Adding Printers to Print Studio.

Print Studio uses Print Manager to provide printer definitions and manage these printers. Print Manager source can be found at https://github.com/spark3dp/print-manager.git.

We support the easy addition of FDM and DLP type printers and provide examples of these. The rest of this document highlights how to modify the printer database and what resources are required.
The branch addMakerBot2x in the above source tree shows an example of adding to the database.

You will also need to download RoopaServer from Release in1.1 in github.com/spark3dp/print-manager.git We support linux, macos and win7, so you can choose your development platform.

If you need to process the native DLP/FDM file please read the translate readme on https://github.com/spark3dp/print-manager/spark-print-mgr/printableTranslation/README.md

Adding a printer to Spark PrintManager requires the following resources:

1. ### Print bed geometry

   Create a poly model of the print bed with
   - As little triangles as possible
   - Normals pointing to the outside
   - Normals being saved as face-normals (to avoid smooth shading of the print bed geometry)
   - Correct bed dimensions (not the build volume dimensions)
   - Saved as *.obj format with .mtl textures assigned
   - The materials manually replaced with the materials we have designed.
   - We recommend NO branding as part of the print bed geometry (less polys) other than through textures

   The geometry needs to combined in a zip file including
   - Geometry
   - Mtl file
   - Any texture files

     Zip and geometry files need to have the same name

i.e:

- PrinterName.zip
  - PrinterName.obj
  - PrinterName.mtl
  - PrinterName_texture.png

2. Icons/graphics:

We require the following visuals to be generated per printer:

	Format	Dimensions
Printer branding	Png	454x90
Default icon to be sent to the printer	Defined by printer firmware	Defined by printer firmware
Printer icon (non-retina)	Png	50x50
Printer icon (retina)	Png	100x100

3. Definition of printer:

1. Printer properties are defined in printerType.json

```
,
    {
      "id": "3F64F6EC-A1DF-44AB-A22E-58C036F2F475[1]",
      "version": 1,
      "name": "<printer name>",
      "manufacturer": "<manufacturer name>",
      "registration_url" : null,
      "model_number": "1.0.0",
      "icon_id": "data/icon_id.png",
      "icon50x50_id": "data/icon50x50.png",
      "icon100x100_id": "data/icon100x100.png"[2],
      "technology": "FDM",
      "default_material_id": "FB67831E-BB63-4C76-BC00-
8D84F8F44CB9[3]",
      "default_profile_id": "CF313AC0-FDE6-467A-9E8B-
797F0F35E6A3[4]",
```

[1] To create a new printer we require a random id number in this format
[2] Icons used in PrintManager UI as well as PrintStudioprinter selection panel
[3] The material ID needs to correspond to a material defined in the materials.json file.
[4] The profile ID needs to correspond to an existing printer profile in the profile.json file.

```
"firmware": {
   "type": "firmwaretype",
   "version": "1.0.0"
},
"build_volume": {
   "type": "Cartesian",
   "home_position": [0, 0, 0],
   "park_position": [<number x>, <number y>, <number z>],
   "bed_size": [
      <number x>,
      <number y>,
      <number z>
   ],
   "bed_offset": [
      <number x>,
      <number y>,
      <number z>
   ],
   "bed_file_id": "data/bed_file.zip[5]"
},
"max_materials": 1,
"printable": {
   "content": "application/<g-code format>",
   "thumbnail": "image/png",
   "extension": "<extension>",
   "generates_supports": false,
   "packager_data": {
      "icon_file_id": "data/icon_filePrintableIcon.bmp[6]"
   }
},
"supported_connections": [
   {
      "type": "usb",
      "protocol": "<usb protocol>"
   }
],
"preferred_connection": "usb",
"software_info": {
   "name": "<manufacturer name>",
   "url": "<manufacturer URL>"
},
```

[5] Archive containing a print bed obj file with material *.mtl definition . See also 'Print Bed Geometry' above.

[6] Default icon file sent to the printer with a print job.

```
  "printer_capabilities": {
    "num_extruders": 1,
    "nozzle_temp_max": 300,
    "nozzle_max_volume_per_sec": 300,
    "nozzle_diameter": 0.04,
    "nozzle_offset": [0, 0, 0],
    "nozzle_retraction_length": 0.1,
    "nozzle_lift_z": 0.05,
    "nozzle_extra_length_on_restart": 0.15,
    "e_speed_max": 2.0,
    "nozzle_min_travel_on_retraction": 0.1,
    "bed_temp_max": 0,
    "xy_speed_max": 20,
    "z_speed_max": 0.01,
    "travel_feed_rate": 10,
    "z_axis_feed_rate": 3
  },
  "_files": [
    "icon_id",
    "icon50x50_id",
    "icon100x100_id",
    "build_volume.bed_file_id",
    "printable.packager_data.icon_file_id"
  ]
}
```

2. Available materials need referencing in materials.json
3. Default settings are defined in profiles.json

4. Location of data base files:

Printer Types, Materials and Profiles

print-manager/spark-print-data

Icons and print bed geometry

Print-manager/spark-print-data/data

Adding a new printer:

If you are doing this on a machine that you have installed Print Studio. You will need to stop the service (or start your PrintManager on another port). See Print Manager Documentation at github.com/spark3dp/print-manager. When it is stopped you can start the server up by typing node server.js. The server will be started on localhost:9998, this is where Print Studio expects to see it.

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