Gest-Q

Software for print queues installation

Features Description

Gest-Q Version 3.6.2610.99

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2. PRESENTATION

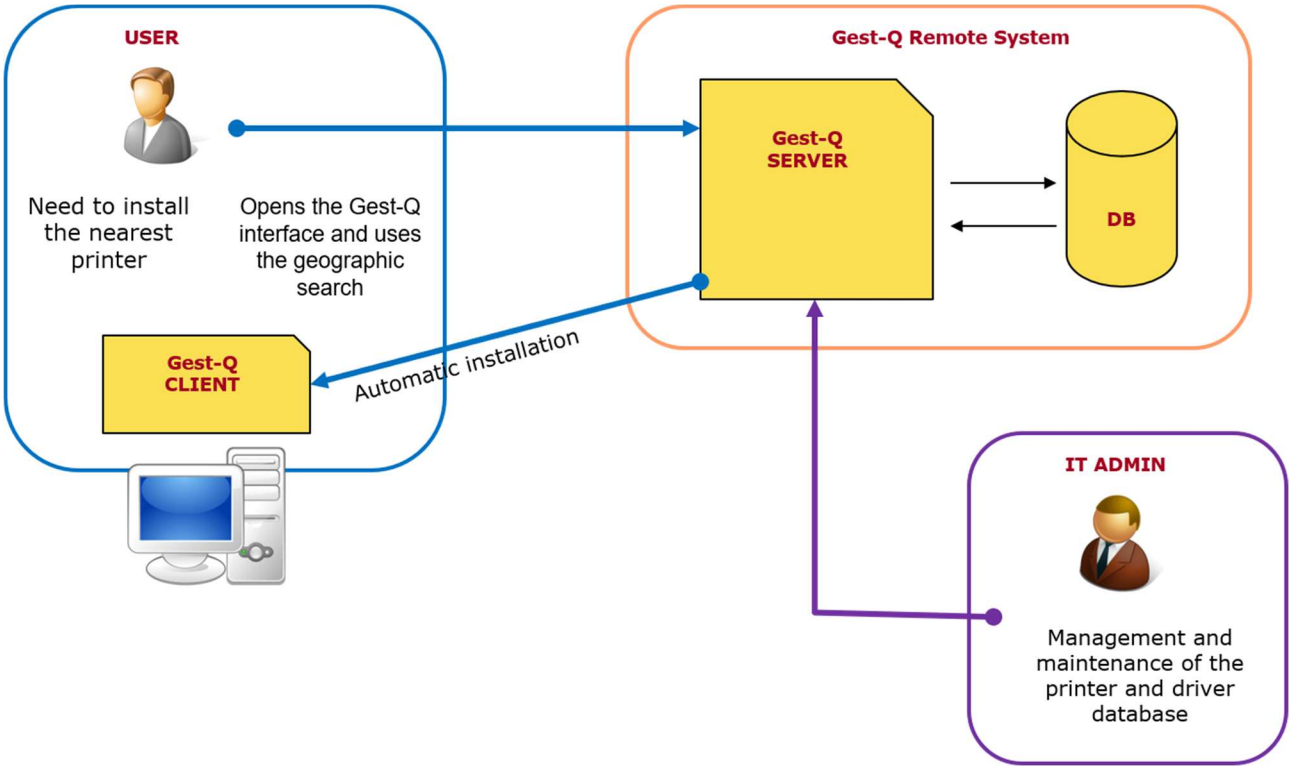
Gest-Q is a Glocal Value proprietary solution to manage, profile, and distribute print queues. Thanks to Gest-Q the user can search for the network printer he wants to use and proceed with the installation by simply clicking a button.

The solution was developed to address some common problems with print queues management:

- Centralized management through print servers is too expensive.
- Work on hundreds or thousands of workstations that require at least one print queue to be installed, depending on their geographical location.
- Each workstation requires technical staff to handle installation and queue configuration.

Thanks to its key attributes, Guest-Q addresses the following issues:

- Operation without print server
- User and management interface is very simple to use, especially for employees with no technical expertise
- Once the printer is identified in the list of available printers, you can install the print queue with a single click.



Gest-Q – Operating Principles

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In fact, Gest-Q automatically recognizes the PC operating system by installing and configuring the selected printer on your PC using the driver associated with the printer in the admin portal. The user only needs to perform a printer scan. Each user receives a unique installation button wherever the operating system is located. When the installation is complete, the message "Operation Complete" appears.

The operating methods supported by Gest-Q are essentially two and allow:

- users who are typically the employees of the company can install printers that are closest to their workstations independently (on demand installations). The installation includes downloading and installing drivers, print ports, and print queues.
- administrators to manage the printer fleet and create rules for a forced distribution of print queues (forced-setup installation).

It is possible to install 2 types of network printers:

- Printers based on **TCP / IP ports**, installed directly on the user's PC with creation of the TCP port.
- **SHARED** printers, the printers installed on the Print Server and shared on the user's PC. Shared queues can be related to a physical printer or to a virtual printer (if a software for the accounting is in use).

Printer driver will be installed for both types of printers, if not already available in the driver store on the user's PC.

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3. SOLUTION DESCRIPTION

3.1 SOLUTION ARCHITECTURE

Guest-Q is a "client-server" solution based on a variety of components that can also be installed and configured distributed inside or outside your corporate network.

- **[SERVER] Gest-Q.AdminPortal**

  Web portal of Administration: Print Queue and Configuration Management Interface (admin access via login).

  - Technical Note: It must be installed on a web server inside or outside your corporate network (IIS)

- **[SERVER] Gest-Q.RestService**

  Web-Service Communication: A software component that communicates with your client PC over an http call that provides all the instructions for installing the print queue.

  - It must be installed on a web server inside or outside your corporate network (IIS)

- **[SERVER]** Database: The infrastructure where all the data of the solution is stored.
  - The database must be SQL Server and must be accessible through ODBC from the Web Services and Administration Portal.
- **[SERVER]** Driver Repository: folders where driver .ZIP packages are stored.
  - These folders can also be configured on the File System in a distributed manner on different servers, as long as they are reachable via http for clients to download (for example, creating IIS application traces).
- **[CLIENT] Gest-Q.Tray**

  Tool Client: The local component that must be installed on each client PC and provides the user with a print queue discovery mask.

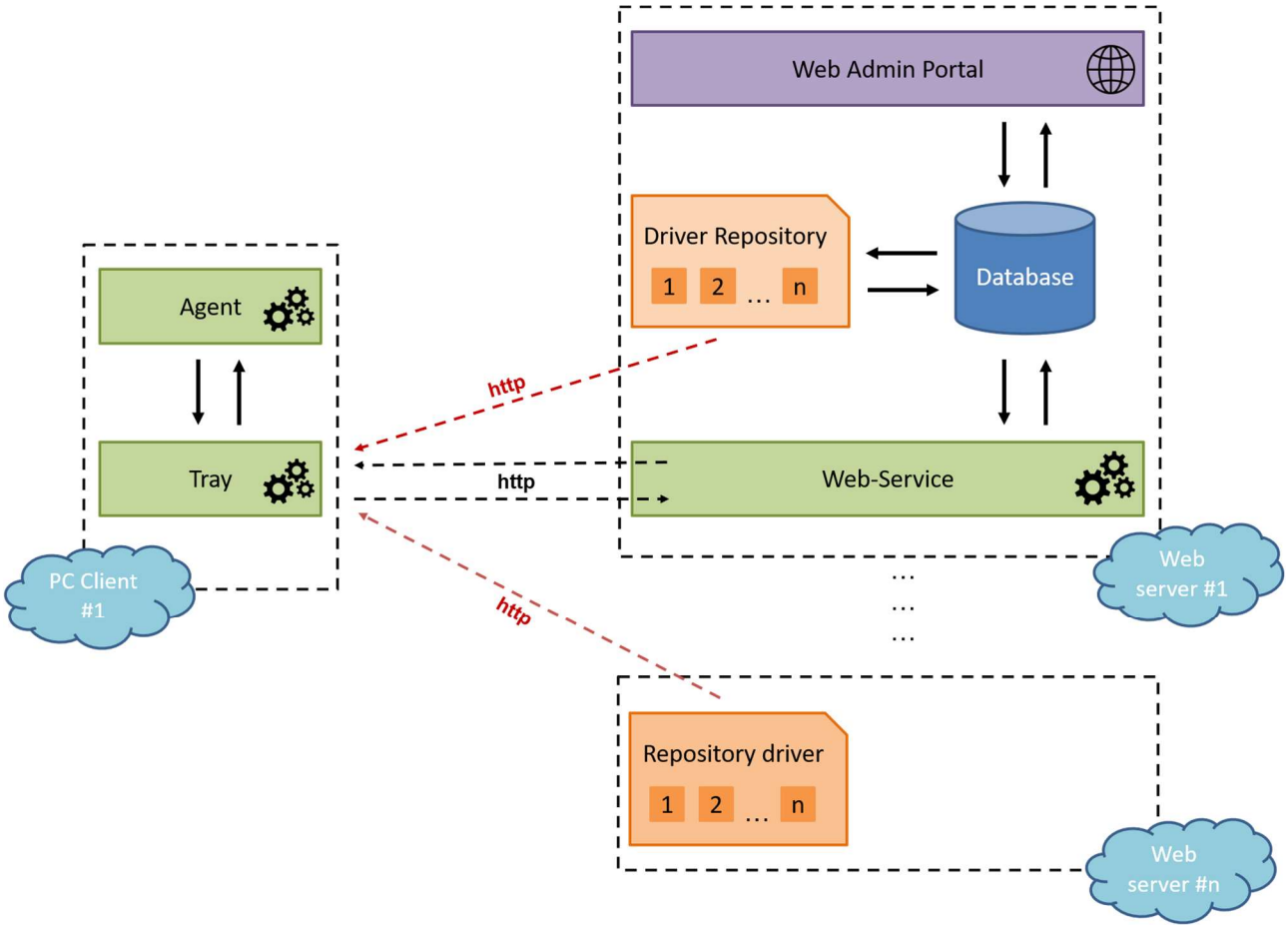
  - It needs to communicate via http with the Web-Service.
  - Technical Note: the module is a user-authorized service that must be installed on all client PCs.

- **[CLIENT] Gest-Q.Agent**

  Tool Agent: it is the local service, it must be installed on each client in AutoStart, responsible for installing "critical" drivers and printers that users of type "User Standard" cannot perform. communicate via HKCU logs with the tool client.

  - Technical Note: the module requires a LOCAL systems to be installed as a service on all client PCs so that users can perform tasks that they cannot do due to their limited privileges.

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Gest-Q - Solution Architecture

Guest-Q is a solution that consists of the server part (print queue management and configuration only) and the client part (a user-only interface to find and install the printer you want).

Server parts can be installed on corporate networks or cloud servers. In fact, communication with the client side is only guaranteed through http calls that provide the configuration and data needed to install the print queue, including drivers.

3.2 TYPE OF QUEUES

With Guest-Q, you can install connected printers through:

- TCP Protocol: print directly from PC to printer.
- Network sharing: shared printers on the printer server (concerning a physical or virtual printer if an accounting software is installed).

Therefore, Gest-Q is suitable for the exact distribution of the queue, even if you have accounting software such as PaperCut, Equitrac, etc.

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3.3 PRINT DRIVERS

Guest-Q supports all Windows printer drivers.

When you configure a solution, the administrator creates a driver database through the Guest-Q portal and connects it to each print queue.

You can specify multiple servers to download packages to optimize Internet bandwidth and accelerate driver downloads.

N.B. The latest generation printer drivers are signed with proprietary certificates that Microsoft does not recognize as trustworthy, so installing them requires additional administrative authorization that previous generation drivers didn't need.

To bypass this issue, GestQ natively supports 2 methods if the driver installation in the OS Driver Store fails:

- Manual extraction of certificates from the .CAT files used: in this case, the .CER certificates need to be placed inside the driver package in the main files folder. If GestQ detects at least one .CER file, it proceeds with its installation on the client in:
    - Root
    - TrustedPublisher
- Automatic extraction of certificates from all the .CAT files present in the package: in this case, the .CER certificates will be automatically extracted by the procedure and installed on the client in:
    - Root
    - TrustedPublisher

3.4 USERS WITHOUT ADMINISTRATIVE RIGHTS

Driver installation is considered important in the Microsoft Windows operating system and is only available to users with administrative privileges on their PC.

Guest-Q is designed to allow you to install drivers and printers even if you have standard users on your PC who do not have administrative privileges.

This is the case for many companies that do not want employees to install third-party software independently.

3.5 LANGUAGE

The Administration Web Portal is intended for technical staff and is available in English only.

Instead, the Guest-Q client, available to users, provides multilingual support based on the centralized configuration that is set up. The basic languages are English, Italian, German, French, and Spanish.

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3.6 PROCEDURE FOR ON DEMAND USE

Users who need to install a new print queue on their PC (following the supply of a new pc or the change of their location) start the Guest-Q software by selecting from the system tray icon on their PC or applications that have already been installed.

Otherwise, the user must install the "Gest-Q Client" package (if authorized) or wait for the solution to be deployed to his PC through the SCCM.

When available and ready to use, the user can start the Guest-Q interface searching:

- through the list of programs on your PC ("Windows").

or

- opening the always active icon (except forced closure) in the system tray.

The interface provides a print queue search with some filters that may be applied:

- Technical research parameters:
  - Hostname, IP address, Tag Number, Serial Number
- Geographic research variables:
  - City, location, building floor, office

As a result, you can select the most convenient or the most appropriate print queue and start silent installation automatically.

The print queues proposed to users can also be filtered based on their own attributes, depending on the installation rules configured by user name, PC name, IP range, or AD group.

The print queue is installed by activating the Guest-Q agent directed through the system registry, which encrypts and securely installs print queue data.

Forwarded data are: the network IP (if TCP queue), queue name (if TCP queue), or share (if SHARED queue), driver, INF file. They are written to the registry key under LOCAL USER.

The Guest-Q agent polls log keys to users who are logged on every 10 seconds. Read the print queue data and start the installation. It check for driver presence.

The agent then creates a TCP/IP port and print queue (if TCP queue) or installs a shared printer on the print server (FOLLOW-YOU queue). Finally, record the end of the operation status in the register in LOCAL USER.

The Guest-Q client tool checks the status in polling, detects that the task is complete, and asks the user whether to set the queue as its default value. This will display a properly terminated operational message.

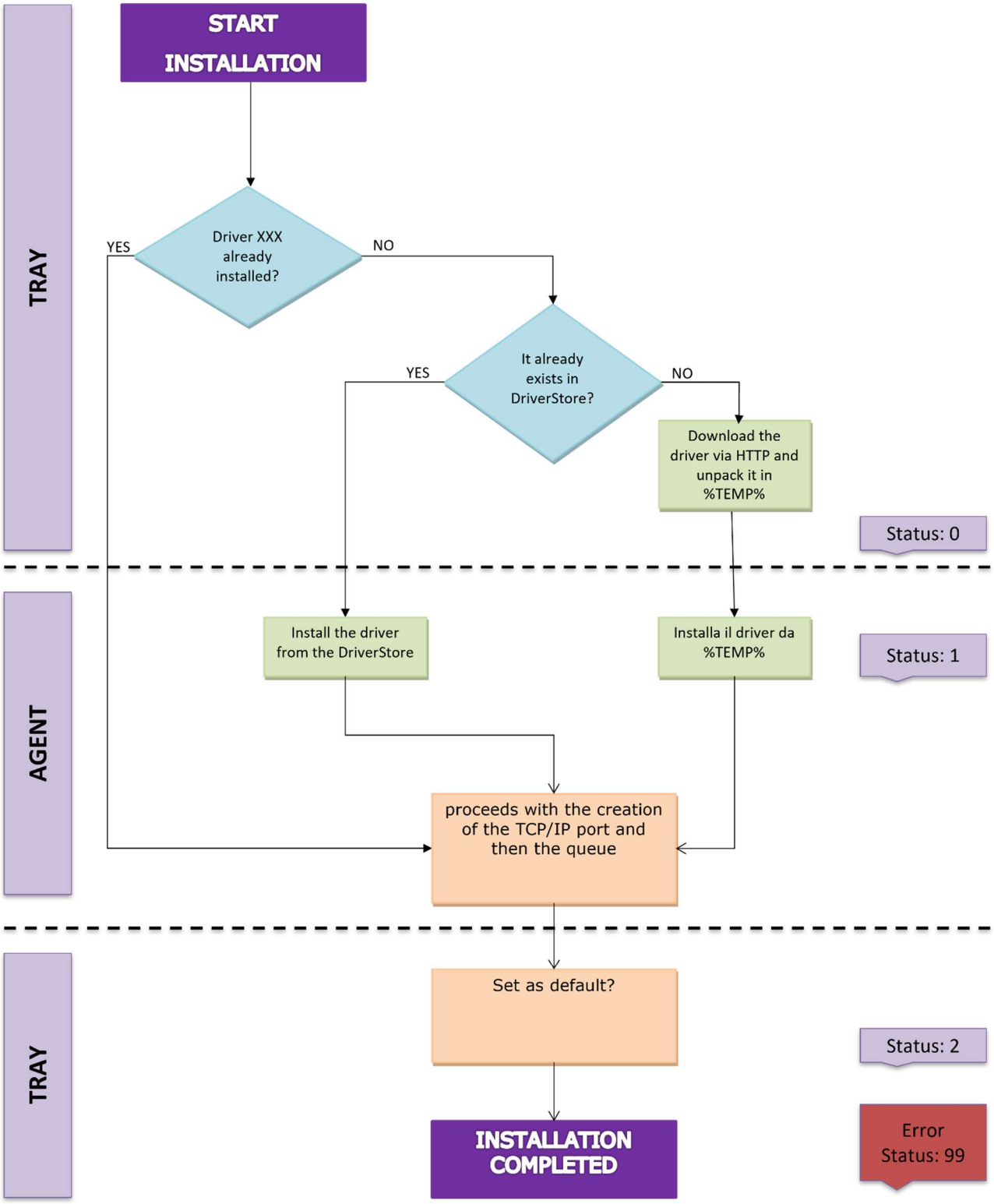
Errors in this procedure are handled by sending an error message and asking technical support to contact you.

Then the user is prompted to set the new printer as the default.

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3.6.1 TCP QUEUE INSTALLATION SCHEME

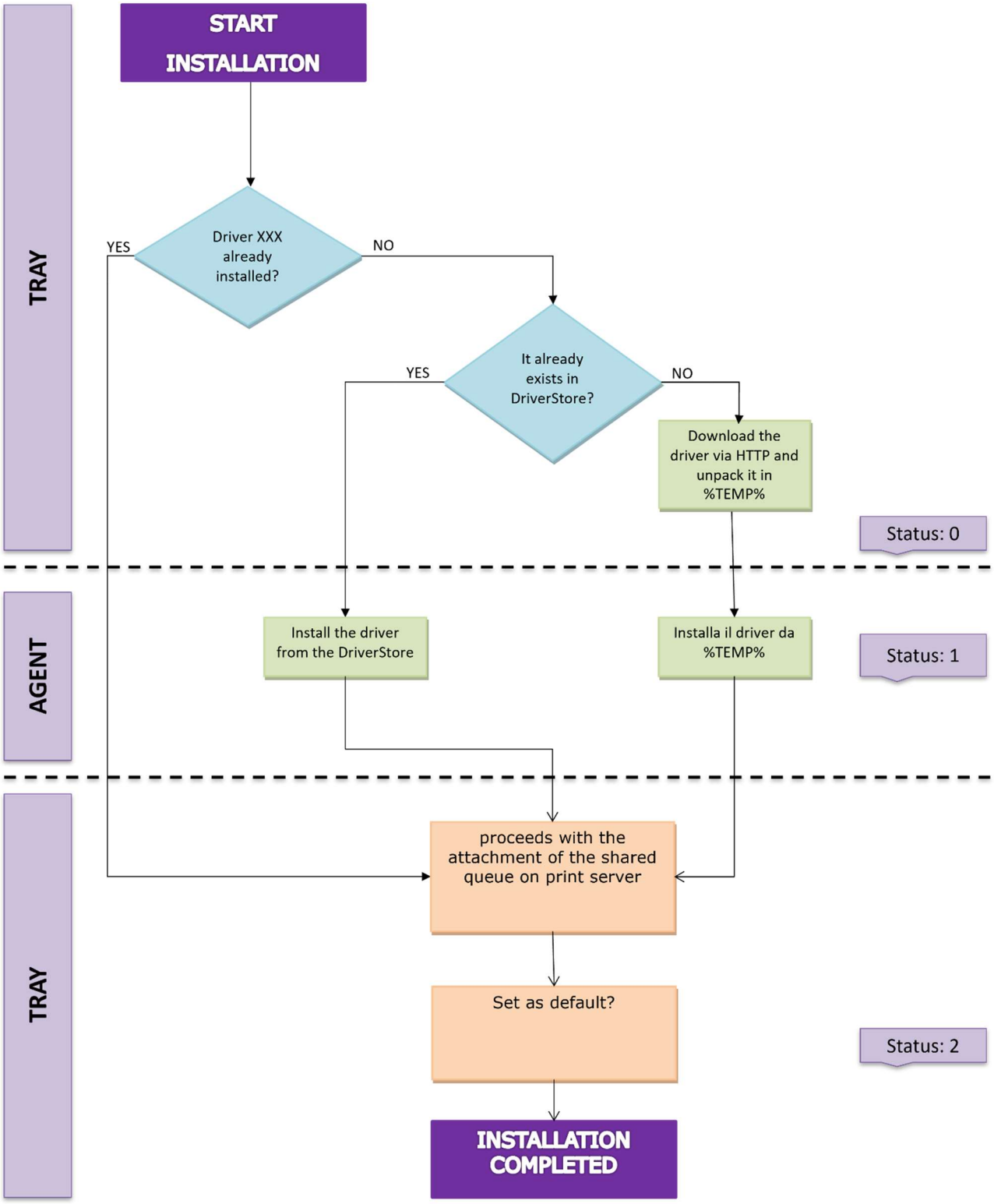
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Gest-Q – TCP queue installation scheme

3.6.2 SHARED QUEUE INSTALLATION SCHEME

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Gest-Q – Shared Queue installation scheme

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3.7 FORCED USE PROCEDURE

This feature is useful for Network Administrators to forcibly and silently install print queues on users' PCs, typically employees, based on definable rules.

The rules provide for the setting of parameters such as:

- Specific PC (by name or IP)
- Specific Domain User
- Network groups (IP range)
- Active Directory User Groups

Of course, each rule must be applied to one or more print queues, which will be installed if the clients comply with the "match" rules set in the configuration parameters of the rule itself.

PCs equipped with the Gest-Q Agent that fall within the rules defined by the administrator will proceed autonomously to the installation of the print queue.

3.8 MAINTENANCE USE PROCEDURE

This feature is useful for Network Administrators to do maintenance activities forcibly and silently on the print queues on users' PCs, typically employees, based on definable rules.

Maintenance activities supported are:

1. Remove a print queue that is no longer available
2. Update the driver of an already installed queue

The rules provide for the setting of parameters such as:

- Specific PC (by name or IP)
- Specific Domain User
- Network groups (IP range)
- Active Directory User Groups

Of course, each rule must be applied to one or more print queues, which will be updated if the clients respect the "match" rules set in the configuration parameters of the rule itself.

The PCs equipped with the Gest-Q Agent that fall within the rules defined by the administrator will proceed autonomously to update or remove the print queue.

3.9 FOLLOW-USERS USE PROCEDURE

This feature is useful for network administrators to silently and forcefully align print queues on user PCs, typically employees who frequently move locations, based on definable rules.

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Follow-Users activities supported are:

- Installing a print queue, a concept that can be broken down into:
  - Installing if the print queue does not exist on the client
  - Updating an existing print queue (which is done by removing and then reinstalling the queue).

  When creating a rule, you don't need to specify whether it's an installation or update rule; the system determines its nature when the rule is executed.
- Deleting print queues that are present on both the client and Gest-Q but don’t have any valid Follow User Rules associated with them.

The rules require the following parameters to be set:

- Specific PC (by name or IP)
- Specific Domain User
- Network Groups (IP range)
- Active Directory User Groups

Of course each rule must be applied to one or more print queues, which will be installed if the clients meet the "match" rules set in the rule's configuration parameters.

PCs equipped with the Gest-Q Agent that fall within the rules defined by the Administrator will automatically install the print queue.

3.10 MULTITENANT

The solution was designed to be used in the following contexts:

- [Single User] Single end customer who uses Gest-Q for the management and distribution of their print queues
- [Multitenant] Reseller or technological partner who uses Gest-Q for the management and distribution of print queues to all its customers, like a continuous service or only in the initial installation phase following the supply of the company MFD

Gest-Q allows global management of settings but also dedicated administration for individual configurations dedicated to the specific company that uses the queue distribution service. There are global and specific user profiles with visibility and data administration privileges only on the specific company.

3.11 SECURITY

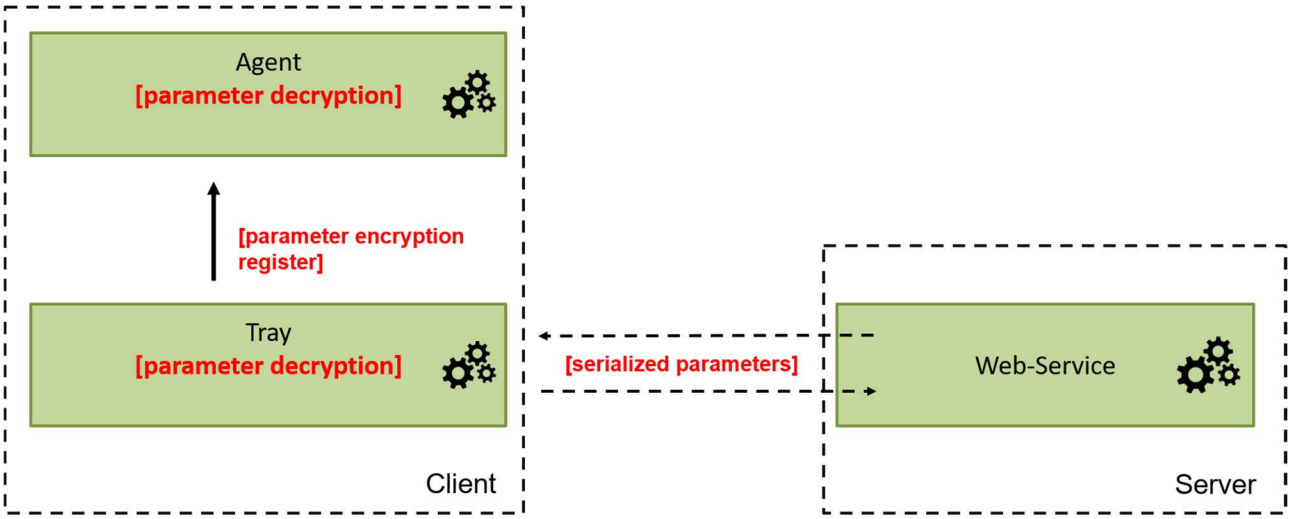
Security is an important aspect of the solution. The critical point is in the Gest-Q. Agent installed on clients that has local administrative rights on clients (LOCAL systems).

The service has no open port to the network; the only point of contact is the registry key on CURRENT USER from where it reads the input data.

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This data is the parameters used to instruct the service to create the print queue (IP, printer name, driver, etc..) and the validity is checked before being used as parameters. For maximum security, however, they are encrypted with Tiple DES symmetric key (168 bits) to ensure that the user cannot modify them.

Data encryption is used in 2 stages, as can be seen from the following scheme:



Gest-Q – Communication scheme between SW components

The private encryption and decryption key will be randomly generated according to the customer's company policies and inserted into the source code before distribution.

3.12 BANDWIDTH CAPACITY

The client-server communication on which Gest-Q is based is linked to web calls via HTTP.

In terms of bandwidth, these are calls with minimum weight, however linked to the amount of information that the server has to provide to the client (in turn depending on the configuration made at print queue level and viewing and installation privileges).

Below are the data for the http calls provided by the client-server solution with the weight, in terms of bytes, necessary to estimate the possible bandwidth occupation based on the number of active clients at the same time:

- Communication of configuration: **3 KB**
- Recovery of the list of print queue: **0,4 KB + 0,8 KB/queue**
- Registration of generic log: **0,3 KB**
- Registration of installation log: **0,3 KB**
- Forced Rules: **0,4 KB + 0,8 KB/queue**
- Maintenance Rules: **0,6 KB (or 1,2 KB) + 0,3 KB/queue**
- FollowUsers Rules: **0,6 KB (or 1,2 KB) + 0,3 KB/queue**

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On the basis of the above data, it is possible to estimate the bandwidth of the planned operations that can be performed by the Users as shown in the table below.

Action	Weight	Call type
Start	5 KB + 1KB/printer (on-demand) + 1KB/queue (forced) + 0,3 KB/log	1. Configuration 2. Printing queue list 3. Generic logs
Refresh	5 KB + 1KB/printer (on-demand) + 1KB/queue (forced) + 0,3 KB/log	1. Configuration 2. Printing queue list 3. Generic logs
On-Demand Print Queue Installation	[driver package] + 0,6 KB + 0,3 KB/log additional	1. Download driver (if necessary) 2. Generic logs (min: 1-max: 6) 3. Log installation
Check Forced Rules	0,4 KB + 0,8 KB/queue	1. Forced Rules
Print queue installation from Forced Rule	[driver package] + 0,6 KB + 0,3 KB/log additional	1. Download driver (if necessary) 2. Generic logs (min: 1-max: 6) 3. Log installation
Check Maintenance Rules	0,4 KB + 0,8 KB/queue	1. Maintenance Rules
Remove print queue from Maintenance Rule	0,6 KB + 0,3 KB/log additional	1. Generic logs (min: 1 – max: 4) 2. Log disinstallazione
Update print queue from Maintenance Rule	[driver package] + 1,2 KB + 0,3 KB/log additional	1. Generic logs (min: 2 – max: 8) 2. Disinstallation logs 3. Download driver (if necessary) 4. Installation logs
Print queue installation from FollowUsers Rule	[pacchetto driver] + 0,6 KB + 0,3 KB/log additional	1. Download driver (if necessary) 2. Generic logs (min: 1 – max: 8) 5. Log installation
Remove print queue from FollowUsers Rule	0,6 KB + 0,3 KB/log additional	1. Generic logs (min: 1 – max: 8) 2. Log uninstall

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Update print queue from FolowUsers Rule	[pacchetto driver] + 1,2 KB + 0,3 KB/log additional	1. Generic logs (min: 2 – max: 8) 2. Log uninstall 3. Download driver (if necessary) 3. Log installation

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4. INSTALLATION

4.1 REQUIREMENTS

SERVER

Gest-Q is a web portal made in C# and ASP.NET technology; and ASP. It needs a Microsoft Windows server with the following features:

- S.O. Microsoft Windows 2022 or later
- IIS version 11.0 or major, with enabled for page ASP.NET support
- .NET framework 4.7 or major

It also requires the presence of a Microsoft SQL SERVER database (version 2022 or higher), with Microsoft SQL Server Management Studio interface for managing the database itself.

CLIENT

It is necessary to provide for the installation of Gest-Q software on users' Microsoft Windows PC clients. The installation can be performed with the package provided or with distribution via Active Directory.

Client PCs using Gest-Q must have the following characteristics:

- S.O. Microsoft Windows 10 or Microsoft Windows 11
- .NET framework 4.5.2 or later
- Clients must be able to communicate via http with the end-point of the server part of the solution (Web-Service), which may be installed inside or outside the business network.
    - Standard communication ports are 80 and 443, but other ports could also be used, based on the server-side configuration.

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