



White paper: Xertified & Testa Center

XoT Technology™ – cyber security through identity based access control

Cyber security and protection against external threats are gigantic challenges for global digitization and development in IoT. Security risks affect everything from science and manufacturing industries to public authorities and other highly exposed organisations. To solve this problem, the Swedish cyber company Xertified has developed the XoT Technology™, providing undeniable digital identities for both man and machine to enable dedicated access control. After being verified at the open test bed for life science technology and biomanufacturing at Testa Center in Uppsala, the solution is now available in the market as well as an implemented solution in their own digital environment.

The matter of cyber security has never been more relevant than right now, due to a number of different factors. The world situation is increasingly uncertain and unstable, adapting to a new reality with a gruesome full-scale war in Ukraine and its subsequent effects.

At the same time, digitization gains new ground, which certainly creates completely new opportunities – and also challenges. When more machines and features are digitized, criminal elements increase their focus on cyber-attacks against companies, authorities and organizations. Their operations can range from sabotage to cyber-attacks or intrusions. Sabotage can be targeted at vital functions in society such as energy production, for the purpose of extortion. Cyber-attacks and intrusions often target large industries and branches like the mining industry for purposes of industrial espionage and gain access to secret assets.

CURRENT SOLUTIONS ON CYBER SECURITY

In times when extremely large numbers of hacker attacks occur daily, the only completely safe solution for high tech industries and biotechnological research and production up until now, has been to work off-line. Although this ensures that the business is not affected by cyber intrusions, it also causes negative effects.

For example, legacy life science devices are often not up to date with the latest security patches due to regulatory compliance. In addition, the handling of result files and other sensitive documents is far from optimal when handled for example by sending USB sticks. Quite naturally, there is always a risk in passing on sensitive asset information with that type of aid, as it involves elements that are not fully reliable.

THE TECHNOLOGY WAS TESTED AND VERIFIED AT THE TESTA CENTER

Xertified specializes in solutions for a safer internet, which ultimately means a safer and more secure society. In today's world, it is estimated that there are more than

two billion unsecured digital devices globally, in both industrial environments and important community services and functions.

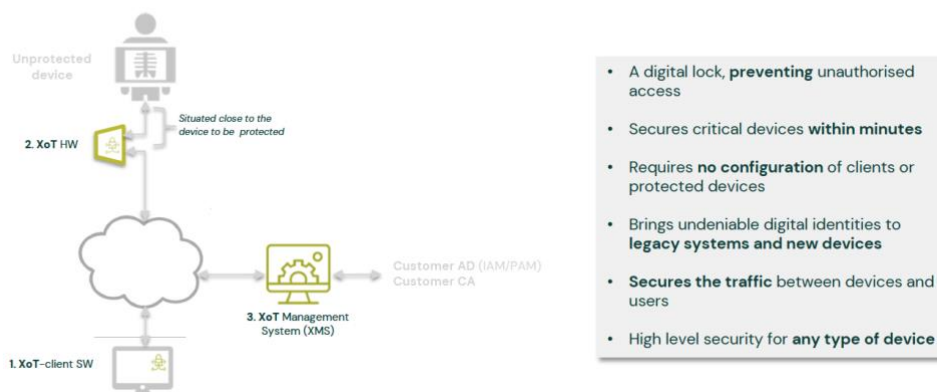
Xertified has therefore developed hardware and software solution XoT Technology™, that enables digital identification on an individual and device level. Before launch, the product went through a tough process at the Testa Center in Uppsala, a test environment for testing and verification of technical equipment in authentic bioprocess environments. The processes within life science and bioproduction have extremely high safety requirements and thanks to the help of the Testa Center and financial support from Vinnova (administered by STUNS Life Science), the technology could be tested in an authentic production setting.

The specialists at the Testa Center have extensive experience from the process industry within life science and were able to assist Xertified with support and insights linked to the production of biopharmaceuticals. This included the various aspects of cyber security that exist in the industry and how Xertified's solution should be applied to Testa Center's equipment to provide relevant data and insights. The analysis of the test results enabled further development of the XoT Technology™, which was carried out before it was ready to be launched on the market.

THE IDEA BEHIND XERTIFIED'S PATENTED SOLUTION

XoT Technology™ has been developed to ensure the identity of both man and machine, which has previously been the biggest challenge for connected devices. The technology requires no configuration of clients or protected devices and can be used for any digital device that has an IP address and a standard communication port, regardless of size, function and age.

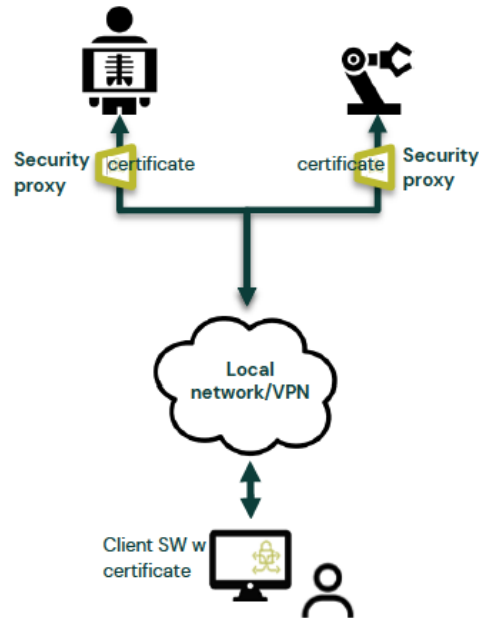
XoT technology™ basics



End-user access to various devices
An end user wants to connect to one or several resources within a controlled network.

Access is being allowed based on policies and rules activated in the management system.
A strict zero trust approach is used, never trusting the user, always verifying each individual connection attempt.

The solution enables end-to-end encryption and two-way authentication by client and Security proxy unit.



Xertified is unique in offering authentication based on PKI certificates and open sources, with an encrypted, unbroken communication that is set up between the XoT device and Client hard drive using XoT Technology™ as a proxy/gateway. This requires either a physical XoT device, based on standardized hardware and Xertified's software, or a virtual version that can be installed on devices and in cloud environments.

By the end of 2022, Xertified has 14 approved patents for the solution, making them the only company in Europe to be allowed to function as a proxy via PKI with responsibility for IT security. In addition to the existing patents for Europe, there are patents pending and expected to be approved shortly for the rest of the Western world.

MAXIMIZES THE SECURITY AT TESTA CENTER

After successful project with tests and subsequent evaluations at Testa Center, Xertified's solution was refined to make it ready to take to market. In addition, Testa Center decided to purchase and install a version of XoT Technology™, in order to offer maximum cyber security to its own customers at the facility. One of the positive aspects that has been highlighted by Testa Center is that the solution, despite solving such a complicated and serious problem, is still rather easy to both understand and use. Even those with limited IT experience and knowledge can

understand the fundamentals of how the solutions works, without support by specialists from the IT department.

FACILITATES DIGITALIZATION REGARDLESS OF INDUSTRY

The experiences from the test project at Testa Center show that the solution has high potential in healthcare and bioproduction. A well-known problem in the production of life science devices today is that it takes place in physically and digitally closed environments with strict validation process before entering the market. This means that the products cannot be patched when used in production due to regulatory compliance. This is of course not optimal, given the extremely critical environments and operations they must operate in. However, XoT Technology™ can secure this type of production environments, by taking over the cyber responsibility for the device.

One of the main purposes of digitization is to streamline processes, and the challenges in terms of cyber security hinder development in a variety of industries besides life science and biomanufacturing. A solution that fully secures the identity of both man and machine would, for example, change the possibilities completely for large manufacturing industries that today are forced to work digitally isolated from the outside world. The same applies to public authorities and other important functions in the society, where safe and secure operation is crucial for the residents. XoT has been received as a game-changing technology and is expected to contribute to the next important step in global digitization.

SUMMARY

Xertified has developed a unique PKI-based solution for dedicated access control, which makes it possible to identify both human and machine with certainty. XoT Technology™ can be used on all digital devices that has an IP address and a standard communication port, regardless of size, field of use and age. The solution has been tested and further developed at Testa Center, where it is now part of the facility's safety system. By simply but effectively preventing cyber intrusions in sensitive environments, XoT Technology™ is expected to create completely new opportunities for both digitized industries, bioproduction and important society functions and services.

Xertified provides security solutions for a safer Internet, and in the end – a more secure society. By eliminating the possibility to interfere with IoT / OT devices, we also contribute to a safer Internet as a common foundation for fair play, innovation, and business opportunities for companies and users of advanced technology.

Testa Center is a major initiative between the Swedish government and Cytiva to secure the growth of life science industry, and its manufacturing capabilities. One major objective for Testa Center, being an innovation hub for biological production, is to bridge the gap from discovery to industrialization.

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