Condition Based Services System Requirements and Infrastructure

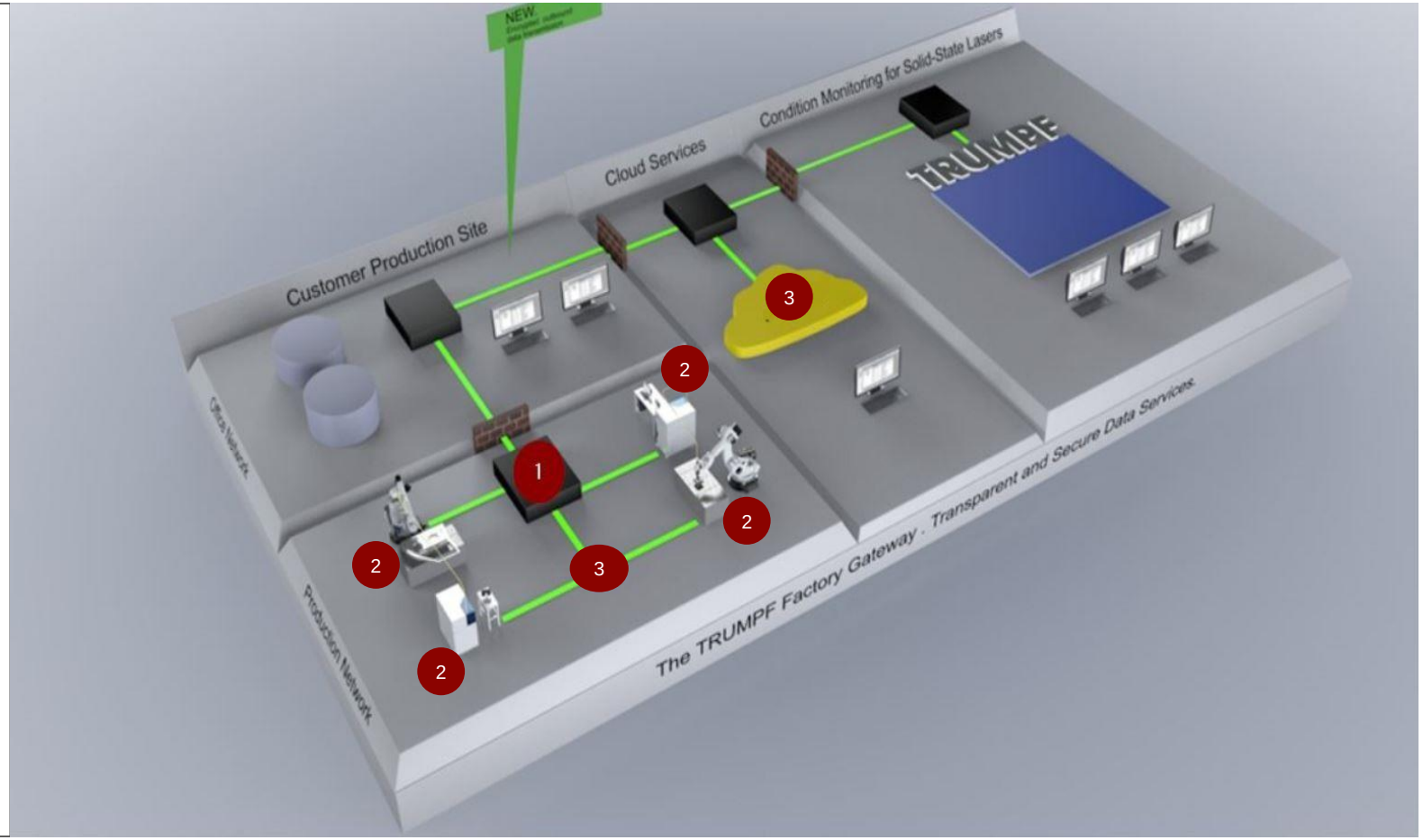
Andreas Trabi I IT Laser Technology

TRUMPF

Network and infrastructure

Overview

1. Factory Gate
2. Laser devices
3. Cloud Gate & network ports



System requirements

1. Factory Gate

Advantages of Factory Gate

- The Factory Gate is a software, usually run on a PC or Virtual Machine (VM) provided by the customer
- The purpose of the Factory Gate is to
  - collect the laser condition monitoring data of all connected lasers
  - encrypt the condition monitoring data
  - send the encrypted data to TRUMPF
- Furthermore the Factory Gate is required to run the Smart View Services dashboard.
- Solely based on outbound http/https (ws/wss) communication: Port 80, Port 443
- No VPN tunnels necessary
- Scalable
- Meshable
- Runs on existing IT infrastructure

VM or PC for Installation of Factory Gate

Recommended for up to 30 laser devices

- Microsoft Windows 10 / Windows Server 2016 R2 or higher
- equivalents Windows Embedded-Systems
- Linux operating system with .NET Core 3.1.
  50 GB memory space

- .NET Framework: 4.7.2 or higher
- .NET Core: 3.1.4 or higher
- CPU: Intel i5 Quad Core CPU or better (minimum 2 cores) 1GHz or faster processor or SoC
- RAM: 4 GB RAM (recommended: each core 2 GB)
- Hard disk : 16GB for 32-bit OS or 20GB for 64-bit OS
  For a virtual machine: Hard disk with dynamic capacity or at least 64 GB memory capacity.

System requirements

2. Laser devices

Marking Laser

- Laser-Series
  TruMark Series 1000, 3000, 5000 or 6000
- Operating System
  Windows 7 (32/64bit) + .NET Framework 4.0
- TruTops Mark
  No restrictions
- Firmware (min)
  - TruMark 3330 – CMU FW 1130
  - TruMark 1110/1108 LCU1 FW 1090
  - TruMark 5010/5008 LCU1 FW 4070

Solid State Laser

- Laser-Series
  TruDiode, TruDisk, TruMicro, TruPulse
- Hardware
  Control unit type CPX V1 - 4
- Software
  TruControl 1000 ≥ 1.50 (e.g. update if necessary)

Exceptions:
For Laser-Series of TruDisk XXXX 2C and TruPulse the Service “Condition Monitoring” is not available because of missing Condition Monitoring Data-Export functionality.

System requirements

3. Cloud Gate & network ports

Connectivity from Factory Gate to Laser

To collect condition data from the laser through the LAN, the following network configuration has to be done.

- OPC UA Server (part of laser control):
  Port 4840, inbound on laser (mandatory)
- SSH: Port 22, inbound on laser
  (mandatory for TruControl Version <= V.2.24)
- ICPM / Ping (recommended for connectivity diagnostics)
- Web Socket Protocol (ws/wss) should be enabled for better network performance

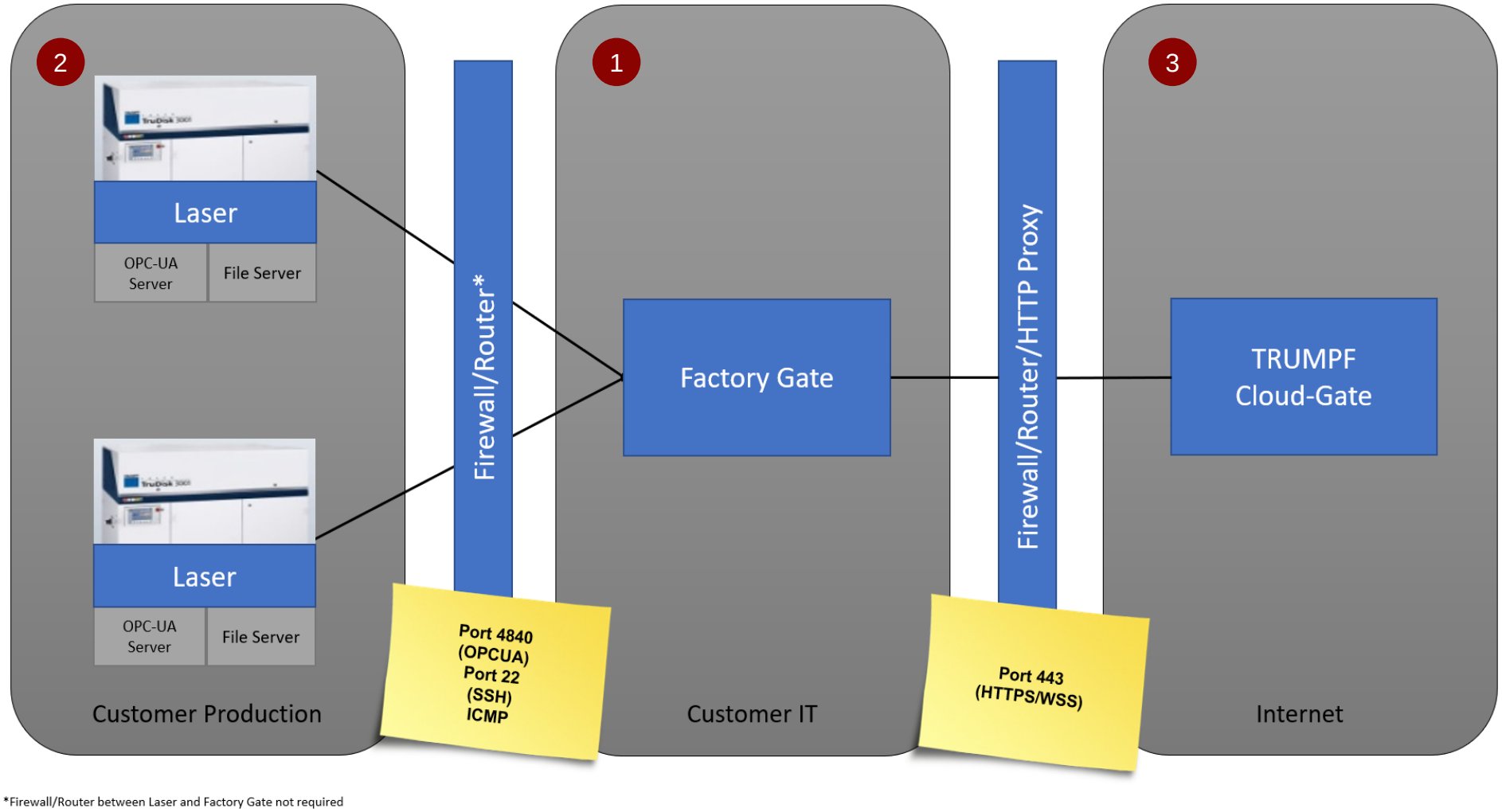
Connectivity from Factory Gate to TRUMPF

The connection to the Cloud Gate through the Internet is protected via HTTPS. No condition data is stored in the Cloud Gate. To send condition date from the Factory Gate to TRUMPF via the Internet, the following network configuration has to be done.

- To Cloud Gate : Port443 / HTTPS
- Cloud Gate URL: wss://trumpf.axoom-gate.com
- HTTP proxy is supported:
  Proxy account/credentials need to be configured on the Factory Gate, if so required by the proxy

Network and infrastructure

Example of a typical network topology



*Firewall/Router between Laser and Factory Gate not required

Andreas Trabi
IT Laser Technology
+49 7422 515-8700
04_Connectivity@trumpf.com

TRUMPF