ANRC

RedHat Linux Kernel Internals Laboratory Exercises

Lab 7: Kernel Memory Allocation

Objective: In this lab you will build a LKM called “slabex” will exercise some of the linux kernel slab allocation routines. Specifically, your module will create and allocation memory, objects and then free them.

1. The following output demonstrates what your module should print to the debug log.

```
[175413.057990] slabex: init_module() called
[175413.057994] slabex: Initializing kmem cache
[175413.058011] slabex: Cache name is in slab kmalloc-32
[175413.058012] slabex: Cache object size is 32
[175413.058012] slabex: Allocating object in my_cachep with GFP_KERNEL flag
[175413.058013] slabex: Object created, freeing ...
[175413.058013] slabex: Object freed
[user@localhost Lab7]$
```

Hints:

- Create a new project “Lab7” and import the files from your “RHKI/Lab7” folder to get started.
- Use the following code sequence to get started with the LKM.
- View the slabs in /proc/slabinfo

```
static struct kmem_cache *my_cachep;

static void init_my_cache(void)
{
                /* kmem_cache_create */
}

void slab_ex(void)
{
     void *myobject;

     /* kmem_cache_alloc*/
     /*kmem_cache_free */
}

static void remove_my_cache(void)
{
     /*kmem_cache_destroy*/
}

int init(void)
{
     printk(KERN_INFO "slabex: init_module() called\n");
     printk("slabex: Initializing kmem cache\n");
     init_my_cache();
     slab_ex(); /* create and free objects within the cache */
     return 0;
}
```