radix tree用于在unsigned long与void *之间建立关联
(unsigned long, void *)
整数　v.s. 指针

有点象hash,hash key是unsigned long，而hash value是指针。

> int radix_tree_insert(struct radix_tree_root , *unsigned long, void*);

把(unsigned long, void *)放入trdix tree

> void *radix_tree_lookup(struct radix_tree_root* , unsigned long);

由unsigned long从radix tree中查询void *

> void *radix_tree_delete(struct radix_tree_root* , unsigned long);

从radix tree中删除以unsigned long标示的(unsigned long, void *) pair。

> void *radix_tree_delete_item(struct radix_tree_root* , unsigned long, void *);

delete (unsigned long, void *) from radix tree

```
#define RADIX_TREE(name, mask) \
    struct radix_tree_root name = RADIX_TREE_INIT(mask)
```

静态初始化radix tree

> static RADIX_TREE(pwm_tree, GFP_KERNEL);

以drivers/pwm/core.c为例

```
#include <linux/radix-tree.h>
```

- define a radix tree

  > static RADIX_TREE(pwm_tree, GFP_KERNEL);

- lookup void * according to unsigned long

```
static struct pwm_device *pwm_to_device(unsigned int pwm)
{
    return radix_tree_lookup(&pwm_tree, pwm);
}
```

- delete the item from radix tree according to unsigned long

```
    for (i = 0; i < chip->npwm; i++) {
        struct pwm_device *pwm = &chip->pwms[i];
        radix_tree_delete(&pwm_tree, pwm->pwm);
    }
```

- insert item into radix tree

```
    for (i = 0; i < chip->npwm; i++) {
        pwm = &chip->pwms[i];

        pwm->chip = chip;
        pwm->pwm = chip->base + i;
        pwm->hwpwm = i;

        radix_tree_insert(&pwm_tree, pwm->pwm, pwm);
    }
```