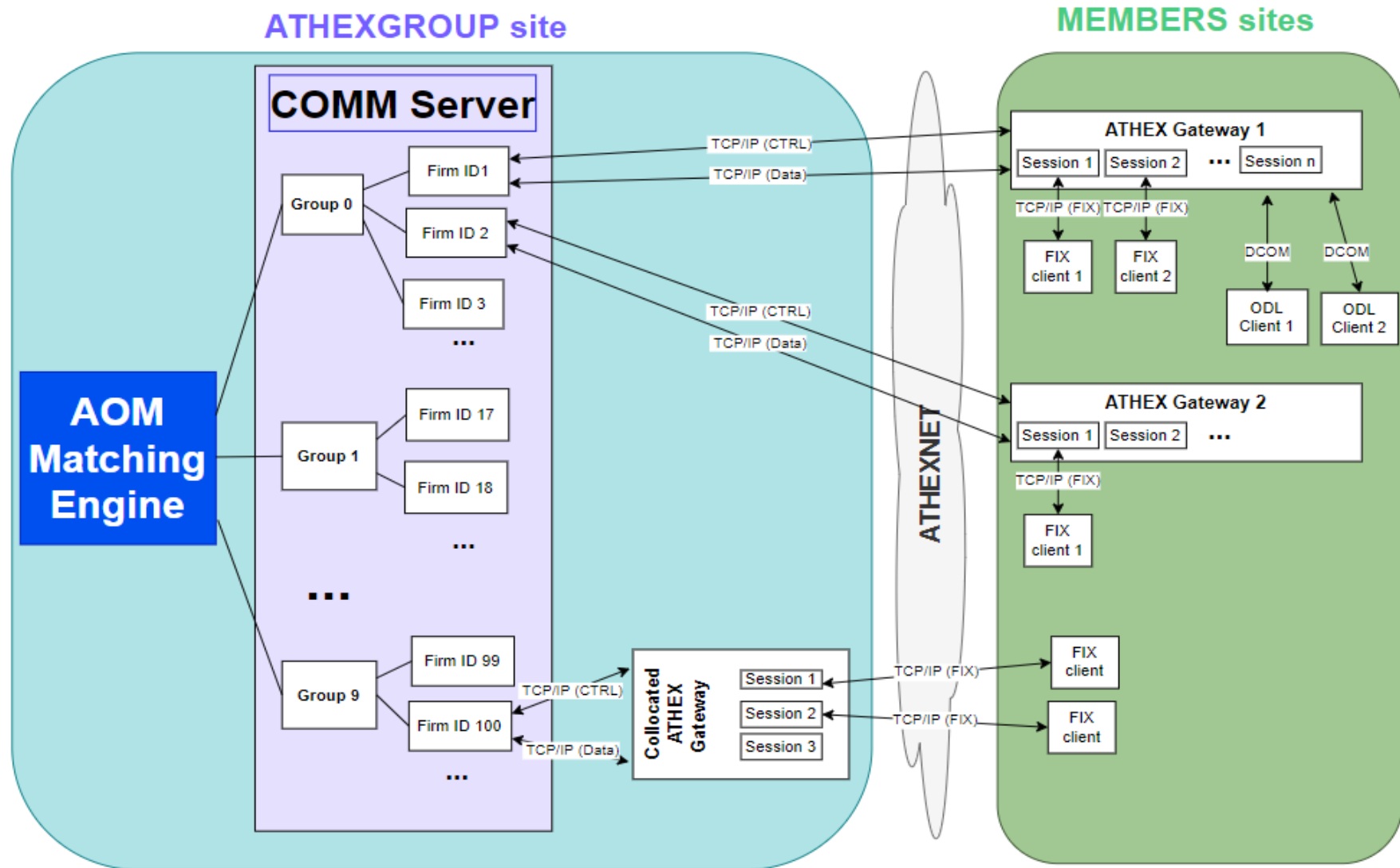# ATHEXGROUP

The new ATHEX FIX Server

Trading Systems Development Dpt

06/06/2022

Current COMM Server / ATHEX GW architecture

Shortcomings of current configuration

➢ Use of ATHEX GW (complex, hard to configure and support)

➢ Multiple points of failure

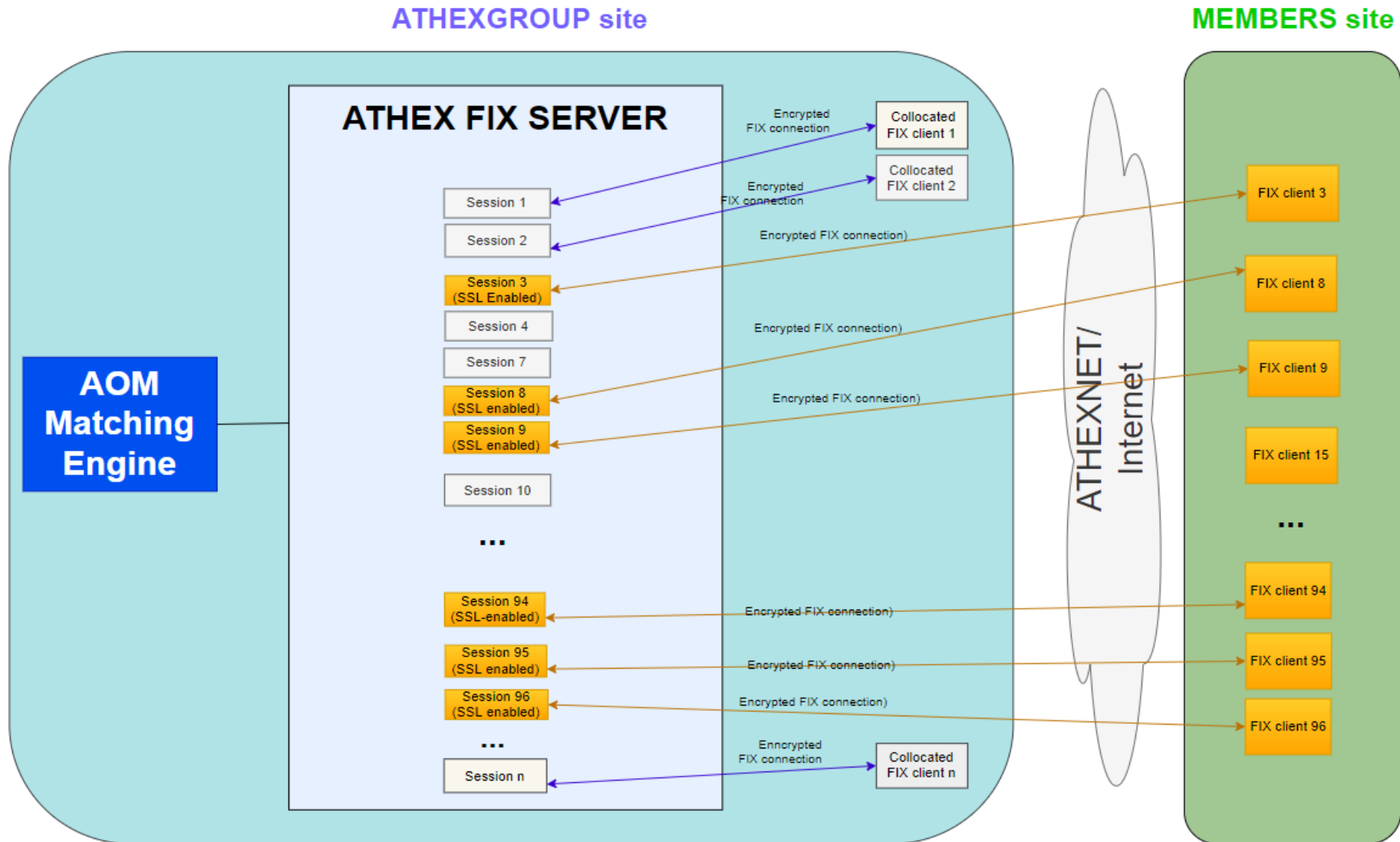➢ Complexity

➢ Poor performance

➢ Outdated environment

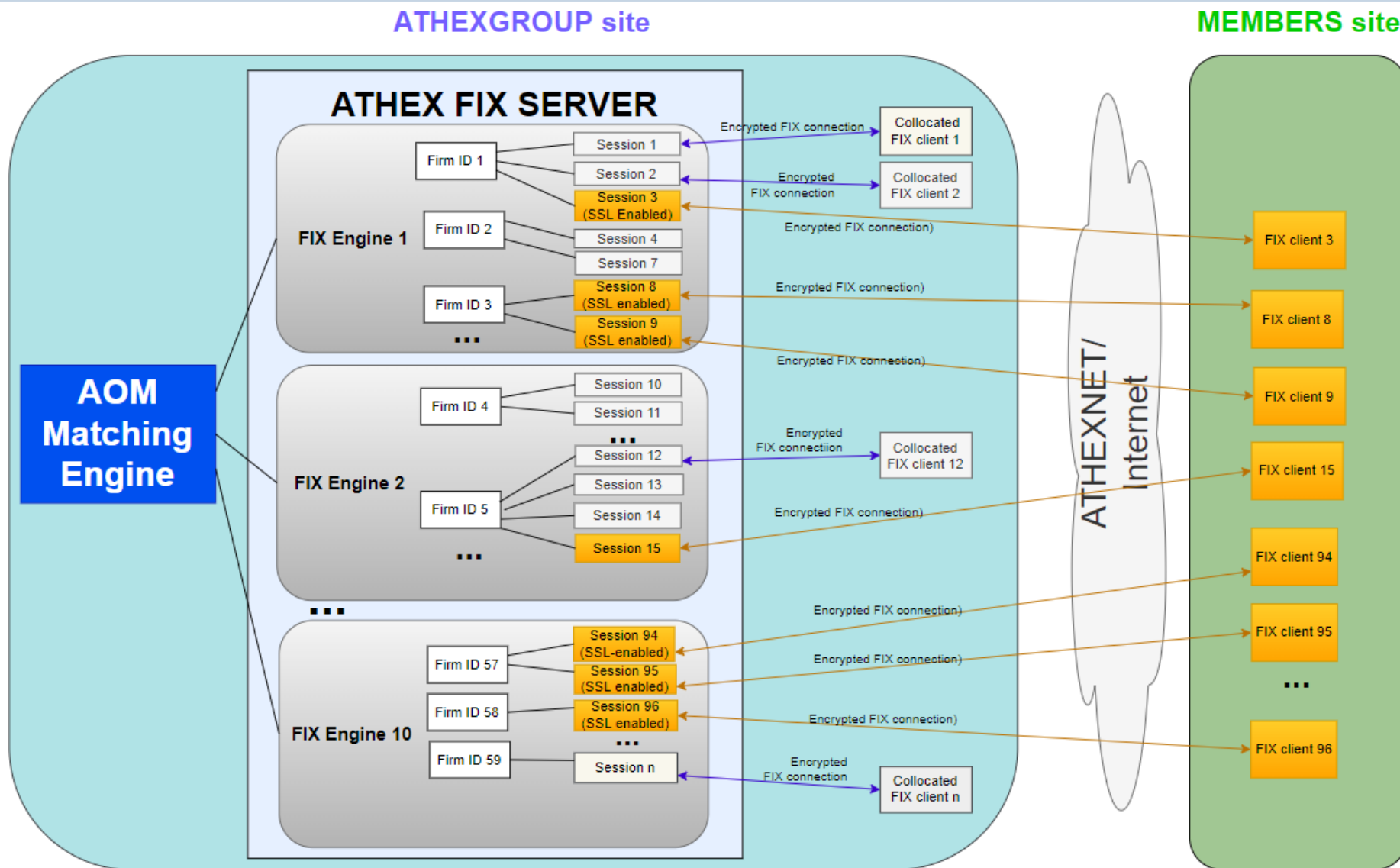**ATHEX FIX Server** will substitute COMM Server and eliminate the ATHEX GWs

➤ Accepts and manages Members' FIX sessions without the use of an ATHEX GW

➤ FIX enabled (FIX 4.4) using OnixS FIX Engine

➤ Radical performance improvement

➤ FIX 4.4 supported by ATHEX FIX Server is quite similar but not identical to the one supported by ATHEX Gateway

➤ Natively supports encryption (up to TLS 1.3)

➤ No support for ODL messages

ATHEXGROUP site

MEMBERS site

ATHEX FIX SERVER

FIX Engine 1

- Firm ID 1
  - Session 1 — Encrypted FIX connection → Collocated FIX client 1
  - Session 2 — Encrypted FIX connection → Collocated FIX client 2
  - Session 3 (SSL Enabled)
- Firm ID 2
  - Session 4
  - Session 7
- Firm ID 3
  - Session 8 (SSL enabled)
  - Session 9 (SSL enabled)
  - ...

FIX Engine 2

- Firm ID 4
  - Session 10
  - Session 11
  - ...
- Firm ID 5
  - Session 12 — Encrypted FIX connectiion → Collocated FIX client 12
  - Session 13
  - Session 14
  - Session 15
  - ...

...

FIX Engine 10

- Firm ID 57
  - Session 94 (SSL-enabled)
  - Session 95 (SSL enabled)
- Firm ID 58
  - Session 96 (SSL enabled)
  - ...
- Firm ID 59
  - Session n — Encrypted FIX connection → Collocated FIX client n

AOM Matching Engine

ATHEXNET/ Internet

Encrypted FIX connection) → FIX client 3

Encrypted FIX connection) → FIX client 8

→ FIX client 9

→ FIX client 15

Encrypted FIX connection) → FIX client 94

Encrypted FIX connection) → FIX client 95

...

Encrypted FIX connection) → FIX client 96

Advantages of the new ATHEX FIX Server

➤ Better performance (lower latency, higher throughput, less spikes in high load)

➤ Elimination of ATHEX GWs

➤ Enhanced security (native ssl support, authentication)

➤ Ability to connect over the internet (with ssl encryption)

➤ Enhanced recovery

➤ Modern and less complex infrastructure

➤ Better scalability

➤ Less points of failure

➤ Standard and widely used protocol (FIX 4.4)

➢ All sessions specified in the ATHEX FIX Server are replicated (will be explained in a next slide)

➢ In case of an outage on the ATHEX FIX Server side, FIX clients should try to reconnect to their replicated sessions

➢ Recovery procedures are described in detail in the ATHEX FIX Server Specifications document

Types of available FIX sessions

➢ **Trading session**

Supports order/quote/trade report management. Each session of this type receives information for all its own orders/quotes/trade reports and unsolicited information sent by the Trading Server targeting the trading session or its Member or all the participants

➢ **Drop-copy session**

It allows a Member to receive all application messages directed to all its connections (ORAMA, ATHEX GW, XNET Trader, ATHEX FIX Server sessions). A Member is not allowed to send any application message through the drop-copy session

Properties of a FIX session

➢ SenderCompID - unique for each session

➢ TargetCompID - same for all sessions

➢ Username (tag 553 in FIX Logon message) - unique for each session

➢ Password (tag 554 in FIX Logon message) - unique for each session

➢ Trading session or DropCopy session

➢ Primary port - unique for each session

➢ Backup port - unique for each session (used for session recovery)

Note: The above session properties will be communicated to Member by ATHEX

FIX session authentication

- In FIX client's **Logon**, the following fields shall be completed

  - **Username** (tag 553) - mandatory

  - **Password** (tag 554) - mandatory

  - **NewPassword** (tag 925) - optionally

- Username and Password are FIX session properties communicated to Member by ATHEX

- NewPassword is submitted by the FIX client in case a password change is required

  NewPassword shall follow the rules below

  - At least 8 characters long

  - At least one uppercase character

  - At least one lowercase character

  - At least one digit

  - At least one punctuation character

FIX session security

➢ SSL encryption is mandatory for all FIX clients

➢ ATHEX FIX Server offers up to TLS 1.3 encryption

➢ Use of server-side certificate only

➢ Two ways for encrypted FIX connection

  ➢ FIX client that supports native SSL encryption

  ➢ Use of a proxy (i.e. stunnel)

Recovery of FIX sessions
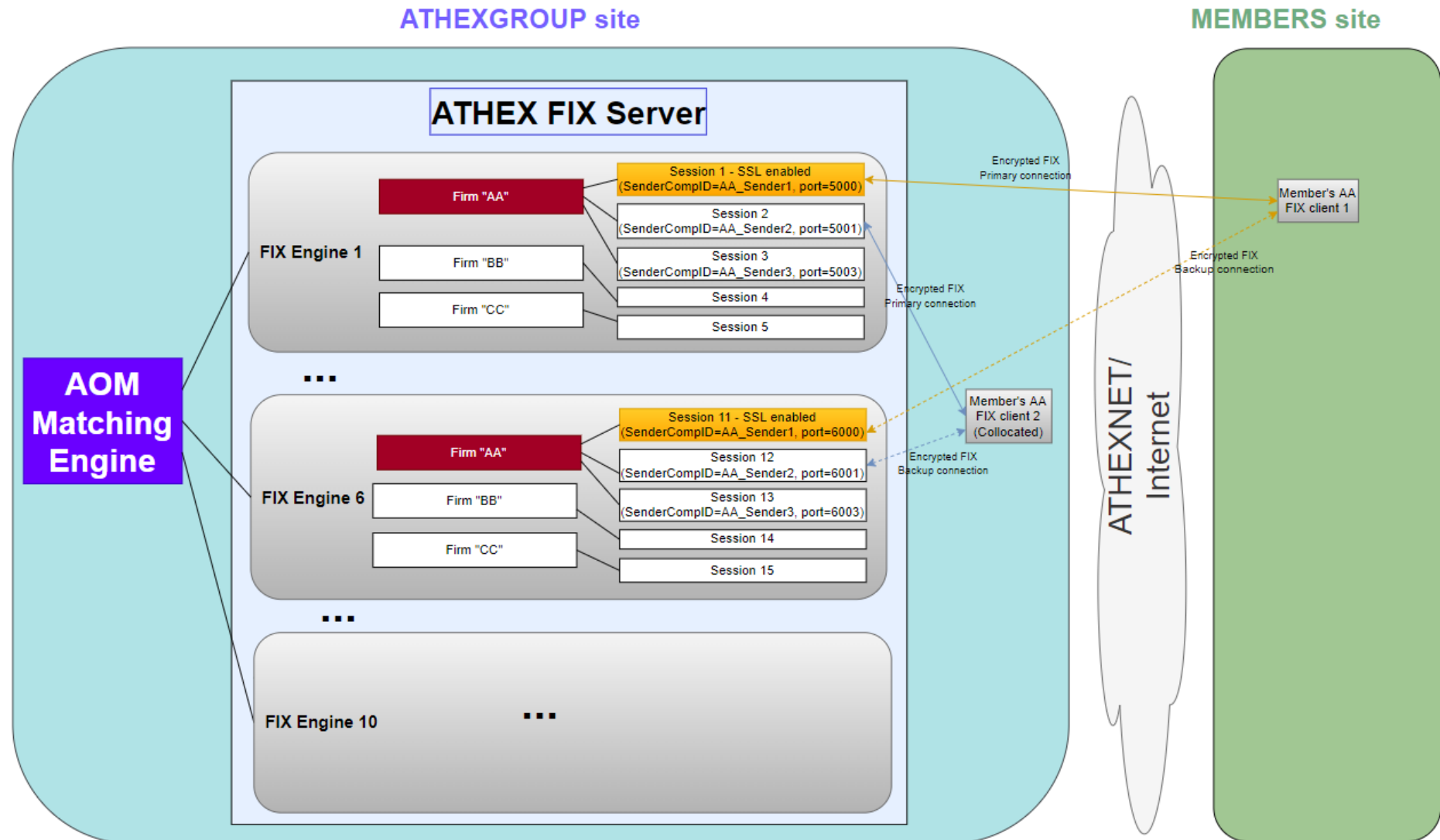
ATHEX FIX Server performance advantage

- **Current Comm Server**

  - Adds approximately 2.4 milliseconds to overall latency (median)

  - A lot of spikes in high load

- **ATHEX Gateway**

  - Adds approximately 0.5 milliseconds to overall latency (median)
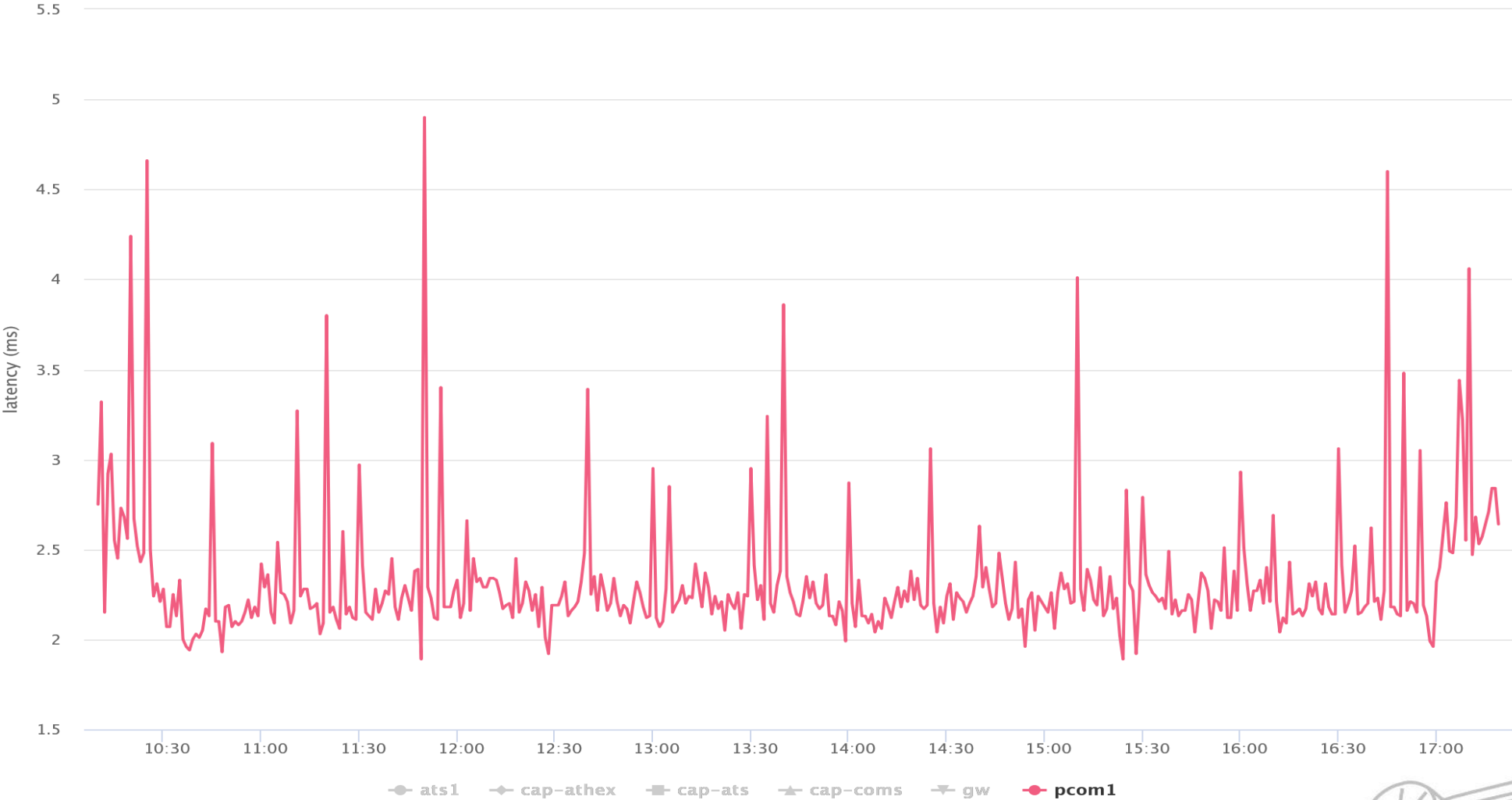
- **ATHEX FIX Server metrics**

  - Round – trip latency (inside ATHEX FIX Server): ~400μsec (+200 μsec for encryption)

  - Throughput of one FIX engine: >20000 messages/second

  - Latency in ATHEX FIX Server stays intact in relatively high load

Total latency gain > 2.5msec

Current Comms Server (diff) latency (daily avg.)

Average latency diff per minute

Transition to ATHEX FIX Server environment

➢ Comm Server + ATHEX GWs and the ATHEX FIX Server environments will co-exist for a period, both in UAT and PROD environments

➢ Installation of ATHEX FIX Server in UAT

  ➢ Initially, ATHEX FIX Server sessions will be created in UAT environment. Their properties will be communicated to Members

  ➢ Some members will be requested to slightly reconfigure their UAT ATHEX Gateways. The only change that will be requested is the registry setting below

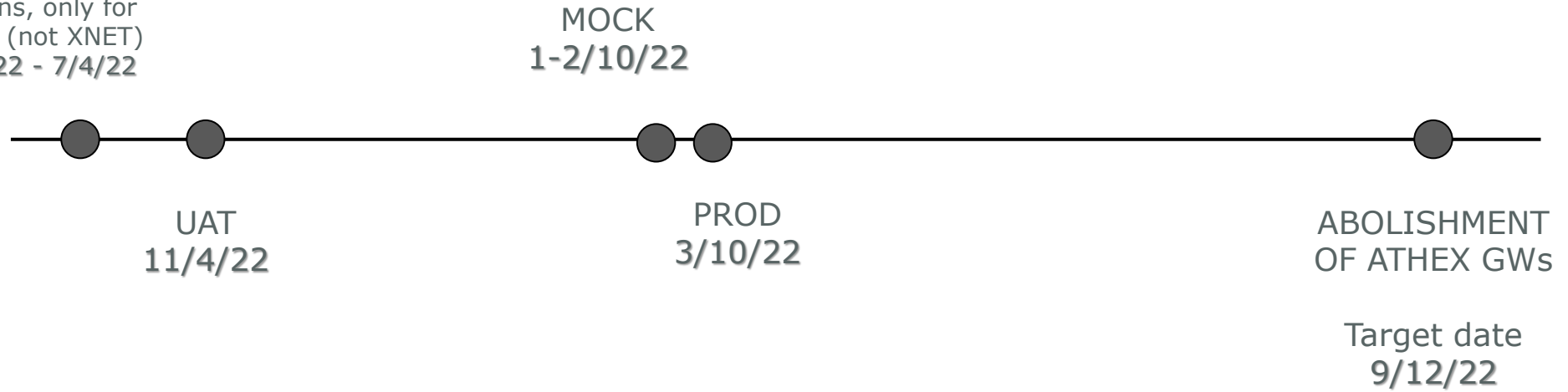   *[HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\ATHEX\ETS_Service\ServerID]*

ATHEX FIX Server – Comm Server coexistence
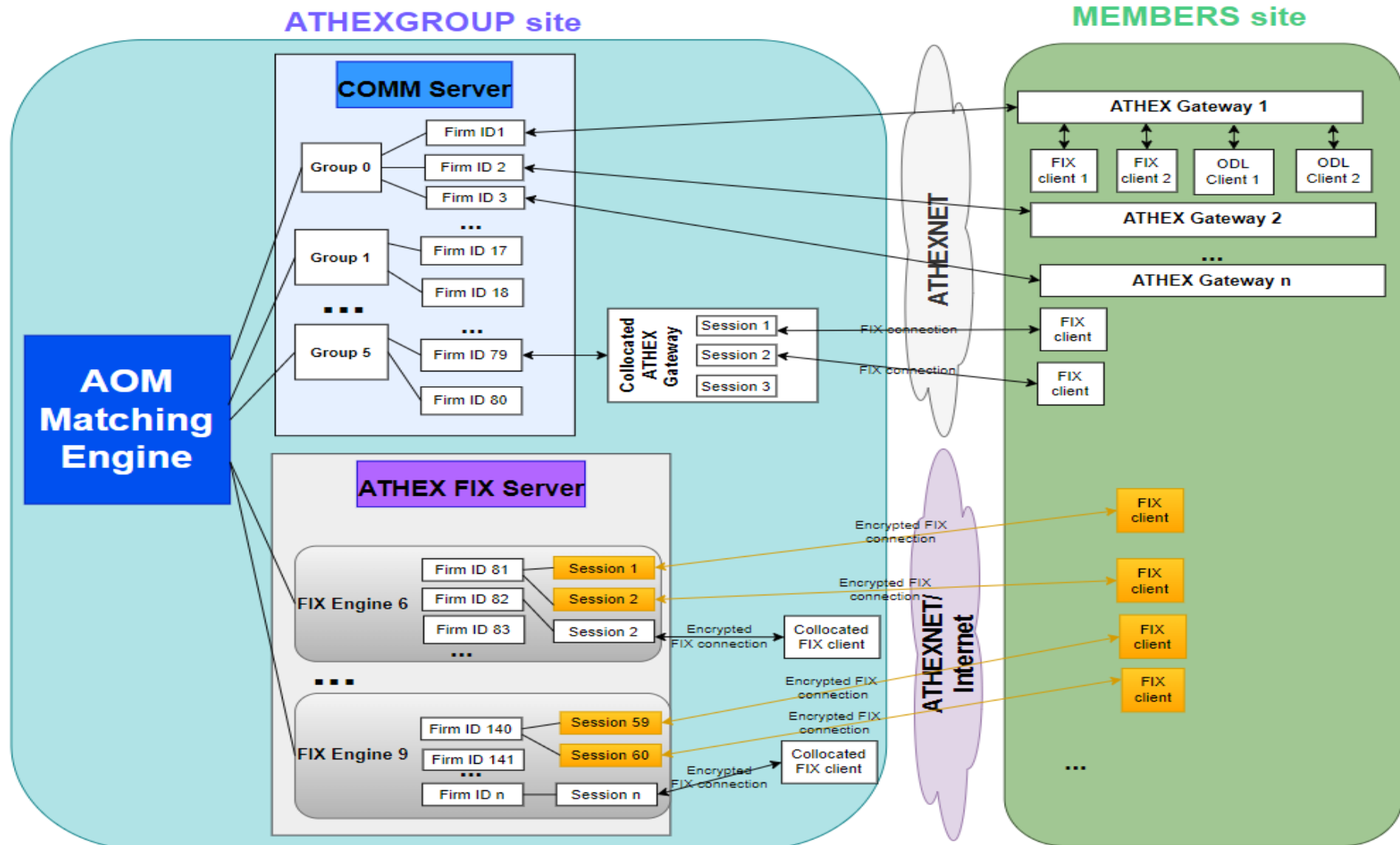
Estimated project timeline

*Requests for the
# of UAT FIX
sessions, only for
ATHEX (not XNET)
31/3/22 - 7/4/22

MOCK
1-2/10/22

UAT
11/4/22

PROD
3/10/22

ABOLISHMENT
OF ATHEX GWs

Target date
9/12/22

*By sending an e-mail to members-support@athexgroup.gr

Thank you