

MARS Code Reorganization

Build Systems, Code Repositories, and much more ...

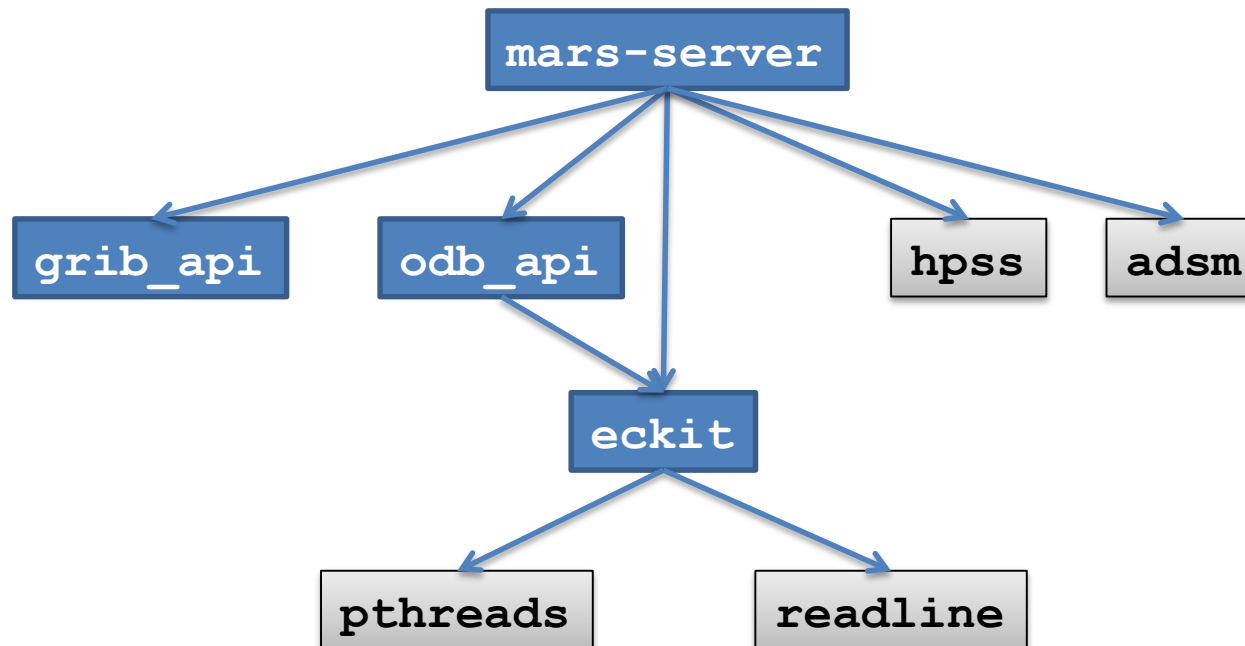
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Code Cleanup – MARS Server

- Reorganized MARS Server into ...
 - **mars-server** : mars libraries & executables
 - **odb_api** : ODB indexing, decoding & encoding
 - **grib_api** : GRIB indexing, decoding & encoding
 - **eckit** : C++ toolkit

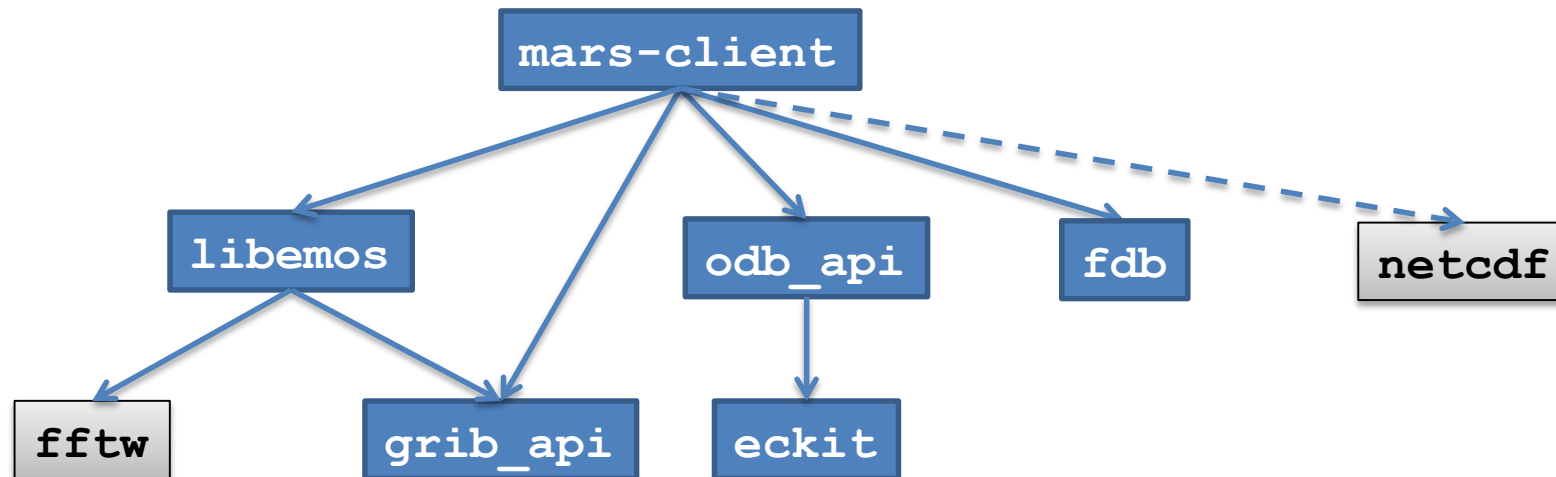


Code Cleanup – What is ecKit?

- C++ libraries
- Common software toolbox for other software packages:
 - ODB
 - MIR
 - Hermes
 - (new) FDB
- Interface the ***operation system*** with an object oriented model...
 - Monitoring of processes
 - Threads
 - Persistent objects
 - Networking and Serialization protocols
 - Data Handle(s), I/O and Filesystem handling
 - Commands (for the MARS adm tool)

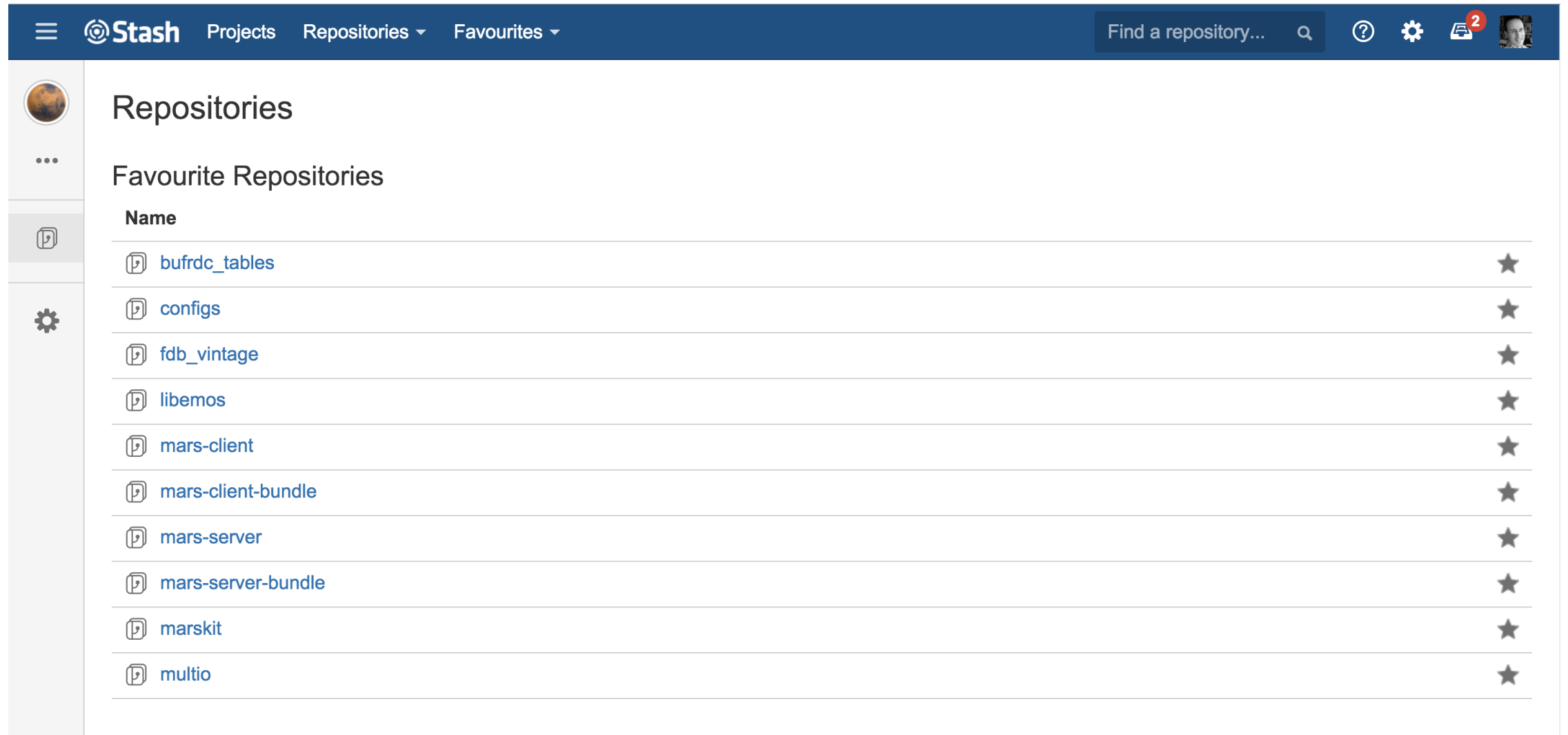
Code Cleanup – MARS Client

- Reorganized MARS Server into ...
 - **mars-client** : mars client library & executable(s)
 - **odb_api** : ODB indexing, decoding & encoding
 - **eckit** : C++ toolkit
 - **grib_api** : GRIB indexing, decoding & encoding
 - **libemos** : interpolation
 - **fdb** : disk caching inside supercomputer



Code Repositories – New version control system

- Migrated from a monolythic **Perforce** to **Git**
- **Multiple** repositories, once per software package



The screenshot shows the Stash web interface. The top navigation bar includes the Stash logo, 'Projects', 'Repositories', and 'Favourites' menus. A search bar on the right says 'Find a repository...'. The main content area is titled 'Repositories' and 'Favourite Repositories'. A list of repositories is shown, each with a repository icon, its name, and a star icon indicating it is a favorite.

Name
bufrdc_tables
configs
fdb_vintage
libemos
mars-client
mars-client-bundle
mars-server
mars-server-bundle
marskit
multio

New Build System – What is CMake?

- Toolset to **build**, **test** and **package** software
- Meta-build system
 - Generates files for other (native) build systems: Makefiles, NMake, Ninja ...
- Cross-platform, written in C++, runs on all UNIX's, Mac and Windows
- Provides **operating system introspection** ...
 - recognise compiler and os features (`HAVE_FSEEKO`, `HAVE_FSYNC`, `HAVE_SYS_TIME`, ...)
- CMake is a programming language
 - Regex, macro expansion, list processing, ...
- Unit test integration (CTest)
 - `make test`
- Automatic packaging (CPack)
 - Generates tar.gz, tar.bz2, RPM's, DEB's, Mac .dmg .pkg, Windows Null Soft Installer
 - `make package` or `make package_source`

How does CMake work?

- Configure

 - `cmake /path/to/src [options]`

- Options: **-D`VARIABLE`=`VALUE`**

 - `DCMAKE_C_COMPILER=gcc`

 - `DCMAKE_BUILD_TYPE=Debug | Release | ...`

 - `DCMAKE_C_FLAGS="-Wall -ansi"`

 - `DCMAKE_CXX_FLAGS="-Wall -std=c++98"`

 - `DCMAKE_INSTALL_PREFIX=/path/to/install`

 - `DGRIB_API_PATH=/my/own/grib/install`

- Build

 - `make -jN`

- Install

 - `make install`

What is ecBuild?

- Collection of **CMake** functions

- `ecbuild_add_option(FEATURE ODB ...)`
- `ecbuild_add_library(TARGET marslib ...)`
- `ecbuild_enable_python()`
- etc

- Provides a ***consistent build strategy*** across software layers

- Solve portability problems ***once...***

- Also provides a wrapper script around CMake

- `$src/bin/ecbuild --build=production -- -DENABLE_ODB=ON $src`

Using ecBuild ...

```
tar zxf MarsServer-7.5.0.0-Source.tar.gz
cd MarsServer-7.5.0.0
src=$(pwd)
mkdir build
cd build
$src/bin/ecbuild --build=production -- -DENABLE_WARNINGS=ON $src
make -j4
make install
```

What is ecBuild?

```
-- Configuring done
-- Generating done
CMake Warning:
  Manually-specified variables were not used by the project:

  ENABLE_ODB

-- Build files have been written to: /Users/tlmq/TMP/MarsServer-7.5.0.0-Source/build
[12:30:18 ~26% Δ74% [ tlmq@mqmacbook2:~/TMP/MarsServer-7.5.0.0-Source/build ] > make -j4
Scanning dependencies of target grib_types
[ 0%] Generating io/Length.b
[ 0%] Generating types/VerifyingDate.b
[ 0%] Building Fortran object grib_api/fortran/CMakeFiles/grib_types.dir/grib_types.f90.o
Scanning dependencies of target grib_api
[ 0%] Building C object grib_api/fortran/CMakeFiles/grib_types.dir/grib_fortran_kinds.c.o
[ 0%] Generating io/Offset.b
[ 0%] Generating types/Double.b
[ 0%] Generating types/ClimateDate.b
[ 0%] Linking Fortran executable grib_types
[ 0%] Generating types/DayOfYear.b
[ 0%] Generating types/DateTime.b
[ 1%] Generating types/Grid.b
[ 1%] Generating types/Month.b
[ 1%] Built target grib_types
[ 1%] Generating types/Time.b
[ 1%] Generating types/Date.b
Scanning dependencies of target eckit
[ 1%] Building C object grib_api/src/CMakeFiles/grib_api.dir/grib_api_version.c.o
[ 1%] Building C object grib_api/src/CMakeFiles/grib_api.dir/action.c.o
[ 1%] Building C object grib_api/src/CMakeFiles/grib_api.dir/action_class_alias.c.o
[ 1%] Building CXX object eckit/src/eckit/CMakeFiles/eckit.dir/eckit_version.cc.o
[ 3%] Building C object grib_api/src/CMakeFiles/grib_api.dir/action_class_gen.c.o
[ 3%] Building CXX object eckit/src/eckit/CMakeFiles/eckit.dir/container/KDMapped.cc.o
[ 3%] Building C object grib_api/src/CMakeFiles/grib_api.dir/action_class_if.c.o
[ 3%] Building CXX object eckit/src/eckit/CMakeFiles/eckit.dir/io/Length.cc.o
[ 3%] Building C object grib_api/src/CMakeFiles/grib_api.dir/action_class_switch.c.o
[ 3%] Building C object grib_api/src/CMakeFiles/grib_api.dir/grib_accessor_class_g1fcperiod.c.o
[ 3%] Building CXX object eckit/src/eckit/CMakeFiles/eckit.dir/io/DataHandle.cc.o
[ 3%] Building C object grib_api/src/CMakeFiles/grib_api.dir/grib_accessor_class_g1end_of_interval_monthly.c.o
```

What is ecBuild?

Collection of CMake functions

```
ecbuild_add_option( FEATURE ODB ... )
```

```
ecbuild_add_library( TARGET marslib ... )
```

```
ecbuild_enable_python()
```

Provides a consistent *build strategy* across software layers

Solve portability problems once...

Also provides a wrapper script around CMake

Automated Build & Testing – Atlassian Bamboo

Build Dashboard

Wallboard ▾



Tiago Quintino

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Broken Plans



Build History

Latest Changes

- Saturday 5 March 2016
- Merge pull request #51 in ECSDK/eckit from feature/ECKIT-115-tcp-stream-exposes-socket to develop 12:23:43 PM
* commit 'b80792243f645e14e36a700859caade07bdb2345':
[ECKIT-115](#) InstantTCPStream: make socket method public
[ECKIT-115](#) TCPStream: make socket method public
- ❗ ProdGen > Prodgen-bundle > #649
 - ❗ ODB-API > ODB API public release preparation > #738
 - ✅ Software Support > Continuous Integration > #2916
 - ✅ eckit > opensuse131 > #1137
 - ✅ eckit > opensuse113 > #560
 - ✅ eckit > macosx1010 > #591

- Friday 19 February 2016
- Merge pull request #49 in ECSDK/eckit from fix/ECKIT-111-cachelru-purge-trimmed to develop 12:03:37 PM
* commit 'c2057014ea7b749deaad7e4027c7b1f113a79fd8':
[ECKIT-111](#) CacheLRU: purge trimmed entries
- ❗ ProdGen > Prodgen-bundle > #584
 - ✅ Software Support > Continuous Integration > #2824
 - ❗ ODB-API > ODB API public release preparation > #658

Favourite plans

- Atlas
- [opensuse131](#) ✅ #1185 8 seconds ago 🔄 ✎ ★
- COPE
- [opensuse131](#) ⚙️ #671 23 minutes ago 🔄 ✎ ★
- eckit
- [macosx1010](#) ✅ #593 1 hour ago 🔄 ✎ ★
 - [opensuse113](#) ✅ #561 48 minutes ago 🔄 ✎ ★
 - [opensuse131](#) ⚙️ #1139 1 hour ago 🔄 ✎ ★
- EMOSLIB
- [opensuse131](#) ✅ #828 3 minutes ago 🔄 ✎ ★
- fctest
- [macosx1010](#) ✅ #223 51 minutes ago 🔄 ✎ ★
 - [opensuse131](#) ✅ #233 1 hour ago 🔄 ✎ ★
- FDB
- [opensuse131](#) ✅ #640 32 minutes ago 🔄 ✎ ★

Issue & Bug Tracking

My Dash

+ Add Gadget
 ✎ Edit Layout
 ⚙️ Tools ▾

Projects	
Atlas (ATLAS)	
Lead: Willem Deconinck	
ecBuild (ECBUILD)	
Lead: Tiago Quintino	
ecCodes (ECC)	
Lead: Enrico Fucile	
ecFlow (ECFLOW)	
Lead: Avi Bahra	
ecKit (ECKIT)	
Lead: Tiago Quintino	
EMOSLIB (EMOS)	
Lead: Pedro Maciel	
FDB (FDB)	
Lead: Tiago Quintino	
GRIB-API (GRIB)	
Lead: Shahram Najm	
Hermes (HRM)	
Lead: Florian Rathgeber	
MARS (MARS)	
Lead: Manuel Fuentes	
Metabuilder (METAB)	
Lead: Avi Bahra	

Issues in progress			
T	Key	P ↓	Summary
	MIR-107	↑	Config file requires installation
	MARS-501	↑	Failing task in MARS suite gauss_regular
	MARS-493	↑	assertion fail when running test_odb_filter_req with prodgen-bundle
	MARS-499	↑	Test mars-server 7.5.1 with upcoming eckit release 0.10.0
	MARS-500	↑	building MARS client without FDB support
	FDB-60	↑	Retriever and Archiver to use MarsRequest
	ATLAS-67	↑	Make Atlas depend on Eigen optionally for Vector3d
	ATLAS-70	↑	Fortran line too long after 132 characters

1-8 of 8

Favourite Filters	
Build Support Filter	452
GRIB V2.0.0	0
My Open Sprints	5

Filter Results: Team Working On			
T	Key	P	Summary
	ATLAS-70	↑	Fortran line too long after 132 characters
	HRM-109	↑	Evaluate product generation throughput
	MARS-512	↓	Cache md5 hash on MarsRequest
	HRM-104	↓	Clean up logging
	HRM-113	↑	Batch picker
	HRM-92	↑	Broker should forget queued tasks from killed clients
	HRM-112	↑	Cleanly disconnect client
	HRM-111	↑	Add sender id to Message
	HRM-108	↑	Improve monitor status output
	HRM-110	↓	Move unused code to sandbox
	ECBUILD-211	↑	Rewrite FindFFTW.cmake macro
	ECBUILD-209	↑	FFTW detection fails to report problems and full requirements
	MIR-107	↑	Config file requires installation

Questions?

MARS Administrators ?

From Wikipedia...

Curator, (from Latin: *curare*, meaning "**to take care**") is a **manager or overseer**. ... is a content specialist charged with an institution's collections and involved with the interpretation of ... material.

More recently, new kinds of curators have started to emerge: **curators of digital data objects** ...

Digital curation is the selection, preservation, maintenance, collection and archiving of digital assets.

Digital curation establishes, maintains and adds value to repositories of digital data for present and future use.