

# Introducing ntt

modern tools for TTCN-3

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## TTCN-3 at Nokia (2008)

Our Nokia internal toolset is called **k3**:

- introduced 2008, quickly adopted throughout Nokia
- really fast bytecode compiler:
  - before: 100,000 lines of code in 20 minutes
  - k3: 2,000,000 lines of code in less than a 1 minute
- extensible runtime:
  - machine readable log-files
  - adapters and codec loaded during runtime
  - millions of tests each day

**We focus on k3 core; users develop adapters, codecs, post-processing tools, ...**

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## Why not open source k3?

- thought about it
- four major pain points

# The Pain Points

## Pain 1: Project fragmentation

- duplication of adapters, codecs, tools, build-scripts, ...
- unclear responsibilities
- orphaned repositories
- skyrocketing maintenance

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## Pain 2: Missing best practices

A lot of insecurity.

How to:

- organize modules?
- format code?
- handle timeouts?
- start a SUT?
- synchronize when SUT is ready
- integrate with your build-system?
- test adapters?
- write a asynchronous network adapter in C++?

## Pain 3: C++

Language issues:

- each programmer using a different subset of the language
- shortcomings in memory management, concurrency, network programming, ...

Deployment issues:

- long compilation times
- uncontrolled dependencies (JSON, XML, ...)
- ABI complications (gcc4 vs. gcc5 vs. LLVM vs. LTO vs. libstdc++.so)

Requires many external components to function:

- building, profiling, debugging, testing, formatting, ...

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## Pain 4: Latency

Modern development has shifted. Users expect:

- automatic formatting
- automatic refactoring
- autocomplete
- go to definition
- warnings about code smell
- immediate feedback as you type

Classic compiler architectures fail:

- too slow
- poorly operate on incorrect code
- no high fidelity syntax trees



## Advent of 5G

- we decided to do things differently
- we can do better

k3 was modernized and became **ntt**

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# Introducing ntt

## Goal

The user should not be distracted by the TTCN-3 tool and focus on writing tests.

## Designed to resolve the major pain points

- easy integration of third-party tools
- consistent user interface for easier access to test environment
- mostly written in Go
- low latency compiler architecture

## A young project

- not all functionality is available already
- available tools:
  - "ntt show" queries test suite configuration
  - "ntt list" filters modules, tests and imports
  - "ntt lint" checks for code smells
  - "ntt tags" generates a ctags file
  - ...
- available scripts:
  - feature rich CMake Module
  - gRPC/Protobuf descriptions

and most importantly...

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# TTCN-3 Language Server

## What's a language server?

- usually started by an editor or IDE
- helps understanding source code
- provides features like go to definition, autocompletion, ...
- like a universal plugin, which works for all IDEs, Vim, Emacs, ...

### Further reading:

- <https://langserver.org/> (<https://langserver.org/>)
- [Official page for language server protocol specification](https://microsoft.github.io/language-server-protocol/)

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## How to install and use ntt as language server?

For most editors ntt has to be installed and configured still manually.

But we are simplifying the process by deploying automatic installation:

- **Vim** (<https://github.com/mattn/vim-lsp-settings>)
- **Microsoft Visual Studio Code** (<https://marketplace.visualstudio.com/items?itemName=Nokia.ttcn3>) (in progress)
- Sublime (to be done)
- ...

An up to date list is available [here](https://nokia.github.com/ntt/editors) (<https://nokia.github.com/ntt/editors>)

## Focus

Finishing the language server first brings the most benefits for users.

Next planned language server features:

- improve go to definition
- add diagnostics for errors, warnings and code smells
- add initial formatter
- add autocompletion



# Thank you

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<https://nokia.github.io/ntt> (<https://nokia.github.io/ntt>)