

Connectivity Document:
Commodity, Equity Derivatives
and
Currency / Interest Rates
NUTRON



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1. References

Document*	Author	Version	Issue Date

2. Version Control

Version	Author	Date	Reason for Changes
Version 2.0	Matthias Kempgen	12 February 2007	Bandwidth requirements, Front End section, IP addresses
Version 2.1	Matthias Kempgen	13 February 2007	Added NAS request process
Version 2.2	Matthias Kempgen	13 February 2007	Glossary updated
Version 2.3	Matthias Kempgen	01 August 2007	Added Production IP addresses and port numbers
Version 2.4	Matthias Kempgen	16 October 2007	Added Windows VISTA as a supported Operating System
Version 2.5	Matthias Kempgen	01 March 2008	Updated Bandwidth requirements and PC specifications Added backup link note under 'Connectivity to the JSE network'
Version 2.6	Matthias Kempgen	11 June 2008	Link to download MSXML4
Version 2.7	Matthias Kempgen	31 July 2008	Added Prod and QA availability and market times
Version 2.8	Matthias Kempgen	14 October 2008	Amended open order period ahead of Agris go-live in section 5.10
Version 2.9	Matthias Kempgen	04 May 2009	Added IP addresses for NUTRON post JSE router cutover project
Version 2.10	Matthias Kempgen	20 June 2009	Addition of external test environments for the new Yield-X markets
Version 2.11	Matthias Kempgen	26 August 2009	Addition of Yield-X production environment details
Version 2.12	Matthias Kempgen	12 November 2009	Addition of production Yield-X Market times
Version 2.13	Matthias Kempgen	23 November 2009	Addition of new EDM and APD external test environment IP addresses
Version 2.14	Matthias Kempgen	06 May 2010	Added Global Market ports
Version 2.15	Matthias Kempgen	21 July 2010	Renaming of Markets
Version 2.16	Matthias Kempgen	26 August 2010	Minimum bandwidth recommendations updated
Version 2.17	Matthias Kempgen	23 May 2011	Minimum Bandwidth recommendations updated Minimum workstation recommendations

3. Introduction

The purpose of this document is to illustrate the connectivity options available to customers (Trading Members, Clearing Members and Information Subscribers) who will access the new JSE trading systems for Commodity Derivatives, Equity Derivatives, Global markets, Currency Derivatives and Interest Rates.

The JSE reserves the right to change IP addresses and port numbers of the new trading system environments but will communicate any such changes.

Information Subscribers – please refer specifically to section 5.9 for information on infrastructure requirements for connection to the new systems via the API as well as all other sections of the document

4. Glossary of terms

IP	Internet Protocol
IPX	Novell Netware protocol (Internetwork Packet Exchange)
ISDN	Integrated Services Digital Network
JSE	JSE Ltd
NUTRON	Nu Trading Online
TCP	Transmission Control Protocol
Users	Recipients of JSE derivatives trading and information services
NAS	Network Access Service

5. User Connectivity

5.1 Connectivity to the JSE Network

Currently members connect to the JSE systems using dial-up, ISDN or leased lines, with routers configured for TCP/IP.

To access the new system various options are available:

1. Users can connect via existing leased lines. Users need to consider bandwidth utilisation on these circuits and impact to their current trading activities, and may as a result need to consider bandwidth upgrades to existing circuits. Routers must be configured for IP (see section 3.2 below).
2. Members can elect to install new leased lines to facilitate connectivity to the new trading system.
3. MTN Managed Network option – this option will enable users to connect to the JSE via the MTN MPLS network offering cost advantages and introducing connectivity options like leased line connectivity to a local MTN POP.
4. ISDN Router dialup to the Commodity Derivatives, Equity Derivatives, Global markets, Currency Derivatives and Interest Rates external user test environment and production environments is also available

Additional requirements for connectivity to the new trading system are:

- Private (as allocated by the JSE) class IP address space or public class IP address space
- Cisco router (recommended)
- In light of the soon to be released connectivity requirements market participants are reminded that a backup link to the JSE will become a mandatory requirement.

If the member chooses to use their own public class IP address space this needs to be communicated to the JSE via the Derivative_Info@jse.co.za or Yield-X_Info@jse.co.za.

5.2 Configuring Router for IP

The member's network and interface cards need to be enabled for TCP / IP connectivity. Sample router and switch configurations for TCP / IP networks can be obtained from www.cisco.com or member's can contact their IT support provider.

For the JSE to configure members on TCP / IP, information is required and should be submitted to derivative_info@jse.co.za or yield-x_info@jse.co.za as a request for configuration.

Should a member wish to connect via the MTN managed network solution members will be assisted with the setup.

5.3 Firewall / Router Configuration

1. The following information is required to update firewall/router configurations if installed:

Test environment

1. **Test Commodity Derivatives, Equity Derivatives, Global markets, Currency Derivatives and Interest Rates:**

Proxy host address:	196.216.152.30
TCP port (Trading Engine - Equity Derivatives):	2003
TCP port (Trading Engine - Commodity Derivatives):	2210
TCP port (Trading Engine – Currencies and Interest Rate Products)	2269
TCP port (Global Market)	2007

TCP port (Click Once - Equity Derivatives and Commodity Derivatives):	4410 or 4411
TCP port (Click Once – Currency Derivatives and Interest Rates Market)	4469

Production environment

1. **Production Commodity Derivatives, Equity Derivatives, Global markets, Currency Derivatives and Interest Rates:**

Proxy host address:	196.216.152.131
TCP port (Trading Engine - Equity Derivatives):	2003
TCP port (Trading Engine - Commodity Derivatives):	2210
TCP port (Trading Engine – Currencies and Interest Rate Products)	2269

TCP port (Trading Engine – Global Market)

2007

TCP port (Click Once - Equity Derivatives and Commodity Derivatives): 4410 or 4411

TCP port (Click Once – Currencies and Interest Rate Products)

4469

5.4 Routing

Customers must use static routing to route data across the interface between the Customer Network and the JSE Network.

The following IP network configurations are required on the routers to facilitate connectivity:

Production and Test environments:

IP route 196.216.152.0 255.255.254.0

5.5 Minimum Bandwidth Requirements and Recommendations for Trading Members and Information Subscribers

1. Bandwidth Requirements for the new NUTRON trading engine for all available markets:

1. Commodity Market

64k on average per user during a trading day (based on current production activity and will vary depending on the number of users per participating customer)

Users are also advised that the 64k is for receiving data only across all instrument categories – this requirement will increase with trading activity by users per front end / API application. Customers need to calculate these additional bandwidth requirements themselves.

2. Equity Derivative Market

180k on average per user during a trading day (based on current production activity and will vary depending on the number of users per participating customer)

This figure is expected to increase further with new algorithmic systems connecting to the exchange.

Users are also advised that the 180k is for receiving data only across all instrument categories – this requirement will increase with trading activity by users per front end / API application. Customers need to calculate these additional bandwidth requirements themselves.

3. Currencies and Interest Rate Products

180k on average per user during a trading day (based on current production activity and will vary depending on the number of users per participating customer)

This figure is expected to increase further with new algorithmic systems connecting to the exchange.

Users are also advised that the 180k is for receiving data only across all instrument categories on this market – this requirement will increase with trading activity by users per front end. Customers need to calculate additional bandwidth requirements themselves.

4. Global Market

64k on average per user during a trading day (based on current production activity and will vary depending on the number of users per participating customer)
 User are also advised that the 64k is for receiving data only across all instrument categories on this market – this requirement will increase with trading activity by users per front end / API application. Customers need to calculate additional bandwidth requirements themselves.

General Notes -

- Users can configure their front end to only 'listen' for updates on the instruments they are interested in viewing. Nutron will only send data for contracts that have open windows on your display.
- Users that cannot cater for the average recommended bandwidth above should consider only 'listening' on a selected group of contracts.
- Please note that users need to cater for sufficient bandwidth in addition to this if they wish to use any algorithmic or auto-quoting software/functionality. This will also apply to users who wish to view all active instruments with auto-quoting activity.
- In addition JSE auto-quote enabled users are able to view the underlying prices for all auto-quote enabled instruments – this functionality requires at least 10k per user depending on the number of linked instruments
- Customers are requested to cater for the possibility of temporary spikes due to increased market activity

As at 24 May 2011 the following behaviour has been observed for the main instrument groups per market:

	Average per second (k)	Peak per second (k)
Equity Derivatives		
Index Futures	40k	85k
Dividend Neutral and Single Stock Futures	130k	400k
Options	10k	15k
Currency Derivatives and Interest Rates		
Currency Derivatives	120k	240k
Commodity Derivatives		
Agri Futures	20k	64k
Agri Options	20k	64k
Global Market		
Commodities	20k	64k

2. Bandwidth Requirements for Information Subscribers:

1. The JSE recommends 512k per 'listener' per market when subscribing to all available instruments.

3. End of Day / IDS file downloads:

- Specifications on these files are being finalised, however the JSE estimates that the complete set of available files will not exceed 4MB per day per market if all files are subscribed to.

5.6 Client workstation minimum requirements

The new NUTRON front end application should be installed on a PC with the following recommended specifications:

Recommended:

Quad CPU
4GB RAM
Windows XP sp2
Minimum 2GB available disk space
Network Interface Card

OR

Quad CPU
4GB RAM
Windows 7
Minimum 2GB available disk space
Network Interface Card

PLEASE NOTE: The file downloads to HTML and XML from the front end require the MSXML4 pack to be installed on the workstation. This can be downloaded from:

<http://www.microsoft.com/downloads/details.aspx?familyid=3144b72b-b4f2-46da-b4b6-c5d7485f2b42&displaylang=en>

Users are advised that these base requirements do not cater for the trading front end in combination with other applications (e.g. e-mail, pricing tools, etcetera). Each user is required to do sufficient testing to ensure their respective workstations are up to specification as required.

5.7 Information Subscriber requirements

Information Subscribers will make use of the same API as the trading members– the API document for the new Commodity Derivatives, Equity Derivatives, Global markets, Currency Derivatives and Interest Rates systems (which is available separately) specifically indicates messages to be used by Information Subscribers to connect and access public information.

Please note that the new Commodity Derivatives, Equity Derivatives, Global markets, Currency Derivatives and Interest Rates API is based on the TCP/IP communications protocol.

5.8 System availability and market times for the Production and External Test Environments

1. External Test Environment Times

Commodity Derivatives (all times South African Standard Time)

Time	State of system	Comments
08h30 – 09h00	Download only period	
09h15 – 09h30	Open Order period for all instruments	
09h30 – 23h30	Market open	External Test environment is unsupported between 17h00 – 8h30
23h30 – 23h55	Market is in Admin period	
23h55 – 05h00	Download only period	
05h00 – 08h30	Market offline	

Equity Derivative Market (all times South African Standard Time)

Time	State of system	Comments
08h30 – 09h00	Download only period	
09h15 – 09h30	ALSI contract in opening auction	
09h30 – 23h30	Market open	External Test environment is unsupported between 17h00 – 8h30
23h30 – 23h55	Market is in Admin period	
23h55 – 05h00	Download only period	
05h00 – 08h30	Market offline	

Currencies and Interest Rates

Time	State of system	Comments
08h30 – 09h00	Download only period	
09h30 – 23h30	Market open – all instruments in continuous trading	External Test environment is unsupported between 17h00 – 8h30
23h30 – 23h55	Market is in Admin period	
23h55 – 05h00	Download only period	
05h00 – 08h30	Market offline	

2. Production Environment Times

Commodity Derivatives (all times South African Standard Time)

Time	State of system	Comments
05h00 – 08h50	Download only period	
08h50 – 8h59	Open Order period for all instruments	All instruments in open order period
09h00	Market open	
12h00	Grains market closes	Grain contracts, soya and sunflowers close at this time
12h00 – 12h45	Grains Admin period for the spot month	
12h00 – 14h30	Grain Admin period for all other expiries	
17h00	Commodities Close	Oil, Gold, Silver, Copper and Platinum close
17h00 – 17h15	Commodities Admin period	
17h15 – 03h00	Download only period	
03h00 – 05h00	Market offline	

Equity Derivatives Market (all times South African Standard Time)

Time	State of system	Comments
05h00 – 08h00	Download only period	
08h00 – 08h25	Overnight Admin – Reporting trades below minimums	
08h25 – 08h30	Opening Auction	
08h30 – 17h30	Continuous Trading - Market open	
17h30 – 18h15	Market is in Admin period	
18h00 – 03h00	Download only period	

03h00 – 05h00	Market offline	
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Currencies and Interest Rates

Time	State of system	Comments
05h00 – 08h00	Download only period	
08h00 – 08h59	Admin period for Currency Futures	
08h00	All instruments EXCEPT currency futures in continuous trading	
09h00	Currency Futures Continuous Trading	
17h00 – 17h30	Market is in Admin period	
18h00	Reporting of Spot Bond transactions ends	
17h15 – 03h00	Download only period	
03h00 – 05h00	Market offline	

6. Contact List for help or queries

Software or Technical Queries:

The JSE Trading Division can be contacted via the following e-mail address:

Derivative_Info@jse.co.za