

History of an Exchange Architecture

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Products traded on Eurex®: Standardized derivatives on financial products



Futures

A future is a standardized contract between two parties. The parties agree to exchange a defined asset at an agreed price at a certain point of time in the future.

Options

An option is a standardized contract between two parties. The buyer of an option purchases – against payment of the option price (premium) – the right to buy (call) or sell (put) a defined amount of a certain financial product at an agreed price until, or at, a certain point of time in the future.

Eurex products



Equity derivatives	Futures and options on equity indices	Volatility index futures	EXTF Futures	Interest rate derivatives		Credit derivatives
				Fixed income	Money market	
Options n 51 Germany n 41 France n 35 Switzerland n 25 Netherlands n 11 Italy n 11 Scandinavia n 10 USA n 6 Spain n 4 Russia	n DAX® n TecDAX® n MDAX® (Futures) n SMI® n SMIM® (Futures) n OMX Helsinki 25 n RDXxt® (Futures) Dow Jones STOXX® n 50 n EURO 50 n 600 n Mid 200 n Sector (Futures) n 600 Sector n Italy Titans 30 n Global Titans 50 SM	n VDAX-NEW® n VSMI® n VSTOXX®	n DAX ^{EX} n XMTCH on SMI n Dow Jones Euro STOXX 50 ^{EX} n iShares Dow Jones Euro STOXX 50	Futures n Schatz n Bobl n Bund n Buxl® n Conf Options n Euro-Schatz n Euro-Bobl n Euro-Bund	Futures n One-month Eonia n Three-month Euribor n Options on three-month Euribor	n iTraxx® Europe 5-year Index Futures n iTraxx® Europe Hi Vol 5-year Index-Futures n iTraxx® Europe Cross-over 5-year Index-Futures
Futures n 358 DJ STOXX 600 n 54 EURO STOXX 50 n 44 CAC 40 n 40 MDAX und TecDAX n 31 DAX n 26 SMI n 16 RDXxt						

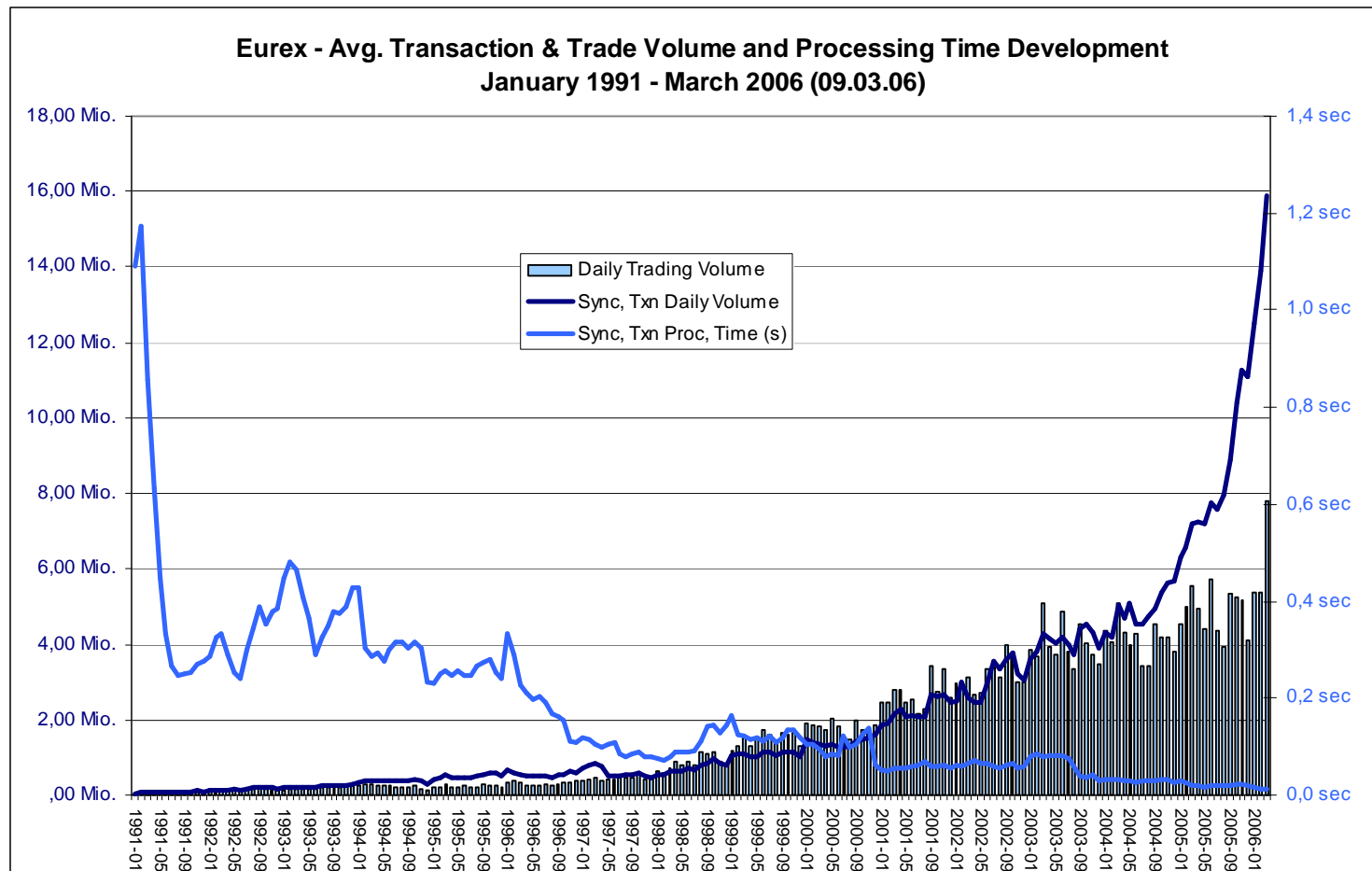
Eurex[®] network: 393 participants trading in 20 countries



As at February 2007

Market Requirements driving DBAG-IT

Processing time reduced despite significant volume growth



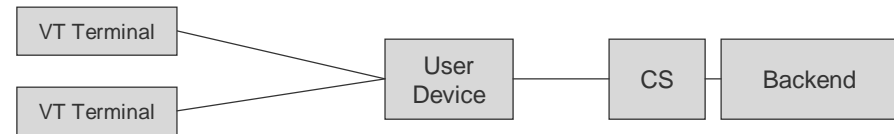
Evolution of Eurex Connection Architecture



Connection Architecture

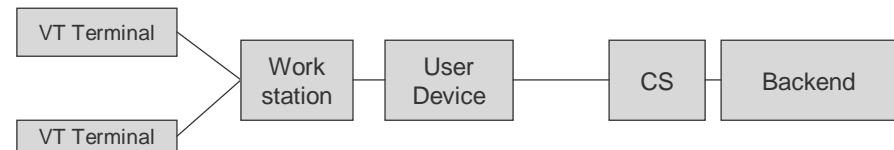
1989

- 3 – Tier Architecture
- Everthing VMS based



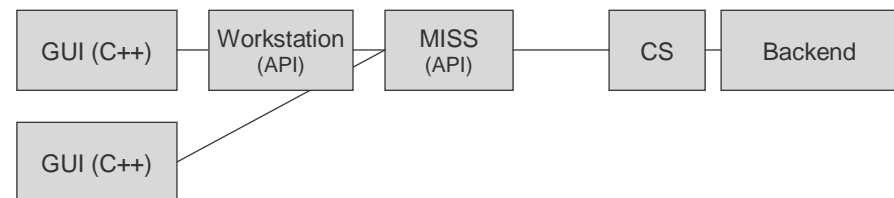
1993

- “Distributed User Device” architecture
- AIX Unix as User Platform



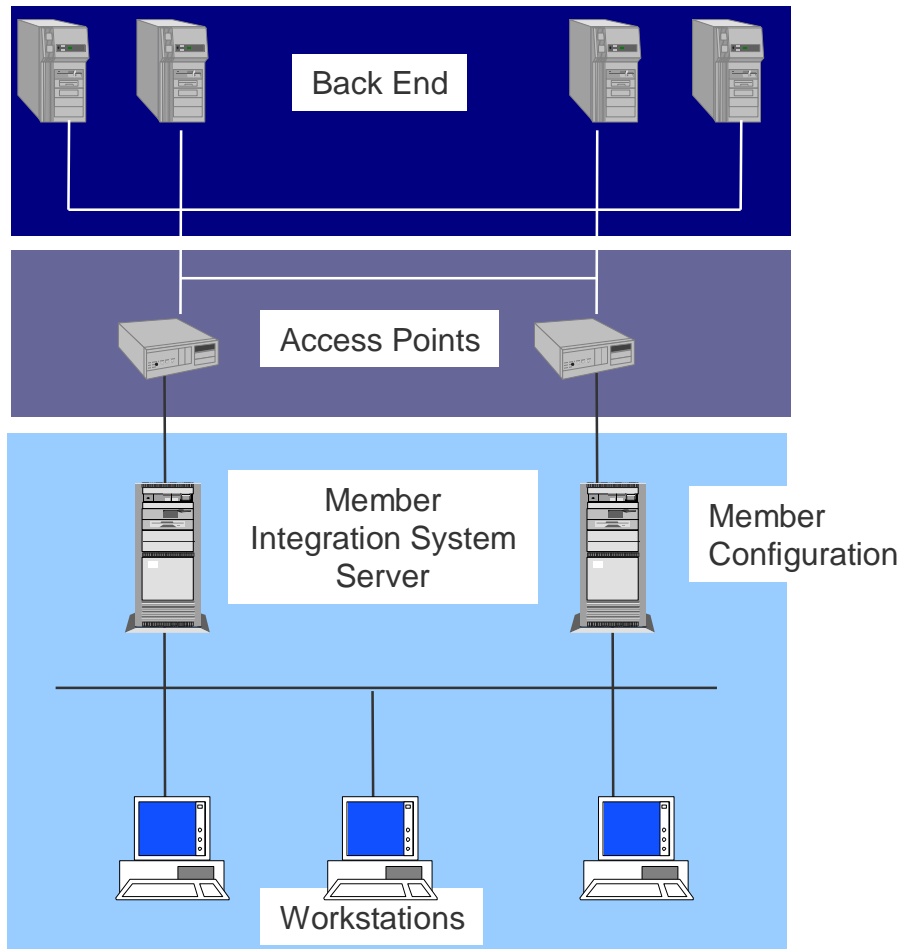
1999

- API
- Graphical User Interface
- Solaris & NT only User Platforms



Summary: Basic 3-tier connection architecture was stable from 1989 to 2007

Connection Architecture– Eurex



System Characteristics

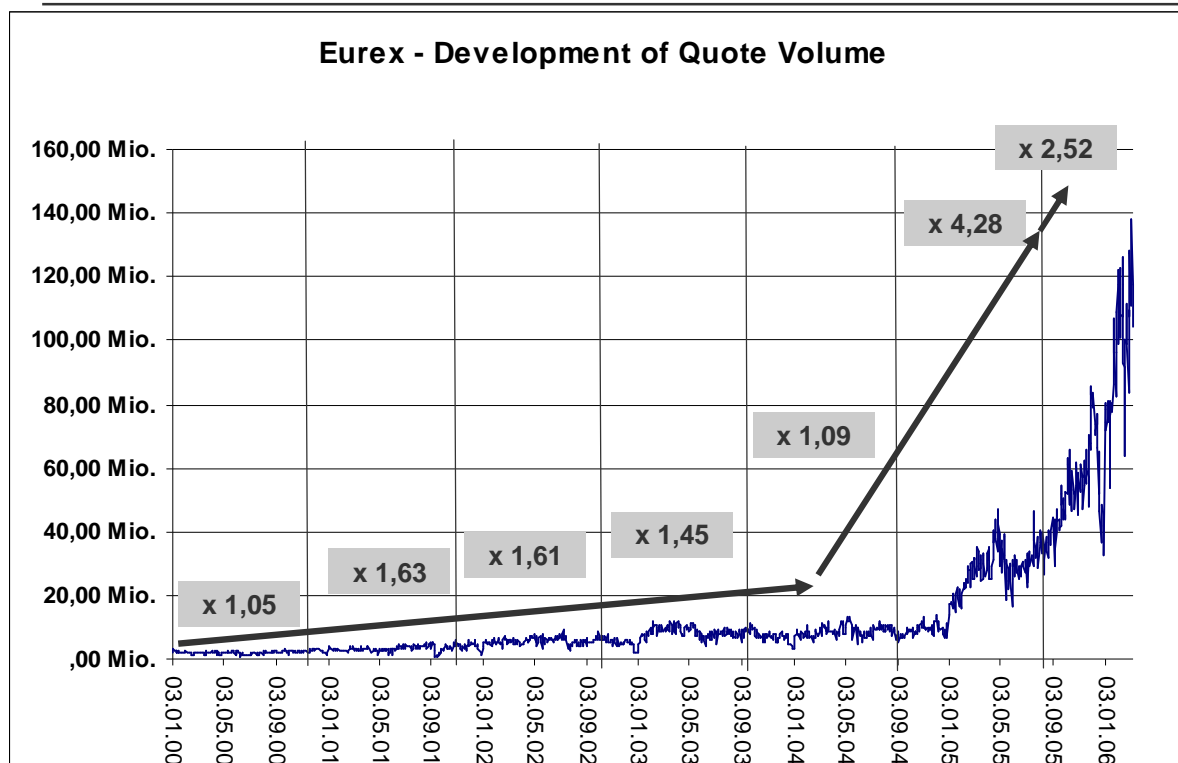
- § Distributed, context-free message-based architecture
- § Hierarchical 4-tier Client/Server design
- § Real-time transaction system
- § Backend HP Alphaservers / Itanium (2007)
- § 4 nodes forming an OpenVMS cluster: mutual fail-over and load balancing
- § Programming languages: COBOL, C, C++
- § BCM model: Active-Active (server cluster distributed geographically)
- § Same access path for all customers (Backend – Access Point – Member Server)
- § Frontend: Java-GUI, VALUES API

Eurex – Market Developments 2005/2006

Significant Increase of Quote Volume challenges IT

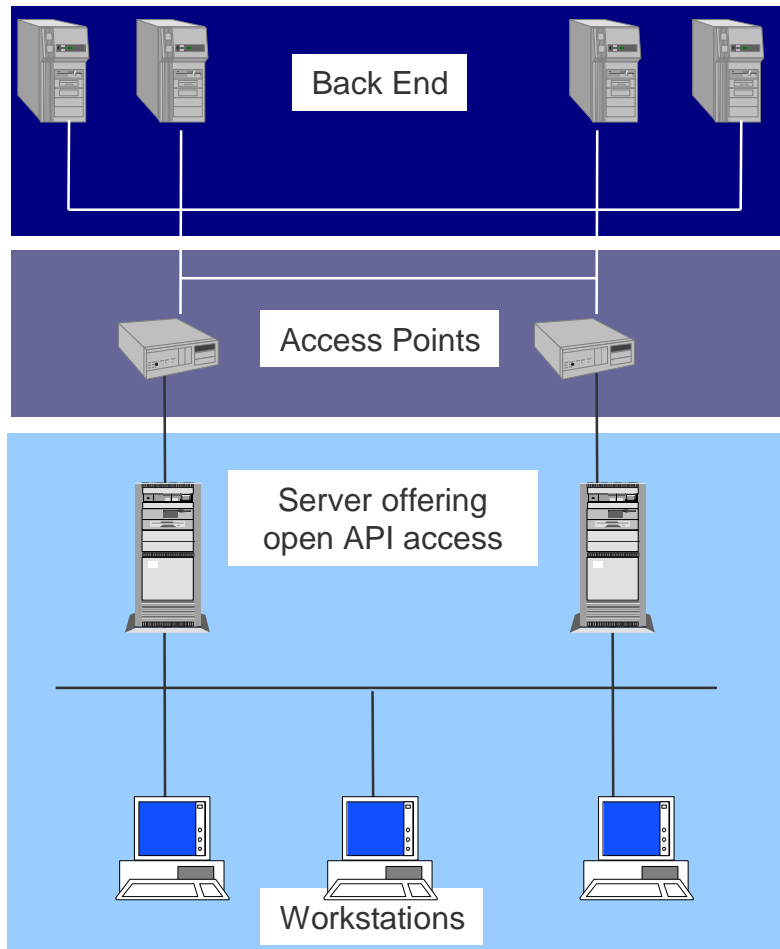


Due to new Market Maker Programs and listing of Single Stock Futures quote volumes increased by the factor of 4,28 in 2005 and by 2,52 in the first 2,5 months in 2006



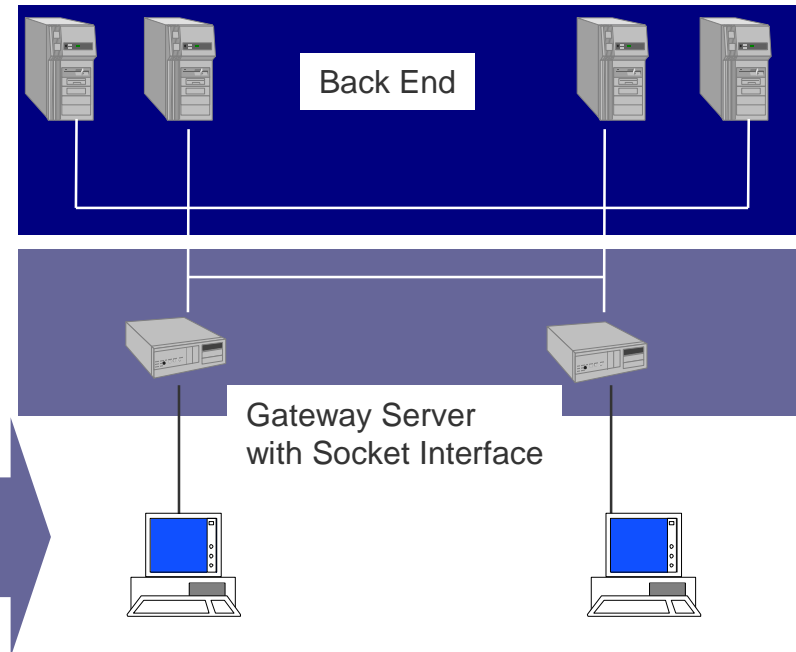
Annual Quote Volume Growth

System Architecture – Eurex



Exchange Site

Member Site



Advantages:

- Platform independent at Member Site
- Reduce round trip times (i.e. latency)
- Offering of higher bandwidths



for more details see

www.eurexchange.com

www.deutsche-boerse.com

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