each of the exchanges 21 to 35 in the network, there are shown a plurality of communication paths 30,each of which may comprise a plurality of communication circuits, including cables, optical links or radio links for carrying voice and/or data communication between the various exchanges within the network.

[0014] The network of FIGURE 1 also includes a network control system 40 which is connected to each of the exchanges 21 to 35 within the network by means of communication links 41 (represented by dotted lines). Signaling messages are exchanged over each of the paths 30 and links 41 in accordance with a defined protocol specified for the communications.

[0015] A portion of an advanced telecommunications network that provides additional enhanced services over and above user-dialable voice services, is illustratively shown in FIGURE 2. In FIGURE 2, a portion of a network 51 incorporates a plurality of separate nodes. For example, a local PSTN node 53 may be connected to an ISDN node 54, both of which are coupled to a first private business group node 55 which is in turn coupled to a second private business group node 56. The local PSTN node 53 communicates with the business group node 55 through a first protocol 57, while the ISDN node 54 communicates with both the local PSTN node 53 and the private business group node 55 through second protocols 58 and 59, respectively. The ISDN node 54 may communicate with other ISDN nodes via a third protocol 61 and the private node 56 communicates with the private node 55 via a fourth protocol 62. The PSTN node 53 may communicate with other PSTN nodes via a fifth protocol 65. Each of the separate nodes 53 to 56 include telephone subscribers 63 while the private business group node 56 and the ISDN node 54 may also include data communications subscribers 64. The way in which each of these nodes communicate with other disparate nodes via certain defined protocols is reflective of the need for a flexible means to define communication signaling message standards, such as by ASN.1 notation. The implementation of such uniform signaling standards enables computers on the PSTN, as well as private networks, to exchange information in a clear and reliable fashion. The telecommunications network of FIGURE 2 incorporates a variety of advanced functions and features such as ISDN services, for example through ISDN node 54.

[0016] In order to provide these additional services, telecommunications systems designers and service providers have long sought additional capabilities from their telecommunication equipment. In addition, telecommunications operating companies have also sought to automate the process of gathering and transmitting call charging information. The automation of call charging information reduces costs and increases operating efficiencies. Additional user-demanded services include the transmission of the name and number of the calling party along with or preceding a call and the ability to charge the cost of a call to third parties other than those initiating or terminating a call, etc.

[0017] One of the most significant barriers to the provision of these additional services has been the lack of uniformity in the design and operation of central office switching systems (CSSs) and of private branch exchanges (PABXs or PBXs). It should be noted that the problems of interoperability are more acute within the public switched telecommunications network (PSTN) applications than for private applications. This is because in a private application, such as a PBX, a user can avoid interoperability problems by simply using a single vendor for all of its equipment needs within its network and then depend on the equipment vendor to solve any such problems as and when they arise. However, the single vendor solution to interoperability problems is neither feasible nor desirable for PSTN applications.

[0018] Since there has been no market-driven solution to the quest for uniformity in the provision of supplementary services while avoiding the interoperability problem, numerous attempts have been made by the various national entities which operate telecommunication systems to set harmonious standards for the provision of supplementary services.

[0019] As discussed briefly above, the CCITT has developed standards for the notation and representation of protocols for the interchange of data between disparate telecommunications computers. The format of much of the data that is to be exchanged between various telecommunications applications on different vendor platforms is currently specified using the aforementioned Abstract Syntax Notation One (ASN.1) language, more fully described below. The actual encoding and decoding of data to be transmitted according to an ASN.1 data format specification is commonly done using the Basic Encoding Rules (BER), also explained at greater length below.

[0020] In designing new versions of Private Branch Exchanges (PBX), manufacturers of telecommunications systems and devices commonly use a standardized functional protocol to support supplementary services. One such functional protocol is the Generic Functional Protocol For The Support Of Supplementary Services (GFP), the details of which are also set forth below. The GFP offers a standard format for transferring information, such as the name of the calling or connected party, charging information, etc., across an ISDN line. The use of a standardized protocol such as GFP, permits PBXs manufactured by different vendors to be interconnected into an ISDN network. The GFP standard was set by the European Telecommunications Standards Institute (ETSI) and the European Computer Manufacturers Association (ECMA) and is described in the ASN.1 specification. The GFP data is sent across an ISDN line according to the BER.

[0021] Referring now to FIGURE 3, a block diagram of a software system 300 using ASN.1 specifications is described. The software system 300 includes application programs 305a, 305b which are capable of performing a variety of functions such as providing supplementary services in a telecommunications system. Application program 305a