# MPTCP Application Considerations
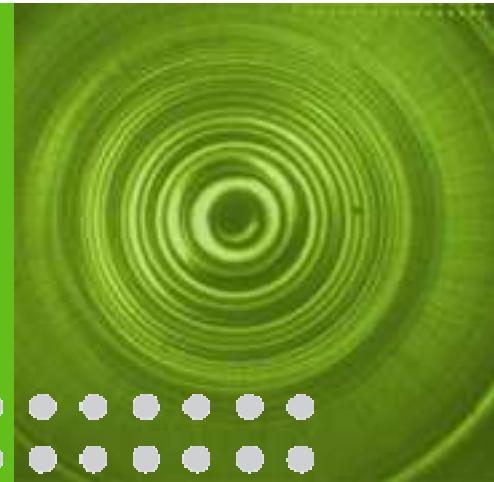
# draft-scharf-mptcp-api-02

**Michael Scharf** <michael.scharf@alcatel-lucent.com>
Alan Ford <alan.ford@roke.co.uk>

IETF 78, July 2010

## Scope and Status

- **Comparison** of MPTCP and TCP

  - **Tutorial-style description** of performance impact and potential problems
  - **No significant change** compared to -01

- Operation of MPTCP with **legacy applications**

  - **Issues with existing sockets API:** Address issues, socket options, default enabling, etc.
  - **Some clarifications** compared to -01

- **Basic API** for MPTCP-aware applications

  - Specification of a **minimal MPTCP API**
  - **Completely new text** in -02

- Other **compatibility issues**

  - Incompatibilities with other multihoming solutions, interactions with DNS
  - **Extended text** in -02

- **Advanced API: Out-of-scope of this draft**

# Operation of MPTCP with Legacy Applications
## Changes Compared to -01

- **Different path management** MAY be used if TCP_NODELAY is set

- A new **note on stack-internal heuristics** potentially used by MPTCP

  - E. g., to classify an application and adapt heuristics implicitly

  - Addresses a comment from Anaheim

  - Summary: "Use the TCP API in a reasonable way" - not that specific to MPTCP

# Basic MPTCP API for MPTCP-Aware Applications
## Scope

- Focus of the basic API: **Minimum set of functions**

  - API provides an **equivalent level of control and information** as exists for TCP

  - Only deals with **enabling** and **address management** of MPTCP

  - Should be simple and rather straightforward

- **Advanced API** could offer more control to applications

  - **Out-of-scope** of this draft, which only specifies the basic API

  - Currently, an **appendix** lists some initial ideas as a potential starting point

  - Suggestion: Describe advanced API in **another draft**, once there is more experience

- **Any comments on this split between basic and advanced API?**

# Basic MPTCP API for MPTCP-Aware Applications
## Functions getpeername() and getsockname()

- **Legacy apps**

  - MPTCP stack MUST always return the **addresses of the first subflow**

- **MPTCP-aware apps (which, for instance, explicitly enable MPTCP)**

  - Choice 1: **Return address of first subflow**, too

  - Choice 2: **Failure with EMULTIPATH**, since the basic API provides an alternative

  - Choice 3: **Leave behavior to implementation**

  - **No recommendation in current draft**, i. e., behavior is left to implementation

- **Any comments?**

# Basic MPTCP API for MPTCP-Aware Applications
## Suggested API

- Only **new socket options**

- **No new functions** (such as bindx), to be as backward compatible as possible

- Four new socket options:

| Purpose | Name TCP_MULTIPATH... | Get | Set | Data type |
|---|---|---|---|---|
| Enable/disable | ..._ENABLE | x | x | int |
| Bind MPTCP to a set of given local addresses | ..._BIND | | x | list of "struct sockaddr" |
| Get the addresses used by the MPTCP subflows | ..._SUBFLOWS | x | | list of pairs of "struct sockaddr" |
| Get the local connection identifier (e. g., local token) | ..._CONNID | x | | uint32 |

# Basic MPTCP API for MPTCP-Aware Applications

## Open Issues

- **TCP_MULTIPATH_BIND**

  - Allows to update the full list of "allowed" local addresses

  - Question: Is such an **explicit update during connection lifetime** reasonable?

  - Question: What **if an interface is not present any more in the list**?

  - Current text: MPTCP **MAY close the corresponding subflows**

  - Is this reasonable? Should it **be stronger than a MAY** for address removal? Or is this feature unnecessary once a connection has been set up?

- **TCP_MULTIPATH_CONNID**

  - Returns a local connection identifier for the MPTCP connection, which **SHOULD be the same as the local connection identifier** sent in the MPTCP handshake.

  - Provides a safe way for an application to **uniquely identify a MPTCP connection** (analogous to 5-tuple in single-path TCP).

  - Is there agreement that this is **useful feature**?

# Next Steps

- Main change compared to version -01: **Focus on a basic API**

  - Document only specifies a **minimum API** for address management

  - An **advanced API is out-of-scope** and may be addressed in a separate draft

- **Application considerations** part of the draft seem to be **rather stable**

  - **Basic API** will be aligned with the ongoing implementation efforts and experiments

  - **Feedback and reviews** are still very welcome

- **Ready for WG adoption?**

  - Either **with the basic API**

  - Or, alternatively, **without the basic API**