K2 SIMU
CONNECTION SERVER
SOFTWARE

INSTALLATION GUIDE
v1.4

Please, always check the www.bse.hu website to see whether you are using the latest version of the present document.

Author:	IT Development and Operation Division
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Contents

1.   Introduction

The Installation Guide for K2 Connection Server Software (hereinafter: the Software) summarises the steps for the Software installation and its environmental requirements. Installation of the Software enables trading on the markets of the Budapest Stock Exchange Ltd. (hereinafter: the BSE), inasmuch that the relevant network and communication channels are available.

1.1.   Targeted User Group

This document was prepared for Remote Traders' IT professionals who are authorised to change settings and perform installations on workstations used by brokers, i.e.
- IT staff at Remote Traders
- System Administrators
- Professionals at IT companies authorised by Remote Traders to operate IT systems.

1.2.   Legal Issues Concerning the Use of K2 Connection Server s

The use of the Software is controlled by BSE regulations and an individual contract between the Remote Trader and the BSE. Both the Regulations On the Operation and Use of Remote Trading and the CEO's resolution putting the Regulations into effect can be viewed at the BSE's official publication site on the Internet, www.bse.hu. The development and marketing licence rights of the Software are granted to the BSE while the utilisation rights are granted to the Remote Trader according to the contract between the BSE and the Remote Trader at the time of preparing this document. Other users are not permitted to use or apply the Software for any purpose.

2.   Installing the Software

2.1.   Hardware and Software Requirements of the Software Installation

The hardware and operating system requirements for installing and running the Software are published by the BSE in the form of a resolution from the CEO. The resolutions can be found on the BSE website. The conditions described in this document must be met in order to install the Software. The current document describes the installation in a Red Hat Linux environment.

The following operating systems are supported at the time of preparing this document:

Red Hat Linux ,HP-UX

The tested environments are as follows:

> *Red Hat Linux 4, 5, 6.5*
> *HP-UX 11.0 (PA-RISC)*

If you wish to install the Software under a newer version of the operating systems, please check whether it is listed among the environments tested by the BSE.

Minimum hardware requirements
- *IBM PC PIII or higher*
- *Min. 128 MB Ram*
- *10 GB hard disk*
- *video card, 1024*768 resolution.*

2.2. Downloading the Software Installation Kit

In order to install the Software, download the Software Installation Kit, which can be accessed on this link: https://bse.hu/pfile/file?path=/site/Magyar/Dokumentumok/Tozsdetagoknak/MIFID-II/K2_Installation_Kit_MiFID_version_SIMU.zip1

If you download the installation kit from the website, it is recommended that you download it on another computer and transfer the installation kit to the Trader Workplace PC on a data medium or through the network.

2.3. Preparations

Your computer may contain earlier versions in various directories, previously copied by the BSE. As these are simply copied, they can be removed by deleting the files and directories. Please be sure to keep the earlier configuration files (e.g. */k2/cfg/pgw1.cfg, /k2/cfg/pgw2.cfg, /etc/services, /k2/cfg/ifss.uaf, k2/cfg/pgwtsmr1.ini,* and */k2/cfg/pgwtsmr2.ini*).

2.4. Other Components Required for Operating the K2 Software

For *Linux/Red Hat* distribution

ntp-4.1.1-1.i386.rpm Network Time Protocol Package or a higher version is required for time synchronisation with the BSE Central System (this package can be found on the Red Hat distribution installation disk)

– install: rpm –i ntp-4.1.1-1.i386.rpm

after installing the package, adjust the following settings in the */etc/ntp.conf* file

 # BSE NTP Server

server 192.168.7.120 prefer

server 192.168.7.2

server 192.168.7.3

server 192.168.7.4

pdksh-5.2.14-16.i386.rpm – (ksh) Korn Shell clone program or a higher version is required to run k2 ksh-shell scripts (this package can be found on the Red Hat distribution installation disk)

– *install : rpm –i pdksh-5.2.14-16.i386.rpm*

openssh-server-3.1p1-3.rpm – SSH server package or a higher version required for remote access and verification (this package can be found on the Red Hat distribution installation disk)

– *install : rpm –i openssh-server-3.1p1-3.rpm*

after installing the package, the following must be set in the */etc/ssh/ssd_config* file:

Port 22
Protocol 2
HostKey /etc/ssh/ssh_host_rsa_key
HostKey /etc/ssh/ssh_host_dsa_key

PermitRootLogin no
RSAAuthentication yes
PubkeyAuthentication yes
AuthorizedKeysFile   .ssh/authorized_keys
PasswordAuthentication no
PermitEmptyPasswords no

If this latter parameter group is set, BSE personnel can use a K2 username to remotely log on to your computer (if it can be accessed through a network) via SSH.

In order to stop SSH service, type the following command as a root user: service sshd stop.

Installation steps for the server Software in a Red Hat Linux environment (connecting to the BSE live trading system):

1. Create a user with a k2 username in your system, and log on as the new user
   e.g. *adduser k2*

   Important! NOW Log on as a k2 user and continue with the subsequent installation steps.

2. Start the installation kit that was downloaded according to paragraph 2.2 with the following command on the *Linux* platform, in the *k2 user's $HOME directory*

   cd $HOME
   gzip –cd k2_2_3_1_linux_install.tar.gz | tar –xvf –

   After successful installation, the following directories are installed:
   /aststools   - aststools components
   /k2   - main directory
   /k2/bin   - executable files
   /k2/cfg   - configuration files
   /k2/doc   - documentation
   /k2/log   - log files
   /k2/pkg   - prepared ifsc packages

3. After completing the commands of the previous paragraph, the *.bash_profile* of the k2 user is

prepared. Check the following configuration commands in the *.bash_profile* file or set them in the *profile* of the given user if another *shell* is run:

. ./aststools.sh	Important! There is a space between the two dots!
. ./setup.sh	Important! There is a space between the two dots!

the */k2/aststool.sh* and */k2/setup.sh* scripts will automatically set the parameters required to operate k2. These parameters are as follows:

TSMR2=/home/k2/aststools/TSMR
SYSSRV2=/home/k2/aststools/TSMR/
AMP2=/home/k2/aststools/PhaseII/pub/
TSMRMSGFILE=$TSMR2/tsmr.msg
PGWROOT= 'pwd'
TSMR2CONFIG=$PGWROOT/cfg/pgwtsmr2.ini
PGW2CONFIG=$PGWROOT/cfg/pgw2.cfg
SL_LIBRARY_PATH=$SH_LIBRARY_PATH:$PGWROOT/bin
PATH=$PATH:$HOME/bin:$HOME/k2/k2/bin

4. Find and complete the following items in the */k2/cfg/pgw1.cfg* and */k2/cfg/pgw2.cfg* files (after signing the contract, the required information can be obtained from BSE personnel):

    username =
    firmname =
    licence =

5. Insert the following lines into the */etc/services* file:

    # MMTS
    mm2_gateway 30005/tcp
    mm2_gateway 30005/udp

    # k2
    ifss2   40011/tcp
    ifss2   40011/udp

6. Setting the SHM (Shared Memory)

    Set the shared memory (SHM) size as a root user:
    -   *echo 134217728 >/proc/sys/kernel/shmmax* – sets the kernel shared memory
    -   write the following setting into the */etc/sysctl.conf* file: *kernel.shmmax = 134217728*

7. Configuring the number and names of the clients logging on to the server Software:

    The maximum number of client applications connected to the server Software is set by the purchased and installed licence file. If you purchased the Standard or Plus version, set the appropriate number (5 or 10) of client users (applications).

    Each client application logs on to the server Software with a separate identity code. Set these codes in the /k2/cfg/ifss.uaf file.

    # ifss.uaf file

```
demob:password:a:query,entry,confirm,config,admin,bypass
demo:password:a:entry,confirm,query,config,admin
broker1:pwd1:a:query,entry,confirm
broker2:pwd2:a:query,entry,confirm,config,admin
broker3:pwd3:a:query,entry
#broker4:pwd4:a:query,confirm,entry
broker5:pwd5:a:query,entry,confirm,config
broker6:pwd6:a:query
```

The structure of the lines are as follows:

<client username>:<client password>:<client state>:<client authorisation>

client state: "a" = active, "s" = suspended (without quotation marks).

client authorisations: combination of the following items separated by commas

> **query** Authorisation for data queries.
>
> **entry** Entering, modifying, and deleting data.
>
> **confirm** Confirming orders in K2.
>
> **config** Configuring lists from the order book.
>
> **bypass** The entered orders become confirmed automatically.
>
> **admin** Not used.

8. Test start of the server Software (PGW and IFSS modules)

You can use the following commands to test whether the Software starts and logs on to the BSE central trading system. This requires an operating network connection, and you will need the MMTS username and ID issued by the BSE Listing and Supervisory Division (you will need this information for the *k2start 1* and *k2start 2* commands).

```
$PGWROOT/k2start 2
 export IFSHOST=localhost
 export IFSSERVICE=ifss2
 export IFSUSER=demo
 export IFSPWD=password
$PGWROOT/bin/get_table -2 market
```

When running the get_table -2 market command, the market table data are displayed in the following form:

```
2|MKT|COM      |Commodity            |00|
2|MKT|DEV      |Deviza alaptermékek     |00|
2|MKT|FUT      |Határidõs piac        |00|
2|MKT|GAB      |Gabona             |00|
2|MKT|KÖTV      |Állampapírok         |00|
2|MKT|OPT      |Opciós piac         |00|
2|MKT|RV       |Részvények          |00|
```

 If the test run fails, an error message informs you of the error.

2.5. Installation Steps of the Server Software in a Red Hat Linux Environment (Connecting to the BSE MIFID2 TEST Trading System)

In order to connect to the BSE TEST trading system, change the following item in the /k2/cfg/pgwtsmr2.ini files

broadcastAddress=192.168.6.1
# test server IP address

2.6. Installing the Client Software (IFSC) Routine Directory in a Windows Environment

Installing the IFSC package in a Windows NT or WIN32 system:

1. Create an empty directory, e.g. k2. This is the PGWROOT directory.

2. Set the environment as follows:

Insert the following lines into the \System32\drivers\etc\services file:

ifss2   40011/tcp
ifss2   40011/udp

Copy the *ifs.dll* or *ifstest.dll* file into the directory of your application, or into the \System32 directory in order to operate your k2 client application.

3. Test start

You can use the following commands to test whether the client Software is able to appropriately connect to the server Software. This requires a network connection between the K2 server and the K2 client computer, and the K2 server must be running.

In a Windows environment, get to the *cmd* prompt – Start – Run – *cmd* and then set the following environment variables:

set IFSHOST=localhost
set IFSSERVICE=<service name of ifss>
set IFSUSER=demo
set IFSPWD=password
get_table -2 market

When running the get_table -2 market command, the market table data are displayed in the following form:

```
2|MKT|COM        |Commodity            |00|
2|MKT|DEV        |Deviza alaptermékek      |00|
2|MKT|FUT        |Határidõs piac       |00|
2|MKT|GAB        |Gabona           |00|
2|MKT|KÖTV        |Állampapírok         |00|
2|MKT|OPT        |Opciós piac        |00|
2|MKT|RV         |Részvények         |00|
```

If the test run fails, an error message informs you of the error.

3.　Contacting the Help Desk

If you have any installation related problems, please contact the Help Desk.
Telephone: 429-6753