

Nginx Lists

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Introduction :

The concept of Lists is implemented in nginx using these two files :

- ngx_list.c -> Present in src/core/ directory
- ngx_list.h -> Present in src/core/ directory

The lists are container for storing data and are very similar to arrays in nginx.

List Structure :

The list concept is implemented by use of two structures. One of these is the head node which maintains the linked list. This structure is ngx_list_t. In nginx the concept of linked list is different than normal linked list. In normal linked one element can be stored at each node but in nginx each node in a linked list is itself a linked list. Thus the main linked list is maintained by ngx_list_t and the part of the linked list (i.e. linked list for each node) is maintained by ngx_list_part_t. Thus we can say that each node of linked list maintained by ngx_list_t is itself a linked list maintained by ngx_list_part_t.

The data structure for the list is defined as follows :

ngx_list_part_t Structure:

```
typedef struct ngx_list_part_s ngx_list_part_t;
```

```
struct ngx_list_part_s {  
    void      *elts;  
    ngx_uint_t  nelts;  
    ngx_list_part_t *next;  
};
```

The structure is similar to that of the array.

- elts is a pointer to the linked list of elements. Pointer to actual data allocated using malloc.
- nelts is the number of elements in the list
- next is the pointer to next node or element.

Ngx_list_t Structure [Head node of the linked list]:

```
typedef struct {  
    ngx_list_part_t *last;  
    ngx_list_part_t part;  
    size_t          size;  
    ngx_uint_t      nalloc;  
    ngx_pool_t      *pool;  
} ngx_list_t;
```

Here the parameters are :

- last : pointer to the end of list of node(ngx_list_part_t)
- part : pointer to the next node in the list (ngx_list_part_t)
- size : size of each element
- nalloc : The no of elements for which space is to be allocated. Each list part(ngx_list_part_t) will be allocated nalloc size space.

- pool : The memory pool to be used for allocating space.

List Implementation in memory:

The following diagram shows how list structure gets stored in memory.

