ProCloud3D: Additive manufacturing on an industrial scale

Wibu-Systems adds its security and licensing expertise for a smarter industrial world

Karlsruhe, Germany – Wibu-Systems, a world-renowned IT security leader at the service of connected industry, has joined prominent German and Chinese industry partners and top actors from the academic world, including Germany's RWTH Aachen University and the Beijing University of Technology, for the ProCloud3D research project. The venture is putting the concept of a smarter production industry to the test with a high-performance platform for industrial-scale additive manufacturing that keeps those most intangible, but most invaluable assets, designs, and production data, safe and secure, wherever the actual products are made and whoever is making them. Selected as one of two projects in the running for funding support from both China's Ministry of Science and Technology and Germany's Ministry of Education and Research, ProCloud3D is set to be a milestone demonstration of the powerful vision of Industry 4.0 and the "China Strategy 2015 to 2020" program.

As traditional manufacturing begins to give way to new forms of doing business in the industry, academic researchers and commercial enterprises – both household names and aspiring young startups – are questioning what this will mean in practice. Smarter, connected machines have learned to make even highly customized goods in both massive production runs and strictly limited editions, as their new versatility allows them to cut out much of the labor-intensive retooling and setup that had long kept factories tied to producing one thing only and only in large numbers. With industrial 3D printers pushing the envelope for what customization can mean, this has upended many of the commercial calculations and business models that manufacturers had adhered to with little change since the third industrial revolution.

But this new freedom comes at a cost, and that is the transition from a dependence on physical hardware to a reliance on more intangible factors: Software, data, and connectivity. For the new business models promised by Industry 4.0 to come to fruition, the providers of manufacturing-as-a-service and their clients require new platforms and infrastructure in place to handle the data transactions needed to make the system work. ProCloud3D intends to create such a holistic platform for intelligent manufacturing and smart services, using industrial additive manufacturing (AM) as an ideal test case. In industrial AM, 3D printers can create nearly any geometric form from a stream of data – the designs and machine operating instructions that become the essential asset in the new industrial economy. The platform envisioned by ProCloud3D will show how these assets can be shared, processed, and handled effectively and securely in the cloud.

The platform revolves around a web frontend, which provides usage of the technology database where the essential data, the designs, and the code needed to make parts on the ground are stored. This data is transferred and processed in a holistically automated process chain to arrive at the 3D printer, potentially located on the other side of the world. ProCloud3D covers the entire flow from a client ordering a production service to the necessary data's secure processing and transmission and on to its translation into actual operating instructions for the provider of the additive manufacturing service.

With Wibu-Systems' expertise in data protection and the licensing of digital assets, the specialists from Karlsruhe occupy a central spot in the ProCloud3D undertaking: Securing the entire process against threats from multiple vectors. The data has to be protected at every step from its source to its destination to prevent theft, counterfeiting, and industrial espionage, and the business model depends on all parties knowing that the data is used only for the purpose it is meant

for and only to the intended extent. This is not just to stop unscrupulous producers from making surplus products for the grey market, but it is indeed a fundamental building block of the entire system: The ability to place specific orders in an open and free market for manufacturing services, with the necessary controls and certainty to make correct billing possible. From the ability to share data with the confidence that protected designs and confidential business information cannot be stolen or tampered with to the knowledge that the commissioned manufacturer will be able to create exactly the components and products that were ordered, without commercial, security, or quality risks, the platform thus weaves together the many strands for the concept of distributed manufacturing to function as intended, with trust and security built in by design.

Alvaro Forero, Head of CERT, Professional Consultant, and Security Expert at Wibu-Systems, is proud of the company's contribution: "ProCloud3D is an important test case for the potential of industrial additive manufacturing, open data marketplaces, and manufacturing-as-a-service. It is great to see Wibu-Systems' technology playing such a key part in making the vision of a new industrial economy come true."

Moritz Kolter, Project Leader and Ph.D. candidate at the Chair of Digital Additive Production at RWTH Aachen, emphasizes the importance of trust for the evolution of AM: "Developing trust in a shared and decentralized supply chain is key to not only bringing the benefits of Additive Manufacturing to fruition, but more importantly, forming the basis for making it accessible to everyone, thus, enabling new business models."

Andreas Collet, Leader of the Digital Production Group at the Chair of Digital Additive Production, works on data formats, information models, and software architecture to achieve full data driven AM-potentials. He

added: "It is great to see that our research helps bring projects like ProCloud3D to life and transfer knowledge from academia to meaningful industrial applications in an international and trustful cooperation."
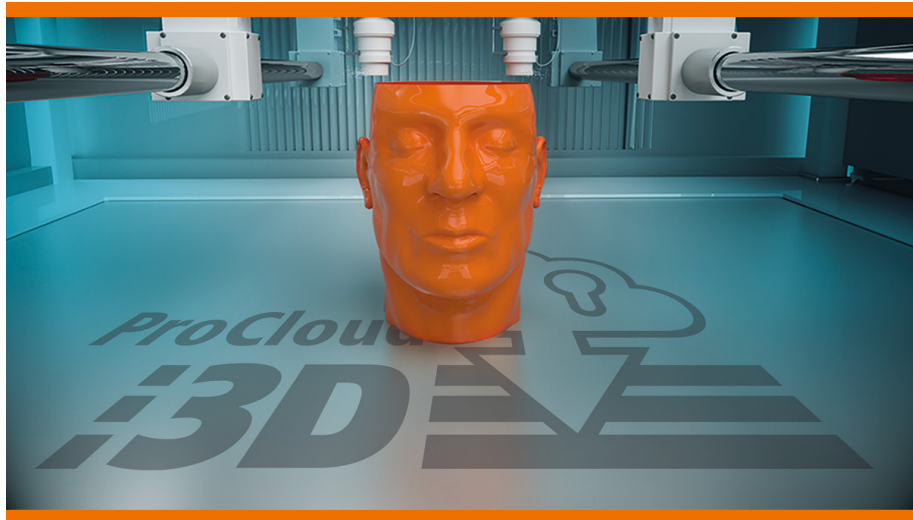
Wibu-Systems brings its expertise in data protection and the licensing of digital assets for the ProCloud3D research project, providing a high performing platform for industrial additive manufacturing.

About Wibu-Systems
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Wibu-Systems, a privately held company founded by Oliver Winzenried and Marcellus Buchheit in 1989, is an innovative security technology leader in the global software licensing market. Wibu-Systems' comprehensive and award-winning solutions offer unique and internationally patented processes for protection, licensing and security of digital assets and know-how to software publishers and intelligent device manufacturers who distribute their applications through PC-, PLC, embedded-, mobile- and cloud-based models.

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