Open Communications Architecture Forum

OCAF Focus Group

Accelerating Open Standards for Deploying Next Generation Networks

Open Standards Components for the Telecommunications Industry

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This paper addresses the business and technology challenges impacting the telecommunications industry as it looks to create, adopt and implement cost-effective, mutually beneficial open standards-based infrastructures and commercial off-the-shelf components. It focuses on the leading role the Open Communications Architecture Forum (OCAF) Focus Group plays in building, codifying and publishing a reference framework of functional and nonfunctional requirements, use cases, and specifications that will accelerate the deployment of next generation network (NGN) infrastructure and services throughout the industry.

Key topics addressed in this paper include:

- The business and technology drivers that are impacting the telecommunications industry and the way it develops, markets, packages and sells products and solutions
- The movement towards an industry-wide adoption of open, standards-based architectures, components and building blocks
- How OCAF will provide an agreed-upon framework detailing the interfaces and standards essential to the integration of COTS components into NGNs
- A detailed discussion of the issues and imperatives impacting telecommunications providers, technology vendors and equipment manufacturers
- The opportunities and benefits to be realized by the adoption of OCAF specifications
- How heterogeneous, converged networks that incorporate new open, standards-based requirements will propel innovative services and products while helping to reduce operating and development costs.

1 Introduction: The Telecommunications Industry Transformed

The telecommunications industry is currently undergoing a significant transformation – one that is profoundly revolutionizing overall business strategies, operational infrastructures, supply chains and customer relationships. Intensive industry focus on cost containment and profitability, explosive user demands for price-competitive 24x7 accessibility to services, and the growing number of networked devices are all driving telecommunications service providers, solutions providers, independent software vendors (ISVs) and technology suppliers to rethink, reengineer and reenergize the way solutions are developed, packaged, marketed and sold.

In addition, ever-increasing data-storage and transmission requirements may be having a significant impact on existing infrastructures and circuit-switched networks. These traditional networks, built initially for voice or data communications, often do not have the capacity, scalability or flexibility necessary for accelerating time to market or handling sizable, increasing bandwidth requirements (or even the capability to efficiently handle today's high-bandwidth services).

That is why it now has become business critical and technologically prudent to transform the telecommunications industry via an industry-wide adoption of open standards-based architectures, components and building blocks. That is due to:

- Business leadership directives continuing to focus on reducing capital and operational expenditures to wring additional cost efficiencies to enhance the bottom line

- Senior leadership aggressively looking to grow market share through new market penetration and increased services
- Information technology (IT) leadership seeking a cost-effective, dynamic ecosystem of software developers

These factors are driving technology providers and hardware vendors as well as solution and service suppliers to integrate solutions based on a common architecture and a standards-based taxonomy. This will help afford all industry players the opportunity to achieve a greater return on investment (ROI) and a lower total cost of ownership (TCO).

2 Opening the Infrastructure to Open Standards: The OCAF Mission

For telecommunications providers, manufacturers and vendors to respond quickly to the explosive demands of the marketplace and help foster and support a healthy service-provider community, it is essential that they make the transition from proprietary, "locked-in" network solutions to an open, available ecosystem of software, hardware and professional services. Efficiencies can be gained through:

- **Use of open source platforms such as Linux.®** These platforms can help companies build security-rich, flexible and scalable infrastructures, achieving the levels of cost and time efficiencies crucial to accelerating development processes and speeding time to market.
- **Reuse of high-volume, commercial off-the-shelf components (COTS).** These components have been successfully leveraged by many enterprises outside of the telecommunications space and are now available and fortified to meet the stringent and specific needs of telecommunications-specific vendors.
- **Adoption of and adherence to telecom-specific standards.** These recently created standards (e.g., SAF, NPF, CGL) are cornerstones of the COTS components being developed and reused by solutions providers.

In May 2004, to help expedite the emerging shift to the new COTS model, accelerate the adoption of open standards components, and further the deployment of next generation network (NGN) infrastructure and services, the International Telecommunication Union Telecommunication Standardization Sector (ITU-T) established the Open Communications Architecture Forum (OCAF) Focus Group. The group, which resides under Parent Study Group 13, consists of key communications and information technology representatives from many of today's leading service providers, equipment manufacturers, technology providers and ISVs. *"Our mission is to accelerate the ecosystem of COTS components by creating a reference framework, and then validating that framework with requirements from service and solution providers."* according to Doug Dreyer, Alliance Director, IBM, and OCAF Chair.

This mission is to link to existing standardizations bodies and utilize industry accepted standards to drive industry agnostic elements into an overall specification called the Carrier Grade Open Environment (CGOE) framework as well as help realize OCAF compliance in terms of component use and acceptance. The CGOE framework is a structure for the end-to-end integration of open, next generation telecommunications enterprise solutions.

By working together and leveraging each member's unique proven skills, knowledge and client experiences, this global constituency will produce guidelines (i.e., definitions, functional and nonfunctional requirements, and use cases) for a set of open standards-based components. These efforts, which may result in ITU-T Recommendations, will serve as critical elements in the development of standardized, platform-agnostic COTS components – components that can help in achieving cost reductions while helping to drive services diversification due to convergence.

According to Robert Withrow, Consulting Engineer, Nortel, and Co-Chair of OCAF, *"OCAF is the first forum coming at the crossroads of the IT sector and the telecommunications sector. This forum bridges the service application layer and network infrastructure layer."*

"Telecommunications is basically a platform. It has been that from the very beginning, but for many years it was just a platform for voice. Today, and more so tomorrow, it will be a platform also for communicating objects, for applications, for human to machine communications. Standards were important in the past as an efficient way to create a common agreement among Telcos to deliver effective service in an economical way. Standards in the future will be essential, since they are the link among a variety of industries that are not involved in telecommunications directly but whose business will depend on the use of telecommunications resources." Pileri Stefano, Executive Vice President, Telecom Italia.

3 | OCAF: A Framework for Innovation and Reliability

As service and solution providers shift from proprietary solutions to COTS software and hardware, standards compliance becomes critical to true interoperability between systems and components. OCAF understands that component functionality (i.e., what the function does) and nonfunctional requirements (i.e., the agreed-to attributes of that function) need a consistent definition if solutions are to be deployed successfully. *"By defining what components are required and creating effectively a menu of components and their respective use cases (that is, how to interface to these components), we can help the industry understand how to build solutions,"* says Jim Lawrence, Chief Technology Officer, Clovis Solutions.

To help achieve the goals it has set forth, OCAF comprises two core working groups:

- **Solutions Working Group** – Reviews service scenarios and descriptions, and develops an open standards component/product solution map. The process will identify functional requirements (e.g., logging and signaling), nonfunctional requirements (e.g., scalability, availability and security) and technical requirements.
- **The Carrier Grade Open Environment (CGOE) Working Group** – Develops a reference model using open industry standards and external interfaces to assist in identification, classification and interoperation of COTS components that satisfy the requirements defined by the OCAF Solutions Working Group.

Through the combined efforts of these two working groups, OCAF will provide an agreed upon framework detailing the interfaces and standards essential to the integration of COTS components into NGNs. Providers and manufacturers seeking external vendors to integrate components into their solutions can leverage these requirements in their RFP process, thereby ensuring that compliant components are identified and incorporated into the overall solution. OCAF-compliant "plug-and-play" components from a diverse, global ecosystem of vendors and partners will reduce development costs across the entire telecommunications industry, leading to expedited time to market and higher-value services.

"We need innovation for a healthy industry, starting with the service providers, all the way down to the solution and equipment providers. What we are doing in OCAF is to provide deliverables that undergo a steady process of evolution as technology changes. Service providers are shifting from circuit-switched platforms to next generation network platforms. If we are going to deploy these platforms, the time is now." Dr. Veeru Ramaswamy, Director of Services Technology, Comcast New Media Development and Chair of OCAF Solutions Working Group.

4 **Addressing New Imperatives, Maximizing Return**

To understand the essential role OCAF plays in the burgeoning NGN space, it is vital to examine the issues and imperatives impacting telecommunications providers, technology vendors and equipment manufacturers. Mission-critical issues include:

- The convergence of voice, video and data onto a single network. This drives the need for greater bandwidth, security and QoS requirements and the creation of an open architecture that can handle reliable, low-cost delivery of innovative services to commercial and residential customers.

- Continuing emphasis on driving costs out of product/service development so as to ensure market competitiveness and increased margins. This includes a movement away from proprietary platforms due to the high cost of development, as well as the inability to find third-party support from ISVs. *"Nobody can afford to make an investment in building proprietary solutions. With today's economic environment, the industry needs a new way to do business. What we are trying to do is leverage commodities for as much of the stack as possible…Why should we waste resources and time to differentiate the plumbing, which clients don't see or even care about?"* says Max Bornschlegl, Vice President, Systems Engineering Management Systems, Siemens Communications Carrier Development.

- The emergence of new service providers offering innovative solutions based on newly designed infrastructures—infrastructures built on open standards that dramatically lower costs and increase functionality. The increasingly dense competitive space is pushing market leaders to update and/or replace their infrastructures, resulting in "retiring" existing infrastructures.

- The increasing interest in the latest technologies such as Voice over IP (VoIP), which will operate over sophisticated data networks and NGNs instead of traditional public-switched telephone networks (PSTNs). The sophisticated nature of VoIP has resulted in some users abandoning standard telephone contracts completely. As businesses move to IP Centrex and both commercial and residential customers demand push-to-talk functionality, the increase in data demands (due to the packetized transmission of these technologies) will have a significant impact on existing network resources and storage capabilities.

The Service Availability™ Forum (SAF) is a consortium of industry-leading communications and computing companies working together to develop and publish high availability and management software interface specifications. SAF works to foster an ecosystem that will enable the use of COTS building blocks in the creation of high availability network infrastructure products, systems and services. For more information about this group, its mission and members, please visit www.saforum.com.

5 Driving Change through Open Standards COTS Components

With the adoption of an open-standards component model, the OCAF Focus Group believes a robust ecosystem of component manufacturers and technology providers will drive plug-and-play capabilities across the industry. For the various players within the telecommunications industry, there will be sizable changes, opportunities and benefits realized by the acceleration and adoption of the OCAF specifications.

Telecommunications Solutions Providers

For telecommunications solution providers, the COTS component choices – in middleware and applications – can translate into R&D effectiveness, and in how and what they deliver to their service provider clients. With access to standardized components, these solution providers can benefit from a reduction in development expense and a faster time to market. This allows them to focus on higher-value aspects of their business, and enables them to provide more integrated solutions to service providers.

Until recently, solution providers would create and build all components internally. They now look to become solution assemblers – focused on driving value to their service provider customers. Dr. Bilel Jamoussi, Director, Strategic Standards, CRO Office, Nortel, indicates, *"There is no direct benefit in having our company and our competitors all building stacks. The CGOE reference framework will empower service providers and solution providers to focus on differentiating their offerings by enabling the COTS ecosystem to supply much of the nondifferentiating platform each of them needs."*

Telecommunications Service Providers/Carriers

For service providers, OCAF envisions a robust marketplace where low-cost, readily available, OCAF-compliant COTS components are well-defined. Carriers are eager to adapt as they continually look for new sources of revenue derived from enterprise telephony and consumer-based services. Viable, competitive service providers will drive innovation by combining different technologies, open standards, and OCAF-compliant COTS components from a host of technology providers and ISVs.

"The synergy of service providers along with solutions and technology providers is extremely crucial for providing differential NGN services to customers in a cost-effective and timely fashion. OCAF provides a standardized framework to improve this synergy through the flexibility, interoperability and cost-effectiveness of open COTS-based plug-and-play platforms," according to Steve Craddock, Senior Vice President, Comcast New Media Development.

Service providers also need to reduce capital and operating expenditures to remain cost competitive in their marketplace. *"Operational expense is a critical topic with line of business executives within the provider organization. They are giving significant attention to the OCAF Forum around interoperability, testing, scalability and availability of solutions. How they all can be maintained at a lower cost. And how the operational and support staff can be reduced by the sharing of costs within an enterprise,"* says Ed Bailey, Solution Consultant, IBM.

While a diverse number of components are currently available, there is no clearly defined blueprint for the functional and nonfunctional requirements inherent in these components. This lack of compliance and mutually agreed-to specifications can result in additional time and expense related to customization. Once OCAF specifications become accepted in the telecommunications industry, then minimal customization (e.g., adding applicable APIs) will need to be undertaken.

"In the past, there were no options to buy pieces of our platform from different suppliers; they came from one vendor. Because we now buy from a variety of vendors, we are faced with more complexity in terms of integrating the equipment in our production environment. We can only do well if the building blocks we buy from our vendors are open and standardized." Emery Hanzel, Cisco Director of Engineering, Next Generation Networks Architecture.

While service providers are ready and eager to adapt to and embrace open standards, they need to take necessary actions to help ensure that the emerging platforms and related COTS components will offer the same level of reliability and carrier grade robustness currently available through existing proprietary systems.

Technology Providers and Software Vendors

For technology providers and software vendors, global industry initiatives are critical to driving industry-wide standards around a telecommunications framework. Through standardization and adoption of a common framework, technology providers can minimize the unique customizations currently required on middleware and software products. This increases reuse throughout the industry, which will drive down cost and focus resources on developing new technology solutions for the industry.

"Service providers require building blocks that enable them to deliver services faster, accelerate innovation, reduce lifecycle costs and provide equipment provider choice. They also require a new level of 'future proofness' that protects their investments in NGN. Building blocks integrated from standards-based COTS hardware and software components are critical in satisfying these challenging requirements," states Clovis's Jim Lawrence.

Compliance with OCAF functional and nonfunctional requirements will almost guarantee that technology providers and ISVs meet industry-wide standards. Service providers will desire a level of assurance that when they purchase a specific product there are multiple vendors who can provide similar, OCAF-compliant, open standards-based component functionality for that middleware or software offering.

> *"There will be an acceleration of equipment manufacturers to more of a software-based business…This opens the opportunity for greater functionality to be delivered more quickly to the market as well as the potential for greater interchangeability of components and elements."*
> Bruce Anthony, IBM.

6 Summary: Next Steps to Next Generation Networks

As service providers migrate from legacy voice and/or data networks to flexible, scalable and security-rich next generation networks, standards compliance will be critical to accelerating adoption throughout the industry. Heterogeneous, converged networks incorporating new, open standards-based functional and nonfunctional requirements will help propel innovative services and products into the marketplace while reducing costs associated with redundant processes, proprietary systems and outdated applications. Additionally, by leveraging industry standards, providers, manufacturers and vendors can define their own company-wide standards for business-critical processes, frameworks and methodologies.

The OCAF Focus Group's commitment to standards formulation, distributed architectures and enhanced functionality will help gain widespread acceptance – essential to the successful integration of open building blocks within converged network infrastructures. The importance of defining a common approach will be manifested in the delivery of an interoperable, integrated platform leveraging applicable standards and architectures. The group's dedicated efforts will result in speedier execution, a rich portfolio of OCAF-compliant COTS components and applications, a reduced total cost of ownership related to service delivery, and increased involvement of subscribers in provisioning and administrating services.

> *OCAF's initial charter was established by its founding members: Avaya, Cisco, Comcast, Deutsche Telekom, France Telecom, IBM, Lucent, Nortel, NTT, Siemens and Telecom Italia. This membership has increased significantly since its inception.*

7   For More Information

To learn more about OCAF's role in building a set of recommendations for open standards-based, building blocks/components and the group's overall mission, charter, activities and membership, please visit www.itu.int/itu-t/ocaf.