Web Services based Convergence Model in NGN

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Web Services based convergence model

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ABSTRACT

The 'convergence service' in NGN implies the integration of services in NGN with a unified manner to access each service in order to interwork with each service. This paper shows the convergence model for NGN based on Web Services and provides a detailed scenario of each convergence model in form of Web Services.

키워드

Web Services, NGN, Convergence Service, WSG(Web Services Gateway)

I. Introduction

The 'convergence service' in NGN implies the integration of services in NGN with a unified manner to access each service in order to interwork with each service. This paper shows the convergence model for NGN based on Web Services and provides a detailed scenario of each convergence model in form of Web Services. Also, In this paper, the basic convergence model, extended convergence model, and the convergence scenario based on each convergence model are described.

II. Basic convergence model

The basic convergence model indicates the interaction model between the services requester and service provider; this is Web Services-enabled NGN Services. Figure 20 shows the basic convergence model based on Web Services for Internet and NGN services. The WSP in the Internet and NGN publish their interfaces to the Web Services Registry and the application support functions & service support functions components, respectively. The WSR is able to find the Web Services it requires through the Web Services registry, and the application support functions & service support functions are able to create Web Services.

Components

- WSR : request component used for calling the WSP
- WSP (3^{rd} Party NGN Services) : The WSPcomponentfor3^{rd}partyNGNservices

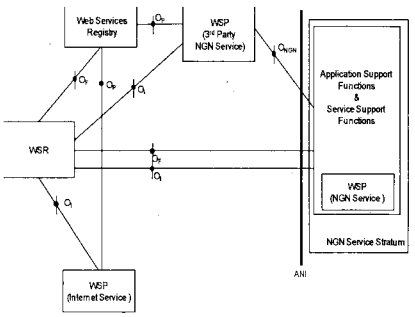

Figure 1. The components and operations for the basic convergence model

- WSP (Internet service) : WSP component for Internet services
- registry : Searchable set of service descriptions in which service providers publish their service descriptions
- Application support functions & Service support functions: Providing numerous NGN services based on NGN

capabilities for 3rd party service providers and applications. The WSP inapplication support functions & Service support functions is not the FE for NGN, and it is one of the services of NGN, which provides the interface.

Key to operations

O_I Binding operation (O_I) between WSR and 3rd Party WSP for NGN services or NGN operation(O_I) for discovering, interaction with WSP in NGN or binding operation (O_I) between WSR and WSP for Internet services

O_{NGN} Proprietary operation (O_{NGN}) between 3rdParty provider and NGN services

O_P Publishing operation (O_P) for the service description of NGN services or publishing operation (O_P) for the service description of Internet services

O_F Finding operation (O_F) for WSP

III. Extended convergence model

The extended convergence model is another interaction model between the WSP and NWSP. In essence, all of the interaction based on Web Services is covered by the basic convergence model. However, although a service in NGN is not Web Services, the services can be considered in the convergence model. For the extended convergence model, the WSG is required to adopt the NWSP.

Figure 2 shows the extended convergence model that is usage of NWSP and NWSR in NGN through the WSG. The WSG is able to support more advanced features such as service screening and service compositions. Therefore, this model can provide the advanced convergence model with services in NGN/Internet depending on the capability of the WSG.

Components

- WSR: request component used for calling the WSP
- WSP (3rd Party NGN services) : NGN services to the called WSR
- NWSP (3rd Party NGN services) : NGN services to the called WSG
- WSP (Internet service): WSP component for Internet services
- registry: Searchable set of service descriptions in which service providers publish their service descriptions
- WSG: Gateway for interoperability between and NGN Services
- Application support functions & Service support functions: Providing numerous NGN services based on NGN capabilities for 3rd party service providers and applications. The WSP and NWSP in Application support functions & Service support functions is not the FE for NGN, and it is one of service of NGN with interface, or other propriety interface.
- NWSR: Services request component, which has no feature

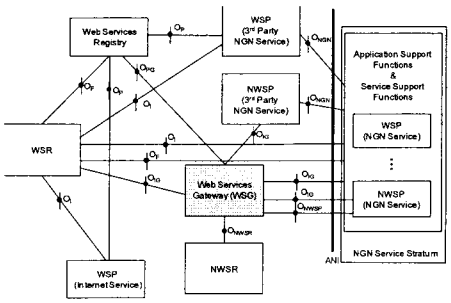

Figure 2. The components and operations for the extended convergence model

Key to operations

O_I Bind operation (O_I) between WSR and 3rd Party WSP of NGN or bind operation(O_I) between WSR and WSP on NGN or Internet

O_{NGN} Proprietary operation (O_{NGN}) between 3rd Party WSP and NGN services

O_{IG} WSG operation (O_{IG}) between WSR and WSG and WSG and NGN service

O_{PG} Publishing and finding operation

(O_{PG}) for the service description of WSG and WSP in internet, respectively

O_P Publishing operation (O_P) for the service description of 3rdPartyNGNservicesorpublishingoperation(O_P) for the service description of Internet services

O_F Finding operation (O_F) for WSR

O_{NWSP} Interaction operation (O_{NWSP}) between WSG and NWSP in NGN

O_{NWSR} Interaction operation (O_{NWSR}) between WSG and NWSR in NGN

IV. Convergence service scenarios

The web-based call disposition service provides web pages for a called party to select response menu items such as answer, reject, or forwarding to voice mail when a call arrives to the called party in parallel to normal incoming call ringing.

The call disposition menu is provided based on , by which a personalized and customized call response menu is possible.

For this service, it is assumed that:

- The terminal equipment of the user is able to support both SIP communications and functions.
- The application server providing NGN communication services is able to access directly when AS has interfaces, or through WSG when AS does not have interfaces.

The following figures show possible scenarios for the use cases of the web call disposition service.

(1) Caller A originates a call to Callee B. The terminating S-CSC-FE delivers SIP INVITE to trigger the NGN communication service on application server FE (AS-FE).
(2) AS-FE sends a message to WSG to request the URL for the Callee's call disposition WSP and to request a disposition response.
(3) WSG retrieves WSDL from the Web Services registry and then sends the URL and disposition request to the WSP.
(4) WSP returns the URL, and AS-FE then returns that URL in the Call-Info field of INVITE to the Callee B. B sends normal response 200 OK, to complete the transaction (normal answer case).
(5) Using the web URL, Callee B's terminal connects to the web server to obtain his personalized web call disposition menu. The web page provides and prompts menus such as call accept, reject, or forward to voice mail.
(6) User B answers via an input response on the menu page. This result is sent to the web call disposition service, WSG and then the AS-FE.
(7) Based on the input result, AS-FE determines further routing. In this case, it is normal calls accept and the AS-FE connects the call to the called party.

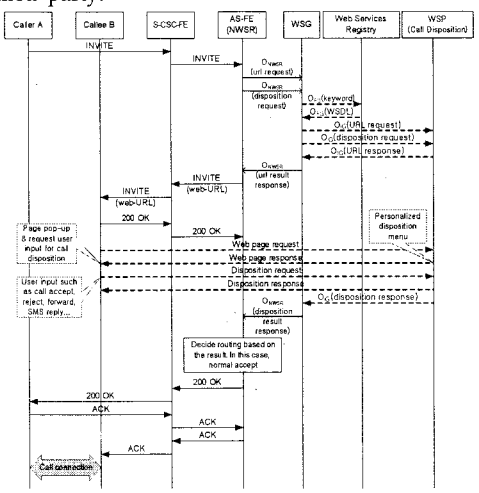

Figure 3. Non-web NGN service requesting web disposition service (Call disposition scenarios)

(1) Caller A originates a call to Callee B. The terminating S-CSC-FE delivers SIP INVITE to trigger the NGN communication service on application server FE (AS-FE).
(2) AS-FE queries and retrieves WSDL from the Web Services registry and then sends the URL and disposition request to the WSP.
(3) When AS-FE receives the URL, it sends the URL in the Call-Info field of INVITE to the Callee B. B sends a normal response 200 OK to complete the transaction.
(4) Using the web URL, Callee B's terminal connects to the WSP to obtain his personalized

web call disposition menu. The web page provides and prompts menu items such as call accept, reject, or forward to voice mail.

(5) User B answers by input response on the menu page. This result is sent to the WSP and then to the AS-FE.

(6) Based on the input result, AS-FE determines further routing. In this case, it is normal call accept, and the AS-FE connects the call to the called party.

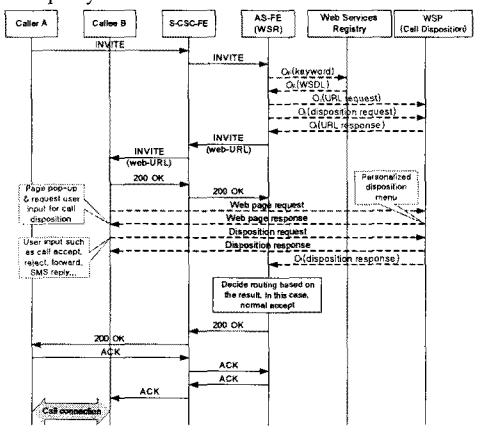

Figure 4. Web NGN service requesting web disposition service (Call disposition scenarios)

V. Conclusion

The term 'convergence' in NGN has focused mainly on the convergence of media, such as voice, data, and video. However, to realize the ultimate convergence of services in NGN, it is necessary to develop detailed requirements to allow for the convergence of services. It is also important to identify clearly the value being added by a convergence service. The 'convergence services' in NGN implies the integration of services in NGN with a unified manner to access each service in order to interwork with each service.

In this paper, we shows the convergence model based on Web Service in NGN, and describes the interface, operation, and its scenario titled "Web-based call disposition scenario".

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