# TCF - Target Communication Framework Update for Helios

Martin Oberhuber

Pawel Piech

Wind River

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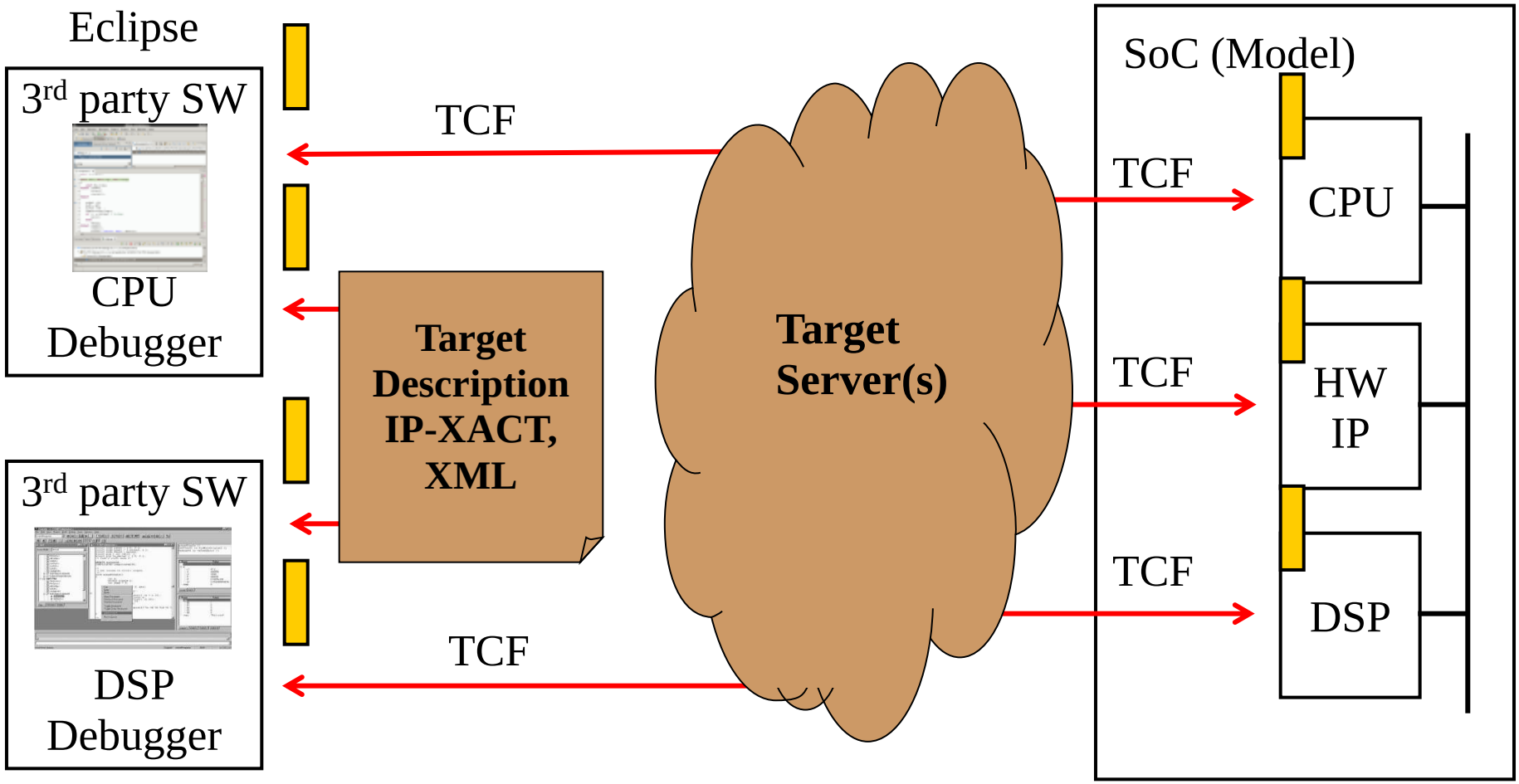
# Motivation: Simple Stacks and Collaboration through an Open Standard

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# Design Goals of TCF

- Protocol Framework provides common infrastructure

–communication protocol

–Agent: “Service container”

–Proxying

- Same protocol on all layers supporting value-add

–Support pass-through

- Tools can use services in uniform way
- Service implementers can focus on functionality



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# TCF - Core Design Ideas

- Use the same extendable protocol end-to-end
  - allow value-adding servers to intercept select services
- Extension: Abstract Services as building blocks
  - Same tool for multiple targets (e.g. agent, OCD, simulator)
  - Avoid tools specific agents
  - Bridge gap with specific services to configure common ones
- Data-driven by target
  - Service knows best how to represent the system
  - If not possible, put the knowledge in the lowest possible layer and data drive the layers above
  - Auto-discover targets and their capabilities
- Support high latency communication links


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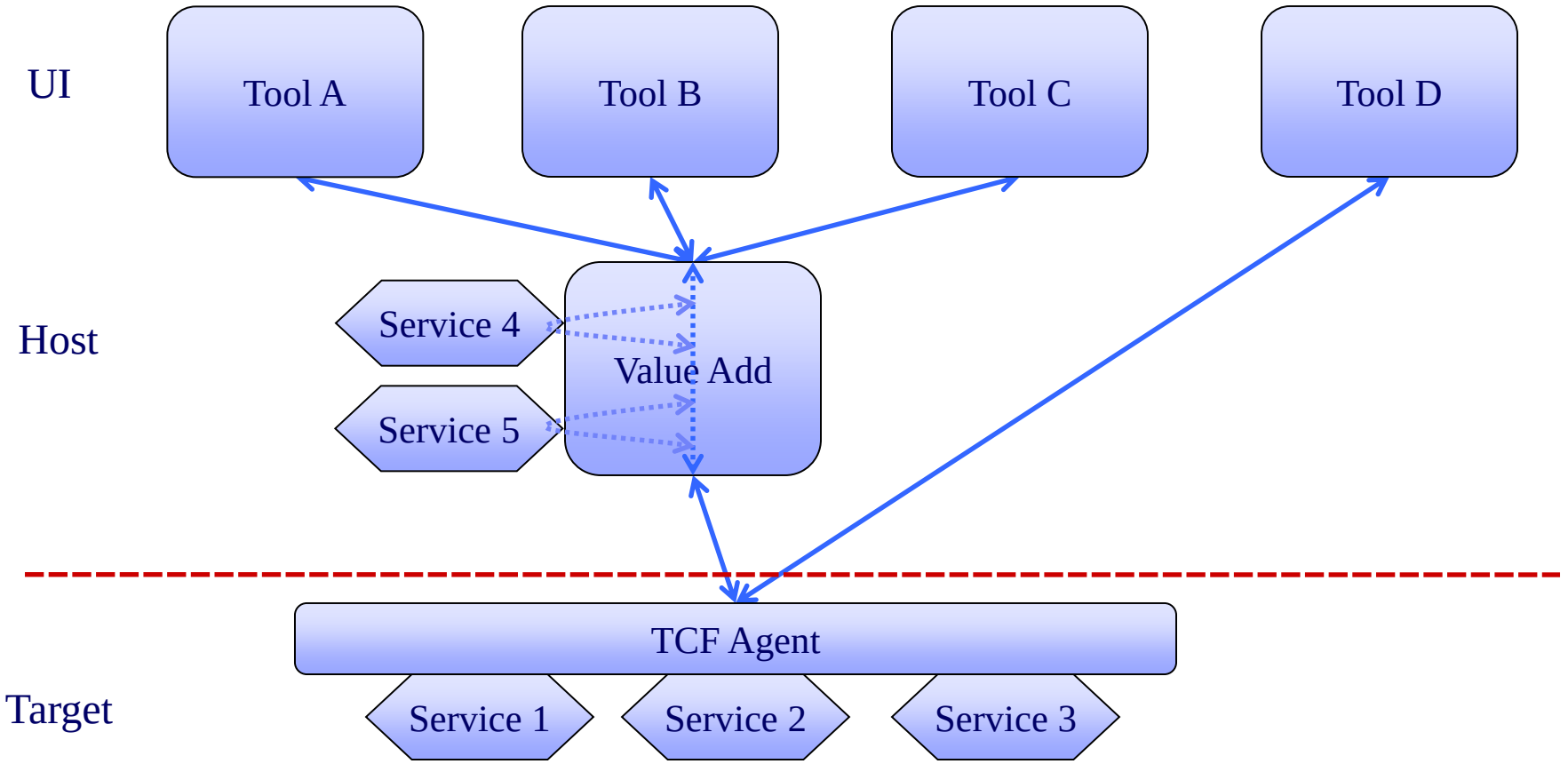
# TCF: Common agent and protocol



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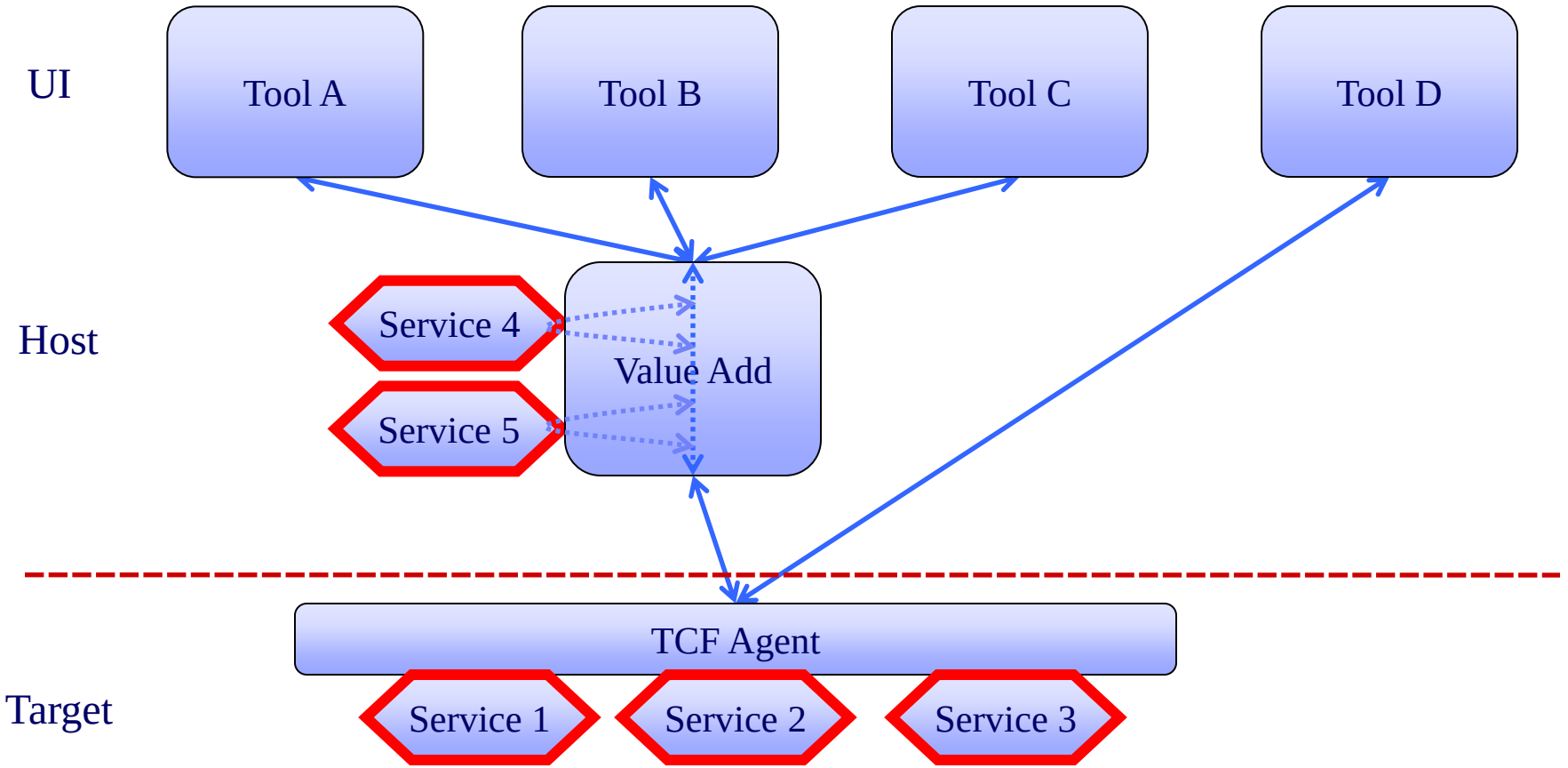
# Service



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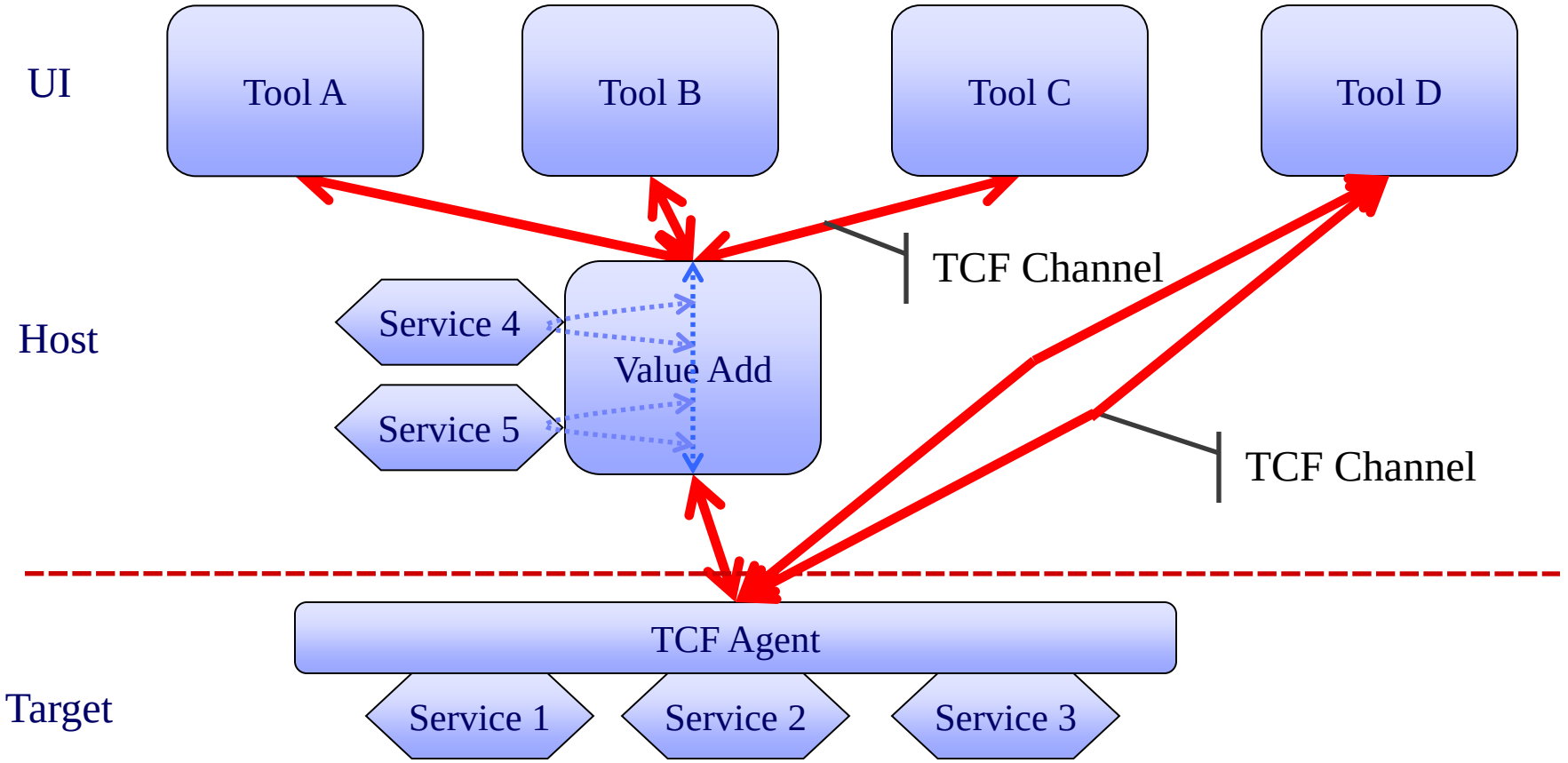
# Message Channel



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# Channels and Messages

- Communication between **peers** use **channels**
- Channels abstract/hide the transport layer
  - Currently TCP
  - Possible: RS232, JTAG, USB etc
- Channels transmit **Messages**
  - **Asynchronous** command / response with tokens
  - JSON marshalling
  - Events – order guaranteed
  - Progress
  - Can Proxy / Tunnel channels through value-add
- New: **Streams service** on top of Channels


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# What's in the Box

- Available from the git Repository:
  - Lightweight configurable plain C agent
    - Compiles out of the box on Linux, Windows native, Cygwin
    - Easy to port to other OS, e.g. VxWorks, Symbian
    - Supports basic debugging, file transfer, proxy and auto-discovery
  - Plain Java protocol framework org.eclipse.tm.tcf.core
  - Eclipse layer org.eclipse.tm.tcf for lazy loading (extension reg.)
    - Exemplary RSE Plug-in and Platform/Debug integration
  - A couple of exemplary plain C commandline utilities
    - New: plain C Debug Server value-add
  - Protocol specification, Getting Started documentation

- http://wiki.eclipse.org/TCF and last year's TCF Tutorial


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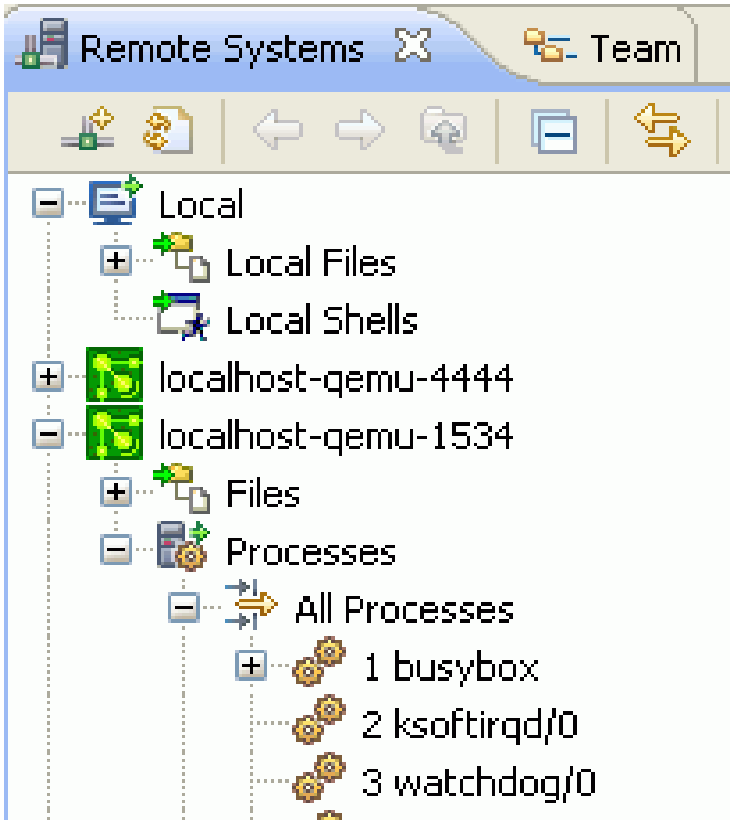
# Demo

- ./agent -L-
- Connect RSE
  - **discovers agent**
  - **File transfer, processes**
- Build CDT Sample app
- Launch Debugger



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# Current Status of Adoption

- Stable core protocol specification
  - Standardization at **Power.org** (hardware connectivity)
  - Working on Services standardization
- Stable C agent framework
  - Initial use in commercial products, e.g. **Wind River** Workbench
  - Open Source use in EDC (Eclipse Debugger for C/C++), **Nokia**
  - Whitebox Adoption Model: F**reescale, Atmel, Mentor**
    - Migrate proprietary legacy agents into TCF agent plugins
    - TCF value-add for conversion from legacy protocol
- Exemplary RSE and Platform/Debug Integration
- Support for Tracing (**Ericsson, Linuxtools**, Polymtl.ca)


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# What's New in Helios

- Streaming and Zero-Copy Binary Transfer (LTTng)
- Agent: Dynamic Loading of Services as Sharedlib
- Debug Server Value-Add
  - Splitting ELF reading from agent
- SSL connection to the agent
- Formalized a Programming Pattern for guaranteed data consistency when dealing with multiple data sources
  - ACPM (Asynchronous Cache Programming Model)
  - Used in the debug client and TCF Server value-add
  - Asynchronous implementation of File System Service


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# References / Q&A

- http://wiki.eclipse.org/TCF
  - **Overview, Getting Started Docs**
  - **Code Repository access, Mailing list access**
- EclipseCon 2009 TCF Tutorial

Questions ?



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