OSDU Data Platform
Application Developer Training

DDMS Core Concepts
DDMS: Concepts

A DDMS...

» delivers optimized handling of data for each (non-overlapping) “OSDU domain” (e.g. vertical discipline or horizontal functional capability)

» delivers capabilities not supported by OSDU generic normal APIs; A DDMS delivers exclusive access for a set of defined kind/type representations: * e.g. WPC--SeismicTraceData in OVDS form.

» can help achieve the extension of OSDU Data Platform scope to new business areas

» may be developed in a distributed manner with separate resources/sponsors

» is part of the overall OSDU Data Platform’s common code (open source)

» is defined owned, governed, distributed and maintained by the OSDU Forum
## OSDU DP Data Principles

<table>
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<tr>
<th>All migrated, acquired, and created data is preserved</th>
<th>Data is discoverable</th>
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<tr>
<td>Ingestion and retention minimize data loss. [Exception: During DDMS activity, data content being built is not considered ‘retained’ until fully built]</td>
<td>All data context (metadata) are harmonized and indexed for Search. Master/reference data content as well. [A DDMS may offer optimized indexed deep search capabilities.]</td>
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<td>Data is globally identifiable</td>
<td>Data is consumable</td>
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<td>Context specific data identity prevents compromising data.</td>
<td>All data persisted must be exposed in a way that is consumable to other users of the OSDU Data Platform.</td>
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<td>Data is immutable</td>
<td>Improved data is new data</td>
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<td>Data content and context (metadata) always. [Low value intermediate data may be soft deleted, judgement subject to cost trade-offs.]</td>
<td>Enrichment results in new data honoring immutability of existing data; link through versioning (master/reference) and lineage (components).</td>
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<td>Data is access controlled</td>
<td>Data lineage is tracked</td>
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<td>Complies with Data Platform Authentication and Authorization</td>
<td>All transformations and workflows provide lineage assertions from new data back to predecessors, sources, etc.</td>
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<td>Data is governed for right of use</td>
<td>Data and service are managed by Platform Instance</td>
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<td>Implements Data Platform Policy based Entitlements</td>
<td>Operational procedures apply consistently across the platform</td>
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DDMS: Detailed definitions (1 of 2)

» **Service:** A DDMS is an **OSDU application accessible service** with one set optimized APIs:
  – A DDMS implementation shares in all relevant aspects of OSDU DP architecture, governance, infrastructure, technology, and behavior; and calls on OSDU DP internal services, as appropriate.
  – A DDMS implementation is part of the overall OSDU DP common code, is governed by the OSDU Forum, and is distributed in each OSDU DP release.

» **Domain:** A DDMS has a **scope** corresponding to:
  – Single vertical discipline or business area, or (Ex: Petrophysics, Geophysics/seismic)
  – A functional aspect of one or more vertical disciplines or business areas (Ex: Earth Model)

» **Optimised Domain APIs:** A DDMS delivers **high performance capabilities** not available using generic normal DP APIs, such as:
  – DDMS APIs to access or build partial content defined OSDU DP data kinds/types, including very large content datasets
  – DDMS APIs to access or build derived data structure instances for application use from one or more defined OSDU data kinds/types
  – DDMS APIs to accessing intelligently selected subsets of content based on ‘deep search’ content-based criteria, including criteria based on bulk/array data structures
DDMS: Detailed definitions (2 of 2)

» **Seamless Layered Linkage for data content:**
  - DDMS API implementations handle domain API behavior according to defined content data models and mappings to data storage actions.
  - Each data storage action is handled in one of three ways: an OSDU DP internal storage service, an OSDU DP resident ‘access library’ in a DDMS, or directly through the SPI (Service Provider Interface) to a CSP storage technology (where applicable).

» **Application / DP Interface Design Pattern:** Using both DP generic normal APIs and a DDMS’s optimized APIs:
  - Application uses OSDU DP generic normal APIs to discover and access the data needed to prepare and carry out application data actions.
  - Application uses DDMS optimized APIs to read/write new, potentially partial data content to perform workflow steps, algorithms, visualizations, derivations, etc., accessing and building.
  - Note that DDMS API service implementations call a generic OSDU DP service to handle support for ‘context’ (dataset metadata, WPC and WP metadata, master data, reference data).
Discipline Examples:

- **Seismic / Geophysics DMS** including seismic with provision to grow to no-seismic Geophysics; offering high-performance selective and subset access to super-large datasets.

- **Petrophysics / Well Log (Wellbore) DMS** including well log; offering high-performance searchability of curve values across logs, wells, etc. integrating references to property values from wellbores and more.

- **Reservoir / Modeling / Geology DMS** offering high-performance support for earth models building, interpretation, optimization, and simulation.

- **Well Delivery / Drilling DMS** offering high-performance support for planning, execution, and analytics.

- **Production DMS** offering efficient support for reporting and operational planning, including suitable reservoir and flow models.

Functional Example:

- **Earth Model DMS** offering support for subsurface model description, visualization, and interpretation relevant for geological, reservoir optimization, production modelling, and other purposes.
DDMS + Generic: Architecture Diagram

Applications Layer

- Domain "A" DDMS service: (data content + context) "get", query, "put"
- Domain "C" DDMS service: (data content + context) "get", query, "put"
- Domain "B" DDMS service: (data content + context) "get", query, "put"

OSDU DP API Layer

- OSDU Forum Governed Dev & Distribution
- Other services

Internal ingest service —> OSDU Data Catalogue Records (context + master/ref/content)

OSDU Data Cat. Rec. Indexer

"File" Content Storage Service

"Special 1" Content Storage Service

"Special 2" Content Storage Service

CSP Implementation, developed by CSP and provisioned, and deployed by Platform Provider

CSP Tech

- Data Catalog Records
- Search Engine
- "File" Storage
- "Special 1" Storage
- "Special 2" Storage

Unified operational policies
DDMS: R3 Status

Application & Middleware

OSDU Core Platform (Generic) APIs

OSDU Core Platform

Service Provider Interface (SPI)

Cloud Service Provider (CSP) Implementation Instance

OSDU Well Delivery DDMS (in development)

OSDU Reservoir DDMS (in development)

Wellbore DDMS APIs

OSDU Wellbore DDMS

Seismic DDMS APIs

OSDU Seismic DDMS

OSDU Well Delivery DDMS

OSDU Reservoir DDMS

OSDU Wellbore DDMS

OSDU Seismic DDMS

OSDU Well Delivery DDMS

OSDU Reservoir DDMS

OSDU Wellbore DDMS

OSDU Seismic DDMS
Thank you!