(U) A SIGINT SOA?

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(U//FOUO) Attention, Systems Engineers and Analysts, Program Managers, Developers, and website, application and database owners: SID is moving toward a Service-Oriented Architecture. What does that entail?

(U//FOUO) Many of you have probably heard the IT industry's enthusiastic support for Service-Oriented Architectures (SOA) as the way forward for large enterprises, or that DOD CJCS doctrine endorses implementation of an SOA to enable network-centric operations, or that the ODNI CIO (responsible for Intelligence Community Enterprise Architecture) specifies an IC-wide SOA to enable an intelligence Information Sharing Environment. Furthermore, the commercial sector's broad scale use of SOA-related technologies will drive many of the products and applications we use in our daily SIGINT mission in this direction.

(U//FOUO) So, what does this all mean for SIGINT? At the minimum, this means that **NSA will need to implement SOA technologies and practices in order to meet IC and DOD mandates for intelligence information sharing.** This movement to an SOA is a good thing, as for many years NSA has been moving to a construct of a service-based architecture consisting of modular mission application services that can be integrated in a flexible, loosely coupled manner.

(U) Advantages of SOA

(U//FOUO) Service-Oriented Architectures use a strategy that organizes the discrete capabilities contained in enterprise applications into interoperable, standards-based services that can be rapidly combined and re-used to meet dynamically changing mission needs. This provides a cost-effective means to leverage existing investments (legacy applications) and integrate new capabilities to provide improved mission capabilities even to authenticated-but-unanticipated users. Moving from the present tightly coupled vertical SIGINT systems to a loosely coupled set of re-usable services that are horizontally integrated provides greater flexibility, extensibility and agility against continuous target communication changes. This also enables cross-domain information sharing and better use of resources. An agile SIGINT system architecture is a critical enabler to cope with the dynamically changing SIGINT target communications environment.

(U) SOA vs. Web Services

(U) The SOA term is often synonymously used with the term Web Services; however, it goes beyond Web Services. Web Services protocols and standards (SOAP , UDDI , WSDL , SAML , etc.) provide the foundation for an SOA but an SOA includes:

- Use of semantic metadata to enable machine and human discovery of data and services;
- Use of an Enterprise Service Bus (ESB) to enable cross-domain integration; and
- Use of Orchestration to enable flexible business process management workflows between loosely coupled services

(Please see our SOA Tutorial for more information.)

(U//FOUO) A key to an SOA is that services have ***exposed interfaces*** with formally controlled Service Level Agreements (SLA) that fully define the service functionality, performance parameters, and invocation mechanisms. Such services must be registered so that they can be readily discovered and invoked by any authorized consumer, and especially by unanticipated users or systems. This allows rapid activation and linkage of services to support new or evolving missions. An SOA makes application functionality available through shared services discoverable

on a network through a Universal Description, Discovery and Integration (UDDI) registry. This will provide a basis for code re-use and application sharing, thereby decoupling applications from the infrastructure.

(U) Next Steps for NSA

(U//FOUO) IC and DOD near-term requirements mandate that NSA establish an on-line (JWICS) UDDI registry where NSA publishes its on-line XML and web services-enabled data files, databases and mission applications so that they are discoverable by IC and DOD users. In FY07, SIGINT System Engineering (SSE) will be leading a cross-functional ITD and SID line-organization IPT (Integrated Product Team) in developing and implementing a web services-enabled UDDI registry and SOA practices. The goal is for SID to get an early prototype SOA learning experience in FY07 so that NSA can begin enabling SIGINT operational SOA services both internally and for external customers (on JWICS) in FY08.

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