

## LDAXR

Load-Acquire Exclusive Register derives an address from a base register value, loads a 32-bit word or 64-bit doubleword from memory, and writes it to a register. The memory access is atomic. The PE marks the physical address being accessed as an exclusive access. This exclusive access mark is checked by Store Exclusive instructions. See [Synchronization and semaphores](#). The instruction also has memory ordering semantics as described in [Load-Acquire, Store-Release](#). For information about memory accesses, see [Load/Store addressing modes](#).

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
1	x	0	0	1	0	0	0	0	1	0	(1)	(1)	(1)	(1)	(1)	1	(1)	(1)	(1)	(1)	(1)										
size								L				Rs				o0				Rt2				Rn				Rt			

### 32-bit (size == 10)

```
LDAXR <Wt>, [<Xn|SP>{, #0}]
```

### 64-bit (size == 11)

```
LDAXR <Xt>, [<Xn|SP>{, #0}]
```

```
integer n = UInt(Rn);
integer t = UInt(Rt);

constant integer elsize = 8 << UInt(size);
integer regsize = if elsize == 64 then 64 else 32;
boolean tagchecked = n != 31;
```

## Assembler Symbols

- <Wt> Is the 32-bit name of the general-purpose register to be transferred, encoded in the "Rt" field.
- <Xt> Is the 64-bit name of the general-purpose register to be transferred, encoded in the "Rt" field.
- <Xn|SP> Is the 64-bit name of the general-purpose base register or stack pointer, encoded in the "Rn" field.

## Operation

```
bits(64) address;
bits(elsize) data;
constant integer dbytes = elsize DIV 8;

AccessDescriptor accdesc = CreateAccDescExLDST(MemOp_LOAD, TRUE, tagchecked,
if n == 31 then
```

```

CheckSPAlignment ();
address = SP[];
else
    address = X[n, 64];

// Tell the Exclusives monitors to record a sequence of one or more atomic
// memory reads from virtual address range [address, address+dbytes-1].
// The Exclusives monitor will only be set if all the reads are from the
// same dbytes-aligned physical address, to allow for the possibility of
// an atomicity break if the translation is changed between reads.
AArch64.SetExclusiveMonitors (address, dbytes);

data = Mem[address, dbytes, accdesc];
X[t, regsize] = ZeroExtend (data, regsize);

```

## Operational information

If PSTATE.DIT is 1, the timing of this instruction is insensitive to the value of the data being loaded or stored.

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