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NORTEL

Product Brief Nortel's Adaptive Application Engine

Delivering on the NGN 2.0 vision of converged IP communications and applications

Today, people have access to more communication devices and services than ever before. In this hyperconnected world, every device that can be connected will be connected, and every technology from personal appliances to business systems can and will communicate. The proliferation of

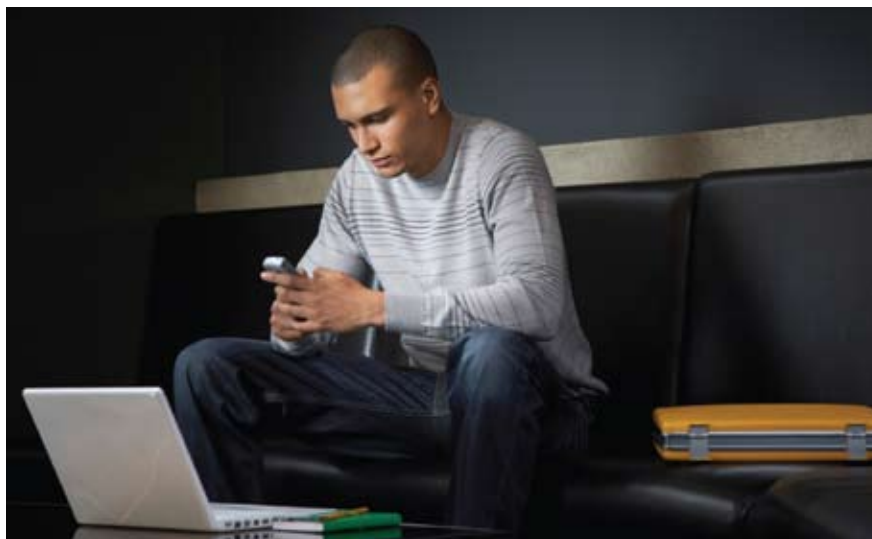
communications devices and applications has greatly enhanced our productivity. However, it has also left many people feeling overwhelmed by the large number of communications options they need to manage. One company — Nortel — is working to alleviate this dilemma by making communications powerful, yet simple.

NGN 2.0 is defined as the convergence of Web 2.0 applications, such as social networking and web mashups, with IP voice and multimedia communication services delivered over any broadband IP path. Examples of this service evolution include “Click-to-Call” communications on a Facebook web page, instant

messaging from your cellphone to your TV screen and managing your DVR from your cellphone. Other applications could include making voice calls from your Wi-Fi-enabled MP3 player or receiving a ship date confirmation from an inventory system on your cellphone. NGN 2.0 services also bring benefits to business customers. Unified communications, for example, enables a user to click on an email and join a video conference, and can provide a live operator to assist customers with orders. NGN 2.0 will continue to evolve as IP applications increase in sophistication and incorporate IP communications and personalized content.

Nortel's Adaptive Application Engine software delivers immediate value through:

- A comprehensive IP voice and multimedia feature set
- Enabling multiple deployment options by being hardware-agnostic
- Expanded scalability from as few as hundreds to as many as millions of subscribers
- An Open Programmability Environment that enables developers to create new, differentiating features
- Support for all network configurations in a single release including Standalone SIP application server, in conjunction with IP softswitch and IMS-compliant application server

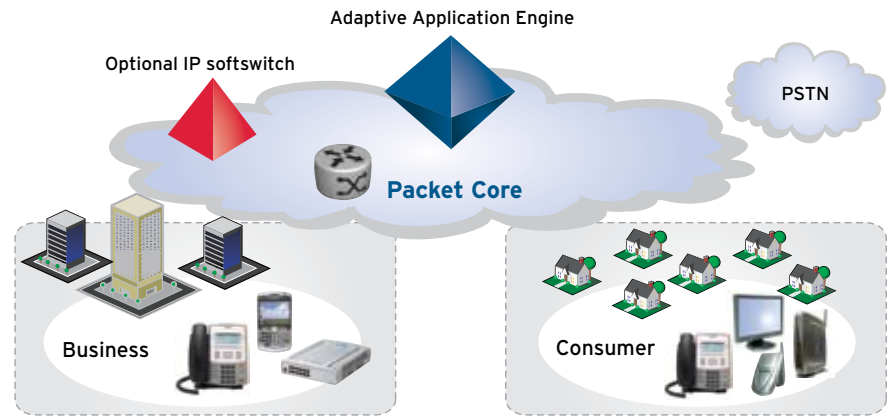


The Nortel Adaptive Application Engine makes the demands of the NGN 2.0 world simple. With Adaptive Application Engine software, service providers can extend voice and multimedia communications into the rapidly expanding IP-based application environment. Nortel's industry standards-based Open Programmability Environment enables service providers to create new applications using the Adaptive Application Engine and deliver new, differentiating services to market quickly and easily.

Adaptive Application Engine software builds on the market-leading capabilities of the Communication Server 2000 IP softswitch and the Application Server 5200 and can be deployed into both platforms through a simple software upgrade.

Furthermore, the Adaptive Application Engine software ensures that services are independent of the IP access technology, giving providers the ability to deliver a consistent service set across multiple broadband IP networks.

End users want simpler, more effective communications solutions. In a research study commissioned by Nortel in late 2007, more than one quarter of respondents were interested in applications that personalize their communications and provide them with a higher level of control among their wired and wireless devices. The Nortel Adaptive Application Engine helps service providers offer services that will simplify end-users' lives by increasing control over their communications, personalizing their communications to fit their individual needs, and increasing the capabilities of their communications beyond voice and simple data across disjointed IP access.



Offer new services that enhance personal productivity, mobility and personalization

Business customers are a critical component of the communications market. And, for businesses, keeping up with rapidly changing technology and productivity systems is not a choice, but a necessity. Businesses must constantly look for new channels to market, enhance customer service to clients, and improve the quality of their products and services, which necessitates the best in communications. For these reasons, business customers have been leaders in adopting rapidly evolving communication services. Cutting-edge communications give businesses the potential of a clear step up in operational and productivity systems.

Residential customers, another key element of the communications market, bring different challenges. These customers are segmented into different profiles, from simple users who are more than happy with a regular phone and/or a mobile, to the technology savvy users who demand the latest service, the most recent terminals and the most exciting quality of experience. The drivers for service adoption for the residential market, in order of priority, are convenience, flexibility and cost savings.

The Adaptive Application Engine has been designed to deliver the scale and functionality necessary for service providers to address both residential and business market segments. With an IP communications foundation that enhances personal productivity and mobility, the Adaptive Application Engine software also converges these services with IP-based applications. By delivering ubiquitous access to IP communications services independent of broadband IP access, service providers can offer their customers mobility and freedom, and turn the challenges of Hyperconnectivity into opportunities. Nortel's Adaptive Application Engine meets the needs of consumers and businesses with the evolution of IP voice and multimedia features delivered through PC-based softphone, personal agent, collaboration, video and voice terminals.

Multimedia clients

Multimedia clients use a personal computer to add new dimensions to interaction with others, extending beyond voice and text to the integration of voice, text, video and sharing. The PC becomes another "always-on" device in the home for additional communication, using video, contact management, click-to-call, integrated messaging, and music and photo sharing. Users also have access to a personal meet-me service, empowering them with their own personal "conference

bridge” to use at any time for communication situations that require more than two participants. The instant messaging (IM) environment for Adaptive Application Engine subscribers is also extended to IM users from Yahoo, AOL, Google and MSN.

Web portal

The web portal enables subscribers to personalize their service by providing greater control of their every-day communications. End users can perform per-call screening and forwarding, allowing incoming calls to be handled using pre-defined rules based on caller information, as well as on the time of day and the day of week of the call. Other personalization services include multiple device management, which enables users to manage multiple devices as one system, with “one phone number” service and a single, unified communications voice mailbox that is shared by many devices. The architecture of the web portal has been designed to be highly modular, enabling greater customization and portability of web portal functions to other service provider portals.

Video

Users can have multi-point video conferencing from their desktops, without the need for special rooms or complicated dialing procedures. Service providers can offer this choice to customers as an optional video calling feature that is as simple to use as clicking on a name in a personal or group directory.

Voice

Workers can stay in contact while on the road, and families can manage their communications with a soft, second line service that is delivered over broadband DSL and cable infrastructures. Using Session Initiation Protocol (SIP) capabilities, Adaptive Application

Engine software provides comprehensive residential and SMB telephony features, including call forwarding, call hold, call transfer, call waiting, call mute and calling line ID (with name, number and subject) over broadband in a Voice over IP (VoIP) infrastructure. Other consumer-friendly features include a teen service, where you can assign each member of your family with a separate phone number, each having its own distinctive ring.

Other applications, which extend the IP voice and multimedia communications capabilities of the Adaptive Application Engine into advanced NGN 2.0 application domains, include:

IP Voice over IPTV

IPTV and VoIP multimedia can be linked together, and television set-top boxes can become multimedia SIP endpoints, along with mobile phones, PCs and other consumer entertainment devices. Users can enjoy a consistent experience across various device types, taking triple-play to the next level. Voice and data services can be converged into an IPTV environment with the same look and feel as a SIP-based wireline or wireless device.

Web Services

Developers can create communications-enabled applications and integrate them into business processes or social networking activities. For example, teens can include a “Click to Call Me” communication link from their Facebook pages, linking to any wireline or wireless device to complete the call. A business user can receive a ship date confirmation from an inventory system after placing a web-based order from a mobile phone.

Fixed Mobile Convergence

Fixed Mobile Convergence delivers converged wireless service between

cellular and Wi-Fi domains using dual-mode mobile devices. This service includes a dual-mode (cellular/Wi-Fi) handset that works as a regular mobile and as a SIP phone at home or at Wi-Fi hotspots.

In today’s mobile world, consumer and business users will benefit from the convenience that the Adaptive Application Engine delivers. When a user isn’t at home, telephone calls using the single number feature are routed automatically to his or her SIP identity when on Wi-Fi coverage, or to a cellular number if not registered in the SIP network. And, this is only one of the many comprehensive Fixed Mobile Convergence service portfolio options that the Adaptive Application Engine can deliver. Other options include converged mobility, mobile converged desktop, mobile extension, and hosted or mobile assistant.

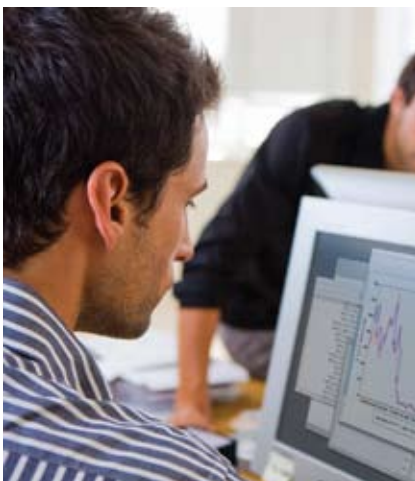
The Adaptive Application Engine Open Programmability Environment: Nortel’s ongoing commitment to enabling open, flexible solutions

The true opportunities delivered by NGN 2.0 lie in its ability to extend IP communications capabilities into the IP applications space. A vast ecosystem of independent software vendors and system integrators exists that can further develop and customize applications and offer infinite communication possibilities. The Adaptive Application Engine continues Nortel’s long history of delivering open, standards-based solutions. The openness and flexibility of the Adaptive Application Engine is based on making communication resources available on a network as independent services or components that can be accessed and made available to create new applications and composite services, delivering a real Service Oriented Architecture (SOA) implementation made in a truly open and simple way.

The Adaptive Application Engine Open Programmability Environment is enabled through:

- Industry-standard development interfaces, including JAIN SLEE, SOAP, Parlay X APIs and ECMA 348, which enable service providers to leverage existing developer skill sets, application development tools and third-party service execution environments. These development interfaces allow service providers to take advantage of the industry-wide acceptance, ease and speed of development, and ready access to a knowledgeable workforce. There are, for example, more than three million Java developers.
- The assistance of third-party interoperability, which makes it possible for service providers to utilize off-the-shelf third-party products and services, such as unified messaging, voicemail and pre-paid calling in the deployment of new services.
- Nortel's Global Services Custom Development Service, which enables service providers to engage trained service developers to facilitate the development and deployment of new services customized to meet their specific needs.

The Adaptive Application Engine provides an industry standards-based solution that enables the end-to-end



service customization capability service providers need to establish a competitive advantage in the market. This openness is driving potential for growth in services revenue and customer loyalty through service differentiation, and is reducing the operational and capital expenditures needed to create and maintain new services.

Adaptive Application Engine deployment model

As many customers are deploying software for communications and applications over common hardware platforms, Adaptive Application Engine software offers a hardware freedom deployment model that enables customers to deploy a hardware solution optimized to meet their specific performance needs. Adaptive Application Engine software extends this model by making use of Nortel's extensive expertise in developing mission-critical systems to deliver true carrier-grade performance.

Hardware freedom model

To provide customers with additional flexibility and opportunities for deployment cost savings, Adaptive Application Engine software will be delivered with a hardware freedom model.

Delivering expanded hardware options

- Adaptive Application Engine software components can be delivered on hundreds of Red Hat Enterprise Linux certified server options expanding the deployment options available to customers.
- Service providers can take advantage of greater vendor savings by using existing server models that are being utilized for other IP applications. Further savings can be achieved through the lower training, spares and other operational costs of using existing server models.

- A turnkey solution model will be offered using high-performance, small footprint servers for customers who require a turnkey solution.
- Nortel Global Services will also offer a service solution to customers who need to deploy a turnkey solution using their own server models.

Support for multiple network configurations in a single release

Adaptive Application Engine software can be deployed into all customers' network models in a single release:

- **Standalone SIP Application Server:** Adaptive Application Engine software brings Nortel's vast experience in IP voice and multimedia communications, and regulatory and gateway functions to deliver a comprehensive, standalone SIP application server.
- **In conjunction with IP softswitches:** Adaptive Application Engine software will deliver NGN 2.0 services as part of an integrated solution with IP softswitches, such as the Communication Server 2000 IP softswitch, which enables advanced SIP communications side by side with full PSTN replacement capability. Communication Server 2000 customers will be able to take advantage of integrated OA&M and provisioning.
- **IMS Application Server:** Adaptive Application Engine software can be deployed as a fully-compliant IMS application server in any IMS network from day one. This functionality enables customers to deploy IMS today, or to deploy Nortel Adaptive Application Engine software as a standalone SIP server today and add IMS to it when the carrier is ready. The Adaptive Application Engine can also run in both modes simultaneously, giving carriers unmatched flexibility in their service delivery and network evolution needs.

Migration for existing Communication Server 2000 and Application Server 5200 customers

The Adaptive Application Engine builds on the market-leading capabilities of the Communication Server 2000 IP soft-switch and the Application Server 5200 application server. Adaptive Application Engine software can be deployed into both the Communication Server 2000 and Application Server 5200 through a simple software upgrade.

Carrier-grade application server

The Adaptive Application Engine delivers the reliability, scalability and manageability needed to deliver profitable mass-market services.

Predictable voice and multimedia performance

- Virtual Call Admission Control (VCAC)
- Key component of end-to-end Quality of Service (QoS) solution

5 9's reliability*

- NEBS-compliant hardware
- Geographic survivability architecture
- Software upgrades that do not require systems to be removed from service

* Based on turnkey solution model

Expanded scalability

- Solution can scale from hundreds to millions of subscribers
- Multiple Adaptive Application Engine systems can be networked as capacity needs dictate

Integrated management and billing

- Comprehensive management, provisioning and accounting functions are incorporated into the Adaptive Application Engine

- Interfaces are available for communication to service provider OSS and billing systems

Regulatory and legal compliance

- Compliance with E911, CALEA and other regulatory and legal requirements

Key specifications

Capacity (SIP hosted communication services application)

- Up to three million SIP subscribers per logical system

Hardware supported

- Hundreds of industry-standard servers are supported as part of Nortel's hardware freedom model

Standards participation

- IETF
- PacketCable
- TISPAN
- 3GPP/3GPP2
- OMA

Protocols supported

- Session Initiation Protocol (SIP) (SIP 3GPP, SIP IETF)
- H.323
- SIP-Telephony (SIP-T)
- RTP/SRTP
- Common Channel Signaling System 7 (CCS7) including regional variants
- Primary Rate ISDN (PRI) including regional variants
- Call Associated Signaling (CAS) including regional variants

Web services

- Parlay X
- HTML/SOAP
- Java-based API
- ECMA 348

Interfaces supported

- 10/100BaseT Ethernet

Management

- SNMP
- XML
- SOAP/HTTP

Conclusion

We are now entering the inflexion point between the migration toward SIP/IP-based voice and multimedia communication over any IP broadband access and the growth of Web 2.0 IP applications. These trends will continue to converge with the integration of IP communications into the applications space. Meanwhile, consumers and businesses are seeking solutions to simplify how communications and applications will be delivered in this NGN 2.0 world.

Nortel's strength in providing real-time capabilities and network-oriented functions, combined with its expertise in the wireless, wireline, carrier, enterprise, applications and infrastructure arenas, brings the true value of communications to business and residential customers. The Adaptive Application Engine's convergence of IP communications and applications delivers a rich feature set and greater customization of services over multiple IP access networks, resulting in enriched yet simpler end-user communications experiences and higher business agility, accuracy, speed and ROI for carriers.

The Adaptive Application Engine delivers multiple key values to service providers, including:

- A comprehensive IP voice and multimedia feature set for residential and business customers
- The hardware freedom model, which increases service provider deployment options and expands scalability from hundreds to millions of subscribers
- The Open Programmability Environment, which provides industry-based protocols that enable millions of developers to develop differentiated new features
- Support for all network configurations in a single release, including a standalone SIP application server in conjunction with an IP softswitch and IMS-compliant application server

Nortel's comprehensive solutions enable carriers to provide business and residential customers with easy and simple implementation of converged communication services. These solutions are offered under the IP Powered Business and Home portfolio and include recommended feature bundles, certified terminals and clients, and marketing support to assist service providers in driving revenue into these segments.

Why Nortel?

Nortel's Global VoIP leadership delivers a key advantage to our customers. According to Dell'Oro, Nortel is the worldwide leader in Carrier VoIP for the last six years (2002-2007). Nortel provides VoIP and multimedia solutions to many of the world's leading service providers, including Bell Canada, Rogers Communications, SaskTel, Telus, Verizon, Embarq, Verizon Business, BT, Cable & Wireless, and Neuf Cegetel. Nortel has deployed its existing SIP applications with more than 100 operators globally.

Nortel is a leader in Gartner's "Magic Quadrant For Softswitch Architecture 2007", which states "IMS product development for incumbent and rural customers demonstrates Nortel's commitment to the market and its feistiness in fending off the competition." Nortel continues to build on this leadership with the launch of our Adaptive Application Engine.



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