w: go:t w:l	/t2/t3 NA :NA 1/t2 NA :NA	go:t1/ w: /w go:t w: /w	/t2/t3 NA :NA 1/t2 NA	go:t1/ w:l /w: go:t w:l	/t2/t3 NA NA NA 1/t2 NA	go:t w:l /w: go:t w:l	1/t2 NA NA 1/t2 NA NA	go:t w:l /w: go w:l /w:	1/t3 NA :NA :t1	go:t1/ w: /w go:t	/t2/t3 t4 ::t3 1/t2 NA NA	go:t w:f /w: go:t w:f	1/t2 NA NA 1/t2 NA NA	go:t1 w:N /w: go:	I/t3 NA NA NA :t1 NA
ep1	go:t1/ w:l /w: go:t w:l /w:	/t2/t3 NA :NA 1/t2 NA :NA	go:t1/ w: /w go:t w: /w	/t2/t3 NA :NA :NA 1/t2 NA :NA	go:t1/ w:l /w: go:t w:l /w:	/t2/t3 NA NA NA 1/t2 NA NA	go:t w:l /w: go:t w:l /w:	1/t2 NA NA 1/t2 NA NA	go:t w:l /w: go w:l /w: go	1/t3 NA :NA :t1 NA	go:t1/ w: /w go:t w:l	/t2/t3 t4 ::t3 1/t2 NA NA ::t1	go:t' w:f /w: go:t' w:f /w:	1/t2 NA NA 1/t2 NA NA	go:t1 w:N /w: go: w:N /w:	I/t3 NA NA NA Ht1 NA NA

	occ1		ltx1c		ltx2c	осс2	occ1	ltx3	ltx1oc	c1ltx2	ltx2oc	c1ltx1	ltx3o	occ1	ltx	4
t1	occ	С	LTX	c bd1	LTX	c bd1	occ	С	LTX	c bd1	LTX	c bd1	LTX	c bd1	LTX	c bd1
t2	LTX	c bd2	occ	a:t1	LTX	c bd1 r:t1	LTX	c bd2	occ	a:t1	LTX	c bd1 r:t1	LTX	c bd1 r:t1	LTX	c bd1 r:t1
t3	LTX	c bd2 r:t2	LTX	c bd3	occ	a:t2	LTX	c bd2 r:t2	LTX	c bd3	occ	a:t2	LTX	c bd1 r:t2	LTX	c bd1 r:t2
t4	occ	a:t3	occ	a:t3	occ	С	LTX	c bd2 r:t3	LTX	c bd3 r:t3	LTX	c bd4	occ	a:t3	LTX	c bd1 r:t2
read b	t	1	t	3	t	4	t	1	t	3	t	4	ť	1	t	1
	<u> </u>	/t2/t3		1/t3		1/t2		/t2/t3		1/t3		1/t2	go:t1/			′t2/t3
ep1		NA		NA	w:l			t4		:t4	w:l		w: l		w:	
	-	:NA	 	:NA	/w:			r:t3		/:t3		:NA	/w:		/w	
272	I ——	1/t2 :t3		:t1 NA	go:t w:l	1/t2		1/t <mark>2</mark> 3/t4	go	NA	go:t w:l	1/t2	go:t ⁻ w:		go:t° w:t3	
ep2		/:t2	ļ	:NA		NA NA		2/t3		:NA		:NA	/w		/w:t	
	⊹	:t1		:t1	go		go		go		go		go		go	
ер3	⊩—	NA	— <u> </u>	NA		t2	w:			NA		:t2	w:t2		w:t2/	
· .		:NA	/w	:NA	/w			:NA	 	:NA	/w		/w:t			/t2/t3

on going tx =go waiting tx = w waited tx = /w

OCCはできるだけ early abortさせている

