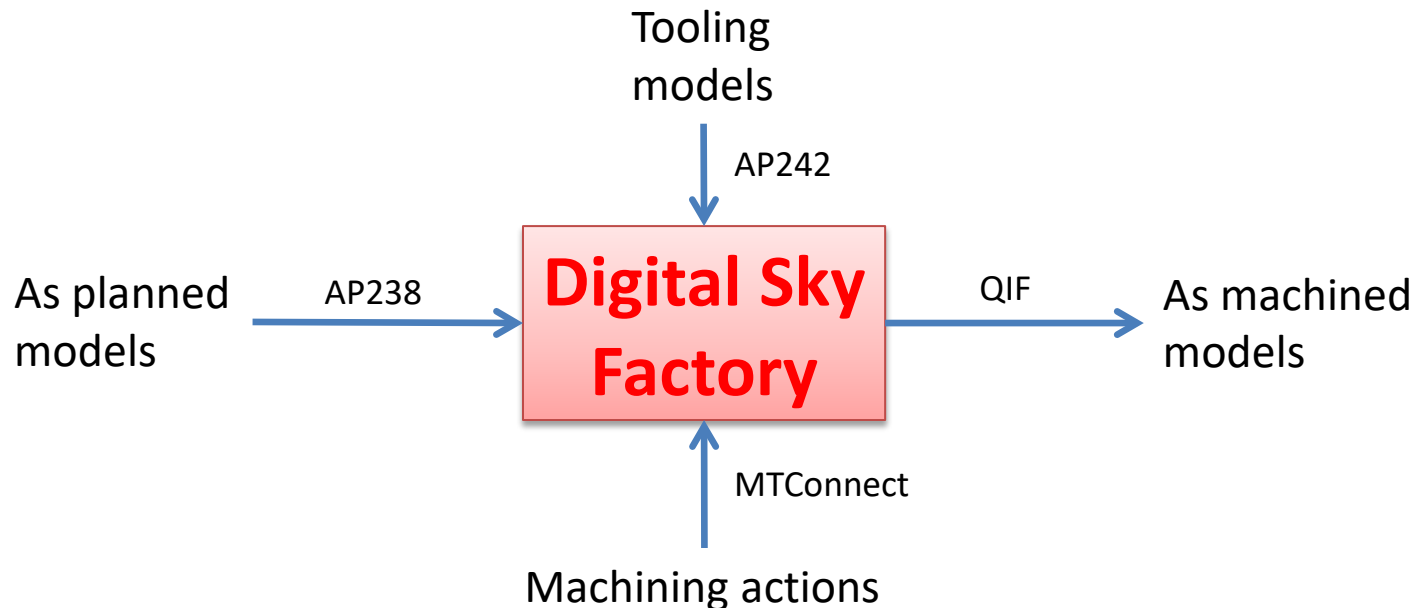


DigitalSkyFactory

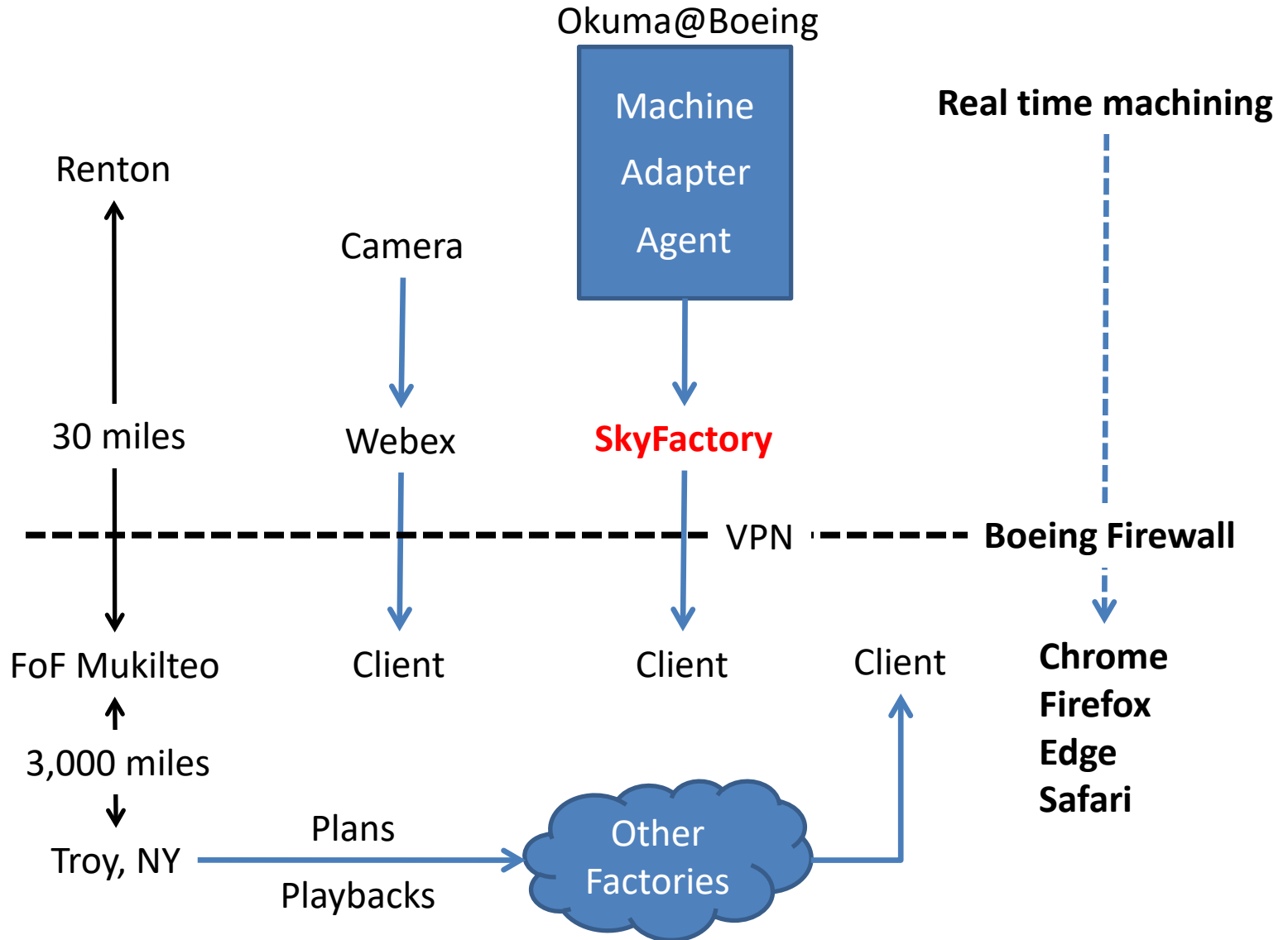
Adaptive programming
using digital twins

What is the DigitalSkyFactory?

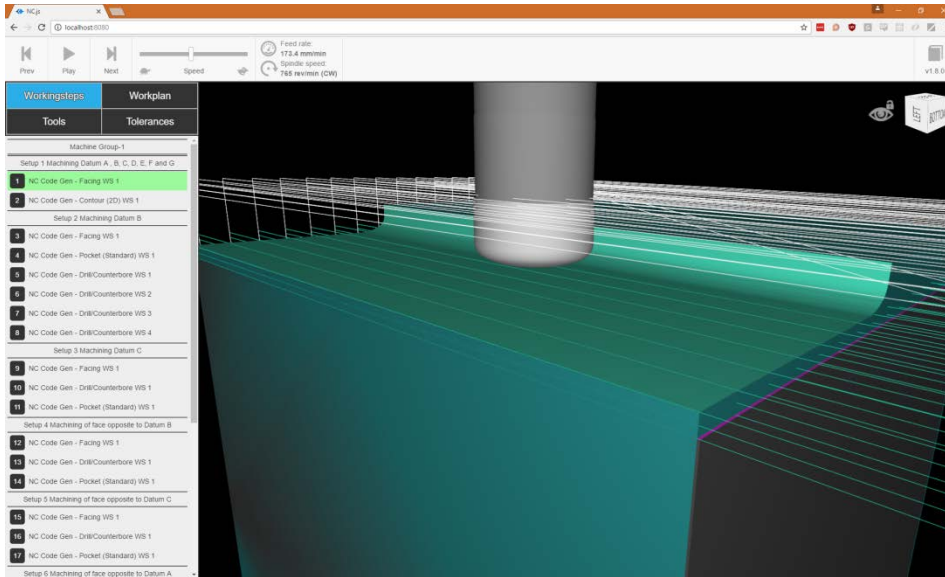
- A digital twin in the cloud
 - Connected to the real factory using smart phones
 - Performing measurements and suggesting adjustments
 - Sharing results with design, planning and production



Example deployment



Example applications

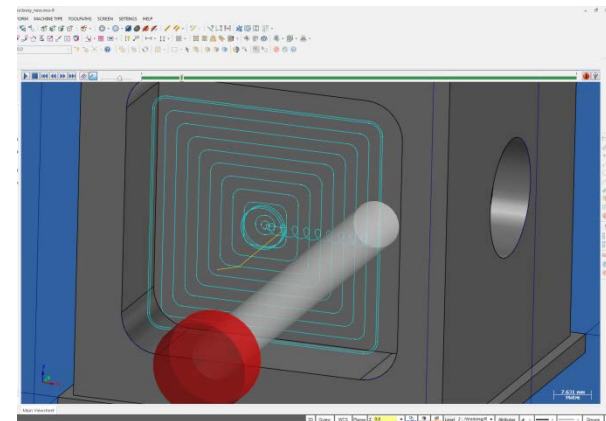


• Tooling optimization App

- Operates on smart phones and tablets
- *Advice on feed changes*
- 15% more efficient while continuing to meet tolerances

• Solution generation service

- Making SkyFactory data
- Titanium process solutions
- NC generation from stage models



System and Services

- S** TEP Backbone
- W** eb Gateway
- I** nterpretation Env.
- M** anufacturing App.



"03" 14-06-05



"Mind the Gap" 14-02-02



Smart Phones and Tablets

Wet

Dry

1. Validation GUI



2. Inspection



Smart Metrology Advisor (Virtual CMM)



Node.js



Three.js



Sky Factory



3. Optimization

AVM iFAB

Smart Machining Advisor (MCx, CAx)

Final results
XML
KPI
QIF

S
STEP

S
STEP NC



XML

MTConnect

Boeing

CNC Machine

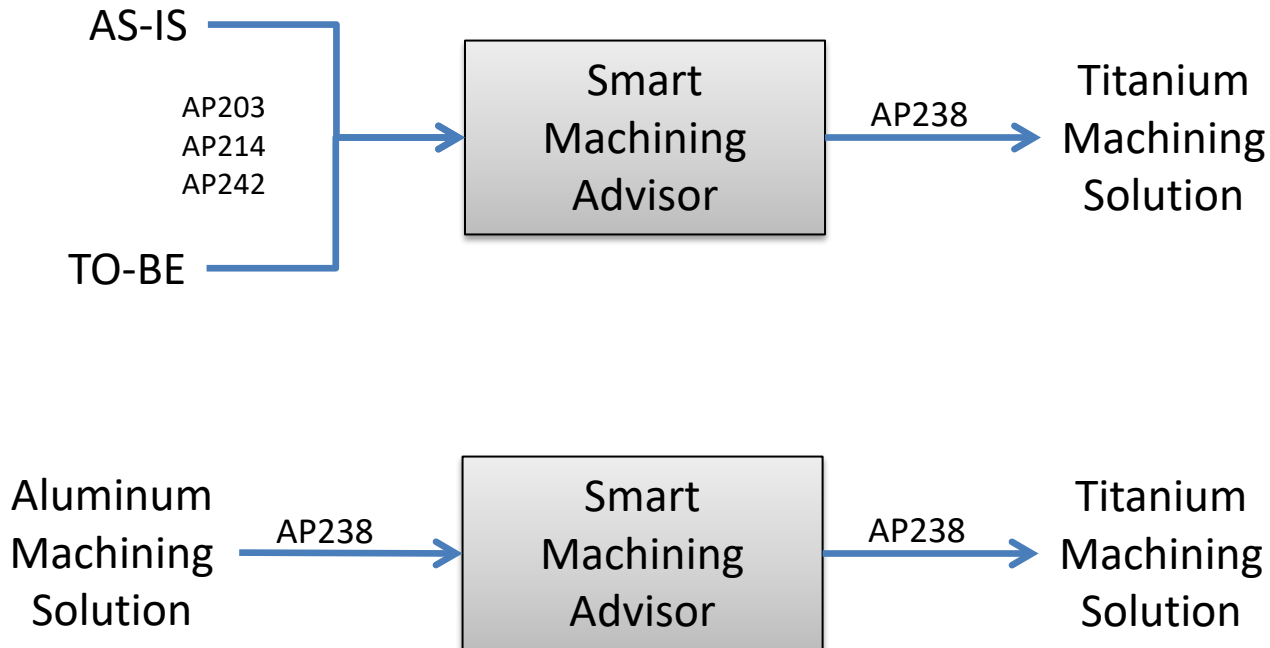
Operator

3rd Party

G-code

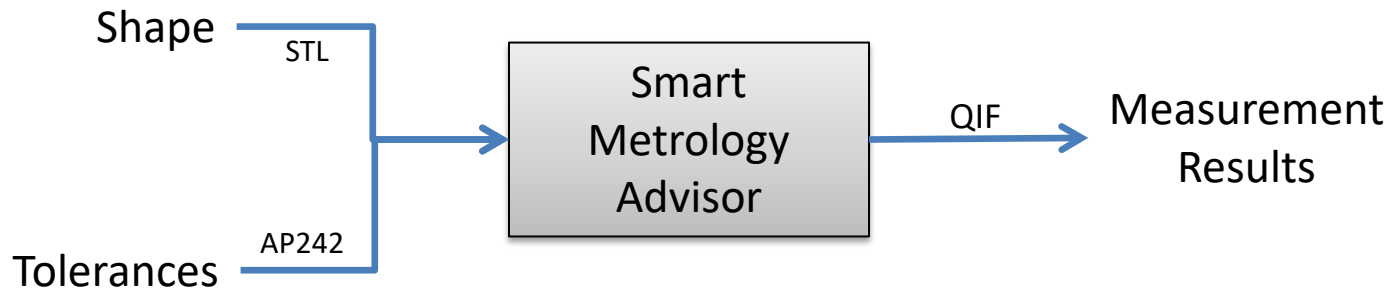
Smart Machining Advisor

- Cloud service for machining solutions
 - Developed by Penn State for DARPA AVM program



Smart Metrology Advisor

- Cloud service for measurement
 - Developed by Mitutoyo and ITI

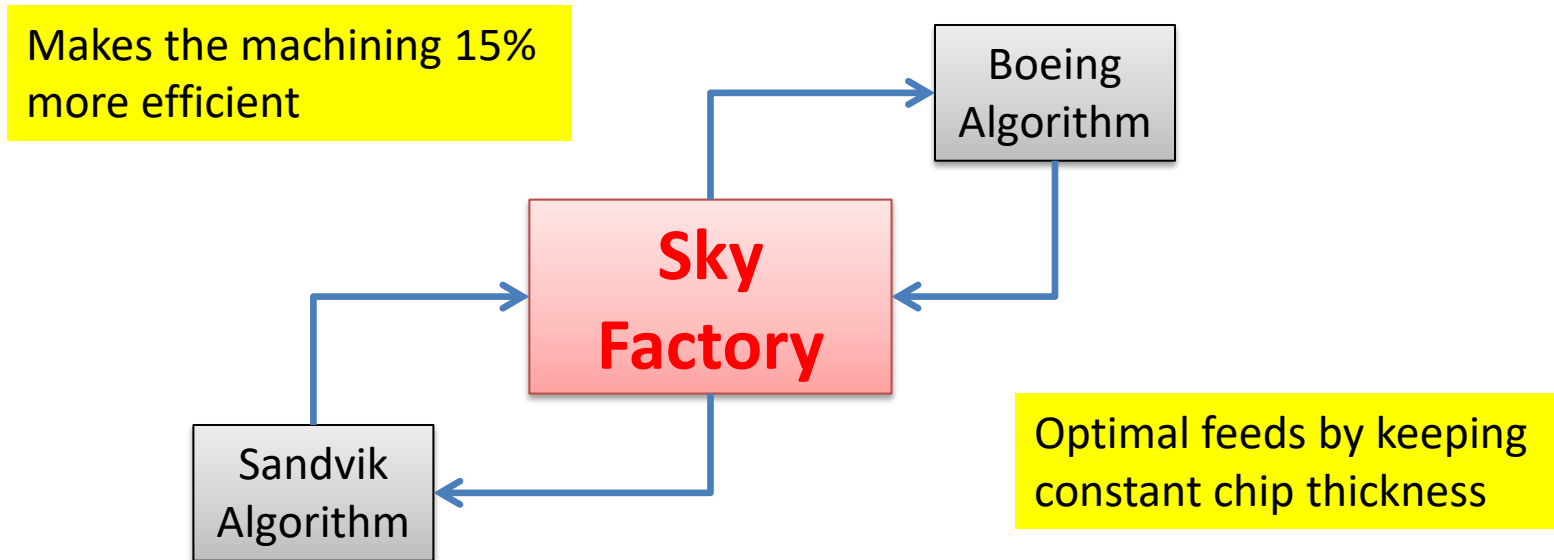


AP242 extension will complete the loop

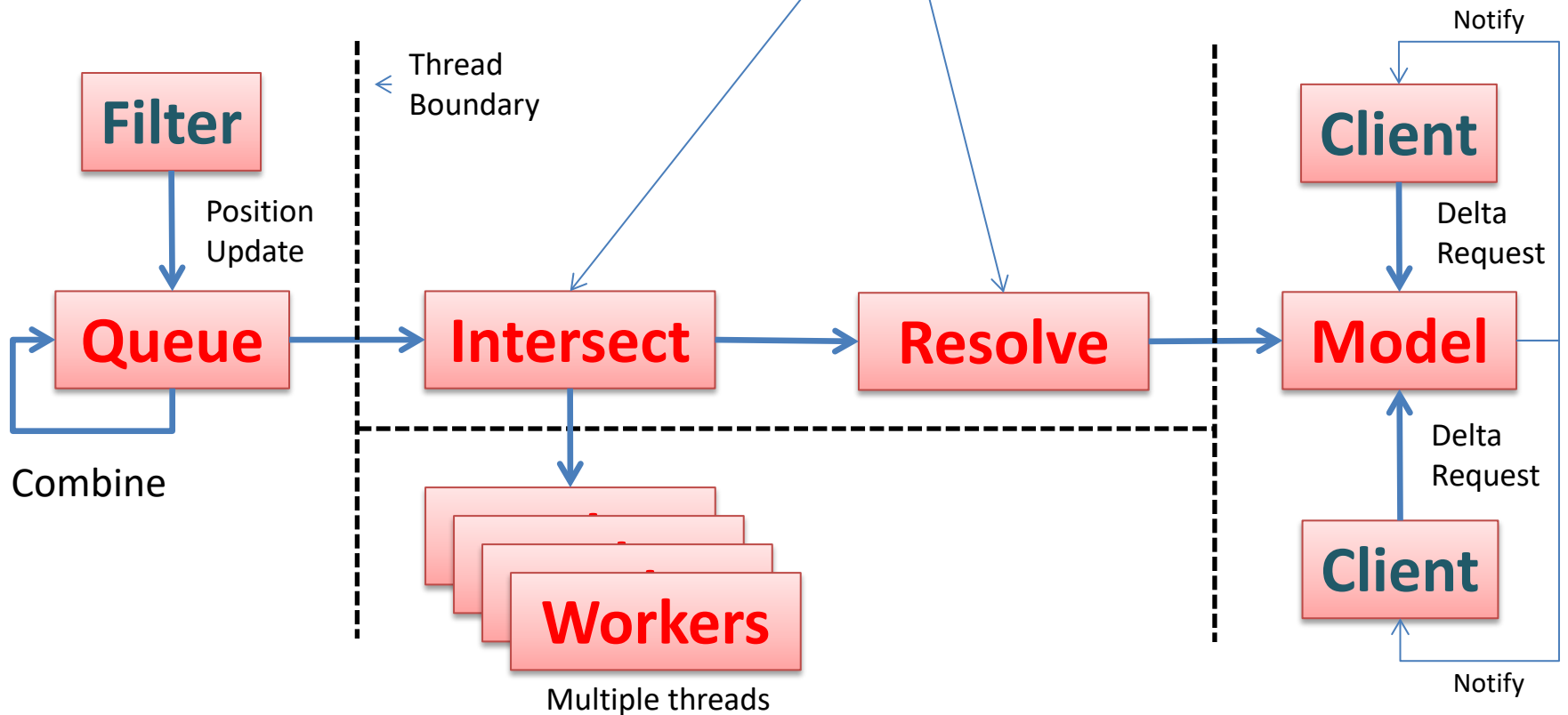
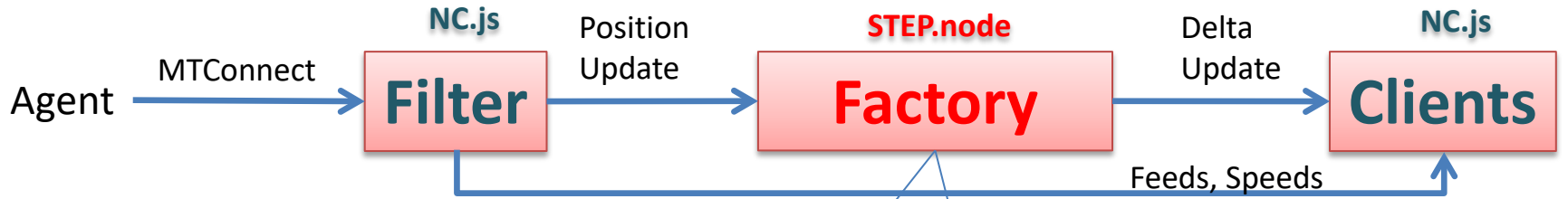


Smart Tooling Advisor

- Apps that run on the SkyFactory
 - Real time adaptive programming



Factory Processing



What next

- You can deploy your own DigitalSkyFactory
 - NC.js (client) and STEP.node (server)
 - On our home page: <http://www.steptools.com/>
- And use the services
 - Smart Machining to build your data
 - Smart Metrology to measure your results
 - Smart Tooling to optimize your codes
- We are looking for partners for further development