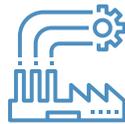




# FDT<sup>®</sup> (3.0) Unified Environment

Integrating Tomorrow's Technology

# A New Era of Industrial Automation



With the advent of the Industrial Internet of Things (IIoT) and the connected world, there is a need for open and interoperable standards to ensure powerful measurement and control assets can communicate and work together as needed in smart industrial operations.

INDUSTRIAL ORGANIZATIONS ARE SEEKING TO:

*Establish a modern, integrated automation architecture*

*Achieve secure, cloud-based enterprise data access*

*Enable interoperable control networks*

*Optimize connectivity and information exchange*

*Protect legacy technology investments*

*Scale solutions across the entire enterprise*

# Open Standard for Sensor-to-Cloud Integration



An international, non-profit corporation led by major global companies active in industrial automation, FDT Group is focused on enabling modernized asset integration and access to performance data for visualizing crucial operational problems in the digital transformation era. Tens of thousands of FDT®-enabled systems are deployed along with millions of Device Type Managers™ (FDT/DTMs™), making FDT the most widely adopted standard for integration of assets in process and factory automation systems.

FDT is a disruptive technology for modern industrial operations, it is a key enabler of the Fourth Industrial Revolution, with an IIoT server-based solution providing advancements for cloud-based enterprise data access, mobility apps, and the use of augmented reality. Another key milestone has been FDT's ability to migrate from an integration standard to an information exchange platform for device-specific information using the FDT/OPC UA companion specification to offer connectivity in IIoT and Industry 4.0 applications.

SUPPORT FOR ALL INDUSTRY STANDARDS, PLATFORMS AND PROTOCOLS



FDT represents the leading global standard for universal device and network integration for both the process and factory automation markets. It is engineered for use with all major industrial communications protocols and proprietary protocols with fully transparent tunneling through any mixed network topology.

# Flexible Architecture for the Industrial Enterprise



FDT Group's development of the FDT (3.0) Unified Environment (FDT UE) meets crucial industry requirements, providing a flexible platform for deployment of various IIoT-based solutions. FDT UE is multi-faceted, scalable and agile, and can be utilized in a host of diverse operating environments due to its operating system independence. This approach results in a flexible FDT Server architecture and robust FDT Desktop environment which bridges the current FDT install base with next-generation technology and creates an excellent starting point for new applications.

FDT Group has incorporated industry-driven feedback into its latest developments for the intelligent industrial enterprise. Working groups have focused on key criteria such as:

- *FDThub™ provides a single DTM repository designed for both cloud-based and on-premise air-gapped system deployment, providing easy access to all certified DTMs.*
- *FDT mobility expands access to critical device data and improving workflow for plant workers with its mobile device management interface along with apps to enhance maintenance efficiency.*
- *FDT security empowers a comprehensive security solution designed to safeguard data access from the enterprise all the way down to the device level for connected and air-gapped requirements.*

## Advancing today's intelligent automation

The FDT UE solution provides an opportunity to advance intelligent automation with standards-based, information-driven business models meeting the demands of the process, hybrid and discrete automation markets.

*Transforming manufacturing practices; enabling open, secure and flexible deployment architectures; and providing robust, built-in security features.*

*Natively integrating OPC UA and supporting comprehensive control and web services for secure mobile, cloud, on-premise, edge and enterprise-wide applications.*

*Employing the latest technology to allow for a server-based architecture that is both operating system independent and future-proof.*

# How the FDT Server Solution Works

- A FDT Server**
- Utilizes .NETCore open source software to build device, cloud and IIoT applications.
  - Compatible with a choice of operating systems, including macOS, Linux and Windows.
  - Offers a variety of deployment options, including cloud, edge, on-premise and air-gapped.
  - Employs Server Common Components relieving the developer of integrating the standard into products, allowing them to focus on value-added capabilities.

- B Core Server**
- Functions as IIoT data hub for the FDT Server.
  - Included in Server Common Components.
  - Incorporates DTM user interfaces and business logic.
  - Stores, instantiates and executes DTMs, which are always kept up to date via the *FDThub* repository.
  - Provides the FDT topology information.

- C Custom Server Value-add**
- Integrates into a larger system for enhanced functionality, including higher level, complex systems such as asset management applications, PLC tools and DCS/engineering applications.
  - Utilizes Server Common Components with all the basic coding groundwork for business logic, project data and Web UI, which system vendors can customize by adding their own wrapper for branding purposes.

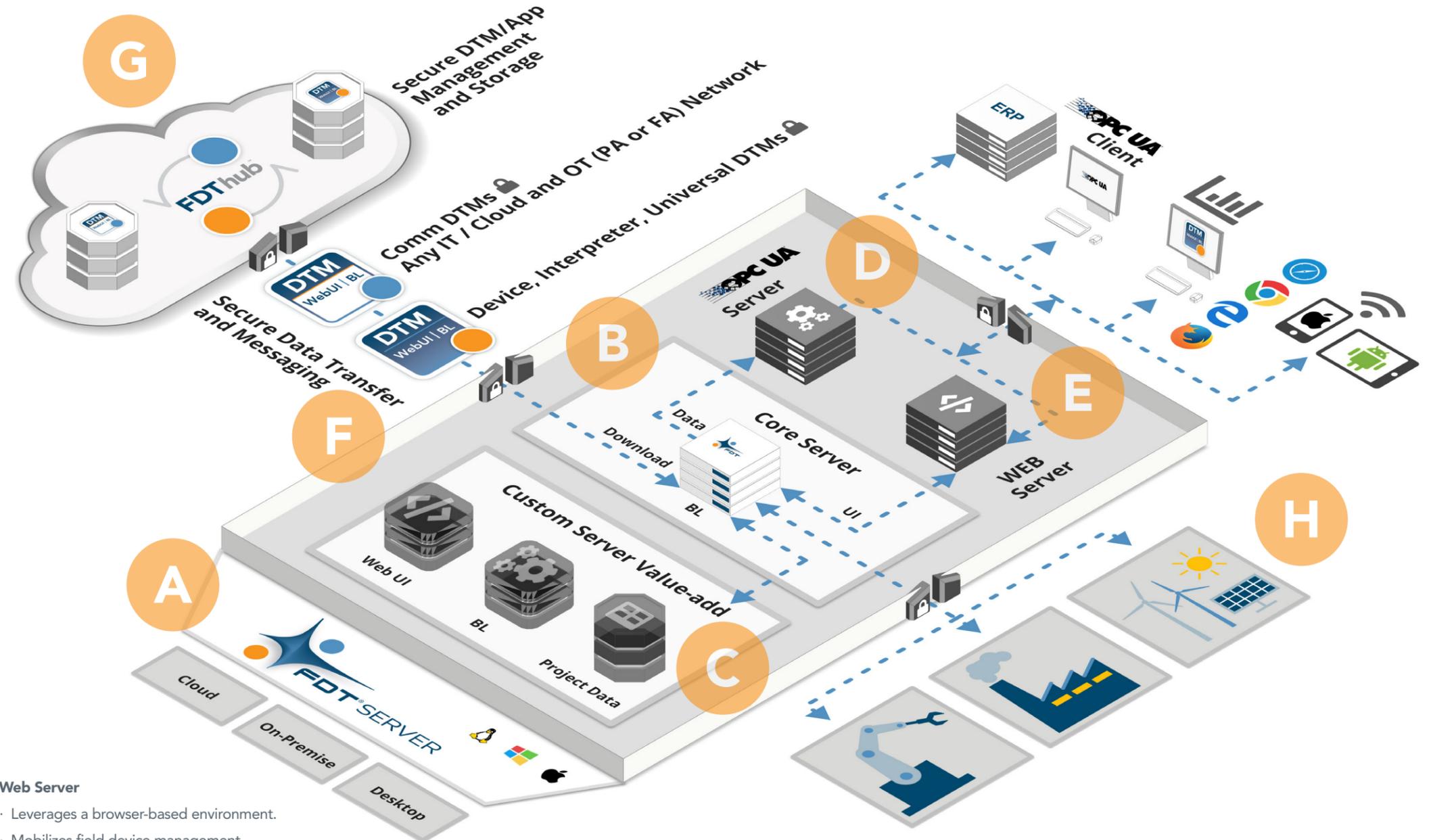
- D OPC UA Server**
- Leverages a client-based environment.
  - Enables IT/OT integration and gateway to data and health information.
  - Allows developers to leverage industry-standard OPC UA Server included in the Server Common Components, or easily exchange it for their preferred OPC UA Server.
  - Supports ERP/MES to optimize enterprise-level connectivity, plant availability and quality yield production.
  - Offers OPC UA client/server-authenticated access to plant application data.
  - Utilizes Publish-Subscribe environment for real-time data exchange.

- E Web Server**
- Leverages a browser-based environment.
  - Mobilizes field device management.
  - Transforms OT access for improved asset management and maintenance.
  - Enables browser-based access to physical plant/facility assets using authenticated computer, tablet or phone, or via DCS, PLC, asset management application, etc.
  - Programmed into Server Common Components however, system vendors may replace the preprogrammed Web Server with their server of choice.

- F Security**
- Provides encrypted communications using Transport Layer Security (TLS).
  - Utilizes on-the-wire-security for enabled industrial automation protocols.
  - Implements role-based user security.
  - Supports 509v3 certificates for authentication.

- G FDThub™**
- Enables convenient access to all certified Device and Communication DTMs in a single repository.
  - Supports cloud-based deployment with automatic device discovery.
  - Available as a local server for on-premise, air-gapped deployment.
  - Supports machine-to-machine communications with 509 certificates for machines with authorized access.

- H Remote Facility Connections**
- Allows a single server to support multiple facilities.
  - Provides access to *FDThub* DTM repository.
  - Optimizes security and connectivity via TLS, 509v3 certificates, authentication, authorization, and encryption.
  - Compatible with VPN for IT environments, edge with a gateway for a specific protocol such as MQTT or AMQP and Intranet — ensuring communication stays within the secure enterprise network.



# Empower Innovative Business Models

---



Recent developments within FDT technology, including the FDT UE architecture, deliver a highly refined and rigorously tested solution for companies seeking to develop a new generation of DTMs for their smart device portfolios. These Web- and Common Components-based DTMs empower a client-server architecture allowing for separation of the User Interface (UI) and Business Logic (BL) modernizing DTMs to work like apps as part of the FDT UE solution.

FDT UE-based DTMs automatically make device data and health information available via the OPC UA server embedded on the FDT Server. This empowers countless new innovative business models such as a data driven approach to maintenance, rich integration of live plant data with MES and ERP systems and asset management as service.

## The DTM portfolio includes:



### Device DTMs

Support one or a family of common devices such as pressure or temperature transmitters.



### Interpreter DTMs

Interpret other types of device representations, such as Device Descriptions (DDs), Electronic Device Descriptions (EDDs), Field Device Integration (FDI) Device Packages, and IODD to allow configuration and parameter access within an FDT system.



### Universal DTMs

Universally represent all devices with the compliant parameters of a specific protocol.



### Communication (Comm) DTMs

Standardize the communication channel to the operations of the mapped IT/OT network protocol.



### Gateway DTMs

Allow communication to transition between the communications paths of different protocols.



# Unlocking universal device integration

The FDT Server platform improves the automation device supplier business model by allowing for creation of DTMs that will seamlessly integrate with any Server or Desktop hosting environment. This solution holds the key to unlocking universal device integration.

- Move from a limited desktop environment to a modern, cloud-based browser environment.
- Utilize HTML5 to eliminate coding challenges associated with co-mingled business logic and GUIs.
- Deploy "FDT as a Service" with a centralized, online FDT hub repository providing convenient access to certified DTMs for distribution to customers. Device discovery triggers automatic download or search results in the case of multiple DTMs.
- Comply with NAMUR NE-107 recommendations for predictive maintenance.
- Author with DTM Common Components to ensure DTMs are OPC UA-compatible.
- Utilize OPC UA Pub-Sub environment for historians and asset health diagnostics in real-time.
- Employ granular runtime environment with "static functions" for processing information for a specific function without running the full DTM.
- Enable vertical communications to allow for tunneling (nesting) to end devices in the event of a mixed network topology.
- FDT UE DTMs, legacy DTMs and all other device representations (including FDI Device Packages, DDs, EDDs, ODDs, and GSDs) are compatible with a Windows-based FDT Desktop environment.

# The FDT Integration Advantage



FDT was built to support a comprehensive, open architecture for the connected world of industrial automation. The backbone architecture, standardized independent of industrial automation networks, enables the highest levels of universal device integration and asset management. The collaboration platform supports a robust networking integration model, which allows for seamless integration mapping to connect intelligent assets relaying device-specific diagnostic data across the enterprise.

## KEY BENEFITS FOR INDUSTRIAL AUTOMATION USERS:

- |   |  |  |  |
|---|--|--|--|
| <i>Transition to the latest IIoT and industry 4.0 solutions</i> | <i>Enable universal device and network integration</i>                       | <i>Ensure seamless data exchange across the enterprise</i> | <i>Deploy a scalable single-user (desktop) or multi-user (server) platform</i> |
| <i>Manage certified DTMs with a secure online repository</i>    | <i>Utilize mobility apps to increase the productivity of plant personnel</i> | <i>Protect investments in legacy technology</i>            | <i>Ensure greater confidence through built-in security</i>                     |

**Empowering the Intelligent Enterprise**



### For More Information

Please visit [fdtgroup.org](http://fdtgroup.org) or contact  
the FDT Group Business Office:

Phone: +32 (0)10 22 22 51

E-mail: [inquiry@fdtgroup.org](mailto:inquiry@fdtgroup.org)

©2022 FDT Group. FDT is a registered trademark, and FDT Unified Environment™, FDT UE™, and Device Type Manager™, DTM™, and FDThub™ are trademarks of the FDT Group. All other product brands or product names are trademarks of their respective owners.