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Subject: RGBA and ImageBuffer classes improve  
Posted by [tojocky](#) on Thu, 05 May 2011 19:02:22 GMT  
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Hello,

I propose to improve class RGBA like:

```
template<typename T>
struct RGBA_T : Moveable<RGBA_T<T>> {
    T b, g, r, a;
};

typedef RGBA_T<byte> RGBA;
```

And classe ImageBuffer Like:

in .h file

```
template<class T>
class ImageBuffer_T : NoCopy {
    mutable int kind;
    Size size;
    Buffer<RGBA_T<T>> pixels;
    Point hotspot;
    Point spot2;
    Size dots;

    void Set(Image& img);
    void DeepCopy(const ImageBuffer_T<byte>& img);

    RGBA_T<T>* Line(int i) const;
    RGBA* Line8(int i) const;
    friend void DropPixels__(ImageBuffer_T<T>& b) { b.pixels.Clear(); }

    friend class Image;

public:
    void SetKind(int k) { kind = k; }
    int GetKind() const { return kind; }
    int ScanKind() const;
    int GetScanKind() const { return kind == IMAGE_UNKNOWN ? ScanKind() : kind; }

    void SetHotSpot(Point p) { hotspot = p; }
    Point GetHotSpot() const { return hotspot; }

    void Set2ndSpot(Point p) { spot2 = p; }
    Point Get2ndSpot() const { return spot2; }
```

```

void SetHotSpots(const Image& src);

void SetDots(Size sz)           { dots = sz; }
Size GetDots() const          { return dots; }
void SetDPI(Size sz);
Size GetDPI();

Size GetSize() const           { return size; }
int GetWidth() const           { return size.cx; }
int GetHeight() const          { return size.cy; }
int GetLength() const          { return size.cx * size.cy; }

RGBA *operator[](int i)         { return Line8(i); }
const RGBA *operator[](int i) const { return Line8(i); }
RGBA *operator~();
operator RGBA*();
operator RGBA_T<uint16>*();
operator RGBA_T<uint32>*();
const RGBA *operator~() const;
operator const RGBA*() const;

operator const RGBA_T<uint16>*() const;
operator const RGBA_T<uint32>*() const;

void Create(int cx, int cy);
void Create(Size sz)           { Create(sz.cx, sz.cy); }
bool IsEmpty() const           { return (size.cx | size.cy) == 0; }
void Clear()                  { Create(0, 0); }

void operator=(Image& img);
void operator=(ImageBuffer_T<byte>& img);

ImageBuffer_T()                { Create(0, 0); }
ImageBuffer_T(int cx, int cy)   { Create(cx, cy); }
ImageBuffer_T(Size sz)         { Create(sz.cx, sz.cy); }
ImageBuffer_T(Image& img);
ImageBuffer_T(ImageBuffer_T<byte>& b);
// BW, defined in CtrlCore:
ImageBuffer_T(ImageDraw& iw);
};

typedef ImageBuffer_T<byte> ImageBuffer;

template<class T>
void ImageBuffer_T<T>::SetHotSpots(const Image& src){
    SetHotSpot(src.GetHotSpot());
}

```

```

Set2ndSpot(src.Get2ndSpot());
}

template<class T>
void ImageBuffer_T<T>::Create(int cx, int cy){
    ASSERT(cx >= 0 && cy >= 0);
    size.cx = cx;
    size.cy = cy;
    pixels.Alloc(GetLength());
#ifdef _DEBUG
    RGBA_T<T> *s = pixels;
    RGBA_T<T> *e = pixels + GetLength();
    byte a = 0;
    while(s < e) {
        s->a = a;
        a = ~a;
        s->r = 255;
        s->g = s->b = 0;
        s++;
    }
#endif
    kind = IMAGE_UNKNOWN;
    spot2 = hotspot = Point(0, 0);
    dots = Size(0, 0);
}

template<class T>
void ImageBuffer_T<T>::DeepCopy(const ImageBuffer& img){
    Create(img.GetSize());
    SetHotSpot(img.GetHotSpot());
    Set2ndSpot(img.Get2ndSpot());
    SetDots(img.GetDots());
    memcpy(pixels, img.pixels, GetLength() * sizeof(RGBA));
}

template<class T>
void ImageBuffer_T<T>::Set(Image& img){
    if(img.data)
        if(img.data->refcount == 1) {
            size = img.GetSize();
            kind = IMAGE_UNKNOWN;
            hotspot = img.GetHotSpot();
            spot2 = img.Get2ndSpot();
            dots = img.GetDots();
            pixels = img.data->buffer.pixels;
            img.Clear();
        }
    else {

```

```

DeepCopy(img.data->buffer);
kind = IMAGE_UNKNOWN;
img.Clear();
}
else
Create(0, 0);
}

template<class T>
void ImageBuffer_T<T>::operator=(Image& img){
Clear();
Set(img);
}

template<class T>
void ImageBuffer_T<T>::operator=(ImageBuffer& img){
Clear();
Image m = img;
Set(m);
}

template<class T>
ImageBuffer_T<T>::ImageBuffer_T(Image& img){
Set(img);
}

template<class T>
ImageBuffer_T<T>::ImageBuffer_T(ImageBuffer& b){
kind = b.kind;
size = b.size;
dots = b.dots;
pixels = b.pixels;
hotspot = b.hotspot;
spot2 = b.spot2;
}

template<class T>
void ImageBuffer_T<T>::SetDPI(Size dpi){
dots.cx = int(600.*size.cx/dpi.cx);
dots.cy = int(600.*size.cy/dpi.cy);
}

template<class T>
Size ImageBuffer_T<T>::GetDPI(){
return Size(dots.cx ? int(600.*size.cx/dots.cx) : 0, dots.cy ? int(600.*size.cy/dots.cy) : 0);
}

and .cpp

```

```

template<class T>
RGBA_T<T>* ImageBuffer_T<T>::Line(int i) const{
    ASSERT(i >= 0 && i < size.cy); return (RGBA_T<T> *)~pixels + i * size.cx;
}

template<>
RGBA* ImageBuffer_T<byte>::Line8(int i) const{
    ASSERT(i >= 0 && i < size.cy); return (RGBA *)~pixels + i * size.cx;
}

template<>
RGBA* ImageBuffer_T<byte>::operator~(){
    return pixels;
}

template<>
ImageBuffer_T<byte>::operator RGBA*(){
    return pixels;
}

template<>
ImageBuffer_T<uint16>::operator RGBA_T<uint16>*(){
    return pixels;
}

template<>
ImageBuffer_T<uint32>::operator RGBA_T<uint32>*(){
    return pixels;
}

template<>
const RGBA* ImageBuffer_T<byte>::operator~() const{
    return pixels;
}

template<>
ImageBuffer_T<byte>::operator const RGBA*() const{
    return pixels;
}

//uint16
template<class T>
ImageBuffer_T<T>::operator const RGBA_T<uint16>*() const{
    return pixels;
}

```

```

template<>
ImageBuffer_T<uint16>::operator const RGBA_T<uint16>*() const{
    return pixels;
}

//uint32
template<class T>
ImageBuffer_T<T>::operator const RGBA_T<uint32>*() const{
    return pixels;
}

template<>
ImageBuffer_T<uint32>::operator const RGBA_T<uint32>*() const{
    return pixels;
}

template<>
int ImageBuffer_T<byte>::ScanKind() const{
    bool a255 = false;
    bool a0 = false;
    const RGBA *s = pixels;
    const RGBA *e = s + GetLength();
    while(s < e) {
        if(s->a == 0)
            a0 = true;
        else
            if(s->a == 255)
                a255 = true;
            else
                return IMAGE_ALPHA;
        s++;
    }
    return a255 ? a0 ? IMAGE_MASK : IMAGE_OPAQUE : IMAGE_EMPTY;
}

```

The proposed realization is not finished yet, but the first worked step is done!

I use this classes to read image in 16/32 bits.

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