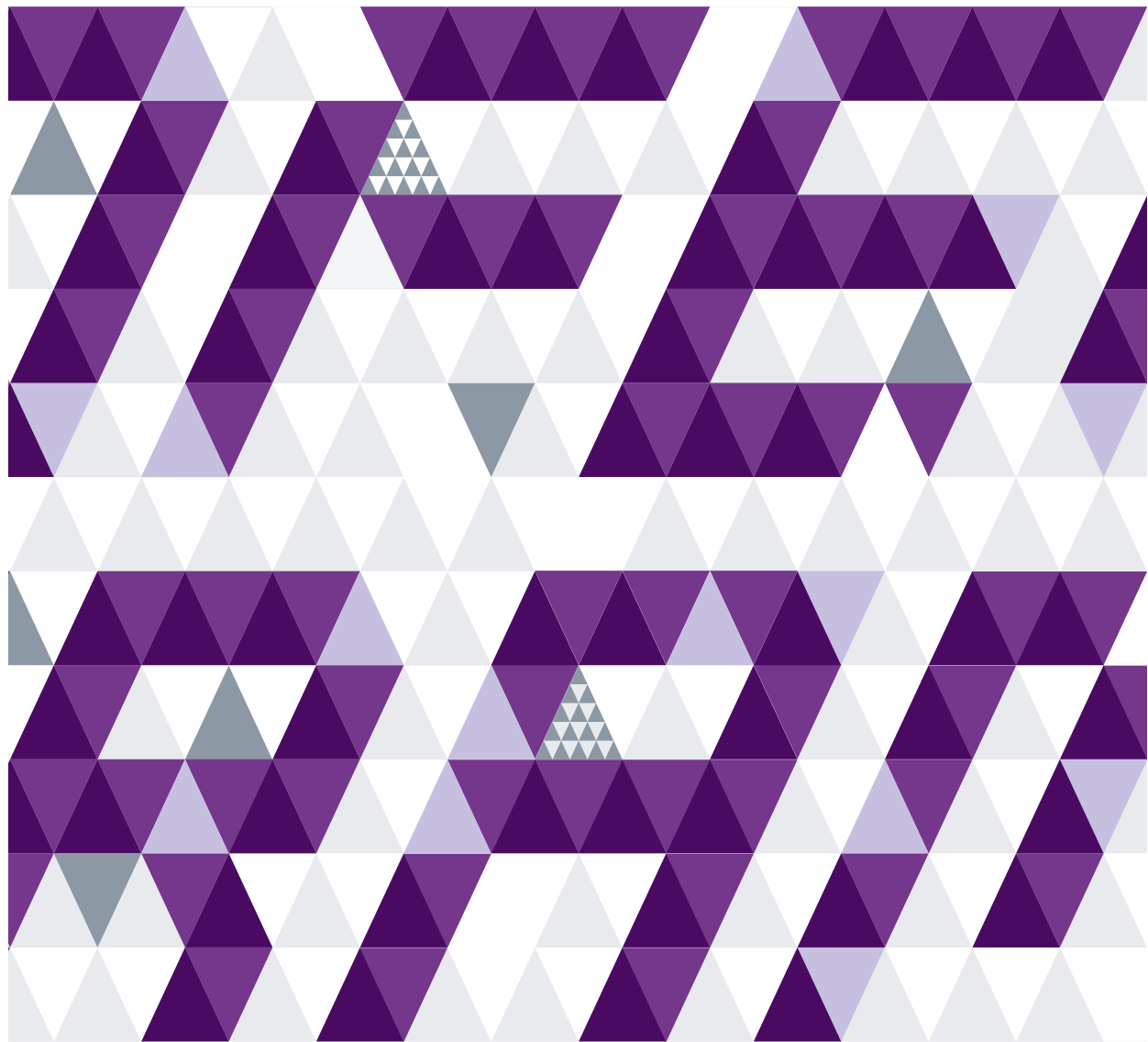# Tmax *Rehosting Solution*
OpenFrame

A Mainframe Rehosting Solution

A rehosting solution that automatically migrates
mainframe programs to an open system environment
without modifications

TmaxSoft

Tmax *Rehosting Solution*
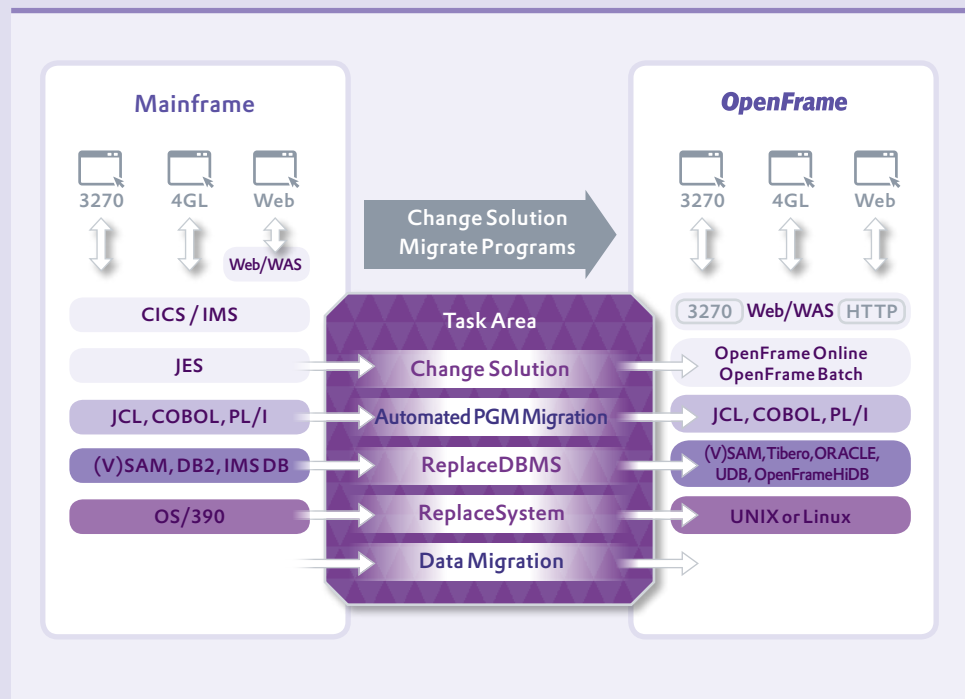# OpenFrame

A Mainframe Rehosting Solution

Migrates mainframe programs without modifying the source code for use in an open system environment.

Provides compilers and an integrated assets management environment for automated migration.
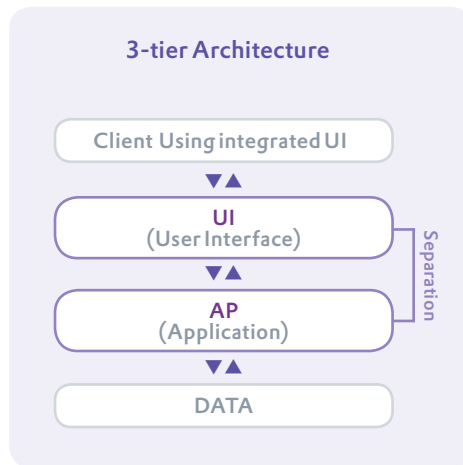
What's OpenFrame

OpenFrame is a rehosting solution that migrates existing mainframe programs without modifying the source code for users in a reliable and high-performance open system environment. It provides an optimal open system environment at minimal cost through future-oriented standard architecture, automated migration, compilers, and an integrated assets management environment.

Mainframe

3270	4GL	Web

Web/WAS

CICS / IMS

JES

JCL, COBOL, PL/I

(V)SAM, DB2, IMS DB

OS/390

**Change Solution
Migrate Programs**

Task Area

Change Solution

Automated PGM Migration

Replace DBMS

Replace System

Data Migration

OpenFrame

3270	4GL	Web

3270 Web/WAS HTTP

OpenFrame Online
OpenFrame Batch

JCL, COBOL, PL/I

(V)SAM, Tibero, ORACLE,
UDB, OpenFrameHiDB

UNIX or Linux

Key
Benefits

Future-oriented Standard Architecture

Built upon a future-oriented standard 3-tier architecture to create an open system environment that offers maximum reliability, high performance, scalability, and flexibility.

3-tier Architecture

Client Using integrated UI

▼▲

UI
(User Interface)

▼▲

AP
(Application)

▼▲

DATA

Separation

Flexibility

Separates the UI from the AP to flexibly respond to changes. (Changing the UI does not require modifying the AP.)

Scalability

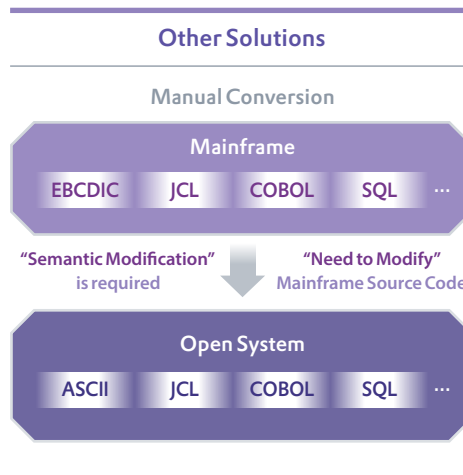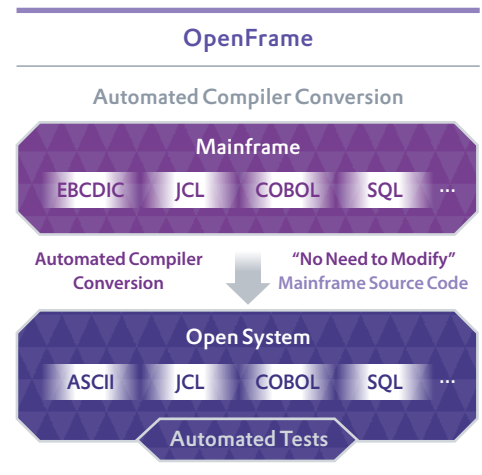Easy to integrate APs, increasing AP scalability.

Efficiency

Efficiently handles business since an AP does not process the UI.

Automated Conversion

Provides advanced compiler technology that implements automated conversion and enables reliable migration to an open system environment at minimal cost.

Other Solutions

Manual Conversion

Mainframe

| EBCDIC | JCL | COBOL | SQL | ... |

"Semantic Modification" is required

"Need to Modify" Mainframe Source Code

Open System

| ASCII | JCL | COBOL | SQL | ... |

- Requires manual modification of semantics and mainframe source code.
- Lengthens the rehosting project period.
- Increases human resources and migration risks.

OpenFrame

Automated Compiler Conversion

Mainframe

| EBCDIC | JCL | COBOL | SQL | ... |

Automated Compiler Conversion

"No Need to Modify" Mainframe Source Code

Open System

| ASCII | JCL | COBOL | SQL | ... |

Automated Tests

- Unnecessary to modify mainframe source code, and provides automated compiler conversion.
- Drastically shortens the rehosting project period.
- Provides convenient migration and minimizes migration risks.
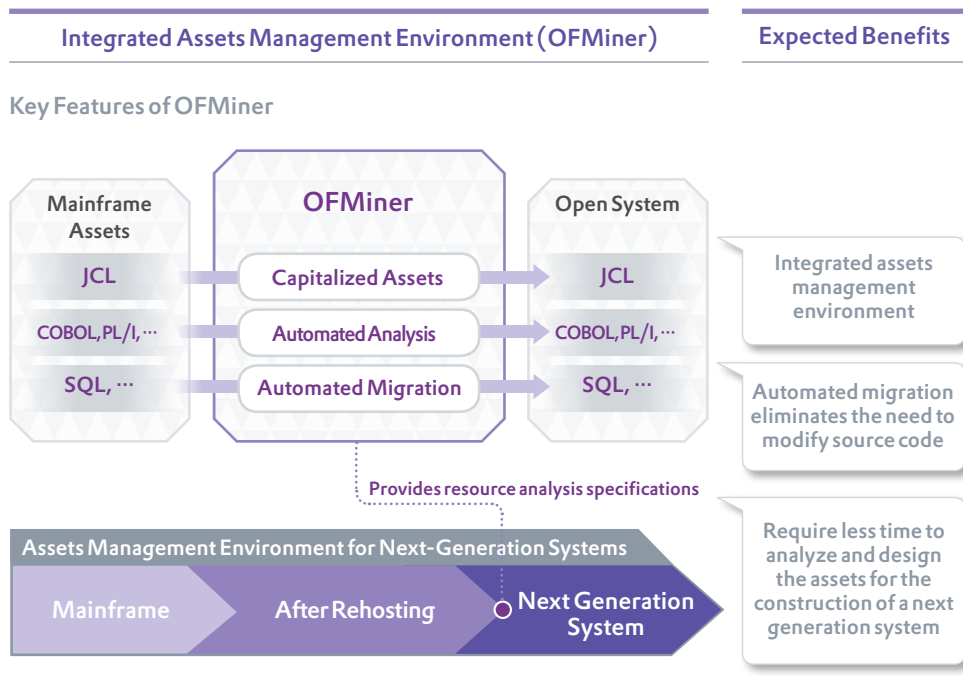
Key
Benefits

Proprietary Compilers

Offers the world's only assembler compiler that not only converts mainframe programs written in COBOL or PL/I but also solves various migration issues in a timely manner and maximizes application source code reusability.

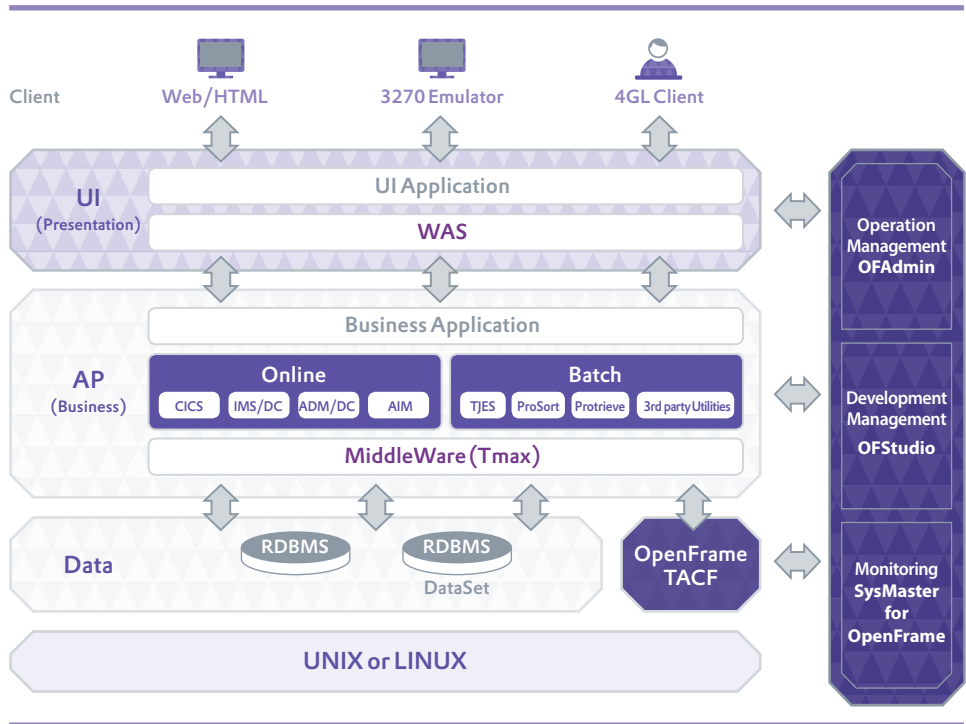| Application Type	Migration Issues	OpenFrame Compiler
Assembler	No supported compilers → Need to redevelop all source codes	Assembler Compiler, **OFASM** **Automated compiler conversion** (No need to redevelop assembler codes)
COBOL	Oligopolistic compiler market → **Dominated by high-cost legacy compilers**	COBOL Compiler, **OFCOBOL** **Supports diverse standards** (COBOL85, IBM Extension Language Elements)
PL/I	Low-level compiler functionality → **Limited support for automatic migration**	PL/I Compiler, **OFPLI** **Supports all PL/I language specifications**

Integrated Assets Management Environment

The key features of OFMiner help provide an integrated assets management environment. It also enables mainframe assets to be migrated to a more reliable open system, without modifying the source code.

Integrated Assets Management Environment (OFMiner)   **Expected Benefits**

Key Features of OFMiner

Mainframe Assets	OFMiner	Open System	
JCL	Capitalized Assets	JCL	Integrated assets management environment
COBOL, PL/I, …	Automated Analysis	COBOL, PL/I, …	
SQL, …	Automated Migration	SQL, …	Automated migration eliminates the need to modify source code

Provides resource analysis specifications

Assets Management Environment for Next-Generation Systems

Mainframe   **After Rehosting**   **Next Generation System**

Require less time to analyze and design the assets for the construction of a next generation system

Key Features

Architecture

Future-oriented standard 3-tier architecture provides maximum reliability, high performance, scalability, and flexibility.

Online (OpenFrame Online)

OpenFrame Online's architecture separates the UI from an AP to offer maximum scalability, while the TP-monitor (Tmax) based online engine copes with various mainframe middleware. Application program interfaces and runtime resources enable CICS/IMS programs to be run on a UNIX system without modifications. Relevant management commands and tools are provided for the operation.
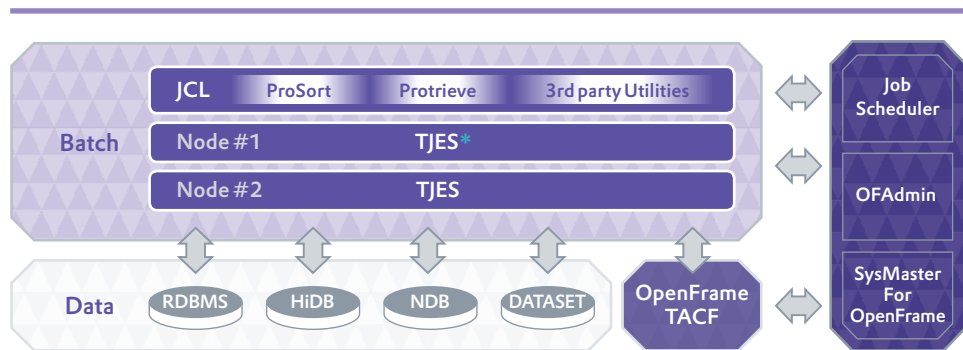
Distributed Transaction Processing

- Provides distributed transaction processing for heterogeneous databases
- Provides transaction recovery functions
- Provides transaction trace functions via GUID

High Availability

- Supports optimized usage of system resources via load-balancing features
- System downtime is reduced or eliminated as a result of distributed clustering
- Real-time fault recovery and failover

CICS/IMS Runtime Environment

- Supports an application program interface (API)
- Supports runtime resources such as TSQ, TDQ, and SPA
- Supports UI such as BMS, MFS, and PSAM
- Supports terminals such as TN3270 and Web

Business Scalability

- Supports bi-directional integration with WAS
- Connects to an external system through MCI
- Supports a client/server environment

Key
Features

Batch (OpenFrame Batch)

OpenFrame Batch provides powerful management tools for batch programs to ensure reliability of batch jobs and to handle mass processing. It also provides utilities used by mainframes as sub-components.

- Provides an architecture similar to that of a mainframe, and reuses existing JCL.
- Supports an environment to process JCL and jobs for each system (IBM MVS, Fujitsu XSP, MSP, and Hitachi VOS).
- Manages resources related to operating tasks and jobs through TJES.
- Supports a TSO communications business environment and the CLIST language.
- Provides various utilities and automated migration of batch applications.

* TJES : Tmax Job Entry Subsystem

Security (OpenFrame TACF)

Provides functions for user authentication, authority management, and resource access management for an optimal security environment.

TSAM

TSAM corresponds to VSAM, which is commonly used in various mainframe environments. TSAM enables applications developed in a legacy environment with a dataset processing method to be reliably run on an open system environment at high performance without modifications.

HiDB

HiDB corresponds to IMS/DB in an IBM mainframe environment. It enables applications developed in an existing environment to be run on a rehosting environment without modifications by providing DL/I interface compatibility. It supports various layers in a layered model database with reliability and high performance.
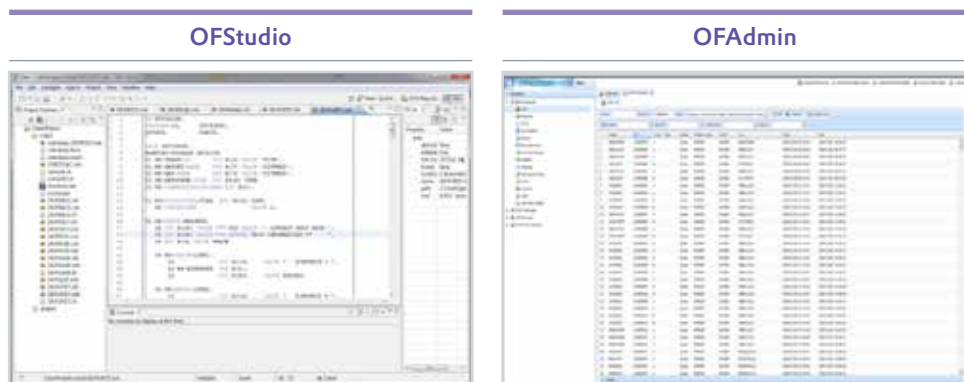
NDB

NDB corresponds to AIM/DB in a Fujitsu mainframe environment. It completely implements logical and physical structures of the existing AIM/DB with reliability and high performance. It enables applications to run on a rehosting environment without modifications by supporting navigational DML.

Operation Management (OFAdmin)

OFAdmin offers a powerful GUI-based user interface and an environment in which applications are efficiently operated and monitored. Users can access OFAdmin in the latest user-friendly environment through a web browser without having to install separate client software.

Development Management (OFStudio)

OFStudio is a GUI-based integrated development environment tool that provides powerful user interfaces and an efficient application development environment. It enables developers to efficiently operate and maintain migrated JCL, COBOL, and PL/I applications.

OFStudio	OFAdmin

OFTest

OFTest drastically shortens the rehosting project period by automating unit tests, application scenario tests, and load tests. It also increases test accuracy by providing data field based and online screen based comparisons and verification.

Compiler

OpenFrame's compiler is a conversion tool that enables mainframe programs written in COBOL, PL/I, and assembler to be used in an open system. Compilers developed with TmaxSoft's proprietary technology compile programs without modifying their source code and minimize potential issues caused by the differences between a mainframe and open system environments.

Utility

OpenFrame provides utilities that enable various mainframe applications and 3rd party software to run in an open system environment.

ProSort	Supports sorting, merging, and the operation of large volumes of files and datasets for mainframe batch jobs. It allows SORT scripts written in an existing mainframe to be used in an open system environment without modifications because its syntax is compatible with DFSORT syntax unlike other products.
ProTrieve	Provides functions found in Easytrieve Plus (a reporting utility commonly used in a mainframe) in an open system environment. It offers various statistics functions about datasets and DB2 data without modifying scripts written for Easytrieve.
Dataset Utility	Provides functions found in a mainframe's default dataset utility (IDCAMS, ICEGENER, IEBCOPY, IEBGENER, IEBEDIT, IEHPROGM, and DSNUTILB) in an open system environment.
Other Utilities	Provides the FTP, IEBDG, SDSF, ISRSUPC, DSNTIAD, DSNUTILB, and IKJEFT01 functions in an open system environment.

TmaxSoft

TmaxSoft Co., Ltd.

5, Hwangsaeul-ro 329beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 463-824, South Korea

+82-31-8018-1000
info@tmax.co.kr

www.tmaxsoft.com

TmaxSoft Japan Co., Ltd.

F Sanko Bldg, 3-12-16 Mita, Minato-Ku, Tokyo, 108-0073 Japan

+81-3-5765-2550
info@tmaxsoft.co.jp

jp.tmaxsoft.com

TmaxSoft Inc.

560 Sylvan Avenue Englewood Cliffs, NJ 07632 USA

+1-201-567-8266
info@tmaxsoft.com

us.tmaxsoft.com

Beijing TmaxSoft System Software Co., Ltd.

Room 1101, Building B, Recreo International Center, East Road Wang Jing, Chaoyang District, Beijing, 100102, P.R.C

+86-10-5783-9188
info@tmaxsoft.com.cn

cn.tmaxsoft.com

TmaxSoft UK Ltd.

Surrey House, Suite 221, 34 Eden Street, Kingston-Upon-Thames, KT1 1ER United Kingdom

+44-(0)20-8481-3776
info.uk@tmaxsoft.com

www.tmaxsoft.com

Tmax Singapore Pte. Ltd.

430 Lorong 6, Toa Payoh 10-02, OrangeTee Building, 319402 Singapore

+65-6259-7223
info.sg@tmaxsoft.com

www.tmaxsoft.com

Tmax Rus L.L.C.

Grand Setun Plaza, No A204 Gorbunova st.2, Moscow, 121596 Russia

+7(495)970-01-35
info.rus@tmaxsoft.com

ru.tmaxsoft.com

Tmax Brasil Sistemas e Serviços Ltda.

Av. Copacabana, 177, sala 32, 18 do Forte Empresarial, Alphaville, Barueri, São Paulo, Brasil, CEP 06472-001

+55-11-4191-3100
info.bra@tmaxsoft.com

br.tmaxsoft.com