

## SiMPLE - the interactive multicast proxy

SiMPLE is an interactive *IP-multicast* solution exploiting proxy/cache techniques. The goal is an efficient utilisation of broadband networks providing broadcast transmission. SiMPLE is a software system providing proxy functions at the server side and also at the client side.

The SiMPLE client proxy (*UES*) accepts HTTP requests, translates them into messages which represent UDP/ICP messages and checks if it can satisfy this request from the locally cached contents. If this is not the case it forwards them to the SiMPLE server proxy (*BUS*), which in turn translates the request back into a standard HTTP format which is then satisfied by an external proxy. The reply to the original request is sent back via IP-multicast not only to the requesting client proxy but to the whole multicast group. The motivation is that other client proxies, which have not requested this object, can store the results on the local harddisk cache for later retrieval or additional processing. Hence, SiMPLE provides both interactive cache replication services and non-interactive multiple cache updates and uses satellite bandwidth in a very efficient mode.

SiMPLE is an *interactive* multicast proxy, which replicates only that portion of the Web, which has been requested by at least one client. This approach allows broadband operators to determine dynamically the contents which should be pushed when, since this can be deduced from their customers' browsing behaviour. Hence, they are able to utilise their bandwidth very economically.

SiMPLE includes a powerful *push* service which is supported by the DataCast protocols. In addition, it allows for caching updates during the off-hours, thus eliminating peak-hour bottlenecks. Cached content, uniquely addressed by a URL, is available directly from the SiMPLE client proxy through the users Web browser. Ultimately, SiMPLE also supports pushing of virtual domains, that is, domains which do not exist on the real Internet, making multimedia kiosks easy to implement and to update.

SiMPLE enhances multicast enabled broadband networks by seamless adding multicast *proxy* update services. Whereas current

hierarchical proxies are based on point-to-point cache updates, SiMPLE is truly a point-to-multipoint solution. Integrating sophisticated multicast transport and session protocols into a versatile multicast proxy/cache solution, SiMPLE significantly increases network efficiency.

SiMPLE is an efficient *overlay* network solution, bypassing highly loaded or congested links by multicast delivery. Broadcast networks, such as wireless or satellite, benefit immediately by multicast delivery. For isolated or poorly connected high-speed network islands SiMPLE provides a means to speed up Web downloads significantly.

SiMPLE is perfect for highly asymmetric *satellite* networks since it is specifically designed to use UDP over the return channel with limited capacity and IP-multicast on the forward channel. By design SiMPLE uses TCP only at the edges of the satellite network to connect clients and client proxy, and server proxy and servers. Thus, SiMPLE performance is not affected by TCP slow-start, window sizes and RTTs. On the contrary, SiMPLE is an interactive multicast push service, where performance and quality of service parameters, such as rate and reliability are controlled by the SiMPLE proxies.

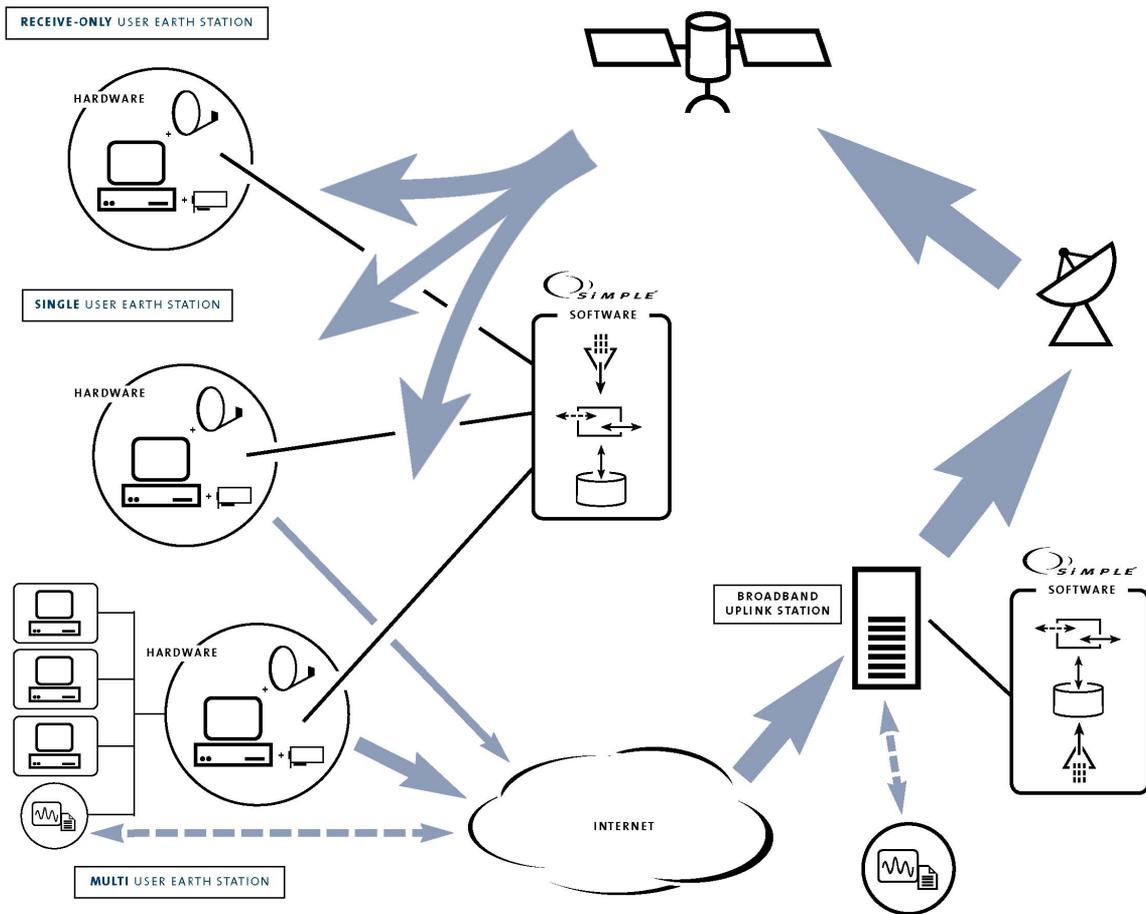
SiMPLE is built around a flexible framework of functional modules and a control program, managing required modules, such as the proxy and the cache, and optional modules, such as the filter. Most modules can be incorporated or updated on the fly. The SiMPLE configuration *management* allows remote configuration and control of all modules through a Web browser interface. Additionally, remote access and control can be restricted.

SiMPLE is an *Internet recorder*, storing the users most frequented Web contents on the users harddisk, thus eliminating the need to request and transmit it over and over again. In addition, it plays back this content upon the users request, effectively eliminating the network latency.

SiMPLE supports the most popular operating systems Windows (95/98/ NT/Me/ 2000) and Linux.

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**SIMPLE** is the composition of new services, Interactive Multicast Web-browsing and Automatic Selection and Delivery of content. It implements several new technologies:

- ¥ Object DataCast protocol
- ¥ Restricted Reliable Multicast Protocol
- ¥ IP-multicast over DVB/MPEG-2

Multicasting has never been that easy, flexible and reliable before!

**SIMPLE** features new and optimized multicast protocols for use over any broadcast network such as DVB/MPEG-2. A best effort, limited reliable multicast mode is available for systems without return channel and a fully reliable mode with minimum return channel bandwidth usage which scales perfect for large numbers of users!

Any broadcast network benefits from **SIMPLE** technology. Combining break through technologies, **SIMPLE** provides solutions for multicast proxies, multimedia push and

automatically selected and scheduled delivery services. Advanced content filtering at server and client stations substantially saves bandwidth and provides content control. Due to the use of Internet standards **SIMPLE** fits seamlessly into any existing proxy hierarchy.

**SIMPLE** features flexible and complete configuration through Windows™ and Web-based interfaces. An automated setup procedure simplifies the software installation. Powerful monitoring modules allow accounting and support easy problem tracking.

Who will benefit from using **SIMPLE** ?

- ¥ Content providers and users
- ¥ ISPs with many scattered sites
- ¥ Intranet operators with central archiving facilities
- ¥ Extranet operators with high QoS demands

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|--|-----------|--|-----------|
|  | CLIENT PC |  | SATELLITE |
|  | INTERFACE |  | CACHE     |
|  | ANTENNA   |  | FILTER    |
|  | SERVER    |  | PROXY     |
|  | UPLINK    |  | MONITOR   |

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