

BISTECH 3.0 Briefing



**BORSA
İSTANBUL**

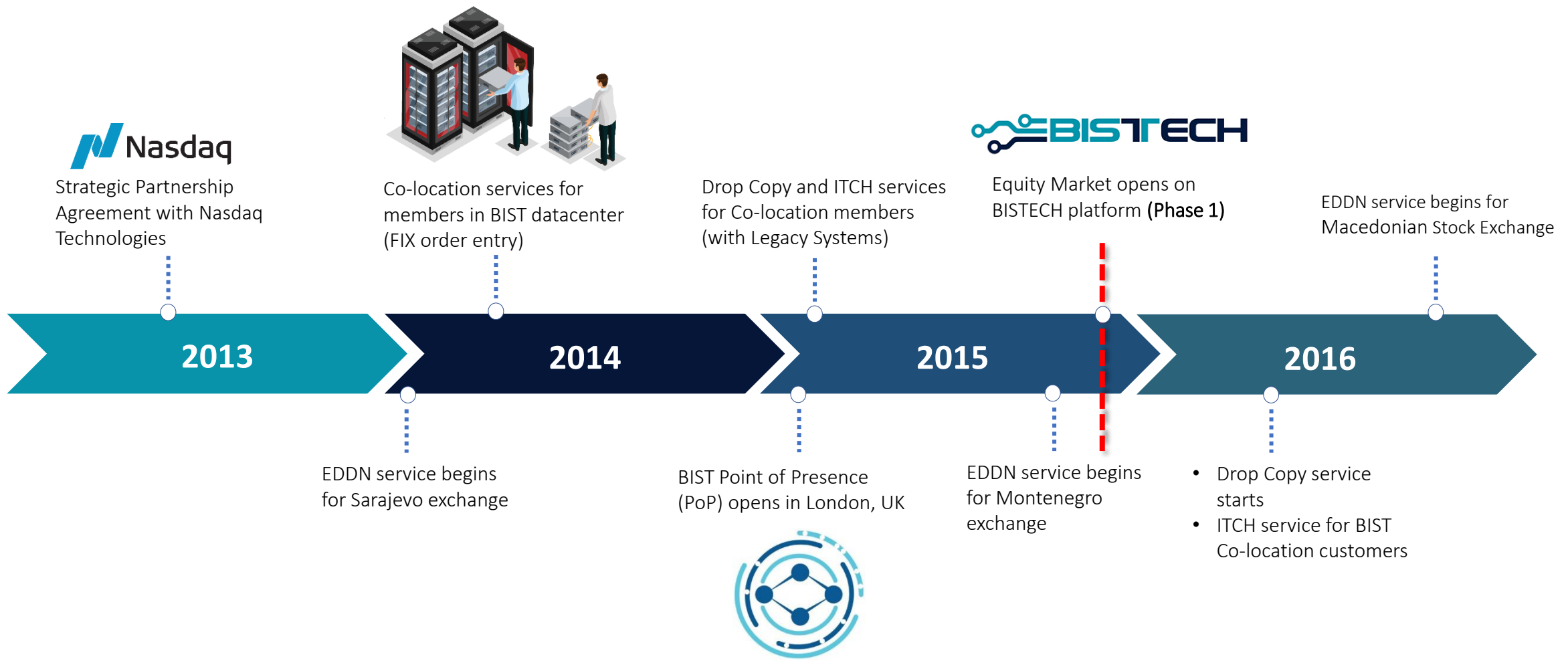
November 2022

AGENDA

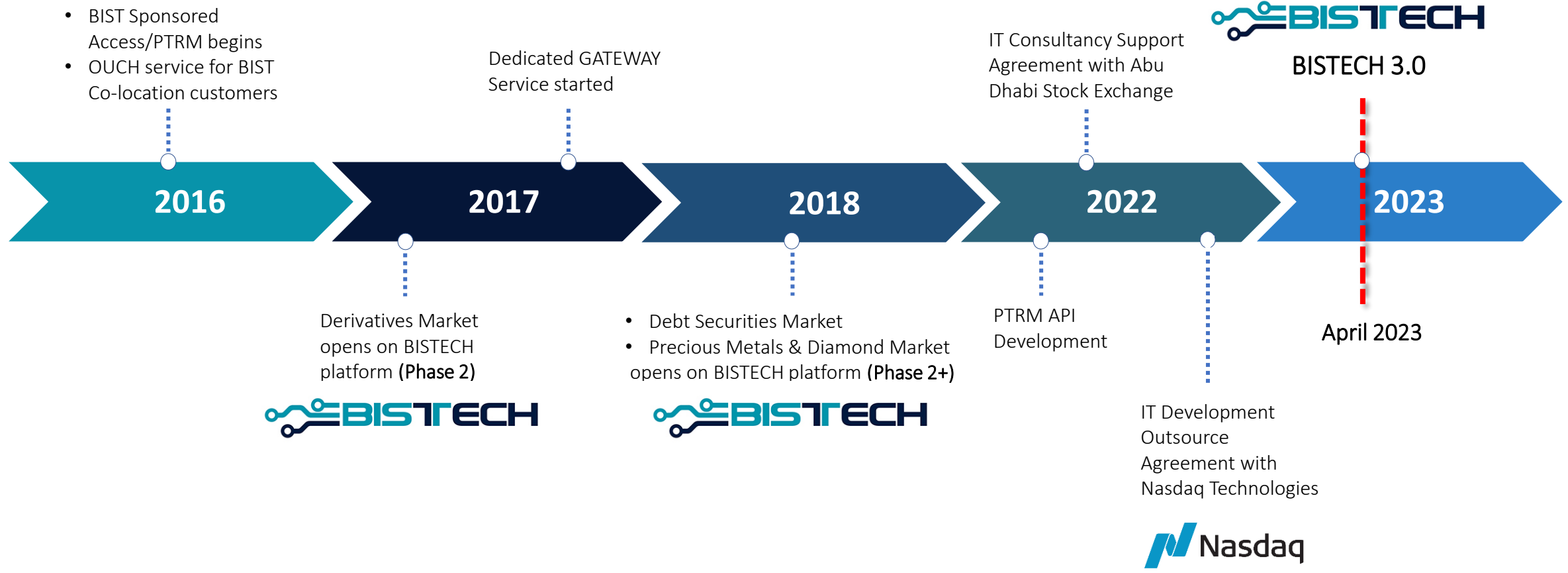
- BISTECH Roadmap
- Motivation of BISTECH 3.0
- BISTECH Statistics
- BISTECH 3.0 Scope and Related Changes
- BISTECH 3.0 IP Mapping Changes
- BISTECH 3.0 Timeline
- Q&A



BISTECH Roadmap



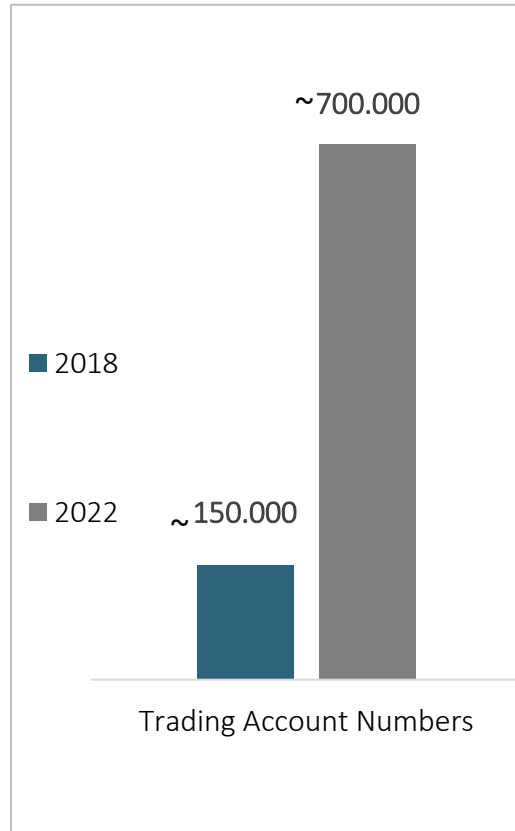
BISTECH Roadmap



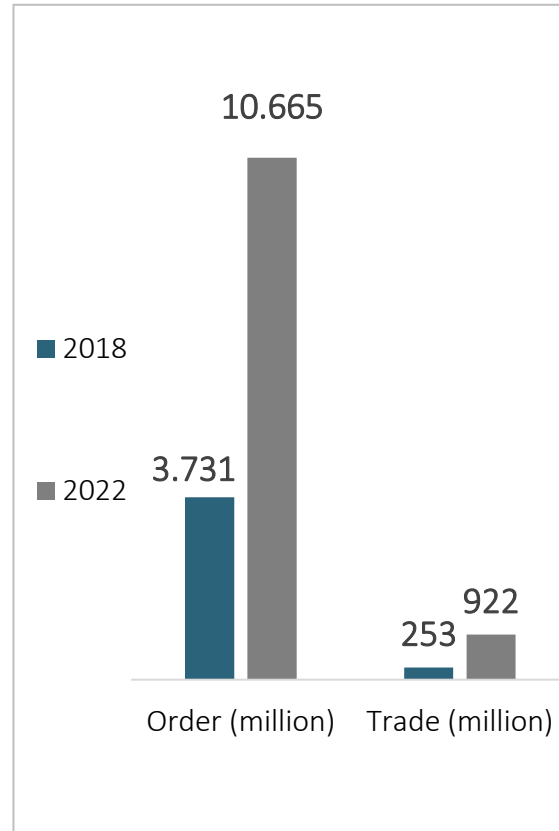
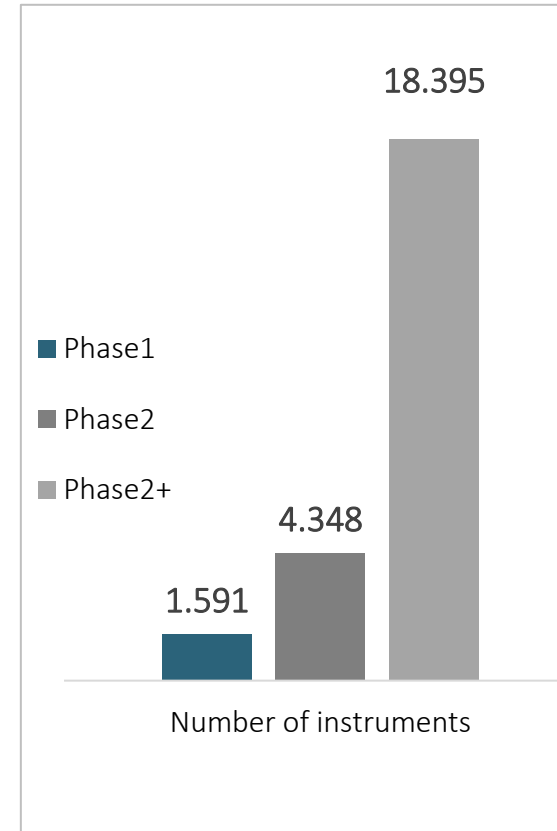
Motivation of BISTECH 3.0



Increase in the number of trading users/accounts



Increase in the number of orders/trades

Number of instruments
(unbalanced load between partition)

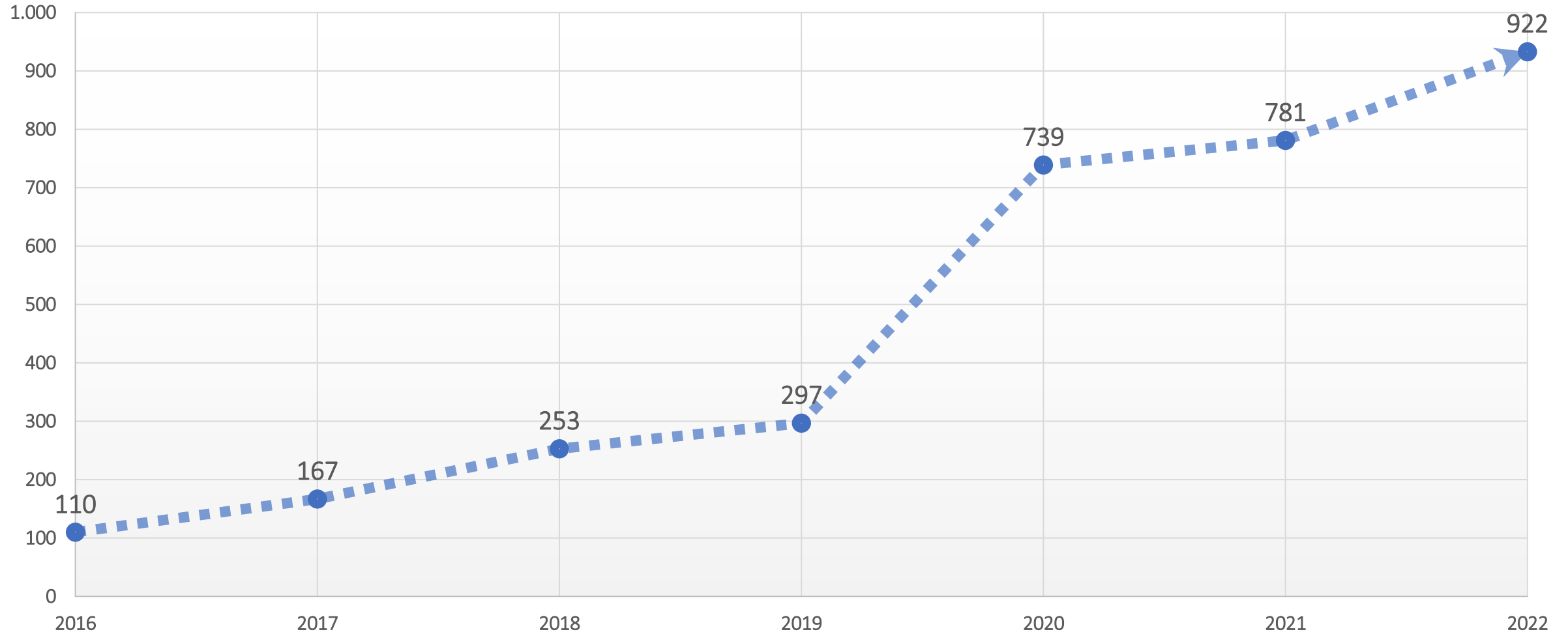
Performance enhancement

- Improving transaction round-trip time (Matching engine & Gateway latency)
- Minimize latency differences between partitions

BISTECH Statistics



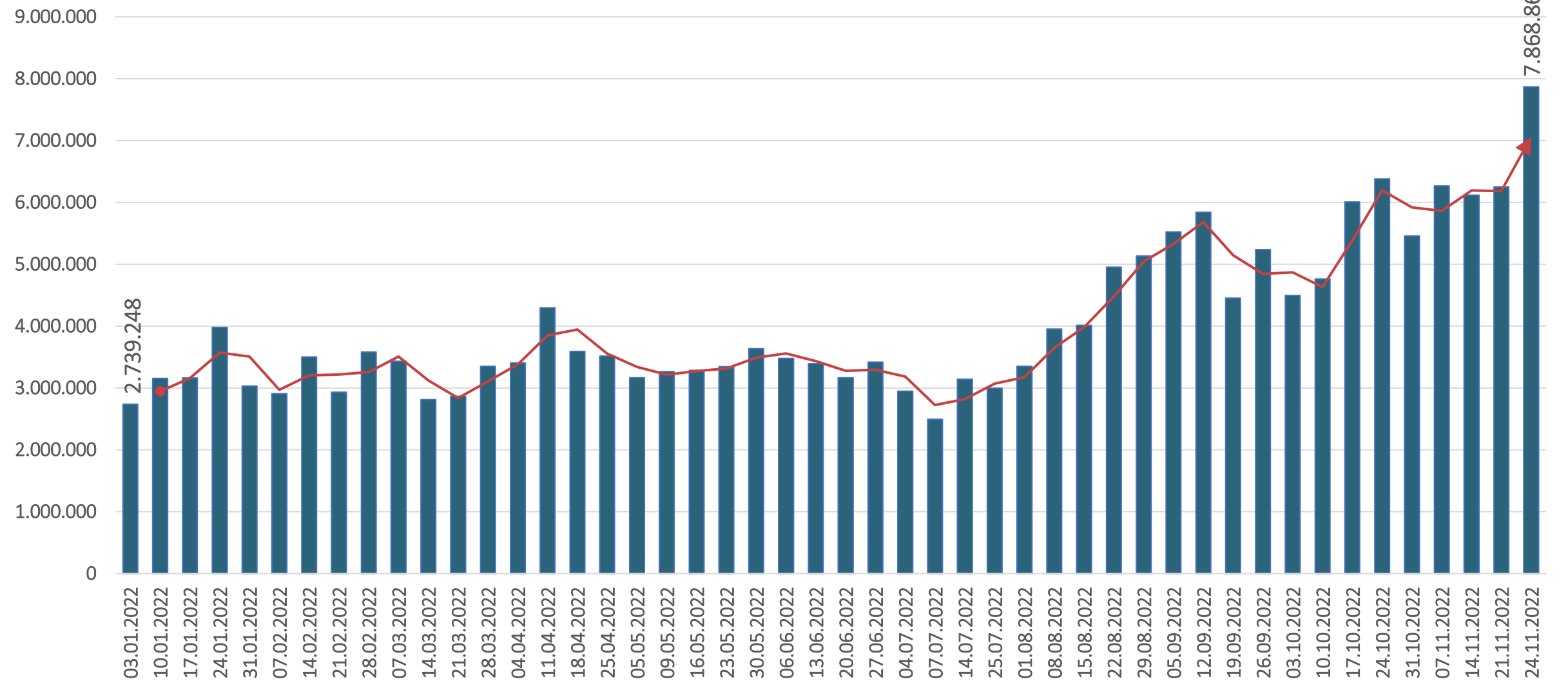
Total Number of Trade by Year (million)



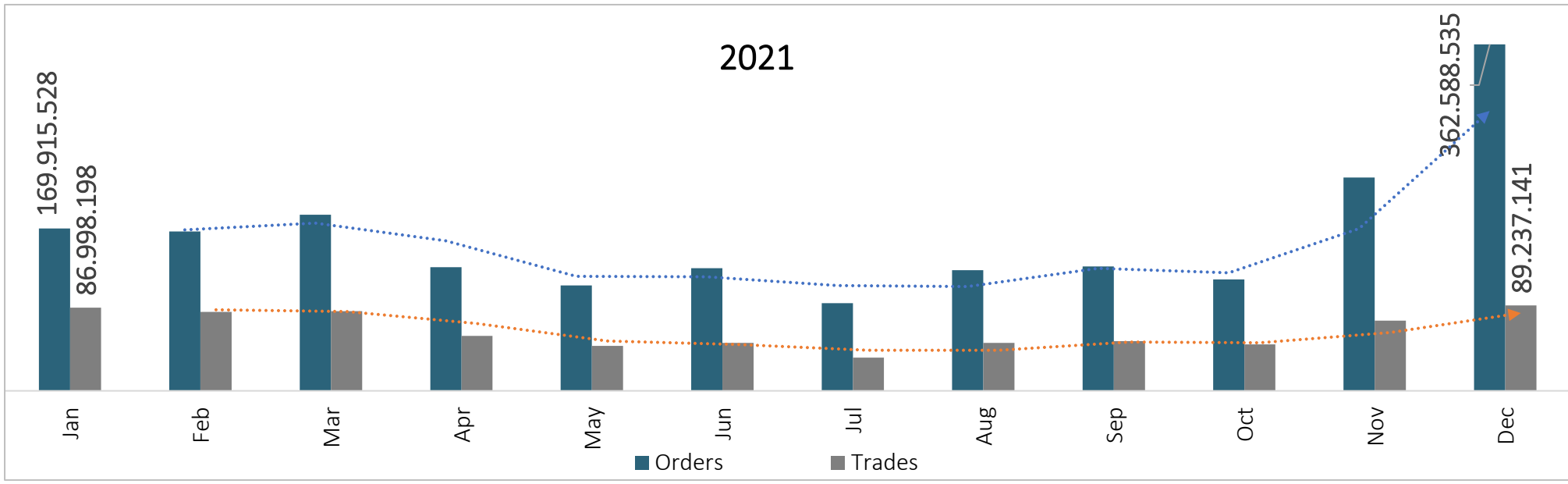
Number of Trades in 2022



Number of Trades



Total Number of Orders & Trades (2021 vs 2022)



2021
Total Trade Number
781M



2022
(11 months)
Total Trade Number
922M

Breakdown of Numbers by Markets

2021

Market	Total No. of Orders
Fixed Income	3,289,475
Precious Metal	48,625
Equity	1,588,175,292
Derivatives	347,675,919

Market	Total No. of Trades
Fixed Income	905,577
Precious Metal	19,903
Equity	665,047,241
Derivatives	89,035,081

2022

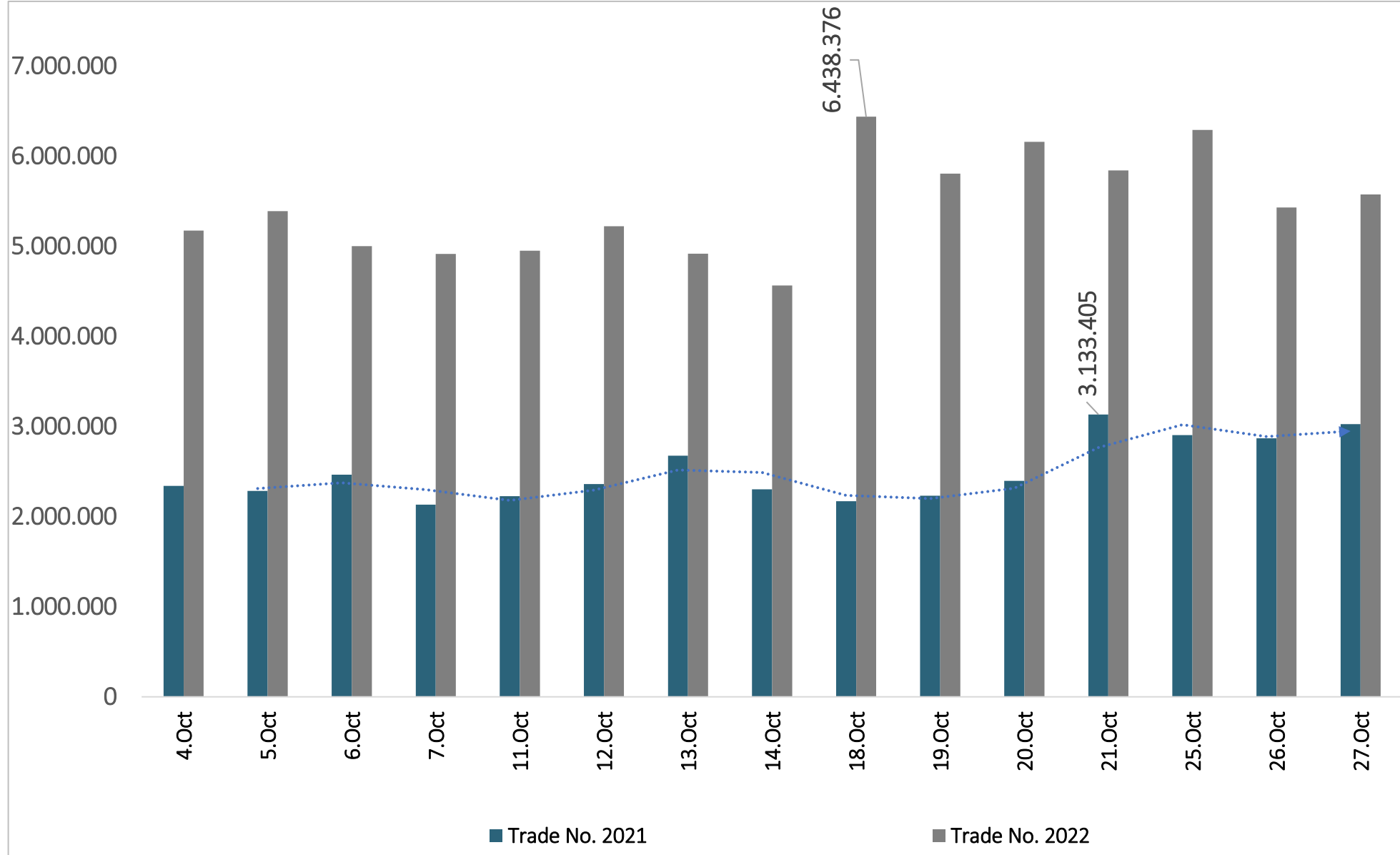
Market	Total No. of Orders
Fixed Income	3,608,318
Precious Metal	88,217
Equity	3,243,100,874
Derivatives	462,553,408

Market	Total No. of Trades
Fixed Income	755,818
Precious Metal	39,
Equity	798,505,582
Derivatives	123,112,528

Increasing number of orders
Equity %104 **Derivatives %33**

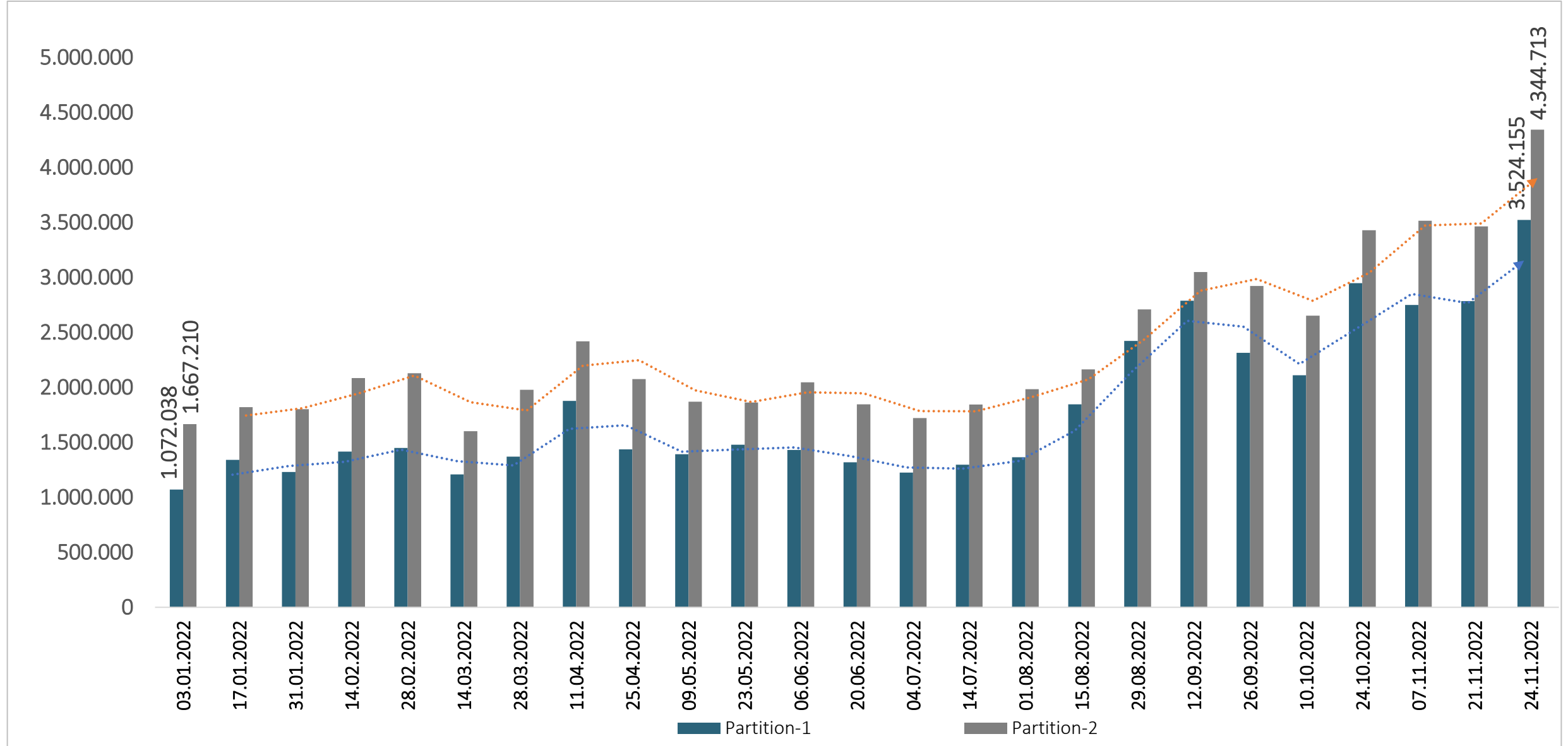
Increasing number of trades
Equity %20 **Derivatives %38**

Change in Number of Trades (October 21 vs October 22)



Change in maximum trade number
%105

Increasing Trend in Number of Trades by Partition (2022)



BISTECH 3.0 Scope and Related Changes



Change in Number of Partitions

- Instrument distributions have been rearranged to balance the load between the partitions
- Trading system will process transactions faster and more efficiently (low latency-high throughput)

Architectural Changes

- FIX/OUCH Order Entry Gateways will be switched from single-threaded to multi-threaded architecture
- **Partition independent gateways:** As the partition dependency will be eliminated in FIX/OUCH Order Entry channels, related users will be able to send orders to all of the partitions

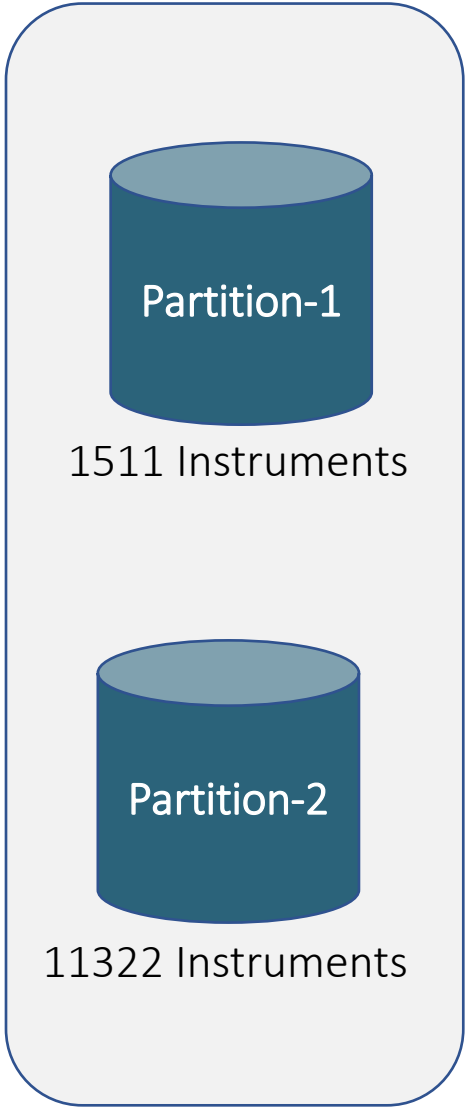
Continuous Monitoring and Dynamic Load Balancing

- Number of partitions will be subject to change for balancing the load (after BISTECH 3.0 transition)

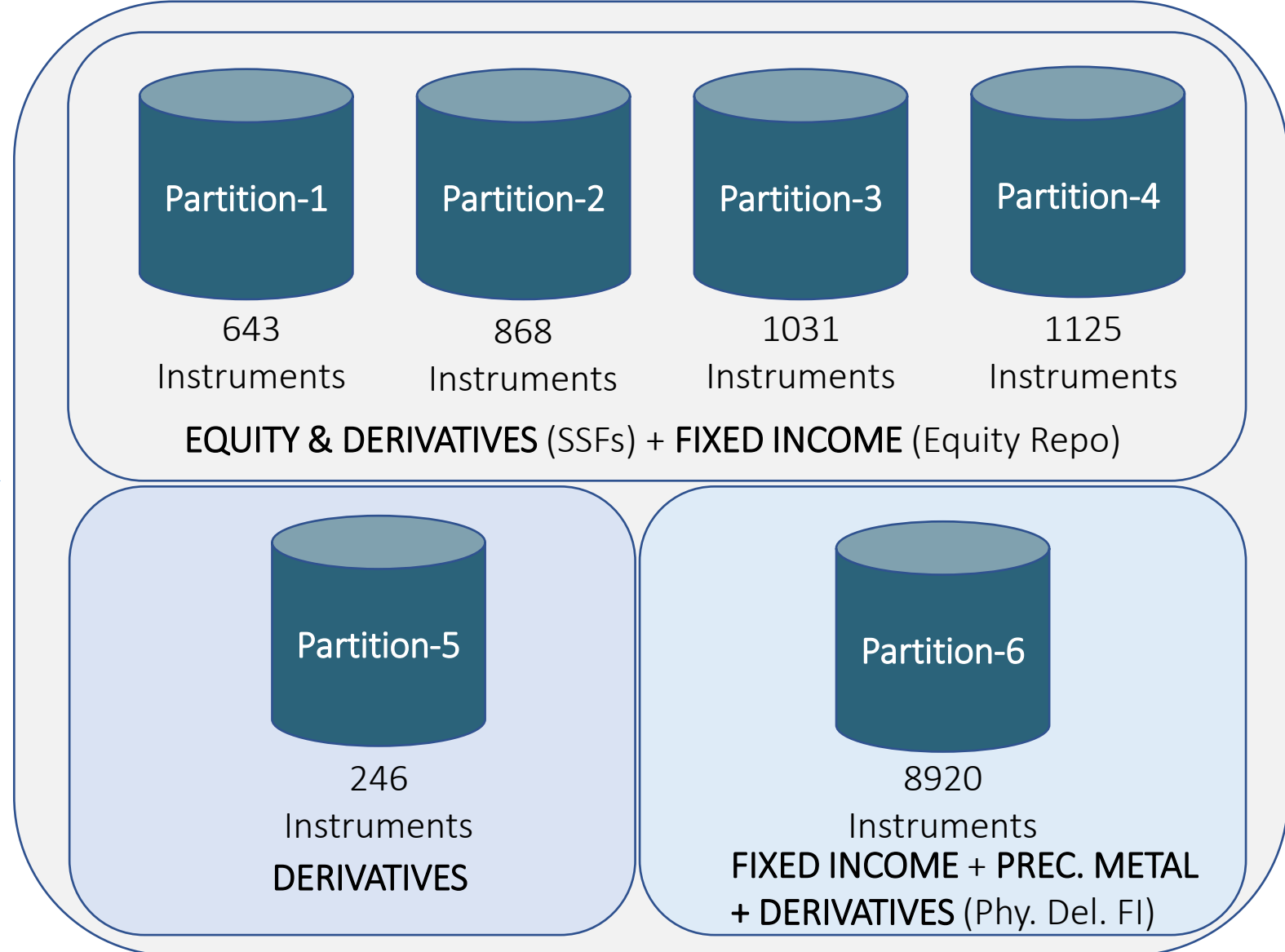
BISTECH 3.0 Partition Composition



Current Version

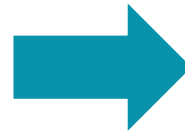


BISTECH 3.0



Current Version

	Equity Market	Derivatives Market	Fixed Income Market	Precious Metals and Diamond Markets
Partition 1	X	X	X	
Partition 2	X	X	X	X



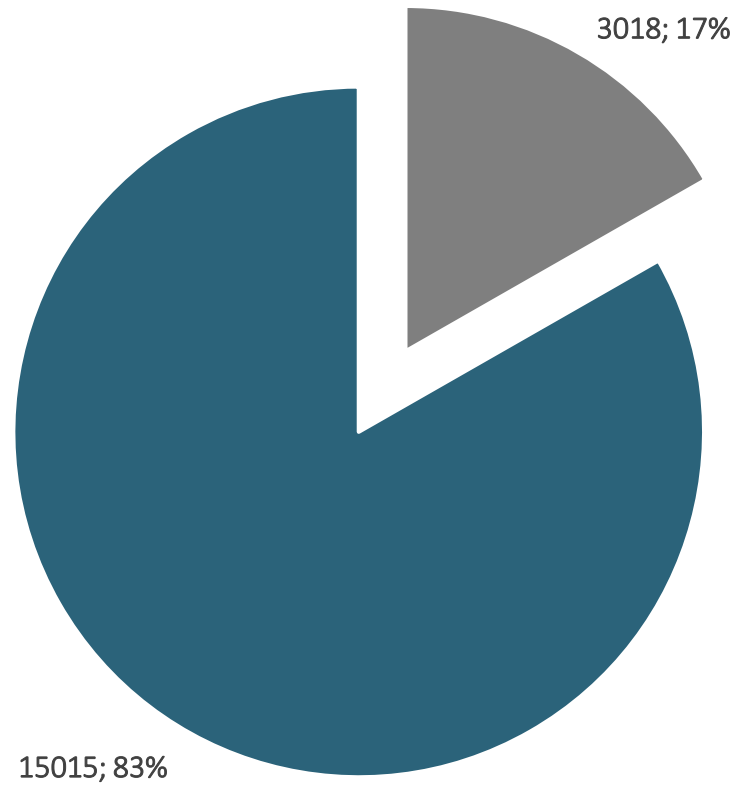
BISTECH 3.0

	Equity Market	Derivatives Market	Fixed Income Market	Precious Metals and Diamond Markets
Partition 1	X	X	X	
Partition 2	X	X	X	
Partition 3	X	X	X	
Partition 4	X	X	X	
Partition 5		X		
Partition 6		X	X	X

Instruments between partitions (current vs. BISTECH 3.0)



Number of instruments (as of 28-11-2022)

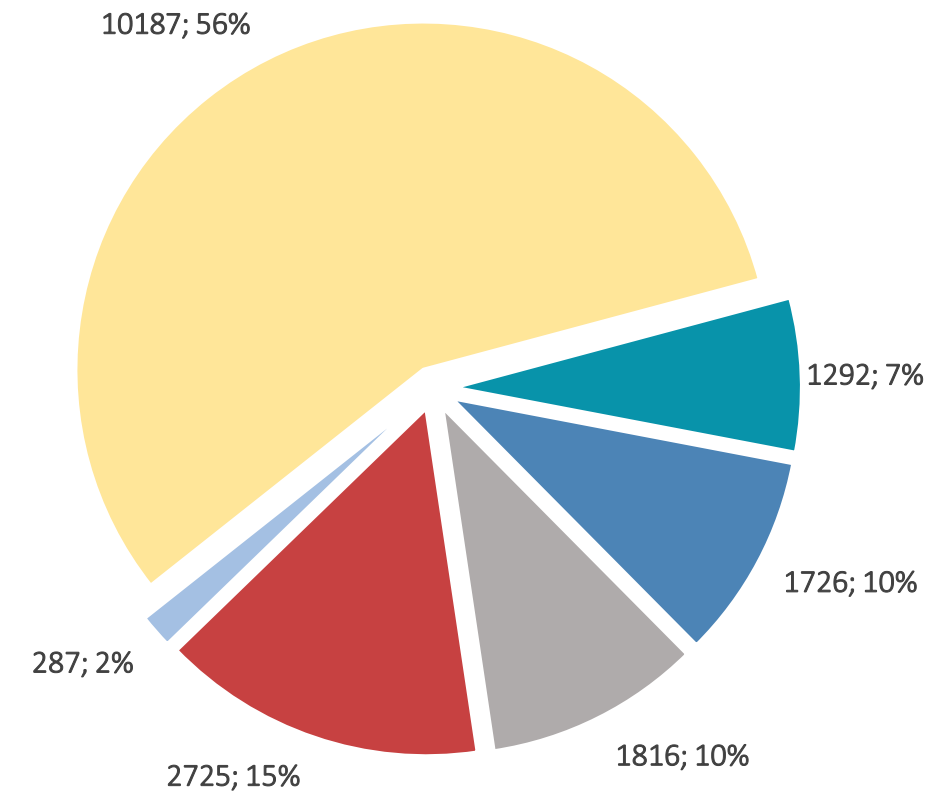


■ Partition-1 ■ Partition-2

Rate of Partition-1 change in last year: %100 (1511 →3018)

Rate of Partition-2 change in last year: %33 (11322 →15015)

Number of instruments BISTECH 3.0 (projected)



■ Partition-1 ■ Partition-2 ■ Partition-3
■ Partition-4 ■ Partition-5 ■ Partition-6

FIX & OUCH Order Entry

- Each FIX/OUCH user of a market will be able to send orders to all of the partitions
- Market based separate users will continue

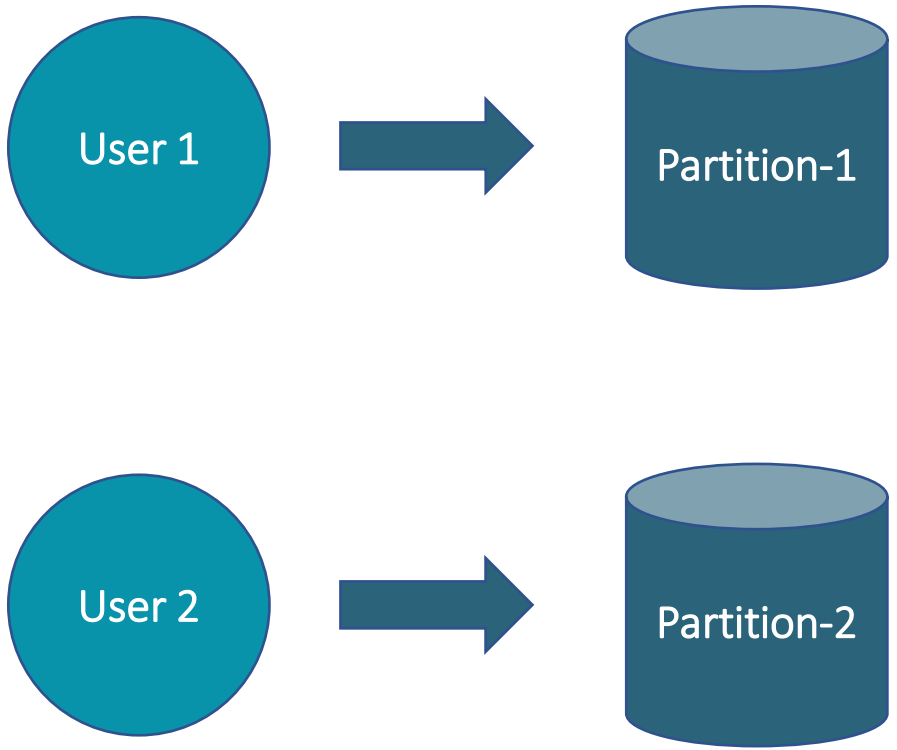
FIX Drop Copy

- Partition based Drop Copy connections will continue
- All existing Drop Copy users will be suspended
- Partition based new Drop Copy users will be defined with new naming convention
- FIX API Drop Copy channel failover architecture changed from Active-Passive to Active-Active

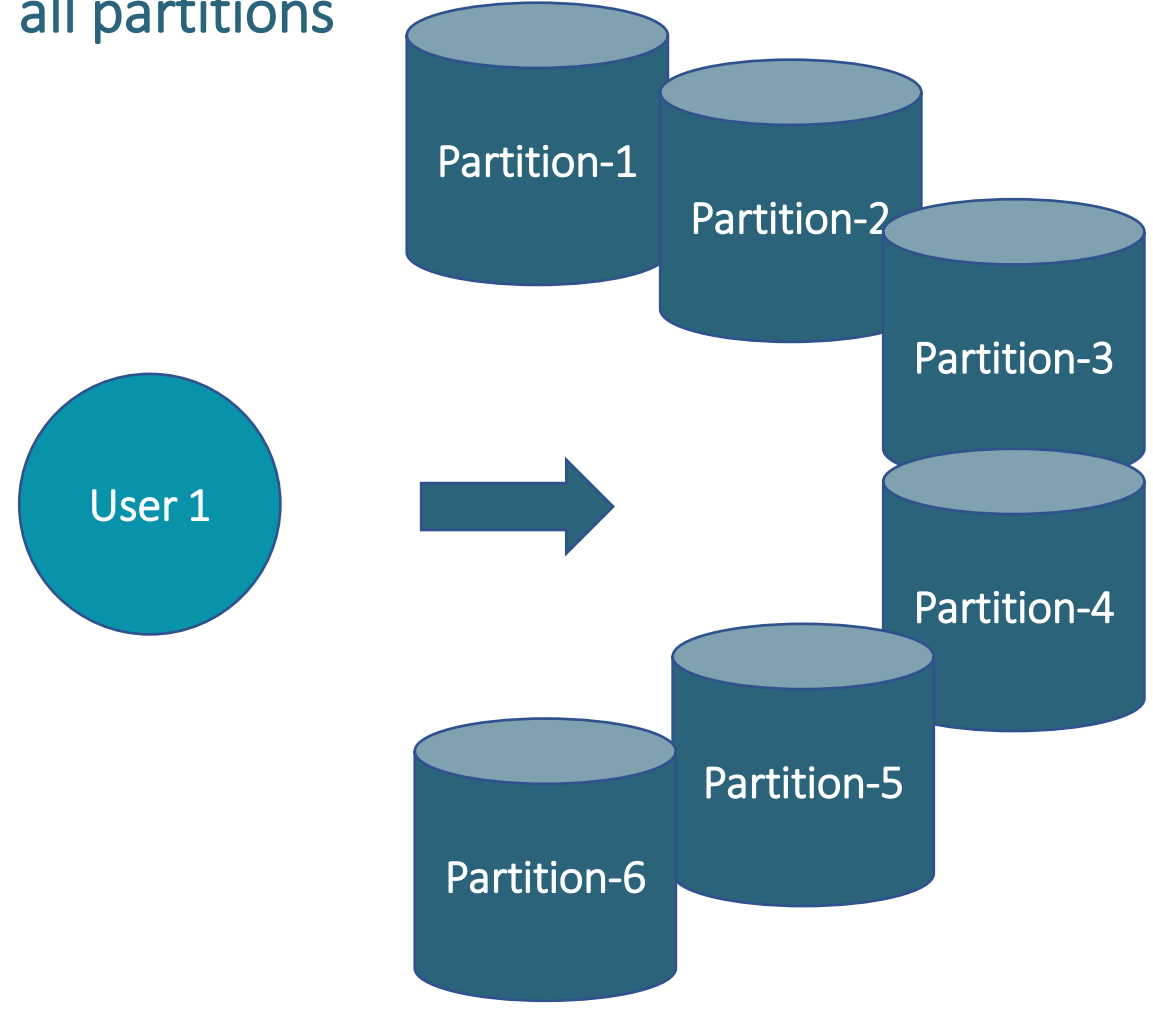
ITCH API

- Partition based ITCH data flow will continue
- Additional ports for newly added partitions will be defined

Currently, at least two users are needed for different partitions



With BISTECH 3.0, one user can access to all partitions



Second user given for accessing 2nd partition will become obsolete and will be deactivated.

Example:

Member **YYY** has the following 13 users for FIX Order Entry;

- Equity;
YYY_FIX1, YYY_FIX2, YYY_FIX3, YYY_FIX4,
YYY_FIX5, YYY_FIX6
- Derivatives;
YYY_FIX1_D, YYY_FIX2_D, YYY_FIX3_D,
YYY_FIX4_D
- Fixed Income;
YYY_FIX1_F, YYY_FIX2_F
- Prec. Metals and Diamond Markets;
YYY_FIX1_K

With BISTECH 3.0, for all market connections, it will be able to continue with 7 users, 6 users have become passive;

- Equity;
YYY_FIX1, ~~YYY_FIX2~~, YYY_FIX3, ~~YYY_FIX4~~,
YYY_FIX5, ~~YYY_FIX6~~
- Derivatives;
YYY_FIX1_D, ~~YYY_FIX2_D~~, YYY_FIX3_D,
~~YYY_FIX4_D~~
- Fixed Income;
YYY_FIX1_F, ~~YYY_FIX2_F~~
- Prec. Metals and Diamond Markets;
YYY_FIX1_K

Second user given for accessing 2nd partition will become obsolete and will be deactivated.

Example:

Member **YYY** has the following 10 users for OUCH Order Entry;

- Equity;
YYYEH1, YYYEH2, YYYEH3, YYYEH4, YYYEH5, YYYEH6
- Derivatives;
YYYDH1, YYYDH2, YYYDH3, YYYDH4

With BISTECH 3.0, for all market connections, it will be able to continue with 5 users, 5 users have become passive;

- Equity;
YYYEH1, YYYEH2, YYYEH3, YYYEH4, YYYEH5, YYYEH6
- Derivatives;
YYYDH1, YYYDH2, YYYDH3, YYYDH4

- All existing Drop Copy users will be de-activated.
- New Drop Copy users created with new naming convention

Example:

Member **YYY** has the following 6 users for Drop Copy;

- Equity;

YYY_FIXUEADC1, YYY_FIXUEADC2, YYY_FIXUEADC3,
YYY_FIXUEADC4, YYY_FIXUEADC5, YYY_FIXUEADC6

With BISTECH 3.0 all users will be de-activated;

- Equity;

YYY_FIXUEADC1, YYY_FIXUEADC2, YYY_FIXUEADC3,
YYY_FIXUEADC4, YYY_FIXUEADC5, YYY_FIXUEADC6

New Users will be created:

YYY_FIXUEA_DC1_P1_E, YYY_FIXUEA_DC1_P2_E, YYY_FIXUEA_DC1_P3_E, YYY_FIXUEA_DC1_P4_E
YYY_FIXUEA_DC2_P1_E, YYY_FIXUEA_DC2_P2_E, YYY_FIXUEA_DC2_P3_E, YYY_FIXUEA_DC2_P4_E
YYY_FIXUEA_DC3_P1_E, YYY_FIXUEA_DC3_P2_E, YYY_FIXUEA_DC3_P3_E, YYY_FIXUEA_DC3_P4_E

Following channels will not be affected with BISTECH 3.0

- **Trading Workstation (TW)** of Equity Market & Derivatives Market(VIOP) & Debt Securities Market
- **Web Trader (KIT)** of Precious Metals And Diamond Markets
- **FIX Reference Data**
- **Data Dissemination** (Market and Index Data Flow over TIP API) for all BIST Markets
- **Pre-Trade Risk Management (PTRM) GUI and API**

IP addresses of TW, TIP, FIX, OUCH and ITCH channels will be changed due to new hardware park.

Note: There is no need to renew FIX/OUCH API certificates. Although those who will apply a new certification will be liable to the updated documents of related protocols.

BISTECH 3.0 IP Mapping Changes



The main reasons why we change the Public IP Addresses:

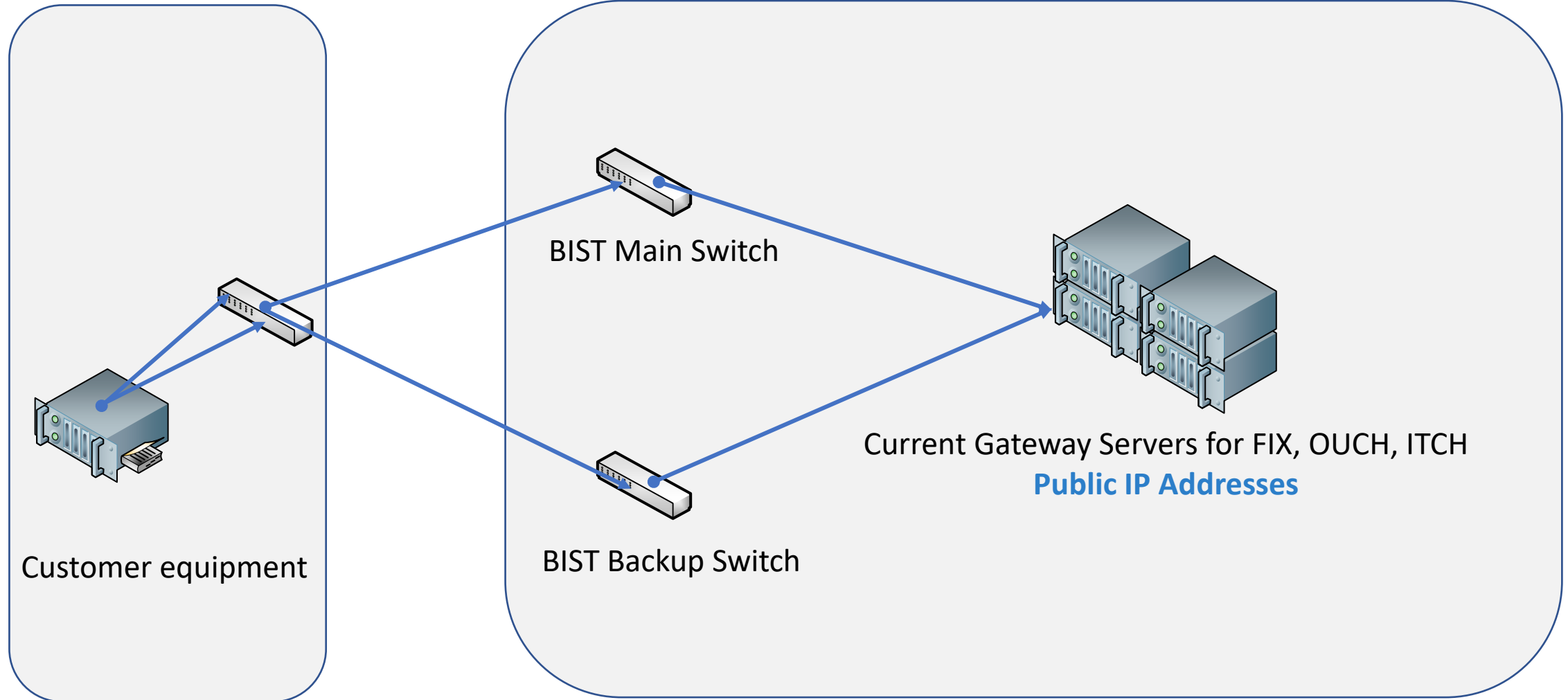
- Due to the rapid increase in the number of gateways, new IP address blocks are needed.
- There are a limited number of Public IP Address blocks worldwide. There are not enough Public IP Address to migration phase of BISTECH 3.0

Transition Phase:

- The Public IP subnets of Co-location Gateway Servers is going to be replaced with Private IP blocks.
- Only Private IP subnets is going to be used for BISTECH 3.0 Co-location infrastructure.
- The relevant IP addresses which is related each member will be notified member by member during the BISTECH 3.0 transition period.

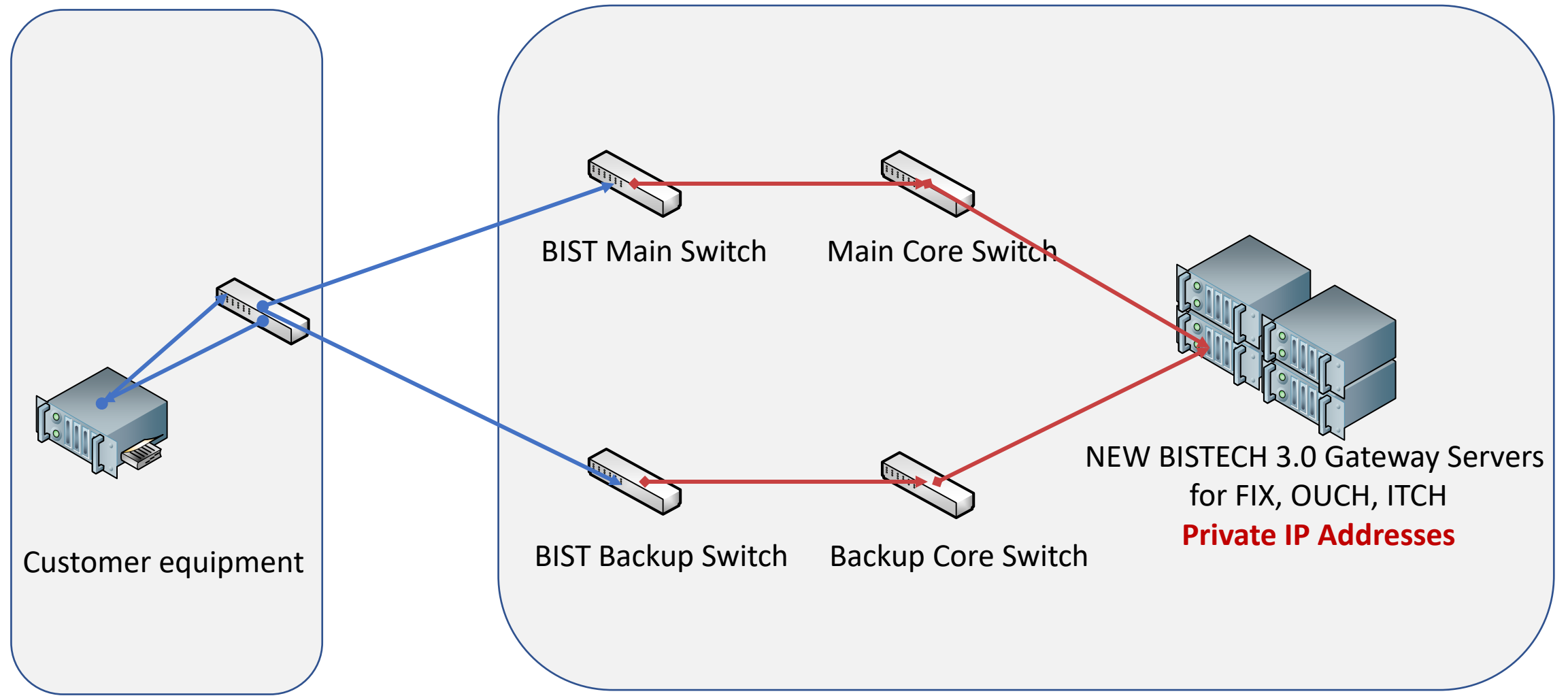
Co-location cabinet

BIST Data Center



Co-location cabinet

BIST Data Center



Customer equipment

BIST Main Switch

Main Core Switch

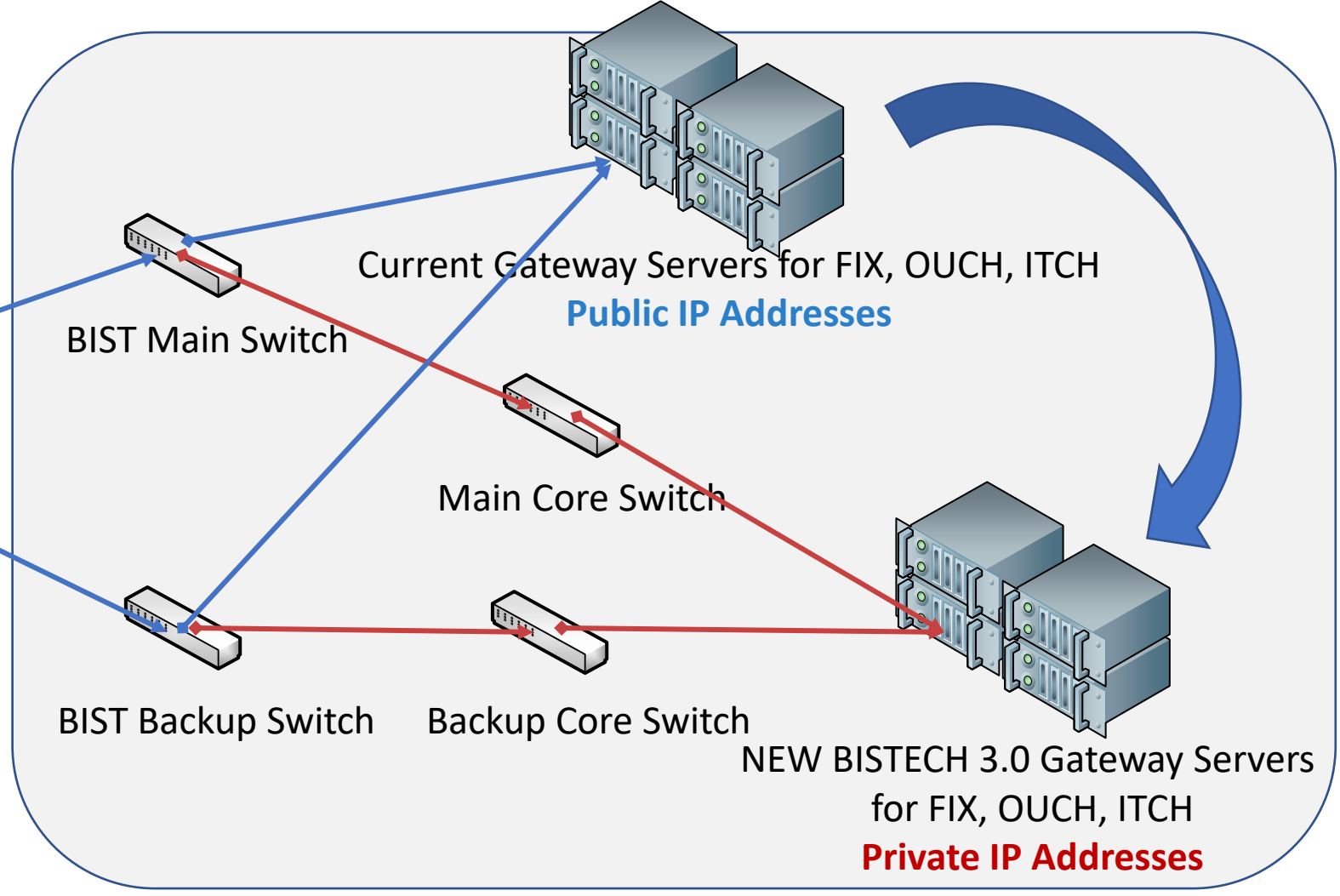
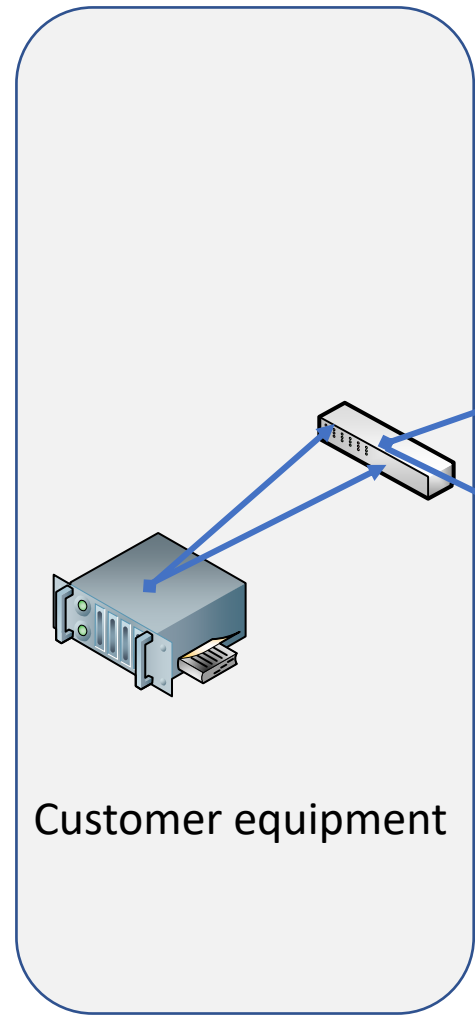
BIST Backup Switch

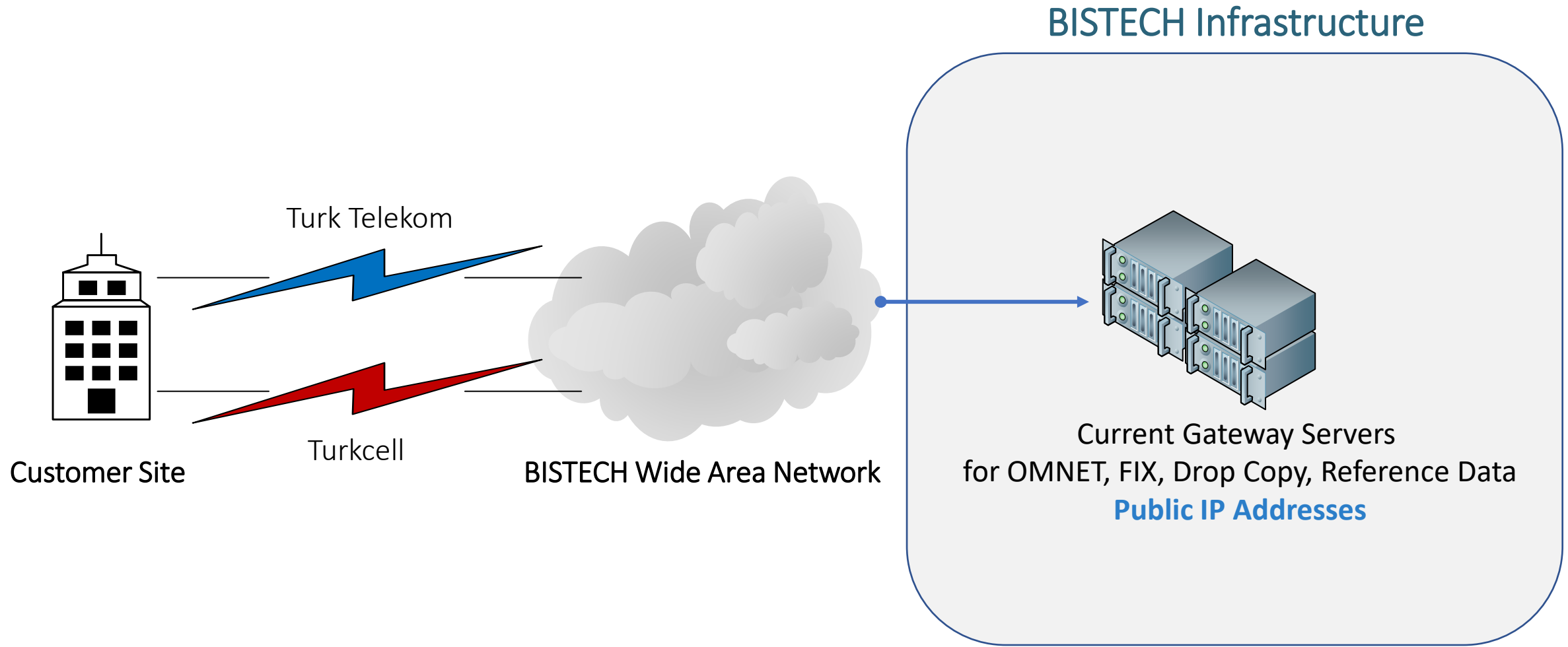
Backup Core Switch

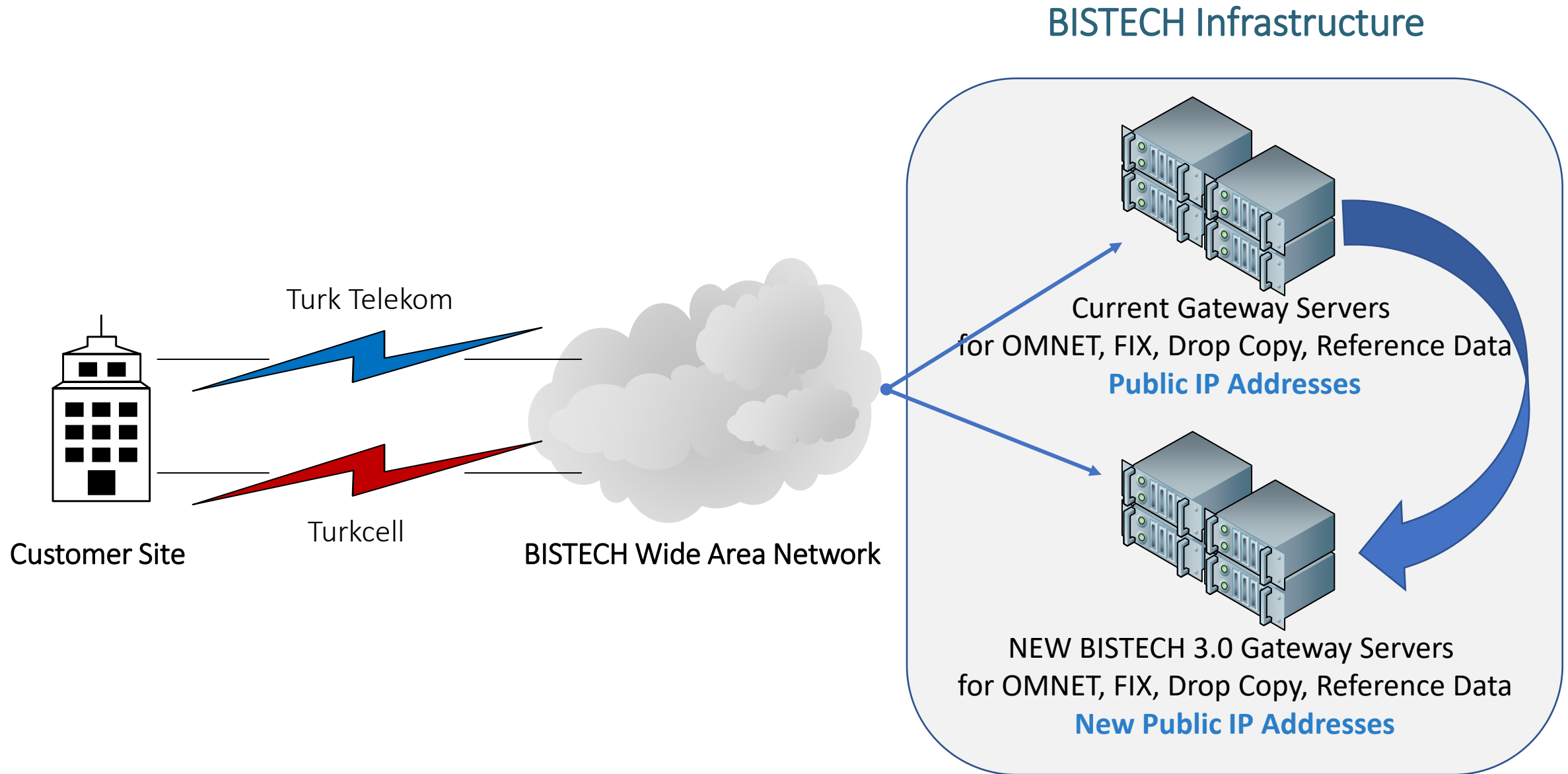
NEW BISTECH 3.0 Gateway Servers
for FIX, OUCH, ITCH
Private IP Addresses

Co-location cabinet

BISTECH Infrastructure

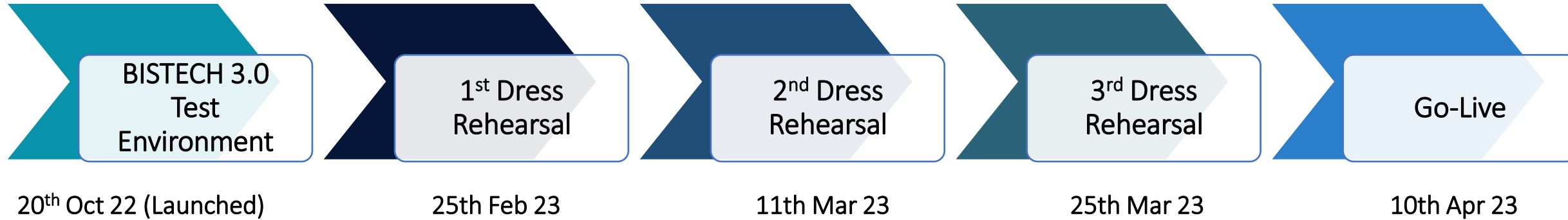






BISTECH 3.0 Timeline





- Launch of BISTECH 3.0 Production Environment for testing purposes: Second half of January 2023 (only weekends)
- Rehearsal tests will be run on the brand new BISTECH 3.0 Production hardware park

Pre-Prod Test Environment:

It involves application and configuration changes that will take place in production environment.

Prod-Like Test Environment:

Generally version of the test system is same as production system. However, new software changes and bug fixes (for production) will be uploaded to this test environment for a certain period of time before production release.

(NEW) BISTECH 3.0 Test Environment:

BISTECH 3.0 test environment. For connection details; 'Bistech 3.0 Test Environment Technical Information Document': <https://www.borsaistanbul.com/files/bistech-3-0-test-environment-technical-information-document.pdf>

Thank You

Any questions?

Visit our website : <https://www.borsaistanbul.com/en/sayfa/2530/technical-documents>

Contact us : bistechsupport_autoticket@borsaistanbul.com

