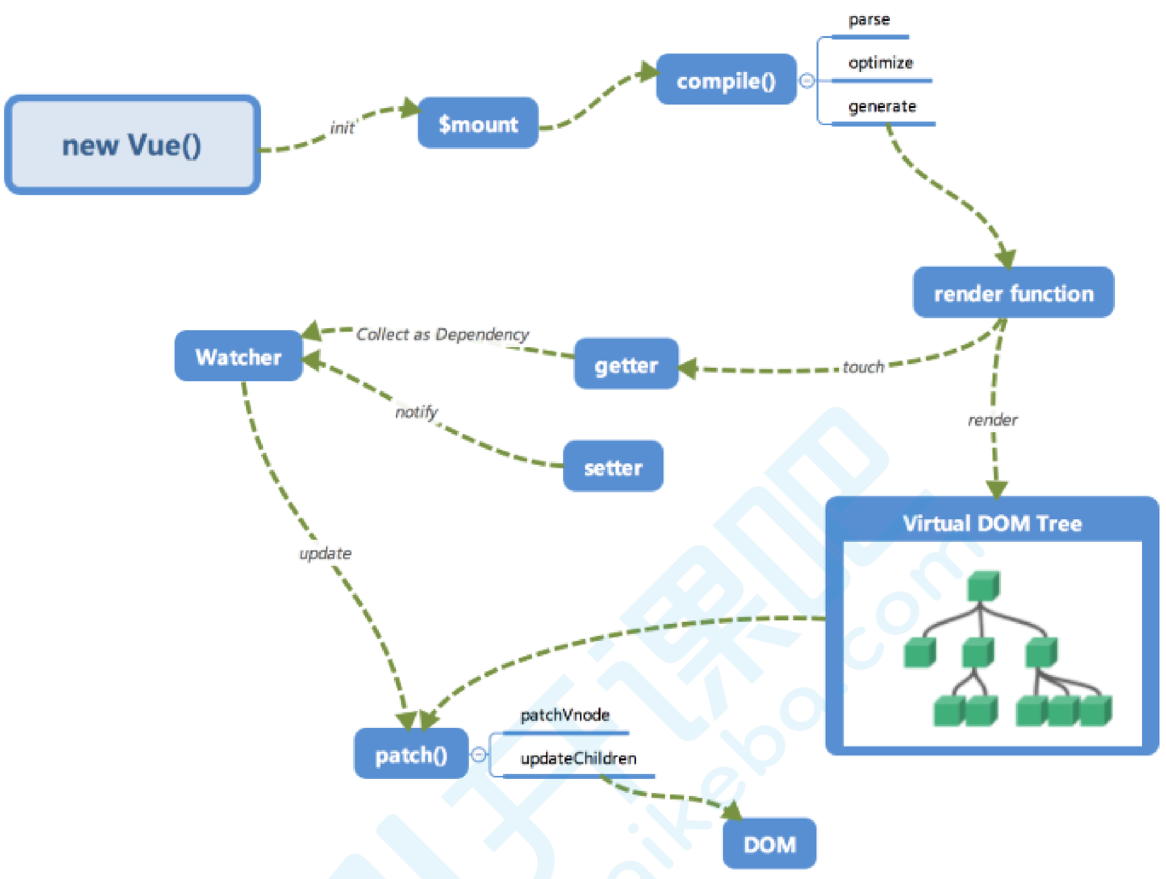
Vue工作机制



初始化

在 `new Vue()` 时会调用_init()进行初始化，会初始化各种实例方法、全局方法、执行一些生命周期、初始化props、data等状态。其中最重要的是data的「**响应化**」处理。

初始化之后调用 `$mount` 挂载组件，主要执行编译和首次更新

编译

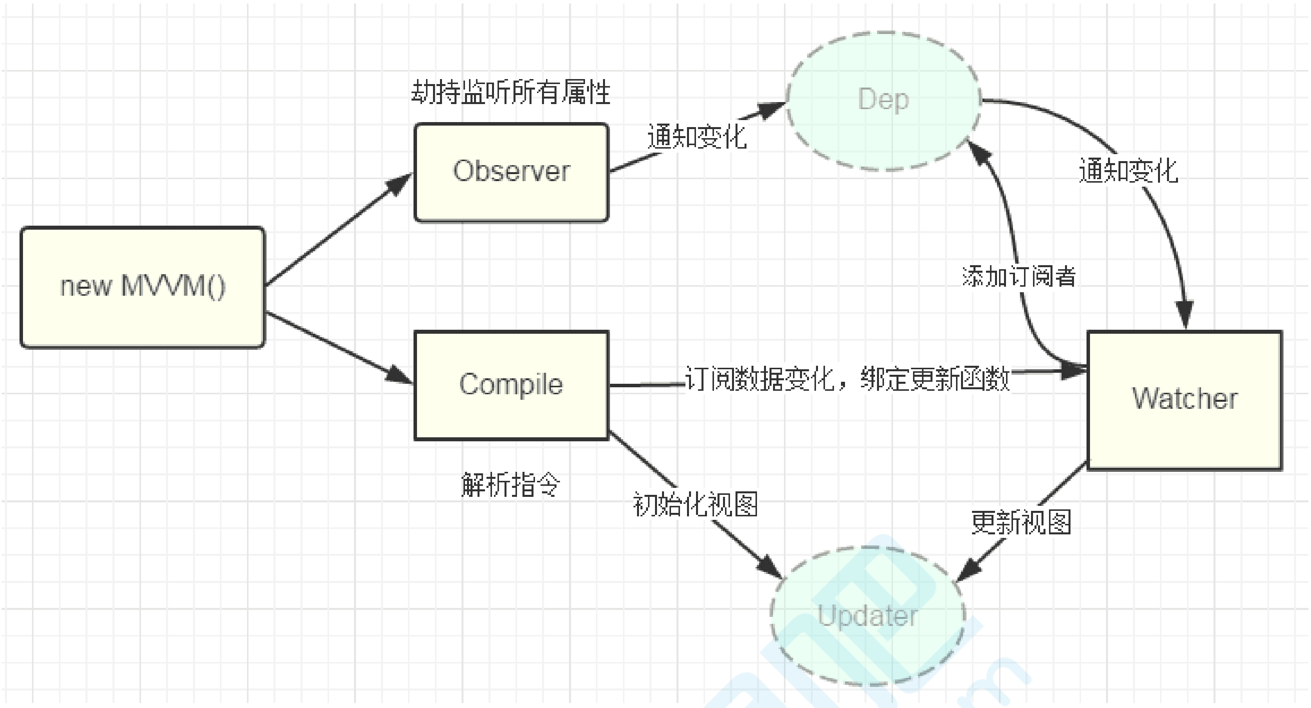
编译模块分为三个阶段

1. parse：使用正则解析template中的vue的指令(v-xxx) 变量等等 形成抽象语法树AST
2. optimize：标记一些静态节点，用作后面的性能优化，在diff的时候直接略过
3. generate：把第一部生成的AST 转化为渲染函数 render function

更新

数据修改触发setter，然后监听器会通知进行修改，通过对比新旧vdom树，得到最小修改，就是 `patch` ，然后只需要把这些差异修改即可

实现kvue



kvue源码

```
// 期待用法
// new KVue({
//     data:{msg:'hello'}
// })

class KVue {
  constructor(options) {
    this.$options = options;

    //处理data选项
    this.$data = options.data;
    // 响应化
    this.observe(this.$data);

    // new Watcher();
    // this.$data.test;
    // new Watcher();
    // this.$data.foo.bar;

    new Compile(options.el, this);

    if (options.created) {
        options.created.call(this);
    }
  }

  observe(value) {
      if (!value || typeof value !== 'object') {
       return;
      }
      // 遍历对象
      Object.keys(value).forEach(key => {
          this.defineReactive(value, key, value[key])
          // 代理到vm上
          this.proxyData(key);
      })
  }
  proxyData(key) {
    Object.defineProperty(this, key, {
        get(){
            return this.$data[key];
        },
        set(newVal){
          this.$data[key] = newVal;
        }
    })
  }
  defineReactive(obj, key, val) {
      const dep = new Dep();

      Object.defineProperty(obj, key, {
          get(){
              // 将Dep.target添加到dep中
              Dep.target && dep.addDep(Dep.target)
              return val;
          },
          set(newVal){
            if (newVal !== val) {
                val = newVal;
                // console.log(`${key}更新了: ${newVal}`);
                dep.notify();
            }
          }
      })
      // 递归
      this.observe(val);
  }

}

class Dep {
    constructor(){
        this.deps = [];
    }

    addDep(dep) {
        this.deps.push(dep)
    }

    notify() {
        this.deps.forEach(dep => dep.update())
    }
}

class Watcher {
    constructor(vm, key, cb) {
        this.vm = vm;
        this.key = key;
        this.cb = cb;

        Dep.target = this;
        this.vm[this.key];// 添加watcher到dep
        Dep.target = null;
    }
    update() {
        // console.log('属性更新了');
        this.cb.call(this.vm, this.vm[this.key])
    }
}
```

compile源码

```
// new Compile(el, vm)

class Compile {
  constructor(el, vm) {
    this.$vm = vm;
    this.$el = document.querySelector(el);

    if (this.$el) {
      // 提取宿主中模板内容到Fragment标签，dom操作会提高效率
      this.$fragment = this.node2Fragment(this.$el);
      // 编译模板内容，同时进行依赖收集
      this.compile(this.$fragment);
      this.$el.appendChild(this.$fragment);
    }
  }

  node2Fragment(el) {
    const fragment = document.createDocumentFragment();
    let child;
    while ((child = el.firstChild)) {
      fragment.appendChild(child);
    }
    return fragment;
  }
  compile(el) {
    const childNodes = el.childNodes;

    Array.from(childNodes).forEach(node => {
      // 判断节点类型
      if (node.nodeType === 1) {
        // element节点
        // console.log('编译元素节点'+node.nodeName);
        this.compileElement(node);
      } else if (this.isInterpolation(node)) {
        // 插值表达式
        // console.log('编译插值文本'+node.textContent);
        this.compileText(node);
      }

      // 递归子节点
      if (node.childNodes && node.childNodes.length > 0) {
        this.compile(node);
      }
    });
  }

  isInterpolation(node) {
    // 是文本且符合{{}}
    return node.nodeType === 3 && /\{\{(.*)\}\}/.test(node.textContent);
  }

  compileElement(node) {
    // <div k-model="foo" k-text="test" @click="onClick">
    let nodeAttrs = node.attributes;
    Array.from(nodeAttrs).forEach(attr => {
      const attrName = attr.name;
      const exp = attr.value;
      if (this.isDirective(attrName)) {
        const dir = attrName.substring(2);
        this[dir] && this[dir](node, this.$vm, exp);
      }
      if (this.isEvent(attrName)) {
        const dir = attrName.substring(1);
        this.eventHandler(node, this.$vm, exp, dir);
      }
    });
  }
  isDirective(attr) {
    return attr.indexOf("k-") === 0;
  }

  isEvent(attr) {
    return attr.indexOf("@") === 0;
  }
  compileText(node) {
    console.log(RegExp.$1);

    this.update(node, this.$vm, RegExp.$1, "text");
  }

  update(node, vm, exp, dir) {
    let updatrFn = this[dir + "Updater"];
    updatrFn && updatrFn(node, vm[exp]);
    // 依赖收集
    new Watcher(vm, exp, function(value) {
      updatrFn && updatrFn(node, value);
    });
  }
  text(node, vm, exp) {
    this.update(node, vm, exp, "text");
  }
  textUpdater(node, val) {
    node.textContent = val;
  }

  eventHandler(node, vm, exp, dir) {
    const fn = vm.$options.methods && vm.$options.methods[exp];
    if (dir && fn) {
      node.addEventListener(dir, fn.bind(vm));
    }
  }

  html(node, vm, exp) {
    this.update(node, vm, exp, "html");
  }

  model(node, vm, exp) {
    // data -> view
    this.update(node, vm, exp, "model");
    // view -> data
    node.addEventListener("input", e => {
      vm[exp] = e.target.value;
    });
  }

  htmlUpdater(node, value) {
    node.innerHTML = value;
  }

  modelUpdater(node, value) {
    node.value = value;
  }
}
```

测试代码

```
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <title>Document</title>
```

```html
</head>

<body>
    <div id="app">
        <p>{{name}}</p>
        <p k-text="name"></p>
        <p>{{age}}</p>
        <p>
            {{doubleAge}}
        </p>
        <input type="text" k-model="name">
        <button @click="changeName">呵呵</button>
        <div k-html="html"></div>
    </div>
    <script src='./kvue.js'></script>
    <script src='./compile.js'></script>

    <script>
        const kaikeba = new KVue({
            el: '#app',
            data: {
                name: "I am test.",
                age: 12,
                html: '<button>这是一个按钮</button>'
            },
            created() {
                console.log('开始啦')
                setTimeout(() => {
                    this.name = '我是测试'
                }, 1500)
            },
            methods: {
                changeName() {
                    this.name = '哈喽，开课吧'
                    this.age = 1
                }
            }
        })
    </script>
    <!-- <script src="./kvue.js"></script>
    <script>
        const app = new KVue({
            data: {
                test: 'kaikeba',
                foo: {bar:'bar'}
            }
        })

        app.$data.test = '我变了'
        app.$data.foo.bar = '我变了'
        app.test = '我又变了'
    </script> -->
</body>
```

```
</html>
```