The Fuego Core *Captio* Collaborative Editor
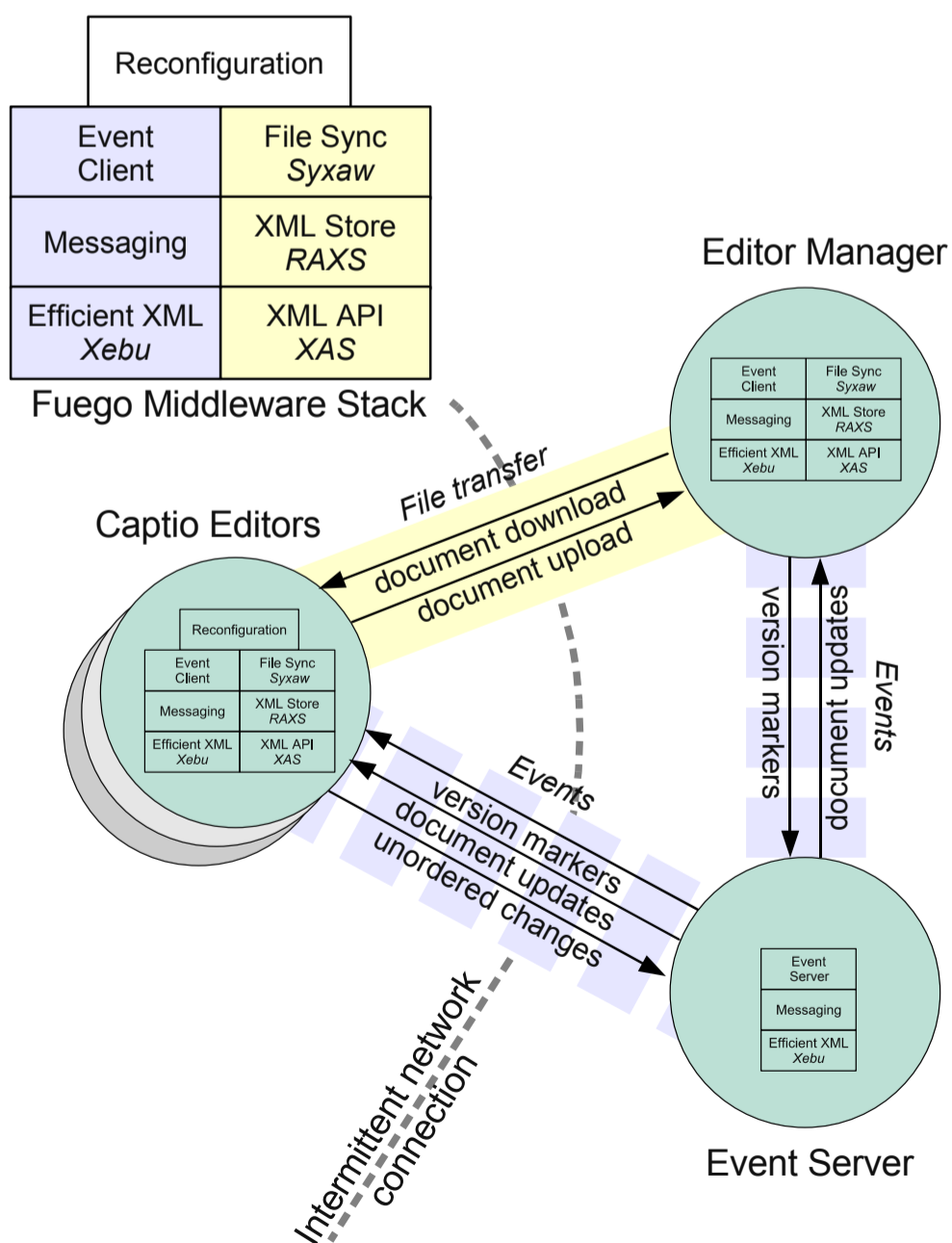
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The *Captio* Editor

- Collaborative editor supporting *asynchronous online* and *synchronous offline* modes

- Runs on limited devices such as mobile phones

- Data format is XML

- Built on the Fuego Core mobility middleware [1]

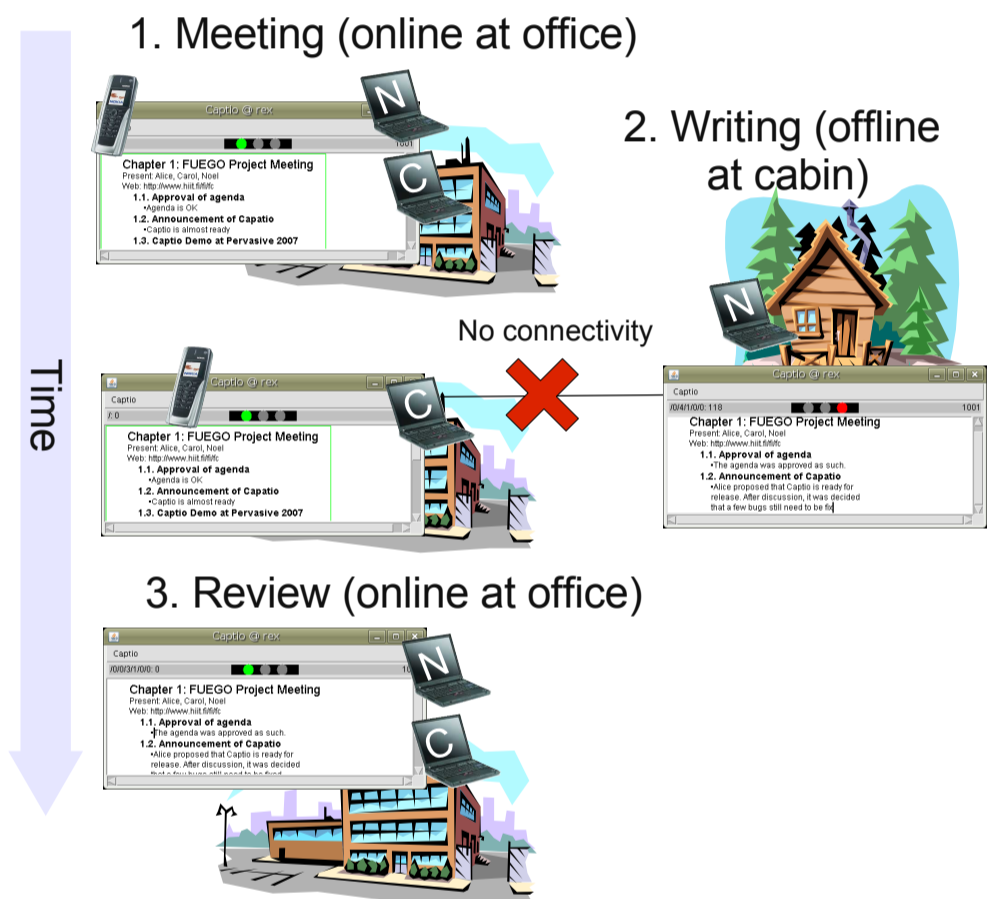- Open Source release in 2008, `http://www.hiit.fi/fi/fc`

Middleware Components

- An efficient XML encoding is provided by *Xebu*

- *XAS* is an advanced XML API, with, e.g., out-of-order parsing

- *RAXS* is a versioned and synchronizable store for XML files

- *Syxaw* synchronizes (XML) files that are linked across devices

- Event channel publish/subscribe is handled by the *event service*

- *Reconfiguration* toggles between online and offline according to network conditions.

Fuego Middleware Stack

Captio Operation

- Multiple streams of *change* events from the editor clients are merged into an ordered stream of *update* events at the *Event Server*

- *Update* events are broadcast to all clients and the *Editor Manager*

- The *Editor Manager* periodically assigns a version number to the document, which is inserted in the stream of events as a *version marker*.

- File synchronization is made to the *Editor Manager* and a yields an XML file with a version number.

- When going online, an editor synchronizes the document file, and applies any *update* events after the version marker corresponding to the version of the file.

1. Meeting (online at office)
2. Writing (offline at cabin)
No connectivity
3. Review (online at office)

Meeting Minutes Demo Scenario

1. Alice, Carol, and Noel are in a meeting, and concurrently add notes to the meeting minutes document. Alice has a mobile phone, and the others have laptops.

2. Noel takes a trip to his cabin with his laptop, where he expands the notes. There is no Internet connectivity to the cabin, so Noel works in offline mode.

3. When Noel returns, he reviews the minutes with Carol. They do this in online mode.

References

[1] Sasu Tarkoma, Jaakko Kangasharju, Tancred Lindholm, and Kimmo Raatikainen. Fuego: Experiences with mobile data communication and synchronization. In *17th Annual IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)*, September 2006.

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