

IHO S-100 Working Group

KHOA S-100 Test bed

Presented by KHOA



General Information

- Name of testbed: KHOA S-100 Testbed Project
- Location of testbed: Busan, ROK
- Time and duration of testbed: Ongoing till S-100 testbed project of IHO is completed
- Contact person(s): Yong Baek, ybaek@korea.kr (Project Manager)
- Testbed website: N/A
- Organization(s) involved : KHOA (Korea Hydrographic and Oceanographic Agency)
- Funding program and budget: KHOA
- Last Edited/Updated: January 30, 2019



Executive summary

- Aims
 - to develop **Phase 3 (Simple Viewer)** and **Phase 6 (shore based ECDIS)** of S-100 test framework to support the S-100 Testbed project of the IHO
 - Through the development of **Phase 3 (Simple Viewer)**, Phase 1, a catalogue produced through S-100 infrastructure, and Phase 2 including simple production tool, S-101 converted, S-100 simple overlay can be validated.
 - Phase 4 and Phase 5 can be validated through the development of **Phase 6 (shore based ECDIS)**



Methodology used for data collection

- Data applied to KHOA S-100 Testbed
 - S-10X Feature Catalogue (XML)
 - S-10X Portrayal Catalogue (XSLT, Lua)
 - TDS in 8211 ([S-101](#))
 - TDS in GML ([S-122](#), [S-123](#), [S-124](#), [S-127](#), [S-128](#))
 - TDS in HDF-5 ([S-102](#), [S-104](#), [S-111](#))



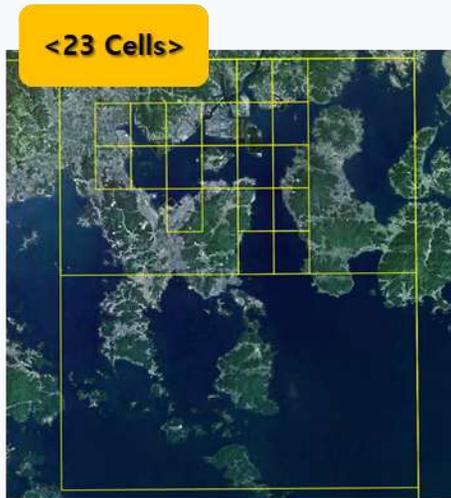
Technical solutions used

- The following solutions were applied
 - **S-100 Portrayal process**: Portrayal rule was applied and screen was presented (XSLT application method) about S-10X TDS according to S-100 Chapter 9.
 - **S-10X TDS**: Processing various data formats including 8211, GML and HDF-5
 - **S-100 Exchange Catalogue**: Loading and processing data according to information included in exchange set catalogue
 - **S-100 Interoperability**: Organizing screen presentation methods among S-100 product specifications from portrayal perspective
 - **Plug & Play Concept**: Changes to data model of S-100 product specifications are applied to Feature/Portrayal Catalogue. Data processing and screen presentation are applied according to Catalogues information.



Creation of S-100 test datasets

- S-101 ENC



Gwangyang

Cell Name		
KR3F4H00	KR647B14	KR647B26
KR4F4H20	KR647B15	KR647B27
KR5F4H21	KR647B16	KR647B34
KR5F4H22	KR647B17	KR647B36
KR647B06	KR647B22	KR647B37
KR647B07	KR647B23	KR647B46
KR647B12	KR647B24	KR647B47
KR647B13	KR647B25	-



Gwangan

Cell Name	
KR5F2O34	KR5F4C12

↑ New

↓ Update



Gwangan

Cell Name		
KR4F2O40	KR666D94	KR656B03
KR4F4C20	KR666D95	KR656B04
KR5F2O43	KR656B01	-
KR5F4C21	KR656B02	-



Busan

Cell Name	
KR4G3A40	KR659C72
KR4G3B30	KR659C73
KR5G3A44	KR658D90
KR5G3B33	KR659C81
KR659C71	KR659C82
KR659C83	KR658D00
KR659C91	KR659C92
KR659C93	-

S-100WG-4, Denmark, 27 – 29 Feb



Creation of S-100 test datasets

- Creation of NPUB TDS

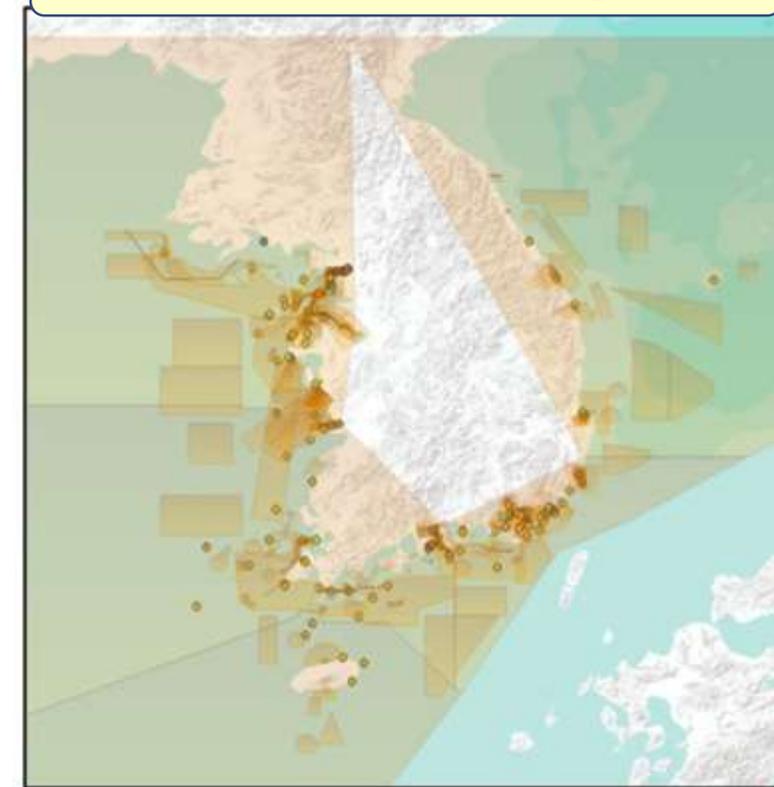
S-122 Marine Protected Area



S-123 Radio Signals



S-127 Marine Traffic Management



Update of the S-100 Simple Viewer

- Focused to test NPUB test datasets and apply Lua portrayal process

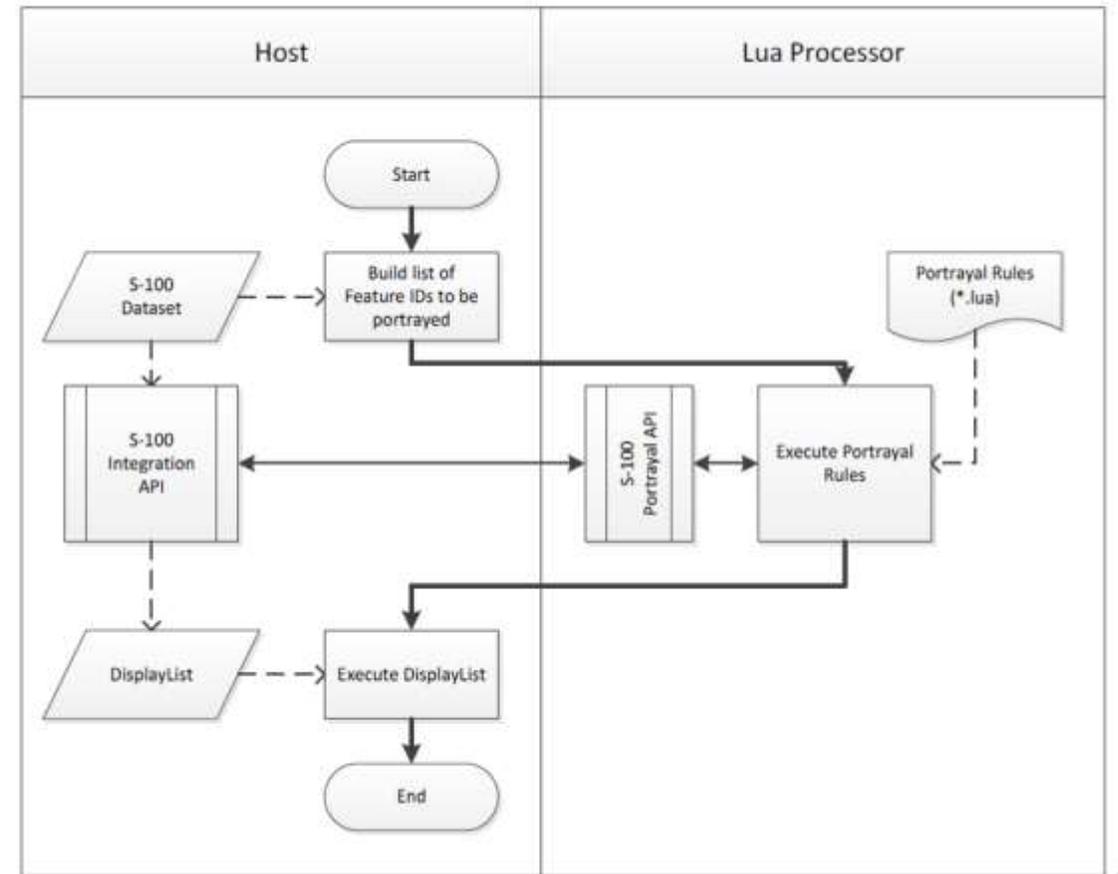
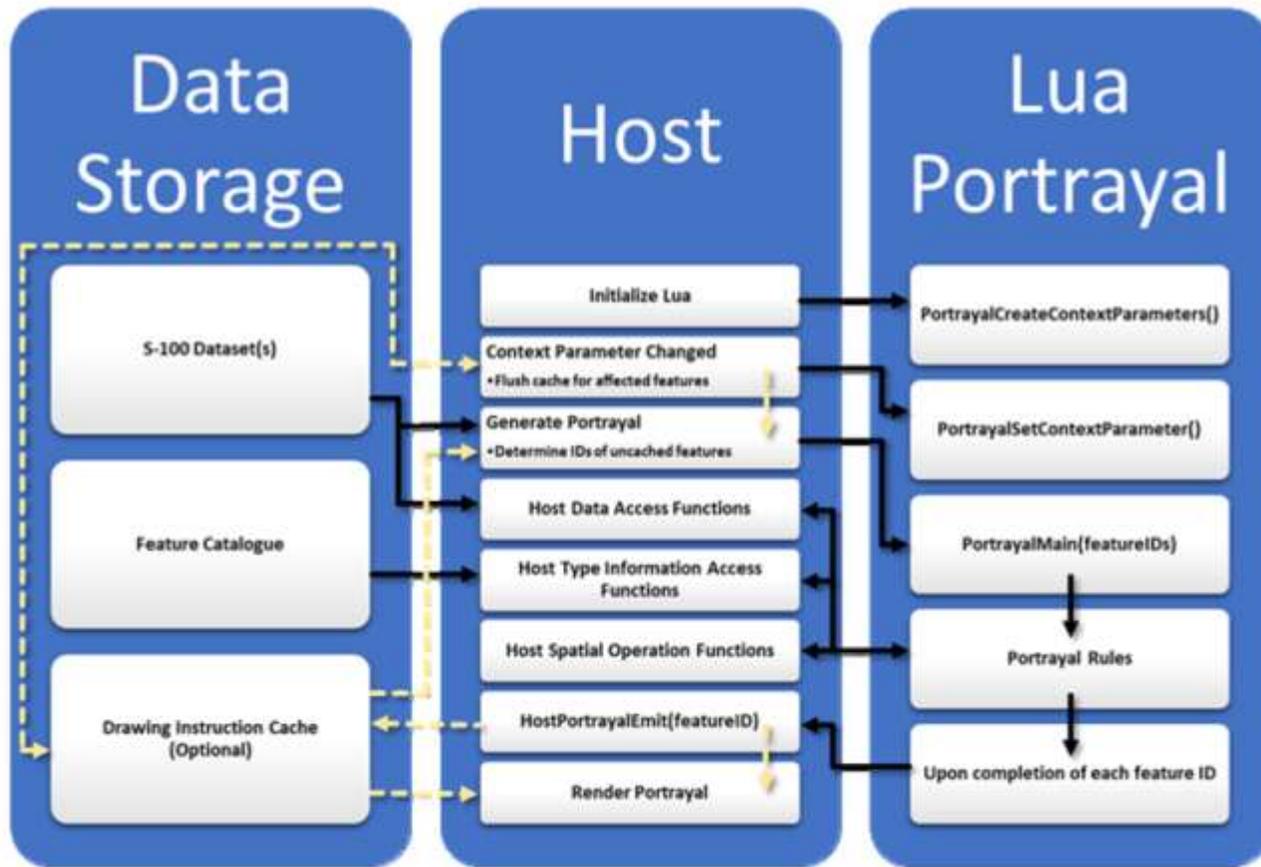
The screenshot displays the S-100 Simple Viewer software interface. The main window shows a map of the Yellow Sea with various overlays, including a red square and several yellow circles. The interface includes a menu bar (Home, Edit, Route Planning, Help, Tool), a toolbar with icons for zooming, coordinates, and other functions, and a status bar showing coordinates and scale. On the left, there is a Layer Manager and Data Set Identification panel. On the right, there is an Attribute List panel and a Logger panel. The bottom of the interface shows a Current Selection table.

Feature ID	Name	Geometry	Lat	Long	Relation Ord	Feature type
629	MilitaryPracticeArea	surface	36.000000	125.000000	0	Feature



Update of the S-100 Simple Viewer

- Lua process



Update of the S-100 Simple Viewer

- Lua process



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❖ Source

Lua is free software distributed in [source code](#). It may be used for any purpose, including commercial purposes, at absolutely no cost.

All [versions](#) are available for [download](#). The current version is [Lua 5.3](#) and its current release is [Lua 5.3.5](#).



[lua-5.3.5.tar.gz](#)

2018-06-26, 297K

md5: 4f4b4f323fd3514a68e0ab3da8ce3455

sha1: 112eb10ff04d1b4c9898e121d6bdf54a81482447

❖ Building

Lua is implemented in pure ANSI C and compiles unmodified in all platforms that have an ANSI C compiler. Lua also compiles cleanly as C++.

Lua is very easy to build and install. There are [detailed instructions](#) in the package but here is a simple terminal session that downloads the current release of Lua and builds it in Linux:

```
curl -R -O http://www.lua.org/ftp/lua-5.3.5.tar.gz
tar xzf lua-5.3.5.tar.gz
cd lua-5.3.5
make linux test
```

Update of the S-100 Simple Viewer

- S-100 4.0 part 13 – Scripting
 - This Part defines a standard mechanism for including scripting support in S-100 based products. Scripting provides for processing of S-100 based datasets via script files written in the Lua programming language.
- Standard Script Functions (C#)
 - Standard Catalogue Functions
 - Standard Host Functions

Lua <-> C++
Table type (Stack)

13-8.2 Standard Host Functions

C#

```
string[] HostGetFeatureIDs()  
string HostFeatureGetCode(string featureID)  
string[] HostGetInformationTypeIDs()
```



13-8.2 Standard Host Functions

C++

```
int HostGetFeatureIDs(lua_State* L)  
int HostFeatureGetCode(lua_State* L)  
int HostGetInformationTypeIDs(lua_State* L)
```



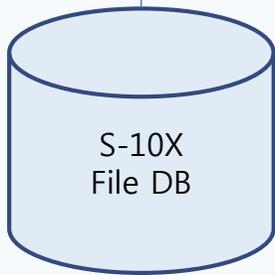
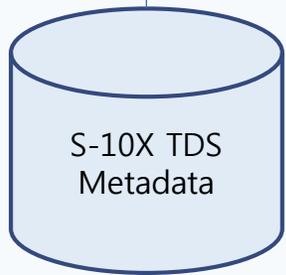
Development of the TDS Management System

- Metadata DB and TDS management system

TDS Management System



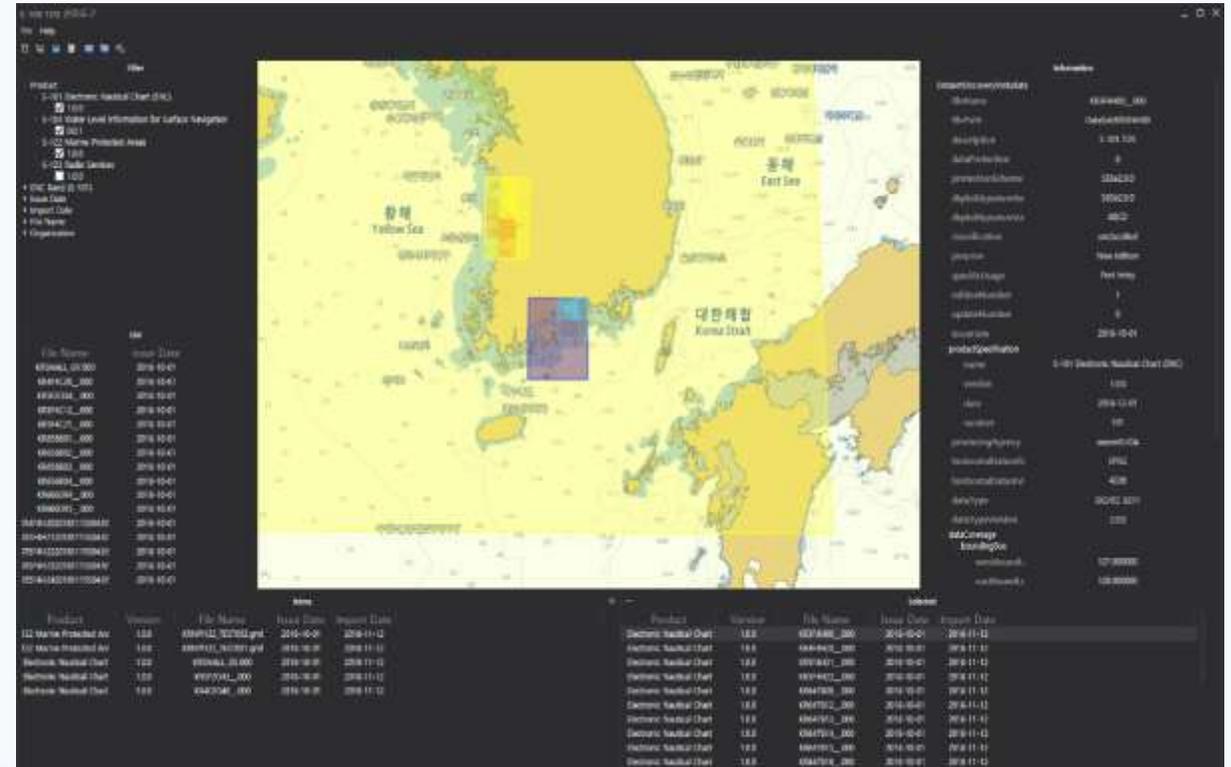
Exchange set



S-100 Test system



xFTP



Conclusions and Recommendations

- Conclusions
 - The project focused the development of S-100(Phase 3) Viewer and Shore based ECDIS(Phase 6) according to the S-100 Test Framework.
 - In the reporting period, KHOA tested the NPUB test datasets and tried to apply the Lua portrayal process in the S-100 simple viewer
 - The TDS Management system was developed to manage S-100 data and package S-100 exchange set
 - The ECDIS SW in the S-100 test system was changed as the latest version and the UKC function was improved to support the 2.5D chart.



Conclusions and Recommendations

- Recommendations

- KHOA is trying to apply the Lua portrayal process in the S-101 simple viewer,
- but due to lack of experience of the Lua technology and information to develop the Host Function
- the SW development is very slow and some difficulties are encountered
- it is recommended to discuss related issues.
 - **Provide Standard C++ host function in the Part 13 Scripting**
 - **Explanation of exchange data contents between Lua and Host function**
 - **Explanation of data types and structures used in the Lua Rules**
 - **Provide an example(tutorial) source code of how to use the Lua process**

