Nginx Array

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Introduction:

Arrays are the basic containers in nginx. Other data structures makes use of these arrays for their implementation. In nginx the array implementation is handled mainly by two files :

- ngx_array.h   - Present in src/core/ directory
- ngx_array.c   - Present in src/core/ directory

The ngx_array.h file defines the array structure as well as other variables and function prototypes. The ngx_array.c file defines the various operations/functions.

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Array structure:

Nginx implements its own version of the array data structure. Unlike the normal array it has many different features.
Array is implemented using the structure ngx_array_t.
The definition for the ngx_array_t is given as :

```
typedef struct {
        void        *elts;
        ngx_uint_t   nelts;
        size_t       size;
        ngx_uint_t   nalloc;
        ngx_pool_t  *pool;
} ngx_array_t;
```

Brief explanaion for the above structure :

elts : elts is a pointer to the array elements. It points to the starting position of the data area of the array.

nelts : Keeps the track of the number of elements stored.

size : Refers to the size of individual elements

nalloc : It refers to the number of elements for which space is allocated .It
   differs from nelts in sense that nelts stores the current number of elements in array not total number of elements
   for which space is allocated.

pool :   pool points to the memory pool which is to be used to allocate memory for the array structure and its
   elements.

While creating the array, array->nelts must initialized before initializing array->elts otherwise error may pop up thinking that array->elts may be referenced without pushing any elements.

4 bytes	elts
4 bytes	nelts
4 bytes	size
4 bytes	nalloc
4 bytes	pool
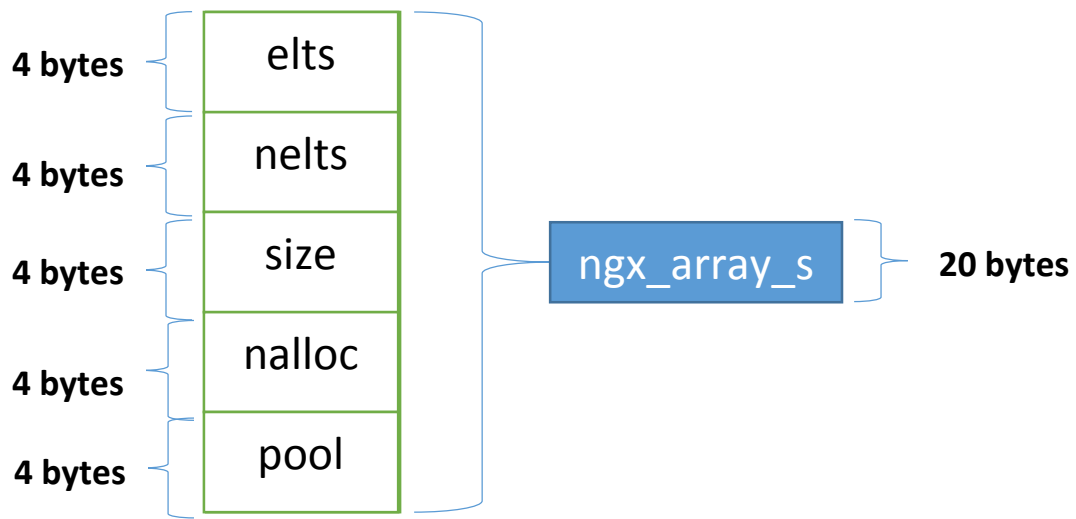
ngx_array_s — 20 bytes

The memory implementation of the array structure is shown on the next page

Implementation of arrays in memory :

The size of ngx_array_t structure is 20 bytes. These arrays are allocated a space in memory pool. The space required for the array is equal to the sum of space required to store the ngx_array_t structure i.e. 20 bytes and the space required to store the array elements.

This diagram show how the array is implemented using memory pool.