Case Study / Customer Story: 3D Systems

Secure Connected 3D Printers using KeyScaler and ThingWorx

This case study provides an overview of why 3D Systems chose Device Authority's KeyScaler platform to deliver robust security to differentiate their products and services for their customers.

Introduction to 3D Systems

Born from a spark of inspiration in 1983, 3D Systems has run on innovation for over 30 years. Co-founded by the inventor of 3D printing, Charles ("Chuck") Hull, 3D Systems has grown into a global 3D solutions company focused on connecting our customers with the expertise and digital manufacturing workflow required to solve their business, design or engineering problems.

From digitization, design and simulation through manufacturing, inspection and management, 3D Systems' comprehensive portfolio of technologies provides a seamless, customizable workflow designed to optimize products and processes while accelerating outcomes. With advanced hardware, software and materials as well as on demand manufacturing services and a global team of experts, 3D Systems is on a mission to transform businesses through manufacturing innovation.

3D Systems: 3D Connect for 3D Printers

3D Connect Service provides a secure cloud-based connection from installed printers to 3D Systems service teams for proactive and preventative support, enabling better service to improve uptime and deliver production assurance for a customer's system.

3D Systems has integrated their 3D Connect Service with PTC's ThingWorx IoT platform. The ThingWorx platform actively manages sensor data collected from the printers in near-real time and generates alerts to authorized 3D Systems service employees when predefined operating limits are exceeded. The authorized 3D Systems employees have the ability to observe the historical data collected in order to help determine whether servicing of the affected printer is required.

3D Systems customers may also use 3D Connect Manage as a dashboard overview of their printer fleet. Based on the same 3D Connect adapter device and data uploaded to ThingWorx, customers can see utilization of their printer(s) over time, materials used, jobs complete, and printer sensor readings.

The Challenge: Security and Privacy

Connected 3D printers allow businesses to gather information about how their products behave and use it to understand and predict future behaviors. In addition, connected printers have given rise to the Printing as a Service usage model. However, with any IoT device, there are security challenges.

3D Systems products and services need to address the challenge of a secure application connection. The 3D printers are connected to the internet through the 3D Connect hardware adapter and need to ensure security so there is no compromise to the printer and data. The integrity of the 3D Connect device and data is important in order to trust the 3D printed material / product.
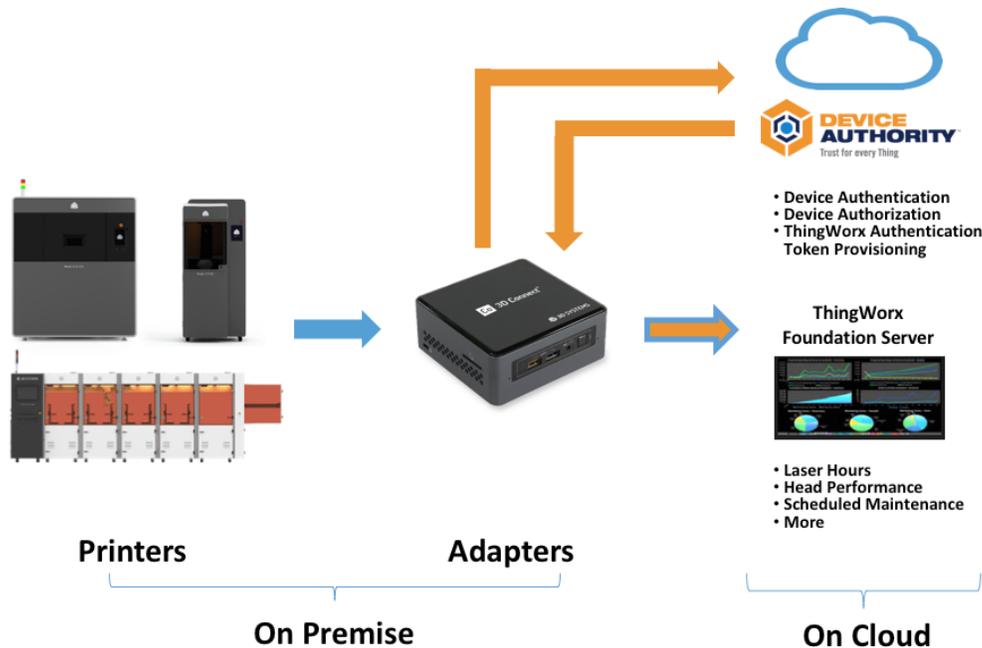
Our Solution

For 3D Systems' security challenges, Device Authority's KeyScaler has delivered:

- Identity assurance

- Secure device credential management

- Scalability through automation

- Security differentiation

Device Authority's KeyScaler platform provides the ability to personalize identity for 3D Systems' 3D Connect Adapter devices that enable cloud connect services.

- By ensuring the devices have a unique, trusted identity, we can ensure that the data associated is also trusted.

- Device-bound key derivation for authentication provides assurance that the key has not been compromised and is wholly owned by a given 3D Connect adapter device.

- Integrity checking at the device side will ensure that any compromise of the device software/firmware will be recognized and highlighted.

- KeyScaler delivers a more enhanced security solution above ThingWorx's Application Key, which enables a scalable method for device registration, authentication, and on-going validation to the platform.

- KeyScaler's authentication extension developed specifically for ThingWorx (available via PTC marketplace) offers an easy security integration into the platform.

KeyScaler platform creates the secure root of trust to the 3D Connect adapter. Leveraging our patented authentication technology, we can ensure that only authorized devices can communicate, connect (both to KeyScaler and to PTC's ThingWorx platform) and send/receive data. From within the KeyScaler console, administrators can control and define how often credentials (PKI certificates and passwords) are rotated.

Why did 3D Systems choose Device Authority's KeyScaler for security?

3D Systems realized they wanted to differentiate their products and services within a technology driven market. By taking a security first approach, and implementing KeyScaler technology, they have a superior product in a world of billions of connected devices – whereas other manufacturers may experience challenges when vulnerabilities cause downtime.

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