



NodePoint IT System - Linux version 1.4.6

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<http://nodepoint.ca>

September 25, 2015

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1 Introduction

NodePoint is an IT platform based on the Bootstrap framework providing a number of components for tickets management, inventory control, support articles, tasks and more. It is meant to be simple to setup and use, yet still offers most features one would expect in such a system. It is provided as freely available open source software under the MIT License.

Here are some of the available features:

- **Users management:** Allow users to register accounts, reset their passwords, email addresses and more.
- **Access level permissions:** Six access levels allow you to control who has access to add tickets, modify their statuses, manage projects, and so on.
- **Active Directory integration:** Use the stand alone users component or synchronize with your AD domain.
- **Projects and milestone control:** Add projects and create milestones against those projects.
- **Statistics and reports:** Monitor your instance through a number of reports.
- **Custom home page:** See the tickets you created, are assigned to, or follow on your home page.
- **Custom forms:** Use the default form or create custom ones to customize the ticket entry page.
- **Full text search and filters:** Filter tickets by product, status or do a custom search.
- **Follow and auto assignment:** Users can follow tickets, assign themselves to work on issues, or auto assign themselves to projects.
- **Comments and file uploads:** Leave comments or attach files related to tickets.
- **Knowledge base articles:** Create articles to build a knowledge base linked to your products.
- **Tasks management:** Create tasks and assign them to users, with due dates and completion rates.
- **Inventory control:** Add items that users can checkout, with full approval control.
- **Clients directory:** Make a clients listing which can then be used with tickets and items.
- **Time tracking:** Users assigned to tickets can enter the time they took to solve issues and track their time.
- **Easy to install:** NodePoint works on Windows and Linux, is easy to install, and can be configured in minutes.
- **Trivial to update:** See when an update is available and update your instance with a single copy operation.
- **Responsive design:** Using the Bootstrap framework, NodePoint works just as well on the desktop as on mobile.
- **Simple and elegant interface:** The interface is easy to understand and elegant for your users to use.
- **Email notifications:** NodePoint comes with built-in email notifications.
- **JSON API:** Create custom scripts or link other systems to enter tickets automatically.

1.1 Requirements

NodePoint was created for small to medium sized organizations (less than 5,000 users, less than 100,000 tickets). It runs on a single server and does not require any external resource. Configuration settings are stored in the `../nodepoint.cfg` file while data is stored in a file database from a customizable location (the `../db` folder by default). As such, only two requirements are needed to install:

- A 64 bits Linux host.
- Apache web server.

1.2 Installation

Follow these steps to complete a new installation:

1. Download NodePoint from <http://nodepoint.ca> and unzip the folder where you want files to live, for example `~/nodepoint`.
2. Make sure `www/nodepoint.cgi` can be executed by the web server, and it has write access to `../nodepoint.cfg`, `../db` and `../uploads`. This is done by default using the included `.htaccess` file but may require some modifications to your server's default configuration file.
3. Map a virtual host in your `httpd.conf`, or link the `www` folder, for example: `ln -s /var/www/nodepoint ~/nodepoint/www` (paths may differ based on your Linux distribution).
4. Access the site from *localhost* (e.g. `http://localhost/nodepoint`) and complete the first time configuration (see below).

1.3 Upgrading

NodePoint is designed to be fully upgradable from any minor version to another. For example, `1.x.x` to `1.x.x`. To upgrade from a previous NodePoint version, simply copy the new `www` folder onto the old one. This will overwrite all product files but leave your configuration, data and uploads.

1.4 Uninstalling

You can remove a NodePoint installation from a host in two steps:

1. Remove the folder where your NodePoint files live (backup your database if you wish to retain your data).
2. Remove the virtual host entry from your web server.

1.5 Troubleshooting

1.5.1 If you get a 500 server error

Check in your server log what the likely error might be. Try to run `~/nodepoint/www/nodepoint.cgi` from a shell. Make sure you have a 64 bits OS.

1.5.2 You see a list of files in your browser instead of the proper interface

Make sure the `.htaccess` file is present, and that your Apache configuration allows overrides. Look for the line *AllowOverride All* in your default site configuration file.

1.5.3 If you get the error Could not access configuration file or initial settings don't seem to save

Make sure NodePoint has write access to `../nodepoint.cfg`. Make sure the file only contains one line with the text *dummy value*.

1.5.4 If you get the error Could not access database

Make sure NodePoint has write access to the database, by default `../db/nodepoint.db`.

1.5.5 If you forgot your admin password

Simply delete the `nodepoint.cfg` configuration file on the server and recreate it through the web interface from *localhost*.

1.5.6 If email notifications don't work

This is typically because of permission issues. Make sure that:

- The user that NodePoint runs under has permission to make network connections.
- The firewall is allowing outgoing connections.
- The SMTP server is accepting connections from the NodePoint server and email address you set.

1.6 Best practices

1.6.1 Backups

NodePoint is likely to hold data you may not want to lose. The product stores information in three different locations:

First, configuration data is stored in the `nodepoint.cfg` file. There is very little information stored there, and you can view all of it on the **Settings** screen. Some of the information you may wish to backup includes:

- The administrator password.
- The API read and write keys.
- Information for your SMTP and Active Directory servers.
- Any other changes made such as default access levels, database location etc.

The most important data is held in the database file. This includes tickets, articles, user information, and so on. This file should be backed up on a regular basis. You can simply copy the file somewhere through a script, or as part of a backup strategy.

Finally, all uploads are stored in the `../uploads` folder. This includes both images used with products, along with files uploaded by users as part of ticket comments. These should also be backed up as part of any backup strategy you may have.

1.6.2 Restores

Restoring a NodePoint installation is fairly simple. Once you have finished a new installation, simply restore your backed up data before accessing the NodePoint site. There is nothing to restart and no service to worry about.

1.6.3 Data integrity

Data stored in the `nodepoint.db` file is stored in SQL format, using very efficient and proven technology. Locks are used to avoid data duplication. Data corruption is unlikely, but backups should still be done in the rare case that something happens to the file. Partial recovery is possible but not something to be attempted on a live system.

This does mean that you can access the data directly using a SQLite client. This however is highly discouraged without first contacting us for support. Doing the *vacuum* operation for example will corrupt your data.

1.7 Security concerns

By default, data stored in the database is accessible from anyone with login access to the server. As such, only administrators should be given physical access to the server used. User passwords are stored in a hashed format, both for the administrator and regular users.

Using SSL is highly recommended and does not impact the operation of NodePoint at all. Simply add an encryption certificate to your web server and access the product normally.

NodePoint is a stateless system, which means that users are re-authenticated at every operation. This means that things like cookie hijacking or manipulation will not allow a user to gain access if their password becomes invalid. Note that users cannot be deleted in order to avoid many items and operations becoming orphaned. To remove permissions from a user, setting their access level to 0 is the best way to proceed. If email notifications are enabled and Active Directory integration is disabled, users can also reset their own passwords through the *lost password* form.

The API provided uses a read and write key. This means that all operations are done as a special *api* user. Different amounts of secrecy can be used for the two keys, such as users having access to a script that exposes the read key, but the write key only being used on a server side script. If **User Impersonation** is configured, the API calls can specify a specific user for a number of operations as well.

If you specify a SMTP server for email notifications along with a username and password, these will be stored in plain text. This is unavoidable for NodePoint to be able to log into your email server. It is recommended that you use IP based filtering instead of a specific account.

NodePoint provides a file upload system. This can be used to upload project images, file attachments to comments, and file upload fields on custom forms. Users may use this feature to upload malicious files.

You should use an anti-virus software to scan for potential threats. You can also restrict the access level required to upload files on the **Settings** page, or disable uploads completely.

Finally, while NodePoint offers Active Directory integration, note that this is done using LDAP Simple Bind, not Kerberos, in order to allow both the Windows and Linux version to support this feature. LDAP over SSL can be implemented to provide encryption.

1.8 Support

If you need any functionality that is not covered by the base product, check out the **Resources** section of the web site where various scripts can be found. You can use the plugin options along with the JSON API to extend the functionality of the product.

Here are some examples of scripts available:

- Batch import of tickets from a CSV file.
- Desktop ticket support client.
- Create tickets from an email IMAP inbox.

1.9 Additional customization

While NodePoint was created to support many features and provide several customization options, there are cases where you may have additional needs. This is why the source is freely available on GitHub for you to modify.

Alternatively, you can contact the author at `dendory@live.ca` if you have any suggestions for future versions of the product.

2 Configuration

Basic configuration options are defined the first time you access the product. To prevent outsiders from resetting your configuration in the event that the data is lost, the initial configuration must be done from the local host. The same information is available both from this initial configuration and at any point from the **Settings** page while logged in as the product administrator.

2.1 Initial configuration

When you first access NodePoint, you are presented with this screen:

Info: Initial configuration not found! Create it now.

Initial configuration

These settings will be saved in the Registry. It allows NodePoint to connect to the database server and sets various default values.

Database file name:

Site name:

Favicon:

Bootstrap template:

Interface theme color:

Ticket visibility:

Tickets will have a default visibility when created. Public tickets can be seen by people not logged in, while private tickets require people to be logged in to view. Restricted ones can only be seen by authors and users with the **2 - Restricted view** level, ideal for helpdesk/support portals.

Allow user registrations: ☒

Default access level:

New registered users will be assigned a default access level, which can then be modified by users with the **5 - Users management** level. These are the access levels, with each rank having the lower permissions as well:

Level	Name	Description
6	NodePoint Admin	Can change basic NodePoint settings
5	Users management	Can create users, reset passwords, change access levels
4	Products management	Can add, retire and edit products, edit articles

The page includes reasonable defaults along with some explanations of what each option does. You should read them carefully. At a minimum, you must specify an administrator password. Do not lose it, as it is required to change the configuration at a later point.

2.2 Configuration options

These are the default configuration values for NodePoint. They have to be defined during first use and can be modified by the product administrator later from the **Settings** tab.

- **Database file:** This is the NodePoint database file.
- **Admin name:** The product administrator.

- **Admin password:** The password for the administrator.
- **Site name:** The name shown at the top left of the interface.
- **Public notice:** This notice is shown on every page. Leave empty to remove the notice.
- **Bootstrap template:** This is a CSS file used by NodePoint. It should be a valid Bootstrap template, or could contain extra CSS elements you wish to use. The default file is `default.css` and contains a few such elements.
- **Interface theme color:** The color of panels in the interface.
- **Favicon:** This is the icon shown by web browsers in the URL bar.
- **Ticket visibility:** When set to *Public*, all tickets will be visible by logged in and guest users. When set to *Private*, people need to log in to view tickets. *Restricted* prevents people without at least the Restricted View access level from viewing others' tickets. This is a good choice for IT/Helpdesk systems.
- **Default access level:** The access level for new users. The default is 1.
- **Allow registrations:** Allow guest users to register a new account. If set to no, the only way to add new accounts is if a user with Users Management access adds one.
- **Allow guest tickets:** Allow guest users to file tickets.
- **API read key:** Used for some API operations.
- **API write key:** Used for some API operations.
- **Allow user impersonation:** Allows API calls to specify a *from_user* parameter when creating a ticket.
- **SMTP server:** The hostname for email notifications. Leave empty to disable email notifications.
- **SMTP port:** The port number for SMTP connections, defaults to 25.
- **SMTP username:** User for SMTP connections, if your mail server requires authentication.
- **SMTP password:** Password for SMTP connections, if your mail server requires authentication.
- **Support email:** The email from which email notifications come from.
- **Notifications plugin:** Call an application or script when a notification is sent. You can use the following variables here: *%user%*, *%title%* and *%message%*. For example: `echo %message% >> ..\%user%.log`
- **Checkout plugin:** Call an application or script when an inventory item is checked out or approved. You can use the following variables here: *%user%* and *%serial%*. For example: `python add_license.py -item %serial% -user %user%`
- **Task completion plugin:** Call an application or script when a user completes (100%) a task assigned to them. Variables allowed are: *%user%*, *%task%*, *%product%* and *%due%*. For example: `echo %user% completed task %task% due on %due% >> tasks.log`
- **Upload folder:** Where product images and comment files are stored. Leave empty to disable uploads.
- **Minimum upload level:** The minimum access level a user must have to attach files to comments.
- **Items managed:** The type of items NodePoint should manage. This is purely a UI customization.
- **Custom ticket field:** The name of the third ticket field in the default form (after *title* and *description*). This can be used to ask users who fill in tickets to list related tickets, or any other information relevant to your particular installation.

- **Custom ticket type:** The type of field. If *text*, then the entries will be shown as text. If *URL*, then links will be assumed. If *checkbox*, then users will have to select yes or no.
- **Active Directory server:** Enter your domain controller address to enable AD integration. Users will be created dynamically as they first log on, and passwords will be checked against AD using LDAP.
- **Active Directory domain:** The domain to use for AD integration (in NT4 format).
- **Components:** Activate components that you require. This does not remove their functionality, only hiding them from the interface.

See chapter 4 for information about components.

3 Users and activity

NodePoint provides a simple way to manage users based on their access levels. Users have a specific level, which determines what shows up to them in the interface and what they can do. They can also enter an optional email address for notifications. Email addresses must be confirmed through the sending of an automated token when they first register, if email notifications are turned on. Users also have a password which can be changed by the user under the **Settings** page, or reset by someone with the Users Management level.

These are the access levels used by NodePoint along with a short description:

Level	Name	Description
6	NodePoint Admin	Can change basic NodePoint settings.
5	Users management	Can manage users, reset passwords, edit clients.
4	Projects management	Can add, retire and edit projects, edit articles and items.
3	Tickets management	Can create releases, update tickets, track time.
2	Restricted view	Can view statistics, restricted tickets and products.
1	Authorized users	Can create tickets and comments.
0	Unauthorized users	Can view private tickets.

NodePoint has a few special user accounts. The *admin* account is used as product administrator and acts differently than normal user accounts. It should only be used for administrative functions. *Guest* is used to specify people who are not logged in, and cannot be registered as a user account. The name *api* refers to any change made using the JSON API. The *demo* account can be registered normally but cannot change its own password, and is meant for product demos.

3.1 Users management

Management of user passwords and access levels can be done by anyone with access level 5 or higher. With the right access level, this panel will then be available in the **Settings** page:

Users management					
Filter users by access level: All 0 1 2 3 4 5					
User name	Email	Level	Change access level	Reset password	Last login
test		1	Change access level	Reset password	Tue May 19 06:55:51 2015
tyrion	tyrion@seven-kingdoms.local	4	Change access level	Reset password	Fri May 15 11:57:04 2015
cersei	cersei@seven-kingdoms.local	3	Change access level	Reset password	Thu Apr 16 11:45:36 2015

From there you can see a list of users, their email addresses, access levels, last logins along with the options to change their access levels and reset their passwords. Note that email notifications will only be sent out to users who confirmed their email addresses.

Note that while there is no lock or ban function, setting the access level to 0 restricts most functions. This panel also allows passwords to be reset.

Finally, new users can be created from that panel. If the **Allow Registrations** option is enabled, people can also register new user accounts from the login screen.

Here are the character restrictions for users:

- **User names:** Between 3 and 20 characters, using alphanumeric characters, plus the dot and dash. User names are not case sensitive during login authentication.
- **Passwords:** At least 6 characters.
- **Email addresses:** At the most 99 characters.

3.2 Active Directory integration

Active Directory integration can be enabled in the initial configuration, which will link the users management panel to your domain controller. Passwords will no longer be stored in the NodePoint database. Once a user attempts to login, their credentials will be validated, then NodePoint will check if a user entry exists in the database. A new entry will be created on first login. Users still need to set their email addresses for email notifications to work. Access levels can still be assigned to users to control their access to the NodePoint interface.

Authentication uses the LDAP protocol. You must specify a valid domain controller hostname or IP address for logins to work. If a login fails, you can view the log on the **Settings** page to see the error message.

3.3 Reports

User activity can be monitored through two graphs along with a number of reports. The first graph shows the number of tickets entered per day for the last 7 days. The second one shows an overview of all tickets based on status. Reports can be shown on the screen or downloaded as CSV documents to open in a spreadsheet application. Both are available to users of level 2 and higher on the **Settings** page.



4 Components

NodePoint is divided into multiple components that you can enable or disable in the configuration as a product administrator. You can turn them on or off depending on your needs. For example, a help desk portal could have the **Tickets Management**, **Time Tracking** and **Support Articles** components enabled, while a project management portal could have only the **Tasks Management** component enabled.

4.1 Tickets Management

Users who have an access level of 1 or higher can enter tickets on the **Tickets** page. The default form asks for a title, description and a custom entry type, configurable in the initial settings. Custom forms can also be designed and assigned to projects by users of access level 4 and above. These custom forms can have up to 10 fields, each field can be a text area, a check box, satisfaction rating, and so on. Projects that have a custom form assigned will display that form to users instead of the default one.

Users with access level 3 or above can modify tickets. When a ticket is modified, the description is updated to show who modified it, and what parameters were changed, such as the title, description, status and resolution. Open tickets do not require a resolution, but every other status does. The list of tickets can be filtered based on project, status and so on.

4.1.1 Custom forms

To use custom forms, follow these steps:

1. Add at least one project on the **Projects** page.
2. Create a custom form on the **Settings** page.
3. Assign that form to the project.

Here is an example of a custom form being built along with the result:

The image displays two screenshots from the NodePoint IT System interface. The left screenshot shows the 'Custom form' configuration page, and the right screenshot shows the 'Create a new ticket' form generated from that configuration.

Custom form configuration (Left):

- Form name:** Helpdesk form 1
- Product linked to this form:** Helpdesk for users
- Fields and Answer types:**

Field	Question	Answer type
Title	The nature of your problem	Some text
1	Is this an urgent issue?	Yes / No
2	How many hours did you spend trying to solve it?	Number
3	Describe your issue:	Lots of text
4	Satisfaction weee	Satisfaction scale
5	Check?	Checkbox
6	True or false kinda thing..	True / False
7	Pick a date:	Date
8	Your IP:	IP address
9		Some text

Create a new ticket form (Right):

- Product name:** Helpdesk for users
- Release:** 1.0
- Fields:**
 - The nature of your problem: Text input
 - Is this an urgent issue?: Radio buttons (Yes, No)
 - How many hours did you spend trying to solve it?: Number input
 - Describe your issue: Text area
 - Satisfaction weee: Satisfaction scale
 - Check?: Checkbox
 - True or false kinda thing..: Radio buttons (True, False)
 - Pick a date: Date input (mm/dd/yyyy)
 - Your IP: IP address input (10.10.1.1)

4.1.2 Following and assignment

Any logged in user can follow a ticket by clicking the proper option on the ticket's screen, which will add that ticket to their home screen for easy reference. This is meant as a way to follow an issue you are not actively working on.

Users with access level 3 or higher can assign themselves to a ticket by clicking the proper checkbox on the ticket's screen. This is meant as a way to assign resources to a particular issue.

Auto assignment can also be used to assign specific users to any ticket filed against a project. You can add yourself to the auto-assign list of a product by clicking the button on the project's screen:



Both followed and assigned tickets are listed on the user's home page. Finally, email notifications are sent out when a ticket is created, modified or a comment is added. The notifications are sent to the ticket author and users assigned to that ticket.

4.2 Support Articles

The **Articles** page hosts articles that can be used to document common use cases, common issues, or to build a knowledge base for your organization. Articles are created in *draft* mode, which hides them from users with an access level lower than 4. Only once they are published are they visible to all users.

Users with at least access level 3 can link articles to tickets. These can be used to assign related documentation to issues, or used as categories. Linked tickets (except closed ones) are listed on the article's page, which makes it easy to track which tickets are assigned to a specific article.

4.3 Time Tracking

When updating a ticket, users can track the time they spent on the issue, which will be added to the time table for that ticket. A total of all the time spent on tickets by a specific user is shown on the **Settings** page. A report is also available with the total time spent by all users.

Time entries cannot be removed since it acts as a timestamp for work done. Corrections can be made by entering negative values.

4.4 Shoutbox

The shoutbox is a simple chat area on the home page that all users can use. The box shows the last few entries made by users, and individual entries can be deleted by users with access level 5 or higher.

4.5 Tasks Management

The tasks management component can be used to manage products or projects, create new tasks needed to be completed, and assign these tasks to users with due dates. Users with access level 4 or higher can create new tasks on the **Projects** page:

Tasks

Add a new task

Assign user:

test

Due by:

mm/dd/yyyy

Add task

Current tasks

Task	Assigned to	Completion	Due by	
Setting up the project management calendar	tyrion	100%	Completed	Delete
Recruiting contractors for the work	cersei	0%	07/01/2015	Delete
Setting up the backend server for the work to begin	tyrion	100%	Completed	Delete
Implementation of the web scripts - phase 1	tywin	30%	08/12/2015	Delete
Implementation of the web scripts - phase 2	tywin	0%	10/17/2015	Delete

New tasks created will send an email notification to the user assigned to the task, and all tasks will show on the user's home page. There, users can modify the completion rate for each item. Completed and overdue tasks will also be highlighted.

4.6 Clients Directory

The clients directory can be used to keep track of clients or contacts from the **Settings** page. New clients can be added along with specific information such as email, phone number or notes by users of access level 5, details seen by users of level 2 and higher. The following statuses can be assigned to clients:

- **Prospect:** A prospective client.
- **Contact:** A contact entry.
- **Paid:** A paid client.
- **Unpaid:** An unpaid or default client.
- **Closed:** A closed entry (no ticket can be filed against closed clients).

If the clients directory is enabled, the *Clients* field type can be added to custom ticket forms, which will show a drop down list of available clients when creating new tickets, to assign issues to specific clients. This can be used as a CRM portal to keep track of interactions with clients.

4.7 Inventory Control

The Inventory Control component allows users with access level 4 or higher to add items to the **Items** page. These items can be linked to projects or clients, and can be checked out by other users. Approval can also be required, in which case users will need to request access, and someone with access level 4 or higher will need to approve the request. This component can be used to keep track of physical items such as computers, keyboards and phones, or even software licenses:

Inventory items			
<div>Sort by: ▼ Sort</div>			
Type	Name	Serial	Status
Desktop	HP Pavilion dv6	824-dv6-0001	Available
Desktop	HP Pavilion dv6	824-dv6-0002	Checked out by: tyrion
Mouse	Logitech mousepad	2463-51345-0001	Checked out by: tyrion
Keyboard	Logitech keyboard	6781-52362-0001	Checked out by: tyrion
Phone	iPhone 6	23-6234-62b	Available
Phone	Samsung S3	325-5427146-7527	Waiting approval for: arya

When a user checks out an item, additional information such as item location, lock codes or other secret data can be displayed on the item's page and sent through email to that user, so that the person can retrieve it. This information field is otherwise hidden from other users. If approval is required, a notification will be sent to all available users with level 4 or higher. They can then decide to approve or deny the request.

Users with checked out items will see a list of items on their home page, and can then return the item, making it available to other users. A checkout history is kept for each item and shown on the item page, showing all past requests and events. Items can also be manually assigned to users, or made unavailable, preventing any user from requesting or checking them out.

An *items* field is available to be used in custom ticket forms, which will display a list of checked out items that the user can file tickets about. Finally, a checkout plugin can be used to accomplish some automated task when an item is checked out, approved or assigned to a user.

4.8 Billing

The Billing component allows you to assign tickets to clients with either a fixed rate or an hourly rate. As such, this component requires the Tickets Management and Clients Directory components to be enabled. For hourly rates, the Time Tracking component must also be enabled.

When editing a ticket, a user of level 3 or higher can select a client from the drop down list, among clients that have been entered in the directory. Once tickets have been assigned to a client, the list of tickets with hours spent are listed on that client's page. The cost and currency can also be adjusted on that page.

5 JSON API

NodePoint provides a JSON based REST API that can be used to accomplish some basic tasks. This can be useful to integrate the system with existing products, or to use with custom scripts. Each API call requires either the *read* or *write* key. The calls can be made using GET or POST.

Here is a list of commands:

5.1 Show ticket

- api=show_ticket
- key=<read key>
- id=<ticket id>

5.2 List tickets by product

- api=list_tickets
- key=<read key>
- product_id=<product id>

5.3 List users

- api=list_users
- key=<read key>

5.4 Verify user password

- api=verify_password
- key=<read key>
- user=<user name>
- password=<password>

5.5 Change user password

- api=change_password
- key=<write key>
- user=<user name>
- password=<password>

5.6 Add new user

- api=add_user
- key=<write key>
- user=<user name>
- password=<password>
- email=<email>

5.7 Add ticket

- api=add_ticket
- key=<write key>
- product_id=<product id>
- release_id=<release id>
- title=<ticket title>
- description=<ticket description>
- custom=<custom field>
- from_user=<valid user>

5.8 Add comment

- api=add_comment
- key=<write key>
- id=<ticket id>
- comment=<comment>

5.9 Add release

- api=add_release
- key=<write key>
- product_id=<product id>
- release_id=<release id>
- notes=<notes>

5.10 Add task

- api=add_task
- key=<write key>
- product_id=<product id>
- description=<task description>
- user=<assigned user>
- due=<mm/dd/yyyy>

5.11 List tasks

- api=list_tasks
- key=<read key>
- user=<user>

5.12 List clients

- api=list_clients
- key=<read key>

5.13 Add item

- api=add_item
- key=<write key>
- product_id=<product id>
- client_id=<client id>
- approval=<0|1>
- type=<item type>
- name=<item name>
- serial=<serial number>
- info=<additional information>

5.14 List items

- api=list_items
- key=<read key>

5.15 Assign item

- api=assign_item
- key=<write key>
- id=<item id>
- user=<user>

5.16 Return item

- api=return_item
- key=<write key>
- id=<item id>

5.17 Show time tracking

- api=show_time
- id=<ticket id>
- key=<read key>

5.18 Show billing information

- api=show_billing
- client=<client name>
- key=<read key>

5.19 Code example

The following code snippet is a Python example of how to access the API. This script connects to a local NodePoint instance and lists all the users:

```
import json
import urllib.request
import urllib.parse

post_params = {'api': 'list_users', 'key': '0qvG4DkOz8NZnkuhn4aczck7r3qQVYS4'}

post_args = urllib.parse.urlencode(post_params)
data = post_args.encode()
stream = urllib.request.urlopen('http://localhost/nodepoint/', data)
result = stream.read()
charset = stream.info().get_param('charset', 'utf8')
users = json.loads(result.decode(charset))
for user in users['users']:
    print(user['name'])
```

6 License

The MIT License (MIT)

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