1. Introduction

1.1. Get in touch

If you have questions regarding the contents of this document, or do you want to get in touch with our sales and/or support team, then we can be reached via:

- **Phone**: (+45) 3211 2222, open:
  - Monday-Thursday at 08:30 – 16:30 CET
  - Friday at 08:30 - 15:30 CET
- **Email**:
  - Sales: sales@auwau.com
  - Support: support@auwau.com
- **Web**: www.auwau.com

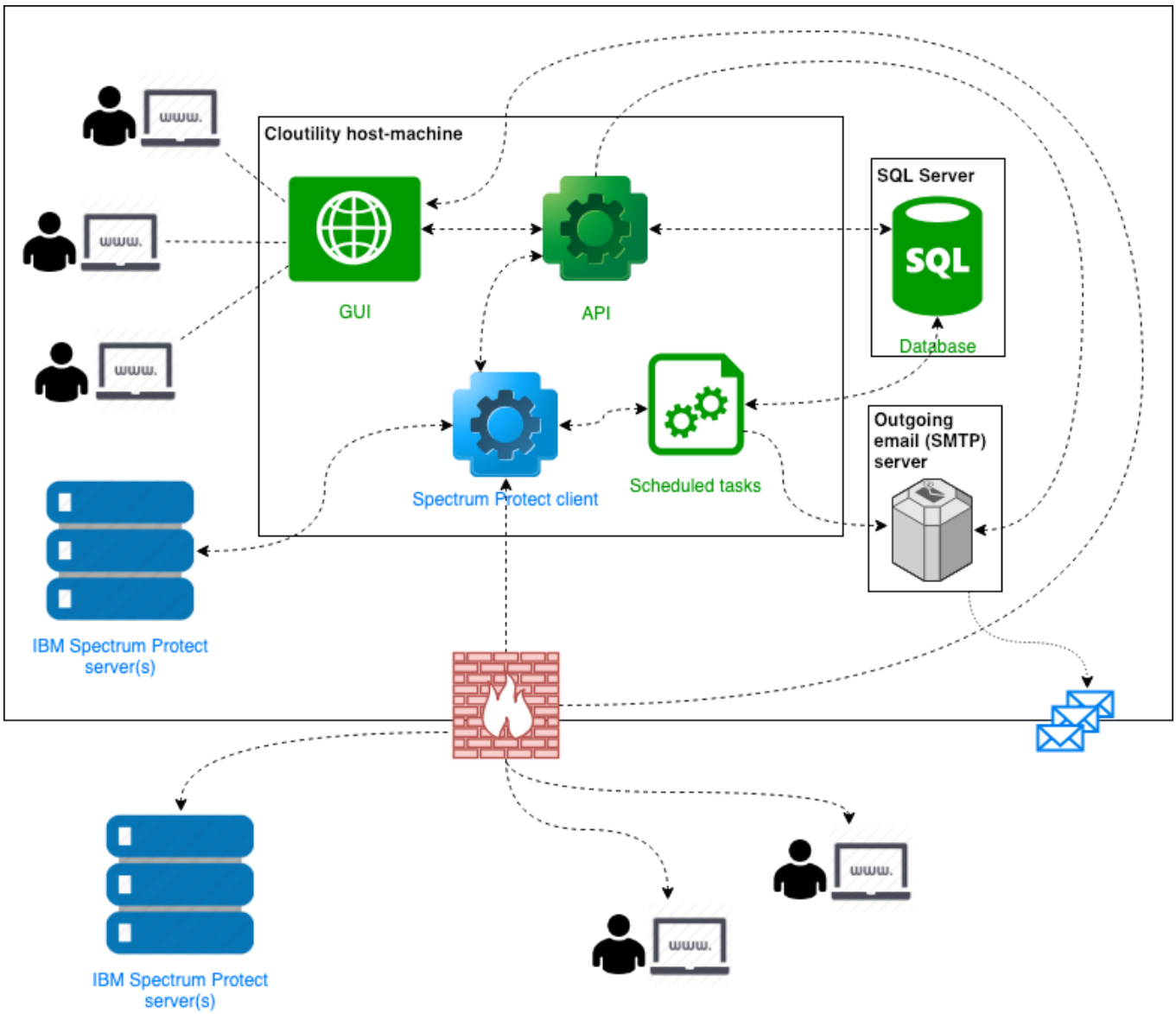
1.2. System overview

From a high-level technical standpoint, Cloutility consists of the following elements:

1. (Prerequisite: Spectrum Protect infrastructure which can be accessed from the host-machine – although this is not directly part of Cloutility.)
2. Prerequisite: A Microsoft SQL Server (Enterprise; Standard; or Express) which hosts the Cloutility **database** containing all of the business-layer data (the database is automatically created on the SQL Server during installation of Cloutility, but the SQL Server itself must be available in order to perform the installation).
3. Prerequisite: A working **outgoing email (SMTP) server** (see Outgoing email (SMTP) server).
4. A set of automated **scheduled tasks** (Windows services/daemons) which synchronize data between the Spectrum Protect infrastructure and the Cloutility **database**; generate various reports and billing data etc.
5. An extensive (RESTful) web **API** through which all on-demand operations can be initiated.
6. A web-based graphical user interface (**GUI**) which uses the API and allows you to e.g. model the business hierarchy; activate backup-clients; access reports and analytics etc.

The components and information flow are depicted in the figure below:

Components and information flow



Please note that the figure depicts a "Cloutility (only) host-machine" setup where the SQL Server is located on a separate host-machine. Cloutility also supports a "Cloutility + SQL on same host-machine" setup. Please refer to "Cloutility server (host-machine) requirements" for further details.

1.3. Web-browser support for GUI

The GUI supports the following web-browsers (preferred order):

1. Google Chrome (Microsoft Windows/Apple macOS).
2. Microsoft Edge (Microsoft Windows 10).
3. Microsoft Internet Explorer 11/IE11 (Microsoft Windows 7/8.1).
4. Apple Safari (Apple macOS).

2. Before you begin (requirements and recommendations)

This section contains a set of requirements and recommendations for your Cloutility host-machine and its environment:

- → Host-machine.
- → Accounts.
- → Outgoing email (SMTP) server.
- → Domain name system (DNS).
- → Secure Socket-Layer (SSL) certificate(s).

2.1. Host-machine

We recommend using a virtual machine (VM) as the host-machine as it enables you to create "snapshots" through the process including the final state in which Cloutility is fully operational. If you're running a "**Cloutility (only) host-machine**" setup (refer to Cloutility server (host-machine) requirements) you will be able to revert to the final snapshot at any time (and update to the latest software-build) and your system will be operational (again).

For VMs, we recommend taking snapshots at the following stages:

1. When Windows Server has been fully updated.
2. When Cloutility has been installed.
3. When Cloutility has been configured to use "custom URLs" (refer to Configuring Internet Information Services (IIS) for custom URLs).

Snapshot #2 can probably be removed once snapshot #3 has been taken, but it's nice to be able to revert to snapshot #2 until stage #3 is reached.

2.2. Accounts

2.2.1. Windows or Active Directory user account

Cloutility can be set up to the following administrative user account configurations:

Administrative user account configuration	Scheduled tasks (author)	IIS application pools (identity)	Comment
Current (Windows or Active Directory) user account	User account	User account	Windows Authentication and SQL Server Authentication supported for database connection.
SYSTEM/LocalSystem	none (SYSTEM)	LocalSystem	SQL Server Authentication required for database connection.

The (Windows or Active Directory) user account installing Cloutility should:

1. Be a local administrator on the host-machine.

> Regardless of which configuration is used, the selected account must have permission to execute "scheduled tasks" without being logged into Windows.

Refer to Installation identity and onward when selecting the installation identity and choosing the administrative user account configuration.

2.2.2. SQL Server user account

The user account used to access the SQL Server must:

1. Be a member of either the `sysadmin` fixed server role, or use a login which adheres to the following settings:
    1. Server roles: `dbcreator`
    2. User mapping (role memberships):
        1. Cloutility database:
            1. `db_owner`.

    2. msdb*:
        1. `db_datareader`.
        2. `db_datawriter`.
    3. Securables: `Connect SQL`.

* The (databases > system databases >) “msdb” database is used to store information regarding the Cloutility database version, which is used when applying (Cloutility database) updates. The specified roles grants the account `select`, `insert` and `update` privileges to the database.

> If using SQL Server Authentication, please ensure that the password for the SQL Server account doesn't contain (single or double) quotation marks, i.e. `'` and/or `"`, as the software-installer will not be able to authenticate the user account as part of the installation process.

2.3. Outgoing email (SMTP) server

An integral part of Cloutility is its ability to send emails related to e.g.:

- **User account activation** (account passwords *can* be specified manually when adding a new user, but isn't recommended).
- **Password resets**.
- **Status reports**.
- **Billing data**.

... etc., so we recommend having access to an outgoing email (SMTP) server before installing Cloutility. Refer to Email settings for configuration assistance.

> **Explicit SSL/TLS supported**
> In order for SSL/TLS connections to work, the SMTP host must support "**explicit SSL/TLS**", i.e. connections which are initiated unencrypted and then switch to an encrypted state. "Implicit SSL/TLS", i.e. connections which are initiated as encrypted, are currently not supported.

2.4. Domain name system (DNS)

Although it's not necessary to have in place before starting to set up Cloutility, we recommend having considered and preferably set up your "domain name system" (DNS) so that the Cloutility host-machine can be reached (at least) from your internal network (and perhaps already also from the Internet). Cloutility runs the following websites which each requires its own domain:

1. **API**: The extensive RESTful API:
    1. Domain example: api.mydomain.tld
2. **App**: The web-application (GUI):
    1. Domain example: mydomain.tld, www.mydomain.tld, app.mydomain.tld, portal.mydomain.tld

If you have the DNS set up and running before you start installing Cloutility, you will quickly be able to access it from other devices on your network, instead of just from the host-machine itself.

Refer to Configuring Internet Information Services (IIS) for custom URLs and onward when performing the actual configuration of Internet Information Services (IIS) and Cloutility.

2.5. Secure Socket-Layer (SSL) certificate(s)

We recommend accessing Cloutility over a Secure Socket-Layer (SSL) protocol (or "HTTPS") to ensure that the communication is encrypted. Refer to Bonus: SSL certificates for assistance on how to acquire and configure Internet Information Services (IIS) to use SSL certificate(s).

3. System requirements and implementation prerequisites for on-site installations

This chapter describes the prerequisites for installing and running Cloutility in your own infrastructure, i.e. as an on-site installation.

3.1. Cloutility server (host-machine) requirements

Cloutility requires a host-machine running a 64-bit edition of the Microsoft Windows Server operating system, i.e. (in preferred order):

Operating system	Note
Microsoft Windows Server 2016	
Microsoft Windows Server 2012 R2	
Microsoft Windows Server 2012	
Microsoft Windows Server 2008 R2 SP1	The Cloutility installer may fail on the first installation attempt. Run once, fail, reboot the host-machine and run installer again.
Microsoft Windows Server 2008 (64-bit) SP2	The Cloutility installer may fail on the first installation attempt. Run once, fail, reboot the host-machine and run installer again.

Depending on your preference, you can use a Microsoft SQL Server (SQL) which is installed either on the host-machine itself or on a remote host-machine which is accessible from the Cloutility host-machine. The minimum requirements for setups with 1000 assigned backup nodes are:

	Cloutility (only) host-machine	Cloutility + SQL on same host-machine
Processor	(modern) Intel quad core	(modern) Intel quad core
Memory (RAM)	8 GB	16 GB
Storage available for installation	15 GB*	200 GB

* Min. 1 GB disk space: Besides the installation itself the only disk space required by Cloutility is the space needed for final invoices to customers, e.g. PDF files, if you choose to let Cloutility handle their distribution via email and subsequently make them available for download via the API/GUI.

3.2. Software

The software-installer can be run on a fresh host-machine and will download and/or install; and configure most dependencies (apart from the database server). Automatically installed/configured dependencies include:

1. Microsoft Internet Information Services (IIS) 6 (or newer) with support for Microsoft .NET 4.5 applications.

The only dependencies which need be installed on the host-machine prior to installing Cloutility are:

1. Microsoft .NET framework 4.5.2 (.NET framework) or newer.
2. IBM Spectrum Protect Storage Manager Administrative Client version 6 or higher with "**Administrative Client Command Line files**": http://www-01.ibm.com/support/docview.wss?uid=swg21239415 (a detailed walk-through of the installation/configuration can be found in IBM Spectrum Protect Administrative Client (configured for English language in DSM.opt file)). You are able to install Cloutility without the administrative client installed on the host-machine, but you will not be able to connect to a Spectrum Protect server before the administrative client is available.
    - Please be sure to use English for the communication language, e.g. by modifying the `C:\Program Files\Tivoli\TSM\baclient\dsm.opt` file to `language enu`, if necessary.
        - Note: If modifying the dsm.opt file, the ONLY contents of the said file can be:

`language enu`

Any other (or additional) content can prevent Cloutility from working as intended!

3. An IBM Spectrum Protect administrator's account.
    - If managing data in container storage pools, the Spectrum Protect account must have "system privilege", "unrestricted storage privilege", or "restricted storage privilege" for the storage pool in order to issue the "`generate dedupstats`" command required for generating logical data storage values.

Besides from the above dependencies, the following prerequisites should be available prior to installing Cloutility:

- **Need to have**:
    1. The Windows user account used for installing Cloutility must have permission to execute “scheduled tasks” without the user being logged in: During the installation all Cloutility's scheduled tasks are associated with the user account performing the installation.
    2. Network access between the Spectrum Protect servers and Cloutility host-machine.
    3. An **SQL** (2017; 2016; 2014; 2012; 2008 R2; or 2008 Service Pack 2) supporting “Data-tier Application Support” (DAC) packages in order to be upgradable by our software-installer. Important things to note:
        - Cloutility supports either “**Windows Authentication**” or “**SQL Server Authentication**”.
            - When using “Windows Authentication” the user account used for installing Cloutility must have access to the SQL Server.
        - Cloutility will create its own database (default name: “CloudPortal”) during installation of the software, so no database needs to/should be created prior to installing Cloutility.
        - The Information regarding SQL host; database name; and user will be auto-filled when performing future upgrades Cloutility - the password must be entered upon each upgrade.
        - As a rule of thumb, each backup node requires a minimum of approx. 0.01 MB of space per day/(0.01 MB x 365 days =) 3.65 MB per year on the SQL Server, resulting in a backup node/GB ratio of approx. (1 GB = 1024 MB/3.65 =) 280 backup nodes/GB per year.
    4. Access to a working **outgoing email (SMTP) server**, used for validating new users; e-mail reporting etc. You are, however, able to install the software without a working SMTP server, but will experience somewhat limited functionality until one is available to Cloutility.
    5. If you want to run scheduled tasks under a user account performing the installation (as opposed to the SYSTEM account), the **local security policy** named “**Network access: Do not allow storage of passwords and credentials for network authentication**” needs to be disabled on the host-machine. To do this:
        - Open the “local security policy” application in Windows.
        - Navigate to: “Local policies > security options”.
        - Locate and double-click on “Network access: Do not allow storage of passwords and credentials for network authentication”.
        - Set value to “disabled”.
        - Click “OK”.
- **Nice to have**:
    1. **Microsoft SQL Server Management Studio** (SSMS) preferably installed on the host-machine itself (for debugging purposes, optional).
    2. A **web-browser** (Google Chrome recommended) which can access the GUI from the host-machine (required for initial setup).

3.3. Network access

The host-machine running Cloutility should be able to communicate with the **Auwau API** located at:

- URL: https://remote.backupportal.com
- IP address: 185.66.187.140

This network access is used:

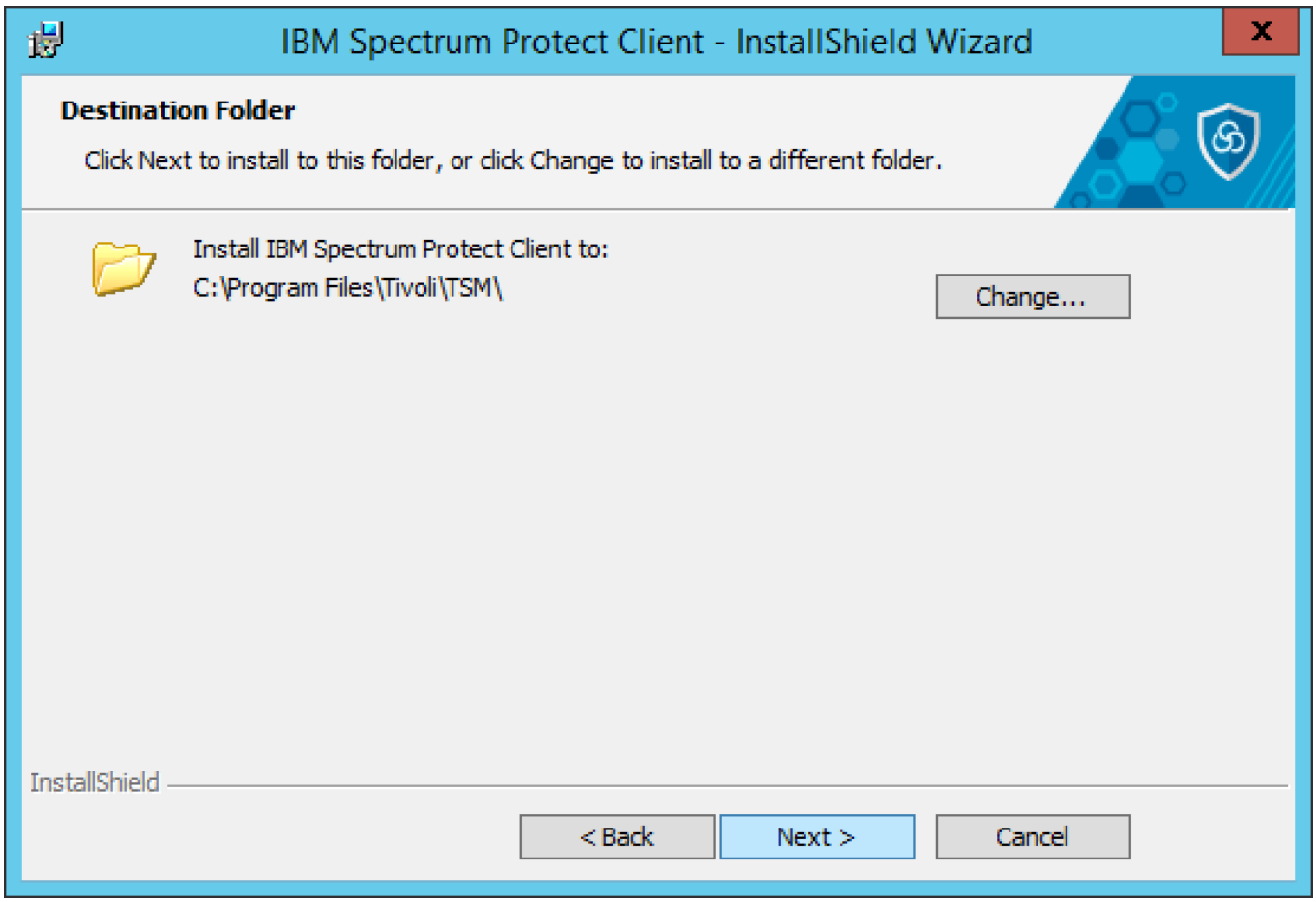
1. For software updates (checked at: https://remote.backupportal.com/v1/updates) when using the "check for updates" functionality for Cloutility.
2. As an endpoint for the exchange of license related meta-data regarding the use of the Cloutility installation. This information is used by Auwau for billing purposes. Depending on your Cloutility licensing model your Cloutility installation may not be required to send data to the **Auwau API** and will fully function regardless. The exchanged meta-data is the:
    1. **amount of data**.
    2. **number of consumption units**.
    3. **number of business units**.

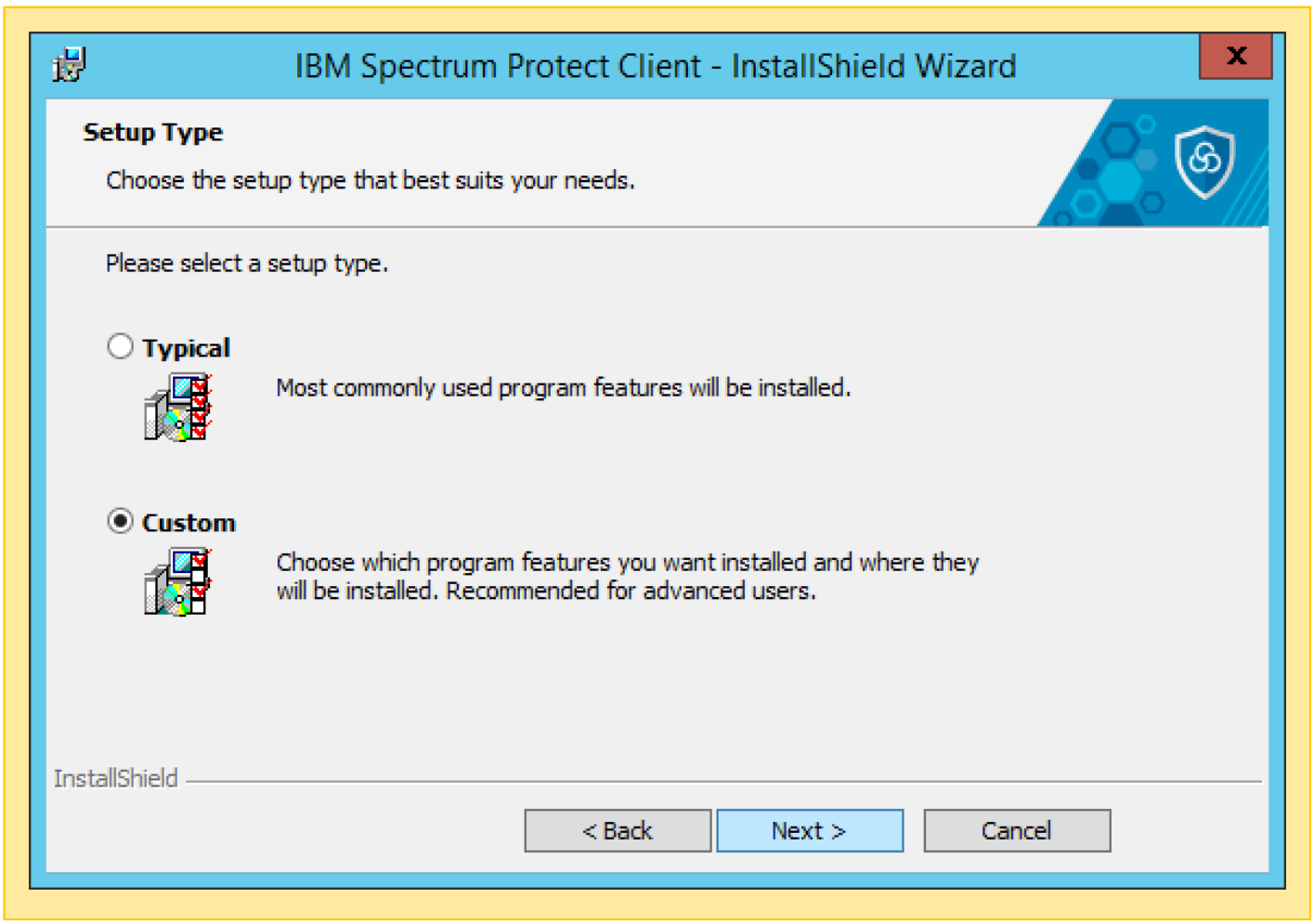
All communication with the Auwau API takes place over an SSL encrypted network connection.

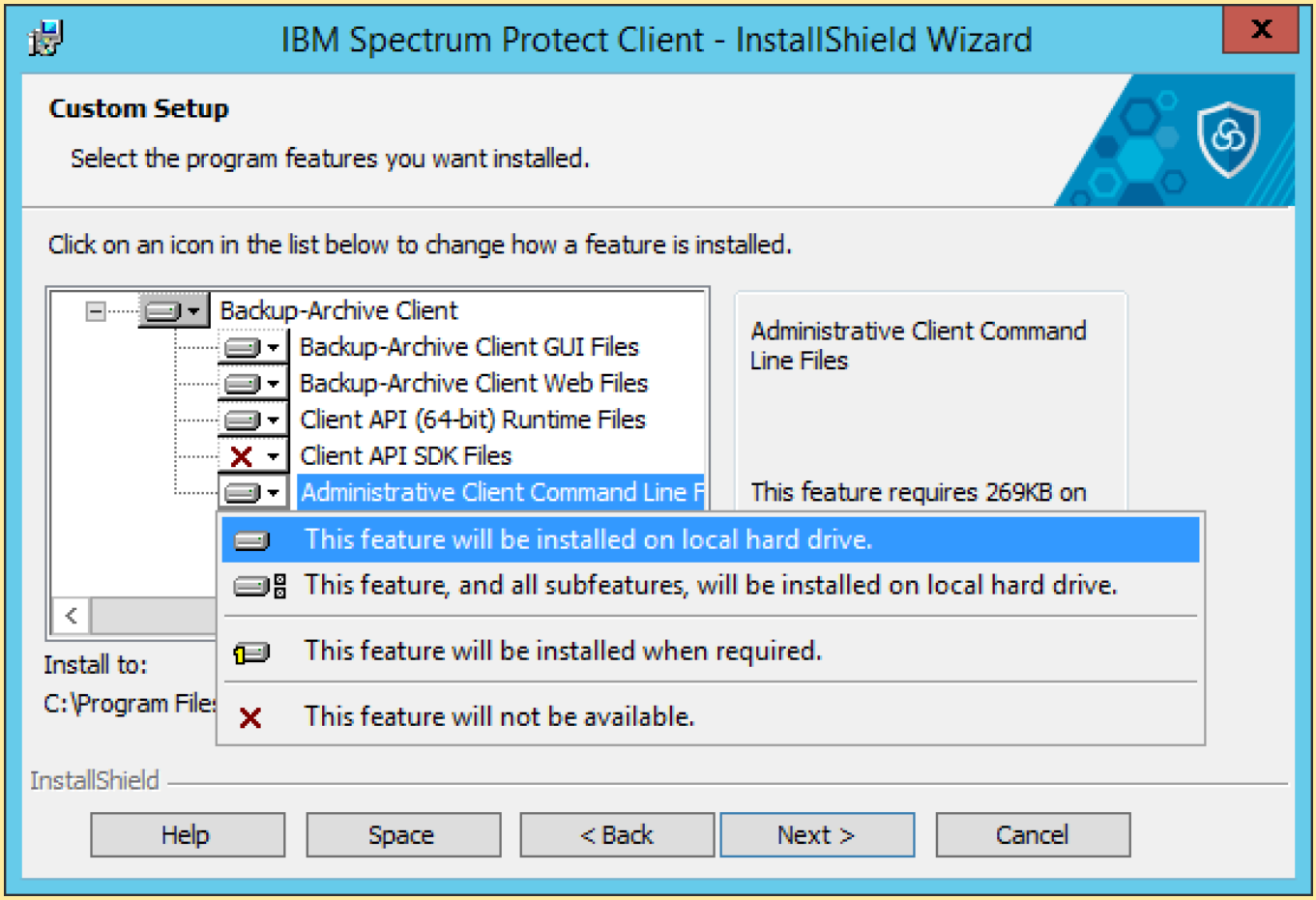
4. Installing prerequisite software

4.1. IBM Spectrum Protect Administrative Client (configured for English language in DSM.opt file)

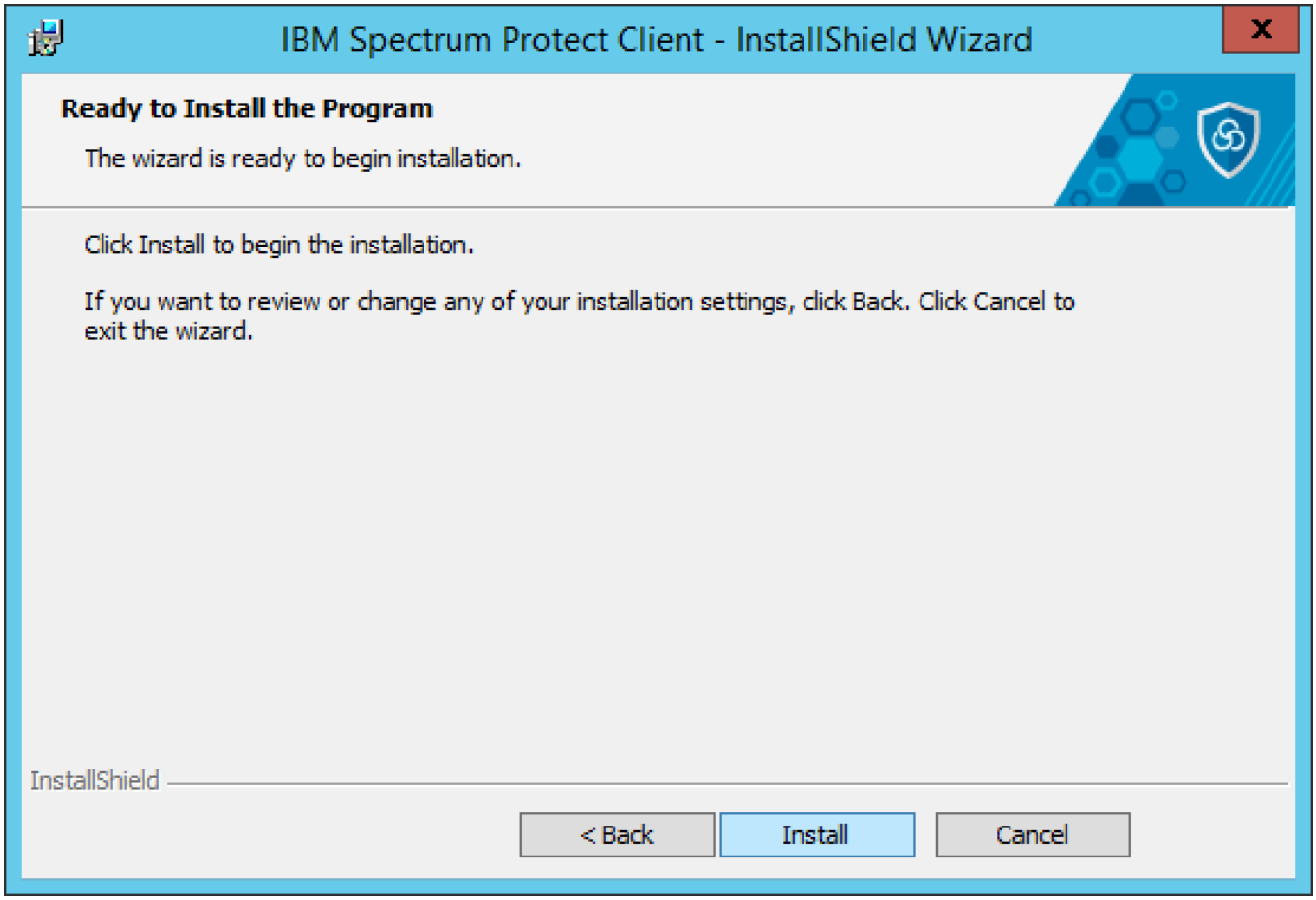
The administrative client (part of the "IBM Spectrum Protect Client") is free and can be downloaded from IBM. Locate it by searching the web, e.g. using google.com, for "IBM Spectrum Protect Client download".

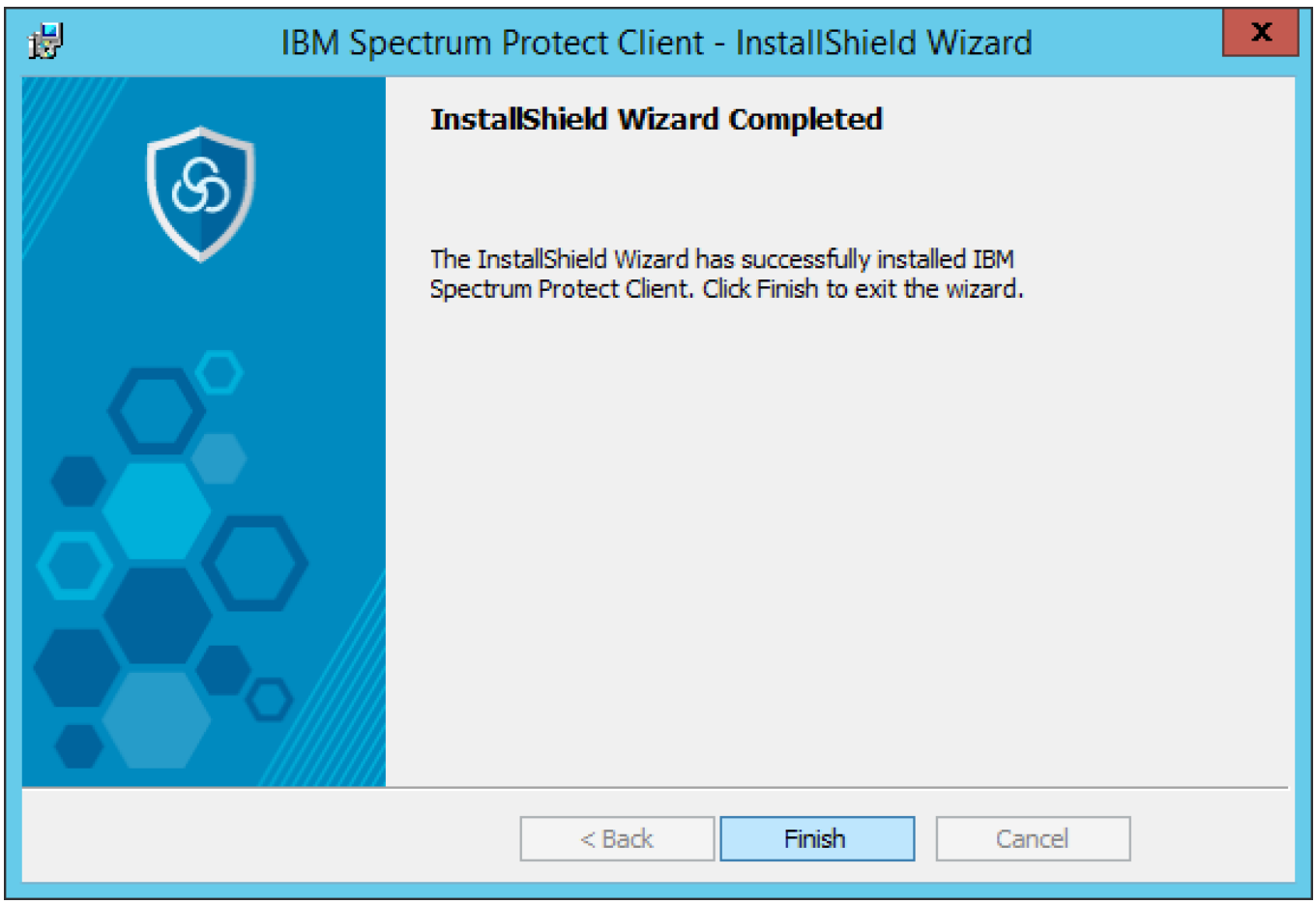

IBM Spectrum Protect Client - InstallShield Wizard
Destination Folder
Click Next to install to this folder, or click Change to install to a different folder.
Install IBM Spectrum Protect Client to:
C:\Program Files\Tivoli\TSM\
Change...
InstallShield
< Back
Next >
Cancel


IBM Spectrum Protect Client - InstallShield Wizard
Setup Type
Choose the setup type that best suits your needs.
Please select a setup type.
Typical
Most commonly used program features will be installed.
Custom
Choose which program features you want installed and where they will be installed. Recommended for advanced users.
InstallShield
< Back
Next >
Cancel



Make sure to include (i.e. choose "this feature will be installed on local hard drive") the "Administrative Client Command Line Files" as part of the Spectrum Protect Client configuration as Cloutility uses this component for communicating with Spectrum Protect servers.


IBM Spectrum Protect Client - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel


IBM Spectrum Protect Client - InstallShield Wizard
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed IBM Spectrum Protect Client. Click Finish to exit the wizard.
< Back
Finish
Cancel

The administrative client must be using the English language pack. To ensure this, please make sure that if a **dsm.opt** file exists (in **C:\Program Files\Tivoli\TSM\baclient**) on the host-machine, it should only contain the following data:

```
language enu
```

Any additional information in the **dsm.opt** file, e.g. specification of `tcpserveraddress`, can cause Cloutility to malfunction, so please refrain from adding anything but the above.