



# Makani MAPI Protocol Optimization

## MAPI – The Problem

Microsoft Outlook is the most common enterprise e-mail application often paired with Microsoft Exchange Server. Exchange uses the Messaging Application Programming Interface (MAPI) protocol. Unfortunately, Outlook e-mail users often experience debilitating response times (especially during morning log-ons) not only while sending and receiving e-mails, but also while accessing group message folders or changing calendar elements.

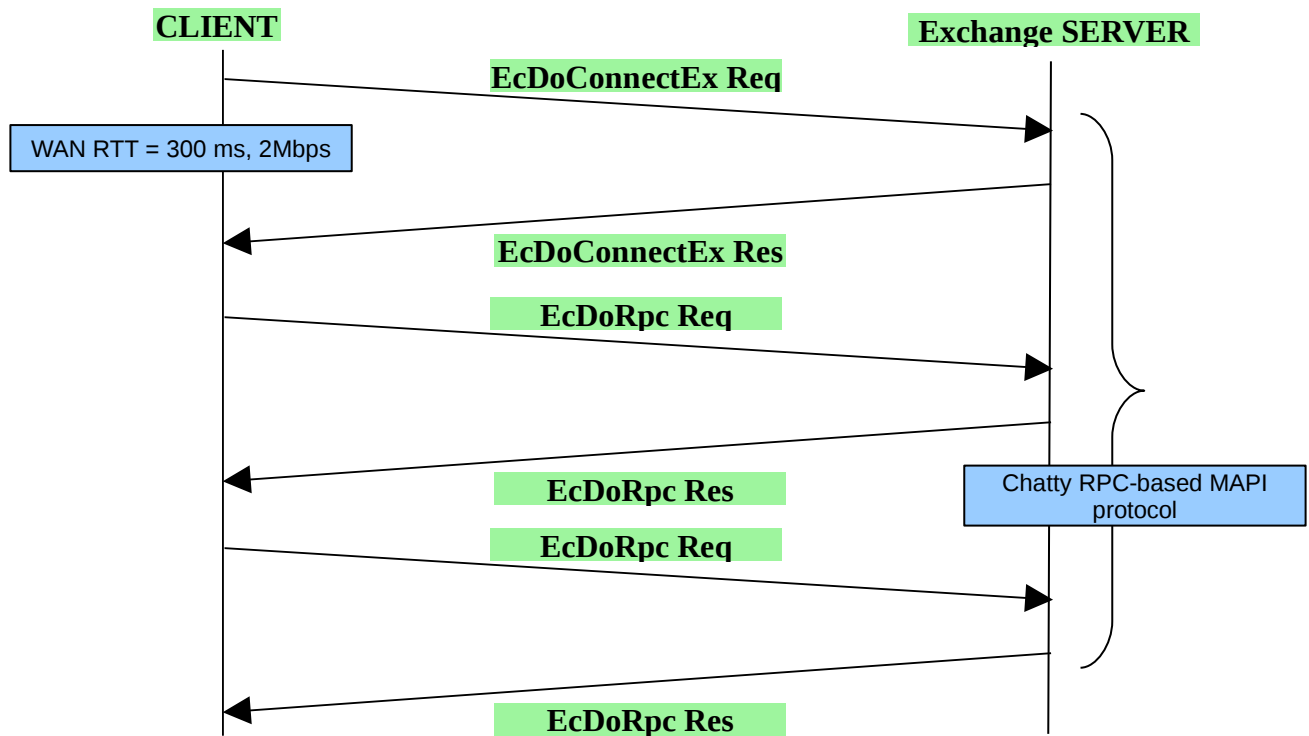
## MAPI Protocol Optimization

Makani's MAPI Protocol Optimization utilizes in-depth knowledge of the Messaging Application Programming Interface (MAPI) protocol to accelerate user response time. By acting as a proxy between the client and server, and having a detailed understanding of how the MAPI protocol functions, Makani products anticipate user requests, resulting in data retrieval before clients have even requested it. Due to the traditionally "chatty" nature of MAPI (see Figure 1), the performance improvement can be considerable.

With MAPI Protocol Optimization, Makani appliances can consolidate messages to reduce the number of round-trips required over the WAN to satisfy requests, and also download user e-mail real-time to the local Makani appliance, even after users have logged out of Outlook. These optimizations effectively minimize delays associated with waiting for data retrieval, and thus allow users to stop waiting on applications and start being more productive.

## MAPI Split-Proxy Implementation

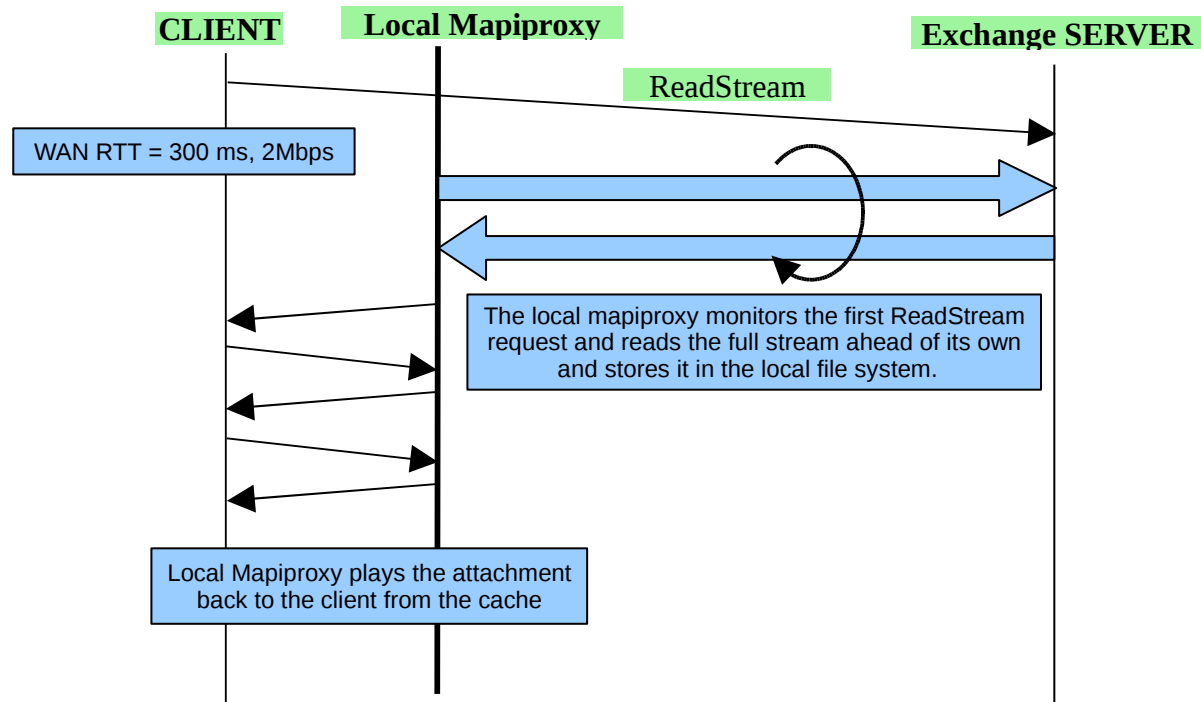
MAPI Protocol Optimization is possible because Makani appliances have the ability to terminate user requests as if they were the server and initiate connections to other Makani appliances across the WAN in which they can intelligently make requests. Because of this split proxy implementation (one proxy on each side of the WAN), optimizations are available that would not be possible with a standalone solution.



**Fig. 1 Chattiness in RPC-based MAPI protocol**

## Read-ahead Stream Optimization in MAPI

Makani's MAPI Optimization has the ability to minimize user response time by implementing deterministic read-ahead that anticipates client requests. In MAPI RPC transmissions are broken into blocks of data. Whether the client or server is sending data, the data transmission requires that the receiver acknowledge the last block of data before sending the next block. The delay associated with each of these acknowledgments, therefore, represents time spent waiting instead of data sent (see Figure 1). With Makani's Aggressive Read-Ahead Stream Optimization for MAPI, the Makani appliance closest to the client can monitor the first ReadStream request and reads the full stream ahead of its own and stores it in the local file system. While the data is being received by the local appliance across the WAN, it also transmits the data blocks to the client. By pipelining multiple RPC messages into read ahead requests, the number of round-trips over the WAN is minimized, latency is reduced, and consequently performance is improved.



**Fig. 2 Read-ahead Stream Optimization in MAPI**

## Conclusion

Unlike other vendors, Makani implements a true MAPI Proxy built right into the appliance. Having an application level proxy means that Makani appliances have more control over MAPI connections, and have the ability to perform application specific optimizations not available with other generic optimizations.

Because each Makani product has a deep understanding of the MAPI protocol, it can therefore act on behalf of a client to make the interaction much more efficient. This results primarily in a dramatic improvement not only while sending and receiving e-mails but also while accessing group message folders or changing calendar elements. The Makani MAPI optimization also works seamlessly with Makani Latency Buster™ architecture and will benefit from its ability to reduce data traversing the WAN just as other applications. All of this ultimately results in a solution that delivers vastly improved performance over the WAN.



Makani offers high-performance, easy-to-use and technically innovative solutions for next-generation wide-area networked data services. Makani Enhancers™ are deployed for wide-area data acceleration and optimization. Makani Mobilizer™ appliances are deployed in the customer's network for blazing-speed data access over a wide-range of access networks. Founded in 2006, Makani is headquartered in San Francisco with regional offices all over the world.