

1) before:

```
R7  [a3] = 0
R8  [t0] = 0
R9  [t1] = 0
R10 [t2] = 0
R11 [t3] = 0
R12 [t4] = 0
R13 [t5] = 0
R14 [t6] = 0
R15 [t7] = 0
R16 [s0] = 0
R17 [s1] = 0
R18 [s2] = 0
R19 [s3] = 0
R20 [s4] = 0
R21 [s5] = 0
R22 [s6] = 0
R23 [s7] = 0
R24 [t8] = 0
R25 [t9] = 0
R26 [k0] = 0
R27 [k1] = 0
R28 [gp] = 268468224
R29 [sp] = 2147482044
R30 [s8] = 0
R31 [ra] = 0
```

After:

```
R4  [a0] = 1
R5  [a1] = 214748204
R6  [a2] = 214748205
R7  [a3] = 0
R8  [t0] = 25
R9  [t1] = 5
R10 [t2] = 15
R11 [t3] = 8
R12 [t4] = 30
R13 [t5] = 7
R14 [t6] = 0
R15 [t7] = 0
R16 [s0] = 15
R17 [s1] = 10
R18 [s2] = 7
R19 [s3] = 2
R20 [s4] = 18
R21 [s5] = -3
R22 [s6] = 37
R23 [s7] = 0
R24 [t8] = 0
R25 [t9] = 0
R26 [k0] = 0
R27 [k1] = 0
```

2)

User data segment [10000000]..[10040000]  
[10000000]..[1003ffff] 00000000

User Stack [7ffff9bc]..[80000000]

[7ffff9bc]	0000000001				. . . .
[7ffff9c0]	2147482230	0000000000	2147483615	2147483604	v . . . . .
[7ffff9d0]	2147483579	2147483571	2147483554	2147483531	. . . . .
[7ffff9e0]	2147483466	2147483438	2147483406	2147483390	J . . . . .
[7ffff9f0]	2147483336	2147483299	2147483281	2147483255	. . . . . w . . .
[7ffffa00]	2147483241	2147483216	2147483193	2147483170	i . . . P . . . 9 . . . "
[7ffffa10]	2147483155	2147483111	2147482997	2147482887	. . . . . u . . . . .
[7ffffa20]	2147482840	2147482809	2147482786	2147482763	. . . . .
[7ffffa30]	2147482752	2147482735	2147482702	2147482675	. . . . o . . . N . . . 3 . . .
[7ffffa40]	2147482655	2147482601	2147482568	2147482527	. . . . .
[7ffffa50]	2147482511	2147482492	2147482474	2147482450	. . . .   . . . j . . . R . . .
[7ffffa60]	2147482432	2147482416	2147482331	2147482286	@ . . . 0 . . . . .
[7ffffa70]	0000000000	1747910656	0795176303	1937072740	. . . . . / h o m e / d b u s
[7ffffa80]	1768042356	1668637300	0796157291	0825372722	t / b i t b u c k e t / 2 0 2 1
[7ffffa90]	1818322527	1667587948	0925984112	1634479920	_ f a l l _ e c p e 1 7 0 / l a
[7ffffaa0]	0791687522	1953653104	1935748657	1146617965	b 1 0 / p a r t 1 . a s m . X D
[7ffffab0]	1329815367	1195984462	1380533343	1697594707	G _ C O N F I G _ D I R S = / e
[7ffffac0]	2016371572	2016372580	1965909860	1953396066	t c / x d g / x d g - u b u n t
[7ffffad0]	1697593973	2016371572	1476421476	1147094852	u : / e t c / x d g . X D G _ D
[7ffffae0]	1598116929	1397901636	1937059645	1752379250	A T A _ D I R S = / u s r / s h
[7ffffaf0]	0795177569	1853186677	0792360308	0796029813	a r e / u b u n t u : / u s r /
[7ffffb00]	1633906540	1752379244	0795177569	1937059642	l o c a l / s h a r e / : / u s
[7ffffb10]	1752379250	0795177569	1635135290	1768697714	r / s h a r e / : / v a r / l i
[7ffffb20]	1853042530	0795111521	1802724708	0007368564	b / s n a p d / d e s k t o p .
[7ffffb30]	1027888976	1836017711	1650732901	0007631733	P W D = / h o m e / d b u s t .
[7ffffb40]	1230984273	1330470733	1162630468	1969383741	Q T _ I M _ M O D U L E = i b u
[7ffffb50]	1246167155	1162108755	1598510402	1347704143	s . G J S _ D E B U G _ O U T P
[7ffffb60]	1933399125	1919247476	1145503858	1397052237	U T = s t d e r r . G D M S E S
[7ffffb70]	1313818963	1969386813	0007697518	1096766545	S I O N = u b u n t u . Q T _ A
[7ffffb80]	1397048131	1229080915	1498696012	1392521533	C C E S S I B I L I T Y = 1 . S
[7ffffb90]	1280066888	1768042301	1633824622	1392535667	H F T - / b i n / b a s h s

**User data segment [10000000]..[10040000]**

```
[10000000]..[1000ffff] 00000000
[10010000] 0000000037 0000000000 0000000000 0000000000 % . . . . .
[10010010]..[1003ffff] 00000000
```

**User Stack [7ffff9bc]..[80000000]**

```
[7ffff9bc] 0000000001 . . . .
[7ffff9c0] 2147482230 0000000000 2147483615 2147483604 v . . . . .
[7ffff9d0] 2147483579 2147483571 2147483554 2147483531 . . . . .
[7ffff9e0] 2147483466 2147483438 2147483406 2147483390 J . . . . .
[7ffff9f0] 2147483336 2147483299 2147483281 2147483255 . . . . . w . . .
[7ffffa00] 2147483241 2147483216 2147483193 2147483170 i . . . P . . . 9 . . . " . . .
[7ffffa10] 2147483155 2147483111 2147482997 2147482887 . . . . . u . . . . .
[7ffffa20] 2147482840 2147482809 2147482786 2147482763 . . . . .
[7ffffa30] 2147482752 2147482735 2147482702 2147482675 . . . . o . . . N . . . 3 . . .
[7ffffa40] 2147482655 2147482601 2147482568 2147482527 . . . . .
[7ffffa50] 2147482511 2147482492 2147482474 2147482450 . . . . | . . . j . . . R . . .
[7ffffa60] 2147482432 2147482416 2147482331 2147482286 @ . . . 0 . . . . .
[7ffffa70] 0000000000 1747910656 0795176303 1937072740 . . . . . / h o m e / d b u s
[7ffffa80] 1768042356 1668637300 0796157291 0825372722 t / b i t b u c k e t / 2 0 2 1
[7ffffa90] 1818322527 1667587948 0925984112 1634479920 _ f a l l _ e c p e 1 7 0 / l a
[7ffffaa0] 0791687522 1953653104 1935748657 1146617965 b 1 0 / p a r t 1 . a s m . X D
[7ffffab0] 1329815367 1195984462 1380533343 1697594707 G _ C O N F I G _ D I R S = / e
[7ffffac0] 2016371572 2016372580 1965909860 1953396066 t c / x d g / x d g - u b u n t
[7ffffad0] 1697593973 2016371572 1476421476 1147094852 u : / e t c / x d g . X D G _ D
[7ffffae0] 1598116929 1397901636 1937059645 1752379250 A T A _ D I R S = / u s r / s h
[7ffffaf0] 0795177569 1853186677 0792360308 0796029813 a r e / u b u n t u : / u s r /
-----
```

3)

PC = 0  
EPC = 0  
Cause = 0  
BadVAddr = 0  
Status = 805371664

HI = 0  
LO = 0

R0 [r0] = 0  
R1 [at] = 0  
R2 [v0] = 0  
R3 [v1] = 0  
R4 [a0] = 1  
R5 [a1] = 2147482048  
R6 [a2] = 2147482056  
R7 [a3] = 0  
R8 [t0] = 0  
R9 [t1] = 0  
R10 [t2] = 0  
R11 [t3] = 0  
R12 [t4] = 0  
R13 [t5] = 0  
R14 [t6] = 0  
R15 [t7] = 0  
R16 [s0] = 0  
R17 [s1] = 0  
R18 [s2] = 0  
R19 [s3] = 0  
R20 [s4] = 0  
R21 [s5] = 0  
R22 [s6] = 0  
R23 [s7] = 0

```
Cause      = 0
BadVAddr   = 0
Status      = 805371664

HI          = 0
LO          = 0

R0  [r0] = 0
R1  [at] = 268500992
R2  [v0] = 10
R3  [v1] = 0
R4  [a0] = 1
R5  [a1] = 2147482048
R6  [a2] = 2147482056
R7  [a3] = 0
R8  [t0] = 0
R9  [t1] = 0
R10 [t2] = 0
R11 [t3] = 0
R12 [t4] = 0
R13 [t5] = 0
R14 [t6] = 0
R15 [t7] = 0
R16 [s0] = 10
R17 [s1] = 15
R18 [s2] = 6
R19 [s3] = 0
R20 [s4] = 0
R21 [s5] = 0
R22 [s6] = 0
R23 [s7] = 0
R24 [t8] = 0
R25 [t9] = 0
R26 [t10] = 0
```

4)

User data segment [10000000]..[10040000]  
[10000000]..[1003ffff] 00000000

User Stack [7ffff9bc]..[80000000]

[7ffff9bc]	0000000001				. . . .
[7ffff9c0]	2147482230	0000000000	2147483615	2147483604	v . . . . .
[7ffff9d0]	2147483579	2147483571	2147483554	2147483531	. . . . .
[7ffff9e0]	2147483466	2147483438	2147483406	2147483390	J . . . . .
[7ffff9f0]	2147483336	2147483299	2147483281	2147483255	. . . . . w . . .
[7ffffa00]	2147483241	2147483216	2147483193	2147483170	i . . . P . . . 9 . . . " . . .
[7ffffa10]	2147483155	2147483111	2147482997	2147482887	. . . . . u . . . . .
[7ffffa20]	2147482840	2147482809	2147482786	2147482763	. . . . .
[7ffffa30]	2147482752	2147482735	2147482702	2147482675	. . . . o . . . N . . . 3 . . .
[7ffffa40]	2147482655	2147482601	2147482568	2147482527	. . . . .
[7ffffa50]	2147482511	2147482492	2147482474	2147482450	. . . .   . . . j . . . R . . .
[7ffffa60]	2147482432	2147482416	2147482331	2147482286	@ . . . 0 . . . . .
[7ffffa70]	0000000000	1747910656	0795176303	1937072740	. . . . . / h o m e / d b u s
[7ffffa80]	1768042356	1668637300	0796157291	0825372722	t / b i t b u c k e t / 2 0 2 1
[7ffffa90]	1818322527	1667587948	0925984112	1634479920	_ f a l l _ e c p e 1 7 0 / l a
[7ffffaa0]	0791687522	1953653104	1935748658	1146617965	b 1 0 / p a r t 2 . a s m . X D
[7ffffab0]	1329815367	1195984462	1380533343	1697594707	G _ C O N F I G _ D I R S = / e
[7ffffac0]	2016371572	2016372580	1965909860	1953396066	t c / x d g / x d g - u b u n t
[7ffffad0]	1697593973	2016371572	1476421476	1147094852	u : / e t c / x d g . X D G _ D
[7ffffae0]	1598116929	1397901636	1937059645	1752379250	A T A _ D I R S = / u s r / s h
[7ffffaf0]	0795177569	1853186677	0792360308	0796029813	a r e / u b u n t u : / u s r /
[7ffffb00]	1633906540	1752379244	0795177569	1937059642	l o c a l / s h a r e / : / u s
[7ffffb10]	1752379250	0795177569	1635135290	1768697714	r / s h a r e / : / v a r / l i
[7ffffb20]	1853042530	0795111521	1802724708	0007368564	b / s n a p d / d e s k t o p .
[7ffffb30]	1027888976	1836017711	1650732901	0007631733	P W D = / h o m e / d b u s t .
[7ffffb40]	1230984273	1330470733	1162630468	1969383741	Q T _ I M _ M O D U L E = i b u
[7ffffb50]	1246167155	1162108755	1598510402	1347704143	s . G J S _ D E B U G _ O U T P
[7ffffb60]	1933399125	1919247476	1145503858	1397052237	U T = s t d e r r . G D M S E S
[7ffffb70]	1313818963	1969386813	0007697518	1096766545	S I O N = u b u n t u . Q T _ A

User data segment [10000000]..[10040000]  
[10000000]..[1003ffff] 00000000

User Stack [7ffff9bc]..[80000000]

[7ffff9bc]	0000000001				. . . .
[7ffff9c0]	2147482230	0000000000	2147483615	2147483604	v . . . . .
[7ffff9d0]	2147483579	2147483571	2147483554	2147483531	. . . . .
[7ffff9e0]	2147483466	2147483438	2147483406	2147483390	J . . . . .
[7ffff9f0]	2147483336	2147483299	2147483281	2147483255	. . . . . w . . .
[7ffffa00]	2147483241	2147483216	2147483193	2147483170	i . . . P . . . 9 . . . "
[7ffffa10]	2147483155	2147483111	2147482997	2147482887	. . . . . u . . . . .
[7ffffa20]	2147482840	2147482809	2147482786	2147482763	. . . . .
[7ffffa30]	2147482752	2147482735	2147482702	2147482675	. . . . o . . . N . . . 3 . . .
[7ffffa40]	2147482655	2147482601	2147482568	2147482527	. . . . .
[7ffffa50]	2147482511	2147482492	2147482474	2147482450	. . . .   . . . j . . . R . . .
[7ffffa60]	2147482432	2147482416	2147482331	2147482286	@ . . . 0 . . . . .
[7ffffa70]	0000000000	1747910656	0795176303	1937072740	. . . . . / h o m e / d b u s
[7ffffa80]	1768042356	1668637300	0796157291	0825372722	t / b i t b u c k e t / 2 0 2 1
[7ffffa90]	1818322527	1667587948	0925984112	1634479920	_ f a l l _ e c p e 1 7 0 / l a
[7ffffaa0]	0791687522	1953653104	1935748658	1146617965	b 1 0 / p a r t 2 . a s m . X D
[7ffffab0]	1329815367	1195984462	1380533343	1697594707	G _ C O N F I G _ D I R S = / e
[7ffffac0]	2016371572	2016372580	1965909860	1953396066	t c / x d g / x d g - u b u n t
[7ffffad0]	1697593973	2016371572	1476421476	1147094852	u : / e t c / x d g . X D G _ D
[7ffffae0]	1598116929	1397901636	1937059645	1752379250	A T A _ D I R S = / u s r / s h
[7ffffaf0]	0795177569	1853186677	0792360308	0796029813	a r e / u b u n t u : / u s r /
[7ffffb00]	1633906540	1752379244	0795177569	1937059642	l o c a l / s h a r e / : / u s
[7ffffb10]	1752379250	0795177569	1635135290	1768697714	r / s h a r e / : / v a r / l i
[7ffffb20]	1853042530	0795111521	1802724708	0007368564	b / s n a p d / d e s k t o p .
[7ffffb30]	1027888976	1836017711	1650732901	0007631733	P W D = / h o m e / d b u s t .
[7ffffb40]	1230984273	1330470733	1162630468	1969383741	Q T _ I M _ M O D U L E = i b u
[7ffffb50]	1246167155	1162108755	1598510402	1347704143	s . G J S _ D E B U G _ O U T P
[7ffffb60]	1933399125	1919247476	1145503858	1397052237	U T = s t d e r r . G D M S E S
[7ffffb70]	1313818963	1969386813	0007697518	1096766545	S I O N = u b u n t u . Q T _ A
[7ffffb80]	1397048131	1229080915	1498696012	1392521533	C C E S S I B I L I T Y = 1 . S
[7ffffb90]	1280066888	1768042301	1633824622	1392535667	H E I . I . = / h i n / h a s h S



```
PC          = 0
EPC         = 0
Cause       = 0
BadVAddr    = 0
Status      = 805371664

HI          = 0
LO          = 0

R0  [r0]    = 0
R1  [at]    = 0
R2  [v0]    = 0
R3  [v1]    = 0
R4  [a0]    = 1
R5  [a1]    = 2147482048
R6  [a2]    = 2147482056
R7  [a3]    = 0
R8  [t0]    = 0
R9  [t1]    = 0
R10 [t2]    = 0
R11 [t3]    = 0
R12 [t4]    = 0
R13 [t5]    = 0
R14 [t6]    = 0
R15 [t7]    = 0
R16 [s0]    = 0
R17 [s1]    = 0
R18 [s2]    = 0
R19 [s3]    = 0
R20 [s4]    = 0
R21 [s5]    = 0
R22 [s6]    = 0
R23 [s7]    = 0
```

```
R0  [r0] = 0
R1  [at] = 268500992
R2  [v0] = 10
R3  [v1] = 0
R4  [a0] = 1
R5  [a1] = 2147482048
R6  [a2] = 2147482056
R7  [a3] = 0
R8  [t0] = -1
R9  [t1] = 0
R10 [t2] = 0
R11 [t3] = 0
R12 [t4] = 0
R13 [t5] = 0
R14 [t6] = 0
R15 [t7] = 0
R16 [s0] = 78
R17 [s1] = 0
R18 [s2] = 0
R19 [s3] = 0
R20 [s4] = 0
R21 [s5] = 0
R22 [s6] = 0
R23 [s7] = 0
```

6)

User data segment [10000000]..[10040000]  
[10000000]..[1003ffff] 00000000

User Stack [7ffff9bc]..[80000000]

[7ffff9bc]	0000000001				. . . .
[7ffff9c0]	2147482230	0000000000	2147483615	2147483604	v . . . . .
[7ffff9d0]	2147483579	2147483571	2147483554	2147483531	. . . . .
[7ffff9e0]	2147483466	2147483438	2147483406	2147483390	J . . . . .
[7ffff9f0]	2147483336	2147483299	2147483281	2147483255	. . . . . w . . .
[7ffffa00]	2147483241	2147483216	2147483193	2147483170	i . . . P . . . 9 . . . " . . .
[7ffffa10]	2147483155	2147483111	2147482997	2147482887	. . . . . u . . . . .
[7ffffa20]	2147482840	2147482809	2147482786	2147482763	. . . . .
[7ffffa30]	2147482752	2147482735	2147482702	2147482675	. . . . o . . . N . . . 3 . . .
[7ffffa40]	2147482655	2147482601	2147482568	2147482527	. . . . .
[7ffffa50]	2147482511	2147482492	2147482474	2147482450	. . . .   . . . j . . . R . . .
[7ffffa60]	2147482432	2147482416	2147482331	2147482286	@ . . . 0 . . . . .
[7ffffa70]	0000000000	1747910656	0795176303	1937072740	. . . . . / h o m e / d b u s
[7ffffa80]	1768042356	1668637300	0796157291	0825372722	t / b i t b u c k e t / 2 0 2 1
[7ffffa90]	1818322527	1667587948	0925984112	1634479920	_ f a l l _ e c p e 1 7 0 / l a
[7ffffaa0]	0791687522	1953653104	1935748659	1146617965	b l 0 / p a r t 3 . a s m . X D
[7ffffab0]	1329815367	1195984462	1380533343	1697594707	G _ C O N F I G _ D I R S = / e
[7ffffac0]	2016371572	2016372580	1965909860	1953396066	t c / x d g / x d g - u b u n t
[7ffffad0]	1697593973	2016371572	1476421476	1147094852	u : / e t c / x d g . X D G _ D
[7ffffae0]	1598116929	1397901636	1937059645	1752379250	A T A _ D I R S = / u s r / s h
[7ffffaf0]	0795177569	1853186677	0792360308	0796029813	a r e / u b u n t u : / u s r /
[7ffffb00]	1633906540	1752379244	0795177569	1937059642	l o c a l / s h a r e / : / u s
[7ffffb10]	1752379250	0795177569	1635135290	1768697714	r / s h a r e / : / v a r / l i
[7ffffb20]	1853042530	0795111521	1802724708	0007368564	b / s n a p d / d e s k t o p .
[7ffffb30]	1027888976	1836017711	1650732901	0007631733	P W D = / h o m e / d b u s t .
[7ffffb40]	1230984273	1330470733	1162630468	1969383741	Q T _ I M _ M O D U L E = i b u
[7ffffb50]	1246167155	1162108755	1598510402	1347704143	s . G J S _ D E B U G _ O U T P
[7ffffb60]	1933399125	1919247476	1145503858	1397052237	U T = s t d e r r . G D M S E S
[7ffffb70]	1313818963	1969386813	0007697518	1096766545	S I O N = u b u n t u . Q T _ A
[7ffffb80]	1397048131	1229080915	1498696012	1392521533	C C E S S I B I L I T Y = 1 . S
[7ffffb90]	1280066888	1768042301	1633824622	1392535667	H E L L = / b i n / b a s h . S

---

**User data segment [10000000]..[10040000]**

```
[10000000]..[1000ffff] 00000000
[10010000] 00000000078 -1 0000000000 0000000000 N . . . . .
[10010010]..[1003ffff] 00000000
```

*(Handwritten: A circled '00000000078' with an arrow pointing to '-1', and a circled '-1' with an arrow pointing to '0000000000'. Below the first line is a handwritten 'X' and below the second line is a handwritten 'L'.)*

**User Stack [7ffff9bc]..[80000000]**

```
[7ffff9bc] 00000000001 . . . . .
[7ffff9c0] 2147482230 0000000000 2147483615 2147483604 v . . . . .
[7ffff9d0] 2147483579 2147483571 2147483554 2147483531 . . . . .
[7ffff9e0] 2147483466 2147483438 2147483406 2147483390 J . . . . .
[7ffff9f0] 2147483336 2147483299 2147483281 2147483255 . . . . . w . . . .
[7ffffa00] 2147483241 2147483216 2147483193 2147483170 i . . . P . . . 9 . . . " . . .
[7ffffa10] 2147483155 2147483111 2147482997 2147482887 . . . . . u . . . . .
[7ffffa20] 2147482840 2147482809 2147482786 2147482763 . . . . .
[7ffffa30] 2147482752 2147482735 2147482702 2147482675 . . . . o . . . N . . . 3 . . .
[7ffffa40] 2147482655 2147482601 2147482568 2147482527 . . . . .
[7ffffa50] 2147482511 2147482492 2147482474 2147482450 . . . . | . . . j . . . R . . .
[7ffffa60] 2147482432 2147482416 2147482331 2147482286 @ . . . 0 . . . . .
[7ffffa70] 0000000000 1747910656 0795176303 1937072740 . . . . . / h o m e / d b u s
[7ffffa80] 1768042356 1668637300 0796157291 0825372722 t / b i t b u c k e t / 2 0 2 1
[7ffffa90] 1818322527 1667587948 0925984112 1634479920 _ f a l l _ e c p e l 7 0 / l a
[7ffffaa0] 0791687522 1953653104 1935748659 1146617965 b l 0 / p a r t 3 . a s m . X D
[7ffffab0] 1329815367 1195984462 1380533343 1697594707 G _ C O N F I G _ D I R S = / e
[7ffffac0] 2016371572 2016372580 1965909860 1953396066 t c / x d g / x d g - u b u n t
[7ffffad0] 1697593973 2016371572 1476421476 1147094852 u : / e t c / x d g . X D G _ D
[7ffffae0] 1598116929 1397901636 1937059645 1752379250 A T A _ D I R S = / u s r / s h
[7ffffaf0] 0795177569 1853186677 0792360308 0796029813 a r e / u b u n t u : / u s r /
[7ffffb00] 1633906540 1752379244 0795177569 1937059642 l o c a l / s h a r e / : / u s
[7ffffb10] 1752379250 0795177569 1635135290 1768697714 r / s h a r e / : / v a r / l i
[7ffffb20] 1853042530 0795111521 1802724708 0007368564 b / s n a p d / d e s k t o p .
[7ffffb30] 1027888976 1836017711 1650732901 0007631733 P W D = / h o m e / d b u s t .
[7ffffb40] 1230984273 1330470733 1162630468 1969383741 Q T _ I M _ M O D U L E = i b u
[7ffffb50] 1246167155 1162108755 1598510402 1347704143 s . G J S _ D E B U G _ O U T P
-----
```

7)

```
HI          = 0
LO          = 0

R0  [r0] = 0
R1  [at] = 0
R2  [v0] = 0
R3  [v1] = 0
R4  [a0] = 1
R5  [a1] = 2147482048
R6  [a2] = 2147482056
R7  [a3] = 0
R8  [t0] = 0
R9  [t1] = 0
R10 [t2] = 0
R11 [t3] = 0
R12 [t4] = 0
R13 [t5] = 0
R14 [t6] = 0
R15 [t7] = 0
R16 [s0] = 0
R17 [s1] = 0
R18 [s2] = 0
R19 [s3] = 0
R20 [s4] = 0
R21 [s5] = 0
R22 [s6] = 0
R23 [s7] = 0
R24 [t8] = 0
R25 [t9] = 0
R26 [k0] = 0
R27 [k1] = 0
R28 [gp] = 268468224
R29 [sp] = 2147482044
```

```
R1  [at] = 1
R2  [v0] = 10
R3  [v1] = 0
R4  [a0] = 1
R5  [a1] = 2147482048
R6  [a2] = 2147482056
R7  [a3] = 0
R8  [t0] = -1
R9  [t1] = 0
R10 [t2] = 268500992
R11 [t3] = 26
R12 [t4] = 0
R13 [t5] = 0
R14 [t6] = 0
R15 [t7] = 0
R16 [s0] = 268500992
R17 [s1] = 0
R18 [s2] = 12
R19 [s3] = 0
R20 [s4] = 0
R21 [s5] = 0
R22 [s6] = 268501012
R23 [s7] = 17
R24 [t8] = 0
R25 [t9] = 0
R26 [k0] = 0
R27 [k1] = 0
R28 [gp] = 268468224
R29 [sp] = 2147482044
R30 [s8] = 0
R31 [ra] = 4194328
```

8)

User data segment [10000000]..[10040000]  
[10000000]..[1003ffff] 00000000

User Stack [7ffff9bc]..[80000000]

[7ffff9bc]	00000000001				. . . .
[7ffff9c0]	2147482230	00000000000	2147483615	2147483604	v . . . . .
[7ffff9d0]	2147483579	2147483571	2147483554	2147483531	. . . . .
[7ffff9e0]	2147483466	2147483438	2147483406	2147483390	J . . . . .
[7ffff9f0]	2147483336	2147483299	2147483281	2147483255	. . . . . w . . .
[7ffffa00]	2147483241	2147483216	2147483193	2147483170	i . . . P . . . 9 . . . "
[7ffffa10]	2147483155	2147483111	2147482997	2147482887	. . . . . u . . . . .
[7ffffa20]	2147482840	2147482809	2147482786	2147482763	. . . . .
[7ffffa30]	2147482752	2147482735	2147482702	2147482675	. . . . o . . . N . . . 3 . . .
[7ffffa40]	2147482655	2147482601	2147482568	2147482527	. . . . .
[7ffffa50]	2147482511	2147482492	2147482474	2147482450	. . . .   . . . j . . . R . . .
[7ffffa60]	2147482432	2147482416	2147482331	2147482286	@ . . . 0 . . . . .
[7ffffa70]	00000000000	1747910656	0795176303	1937072740	. . . . . / h o m e / d b u s
[7ffffa80]	1768042356	1668637300	0796157291	0825372722	t / b i t b u c k e t / 2 0 2 1
[7ffffa90]	1818322527	1667587948	0925984112	1634479920	_ f a l l _ e c p e 1 7 0 / l a
[7ffffaa0]	0791687522	1953653104	1935748660	1146617965	b 1 0 / p a r t 4 . a s m . X D
[7ffffab0]	1329815367	1195984462	1380533343	1697594707	G _ C O N F I G _ D I R S = / e
[7ffffac0]	2016371572	2016372580	1965909860	1953396066	t c / x d g / x d g - u b u n t
[7ffffad0]	1697593973	2016371572	1476421476	1147094852	u : / e t c / x d g . X D G _ D
[7ffffae0]	1598116929	1397901636	1937059645	1752379250	A T A _ D I R S = / u s r / s h
[7ffffaf0]	0795177569	1853186677	0792360308	0796029813	a r e / u b u n t u : / u s r /
[7ffffb00]	1633906540	1752379244	0795177569	1937059642	l o c a l / s h a r e / : / u s
[7ffffb10]	1752379250	0795177569	1635135290	1768697714	r / s h a r e / : / v a r / l i
[7ffffb20]	1853042530	0795111521	1802724708	0007368564	b / s n a p d / d e s k t o p .
[7ffffb30]	1027888976	1836017711	1650732901	0007631733	P W D = / h o m e / d b u s t .
[7ffffb40]	1230984273	1330470733	1162630468	1969383741	Q T _ I M _ M O D U L E = i b u
[7ffffb50]	1246167155	1162108755	1598510402	1347704143	s . G J S _ D E B U G _ O U T P
[7ffffb60]	1933399125	1919247476	1145503858	1397052237	U T = s t d e r r . G D M S E S
[7ffffb70]	1313818963	1969386813	0007697518	1096766545	S I O N = u b u n t u . Q T _ A
[7ffffb80]	1397048131	1229080915	1498696012	1392521533	C C E S S I B I L I T Y = 1 . S
[7ffffb90]	1280066888	1768042301	1633824622	1392535667	H E L L = / b i n / b a s h . S

FP Regs	nt Regs [10]	Data	Text
Int Regs [10]		Data	
PC	= 4194496	User data segment [10000000]..[10040000]	
EPC	= 0	[10000000]..[1000ffff] 00000000	
Cause	= 0	[10010000] 0000000026 0000000028 0000000030 0000000032	
BadVAddr	= 0	[10010010] 0000000034 0000000001 0000000002 0000000003	
Status	= 805371664	[10010020] 0000000004 0000000005 0000000000 0000000000	
		[10010030]..[1003ffff] 00000000	
HI	= 0	User Stack [7ffff9bc]..[80000000]	
LO	= 0	[7ffff9bc] 0000000001	
R0 [r0]	= 0	[7ffff9c0] 2147482230 0000000000 2147483615 2147483604	
R1 [at]	= 1	[7ffff9d0] 2147483579 2147483571 2147483554 2147483531	
R2 [v0]	= 10	[7ffff9e0] 2147483466 2147483438 2147483406 2147483390	
R3 [v1]	= 0	[7ffff9f0] 2147483336 2147483299 2147483281 2147483255	
R4 [a0]	= 1	[7ffffa00] 2147483241 2147483216 2147483193 2147483170	
R5 [a1]	= 2147482048	[7ffffa10] 2147483155 2147483111 2147482997 2147482887	
R6 [a2]	= 2147482056	[7ffffa20] 2147482840 2147482809 2147482786 2147482763	
R7 [a3]	= 0	[7ffffa30] 2147482752 2147482735 2147482702 2147482675	
R8 [t0]	= -1	[7ffffa40] 2147482655 2147482601 2147482568 2147482527	
R9 [t1]	= 0	[7ffffa50] 2147482511 2147482492 2147482474 2147482450	
R10 [t2]	= 268500992	[7ffffa60] 2147482432 2147482416 2147482331 2147482286	
R11 [t3]	= 26	[7ffffa70] 0000000000 1747910656 0795176303 1937072740	
R12 [t4]	= 0	[7ffffa80] 1768042356 1668637300 0796157291 0825372722	
R13 [t5]	= 0	[7ffffa90] 1818322527 1667587948 0925984112 1634479920	
R14 [t6]	= 0	[7ffffaa0] 0791687522 1953653104 1935748660 1146617965	
R15 [t7]	= 0	[7ffffab0] 1329815367 1195984462 1380533343 1697594707	
R16 [s0]	= 268500992	[7ffffac0] 2016371572 2016372580 1965909860 1953396066	
R17 [s1]	= 0	[7ffffad0] 1697593973 2016371572 1476421476 1147094852	
R18 [s2]	= 12	[7ffffae0] 1598116929 1397901636 1937059645 1752379250	
R19 [s3]	= 0	[7ffffaf0] 0795177569 1853186677 0792360308 0796029813	
R20 [s4]	= 0	[7ffffb00] 1633906540 1752379244 0795177569 1937059642	
R21 [s5]	= 0	[7ffffb10] 1752379250 0795177569 1635135290 1768697714	
R22 [s6]	= 268501012	[7ffffb20] 1853042530 0795111521 1802724708 0007368564	
R23 [s7]	= 17	[7ffffb30] 1027888976 1836017711 1650732901 0007631733	
		[7ffffb40] 1230984273 1330470733 1162630468 1969383741	
		[7ffffb50] 1246167155 1162108755 1598510402 1347704143	

9)



User data segment [10000000]..[10040000]  
[10000000]..[1003ffff] 00000000

User Stack [7ffff9bc]..[80000000]

[7ffff9bc]	0000000001				. . . .
[7ffff9c0]	2147482230	0000000000	2147483615	2147483604	v . . . . .
[7ffff9d0]	2147483579	2147483571	2147483554	2147483531	. . . . .
[7ffff9e0]	2147483466	2147483438	2147483406	2147483390	J . . . . .
[7ffff9f0]	2147483336	2147483299	2147483281	2147483255	. . . . . w . . .
[7ffffa00]	2147483241	2147483216	2147483193	2147483170	i . . . P . . . 9 . . . "
[7ffffa10]	2147483155	2147483111	2147482997	2147482887	. . . . . u . . . . .
[7ffffa20]	2147482840	2147482809	2147482786	2147482763	. . . . .
[7ffffa30]	2147482752	2147482735	2147482702	2147482675	. . . . o . . . N . . . 3 . . .
[7ffffa40]	2147482655	2147482601	2147482568	2147482527	. . . . .
[7ffffa50]	2147482511	2147482492	2147482474	2147482450	. . . .   . . . j . . . R . . .
[7ffffa60]	2147482432	2147482416	2147482331	2147482286	@ . . . 0 . . . . .
[7ffffa70]	0000000000	1747910656	0795176303	1937072740	. . . . . / h o m e / d b u s
[7ffffa80]	1768042356	1668637300	0796157291	0825372722	t / b i t b u c k e t / 2 0 2 1
[7ffffa90]	1818322527	1667587948	0925984112	1634479920	_ f a l l _ e c p e 1 7 0 / l a
[7ffffaa0]	0791687522	1953653104	1935748661	1146617965	b 1 0 / p a r t 5 . a s m . X D
[7ffffab0]	1329815367	1195984462	1380533343	1697594707	G _ C O N F I G _ D I R S = / e
[7ffffac0]	2016371572	2016372580	1965909860	1953396066	t c / x d g / x d g - u b u n t
[7ffffad0]	1697593973	2016371572	1476421476	1147094852	u : / e t c / x d g . X D G _ D
[7ffffae0]	1598116929	1397901636	1937059645	1752379250	A T A _ D I R S = / u s r / s h
[7ffffaf0]	0795177569	1853186677	0792360308	0796029813	a r e / u b u n t u : / u s r /
[7ffffb00]	1633906540	1752379244	0795177569	1937059642	l o c a l / s h a r e / : / u s r
[7ffffb10]	1752379250	0795177569	1635135290	1768697714	r / s h a r e / : / v a r / l i
[7ffffb20]	1853042530	0795111521	1802724708	0007368564	b / s n a p d / d e s k t o p .
[7ffffb30]	1027888976	1836017711	1650732901	0007631733	P W D = / h o m e / d b u s t .
[7ffffb40]	1230984273	1330470733	1162630468	1969383741	Q T _ I M _ M O D U L E = i b u
[7ffffb50]	1246167155	1162108755	1598510402	1347704143	s . G J S _ D E B U G _ O U T P
[7ffffb60]	1933399125	1919247476	1145503858	1397052237	U T = s t d e r r . G D M S E S
[7ffffb70]	1313818963	1969386813	0007697518	1096766545	S I O N = u b u n t u . Q T _ A
[7ffffb80]	1327048131	1328080015	1408586012	1325521522	C C F S E T P T T T V - 1 e

EPC = 0  
Cause = 0  
BadVAddr = 0  
Status = 3000ff10  
HI = 0  
LO = 0  
R0 [r0] = 0  
R1 [at] = 10010000  
R2 [v0] = 0  
R3 [v1] = 0  
R4 [a0] = 10010140  
R5 [a1] = ff  
R6 [a2] = 7ffff9e8  
R7 [a3] = 0  
R8 [t0] = 65  
R9 [t1] = 0  
R10 [t2] = 0  
R11 [t3] = 0  
R12 [t4] = 0  
R13 [t5] = 0  
R14 [t6] = 0  
R15 [t7] = 0  
R16 [s0] = 10010006  
R17 [s1] = ff  
R18 [s2] = 0  
R19 [s3] = 0  
R20 [s4] = 0  
R21 [s5] = 0  
R22 [s6] = 0  
R23 [s7] = 0  
R24 [t8] = 0

User data segment [10000000]..[10040000]

[10000000]..[1000ffff]	00000000				the e in question
[10010000]	76666c6d	76666c6d	00000000	00000000	m l f v s m . . . . .
[10010010]..[100100ff]	00000000				
[10010100]	65746e45	value of e	69727453	203a676e	E n t e r a S t r i n g :
[10010110]	4e002020	2065206f	6e756f46	20650064	. N o e F o u n d . e
[10010120]	6e756f66	74612064	6d656d20	2079726f	f o u n d a t m e m o r y
[10010130]	72646441	3a737365	00002020	10010006	A d d r e s s : . . . . .
[10010140]	0000000a	00000000	00000000	00000000	. . . . .
[10010150]..[1003ffff]	00000000				

User Stack [7ffff9bc]..[80000000]

[7ffff9bc]	0000000001				. . . .
[7ffff9c0]	7ffffa76	00000000	7fffffd4	7fffffd4	v . . . . .
[7ffff9d0]	7fffffb3	7fffffb3	7fffffa2	7fffffb8b	. . . . .
[7ffff9e0]	7fffffa4a	7fffff2e	7fffff0e	7ffffefe	J . . . . .
[7ffff9f0]	7ffffec8	7ffffea3	7ffffe91	7ffffe77	. . . . . w . . .
[7ffffa00]	7ffffe69	7ffffe50	7ffffe39	7ffffe22	i . . . P . . . 9 . . . "
[7ffffa10]	7ffffe13	7ffffde7	7ffffd75	7ffffd07	. . . . . u . . . . .
[7ffffa20]	7ffffcd8	7ffffcb9	7ffffca2	7ffffc8b	. . . . .
[7ffffa30]	7ffffc80	7ffffc6f	7ffffc4e	7ffffc33	. . . . o . . . N . . . 3 . . .
[7ffffa40]	7ffffc1f	7ffffbe9	7ffffbc8	7ffffb9f	. . . . .
[7ffffa50]	7ffffb8f	7ffffb7c	7ffffb6a	7ffffb52	. . . .   . . . j . . . R . . .
[7ffffa60]	7ffffb40	7ffffb30	7ffffadb	7ffffaae	@ . . . 0 . . . . .
[7ffffa70]	00000000	682f0000	2f656d6f	73756264	. . . . . / h o m e / d b u s
[7ffffa80]	69622f74	63756274	2f74656b	31323032	t / b i t b u c k e t / 2 0 2 1
[7ffffa90]	6c61665f	63655f6c	73716570	616c2f30	_ f a l l _ e c p e 1 7 0 / l a
[7ffffaa0]	2f303162	74726170	73612e35	4458006d	b 1 0 / p a r t 5 . a s m . X D
[7ffffab0]	4f435f47	4749464e	5249445f	652f3d53	G _ C O N F I G _ D I R S = / e
[7ffffac0]	782f6374	782f6764	752d6764	746e7562	t c / x d g / x d g - u b u n t
[7ffffad0]	652f3a75	782f6374	58006764	445f4744	u : / e t c / x d g . X D G _ D
[7ffffae0]	5f415441	53524944	73752f3d	68732f72	A T A _ D I R S = / u s r / s h
[7ffffaf0]	2f657261	6e756275	2f3a7574	2f727375	a r e / u b u n t u : / u s r /
[7ffffb00]	61636f6c	68732f6c	2f657261	73752f3a	l o c a l / s h a r e / : / u s r
[7ffffb10]	68732f72	2f657261	61762f3a	696c2f72	r / s h a r e / : / v a r / l i

Address of e

