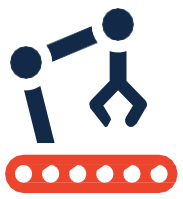
nexbe+

Integrated Automation and Control Solution

Our smart factory platform offers a range of packaged solutions for optimized factory automation, ensuring a smooth and reliable experience from installation to operation.
By harnessing data from individual equipment and inter-equipment processes, our integrated solution streamlines production management, equipment maintenance, and real-time monitoring. With instant processing capabilities, it helps customers make better use of their resources and achieve maximum operational efficiency.



EAS

Equipment Automation S/W

Field-oriented Optimized service

What does it do?

nexbe+ EAS is an integrated equipment automation software designed for seamless equipment automation and operation.

- Provides a comprehensive suite of features essential for equipment automation.
- Empowers users to operate equipment more efficiently and intelligently.

30 Years of Experience in Factory Automation System Operations!

Factory optimization services designed by field experts for maximum efficiency

Industry Industrial Automation

- A leading provider of total factory automation solutions
- Offers production automation services across various industries
- Delivers a wide range of solutions and products for domestic and international markets
- Provides specialized solutions and products for display, semiconductor, and general manufacturing factories

Equipment Automation Operations

- Inline/Online job processing
- Equipment CIM operations

Engineering for **enhanced equipment productivity**

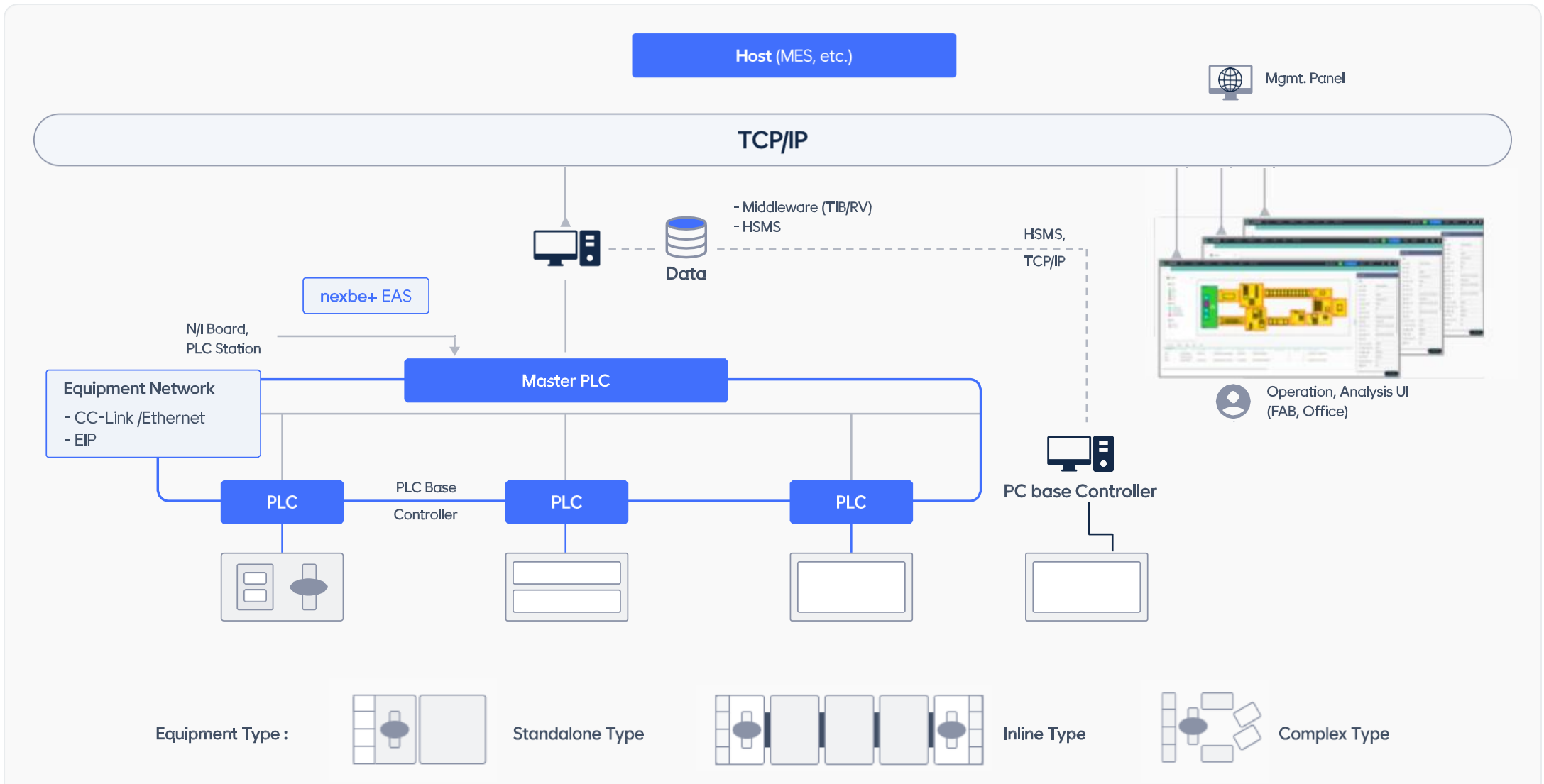
- Quick data collection
- Transport tact time
- Tact time analytics

01 CIM Architecture

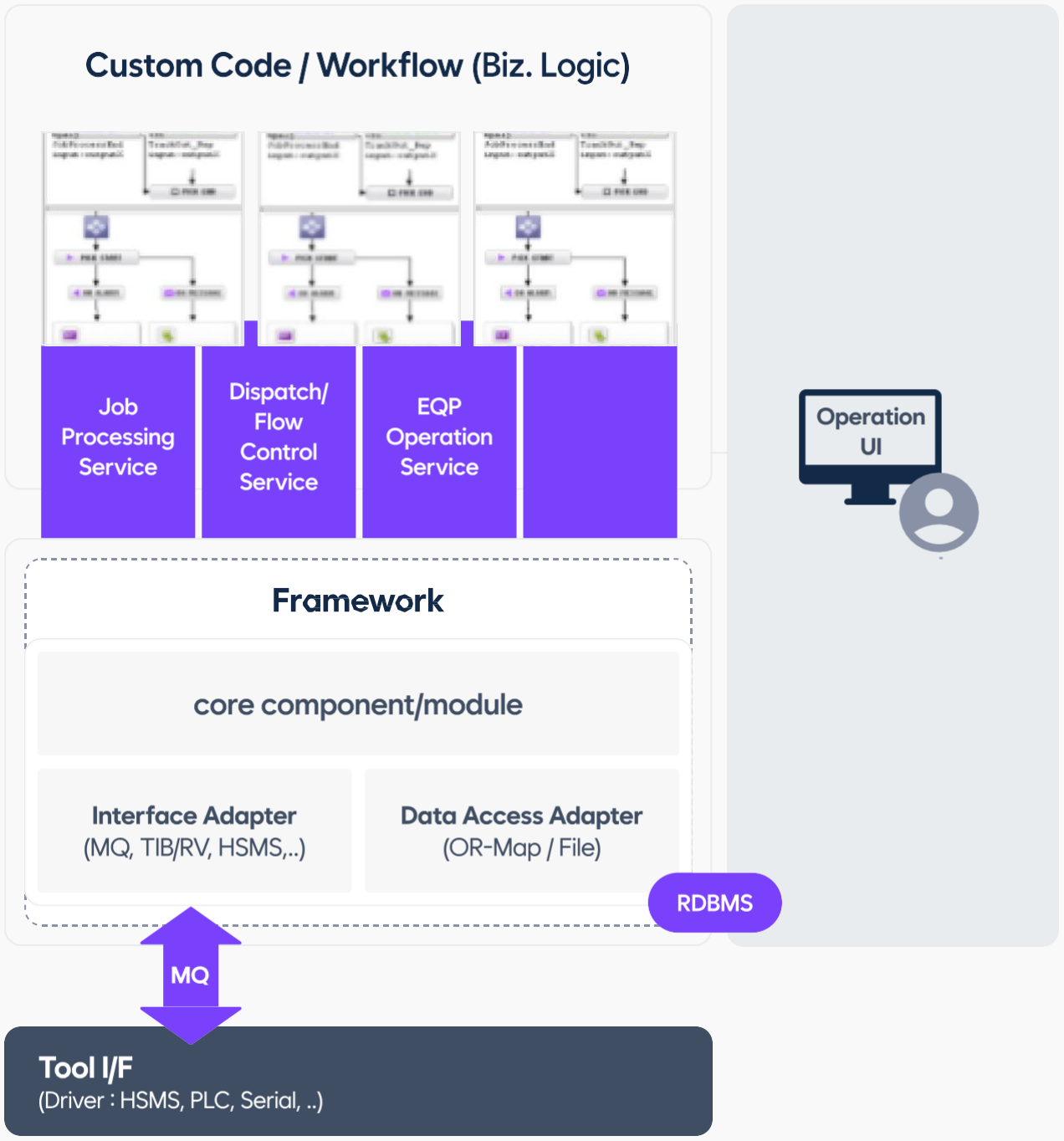
Supports PLC communication network

- CC-Link/IE (N/I Board or Master PLC Station), Ethernet
- EIP

Supports HSMS/Serial communication



02 Unified Framework with Equipment & Factory-Specific Services



Service-oriented architecture

- Reusable & loosely coupled components
- Business logic implementation through workflows

Component-based development (CBD)

- Service components & interfaces
- Data modeling and object creation

Customization features

- Core component API for custom business logic implementation
- Unified user class integration

Scalable architecture

- Modular functional components
- Separation of business logic and data I/F

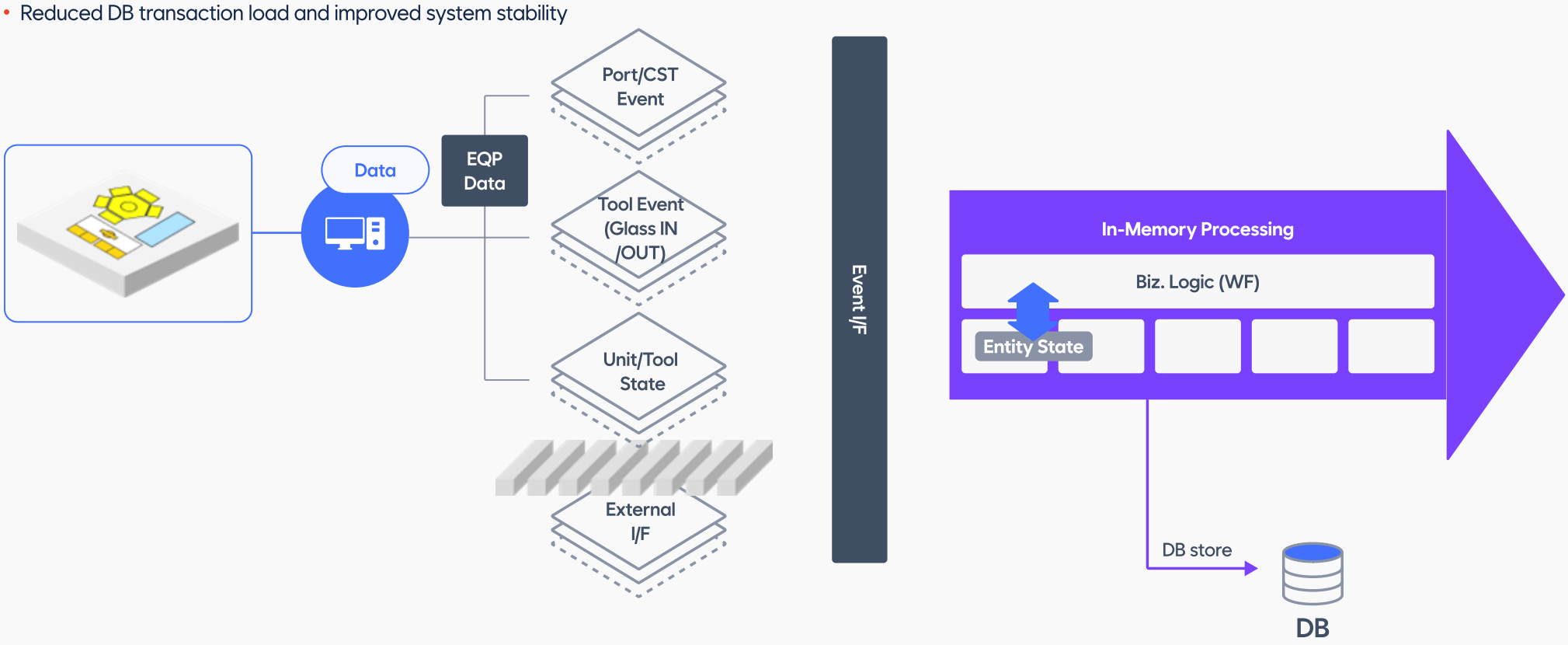
Development language

- Server : Java
- UI : Java, Vue.js
- Tool I/F : C#

03 Fast Data Processing

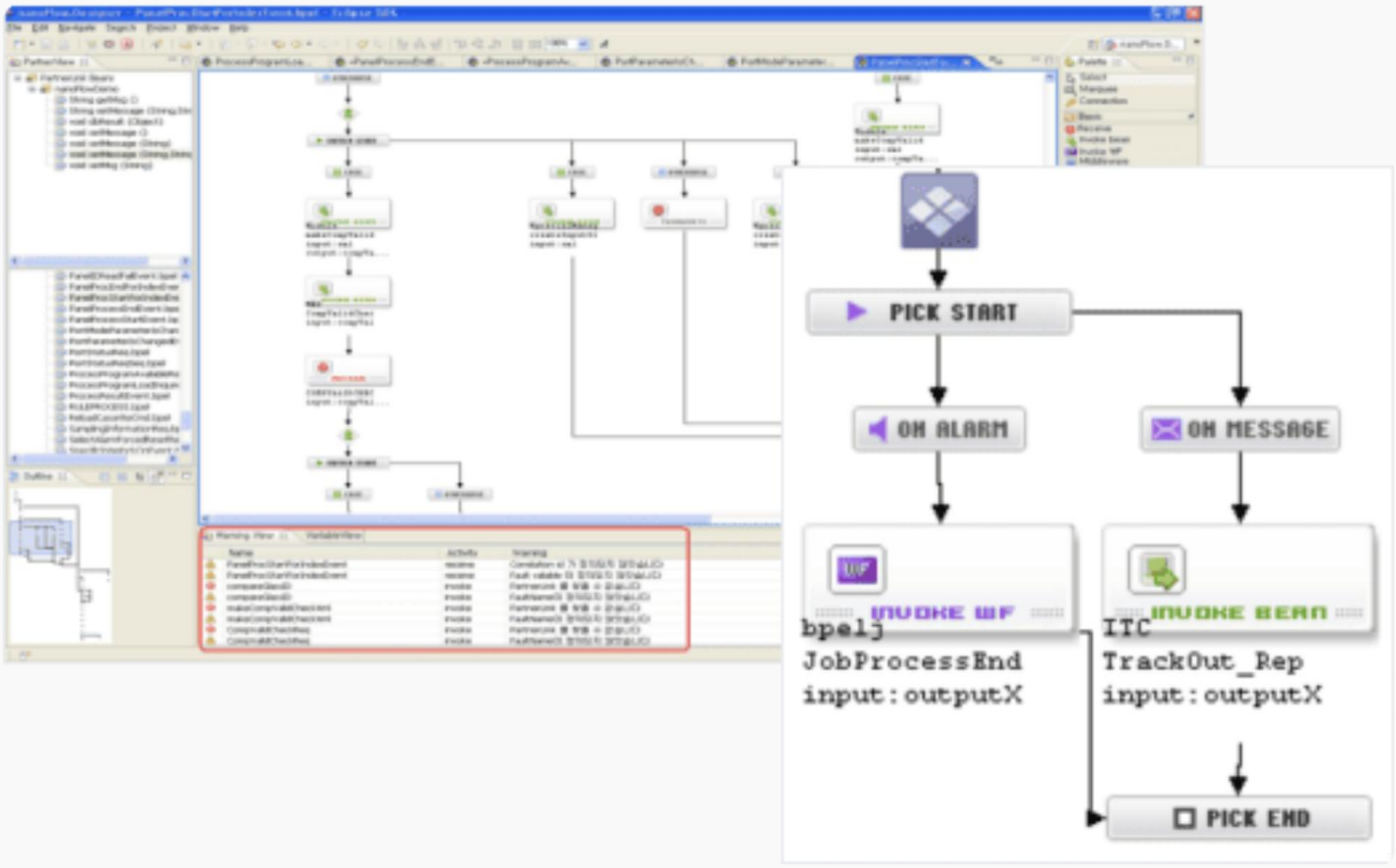
In-memory Processing

- Reduced transaction latency *Typical response time is "00 ms"
- Reduced DB transaction load and improved system stability



04 Tool-based Development - Workflow

Business logic flow modeling	Flexibility	Visualization
• Creation of processing flows for each event • Automatic binding of required methods • Process flow creation of Switch, Wait, Sequence, and Parallel flows	• No re-compile and re-start required • Real-time patch deployment and execution • Effortless modifications	• Intuitive visualization of business logic flows



Product Configuration

Software components

Solution	Product		Explanation
	Name	Version	
Equipment Automation	**nexbe+** EAS	3.0	Equipment automation software
Communication I/F Module	Bridge P	3.0	PLC I/F test and runtime
Management Tool	EMPanel (BC Studio)	1.0	**nexbe+** EAS monitoring and management
DBMS	Firebird	3.0	Support for Freeware RDBMS (default) and other common RDBMS

Development environment

Server

- Spring Framework
- **ezieco**
- IDE Env.: Eclipse, STS

UI

Backend

- Spring Framework

ezieco

- IDE Env.: Eclipse, STS

Frontend

- aim WEB Framework
- IDE Env.: Visual Studio Code

Application Framework

- JVM8 (Java 1.8)
- Node.js, Vue.js3

Field-oriented Optimized service

01 Monitoring and Operations UI

- EQP state monitoring
- Processing status monitoring (Lot, Cassette, Glass)
- WIP tracing
- Job Processing (Lot Start/End)
- Recipe operations
- Indexer dispatching operations/modeling
- Data/History View
- Supports multiple UIs
- Supports remote UIs

02 Communication & Equipment Status Management

- **Equipment Communication Status**
  - CIM Mode / Inline Mode
  - Equipment Alive / Local Alarm State
- **Host Control Status**
  - Connection State / Online Mode
- **Equipment Status**
  - Supports E10 State

03 Port/Cassette Processing

- **Port Operations**
  - Port Operation Mode (Loader Operation Mode, Job Operation Mode)
  - Port Status / Port Mode / Port Type
  - Port Enable Mode
  - Port Transfer Mode (MGV/AGV/Stocker Inline)
- **Cassette Operations**
  - Cassette Data Online Download
  - Cassette Data Edit
  - Cassette Process Control
    (Start / Start By Count Pause / Resume / Abort / Cancel Map Download)

04 WIP Management

- **Glass Tracking Data Management**
  - Glass ID, type, size, status, location
  - Glass quantity
  - Dummy/Rework data management
  - Inspection data management
  - Tracking data management
- **Glass Process Data Collection**
  - Equipment processing data for each Glass/Lot
  - Processing data, inspection data, measurement data, material information
- **WIP Monitoring**
  - Real-time processing Lot/Cassette/Glass status monitoring

05 Inline Flow Control

- **Glass Flow Control for Equipment/Conveyor Lines**
  - Logical sub-block configuration & control of Glass flow between sub-blocks (e.g., buffer control logic, Glass insertion logic)
  - Supports product changeovers (continuous production of multiple products)
  - Cold Run
  - Supports reprocessing and clean-out

06 Recipe Managrment

- **Recipe Management**
  - Current Recipe Report
  - Recipe validation (recipe parameter validation, recipe validation mode, recipe interlock verification)
  - Recipe editing (Create/Delete/Modify)
  - Recipe Table Upload/Download
  - Recipe Auto Change Mode
- **Recipe Parameter Management**
  - Recipe Parameter Collection / Report
  - Recipe Parameter Download

Host Recipe ID	Master Recipe (PPID)	Local Recipe ID			
		L2	L3	L4	–
HOST8-32T-PPID1	001	003	024	025	–

07 Glass Dispatching

- **Robot Control for Glass Transport**
  - EAS determines glass transport commands, including From-To positions
  - Indexer PLC controls the actual glass movement
  - Reduces process time by generating transport commands in advance
- **Glass Transport Flow Control**
  - Implements rule-based transport logic
  - Glass flow control
    (Recipe, Operation Mode, Dispatching for diverse flow)

08 Sorting

- **Sorting by Plan**
  - Sorting by plan - for Online/Offline
  - Indexer as Sorter (using the EAS Glass Dispatching function)
  - Automatic merging of remaining glasses (merging Source Cassettes)
- **Glass sorting at Unloader Port**
  - Glass sorting based on Judge/Grade, ID Rule, and Defect criteria

09 Sampling

- **Sampling**
  - Sampling using MES sample flags
  - Sampling using sample sets in EAS UI - Sample Cassette/Slot modeling

10 인증

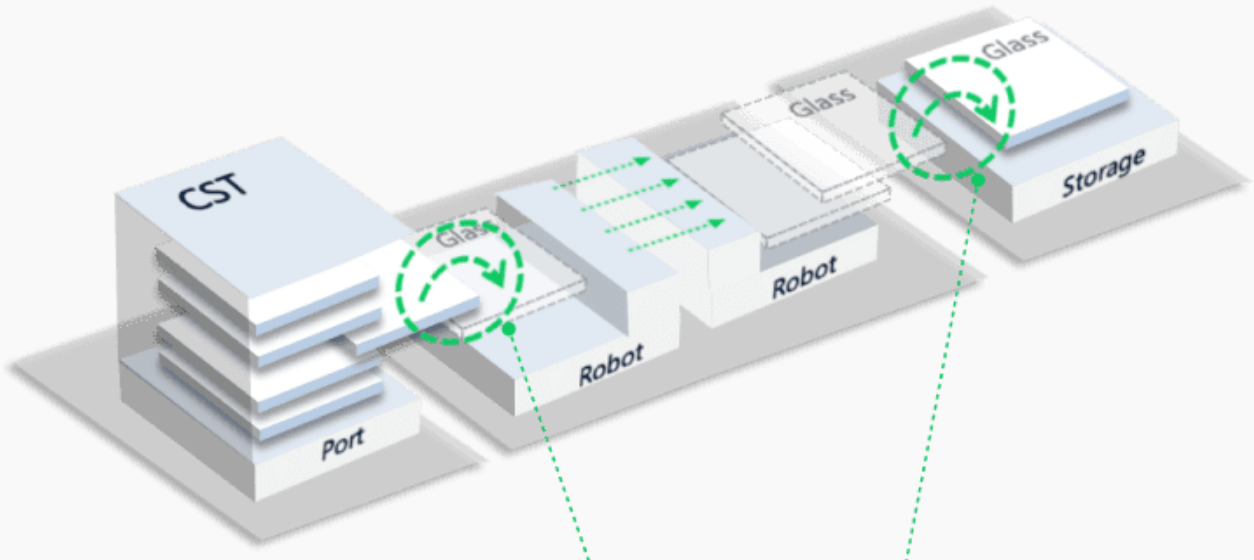
- **User Management**
  - User group registration/management
  - User registration/management
- **User Authentication**
  - Access control using passwords
  - Menu access control by user group
- **Logging**
  - Records successful/failed authentication attempts

11 Data Collection

- **Engineering Data Collection and Transfer to External Quality Systems**
  - Equipment (PLC) data collection (supports adjustable collection intervals starting from 0.2 seconds, configurable per equipment)
  - Data provision (supports runtime configuration for interval changes and data selection)

12 Tact Time

- **Indexer Transport Time**
  - Records robot transport events as CSV files for easy analysis in Excel
- **Process Time for Inline Processing Equipment**
  - Tracks process start-to-end times for glass processing across equipment
  - Displays data in chart format (by equipment and recipe)



- Provides transport time analysis from the initial stages of operation
- →Enables rapid transport time adjustment actions (EAS and EQP)

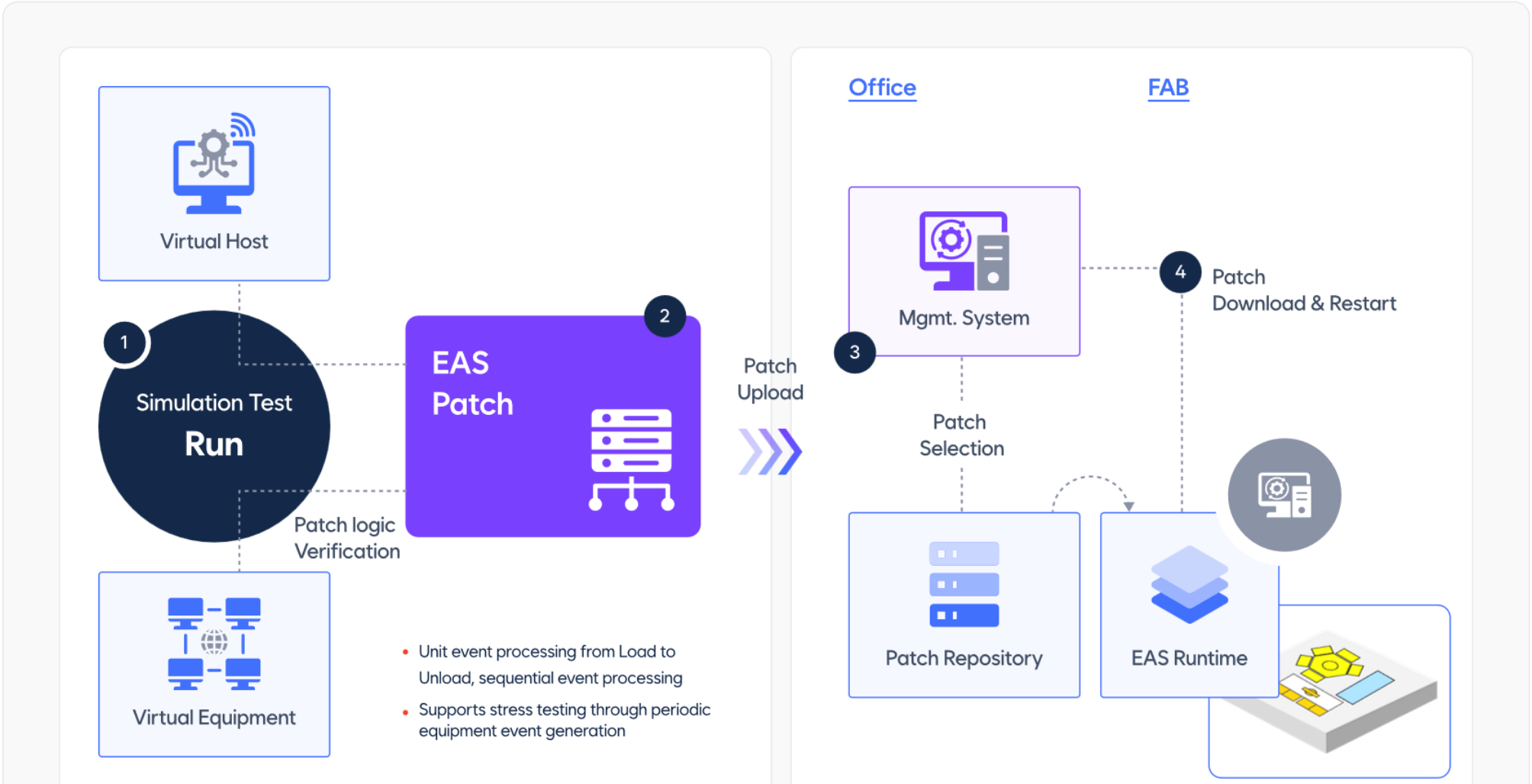
Time	Glass Code	Robot CMD	Robot Event	Location	Time Interval
15:00.0	131441(369,2)	Transfer			
15:01.6	131441(369,2)		Robot Arm Load	CM1	00:01.6
15:21.9	131441(369,2)		Robot Arm unload	PM1	00:20.3
15:22.0	131441(369,2)		Command Complete Report		00:00.1
15:49.4	196977(369,3)	Transfer			00:27.4
15:51.0	196977(369,3)		Robot Arm Load	PM2	00:01.6
16:11.3	196977(369,3)		Robot Arm unload	CM1	00:20.3

13 System Management

- **System Management**
  - Start/End process execution
  - System health (CPU, Memory)
  - Patch & Deploy EAS
  - Patch version control
  - Patch repository control
  - Patch history tracking
- **System Monitoring**
  - Process execution status
  - Error monitoring & alerts (Process Down, OS Down)
  - Automatic process restart on failure
  - Process status alarm reporting
- **Patch**
  - Select equipment & version for patching
  - Supports simultaneous patching of multiple equipment
  - Patch options (forced patch or manual confirmation)
- **Back-up**
  - Configurations/modeling data
- **Quick Roll-back**
  - Easily roll-back to a previous version if issues arise with the patched version
  - EAS server integration within FAB

14 Simulation & Patch

- Comprehensive patch testing environment → Simulation tests → Apply patches on-site



15 Modeling

- **Tool-based Modeling**
  - Equipment data / layout modeling
  - Data modeling & configuration (Data variables, State variables, Alarms, etc.)

16 I/F Configuration & Testing

- **Tool-based Development - HSMS I/F**
  - Defines SECS messages
  - Generates message configuration files
  - Provides a simulator for HSMS I/F testing

17 Set Up & Trouble Shoot

- **Equipment Testing & Troubleshooting - PLC Data**
  - Real-time PLC data view for testing and issue analysis
- **Inline Testing & Troubleshooting - Transactions**
  - Supports inline testing for engineers - guaranteed inline testing quality
  - Automatic validation of equipment event accuracy
    (Unit events & sequential events: based on scenario test models)
  - Provides both online (semi-real-time) and offline views
- **Link Signal Chart View**
  - Logs link signals (collects Link Signal On/Off data)
  - Supports Link Signal I/F charts
  - Provides both online (semi-real-time) and offline views
- **Log Viewer**
  - Easy log search and analysis
- **EAS Trouble Dash Board**
  - Monitors abnormal operations across lines
    EAS-MES track in/out failures, EAS-EQP transaction failures/timeouts
    Unresponsive robot, customization errors
- **EAS Trouble Dash Board**
  - Monitors the most problematic lines currently
    Top 5 Trouble items & equipment