Service Performance

ArcGIS Server Performance Recommendations: https://enterprise.arcgis.com/en/server/latest/administer/linux/tuning-your-arcgis-server-site.htm

Modifications Made:

- CERES Service:
  - Changed Maximum number of instance per machine to: **4**

Response from ImageService Performance

We use arcgis-server-8.gisdemo.net server. The command is time wget HTML query URL. The parameter **Max Mosaic Image Count** controls the number of values returned. In CRF, it is set to null. In MRF, it is set to 50. In CoG/netCDF-4 it is set to 20.

Product	Format	Storage	Time (s)	Note
CERES	CRF	S3	4.2	1 URL call / Sampling 1,000 points
CERES	CRF	EBS (=Local)	3.8	**SDT-79** - Getting issue details... STATUS
CERES	CRF	S3	5.0	returns 8,760 points even if input parameter is 20.
CERES	CRF	Local	5.1	returns 8,760 points even if input parameter is 20.
CERES	MRF	S3	2.4	Output has much less points (=50) than CRF (=8,760).
CERES	CoG	S3	3.6	Output has 20 points. 8,760 CoG files.
CERES	netCDF-4	S3	1.24	Output has 20 points. 8,760 netCDF-4 files.

Transformation Performance

Please adjust lambda timeout parameter in serverless.yml for MDCS script or data conversion. Timeout can generate incomplete Mosaic Dataset (MD) or MRF file.

Product	From	To	Time	Size	Note
CERES	Mosaic Dataset	CRF	2h 45m	14GB	ArcGIS Pro / 52,673 files **SDT-74** - Getting issue details... STATUS
CERES	netCDF-4 on S3	MD on local DB	6h	200 rows	ArcGIS Pro 2.6 / 8,760 = (24 * 365) rows.
CERES	netCDF-4 local	MD on local DB	1h 4m 50s	2.58GB	ArcGIS Pro 2.6 / 8,760 = (24 * 365) rows.
CERES	AWS RDS Table	MD on local DB	1h 42m 20s		ArcGIS Pro 2.6 Input table points to 8,760 CoG on S3 Parallel processing parameter = 4
CERES	AWS RDS Table	MD on local DB	46m 46s		ArcGIS Pro 2.6 Input table points to 8,760 netCDF-4 on S3 Parallel processing parameter = 4
MERRA2	365 file list text file	Table	38s	24 * 365 rows	Miniconda 3.7 python and ls2rds.py script (sqlalchemy)
MERRA2	1 file list text file	Table	0.35s	24 rows	Miniconda 3.7 python and ls2rds.py script (sqlalchemy)
MERRA2	AWS RDS Table	MD on RDS	3m 14s	2 rows (Cache size: 230K/file)	2 NetCDF subset on S3 MDCS script on ArcGIS Server Linux 10.7.1
MERRA2	AWS RDS Table	MD on RDS	1m 40s ~ 2m 30s	24 rows	24 NetCDF subset on S3 MDCS script on ArcGIS Server Linux 10.7.1
MERRA2	AWS RDS Table	MD on RDS	3m 54s	24 * 4 rows	4 NetCDF files on S3 MDCS Script on ArcGIS Server Linux 10.7.1

MERRA2	AWS RDS Table	MD on RDS	3m 6s	24 * 365 rows	365 NetCDF files on S3 ArcGIS Pro on Windows Server (Adding Rasters only; no pixel cache; no multidim geoprocessing)
MERRA2	MD on RDS	MD on RDS	1hr	24 * 365 rows	365 NetCDF files on S3 MDCS **Calculate Statistics** script on ArcGIS Server Linux 10.7.1 BMI is very quick.
MERRA2	MD on RDS	CRF on local disk	25m 48s	19.4GB 17,597 files 26,284 folders 24 * 365 rows	Using ArcGIS Pro 2.5.1 with the following options • Transpose on • Process as Multidim
MISR	netCDF-4	netCDF-4	7m 30s	454M	Subsetting 365 netCDF-4 files and merging with ncks from the downloaded files onArcGIS Server Linux 10.8.
MISR	netCDF-4	Mosaic on local disk	19m 18s		• 2019 merged netCDF-4 (time=365) • ArcGIS Pro 2.6 in Windows Server
MISR	Mosaic on local disk	CRF on local disk	10hr 10m 53s	2.4GB	Using ArcGIS Pro 2.6 with the following options • Transpose on • Process as Multidim
MOP03J	HDF-EOS5	MRF	0.065	24M	C++ (gdal_translate) / 1 file
MOP03J	HDF-EOS5	MRF	0.365	24M	Python (mrf.py) / 1 file
MOP03J	AWS RDS Table	MD on RDS	2m 30s	3 rows	3 MRF files on S3 MDCS Script on ArcGIS Server Linux 10.7.1
Sentinel-2	AWS RDS Table	MD on RDS	17m 50s	789 rows	• ArcGIS Pro 2.6 in Windows Server • CoG files on us-west-2.
TerraFusion	netCDF-4/HDF5	OPeNDAP HTML form	4m	Source file: 32.8 G	AWS Open Data S3 on us-west-2
TerraFusion	netCDF-4 /HDF5 S3	OPeNDAP DDS only	2m17s	Source file: 32.8 G DDS: 199.78k	AWS Open Data S3 on us-west-2 wget
TerraFusion	netCDF-4 /HDF5 S3	GeoTIFF on local disk	109s	25G	EC2 miniconda 3.7 gdal + pyresample & S3 on us-east-1 MODIS 2030x1354 subset
TerraFusion	netCDF-4 /HDF5 S3	GeoTIFF on local disk	157s	32.8G	EC2 miniconda 3.8 gdal 3.0.2 + pyresample & S3 on us-west-2 MODIS 2030x1354 subset
TerraFusion	netCDF-4 /HDF5 local	GeoTIFF on local disk	0.9s	32.8G	EC2 miniconda 3.8 gdal 3.0.2 + pyresample MODIS 2030x1354 subset
TerraFusion	netCDF-4 /HDF5 S3	GeoTIFF on local disk	14.9s	32.8G	EC2 miniconda 3.8 gdal 3.1.2 + pyresample & S3 on us-west-2 MOPITT 436x29 subset
TerraFusion	THREDDS S3	GeoTIFF on local disk	604s	32.8G	EC2 miniconda 3.8 pydap + pyresample & S3 on us-west-2 MOPITT 436x29 subset
TerraFusion	THEDDS Local	GeoTIFF on local disk	1s	32.8G	TerraFusion file was copied into local drive. EC2 miniconda 3.8 pydap + pyresample MOPITT 436x29 subset THREDDS run on the same machine.
TerraFusion	THEDDS Local	netCDF4 on local disk	30.7s	32.8G	TerraFusion file was copied into local drive. EC2 miniconda 3.7.6 pydap + pyresample on **us-east-1** MODIS 2030x1354 subset
TerraFusion	THEDDS Local	netCDF4 on local disk	10s	32.8G	TerraFusion file was copied into local drive. EC2 miniconda 3.8 pydap + pyresample MODIS 2030x1354 subset THREDDS run on the same machine.

Publishing Performance

Product	From	To	Time	Size	Note
MERRA2	ArcGIS Server	AWS RDS	1.6s	Empty input table	Create MD input table using psql command line tool.
MERRA2	ArcGIS Server	ArcGIS Portal	31.5s	2 Rasters in MD	Upload service using upload.py arcpy script.
MERRA2	ArcGIS Server	ArcGIS Portal	15.8s	2 Rasters in MD	Delete service using portal.py arcpy script.
MERRA2	ArcGIS Server	AWS RDS	23.5s	2 Rasters in MD	Delete mosaic dataset using delete.py arcpy script.

MERRA2	ArcGIS Server	AWS RDS	1.6s	2 rows in input table	Delete input table using psql command line tool.

Network Transfer Performance

Product	From	To	Time	Size	Note
TerraFusion	S3	ArcGIS Server	189Mbs/sec	32G	

See Also

- Serve data from S3 using Hyrax and s3fs
- https://git.earthdata.nasa.gov/projects/SDT/repos/systematic-data-transformation/browse/src/mop03j2md
- https://www.esri.com/content/dam/esrisites/en-us/about/events/media/UC-2019/technical-workshops/tw-5755-977.pdf (Really good resource for netCDF/MRF/CoG/CRF comparison)