

FUJITSU Software openUTM Enterprise Edition (Unix, Linux and Windows systems)

Version 6.5A
April 2018

Release Notice

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1 General

The open and universal transaction monitor openUTM supports the creation and operation of transactional applications under the FUJITSU operating system BS2000 as well as under commonly available Unix systems (Solaris, HP-UX, AIX) or Linux and Windows systems.

FUJITSU Software openUTM lets you implement client/server architectures and create distributed transaction applications in homogenous and heterogeneous IT infrastructures (multi-tier architecture).

Some tools are included free of charge in the product openUTM:

- *1 • The graphical User Interface WinAdmin for UTM applications is shipped with media kit DVD.
*1 A separate Release Notice is available for WinAdmin.

- *1 • The web based tool WebAdmin is available for administration of UTM applications via Internet
*1 browser.
A separate Release Notice is available for WebAdmin.

- WS4UTM is a tool which offers a convenient method for making program units of a UTM application available as web services. It is possible to call a UTM-Service as a web service from a web application implemented in Java. This allows UTM to be integrated into SOA solutions. (SOA = Service Oriented Architecture)

- "XML for openUTM" provides openUTM with a convenient interface for creating and processing data in the form of XML documents.
A separate Release Notice is available for UTM-XML.

- BizXML2Cobol permits the creation of Cobol data structures from existing service definitions (WSDL description or XML schema) and code, which can be integrated in existing transactional Cobol applications so that these implement the predefined service. Thus, the top-down approach (from the business-relevant definition to implementation) in SOA projects is also supported for the inclusion of existing program logic.

Additionally openUTM can be combined with further chargeable products:

- FUJITSU Software openUTM Client is a product which allows client/server communication with openUTM server applications and is available as a separate product for the Fujitsu operating system BS2000 (see separate Release Notice) as well as for Unix, Linux and Windows systems.
A separate Release Notice is available for openUTM-Client.

- The add-on product FUJITSU Software openUTM LU62 (Unix, Linux and Windows systems) V5.1 supports connectivity to CICS/IMS applications on IBM systems via SNA LU6.2.
A separate Release Notice is available for openUTM LU62.

- The product FUJITSU Software BeanConnect enables UTM applications to connect to Java EE Application Servers. BeanConnect also includes a component for creating Java clients for openUTM.
A separate Release Notice is available for BeanConnect.

- *1 Encrypted transfer of messages between the UTM application and the client is provided by additional
*1 encryption software for openUTM and openUTM Client with the carrier system UPIC.
*1 For the use of the encryption functionality an additional product component has to be ordered and installed.

More information about the listed products and the data sheets is available at:

<http://ts.fujitsu.com/openUTM>

openUTM is part of the comprehensive middleware suite openSEAS. The openSEAS middleware suite enables the simple integration of individual applications and the interaction of existing and new applications. openSEAS perfectly complements the Fusion middleware of our strategic partner Oracle. Oracle Fusion middleware is a market-leading family of pre-integrated products, which ranges from application infrastructure development applications through to business intelligence.

Together this provides the platform for:

- Individual business-critical IT solutions
- Company portals
- Integration solutions for service-oriented architectures
- Web applications and portals
- Business processes

*1 This Release Notice is a summary of the major extensions, dependencies and operating information
*1 with respect to openUTM(Unix, Linux and Windows systems) V6.5A and openUTM-CRYPT
*1 (Unix, Linux and Windows systems) V6.5A under the operating systems Solaris, HP-UX, AIX, Linux and
Windows and all the information necessary for migrating from the predecessor version openUTM
(Unix, Linux and Windows systems) V6.4A.

Changes which have become known subsequently are updated and provided in this file.

*1 The content refers to release level: April 2018.

*1 All changes since the release level from December 2017 are marked in the left margin.

*1 - Marking *1 = release level V6.5A10 from April 2018.

All Unix, Linux and Windows product Release Notices including this one are available on the Internet at the following URL:

<http://manuals.ts.fujitsu.com>

*1 Any changes become known subsequently are noted in this file and published as part of a correction
*1 release.

openUTM (Unix, Linux and Windows systems) is the server component of the client/server package openUTM Enterprise Edition (Unix, Linux and Windows systems).

This package also includes:

openUTM-Client (client/server communication), openUTM WinAdmin and openUTM WebAdmin (graphical administration interfaces).

Not all products are available on all platforms.

The UPIC carrier system for UTM-Client applications with local connections (UPIC local) is part of openUTM.

In the case of openUTM clients on Unix, Linux and Windows platforms connected remotely over a network, two carrier systems are available (UPIC and OpenCPIC), each of which delivers a different functionality.

If one or more predecessor versions are skipped when this current product version is in use, it may be necessary to also take account of the information from the Release Notices (and/or README files) of the predecessor versions.

The use of names, trademarks, etc. in this Release Notice does not entitle readers to assume that these names/designations may be used without restriction by anyone; often the names/designations are protected by law or contract, even if this is not indicated here.

1.1 Ordering

openUTM Enterprise Edition (Unix, Linux and Windows systems) V6.5A can be ordered from your local distributors.

openUTM Enterprise Edition (Unix, Linux and Windows systems) V6.5A is subject to the general terms and conditions of the software product purchase, maintenance, use and service agreement.

1.1.1 Licenses

The licenses are part of the contract that you entered into with Fujitsu Technology Solutions when you purchased openUTM Enterprise Edition.

openUTM Enterprise Edition (Unix/Linux/Windows) is a product for which a license must be purchased. Licenses are required in order to use the product. These are provided as a basic license for each system or partition plus licenses for each user.

For distributed transaction processing, there are also additional licenses in 5 different variants depending on the number of parallel connections between the applications.

For development purposes, development packages are available with one basic license for each system or partition and 2 users for developing UTM applications. Licenses for additional developers can be purchased separately.

The user licenses for openUTM-Enterprise Edition include client and server users.

Licenses for UTM-Cluster applications:

There is no special cluster license for the use of UTM-Cluster functions.

You have to license openUTM on every node regardless of whether you run a stand-alone application or a node application on this computer.

*1 1.1.2 Licenses for encryption

*1 The encryption functions are based on the functionality of the openssl library on the target system.
*1 Additional licenses are not required to this.

1.2 Delivery

1.2.1 Software on data media

openUTM

*1 The openUTM files are supplied on two different DVD data media
- openUTM EED-DVD V6.5 (Software DVD w/o encryption function)
*1 - openUTM EED-DVD V6.5 Crypt (Software DVD with encryption function)

This data media contains additional software products from the openUTM product family and communication products.

*1 The openUTM EED-DVDs must be ordered separately.

openUTM WinAdmin

The openUTM (Unix, Linux and Windows systems) V6.5A delivery includes the product FUJITSU Software openUTM WinAdmin V6.5A with which you can administer UTM applications with a convenient graphical user interface.

1.2.2 Software for downloading

openUTM WebAdmin

The product FUJITSU Software openUTM WebAdmin V6.5A is released together with openUTM V6.5A. openUTM WebAdmin provides an additional graphic administration interface which runs as a web service in contrast to WinAdmin.

openUTM WebAdmin is available for downloading on the openUTM web site
<http://ts.fujitsu.com/openUTM>

XML für openUTM

The software "XML for openUTM" is an add-on to openUTM which is free of charge. Fujitsu Technology Solutions does not accept obligation for bug-fixing.

The Software is available on the web at

<http://ts.fujitsu.com/openUTM>

This component contains the Open Source XML parser libxml2, which is provided in accordance with the conditions of the MIT license. This is included in the application package ('rt') and is also available on the web at

<http://www.opensource.org/licenses/mit-license.html>

1.2.3 Software for WS4UTM and BizXML2COBOL

Consulting project packages, in the context of which the software „WebServices for openUTM" (WS4UTM) and BizXML2Cobol is made available, can be purchased from your local Fujitsu regional office. The manuals can be downloaded from the Internet:

<http://manuals.ts.fujitsu.com>

The use of the software is only permitted within the framework of the license purchased in the project package.

1.3 Documentation

1.3.1 Availability

The documentation is available in Internet:

<http://manuals.ts.fujitsu.com>

1.3.2 Documentation of the Open Group interfaces

<u>Title:</u>	<u>Order number:</u>
CPI-C X/Open CAE Specification Distributed Transaction Processing: The CPI-C Specification, Version 2	ISBN 1 85912 135 7
Reference Model X/Open Guide Distributed Transaction Processing: Reference Model, Version2	ISBN 1 85912 019 9
TX X/Open CAE Specification Distributed Transaction Processing: The TX (Transaction Demarcation) Specification	ISBN 1 85912 094 6
XATMI X/Open CAE Specification Distributed Transaction Processing: The XATMI Specification	ISBN 1 85912 130 6

The X/Open manuals are available on the web. They can be obtained in printed form from bookstores quoting the ISBN number.

2 Software extensions

2.1 New functions in openUTM (Unix, Linux and Windows systems) V6.5A

2.1.1 Long hostnames of up to 64 characters

OpenUTM supports names up to 64 characters in length. Therefore it is no longer necessary to map the names from the UTM generation to a real long name using configuration or mapping files.

The following interfaces were extended to support this:

- Generation
 - KDCDEF statements CON, OSI-CON, PTERM and TPOOL:
For PRONAM= or OSI-CON NETWORK-SELECTOR=, a name of up to 64 characters in length can be specified for the partner computer.
 - KDCDEF statement CLUSTER-NODE:
For HOSTNAME= and VIRTUAL-HOST=, a name of up to 64 characters in length can be specified.
 - KDCDEF statement MAX:
For HOSTNAME=, a name of up to 64 characters in length can be specified.
- Programming
 - KDCS call INFO SI:
 - To receive the available information in full, value 180 must be specified in the KCLA field.
 - New fields KCHSTNML and KCPRONML for returning long hostnames.
 - KDCS call INIT PU:
 - The interface version has been increased to 6.
 - To receive the available information in full, value 356 must be specified in the KCLI field.
 - New fields KCHSTNML and KCPRONML for returning the long hostnames.
 - KDCS call SIGN ST:
 - The interface version has been increased to 4.
 - To receive the available information in full, value 180 must be specified in the KCLA field.
 - The node name in the KCCLNODE field can be up to 64 characters in length.
- KDCADMI administration interface
 - New structure *kc_long_triple_str* in the identification area to support long hostnames. This structure must be used for all objects except KC_MUX. As a result, the data structure version of KDCADMI has changed to version 10 (*version_data* field in the parameter area).
 - New fields for the long hostnames:

Data structure	Field name(s)
<i>kc_cluster_node_str</i>	<i>hostname_long</i> and <i>virtual_host_long</i>
<i>kc_con_str</i> <i>kc_lses_str</i> <i>kc_lterm_str</i> <i>kc_pterm_str</i> <i>kc_tpool_str</i>	<i>praname_long</i>
<i>kc_osi_con_str</i>	<i>network_selector_long</i>
<i>kc_system_par_str</i>	<i>hostname_long</i>

- KDCADM command interface
 - KDCINF command:
If an object of the type CON, LSES, LTERM, OSI-CON, PTERM, or TPOOL contains a long hostname, the information to this object is displayed within two lines.
 - Commands KDCLSES, KDCPOOL, KDCPTERM, and KDCSWTCH:
If an object contains a long hostname, the information to this object is displayed within two lines.
- Messages
 - Message K037 is output every time the long hostname is converted to the short local name and vice versa. This message is used for diagnosis of connection problems. Default target of this message is the SYSLOG file.
- KDCNAMEINFO tool
 - The KDCNAMEINFO tool is provided for assigning IP address to hostname.

2.1.2 Password length of up to 16 characters

The password for a UTM user ID can be up to 16 characters in length.

- Generation
 - KDCDEF statement USER:
For PASS=, a password of up to 16 characters in length can be specified.
For PROTECT-PW=, the maximum value for the minimum length has been increased to 16.
- Programming
 - KDCS call SIGN ON, CK:
In the KCLA field, value 16 must be specified
 - KDCS call SIGN CP:
In the KCLA field, value 32 must be specified
 - KDCS call SIGN ST:
 - The interface version has been increased to 4.
 - To receive the available information in full, value 120 must be specified in the KCLA field.
 - New field KCRPASSL for returning the password from the UPIC protocol.
- KDCADMI administration interface
 - Data structure kc_user_str and kc_user_dyn2_str:
New fields password16 and protect_pw16_lth.
- KDCADM command interface
 - KDCUSER command
For PASS=, a password of up to 16 characters in length can be specified.

2.1.3 Dead letter queue for LPAP and OSI-LPAP

Messages to LU6.1 or OSI-TP partners that are deleted because they could not be delivered due to a permanent error can now be saved in the dead letter queue.

The interfaces have been changed as follow to support this:

- Generation
 - KDCDEF statements LPAP and OSI-LPAP:
The new operand DEAD-LETTER-Q= controls whether undeliverable messages that are deleted from their message queue are to be saved in the dead letter queue.
- Programming
 - For KDCS call DADM with KCOM=MV or MA (moving messages from the dead letter queue), an LPAP or OSI-LPAP partner can also be specified.

- KDCADMI administration interface
Data structures *kc_lpap_str* and *kc_osi_lpap_str*.
New field *dead_letter_q* for controlling the saving of undeliverable messages in the dead letter queue.

2.1.4 Code conversion tables

For code conversion between ASCII-compatible codes and EBCDIC codes, openUTM provides tables for four code conversions on all platforms (two 8-bit conversions and two 7-bit conversions). By default, openUTM uses an 8-bit conversion between ISO8859-i and EBCDIC.DF.04-i on BS2000, Unix, and Linux systems, and an 8-bit conversion between Windows 1252 and EBCDIC.DF.04-F on Windows systems

The following interfaces have been changed to support this:

- Generation
 - KDCDEF statements PTERM and TPOOL:
The operand values MAP=SYS1, SYS2, SYS3, and SYS4 can also be specified on Unix, Linux, and Windows systems. The values may be specified only for transport system applications (partner type APPLI or SOCKET).
 - KDCDEF statements OSI-CON and SESCHA:
New operand values MAP=SYS1, SYS2, SYS3, and SYS4 on Unix, Linux, and Windows systems for the four conversions.
- Programming
 - The sources with the conversion tables are delivered on all platforms and can be adjusted or replaced by custom tables on all platforms.
- KDCADMI administration interface
 - Data structure *kc_pterm_str* and *kc_tpool_str*.
For the *map* field, additional values "1", "2", "3", and "4" are available on Unix, Linux, and Windows systems (for the four conversions). The values may be specified only for transport system applications (partner type APPLI or SOCKET).
 - Data structure *kc_lpap_str* and *kc_osi_con_str*.
For the *map* field, additional values "1", "2", "3", and "4" are available on Unix, Linux, and Windows systems (for the four conversions).

*1

2.1.5 User-specific error handling (Unix and Linux systems)

On Unix and Linux systems, a separate user signal routine can be created. This routine is called as soon as a signal occurs. It replaces the default error handling in openUTM (abnormal service termination + PENDER dump), i.e., it enables a service to be continued despite errors.

*1 Therefore the following interfaces has changed:

- Programming
 - The new functions KCX_REG_SIGNAL_HANDLER and KCX_UN_REG_SIGNAL_HANDLER for registering and deregistering the signal routine in openUTM.
 - The new KCX_SET_RELOAD_FLAG function for exchanging a work process after end-of-transaction and the KCX_WRITE_DUMP function for creating a UTM dump without service cancellation.

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The functions are available in COBOL and C.

2.1.6 Credentials for the XA database connection

- *1 • The credentials for the XA database connection can optional (as was previously the case) be specified in the start parameters.
- The user name and the password for the XA database connection can be changed via administration (KDCADMIN):
 - Operation code KC_MODIFY_OBJECT:
 - New object type KC_DB_INFO
 - New values KC_IMMEDIATE and KC_DELAY in the *subopcode1* field for controlling the time of the password change.
 - Data structure *kc_db_info_str*: New fields *db_userid*, *db_password*.
- The credentials for the XA database connection can be transferred with KDCUPD:
 - TRANSFER statement: New operand DB-CREDENTIALS=.

2.1.7 KDCUPD with changed number of databases

KDCUPD transfers all data even if the number of databases in the new generation increases. Prerequisites for this are that the openUTM version does not change and the sequence of existing databases in the generation remains unchanged.

2.1.8 Moving pending asynchronous messages for LTERM, LPAP, and OSI-LPAP bundles

For LTERM, LPAP, and OSI-LPAP bundles, pending asynchronous messages for slave LTERMs, slave LPAPs, or slave OSI-LPAPs can be automatically moved to a slave with an established connection after the waiting time has elapsed.

- Generation, KDCDEF statement MAX:
New operand MOVE-BUNDLE-MSGS= for controlling automatic moving.
- Administration interface KDCADMIN, data structure *kc_max_par_str*:
New field *move_bundle_msgs* for output of the generated value.

2.1.9 Other changes

- Output of the generation time at the administration interface
 - KDCADMIN data structure *kc_curr_par_str*:
New fields *gen_date_xxx* and *gen_time_xxx* for the output of the date and time of generation.
 - Command KDCINF STAT:
Additional output of the date and time of generation.
- Message when a message to OSI TP and LU6.1 partner is lost
If a message to an OSI TP and LU6.1 partner is deleted because it could not be delivered due to a permanent error, the new message K239 is output.
- Improved performance during communication between UPIC clients and UTM server applications.
- Modification of UTM messages
 - Message texts of K and P messages can also be changed on Windows.
To do this, the UTM tool KDCMMOD and the new UTM tool KDCWMSG are used.
 - Message texts and targets of U messages can be changed on Unix, Linux, and Windows systems. As a result, U messages can also be output to the system log file SYSLOG.
The existing procedure for changing K and P messages can now also be used for U messages.

- The port number range for Unix, Linux, and Windows systems is no longer restricted, i.e., all port numbers from 1 to 65535 can be specified.
- For CON statements as well as PTERM and TPOOL statements with PTYPE=APPLI/UPIC-R/SOCKET, the specification of PRONAM= parameter is now mandatory for Unix, Linux, and Windows systems. The same applies to the NETWORK-SELECTOR parameter of the OSI-CON statement.
- The UTM tool KDCEVAL has been extended as follows:
 - New operand SHOW-TSN in the KDCEVAL command OPTION for activating or deactivating the repeated output of the TSN or PID in the TRACE2 list.
 - Additional outputs in the list header, such as appli mode or test mode.

- *1 • Encryption
*1 The functionality of the openSSL library is used. The openSSL library is provided by the user.
- *1 • Installation on Linux, Unix and Windows systems - logging files
*1 Both, in the installation directory and the bit-mode sub directory the logging files utm.log and
*1 accordingly upic.log exists.
*1 The logging file of the installation directory includes "installation successful" only, if all actions of
*1 the 32 and 64 bit installation were successful.
- *1 • KDCEVAL on Linux, Unix and Windows systems for BeanConnect V6.5
*1 In UTM V6.5A10, the following enhancement is available to evaluate UTM applications.
*1 a) KDCEVAL – new parameter for the command OPTION
*1 OPTION BEANCONNECT = YES | NO or OPTION BC = YES | NO
*1 This parameter is only available for KDCEVAL on Linux, Unix and Windows systems.
*1 With BC = YES the lists TASKS and TACLIST will be output in the same format as used
*1 in BS2000. This means that information related to databases (elapsed times and
*1 number of calls) are issued.
*1 Because in non-BeanConnect applications no database records are written for DB-
*1 User-Calls, this kind of preparation is reasonable for BeanConnect Proxy applications
*1 only.
*1 b) In the lists TRACE and TRACE2 of KDCEVAL database records will be issued also on
*1 Linux, Unix and Windows systems as of openUTM V6.5A10. The issue of database
*1 records takes always place, that means independent from the new option
*1 BEANCONNECT=YES. For non-BeanConnect applications only database records
*1 about the transaction control are contained in one measurement (Start, Finish, Cancel).
*1 c) At the program interface of the administration for BeanConnect Proxy applications at
*1 Opcode *KC_GET_OBJECT* for TACs the fields *db_counter* and *db_elap_msec* are
*1 supplied in the structure *kc_tac_str*. This information can be read out, for example, by
*1 WinAdmin/WebAdmin.

2.2 Implemented change requests (CR)

Some of the new functions listed in section 2.1 were implemented as a result of change requests.

- *1 • Long hostnames of up to 64 characters
- *1 • KDCEVAL – output of the TSN into the list TRACE2

3 Technical information

3.1 Resource requirements

Hard disk storage requirements for installation:

openUTM:

Solaris SPARC	32/64-bit: < 1 GB
Linux	32/64-bit: < 500 MB
HP-UX(Risc)	32/64-bit: < 500 MB
HP-UX (Itanium)	32/64-bit: < 500 MB
AIX	32/64-bit: < 500 MB
Windows	32/64-bit: < 100 MB

The main memory requirements for an executable UTM application depends on the one hand on the types of products used, such as language connections, databases, X/Open interface and distributed processing, and on the other hand on the number and extent of the application programs.

The dynamic memory requirements of the UTM resources for process communication (shared memory) depend on the extent and parameterization of the KDCDEF generation.

3.2 Software configurations

	Solaris SPARC	32/64 Bit	as of V10
	Linux(SuSE)	32/64 Bit	as of SLES 11 PL4
*1	Linux(RedHat)	32/64 Bit	as of RHEL 6.5
	HP-UX (Itanium)	32/64 Bit	as of V11.31
	IBM-AIX	32/64 Bit	as of V6.1
	Windows	32/64 Bit	as of Windows 8.x
	Windows Server	32/64 Bit	as of Windows Server 2012

UTM-Cluster applications are supported on platforms Solaris SPARC and Linux. On Windows systems the general release of UTM-Cluster applications isn't freed.

The node applications of a UTM-Cluster application must run on identical platforms under the same bit mode.

NFS V4 is needed for access to the global cluster files of openUTM-Cluster applications.

*1 The use of openSM2 as of V9 is the prerequisite for the utilisation of the openSM2 function.

The following are supplied with the product for communication over TCP/IP:

*1	PCMX(Solaris)	6.0B30
*1	PCMX(Linux i585)	6.0B30
*1	PCMX(Linux x86_64)	6.0B30
*1	PCMX(HP-UX Itanium)	6.0B30
*1	PCMX(AIX)	6.0B30
*1	PCMX-32(Windows)	5.0B20
*1	PCMX-64(Windows)	5.0B20

The use of PCMX is only license-free in connection with openUTM.

When using openUTM V6.5A, the PCMX version supplied with the DVD or a higher one has to be used.

*1 For the use of the openUTM Crypt component on Unix/Linux systems the software openssl V1.0 is required.

*1 See also www.openssl.org.

The following versions are supported for distributed transaction processing with UTM applications:

openUTM(BS2000)	as of V6.3A
openUTM(Unix, Linux, Windows systems)	as of V6.3A

If problems occur with connections with UTM versions less than V6.3 that Fujitsu Technology Solutions is no longer obliged to maintain, the user is not entitled to warranty or correction claims. In this case we recommend that you update the partner application to versions of openUTM equal or higher than V6.3.

*1 The following products can be used for communication with IBM-SNA systems via LU6.2:
openUTM-LU62 (Unix or Windows systems) V5.1

*1 and, depending on the operating system, the third-party products:
Solaris:
SNAP-IX as of version 7.0.2.4; from Metaswitch Networks
Linux:
IBM Communications Server for Linux as of version 6.4
Windows:
IBM Communications Server for Windows, as of version 6.1.2

The following versions are supported for distributed transaction processing with Java EE applications:
BeanConnect as of V3.0B

For client/server communication optionally:

openUTM-Client(Unix systems/Linux/Windows)	as of V6.3A
(contains carrier systems UPIC V6.3; OpenCPIC V4.0)	
openUTM-Client(BS2000)	as of V6.3A

BeanConnect as of V3.0B
(also contains the component JConnect)

For administration using graphical interfaces:
openUTM WinAdmin V6.5
openUTM WebAdmin V6.5

*1 A C/C++ compiler is required for all Unix/Linux systems, for Windows systems Windows Visual Studio
*1 2005/2008 or higher is needed. For the use of the QuickStart Kit on Windows Visual Studio 2010 is
*1 required.

On Solaris systems Solaris Studio 12 is required for the deployment of the sample application.

Note about using the compiler XL C/C++ for AIX, V11.1:
There is a hindering error in conjunction with shared objects
<<http://www-01.ibm.com/support/docview.wss?uid=swg21443810>>

There is a patch for this problem from IBM which can be installed via "smit".
<<http://www-01.ibm.com/support/docview.wss?uid=swg24032451>>

COBOL-Compiler:
Development of Cobol UTM applications:
NetCOBOL as of V10.4 (Linux 64bit)
NetCOBOL as of V10.1 (Windows 32bit)
Micro Focus Visual COBOL as of V2.0

For runtime:
Cobol runtime licenses from MicroFocus
Note: The introduction of UTM system processes can result in problems with Cobol runtime licenses if the calculation is too exact.

When calculating the required number of licenses a maximum of three additional licenses must be taken into account.

On Unix and Linux systems, the following database systems can be used:

ORACLE	as of V11.2
INFORMIX Enterprise Edition	as of V12.10

On Windows systems, the following database systems can be used:

ORACLE	as of V11.2
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Note:

The software configuration includes some products that are still technically usable but for which later versions are available. You should always try and use the latest versions that are available.

3.3 Product installation

3.3.1 Installation on Unix/Linux platforms

On **Solaris** mount the DVD according to your operating system manual. In the appropriate directory you will find the products which can be installed with „pkgadd“:

```
pkgadd -d <DVD>/<package>.pkg
```

On **Linux** use the standard procedure „rpm“:

```
rpm -i <DVD>/<package>.rpm --nodeps [--ignorearch] [--replacefiles]
      [--prefix=<install-dir>]
```

For installing PCMX, please read the corresponding readme file.

For installing OUTM-LU62, please read the corresponding readme file.

On **HP-UX** mount the DVD (mount -F cdrfs -o cdcase <device> <mountpoint>).

Change to the product directory and run the installation script with:

```
./xpinstall.sh
```

For installing PCMX use:

```
swinstall -s <prod-dir>/cmx.ds -x target_type=tape -x reinstall=true CMX
```

On **AIX** mount the DVD (mount -v cdrfs -r <device> <mountpoint>).

Change to the product directory and run the installation script with:

```
./xpinstall
```

For installing PCMX use:

```
installp -a -F -d <prod-dir>/cmx.ds CMX.all
```

For installing OUTM-LU62, please read the corresponding readme file.

On all Unix and Linux systems both the 32-bit and the 64-bit environment of openUTM is installed

3.3.2 Installation on Windows platforms

*1 On Windows systems there exist two separate installation-packages of openUTM for 32-bit and 64-bit environments. For the installation on a 32-bit or 64-bit environment, please change to the product directory and run "utm-32.msi" or "utm-64.msi" respectively "utm-crypt-32.msi" or "utm-crypt-64.msi" under administration rights.

The recommended installation sequence is as follows:

1. Microsoft Visual C++
2. (optional) selected Cobol Compiler
3. PCMX (from openUTM-DVD)
4. openUTM

As of Windows 8.x openUTM V6.5 must not be installed into a directory which contains spaces, e.g. "Program Files", another directory has to be used.

The length of the installation path must not be longer than 39 characters.

3.3.3 Installation together with C++ environment on Unix/Linux platforms

When using C++ subprograms make sure that the C++ development environment of openUTM can be activated with the installation.

The following applies for the C++ Compiler:

- Solaris: type CC must return as result the C++ Compiler
- Linux: type g++ must return as result the C++ Compiler
- HP: the C++ Compiler must be under /opt/aCC/bin/aCC
- AIX: the C++ Compiler must be under /usr/vacpp/bin/cc

mainutmCC.o is then created during installation of openUTM.

mainutmCC.o can also be created after installation of openUTM (if required) by making the following entries:

```
UTMPATH=<utmpfad>
          <utmpfad>/shsc/CCmainutm
export UTMPATH
```

For further details, see the manual "Using openUTM Applications".

*1 3.3.4 Installation together with an openssl environment on Unix/Linux platforms

*1 The openssl software has to be installed before installing openUTM Crypt. Please check
*1 whether a library named *libcrypto.so* exists under */usr/lib* and */usr/lib64* after installing the openssl
*1 software. If there exists a library named *libcrypto.so.<version>* instead of it, you must set up a symbolic
*1 link:

```
*1 ln -s libcrypto.so.<version> libcrypto.so
```

*1 During the installation of openUTM Crypt on Unix/Linux platforms the UTM Encryption library is linked
*1 with the openssl software, available on the target platform. This happens for the 32 bit runtime
*1 environment as well as for the 64 bit runtime environment.

*1 If during one of the linking actions the openssl software cannot be accessed, the encryption is not
*1 available for UTM. In this case the result is „not successful“. Please analyze the content of the logging
*1 files *libutmencrypt.so.out* and *libutmencrypt.so.err* in the directory *<utmpath>/sys/crypt*.

*1 As soon as the openssl software is available you can repeat the binding action:

*1 a) Login as root and change to the UTM installation directory *<utmpath>*.

*1 b) Execute the script *<utmpath>/shsc/xpcrypt*.

*1 c) Check the linking logging files *libutmencrypt.so.out* and *libutmencrypt.so.err* in the directory
*1 *<utmpath>/sys/crypt*.

3.3.5 Installation logs

During installation on Unix/Linux systems, a file with the name <utmpath>/utm.log is created. This file stores the information output to the terminal during installation.

3.3.6 Notes: Kernel parameters for openUTM

It may be necessary to increase the value of some of the Unix kernel parameters in order to run a UTM application. This affects the following kernel parameters (if more than one kernel parameter is specified per line, all the specified parameters must be changed to the same value):

- MAXUP Maximum number of processes per user
It is always possible that a process bottleneck can arise for individual users (error message: fork failed) if they have to start a very large number of processes. In this event, MAXUP must be adjusted.
- SEMMNS, SEMMNU Maximum number of semaphores and semaphore structures
The maximum number of semaphores required can be calculated using the description of MAX SEMKEY in the "Generating Applications" manual.
You must take into account the fact that other products may be installed on the computer that also require semaphores. For instance, at least 20 semaphores are required for every INFORMIX database that has been started.
- SEMMAP, SEMMNI Maximum number of semaphore identifiers
The semaphores are grouped to form semaphore fields and a (unique) semaphore identifier is assigned to each semaphore field.
openUTM and Informix each group 20 semaphores to form one semaphore field.
- SFSZLIM, HFSZLIM Maximum size of a file (in bytes)
Values as of 48 MB (0x3000000) are generally sufficient even for large UTM dumps.
The entry ULIMIT=... in the file /etc/default/login must also be adjusted to match the new value.
ULIMIT specifies the maximum file size (for normal users) in blocks (1 block = 512 bytes).
- SDATLIM, HDATLIM Maximum swap space per process (in bytes)
- SVMMLIM, HVMLIM Maximum virtual memory per process (in bytes)
In order to allow larger UTM applications to be linked with COBOL program units, these values must be increased to at least 48 MB(0x3000000). When doing this, you must make sure that the swap area of the system is >= 48 MB.

Changing the kernel parameters under Solaris systems

Generally it is not necessary to change the kernel parameters. It is recommended to use "/etc/project" for tuning. Please refer to the Oracle Solaris documentation for details.

Changing the kernel parameters under Linux systems

It is not generally necessary to change the kernel parameters. Please refer to the documentation from your Linux distributor for details on the files in which the values can be changed and on how to generate a new kernel.

Changing the kernel parameters under HP-UX systems

<u>Parameter</u>	<u>Define</u>	<u>Default</u>	<u>Recommendation</u>
Max. no. of processes/user	maxuprc	256	sufficient
Max. no. of semaphore IDs	semmni	64	sufficient
Max. no. of semaphores	semmns	256	1024
Max. no. of semaphore structures	semmnu	30	200
	semume	10	66
Swap space	-	2*Mem	4*Mem

It is recommended that you use the HP tool "/usr/bin/sam" for tuning. For details, refer to the HP manual: System Administration Tasks - HP-9000 Series 800 Computers.

Changing the kernel parameters under AIX systems

Parameter	Define	Default	Recommendation
Max. no. of processes/user	maxuprc	256	sufficient
Max. no. of semaphore IDs	semmni	36	64
Max. no. of semaphores	semmns	128	256
Swap space	-	2*Mem	4*Mem

It is recommended that you use the AIX tool "/usr/bin/smit" for tuning. For details, refer to the AIX manual: System Management Guides - RS/6000.

3.4 Product use

3.4.1 Notes for upgrading to openUTM V6.5A

Perform the following steps when upgrading from an earlier version

- Generate KDCFILE and KDCROOT with the KDCDEF of V6.5A
- Compile the ROOT source
- Compile the MSGTAC program unit, if present
- If a separate message module is used, the source for the message module must first be newly generated with KDCMMOD and then compiled again
- Link the application program
- Transfer the user data with the KDCUPD of openUTM V6.5A to the new KDCFILE if the data is relevant

KDCUPD supports the following version upgrades:

*1	openUTM(Unix/Linux/Windows systems) V6.2A	to	openUTM(Unix/Linux/Windows systems) V6.5A
	openUTM(Unix/Linux/Windows systems) V6.3A	to	openUTM(Unix/Linux/Windows systems) V6.5A
	openUTM(Unix/Linux/Windows systems) V6.4A	to	openUTM(Unix/Linux/Windows systems) V6.5A
	openUTM(Unix/Linux/Windows systems) V6.5A	to	openUTM(Unix/Linux/Windows systems) V6.5A

Note:

A transfer of the user data with KDCUPD from 32-bit mode to 64-bit mode is within the actual version.

3.4.2 Converting a stand-alone application to a UTM-Cluster application

The following conversions are possible with a UTM-Cluster application:

- Conversion of a stand-alone application V6.5A to a UTM-Cluster application V6.5A
- Conversion of a UTM-Cluster application V6.5A to a stand-alone UTM application V6.5A

For detailed description see the manual "Using under Unix and Windows Systems".

3.4.3 Client programs with a local connection to openUTM

Client programs with a local connection to openUTM must be recompiled and linked again.

3.4.4 Linking UTM OSI-TP applications on Unix and Linux platforms:

The following sequence must be adhered to when specifying the OSS libraries:
The library libossutm.so must be specified first followed by the library liboss.so.

If the sequence is not adhered to, the following startup error occurs:

P001 Error on OSS call (o_create() -): - 1, 300, 199, 0
K060 Application run aborted; reason = XINI06

3.4.5 Linking and running UTM applications on Unix and Linux systems

As of openUTM V6.5 the environment variable LD_LIBRARY_PATH or LD_LIBRARY_PATH_64 must be set to <utmpath>/sys when linking and running a UTM application on Unix and Linux systems.

3.4.6 Linking UTM applications on AIX systems

As of openUTM V6.5 the library <utmpath>/sys/libutmconvt.so must be specified when linking a UTM application on AIX systems.

*1 3.4.7 openUTM V6.5A KDCDEF without Encryption

*1 During the run of the UTM generation with KDCDEF (without Encryption) in V6.5A00 the message K508
*1 is output, if the partner is generated as of type UPIC-R, unless the instruction *OPTION GEN-RSA-*
*1 *KEYS=NO* in the generation has been specified.
*1 Even though this behaviour was described, but UTM has created a RSA key in the case of KDCDEF
*1 (without Encryption) also. Therefore the specification of *OPTION GEN-RSA-KEYS=NO* was not
*1 necessary. With V6.5A10 this is no longer possible.

*1 3.4.8 Notes for the use of openUTM V6.5A incl. Encryption

- *1 • Windows systems
*1 During the run of the tool KDCDEF and the run of the UTM application it must be ensured, that
*1 the library libeay32.dll is found. If necessary the PATH variable has to be extended in an
*1 applicable manner.
- *1 • AIX systems
*1 Additionally the LIBPATH variable has to be extended by the value “<utmpath>/sys” on AIX
*1 platforms

3.4.9 Notes on a sample application for UTM-Cluster applications

The following must be taken into account when installing a sample application for a UTM node:

- For a sample application the conversion of an installed UTM node application into a stand-alone application is not supported.
- A filebase directory for a node application and a filebase directory for a stand-alone application must not be created in the file tree under the same superordinate directory.

3.5 Discontinued functions and those to be discontinued

3.5.1 Discontinued functions

Several functions have been deleted and can no longer be generated in KDCDEF. If they are still specified, this will be rejected with a syntax error in the KDCDEF run.

The following has been deleted:

- The conversion file between short and long hostnames (mapping function) and the environment variable UTM_NET_HOSTNAME are no longer supported, because by default openUTM supports hostnames of up to 64 characters in length.
- KDCDEF statement MAX:
Operand NET-ACCESS= for setting up the network connection (single-threaded/multi-threaded). The multi-threaded network connection is always used.
- KDCDEF statement FORMSYS for a formatting system.
- KDCDEF statement OPTION:
Operand CHECKTNS= for comparing the UTM generation with the TNS generation.

3.5.2 Functions to be discontinued

- TNS operation
In openUTM V6.5 the TNS functionality will be supported for the last time.
As of openUTM V6.5 the address information has to be specified completely at the configuration with KDCDEF.
- Encryption
With openUTM V6.5 following encryption Level are supported for the last time:
 - Encryption level 1 and 2 for PTERM and TPOOL
ENCRYPTION-LEVEL=1 (length of RSA key 200 Bit, DES method)
ENCRYPTION-LEVEL=2 (length of RSA key 512 Bit, AES method)
 - Encryption level 1 for TAC
Operand value *ENCRYPTION-LEVEL=1* for KDCDEF statement TAC
(Encryption with the DES method)

3.6 Incompatibilities

- KDCS interface
 - call INFO SI
The length of the data, returned by the KDCDEF call INFO SI, has been changed. Existing programs get the return code 01Z in openUTM V6.5. To avoid this return code, these programs have to be translated new with the data structure of openUTM V6.5.
 - calls SIGN ON, CK and CP
At SIGN ON and SIGN CK the parameter KCLA have set to 16 (up to now 8) and at SIGN CP to 32 (up to now 16), otherwise the call delivers the return code 43Z.
 - call DADM RQ
At DADM RQ the parameter KCLA have set to 54 (up to now 53), otherwise the call delivers the return code 01Z.
- Administration
 - Program interface in general:
The program interface of the administration has changed incompatible. Existing programs are not affected.
If administration programs will be translated and *version_data* set to the actual version 10 (KC_VERSION_DATA_10), the new fields for the long hostnames must be served respectively for calls to modify objects. For calls to read object characteristics in the IdArea and the SelectionArea the fields for the long hostnames must be served also. Affected are the objects KC_CON, KC_LSES, KC_PTERM, KC_TPOOL, and KC_CLUSTER_NODE.
KC_GET_OBJECT: for the object types KC_LPAP, KC_OSI_CON, KC_PTERM, and KC_TPOOL in the field *map* the value ,1' instead of ,S' for SYS1/SYSTEM1/SYSTEM will be returned in the data structures *kc_lpap_str*, *kc_osi_con_str*, *kc_ptrm_str* and *kc_tpool_str*.
 - Program interface *obj_type=KC_DB_INFO*:
As of openUTM V6.5 you have to specify *id_lth=2* for calls at the program interface with *opcode=KC_GET_OBJECT* and *obj_type=KC_DB_INFO*. Up to now *id_lth=0* has had to be specified.
 - Program interface *obj_type=KC_USER*:
Administration programs, which sets a new, already encrypted, password (*pw_encrypted = `Y ^ A`*) for a user, have to set the version of the program interface of the administration (*version_data*) to the actual version 10 (KC_VERSION_DATA_10) and to write the new encrypted password in the new field *password16*.
- Messages
The messages K028 and K121 are omitted. They will no longer used by openUTM V6.5. For the messages K004 and K006 message texts have changed.
- Standard logon method and intermediate dialog of a logon process
The standard logon method of UTM and the intermediate dialog of a logon process have been converted to output minimum of information about the validity of user ID and password if the credentials are invalid.

*1
*1
*1
*1

The messages K004 and K006 can no longer be differentiated when issued to the targets, STATION, SYSOUT, and SYSLST, because the texts of these messages are adapted. For the message targets MSGTAC, SYSLOG, and USER-DEST the messages K004 and K006 can be differed furthermore.

If the end of the validity of the password has reached and the application is generated without Grace-Sign-On, the message K092 is outputted first (up to now K120). This happens for users with light or with dark password, but only no login operation is active. After the input of the password the message K120 is output, if the password was correct. Message K006 is issued alternatively.

Has the validity of the password ended and the application is generated with Grace-Sign-On, the message K092 will be put out first (up to now K155). This happens for user with light or with dark password. For user with dark password this happens also in an intermediate dialog of a

login process. If the old Password is given correctly, than one of the messages K097, K120, K125, or K155 will be output depending on the situation. Message K006 is issued alternatively.

For a user with a dark password, which expires shortly, the message K092 is issued (up to now K121). If the old Password is given correctly, than the message K122 will be issued together with the message K008. The user has the new occasion to change the password not before the next login.

For user with dark password, for which the minimum of validity has not reached, the message K092 is issued for the requirement of the password (up to now K028). Changes a user the password in the message K092, although it is forbidden at that time, the user will be signed in and openUTM issues together with the message K008 the new message K112 (A password change is not possible at this time).

Is user locked or already signed in, than the password will be checked first. Therefor the message K092 is issued first if applicable. This happens for users with dark password also in an intermediate dialog of a login process. If the password is inserted correctly, one of the messages K005 or K007 is issued depending on the situation. Message K006 is issued alternatively.

In the case the inserted login name is unknown for the application it will be prompted for input with message K092 first. Only after an input of a password the login of the unknown user will be refused.

*1 **The changes in the message outputs of a user logon have to be regarded particularly by**
*1 **programs, which emulates a terminal interface.**

- MSGTAC program
The interface of the MSGTAC program has changed incompatible. Fields, containing the hostname or passwords are extended to 64 bytes. The MSGTAC user programs have to be adapted respectively.

*1 **At an evaluation of the SYSLOG file by an own program users have to respect the**
*1 **changed MSGTAC structures.**

- Logging Exit
The interface to the Logging Exit has changed incompatible. The fields, containing the hostnames, are extended to 64 bytes.

*1 **The user programs for the Logging Exit have to be adapted respectively.**

- BCAM Trace in openUTM
The maximum length of data, which can be recorded at online BCAM trace function, is shorted by 56 bytes. The actual maximum value is now 32.624.

- Generation
 - MAX TRMSGLTH
Independent of the generated value for MAX TRMSGLTH KDCDEF takes always the maximum value of 32700 for TRMSGLTH.
 - PRONAM and NETWORK Selector
As of openUTM V6.5 for the generation parameters
CON PRONAM=
PTERM PRONAM=
TPOOL PRONAM=
OSI-CON NETWORK-SELEKTOR=
an input of blanks as hostname or network selector will be rejected with an error message by KDCDEF, same procedure as on BS2000 systems.
The input of blanks as hostname is only permitted for PTERM and TPOOL with PTYPE = TTY, UPIC-L or PRINTER.

3.7 Restrictions

3.7.1 Restrictions in UTM-Cluster applications

None

3.7.2 General restrictions

- Operating an openUTM application
On Windows 64-bit platforms the PCMX functionality TNS is no longer supported. I. e. all necessary address information for the communication has to be specified at the generation with KDCDEF.
- Notes on using the sample application:
No warranty is offered for the sample application and no service commitment is entered into.
- On AIX systems, the UTM system modules can only be linked in statically. This is the same as for predecessor versions of UTM V6.5A.

3.8 Procedure in the event of errors

The following documentation is required for diagnosis if an error occurs:

- Detailed description of the error situation
- Versions/correction statuses of the software involved
- Exact details on the computer type

All error documentation should be as complete as possible. The following error documentation is required:

- UTM dumps for all work processes and the associated gcores. These files should be available as binary files, i.e. not in print-edited form
- SYSLOG file(s)
- stdout/stderr logs of the UTM processes
- KDCDEF generation, start procedure and start parameter
- core files with the associated phases (utmwork) and shared objects. The shared objects can be determined using "ldd utmwork"
- Linker and compiler lists

Also in the event of errors in a UTM-Cluster application:

- all Cluster global files, logs, and DUMPS of all node applications
- In case of problems that were caused by the interaction of the node applications the log files of all other node applications
- The start procedure and the procedures specified during generations as EMERGENCY-CMD and FAILURE-CMD

An attempt should be made to reproduce the errors using static libraries.

Procedure in the event of errors:

- Analyze the PENDER dump
- Reproduce the error using a suitable debugger such as dbx, gdb
- Determine the call hierarchy for the core using a debugger

If the application terminates abnormally, the UTM dumps and gcores of all processes must be saved. If possible, the termination should be reproduced with TESTMODE=ON (start parameter).

Termination with signals

If a PENDER dump occurred with 70Z/XT10 or XT11 or if the application terminated with SIG010/SIG011 (SIGBUS/SIGSEGV signal), UTM signal handling should be deactivated with the start parameter START STXIT=OFF so that a core dump will immediately be generated when the faulty command is issued.

Before the application is restarted again, it is absolutely necessary to call kdcrem in order to delete or reset any semaphores and shared memories which may still be present as well as any status information on the application in the *<utmpfad>/applifile*.

The following additional documentation can also be created in the event of errors relating to the openUTM network connection:

- Messages from the UTM network processes in stdout/stderr
- CMX traces
- OSS traces
- UTM-BCAM trace
- Conversion file for containing entries for mapped hostnames
- In the case of heterogeneous connections, generation information and trace from openUTM LU6.2 and its SNA components and from the IBM SNA system

For details on creating the UTM-BCAM traces and the OSS traces, refer to the manual "Messages, Debugging and Diagnostics".

The following additional documentation can also be created in the event of errors relating to databases:

- XA debug trace
- For further documentation, see the relevant Release Notice for the database system

Following startup errors (message K049), for instance with insert 40 / 32, the UTM tool kdcrem must be called before the program is restarted.

4 Hardware support

Support is provided for the hardware, on which the mentioned operating system versions can run. This includes all systems based on Intel x86 technology, such as laptops, PCs, PRIMERGY systems; Itanium-based systems; SPARC systems, e.g. PRIMEPOWER systems and other Unix systems: IBM pSeries; HP PA-RISC, e.g. series 9000; other platforms on request.

CPU at least 250 MHz, RAM at least 256 MB

UTM-Cluster applications:

- A network file system/service (NFS) is necessary for the operation of UTM-Cluster applications
- openUTM (Solaris systems):
Nodes of a UTM-Cluster application can be systems with different Solaris versions, but standardized addressing (either 64-bit or 32-bit). It is not possible to use nodes with other operating systems (Linux, BS2000)
- openUTM (Linux systems):
Nodes of a UTM-Cluster application can be systems with different Linux versions, but standardized addressing (either 64-bit or 32-bit). It is not possible to use nodes with other operating systems (Unix systems, other Linux distributions, BS2000)