TTCN-3 @ Ericsson

or…

How to get 1500 TTCN-3 users?

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Make sure you have the right tools!

Make sure you have the right tools!

Make sure you have the right tools!

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Some about Ericsson…

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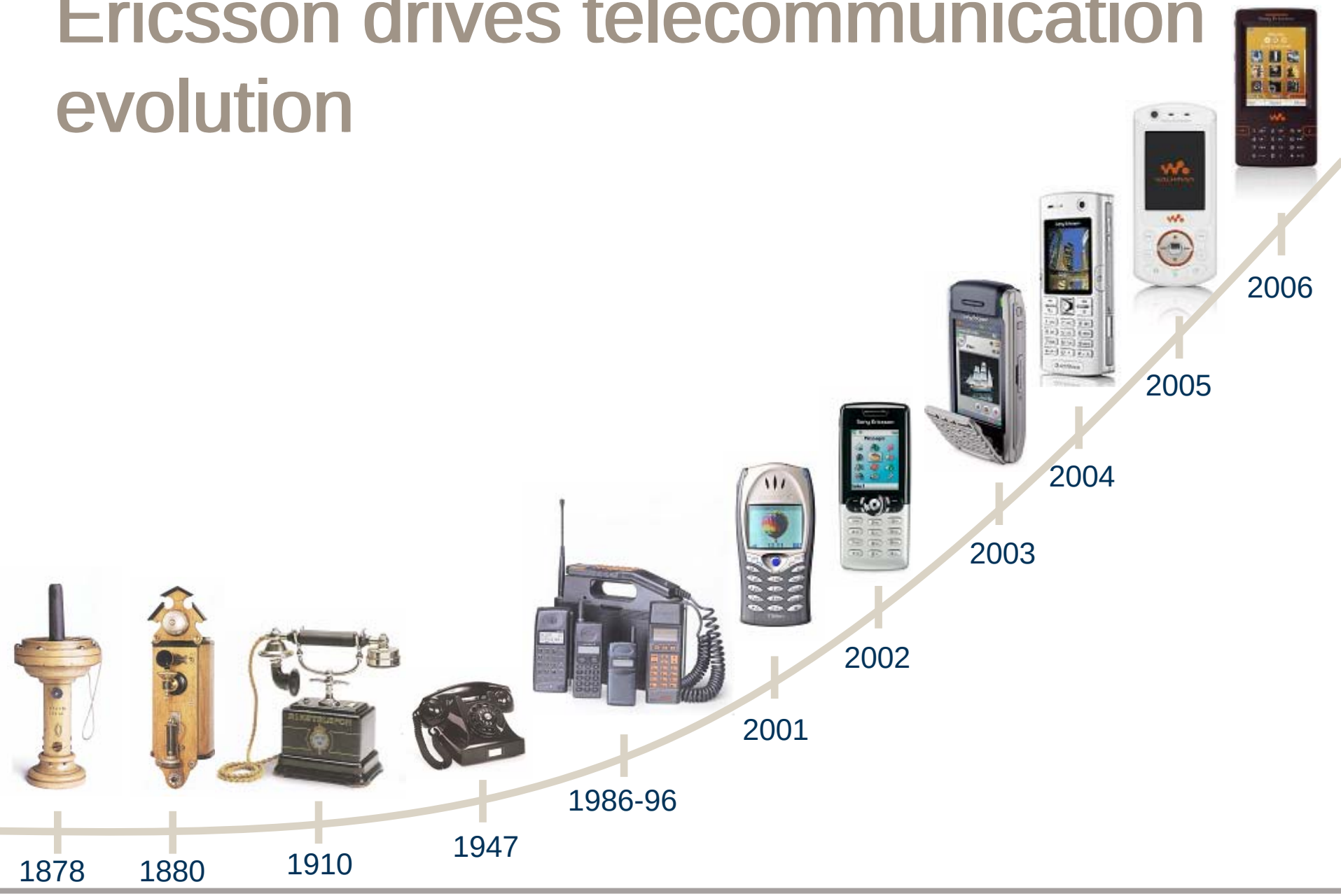
Technology Leadership for 130 years

Ericsson history

130 years of leadership

1878	Telegraph to telephone
1923	Manual to automatic
1968	Electro mechanics to computer control
1978	AXE first deployment
1981	Fixed to mobile
1991	1G analog to 2G digital mobile technology
1998	Converge telecom and data in fixed and mobile networks
1999	Moving toward 3G and mobile Internet
2000	First large scale layered architecture
2001	First 3G WCDMA call on public network, operator Vodafone
2002	Carrier class IP DSLAM
2003	First mobile softswitch deployment
2004	Breakthrough of WCDMA
2005	Mobile Broadband with HSDPA
2006	First field deployment of VDSL2 in Europe

Ericsson drives telecommunication evolution



Standardization Landscape

Some about Testing…

The testing challenge

TTCN-3 @ Ericsson

A lot more to test…

- Telecom represents an ever increasing network complexity
- Test are expected under customer like (load test) behaviour
- Agile development methods drives more testing (daily test)
- New platforms and processors (multi-core) are non-deterministic

…in a lot less time!

- Ericsson R&D are on the path to reduce lead-time by 50%

The test tool challenge

TTCN-3 @ Ericsson

Once upon a time…

- Lack of good tools for test automation (true automation)
- Several scripting languages with different logics, capabilities and syntax
- Each tool had its own user interface, formats of logging and configuration
- Tools were stand alone monoliths incapable of communicating

…but now with TTCN-3 !

- One scripting language
- One user interface
- One logging format
- One configuration format
- One tool integration technology eclipse

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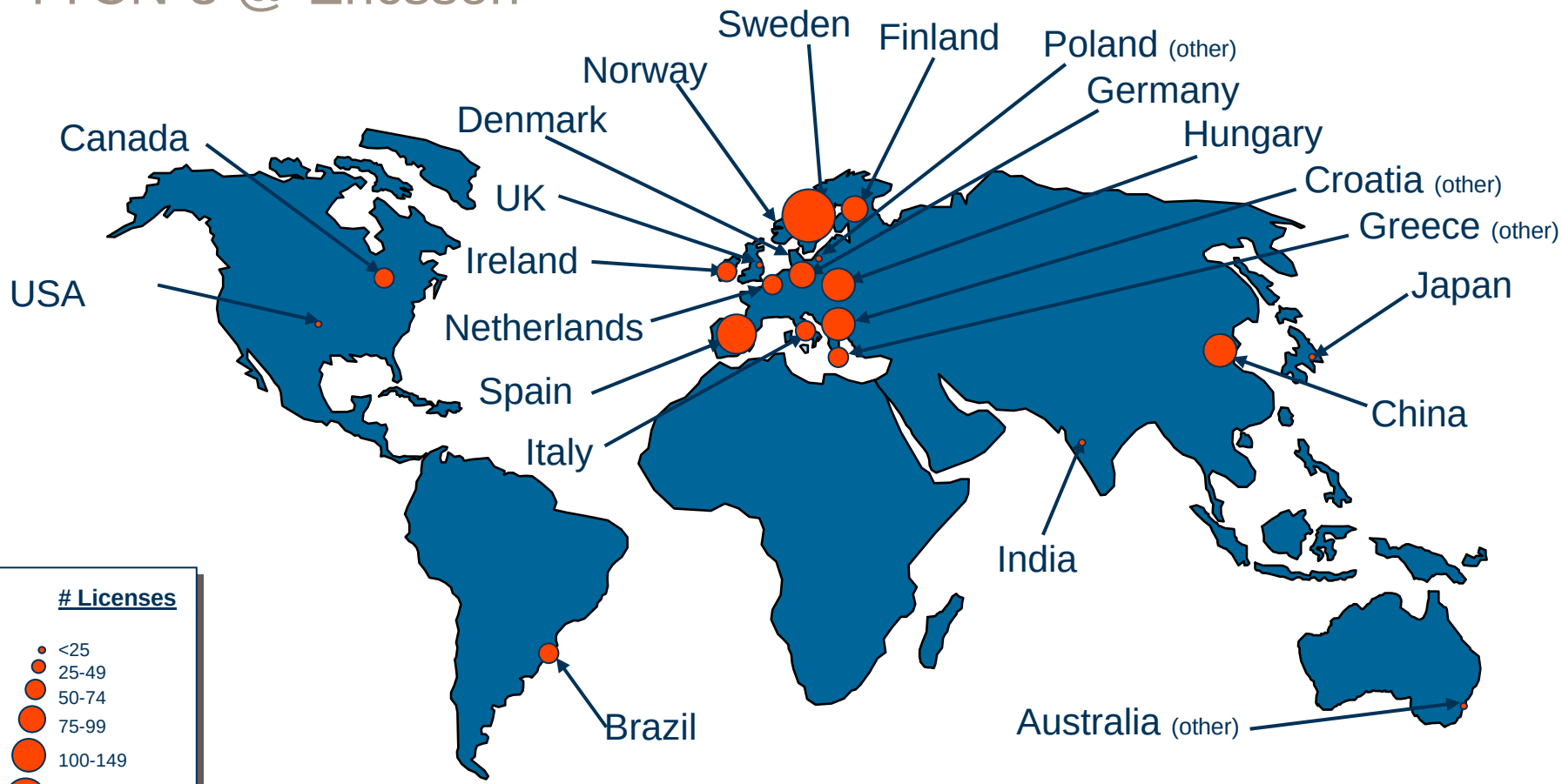
History

TTCN-3 @ Ericsson

1992	Development **start of a *TTCN-2* toolset**, the *System Certification System (SCS),* at Ericsson, Finland
1993	First release of *SCS*
1997	Development responsibility of *SCS* is moved from Finland to the *Test Competence Center (TCC)* at Ericsson, Karlskrona, Sweden. The *Conformance Test Lab* (research) is established in Ericsson, Hungary
2000	As a part of a master thesis the *Conformance Test Lab* develops a ***TTCN-3* tool prototype called *TITAN***
2002	The *TITAN* tool is presented at the *ETSI* launch event of *TTCN-3* as the only functional tool
2003	The whole *TCC* operation and *SCS* responsibility is moved from Sweden to Ericsson, Hungary, and the first official *TITAN* release is made
2004	No further development of the *SCS* tool, full focus on *TITAN.*
2006	First *TITAN* load solution launched.
2007	The *SCS* tool is put at end-of-life, while ***TITAN* has gained 1500+ Ericsson users**, provided solutions for large number of *Protocol* and *Test Ports* with supports for multiple *platforms* and supplied an *Eclipse IDE* and *log viewer*

Deployment geographically

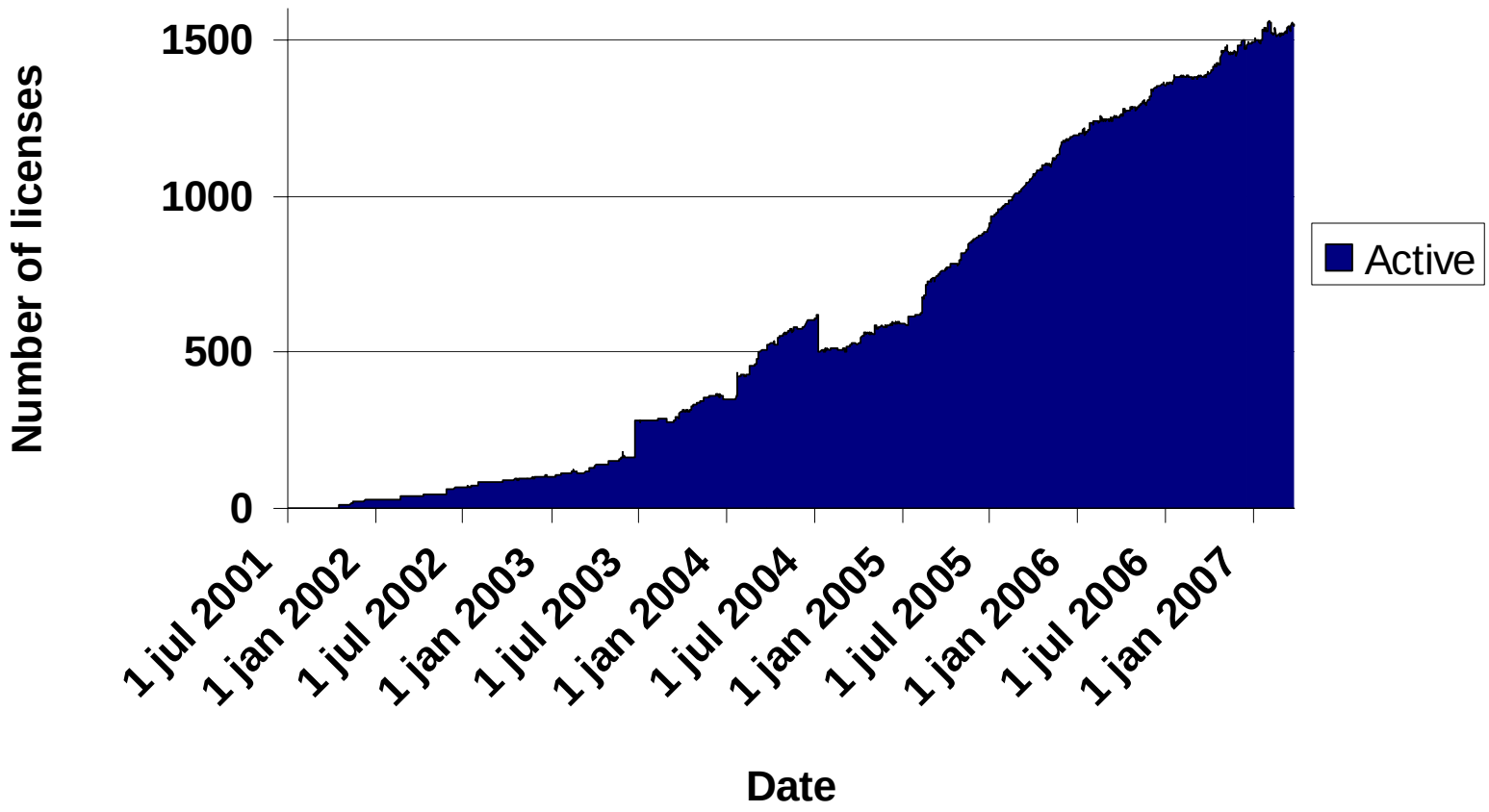
TTCN-3 @ Ericsson



- **R&D centres in 17 countries**
- **TTCN-3 deployed in 15 R&D centres + 4 other centres**

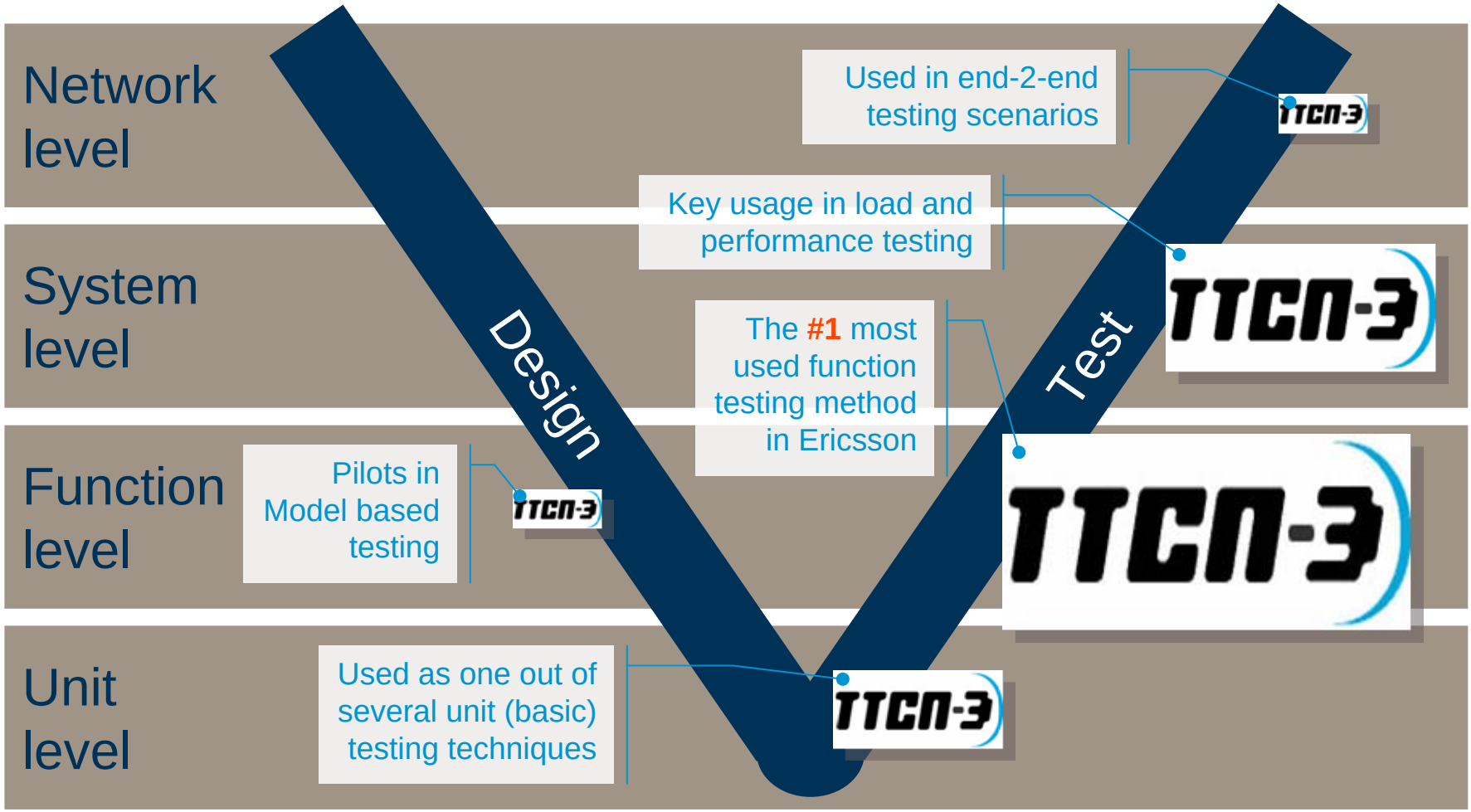
Deployment over time

TTCN-3 @ Ericsson



Deployment in test phases

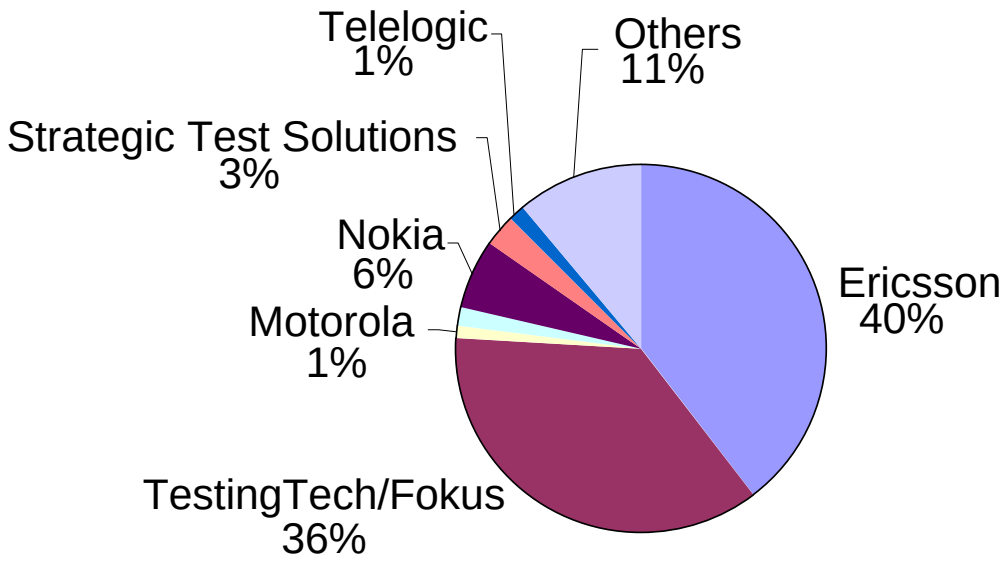
TTCN-3 @ Ericsson



Standardization

TTCN-3 @ Ericsson

- Ericsson/TCC actively participates in
  - TTCN-3 language specification (standards making)
  - TTCN-3 language maintenance (decision of CR)
  - TTCN-3 language usage (writing standard test suites in TTCN-3)



Accepted CRs to TTCN-3 ed.3 in the parts (part 1, 4 and 7) where Ericsson is active - Core language, Operational semantics and mapping TTCN-3 to ASN.1

TTCN-3

TITAN

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What is TITAN?

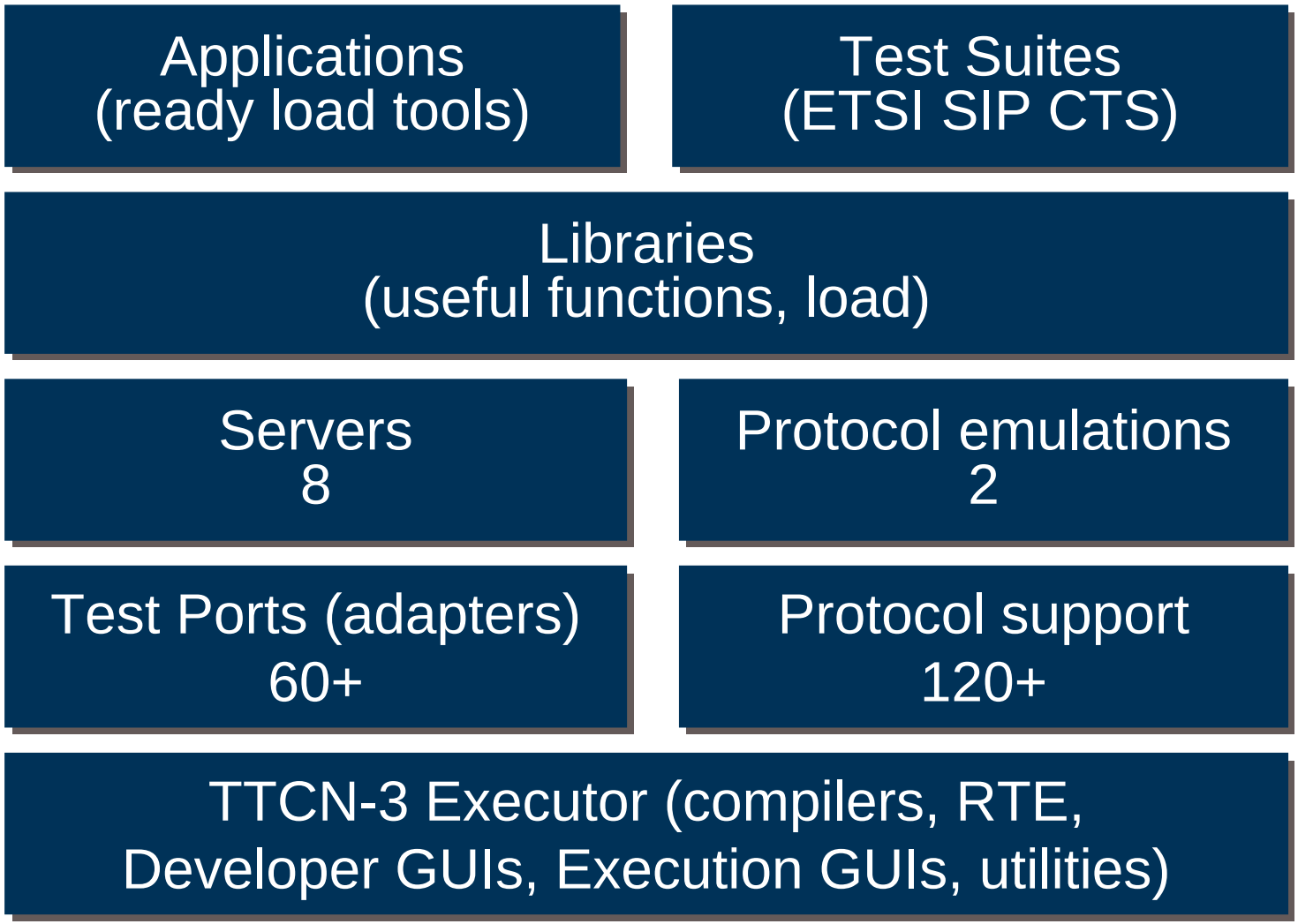
TTCN-3 @ Ericsson

- **World's first** fully functional TTCN-3 test tool!
  - Was the only one supporting edition 1 of the language (2000-2002)
  - The only functional tool presented at the TTCN-3 Launch event of ETSI (2002)
- A **software test tool** capable of load
  - Supports multiple platforms: Solaris, Linux SUSE9.x, SLES8, RedHat9, FreeBSD, Windows (cygwin) and proprietary platforms
  - Load capabilities thanks to an efficient (C/C++) run-time-environment
- An **Ericsson proprietary tool**, not available outside Ericsson*

** Except ETSI and BUTE*

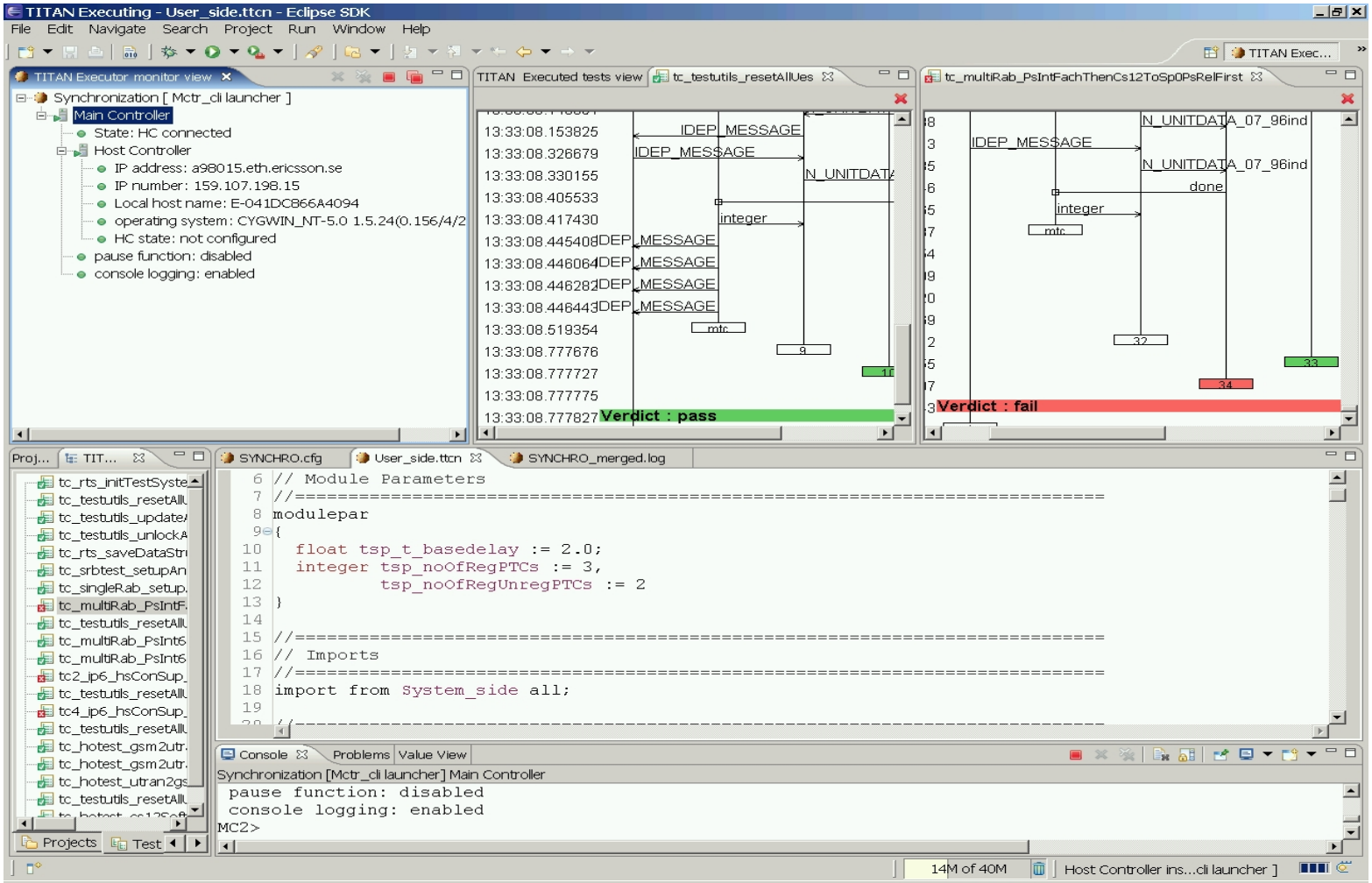
More than just a test tool

TTCN-3 @ Ericsson



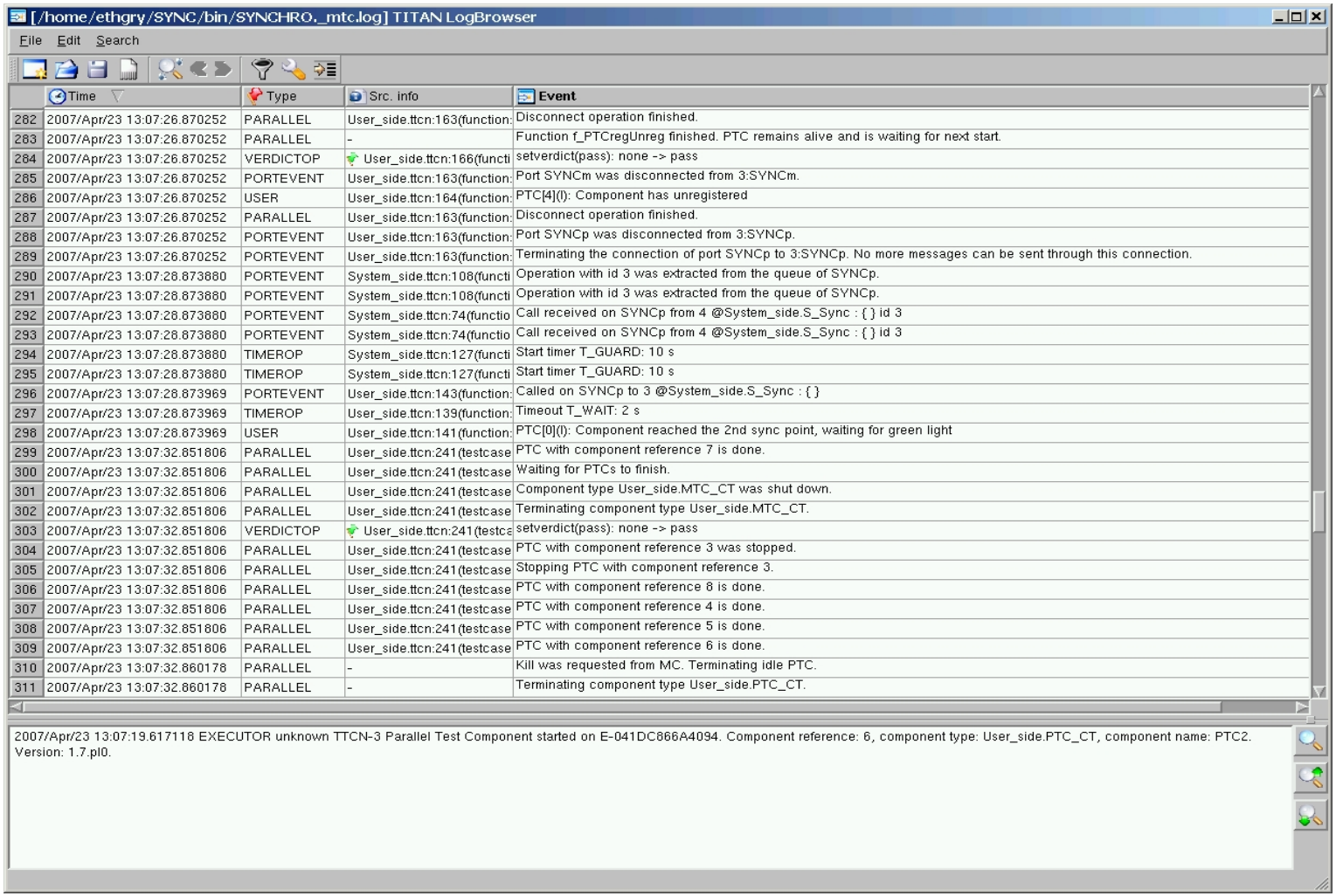
Efficient test design and execution

TTCN-3 @ Ericsson



Efficient test result analysis

TTCN-3 @ Ericsson



	Time	Type	Src. info	Event
282	2007/Apr/23 13:07:26.870252	PARALLEL	User_side.ttcn:163(function:	Disconnect operation finished.
283	2007/Apr/23 13:07:26.870252	PARALLEL	-	Function f_PTCregUnreg finished. PTC remains alive and is waiting for next start.
284	2007/Apr/23 13:07:26.870252	VERDICTOP	User_side.ttcn:166(functi	setverdict(pass): none -> pass
285	2007/Apr/23 13:07:26.870252	PORTEVENT	User_side.ttcn:163(function:	Port SYNCm was disconnected from 3:SYNCm.
286	2007/Apr/23 13:07:26.870252	USER	User_side.ttcn:164(function:	PTC[4](): Component has unregistered
287	2007/Apr/23 13:07:26.870252	PARALLEL	User_side.ttcn:163(function:	Disconnect operation finished.
288	2007/Apr/23 13:07:26.870252	PORTEVENT	User_side.ttcn:163(function:	Port SYNCp was disconnected from 3:SYNCp.
289	2007/Apr/23 13:07:26.870252	PORTEVENT	User_side.ttcn:163(function:	Terminating the connection of port SYNCp to 3:SYNCp. No more messages can be sent through this connection.
290	2007/Apr/23 13:07:28.873880	PORTEVENT	System_side.ttcn:108(functi	Operation with id 3 was extracted from the queue of SYNCp.
291	2007/Apr/23 13:07:28.873880	PORTEVENT	System_side.ttcn:108(functi	Operation with id 3 was extracted from the queue of SYNCp.
292	2007/Apr/23 13:07:28.873880	PORTEVENT	System_side.ttcn:74(functio	Call received on SYNCp from 4 @System_side.S_Sync : { } id 3
293	2007/Apr/23 13:07:28.873880	PORTEVENT	System_side.ttcn:74(functio	Call received on SYNCp from 4 @System_side.S_Sync : { } id 3
294	2007/Apr/23 13:07:28.873880	TIMEROP	System_side.ttcn:127(functi	Start timer T_GUARD: 10 s
295	2007/Apr/23 13:07:28.873880	TIMEROP	System_side.ttcn:127(functi	Start timer T_GUARD: 10 s
296	2007/Apr/23 13:07:28.873969	PORTEVENT	User_side.ttcn:143(function:	Called on SYNCp to 3 @System_side.S_Sync : { }
297	2007/Apr/23 13:07:28.873969	TIMEROP	User_side.ttcn:139(function:	Timeout T_WAIT: 2 s
298	2007/Apr/23 13:07:28.873969	USER	User_side.ttcn:141(function:	PTC[0](): Component reached the 2nd sync point, waiting for green light
299	2007/Apr/23 13:07:32.851806	PARALLEL	User_side.ttcn:241(testcase	PTC with component reference 7 is done.
300	2007/Apr/23 13:07:32.851806	PARALLEL	User_side.ttcn:241(testcase	Waiting for PTCs to finish.
301	2007/Apr/23 13:07:32.851806	PARALLEL	User_side.ttcn:241(testcase	Component type User_side.MTC_CT was shut down.
302	2007/Apr/23 13:07:32.851806	PARALLEL	User_side.ttcn:241(testcase	Terminating component type User_side.MTC_CT.
303	2007/Apr/23 13:07:32.851806	VERDICTOP	User_side.ttcn:241(testca	setverdict(pass): none -> pass
304	2007/Apr/23 13:07:32.851806	PARALLEL	User_side.ttcn:241(testcase	PTC with component reference 3 was stopped.
305	2007/Apr/23 13:07:32.851806	PARALLEL	User_side.ttcn:241(testcase	Stopping PTC with component reference 3.
306	2007/Apr/23 13:07:32.851806	PARALLEL	User_side.ttcn:241(testcase	PTC with component reference 8 is done.
307	2007/Apr/23 13:07:32.851806	PARALLEL	User_side.ttcn:241(testcase	PTC with component reference 4 is done.
308	2007/Apr/23 13:07:32.851806	PARALLEL	User_side.ttcn:241(testcase	PTC with component reference 5 is done.
309	2007/Apr/23 13:07:32.851806	PARALLEL	User_side.ttcn:241(testcase	PTC with component reference 6 is done.
310	2007/Apr/23 13:07:32.860178	PARALLEL	-	Kill was requested from MC. Terminating idle PTC.
311	2007/Apr/23 13:07:32.860178	PARALLEL	-	Terminating component type User_side.PTC_CT.

Load capabilities

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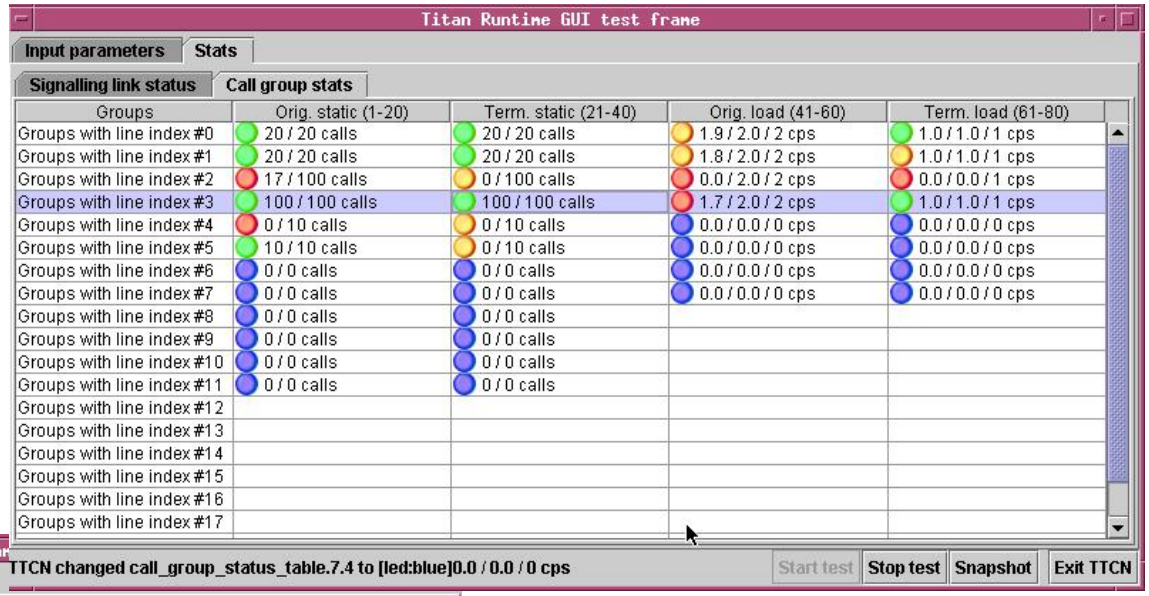
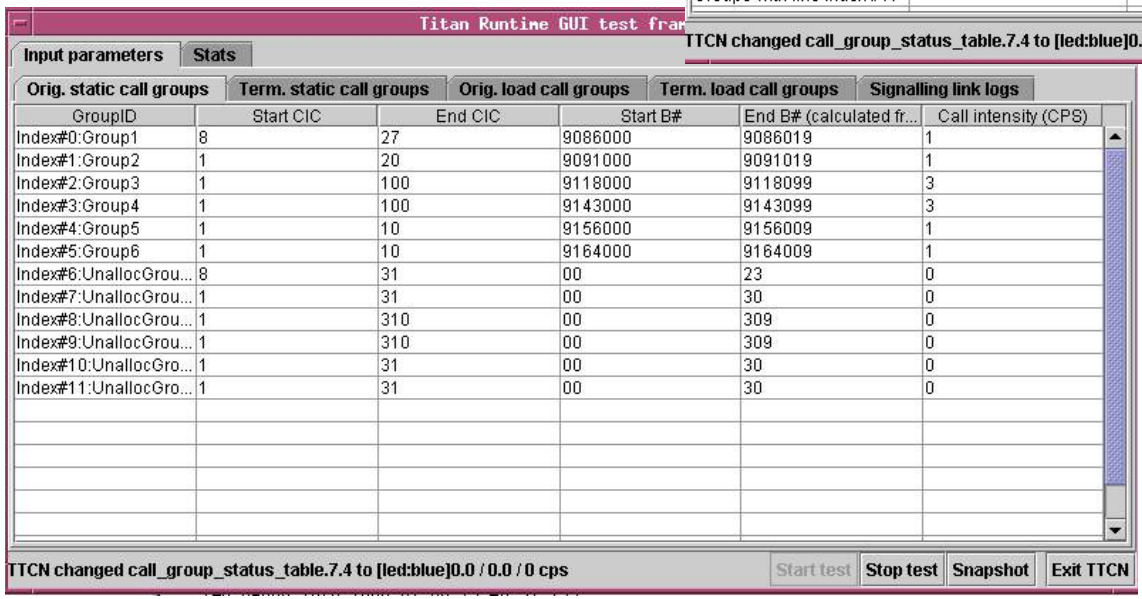
- The load solution, *TITANsim*, is tailored to different telecom system characteristics





example from an existing load solution

Successes

How to get 1500 TTCN users?

TTCN-3 @ Ericsson

- Long **TTCN history** generating high maturity
  - Research even before commercial vendors
- Pushing for the use of a **standard test notation**
  - Easy reuse, competence build-up, a single tool
- Active participation in **ETSI**
  - To grant the Ericsson needs
- In-house **tools development**
  - For fast provisioning, test port development, training, etc
- Dedicated **support group**
  - The Test Competence Centre and local groups
- Reference **network**
  - Truly committed TTCN champions, yearly internal TTCN conference
- An R&D all **management commitment**
  - Long term granted funding

Contact

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- Presenter

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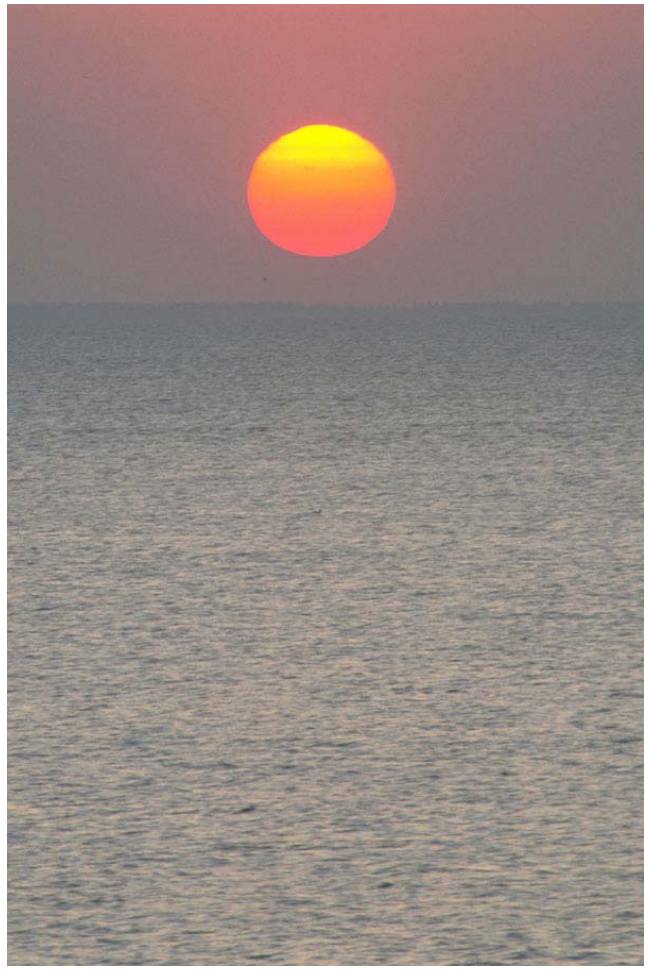


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