TransparencyAA10.1 Sample

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This sample, contributed by AMD, presents a technique for achieving MSAA quality rendering for primitives that require transparency. It utilizes Direct3D 10.1 APIs and hardware to make use of the new fixed MSAA sample patterns, and the export of the coverage mask from the pixel shader.

Path

Source	SDK root\Samples\C++\Direct3D10\TransparencyAA10.1
Executable	SDK root\Samples\C++\Direct3D10\Bin\x86 or x64\TransparencyAA10.1.exe

The TransparencyAA10.1 sample demonstrates three techniques for rendering primitives that require transparency.

Alpha Test

This technique is the simplest of the three. It makes use of an alpha reference value and the discard instruction to emulate Direct3D 9 fixed-function alpha testing. The image quality achieved is low, as edges appear aliased even with the application running in MSAA modes.

Alpha To Coverage

Please see the topic "alpha-to-coverage" for a detailed explanation of how this technique works. The image quality generated is higher than the previous technique, although it is possible to see dithering patterns occurring, and this can detract from the overall quality attained.

```
Texture2DMS<float,1> g_txDepthMSAA;
```

Sampling a multisampled resource is similar to sampling a non-multisampled resource. However, a third texture coordinate is required to select which multisample to fetch.

```
fDepth = g_txDepthMSAA.Load( int3( iScreenCoord, 0 ), 0 );
```

On Direct3D 10.1–enabled hardware, this sample will enable MSAA and use loads from a multsampled render target to fetch the depth values that are needed to create the depth of field effect. On Direct3D 10 hardware, MSAA will be disabled.

Transparency AA

This final technique makes use of the new fixed MSAA sample patterns that were introduced in Direct3D 10.1. They are defined in the TransparencyAA10.1.fx file as follows:

```
static const float2 v2MSAAOffsets[2] =
{
float2(0.25, 0.25),                 float2(-0.25, -0.25)
};

static const float2 v2MSAAOffsets[4] =
{
float2(-0.125, -0.375),             float2(0.375, -0.125),
float2(-0.375,  0.125),             float2(0.125,  0.375)
};

static const float2 v2MSAAOffsets[8] =
{
float2(0.0625, -0.1875),    float2(-0.0625,  0.1875),
float2(0.3125,  0.0625),    float2(-0.1875, -0.3125),
float2(-0.3125,  0.3125),   float2(-0.4375, -0.0625),
float2(0.1875,  0.4375),    float2(0.4375, -0.4375)
};
```

The pixel shader uses these constants to sample multiple times from the alpha texture. Therefore, this technique does incur a performance hit as compared to the previous two. Each of the alpha samples

collected is compared with an alpha reference value, and if it passes the test, the output coverage mask is updated accordingly. This is only possible in Direct3D 10.1.

In this way, it is possible to achieve full MSAA quality while rendering transparent primitives.

Thanks to EA Phenomic for donating the Foliage.dds texture to this sample.