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NASA'S EARTH OBSERVING SYSTEM
DATA AND INFORMATION SYSTEM

Unified Metadata Model-Services (Metadata Curation)

Apr 23th, 2018

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Agenda

- Overview of Initial Unified Metadata Model-Services UML Data Model
- Discussion of Metadata Curation Approach
- Backup slides: Examples (discuss as time allows)

Service Definition

What is a Service? We are defining this as a web service or portal, software or tool.

We need to recognize SERF legacy for services, but extend NASA web services to include future support for access of NASA data from the cloud. These services provide a method of transforming the data (e.g. subsetting, reprojection or reformatting, or a combination of these).

How to I discover and utilize a service?

In the simplest scenario, we can use a web browser to search for services. This provides some limited usefulness.

In order to locate web services or portals, software or tools,
we can use the GCMD client to search and return metadata for services. https://gcmd.nasa.gov/

In order to discover and transform data,
we can use the EDSC client to search and return *transformed* data via services. https://earthdata.nasa.gov/

How are services described?

Typically, services are described by their attributes, e.g.

Service Name: “SERVIR”

Service LongName: “Mesoamerican Visualization and Monitoring System (SERVIR)”

Service Type: “WEB PORTAL”

Service Version: “1.8”

Service RelatedURL: “https://www.servirglobal.net/default.aspx”

Services in general can be characterized by their: Name, LongName, Type, Version, RelatedURL, etc.

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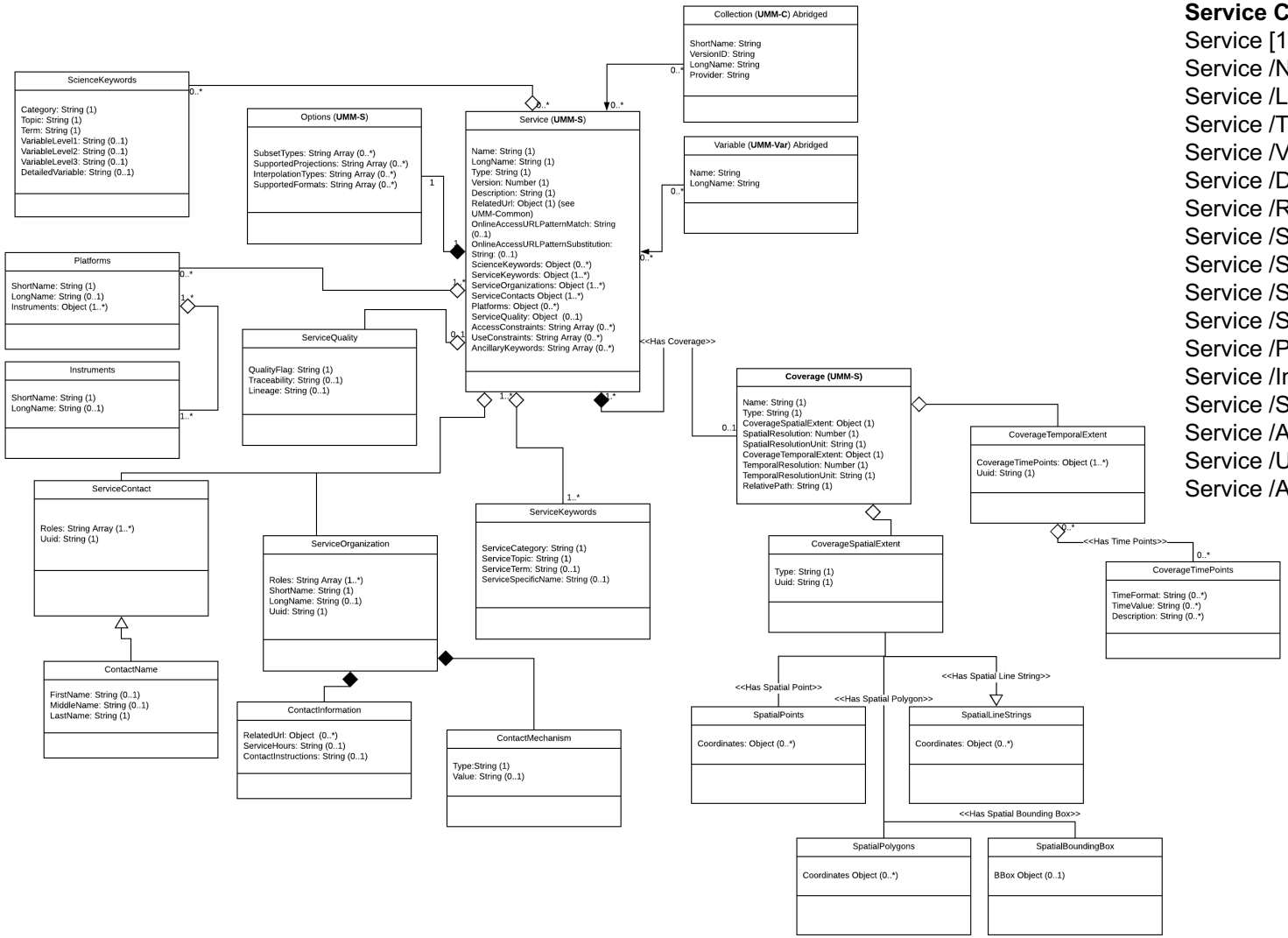
Unified Metadata Model-Services



Service Class Elements

Service [1..N]
Service /Name [R]
Service /LongName [R]
Service /Type [R]
Service /Version [R]
Service /Description [R]
Service /RelatedURL [R]
Service /SciencKeywords [O]
Service /ServiceKeywords [R]
Service /ServiceOrganization [R]
Service /ServiceContact [R]
Service /Platform [O]
Service /Instrument [O]
Service /ServiceQuality [R]
Service /AccessConstraints [O]
Service /UseConstraints [O]
Service /AncillaryKeywords [O]

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Metadata Curation

a. Service Creation

Step 1) Identify the service which warrants a new service record. Decide the scope and uniqueness of the service. (Name, Description, Type, Version, etc.) Decide what ServiceOptions are available via this service (Spatial, Temporal, Variable subsetting, reprojection reformatting, etc.). Determine which URLs are specific to this service.

Step 2) Use MMT to edit the new service record.

Step 3) Verify the service record for completeness in MMT.

b. Collection Curation

Step 1) Analyze current collection metadata for service metadata already present.

Step 2) Are service-related URLS present in the RelatedURLs, OnlineAccessURLs?

Step 3) Are these URLs out-of-date? (look for ftp, http protocol identifiers). All NASA URLs are moving to https. Remove URLs if necessary.

Step 4) Verify the collection record in MMT.

c. Collection-Service Association

Step 1) Consider which collection(s) are related to this service.

Step 2) Make the associations (concept IDs from the collection(s) to the concept ID of the new service).

Step 3) Verify the collection-service association in MMT.

d. Collection, Service Search and Discovery

Step 1) Search for the collections via the EarthData Search client – determine that the service can be selected for those collection(s). Check that the various ServiceOptions are listed correctly. Ensure the version of the components, i.e. EDSC UI, MMT, and CMR is populated with metadata as expected (SIT, UAT, PROD).

Backup Slides:

EOS and Non-EOS Services

EXAMPLES

Required fields and showing how our examples populate the Service class fields*

Name	LongName	Type	Version	Description	RelatedURL	ScienceKeywords	ServiceKeywords	ServiceContact	Platform
SERVIR	Mesoamerican Visualization and Monitoring System (SERVIR)"	WEB PORTAL	1.0	SERVIR-Mesoamerica is regional service	https://www.servirglobal.net/default.aspx	AGRICULTURE >FOREST SCIENCE >FOREST FIRE SCIENCE	DATA ANALYSIS AND VISUALIZATION >VISUALIZATION/IMAGE PROCESSING	SARA GRAVES>256-824-6064	GOES, TERRA, AQUA
BYU_slice_response	SeaWinds 3D Slice Response Software	SOFTWARE PACKAGE	1.0	Access the SeaWinds 3D Slice Response software	http://www.scp.byu.edu/software/slice_response/Xshape_temp.html	ATMOSPHERE >ATMOSPHERIC WINDS >SURFACE WINDS	DATA ANALYSIS AND VISUALIZATION >STATISTICAL APPLICATIONS	DAVID G. LONG>801-422-4383	ADEOS-II
USGS_TOOLS_LATLONG	WRS-2 Path/Row to Latitude/Longitude Converter	TOOL	1.0	Access the WRS-2 Path/Row to Latitude/Longitude Converter	https://landsat.usgs.gov/wrs-2-pathrow-latitudelongitude-converter	SPECTRAL/ENGINEERING >INFRARED WAVELENGTHS >INFRARED IMAGERY	DATA MANAGEMENT/DATA HANDLING >TRANSFORMATION/CONVERSION	US GEOLOGICAL SURVEY EARTH RESOURCE OBSERVATION AND SCIENCE (EROS) LANDSAT CUSTOMER SERVICES>605-594-6151...	LANDSAT
AIRX3STD.006	OPeNDAP Service for AIRX3STD.006	OPENDAP	1.9	OPeNDAP Service for AIRX3STD.006	https://acdisc.gesdisc.eosdis.nasa.gov/opendap/Aqua_AIRS_Level3/AIRX3STD.006/	EARTH SCIENCE >ATMOSPHERE>ALTITUDE	DATA MANAGEMENT/DATA HANDLING >TRANSFORMATION/REPROJECTION	GES DISC SERVICE HELP DESK SUPPORT GROUP>301-614-5224	TERRA, AQUA

Indicates recommended mandatory fields for the UMM-S Service and Coverage classes.

Required fields and showing how our examples populate the Service class fields*

Name	LongName	Type	Version	Description	RelatedURL	ScienceKeywords	ServiceKeywords	ServiceContact	Platform
MOD09Q1.005	OPeNDAP Service for MOD09Q1.005	OPENDAP	2.0	The MOD09Q1 Version 6 product provides an estimate of the surface spectral reflectance of Terra MODIS Bands 1-2 corrected for atmospheric conditions such as gasses, aerosols, and Rayleigh scattering	https://opendap.cr.usgs.gov/opendap/hyrax/MOD09Q1.005	EARTH SCIENCE>ATMOSPHERE, EARTH SCIENCE>ATMOSPHERE>SURFACE SPECTRAL REFLECTANCE	DATA MANAGEMENT/DATA HANDLING >TRANSFORMATION/ REPROJECTION	US GEOLOGICAL SURVEY EARTH RESOURCE OBSERVATION AND SCIENCE (EROS) MODIS CUSTOMER SERVICES>605-594-6151	AQUA
MOD11C2.06	OPeNDAP Service for MOD11C2.006	OPENDAP	1.9	The 16-day composite VI is generated using the two 8-day composite Surface Reflectance granules (MxD09A1) in the 16-day period). **MODIS/Terra Land Surface Temperature and Emissivity 8-Day L3 Global 0.05Deg CMG V006**	https://opendap.cr.usgs.gov/opendap/hyrax/MOD11C2.006	EARTH SCIENCE>ATMOSPHERE, EARTH SCIENCE>ATMOSPHERE>SURFACE SPECTRAL REFLECTANCE	DATA MANAGEMENT/DATA HANDLING >TRANSFORMATION/ REPROJECTION	US GEOLOGICAL SURVEY EARTH RESOURCE OBSERVATION AND SCIENCE (EROS) MODIS CUSTOMER SERVICES>605-594-6151	AQUA
GPM_3IMERGHH.05	THREDDS Service for GPM_3IMERGHH.05	THREDDS	1.0	The GPM_3IMERGHH Ver 05 product provides GPM IMERG Final Precipitation L3 Half Hourly 0.1 degree x 0.1 degree V05 (GPM_3IMERGHH) at GES DISC	https://gpm1.gesdisc.eosdis.nasa.gov/opendap/ncml/aggregation/GPM_3IMERGHH.05	EARTH SCIENCE>ATMOSPHERE, EARTH SCIENCE>ATMOSPHERE>PRECIPITATION	DATA MANAGEMENT/DATA HANDLING >TRANSFORMATION/ REPROJECTION	NASA/GSFC/SED/ESD/GCDC/GESDISC	GPM
MOD021KM	WCS Service for MOD021KM	WCS	1.0.0	WCS Service for MOD021KM	https://modwebsrv.modaps.eosdis.nasa.gov/wcs/6/MOD021KM/GetCapabilities	EARTH SCIENCE>ATMOSPHERE>ALTITUDE, EARTH SCIENCE>ATMOSPHERE>ATMOSPHERIC PRESSURE...	DATA MANAGEMENT/DATA HANDLING >TRANSFORMATION/ REPROJECTION	LAADS>MODAPS	TERRA, AQUA

Indicates recommended mandatory fields for the UMM-S Service and Coverage classes.

Required fields and showing how our examples populate the Service class fields*

Name	LongName	Type	Version	Description	RelatedURL	ScienceKeywords	ServiceKeywords	ServiceContact	Platform
OMTO3G.003	WMS Service for OMTO3G.003	WMS	1.3.0	OMTO3G: OMI/Aura Ozone (O3) Total Column Daily L2 Global Gridded 0.25 degree x 0.25 degree V3	https://disc1.gesdisc.eosdis.nasa.gov/daac-bin/wms_omi?service=WMS&version=1.3.0&request=GetCapabilities	EARTH SCIENCE >ATMOSPHERE>TOTAL COLUMN, EARTH SCIENCE >ATMOSPHERE>OZONE	DATA MANAGEMENT/DATA HANDLING	NASA Goddard Earth Sciences Data and Information Services Center (GES DISC)	TERRA, AQUA
MOD10A1_006_NDSI_Snow_Cover	WMS Service for MOD10A1_006_NDSI_Snow_Cover	OPENDAP	1.9	MODIS (MOD10A1) SNOW COVER (Version 006).	https://n5eil01u.ecs.nsidc.org/DP5/MOST/MOD10A1.006	EARTH SCIENCE >CRYOSPHERE>SNOW COVER	DATA MANAGEMENT/DATA HANDLING	User Services>ORNL DAAC>P.O. Box 2008, MS 6407>Oak Ridge>TN>37831	TERRA, AQUA
MOD13A1_NSI__500m_16_days_NDVI	WMS Service for MOD13A1_NSI__500m_16_days_NDVI	OPENDAP	1.9	MODIS (MOD13A1) 16 day NDVI (Version 006)	http://e4ftl01.cr.usgs.gov//MODV6_Cmp_B/MOLT/MOD13A1.006	EARTH SCIENCE >LAND>NDVI	DATA MANAGEMENT/DATA HANDLING	User Services>ORNL DAAC>P.O. Box 2008, MS 6407>Oak Ridge>TN>37831	TERRA, AQUA
SRTMGL1_003_Band1	SRTMGL1_003_Band 1	OPENDAP	1.9	NASA Shuttle Radar Topography Mission Global 1 arc second V003	http://e4ftl01.cr.usgs.gov//MODV6_Dal_D/SRTM/SRTMGL1.003	EARTH SCIENCE >ATMOSPHERE>ALTITUDE	DATA MANAGEMENT/DATA HANDLING >TRANSFORMATION/REPROJECTION	User Services>ORNL DAAC>P.O. Box 2008, MS 6407>Oak Ridge>TN>37831	TERRA, AQUA

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Indicates recommended mandatory fields for the UMM-S class.

Required fields and showing how our examples populate the Service class fields*

Name	LongName	Type	Version	Description	RelatedURL	ScienceKeywords	ServiceKeywords	ServiceContact	Platform
ORCA_digital_shore	United States Medium Resolution Digital Vector Shoreline	ArcInfo Map	9.1	NOAA's Medium Resolution Digital Vector Shoreline is a high-quality, Geographic Information System-ready, general-use digital vector data set	http://www.ngdc.noaa.gov/mgg/shorelines/noaamrdvs.html (Link broken)	HUMAN DIMENSIONS > BOUNDARIESOCEANS > COASTAL PROCESSES > BEACHES	DATA MANAGEMENT/DATA HANDLING	Coastal Monitoring and Bioeffects Assessments Division, Office of Ocean Resources Conservation and AssessmentNOAA/National Ocean Survey>1305 East-West Highway, SSMC4>: Silver Spring>MD>20910-3281>USA	MAPS

Indicates recommended mandatory fields for the UMM-S class.

Required fields and showing how our examples populate the Service class fields*

Name	Instrument	ServiceQuality	AccessConstraints	UseConstraints	AncillaryKeywords
SERVIR	“”	"Reviewed"	“”	“”	“Converter Data Conversion ”
BYU_slice_response	“”	"Not Reviewed"	“”	“”	“Spatial Response, Data Processing, Seawinds, Interpolation Routines”
USGS_TOOLS_LATLONG	“”	“Available”	“”	“”	“”
AIRX3STD.006	AIRS, AMSU	“Available”	NONE	NONE	“”
MOD09Q1.005	MODIS	“Available”	NONE	NONE	“”
MOD11C2.06	MODIS	“Available”	NONE	NONE	“”
GPM_3IMERGHH.05	GPM	“Available”	NONE	NONE	“”
MOD021KM	MODIS	“Unavailable”	NONE	NONE	“”
OMTO3G.003	OMI	“Available”	NONE	NONE	“”
MOD10A1_006_NDSI_Snow_Cover	MODIS	“Available”	NONE	NONE	“”
MOD13A1_NSI__500m_16_days_NDVI	MODIS	“Available”	NONE	NONE	“”
SRTMGL1_003_Band1	NASA Shuttle Radar	“Available”	NONE	NONE	“”
ORCA_digital_shore	“”	“Unavailable”	NONE	Not for Navigational Purposes	“GIS, Digital Maps”

Required fields and showing how our examples populate the Service class fields*

Name	Options/SubsetTypes	Options/SupportedProjections	Options/InterpolationTypes	Options/SupportedFormats					
SERVIR	“”	“”	“”	“”					
BYU_slice_response	“”	“”	“”	“”					
USGS_TOOLS_LATLONG	“”	“”	“”	“”					
AIRX3STD.006	Spatial, Variable	Geographic	“”	HDF, NetCDF-3, netCDF-4, Binary, ASCII					
MOD09Q1.005	Spatial, Variable	Sinusoidal	“”	HDF, NetCDF-3, netCDF-4, Binary, ASCII					
MOD11C2.06	Spatial, Variable	Sinusoidal	“”	HDF, NetCDF-3, netCDF-4, Binary, ASCII					
GPM_3IMERGHH.05	Spatial, Variable	Geographic	“”	.nc					

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Indicates recommended mandatory fields for the UMM-S Service and Coverage classes.

Required fields and showing how our examples populate the Service class fields*

Name	Options/SubsetTypes	Options/SupportedProjections	Options/InterpolationTypes	Options/Supported Formats					
MOD021KM	Spatial, Variable	Sinusoidal	“”	Hdf, GeoTIFF					
OMTO3G.003	Spatial, Variable	Geogrsphic	“”	HDF, NetCDF-3, netCDF-4, Binary, ASCII					
MOD10A1_006_NDSI_Snow_Cover	Spatial, Variable	Sinusoidal, EASE 2.0	“”	HDF,					
MOD13A1_NSI__500m_16_days_NDVI	Spatial, Variable	Sinusoidal	“”	HDF,					
SRTMGL1_003_Band1	Spatial, Variable	EASE 1.0	“”	ascii					
ORCA_digital_shore	N/A	Trasnverse Mercator	“”	.mpx					

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class.

* See EOS and N

Required fields and showing how our examples populate the Service class fields*

Name	Coverage/Name	Coverage/Type	Coverage /SpatialExtent	Coverage /SpatialResolution	Coverage/SpatialResolution Unit	Coverage /TemporalExtent	Coverage /TemporalResolution	Coverage /TemporalResolution Unit	RelativePath
SERVIR	“”	“”	“”	“”	“”	“”	“”	“”	“”
BYU_slice_response	“”	“”	“”	“”	“”	“”	“”	“”	“”
USGS_TOOLS_LATLONG	“”	“”							
AIRX3STD.006	AIRX3STD.006	BOUNDING BOX	-180.0, -90.0, 180.0, 90.0	1	deg	2002-08-30T00:00:00.000Z, ongoing	1	day	%YEAR%, e.g. “/2002/contents.html”
MOD09Q1.005	MOD09Q1.005	SPATIAL_POLYGON	-179.999951582871, 179.928473473918, -169.920147289013, -169.99173290556 (multiple)	250	m	2000-02-24T00:00:00.000000, 2000-02-25T23:59:59.000000 (multiple)	3	min	%% e.g. /h00v08.ncml.html
MOD11C2.06	MOD11C2.06	BOUNDING BOX	-180.0, -90.0, 180.0, 90.0,	0.05	deg	2000-02-24 T00:00:00, 2000-02-25 T23:59:59	8	day	%%, e.g. /MOD11C2.006.ncml.info
GPM_3IMERGHH.05	GPM_3IMERGHH.05	BOUNDING BOX	-180.0, -90.0, 180.0, 90.0,	0.1	deg	2014-03-12T00:00:00.000Z, 2014-03-12 T00:29:59.999Z	30	min	%YEAR%/%MONTH%, e.g. /2014/03/contents.html

Required fields and showing how our examples populate the Service class fields*

Name	Coverage/Name	Coverage/Type	Coverage /SpatialExtent	Coverage /SpatialResolution	Coverage/SpatialResolution Unit	Coverage /TemporalExtent	Coverage /TemporalResolution	Coverage /TemporalResolution Unit	RelativePath
MOD021KM									
OMTO3G.003									
MOD10A1_006_NDSI_Snow_Cover									
MOD13A1_NSI__500m_16_days_NDVI									
SRTMGL1_003_Band1									
ORCA_digital_shore	Digital Vector Shoreline	BOUNDING_BOX	72.0, 18.7, -66.5, -168.0			1988-01-01 ,1992-12-31			

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class.

* See EOS and N

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