PULSEⓘ

Management, Monitoring and **Migration** for TM1.

- 24/7 Monitoring tool.
- Analyse server and TM1 performance.
- Pro-active alerts. ⓘ
- Change tracking. ⓘ
- Understand objects relationships. ⓘ
- Google for your TM1 model. ⓘ
- Excel, TM1 Web and Canvas tracking. ⓘ
- Migrate changes to production live. ⓘ
- Monitor the health of your system ⓘ

CANVASⓘ

A web development framework built upon the TM1 REST API and delivers a modern READ/WRITE presentation layer to your TM1 applications.

- Very fast on a wide network.
- Get the freedom to do anything you want such as integrating Google Map ⓘ
- 20+ ui components based on existing TM1 functionality.
- Responsive design ⓘ
- Cell based logic (Canvas vs PAW). ⓘ
- **Upload Excel file** into your TM1 cube. ⓘ
- Fully supports **TM1 features**.
- Page Creator (Create a Canvas page from a Cube view).

ARCⓘ

Arc helps you develop higher quality TM1 applications faster

- Write the same code way faster that you have ever done before.
- Modern search capabilities.
- Do your TM1 developments across all your TM1 instances in one platform.
- Debug processes. ⓘ
- Fully support Hierarchies. ⓘ
- Build your own features. ⓘ

BEDROCKⓘ

Bedrock is a Planning Analytics best practice that brings together information and experiences for business intelligence professionals.

- 30-50% reduction in TI coding due to a new functional method employed.
- Increased scalability in terms of business logic complexity, data sizes & concurrency.
- Dramatically faster proto-typing phase.
- Increased auditing & testing via a 3-mode standardised logging system.
- Reduction in Developer/Administration training.
- Reduction in cost of Administrating TM1.

Most Popular TI:

- Bedrock.Dim.Hierarchy.Unwind.All
- Bedrock.Cube.ViewAndSubsets.Create
- Bedrock.Cube.ViewAndSubsets.Delete
- Bedrock.Dim.CloneFromSubset
- Bedrock.Dim.Sub.Create
- Bedrock.Server.DataDir.Backup

HUSTLEⓘ

It enables you to specify the number of concurrent threads you want to be executed at any one time and pass a batch of commands to be executed on these threads.

- How to run it from a TI:

sCommand = 'C:\TM1\Tools\Hustle.exe "RunTIBatch.txt" 16';

ExecuteCommand(sCommand, 1);

- RunTIBatch.txt:

"C:\Program Files\Cognos\TM1\bin\tm1runti.exe" -process Cub.Flight -adminhost CW111 -server flightstats -user TI01 -pwd "" pYear=2000 pMonth=01

TM1pyⓘ

TM1py is **a Python package that wraps the TM1 REST API in a simple to use library.** That makes it easy to build stuff with TM1 and python.

Python is a widely-used general-purpose programming language that lets you work quickly and integrate systems more effectively.

- Use Pandas for Data Analysis and Statistics on top of your TM1 model.
- Load data (e.g. FX, stock data) from web services into TM1 such as Quandl financial.
- Build Machine Learning and Forecasting Algorithms with Python and scikit-learn based on your TM1 data.

Run TM1py scrip from TM1 processes. ⓘ

Supports TM1 Security mode 1, 2, 4 and 5.

Most popular samples:

- Data Science with TM1 ⓘ
- RushTI ⓘ
- fx rates to cube daily.py
- find unused dimensions.py

TM1KILLⓘ

TM1Kill is a small executable that cancels ALL running threads or disconnects ALL users connected to TM1.

- The program is written using C# and runs on the .NET framework 2.0 or later. All communication with TM1 is through the C API
- Run it before your nightly chores, so you make sure that there are no other threads running and no users logged in before the nightly chores start.
- Batch file:

set PATH=C:\Program Files\ibm\cognos\tm1_64\bin64 tm1kill.exe -adminhost "localhost" -server "CXMD" -username "admin" -password "" -cancel -disconnect

ODBC Connectⓘ

ODBC Connect is a Windows user interface for ODBC data sources. It enables you to query both **32bit** and **64bit** ODBC data sources and also extract data using a command line interface.

- Graphical User Interface (GUI) to 32bit and 64bit data sources
- Lists the tables and columns schema in the data source
- Generation of SQL statements by dragging tables to the SQL editor
- Multiple tabbed interface
- Query results in a grid or exported to file
- Detailed error messages to solve query errors
- Command line options to extract data to fil

Articles about TM1 REST APIⓘ

- The **TM1 REST API** is a way of accessing data and everything else in TM1. It is based on web standards making it accessible to a wide range of developers.
- The **TM1 REST API** does however support the OData standard (v4) which provides a common way for accessing data through queries and also updating data.
- The TM1 REST API with Postman ⓘ

SUPPORT PROCESS

- **Support Level1**: Contact your local Cubewise office or post on the Cubewise Forum.
- **Support Level 2**: Your Cubewise contact will create a ticket.

Learn More

Forum (forum.cubewise.com).

Website (code.cubewise.com/).

Blog (code.cubewise.com/blog-summary/)

Training: (cubewise.com/edu/)

Downloads (code.cubewise.com/downloads)

KEY FEATURES

- 24/7 Monitoring tool.
- Analyse server and TM1 performance.
- Keep a full history of what happened.
- Cancel threads or disconnect users.
- Dynamic documentation. ⓘ
- License Optimisation. ⓘ
- Pro-active alerts. ⓘ
- Change tracking. ⓘ
- Understand objects relationships. ⓘ
- Google for your TM1 model. ⓘ
- Migrate changes to production live. ⓘ
- Monitor the health of your system ⓘ

PREREQUISITES ⓘ

- All versions of TM1 from 9.5 onwards
- Open one port for Pulse server
- Default port number is 8099 but can be configured.
- .NET 4.6.1 Framework
- Windows 2008 or later.
- Min 300mb of disk space
- Licenses require server name

TECHNICAL

- Pulse (v5.6 and onwards) uses its own h2 database. ⓘ
- Pulse v5.5.1 uses one h2 and one SQL Lite database.
- Supports SQL Server 2012 and onwards. Pulse can use LDAP directory with CAM Security or Windows Authentication.
- The core low level monitoring and thick client is written in C# on .NET 3.5.
- The application server, documentation and change tracking are written in Java hosted in a Tomcat Application server.
- The web frontend is written in JavaScript using AngularJS, Bootstrap, etc.

SERVICES

- **Pulse for TM1** is used for the TM1 API to perform the management and monitoring of your TM1 installation.
- **Pulse for TM1 Application Server** service manages most of the functionalities that you can find on the Web client

CONFIGURATION

- **Pulse license file** - *\server\License.xml* ⓘ
- **Pulse config** - *\Conf\Pulse.cfg*
- Pulse will use as default 1024 MB, you can increase the JVM Maximum memory. ⓘ
- **Configure SSL** –*\Conf\server.xml* ⓘ
- **Log files** - Pulse for TM1\logs

PULSE.CFG KEY SETTINGS

- **Reset**: set to True to reset Pulse Admin password. ⓘ
- **MaximumElements**: Elements of a dimension which has more elements than this value won't be migrated (Live Migration). ⓘ
- **WindowsAuthentication**: True to enable SSO with windows authentication. ⓘ
- **ConsoleStart**: Set to True to enable the h2 console. ⓘ
- **ConsolePort**: Port to access the h2 console (8090).
- **AutoStartServicesOnly**: Set to True to skip TM1 services set to Manual start.

LOG FILES

- *Pulse.log: Error happened on the Web client.*
- *Monitor.log: Error happened on the Pulse service.*

RECOMMENDED ALERTS ⓘ

- Server Memory > 80%
- Server disk space < 20 GB
- TM1 services are offline
- User Wait time > 60 sec
- Run Time > 120 sec.

MIGRATION

- Views and Subsets can be migrated using only Offline migration. ⓘ
- Elements of a dimension will be migrated only if Source Level is enabled. ⓘ
- Compare two TM1 instances. ⓘ
- Rollback button: Pulse is going to create a migration package and execute it. ⓘ
- Pulse does not live migrate data (including security cube). Attribute values can be migrated. ⓘ
- Executing TI during migration. ⓘ

CHANGE TRACKING - SOURCE CONTROL

- Pulse uses a GIT version control repository to track and store all the history of your changes.
- Pulse tracks for changes every 30 secs by default (Pulse instance settings).
- Pulse does not track data change. TM1 security is considered data therefore not tracked by Pulse.
- Pulse will track dimension changes (elements added/deleted) only if Source Level is enabled. ⓘ

OTHER TIPS

- A long running operation could be anything which takes more than 10 sec.
- Dump files contains files with the details of the previous 10 min of history of TM1 server. ⓘ
- Pulse determines **READ-ONLY** with the **ReadOnlyUser** property in **}ClientProperties** cube. ⓘ
- In Memory/CPU tab, you see the 20 biggest events recorded.

Learn More

Forum (forum.cubewise.com/c/pulse).

Help articles (code.cubewise.com/pulse-help/).

Blog (code.cubewise.com/pulse-blog/)

Training: (code.cubewise.com/pulse-training/).

CAN'T SEE TM1 INSTANCES ⓘ

- Check Pulse user profile.
- Check TM1 Bin directory definition (Administration > Configuration)
- Check SSL certificates.
- Check user account which is running Pulse services.
- Check **AutoStartServicesOnly** in **Pulse.cfg**

UPDATE DOCUMENTATION FAILS ⓘ

- By default, Pulse runs documentation update every day at 1:45am.
- Instance settings, check user name, password and CAM Namespace (Case sensitive). For a new TM1 instance, restart Pulse services and then restart TM1 instance.
- Pulse can't reach the TM1 data folder, check user account running Pulse services. Pulse can't find TM1 bin folder (Administration > Configuration)

EXCEL TRACKING IS NOT WORKING ⓘ

- Check if the Excel Logging option is ticked (Administration > Configuration).
- By default, Pulse logs only TM1 Workbooks.
- By default, Pulse searches on the first 50 rows and 50 columns.
- Check **TM1_LOG_MAX property** is set to 0 in **cwxtndxl.ini** either in *%AppData%\CWExtend* or *%AppData%\CWPulseLogger*
- Check Extend logs *(%AppData%\CWExtend**ErrorLog.txt***)* or Excel Logger logs *(%AppData%\CWPulseLogger**Excel-Logging.log***).*

PULSE DOES NOT START

- User who is running Pulse services needs to have access to TM1 data folder.
- Database could be corrupted. Rename the database and restart Pulse. If you want to recover your data, contact your Cubewise local office for instructions.

KEY FEATURES

- Very fast on a wide network.
- Get the freedom to do anything you want.
- 20+ ui components based on existing TM1 functionality.
- Cell based logic.
- **Upload Excel file** into your TM1 cube. ❶
- Fully supports **TM1 features**.
- Page Creator (Create a Canvas page from a Cube view).

PREREQUISITES ❶

- TM1 server should be minimum 10.2.2 FP5
- Canvas comes with an application server "**Cubewise Application Server**".
- **Open one port** for Canvas server.
- Default port number is **8080** but can be configured.
- TM1 Security supported mode 1,2,4 and 5.
- Licenses require server name.

TECHNICAL

- Canvas uses an Apache Tomcat server (Java application server).
- Canvas' server component is written in Java.
- Canvas uses its own REST API which simplifies the TM1 REST API.
- The **CWAS** contains the Tomcat server and the webapps folder. It can be anywhere you like.
- Does not work with **IIS** but can work side by side, with the only issue being port conflicts.
- Can connect to any data sources through ODBC connection.
- The back-end can connect to anything that Java can, using servlet / JSP page.

SERVICE

- **Cubewise Application Server**, simplified TM1 REST API and optimizes request to TM1 server.

CONFIGURATION

- Enable TM1 REST API for TM1 instance ❶.
- Recommendation 500MB per application.
- *CWAS\webapps\<appName>\css\style.css*
- **License file**: CWAS\conf\Canvas.xml
- *Config file* CWAS\webapps\<appName>\WEB-INF\instances.json
- **Canvas port number**: *CWAS\conf\server.xml*
- **Reset Admin password** *CWAS\webapps\<appName>\WEB-INF\config\security.json* ❶

INSTANCES.JSON

A TM1 instance is defined by its **HTTPPortNumber** in tm1s.cfg,

- **restURI**:

http://<TM1 computer name>:<httpportnumber>

ENABLING TM1 REST API ❶

The **TM1 REST API** is not enabled by default, you need to update your tm1s.cfg on your TM1 server with the following parameter:

- HttpPortNumber=8881

Check if the TM1 REST API is working:

https://localhost:8881/api/v1/$metadata

Learn More

Canvas Best Practice ❶ + Canvas snippets ❶ available on Visual Studio Marketplace

Forum (forum.cubewise.com/c/pulse).

About (#/about): libraries information.

Help (#/help): directives information.

Help articles (code.cubewise.com/canvas-help/).

Blog (code.cubewise.com/canvas-blog/)

Training: (code.cubewise.com/canvas-training/)

KEY DIRECTIVES

- **tm1-ui-dbr**: get a value. ❶
- **tm1-ui-subnm**: create a dropdown list from subset
- **tm1-ui-element-list**: Used for populating a ng-model with an element's properties from a dimension.
- **tm1-ui-element-list**: Used for populating a ng-model with elements from a dimension.
- **tm1-ui-chart**: Generate charts utilizing tm1-ui-chart-dbr as data sources.
- **tm1-ui-progress** shows a spinning gear icon whenever there is an pending request.

KEY LIBRARIES

- **Ui Bootstrap**: Bootstrap components. ❶
- **SheetJS**: helps working with Excel on the web ❶
- **matchMedia**: Helps managing multiple screen sizes. ❶
- **Font Awesome v4**: Icons library. ❶
- **Angular-nvD3** is a charting library.
- **Accounting.js** provides simple and advanced number, money and currency formatting. ❶
- **Lodash**: A modern JavaScript utility library delivering modularity, performance & extras

HTML

HTML to build the layout of your page.

Most popular **HTML tags**:

- **<h1></h1>** heading
- **<div></div>** division
- **<i></i>** icon
- **<p></p>**: Paragraph
- **<table></table>**: Create table
- **<tr></tr>**: New row
- **<th></th>**: New header
- **<td></td>**: New cell for data

CSS

Cascading Style Sheet are used to format the layout of the web pages.

- If you repeat a particular style on two or more elements, make it a CSS class instead.
- Internal Style Sheet
- CSS class should be lower-case and hyphenated between words (warning-message). ❶

BOOTSTRAP 3 ❶

It is a free front-end framework for faster and easier web development. Most popular **Bootstrap classes**:

- **row**: Create a new row.
- **col-lg-12, col-md-12, col-xs-12**: Bootstrap grid
- **btn-info**: create a new button.
- **Panel**: create a panel.
- **Table-striped**: Create striped rows.
- **progress**: create a progress bar.

ANGULARJS

AngularJS v1.6.4 is a structural framework for dynamic web apps.

- Create / Share your own **Service** ❶ or **Directive** ❶.

Most popular **AngularJS directives**

- **ng-model**: stores variable.
- **ng-repeat**: repeat a component.
- **ng-click**: trigger an event on click.
- **ng-if**: remove or recreate a component.
- **ng-class**: dynamically set CSS classes.
- **ng-change**: trigger an event.

JAVASCRIPT

JavaScript is the programming language of HTML and the web.

- Use with care timeout and watch
- $watch -> tm1-change
- $timeout -> ng-if
- Variables/Functions should be **camelCase**

KEY FEATURES

- Write the same code way faster that you have ever done before
- Modern search capabilities ⓘ
- Do your TM1 developments across all your TM1 instances in one platform
- Debug processes ⓘ
- Fully support Hierarchies ⓘ
- Build your own features ⓘ
- Subset Editor ⓘ and Cube Viewer ⓘ

PREREQUISITES ⓘ

- TM1 server should be minimum 10.2.2 FP5 (preferably PAL 2.0.3)
- **Open one port** for Arc server
- Open REST API port for each TM1 instances
- Default port number is **7070** but can be configured.
- TM1 Security supported mode 1,2,4 and 5.

TECHNICAL

- A single executable which can run on the server or laptop
- Arc is multi-platforms(Windows ⓘ , Linux ⓘ and Mac OS ⓘ)
- Arc is mainly written in Go for the backend and the frontend in JavaScript.

LICENSES

- Trialling and Buying Arc ⓘ
- Arc pricing ⓘ
- One subscription per TM1 developer
- Licenses can be requested using the Buy Now button in Arc. ⓘ

CONFIGURATION

- To set up Arc as a Windows service ⓘ :
  - arc.exe -install
- Enabling TM1 REST API for TM1 instance ⓘ
- Recommendation 500MB per application
- Configuration file: Arc/settings.yml

SETTINGS.YML

- Connect to multiple TM1 admin hosts ⓘ
- Connect to an instance using REST API ⓘ
- Arc on the IBM Cloud ⓘ

TM1S.CFG RELATED TO ARC

- **HttpPortNumber**: TM1 REST API port
- **EnableTIDebugging**: Enable Debugging
- **EnableNewHierarchyCreation**: Enable Hierarchies
- **UseSSL**: Use Http or Https when opening Arc

Learn More

Forum (forum.cubewise.com/c/arc).

Help articles (code.cubewise.com/arc-help/).

Blog (code.cubewise.com/arc-blog/)

Support (github.com/cubewise-code/arc-issues/issues)

DEBUGGING ⓘ

- Enable Debugging in TM1, tm1s.cfg file, i.e. EnableTIDebugging =true and restart the TM1 service..
- **Continue**: Run code until the end of the process or a breakpoint.
- **Step In**: Moves line to line and will also enter a child process called by the ExecuteProcess function.
- **Step Over**: Works the same as Step In by moving line to line except it DOESN'T enter a child process called by ExecuteProcess.
- **Step Out**: Continues until the end of the child process and then stops at the next line in the calling process.

FILTERING THE SEARCH ⓘ

- Filtering by objects type, add "**t:<objectType**" such as **t:p** to filter processes and **t:d** to filter dimensions
- Filtering by instance "**i:<instanceName>**" such as **i:cxmd** to get only objects from cxmd

ARC SHORTCUTS ⓘ

- **Ctrl+M**: Show/Hide the menu
- **Ctrl+SPACE**: open snippets
- **Ctrl+Shift+E**: Execute a process
- **TAB**: to navigate between placeholder ⓘ

SUPPORTS HIERARCHIES

- Mastering Hierarchies ⓘ
- Building a new Hierarchy with a process ⓘ
- Set default members ⓘ

OTHER TIPS

- Define templates for new objects ⓘ
- Create your own snippets ⓘ
- Store TM1 credentials ⓘ
- Adding new elements from Excel ⓘ

ARC PLUGINS ⓘ

- How plugins work. ⓘ
- How to create your plugins ⓘ
- Building a new plugin from a template ⓘ
- More plugins samples ⓘ

KEY LIBRARIES IN ARC

- **Ui Bootstrap 4**: Bootstrap components. ⓘ
- **Font Awesome v4**: Icons library. ⓘ
- **Lodash**: A modern JavaScript utility library delivering modularity, performance & extras
- **NGDialog**: modals and popups ⓘ

BOOTSTRAP 4 ⓘ

It is a free front-end framework for faster and easier web development. Most popular **Bootstrap classes:**

- **row**: Create a new row.
- **col-lg-12, col-md-12, col-xs-12**: Bootstrap grid
- **btn-info**: create a new button.
- **Card**: create a card (panel in Bootstrap 3).
- **Table-striped**: Create striped rows.
- **Badge**: create a badge.

ANGULARJS

AngularJS v1.6.4 is a structural framework for dynamic web apps. Most popular **AngularJS directives**:

- **ng-model**: stores variable.
- **ng-repeat**: repeat a component.
- **ng-click**: trigger an event on click.
- **ng-if:** remove or recreate a component.
- **ng-class:** dynamically set CSS classes.
- **ng-change**: trigger an event.