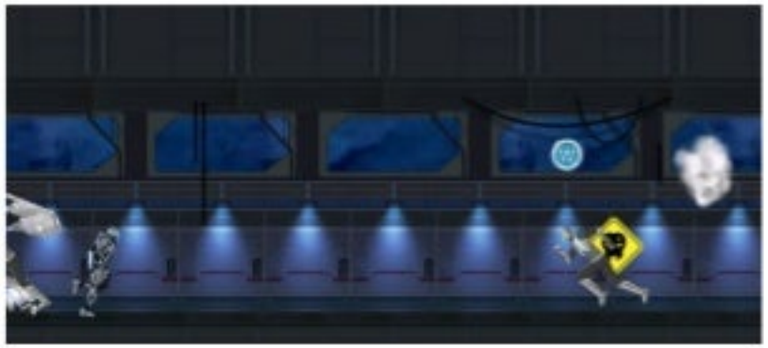
Oxygine 2D

Objects,Events,Debug and Resources

- Based on SDL2. Valve Support.Cross Platform Support
- Got Flash Event System and SceneGraph Hierarchy
- Cross platform. Template generate
- Models system



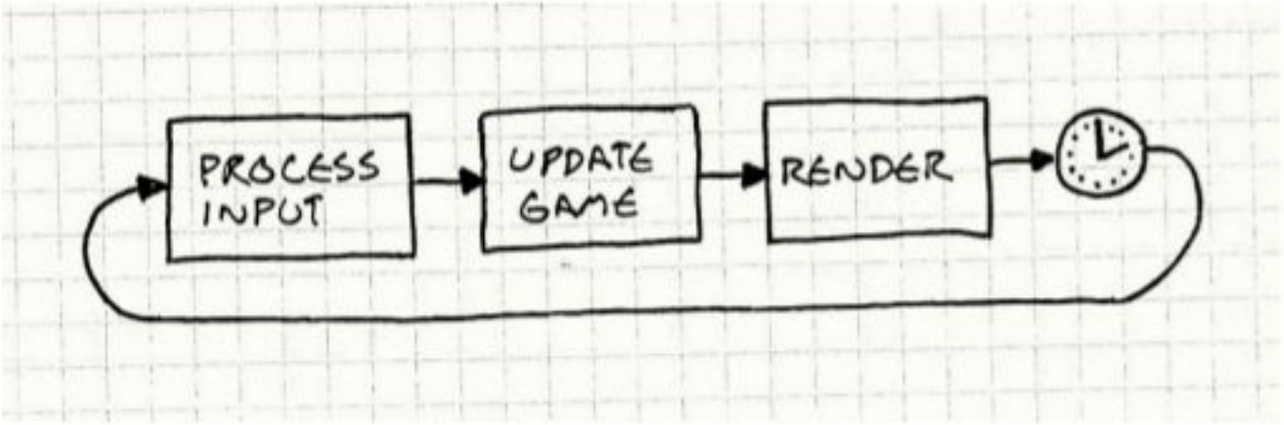
Oxygine

Game Object

(In General)

Simple Life Cycle:Init,Update,Destroy.

```
class GraphicComponent:Component{}
class PhysicComponent:Component{}
```




```
for (auto& o : objects) o->update();
for (auto& o : objects) o->draw(window);
```

Oxygine Application

```
fps=60
objects=43
batches=  1 primitives=  0
update= 0ms render=13ms
textures= 7
```

Scene

Clicked!

Sprite

Sprite with tweens animations

TextField with font

Oxygine

Game Object

Components(Physics,Graphic,Sound,Effects,Events)

DebugMacros(_Debug,_TraceLeak,_TraceLifeCycle)

SafeMemory and Cast

Unique Information and id

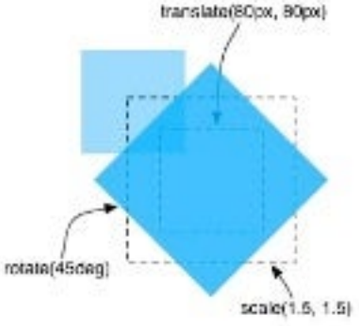
Good Perfomance

Game Object

Every graphic object extends Actor's class.

Actor is a base class in scene graph. It can be moved, rotated, scaled, animated. Actors can have other actors as children. When a parent is transformed, all its children are transformed as well.

```
class Actor : public EventDispatcher,
public intrusive_list_item<spActor>,
public Serializable
```



Compound Transform

Every object extends Object class;

```
class Unit : public Object
```

Game Object

```
class NightStalker:public Actor;{...}; // Actor is a base graphic object
int main(){
_factory.registerItem(&nightStalker,"nightstalker");
_factory.find("nightstalker"); // bad case
// game loop start here
while(true){
// game loop running and update's calls
}
//terminate
}
```

Game Object

NightStalker.h

```
DECLARE_SMART(NightStalker, spNightStalker);
class NightStalker:public Object
{public:
 FACTORY_UNIT(NightStalker, "nightstalker", layer_enemies);
}
```

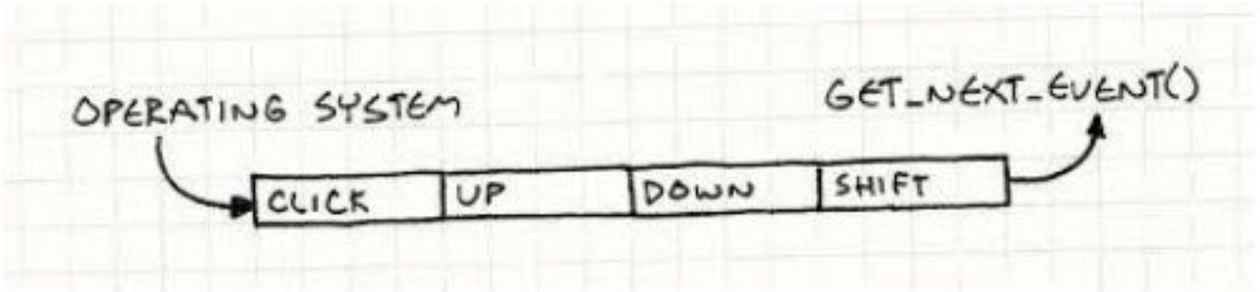
NightStalker.cpp

```
NightStalker::NightStalker(){}
REGISTER_UNIT(NightStalker);
int main(){
const unit_desc* desc = Factory<unit_desc>::find("nightstalker");// now better
OX_ASSERT(desc);
}
```

Events

Notify game aspects of a process.

Based on Event Dispatch flash system.



Event handling

```
void clickHandler(Event*) {}

submitButton->addEventListener(TouchEvent::CLICK, CLOSURE(this, &SomeClass::clickHandler));
submitButton->removeEventListener(TouchEvent::CLICK, CLOSURE(this, &SomeClass::clickHandler));

submitButton->dispatchEvent(Event *event);

submitButton->addEventListener(TouchEvent::CLICK, [](Event*){ // slower then CLOSURE
    log::messageln("button clicked");
});
```

Event propagation and phases

Event handling is the support for event propagation—the transference of a single event applying to multiple objects.

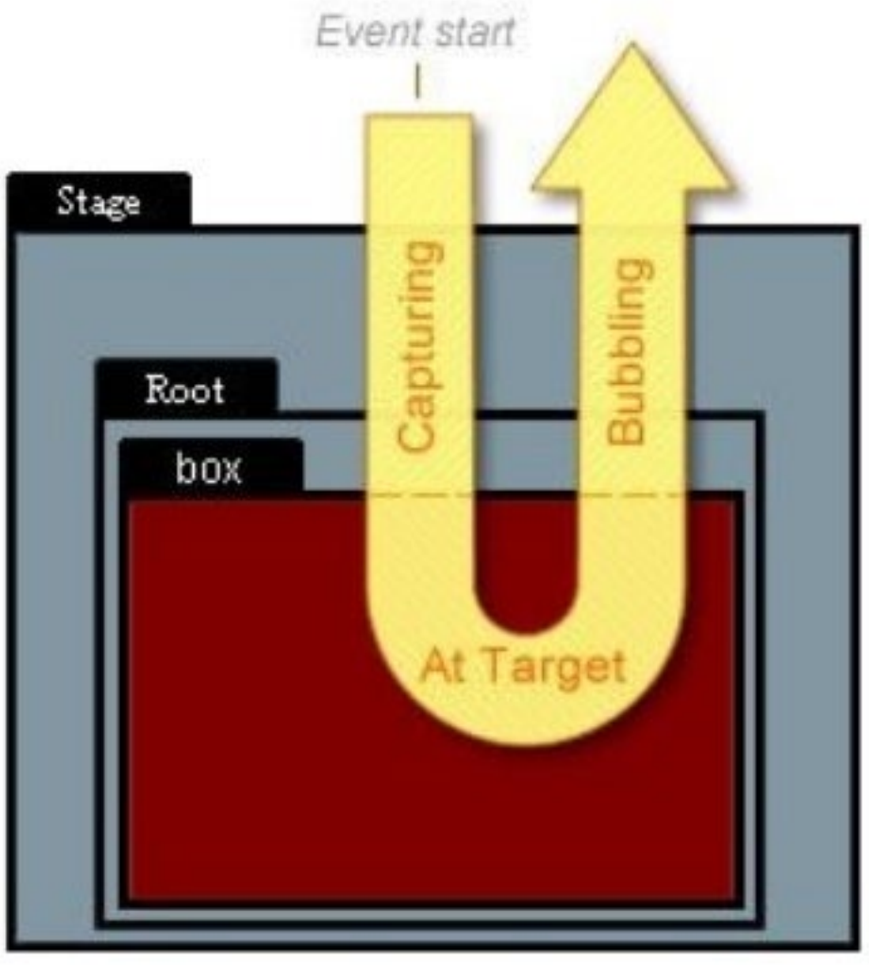
The three phases of an event are capturing, at target, and bubbling:

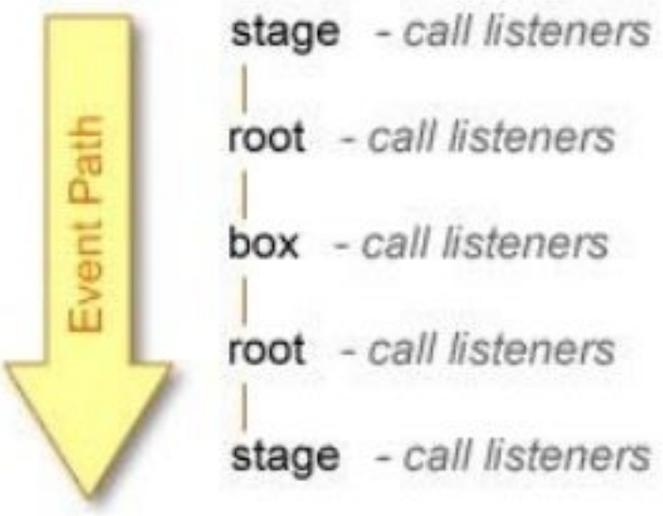
Capturing phase: This represents the parent objects of the target object from which the event originated

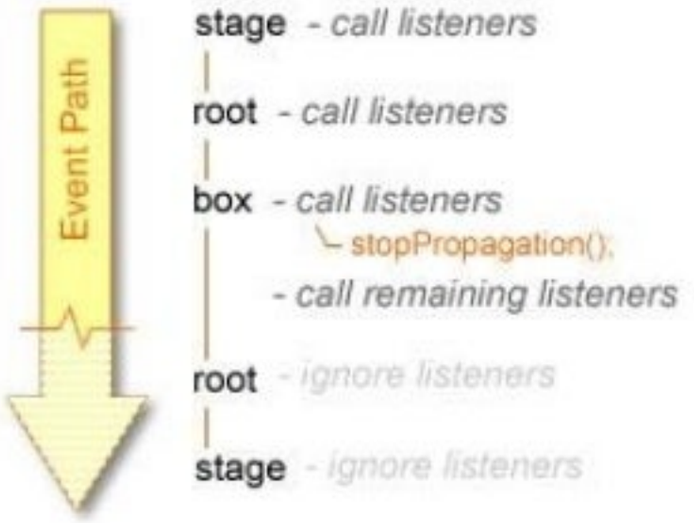
At target phase:The target phase is the phase where the event is at the target object or the object from which the event originated.

Bubbling phase: When an event "bubbles" it follows the reverse path of the capturing phase and works its way back up the parent hierarchy of the target object until reaching the top-most parent or stage.

Event handling







stopPropagation()

stopImmediatePropagation()

Event Properties

```
eventType type;
Phase phase;
bool bubbles;
spEventDispatcher target;
spEventDispatcher currentTarget;
```

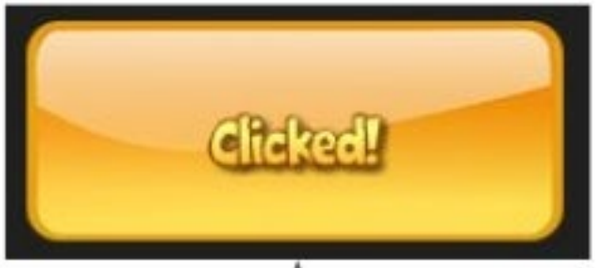
Debug


```
static int fps = 0;
 ++_frames;
if (_frames > 50)
{
    if (tm != _startTime)
    {
        fps = int(((float)_frames / (tm - _startTime)) * 1000);
    }
   _startTime = tm;
    _frames = 0;
}
```

```
typedef std::vector<ObjectBase*>
__createdObjects

__createdObjects& objs = __getCreatedObjects();
__createdObjects::iterator i = std::find(objs.begin(), objs.end(), base);
OX_ASSERT(i != objs.end());
objs.erase(i);
```

Debug

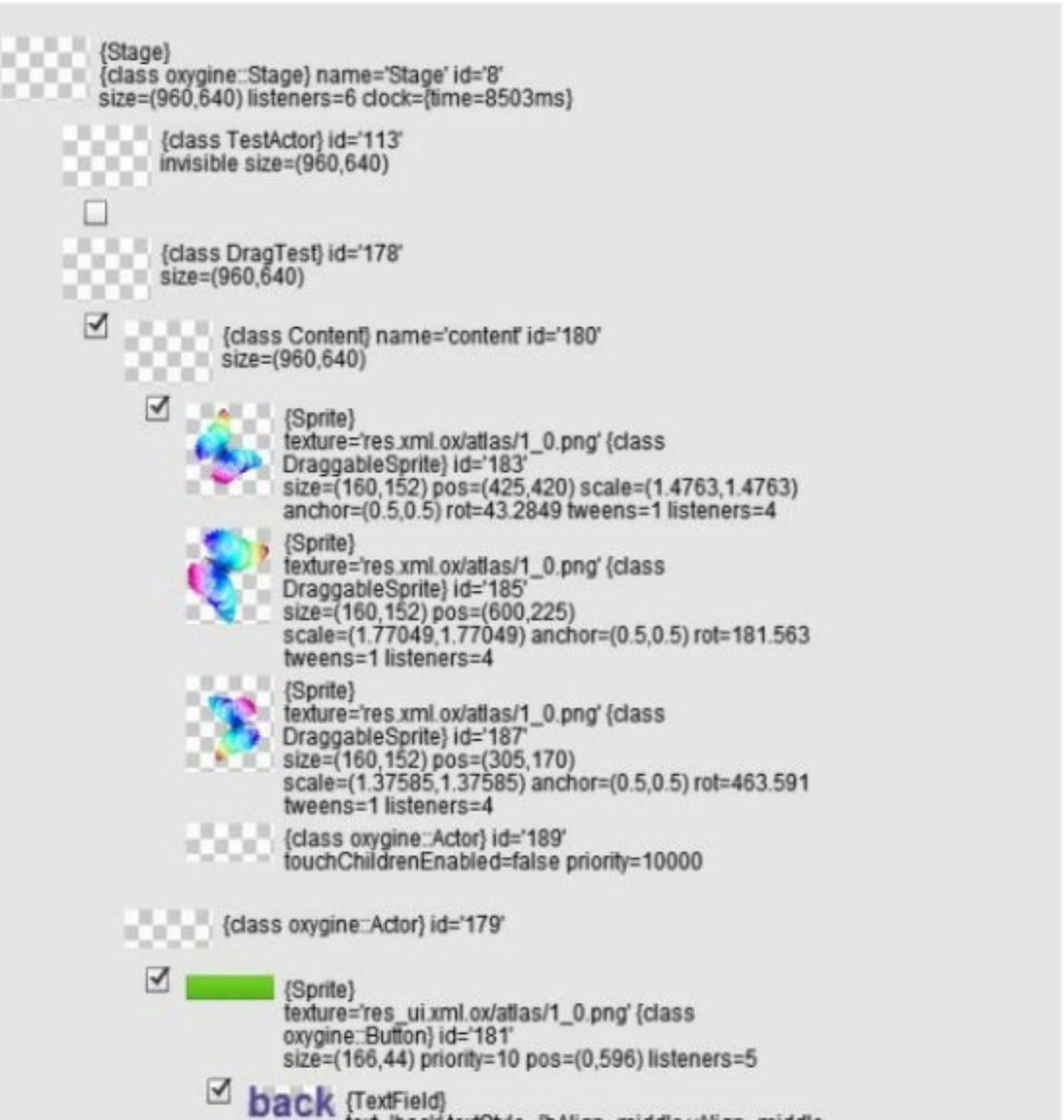


2 primitivies

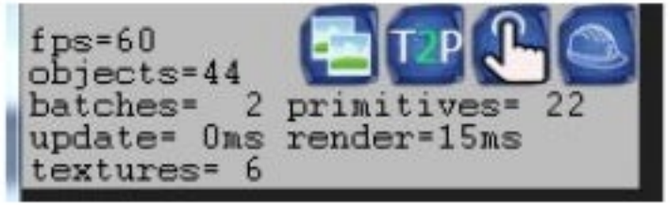
```
int primitives = 0;
primitives += vstats.elements[IVideoDriver::PT_TRIANGLES] / 3;
if (vstats.elements[IVideoDriver::PT_TRIANGLE_STRIP]
primitives += vstats.elements[IVideoDriver::PT_TRIANGLE_STRIP] - 2;
```

16 primitivies

Tree inspector



Debug



Textures count shows whats atlases loaded now in your game

Render- RootActor::render time in milliseconds. It includes all children rendering

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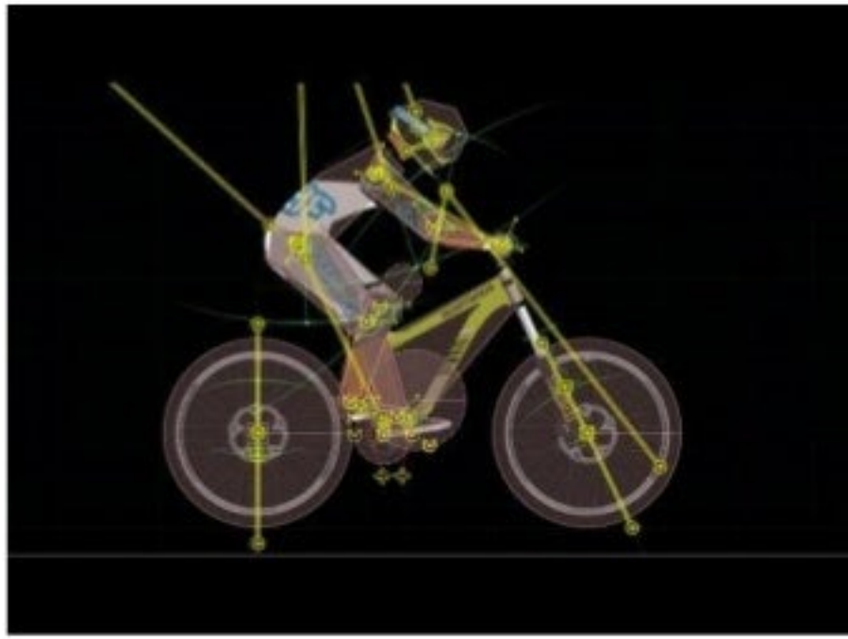
Debug Tools

Finger Could be useful to find out who blocked mouse events

```
ObjectBase::__startTracingLeaks();
new Actor;//leak
new Sprite;//leak
ObjectBase::__stopTracingLeaks();

ObjectBase::dumpCreatedObjects();
```



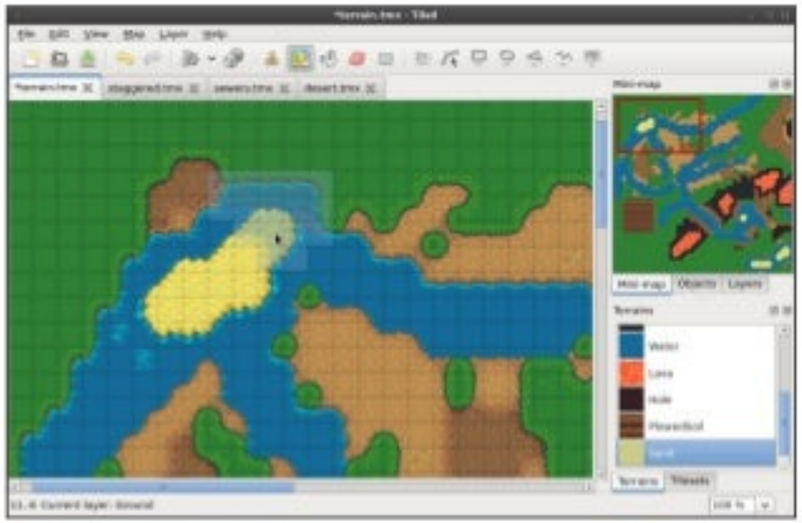
Automatic pause

```
spActor gameField = getGameField();
gameField->setClock(_clock);
_physicWorld->setClock(_clock);
```

Resources

MagicParticles

MapEditor.org.Tiled map



TexturePacker

Resources

```
spTmxMap map =
        TmxMap::loadMap("level1.tmx", resources, [](Tile* t,
oxygine::Sprite* sp)
        {

        });
```

```
float length = rangeX *
resources.getResAnim("images/enviroment/leaves_tile")->getSize().x;
RectF gameSquare(0, 0, length, length);// just load tiles without Map
```

Magic Particles Api

Wrappers and api(DirectX,OpenGl) for all platforms and many engines.

Quick runtime debug/release atlases in one file

2D/3D scene graphic. #Define 2D #Define 3D

Powerful 2D/3D Editor

.Ptc format file

Magic Particles Api

Export in AVI,TGA,PNG,BMP, JGP;

More then 100 examples for 2D/3D

Plugins for Game Engines

Magic Particles Api

```
void ResMagicParticles::init()
  {
      Resources::registerResourceType(ResMagicParticles::create, "magicparticles");
  }

ResMagicParticles *rs = effects.getT<ResMagicParticles>("frost"); // Frost PTC
        const ResMagicEmitter *mpem = rs->getEmitterByName("ring_of_frost");
        spMagicEmitter em = _game->createRelativeEmitter();
        em->setEmitter(mpem);
        em->setAutoDetach(true);
        em->setLoopMode(MAGIC_NOLOOP);
        em->attachTo(_groundScene);
```

Oxygine Resources

```
const Json::Value &bg = level["background"];
        if (!bg.empty())
        {
                spSprite back = new Sprite;
                back->setResAnim(resources.getResAnim(bg.asString()));
                back->attachTo(parent);
                _background = back;
        }
```

// load resources in separate thread

// use oxygine atlas build tool

oxygine-framework/tools/oxyresbuild.py

Support PVRTC, ETC and more.

Works like mobile native compress.

```
<atlas>
        <image file="close.png" />
        <image file="button.png" />
        <image file="anim/run.png" />
</atlas>
```

```
<set scale_factor = "0.5f" />
<atlas>
    <image file="background.png" />
</atlas>
```

Oxygine.org/community.php

Thanks for listening