

[0031] In another embodiment, the processor performs convergence by conditionally processing or rendering content or messages from network bearers according to data received from other network systems.

[0032] In a further embodiment, a session manager service manages linkages between the gateway and external systems for convergence.

[0033] In one embodiment, the processor converts a content format in a received message to an internal format and processes the message in said internal format.

[0034] In another embodiment, the internal format is a mark-up language.

[0035] In a further embodiment, the gateway receives an input message with content of a first format, converts the first format to an internal format, converts the internal format to a second format and routes the message to an external system, receives a response from said external system with said content in a third format, converts said third format to the internal format, and generates an output message with said content in a fourth format.

[0036] In one embodiment, the processor comprises an access control authorization function for managing access rights and user service policies of application provider servers.

[0037] In another embodiment, said function generates a set of access control rights and a user service policy with rights for direct access by the associated application provider server, and a schema of maximum rights which can be assigned by the application provider server in a cascading structure.

[0038] In a further embodiment, said function automatically checks a fresh request for access rights and user service policy against a schema of an existing set of rights.

[0039] In one embodiment, said function is a provisioning service within the gateway which communicates with other services of the gateway via an internal middleware mechanism.

#### DETAILED DESCRIPTION OF THE INVENTION

##### BRIEF DESCRIPTION OF THE DRAWINGS

[0040] The invention will be more clearly understood from the following description of some embodiments thereof, given by way of example only with reference to the accompanying drawings in which:—

[0041] FIG. 1 is a high level diagram showing a service access gateway of the invention and its environment in a typical deployment;

[0042] FIG. 2 is a diagram of the internal architecture of the gateway in one embodiment;

[0043] FIG. 3 is a diagram illustrating instantiation of a service of the gateway;

[0044] FIGS. 4, and 5 are diagrams of different services;

[0045] FIG. 6 is a flow diagram illustrating internal messaging within a service;

[0046] FIG. 7 is a flow diagram illustrating message flow through the gateway;

[0047] FIG. 8 is a message transfer diagram illustrating convergence of content formats;

[0048] FIG. 9 is a more complex message transfer diagram showing convergence;

[0049] FIG. 10 is a flow diagram illustrating cascading of access control; and

[0050] FIG. 11 is a diagram showing cascading of service provider privileges.

#### DESCRIPTION OF THE EMBODIMENTS

[0051] Referring to FIG. 1 a service access gateway 1 is located to interface between an external domain, such as the Internet, and a mobile operator's domain. In the former, it interfaces with individual application provider servers 2 ("AP"s) and with an aggregate AP server 3, which in turn is linked with multiple individual APs 4. There may be a cascaded arrangement, with one aggregate AP being linked to one or more further aggregate APs. On the mobile network side the gateway 1 interfaces with a wide variety of mobile network enablers including a short message service centre (SMSC) 10, a multi-media message service centre (MMSC) 11, a wireless application protocol (WAP) gateway 13, a location server 15, and a presence server 14. The interconnections on both sides vary with the particular situation.

[0052] The gateway 1 can be set up in a very versatile manner to handle mobile station requests for and any download of a wide variety of content-rich messages. It does this for simple or complex cascaded AP arrangements and in a manner for convergence of content formats and/or bearers in a dynamic manner. This may include conditional delivery or non-delivery according to service logic and data returned from network services such as location server, presence server or time server. This is described in more detail below.

[0053] Referring to FIG. 2, the gateway 1 comprises one or more services and an underlying CORBA middleware communication mechanism 20. In this embodiment the gateway has the following services, although this will be different for each set-up of the gateway software architecture, determined according to the environment:

[0054] 21: a session manager;

[0055] 22: a work flow manager (WFM);

[0056] 23: an edge SMTP bearer service;

[0057] 24: a transaction manager;

[0058] 25: an edge SMPP bearer service;

[0059] 26: a transaction logging service;

[0060] 27: an entity resolution service;

[0061] 28: a content processing service;

[0062] 29: a billing service;

[0063] 31: an edge HTTP service 31; and

[0064] 33: an edge SOAP bearer service.