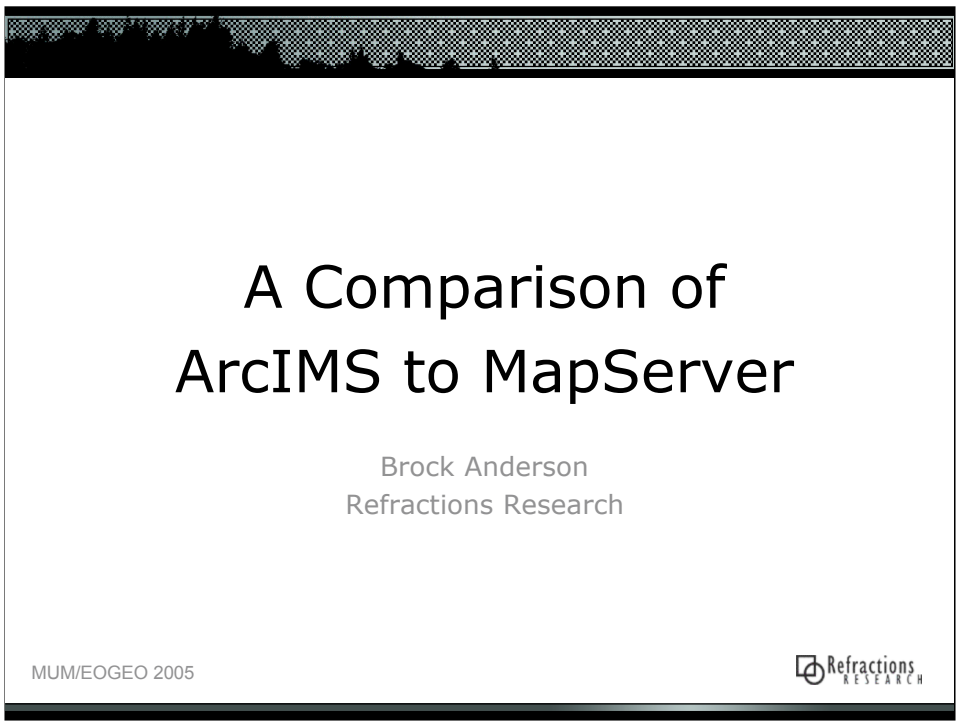
A Comparison of
ArcIMS to MapServer
Brock Anderson
Refractions Research
MUM/EOGEO 2005
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RESEARCH

Refractions Research

- Victoria, BC, Canada
- Spatial Systems Consulting
- Open Source Software
- PostGIS
  uDig / GeoTools

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The Client

BRITISH COLUMBIA

- BC's Ministry of Sustainable Resource Management (Information Management Branch)
  - Use mostly ESRI products in their mapping infrastructure.
  - Were frustrated with ArcIMS's administrative neediness.
  - Were looking for WMS alternatives to ArcIMS. We suggested MapServer.

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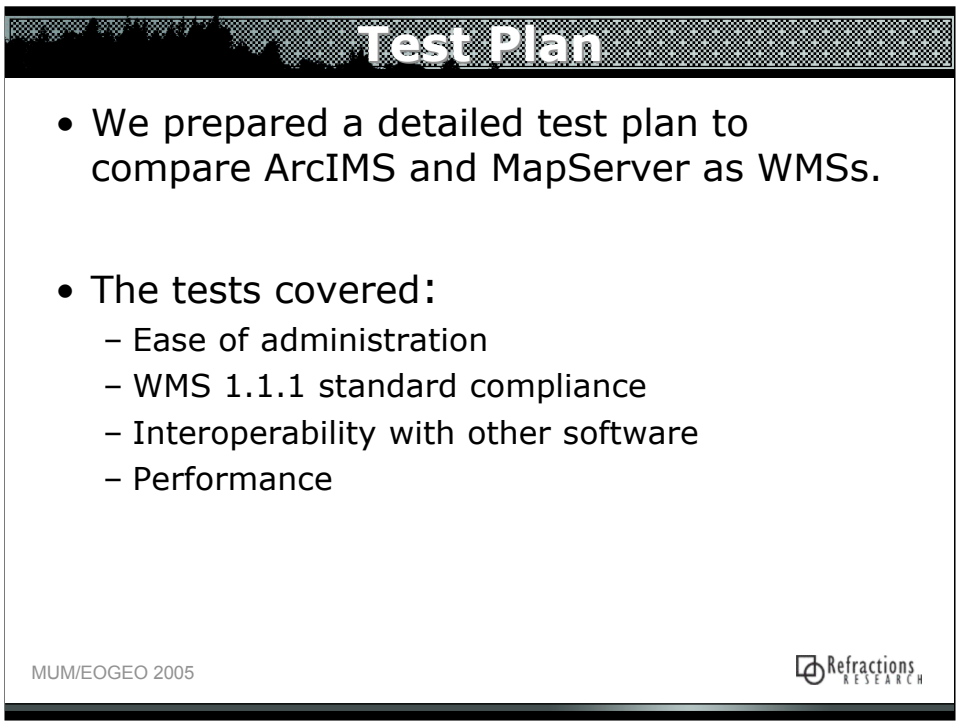
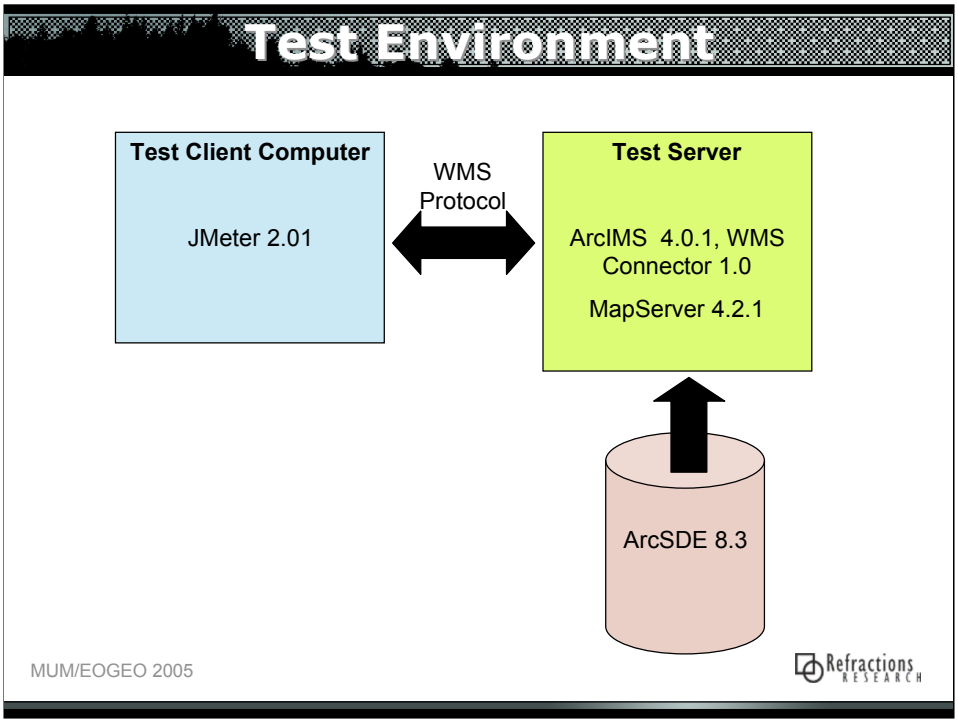


* Ease of administration
  - KEY TEST: time to add and reload services

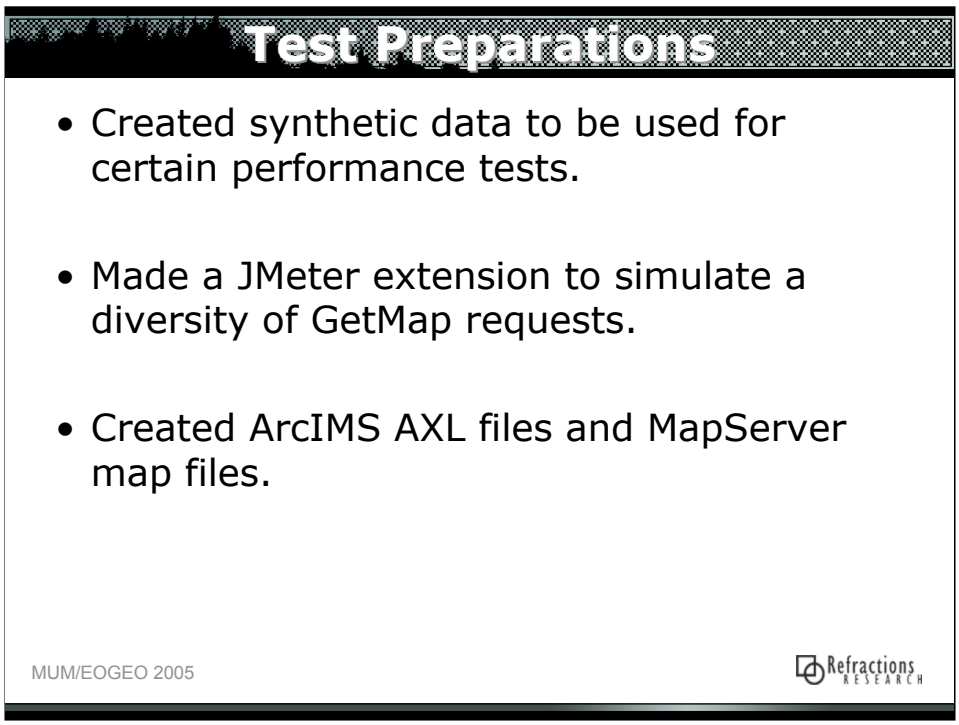
* Interoperability with other software
  - KEY TEST: supports ArcSDE 8.3 and 9.x?

* WMS Standard compliance
  - KEY TEST: OGC WMS CITE

* Performance (with ArcSDE)
  - KEY TEST: feature density
  - KEY TEST: feature complexity
  - KEY TEST: image output format
  - KEY TEST: concurrency
  - KEY TEST: reprojection
  - KEY TEST: throughput "under regular operating conditions"



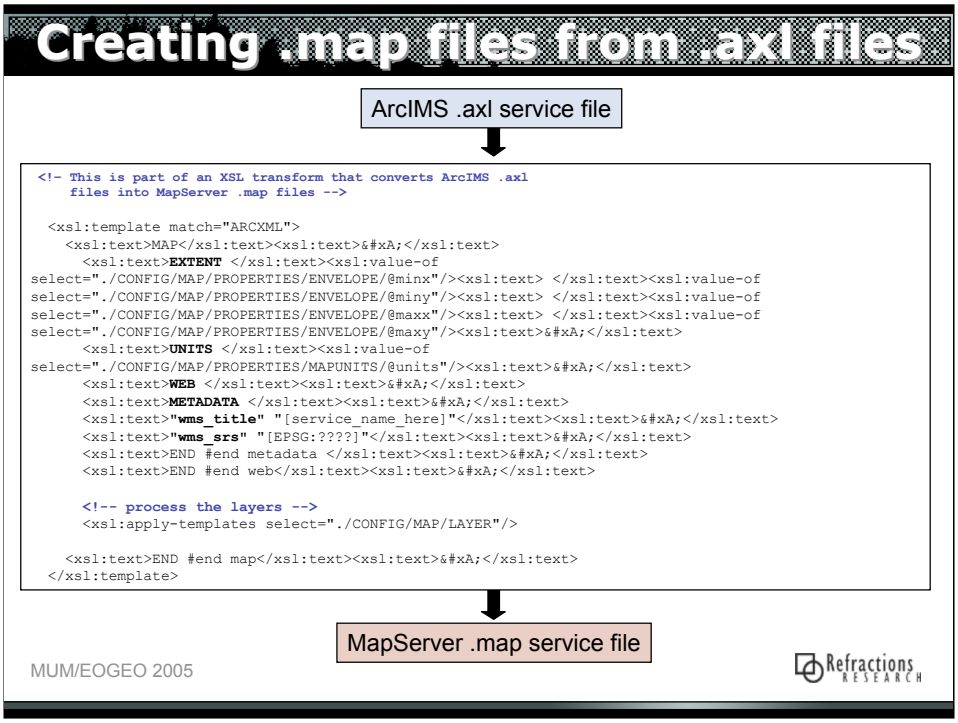
Jmeter is open source software designed to load test functional behavior and measure performance .



•Synthetic data used for feature density and feature complexity test.

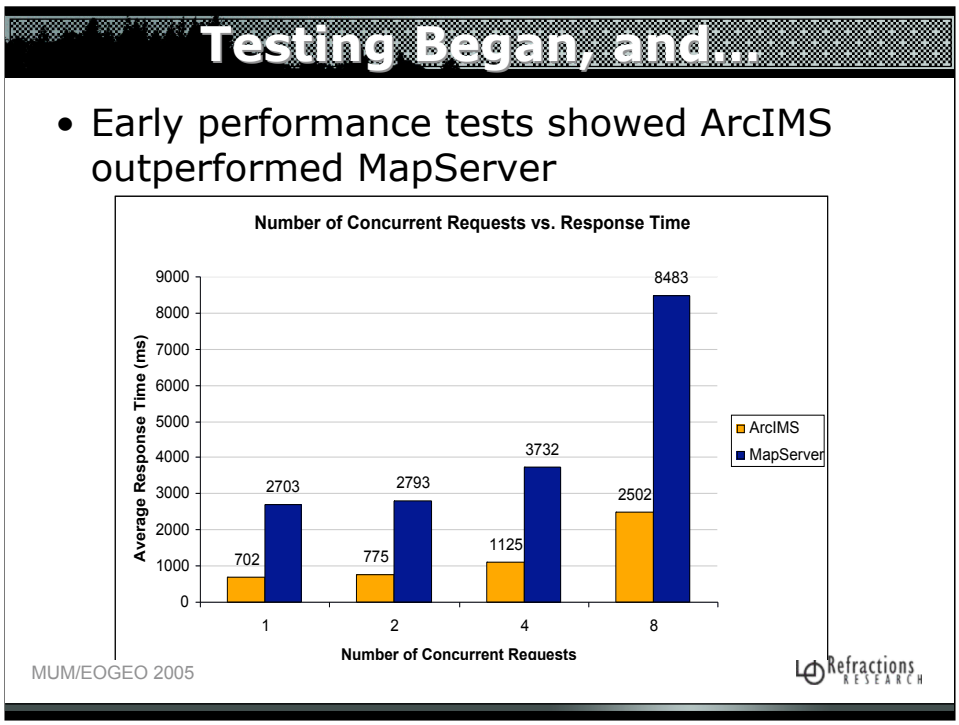
•JMeter extension used to generate WMS requests with random bboxes.

•Started with AXL files, and transformed them into .map files



•Our client had an “optimized” .axl file containing their provincial basemap data.

•We used that .axl file to create a .map file from.



•An initial test to convince ourselves that MapServer was comparable to ArcIMS

•We requested the same map each time: 4 layers (including points, lines and polygons)

•Each level of concurrency run for 10 minutes.

•Mention that 1) all graphs have at least 30 samples per point. 2) All tests done against ArcSDE.

MapServer's Bottlenecks

- Profiling revealed two main bottlenecks:
  - 1 to 2 seconds of ArcSDE connection overhead per GetMap request
  - Additional overhead extracting features from ArcSDE

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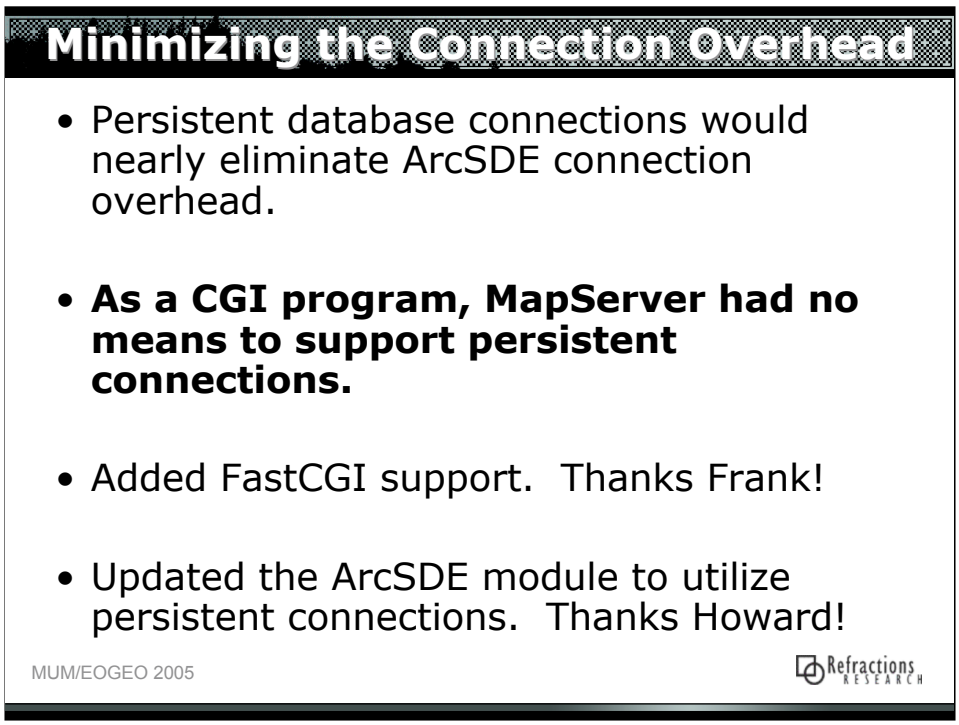

•Frank Warmerdam added FastCGI support to MapServer, and he created a connection pooling API

•Howard Butler updated the ArcSDE module to utilize connection pooling

Using MapServer with FastCGI

1. Compile MapServer with FastCGI support.
2. Configure your web server with a FastCGI module.
3. Update your map files:

```
LAYER
        PROCESSING "CLOSE_CONNECTION=DEFER"
        #all other layer settings here...
END #LAYER
```

* Persistent connections are most useful for data sources with large connection overhead, such as ArcSDE.

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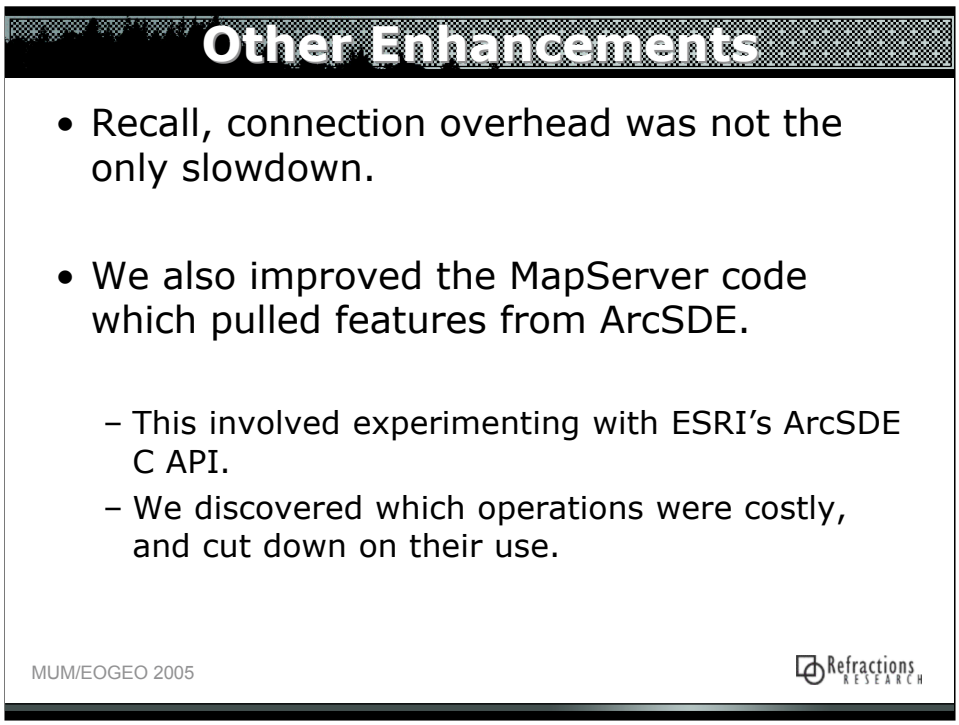
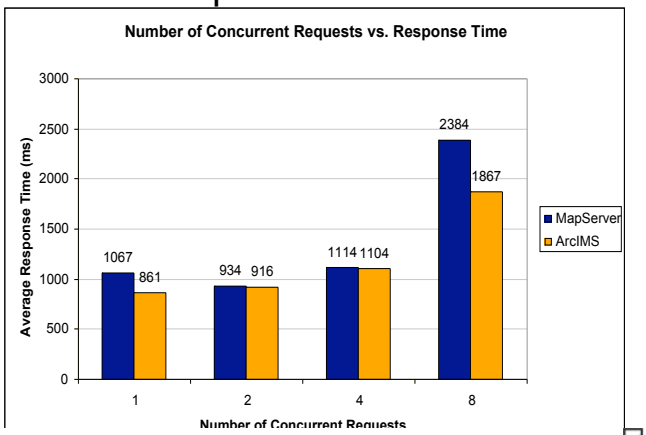


*Performance is best for the default version of ArcSDE layers.

The Same Test Again

- The earlier performance test was run again, this time with FastCGI and the other performance improvements.



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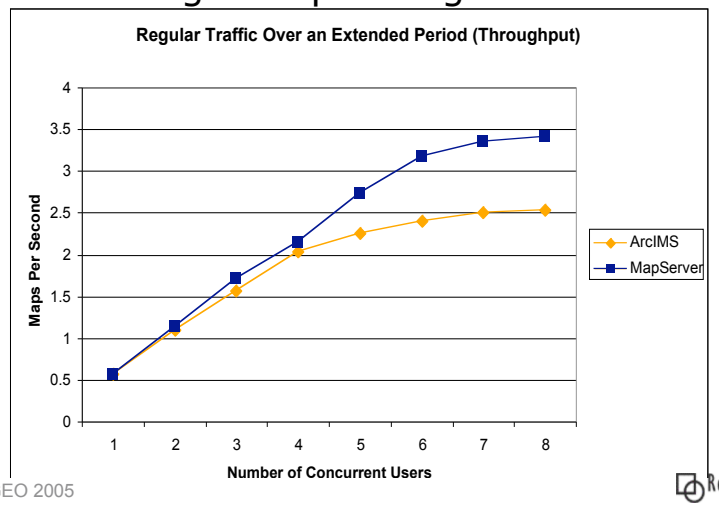
Performance Test Results (Throughput)

- MapServer now outperforms ArcIMS under MSRM's "regular operating conditions."



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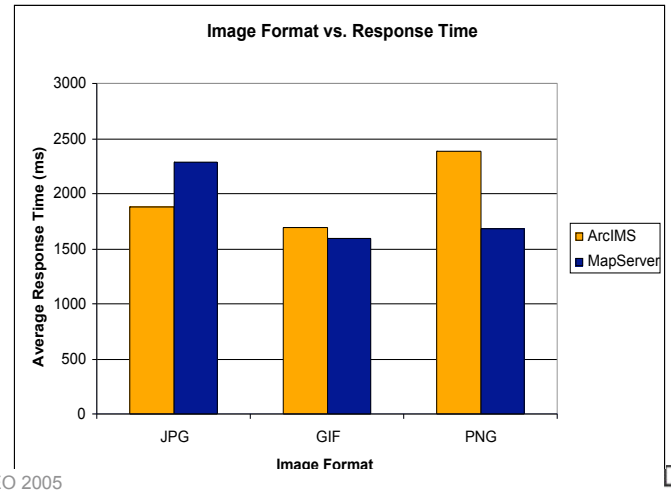
•The higher the better on this graph only

•Difference between concurrency test and this test:

- •This test uses random requests for 10 min.
- •This test doesn't hit the server with a sudden burst of requests. They are ramped up.

Performance Test Results (Image Format)

- MapServer is slightly faster to return GIF and PNG images. ArcIMS is faster for JPG.



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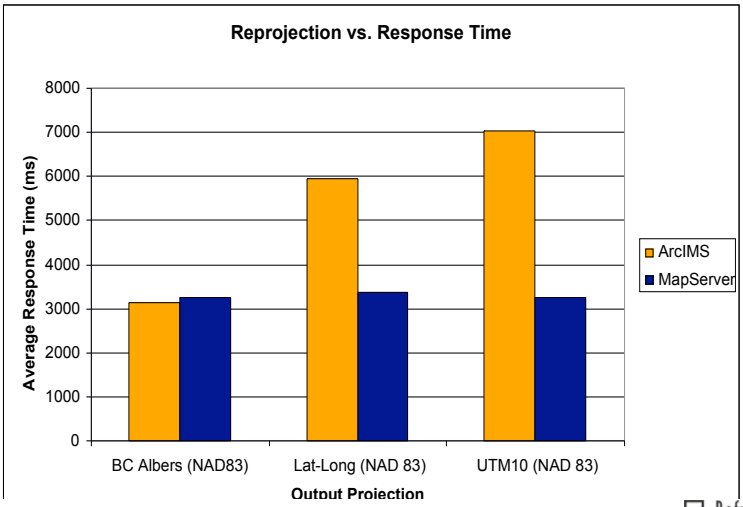
Performance Test Results (Reprojection)

- MapServer reprojects faster than ArcIMS.



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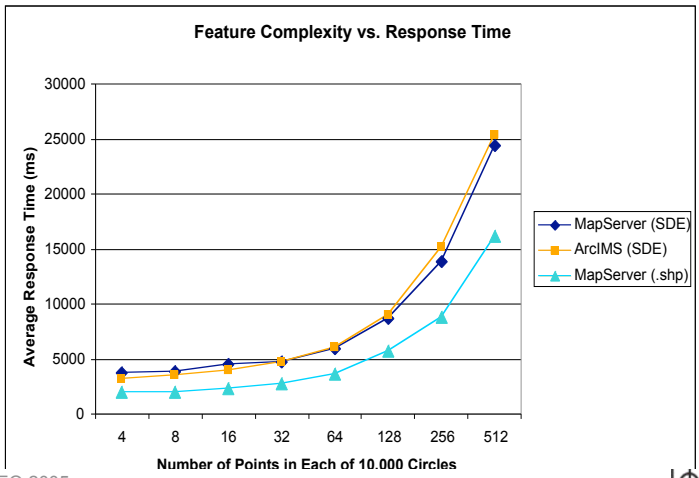
Performance Test Results (Feature complexity)

- Feature complexity affects both servers almost equally (from ArcSDE).



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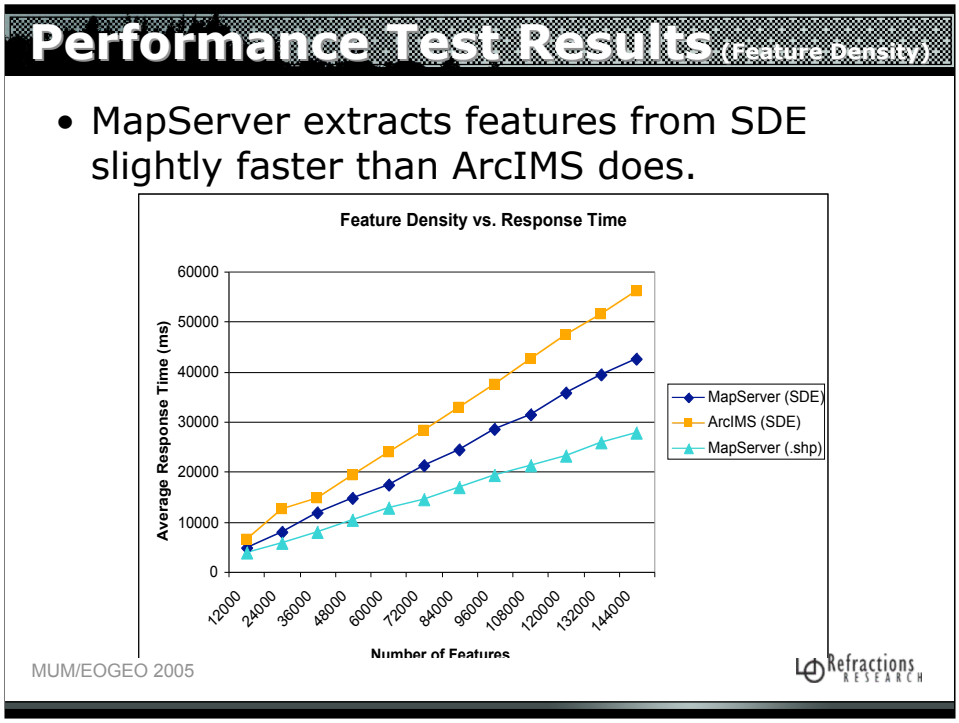
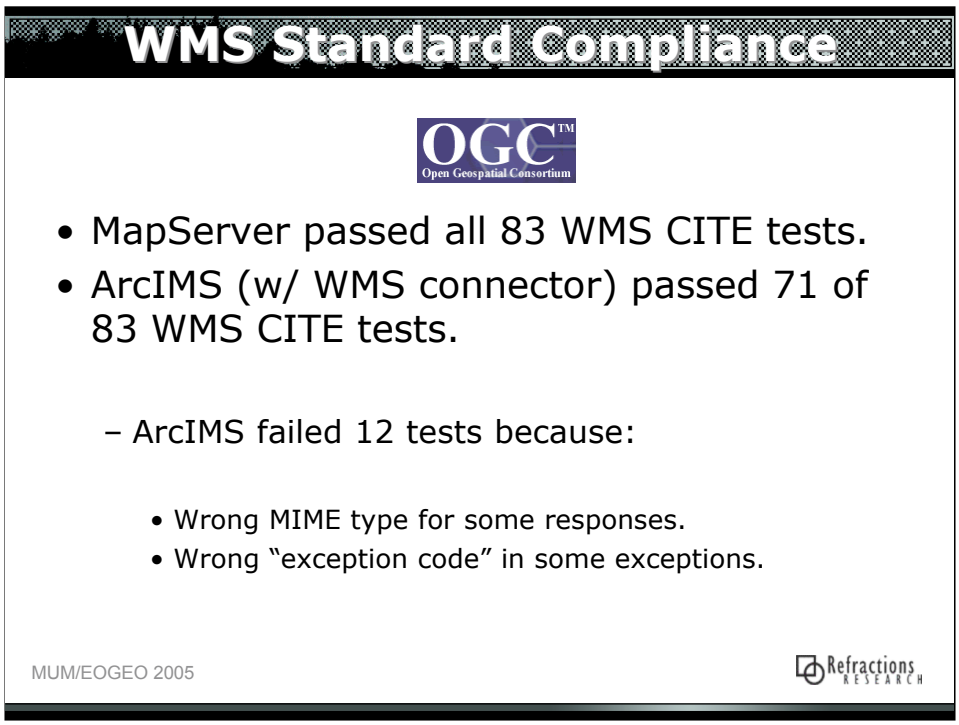


Actually, this test demonstrates that MapServer (extracts features from SDE) + (draws the map) faster



•MIME type of responses is typically expected to be "application/vnd.ogv.se_xml"

Ease of Administration

- MapServer administration benefits
  - No need to reload services (when service files change)
  - MapServer restarts faster (as fast as the web server)
- ArcIMS administration benefits
  - More granular control over log levels

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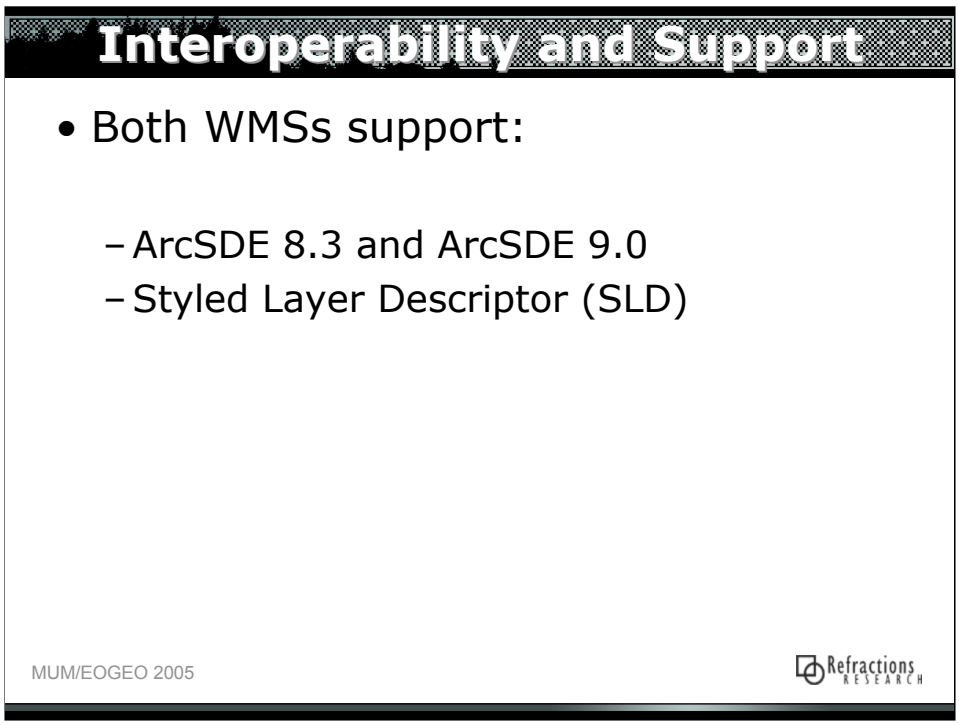
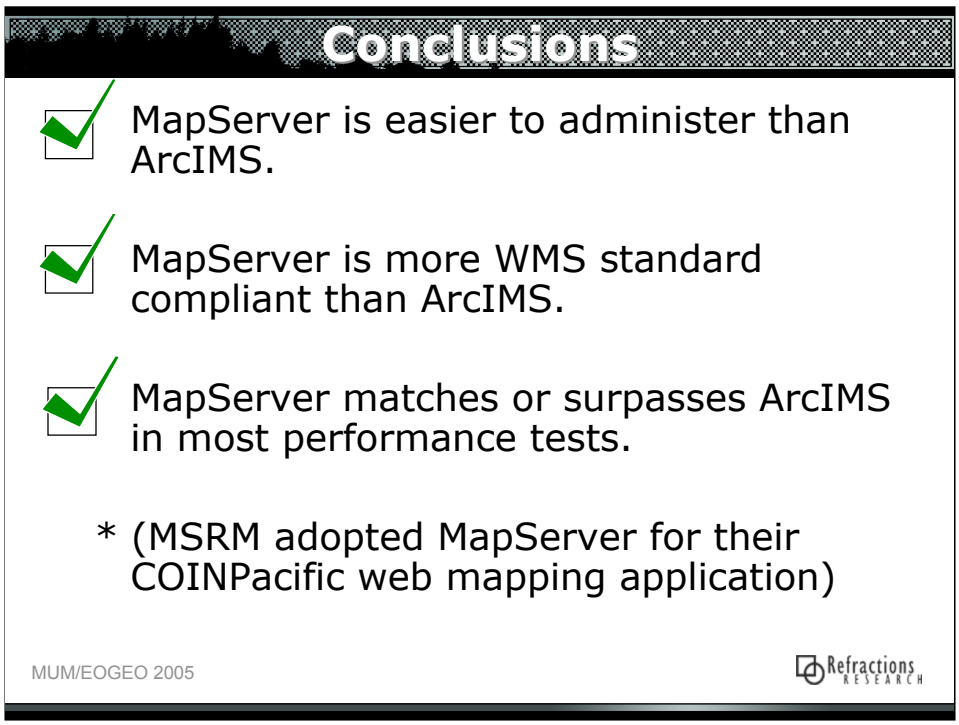


I don't know how fully either server supports SLD, but our testing showed that both support these basic features:

•Selecting and styling based on a attribute value

•Selecting and styling based on spatial location (within a bounding box)


Conclusions
MapServer is easier to administer than ArcIMS.
MapServer is more WMS standard compliant than ArcIMS.
MapServer matches or surpasses ArcIMS in most performance tests.
* (MSRM adopted MapServer for their COINPacific web mapping application)
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Questions?

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