

# Real-Time Media Flow Protocol

## *Frequently Asked Questions - External*

### **What is the Real-Time Media Flow Protocol (RTMFP)?**

The Real-Time Media Flow Protocol (RTMFP) is a new communication protocol from Adobe that enables direct end user to end user peering communication between multiple clients running an application built for Adobe Flash Player or Adobe AIR for the delivery of rich, live, real-time communication.

### **When will RTMFP be available? What will be needed to work with RTMFP?**

RTMFP requires Adobe Flash Player 10 or Adobe AIR 1.5 as well as an RTMFP-capable server to introduce the clients. A future version of Flash Media Server will support this technology but no release plans have been announced.

### **What new functionality do Adobe Flash player 10 and AIR 1.5 enable?**

By using RTMFP, applications that rely on live, real-time communications, such as social networks and multi-user games will be able to deliver higher quality communication solutions. Flash Player 10 and AIR 1.5 will also enable end-users to connect and communicate directly with each other using their computer's microphone and webcam. Flash Player 10 and AIR 1.5 will not support file or document sharing.

### **What are the benefits of RTMFP?**

RTMFP will help to **reduce the bandwidth delivery costs** for direct, live, real-time communication solutions, such as audio and video chat and multi-player games. Because RTMFP can send data directly between the end-user clients and not through the server, bandwidth is not being used at the server so solutions are less expensive to scale.

RTMFP also increases **the quality of delivery** through the use of UDP. UDP is a more efficient way to send video and audio data over the Internet that can ensure that connections are not interrupted if the variations occur within the network and provide for lower latency delivery of live media.

RTMFP has two features that improve connection reliability over other protocols, such as TCP.

**Rapid Connection Restore:** Connections are re-established quickly after brief outages. For example, when a wireless network connection experiences a dropout. After reconnection, the connection has full capabilities instantly.

**IP Mobility:** Active network sessions are maintained even if a client changes to a new IP address. For example, when a laptop on a wireless network is plugged into a wired connection the connection will not be interrupted. This is a critical requirement for communication or live solutions.

## What is the Real-Time Media Protocol (RTMP)?

RTMP is a proprietary 2-way protocol developed by Adobe Systems for streaming audio, video and data over the Internet, between a Flash Player and a server.

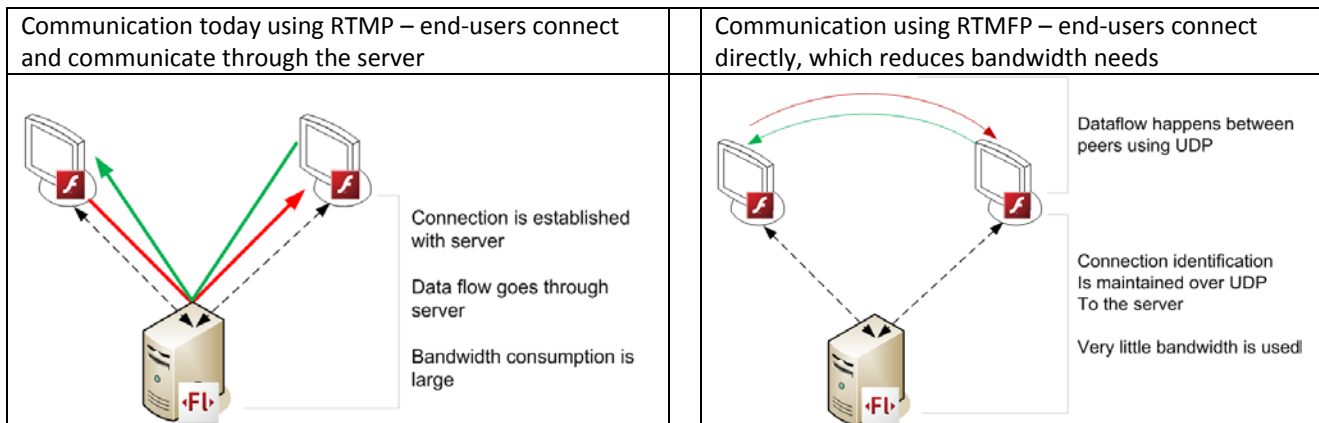
For more information, go to:

[http://www.adobe.com/devnet/flashmediaserver/articles/overview\\_streaming\\_fms3\\_02.html](http://www.adobe.com/devnet/flashmediaserver/articles/overview_streaming_fms3_02.html).

## How does RTMFP differ from RTMP?

The principle difference is how the protocols communicate over the network. RTMFP is based on User Datagram Protocol (UDP), whereas RTMP is based on the Transmission Control Protocol (TCP). UDP-based protocols have significant advantages over TCP-based protocols in the efficient delivery of live streaming media, decreased latency, increased voice/audio quality, and greater connection reliability.

Unlike RTMP, RTMFP also supports sending data directly from one Adobe Flash Player to another, without going through a server. A server-side connection will always be required to establish the initial connection between the end-users and can be used to provide server-side data execution or gateways into other systems. The user of a Flash Media Server will also be required to authorize network address lookup and NAT traversal services for the clients to prevent Flash Player from being used in an unmanaged way.



### What are some example solutions that can be built with RTMFP?

RTMFP will enable a higher capacity and quality delivery for live communication solutions such as VoIP, webcam chat, multiplayer games. Some examples of solutions that may be built using RTMFP include:

Webcam Chat	Voice over IP (VoIP)	Multi-player Games
<p>A developer leverages the published API of a social networking site and RTMFP to create a webcam chat application for use between end-users of the site.</p> <p>The use of RTMFP in combination with a Flash Media Server enables end-users to find and establish a 1-way data/media stream directly with another end-user.</p> <p>Because RTMFP flows data between the clients and not the server, bandwidth is not being used at the server, and is much less expensive to scale.</p>	<p>A developer builds a desktop application on Adobe AIR that allows one end-user to “call” contacts listed in their instant message application. The AIR application will establish an RTMFP connection with Flash Media Server to find the other user and receive information from the instant messaging interface.</p> <p>The end-user receives a notification of the incoming call and can accept or decline the call. Once accepted, the audio will flow directly between the end-users’ desktop clients, not through the server.</p> <p>Because RTMFP uses UDP, end-users experience a consistently high-quality experience even if variations occur in the network.</p>	<p>A game developer would like to add additional multi-player functionality to their application. This dramatically increases the data shared between the users, so it must be done in an efficient way so as not to cause latency and slow down the end-user experience.</p> <p>By using RTMFP to send the data within the application, the data flow will occur directly between the end-user over UDP.</p>

### What is the User Datagram Protocol (UDP)? Why is UDP important to RTMFP?

UDP is an efficient internet protocol to allow partially-reliable (lossy) delivery of media and data. UDP, unlike TCP, does not try to recover data that has been lost in transmission. This allows video and audio to keep up with live, real-time communication and reduce delay caused by latency, which is a priority for these types of real-time solutions. TCP waits for packets which can cause delays or interruptions in the delivery. UDP can also support direct peer-to-peer communication in networks served by Network Address Translation (NAT) routers. More information on UDP is available at [http://en.wikipedia.org/wiki/User\\_datagram\\_protocol](http://en.wikipedia.org/wiki/User_datagram_protocol).

RTMFP is different than other simple UDP protocols because it prioritizes transmission of multiple media flows.

### What is the Transmission Control Protocol (TCP)?

TCP is the Internet protocol used by web browsing, file transfer and email applications. TCP is used today by the HTTP protocol for web servers and the RTMP protocol to deliver video, audio and data from Flash Media Server to Flash player and AIR. TCP is useful because it reliably delivers data, but that reliability may add latency, reducing the quality of live media streaming.

For more information, go to [http://en.wikipedia.org/wiki/Transmission\\_control\\_protocol](http://en.wikipedia.org/wiki/Transmission_control_protocol).

### **How does RTMFP address security and end-user privacy?**

RTMFP network traffic is always encrypted with 128-bit cipher. For a client to play a stream that is published via RTMFP, the client will need to know the name of the stream *plus* have the Peer ID of the publisher. The Peer ID will be a 256-bit value associated with the publisher's identity. In addition, the publisher has the opportunity to accept or reject a peer request before connection is made.

### **What is Peer to Peer (P2P)?**

Peer to Peer (P2P) has various meanings within the technology industry, but typically refers to the establishment of a direct connection between two or more end-users to aid in the movement of data and media.

There are several types of P2P solutions -

- **End User to End User:** Two clients communicate directly without passing their data through the server for low-latency, real-time communication. This is the solution that Adobe is enabling with RTMFP.
- **Swarming:** Many to many communication typically used to share delivery a file via download. Swarming maximizes transfer speed by gathering pieces of a file and downloading these pieces simultaneously from other end-users who already have them. Swarming solutions typically require a standalone application designed to locate and connect to other end-users' computers that have the relevant content. These solutions typically have local file system access. Flash Player 10 will not enable swarming solutions.
- **Multicast:** One to many communication over an IP infrastructure. Multicast speeds content delivery and reduces the burden on the network because a source sends the data packet only once for delivery to a large number of end-users. The nodes in the network take care of replicating the packet to reach multiple end-users only where necessary. Flash Player 10 will not enable multicast solutions.

For more information on Peer to Peer see Wikipedia at <http://en.wikipedia.org/wiki/Peer-to-peer>.

RTMFP uses P2P techniques to ensure a high quality delivery and efficient use of the network. It is a managed connection, which means it requires the authorization of a server to make the introductions. The client must be connected to the server to retain the direct connection.

### **Is RTMFP the same as other peering solutions, such as BitTorrent or Kontiki? Can RTMFP deliver large files over peer-to-peer, similar to BitTorrent?**

No. These other solutions are swarming solutions, which uses many to many P2P communications to share the distribution of files among large numbers of clients. RTMFP allows for direct end user to end user communication, for live, real-time communication solutions, not file transfer

**How will developers work with RTMFP?**

RTMFP enables developers to establish direct end user to end user peering communication between two or more clients running an application built for Adobe Flash Player or Adobe AIR for delivery of live, real-time data. RTMFP is similar to RTMP for client-server connections because RTMFP has full support for all the Flash Media Server functionality currently found in RTMP, including live streaming, recording and playback, shared objects, and remote function calls.

ActionScript developers will use ActionScript (2 or 3) to establish a NetConnection with a future version of Flash Media Server. To make direct connections between Flash player 10 clients, new extensions have been added to the ActionScript class, NetStream, to establish a Flash Player as a publisher or subscriber.

**What are the limitations of RTMFP in Flash Player 10?**

Flash player 10 will not enable swarming, multi-cast or broadcast quality live video. It will only enable communication from the voice and video devices native to your computer (e.g. microphone and webcam) and enables application developers to send ActionScript data messages directly between Flash Players – useful in multi-player game development.

**What technology is RTMFP similar to, who are the competitors?**

Adobe's own RTMP is the closest commercial product available for client-server communication.

**What is the impact of this technology on Content Delivery Networks (CDN)?**

RTMFP will have no impact on the business of a CDN. CDNs primarily focus on the one-way delivery of video on demand and live video on a massive scale, not the direct end user to end user communication enabled by RTMFP. CDNs could play a role in the delivery of RTMFP-enabled applications by helping end-users initiate the desired peering relationship.

**Does Adobe plan to expand the functionality of RTMFP?**

Adobe will continue to evaluate and evolve RTMFP to meet new market needs, however, there are no announcements at this time.