

| No | Cxema | General setup conditions | Notes |
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| 1. | | <p>Within the MOEX Dataspace colocation facility, the client equipment can be connected as follows:</p> <ol style="list-style-type: none">1. Client server equipment is connected directly to MOEX network equipment (hereinafter, L2 link)2. Client server equipment is connected to MOEX through Client network equipment (hereinafter, L3 link). | <p>The clients equipment requirements vary between links . This document contains references to link types for each condition.</p> |
| 2. | L2 | <p>Image 1. L2 link</p> <p>The diagram illustrates the L2 link setup. It features four main network segments: 'Production Trade system network' at the top, 'UAT Trade system network' at the bottom, 'Production network segment' on the left, and 'UAT network segment' on the right. Each trade system network contains three server icons. Each network segment contains two switch icons. The 'Production network segment' is connected to the 'Production Trade system network' via a 'LACP + Trunk' link. The 'UAT network segment' is connected to the 'UAT Trade system network' via a 'LACP + Trunk' link. In the center, an 'L2 connected Client' is represented by a 'Client Server' with five interfaces: eth1, eth0, eth4, eth5, eth2, and eth3. The 'Production network segment' connects to the client's eth1 interface. The 'UAT network segment' connects to the client's eth4 interface. The 'Client Server' is connected to the 'Internet-facing segment' via its eth2 and eth3 interfaces. The 'Internet-facing segment' contains two switch icons and is connected to an 'Internet' icon (a globe with a red cursor). This connection is labeled 'LACP + Access'. Four callout boxes provide additional context: 'Access-list: Client allocated address enabled for PROD access' points to the Production network segment; 'Access-list: Client allocated address enabled for UAT access' points to the UAT network segment; 'Access-list: Client allocated address enabled for Internet access (+NAT)' points to the Internet-facing segment; and another 'Access-list: Client allocated address enabled for PROD access' points to the Production Trade system network.</p> | |

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| 3. | L3 | <p>Image 1. L3 link</p> <p>The diagram illustrates the L3 link architecture. It features three main network segments: the Production network segment (top left), the UAT network segment (bottom left), and the Internet-facing segment (right). The Production network segment contains a Production Trade system network and is connected to the L3 connected Client via a 10GBase-SR connector network (10.215.x.y/30). The UAT network segment contains a UAT Trade system network and is connected to the L3 connected Client via a 10GBase-SX/1000Base-LX/LH connector network (10.214.x.y/30). The Internet-facing segment contains an Internet network and is connected to the L3 connected Client via a 1000Base-TX connector network (10.215.x.y/30). The L3 connected Client is a central hub containing a Client Server and is connected to all three segments. BGP prefixes of the PROD services and UAT services are advertised from the client to the respective segments. Access-lists are configured on the client to enable PROD and UAT access. The Internet-facing segment also has an access-list for Internet access (+NAT). The client's AS number is AS64600, and the segments' AS number is AS48009.</p> | |
| 4. | L2/L3 | MOEX colocation facility in Dataspace contains 3 isolated network segments: | This architecture was created to ensure infrastructure stability and security |
| 4.1 | L2/L3 | A. Production network segment | Used to access the production and gaming environments |
| 4.2 | L2/L3 | B. UAT network segment | used to access UAT |
| 4.3 | L2/L3 | C. Internet-facing segment | Internet access |
| 5. | L2/L3 | The client can connect to one (production) or more network segments, making as many links as needed | |
| 6. | L2/L3 | All connections to each network segment are done via 2 physical links to 2 different MOEX network devices. | Two links provide redundant connection. Internet, iLo, IPMI, UAT connections are not redundant. |
| 7. | L2/L3 | Redundant links facing client equipment can be connected as follows: | Different capabilities for L2/L3 connections. |
| 7.1 | L3 | · to different Client network devices | Recommended. |
| 7.2 | L3 | · to different network interfaces of a single Client network device | Lower level of redundancy, not recommended. |

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| 7.3 | L2 | · to different network interfaces of the Client server | The only possible solution for L2 connections. |
| 8. | L3 | Each Client link should be connected to L3 interfaces with BGP support. | |
| 9. | L2 | Two physical interfaces of each Client equipment connection should have LACP enabled. | The interfaces should have trunking enabled (IEEE 802.1q) in redundant mode (LACP, IEEE 802.3ad) |
| 10. | L2/L3 | Physical connections parameters: | Different capabilities for L2/L3 connections. |
| 10.1 | L3 | · 10G port, 10GBase-SR type (MM fibre) | All 3 network segments are supported |
| 10.2 | L3 | · 10G port with 1G Speed, 1000Base-SX type (MM fibre) or 1000Base-LX type (MM fibre) | Only for UAT network segment |
| 10.3 | L3 | · 1G port, 1000Base-TX type (UTP) | Only for Internet connections |
| 10.4 | L2 | · 10G port, 10GBase-SR type (MM fibre) or 1G port, 1000Base-TX type (UTP) | |
| 11. | L3 | Connections to different network segments on the Client side can be connected to: | |
| 11.1 | L3 | · different network devices | Recommended. |
| 11.2 | L3 | · same network device | Lower level of redundancy, not recommended. |
| 12. | L3 | Within client networks (including endpoint client equipment) access to the services located in different network segments could be organized as follows: | |
| 12.1 | L3 | · from physically different equipment | Recommended. |
| 12.2 | L3 | · from different network interfaces of a single piece of equipment | Lower level of redundancy, not recommended. |
| 12.3 | L3 | · from same network interface of a single piece of equipment | Lower level of redundancy, not recommended. |
| 13. | L3 | Link redundancy on logical level is provided by BGP on each physical link: | |
| 13.1 | L3 | · transit networks (/30) are provided by the Technical center from private address space (RFC 1918) | |
| 13.2 | L3 | · Technical center AS number for Exchange engines-facing connection is AS48009 | |
| 13.3 | L3 | · Technical center AS number for Internet-facing connection is AS64600 | |
| 13.4 | L3 | · Technical center AS number for UAT network-facing connection is AS64700 | |
| 13.5 | L3 | · Client-side AS number is provided by the Technical center from AS64512-AS65534 private range (Client own AS number could also be accepted). | |
| 14. | L2/L3 | For each client the Technical center provides /24 networks from private range (as per RFC 1918) for each isolated network segment and for specific services within one network segment. | |

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| 15. | L2/L3 | Specific addresses within allocated address space are enabled by the Technical center and added into ACLs as per the Client requests | |
| 16. | L2/L3 | Client connections to specific services of a certain network perimeter are only possible from IP addresses enabled by the Technical center from the range of Client-allocated address space for this service/network segment. | |
| 17. | L2 | For L2 connections specific services are available within separate VLANs facing separate network segments. | VLANs should be configured over the pair of links in redundant mode (LACP, IEEE 802.3ad) with IEEE 802.1q trunk for each network segment interface. |
| 17.1 | L2 | Internet-facing connections are made in a different way: - Internet transit network is available in the access mode in the redundant mode (LACP, IEEE 802.3ad) - Internet transit network (management interfaces) is available in the access mode | Trunking configuration (IEEE 802.1q) and VLANs are not required |
| 18. | L3 | The following services are announced over BGP: | |
| 18.1 | L3 | · default route (for internet-facing connections), | |
| 18.2 | L3 | · specific prefixes of the PROD or UAT services (located within PROD and UAT network segments). | |
| 19. | L3 | Announces trading system prefixes include public network (i.e. 91.203.x.x), private networks (i.e. 10.63.x.x) and non-internet advertized networks (i.e. 196.x.x.x). | |
| 20. | L3 | Within PROD network segment announced and real route lengths to trading servers for both physical links are equal. | |
| 21. | L3 | The Client can announce over BGP network prefixes allocated to Client | |
| 22. | L3 | In case the Client has multiple L3 links to the same network segment, the Technical center can accept Client network prefixes for each L3 link. | Used to ensure connection redundancy. |
| 23. | L3 | If necessary, the best route among different Client connections can be set on the Client side by changing AS Path length for specific prefix. | |
| 24. | L3 | Accepted prefix size: max - /24, min - /32. | |
| 25. | L2/L3 | FAST feeds are divided to several groups and are available, including TCP Recovery, from different address spaces and VLANs (for L2), separately for Feed A and Feed B. | |
| 26. | L2 | FAST feeds subscription is done using IGMP protocol. | |
| 27. | L3 | FAST feeds subscription is done using PIM protocol. | Between the Client network equipment and the Technical center network equipment. |
| 27.1 | L3 | Feed A data is provided through one physical link and Feed B – through another. | |

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| 28. | L2/L3 | Address space and VLANs list for PROD network segment: | |
| 28.1 | L2/L3 | IP:10.224.0.0/16 VLAN:224 | Transactional network |
| 28.1 | L2/L3 | IP:10.231.0.0/16 VLAN:231 | FAST (Equities) - Feed A |
| 28.2 | L2/L3 | IP:10.241.0.0/16 VLAN:241 | FAST (Equities) - Feed B |
| 28.3 | L2/L3 | IP:10.232.0.0/16 VLAN:232 | FAST (FX) - Feed A |
| 28.4 | L2/L3 | IP:10.242.0.0/16 VLAN:242 | FAST (FX) - Feed B |
| 28.5 | L2/L3 | IP:10.233.0.0/16 VLAN:233 | FAST (Derivatives) - Feed A |
| 28.6 | L2/L3 | IP:10.243.0.0/16 VLAN:243 | FAST (Derivatives) - Feed B |
| 28.7 | L2/L3 | IP:10.234.0.0/16 VLAN:234 | FAST (Full Order Log for Derivatives) - Feed A |
| 28.8 | L2/L3 | IP:10.244.0.0/16 VLAN:244 | FAST (Full Order Log for Derivatives) - Feed B |
| 29. | L2/L3 | Address space and VLANs list for UAT network segment: | |
| 29.1 | L2/L3 | IP:10.223.0.0/16 VLAN:223 | UAT system transactional network |
| 29.2 | L2/L3 | IP:10.221.0.0/16 VLAN:221 | FAST UAT - Feed A |
| 29.3 | L2/L3 | IP:10.222.0.0/16 VLAN:222 | FAST UAT - Feed B |
| 30. | L2/L3 | Address space and VLANs list for Internet connections: | |
| 30.1 | L2/L3 | IP:10.218.0.0/16 VLAN:218 | Internet transit network |
| 30.2 | L2/L3 | IP:10.219.0.0/16 VLAN:219 | Internet transit network (mgmt interfaces only) |
| 31. | L2 | All address spaces include gateways 10.x.0.1 which should be used for building routes to the VLAN services. The ping utility is used to check the connectivity of gateways 10.x.0.1. | |
| 31.1 | L2 | Gateways 10.218.0.1 and 10.219.0.1 can be used as default gateways in the Internet connection segment | |
| 32. | L2/L3 | In the Internet connection segment, all incoming and outgoing connections are restricted by default, except: - connection to public DNS (8.8.8.8, 8.8.4.4) and internal DNS (85.118.176.17, 85.118.176.19), - outgoing ping from Internet connection network (10.218.0.0/16). | Further connections are allowed at the request. |
| 32.1 | L2/L3 | Addresses 8.8.8.8, 8.8.4.4 (or internal 85.118.176.17, 85.118.176.19) can be used as DNS servers to configure interfaces in the Internet transit network segment. | Other DNS servers can be enabled at the request. |